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FUNCTIONAL SERVICING REPORT

FOR

RICHCRAFT HOMES
TRAILS EDGE NORTH

CITY OF OTTAWA

PROJECT NO.: 20-1195

JUNE 2025

FUNCTIONAL SERVICING REPORT

FOR

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TRAILS EDGE NORTH

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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by the Richcraft Group of Companies to prepare a Functional Servicing Report (FSR) in support of a draft plan of subdivision application for the proposed Trails Edge North development. This document supports the initial servicing strategy for the development area and provides an overview of the anticipated municipal infrastructure requirements related to water, sanitary, and storm services. This FSR has been prepared in coordination with supporting technical studies, including a geotechnical investigation, environmental reports, and planning documentation submitted as part of the application.

The study area is located within the City of Ottawa's urban boundary, in Innes Ward. The site is bounded by future residential lands to the west, Mer Bleue Road to the east, existing commercial lands fronting Innes Road to the north, and a Hydro Corridor to the south. The study area encompasses approximately 82 hectares and includes the following land parcels:

- PIN 04404-1303
- PIN 04404-0280
- PIN 04404-0503
- PIN 04404-0539
- PIN 04404-0541
- PIN 04404-0542
- PIN 04404-0543
- PIN 04404-0544

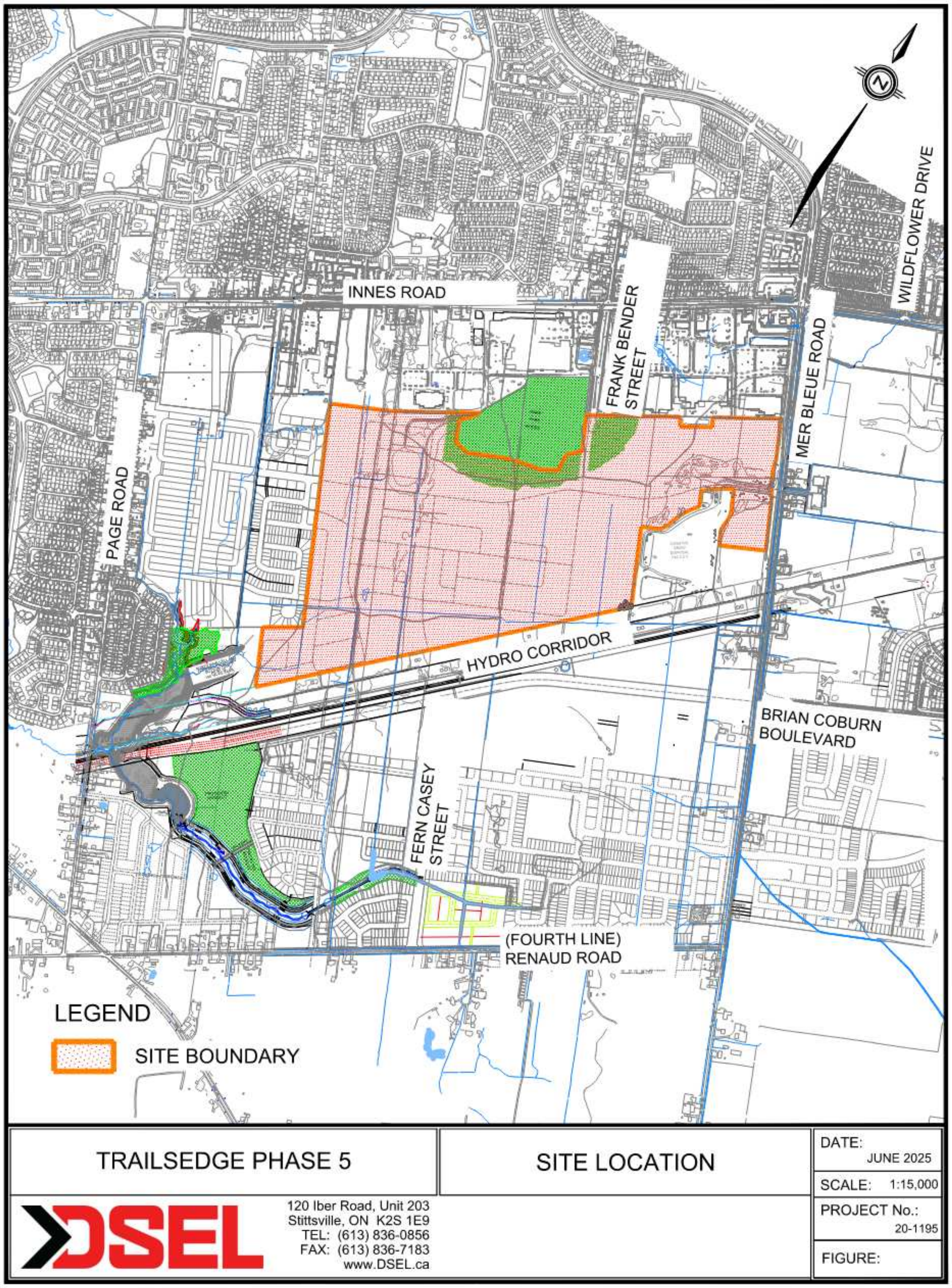

Figure 1-1: Study Area Location

The proposed development includes a mix of residential, employment, and open space uses supported by a local road network with right-of-way widths ranging from 13.40 m (window street adjacent to SWM pond) to 28m (Fern Casey extension).

This FSR builds upon the recommendations and servicing framework established in the *Master Servicing Study for East Urban Community Phase 3 Area Community Design Plan* (MSS) (DSEL, Dec 2020), which identifies the trunk infrastructure and servicing strategy required to support development across the broader Phase 3 area.

The Master Servicing Study was completed to support the Official Plan Amendment based on the East Urban Community Phase 3 Area Community Design Plan (CDP) (Fotenn, 2020), and established a coordinated approach for stormwater management, water distribution, and sanitary servicing.

The MSS identifies existing municipal infrastructure and environmental constraints, outlines the neighbourhood-level trunk services required to support all properties within the study area, establishes stormwater management targets for future site-specific plans, and identifies the infrastructure upgrades necessary to support full build-out.

The purpose of this report is to:

- Present a preliminary servicing strategy to support the Trails Edge North subdivision application;
- Confirm that municipal services can be provided in accordance with the City of Ottawa's design standards and the MSS framework;
- Identify where deviations from the MSS strategy may be appropriate to support efficient development phasing or optimization of infrastructure; and,
- Outline the general approach to stormwater management, minor and major system conveyance, and outlet strategies for the site.

This report is intended to inform City and Agency review of the draft plan of subdivision application and will be further refined through detailed design.

1.1 Existing Conditions

The Trails Edge North study area consists primarily of Greenfield land, historically cleared for agricultural purposes. The following provides an overview of current site conditions based on available documentation, planning context, and technical studies. Select soil and groundwater information is summarized from the *Geotechnical – Existing Conditions Report (PG3130-3, Revision 2), prepared by Paterson Group, dated April 24, 2025.*

Site Description and Topography

The study area is located in the Innes Ward of the City of Ottawa, within a mixed-use context. It is bounded by commercial lands to the north, Mer Bleue Road to the east, future residential development to the west, and a hydro corridor to the south. The site is generally flat, with a mild slope trending westward and southward, and sits approximately at grade with adjacent roadways and properties. A snow disposal facility operated by the City of Ottawa is located at 2170 Innes Road, adjacent to the southern site boundary. A stormwater management facility is located in the northwest portion of the site and currently provides treatment for runoff from the existing commercial development. Treated flows are directed via open ditch to the existing East Urban Community (EUC) Pond 1 stormwater management facility, which serves the broader Phase 3 area.

Drainage and Watershed Context

As identified in the Master Servicing Study (DSEL, 2020), the site has historically contributed drainage to both the Mud Creek and Bilberry Creek watersheds. Based on the most recent delineation at the time of the MSS, the full study area is now understood to drain to the Mud Creek watershed. Runoff from the existing SWM facility flows southward to EUC Pond 1 via an open conveyance system.

Soil and Groundwater Conditions

Subsurface conditions vary across the site. In the northern portion, shallow bedrock is overlain by topsoil, silty sand, and stiff silty clay or clayey silt. The remainder of the site is generally underlain by sensitive silty clay. The bedrock geology consists of interbedded limestone and dolomite of the Gull River Formation, with overburden thicknesses ranging from 0 to 30 m. Atterberg limit testing of the silty clay yielded Plasticity Index values between 24 and 51, confirming high plasticity. Grain size distribution tests supported the soil classifications observed in the field.

Groundwater levels measured during the geotechnical investigation ranged from 0.2 m to 7.3 m below existing grade. Long-term groundwater is estimated between 2.5 m and 3.5 m, with seasonal fluctuations anticipated.

Development Constraints and Adjacent Lands

As noted in the Geotechnical – Existing Conditions Report, East Urban Community Mixed Use CDP (Paterson Group, April 2025), certain areas of the site are subject to maximum permissible grade raises of 2.0 m and 2.5 m. Development in areas where shallow bedrock is present may require blasting, subject to further detailed review.

To the west of the study area, Glenview Homes is advancing a residential development at 3610 Innes Road. A preliminary road and servicing network for Trails Edge North has been coordinated to reflect this adjacent context. Drawings 1–4 illustrate the current development interface and are subject to refinement through subsequent applications

1.2 Development Concept

The proposed development concept for Trails Edge North is illustrated in Appendix A. The plan includes a balanced mix of residential, employment, park, and open space land uses, supported by a structured and interconnected road network. The residential component comprises approximately 253 detached single-family homes, 367 traditional townhomes, 56 bungalow-style towns, 83 dual front towns, and 144 back-to-back towns. In addition, five multi-unit residential blocks are proposed to accommodate a range of low, medium, and high-density housing forms. Employment areas, public parkland, and open space corridors are integrated to support community needs and create a complete neighbourhood.

The street network has been designed to align with the City's road classification standards, incorporating a hierarchy of local and collector roads. Local streets will be constructed with right-of-way (ROW) widths ranging from 13.40 m (window street adjacent to SWM pond) to 18 m, while collector roads will have ROW widths of 24 m and 28 m (Fern Casey extension). The configuration of the road network reflects refinements made during the Draft Plan of Subdivision stage and considers the preliminary servicing and access alignments of adjacent properties, particularly the Glenview Homes lands to the west.

Table 1-1 below provides a breakdown of residential unit counts and the corresponding population projections based on current City of Ottawa design guidelines population per unit (PPU). These values have been applied consistently to support municipal infrastructure planning, as outlined in this FSR.

Table 1-1: Development Projected Population (Updated 2025)

Land Use	Unit Count	Residential Population (PPU)	Projected Population
Singles	253	3.4	861
Towns	367	2.7	991
Bungalow Towns	56	2.7	152
Dual Front Towns	83	2.7	225
Back-to-Back Towns	144	2.7	389
Subtotal Freehold Units	**903**	—	**2,618**
Block 352 (Low Density)	60	2.7	162
Block 280 (Low Density)	53	2.7	144
Block 261 (Medium Density)	156	2.3	359
Block 388 (High Density)	264	1.8	476
Block 389 (High Density)	240	1.8	432
Subtotal Multi-Units	**773**	—	**1,573**
Total Units	**1,676**	—	**4,191**

While the proposed development concept maintains the general structure outlined in the East Urban Community (EUC) Phase 3 Community Design Plan (CDP) and the associated Master Servicing Study (MSS), refinements have been made to respond to site-specific conditions, updated design standards, and coordination with adjacent development. The resulting total projected population of 4,191 represents a slight decrease (approximately 16%) compared to the MSS projection of 4,868 residents. This remains within the overall servicing capacity anticipated by the MSS.

The subdivision will be implemented in phases, guided by the developer's market and construction strategy. Where necessary, temporary access routes and out-of-phase servicing extensions may be employed to support phased development. These interim measures will be subject to City review and approval.

High-density and mixed-use blocks, as well as the employment lands, are expected to be developed through future site plan control applications. While this FSR outlines the anticipated servicing approach for these blocks, detailed servicing designs will be reviewed and approved through subsequent development applications.

1.3 Required Permits / Approvals

The City of Ottawa must approve detailed engineering design drawings and reports prior to construction of the municipal infrastructure identified in this report. This is expected to occur as part of the next steps in the Draft Plan of Subdivision process.

The specific additional approvals and permits listed in Table 1-2 are expected to be required prior to construction of the municipal infrastructure detailed herein. Please note that other permits and approvals may be required, as detailed in the other studies submitted as part of the Draft Plan of Subdivision application (e.g. Tree Conservation Report, Environmental Impact Statement, Phase 1 Environmental Site Assessment, etc.). Coordination and permissions from the landowner will be required for any infrastructure works located outside of the study area.

Table 1-2: Required Permits/Approvals

Agency	Approval Type	Trigger	Remarks
Ministry of the Environment, Conservation and Parks (MECP)	Environmental Compliance Approval (ECA)	Construction of new sanitary and storm sewers	Required for wastewater and stormwater systems. The City reviews and approves design submissions on behalf of MECP under the Transfer of Review program.
	Permit to Take Water (PTTW)	Dewatering >400,000 L/day	Required for significant groundwater pumping during construction (e.g., for deep servicing or basement excavation). Application includes hydrogeological support documentation.

	Environmental Activity and Sector Registry (EASR)	Dewatering between 50,000–400,000 L/day	Registration-based permit process for moderate-volume dewatering. Typically used where full PTTW is not required but construction still necessitates controlled groundwater removal.
Rideau Valley Conservation Authority (RVCA)	Permit under Ontario Regulation 174/06	Closure or alteration of drainage features, grading in regulated areas	Required where development, grading, or infrastructure works interfere with regulated ditches or existing drainage features within conservation authority jurisdiction. Permit ensures appropriate protection of watercourses and wetland functions.
City of Ottawa	Detailed Engineering Design Approval	Construction of municipal infrastructure	Required under the Draft Plan of Subdivision process. The City must review and approve detailed design drawings and supporting reports to ensure compliance with municipal standards and servicing capacity.
	MECP Form 1 – Record of Watermains (Authorized as a Future Alteration)	Construction of watermains	Required under the MECP Transfer of Review program. The City reviews the design and submits Form 1 documentation confirming conformance with MECP criteria.
	Commence Work Notification (CWN)	Start of construction	A formal notification issued by the City allowing construction to proceed following receipt of all applicable approvals and permits. May require coordination with MECP depending on the infrastructure.
	Legal access or servicing agreements	Infrastructure outside subject lands	Legal access, easements, or permissions may be required for works located beyond the study area boundary, such as sewer outlets or temporary grading. Coordination with affected landowners is necessary.

Please note that the design of the Frank Bender Street extension must consider mitigation measures for the adjacent snake habitat. This right-of-way also accommodates municipal services, including culvert connections. Detailed design of the road and associated services will be required and is expected to be subject to site-specific permitting requirements.

In addition, approvals will be required for the proposed road crossing of the Hydro One Corridor and any associated municipal infrastructure located within the corridor. Coordination with Hydro One will be necessary for both the servicing design and adjacent land use planning.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The preparation of this Functional Servicing Report has been informed by the following applicable engineering guidelines, municipal standards, and supporting technical studies:

City of Ottawa Guidelines and Bulletins

- **Ottawa Sewer Design Guidelines**, City of Ottawa, October 2012 (SDG002)
    - Including all applicable Technical Bulletins.
- Ottawa Design Guidelines – Water Distribution, City of Ottawa, July 2010
    - Including all applicable Technical Bulletins.

Provincial Guidelines

- **Design Guidelines for Sewage Works**, Ministry of the Environment, Conservation and Parks (MECP), 2008
- Stormwater Management Planning and Design Manual, MECP, March 2003
- **Appendix A – Stormwater Management Criteria**, Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA). (MECP)

Supporting Technical Reports

- Existing Conditions Water Budget, Palmer, December 2014
- First Innes Shopping Centres SWM Report – Phase 3 Update, Stantec, February 2006
- Geotechnical – Existing Conditions Report, Paterson Group, PG3130-2, Revision 2, April 24, 2025
- Conceptual Site Servicing and Stormwater Management Report, Novatech, 2020
- Mud Creek Cumulative Impact Study, Stantec, 2020
- Environmental Impact Study for Draft Plan of Subdivision, Kilgour, 2025

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The study area lies within the existing City of Ottawa Pressure Zone 2E. An elevated water storage tank located on Frank Bender Street supports pressure regulation and system balancing within this zone.

The surrounding municipal water infrastructure includes:

- A 600 mm diameter watermain along the Hydro Corridor to the south
- A 400 mm diameter watermain within Mer Bleue Road to the east
- A 300 mm diameter watermain within Jargeau Road to the west
- A 300–600 mm diameter watermain within Frank Bender Street (formerly Belcourt Extension) to the north of the study area
- A 400–600 mm diameter watermain within Innes Road

The existing watermain infrastructure is shown in Drawing 4.

3.2 Water Supply Servicing Design

The water distribution strategy for the study area is based on the alignment and sizing of trunk watermains established in the approved Master Servicing Study (MSS). These mains are required to support full buildout of the East Urban Community Phase 3 Area and have been designed to meet the City of Ottawa's Water Supply Guidelines.

Per the MSS (shown in excerpts in Appendix B), in support of full buildout of the MSS area, the following trunk watermains illustrated in Drawing 4 are required within the study area:

- A 300 mm diameter watermain along Fern Casey Street, connecting to the existing 600 mm main within the Hydro Corridor
- A 300 mm diameter watermain along Frank Bender Street, connecting to the existing 300 mm main on Frank Bender Street to the north
- A 300 mm diameter watermain along Jargeau Road, providing connections to both the existing 400 mm main on Mer Bleue Road and a 300 mm connection within the adjacent development to the west

A conceptual layout of the local watermain network is included in Appendix C, demonstrating that a continuous, looped system can be achieved. While generally consistent with the MSS, some realignment has been made to accommodate the updated road network and servicing corridors.

As part of detailed design, hydraulic modelling of trunk and local watermains will be undertaken to confirm that the proposed local network complies with the City's Water Supply Guidelines.

This process may identify the need for additional servicing easements or minor refinements to the lot fabric in the Draft Plan of Subdivision. Richcraft Homes may also seek approval from the City to implement minor alignment or sizing changes during detailed design, provided that such modifications do not result in adverse impacts on service capacity or environmental conditions.

Table 3-1 summarizes the water supply design criteria used in the preparation of the preliminary servicing concept. The criteria are consistent with the City of Ottawa Water Distribution Guidelines and the MECP Design Guidelines.

Table 3-1: Water Supply Design Criteria

Design Parameter	Value
Residential - Single Family	3.4 p/unit
Residential – Townhome/ Semi	2.7 p/unit
Residential – Apartment	1.8 p/unit
Residential Average Daily Demand	280 L/c/d
Residential - Maximum Daily Demand	2.5 x Average Daily Demand
Residential - Peak Hour Demand	2.2 x Maximum Day
Residential – Minimum Hourly Demand	0.5 x Average Daily Demand
Commercial/Institutional Average Daily Demand	35,000 L/gross ha/day
Park Average Daily Demand	9,300 L/gross ha/day
Commercial/Institutional Maximum Daily Demand	1.5 x Average Daily Demand
Commercial/Institutional Maximum Hour Demand	1.8 x Maximum Daily Demand
Commercial/Institutional Minimum Hourly Demand	0.5 x Average Daily Demand
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350kPa and 480kPa
During normal operating conditions pressure must not drop below	276kPa

During normal operating conditions pressure must not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa
Notes: Extracted from Section 4: Ottawa Design Guidelines, Water Distribution (July 2010), Table 4.1 - Per Unit Populations and Design Guidelines for Drinking Water Systems (MECP, 2008), Table 3-1 Peaking Factors. No Outdoor Water Demand considered for residential uses.	

The MSS contemplated the development of the study area by employing a 15,000 L/min fire flow for the design of the trunk watermain network and an average water demand allowance based on the following consumption rates: single family homes at 570 L/unit/d and 1050 L/unit/day outdoor water demand; towns at 560 L/unit/d; apartments at 400 L/unit/day; and employment at 8500 L/ha/d. The trunk watermain network, as identified in the MSS, was designed accordingly.

Table 3-2 summarizes the preliminary water demand estimates prepared for this report, along with a comparison to equivalent values from the MSS. Detailed calculations are provided in Appendix C.

Fire flow requirements will be established at detailed design in accordance with the City of Ottawa Water Supply Guidelines, Fire Underwriters Survey (FUS), and the Ontario Building Code. For planning purposes, preliminary fire flow assumptions have been applied using available information from the concept plan and comparable developments. Where applicable, mitigation measures may be considered to reduce required fire flows.

Table 3-2: Water Demand Estimate and Comparison to Equivalent MSS Demands

	Avg. Daily		**Max Day**		**Peak Hour**		**Fire Flow Requirement**
	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min	L/min
Residential Demand	1173.5	814.9	2,933.7	2,037.3	2,581.7	1,792.8	10000 L/min* (per ISDTB-2014-02)
Commercial Demand	798.70	554.7	1198.1	832.0	2156.5	1497.6	15000 L/min (considered adequate for most types of

Park	54.50	37.8	81.7	56.8	147.1	102.2	structures and occupancies, but is to be confirmed at the detailed design level)
Total Demands	**2,026.7**	**1,407.4**	**4,213.5**	**2,926.0**	**2,303.6**	**1,599.7**	
Demands for Study Area under MSS Dev Stats	2,101.2	1,459.2	4,515.2	3,135.5	4,991.7	3,466.4	
*Residential Fire Flow demands will be confirmed at detailed design. There is a possibility certain units may not meet the requirements to apply the 10,000 L/min cap. In these instances, the Fire Flow demand will be calculated in accordance with the FUS method per the *Water Supply Guidelines.* Mitigation measures may also be proposed to lower the required Fire Flow.							

As noted in Section 1.2, the proposed Draft Plan reflects a slight decrease in anticipated population compared to the derived MSS projections. Accordingly, the estimated water demand under the current development concept is lower than projected in the MSS. As such, the MSS adequately considered the watermain servicing of the study area, and no additional modelling or design information is required in support of the Draft Plan of Subdivision.

3.3 Water Supply Conclusion

The study area will be serviced by the City of Ottawa's 2E pressurized water supply network, with connections made through the trunk watermain infrastructure identified in the approved Master Servicing Study (MSS) and supported by a network of looped local distribution mains.

The water distribution system is to be designed to meet maximum hour and maximum day plus fire flow demands, in accordance with the City of Ottawa Water Supply Guidelines and all applicable Ministry of the Environment, Conservation and Parks (MECP) standards.

The proposed Draft Plan yields a total water demand that is lower than what was previously considered in the MSS for the study area. Accordingly, the trunk watermains identified in the MSS are expected to provide sufficient capacity to support the proposed development.

Detailed hydraulic modelling will be completed at the time of detailed design to confirm the phasing of trunk watermain extensions and to finalize the sizing and alignment of local watermains. Fire flow requirements will also be reviewed based on the proposed land use types and will be confirmed in accordance with the Fire Underwriters Survey, City Water Supply Guidelines, and the Ontario Building Code.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The study area is located within the catchment of the City of Ottawa's Forest Valley Trunk (FVT) sanitary system, which is part of the broader sanitary servicing strategy for the East Urban Community. The FVT is a major regional trunk sewer that provides conveyance capacity to support multiple planned and existing developments in this area of Orléans.

The surrounding municipal wastewater infrastructure includes:

- A 600 mm diameter sanitary trunk sewer within Beaugency Road to the west
- A 675 mm diameter sanitary sewer stub located at the western boundary of the Glenview lands on Street 3, extending from the adjacent Orléans Village development.
- A 900 mm diameter sanitary trunk sewer within Pagé Road further to the west of adjacent subdivision.

The existing sanitary infrastructure offers a direct and efficient connection to the City's sanitary network, eliminating the need for temporary pumping or downstream upgrades. The location of the surrounding sanitary infrastructure and available connection points is illustrated in Drawing 3.

4.2 Wastewater Design

The study area is expected to be serviced by an internal gravity trunk sanitary sewer system ranging in diameter from 300 mm to 600 mm, which is to follow the local road network and select servicing easements. The proposed sanitary servicing layout is illustrated in Drawing 3. As the project proceeds to detailed design, refinements to sewer alignment and sizing will be undertaken, and additional easements may be identified. These changes could necessitate minor adjustments to the lot layout in the Draft Plan to accommodate final infrastructure requirements.

The wastewater servicing strategy is guided by the approved Master Servicing Study (MSS), which identifies the Forest Valley Trunk (FVT) sanitary sewer as the primary outlet for the study area. This connection is intended to be provided through an internal trunk sewer extending west from the site, ultimately connecting to the FVT at Pagé Road via existing public corridors, including Nature Trail Crescent, Ponthieu Circle, and Beaugency Street within the adjacent Orléans Village development.

The MSS confirmed that this segment of the FVT possesses sufficient capacity to accommodate peak sanitary flows from the study area.

In accordance with the MSS, the combined peak flow from these contributing areas—directed to maintenance hole MH1A within the Orléans Village development—was estimated at 113.41 L/s. Refer to Appendix D for the supporting calculations and capacity confirmation.

To guide detailed design, Table 4-1: Wastewater Design Criteria outlines the City of Ottawa Sewer Design Guidelines and assumptions applied to the preliminary design of the internal sanitary sewer network.

Table 4-1: Wastewater Design Criteria

Design Parameter	Value
Residential - Single Family	3.4p/unit
Residential – Townhome/ Semi	2.7p/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon's Peaking Factor, where K=0.8
Commercial / Institutional Flows	35,000 L/gross ha/day
Commercial / Institutional Peak Factor	1.5 if contribution >20%, otherwise 1.0
Light Industrial Flows	35,000 L/gross ha/day
Industrial Peaking Factor	Per Figure in Appendix 4-B, City of Ottawa Guidelines
Infiltration and Inflow Allowance	0.33 L/s/gross ha for all areas
Park Flows	9,300 L/ha/d (75 p/acre per Sewer Guidelines Appendix 4-A)
Park Peaking Factor	1.0
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012, Technical Bulletins, and recent residential subdivisions in City of Ottawa.	

As stated above, the Master Servicing Study (MSS) allocated a peak sanitary flow of 133.41 L/s at MH1A. According to the Glenview storm sewer design sheet, 101.45 L/s was estimated to discharge at MH1A, consisting of 12.52 L/s from the Glenview Homes development and 88.93 L/s as the anticipated future contribution from the Richcraft Homes development.

Table 4-2 presents a comparison of peak sanitary flow estimates from the current Draft Plan of Subdivision and the original MSS assumptions. The updated peak flow directed to MH1A, which includes contributions from both the Richcraft study area and the adjacent Glenview lands, is calculated at 91.15 L/s. This represents a 24% reduction from the original MSS estimate of 113.41 L/s, primarily due to a lower projected population than previously assumed.

Furthermore, the total peak flow remains below the conservative value of 120.83 L/s used in the MSS to assess capacity within the Forest Valley Trunk. As a result, no updates to the trunk sewer design or downstream infrastructure are required.

Supporting calculations are provided in Appendix D.

Table 4-2: Peak Sanitary Flow Contribution to MH1A

	Richcraft Homes (DSEL, Jun 2025)	**Glenview Homes (NOVATECH, Mar 2022)**	**MSS (DSEL, Dec 2020)**
Contributing Drainage Area (Extranous)	82.24 ha	15.5 ha	99.8 ha
Population	4,191	1,218	7,181
Peak Flow	2.68 (MH 142A) + 75.94 (MH 127A) = 78.62 L/s	12.52 L/s	**113.41 L/s**
Total Flow to MH1A	**91.14 L/s**		

To provide design flexibility, Richcraft Homes may request City approval at detailed design for minor adjustments to pipe sizing or alignment, provided that such modifications do not adversely affect servicing capacity or environmental performance.

4.3 Wastewater Servicing Conclusions

The proposed wastewater servicing strategy for the study area has been developed in accordance with the City of Ottawa Sewer Design Guidelines, applicable Technical Bulletins, and all relevant MECP design standards.

Sanitary servicing will be provided through a gravity-based internal sewer network ranging from 300 mm to 600 mm in diameter. This network will convey flows through the study area and connect to the Forest Valley Trunk (FVT) at Pagé Road via existing infrastructure within adjacent developments. This configuration aligns with the recommendations of the approved Master Servicing Study (MSS) and ensures coordinated integration with regional sanitary infrastructure.

The anticipated peak sanitary flow, including contributions from both the study area and the adjacent Glenview lands, remains below the design capacity confirmed in the Master Servicing Study (MSS). The total projected flow does not exceed the conservative threshold established for the Forest Valley Trunk (FVT), and therefore no downstream upgrades are required.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Drainage

The study area consists primarily of undeveloped land, with portions having undergone phased development through prior applications, including the construction of two stormwater management facilities: Pond 1 and Pond 3. These ponds were designed to support development within the East Urban Community (EUC) Phase 3 lands.

In the northwestern portion of the site, an existing SWM facility services the commercial development at 3730 Innes Road. This facility was developed as part of the Innes Road and Belcourt SWM System (IBI Group, 2009), which was designed to manage runoff from the Trinity commercial development. Treated flows are conveyed via an open ditch to EUC Pond 1.

Adjacent to the southern boundary of the study area, the City of Ottawa operates a municipal snow disposal facility at 2170 Innes Road. This facility is physically adjacent but not connected to the Trails Edge North stormwater network.

To the west of the study area, a recently developed subdivision has been constructed between the Trails Edge North lands and Page Road. This adjacent development follows the servicing strategy outlined in the MSS and has been considered in the grading and stormwater planning for Trails Edge North.

The existing EUC Pond 1 serves as the downstream receiving facility for the area. It was designed to accommodate a total contributing drainage area of 326 ha, with an average imperviousness of 57%. The facility was sized to provide a normal level of protection, targeting 70% average long-term suspended solids removal in accordance with MECP guidelines.

5.2 Stormwater Design

The stormwater servicing strategy for Trails Edge North has been developed in accordance with the City of Ottawa Sewer Design Guidelines (2012), Technical Bulletin PIEDTB-2016-01, and the MECP Stormwater Management Planning and Design Manual (2003). Design principles are further guided by the East Urban Community (EUC) Phase 3 Master Servicing Study (MSS) (DSEL, 2020) and reflect the drainage conditions and layout presented in Drawings 1 through 4.

The proposed subdivision includes a mix of detached homes, townhomes, back-to-back townhomes, park blocks, employment lands, open space, and a supporting road network.

Stormwater drainage is managed through a dual system consisting of minor (piped) and major (overland) conveyance components.

Table 5-1 summarizes the standards that will be employed in the future detailed design of the storm sewer network, meeting the requirements in ***Section 5.2*****.**

Table 5-1: Storm Sewer Design Criteria

Design Parameter	Value
Minor System Design Return Period	1:2 year (PIEDTB-2016-01) for local roads, without ponding 1:5 year (PIEDTB-2016-01) for collector roads, without ponding 1:10 year (PIEDTB-2016-01) for arterial roads, without ponding
Major System Design Return Period	1:100 year
Intensity Duration Frequency Curve (IDF) 2-year storm event: A=732.951 | B=6.199 | C=0.810 5-year storm event: A = 998.071 | B = 6.053 | C = 0.814	$i = \frac{A}{\left(t_c + B\right)^C}$
Minimum Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Runoff coefficient for paved and roof areas	0.9
Runoff coefficient for landscaped areas	0.2
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n' for pipe flow	0.013
Minimum Depth of Cover	2.0m from crown of sewer to grade
Minimum Full Flowing Velocity	0.8 m/s
Maximum Full Flowing Velocity	6.0 m/s (where velocities in excess of 3.0 m/s are proposed, provision shall be made to protect against displacement of sewers by sudden movement)

Clearance from 100-Year Hydraulic Grade Line to Building Opening	0.30 m
Max. Allowable Flow Depth on Municipal Roads	35 cm above gutter (PIEDTB-2016-01)
Extent of Major System	To be contained within the municipal right-of-way or adjacent to the right-of-way provided that the water level must not touch any part of the building envelope and must remain below the lowest building opening during the stress test event (100-year + 20%) and 15cm vertical clearance is maintained between spill elevation on the street and the ground elevation at the nearest building envelope (PIEDTB-2016-01)
Stormwater Management Model	DDSWMM (release 2.1), SWMHYMO (v. 5.02) and XPSWMM (v. 10)
Model Parameters	Fo = 76.2 mm/hr, Fc = 13.2 mm/hr, DCAY = 4.14/hr, D.Stor.Imp. = 1.57 mm, D.Stor.Per. = 4.67 mm
Imperviousness	Based on runoff coefficient (C) where Percent Imperviousness = (C - 0.2) / 0.7 x 100%.
Design Storms	Chicago 3-hour Design Storms and 24-hour SCS Type II Design Storms. Maximum intensity averaged over 10 minutes.
Historical Events	July 1st, 1979, August 4th, 1988 and August 8th, 1996
Climate Change Street Test	20% increase in the 100-year, 3-hour Chicago storm
Extracted from City of Ottawa Sewer Design Guidelines, October 2012 and subsequent Technical Bulletins, and based on recent residential subdivisions in the City of Ottawa.	

5.2.1 Minor System Conveyance

The study area will be serviced by an internal gravity storm sewer system following the alignment of the local road network. Stormwater runoff will be conveyed to the EUC Pond 1 stormwater management (SWM) facility. The trunk storm network includes sewer pipes ranging from 450 mm to 2700 mm in diameter, as shown on Drawing 2.

Street catchbasins will collect runoff from road surfaces and front yards, while rear yard catchbasins will serve the backyards. Perforated leads will be used for rear yard catchbasins, except for the final segment connecting to the right-of-way, which will consist of solid pipe, in accordance with the current Sewer Design Guidelines.

The minor system is designed to capture flows from storm events up to and including the 2-year (local streets) and 5-year (collector streets) events assuming the use of inlet control devices (ICDs) for all street catchbasins.

Collector streets:

- Jargeau Road
- Frank Bender Street
- Fern Casey Street

Storm sewer design sheets using the Rational Method are provided in Appendix E. These sheets are based on average predicted runoff coefficients for various land uses, with assumptions consistent with those used in the Master Servicing Study (MSS). As detailed designs progress, the imperviousness and runoff coefficient values will be refined to reflect the proposed building footprints under maximum zoning, driveways, etc. At this stage, the development area and expected imperviousness for the Draft Plan of Subdivision are comparable to the assumptions in the MSS.

In accordance with the MSS, 100-year flows from Innes Park Woods, located north of the study area, and 10-year flows from a portion of Mer Bleue Road have been incorporated into the storm sewer design. Runoff from Innes Park Woods will be captured in a manner that replicates existing drainage conditions, in accordance with the recommendations of the *Environmental Impact Study for Draft Plan of Subdivision (Kilgour, 2025).*

The existing temporary stormwater management pond within the study area is to be decommissioned and the proposed storm sewer network is to capture the flows from the commercial block to the north. Consistent with the MSS, the flow from this commercial block has been considered as controlled to 85 L/s/ha. The level of service provided by the existing temporary SWM facility must be maintained for areas currently serviced by it.

If downstream development occurs prior to the decommissioning of the temporary facility, outflows from the pond will need to be accommodated within the storm system. Once the facility is decommissioned to allow full development to proceed, contractors will be required to provide detailed staging and flow bypass plans to ensure that the level of service for the contributing drainage area is maintained. Tie-in elevations at the property line and any existing emergency overflow routes must be respected during this transition.

The only deviation from the MSS stormwater servicing strategy relates to minor land use and road alignment adjustments associated with the updated concept plan.

As shown on Drawing 2, the proposed storm sewer network is designed to direct flows to two separate northern forebays within the Pond 1 SWM facility, in accordance with the most recent design update documented in the EUC Pond 1 North Main Cell and North Forebay Modifications (DSEL, October, 2023). As indicated in Appendix E, the peak Rational Method design flow to Pond 1, accounting for 2- to 100-year events depending on land use, is estimated at 10,212 L/s

A comparison to the peak flows considered in the MSS is provided in Table 5-2. The results show a 16% reduction in peak Rational Method flow within the storm trunks. Since the development area and imperviousness remain comparable to MSS assumptions, the original MSS is considered to have adequately addressed stormwater servicing of the study area. Therefore, no additional design information is required in support of the Draft Plan of Subdivision.

Table 5-2: Peak Rational Method Storm Flow Contribution to EUC Pond 1

	Trails Edge North FSR (DSEL, July 2022)	**MSS (DSEL, Dec 2020)**
Rational Method Peak Flow from Trunk 1/2	10,033 L/s +179 L/s =10,212 L/s	11,844 L/s

The stormwater flows from the study area were accounted for in the design and sizing of the proposed EUC Pond 1 modifications, as outlined in the MSS and further detailed in the EUC Pond 1 North Main Cell and North Forebay Modifications (DSEL, October, 2023). As such, sufficient capacity within the EUC Pond 1 SWM facility to accommodate the anticipated flows has been demonstrated and will be further confirmed during detailed design.

Note: If future development of the snow storage lot is contemplated, please note that the current storm sewer design, in accordance with the MSS, did not account for this drainage area. The system was designed with a residual capacity of approximately 15–20%, equivalent to an estimated 750 L/s of available capacity. Should inclusion of this area be pursued, a Hydraulic Grade Line (HGL) assessment and corresponding pond capacity evaluation would be required.

5.2.2 Major System Conveyance

Major System Criteria:

- The major overland system will convey flows from the 100-year storm event safely along public ROWs or designated corridors.
- Flow must not contact building envelopes or reach any building openings during the 100-year + 20% climate stress test.
- A vertical clearance of at least 15 cm must be maintained between street spill elevations and adjacent building ground elevations.
- Maximum allowable ponding depth during the 100-year storm is 0.35 m at the gutter.

- Rear yard catchbasins must have defined overland relief routes with a minimum 30 cm vertical clearance from the spill point to building elevations. There will be no overland flow paths between units unless it is a dedicated Block.
- The product of flow depth and velocity on roads must be less than 0.60 m^2/s.
- Local and collector roads must maintain at least half a travel lane passable during storms greater than the 5-year event. Arterial roads must maintain one lane per direction and must not receive major system flow crossings.

Additional stormwater requirements may apply at the detailed design stage, as per the City's standard practice.

Major System

Major system conveyance, or overland flow (OLF), will be provided to accommodate flows in excess of the minor system capacity. OLF is accommodated by generally routing any surface flow exceeding surface ponding along the road network or service easements towards the EUC Pond 1 SWM facility, as shown in Drawing 1.

Consistent with the MSS, the proposed major system design is to have road sags, employment, commercial, park and high density residential blocks within the study area provide onsite storage up to the 100-year storm event.

Refer to section 5.2.7 for the Required Storage Assessment.

5.2.3 Water Quality Control

EUC Pond 1 is constructed and was designed to provide quality control for Trails Edge phase 5 development.

ParameterS used as part of detailed design for EUC Pond 1: Area, Imperviousness

Parameters for this FSR: Area, imperviousness.

5.2.4 Water Quantity Control

EUC Pond 1 is constructed and was designed to provide quantity control for Trails Edge Phase 5.

5.2.5 Supporting Stormwater Modelling

The development was modelled to verify minor and major system components as part of the MSS. As there have been some changes to the road network and some land uses, a PCSWMM model was developed to verify freeboard and major system storage requirements. The following models were developed in support of the stormwater management strategy:

- A **minor system model** to assess pipe sizing, surcharge levels, and hydraulic grade line (HGL) conditions.
- A **block-based model** to estimate storage requirements and analyze runoff characteristics under post-development conditions.

5.2.6 Hydraulic Grade line (HGL)

A preliminary hydraulic grade line (HGL) analysis was completed for the proposed storm sewer system using PCSWMM, a hydrologic and hydraulic modelling software.

Design sheet flow rates were developed using the Rational Method and used as input for the PCSWMM model. A 35% increase was applied to account for additional head pressure on inlet control devices (ICDs) during the 1:100 year storm event. Incremental flows were assigned as baseline inputs in the model to match design sheet values with the 35% adjustment. In some instances, negative flows are applied to account for smaller peak flows in downstream pipes when no additional catchment is added and the time of concentration is increased.

A standard offset of 1.8 m between the road centreline and the USF was used based on standard, low-rise products with full height basements. HGL levels were verified against centerline of roads to ensure a minimum 0.3m freeboard from USF is respected. The criteria being centerline of road – HGL is less than or equal to 2.1 (1.8m centerline of road to USF + 0.3m freeboard).

The preliminary HGL analysis is provided in Appendix E, and confirm the freeboard requirement in respected. At detailed design, a detailed model will be developed to incorporate detailed grading, and respect all OSDG requirements.

5.2.7 Required Storage Assessment

A preliminary storage assessment was completed to estimate the volume required to manage runoff from the 100-year storm event. Given that the site includes a mix of residential units, multi-residential blocks (low, medium, and high density), employment blocks, and park blocks, different strategies were applied to reflect their estimated required storage.

Multi-Residential, Employment & Park Blocks

Release rates were established for the multi-residential, park, and employment blocks based on rational method peak flow estimates.

- 5-year return period was applied to multi-residential and park blocks,
- 2-year return period was applied to employment lands.

These peak flow rates are used to define the allowable release rates to the minor storm system. To estimate storage requirements, it was assumed that the first 15 metres of lot frontage drains uncontrolled to the right-of-way (ROW) . As a result, the allowable release rate for each block was adjusted (equivalent to the 1:100 year peak flow from that area) to account for this overland contribution.

The results of the PCSWMM simulations provide preliminary estimates of storage requirements for each block. Table 5-3 summarizes the key storage characteristics, including the contributing drainage area, peak inflow during the 100-year storm event, adjusted release rate, and the resulting storage volume required to manage controlled outflows.

Table 5-3: Estimated Storage Volumes for Multi-Residential, Employment, and Park Blocks

Block ID	Contributing Area (ha)	Allowable Release Rate (m^3/s)	100yr Estimated Storage Volume (m^3)
Controlled to 2 year			
392A	4.66	0.796	945
392B	5.82	0.994	1103
393	2.31	0.350	467
391A	2.58	0.441	554
391B	1.18	0.202	239
Controlled to 5 year			
Future Block (Lot 4)	6.47	1.687	1064
390	4.05	0.469	180
279	0.61	0.071	64
277	1.20	0.139	75
389	3.00	0.695	423
388	3.30	0.765	415
352	1.38	0.247	279
261	2.48	0.503	501
280	2.04	0.367	413

Note: The required storage volumes presented assume that the first 15 metres of each block frontage contributes uncontrolled overland flow directly to the right-of-way. Should the entire block area be fully intercepted by the storm system, without overland bypass, the required storage volumes would be reduced accordingly.

Residential Unit Area

A sample area north of Frank Bender street and west of Street 5 was modeled to verify that the 1:100 can be stored in road sags and that no major overland flow will be directed towards the Hydro corridor or EUC Pond 1.

Detailed grading, including road sags was undertaken for (DESCRIBE AREA). The area was modelled using a 2year +35% minor system release rate, and 1:100 year storm. The storage within the sags was compared against the runoff volume generated from the 1:100 year storm to ensure sufficient volume is provided and ponding is kept below 0.35cm. The results are presented in Table 5-4.

Table 5-4: Estimated Storage Volumes for residential unit area

ID	Contributing Area (ha)	Max. 100yr Inflow (m^3/s)	Designed Outflow (m^3/s)	Max. 100yr Volume (m^3)
Sample Area				
Sample 1	2.34	0.94	0.473	203

Figure 1 of Appendix E illustrates the detailed design of the representative sample area, highlighting how the 100-year storage volume is captured within the right-of-way. The figure shows the expected surface ponding extent and depth within the roadway cross-section, demonstrating how runoff is temporarily stored and conveyed within municipal property limits. When compared against the required storage volume summarized in Table 5-4, the available ROW storage surpasses the estimated requirement, confirming the no overland flow.

As the project advances to detailed design, storage volumes, release rates, and assumptions will be refined to reflect final grading, site layout, and infrastructure configurations.

5.3 Infiltration

Per the MSS and the Existing Conditions Water Budget (Palmer, December 2014), pre-development infiltration rates are to be preserved for the limited exposed bedrock areas within the EUC Phase 3 CDP area. As discussed in the MSS, the protection of the Innes Park Woods and its surrounding buffer area to the north of the study area will ensure that the infiltration rates in this area will remain unchanged.

The Mud Creek Cumulative Impact Study (Stantec, May 2020) found that the implementation of LIDs would have little impact on the erosion protection requirements for Mud Creek, and as such has recommended that the requirement for LIDs in the EUC MUC CDP study area west of Mer Bleue include:

- A tree planting program in parkland, which is addressed in the CDP (Fotenn, 2020);

- Using infiltration trenches in backyards of singles and townhomes where feasible, which is addressed in the proposed development; and,
- Setting right-of-way widths for the majority of local roadways at 18 m to ensure healthy street trees that will be effective in providing evapotranspiration in post-development conditions, which is addressed in the proposed development.

As noted in Section 5.2.1, as part of the development residential uses, shallow rear yard swales with perforated pipes in rear yards are to be provided, in accordance with City Sewer Design Guidelines.

5.4 Stormwater Servicing Conclusions

A preliminary HGL analysis was conducted as part of this phase to confirm that the proposed storm sewer system can safely convey runoff during the 100-year design event. HGL elevations were calculated throughout the system, and results were compared against corresponding manhole surface elevations to assess potential flooding. A minimum gap of 2.1 m between HGL and surface was used as the design target.

In parallel, a storage analysis was completed to estimated required volume was provided to manage 100-year storm runoff. Using PCSWMM, inflows from each contributing drainage area were routed through the storage nodes. The analysis determined the estimated total 100-year storage requirements for each subcatchment.

6.0 GRADING AND DRAINAGE

The grading for the subdivision is influenced by adjacent developments, future road elevations, and geotechnical constraints. Detailed grading will be completed at the time of detailed design. A conceptual grading plan is provided on Drawing 1.

The following grading and lot-level drainage criteria will be applied during detailed design to ensure appropriate surface drainage and minimize long-term maintenance concerns:

- Maximum driveway slope: 6%
- Minimum and maximum slopes for grassed areas: 2% to 5%
- Slopes exceeding 7% will require terracing at no steeper than 3:1
- Standard swales are to be 0.15 m deep with 3:1 side slopes, unless otherwise specified
- Perforated subdrains will be provided in swales with slopes less than 1.5% to support infiltration and reduce ponding. These may also be used to interconnect rear yard catchbasins where required.

These standards align with the City's expectations for residential land development and are intended to provide consistent surface drainage while supporting the overall stormwater strategy.

As noted in the Geotechnical – Existing Conditions Report, East Urban Community Mixed Use CDP (Paterson Group, April 2025), certain areas of the site are subject to maximum permissible grade raises of 2.0 m and 2.5 m. Where these limits are exceeded or approached, grading will be reviewed and certified by a Geotechnical Engineer prior to construction.

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate, and topography. The extent of erosion losses is exaggerated during construction where vegetation has been removed and the top layer of soil becomes agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

The following specific recommendations to the Contractor will be included in contract documents.

- Limit extent of exposed soils at any given time.
- Re-vegetate exposed areas as soon as possible.

- Minimize the area to be cleared and grubbed.
- Protect exposed slopes with plastic or synthetic mulches.
- Install silt fence to prevent sediment from leaving the site and entering existing watercourses, and clean and maintain throughout construction.
- Install catchbasin inserts during construction to protect from silt entering the storm sewer system.
- Install mud mats in order to prevent mud tracking onto adjacent roads.
- No refueling or cleaning of equipment near existing watercourses.
- No material stockpiles within 30m of existing watercourses, unless otherwise permitted by RVCA and City of Ottawa.
- Provide sediment traps and basins during dewatering.
- Plan construction at proper time to avoid flooding.

The Contractor will, at every rainfall, complete inspections and guarantee proper performance.

Erosion and sediment control will remain in place until the working areas have been stabilized and re-vegetated.

8.0 UTILITIES

Utility services extending to the site may require connections to multiple existing infrastructure points. Consultation with Enbridge gas, Hydro Ottawa, Rogers, and Bell is required as part of the development process to confirm the servicing plan for the subject lands. It is understood through preliminary discussions that there is existing infrastructure surrounding the study area. The servicing strategy is to be confirmed as the design process advances.

9.0 CONCLUSION AND RECOMMENDATIONS

The overall municipal servicing strategy for the subject property was contemplated as part of the *Master Servicing Study for East Urban Community Phase 3 Area Community Design Plan* (MSS) (DSEL, Dec 2020).

This *Functional Servicing Report* (FSR) (DSEL, June 2025) provides details on the planned on-site and off-site municipal services for the subject property, highlights proposed deviations from the MSS, and demonstrates that adequate municipal infrastructure capacity is expected to be available for the planned development of the subject property.

- Water service is to be provided to the study area via extensions of the existing 2E pressure zone watermains, including through neighbouring properties, per the MSS. The estimated population for the subdivision is lower than what was projected in the MSS, resulting in a reduced overall water demand.
- Sanitary service is to be provided to the study area via extensions of the existing sanitary sewer network through neighbouring properties, directing wastewater to the west, to the existing Forrest Valley Trunk sanitary sewer within Pagé Road. Downstream capacity has been confirmed within the MSS. As with water, the lower estimated population has resulted in reduced peak sanitary flows when compared to those assumed in the MSS.
- Consistent with the MSS, the study area is to be serviced by directing post development runoff to the EUC Pond 1 SWM facility. Capacity in the EUC Pond 1 SWM facility is demonstrated in the MSS, and will be confirmed at the time of detailed design.
- Major system conveyance will generally be accounted for by routing surface flow along the road network, service easements and the Hydro Corridor towards the EUC Pond 1 SWM facility. Consistent with the MSS, the proposed major system design is to have employment, commercial, park, medium density residential, and medium-high density residential blocks within the study area provide onsite storage up to the 100-year storm event.
- The site will be graded in accordance with City of Ottawa design guidelines and standards. Consistent with the MSS, in certain areas the proposed road grades are to be higher than the maximum permissible grade raises of 0.5-1.5 m and 2 m per the *Geotechnical – Existing Conditions Report East Urban Community Mixed Use CDP* (Paterson Group, April, 2025). The detailed grading design will be reviewed and certified by a Geotechnical Engineer prior to construction.
- Consistent with the MSS, select Low Impact Development techniques detailed in Section 5.3 will be implemented to promote infiltration of stormwater.

The proposed servicing and grading plans are expected to meet all City, RVCA, and MECP requirements as set out in background studies and current standards.

Prior to detailed design of the infrastructure presented in this report, this FSR will require approval under the *Planning Act* as supporting information for the Draft Plan of Subdivision application. Project-specific approvals are also expected to be required for the infrastructure presented in this report from the City of Ottawa, Ministry of Environment, Conservation and Parks, and Rideau Valley Conservation Authority, among other agencies.

Prepared By:

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Per: Martin Fréchette, P.Eng.

Reviewed By:

David Schaeffer Engineering Ltd.

Per: Alexandre Tourigny, P.Eng.

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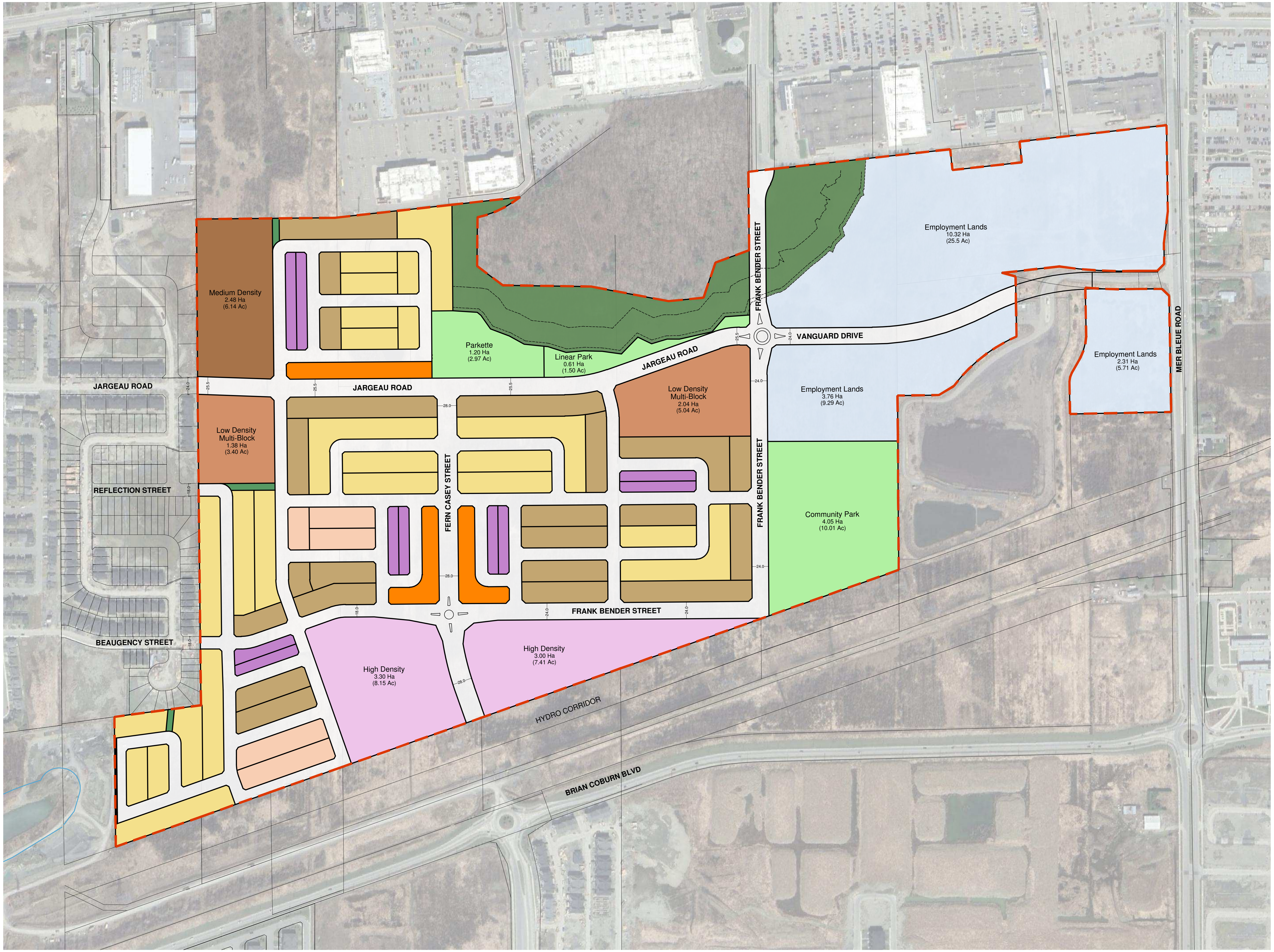
Appendix A

Servicing Guidelines Checklist & Concept Plan



RICHCRAFT

TRAILSEDGE PHASE 5

LEGEND

- Single Detached
- Bungalow Towns
- Front Loaded Towns
- Dual Frontage Towns
- Back-to-Back Towns
- Low Density Multi-Block
- Medium Density
- High Density
- Parkland
- Open Space
- Natural Heritage Feature
- Employment Lands
- MUP
- Subject Lands

NORTH

NAK design strategies

421 RONCESVALLES AVENUE, TORONTO, ON M6R 2N1 CANADA
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1:5000

0 75m 150m

DATE | 05.07.2025 PROJECT | 21116

CP-11

PROPOSED LAND USE PLAN

SKETCH TO ILLUSTRATE UNIT LAYOUT ON

PHASE 5
TRAILS EDGE NORTH
CITY OF OTTAWA

Prepared by Annis , O'Sullivan , Vollebekk Ltd.
October 16, 2020
Revised May 7, 2025

Scale 1 : 1250

Metric
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

LEGEND

31 Foot Product (9.45) =	59 Units	(23%)
35 Foot Product (10.67) =	95 Units	(38%)
44 Foot Product (13.41) =	68 Units	(27%)
50 Foot Product (15.24) =	31 Units	(12%)

TOTAL SINGLE FAMILY UNITS = 253

Townhomes=	367 Units
Bungalow Towns=	56 Units
Dual Front Towns =	83 Units
Back to Back Towns =	144 Units

TOTAL MULTI-FAMILY UNITS = 650

REVISION SCHEDULE

NO.	REVISION	DATE	BY
16	REVISED CONCEPT FOR DISCUSSION	MAY 7, 2025	N
15	REVISED CONCEPT FOR DISCUSSION	MAY 7, 2025	N
14	REVISED CONCEPT FOR DISCUSSION	MAY 6, 2025	N
12	REVISED CONCEPT FOR DISCUSSION	APR. 29, 2025	N
11	REVISIONS	APR. 23, 2025	N
8	REVISIONS	JULY 5, 2022	N
6	REVISIONS	APR. 19, 2022	N
5	BLK. 36 CHANGED TO MED. DENSITY	OCT. 16, 2020	N
4	REVISIONS	AUG. 13, 2020	N
3	REVISIONS	AUG. 7, 2020	AR/N
2	REVISIONS	JULY 16, 2020	N
1	PLAN PREPARED	JAN 6, 2020	N

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Job No. 18818-19 Richcraft Pt Lts 1-4 C3 OF GL DPS D16 N

DEVELOPMENT SERVICING STUDY CHECKLIST

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☐	Date and revision number of the report.	Title Page
☐	Location map and plan showing municipal address, boundary, and layout of proposed development.	Figure 1
☐	Plan showing the site and location of all existing services.	Drawing 2/3/4
☐	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0 & Section 2.0
☐	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☐	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	All sections
☐	Statement of objectives and servicing criteria.	Section 1.0 & Section 3.2, Section 4.2, and Section 5.2
☐	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, Section 4.1, and Section 5.1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Sections 1.1 & 1.2
☐	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Drawing 1
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	*MSS*
☐	Proposed phasing of the development, if applicable.	N/A. Depends on landowner preferred timing
☐	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.1 & Section 2.1
☐	All preliminary and formal site plan submissions should have the following information: -Metric scale -North arrow (including construction North) -Key plan -Name and contact information of applicant and property owner -Property limits including bearings and dimensions -Existing and proposed structures and parking areas -Easements, road widening and rights-of-way -Adjacent street names	All Figures

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	Section 3.2
☐	Availability of public infrastructure to service proposed development	MSS & Section 3.2
☐	Identification of system constraints	MSS & Section 3.2
☐	Identify boundary conditions	Detailed hydraulic assessment N/A for FSR

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Confirmation of adequate domestic supply and pressure	MSS. Detailed hydraulic assessment N/A for FSR.
☐	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	MSS. Detailed hydraulic assessment N/A for FSR.
☐	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Detailed hydraulic assessment N/A for FSR.
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	Detailed hydraulic assessment N/A for FSR.
☐	Address reliability requirements such as appropriate location of shut-off valves	Detailed hydraulic assessment N/A for FSR.
☐	Check on the necessity of a pressure zone boundary modification	MSS.
☐	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	MSS. Detailed hydraulic assessment N/A for FSR.
☐	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	MSS, Section 3.2 & Drawing 4. Detailed hydraulic assessment N/A for FSR.
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	MSS.
☐	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2, Appendix C
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Detailed hydraulic assessment N/A for FSR.

4.3 Development Servicing Report: Wastewater

☐	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 4.2
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	MSS
☐	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1 & 4.2
☐	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	MSS, Section 4.2, Appendix D
☐	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Appendix D
☐	Description of proposed sewer network including sewers, pumping stations, and forcemains.	MSS, Section 4.2, Appendix C & Drawing 3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	MSS
☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☐	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 1.1 & Section 5.1
☐	Analysis of available capacity in existing public infrastructure.	MSS & Section 5.2
☐	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawing 2, Appendix B
☐	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	MSS, Section 5.2
☐	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	MSS & Section 5.2
☐	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	MSS, Section 5.2, & Drawing 2
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	MSS, Section 5.2
☐	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	MSS, Section 5.2, Section 5.3 & Section 5.4
☐	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	*MSS,* Section 5.2
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	MSS, Section 5.2
☐	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	*MSS*
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	Section 5.2
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 5.2, Appendix E & Drawing 2

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐	Identification of potential impacts to receiving watercourses	MSS
☐	Identification of municipal drains and related approval requirements.	N/A
☐	Descriptions of how the conveyance and storage capacity will be achieved for the development.	*MSS,* Section 5.2
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	MSS, Section 5.2 & Drawing 1
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	*MSS & EUC Pond 1 North Main Cell and North Forebay Modifications (DSEL, August 31, 2020)*
☐	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	MSS
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	Section 1.1 & 6.0

4.5 Approval and Permit Requirements: Checklist		
☐	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	Section 1.2
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Section 1.2

4.6 Conclusion Checklist		
☐	Clearly stated conclusions and recommendations	Section 9.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	Attached
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	Section 9.0

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

Appendix B

Excerpts from Supporting EUC Phase 3 Area CDP MSS (DSEL, Dec 2020)

DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
GRADING PLAN

PROJECT No. :	14-733
SCALE	1:4000
DATE:	OCTOBER 2019
DRAWING No.	2

DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
CONCEPTUAL STORM SERVICING

PROJECT No. :	14-733
SCALE	1:5000
DATE:	OCTOBER 2019
DRAWING No.	4

DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 103
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Tel. (613) 836-0856
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www.DSEL.ca

EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
CONCEPTUAL SANITARY SERVICING

PROJECT No. :	14-733
SCALE	1:5000
DATE:	OCTOBER 2019
DRAWING No.	5

DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
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www.DSEL.ca

EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
WATERMAIN SERVICING

PROJECT No. :	14-733
SCALE	1:5000
DATE:	OCTOBER 2019
DRAWING No.	6

Appendix C

Water Demand Calculations

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	253	861
Townhouse (ALL)	2.7	650	1757
B2B	2.7	-	0
Multi-Units			0
Low Density	2.7	113	306
Medium Density	2.3	156	359
High Density	1.8	504	908

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	4191	1173.5	814.9	2933.7	2037.3	2581.7	1792.8

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate		Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Empoyment	35,000.0	L/ha/d	22.82	798.70	554.7	1198.1	832.0	2156.5	1497.6
Parks	9,300	L/ha/d	5.86	54.50	37.8	81.7	56.8	147.1	102.2
Total I/CI Demand				853.2	592.5	1279.8	888.7	2303.6	1599.7
Total Demand				**2026.7**	**1407.4**	**4213.5**	**2926.0**	**4885.3**	**3392.6**

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	319	1085
Townhouse	2.7	746	2015
B2B	2.7	-	0
Apartment			0
Bachelor	1.4	-	0
1 Bedroom	1.4	-	0
2 Bedroom	2.1	252	530
3 Bedroom	3.1	-	0
Average	1.8	688	1239
		2,005	

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	4869	1363.3	946.8	3408.3	2366.9	2999.3	2082.9

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate		Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Empoyment	35,000.0	L/ha/d	19.42	679.70	472.0	1019.6	708.0	1835.2	1274.4
Parks	9,300	L/ha/d	6.26	58.22	40.4	87.3	60.6	157.2	109.2
Total I/CI Demand				737.9	512.4	1106.9	768.7	1992.4	1383.6
Total Demand				**2101.2**	**1459.2**	**4515.2**	**3135.5**	**4991.7**	**3466.4**

Appendix D

Sanitary Servicing Design

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
FERN CASEY STREET																											
Contribution From JARGEAU ROAD, Pipe 49A - 51A						1.72	142				0.00		0.00		1.20		2.92	2.92									
Contribution From JARGEAU ROAD, Pipe 50A - 51A						0.30	25				0.00		0.00		0.00		0.30	3.22									
	51A	55A	0.80		66	2.82	233	3.5	2.64		0.00		0.00		1.20	0.19	0.80	4.02	1.33	4.16	83.0	300	0.20	43.25	0.10	0.61	0.38
	55A	61A	0.77		64	3.59	297	3.5	3.33		0.00		0.00		1.20	0.19	0.77	4.79	1.58	5.11	79.0	300	0.20	43.25	0.12	0.61	0.41
	61A	62A	0.79		66	4.38	363	3.4	4.04		0.00		0.00		1.20	0.19	0.79	5.58	1.84	6.07	81.0	300	0.20	43.25	0.14	0.61	0.43
	62A	66A	0.80		66	5.18	429	3.4	4.74		0.00		0.00		1.20	0.19	0.80	6.38	2.11	7.03	82.0	300	0.20	43.25	0.16	0.61	0.45
To FRANK BENDER STREET, Pipe 66A - 76A						5.18	429				0.00		0.00		1.20			6.38									
STREET 5																											
Contribution From JARGEAU ROAD, Pipe 23A - 25A						2.30	190				0.00		0.00		0.00		2.30	2.30									
Contribution From JARGEAU ROAD, Pipe 24A - 25A						0.38	32				0.00		0.00		0.61		0.99	3.29									
	25A	26A	0.56		46	3.24	268	3.5	3.02		0.00		0.00		0.61	0.10	0.56	3.85	1.27	4.39	43.5	200	0.60	25.41	0.17	0.81	0.60
	26A	28A	1.03		85	4.27	353	3.4	3.93		0.00		0.00		0.61	0.10	1.03	4.88	1.61	5.64	79.5	250	0.25	29.73	0.19	0.61	0.47
	28A	30A	0.63		52	4.90	405	3.4	4.48		0.00		0.00		0.61	0.10	0.63	5.51	1.82	6.40	48.5	375	0.15	67.91	0.09	0.61	0.38
	30A	36A	1.02		85	5.92	490	3.4	5.37		0.00		0.00		0.61	0.10	1.02	6.53	2.15	7.63	79.0	375	0.35	103.73	0.07	0.94	0.54
	36A	37A	1.06		88	6.98	578	3.4	6.28		0.00		0.00		0.61	0.10	1.06	7.59	2.50	8.88	82.0	375	0.45	117.62	0.08	1.06	0.63
To FRANK BENDER STREET, Pipe 37A - 38A						6.98	578				0.00		0.00		0.61			7.59									
JARGEAU ROAD																											
	12A	13A	0.18		15	0.18	15	3.7	0.18		0.00		0.00		0.00	0.00	0.18	0.18	0.06	0.24	37.0	200	4.00	65.60	0.00	2.09	0.46
To FRANK BENDER STREET, Pipe 13A - 14A						0.18	15				0.00		0.00		0.00			0.18									
	24A	25A	0.38		32	0.38	32	3.7	0.38		0.00		0.00	0.61	0.61	0.10	0.99	0.99	0.33	0.81	29.5	200	0.35	19.40	0.04	0.62	0.30
To STREET 5, Pipe 25A - 26A						0.38	32				0.00		0.00		0.61			0.99									
	50A	51A	0.30		25	0.30	25	3.7	0.30		0.00		0.00		0.00	0.00	0.30	0.30	0.10	0.40	31.5	200	0.35	19.40	0.02	0.62	0.24
To FERN CASEY STREET, Pipe 51A - 55A						0.30	25				0.00		0.00		0.00			0.30									
	22A	23A	1.15		95	1.15	95	3.6	1.11		0.00		0.00		0.00	0.00	1.15	1.15	0.38	1.49	88.5	200	1.20	35.93	0.04	1.14	0.55
	23A	25A	1.15		95	2.30	190	3.5	2.17		0.00		0.00		0.00	0.00	1.15	2.30	0.76	2.93	88.5	200	0.35	19.40	0.15	0.62	0.44
To STREET 5, Pipe 25A - 26A						2.30	190				0.00		0.00		0.00			2.30									
	48A	49A	0.86		71	0.86	71	3.6	0.83		0.00		0.00		0.00	0.00	0.86	0.86	0.28	1.12	89.0	200	0.65	26.44	0.04	0.84	0.42
	49A	51A	0.86		71	1.72	142	3.6	1.64		0.00		0.00	1.20	1.20	0.19	2.06	2.92	0.96	2.80	89.0	200	0.35	19.40	0.14	0.62	0.44
To FERN CASEY STREET, Pipe 51A - 55A						1.72	142				0.00		0.00		1.20			2.92									
	95A	96A	1.95		163	1.95	163	3.5	1.87		0.00		0.00		0.00	0.00	1.95	1.95	0.64	2.52	90.5	250	0.25	29.73	0.08	0.61	0.37
	96A	99A	2.06		171	4.01	334	3.4	3.73		0.00		0.00		0.00	0.00	2.06	4.01	1.32	5.05	95.5	300	0.20	43.25	0.12	0.61	0.41
To STREET 4, Pipe 99A - 100A						4.01	334				0.00		0.00		0.00			4.01									
	97A	98A	1.15		96	1.15	96	3.6	1.12		0.00		0.00		0.00	0.00	1.15	1.15	0.38	1.50	55.0	250	0.25	29.73	0.05	0.61	0.31
	98A	99A	1.41		117	2.56	213	3.5	2.42		0.00		0.00		0.00	0.00	1.41	2.56	0.84	3.27	65.5	250	0.25	29.73	0.11	0.61	0.39
To STREET 4, Pipe 99A - 100A						2.56	213				0.00		0.00		0.00			2.56									
			0.15		0	0.15	0			1.62	1.62		0.00		0.00		1.77	1.77									
	1A	2A				0.15	0			2.31	3.93		0.00		0.00	1.91	2.31	4.08	1.35	3.26	65.5	250	0.35	35.18	0.09	0.72	0.45
	2A	3A	0.16		0	0.31	0			5.82	9.75		0.00		0.00	4.74	5.98	10.06	3.32	8.06	65.5	250	0.25	29.73	0.27	0.61	0.51

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha	
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow = 0.330 L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity = 0.600 m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc) 0.013 (Pvc) 0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff= 2.7
Institutional =	0.32	l/s/Ha			Single house coeff= 3.4

Designed: M.B.

Checked: S.M.

Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 3

PROJECT: **TRAILSEDGE PHASE 5**

LOCATION: **City of Ottawa**

File Ref:

Date: 04 Jun 2025

Sheet No. 1 of 4

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-04
PROVINCE OF ONTARIO

OBE 20-1195

SAN.xlsx

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
	3A	4A	0.13		0	0.44	0				9.75		0.00		0.00	4.74	0.13	10.19	3.36	8.10	54.0	250	0.25	29.73	0.27	0.61	0.51
	4A	5A	0.15		0	0.59	0				9.75		0.00		0.00	4.74	0.15	10.34	3.41	8.15	61.5	250	0.25	29.73	0.27	0.61	0.51
	5A	6A	0.15		0	0.74	0			1.18	10.93		0.00		0.00	5.31	1.33	11.67	3.85	9.16	61.5	250	0.25	29.73	0.31	0.61	0.53
	6A	7A	0.20		0	0.94	0				10.93		0.00		0.00	5.31	0.20	11.87	3.92	9.23	83.5	250	0.25	29.73	0.31	0.61	0.53
			0.24		0	1.18	0			2.58	13.51		0.00		0.00		2.82	14.69									
	7A	8A				1.18	0			4.66	18.17		0.00		0.00	8.83	4.66	19.35	6.39	15.22	101.0	250	0.25	29.73	0.51	0.61	0.61
	8A	13A	0.24		0	1.42	0				18.17		0.00		0.00	8.83	0.24	19.59	6.46	15.30	100.5	250	0.25	29.73	0.51	0.61	0.61
To FRANK BENDER STREET, Pipe 13A - 14A						1.42	0				18.17		0.00		0.00			19.59									
FRANK BENDER STREET																											
	11A	13A	1.15		95	1.15	95	3.6	1.11		0.00		0.00		0.00	0.00	1.15	1.15	0.38	1.49	92.5	200	2.80	54.88	0.03	1.75	0.74
Contribution From JARGEAU ROAD, Pipe 12A - 13A						0.18	15				0.00		0.00		0.00		0.18	1.33									
Contribution From JARGEAU ROAD, Pipe 8A - 13A						1.42	0				18.17		0.00		0.00		19.59	20.92									
	13A	14A	0.21		17	2.96	127	3.6	1.47		18.17		0.00		0.00	8.83	0.21	21.13	6.97	17.28	42.5	300	0.20	43.25	0.40	0.61	0.57
	14A	15A	0.46		38	3.42	165	3.5	1.89		18.17		0.00		0.00	8.83	0.46	21.59	7.12	17.85	94.0	300	0.20	43.25	0.41	0.61	0.58
	15A	17A	0.46		38	3.88	203	3.5	2.31		18.17		0.00		0.00	8.83	0.46	22.05	7.28	18.42	94.0	300	0.20	43.25	0.43	0.61	0.59
	17A	18A	0.36		30	4.24	233	3.5	2.64		18.17		0.00		0.00	8.83	0.36	22.41	7.40	18.87	75.5	300	0.20	43.25	0.44	0.61	0.59
	18A	19A	0.37		31	4.61	264	3.5	2.98		18.17		0.00	4.05	4.05	9.49	4.42	26.83	8.85	21.32	75.5	300	0.20	43.25	0.49	0.61	0.61
	19A	20A	0.07		6	4.68	270	3.5	3.04		18.17		0.00		4.05	9.49	0.07	26.90	8.88	21.41	14.0	300	0.20	43.25	0.50	0.61	0.61
	20A	21A	0.48		40	5.16	310	3.5	3.47		18.17		0.00		4.05	9.49	0.48	27.38	9.04	22.00	100.0	300	0.20	43.25	0.51	0.61	0.61
	21A	37A	0.48		40	5.64	350	3.4	3.90		18.17		0.00		4.05	9.49	0.48	27.86	9.19	22.58	99.5	300	0.20	43.25	0.52	0.61	0.62
Contribution From STREET 5, Pipe 36A - 37A						6.98	578				0.00		0.00		0.61		7.59	35.45									
	37A	38A	0.34		28	12.96	956	3.3	10.07		18.17		0.00		4.66	9.59	0.34	35.79	11.81	31.46	70.5	450	0.12	98.76	0.32	0.62	0.55
			0.34		28	13.30	984				18.17		0.00		4.66		0.34	36.13									
	38A	47A	2.18		181	15.48	1165	3.2	12.10		18.17		0.00		4.66	9.59	2.18	38.31	12.64	34.33	70.5	450	0.12	98.76	0.35	0.62	0.56
			0.46		38	15.94	1203				18.17		0.00		4.66		0.46	38.77									
	47A	66A	3.00		249	18.94	1452	3.2	14.83		18.17		0.00		4.66	9.59	3.00	41.77	13.78	38.20	94.0	450	0.12	98.76	0.39	0.62	0.58
Contribution From FERN CASEY STREET, Pipe 62A - 66A						5.18	429				0.00		0.00		1.20		6.38	48.15									
			0.47		39	24.59	1920				18.17		0.00		5.86		0.47	48.62									
	66A	76A	1.83		152	26.42	2072	3.1	20.54		18.17		0.00		5.86	9.78	1.83	50.45	16.65	46.97	97.0	450	0.12	98.76	0.48	0.62	0.61
	76A	77A	0.28		23	26.70	2095	3.1	20.75		18.17		0.00		5.86	9.78	0.28	50.73	16.74	47.27	58.0	525	0.10	136.00	0.35	0.63	0.57
			0.33		27	27.03	2122				18.17		0.00		5.86		0.33	51.06									
	77A	117A	3.30		274	30.33	2396	3.0	23.44		18.17		0.00		5.86	9.78	3.30	54.36	17.94	51.16	69.0	525	0.10	136.00	0.38	0.63	0.58
Contribution From STREET 4, Pipe 109A - 117A						14.99	1245				5.09		0.00		0.00		20.08	74.44									
Contribution From STREET 4, Pipe 116A - 117A						2.21	184				0.00		0.00		0.00		2.21	76.65									
	117A	118A	0.33		27	47.86	3852	2.9	35.93		23.26		0.00		5.86	12.25	0.33	76.98	25.40	73.59	67.5	525	0.10	136.00	0.54	0.63	0.64
	118A	126A	0.16		13	48.02	3865	2.9	36.04		23.26		0.00		5.86	12.25	0.16	77.14	25.46	73.75	33.0	525	0.10	136.00	0.54	0.63	0.64
Contribution From STREET 3, Pipe 122A - 126A						1.23	101				0.00		0.00		0.00		1.23	78.37									
Contribution From STREET 3, Pipe 125A - 126A						0.72	60				0.00		0.00		0.00		0.72	79.09									
	126A	127A	0.20		17	50.17	4043	2.9	37.52		23.26		0.00		5.86	12.25	0.20	79.29	26.17	75.94	41.0	525	0.10	136.00	0.56	0.63	0.64
STREET 3																											
	131A	132A	0.15		8	0.15	8	3.7	0.10		0.00		0.00		0.00	0.00	0.15	0.15	0.05	0.15	26.5	200	0.65	26.44	0.01	0.84	0.22
To STREET 4, Pipe 132A - 135A						0.15	8				0.00		0.00		0.00			0.15									
	124A	125A	0.37		31	0.37	31	3.7	0.37		0.00		0.00		0.00	0.00	0.37	0.37	0.12	0.49	72.5	200	0.35	19.40	0.03	0.62	0.26
	125A	126A	0.35		29	0.72	60	3.6	0.71		0.00		0.00		0.00	0.00	0.35	0.72	0.24	0.95	72.5	200	0.35	19.40	0.05	0.62	0.32
To FRANK BENDER STREET, Pipe 126A - 127A						0.72	60				0.00		0.00		0.00			0.72									

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764 l/s/Ha				
Average Daily Flow =	280	l/p/day		Industrial Peak Factor = as per MOE Graph			
Comm/Inst Flow =	28000	L/ha/da	0.3241 l/s/Ha	Extraneous Flow =		0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509 l/s/Ha	Minimum Velocity =		0.600	m/s
Max Res. Peak Factor =	4.00			Manning's n =	(Conc)	0.013	(Pvc) 0.013
Commercial/Inst./Park Peak Factor =	1.50			Townhouse coeff=		2.7	
Institutional =	0.32	l/s/Ha		Single house coeff=		3.4	

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-04
PROVINCE OF ONTARIO

OBF20-1195

Designed: M.B.	PROJECT: TRAILSEDGE PHASE 5	
Checked: S.M.	LOCATION: City of Ottawa	
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 3	File Ref:	Date: 04 Jun 2025 / Sheet No. 2 of 4

SAN.xlsx

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION: STREET	FROM M.H.	TO M.H.	RESIDENTIAL AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	COMM AREA (ha)	COMM ACCU. AREA (ha)	INSTIT AREA (ha)	INSTIT ACCU. AREA (ha)	PARK AREA (ha)	PARK ACCU. AREA (ha)	C+I+I PEAK FLOW (l/s)	INFILTRATION TOTAL AREA (ha)	INFILTRATION ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	PIPE DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
	119A	120A	0.16		13	0.16	13	3.7	0.16		0.00		0.00		0.00	0.00	0.16	0.16	0.05	0.21	33.0	200	0.35	19.40	0.01	0.62	0.20
	120A	121A	0.05		4	0.21	17	3.7	0.20		0.00		0.00		0.00	0.00	0.05	0.21	0.07	0.27	11.0	200	0.35	19.40	0.01	0.62	0.21
	121A	122A	0.51		42	0.72	59	3.6	0.70		0.00		0.00		0.00	0.00	0.51	0.72	0.24	0.93	106.0	300	0.20	43.25	0.02	0.61	0.25
	122A	126A	0.51		42	1.23	101	3.6	1.18		0.00		0.00		0.00	0.00	0.51	1.23	0.41	1.58	105.5	300	0.20	43.25	0.04	0.61	0.29
To FRANK BENDER STREET, Pipe 126A - 127A						1.23	101				0.00		0.00		0.00			1.23									
STREET 4																											
Contribution From STREET 1, Pipe 133A - 134A						0.08	4				0.00		0.00		0.00		0.08	0.08									
	134A	135A	0.39		20	0.47	24	3.7	0.29		0.00		0.00		0.00	0.00	0.39	0.47	0.16	0.44	70.5	200	0.35	19.40	0.02	0.62	0.25
To STREET 1, Pipe 135A - 136A						0.47	24				0.00		0.00		0.00			0.47									
	128A	129A	0.40		20	0.40	20	3.7	0.24		0.00		0.00		0.00	0.00	0.40	0.40	0.13	0.37	71.0	200	0.65	26.44	0.01	0.84	0.29
	129A	130A	0.06		3	0.46	23	3.7	0.28		0.00		0.00		0.00	0.00	0.06	0.46	0.15	0.43	11.0	200	0.35	19.40	0.02	0.62	0.25
	130A	132A	0.15		8	0.61	31	3.7	0.37		0.00		0.00		0.00	0.00	0.15	0.61	0.20	0.57	26.5	200	0.35	19.40	0.03	0.62	0.27
Contribution From STREET 3, Pipe 131A - 132A						0.15	8				0.00		0.00		0.00		0.15	0.76									
	132A	135A	0.48		24	1.24	63	3.6	0.74		0.00		0.00		0.00	0.00	0.48	1.24	0.41	1.15	85.5	200	0.35	19.40	0.06	0.62	0.34
To STREET 1, Pipe 135A - 136A						1.24	63				0.00		0.00		0.00			1.24									
	110A	111A	0.44		37	0.44	37	3.7	0.44		0.00		0.00		0.00	0.00	0.44	0.44	0.15	0.59	51.5	200	0.65	26.44	0.02	0.84	0.34
	111A	112A	0.10		8	0.54	45	3.7	0.53		0.00		0.00		0.00	0.00	0.10	0.54	0.18	0.71	11.0	200	0.10	10.37	0.07	0.33	0.19
	112A	114A	0.59		49	1.13	94	3.6	1.10		0.00		0.00		0.00	0.00	0.59	1.13	0.37	1.47	69.5	200	0.35	19.40	0.08	0.62	0.36
	114A	116A	0.67		56	1.80	150	3.6	1.73		0.00		0.00		0.00	0.00	0.67	1.80	0.59	2.32	79.0	200	0.35	19.40	0.12	0.62	0.41
	116A	117A	0.41		34	2.21	184	3.5	2.10		0.00		0.00		0.00	0.00	0.41	2.21	0.73	2.83	48.5	200	0.35	19.40	0.15	0.62	0.44
To FRANK BENDER STREET, Pipe 117A - 118A						2.21	184				0.00		0.00		0.00			2.21									
	94A	99A	0.99		82	0.99	82	3.6	0.96	5.09	5.09		0.00		0.00	2.47	6.08	6.08	2.01	5.44	46.0	250	0.25	29.73	0.18	0.61	0.46
Contribution From JARGEAU ROAD, Pipe 96A - 99A						4.01	334				0.00		0.00		0.00		4.01	10.09									
Contribution From JARGEAU ROAD, Pipe 98A - 99A						2.56	213				0.00		0.00		0.00		2.56	12.65									
	99A	100A	1.75		145	9.31	774	3.3	8.27		5.09		0.00		0.00	2.47	1.75	14.40	4.75	15.49	81.0	300	0.20	43.25	0.36	0.61	0.56
	100A	106A	1.75		145	11.06	919	3.3	9.71		5.09		0.00		0.00	2.47	1.75	16.15	5.33	17.51	81.0	300	0.20	43.25	0.40	0.61	0.58
	106A	108A	1.71		142	12.77	1061	3.2	11.09		5.09		0.00		0.00	2.47	1.71	17.86	5.89	19.46	79.0	375	0.15	67.91	0.29	0.61	0.53
	108A	109A	0.93		77	13.70	1138	3.2	11.84		5.09		0.00		0.00	2.47	0.93	18.79	6.20	20.52	43.0	375	0.15	67.91	0.30	0.61	0.54
	109A	117A	1.29		107	14.99	1245	3.2	12.87		5.09		0.00		0.00	2.47	1.29	20.08	6.63	21.97	59.5	375	0.15	67.91	0.32	0.61	0.55
To FRANK BENDER STREET, Pipe 117A - 118A						14.99	1245				5.09		0.00		0.00			20.08									
STREET 1																											
	133A	134A	0.08		4	0.08	4	3.8	0.05		0.00		0.00		0.00	0.00	0.08	0.08	0.03	0.08	14.0	200	0.65	26.44	0.00	0.84	0.17
To STREET 4, Pipe 134A - 135A						0.08	4				0.00		0.00		0.00			0.08									
	138A	139A	0.31		15	0.31	15	3.7	0.18		0.00		0.00		0.00	0.00	0.31	0.31	0.10	0.28	55.0	200	0.85	30.24	0.01	0.96	0.29
	139A	140A	0.06		3	0.37	18	3.7	0.22		0.00		0.00		0.00	0.00	0.06	0.37	0.12	0.34	10.0	200	1.10	34.40	0.01	1.09	0.35
	140A	141A	0.30		15	0.67	33	3.7	0.39		0.00		0.00		0.00	0.00	0.30	0.67	0.22	0.61	59.5	200	0.35	19.40	0.03	0.62	0.28
To STREET 2, Pipe 141A - 142A						0.67	33				0.00		0.00		0.00			0.67									
Contribution From STREET 4, Pipe 132A - 135A						1.24	63				0.00		0.00		0.00		1.24	1.24									
Contribution From STREET 4, Pipe 134A - 135A						0.47	24				0.00		0.00		0.00		0.47	1.71									
	135A	136A	0.42		20	2.13	107	3.6	1.24		0.00		0.00		0.00	0.00	0.42	2.13	0.70	1.95	76.0	200	0.35	19.40	0.10	0.62	0.39
	136A	137A	0.06		3	2.19	110	3.6	1.28		0.00		0.00		0.00	0.00	0.06	2.19	0.72	2.00	10.5	200	0.35	19.40	0.10	0.62	0.40

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764 l/s/Ha			
Average Daily Flow =	280	l/p/day		Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241 l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509 l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00			Manning's n = (Conc)	0.013	(Pvc) 0.013
Commercial/Inst./Park Peak Factor =	1.50			Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha		Single house coeff=	3.4	

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-04
PROVINCE OF ONTARIO

OBBE20-1195

Designed: M.B.	PROJECT: **TRAILSEDGE PHASE 5**
Checked: S.M.	LOCATION: **City of Ottawa**
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 3	File Ref:
Date: **04 Jun 2025**	Sheet No. 3 of 4

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SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

STREET	FROM M.H.	TO M.H.	RES. AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	COMM AREA (ha)	COMM ACCU. AREA (ha)	INSTIT AREA (ha)	INSTIT ACCU. AREA (ha)	PARK AREA (ha)	PARK ACCU. AREA (ha)	C+I+I PEAK FLOW (l/s)	INFILTRATION TOTAL AREA (ha)	INFILTRATION ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	PIPE DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
	137A	141A	0.03		2	2.22	112	3.6	1.30		0.00		0.00		0.00	0.00	0.03	2.22	0.73	2.03	5.5	200	0.35	19.40	0.10	0.62	0.40
To STREET 2, Pipe 141A - 142A						2.22	112				0.00		0.00		0.00			2.22									
STREET 2																											
Contribution From STREET 1, Pipe 137A - 141A						2.22	112				0.00		0.00		0.00		2.22	2.22									
Contribution From STREET 1, Pipe 140A - 141A						0.67	33				0.00		0.00		0.00		0.67	2.89									
	141A	142A	0.06		3	2.95	148	3.6	1.70		0.00		0.00		0.00	0.00	0.06	2.95	0.97	2.68	10.5	200	0.35	19.40	0.14	0.62	0.43

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013	(Pvc) 0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4	

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-04
PROVINCE OF ONTARIO
OOBE20-1195

Designed: M.B.	PROJECT: TRAILSEDGE PHASE 5		
Checked: S.M.	LOCATION: City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 3	File Ref:	Date: 04 Jun 2025	Sheet No. 4 of 4

SAN.xlsx

SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #:	118224
Project Name:	BMR
Date Prepared:	10/4/2019
Date Revised:	3/10/2022
Input By:	Dan Coffey
Reviewed By:	Sam Bahia
Drawing Reference:	118224-GP AND 118224-SAN

Legend:
- PROJECT SPECIFIC INFO
- USER DESIGN INPUT
- CUMILATIVE CELL
- CALCULATED DESIGN CELL OUTPUT
- CALCULATED ANNUAL CELL OUTPUT
- CALCULATED RARE CELL OUTPUT
- USER AS-BUILT INPUT

LOCATION / DEMAND – RESIDENTIAL FLOW

STREET	AREA	FROM MH	TO MH	SINGLES	SEMIS/ TOWNS	APARTS	PARK AREA (ha)	POPULATION (in 1000's)	CUMULATIVE POPULATION (in 1000's)	PEAK FACTOR M	AVG POPULATION FLOW Q(q) (L/s)	PEAKED DESIGN POP FLOW Q(p) (L/s)	PEAKED ANNUAL/RARE POP FLOW Q(AR - Res) (L/s)	RESIDENTIAL DRAINAGE AREA (ha.)	CUMULATIVE RES DRAINAGE AREA (ha.)
Street 9	A1, A2	165	163			168		0.353	0.353	4.00	1.14	3.66	1.96	2.730	2.730
	A3	163	161		14			0.038	0.391	4.00	1.27	4.05	2.17	0.470	3.200
	A4	161	159		4			0.011	0.401	4.00	1.30	4.16	2.23	0.150	3.350
	A5	159	151		28			0.076	0.477	3.98	1.55	4.93	2.64	0.830	4.180
Street 2	A6	157	155		27			0.073	0.073	4.00	0.24	0.76	0.41	0.760	0.760
	A7	155	153		4			0.011	0.084	4.00	0.27	0.87	0.47	0.170	0.930
	A8	153	151		10			0.027	0.111	4.00	0.36	1.15	0.62	0.330	1.260
Street 2	A9	151	145		8			0.022	0.609	3.93	1.97	6.21	3.32	0.330	5.770
Chemin de Jargeau Road	A10	147	145		14			0.038	0.038	4.00	0.12	0.39	0.21	0.450	0.450
	A11	147	EX		25			0.068	0.068	4.00	0.22	0.70	0.38	0.780	0.780
Voie de Cerulean Way	A12	145	141		9			0.024	0.671	3.90	2.18	6.80	3.64	0.330	6.550
	A13	143	141		2			0.005	0.005	4.00	0.02	0.06	0.03	0.080	0.080
Lumen Place	A14	141	139	20				0.068	0.745	3.88	2.41	7.49	4.01	0.800	7.430
	A15	139	137	2				0.007	0.752	3.88	2.44	7.55	4.05	0.180	7.610
	A16	137	129	6				0.020	0.772	3.87	2.50	7.75	4.15	0.270	7.880
Voie de Cerulean Way	A17	143	133		6			0.016	0.016	4.00	0.05	0.17	0.09	0.210	0.210
Street 5	A18	135	133	3				0.010	0.010	4.00	0.03	0.11	0.06	0.150	0.150
Street 5	A19	133	131	7				0.024	0.050	4.00	0.16	0.52	0.28	0.280	0.640
	A20	131	129	14				0.048	0.098	4.00	0.32	1.01	0.54	0.560	1.200
Lumen Place	A21	129	127	6				0.020	0.890	3.83	2.88	8.84	4.74	0.330	9.410
	A22	127	125	10				0.034	0.924	3.82	3.00	9.16	4.91	0.440	9.850
	A23	125	123	2				0.007	0.931	3.82	3.02	9.22	4.94	0.120	9.970
	A24	123	121	3				0.010	0.941	3.82	3.05	9.31	4.99	0.150	10.120
	A25	121	113	15				0.051	0.992	3.80	3.22	9.78	5.24	0.620	10.740
Voie de Persimmon Way	A26	119	117	17				0.058	0.058	4.00	0.19	0.60	0.32	0.710	0.710
	A27	117	115	2				0.007	0.065	4.00	0.21	0.67	0.36	0.160	0.870
	A28	115	113	7				0.024	0.088	4.00	0.29	0.92	0.49	0.330	1.200
Voie de Persimmon Way	A29	113	201	6				0.020	1.101	3.77	3.57	10.77	5.77	0.290	12.230
Street 8	FUTURE	CAP	99					0.375	0.375	4.00	1.22	3.89	2.08	3.090	3.090
	-	99	101					0.000	0.375	4.00	1.22	3.89	2.08	3.090	3.090
	A30	101	103	8				0.027	0.402	4.00	1.30	4.17	2.23	0.550	3.640
	A31	103	201	5				0.017	0.419	4.00	1.36	4.35	2.33	0.270	3.910
Rue de Beaugency Street	A32	105	107	12				0.041	0.041	4.00	0.13	0.42	0.23	0.500	0.500
	A33	107	109	2				0.007	0.048	4.00	0.15	0.49	0.26	0.120	0.620
	A34	109	111	4				0.014	0.061	4.00	0.20	0.63	0.34	0.210	0.830
	-	111	207	0				0.000	0.061	4.00	0.20	0.63	0.34	0.000	0.830
TRUNK SANITARY SEWER															
Rue de Beaugency Street	FUTURE, A35	CAP1	201				6.550	5.545	5.545	3.20	17.97	46.05	24.67	54.930	54.930
	-	201	203					0.000	7.066	3.10	22.90	56.84	30.45	0.500	71.570
	-	203	205					0.000	7.066	3.10	22.90	56.84	30.45	0.120	71.690
	-	205	207					0.000	7.066	3.10	22.90	56.84	30.45	0.000	71.690
	A36	207	1A				1.000	0.011	7.138	3.10	23.13	57.34	30.72	1.000	73.520
TOTALS				151	151	168	7.550		7.138						73.52

DEMAND – INDUSTRIAL / COMMERICAL / INSTITUIONAL FLOW; EXTRANOUS FLOW (AREA METHOD); TOTAL DESIGN FLOW; DESIGN CAPACITY – PROPOSED SEWER PIPE SIZING / DESIGN

STREET	AREA	FROM MH	TO MH	COMMERICAL / INSTIUTIONAL AREA (ha.)	CUMULATIVE COMMERICAL / INSTITUTIONAL AREA (ha.)	AVG DESIGN COMMERICAL / INSTIUTIONAL FLOW Q (ci) (L/s)	COMMERICAL / INSTIUTIONAL PEAK FACTOR	CUMULATIVE ICI DRAINAGE AREA (ha.)	PEAKED DESIGN ICI FLOW Q (CI) (L/s)	CUMULATIVE EXTRANOUS DRAINAGE AREA (ha.)	DESIGN EXTRAN. FLOW Q(e) (L/s)	TOTAL DESIGN FLOW Q(D) (L/s)	LENGTH (m)	PIPE SIZE (mm) AND MATERIAL	PIPE ID ACTUAL (m)	ROUGH. (n)	DESIGN GRADE (%)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak Design / Qcap
Street 9	A1, A2	165	163	0.000	0.000	0.00	1.00	0.000	0.00	2.730	0.90	4.56	57.8	250 PVC	0.254	0.013	0.30	34.0	0.67	13.4%
	A3	163	161	0.000	0.000	0.00	1.00	0.000	0.00	3.200	1.06	5.11	109.4	250 PVC	0.254	0.013	0.25	31.0	0.61	16.5%
	A4	161	159	0.000	0.000	0.00	1.00	0.000	0.00	3.350	1.11	5.27	14.1	250 PVC	0.254	0.013	0.50	43.9	0.87	12.0%
	A5	159	151	0.000	0.000	0.00	1.00	0.000	0.00	4.180	1.38	6.31	112.1	250 PVC	0.254	0.013	0.25	31.0	0.61	20.3%
Street 2	A6	157	155	0.000	0.000	0.00	1.00	0.000	0.00	0.760	0.25	1.01	102.8	200 PVC	0.203	0.013	0.35	20.2	0.62	5.0%
	A7	155	153	0.000	0.000	0.00	1.00	0.000	0.00	0.930	0.31	1.17	13.8	200 PVC	0.203	0.013	0.50	24.2	0.75	4.9%
	A8	153	151	0.000	0.000	0.00	1.00	0.000	0.00	1.260	0.42	1.56	62.5	200 PVC	0.203	0.013	0.35	20.2	0.62	7.7%
Street 2	A9	151	145	0.000	0.000	0.00	1.00	0.000	0.00	5.770	1.90	8.11	76.3	250 PVC	0.254	0.013	0.25	31.0	0.61	26.1%
Chemin de Jargeau Road	A10	147	145	0.000	0.000	0.00	1.00	0.000	0.00	0.450	0.15	0.54	63.2	250 PVC	0.254	0.013	0.25	31.0	0.61	1.7%
	A11	147	EX	0.000	0.000	0.00	1.00	0.000	0.00	0.780	0.26	0.96	99.4	200 PVC	0.203	0.013	0.65	27.6	0.85	3.5%
Voie de Cerulean Way	A12	145	141	0.000	0.000	0.00	1.00	0.000	0.00	6.550	2.16	8.96	77.3	300 PVC	0.305	0.013	0.20	45.1	0.62	19.9%
	A13	143	141	0.000	0.000	0.00	1.00	0.000	0.00	0.080	0.03	0.08	16.6	200 PVC	0.203	0.013	0.65	27.6	0.85	0.3%
Lumen Place	A14	141	139	0.000	0.000	0.00	1.00	0.000	0.00	7.430	2.45	9.94	113.9	300 PVC	0.305	0.013	0.20	45.1	0.62	22.0%
	A15	139	137	0.000	0.000	0.00	1.00	0.000	0.00	7.610	2.51	10.07	14.6	300 PVC	0.305	0.013	0.50	71.3	0.98	14.1%
	A16	137	129	0.000	24.320	7.88	1.50	24.320	11.82	32.200	10.63	30.19	62.8	300 PVC	0.305	0.013	0.20	45.1	0.62	66.9%
Voie de Cerulean Way	A17	143	133	0.000	0.000	0.00	1.00	0.000	0.00	0.210	0.07	0.24	56.5	200 PVC	0.203	0.013	0.65	27.6	0.85	0.9%
Street 5	A18	135	133	0.000	0.000	0.00	1.00	0.000	0.00	0.150	0.05	0.16	33.1	200 PVC	0.203	0.013	0.65	27.6	0.85	0.6%
Street 5	A19	133	131	0.000	0.000	0.00	1.00	0.000	0.00	0.640	0.21	0.73	40.4	200 PVC	0.203	0.013	0.35	20.2	0.62	3.6%
	A20	131	129	0.000	0.000	0.00	1.00	0.000	0.00	1.200	0.40	1.41	84.3	200 PVC	0.203	0.013	0.35	20.2	0.62	7.0%
Lumen Place	A21	129	127	0.000	0.000	0.00	1.00	0.000	0.00	9.410	3.11	11.95	73.0	300 PVC	0.305	0.013	0.20	45.1	0.62	26.5%
	A22	127	125	0.000	0.000	0.00	1.00	0.000	0.00	9.850	3.25	12.41	55.7	300 PVC	0.305	0.013	0.20	45.1	0.62	27.5%
	A23	125	123	0.000	0.000	0.00	1.00	0.000	0.00	9.970	3.29	12.51	12.4	300 PVC	0.305	0.013	0.50	71.3	0.98	17.5%
	A24	123	121	0.000	0.000	0.00	1.00	0.000	0.00	10.120	3.34	12.65	23.0	300 PVC	0.305	0.013	0.20	45.1	0.62	28.0%
	A25	121	113	0.000	0.000	0.00	1.00	0.000	0.00	10.740	3.54	13.32	96.2	300 PVC	0.305	0.013	0.20	45.1	0.62	29.5%
Voie de Persimmon Way	A26	119	117	0.000	0.000	0.00	1.00	0.000	0.00	0.710	0.23	0.83	103.0	200 PVC	0.203	0.013	0.35	20.2	0.62	4.1%
	A27	117	115	0.000	0.000	0.00	1.00	0.000	0.00	0.870	0.29	0.96	14.0	200 PVC	0.203	0.013	0.50	24.2	0.75	4.0%
	A28	115	113	0.000	0.000	0.00	1.00	0.000	0.00	1.200	0.40	1.31	63.2	200 PVC	0.203	0.013	0.35	20.2	0.62	6.5%
Voie de Persimmon Way	A29	113	201	0.000	0.000	0.00	1.00	0.000	0.00	12.230	4.04	14.80	73.8	300 PVC	0.305	0.013	0.20	45.1	0.62	32.8%
Street 8	FUTURE	CAP	99	0.000	0.000	0.00	1.00	0.000	0.00	3.090	1.02	4.91	31.6	200 PVC	0.203	0.013	0.35	20.2	0.62	24.2%
	-	99	101	0.000	0.000	0.00	1.00	0.000	0.00	3.090	1.02	4.91	39.6	200 PVC	0.203	0.013	0.35	20.2	0.62	24.2%
	A30	101	103	0.000	0.000	0.00	1.00	0.000	0.00	3.640	1.20	5.37	12.3	200 PVC	0.203	0.013	0.50	24.2	0.75	22.2%
	A31	103	201	0.000	0.000	0.00	1.00	0.000	0.00	3.910	1.29	5.64	47.9	200 PVC	0.203	0.013	0.35	20.2	0.62	27.8%
Rue de Beaugency Street	A32	105	107	0.000	0.000	0.00	1.00	0.000	0.00	0.500	0.17	0.59	83.4	200 PVC	0.203	0.013	0.35	20.2	0.62	2.9%
	A33	107	109	0.000	0.000	0.00	1.00	0.000	0.00	0.620	0.20	0.70	28.3	200 PVC	0.203	0.013	0.35	20.2	0.62	3.4%
	A34	109	111	0.000	0.000	0.00	1.00	0.000	0.00	0.830	0.27	0.91	26.6	200 PVC	0.203	0.013	0.35	20.2	0.62	4.5%
	-	111	207	0.000	0.000	0.00	1.00	0.000	0.00	0.830	0.27	0.91	1.8	200 PVC	0.203	0.013	0.50	24.2	0.75	3.8%
TRUNK SANITARY SEWER																				
Rue de Beaugency Street	FUTURE, A35	CAP1	201	24.320	24.320	7.88	1.50	24.320	11.82	79.250	26.15	84.02	36.6	525 CONC	0.533	0.013	0.10	141.9	0.63	59.2%
	-	201	203	0.000	24.320	7.88	1.50	24.320	11.82	95.890	31.64	100.30	96.7	525 CONC	0.533	0.013	0.10	141.9	0.63	70.7%
	-	203	205	0.000	24.320	7.88	1.50	24.320	11.82	96.010	31.68	100.34	29.2	600 CONC	0.610	0.013	0.10	202.6	0.69	49.5%
	-	205	207	0.000	24.320	7.88	1.50	24.320	11.82	96.010	31.68	100.34	27.7	600 CONC	0.610	0.013	0.10	202.6	0.69	49.5%
	A36	207	1A	0.000	24.320	7.88	1.50	24.320	11.82	97.840	32.29	101.45	11.9	600 CONC	0.610	0.013	0.10	202.6	0.69	50.1%
TOTALS					24.320					96.010										

DEMAND EQUATION

Design Parameters:

1. Q(D), Q(A), Q(R) = Q(p) + Q(fd) + Q(ici) + Q(e)
2. Q(p) = (P x q x M x K / 86,400)
3. q Avg capita flow (L/per/day)= 280 L/per/day (design); 200 L/per/day (annual and rare)
4. M = Harmon Formula (maximum of 4.0)
5. K = 0.8 (design); 0.6 (annual and rare)
6. Park flow is considered equivalent to a single unit / ha
   Park Demand = 3.25 Single Unit Equivalent / Park ha
7. Foundation Drains 0.45 L/s/unit
8. Q(ici) = ICI Area x ICI Flow x ICI Peak
9 Q(e) = 0.33 L/sec/ha (design); 0.30 L/sec/ha (annual); 0.55 L/sec/ha (rare)

Definitions:

Q(D) = Peak Design Flow (L/sec) Q(A) = Peak Annual Flow (L/sec) Q(R) = Peak Rare Flow (L/sec)
Q(e) = Extraneous Flow (L/sec)
Q(p) = Population Flow (L/sec)
K = Harmon Correction Factor

	Singles	Semis/Towns	Apts (2-BR)
P = Residential Population	3.4	2.7	2.1
Typ Service Diameter (mm)	135		
Typ Service Length (m)	15	15	
I/I Pipe Rate (L/mm dia/m/hr) =	0.007		

Q(fd) = Foundation Flow (L/sec)
Q(ici) = Industrial / Commercial / Institutional Flow (L/sec)

Institutional / Commercial / Industrial			Industrial	Commercial / Institutional	
	Design =		35000	28000	L/gHa/d
	Annual / Rare =		10000	17000	L/gHa/d
ICI Peak *	Design =	Std ICI -->	1.0	1.5	* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)
	Annual / Rare =		1.0		

NOTES

External Flows to be determined as part of detailed design process. Futher coordination with DSEL required.

CAPACITY EQUATION

Q full= (1/n) A R^(2/3)So^(1/2)

Where : Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A = Flow area (m^2)
R = Wetter perimenter (m)
So = Pipe Slope/gradient

SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION						COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL (FULL) (m/s)	VEL (ACT.) (m/s)
North West Sanitary Trunk																										
Trunk 1	1007A	1008A			0.00	0			2.58	2.58					1.57	2.58	2.58	0.85	2.42	58.00	200.00	0.65	26.44	0.09	0.84	0.52
COMMERCIAL	1008A	1009A			0.00	0				2.58					1.57	0.00	2.58	0.85	2.42	86.50	250.00	0.25	29.73	0.08	0.61	0.37
COMMERCIAL	1009A	1010A			0.00	0			1.29	3.87					2.35	1.29	3.87	1.28	3.63	86.50	250.00	0.25	29.73	0.12	0.61	0.41
COMMERCIAL					0.00	0			0.22	4.09						0.22	4.09									
COMMERCIAL	1010A	1011A			0.00	0			1.63	5.72					3.48	1.63	5.72	1.89	5.37	39.50	300.00	0.20	43.25	0.12	0.61	0.00
COMMERCIAL	1011A	1012A			0.00	0			0.99	6.71					4.08	0.99	6.71	2.21	6.29	99.50	375.00	0.15	67.91	0.09	0.61	0.38
COMMERCIAL	1012A	1013A			0.00	0			1.41	8.12					4.93	1.41	8.12	2.68	7.61	117.00	375.00	0.15	67.91	0.11	0.61	0.40
COMMERCIAL	1013A	1014A			0.00	0			1.41	9.53					5.79	1.41	9.53	3.14	8.93	112.00	375.00	0.15	67.91	0.13	0.61	0.41
COMMERCIAL	1014A	1022A			0.00	0			1.54	11.07					6.73	1.54	11.07	3.65	10.38	83.50	375.00	0.15	67.91	0.15	0.61	0.44
COMMERCIAL	1022A	1023A			0.00	0			7.02	18.09					10.99	7.02	18.09	5.97	16.96	96.50	375.00	0.15	67.91	0.25	0.61	0.51
	1023A	1024A	0.65	66	0.65	66	3.63	0.78		18.09					10.99	0.65	18.74	6.18	17.95	81.00	450.00	0.12	98.76	0.18	0.62	0.47
	1024A	1025A	0.20	21	0.85	87	3.61	1.02		18.09					10.99	0.20	18.94	6.25	18.26	79.00	450.00	0.12	98.76	0.18	0.62	0.47
	1025A	1026A	0.13	14	0.98	101	3.59	1.18		18.09					10.99	0.13	19.07	6.29	18.46	51.00	450.00	0.12	98.76	0.19	0.62	0.48
	1026A	1027A	0.20	21	1.18	122	3.58	1.42		18.09					10.99	0.20	19.27	6.36	18.77	74.00	450.00	0.12	98.76	0.19	0.62	0.48
	1027A	1028A			1.18	122				18.09					10.99	0.00	19.27	6.36	17.35	11.00	450.00	0.12	98.76	0.18	0.62	0.47
	1028A	1029A	0.40	41	1.58	163	3.54	1.87		18.09					10.99	0.40	19.67	6.49	19.35	100.00	450.00	0.12	98.76	0.20	0.62	0.48
	1029A	1037A	0.60	61	2.18	224	3.50	2.54		18.09					10.99	0.60	20.27	6.69	20.22	94.00	450.00	0.12	98.76	0.20	0.62	0.48
	1037A	1040A	3.30	334	5.48	558	3.36	6.08		18.09					10.99	3.30	23.57	7.78	24.85	79.00	450.00	0.12	98.76	0.25	0.62	0.51
	1040A	1049A	1.45	147	6.93	705	3.31	7.56		18.09					10.99	1.45	25.02	8.26	26.81	79.00	450.00	0.12	98.76	0.27	0.62	0.52
	1049A	1058A	4.50	455	11.43	1160	3.21	12.07		18.09					10.99	4.50	29.52	9.74	32.80	81.50	450.00	0.12	98.76	0.33	0.62	0.56
PARK	1058A	1059A	5.80	586	17.23	1746	3.10	17.54		18.09			1.27	1.27	11.20	7.07	36.59	12.07	40.81	120.50	450.00	0.12	98.76	0.41	0.62	0.59
	1059A	1090A	0.70	71	17.93	1817	3.09	18.20		18.09				1.27	11.20	0.70	37.29	12.31	41.71	123.00	450.00	0.12	98.76	0.42	0.62	0.59
PARK, EXT FUT			4.30	620	22.23	2437			5.27	23.36			0.56	1.83		10.13	47.42									
	1090A	1095A	12.65	1278	34.88	3715	2.89	34.79		23.36				1.83	14.49	12.65	60.07	19.82	69.10	75.00	450.00	0.15	110.42	0.63	0.69	0.73
Contribution from Trunk 2, MH 1094A-1095A					10.74	1478				0.00				4.64			15.38									
	1095A	1096A	0.50	51	46.12	5244	2.78	47.24		23.36				6.47	15.24	0.50	75.95	25.06	87.54	79.00	525.00	0.12	148.98	0.59	0.69	0.72
	1096A	1107A	2.26	229	48.38	5473	2.77	49.13		23.36				6.47	15.24	2.26	78.21	25.81	90.18	86.50	525.00	0.10	136.00	0.66	0.63	0.67
	1107A	1108A	4.24	429	52.62	5902	2.74	52.41		23.36				6.47	15.24	4.24	82.45	27.21	94.86	87.00	525.00	0.42	278.71	0.34	1.29	1.16
PARK	1108A	1132A	0.06	8	52.68	5910	2.74	52.48		23.36			1.16	7.63	15.43	1.22	83.67	27.61	95.52	31.50	525.00	0.10	136.00	0.70	0.63	0.68
CONTRIBUTION FROM EXTERNAL			0.96	144	53.64	6054	2.73	53.56	4.42	27.78				7.63		5.38	89.05									
			0.95	137	54.59	6191				27.78				7.63		0.95	90.00									
	1132A	1133A	9.80	990	64.39	7181	2.68	62.37		27.78				7.63	18.11	9.80	99.80	32.93	113.41	15.50	600.00	0.10	194.17	0.58	0.69	0.72
	1133A	1A (B.O.)			64.39	7181	2.68	62.37		27.78				7.63	18.11	0.00	99.80	32.93	113.41	15.50	600.00	0.10	194.17	0.58	0.69	0.72
To MH 1A By Others																										
Trunk 2																										
PARK	1203A	1204A	0.40	58	0.40	58				0.00			4.64	4.64	0.75	5.04	5.04	1.66	2.41	81.00	300.00	0.65	77.96	0.03	1.10	0.48
	1204A	1205A	0.89	129	1.29	187	3.53	2.14		0.00				4.64	0.75	0.89	5.93	1.96	4.85	111.00	300.00	0.20	43.25	0.11	0.61	0.40
	1205A	1206A	0.83	120	2.12	307	3.46	3.44		0.00				4.64	0.75	0.83	6.76	2.23	6.42	74.00	300.00	0.20	43.25	0.15	0.61	0.44
	1206A	1207A	1.03	149	3.15	456	3.40	5.02		0.00				4.64	0.75	1.03	7.79	2.57	8.34	75.00	300.00	0.20	43.25	0.19	0.61	0.47
	1207A	1208A			3.15	456				0.00				4.64	0.75	0.00	7.79	2.57	3.32	100.50	300.00	0.20	43.25	0.08	0.61	0.37

LICENSED PROFESSIONAL ENGINEER
K. MITIC
100122349
OCT. 18, 2019
PROVINCE OF ONTARIO

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.108	Harmon Correction Factor =	0.800	
Average Daily Flow =	280	l/p/day		Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	35000	L/ha/da	0.405	Extraneous Flow =	0.330 L/s/ha	
Industrial Flow =	35000	L/ha/da	0.405	Minimum Velocity =	0.600 m/s	
Max Res. Peak Factor =	4.00			Manning's n = (Conc)	0.013 (Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50	if ICI >20%	1.00 if ICI <20%			
Mixed Use	35000.00	L/ha/da				
Institutional =	0.405	l/s/Ha				

Designed:	R.B	PROJECT:	Orleans EUC MUC
Checked:	K.M	LOCATION:	City of Ottawa
Dwg. Reference:		File Ref: 14-733	Date: October, 2019
			Sheet No. 1 of 2

Copy of 733_SAN_Oct1819_Opt1_final.xlsx

D1

SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION						COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
	1208A	1209A	1.90	274	5.05	730	3.31	7.83		0.00				4.64	0.75	1.90	9.69	3.20	11.78	14.50	300.00	0.20	43.25	0.27	0.61	0.51
	1209A	1210A			5.05	730				0.00				4.64	0.75	0.00	9.69	3.20	3.95	112.50	300.00	0.20	43.25	0.09	0.61	0.38
	1210A	1211A			5.05	730				0.00				4.64	0.75	0.00	9.69	3.20	3.95	120.00	300.00	0.20	43.25	0.09	0.61	0.38
	1211A	1212A	3.98	574	9.03	1304	3.18	13.44		0.00				4.64	0.75	3.98	13.67	4.51	18.70	43.50	300.00	0.20	43.25	0.43	0.61	0.59
	1212A	1091A			9.03	1304				0.00				4.64	0.75	0.00	13.67	4.51	5.26	10.00	300.00	0.20	43.25	0.12	0.61	0.41
	1091A	1093A	0.53	54	9.56	1358	3.17	13.95		0.00				4.64	0.75	0.53	14.20	4.69	19.39	33.00	300.00	0.20	43.25	0.45	0.61	0.59
	1093A	1094A	0.64	65	10.20	1423	3.16	14.57		0.00				4.64	0.75	0.64	14.84	4.90	20.22	84.00	375.00	0.15	67.91	0.30	0.61	0.53
	1094A	1095A	0.54	55	10.74	1478	3.15	15.09		0.00				4.64	0.75	0.54	15.38	5.08	20.92	84.50	375.00	0.15	67.91	0.31	0.61	0.54
To Trunk 1, Pipe 1095A-1096A					10.74	1478				0.00				4.64			15.38									
North East Sanitary Trunk																										
External Commercial					0.00	0			10.40	10.40						10.40	10.40									
Mixed Use Block*			2.43	2531	2.43	2531	3.00	24.61	2.43	12.83						4.86	15.26									
					2.43	2531			3.45	16.28						3.45	18.71									
	204A	205A			2.43	2531			6.33	22.61			0.19	0.19	13.77	6.52	25.23	8.33	22.10	525.00	375.00	0.14	65.60	0.34	0.59	0.53
To Pipe 205A - 206A					2.43	2531				22.61				0.19			25.23		22.10							
	201A	202A			0.00	0			5.67	5.67					3.45	5.67	5.67	1.87	5.32	266.00	200.00	0.32	18.55	0.29	0.59	0.51
	202A	203A			0.00	0			0.00	5.67					3.45	0.00	5.67	1.87	5.32	176.00	250.00	0.24	29.13	0.18	0.59	0.44
	203A	205A			0.00	0			10.44	16.11					9.79	10.44	16.11	5.32	15.11	292.50	250.00	0.24	29.13	0.52	0.59	0.60
Contribution from Pipe 204A - 205A					2.43	2531				22.61				0.19			25.23									
	205A	206A			2.43	2531				38.72				0.19	23.56	0.00	41.34	13.64	37.20	150.50	375.00	0.20	78.41	0.47	0.71	0.70
To Existing Vanguard Drive Sanitary					2.43	2531				38.72				0.19			41.34		37.20							
South West Sanitary Trunk																										
Mixed Use Block			3.66	528	3.66	528			3.66	3.66					2.22	7.32	7.32									
Mid-High Density Residential			15.19	1535	18.85	2063	3.06	20.46	4.32	7.98					4.85	19.51	26.83									
	301A	302A	2.28	329	21.13	2392	3.02	23.41		7.98			0.43	0.43	4.92	2.71	29.54	9.75	38.08	791.00	375.00	0.14	65.60	0.58	0.59	0.61
To Sanitary By Others					21.13	2392				7.98				0.43			29.54		38.08							
Road			0.89	0	0.89	0									0.00	0.89	0.89	0.29	0.29	49.00	200.00	0.32	18.55	0.02	0.59	0.23
To Existing Sanitary, Fern Casey Street					0.89	0				0.00				0.00			0.89		0.29							
Mid-High Density Residential			3.69	532	3.69	532	3.37	5.81		0.00				0.00	0.00	3.69	3.69	1.22	7.03	49.00	200.00	0.32	18.55	0.38	0.59	0.55
To Existing Sanitary, Axis Way					3.69	532				0.00				0.00			3.69		7.03							
South East Sanitary Trunk																										
											9.11	9.11	0.36	0.36		9.47	9.47									
Existing Medium Density**	401A	402A	0.99	227	0.99	227	3.50	2.57		0.00	0.23	9.34		0.36	5.73	1.22	10.69	3.53	11.83	114.00	250.00	0.24	29.13	0.41	0.59	0.56
To Existing Sanitary to Gerry Lalonde Drive					0.99	227				0.00		9.34		0.36			10.69		11.83							

*Note: Proposed population 2531 per background servicing study

**Note: Existing population 227 per background servicing study

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.108	Harmon Correction Factor =	0.800	
Average Daily Flow =	280	l/p/day		Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	35000	L/ha/da	0.405	Extraneous Flow =	0.330 L/s/ha	
Industrial Flow =	35000	L/ha/da	0.405	Minimum Velocity =	0.600 m/s	
Max Res. Peak Factor =	4.00			Manning's n = (Conc)	0.013 (Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50	if ICI >20%	1.00 if ICI <20%			
Mixed Use	35000.00	L/ha/da				
Institutional =	0.405	l/s/Ha				

Designed: R.B

Checked: K.M

Dwg. Reference:

PROJECT: Orleans EUC MUC

LOCATION: City of Ottawa

File Ref: 14-733

Date: October, 2019

Sheet No. 2 of 2

LICENSED PROFESSIONAL ENGINEER
K. MITIC
100122349
Oct. 18, 2019
PROVINCE OF ONTARIO

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SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION						COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
NW Quadrant to Nature Trail Crescent	1133A	1A (B.O.)			64.33	7168	2.68	62.26		35.83				7.63	23.00	0.00	107.79	35.57	120.83							
Per Sanitary Sewer Calculation Sheet - prepared by DSEL, October 2018					64.33	7168	2.68			35.83				7.63					120.83							
3490 Innes Rd. Future Dev. Blocks					4.33	1402	3.16	14.36	5.40	5.40				0.00	3.28	9.73	9.73	3.21	20.85							
Future Dev. Blocks taken at EUC Phase 3 CDP Mid-High Residential Density (144 pop/ha)																										
3490 Innes Road					19.75	1516	3.14	15.43	0.00	0.00			1.42	1.42	0.23	21.17	21.17	6.99	22.65							
Per Sanitary Sewer Calculation Sheet - Caivan Communities Orleans Village - prepared by DSEL, May 2018																										
Total to Existing Nature Trail Crescent sewer					88.41	10086	2.56	83.68	41.23	41.23			9.05	9.05	26.51	138.69	138.69	45.77	155.96							

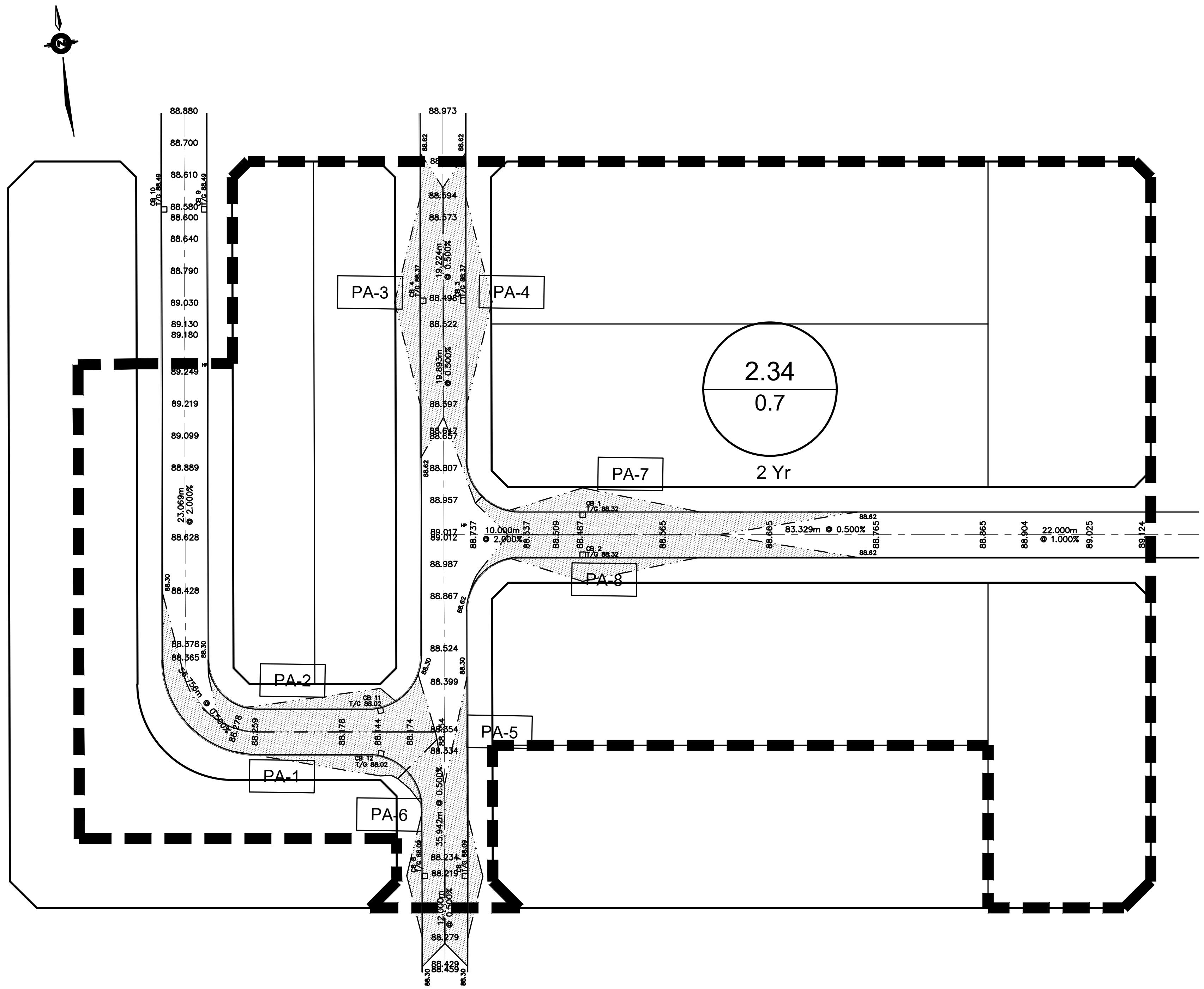
DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.108		Harmon Correction Factor =		0.800	
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph			
Comm/Inst Flow =	35000	L/ha/da	0.405		Extraneous Flow =		0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.405		Minimum Velocity =		0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n =	(Conc)	0.013	(Pvc) 0.013
Commercial/Inst./Park Peak Factor =	1.50	if ICI >20%	1.00	if ICI <20%				
Mixed Use	28000.00	L/ha/da						
Institutional =	0.405	l/s/Ha						

Designed: BK	PROJECT: **Orleans EUC MUC**		
Checked:	LOCATION: **City of Ottawa**		
Dwg. Reference:	File Ref: 14-733	Date: October, 2018	Sheet No. 1 of 1

Appendix E

Stormwater Servicing Design



PONDING VOLUME TABLE

AREA NUMBER	SPILL ELEVATION (m)	GUTTER ELEVATION (m)	MAXIMUM STATIC PONDING DEPTH (m)	MAXIMUM STATIC PONDING AREA (m^2)	MAXIMUM STATIC PONDING VOLUME (m^3)	Volume (round down to 1 decimal) (m³)
PA-1	88.30	88.02	0.28	328.98	30.70	30.7
PA-2	88.30	88.02	0.28	260.60	24.32	24.3
PA-3	88.62	88.33	0.29	309.08	29.88	29.8
PA-4	88.62	88.33	0.29	323.10	31.23	31.2
PA-5	88.30	88.09	0.21	212.24	14.86	14.8
PA-6	88.30	88.09	0.21	215.43	15.08	15.0
PA-7	88.62	88.32	0.30	322.80	32.28	32.2
PA-8	88.62	88.32	0.30	317.87	31.79	31.7
				Sum of Vol=	210.14	m3
				Total Area =	2.34	Ha
				Vol/Area=	**89.80**	m3/Ha

CALCULATIONS:

DRAINAGE AREA = 2.34 Ha

TOTAL PONDING VOLUME = 210.14 m³

PONDING VOL/Ha = 89.80 m³/Ha

LEGEND:

STORM TRIB DRAINAGE AREA

PONDING AREA

PA-1 PONDING AREA ID

103.45 PROPOSED ELEVATION

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

TRAILSEDGE PHASE 5
PONDING VOLUME PER Ha

PROJECT No.:	20-1195
SCALE:	1:1000
DATE:	JUNE 2025
FIGURE:	4

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

Ottawa

LOCATION			AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
STREET 3																																	
	119	120	0.28	0.70	0.54	0.54			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	42	300	300	PVC	0.45	34.0	64.8688	0.9177	0.6175	0.645
	120	121	0.10	0.70	0.19	0.74			0.00	0.00			0.00	0.00			0.00	0.00	10.62	74.51	101.04	118.43	173.10	55	300	300	PVC	0.45	12.5	64.8688	0.9177	0.2270	0.849
	121	122	0.86	0.70	1.67	2.41			0.00	0.00			0.00	0.00			0.00	0.00	10.84	73.71	99.93	117.13	171.19	178	525	525	CONC	0.25	105.5	215.0311	0.9933	1.7701	0.827
	122	126	0.86	0.70	1.67	4.09			0.00	0.00			0.00	0.00			0.00	0.00	12.61	68.04	92.15	107.96	157.73	278	525	525	CONC	1.55	108.5	535.4232	2.4734	0.7311	0.519
Contribution From FRANK BENDER STREET, Pipe 124 - 126						1.30				0.00				0.00				0.00	11.64														
Contribution From FRANK BENDER STREET, Pipe 125 - 126						0.68				0.00				0.00				0.00	10.88														
	126	128	0.49	0.70	0.95	7.03			0.00	0.00			0.00	0.00			0.00	0.00	13.35	65.97	89.31	104.62	152.83	463	900	900	CONC	0.10	57.0	572.4707	0.8999	1.0557	0.810
	128	130	0.71	0.70	1.38	8.41			0.00	0.00			0.00	0.00			0.00	0.00	14.40	63.22	85.54	100.19	146.32	531	975	975	CONC	0.10	86.5	708.6833	0.9492	1.5188	0.750
	130	131	0.24	0.70	0.47	8.87			0.00	0.00			0.00	0.00			0.00	0.00	15.92	59.68	80.70	94.49	137.96	530	975	975	CONC	0.10	29.0	708.6833	0.9492	0.5092	0.747
	131	132	0.11	0.70	0.21	9.09			0.00	0.00			0.00	0.00			0.00	0.00	16.43	58.59	79.21	92.74	135.39	532	975	975	CONC	0.10	13.5	708.6833	0.9492	0.2370	0.751
To STREET 4, Pipe 132 - 134						9.09				0.00				0.00				0.00	16.67														
FERN CASEY STREET																																	
Contribution From JARGEAU ROAD, Pipe 49 - 51						0.00				1.60				0.00				0.00	11.98														
Contribution From JARGEAU ROAD, Pipe 50 - 51						0.00				1.63				0.00				0.00	10.36														
	51	55			0.00	0.00	0.38	0.70	0.74	3.96			0.00	0.00			0.00	0.00	11.98	69.96	94.78	111.06	162.29	375	900	900	CONC	0.10	83.0	572.4707	0.8999	1.5373	0.656
					0.00	0.00	0.37	0.70	0.72	4.68			0.00	0.00			0.00	0.00															
	55	61	2.52	0.70	4.90	4.90			0.00	4.68			0.00	0.00			0.00	0.00	13.52	65.51	88.68	103.88	151.73	736	975	975	CONC	0.25	79.0	1120.5266	1.5008	0.8773	0.657
	61	62			0.00	4.90	0.38	0.70	0.74	5.42			0.00	0.00			0.00	0.00	14.39	63.24	85.57	100.22	146.37	774	975	975	CONC	0.25	82.5	1120.5266	1.5008	0.9162	0.691
	62	66			0.00	4.90	0.37	0.70	0.72	6.14			0.00	0.00			0.00	0.00	15.31	61.05	82.57	96.69	141.19	806	975	975	CONC	0.95	84.0	2184.3085	2.9256	0.4785	0.369
To FRANK BENDER STREET, Pipe 66 - 67						4.90				6.14				0.00				0.00	15.79														
STREET 5																																	
Contribution From JARGEAU ROAD, Pipe 23 - 24						0.00				1.77				0.00				0.00	11.92														
	24	25	0.58	0.70	1.13	1.13			0.00	1.77			0.00	0.00			0.00	0.00	11.92	70.15	95.05	111.38	162.75	247	675	675	CONC	0.25	45.0	420.2941	1.1745	0.6386	0.588
			1.05	0.70	2.04	3.17			0.00	1.77			0.00	0.00			0.00	0.00															
	25	27			0.00	3.17	2.04	0.70	3.97	5.74			0.00	0.00			0.00	0.00	12.56	68.21	92.39	108.24	158.14	746	900	900	CONC	0.50	81.5	1280.0833	2.0122	0.6751	0.583
	27	29	0.59	0.70	1.15	4.32			0.00	5.74			0.00	0.00			0.00	0.00	13.23	66.28	89.75	105.13	153.58	801	900	900	CONC	0.55	45.5	1342.5627	2.1104	0.3593	0.597
	29	35	1.02	0.70	1.98	6.31			0.00	5.74			0.00	0.00			0.00	0.00	13.59	65.31	88.41	103.56	151.27	919	900	900	CONC	0.75	79.0	1567.7754	2.4644	0.5343	0.586
	35	36	1.06	0.70	2.06	8.37			0.00	5.74			0.00	0.00			0.00	0.00	14.12	63.91	86.50	101.31	147.97	1031	900	900	CONC	1.10	85.5	1898.6704	2.9845	0.4775	0.543
To FRANK BENDER STREET, Pipe 36 - 37						8.37				5.74				0.00				0.00	14.60														
FRANK BENDER STREET																																	
	125	126	0.35	0.70	0.68	0.68			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	52	450	450	CONC	0.20	42.5	127.5033	0.8017	0.8835	0.410
To STREET 3, Pipe 126 - 128						0.68				0.00				0.00				0.00	10.88														
	123	124	0.50	0.70	0.97	0.97			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	75	375	375	PVC	0.30	51.5	96.0323	0.8695	0.9872	0.778
	124	126	0.17	0.70	0.33	1.30			0.00	0.00			0.00	0.00			0.00	0.00	10.99	73.21	99.25	116.32	170.01	95	450	450	CONC	0.20	31.5	127.5033	0.8017	0.6549	0.749
To STREET 3, Pipe 126 - 128						1.30				0.00				0.00				0.00	11.64														
	9	10			0.00	0.00	0.19	0.70	0.37	0.37			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	39	300	300	PVC	0.35	45.5	57.2089	0.8093	0.9370	0.673
	10	11			0.00	0.00	0.44	0.70	0.86	1.23			0.00	0.00			0.00	0.00	10.94	73.39	99.49	116.60	170.42	122	375	375	PVC	0.95	103.0	170.8907	1.5473	1.1095	0.714
	11	13			0.00	0.00	0.37	0.70	0.72	1.95			0.00	0.00			0.00	0.00	12.05	69.75	94.50	110.72	161.79	184	375	375	PVC	2.75	87.5	290.7521	2.6325	0.5540	0.632
Contribution From JARGEAU ROAD, Pipe 12 - 13						0.00				0.29				0.00				10.83	10.22														
Contribution From JARGEAU ROAD, Pipe 8 - 13						40.41				2.72				4.43				1.86	15.39														
	13	14			0.00	40.41	0.19	0.70	0.37	5.33			0.00	4.43			0.00	12.69	15.39	60.85	82.31	96.38	140.74	5110	2250	2250	CONC	0.10	42.0	6590.6247	1.6576	0.4223	0.775
	14	15			0.00	40.41	0.39	0.70	0.76	6.09			0.00	4.43			0.00	12.69	15.82	59.91	81.01	94.86	138.50	5092	2250	2250	CONC	0.10	94.5	6590.6247	1.6576	0.9502	0.773
	15	17			0.00	40.41	0.39	0.70	0.76	6.85			0.00	4.43			0.00	12.69	16.77	57.89	78.25	91.62	133.75	4978	2250	2250	CONC	0.10	94.5	6590.6247	1.6576	0.9502	0.755
	17	18			0.00	40.41	0.32	0.70	0.62	7.47			0.00	4.43			0.00	12.69	17.72	56.02	75.70	88.61	129.34	4863	2250	2250	CONC	0.10	76.0	6590.6247	1.6576	0.7642	0.738
					0.00	40.41	0.32	0.70	0.62	8.10			0.00	4.43			0.00	12.69															
	18	19			0.00	40.41	4.05	0.40	4.50	12.60			0.00	4.43			0.00	12.69	18.48	54.61	73.77	86.35	126.02	5118	2250	2250	CONC	0.10	77.5	6590.6247	1.6576	0.7793	0.777
	19	20			0.00	40.41	0.05	0.70	0.10	12.70			0.00	4.43			0.00	12.69	19.26	53.25	71.92	84.17	122.82	4996	2250	2250	CONC	0.10	15.0	6590.6247	1.6576	0.1508	0.758
	20	21			0.00	40.41	0.42	0.70	0.82	13.51			0.00	4.43			0.00	12.69	19.41	53.00	71.57	83.76	122.23	5031	2250	2250	CONC	0.10	99.5	6590.6247	1.6576	1.0005	0.763
	21	36			0.00	40.41	0.42	0.70	0.82	14.33			0.00	4.43			0.00	12.69	20.41	51.38	69.36	81.17	118.42	4932	2250	2250	CONC	0.10	100.0	6590.6247	1.6576	1.0055	0.748
Contribution From STREET 5, Pipe 35 - 36						8.37				5.74				0.00				0.00	14.60														
	36	37			0.00	48.78	0.30	0.70	0.58	20.65			0.00	4.43			0.00	12.69	21.42	49.86	67.29	78.73	114.85	5628	2250	2250	CONC	0.10	69.0	6590.6247	1.6576	0.6938	0.854

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-04
PROVINCE OF ONTARIO
OOBF20-1195

Designed: M.B.	PROJECT:	TRAILSEDGE PHASE 5	
Checked: S.M.	LOCATION:	City of Ottawa	
Dwg. Reference: 2	File Ref:	Date: 04 Jun 2025	Sheet No. SHEET 1 OF 3

stm.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
	37	46			0.00	48.78	0.30	0.70	0.58	21.24			0.00	4.43			0.00	12.69	22.11	48.87	65.94	77.14	112.52	5553	2250	2250	CONC	0.10	72.0	6590.6247	1.6576	0.7240	0.843
	46	47			0.00	48.78	0.12	0.70	0.23	21.47			0.00	4.43			0.00	12.69	22.83	47.88	64.59	75.56	110.20	5455	2250	2250	CONC	0.10	28.0	6590.6247	1.6576	0.2815	0.828
					0.00	48.78	0.28	0.70	0.54	22.01			0.00	4.43			0.00	12.69															
	47	66			0.00	48.78	3.00	0.80	6.67	28.69			0.00	4.43			0.00	12.69	23.12	47.50	64.08	74.96	109.32	5875	2400	2400	CONC	0.10	66.5	7828.3430	1.7304	0.6405	0.750
Contribution From FERN CASEY STREET, Pipe 62 - 66						4.90				6.14				0.00				0.00	15.79														
			0.36	0.70	0.70	54.38			0.00	34.83			0.00	4.43			0.00	12.69															
	66	67	2.34	0.70	4.55	58.94			0.00	34.83			0.00	4.43			0.00	12.69	23.76	46.68	62.96	73.64	107.39	6633	2400	2400	CONC	0.10	65.0	7828.3430	1.7304	0.6260	0.847
	67	76	0.04	0.70	0.08	59.01			0.00	34.83			0.00	4.43			0.00	12.69	24.38	45.90	61.90	72.40	105.58	6525	2400	2400	CONC	0.10	32.5	7828.3430	1.7304	0.3130	0.834
			0.25	0.70	0.49	59.50			0.00	34.83			0.00	4.43			0.00	12.69															
	76	77	1.58	0.70	3.07	62.58			0.00	34.83			0.00	4.43			0.00	12.69	24.70	45.53	61.39	71.80	104.69	6633	2400	2400	CONC	0.10	60.5	7828.3430	1.7304	0.5827	0.847
	77	110	0.30	0.70	0.58	63.16			0.00	34.83			0.00	4.43			0.00	12.69	25.28	44.84	60.46	70.71	103.09	6559	2700	2700	CONC	0.10	69.0	10717.0825	1.8718	0.6144	0.612
To STREET 4, Pipe 110 - 111						63.16				34.83				4.43				12.69	25.89														
JARGEAU ROAD																																	
					0.00	0.00	0.15	0.70	0.29	0.29			0.00	0.00			0.00	0.00															
	12	13			0.00	0.00			0.00	0.29			0.00	0.00	9.74	0.40	10.83	10.83	10.00	76.81	104.19	122.14	178.56	1964	1050	1050	CONC	0.90	39.0	2590.5934	2.9918	0.2173	0.758
To FRANK BENDER STREET, Pipe 13 - 14						0.00				0.29				0.00				10.83	10.22														
					0.00	0.00	0.15	0.70	0.29	0.29			0.00	0.00			0.00	0.00															
	50	51			0.00	0.00	1.20	0.40	1.33	1.63			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	169	600	600	CONC	0.50	33.0	434.1717	1.5356	0.3582	0.390
To FERN CASEY STREET, Pipe 51 - 55						0.00				1.63				0.00				0.00	10.36														
	22	23			0.00	0.00	0.28	0.70	0.54	0.54			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	57	375	375	PVC	1.20	85.0	192.0645	1.7390	0.8147	0.296
					0.00	0.00	0.28	0.70	0.54	1.09			0.00	0.00			0.00	0.00															
	23	24			0.00	0.00	0.61	0.40	0.68	1.77			0.00	0.00			0.00	0.00	10.81	73.81	100.08	117.30	171.44	177	600	600	CONC	0.35	85.0	363.2541	1.2847	1.1027	0.487
To STREET 5, Pipe 24 - 25						0.00				1.77				0.00				0.00	11.92														
	48	49			0.00	0.00	0.41	0.70	0.80	0.80			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	83	600	600	CONC	0.65	88.0	495.0319	1.7508	0.8377	0.168
	49	51			0.00	0.00	0.41	0.70	0.80	1.60			0.00	0.00			0.00	0.00	10.84	73.73	99.97	117.16	171.25	160	600	600	CONC	0.35	88.0	363.2541	1.2847	1.1416	0.439
To FERN CASEY STREET, Pipe 51 - 55						0.00				1.60				0.00				0.00	11.98														
	95	96			0.00	0.00	0.55	0.70	1.07	1.07			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	112	525	525	CONC	0.25	90.5	215.0311	0.9933	1.5185	0.519
	96	99			0.00	0.00	0.59	0.70	1.15	2.22			0.00	0.00			0.00	0.00	11.52	71.43	96.80	113.44	165.78	215	600	600	CONC	0.45	97.0	411.8915	1.4568	1.1098	0.521
To STREET 4, Pipe 99 - 100						0.00				2.22				0.00				0.00	12.63														
	97	98			0.00	0.00	0.13	0.70	0.25	0.25			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	26	375	375	PVC	0.35	54.0	103.7267	0.9392	0.9583	0.254
	98	99			0.00	0.00	0.16	0.70	0.31	0.56			0.00	0.00			0.00	0.00	10.96	73.31	99.39	116.48	170.25	56	450	450	CONC	0.30	64.5	156.1591	0.9819	1.0949	0.359
To STREET 4, Pipe 99 - 100						0.00				0.56				0.00				0.00	12.05														
					0.00	0.00	0.15	0.70	0.29	0.29			0.00	0.00			0.00	0.00															
			1.62	0.80	3.60	3.60			0.00	0.29			0.00	0.00			0.00	0.00															
					0.00	3.60			0.00	0.29	1.77	0.90	4.43	4.43			0.00	0.00															
	1	2	2.31	0.80	5.14	8.74			0.00	0.29			0.00	4.43			0.00	0.00	10.00	76.81	104.19	122.14	178.56	1243	1200	1200	CONC	0.20	65.5	1743.5652	1.5417	0.7081	0.713
					0.00	8.74	0.15	0.70	0.29	0.58			0.00	4.43			0.00	0.00															
	2	3	5.82	0.80	12.94	21.68			0.00	0.58			0.00	4.43			0.00	0.00	10.71	74.19	100.60	117.90	172.33	2190	1500	1500	CONC	0.20	65.5	3161.2940	1.7889	0.6102	0.693
	3	4			0.00	21.68	0.13	0.70	0.25	0.84			0.00	4.43			0.00	0.00	11.32	72.09	97.71	114.51	167.34	2152	1500	1500	CONC	0.20	54.0	3161.2940	1.7889	0.5031	0.681
	4	5			0.00	21.68	0.13	0.70	0.25	1.09			0.00	4.43			0.00	0.00	11.82	70.45	95.46	111.86	163.46	2127	1500	1500	CONC	0.20	54.5	3161.2940	1.7889	0.5078	0.673
					0.00	21.68	0.16	0.70	0.31	1.40			0.00	4.43			0.00	0.00															
	5	6	1.18	0.80	2.62	24.31			0.00	1.40			0.00	4.43			0.00	0.00	12.33	68.89	93.31	109.33	159.74	2289	1500	1500	CONC	0.20	68.5	3161.2940	1.7889	0.6382	0.724
					0.00	24.31	0.20	0.70	0.39	1.79			0.00	4.43			0.00	0.00															
	6	7	4.66	0.80	10.36	34.67			0.00	1.79			0.00	4.43			0.00	0.00	12.97	67.02	90.76	106.32	155.33	2957	1650	1650	CONC	0.20	83.5	4076.1052	1.9063	0.7300	0.725
					0.00	34.67	0.24	0.70	0.47	2.26			0.00	4.43			0.00	0.00															
	7	8	2.58	0.80	5.74	40.41			0.00	2.26			0.00	4.43			0.00	0.00	13.70	65.02	88.02	103.10	150.59	3283	1650	1650	CONC	0.20	101.5	4076.1052	1.9063	0.8874	0.805
					0.00	40.41	0.24	0.70	0.47	2.72			0.00	4.43			0.00	0.00															
	8	13			0.00	40.41			0.00	2.72			0.00	4.43	1.67	0.40	1.86	1.86	14.58	62.76	84.92	99.46	145.25	3478	1800	1800	CONC	0.20	98.0	5140.6126	2.0201	0.8085	0.677
To FRANK BENDER STREET, Pipe 13 - 14						40.41				2.72				4.43				1.86	15.39														

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-04
PROVINCE OF ONTARIO

Designed: M.B.	PROJECT:	TRAILSEDGE PHASE 5	
Checked: S.M.	LOCATION:	City of Ottawa	
Dwg. Reference: 2	File Ref:	Date: 04 Jun 2025	Sheet No. SHEET 2 OF 3

D07-12-1195

stm.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
STREET 4																																	
					0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00						806									
					0.00	0.00			0.00	0.00			0.00	0.00	2.20	0.40	2.45	2.45															
					0.00	0.00	2.48	0.70	4.83	4.83			0.00	0.00			0.00	2.45															
			5.81	0.70	11.31	11.31			0.00	4.83			0.00	0.00			0.00	2.45															
	94	99			0.00	11.31	6.47	0.90	16.19	21.01			0.00	0.00			0.00	2.45	10.00	76.81	104.19	122.14	178.56	4301	1650	1650	CONC	0.30	42.5	4992.1889	2.3347	0.3034	0.861
Contribution From JARGEAU ROAD, Pipe 96 - 99						0.00				2.22				0.00				0.00	12.63														
Contribution From JARGEAU ROAD, Pipe 98 - 99						0.00				0.56				0.00				0.00	12.05														
	99	100			0.00	11.31	1.38	0.70	2.69	26.48			0.00	0.00			0.00	2.45	12.63	68.00	92.10	107.90	157.64	4399	1800	1800	CONC	0.30	81.0	6295.9390	2.4741	0.5456	0.699
	100	106	1.94	0.70	3.78	15.08			0.00	26.48			0.00	0.00			0.00	2.45	13.17	66.44	89.96	105.39	153.95	4567	1800	1800	CONC	0.35	81.0	6800.3913	2.6724	0.5052	0.672
	106	108	0.94	0.70	1.83	16.91			0.00	26.48			0.00	0.00			0.00	2.45	13.68	65.07	88.08	103.18	150.71	4608	1800	1800	CONC	0.35	79.0	6800.3913	2.6724	0.4927	0.678
	108	109	0.65	0.70	1.26	18.18			0.00	26.48			0.00	0.00			0.00	2.45	14.17	63.79	86.33	101.12	147.68	4613	1800	1800	CONC	0.35	55.0	6800.3913	2.6724	0.3430	0.678
	109	110	0.62	0.70	1.21	19.38			0.00	26.48			0.00	0.00			0.00	2.45	14.51	62.94	85.16	99.74	145.66	4637	1800	1800	CONC	0.40	52.0	7269.9241	2.8569	0.3034	0.638
Contribution From FRANK BENDER STREET, Pipe 77 - 110						63.16				34.83				4.43				12.69	25.89														
	110	111	0.20	0.70	0.39	82.93			0.00	61.31			0.00	4.43			0.00	15.13	25.89	44.15	59.51	69.59	101.46	9959	2700	2700	CONC	0.15	45.0	13125.6918	2.2925	0.3272	0.759
	111	113	0.34	0.70	0.66	83.59			0.00	61.31			0.00	4.43			0.00	15.13	26.22	43.79	59.02	69.02	100.61	9913	2700	2700	CONC	0.15	82.0	13125.6918	2.2925	0.5962	0.755
			0.28	0.70	0.54	84.14			0.00	61.31			0.00	4.43			0.00	15.13															
	113	114			0.00	84.14	3.30	0.80	7.34	68.65			0.00	4.43			0.00	15.13	26.82	43.14	58.14	67.99	99.11	10229	2700	2700	CONC	0.15	67.5	13125.6918	2.2925	0.4907	0.779
	114	115	0.04	0.70	0.08	84.21			0.00	68.65			0.00	4.43			0.00	15.13	27.31	42.63	57.45	67.17	97.92	10119	2700	2700	CONC	0.15	10.0	13125.6918	2.2925	0.0727	0.771
	115	116	0.30	0.70	0.58	84.80			0.00	68.65			0.00	4.43			0.00	15.13	27.38	42.56	57.34	67.06	97.74	10128	2700	2700	CONC	0.15	71.0	13125.6918	2.2925	0.5162	0.772
	116	117	0.29	0.70	0.56	85.36			0.00	68.65			0.00	4.43			0.00	15.13	27.90	42.03	56.63	66.22	96.52	10036	2700	2700	CONC	0.15	70.5	13125.6918	2.2925	0.5125	0.765
	117	118	0.04	0.70	0.08	85.44			0.00	68.65			0.00	4.43			0.00	15.13	28.41	41.53	55.95	65.42	95.34	9928	2700	2700	CONC	0.15	10.0	13125.6918	2.2925	0.0727	0.756
	118	132	0.11	0.70	0.21	85.65			0.00	68.65			0.00	4.43			0.00	15.13	28.48	41.46	55.85	65.30	95.17	9921	2700	2700	CONC	0.15	27.0	13125.6918	2.2925	0.1963	0.756
Contribution From STREET 3, Pipe 131 - 132						9.09				0.00				0.00				0.00	16.67														
	132	134	0.69	0.70	1.34	96.09			0.00	68.65			0.00	4.43			0.00	15.13	28.68	41.27	55.59	65.00	94.73	10310	2700	2700	CONC	0.15	85.0	13125.6918	2.2925	0.6180	0.785
Contribution From STREET 1, Pipe 133 - 134						0.00				0.00				0.00				0.00	10.99														
	134	135	0.59	0.70	1.15	97.23			0.00	68.65			0.00	4.43			0.00	15.13	29.29	40.69	54.80	64.07	93.37	10221	2700	2700	CONC	0.15	72.5	13125.6918	2.2925	0.5271	0.779
	135	2150			0.00	97.23			0.00	68.65			0.00	4.43			0.00	15.13	29.82	40.20	54.15	63.30	92.24	10109	2700	2700	CONC	0.15	50.0	13125.6918	2.2925	0.3635	0.770
	2150	HW1			0.00	97.23			0.00	68.65			0.00	4.43			0.00	15.13	30.19	39.88	53.70	62.78	91.48	10033	2700	2700	CONC	0.15	19.5	13125.6918	2.2925	0.1418	0.764
STREET 1																																	
	133	134			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.35	48.0	57.2089	0.8093	0.9885	0.000
To STREET 4, Pipe 134 - 135						0.00				0.00				0.00				0.00	10.99														
	136	2121			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.35	17.0	57.2089	0.8093	0.3501	0.000
	2121	2142	1.22	0.70	2.37	2.37			0.00	0.00			0.00	0.00			0.00	0.00	10.35	75.49	102.38	120.01	175.42	179	1650	1650	CONC	0.10	83.5	2882.2416	1.3479	1.0324	0.062
	138	139			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.85	39.0	89.1537	1.2613	0.5154	0.000
	139	2142			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.52	74.88	101.55	119.03	173.98	0	300	300	PVC	0.45	31.0	64.8688	0.9177	0.5630	0.000

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-04
PROVINCE OF ONTARIO
OOBE20-1195

Designed: M.B.	PROJECT: TRAILSEDGE PHASE 5		
Checked: S.M.	LOCATION: City of Ottawa		
Dwg. Reference: 2	File Ref:	Date: 04 Jun 2025	Sheet No. SHEET 3 OF 3

stm.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

Ottawa

	LOCATION		AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of Conc.	Intensity 2 Year	Intensity 5 Year	Intensity 10 Year	Intensity 100 Year	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF FLOW	RATIO
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	(min)	Q/Q full
North West																																	
TRUNK 1																																	
	2065	2066	0.21	0.70	0.41	0.41	0.21	0.90	0.53	0.53			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	86	450	450	PVC	0.20	96.5	128	0.80	2.01	0.68
	2066	2072	0.32	0.70	0.62	1.03	0.28	0.90	0.70	1.23			0.00	0.00			0.00	0.00	12.01	69.87	94.67	110.93	162.09	188	600	600	PVC	0.14	96.0	230	0.81	1.97	0.82
	2072	2075	3.15	0.70	6.13	7.16	0.20	0.90	0.50	1.73			0.00	0.00			0.00	0.00	13.98	64.30	87.02	101.93	148.87	611	825	825	CONC	0.25	79.0	718	1.34	0.98	0.85
	2075	2083	1.30	0.70	2.53	9.69	0.19	0.90	0.48	2.20			0.00	0.00			0.00	0.00	14.96	61.87	83.70	98.02	143.14	784	975	975	CONC	0.17	85.0	924	1.24	1.14	0.85
	2083	2084	4.30	0.70	8.37	18.06	0.18	0.90	0.45	2.65			0.00	0.00			0.00	0.00	16.10	59.29	80.16	93.86	137.04	1283	1050	1050	CONC	0.28	81.5	1445	1.67	0.81	0.89
			0.18	0.70	0.35	18.41			0.00	2.65			0.00	0.00			0.00	0.00															
			0.20	0.70	0.39	18.80			0.00	2.65			0.00	0.00			0.00	0.00															
			0.90	0.70	1.75	20.55			0.00	2.65			0.00	0.00			0.00	0.00															
			0.95	0.70	1.85	22.40			0.00	2.65			0.00	0.00			0.00	0.00															
					0.00	22.40	1.27	0.40	1.41	4.06			0.00	0.00			0.00	0.00															
	2084	2085	1.90	0.70	3.70	26.10	1.71	0.90	4.28	8.34			0.00	0.00			0.00	0.00	16.91	57.59	77.84	91.13	133.03	2152	1350	1350	CONC	0.18	118.0	2264	1.58	1.24	0.95
	2085	2116	0.71	0.70	1.38	27.48			0.00	8.34			0.00	0.00			0.00	0.00	18.16	55.20	74.57	87.29	127.40	2139	1650	1650	CONC	0.10	119.5	2882	1.35	1.48	0.74
					0.00	27.48	0.56	0.40	0.62	8.97			0.00	0.00			0.00	0.00															
FUTURE EXT. COMM.					0.00	27.48	3.12	0.90	7.81	16.77			0.00	0.00			0.00	0.00															
FUTURE EXT. COMM.					0.00	27.48	0.72	0.90	1.80	18.57			0.00	0.00	2.18	0.40	2.42	2.42															
FUTURE EXT. COMM.			9.47	0.90	0.00	27.48	1.14	0.80	2.54	21.11			0.00	0.00			0.00	2.42					85L/s/Ha	805									
					0.00	27.48	0.89	0.90	2.23	23.34			0.00	0.00			0.00	2.42															
			1.16	0.70	2.26	29.73	2.94	0.80	6.54	29.87			0.00	0.00			0.00	2.42															
			0.24	0.80	0.53	30.27	2.77	0.90	6.93	36.80			0.00	0.00			0.00	2.42															
			2.62	0.70	5.10	35.37	0.23	0.80	0.51	37.32			0.00	0.00			0.00	2.42															
	2116	2117	7.72	0.70	15.02	50.39			0.00	37.32			0.00	0.00			0.00	2.42	19.64	52.63	71.06	83.16	121.35	5598	2250	2250	CONC	0.15	75.0	8072	2.03	0.62	0.69
	2117	2122	0.52	0.70	1.01	51.40			0.00	37.32			0.00	0.00			0.00	2.42	20.25	51.63	69.70	81.57	119.01	5544	2400	2400	CONC	0.11	84.0	8210	1.81	0.77	0.68
	2122	2136	0.65	0.70	1.26	52.67			0.00	37.32			0.00	0.00			0.00	2.42	20.25	51.63	69.70	81.57	119.01	5609	2550	2550	CONC	0.10	84.0	9202	1.80	0.78	0.61
TO TRUNK 2						52.67				37.32				0.00				2.42	21.02														
TRUNK 2																																	
	2041	2042	1.39	0.80	3.09	3.09			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	237	525	525	PVC	0.65	29.5	347	1.60	0.31	0.68
	2042	2043	1.20	0.80	2.67	5.76			0.00	0.00			0.00	0.00			0.00	0.00	10.31	75.65	102.60	120.26	175.80	436	750	750	CONC	0.25	95.5	557	1.26	1.26	0.78
	2043	2044	1.29	0.80	2.87	8.63			0.00	0.00			0.00	0.00			0.00	0.00	11.57	71.26	96.57	113.17	165.38	615	825	825	CONC	0.32	110.0	812	1.52	1.21	0.76
	2044	2046			0.00	8.63	0.22	0.90	0.55	0.55	2.14	0.90	5.35	5.35			0.00	0.00	12.78	67.57	91.50	107.20	156.61	1207	900	900	CONC	0.62	33.5	1425	2.24	0.25	0.85
	2046	2047	2.39	0.80	5.32	13.94	0.23	0.90	0.58	1.13			0.00	5.35			0.00	0.00	13.03	66.86	90.53	106.05	154.93	1602	1200	1200	CONC	0.24	103.5	1910	1.69	1.02	0.84
			0.47	0.80	1.05	14.99	0.26	0.90	0.65	1.78			0.00	5.35			0.00	0.00															
	2047	2048	1.15	0.80	2.56	17.55			0.00	1.78			0.00	5.35			0.00	0.00	14.05	64.11	86.77	101.63	148.43	1823	1500	1500	CONC	0.10	117.0	2235	1.26	1.54	0.82
			0.80	0.80	1.78	19.33	0.25	0.90	0.63	2.40			0.00	5.35			0.00	0.00															
	2048	2049	1.14	0.80	2.54	21.86			0.00	2.40			0.00	5.35			0.00	0.00	15.59	60.41	81.70	95.67	139.69	2029	1500	1500	CONC	0.12	112.5	2449	1.39	1.35	0.83
			0.49	0.80	1.09	22.95			0.00	2.40			0.00	5.35			0.00	0.00															
	2049	2057	0.76	0.80	1.69	24.64	0.25	0.90	0.63	3.03			0.00	5.35			0.00	0.00	16.94	57.53	77.77	91.04	132.90	2141	1500	1500	CONC	0.13	85.5	2549	1.44	0.99	0.84
			0.44	0.80	0.98	25.62			0.00	3.03			0.00	5.35			0.00	0.00															
	2057	2060	6.36	0.80	14.14	39.77	0.24	0.90	0.60	3.63			0.00	5.35			0.00	0.00	17.93	55.62	75.15	87.96	128.39	2955	1800	1800	CONC	0.13	90.5	4144	1.63	0.93	0.71
					0.00	39.77	0.42	0.90	1.05	4.68			0.00	5.35	1.78	0.40	1.98	1.98															
	2060	2061	0.17	0.70	0.33	40.10	0.48	0.90	1.20	5.88			0.00	5.35	9.40	0.40	10.45	12.43	18.86	53.95	72.87	85.28	124.45	4595	1800	1800	CONC	0.23	81.5	5513	2.17	0.63	0.83
	2061	2062			0.00	40.10	0.20	0.90	0.50	6.38			0.00	5.35			0.00	12.43	19.48	52.88	71.41	83.57	121.94	4539	1800	1800	CONC	0.22	79.0	5392	2.12	0.62	0.84
	2062	2063			0.00	40.10	0.13	0.90	0.33	6.71			0.00	5.35			0.00	12.43	20.11	51.86	70.02	81.94	119.55	4474	1800	1800	CONC	0.21	51.0	5268	2.07	0.41	0.85
	2063	2064			0.00	40.10	0.19	0.90	0.48	7.18			0.00	5.35			0.00	12.43	20.52	51.22	69.14	80.90	118.04	4451	1950	1950	CONC	0.14	78.5	5324	1.78	0.73	0.84
	2064	2203			0.00	40.10			0.00	7.18			0.00	5.35			0.00	12.43	21.25	50.10	67.62	79.12	115.42	4353	2100	1950	CONC	0.10	50.0	5483	1.58	0.53	0.79
					0.00	40.10	0.40	0.80	0.89	8.07			0.00	5.35			0.00	12.43															
	2203	2204			0.00	40.10	4.66	0.40	5.18	13.25			0.00	5.35			0.00	12.43	21.78	49.34	66.58	77.90	113.63	4690	2100	2100	CONC	0.11	81.5	5751	1.66	0.82	0.82
	2204	2205			0.00	40.10	0.90	0.80	2.00	15.25			0.00	5.35			0.00	12.43	22.59	48.20	65.03	76.08	110.96	4711	2100	2100	CONC	0.11	111.0	5751	1.66	1.11	0.82
	2205	2206			0.00	40.10	0.84	0.80	1.87	17.12			0.00	5.35			0.00	12.43	23.71	46.74	63.04	73.74	107.53	4685	2100	2100	CONC	0.11	74.0	5751	1.66	0.74	0.81
	2206	2207			0.00	40.10	1.04	0.80	2.31	19.43			0.00	5.35			0.00	12.43	24.45	45.82	61.79	72.27	105.38	4735	2100	2100	CONC	0.11	74.5	5751	1.66	0.75	0.82
	2207	2208			0.00	40.10	1.49	0.80	3.31	22.75			0.00	5.35			0.00	12.43	25.20	44.94	60.58	70.85	103.30	4843	2100	2100	CONC	0.11	103.5	5751	1.66	1.04	0.84
	2208	2209			0.00	40.10	0.39	0.90	0.98	23.72			0.00	5.35			0.00	12.43	26.24	43.77	58.99	68.99	100.57	4774	2100	2100	CONC	0.11	8.0	5751	1.66	0.08	0.83
	2209	2210			0.00	40.10			0.00	23.72			0.00	5.35			0.00	12.43	26.32	43.68	58.87	68.85	100.36	4764	2100	2100	CONC	0.11	120.0	5751	1.66	1.20	0.83
	2210	2211			0.00	40.10			0.00	23.72			0.00	5.35			0.00	12.43	27.52	42.41	57.14	66.82	97.40	4625	2250	2250	CONC	0.10	119.0	6591	1.66	1.20	0.70
	2211	2135			0.00	40.10	4.00	0.80	8.90	32.62			0.00	5.35			0.00	12.43	28.72	41.23	55.54	64.94	94.64	4989	2550	2550	CONC	0.10	36.5	9202	1.80	0.34	0.54
	2135	2136	0.18	0.70	0.35	40.45			0.00	32.62			0.00	5.35			0.00	12.43	29.06	40.91	55.10	64.43	93.89	4964	2700	2700	CONC	0.10	35.0	10717	1.87	0.31	0.46
Contribution From TRUNK 1, PipE 2122 - 2136						52.67				37.32				0.00				2.42	21.02														

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER
K. MITIC
100122349
OCT 18, 2019
PROVINCE OF ONTARIO

Designed: R.B.	PROJECT: Orleans EUC MUC		
Checked: K.M.	LOCATION: City of Ottawa		
Dwg. Reference:	File Ref: 14-733	Date: October 2019	Sheet No 1

E1

733_STM_Oct1819_Opt1.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

Ottawa

Location	LOCATION From Node	LOCATION To Node	AREA (Ha) 2 YEAR AREA (Ha)	2 YEAR R	2 YEAR Indiv. 2.78 AC	2 YEAR Accum. 2.78 AC	5 YEAR AREA (Ha)	5 YEAR R	5 YEAR Indiv. 2.78 AC	5 YEAR Accum. 2.78 AC	10 YEAR AREA (Ha)	10 YEAR R	10 YEAR Indiv. 2.78 AC	10 YEAR Accum. 2.78 AC	100 YEAR AREA (Ha)	100 YEAR R	100 YEAR Indiv. 2.78 AC	100 YEAR Accum. 2.78 AC	FLOW Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	SEWER DATA DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min)	RATIO Q/Q full
	2136	2138	0.37	0.70	0.72	93.83			0.00	69.94			0.00	5.35			0.00	14.86	27.52	42.41	57.14	66.82	97.40	9781	2700	2700	CONC	0.15	90.5	13126	2.29	0.66	0.75
			1.29	0.70	2.51	96.34			0.00	69.94			0.00	5.35			0.00	14.86															
			1.30	0.70	2.53	98.87			0.00	69.94			0.00	5.35			0.00	14.86															
			0.50	0.70	0.97	99.85			0.00	69.94			0.00	5.35			0.00	14.86															
	2138	2139	0.38	0.70	0.74	100.59			0.00	69.94			0.00	5.35			0.00	14.86	21.02	50.44	68.08	79.66	116.22	11988	2700	2700	CONC	0.16	77.0	13556	2.37	0.54	0.88
	2139	2140	0.38	0.70	0.74	101.33			0.00	69.94			0.00	5.35			0.00	14.86	21.56	49.64	66.99	78.38	114.34	11834	2700	2700	CONC	0.15	73.5	13126	2.29	0.53	0.90
	2140	HW	0.11	0.70	0.21	101.54			0.00	69.94			0.00	5.35			0.00	14.86	21.56	49.64	66.99	78.38	114.34	11844	2700	2700	CONC	0.15	47.0	13126	2.29	0.34	0.90
TO POND 1																																	
TRUNK 3																																	
					0.00	0.00	0.98	0.80	2.18	2.18			0.00	0.00			0.00	0.00	21.15														
			2.86	0.70	5.57	5.57	5.61	0.90	14.04	16.22			0.00	0.00			0.00	0.00															
					0.00	5.57	0.95	0.80	2.11	18.33			0.00	0.00			0.00	0.00															
	2025	2026	7.33	0.70	14.26	19.83	0.49	0.90	1.23	19.55			0.00	0.00			0.00	0.00	21.15	50.25	67.82	79.36	115.77	148	1650	1650	CONC	0.14	32.0	3410	1.59	0.33	0.04
	2026	2119	0.39	0.70	0.76	20.59	1.16	0.40	1.29	20.84			0.00	0.00			0.00	0.00	21.48	49.76	67.15	78.57	114.61	1366	1650	1650	CONC	0.16	92.5	3646	1.71	0.90	0.37
	2119	2120	0.66	0.70	1.28	21.87			0.00	20.84			0.00	0.00			0.00	0.00	22.39	48.48	65.41	76.52	111.61	1469	1650	1650	CONC	0.10	47.0	2882	1.35	0.58	0.51
	2120	2121	0.43	0.70	0.84	22.71			0.00	20.84			0.00	0.00			0.00	0.00	22.97	47.70	64.34	75.27	109.78	2204	1650	1650	CONC	0.10	84.5	2882	1.35	1.04	0.76
	2121	2142	1.13	0.70	2.20	24.91			0.00	20.84			0.00	0.00			0.00	0.00	24.01	46.36	62.52	73.13	106.63	2258	1650	1650	CONC	0.10	76.0	2882	1.35	0.94	0.78
	2142	2143	0.37	0.70	0.72	25.63			0.00	20.84			0.00	0.00			0.00	0.00	22.97	47.70	64.34	75.27	109.78	2204	1650	1650	CONC	0.10	43.0	2882	1.35	0.53	0.76
	2143	2144			0.00	25.63			0.00	20.84			0.00	0.00			0.00	0.00	24.01	46.36	62.52	73.13	106.63	2258	1800	1800	CONC	0.10	51.1	3635	1.43	0.60	0.62
	2144	HW			0.00	25.63			0.00	20.84			0.00	0.00			0.00	0.00	24.95	45.22	60.97	71.31	103.97	2260	1800	1800	CONC	0.10	22.5	3635	1.43	0.26	0.62
TO POND 1																																	

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER
K. MITIC
100122349
OCT 18, 2019
PROVINCE OF ONTARIO

Designed: R.B.	PROJECT: Orleans EUC MUC		
Checked: K.M.	LOCATION: City of Ottawa		
Dwg. Reference:	File Ref: 14-733	Date: October 2019	Sheet No. 2

733_STM_Oct1819_Opt1.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Manning 0.013

Ottawa

Location	From Node	To Node	2 YEAR AREA (Ha)	2 YEAR R	2 YEAR Indiv. 2.78 AC	2 YEAR Accum. 2.78 AC	5 YEAR AREA (Ha)	5 YEAR R	5 YEAR Indiv. 2.78 AC	5 YEAR Accum. 2.78 AC	10 YEAR AREA (Ha)	10 YEAR R	10 YEAR Indiv. 2.78 AC	10 YEAR Accum. 2.78 AC	100 YEAR AREA (Ha)	100 YEAR R	100 YEAR Indiv. 2.78 AC	100 YEAR Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	DIA. (mm) (actual)	DIA (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min)	RATIO Q/Q full
NORTH EAST TRUNK*																																	
	201	202	5.68	0.80	12.63	12.63			0.00	0.00			0.00	0.00			0.00	0.00						291	675	675	CONC	0.20	262.0	376	1.05	4.16	0.77
	202	203	0.00	0.90	0.00	12.63			0.00	0.00			0.00	0.00			0.00	0.00						291	675	675	CONC	0.20	193.0	376	1.05	3.06	0.77
			2.20	0.80	4.89	17.53			0.00	0.00			0.00	0.00			0.00	0.00															
	203	204	6.94	0.80	15.43	32.96	1.73	0.90	4.33	4.33			0.00	0.00			0.00	0.00						933	1050	1050	CONC	0.20	294.0	1221	1.41	3.47	0.76
			0.52	0.80	1.16	34.12			0.00	4.33			0.00	0.00			0.00	0.00															
			5.29	0.80	11.76	45.88			0.00	4.33			0.00	0.00			0.00	0.00															
			4.86	0.85	11.48	57.37			0.00	4.33			0.00	0.00			0.00	0.00															
			0.19	0.40	0.21	57.58			0.00	4.33			0.00	0.00			0.00	0.00															
	204	205	3.45	0.90	8.63	66.21			0.00	4.33			0.00	0.00			0.00	0.00						1666	1350	1350	CONC	0.15	513.5	2067	1.44	5.93	0.81
To Existing Storm to Wildflower Drive						66.21				4.33				0.00				0.00	0.00														
SOUTH WEST TRUNK																																	
			7.35	0.85	17.37	17.37			0.00	0.00			0.00	0.00			0.00	0.00															
Commercial			4.28	0.90	10.71	28.08			0.00	0.00			0.00	0.00			0.00	0.00															
Mid-High Density					0.00	28.08	2.28	0.80	5.07	5.07			0.00	0.00			0.00	0.00															
			6.15	0.70	11.97	40.04			0.00	5.07			0.00	0.00			0.00	0.00															
			7.88	0.70	15.33	55.38			0.00	5.07			0.00	0.00			0.00	0.00															
Park	301	302	0.42	0.40	0.47	55.85	0.56	0.90	1.40	6.47			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	4964	2100	2100	CONC	0.12	790.5	6006	1.73	7.60	0.83
To Storm By Others						55.85				6.47				0.00				0.00	10.00														
Mid-High Density Residential			0.00	0.80	0.00	0.00	0.49	0.90	1.23	1.23			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	128	525	525	CONC	0.20	57.0	192	0.89	1.07	0.66
To Existing Fern Casey Street						0.00				1.23				0.00				0.00	10.00														
Mid-High Density Residential					0.00	0.00	3.68	0.80	8.18	8.18			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	853	1050	1050	CONC	0.15	61.5	1058	1.22	0.84	0.81
To Existing Storm, to Axis Way						0.00				8.18				0.00				0.00	10.00														
SOUTH EAST TRUNK																																	
Hydro Easement			1.89	0.40	2.10	2.10			0.00	0.00			0.00	0.00			0.00	0.00															
Hydro Easement			3.33	0.40	3.70	5.80			0.00	0.00			0.00	0.00			0.00	0.00															
			8.94	0.90	22.37	28.17			0.00	0.00			0.00	0.00			0.00	0.00															
Parkette			0.63	0.40	0.70	28.87			0.00	0.00			0.00	0.00			0.00	0.00															
	401	402	0.99	0.80	2.20	31.07			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	2387	1350	1350	CONC	0.30	211.0	2923	2.04	1.72	0.82
To Existing Storm to Gerry Lalonde Drive						31.07				0.00				0.00				0.00	10.00														
Hydro Easement			1.86	0.40	2.07	2.07			0.00	0.00			0.00	0.00			0.00	0.00															
Hydro Easement			2.94	0.40	3.27	5.34			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	410	450	450	CONC	3.00	269.5	494	3.10	1.45	0.83
To Existing Storm, Trigoria Crescent						5.34				0.00				0.00				0.00	10.00														

***NOTE: NORTH EAST TRUNK DEVIATION FROM CITY STANDARDS BASED ON BACKGROUND SERVICING STUDIES. VANGUARD DRIVE CONTROLLED TO 100L/s/Ha. DEVELOPMENT AREA CONTROLLED TO 51.25 L/s/Ha.**

LICENSED PROFESSIONAL ENGINEER
K. MITIC
100122349
OCT 18, 2019
PROVINCE OF ONTARIO

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: R.B.	PROJECT: Orleans EUC MUC		
Checked: K.M.	LOCATION: City of Ottawa		
Dwg. Reference:	File Ref: 14-733	Date: October 2019	Sheet No. 3

733_STM_Oct1819_Opt1.xlsx

Project Name:	EUC
Project Number:	1195
Designed By:	LH
Checked By:	VM
Date:	2025-06-0

David Schaeffer Engineering Limi
600 Alden Road, Suite 606
Markham, ON L3R 0E7

HGL Preliminary Analysis

MH-ID	Invert Elev. (m)	Rim Elev. (m)	Depth (m)	Max. HGL (m)	Clearance from Surface (m)
MH-36	82.42	88.05	5.64	85.93	2.12
MH-66	81.98	87.87	5.89	85.65	2.22
MH-119	85.43	88.08	2.65	85.66	2.42
MH-27	85.48	89.45	3.97	87.01	2.44
MH-35	84.36	89.05	4.68	86.59	2.46
MH-94	84.12	88.78	4.67	86.29	2.49
MH-29	85.22	89.38	4.16	86.88	2.50
MH-96	85.27	88.93	3.66	86.41	2.52
MH-62	83.65	88.56	4.90	85.97	2.59
MH-99	83.66	88.72	5.06	86.13	2.59
MH-77	81.75	88.05	6.30	85.45	2.60
MH-95	85.63	89.13	3.50	86.52	2.61
MH-76	81.84	88.14	6.30	85.52	2.62
MH-67	81.90	88.19	6.29	85.56	2.63
MH-98	85.28	88.82	3.53	86.19	2.63
MH-55	84.76	88.93	4.17	86.29	2.64
MH-61	84.55	88.81	4.26	86.15	2.66
MH-100	83.40	88.60	5.20	85.93	2.67
MH-46	82.25	88.43	6.18	85.75	2.68
MH-47	82.08	88.39	6.31	85.71	2.68
MH-50	85.68	89.13	3.45	86.45	2.68
MH-51	84.95	89.05	4.10	86.36	2.69
MH-37	82.34	88.54	6.20	85.84	2.70
MH-110	81.38	87.95	6.57	85.24	2.71
MH-111	81.30	87.88	6.58	85.17	2.71
MH-113	81.17	87.76	6.59	85.05	2.71
MH-106	83.11	88.48	5.37	85.73	2.75
MH-19	83.10	88.96	5.86	86.21	2.75
MH-21	82.95	88.79	5.85	86.03	2.76
MH-18	83.21	89.12	5.91	86.35	2.77
MH-20	83.06	88.94	5.88	86.14	2.80
MH-49	85.76	89.32	3.55	86.50	2.82

HGL Preliminary Analysis

MH-ID	Invert Elev. (m)	Rim Elev. (m)	Depth (m)	Max. HGL (m)	Clearance from Surface (m)
MH-108	82.80	88.36	5.56	85.53	2.83
MH-114	81.04	87.66	6.62	84.83	2.83
MH-109	82.14	88.28	6.14	85.38	2.90
MH-25	85.91	90.12	4.21	87.19	2.93
MH-115	80.99	87.64	6.65	84.70	2.94
MH-17	83.30	89.39	6.09	86.43	2.96
MH-1	86.52	91.05	4.53	88.02	3.03
MH-4	85.70	90.73	5.03	87.69	3.04
MH-9	89.49	92.75	3.26	89.71	3.04
MH-5	85.50	90.65	5.15	87.60	3.05
MH-3	85.87	90.86	4.99	87.78	3.08
MH-6	85.14	90.55	5.41	87.47	3.08
MH-7	84.91	90.42	5.51	87.31	3.11
MH-2	86.06	91.05	4.99	87.90	3.15
MH-10	89.25	92.72	3.47	89.54	3.18
MH-24	86.56	90.45	3.89	87.26	3.19
MH-15	83.40	89.73	6.33	86.53	3.20
MH-8	84.51	90.27	5.76	87.07	3.20
MH-120	85.25	88.79	3.54	85.53	3.26
MH-23	87.20	90.82	3.61	87.56	3.26
MH-121	84.92	88.67	3.75	85.39	3.28
MH-135	80.30	86.77	6.47	83.49	3.28
MH-2150	80.16	86.64	6.48	83.31	3.33
MH-22	88.45	91.99	3.55	88.61	3.38
MH-14	83.51	90.06	6.55	86.63	3.43
MH-13	83.58	90.12	6.54	86.68	3.44
MH-97	85.55	89.68	4.13	86.21	3.47
MH-122	84.64	88.51	3.87	85.00	3.51
MH-123	83.37	87.98	4.61	84.40	3.58
MH-125	83.11	87.74	4.63	84.16	3.58
MH-48	86.50	90.37	3.87	86.69	3.68
MH-12	85.29	91.43	6.14	87.68	3.75
MH-133	83.82	87.57	3.75	83.82	3.75
MH-116	80.88	88.37	7.50	84.59	3.78
MH-117	80.74	88.19	7.45	84.38	3.81
MH-124	83.14	88.05	4.92	84.23	3.82
MH-118	80.70	88.17	7.48	84.26	3.91
MH-126	82.57	88.11	5.54	84.12	3.99
MH-128	82.44	88.09	5.65	84.05	4.04

HGL Preliminary Analysis

MH-ID	Invert Elev. (m)	Rim Elev. (m)	Depth (m)	Max. HGL (m)	Clearance from Surface (m)
MH-134	80.44	87.77	7.33	83.72	4.05
MH-11	88.22	92.57	4.35	88.50	4.07
MH-131	82.28	88.18	5.90	83.94	4.24
MH-130	82.34	88.22	5.88	83.97	4.25
MH-132	80.60	88.15	7.55	83.86	4.29

TRINITY

Trinity Development Group

TRINITY DEVELOPMENT - INNES / BELCOURT STORMWATER MANAGEMENT SYSTEM OTTAWA, ONTARIO

MUNICIPAL SERVICING
REVIEWED
CITY OF OTTAWA
DEPT OF PLANNING, TRANSIT AND THE ENVIRONMENT
INFRASTRUCTURE APPROVALS DIVISION
FOR MOE SUBMISSION

SIGNED: [signature]

DATE: 05/02/2009

D07-12-08-0001

14252
REVISED

JANUARY 2009

IBI GROUP

E144

Table 1. Post-Development Flow into the Existing Sewer at Innes Road

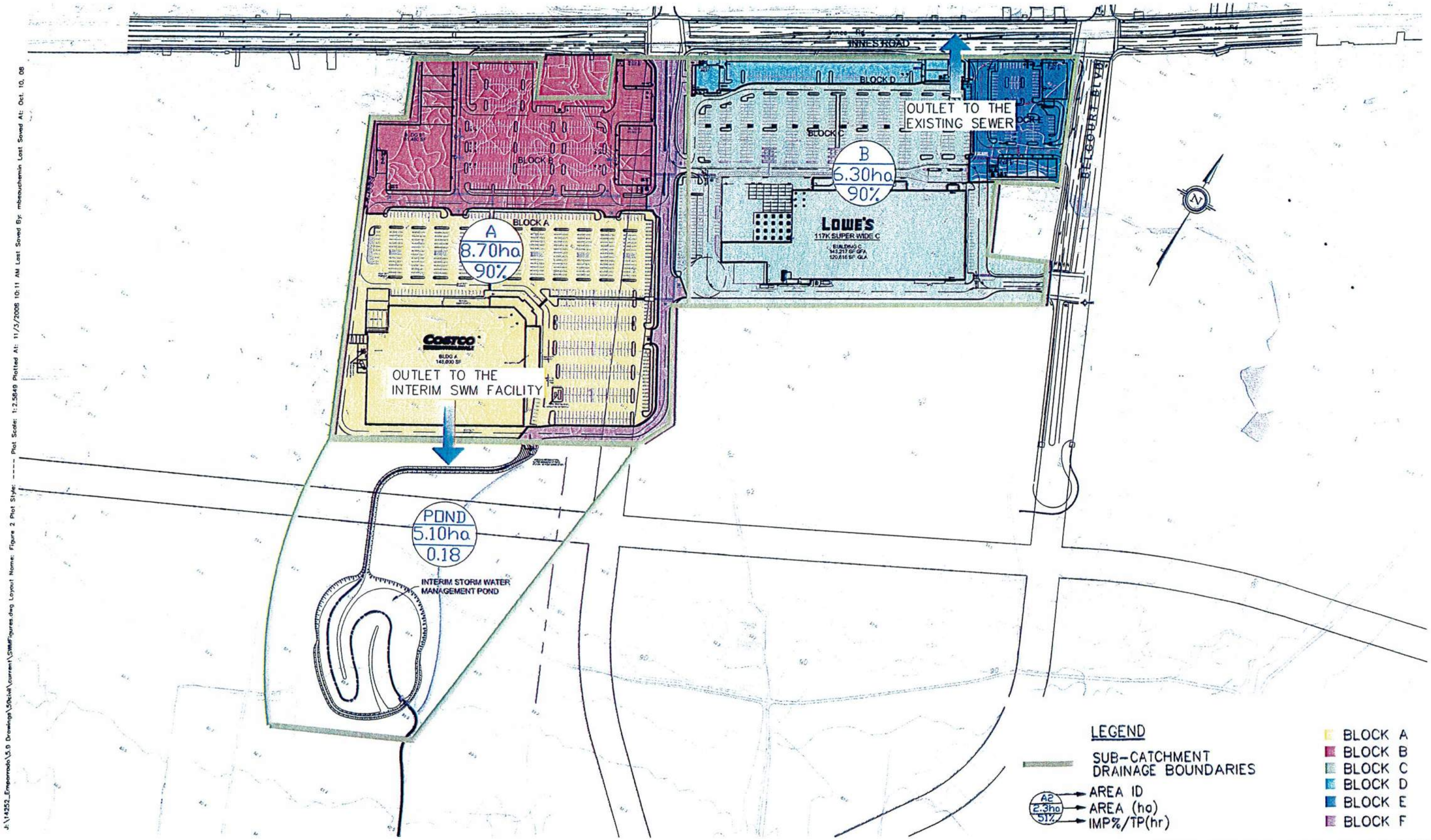
Storm Event	Post-Development Peak Flow (cms)
25 mm 4hr Chicago	0.467
2 Yr 3 hrChicago	0.471
5 Yr 3 hr Chicago	0.476
100 Yr 3hr Chicago	0.493

The above table indicates that the post-development peak flows from Area B outlet to the existing sewer at Innes Road does not exceeded the maximum allowable flow rate of 493 l/s.

From a development perspective, Area B is divided into 3 Blocks (Blocks C, D and E). The minimum required on-site storage is 1830 m^3. Blocks D and E will provide on-site-storage of approximately 400 m^3. Block C will be designed by others and the required on site-storage is approximately 1430 m^3 to ensure zero overflow. For the detail regarding the on-site storage volume and site grading for Blocks D and E, refer to the "Site Servicing Brief", (IBI Group, October 2008).

Drainage Area A

The total drainage area into the interim SWM Facility includes 8.7 ha of Area A and 5.1 ha of rural area located in the vicinity of the facility. The required level of service (85 l/s/ha) and the total inflow into the minor system will be maintained by the capacity restriction and density of the inlets directly connected into the minor system. The required on-site storage volume for Area A corresponds to a level of service of 85 l/s/ha and was determined using the route reservoir routine in SWMHYMO under the 100 year 3 hour Chicago storm. The on-site storage requirements for Area A is approximately 2700 m^3 in order to completely attenuate the runoff from the 100 year 3 hour Chicago storm event. As with the existing conditions, the 25 mm 4 hour Chicago and 2, 5 and 100 year 3 hour Chicago storms were used to evaluate peak flows. The results from the existing conditions model are presented in **Table 2** along with the post-development flows. The SWMHYMO model output and related calculations for the post-development conditions can be found in **Appendices A and C.**



IBI GROUP

Scale

1:3000

Project Title

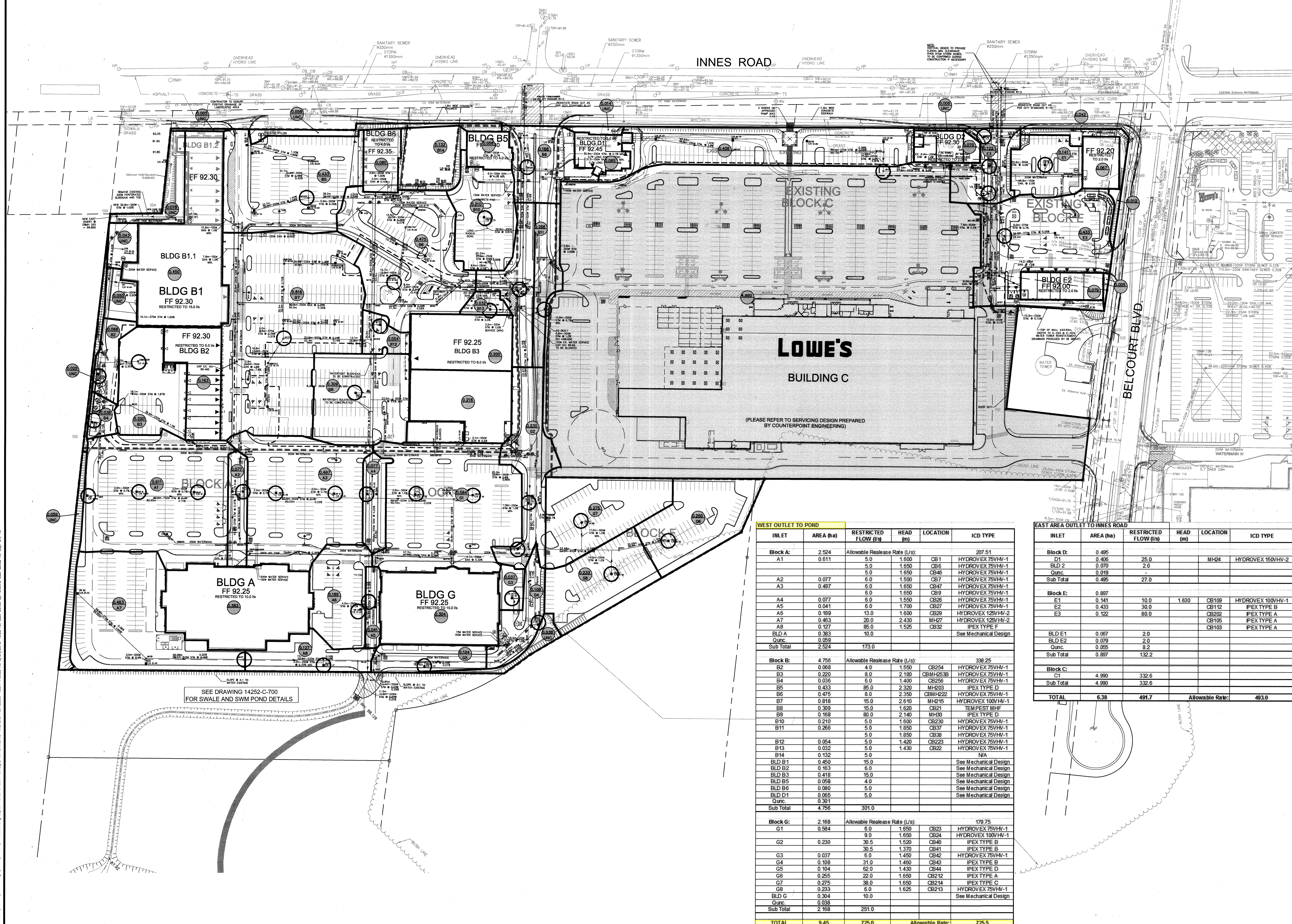
EMPARRADO LANDS

Drawing Title

POST - DEVELOPMENT
DRAINAGE BOUNDARIES

Sheet No.

FIGURE 2



WEST OUTLET TO POND					
INLET	AREA (ha)	RESTRICTED FLOW (l/s)	HEAD (m)	LOCATION	ICD TYPE
Block A:	2.524	Allowable Realease Rate (L/s):			207.51
A1	0.611	5.0	1.600	CB1	HYDROVEX 75VHV-1
		5.0	1.650	CB6	HYDROVEX 75VHV-1
		5.0	1.650	CB46	HYDROVEX 75VHV-1
A2	0.077	6.0	1.500	CB7	HYDROVEX 75VHV-1
A3	0.497	6.0	1.650	CB47	HYDROVEX 75VHV-1
		6.0	1.650	CB9	HYDROVEX 75VHV-1
A4	0.077	6.0	1.550	CB26	HYDROVEX 75VHV-1
A5	0.041	6.0	1.700	CB27	HYDROVEX 75VHV-1
A6	0.189	13.0	1.600	CB29	HYDROVEX 125VHV-2
A7	0.463	20.0	2.430	MH27	HYDROVEX 125VHV-2
A8	0.127	85.0	1.525	CB32	IPEX TYPE F
BLD A	0.383	10.0			See Mechanical Design
Qunc.	0.059				
Sub Total	2.524	173.0			
Block B:	4.756	Allowable Realease Rate (L/s):			338.25
B2	0.068	4.0	1.550	CB254	HYDROVEX 75VHV-1
B3	0.220	8.0	2.180	CBMH253B	HYDROVEX 75VHV-1
B4	0.036	6.0	1.400	CB256	HYDROVEX 75VHV-1
B5	0.433	85.0	2.320	MH203	IPEX TYPE D
B6	0.475	8.0	2.350	CBMH222	HYDROVEX 75VHV-1
B7	0.818	15.0	2.610	MH215	HYDROVEX 100VHV-1
B8	0.309	15.0	1.620	CB21	TEMPEST MHF
B9	0.168	80.0	2.140	MH30	IPEX TYPE D
B10	0.210	5.0	1.600	CB230	HYDROVEX 75VHV-1
B11	0.266	5.0	1.850	CB37	HYDROVEX 75VHV-1
		5.0	1.850	CB38	HYDROVEX 75VHV-1
B12	0.054	5.0	1.420	CB223	HYDROVEX 75VHV-1
B13	0.032	5.0	1.430	CB22	HYDROVEX 75VHV-1
B14	0.132	5.0			N/A
BLD B1	0.450	15.0			See Mechanical Design
BLD B2	0.163	6.0			See Mechanical Design
BLD B3	0.418	15.0			See Mechanical Design
BLD B5	0.058	4.0			See Mechanical Design
BLD B6	0.080	5.0			See Mechanical Design
BLD D1	0.065	5.0			See Mechanical Design
Qunc.	0.301				
Sub Total	4.756	301.0			
Block G:	2.168	Allowable Realease Rate (L/s):			179.75
G1	0.584	6.0	1.650	CB23	HYDROVEX 75VHV-1
		9.0	1.650	CB24	HYDROVEX 100VHV-1
G2	0.230	30.5	1.520	CB40	IPEX TYPE B
		30.5	1.370	CB41	IPEX TYPE B
G3	0.037	6.0	1.450	CB42	HYDROVEX 75VHV-1
G4	0.108	31.0	1.460	CB43	IPEX TYPE B
G5	0.104	62.0	1.430	CB44	IPEX TYPE D
G6	0.255	22.0	1.650	CB212	IPEX TYPE A
G7	0.275	38.0	1.650	CB214	IPEX TYPE C
G8	0.233	6.0	1.625	CB213	HYDROVEX 75VHV-1
BLD G	0.304	10.0			See Mechanical Design
Qunc.	0.038				
Sub Total	2.168	251.0			
TOTAL	9.45	725.0		Allowable Rate:	725.5

EAST AREA OUTLET TO INNES ROAD					
INLET	AREA (ha)	RESTRICTED FLOW (l/s)	HEAD (m)	LOCATION	ICD TYPE
Block D:	0.495				
D1	0.406	25.0		MH24	HYDROVEX 150VHV-2
BLD 2	0.070	2.0			
Qunc.	0.019	-			
Sub Total	0.495	27.0			
Block E:	0.897				
E1	0.141	10.0	1.630	CB109	HYDROVEX 100VHV-1
E2	0.433	30.0		CB112	IPEX TYPE B
E3	0.122	80.0		CB202	IPEX TYPE A
				CB105	IPEX TYPE A
				CB103	IPEX TYPE A
BLD E1	0.067	2.0			
BLD E2	0.079	2.0			
Qunc.	0.055	8.2			
Sub Total	0.897	132.2			
Block C:					
C1	4.990	332.6			
Sub Total	4.990	332.6			
TOTAL	6.38	491.7		Allowable Rate:	493.0

APPROVAL DATE June 28 2013

Felice Petti, P. Eng., Manager
Development Review, Suburban Services

Plan # ~~16300~~ 16433

LEGEND:

PROPOSED CB OR CBMH C/W INLET CONTROL DEVICE

AREA(ha) BLOCK SUB AREA

AREA(ha) UNCONTROLLED AREA

AREA(ha) FUTURE LANDS

No.	REVISIONS	By	Date
20	PHASE 2B NEW SITE PLAN	TRB	13:05:31
19	ADDED CITY STAMP	TRB	13:05:29
18	PHASE 2B NEW SITE PLAN	TRB	13:05:22
17	PHASE 2B NEW SITE PLAN	TRB	13:05:02
16	REVISED PHASE 2B	TRB	13:03:27
15	RE-REVISED SITE PLAN BLDG B5 AS PER 11:01:14	TRB	11:05:26
14	REVISED SITE PLAN BLDG B5	TRB	11:01:14
13	ISSUED FOR CONSTRUCTION PHASE 2B	TRB	10:11:17
12	REVISED AS PER NEW SITE PLAN	TRB	10:11:01
11	ADDED HYDRANT AT BLDG D1	TRB	10:06:10
10	REVISED AS PER NEW SITE PLAN	TRB	10:05:20
9	ISSUED FOR PH. 2B SPA	TRB	10:03:15
8	REVISED ICD BLOCK E	TRB	09:09:11
7	ISSUED FOR CONSTRUCTION	TRB	09:05:21
6	REVISED AS PER NEW SITE PLAN	TRB	09:05:12
5	REVISED PHASE 2	TRB	09:02:12
4	RE-ISSUED FOR TENDER	TRB	08:09:24
3	REVISED AS PER NEW SITE PLAN	DGY	08:09:22
2	REVISED AS PER CITY COMMENTS	TRB	08:07:04
1	ISSUED FOR REVIEW	DGY	07:12:19

TRINITY

IBI GROUP

333 Preston Street
Tower 1, Suite 400
Ottawa, Ontario
Canada K1S 5N4
Tel (613)225-1311
FAX (613)225-9868

Project Title

INNES RD. AND BELCOURT BLVD.
COMMERCIAL DEVELOPMENT

LICENSED PROFESSIONAL ENGINEER
T. R. BRULE
31/05/2013
PROVINCE OF ONTARIO

N

Drawing Title

ICD PLAN

Scale

1:1000

Design	Date
T.R.B.	DECEMBER '07
Drawn	Checked
L.R.	T.R.B.
Project No.	Drawing No.
14252	C-800

DRAWINGS

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

TRAILSEDGE PHASE 5
GRADING PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JUNE 2025
DRAWING No.	1

Block ID	Contributing Area (ha)	Allowable Release Rate (m³/s)	100yr Expected Storage Volume (m³)
Controlled to 2 year			
392A	4.66	0.796	945
392B	5.82	0.994	1103
393	2.31	0.350	467
391A	2.58	0.441	554
391B	1.18	0.202	239
Controlled to 5 year			
Future Block (Lot 4)	6.47	1.687	1064
390	4.05	0.469	180
279	0.61	0.071	64
277	1.20	0.139	75
389	3.00	0.695	423
388	3.30	0.765	415
352	1.38	0.247	279
261	2.48	0.503	501
280	2.04	0.367	413

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TRAILSEDGE PHASE 5
STORM SERVICING PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JUNE 2025
DRAWING No.	2

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

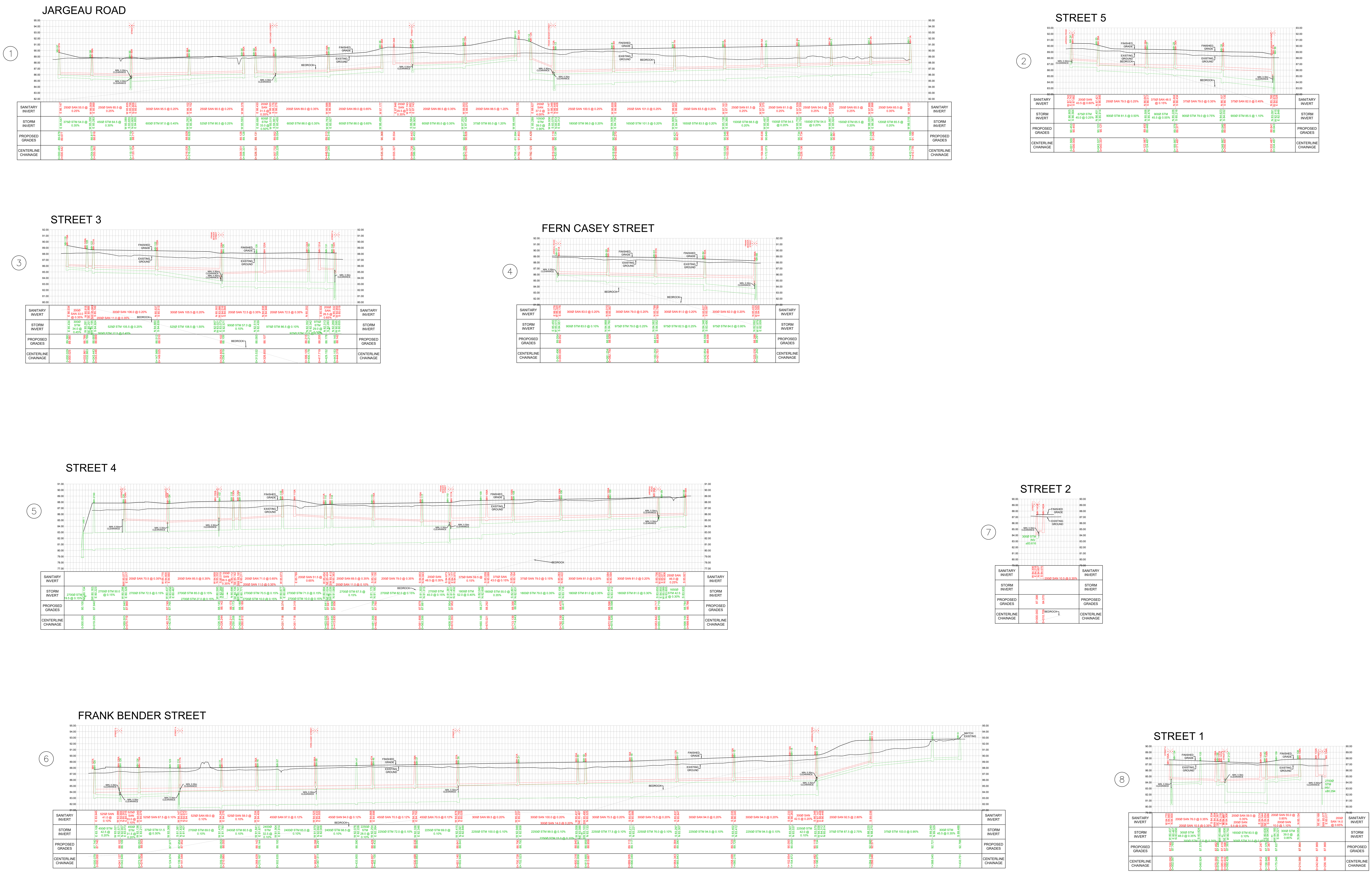
TRAILSEDGE PHASE 5
SANITARY SERVICING PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JUNE 2025
DRAWING No.	3

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

TRAILSEDGE PHASE 5
WATERMAIN SERVICING PLAN

PROJECT No. :	20-1195
SCALE	1:2000
DATE:	JUNE 2025
DRAWING No.	4



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TRAILSEDGE
PHASE 5

CITY OF OTTAWA

PROFILES

SCALE:	H 1:2000 V 1:200	PROJECT No.:	20-1195
DATE:	JUNE 2025	DRAWING:	5

WATERCOURSES, STREAMS, CREEKS, WOODLOTS AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.

THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.

IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF A POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL,

1. IMMEDIATELY NOTIFY THE APPROPRIATE FEDERAL, PROVINCIAL AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES AS THEY DEEM APPROPRIATE TO MITIGATE AGAINST THE ANY ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
3. THE CONTRACT SHALL RESTORE THE AFFECTED AREA TO ORIGINAL CONDITION OR BETTER, ALL TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

THE EXISTING DRAINAGE FEATURES WILL BE PROTECTED UNTIL SUCH A TIME THAT APPROVALS ARE IN PLACE FROM THE RVCA (ALTERATION OF WATERWAYS) AND ALL OTHER REGULATORY AGENCIES. THE JOCK RIVER IS TO BE PROTECTED DURING CONSTRUCTION ACTIVITIES.

THE SILTATION CONTROL PLAN IS INTENDED TO ASSIST THE CONTRACTOR IN THE LAYOUT AND CONSTRUCTION OF THE SILTATION CONTROL FEATURES ONLY. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION OF SITE SERVICES.

MONITORING OF SEDIMENT AND EROSION CONTROLS

MONITORING AND REPORTING TO BE COMPLETED IN ACCORDANCE WITH THE MINISTRY OF THE ENVIRONMENT, CONSERVATION, AND PARKS (MECP) AND RIDEAU VALLEY CONSERVATION AUTHORITY(RVCA) APPROVALS.

MAINTENANCE PROGRAM

ALL DAMAGED ESC MEASURES SHOULD BE REPAIRED AND/OR REPLACEMENT WITHIN 48 HOURS OF THE INSPECTION.

THE ENVIRONMENTAL MONITOR IS REQUIRED TO SUBMIT UPDATES TO THE TOWN/ REGION/ CONSERVATION AUTHORITY BY EMAIL IN A TIMELY MANNER.

SEDIMENT SHOULD BE REMOVED FROM THE SEDIMENT CONTROL FENCING ONCE SEDIMENT HAS ACCUMULATED TO A LEVEL OF ONE-THIRD THE HEIGHT OF FENCING OR TO A HEIGHT OF 30 cm. ANY AMOUNT OF ACCUMULATED SEDIMENT SHOULD BE REMOVED PRIOR TO THE REMOVAL OF THE CONTROL MEASURES.

SEQUENCE OF ACTIVITIES

THE EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

- INSTALLATION OF THE SEDIMENT CONTROL FENCING WHERE INDICATED.
- REMOVAL OF SITE VEGETATION IN ACCORDANCE WITH ALL APPLICABLE BY-LAWS,
- CONSTRUCTION OF THE EROSION AND SEDIMENT CONTROL POND IN ACCORDANCE WITH THE DESIGN DRAWINGS.
- REGULAR MONITORING OF THE SEDIMENT CONTROL FENCES BY THE CONTRACTOR TO VERIFY THAT THE FENCES ARE FUNCTIONING AS INTENDED.
- REGULAR MONITORING OF THE SEDIMENT BASIN TO VERIFY THAT THE BASIN IS FUNCTIONING AS INTENDED.
- REMOVAL OF THE EROSION AND SEDIMENT CONTROL DEVICES ONCE THE SITE HAS BEEN STABILIZED.

LEGEND

SUBJECT LANDS
SILT FENCE
MAJOR OVERLAND FLOW DIRECTION
SWALE

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120 Iber Road, Unit 103
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TRAILSEDGE PHASE 5
EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JUNE 2025
DRAWING No.	6