



URBANTECH®

FUNCTIONAL SERVICING REPORT

12933 BRAMALEA ROAD

**TOWN OF CALEDON
REGION OF PEEL**

**PREPARED FOR
TACC DEVELOPMENTS**

Urbantech File No.: 22-725

1ST SUBMISSION – JUNE 2026

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1 INTRODUCTION

1.1. STUDY PURPOSE

This Functional Servicing Report (FSR) has been prepared in support of the 12933 Bramalea Road Draft Plan and associated Zoning By-Law Amendment planning application to allow for the proposed development of a residential community on the lands located east of Bramalea Road and south of Old School Road in the Town of Caledon. The 12933 Bramalea Road lands, also referred to as the 'Subject Lands' in this report, are illustrated in **Figure 1.1**.

The Subject Lands includes a portion of the larger Mayfield Tullamore Secondary Plan (MTSP) Area, which extends south to Mayfield Road and east to Torbram Road. Preparation of the 12933 Bramalea Road Draft Plan has been synchronized with the adjacent 12580 and 12552 Torbram Road properties (currently Mayfield Golf Club), also within the Mayfield Tullamore Secondary Plan. Functional servicing design of the Subject Lands and adjacent properties were coordinated with the adjacent properties, referencing the 12580 and 12552 Torbram Road FSR (dated February 2026), prepared by SCS Consulting.

This FSR, prepared by Urbantech Consulting, provides the grading, servicing, and stormwater management design required to support the Draft Plan of Subdivision for the Subject Lands. The purpose of this report is to demonstrate that the development can be graded and serviced in accordance with the Town of Caledon, TRCA, and MECP design criteria.

1.2. BACKGROUND & SUBWATERSHED STUDIES

1.2.1. Mayfield Tullamore Local Subwatershed Study

The MTSP Area consists of approximately 612 ha within the Peel Region's Settlement Area Boundary Expansion (SABE) Study Area. The participating landowners make up approximately 438 ha (71.5%) of the total MTSP Area. The Town of Caledon is undertaking the Mayfield Tullamore Local Subwatershed Study (MTLSWS) in support of the planning framework and urban structure proposed for the MTSP Area within the West Humber River subwatershed.

While the MTLSWS is ongoing, the Phase 1 and Phase 2 reports are available to inform FSR work at the Draft Plan level. The Phase 1 Report, prepared in February 2025, characterized existing conditions, including natural heritage features, hydrologic features, and surface / groundwater systems within study area. The Phase 2 Report prepared in April 2025 introduced the preferred land use plan (of the MTSP) and included analysis, impact assessment, mitigation, and recommendations for stormwater management requirements for future SWM facilities on major reaches in the West Humber River subwatershed.

This FSR builds on the recommendations of the MTLSWS Phase 2 report, including quantity, quality, erosion control, and water balance criteria. The Phase 3 report will develop the detailed SWM strategy, including end-of-pipe facilities and low impact development (LID) measures to meet these objectives. When the Phase 3 report is available, its recommendations will be assessed and the 12933 Bramalea Road FSR will be updated as needed.

1.2.2. Background Documents

In preparation of the 12933 Bramalea Road FSR, the following background documents, reports, standards, and criteria were reviewed:

- Mayfield Tullamore Local Subwatershed Study – Phase 1: Subwatershed Characterization and Integration Report, prepared by GEI Consultants, February 2025;
- Mayfield Tullamore Local Subwatershed Study – Phase 2: Subwatershed Impact Assessment, prepared by GEI Consultants, April 2025.
- Mayfield Golf Club Functional Servicing and Stormwater Management Report, prepared by SCS Consulting, February 2026 (Second Submission);
- Region of Peel Development Charges Background Study – November 2020;
- Region of Peel Water and Wastewater Master Plan for the Lake-Based System, 2020;
- Region of Peel Wastewater Development Charges Mapping, 2026;
- Region of Peel Water Development Charges Mapping, 2026;

This report has been prepared to satisfy the applicable requirements of the following standards, criteria, and guidelines:

- Town of Caledon Development Standards Manual, 2019;
- Peel Public Works Stormwater Design Criteria and Procedures Manual, June 2019;
- Consolidated Linear Infrastructure Environmental Compliance Approval Stormwater Management Criteria, September 2022;
- Region of Peel Public Works Watermain Design Criteria, June 2010;
- Region of Peel Public Works Linear Wastewater Standards, March 2023; and
- Toronto and Region Conservation Authority and Credit Valley Conservation stormwater management, water balance, and natural heritage guidelines, as applicable.

1.3. SITE DESCRIPTION

The Subject Lands encompass approximately 69.9 ha east of Bramalea Road and south of Old School Road, as illustrated in **Figure 1.1**. Adjacent future developments within the MTSP Area include DG Group Sentinel Holdings to the east and Mayfield Golf Course Inc. to the southeast. Smaller future developments and holdout properties are also northeast, west, and south of the Subject Lands. A property ownership map is provided in **Figure 1.3**.

The Subject lands lie within the West Humber subwatershed, with tributary 4(3)4-2 and 4(3)2-1 traversing north to south through the site on the western and eastern portions, respectively. The existing land use consists mainly of agricultural lands and a few rural residential properties at the northern limit.

1.4. PROPOSED DEVELOPMENT

The 12933 Bramalea Road Draft Plan, prepared by GSAI, is illustrated in **Figure 1.1**. It has been prepared in accordance with the land uses and policies in the MTSP and coordinated with the adjacent landowners Mayfield Golf Course Inc. and DG Group, as well as the retained consultants (SCS Consulting).

The proposed land use structure includes two collector roads, Street B and Street C. Street B provides a north to south connection from Old School Road as envisaged by the MTSP. Street C provides a west to east connection, crossing over the Natural Heritage System (NHS) corridor of tributary 4(3)4-2, also consistent with the MTSP.

As illustrated in **Figure 1.1**, the proposed Draft Plan land uses are generally consistent with the land use structure provided in the MTSP. The proposed Draft Plan consists mostly of low density and medium density residential lots, with a mixed-use block at the northwestern corner, fronting the Bramalea Road / Old School Road intersection. Two public park blocks and a public elementary school block are also included, with the latter in a central location with frontage on Street B. The West Humber River tributaries are maintained with the required natural feature buffers.

2 PRELIMINARY GRADING

2.1. PROPOSED GRADING

The proposed grading strategy for the Subject Lands has been developed to provide a coordinated grading framework that supports future development, conforms to applicable Town standards, and maintains positive drainage to the designated stormwater management facilities and downstream outlets. The proposed grading framework, including road grades, development limit tie-ins, overland flow routes, and servicing considerations, is illustrated on **Drawing 2.1** (Preliminary Grading Plan).

As shown on **Drawing 2.1**, the proposed grading strategy has been developed with consideration for the following requirements and constraints:

- Conformance with the Town's grading criteria and development standards;
- Matching existing and/or proposed grades (where applicable) along the boundary roads, including Bramalea Road to the west and Old School Road to the north, where feasible;
- Providing compatible grades at the limits of development, including the interface with the Mayfield Golf Club Inc. lands to the southeast, adjacent lands, natural heritage features and associated buffers, and other grading limits identified through the constraint mapping;
- Maintaining positive drainage to the designated stormwater management facilities, storm sewer outlets, overland flow routes, and downstream receiving systems;
- Considering downstream stormwater outlet invert elevations, which influence storm sewer depths, serviceable drainage areas, and the normal water levels of proposed stormwater management facilities;
- Maintaining existing drainage patterns, where feasible;
- Providing adequate cover over proposed municipal servicing, including confirmation of sufficient depth for the proposed sanitary sewer crossing below West Humber Tributary 4(3)4-1;
- Accommodating logical future grading and servicing connections for adjacent development lands;
- Avoiding unnecessary retaining walls, excessive grade transitions, and isolated low points; and
- Providing safe and continuous overland flow conveyance under major storm conditions.

The proposed grading strategy shown on **Drawing 2.1** maintains the existing drainage intent of the lands, while directing runoff to the proposed storm sewer system, stormwater management facilities, designated overland flow routes, and downstream receiving systems. Grading at the development limits has been established to provide suitable tie-ins to Bramalea Road, Old School Road, adjacent lands, constraint areas, and the Mayfield Golf Club Inc. lands, while avoiding adverse impacts to surrounding properties.

The proposed grades were reviewed in relation to the sanitary servicing strategy, including the proposed sanitary sewer crossing below West Humber Tributary 4(3)4-1. This review confirmed that the grading framework can accommodate the required servicing depth and cover, while maintaining compatibility with the proposed road grading and stormwater management strategy.

Proposed internal road grades are shown conceptually on **Drawing 2.1** and will be designed in accordance with Town standards. Road grades meet the Town's minimum and maximum grade requirements, provide adequate servicing depth, maintain positive drainage, and support future development connections.

Overall, the proposed grading framework provides a functional and coordinated approach for development of the Subject Lands, while maintaining compatibility with boundary roads, adjacent lands, constraint areas, municipal servicing, and the overall stormwater management strategy.

2.2. Boundary Grades and Development Interfaces

The Subject Lands are bounded by Bramalea Road to the west, Old School Road to the north, and the Mayfield Golf Club Inc. lands to the southeast. The proposed development grading must be compatible with these boundary conditions to ensure appropriate road, lot, servicing, and drainage connections. These grading interfaces are shown on **Drawing 2.1**.

The grading approach for each boundary condition is summarized below:

- **Bramalea Road:** Proposed grades along the west limit of the Subject Lands will be coordinated with existing and/or future Bramalea Road grades. The grading shown on Drawing 2.1 provides suitable road, servicing, and drainage connections while maintaining positive drainage to the designated outlets.
- **Old School Road:** Proposed grades along the north limit of the Subject Lands will be coordinated with existing and/or future Old School Road grades. The grading shown on Drawing 2.1 provides appropriate tie-ins to the road corridor and maintains positive drainage for both minor and major storm conditions.
- **Mayfield Golf Club Inc. lands:** The southeast interface with the Mayfield Golf Club Inc. lands will be graded to provide a compatible transition between the development lands and adjacent lands. As shown on Drawing 2.1, the grading considers existing and proposed grades, servicing requirements, stormwater management objectives, and the need to accommodate future development without creating drainage constraints.

Where final adjacent grades or road improvement details are not yet available, the proposed grading shown on Drawing 2.1 has been developed to provide flexibility for future refinement, while maintaining positive drainage, adequate servicing depth, and compatibility with the planned development framework. Further coordination will be required through subsequent design stages to confirm final boundary tie-ins, servicing depths, overland flow routes, and servicing crossings.

3 STORMWATER MANAGEMENT STRATEGY

3.1. EXISTING CONDITIONS

Existing (pre-development) overland flow within the subject site is split between the West Humber Tributaries 4(3)4-1 and 4(3)2-1, within the TRCA Humber River subwatershed, Basin 36.

The West Portion of the site drains to the West Humber River Tributary 4(3)4-1. The North/Central portion of the site drains through an existing 450mm culvert and overland to West Humber Tributary 4(3)2-4.

The East portion of the site drainage to West Humber Tributary 4(3)3-1. West Humber River Tributaries 4(3)2-4 and 4(3)3-1 converge and discharge to Tributary 4(3)2-1.

Tributary 4(3)2-1 subsequently joins Tributary 4(3), which conveys flows downstream toward Tributaries 4(2) and 4(1), together with the City of Brampton Block 48-2 Tributary E.

Pre-development drainage catchments, overland flow direction and ultimate discharge locations are shown on **Drawing 3.1**.

TRCA originally created the Humber River Watershed Hydrology model (Visual OTTHYMO). GEI Consultants conducted a local subwatershed study, in collaboration with SCS Consulting Group in 2025, and provided the LSS Visual OTTHYMO model for the study area to the TACC Caledon study team (Urbantech Consulting) in 2026. This model forms the basis of the hydrologic analysis.

3.1.1. Geotechnical / Hydrogeological considerations

GEI Consultants Canada Ltd. completed a Geotechnical Investigation and Report dated March 25, 2026 and a Hydrogeological Investigation dated June 10, 2026. These studies were prepared in support of the subject lands and provide preliminary geotechnical and hydrogeological recommendations for the Subject Lands. Refer to **Appendix B** for the GEI reports.

Geotechnical Conditions

The geotechnical report indicates that the site is generally underlain by topsoil, cohesive glacial till, layered clay and silt, cohesionless sand/silt/gravel deposits, and lower cohesionless glacial till. These conditions are generally considered manageable for the proposed subdivision development; however, several geotechnical and constructability considerations will need to be addressed through detailed design.

Key geotechnical considerations include the depth and constructability of the proposed sanitary servicing, particularly the deep trunk sanitary sewer and the crossing below West Humber Tributary 4(3)4-1. The sanitary sewer may be located at significant depths below existing grade, and the tributary crossing may require specialized construction methods, potentially including trenchless

installation. Further coordination with GEI will be required as the sanitary sewer alignment, crossing geometry, and road grades are refined.

The report also identifies that deeper excavations may encounter wet cohesionless soils, cobbles, boulders, and groundwater-bearing deposits. These conditions could affect excavation stability, groundwater control, crossing design, bedding requirements, trench support, and construction sequencing. As such, dewatering requirements, excavation methods, and temporary support systems will need to be reviewed further during detailed design.

The proposed stormwater management facility is another key consideration. Depending on the final pond location, depth, groundwater conditions, and permanent pool elevation, a liner may be required to limit groundwater interaction and maintain the intended pond function. Additional subsurface investigation may be required within the final pond footprint to confirm liner requirements, uplift considerations, and pond constructability.

From a cost and schedule perspective, the main geotechnical considerations include potential requirements for additional boreholes, groundwater control, specialized sewer crossing construction, trench support, and SWM pond liner systems.

Hydrogeological Conditions

The hydrogeological report indicates that groundwater levels vary across the site, with local groundwater flow generally toward the southeast, toward tributaries of the West Humber River. The site is within the jurisdiction of the TRCA and the CTC Source Protection Region.

From a source water protection perspective, the GEI report indicates that the site is not located within a Wellhead Protection Area or Intake Protection Zone. However, the northwestern portion of the site is partially located within a Highly Vulnerable Aquifer area, and the site is located within a Significant Groundwater Recharge Area. These designations do not prevent development, but they require appropriate consideration of groundwater recharge, water quality protection, infiltration feasibility, and construction-phase groundwater management.

Construction dewatering is expected to be required for portions of the development, particularly for deeper servicing, the SWM facility, and the sanitary sewer crossing. The hydrogeological report identifies preliminary dewatering rates and notes that dewatering approvals may be required depending on final construction methods, excavation depths, groundwater levels, and anticipated pumping rates. Dewatering discharge may also require quality monitoring and potential treatment prior to discharge, subject to final discharge location and applicable approval requirements.

The hydrogeological report also includes a preliminary water balance assessment. The assessment indicates that, without mitigation, post-development conditions would reduce infiltration and increase runoff relative to existing conditions.

As a result, stormwater management and low impact development (LID) measures may be required to maintain water balance objectives, where feasible. A preliminary LID plan to address the infiltration deficit under post-development conditions is discussed further in **Section 3.5**.

Potential LID measures may include amended topsoil, rooftop runoff disconnection, infiltration galleries, bioswales, soakaway systems, or other measures, subject to final grading, servicing, soil permeability, groundwater separation, source water protection requirements, and Town/TRCA approval.

Overall, the geotechnical and hydrogeological reports do not identify any single constraint that precludes development of the Subject Lands. However, they identify several items that will require continued coordination during detailed design, including deep sanitary sewer construction, the tributary crossing, construction dewatering, SWM pond liner requirements, groundwater protection, and water balance/LID requirements.

3.2. Proposed Drainage

The proposed drainage system for the Subject Lands consists of a minor storm sewer system and a major overland flow system. The proposed storm sewer and overland flow drainage patterns are illustrated on **Drawing 3.2**. The storm sewer design sheets are provided in **Appendix C**.

3.2.1. Minor System

The minor storm sewer system has been designed to convey the 10-year storm event in accordance with the Town of Caledon design standards and the applicable IDF parameters. Flows in excess of the 10-year storm event will be conveyed overland through the major drainage system to the designated stormwater management (SWM) facilities and outlet locations.

The storm sewer inverts at the SWM facility inlets will be established such that the storm sewer system is not surcharged during the 10-year storm event, taking into consideration the corresponding extended detention water level in the receiving SWM facility. This will be confirmed during detailed design through a hydraulic grade line analysis.

3.2.2. Major System

The major drainage system will consist of the proposed internal road network and overland flow routes. The road network will be graded to safely convey excess runoff up to the 100-year storm event within the proposed right-of-way limits and toward the designated SWM facilities and outlet locations.

The major system flow routes and drainage directions are shown on **Drawing 2.1** and **Drawing 7.1**. The capacity of the major system will be confirmed during detailed design through overland flow analysis, once final grading and servicing plans are available. The major system flow width will not impact capacity, since the drainage areas are relatively small and additional capture can be provided to ensure that the road capacity is not exceeded.

3.3. Stormwater Management Strategy

As shown on **Drawing 3.3** and **Drawing 7.1**, three stormwater management facilities are proposed to provide stormwater controls for the proposed neighbourhood/residential development areas. The

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SWM facilities are located within the West Humber River watershed and will be designed to satisfy the applicable stormwater management criteria established through the Mayfield Tullamore Local Subwatershed Study.

The proposed SWM facility locations have been selected based on the following considerations:

- utilizing existing and natural low points to minimize earthworks and maintain existing drainage patterns, where feasible;
- providing permanent pool storage with outlets to the designated receiving watercourse;
- maintaining existing flow input locations along the receiving watercourse, where feasible;
- minimizing storm sewer depths, lengths, and pipe sizes;
- efficiently using land while maximizing the serviceable drainage area; and
- maintaining positive drainage to the designated stormwater management outlets.

One SWM facility, identified as SWM Facility 1, is proposed within the TACC Caledon lands. Two additional SWM facilities, identified as SWM Facilities 3 and 4, are located south of the Subject Lands and will receive drainage from portions of the TACC Caledon lands. The design of SWM Facilities 3 and 4 was prepared under separate cover by SCS Consulting, as part of the Mayfield Golf Club Inc. Functional Servicing and Stormwater Management Report, dated February 2026.

SWM Facilities 3 and 4 were designed using allowable release rates for the 2-year through 100-year storm events, based on the unit flow equation for Humber River Sub-Basin 36. Regional storm controls were also established to control proposed Regional Storm flows to existing conditions.

The SCS Consulting hydrologic modelling included preliminary assumptions for the contributing drainage area and imperviousness from the TACC Caledon lands. The current hydrologic modelling completed by Urbantech Consulting has refined the drainage areas and imperviousness values based on the most current development concept, grading, and servicing information. Urbantech's modelling will be used to confirm whether SWM Facilities 3 and 4 (designed by others) provide sufficient storage for the updated drainage conditions.

The functional design of SWM Facility 1, located in the northwest portion of the Subject Lands, has been completed by Urbantech Consulting.

3.3.1. Imperviousness

The preliminary SWM facility sizing requires an estimate of the imperviousness for each contributing drainage area. The catchment imperviousness is a parameter used in the VO6 hydrologic model in order to determine proposed peak flow rates and required SWM storage volumes.

The imperviousness value for each drainage catchment was determined based on the proposed Draft Plan land use composition within each drainage area. The imperviousness assumptions for each land use were generally adopted from the Mayfield Golf Club Inc. Functional Servicing and Stormwater Management Report, prepared by SCS Consulting, to maintain consistency with the modelling parameters used for SWM Facilities 3 and 4. The adopted imperviousness values are summarized in **Table 3.1**.

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Table 3.1: Percent Imperviousness by Land Use

Land Use Type	Percent Imperviousness
Single Detached	63%
Street Townhouse	65%
Back-to-Back Townhouse	90%*
Rear-Lane Townhouse	90%*
Mixed Use / Retail	90%
School	77%
Park	15%
Walkway	15%**
Buffer / Open Space	0%
SWM Pond	50%
NHS	0%
Residential Reserve	65%***
Road Widening	100%
Road ROW	100%

* Assumed to be equivalent to "Laneway Townhouses" in the imperviousness table from the Mayfield Golf Club Inc. FSR.

** Assumed to be equivalent to "Parks/Vista Blocks" in the imperviousness table from the Mayfield Golf Club Inc. FSR.

*** Assumed to be equivalent to "Townhouses" in the imperviousness table from the Mayfield Golf Club Inc. FSR.

The catchment areas draining to the proposed SWM facilities are shown on **Drawing 3.3** and the corresponding weighted imperviousness values are summarized in **Table 3.2**.

Table 3.2: Pond Catchment Areas and Imperviousness

Catchment	Total Area (ha)	Impervious Area (ha)	Imperviousness (%)
SWM Pond 1	8.79	7.09	80.7
SWM Pond 3	79.40	56.46	71.1
SWM Pond 4	14.76	8.52	57.7

3.3.2. Stormwater Management Criteria

The stormwater management requirements for the Subject Lands are based on the criteria established through the Mayfield Tullamore Local Subwatershed Study and applicable TRCA, Town of Caledon, and CLI-ECA requirements.

The Subject Lands ultimately outlet to the West Humber River system, including West Humber Tributary 4(3)4-1, Tributary 4(3)3-1, and Tributary 4(3)2-1, where the TRCA criteria for Humber River subwatershed Basin 36 applies.

The applicable criteria include water quality control, erosion control, quantity control, Regional Storm control, and water balance requirements, as summarized below.

Water Quality Control

The West Humber River tributaries require Enhanced Level 1 water quality control, equivalent to long-term removal of 80% total suspended solids, in accordance with the MOE Stormwater Management Planning and Design Manual, 2003.

For the Subject Lands, water quality control will be provided through a treatment train approach, including end-of-pipe SWM facilities and LID measures, where feasible. The proposed strategy will also consider the Town of Caledon's CLI-ECA stormwater management criteria, which prioritizes retention, LID filtration, and conventional stormwater management in that order.

Erosion Control

Erosion control targets for the West Humber River were established through the Mayfield Tullamore Local Subwatershed Study. The erosion control criteria is to release the 25 mm runoff volume from the proposed SWM pond over an extended detention of 48 hours. As per the TRCA SWM criteria and the Mayfield Tullamore LSWS, an additional on-site retention of 5 mm is required for erosion control.

Quantity Control

As identified in the Phase 1 Mayfield Tullamore Local Subwatershed Study, prepared by GEI Consultants, the Subject Lands are located within the Humber River watershed, Sub-Basin 36.

The Humber River hydrology assessment considered both the 6-hour and 12-hour AES storm distributions for the 2-year through 100-year storm events. The 6-hour AES storm distribution was adopted for quantity control design, as it resulted in more conservative peak flows and larger quantity control requirements. The Regional Storm was assessed using the last 12 hours of the Hurricane Hazel storm distribution under AMC III conditions.

The allowable release rates for the 2-year through 100-year storm events were established based on Unit Flow Equation F for Humber River Sub-Basin 36, as identified in Table E.1 of the TRCA Stormwater Management Criteria. The Regional Storm allowable release rate was established based on the existing Regional Storm peak flow rate to each outlet.

The following three downstream outlet locations were identified for the Subject Lands, as shown on **Drawing 3.1**:

- Outlet 1, located on tributary 4(3)4-1 south of SWM Pond 1 and south of existing drainage catchments 201B and 202B.
- Outlet 3, located on tributary 4(3)2-1 south of SWM Pond 3 and south of existing catchment 103.
- Outlet 4, located on tributary 4(3)2-1 south of SWM Pond 4 and south of existing catchment 105, upstream of the confluence of tributaries 4(3)2-1 and 4(3)2-4.

The existing / target Regional Storm peak flows from the Subject Lands to the outlet locations are summarized below in **Table 3.3**.

Table 3.3: Pond Catchment Areas and Imperviousness

Design Storm	Outlet 1	Outlet 3	Outlet 4
Regional Storm	8.55 m³/s	12.75 m³/s	1.99 m³/s

For the portion of the Subject Lands draining to SWM Facility 1, the applicable TRCA quantity control targets are summarized below in **Table 3.4**.

Table 3.4: Pond Catchment Areas and Imperviousness

Design Storm	Sub-Basin 36 Unit Flow Rate Equation	Unit Flow Rate
2-Year Storm	$9.506 - 0.719 \ln(A)$	0.0079 m³/s/ha
5-Year Storm	$14.652 - 1.136 \ln(A)$	0.0122 m³/s/ha
10-Year Storm	$17.957 - 1.373 \ln(A)$	0.0150 m³/s/ha
25-Year Storm	$22.639 - 1.741 \ln(A)$	0.0189 m³/s/ha
50-Year Storm	$26.566 - 2.082 \ln(A)$	0.0220 m³/s/ha
100-Year Storm	$29.912 - 2.316 \ln(A)$	0.0249 m³/s/ha
Regional Storm, Outlet 1	Existing Regional Storm peak flow	8.55 m³/s

The proposed SWM facilities will be designed to control post-development flows to the applicable allowable release rates for the 2-year through 100-year storm events and to the existing Regional Storm peak flow rates.

CLI-ECA Stormwater Management Requirements

The proposed stormwater management strategy will also be designed to address the Town of Caledon's Consolidated Linear Infrastructure Environmental Compliance Approval stormwater management criteria.

For water quality control, the CLI-ECA criteria require control of the 90th percentile storm event. Where conventional end-of-pipe stormwater management facilities are required, Enhanced Level 1 protection, equivalent to 80% TSS removal, is to be provided.

The CLI-ECA criteria establish the following hierarchy for water quality control:

1. Retention through infiltration, reuse, or evapotranspiration;
2. LID filtration; and
3. Conventional stormwater management.

The CLI-ECA also requires that post-development annual groundwater recharge be controlled to meet pre-development recharge conditions. Any infiltration deficit must be addressed through infiltration-based measures.

3.3.3. Thermal Mitigation Requirements

Thermal mitigation practices are recommended in the Subwatershed Study for Mayfield Tullamore Local Subwatershed Study. Thermal mitigation can be achieved by implementing effective stormwater management facility measures (shading, orientation, outlet design, floating islands, etc.), including LIDs. Thermal mitigation options will be further refined through Draft Plans and detailed design and will reference CVC's *Thermal Impacts of Urbanization including Preventative and Mitigation Techniques*" (draft, December 2010).

3.4. SWM Pond Design

The proposed SWM ponds are designed as wet pond facilities incorporating a wet forebay and subsequent wet cell. Flow between the forebay and wet cell is routed via a submerged weir. The proposed SWM ponds are able to meet or exceed all the SWM pond criteria discussed previously in **Section 3.3.2**. SWM pond configuration and design has respected the guidelines as set out by the Ontario Ministry of the Environment's (MOE) Stormwater Management Planning and Design Manual (March 2003).

The preliminary designs of the SWM ponds include:

- The side slopes within the ponds are 4:1 from the bottom of the permanent pool to 0.5 m below the normal water level, and from 0.5 m above the normal water level to the top of pond. 7:1 slopes are provided from 0.5 m below the normal water level to 0.5 m above the normal water level.
- The side slopes on the outside of the pond are 4:1 and were graded to match the proposed grades at the pond block boundaries.
- Grades around pond blocks are set to match the proposed development grades.
- The access roads are currently located around the SWM facility at the free board elevation and

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extend to reach the headwalls, outlet structures and sediment drying areas.

- The width of the access road is 5.0 m. The purpose of the access road is to provide a suitable road for machinery at the time of maintenance to reach the outlet/inlet structures and the bottom of the sediment forebays in order to be properly cleaned.
- A 0.3 m freeboard is established above the active storage water level.
- Invert elevations of inlet pipes in the SWM facilities were assumed at the permanent pool elevation.
- The pond outlets discharge to the nearest watercourse. Ponds located adjacent to Mayfield Road are proposed to discharge to the culverts that are proposed to be constructed by the Region.
- Further detailed design will be completed in accordance with the Town of Caledon and the Ontario Ministry of Environment (MOE) Design Criteria. Refinements will be made to the inlet and outlet structures, access roads and emergency overflow spillways.
- Overall minimum facility length-to-width ratio of 3:1.
- Minimum forebay length-to-width ratio of 2:1.
- Maximum permanent pool depth of 3 m.
- Maximum active storage depth of 2.3 m.

All reasonable assumptions have been made based on standard current engineering practice. Outfall configurations have only preliminarily been sited and will require further site investigation and design considerations.

The preliminary designs of the SWM ponds have been completed to establish the required size of each of the SWM blocks to ensure sufficient lands are provided. The initial drafting process of the SWM ponds was iterative and attempted to optimize use of the SWM blocks and minimize impacts to the surrounding lands.

3.4.1. SWM Pond Stage-Storage-Discharge Characteristics

The preceding sections provide the storage volume and flow targets for the 2 to 100-year and Regional storm events, based on the SWM criteria from the Subwatershed Studies.

The permanent pool volume for each of the proposed SWM facilities was sized according to Table 3.2 in the MOE's Stormwater Planning and Design Manual (2003). The quality control sizing calculations for the proposed SWM facility are provided in **Appendix D**.

The 6-hour AES storm distribution was used as it resulted in more conservative volumes compared to the 12-hour AES storm distribution.

The preliminary stage-storage-discharge curves based on the proposed grading, and release rate requirements, were developed for proposed SWM facility 1 using VO6, as summarized in **Table 3.5** below.

Table 3.5: SWM Pond 1 Stage-Storage-Discharge Relationship

Storm Event	Required Volume (m ³)	Provided Volume (m ³)	Stage (m)	Target Release Rate (m ³ /s)
Permanent Pool	1,798	3,650	264.70	N/A
Extended Detention	1,766	1,864	265.20	0.017
2-Year	2,139	2,344	265.30	0.070
5-Year	2,779	2,836	265.40	0.107
10-Year	3,230	3,342	265.50	0.132
25-Year	3,804	3,860	265.60	0.166
50-Year	4,228	4,391	265.70	0.194
100-Year	4,653	4,662	265.75	0.219
Regional	7,190	7,240	266.20	0.923

The stage-storage-discharge data for SWM Facility 1 provided in **Table 3.5** is subject to change based on the detailed outlet structure design for the proposed SWM pond facility. However, the target storage volumes and discharge rates will be maintained, unless the proposed drainage areas are revised at detailed design. Rating curves for SWM facilities 3 & 4 used in the VO6 model were maintained, per the Mayfield Golfclub VO6 model provided by SCS Consulting, for consistency. The VO model output is shown in **Appendix D**.

3.4.2. Drawdown Time

Preliminary orifice sizing was completed to determine the drawdown time of the extended detention volume in SWM Pond 1. As discussed in **Section 3.3.2**, the erosion control criteria is to release the 25 mm runoff volume from the proposed SWM pond over an extended detention of 48 hours.

Table 3.6: Extended Detention Orifice Sizing

SWM Pond	Extended Detention Volume (m ³)	Extended Detention Release Rate (m ³ /s)	Orifice Size (mm)
SWM Pond 1	1,766	0.017	110

As per the drawdown time calculations provided in **Appendix D**, the drawdown time for the proposed pond is 2 days (48.8 hours), which meets the erosion criteria.

3.4.3. Downstream assessment / External SWM Facilities

A comparison of peak flows was completed to confirm that the proposed SWM controls, including Regional control, will mitigate any increase in downstream peak flows at selected outlet locations resulting from the subject development. The three outlet locations were compared in the existing and proposed conditions VO6 model scenarios in order to measure impacts of the subject development on downstream peak flows.

The following tables summarize the peak flow comparison at the outlets for existing and proposed scenarios.

Table 3.7: Outlet 1 (NHYP 41) Peak Flow Comparison

Storm	Existing Peak Flow (m ³ /s)	Proposed Peak Flow (m ³ /s)
2-Year	0.737	0.773
5-Year	1.248	1.292
10-Year	1.626	1.673
25-Year	2.133	2.182
50-Year	2.532	2.581
100-Year	2.937	2.986
Regional	8.545	8.439

Table 3.8: Outlet 3 (NHYP 62) Peak Flow Comparison

Storm	Existing Peak Flow (m ³ /s)	Proposed Peak Flow (m ³ /s)
2-Year	1.447	0.583
5-Year	2.524	0.821
10-Year	3.345	1.053
25-Year	4.463	1.626
50-Year	5.351	2.140
100-Year	6.265	2.672
Regional	12.747	11.458

Table 3.9: Outlet 4 (NHYD 26) Peak Flow Comparison

Storm	Existing Peak Flow (m³/s)	Proposed Peak Flow (m³/s)
2-Year	0.185	0.051
5-Year	0.328	0.119
10-Year	0.440	0.180
25-Year	0.594	0.260
50-Year	0.718	0.329
100-Year	0.847	0.399
Regional	1.997	1.385

The results demonstrate that there is a reduction in peak flow at the selected outlet locations under post-development conditions, confirming that appropriate mitigation has been provided in the proposed SWM facilities.

As per the Mayfield Golf Club FSSR (February 2026) prepared by SCS, Ponds 3 and 4 did not have explicit volumes designated for the various return period events. However, based on the storage requirements determined with the VO6 hydrology model and the maximum volume provided, per the FSSR by SCS, it was confirmed that Ponds 3 and 4 are sufficiently sized to manage the drainage from the subject lands.

Table 3.10: Pond 3 Required Volumes

Pond 3 Design Events	Volume Required (m3)
2-Year	17,254
5-Year	23,957
10-Year	28,117
25-Year	32,564
50-Year	35,733
100-Year	38,818
Regional	61,053
Maximum Storage Provided	66,842

Table 3.11: Pond 4 Required Volumes

Pond 4 Design Events	Volume Required (m3)
2-Year	2,980
5-Year	3,928
10-Year	4,505
25-Year	5,246
50-Year	5,797
100-Year	6,338
Regional	12,430
Maximum Storage Provided	13,300

Refer to **Appendix D** for the digital model files and results.

3.4.4. SWM Pond Inlet and Outlet Design

Inlet and outlet size and locations for each pond are shown on **Drawing 7.1**. The size of inlet pipes has been minimized where possible; however, box culverts are preferred as they can provide greater conveyance capacity with less pipe depth in locations where cover is limited.

The proposed pond inlet structures will be designed according to the Town standards and will discharge into the pond forebay. The forebay will be designed according to the settling and dispersion length equations provided in Section 4.6.2 of the MOE SWM Planning and Design Manual (2003).

The SWM pond facilities will have multiple outlet components, including extended detention, flood flows, emergency spillway and a maintenance drawdown pipe or sump (where applicable). The pond outlet details will be determined at the detailed design stage.

The extended detention pipe will consist of a reverse-slope bottom draw pipe extending from the bottom of the pond to an orifice plate on the control structure. The submerged end of the proposed bottom draw pipe will be fitted with a perforated pipe section of sufficient area of opening and will be protected by a gravel jacket. The orifice plate will be sized to meet the required extended detention flows and required drawdown time. The orifice plate will be bolted onto the outlet structure with the invert set at the permanent pool water level. To prevent potential blockage of the extended detention control by debris, etc., a minimum orifice size of 75 mm is desirable.

A series of orifices or a compound weir knock-out will be designed at the detailed design stage for the pond outlet control structure in order to achieve the quantity control target flows.

The conveyance of emergency flows (i.e., uncontrolled Regional flows) through the SWM pond facilities will be accommodated by emergency outlet structures within the pond set above the Regional pond operating water level, in the event that all outlet structures within the SWM pond are blocked. The emergency conveyance details will be provided at the detailed design stage for the proposed SWM facilities.

If the grading and pond design permit, maintenance sumps or drawdown pipes will be provided to drain the facilities for the purpose of maintenance works. These operations and maintenance structures will also connect to the pond outfall structures.

The proposed outfall headwalls for the pond outlets will be designed to Town Standards.

3.4.5. Pond Naturalization

The main purpose of stormwater management is to maintain watershed hydrology and protect the ecological health and integrity of downstream waterbodies by providing the flood, erosion and water quality controls necessary to protect downstream ecosystems. In addition to these functions, SWM facilities can complement and support adjacent natural heritage systems and their ecological functions. As this green infrastructure is typically constructed adjacent to valley and creek corridors which form part of natural heritage systems, they can enhance linkage and buffering functions and opportunities to improve the condition quality of adjacent natural features. Many of these functions can be achieved by naturalizing components of the SWM facilities by planting a diversity of locally native trees, shrubs and groundcovers.

The use of native species in naturalization is beneficial to maintaining and enhancing local biodiversity. Often times, adjacent natural heritage systems are in a degraded ecological state and have lost much of their native biodiversity, so providing a source of native seed nearby can help to restore these systems.

Consistent with the *Stormwater Management Facility Planting Guidelines* (CVC 2003) and *Thermal Impacts of Urbanization including Preventative and Mitigation Techniques* (CVC 2011), it is recommended that locally native tree, shrub and groundcover species be utilized for landscaping the proposed SWM facilities.

The purpose of inlet and outlet plantings is two-fold:

- To provide shading of incoming and outgoing water; and
- To help prevent substrate erosion.

Numerous native trees and shrubs can be utilized for these areas including, trembling aspen, large-toothed aspen, red maple, sugar maple, speckled alder, red-osier and grey dogwood, nannyberry, and numerous native species of willow.

Landscaping plans for the proposed SWM pond facility will be prepared at detailed design.

The timing of SWM pond landscaping is dependent on timing of development. Plant species that are dependent on the permanent pool elevation will not be installed until it is confirmed that the SWM facility functionally maintains the permanent pool elevations. Further, no planting of any proposed aquatic species in the sediment forebay and/or areas of the permanent pool will be undertaken until after initial cleaning and subsequent assumption.

3.4.6. Thermal Mitigation Measures

A number of mitigation measures were considered in this study, including mitigation measures that research suggests will have an impact on reduction of water temperature (where feasible).

Of specific interest is the CVC study “*Thermal Impacts of Urbanization including Preventative and Mitigation Techniques*” (draft, December 2010), which indicated that an east-west pond orientation can reduce the hours of potential solar radiation, although a north-south orientation is preferable for narrow SWM facilities. Similarly, orienting the long side of the facility perpendicular to the prevailing wind direction (west) can assist in reducing thermal impacts.

The Draft CVC Thermal Impacts report identified five “zones” where thermal mitigation measures can be implemented. These include:

- Zone 1 – Up-gradient (i.e., pond catchment area)
- Zone 2 – SWM facility inlet
- Zone 3 – SWM facility
- Zone 4 – SWM facility outlet
- Zone 5 – Riparian corridor

Table 3.12: Thermal Mitigation Measures

SWM Facility Feature	Zone
Energy transfer between warm storm runoff and cool sub-surface storm sewers	Zone 1
LID measures	Zone 1
Roof colour	Zone 1
Downspout disconnection	Zone 1
Up-gradient plantings	Zone 1
Buried inlet pipe	Zone 2
Inlet cooling trench	Zone 2
Inlet plantings	Zone 2
Shading of open water areas by maximizing canopy	Zone 3
Artificial shade systems	Zone 3
Floating island	Zone 3
Reduce open water area	Zone 3
Increased L:W ratio	Zone 3

SWM Facility Feature	Zone
Pond orientation to reduce solar inputs	Zone 3
Pond orientation to increase exposure to prevailing wind	Zone 3
Landscaped jetties for shading	Zone 3
Sub-surface SWM ponds	Zone 3
Outlet sub-surface cooling trench and shading	Zone 4
Concrete outlet pipe	Zone 4
Introduce cool water at SWM pond outlets such as foundation drain collectors (FDC), where feasible	Zone 4
Reversed slope submerged pond outlet and extra permanent pool depth at outlet	Zone 4

As shown on **Drawing 3.5**, thermal mitigation is provided in SWM Pond 1 by the 3 m-deep permanent pool in the pond wet cell.

3.5. SITE WATER BALANCE AND LOW IMPACT DEVELOPMENT

In addition to meeting the quantity, quality, and erosion control targets, the proposed SWM strategy will address water balance requirements for the subject lands. The site water balance aims to mimic pre-development groundwater recharge rates in order to maintain groundwater as a source of flow.

3.5.1. Site Water Balance

A site water balance assessment was conducted by GEI as part of the Hydrogeological Investigation (dated June 2026), in order to determine local pre-development annual infiltration volumes, impacts of proposed development to annual infiltration volumes, and the impact of potential mitigation measures to preserve annual groundwater recharge under post-development conditions.

Development of an area affects the natural water balance. The most significant difference is the addition of impervious surfaces as a type of surface cover (i.e., roads, parking lots, driveways, and rooftops). Impervious surfaces prevent infiltration of water into the soils and the removal of the vegetation removes the evapotranspiration component of the natural water balance. The evaporation component from impervious surfaces is relatively minor compared to the evapotranspiration component that occurs with a healthy vegetation cover. The net effect of the development of a property is expected to be an increase in the water surplus resulting in a decrease in infiltration and an increase in runoff.

Per the water balance assessment prepared by GEI, the subject development will result in a decreased annual infiltration of 63,487 m³/year (-66%), as compared to pre-development conditions.

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The Hydrogeological Investigation by GEI, including the water balance assessment, is included in **Appendix B**.

3.5.2. Low Impact Development (LID) Plan

LID measures are recommended, where practical, in order to promote infiltration and mitigate the overall infiltration deficit resulting from post-development conditions. While end of pipe facilities provide the minimum required SWM controls, the use of LID (Low Impact Design) stormwater management measures can be helpful to reduce the amount of runoff by increasing on-site retention, infiltration, and evapotranspiration. The use of LIDs in a “treatment train” approach has long been endorsed by the TRCA.

There are many LID measures available for use. Techniques to maximize the water availability in pervious areas, such as designing grades to direct roof runoff towards open space areas throughout the development, where possible (e.g., yards, boulevards, landscaped areas, swales, green space in parking lots, etc.), which can increase recharge in the developed area. Where possible, increasing topsoil depths in the pervious areas to retain more water in storage can also assist to reduce runoff volumes and increase the potential for infiltration. Other engineered LID measures such as infiltration and/or exfiltration trenches, HDFs, enhanced grass swales, and bioswales can be used to reduce runoff volumes and increase the potential for infiltration.

Drawing 3.5 shows the interpreted depth of groundwater throughout the subject lands, as well as preliminary preferred locations for LID measures. LID placement is typically best in areas where groundwater is at least 2+ m below proposed grade. As shown on **Drawing 3.5**, there are areas within the subject lands where high groundwater restricts potential locations for LID measures.

The preliminary water balance mitigation plan includes the following LID measures:

- **Park LID:** An infiltration gallery is proposed within the northeast park, as shown on **Drawing 3.5**. These are rectangular trenches lined with geotextile fabric, filled with clean granular stone or void-forming materials. A void ratio of 40% is assumed for the proposed infiltration gallery. Storm runoff from the storm sewer within the ROW adjacent to the park block is to be diverted to the infiltration gallery.
- **SWM Pond LID:** Infiltration chambers are proposed within the SWM Pond 1 block, as shown on **Drawing 3.5**. Infiltration chambers provide large volume of underground void space, all the while maintaining the necessary structural stability for sub-surface Best Management Practices (BMPs). They consist of a variety of proprietary modular structures that can be installed beneath paved parking lots or landscaped areas. Typically featuring open bottoms, perforated side walls, and optional stone-filled reservoirs below, these chambers are versatile in treating runoff from roofs, walkways, parking lots, and roads, given proper sedimentation pre-treatment measures. Due to their significant storage capacity, this technology is often utilized in areas where little to no space is available for other stormwater BMP solutions. Storm runoff from the storm sewer discharging to SWM Pond 1 is to be diverted to the infiltration chambers.

The water balance mitigation proposed as part of the preliminary LID plan is summarized in **Table 3.13** below.

Table 3.13: Preliminary LID plan

Infiltration Galleries	Pond Block LID	Park LID
Total Drainage Area (ha)	7.40	0.88
Total Impervious Area (ha)	6.04	0.28
LID footprint (m ²)	525	280
LID depth (m)	1.40	1.00
Total LID volume (m ³)	735	280
LID infiltration volume (m ³)	735	112

As per the Hydrogeological Investigation by GEI, the proposed water balance mitigation reduces the infiltration deficit from -60% to -26%. Subject to Town approval, if the proposed public LIDs are not feasible due to maintenance constraints, opportunities to incorporate LIDs on private lots (i.e., infiltration trenches) can be investigated.

4 CHANNEL HYDRAULICS / CHANNEL CORRIDORS

The TRCA HEC-RAS model for West Humber Creek Tributary 4(3)4-1 was received and used as the basis for the hydraulic assessment of the proposed road crossing. No changes to the existing channel grading, channel alignment, or overbank grading are proposed as part of the development. Accordingly, the existing HEC-RAS geometry was maintained, with the exception of adding the proposed road crossing. This model was used to establish the Draft Plan development limits / setbacks from the various hazards.

The proposed crossing was modelled as a box culvert with a clear opening of 4.2 m width by 1.8 m height. The purpose of the assessment was to confirm the hydraulic impacts associated with the proposed crossing relative to existing conditions. The resulting existing and proposed water surface elevations are summarized below at the cross-sections that are upstream and downstream of the subject lands. As shown in **Table 4.1**, while there are local impacts due to the crossing, there are no impacts upstream or downstream of the subject lands.

Table 4.1: HECRAS Existing and Proposed WSEL

Station	Existing WSEL (m)	Proposed WSEL (m)	Difference
1765.97	270.91	270.91	0.00
Old School Road			
1738.95	269.19	269.19	0.00
1711.76	268.71	268.70	-0.01
1674.27	268.32	268.32	0.00
1674.27	268.25	268.25	0.00
1652.33	268.22	268.22	0.00
1631.53	268.20	268.21	0.01
1597.70	268.20	268.20	0.00
1564.39	268.20	268.20	0.00
1550.30	266.80	266.79	-0.01
1531.80	266.42	266.79	0.37
1531.80	265.93	266.43	0.50
1511.74	265.16	265.90	0.74
1474.21	264.85	265.90	1.05

Station	Existing WSEL (m)	Proposed WSEL (m)	Difference
1407.88	265.16	265.19	0.03
1370.19	264.85	264.74	-0.11
1304.98*		264.43	
		Proposed 4.2 m W × 1.8 m H Box Culvert	
1284.50	264.02	264.15	0.13
1257.27	263.66	263.75	0.09
1237.27*		263.44	
1205.23	262.97	262.97	0.00
1148.69	262.26	262.26	0.00
1089.95	261.54	261.54	0.00
1039.45	260.28	260.28	0.00

*Station added in Proposed model

The following are recommendations for the implementation and construction of the proposed crossing:

- Construction should be carried out within the existing channel during low-flow conditions and as regulated by the fisheries timing window, or as dictated by the Conservation Authority.
- The design elements are unique and as such, the designer or representative should be part of construction supervision to ensure proper installation and function of the design elements. Onsite supervision will ensure a rapid response to construction issues.
- Dewatering discharge should be pumped at least 30 m from the channel through a filter bag prior to release on the floodplain. The water should be dispersed across the floodplain through straw bales or Filtrexx Silt Soxx.
- All materials and equipment used in the construction should be maintained to prevent deleterious substances from entering the water. A staging area, with appropriate erosion controls, should be placed away from the work area. All re-fuelling and maintenance should be conducted in the staging area.

5 SANITARY SERVICING

5.1. Existing Sanitary Servicing and Regional System Capacity

The subject lands are serviced by the Region of Peel's lake-based wastewater system, which collects wastewater from the Town of Caledon, City of Brampton, and City of Mississauga. The lake-based system consists of the G.E. Booth wastewater treatment facility and a network of gravity sewers (both trunk and local).

Wastewater generated from the development area will be conveyed south / south east, via the proposed sanitary trunk sewer crossing of the West Humber Tributary 4(3)2-1 extended through the proposed Mayfield Golf Course Inc. development.

- Wastewater generated from the lands east of Bramalea Road / west of the West Humber Tributary 4(3)4-1 will cross beneath the tributary at Street C, for connection to the trunk along Street B for ultimate tie in to the future sewer connection.
- Wastewater generated from the balance of the subject lands will also drain towards the connection at Street B.

The entire development relies on the proposed connection to the sanitary trunk through the Mayfield Golf Course Inc. lands. This trunk is identified on the Region's water/wastewater master plan as a 750mm diameter sewer, scheduled for completion in 2032 (component number 56949 / project number 31-2198).

If required to accommodate development timing, the landowner/developer group, including the Mayfield Golf Course Inc. lands, may enter into a front-ending agreement with the Region for delivery of necessary Regional infrastructure ahead of the capital program planning schedule (subject to budget availability/approval).

5.2. Background and Guiding Studies for Sanitary Servicing

The sanitary servicing design for the subject lands has been prepared in accordance with the strategies put forth in the following higher-level planning documents:

- Region of Peel DC Infrastructure study (2026)
- Peel Public Works Linear Wastewater Standards (March, 2023)
- Mayfield Golf Club Inc. FSSR (SCS, February 2026)
- Regional DC Infrastructure Capital Program and associated mapping ([Year])

The proposed sanitary servicing strategy outlined in this FSR has been prepared in accordance with the servicing concepts established in the SCS FSSR and is consistent with the Regional Master Servicing Plan and Region standards.

5.3. Proposed Sanitary Servicing Strategy

Drawing 5.1 shows the proposed sanitary servicing strategy for the subject lands, including all existing and future Regional service connections. The development area is intended to be serviced by a series of local sub-trunk sewers, generally draining from north to south / west to east, connecting into the planned trunk sewer on the Mayfield Golf Course Inc. lands.

The Mayfield Golf Course Inc. FSSR by SCS indicated a 600mm sanitary trunk downstream of the subject lands. The sanitary connection through the Mayfield Golf Course Inc. lands was not sized in the SCS FSSR, but based on the drainage area / population approaching the connection at Street B, a minimum size of 675mm is required for the connection, with a larger trunk downstream (likely 750mm as suggested by the Region's DC study).

Internal sanitary sewers are generally 200mm, with sub-trunks extending to capture external drainage areas from the west and east in the range of 450mm to 675mm.

Sufficient level of detail regarding the sanitary sewer design was completed at this FSR stage to ensure that both internal lands and external lands can be serviced to meet Municipal and Regional standards. The sanitary sewer design demonstrates servicing viability without placing undue restrictions on the following external areas:

- Ext-1A - north of Old School Road with an area and population of 64.44 ha / 4,511 people, respectively (connection at MH246 on Street B)
- Ext-2A – west of Street X / east of West Humber Tributary 4(3)4-1 with area and population of 3.48 ha / 244 people, respectively (connection at MH66A on Street DD)
- Ext-3A – west of Bramalea Road (sewer extension by others), with area and population of 187.29 ha / 16,701 people, respectively (connection at MH70A on Street X).

Servicing of the subject lands ensures sufficient sewer depth and sewer size to accommodate future connections.

5.4. Sanitary Design Criteria and Wastewater Generation Rates

Regional wastewater design criteria and design standards are taken from the Peel Public Works Linear Wastewater Standards (March 2023). Pipe size, slope, and depth will follow the current Design Manual.

Table 5.1: Regional Wastewater Generation Design Criteria

Population Type	Average Dry Weather Flow (L/cap/day)	Peaking Factor	Inflow & Infiltration (L/s/ha)
Residential	290	Harmon Formula	0.260

The Harmon Formula is applied as follows:

$$PF = 1 + 14 / (4 + (P/1000)^{0.5})$$

Where PF = Peaking Factor (minimum 2.0, maximum 4.0) and P = Tributary equivalent population. The extraneous flow (inflow and infiltration - I&I), is used as an allowance to account for any infiltration and inflow that makes its way into the wastewater system over the lifespan of the infrastructure. The I&I rate of 0.26 L/s/ha generally applies to the gross area of all lands (all land use types) at the FSR stage.

The design flow is determined as:

$$\text{Design flow} = (\text{DWF} \times \text{PF}) + \text{I\&I}$$

Where:

- DWF = Dry weather flow based on Daily per Capita Flow × Equivalent Population
- I&I = 0.26 L/s/ha × Gross Tributary Area (ha)

Populations were calculated based on the following Regional criteria:

Table 5.2: Population Densities

Housing / Land Use Type	Density (persons/ha)
Single Family (≥ 10 m frontage)	50
Single Family (< 10 m frontage)	70
Semi-Detached	70
Townhouses	175
Apartment Buildings	475
Light Industrial	70
Commercial	50

Notes:

- Where the proposed population equivalent for apartments exceeds 475 persons/hectare, the design population shall be calculated based on 2.7 persons per unit × No. of Units / Area.
- For institutional uses: Junior Public Schools = 1/3 × students (600 minimum); Senior Public Schools = 1/2 × students (900 minimum); Secondary Schools = 2/3 × students (1,500 minimum); Hospitals = 3 persons/bed.
- For future/external lands where unit counts are not yet available, use the persons-per-hectare method with appropriate density for the anticipated land use.
- Population densities taken from the Peel Linear Wastewater Standards and the Region's latest DC Background Study. These values may be superseded by future updates to Regional standards.

Pipe sizing is determined using Manning's formula. The Region's minimum pipe size is 200 mm diameter. Additional pipe design criteria per the Regional Linear Wastewater Standards:

Parameter	Requirement
Coefficient of roughness (Manning's n)	0.013 (all pipes)
Minimum grade – starting legs	1.00%
Minimum grade – 250 mm pipes	0.40%
Minimum grade – 300 mm pipes	0.35%
Minimum grade – pipes > 300 mm	0.30%
Minimum velocity	0.6 m/s (0.75 m/s per some Regions)
Maximum velocity	3.0 m/s
Maximum d/D at design flow	70%
Pipes 200 mm to 525 mm	Non-pressure designed
Pipes ≥ 600 mm	Pressure designed (hydrostatic test to 345 kPa / 50 psi)

Refer to the Sanitary Sewer Design Sheet in **Appendix C** and **Drawing 5.1** in **Appendix C**.

6 WATER SERVICING

6.1. WATER DISTRIBUTION

The subject lands are serviced by the Region of Peel's lake-based water system, which distributes water from (Lake Ontario to the Town of Caledon, through the City of Mississauga and City of Brampton). The Region's lake-based system consists of treatment facilities, pumping stations / reservoirs, and distribution systems.

Water service to the development will be provided from the Region of Peel's Pressure Zone 7 system. AECOM Canada ULC completed a detailed hydraulic analysis of the proposed water servicing (West Tullamore Water Servicing Hydraulic Analysis, September 2025, Final). The findings of that study form the basis of this section.

6.2. Existing System

The existing Zone 7 water system in the vicinity of the subject lands is supplied primarily by the Mayfield Elevated Tank (Zone 7C), which receives water from the North Brampton Pumping Station and the Alloa Pumping Station. Currently, no dedicated pumping station or storage facility exists in the Zone 7 East (7E) sub-area where the development is situated.

According to the AECOM study, key regional infrastructure planned under the Region's Development Charges (DC) Master Plan includes:

- A 400 mm watermain on Old School Road (Zone 7) — Project No. 31-1199, C-2034 (Components 58494, 58496);
- A 400 mm watermain distribution extension (within the subject lands) running from Dixie Road to Bramalea Road, south of Old School Road — DC Project No. 51591, currently planned for 2033;
- The Victoria Reservoir — Project No. 10-1966, C-2026 (Component 58652);
- The Victoria Pumping Station (Zone 7) — Project No. 28-1580, EA-2028 (Component 22350); Project No. 30-1963, D-2030 (Component 23447); C-2032 (Component 23448);
- The West Caledon Elevated Tank (Zone 7) — D-2026 (Component 58668); Project No. 23-1941, C-2028 (Component 20685); and
- A 300 mm local distribution watermain on Torbram Road (by others) — Project No. 31-1198, C-2032 (Component 58508), with a future connection to the subject lands. While this main provides an additional point of connection, it is not anticipated to be required for system pressure or fire flow adequacy based on the hydraulic analysis results.

While the West Caledon Elevated Tank is not located in close proximity to the subject lands, the AECOM study confirmed that it provides additional storage capacity to the Zone 7 system as a whole.

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Under the 2031 scenario with the West Caledon Elevated Tank, Mayfield Elevated Tank, Victoria Elevated Tank, and Victoria Reservoir/Pumping Station all in service, the Zone 7 system maintains normal storage fluctuation, satisfactory pressures (40–100 psi), and available fire flows exceeding 100 L/s at all nodes within the development area.

6.3. Proposed Water Servicing

The development will connect to the Zone 7 system via the proposed 400 mm watermain on Old School Road and along Street C, as well as the 300mm watermain proposed on the Mayfield Golf Course Inc. lands at Street B. Future connections by others are proposed to the Torbram Road distribution main at Street C and the 300mm extension at Bramalea Road.

The local watermain will be sized through additional water distribution analysis at detailed design. Refer to **Drawing 6.1** for the proposed water distribution system.

6.4. Design Criteria

The hydraulic modelling evaluation was conducted in accordance with the Ministry of the Environment, Conservation and Parks (MECP) guidelines and the Region of Peel's linear design standards (March 2023). The following criteria were applied:

Parameter	Requirement
Normal operating pressure	40–100 psi
Minimum pressure under fire flow	20 psi
Maximum pipe velocity (normal conditions)	2.0 m/s
Minimum available fire flow	100 L/s at each node

6.5. Water Demand Estimates

Water demands were calculated by AECOM using the Region of Peel's current consumption rates (average day demand and maximum day demand) and peaking factors, as summarized below. Note that the AECOM study, dated 2025, may represent a slightly different area and population compared to the more recent sanitary analysis.

Land Use	Area (ha)	Density (ppl/ha)	Population	Consumption (L/cap/d)	ADD (L/s)	Peaking Factor	MDD (L/s)
Detached / Street Townhouse	25.81	70	1,807	250	5.23	1.8	9.41
Rear Lane Townhouse	6.29	175	1,101	250	3.19	1.8	5.73
Back to Back Townhouse	1.51	175	264	250	0.76	1.8	1.38
Mixed Use	1.04	70	73	250	0.21	1.8	0.38
Park / Open Space	3.39	80	271	210	0.66	1.4	0.92

Land Use	Area (ha)	Density (ppl/ha)	Population	Consumption (L/cap/d)	ADD (L/s)	Peaking Factor	MDD (L/s)
School	2.84	80	227	210	0.55	1.4	0.77
Total	40.88	—	3,743	—	10.60	—	18.59

The total residential Maximum Day Demand (MDD) is 16.9 L/s and the employment MDD is 1.69 L/s, for a combined study area MDD of 18.59 L/s and an Average Day Demand (ADD) of 10.60 L/s.

6.6. Hydraulic Analysis Results

AECOM updated the Region of Peel's hydraulic model with the latest master planning demands and DC infrastructure corresponding to scenario years 2026, 2028, and 2031. Key results are summarized below:

2026 MDD Scenario:

- System pressures meet the 40–100 psi requirement under normal conditions.
- Available fire flows are insufficient when the development is served only via the Old School Road watermain.
- With the advancement of DC Project #51591 (400 mm watermain from Dixie Road to Bramalea Road) to 2026, and the addition of the 400 mm Bramalea Road connection, fire flows meet the 100 L/s minimum at all nodes and system redundancy is achieved.

2028 MDD Scenario:

- System pressures meet all requirements.
- Available fire flows meet the minimum 100 L/s criteria even without the Bramalea Road connection.
- The Mayfield Elevated Tank exhibits a draining pattern under base conditions due to inadequate pumping to Zone 7 — a system-wide deficiency not attributable to the subject development. Advancement of the Victoria Pumping Station to 2028 resolves this issue and restores normal tank level fluctuation.

2031 MDD Scenario:

- All key infrastructure (Mayfield ET, Victoria ET, Victoria PS, West Caledon ET) is in service.
- System pressures and fire flows meet all design criteria.
- Storage levels at all Zone 6 and Zone 7 facilities fluctuate normally.

6.7. Storage and Pumping Considerations

A desktop storage and pumping capacity analysis determined that the Mayfield Elevated Tank (Zone 7C) has an existing storage deficit relative to MECP requirements for emergency, fire, and equalization volumes, even without the subject development considered. The following servicing strategy has been identified to address this deficit:

- **2026:** Transfer Zone 7C equalization volume to Alloo Reservoir and North Brampton Reservoir.

- **2028:** Expedite construction of the Victoria Reservoir and Pumping Station.
- **Post-2028:** Transfer Zone 7C fire storage from Mayfield ET to Victoria Reservoir; restore equalization storage to Mayfield ET.

Implementation of this strategy results in satisfactory storage conditions across all pressure zones through 2030. The pumping capacity analysis confirms that North Brampton PS, Alloa PS, and Victoria PS (once operational) can collectively service forecasted Zone 7 demands.

6.8. Summary and Recommendations

Based on the hydraulic analysis, the proposed development can be adequately serviced through the Region of Peel's Pressure Zone 7 system, subject to the following:

- **Advancement of DC Project #51591** — The 400 mm watermain south of Old School Road (Dixie Road to Bramalea Road) should be advanced from 2033 to 2026 to enable the Bramalea Road looping connection and satisfy fire flow requirements under initial build-out conditions.
- **Advancement of Victoria Pumping Station** — The Zone 7 Victoria Pumping Station should be advanced from 2030 to 2028 to address system-wide pumping deficiency and maintain normal storage fluctuation at Mayfield ET.
- **Internal Distribution** — The internal watermain network shall consist of a 400 mm loop connecting to both Old School Road and Bramalea Road, providing adequate capacity and redundancy for domestic and fire protection demands.

The detailed hydraulic analysis is appended to this report in **Appendix C** (AECOM, *West Tullamore Water Servicing Hydraulic Analysis*, Project No. 60748510, September 2025, Final).

7 ROADS

7.1. ROAD NETWORK

The Subject Lands are located within the broader Mayfield Tullamore Secondary Plan study area reviewed in the Transportation Impact Study Update prepared by BA Group, dated February 11, 2026. The proposed road network for the Subject Lands has therefore been developed to integrate with the broader planned transportation framework, while also providing appropriate access, grading, servicing, stormwater management, and development connectivity for the Subject Lands.

The proposed road pattern generally aligns with the Mayfield Tullamore Secondary Plan framework and the road network assumptions reviewed through the Traffic Impact Study Update. The broader transportation network is based on the use of the existing arterial road network for access to and from the community, supplemented by an internal collector and local road system. The collector road network is intended to provide primary vehicular access to the boundary road network, support future transit access, and form the primary internal cycling spine for the community. Local roads are intended to provide access within the planned development areas and are to be designed as accessible, low-speed streets that are safe for all road users.

The Transportation Impact Study Update notes that the collector road network has been refined through discussions with the Town of Caledon and is generally consistent with the Town's January 2026 Multi-Modal Transportation Master Plan Addendum. Within the broader Secondary Plan study area, the collector road network includes two east-west urban corridors and residential collector roads that provide north-south and internal circulation. The proposed road framework for the Subject Lands has been coordinated with this broader network to support permeability, connectivity to boundary roads, active transportation, and future transit access.

7.2. ROAD RIGHTS-OF-WAY

The proposed internal road network is shown on Drawing 2.1 – Preliminary Grading Plan, and the corresponding right-of-way cross-sections are provided on Drawing 7.4.1 to Drawing 7.4.5. The proposed road sections are based on applicable Town of Caledon standard road cross-sections and include the following:

Drawing 7.4.1: 8.0 m laneway right-of-way;
Drawing 7.4.2: 18.0 m local road right-of-way;
Drawing 7.4.3: 20.0 m neighbourhood collector right-of-way;
Drawing 7.4.4: 23.5 m residential collector right-of-way with multi-use path; and
Drawing 7.4.5: 26.0 m urban collector right-of-way.

The Transportation Impact Study Update identifies that 26.0 m rights-of-way are proposed for urban corridors, consistent with the recommendations of the MMTMP Addendum, and that 23.5 m rights-of-way are proposed for residential collector roads. The report also notes that the Town requires the local road right-of-way to follow the Town's standard local road section, that the 23.5 m minor collector section accommodates on-street parking and multi-use paths, and that a 26.0 m major

collector right-of-way is considered sufficient. The proposed road cross-sections have been prepared to reflect the agreed Town requirements and will be refined, as required, through subsequent detailed design.

7.3. FUTURE ROAD IMPROVEMENTS AND CROSSINGS

The broader transportation study also identifies planned improvements (by others) to the surrounding road network, including widening and urbanization of Old School Road, Bramalea Road, and Torbram Road by the Town of Caledon. Highway 413 is also planned north of Old School Road, with a planned interchange at Bramalea Road. The proposed road network for the Subject Lands has been developed with regard for these future boundary road and regional transportation improvements.

One road crossing of West Humber Tributary 4(3)4-1 is proposed within the subject lands. The crossing has been located to support the planned road network and maintain connectivity through the development, while coordinating with grading, servicing, stormwater management, and environmental constraints. The detailed design of the crossing will be completed in accordance with applicable Town, Region, and conservation authority requirements, including hydraulic, environmental, grading, servicing, and erosion protection considerations.

The proposed road network has been coordinated with the grading and servicing strategy to maintain positive drainage to the designated storm sewer system, stormwater management facilities, and overland flow routes. Road grades have been developed to match boundary conditions, accommodate future development connections, maintain servicing cover, and avoid isolated low points. Final road profiles, intersection grading, transit stop locations, active transportation facilities, and traffic control requirements will be confirmed through subsequent detailed design and transportation review.

7.4. TRAILS

The active transportation network for the Subject Lands will be provided primarily through sidewalks within the proposed road rights-of-way. The sidewalk network is intended to provide safe and continuous pedestrian connections throughout the development, including connections to internal roads, future development blocks, community destinations, boundary roads, and transit opportunities.

Sidewalks will be provided in accordance with the applicable Town of Caledon standards and will be coordinated with the proposed road cross-sections, grading, servicing, utilities, and stormwater management infrastructure. The sidewalk network will also support pedestrian access to the broader active transportation system planned for the surrounding area.

No trails are proposed within the Natural Heritage System as part of the Subject Lands. It is noted that the Town of Caledon Active Transportation Master Plan (June 2024) identifies broader active transportation opportunities in the vicinity of the Subject Lands, including potential opportunities

within the Natural Heritage System east of the site and along Bramalea Road. These broader opportunities are external to the Subject Lands and would be completed by others, if implemented.

The proposed active transportation approach for the Subject Lands is therefore limited to sidewalks within the planned road network. Final sidewalk locations, widths, grading, and connections will be confirmed through subsequent detailed design in accordance with Town standards.

8 DEVELOPMENT STAGING and ESC PLANNING

Preliminary development staging and sub-phases have not yet been determined, and may be subject to the timing of the external infrastructure works.

If required to accommodate development timing and phasing, the proponent and adjacent developments may enter into a front-ending agreement with Peel Region to deliver necessary regional infrastructure ahead of the capital program planning schedule. This will be further discussed as planning proceeds.

Considerations for interim phasing of stormwater management, water, sanitary and floodplain channelization will be reviewed, as required, with the Planning Authorities at an appropriate time in the process. Coordination will be necessary to ensure adequate site access, servicing, etc.

8.1. Erosion and Sediment Control Plan During Construction

Rigorous erosion and sediment control measures will be designed, implemented and maintained throughout the construction period. At detailed design, an Erosion and Sediment Control Plan will be prepared and designed in conformance with the Town and Conservation Authority guidelines (e.g., Erosion and Sediment Control Guide for Urban Construction (2019)).

Erosion and sediment control will be implemented for all construction activities including topsoil stripping, earthworks, foundation excavation and stockpiling of materials and will remain in place and functional until bare surfaces are stabilized.

The following erosion and sediment control measures are typical for this type of development:

- Natural features will be staked, and temporary fencing provided to keep machinery out of sensitive areas.
- Sediment control fence and snow fence will be placed prior to earthworks.
- Logistics/construction plan will be implemented to limit the size of disturbed areas, minimizing the non-essential clearing and grading areas.
- Temporary sediment ponds
- Rock check-dams and cut-off swales will be provided, where required, in order to control, slow down and direct runoff to sediment basins.
- Sediment traps will be provided.
- Gravel mud mats will be installed at construction vehicle access points to minimize off-site tracking of sediments.
- All temporary erosion and sediment control measures will be routinely inspected / monitored and repaired during construction. Temporary controls will not be removed until the areas they serve are restored and stable.

- The “multiple barrier approach” will be applied to all construction stages to ensure erosion is prevented rather than reduced. Recommended measures are to be installed prior to the initiation of the earthworks and grading.

Permit applications will be prepared to support any grading works within and adjacent to TRCA regulation limits. Temporary sediment control ponds will be constructed at locations of the ultimate SWM pond. E&SC measures will be implemented to protect diversion channels and watercourses at all times during construction, including tunnelling operations and road crossings.

9 CONCLUSION

This Functional Servicing Report has been prepared in support of the proposed development at 12933 Bramalea Road in the Town of Caledon. The report confirms, at a functional level, that the Subject Lands can be graded, serviced, and provided with stormwater management infrastructure in accordance with applicable Town of Caledon, Region of Peel, TRCA, CLI-ECA, and Mayfield Tullamore Local Subwatershed Study requirements.

- The proposed grading strategy provides a coordinated framework for development of the Subject Lands. The preliminary grading has been developed to maintain positive drainage, match existing and future boundary conditions along Bramalea Road and Old School Road, provide suitable interfaces with adjacent lands including the Mayfield Golf Club Inc. lands, and accommodate municipal servicing, stormwater management, overland flow routes, and future development connections.
- The geotechnical and hydrogeological investigations completed by GEI Consultants Canada Ltd. identify no single constraint that precludes development of the Subject Lands. However, the reports identify several items requiring further review through detailed design, including deep sanitary sewer construction, the sanitary sewer crossing below West Humber Tributary 4(3)4-1, construction dewatering, SWM pond liner requirements, groundwater protection, and water balance/LID requirements. Additional coordination with GEI is ongoing with respect to the site water balance, which may inform the final LID strategy, including the type, location, feasibility, and sizing of infiltration or retention-based measures.
- The proposed storm drainage system consists of a minor storm sewer system and a major overland flow system. The minor system has been designed to convey the 10-year storm event, while flows exceeding the minor system capacity will be conveyed overland through the proposed road network to the designated stormwater management facilities and outlet locations. The major system capacity, storm sewer hydraulic grade line, and final inlet/outlet elevations will be confirmed through detailed design.
- The stormwater management strategy includes three SWM facilities serving the Subject Lands and contributing external drainage areas. SWM Facility 1 is located within the Subject Lands, while SWM Facilities 3 and 4 are located to the south within the Mayfield Golf Club Inc. lands and were previously designed by SCS Consulting. Urbantech's current modelling has refined the drainage area and imperviousness assumptions for the TACC Caledon lands and confirms that the proposed SWM strategy is intended to provide the required water quality, erosion, quantity, Regional Storm, thermal mitigation, and CLI-ECA water balance controls.
- SWM Facility 1 has been functionally designed as a wet pond facility and provides the required permanent pool, extended detention, and active storage volumes for the applicable storm events. The proposed pond outlet controls have been sized to meet the required erosion and quantity control release rates, and the proposed drawdown time satisfies the erosion control target. The proposed SWM strategy also demonstrates that post-development peak flows are controlled at the identified downstream outlet locations.

- The TRCA HEC-RAS model for West Humber Tributary 4(3)4-1 was used to assess the proposed road crossing. No changes to the existing channel grading, alignment, or overbank grading are proposed. The model was updated only to include the proposed road crossing, represented as a 4.2 m wide by 1.8 m high box culvert. The results indicate that hydraulic impacts are localized to the immediate vicinity of the proposed crossing, with no impacts to water surface elevations at the upstream or downstream limits of the assessed reach.
- Sanitary servicing for the Subject Lands will be provided by a local and sub-trunk sewer network conveying flows toward the planned sanitary trunk sewer through the Mayfield Golf Club Inc. lands. The proposed sanitary design confirms that the Subject Lands can be serviced and that future/external drainage areas can be accommodated without placing undue restrictions on adjacent lands. The timing of downstream Regional sanitary infrastructure will require continued coordination with the Region of Peel and adjacent landowners. If required, front-ending of Regional infrastructure may be considered to support development timing.
- Water servicing will be provided from the Region of Peel Zone 7 lake-based water system. The proposed water servicing strategy relies on planned Regional watermain infrastructure, including the Old School Road watermain and future internal and external watermain connections. Based on the supporting hydraulic analysis completed by AECOM, the Zone 7 system is expected to provide adequate pressures and fire flow under the planned infrastructure scenario. Final watermain sizing and detailed hydraulic confirmation will be completed through detailed design.
- The proposed road network has been coordinated with the broader Mayfield Tullamore Secondary Plan transportation framework and the Traffic Impact Study Update. The internal road network, right-of-way sections, active transportation provisions, and proposed crossing of West Humber Tributary 4(3)4-1 will be refined through detailed design in coordination with the Town, Region, TRCA, and adjacent landowners, where required.
- Erosion and sediment control measures will be implemented during construction to protect downstream watercourses, natural heritage features, storm infrastructure, and adjacent lands. Detailed erosion and sediment control plans will be prepared as part of subsequent design submissions.

Based on the analyses completed to date, the proposed development can be supported from a functional servicing, grading, stormwater management, sanitary servicing, water servicing, and road infrastructure perspective. Further refinements will be completed during detailed design to confirm final grading, servicing alignments, hydraulic grade lines, SWM facility details, LID requirements, dewatering requirements, crossing design, utility coordination, and agency approval requirements.

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APPENDIX A

DRAWINGS AND FIGURES

APPENDIX B

APPENDIX C

APPENDIX D

APPENDIX E

APPENDIX F

APPENDIX G