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FUNCTIONAL SERVICING REPORT

FOR

RICHCRAFT HOMES TRAILS EDGE NORTH

CITY OF OTTAWA

PROJECT NO.: 20-1195

JANUARY 2026

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FUNCTIONAL SERVICING REPORT

FOR

RICHCRAFT HOMES
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

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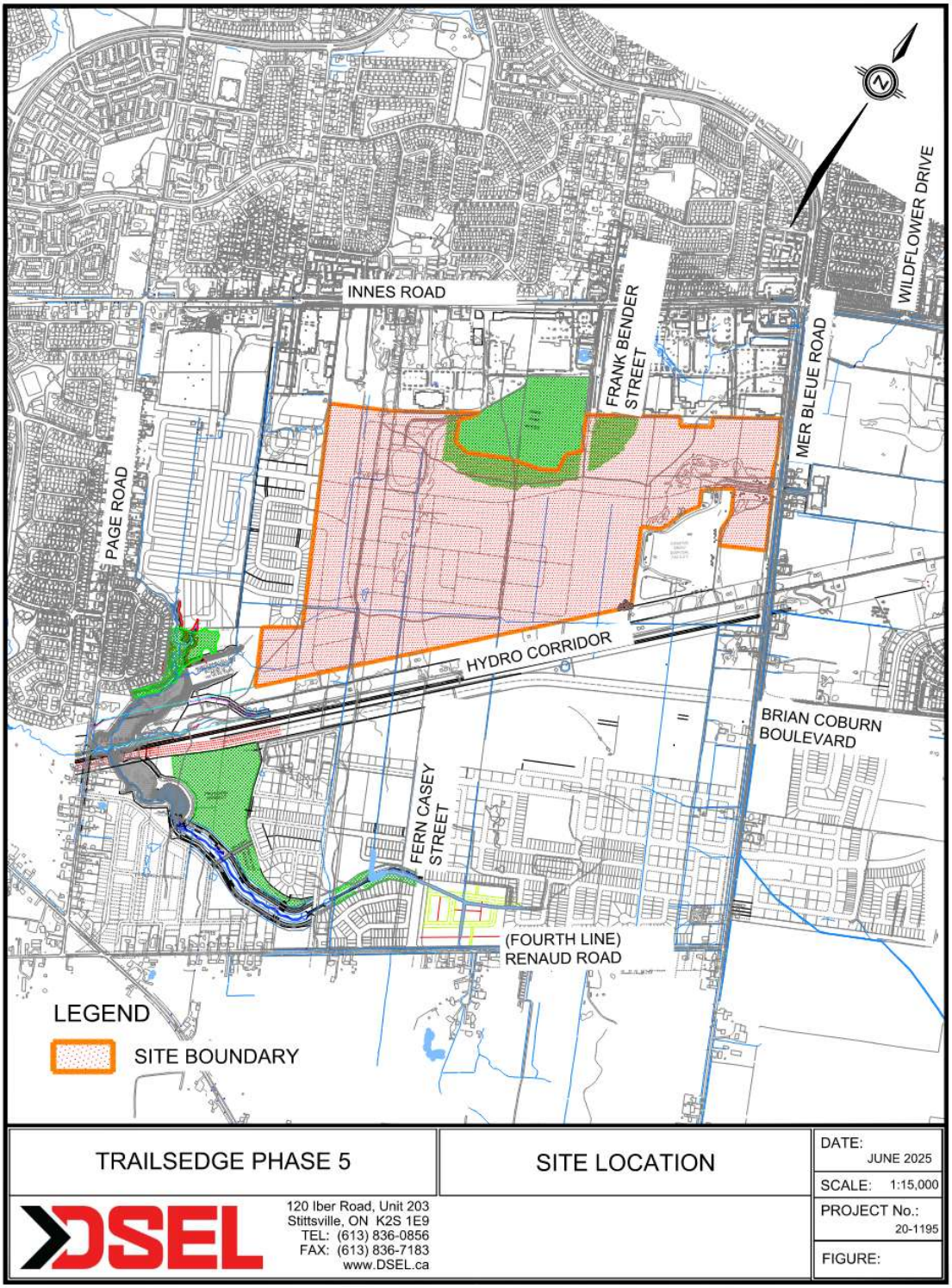

Figure 1-1: Study Area Location

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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 14.75 m to 24 m.

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.*

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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

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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 287 detached single-family homes, 365 traditional townhomes, 56 bungalow-style towns, 42 dual front towns, and 152 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 14.75 m and 18 m right-of-way (ROW) widths, while collector roads will have ROW widths of 24 m and 28 m. 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 2026)

Land Use	Unit Count	Residential Population (PPU)	Projected Population
Singles	287	3.4	976
Towns	365	2.7	986
Bungalow Towns	56	2.7	152
Dual Front Towns	42	2.7	114
Back-to-Back Towns	152	2.7	411
Subtotal Freehold Units	**902**	**—**	**2,639**
Block 373 & 301 (Low Density)	228	2.7	616
Block 261 294 (Medium Density)	142	2.3	32759
Block 409 & 410388 (High Density)	504	1.8	908476
Subtotal Multi-Units	**874**	**—**	**1,851**
Total Units	**1,776**	**—**	**4,490**

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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 4,490 represents a slight decrease (approximately 8%) 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)	Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA)	Construction of new linear sanitary, storm and watermain systems	Covered under the City's CLI-ECA for wastewater and stormwater systems. The City reviews and approves design submissions under its municipal CLI-ECA in lieu of separate MECP review.
	Permit to Take Water (PTTW)	Dewatering >400,000 L/day	Required for significant groundwater pumping during construction (e.g., for

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			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.

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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, December 2025 (SDG002)
- **Ottawa Design Guidelines – Water Distribution**, City of Ottawa, December 2015 (WDG002)

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, July 7, 2019
- **Conceptual Site Servicing and Stormwater Management Report**, Novatech, 2020
- **Mud Creek Cumulative Impact Study**, Stantec, 2020
- **Environmental Impact Statement – Trails Edge North**, GHD, 2020

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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.

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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 provided Water Distribution Guidelines for population above 3000 (refer to Appendix C).

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 (high-, med-, low-density)	1.8 p/unit, 2.3 p/unit, 2.7 p/unit
Residential Average Daily Demand – Single Family Home	180 L/c/d
Residential Average Daily Demand – Multi Family Townhome	198 L/c/d
Residential Average Daily Demand – High Density Building	219 L/c/d
Outdoor Water Demand (OWD) – Single Family Home	700 L/unit/d
Outdoor Water Demand (OWD) – Multi Family Townhome	350 L/unit/d
Residential Maximum Daily Demand – Single Family Home	Average Daily Demand + OWD
Residential Maximum Daily Demand – Multi Family Townhome	Average Daily Demand + OWD
Residential Maximum Daily Demand – High Density Building	Average Daily Demand
Residential Peak Hour Demand – Single Family Home	2.7 x Maximum Day
Residential Peak Hour Demand – Multi Family Townhome	2.3 x Maximum Day
Residential Peak Hour Demand – High Density Building	1.6 x Maximum Day
Residential Minimum Hourly Demand	0.5 x Average Daily Demand
Commercial/Institutional Average Daily Demand	17,000 L/gross ha/day

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Park Average Daily Demand	17,000 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 peak 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 (December 2025), Table 4.1, and City of Ottawa approved Guidelines for populations exceeding 3000.	

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 8,500 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.

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Table 3-2: Water Demand Estimate & 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	986.2	684.8	1,443.9	1,002.7	2,807.2	1,949.4	10,000 L/min* (Per ISDTB-2014-02)
Commercial Demand	281.7	195.6	422.5	293.4	760.6	528.2	15,000 L/min (Considered adequate for most types of structures and occupancies, but is to be confirmed at the detailed design level)
Park	86.19	59.9	129.3	89.8	232.7	161.6	
Total Demands	**1,354.0**	**940.3**	**1,995.8**	**1,385.9**	**3,800.5**	**2,639.2**	
Demands for Study Area under MSS Dev Stats	1,855.4	1,288.5	2,253.0	1,564.6	3958.9	2,749.2	

*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. The MSS still 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.

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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.

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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.

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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, December 2025, 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

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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 93.66 L/s. This represents a 17% 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, Dec 2025)	**Glenview Homes (NOVATECH, Mar 2022)**	**MSS (DSEL, Dec 2020)**
Contributing Drainage Area (Extraneous)	82.24 ha	15.5 ha	99.8 ha
Population	4,490	1,218	7,181
Peak Flow	2.97 (MH 142A) + 78.17 (MH 127A) = 81.14 L/s	12.52 L/s	
Total Flow to MH1A	**93.66 L/s**		**113.41 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.

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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.

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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 temporary 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 provide quality control for 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.

5.1.1 Existing Temporary SWM Pond

An existing temporary stormwater management (SWM) pond is located within the Richcraft Lands, northwest of the subject site. This facility provides quality control for runoff generated from the Innes Road and Belcourt Boulevard Commercial Development situated north of the Richcraft Lands. It is important to note that the commercial area implements its own quantity control measures, achieved through a combination of rooftop storage and surface ponding. As shown on the ICD and Ponding Plan included in Appendix E, runoff from the commercial development discharging to the temporary SWM pond is restricted to a release rate of 76.72 L/s/ha (725 L/s) through on-site inlet control devices (ICDs).

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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 (2025). 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	$i = \frac{A}{(t_c + B)^C}$
Minimum Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Runoff coefficient for paved and roof areas	0.9
Runoff coefficient for landscaped areas	0.2
Minimum Sewer Size	250 mm diameter

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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	PCSWMM with SWMM 5.2.4 Engine
Model Parameters	Infiltration Method = Horton, 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.
Climate Change Street Test	20% increase in the 100-year, 3-hour Chicago storm

Extracted from City of Ottawa Sewer Design Guidelines, December 2025, and based on recent residential subdivisions in the City of Ottawa.

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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.

Where stormwater trunk sewers exceed 1500 mm in diameter within 18 m right-of-ways, a modified ROW detail has been developed to address potential proximity conflicts associated with the larger pipe size, including adjacent utility trenches, streetlight foundations, and other underground infrastructure (refer to Figure 3).

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.

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 by a cutoff swale designed to replicate existing drainage conditions, as recommended in the *Environmental Impact Statement (GHD, 2020).* This swale forms part of the ultimate drainage system and is sized to convey the 100-year event from the woodlot to the minor system. The supporting calculations for the swale design have been included in Appendix E.

The temporary stormwater management pond currently within the study area is to be decommissioned and the proposed storm sewer network is to capture the flows from the

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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. More details regarding decommissioning and contractor responsibilities are described in section 5.2.3.

The only corresponding deviation from the MSS stormwater servicing strategy is the use of a single major storm trunk system, whereas the MSS had originally proposed two. As the design advanced and the land use layout, grading, and drainage patterns were refined, it was determined that a second trunk was not required to meet conveyance or capacity needs.

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 approved EUC Pond 1 North Main Cell and North Forebay Modifications Report (DSEL, February, 2023). As indicated in Appendix E, the peak Rational Method design flow to Pond 1 is estimated at 11,000 L/s. A comparison to the peak flows considered in the MSS is provided in Table 5-2. The results show a 7% reduction in peak Rational Method flow within the storm trunks.

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

Rational Method Peak Flow	Trails Edge North FSR (DSEL, Nov 2025)	MSS (DSEL, Dec 2020)
North Forebays	10,818 + 182 = 11,000 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, February, 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.

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 10–15%, 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.

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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.

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.

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.

5.2.3 Existing Temporary SWM Pond Decommissioning

An existing temporary stormwater management (SWM) pond currently provides quality control for the Innes Road and Belcourt Boulevard Commercial Development located north of the Richcraft Lands. This commercial area implements its own quantity control measures through rooftop storage and surface ponding, with discharge to the temporary SWM pond restricted to a release rate of 76.72 L/s/ha (725 L/s).

With the implementation of the proposed development, the temporary SWM pond will be decommissioned, and the existing discharge will be intercepted and conveyed within the new minor system storm sewers. The proposed storm sewer system will be designed to

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accommodate a conservative release rate of 85 L/s/ha for the commercial development, which remains consistent with the MSS and ensures compatibility with the existing 76.72 L/s/ha release rate.

Following the decommissioning of the temporary facility, EUC Pond 1 will provide quality control for the runoff previously managed by the temporary pond.

Prior to the decommissioning, the Contractor will be responsible for preparing detailed staging and flow bypass plans to ensure uninterrupted service for the contributing drainage area. In addition, tie-in elevations at property boundaries and existing emergency overflow routes must be respected throughout the transition period to prevent any disruption to drainage functionality or potential flooding impacts.

5.2.4 Proposed Quality & Quantity Control

EUC Pond 1 was constructed and designed to provide both water quality and quantity control for the Trails Edge Phase 5 development and the surrounding tributary area. The drainage area and imperviousness values used in this FSR are consistent with those applied in the final EUC Pond 1 Expansion Design Brief (DSEL, 2023). As summarized in Table 5-3, the contributing area remains essentially unchanged, and the overall imperviousness is lower than the values applied in the pond design.

Table 5-3: EUC Pond 1 (Forebay C) Drainage Area Comparison

EUC Pond 1 Expansion Design Brief (DSEL, 2023)		Functional Servicing Report (DSEL, 2026)	
Area(ha)	Imperviousness	Area(ha)	Imperviousness
107.53	74 %	107.5	68%

5.2.5 Supporting Stormwater Modelling

As there have been some changes to the road network and land uses compared to the MSS, 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 post-development conditions.

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5.2.6 Hydraulic Grade line (HGL)

A PCSWMM model was developed to model the minor system and complete a preliminary HGL analysis. Inflows to the minor system were modelled using the Rational Method peak flow from each subcatchment, consistent with the drainage plan. To account for additional head acting on the ICDs during the 100year storm event, minor system flows were increased by 35% in the model. The 35% adjustment serves as a rule of thumb, consistent with past projects where detailed modelling produced peak flows in the minor system about 35% higher than Rational Method estimates under similar conditions.

As the rational method produces peak flows and not hydrographs, negative inflows are implemented in certain nodes to correct for segments with no incremental areas and longer time of concentration, which reduces the peak flow from the upstream segment.

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 more than or equal to 2.1 (1.8m centerline of road to USF + 0.3m freeboard).

Per the *Pond 1 East Urban Community North Main Cell And North* Design brief (DSEL, 2023), the maximum allowable 100-year pond level is 83.00m during the 100-year 24-hour SCS. As such the HW1 outfall is set to a Fixed Stage = 83.00m, which establishes a constant downstream water surface elevation of 83.00 m at the outfall. The storm system outlet is lower than the Pond 1 HGL and operates under submerged conditions, meaning the downstream water level exerts a backwater effect on the system. This backwater influences upstream hydraulic performance and is accounted for through the Hydraulic Grade Line (HGL) analysis and incorporated in PCSWMM as a hotstart, which evaluates how these conditions impact water levels and flow capacity within the upstream network.

The preliminary HGL analysis is provided in Appendix E, and confirms the freeboard requirement is 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

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Release rates were determined for the multi-residential, park, and employment blocks based on 10-minute time of concentration peak flow estimates using the Rational Method. The allowable release rate was established such that the 100-year storm event is controlled to the equivalent of a 2-year or 5-year storm event, as per the following:

- Multi-residential and park blocks – controlled to a 5-year return period.
- Employment lands – controlled to a 2-year return period.

For the purpose of estimating storage requirements, the first 15 metres of each block frontage were assumed to drain uncontrolled toward the City right-of-way (ROW).

The results of the PCSWMM simulations provide preliminary estimates of storage requirements for each block. Table 5-4 summarizes the key storage characteristics, including the contributing drainage area, peak inflow during the 100-year storm event, allowable release rate, and the estimated storage volume required to manage controlled outflows.

Table 5-4: Estimated Storage Volumes for Blocks

Block ID	Contributing Area (ha)	Allowable Release Rate (m^3/s)	Allowable Release Rate (L/s)	Allowable Release Rate per Ha ($m^3/s/ha$)	Allowable Release Rate per Ha(L/s/ha)	Outflow Location (Manhole)	100yr Estimated Storage Volume (m^3)
Controlled to 2-year							
414B	5.82	0.994	994	0.171	171	MH2, MH3	1444
413	2.31	0.395	395	0.171	171	MH1, MH2	596
External 413	1.62	0.277	277	0.171	171	MH1, MH2	408
412A	2.76	0.471	471	0.171	171	MH7, MH8	734
414A	4.66	0.796	796	0.171	171	MH6, MH7	1189
412B	1.18	0.202	202	0.171	171	MH5, MH6	349
Controlled to-5 year							
Future Block (lot 4)	6.47	1.687	1687	0.261	261	MH94, MH99	1347
373	1.38	0.28	280	0.203	203	MH99, MH100	247
411	3.87	0.448	448	0.116	116	MH18, MH19	261
301	2.04	0.414	414	0.203	203	MH25, MH27	336
300	0.40	0.046	46	0.115	115	MH22, MH23	72
418	1.20	0.138	138	0.115	115	MH50, MH51	121

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294	1.98	0.402	402	0.203	203	MH95, MH96	351
410	3.00	0.695	695	0.232	232	MH47, MH66	605
409	3.30	0.765	765	0.232	232	MH113, MH114	637

Note: The Estimated storage volumes presented assume that the first 15 metres of each block frontage contributes uncontrolled overland flow directly to the right-of-way.

The allowable release rate per hectare for the 5-year controlled blocks varies because each land use has a different runoff coefficient. These blocks include high-density residential (RC 0.8), low and medium-density residential (0.7), and parkland (0.4). Their peak flows result in different allowable release rates per hectare for each area.

Residential Unit Area

A representative sample area was modeled to verify that the 1:100 can be stored in roadway 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 the sample area north of Frank Bender street and west of Street 5. The area was modelled using the 100-year storm, with the outflow set to a 2-year Rational Method release rate, assuming a 10-minute time of concentration and applying a 35% increase to account for the additional head acting on the ICDs during the 100-year storm event. The storage within the sags was compared against the runoff volume generated from the 100-year storm to ensure sufficient volume is provided and ponding is kept below 0.35cm. The results are presented in Table 5-5.

Table 5-5: Estimated Storage Volumes for Residential Unit Sample area

ID	Contributing Area (ha)	Max. 100yr Inflow (m^3/s)	Designed Outflow (m^3/s)	Required 100yr Storage Volume (m^3)	Provided 100yr Storage Volume (m^3)	100yr Storage Volume per Area (m^3/ha)
Sample Area						
Sample 1	2.34	0.94	0.473	203	210	89.80

A figure (Figure 1) is provided in Appendix E to demonstrate the storage assumptions for roadway sags. The figure shows the expected surface ponding extent and depth within the roadway cross-section. When compared against the required storage volume summarized in Table 5-5, the available ROW storage surpasses the estimated requirement, confirming the no overland flow.

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For comparison, Figure 2 – Surface Storage Calculations has been added to Appendix E. This figure illustrates the neighbouring East Urban Community Phase 3 surface storage area and references detailed road ponding design data from the adjacent subdivision to establish an average surface storage volume per hectare. The resulting average of 172 m^3/ha confirms that the sample estimate of 89.80 m^3/ha used in this FSR is conservative.

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 & Water Balance

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

The proposed stormwater 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. Storm servicing will be provided through a gravity-based internal sewer network that will convey flows to EUC Pond 1 which has been sized to accommodate the development.

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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.

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7.0 CLI-ECA APPENDIX A CONFORMANCE

The Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) process requires the municipal stormwater management system to meet the criteria set out in Appendix A. Specifically water quality, water balance and construction erosion and sediment control.

Water quality for the stormwater is provided through the Pond 1 design. The required TSS removal target for Mud Creek is 70%. While the overall pond system was designed to achieve Normal protection (70% long-term average TSS removal), the expanded North Main Cell and North Forebays were designed to provide Enhanced protection (80% long-term average TSS removal) for the flows treated within the North Forebays. Further details on the Pond 1 design and the major and minor systems are provided in Sections 5.2.1 to 5.2.3 and in the *Master Servicing Study for the East Urban Community Phase 3 Area Community Design Plan.*

The water balance and infiltration requirements outlined in the *Master Servicing Study for the East Urban Community Phase 3 Area Community Design Plan (MSS)* recognize that infiltration potential is limited due to the low permeability of the clay soils and the presence of a perched water table. As a result, infiltration volumes achievable through Low Impact Development (LID) measures are expected to be minimal. The proposed implementation strategies for the development are summarized in Section 5.3 – Infiltration and Water Balance. Additional details on the desired water balance approach are provided in Section 11.6 of the MSS and in the *Existing Conditions Water Budget report (Palmer, 2014)*.

According to Appendix A of the CLI-ECA, Erosion and sediment control (ESC) for construction must be outlined in an ESC plan. An ESC plan is included in the civil engineering drawing set. These drawings note that the work for the ESC will be carried out per CANCSA W202-18.

The erosion threshold criteria were established in the *Master Servicing Study for East Urban Community Phase 3 Area Community Design Plan (MSS)* as well as *the Approved Environmental Impact Study (EIS, Kilgour & Associates LTD, 2023)*. These criteria were confirmed and adhered to during the design of Pond 1, which has since been approved and constructed. The current design for Trails Edge continues to align with the erosion threshold criteria established for Pond 1.

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8.0 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 swale along the southern boundary shown on the Erosion and Sediment Control (ESC) drawing illustrates a temporary feature implemented at the start of construction. The purpose of this temporary feature is to convey flow to a controlled discharge location where sediment can be removed prior to the drainage exiting the site.

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.

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9.0 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.

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10.0 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 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.

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

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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:

David Schaeffer Engineering Ltd.

Per: Martin Fréchette, P.Eng.

Reviewed By:

David Schaeffer Engineering Ltd.

Per: Alexandre Tourigny, P.Eng.

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Z:\Projects\20-1195_Richcraft-EUC_North\B_Design\B3_Reports\B3-2_Servicing (DSEL)\2025-10-08_FSR_4th

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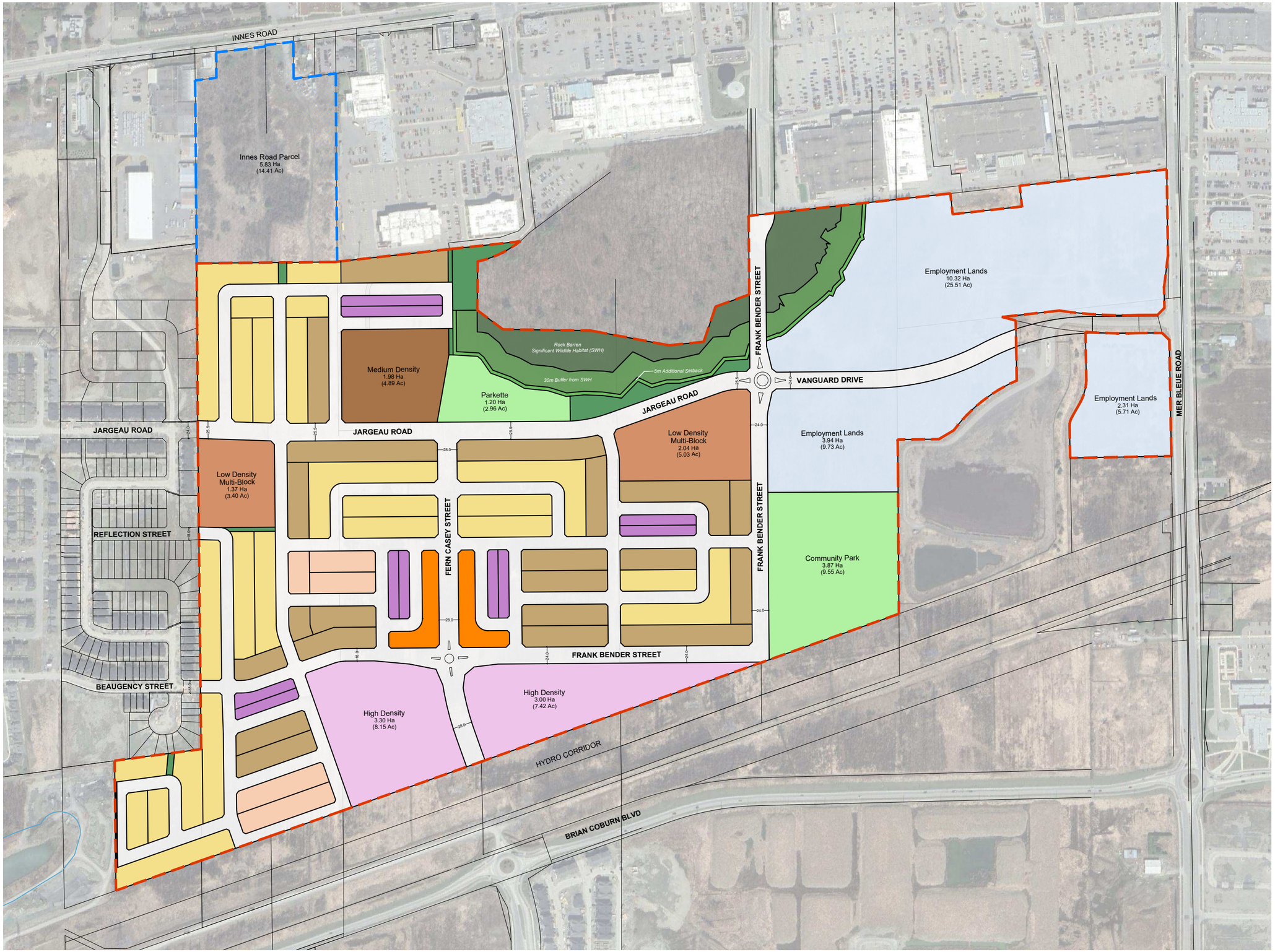
APPENDIX A

- Trailsedge Phase 5 Concept Plan v17 (NAK, December 18, 2025)
- Unit Layout Draft Plan (AOV, January, 2026)
- Servicing Guidelines Checklist (DSEL, November 25, 2025)



PROPOSED LAND USE 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
- Rock Barren Significant Wildlife Habitat (SWH)
- 30m Buffer from SWH
- 5m Additional Setback
- Employment Lands
- MUP
- Subject Lands
- Innes Road Parcel

NORTH

NAK design strategies

213 STERLING ROAD, SUITE 211, TORONTO, ON M6R 2B2 CANADA
T 416.340.8700 F 416.340.7100 NAKDESIGNSTRATEGIES.COM

1:5000

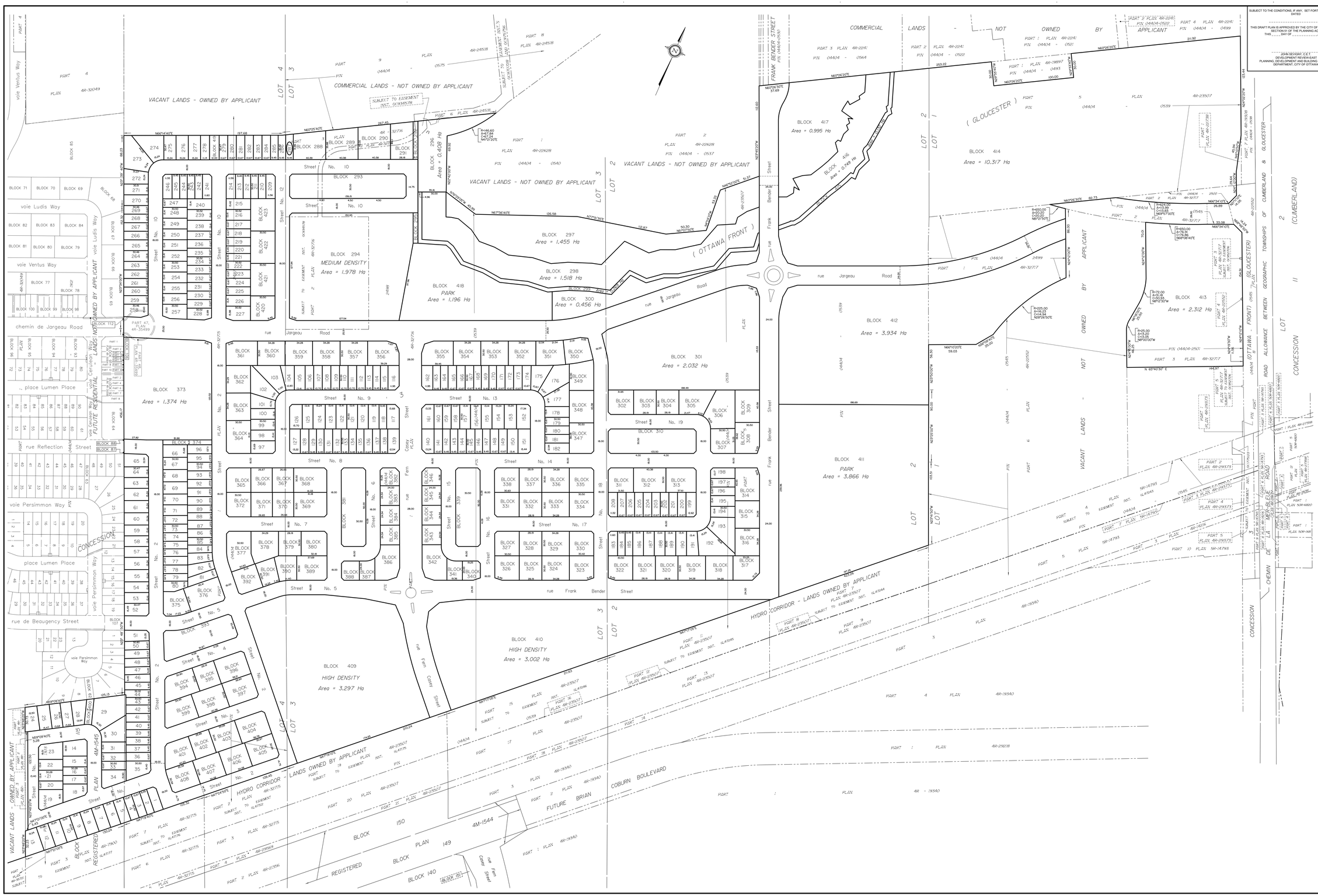
0 75m 150m

DATE | 12.18.2025

PROJECT | 21116

CP-17

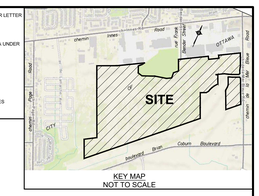
U:\Skara\2021\21116 - Trailsedge Phase 5\Design\2024-06-04 Community Master Plan.dwg\2025-12-18_Trailsedge Phase 5_v17.dwg



SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED
_____

THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT
This _____ DAY OF _____, 20__

JOHN SEVIGNY, C.E.T.
DEVELOPMENT REVIEW-EAST
PLANNING, DEVELOPMENT AND BUILDING SERVICES
DEPARTMENT, CITY OF OTTAWA



KEY MAP
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION OF
PART OF LOTS 1, 2, 3 and 4
CONCESSION 3 (OTTAWA FRONT)
Geographic Township of Gloucester
and
PART OF BLOCK 115
REGISTERED PLAN 4M-1545
CITY OF OTTAWA
Prepared by Annis , O'Sullivan , Vollebekk Ltd.

Scale 1 : 1250
50 37.5 25 12.5 0 25 50 Metres

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

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.

_____ _____
Date K. Hartwick
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

This is to certify that I am the owner / agent of the lands to be subdivided and that this plan was prepared in accordance with our instructions.

_____ _____
Date Steve Grandmont
RICHCRAFT HOMES LTD.
2322028 ONTARIO INC.
I have authority to bind the corporation.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

(a) see plan
(b) see plan
(c) see plan
(d) single family, multi-family residential housing, park land and open space
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) sanitary, storm sewers, municipal water, bell, hydro, cable and gas to be available
(l) see plan

REVISION SCHEDULE

NO.	REVISION	DATE	BY
23	REVISIONS	JAN. 7, 2026	N
22	REVISIONS	JAN. 6, 2026	N
21	REVISIONS	NOV. 25, 2025	N
20	REVISIONS	NOV. 13, 2025	N
19	REVISIONS	NOV. 12, 2025	N
18	WILDLIFE HABITAT & BUFFER BLOCKS ADDED	NOV. 5, 2025	N
17	UPDATED CITY SIL BOX	MAY 27, 2025	N
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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Email: Nepean@aovltd.com
Ontario Land Surveyors
Job No. 19R8019 Richcraft Pt Lts 1-4 C3 OF G, OPS 023 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.	Figures 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 1.4
☐	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 & Figure 5. 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 & Figure 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 5.3
☐	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Figure 5, 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 5.3, & Figure 5
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	MSS, Section 5.3
☐	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 5.3
☐	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 5.3
☐	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 5.3
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 5.3, Appendix E & Figure 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 5.5
☐	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 5.3 & 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 & 5.6

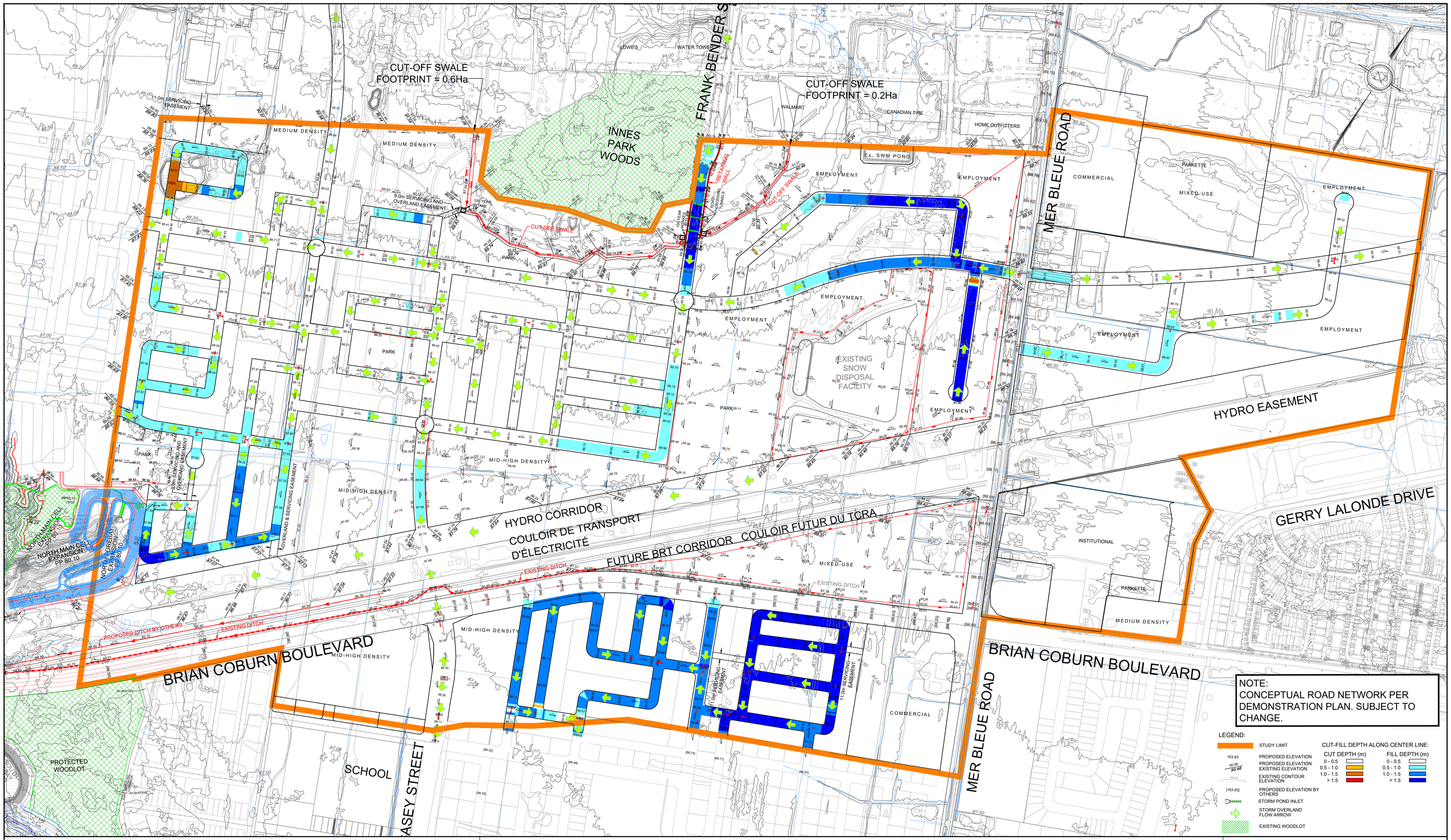
4.5 Approval and Permit Requirements: Checklist		
☐	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation 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 8.0
☐	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.	N/A first submission
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	Section 8.0

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

APPENDIX B

- Excerpts from MSS (DSEL, Dec 2020)



DSEL
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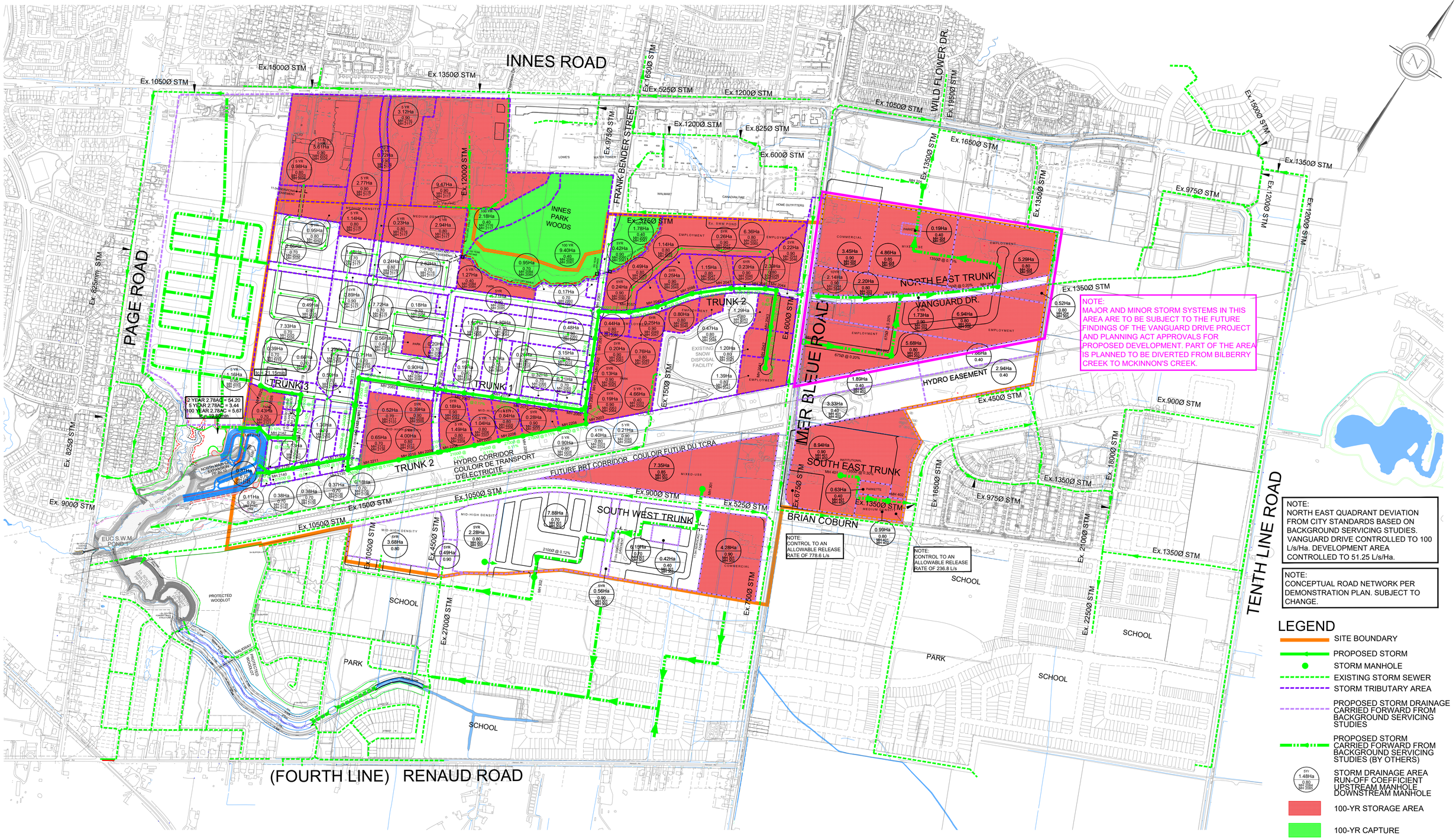
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
GRADING PLAN

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



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Fax. (613) 836-7183
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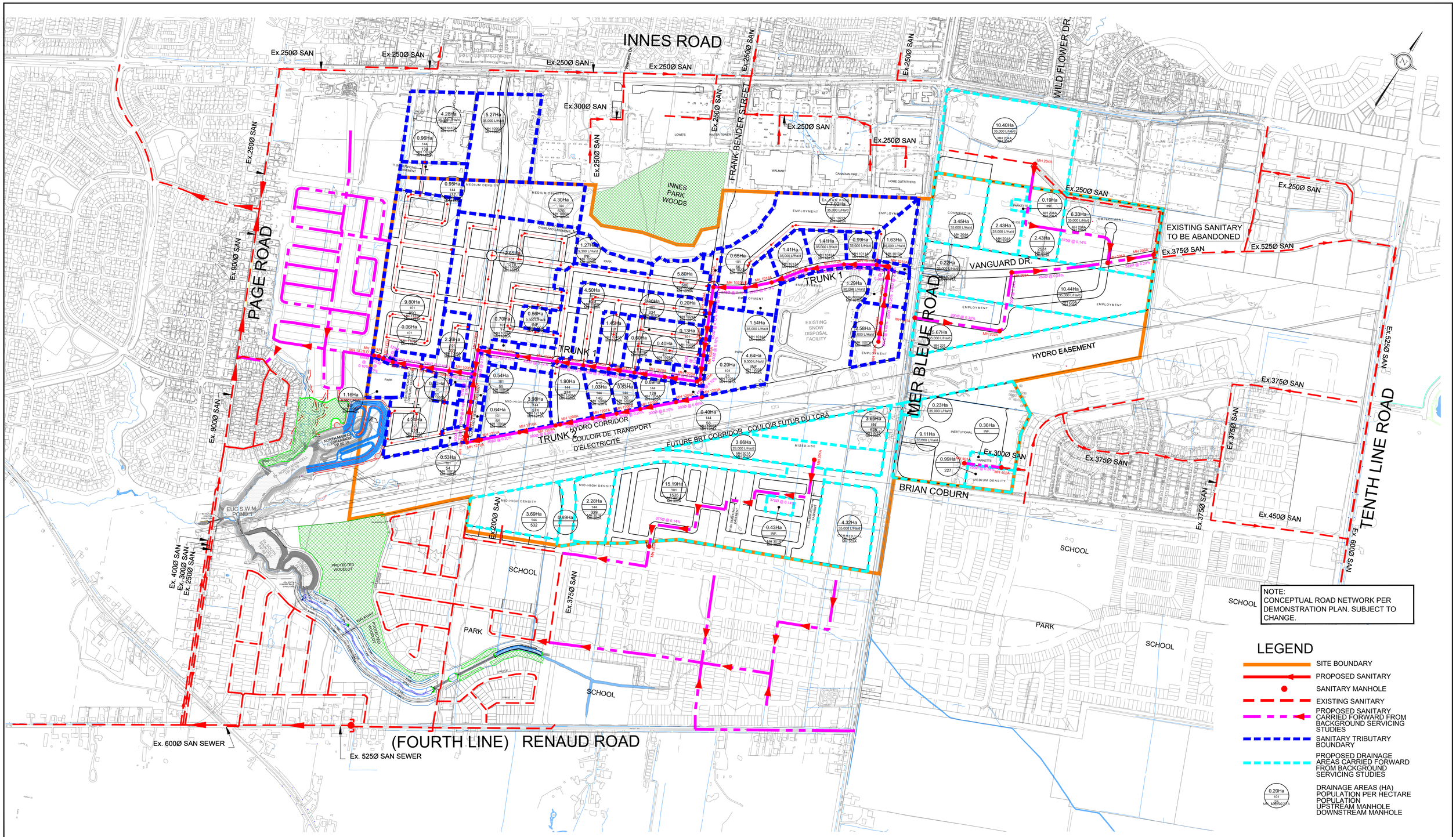
EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
CONCEPTUAL STORM SERVICING

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



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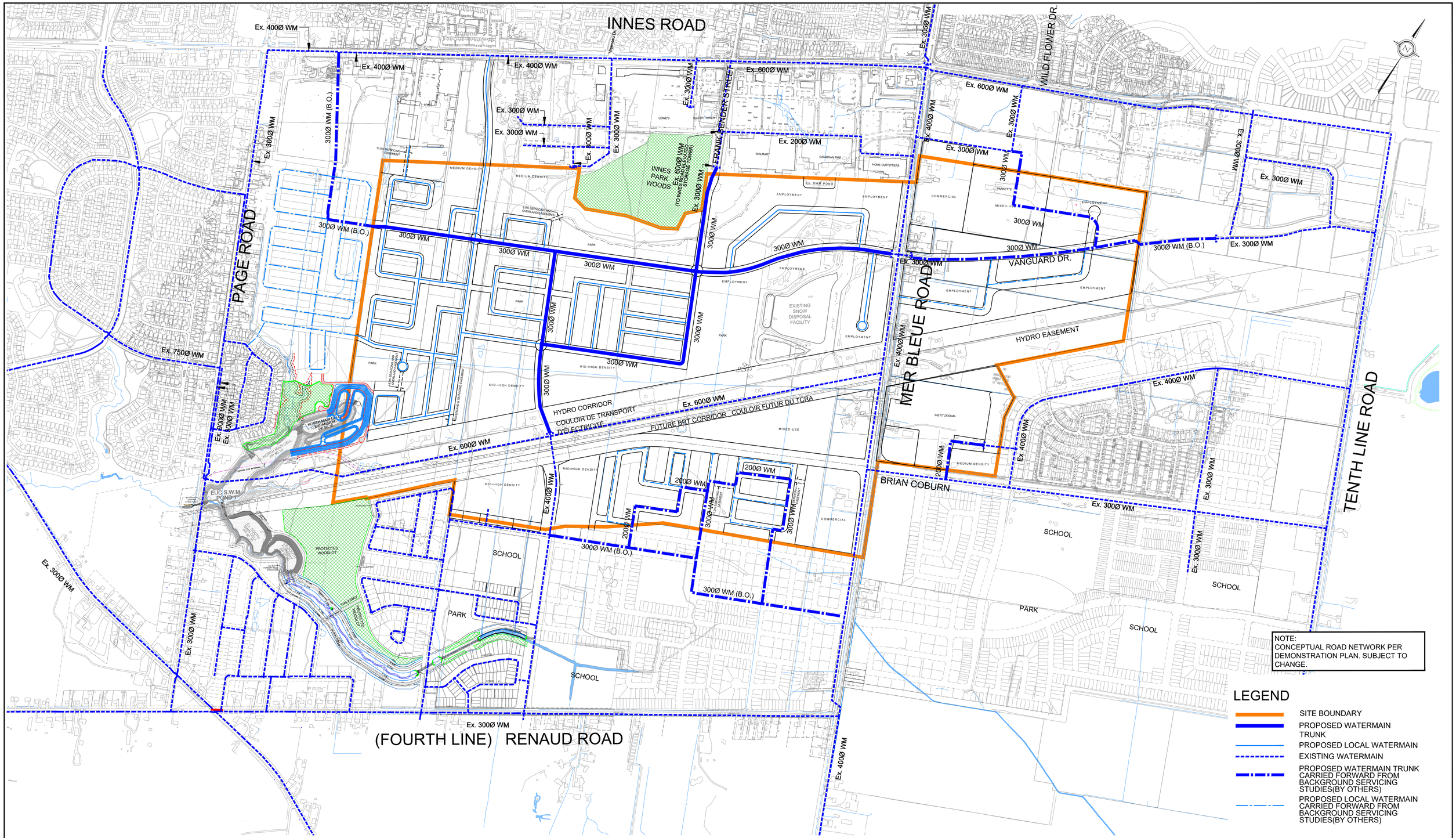
EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
CONCEPTUAL SANITARY SERVICING

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



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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

- City of Ottawa Correspondence: Peak Factors for Populations Exceeding 3000 (City of Ottawa, November 2024)
- Peak Factors for Populations Exceeding 3000 Criteria (City of Ottawa, November 2024)
- Water Demand Calculations (DSEL, January 2026)
- MSS Water Demand Calculations (DSEL, Dec, 2020)
- MSS Hydraulic Capacity and Modeling Analysis (GeoAdvice, July 2018)

Kyle Nebres

From: Kyle Nebres
Sent: January 20, 2026 1:18 PM
To: Kyle Nebres
Subject: FW: City Water Demand Parameters for Populations exceeding 3000
Attachments: DraftFinal_SystemLevelDemandParameters_24May2024(JB).xlsx

---

From: Alex Tourigny
Sent: November 28, 2024 10:34 AM
To: Adam Fobert <AFobert@dsel.ca>; Marc Pichette <MPichette@dsel.ca>; Matt Wingate <MWingate@dsel.ca>; Braden Kaminski <BKaminski@dsel.ca>; Steve Merrick <SMerrick@dsel.ca>; Peter Mott <PMott@dsel.ca>; Alexandra Marchese <AMarchese@dsel.ca>; Hannah Bulmer <HBulmer@dsel.ca>; Jeremy Chouinard <JChouinard@dsel.ca>
Subject: City Water Demand Parameters for Populations exceeding 3000

FYI – From the City.

Hi Alex,

I have just been made aware that given the population exceeds 3,000, please use the attached system-level parameters to calculate the demands for the application. Please note that these parameters were recently developed internally exclusively for populations exceeding 3,000.

Let me know if you have any questions.

Best Regards,

Mohammed Fawzi, P.Eng.
Senior Project Manager (A), Infrastructure Approvals
Development Review – West Branch
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 Avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

System Level Parameters for MSS (2024)	Consumption Rate[1]	Population Density cap/unit[3]	Average Day Demand (L/unit/day)	Residential Outdoor Water Demand (OWD) (L/unit/day)[4]	Maximum Day Demand (L/unit/day)	Peak Hour Demand
SFH	180	3.4	612	700	Average Day Demand + OWD	2.1 x Maximum Day Demand
MLT	198	2.7	535	350	Average Day Demand + OWD	2.1 x Maximum Day Demand
MLT without rear yards	198	2.7	535	0	Average Day Demand	1.6 x Maximum Day Demand
APT	219	1.8	394	0	Average Day Demand	1.6 x Maximum Day Demand
EMP[2]	138	1	138	N/A	1.5 x Average Day Demand[5]	1.8 x Maximum Day Demand
Water Loss per connection	N/A	N/A	80	N/A	Average Day Demand	Average Day Demand
Total Demand			**Sum above for Total Average Day**		**Sum above for Total Max Day**	**Sum above for Total Peak Hour**

[1] Values represent L/cap/day for residential land uses and L/emp/day for employment areas.

[2] Apply a rate of 17,000 l/h/day if employment totals are unknown. The rate represents the average demand for ICI areas at the 90th percentile.

[3] Occupancy factors should be chosen according to housing type. The values shown were extracted from Section 4.2.8 of the Ottawa Design Guidelines - Water Distribution (2010)

[4] Outdoor water demand is applied to single family, semi-detached and townhome units with rear yards.

[5] The 1.5 multiplier represents the additional outdoor water demand associated with employment areas.

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

2026-01-20 Domestic Demand (2025 Parameter)

Type of Housing	Per / Unit	Units	Pop	OWD (m3/d)
Single Family	3.4	287	976	200.9
Townhouse	2.7	365	986	127.8
Bungalow Towns	2.7	56	152	19.6
Dual Front Towns	2.7	42	114	14.7
B2B	2.7	152	411	53.2
Multi-Units				
Low Density	2.7	228	616	
Medium Density	2.3	142	327	
High Density	1.8	504	908	

		Population		Average Day Demand			OWD Outdoor Water Demand (L/unit/day)			Max Day	Peak Hour
Dwelling Type	Number of Units	Persons per Unit	Population Per Dwelling Type	(L/cap/d)	(L/d)	(L/s)	(L/unit/d)	(L/d)	(L/s)	(L/s)	(L/s)
Singles	287	3.4	976	180	175,644	2.03	700	200,900	2.33	4.36	12.20
Townhouse	615	2.7	1661	198	328,779	3.81	350	215,250	2.49	6.30	10.07
Multi-Residential (Low Density)	228	2.7	616	198	121,889	1.41	0	0	0.00	1.41	2.26
Multi-residential (Medium Density)	142	2.3	327	219	71,525	0.83	0	0	0.00	0.83	1.32
Apartment	504	1.8	907	219	198,677	2.30	0	0	0.00	2.30	3.68
Subtotal	**1776**		**4486**			**10.38**			**4.82**	**15.19**	**29.54**
					(+10%)	**11.41**				**16.71**	**32.49**

	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	4490	986.2	684.8	1443.9	1002.7	2807.2	1949.4

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	17,000.0 L/ha/d	16.57	281.69	195.6	422.5	293.4	760.6	528.2
Parks	17,000.0 L/ha/d	5.07	86.19	59.9	129.3	89.8	232.7	161.6
		Total I/CI Demand	367.9	255.5	551.8	383.2	993.3	689.8
		Total Demand	**1354.0**	**940.3**	**1995.8**	**1385.9**	**3800.5**	**2639.2**

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

Domestic Demand (MSS Check 2018 Parameter)

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	319	1085
Townhouse	2.7	746	2015
Bungalow Towns	2.7	-	0
Dual Front Towns	2.7	-	0
B2B	2.7	-	0
Multi-Units			
Low Density	2.7	-	0
Medium Density	2.1	252	530
High Density	1.8	688	1239

	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	1117.5	776.0	1485.9	1031.9	2961.8	2056.8

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Area**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Empoyment	35,000.0 L/ha/d	19.42	679.70	472.0	679.7	472.0	883.6	613.6
Parks	9,300.0 L/ha/d	6.26	58.22	40.4	87.3	60.6	113.5	78.8
Total I/CI Demand			737.9	512.4	767.0	532.7	997.1	692.5
Total Demand			**1855.4**	**1288.5**	**2253.0**	**1564.6**	**3958.9**	**2749.2**

Hydraulic Capacity and Modeling Analysis East Urban Community Mixed-Use Centre Development

Final Report

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OQM | Organizational Quality Management Program

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1 Introduction

GeoAdvice Engineering Inc. ("GeoAdvice") was retained by David Schaeffer Engineering Ltd. ("DSEL") to size the proposed water trunk main network for East Urban Community Mixed-Use Centre Development ("development") in the City of Ottawa, ON ("City").

East Urban Community Mixed-Use Centre Development is located between Innes Road and Renaud Road, East of Page Road. The development will be serviced by pressure zone 2E.

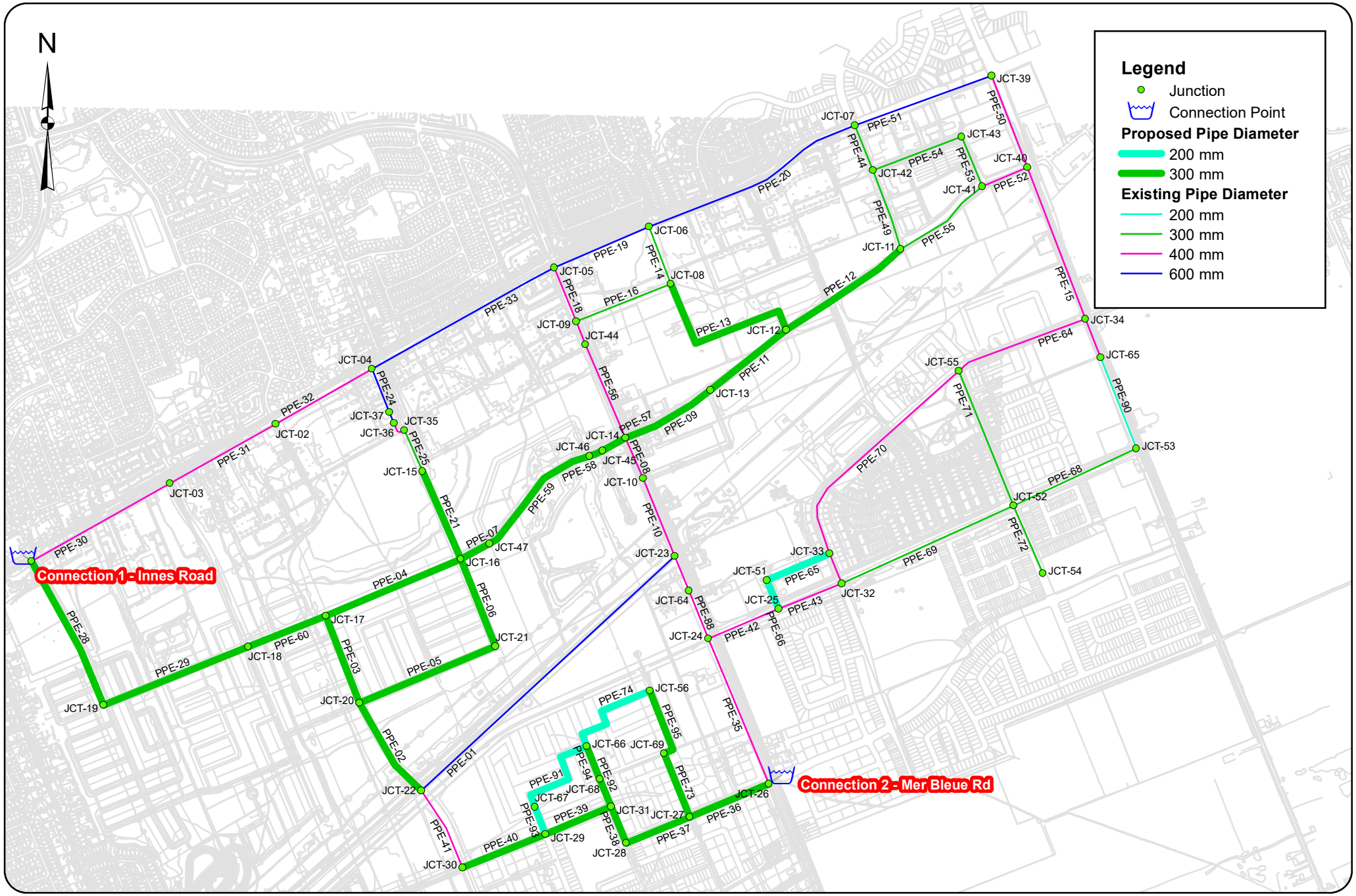
There are 605 single detached dwellings, 1,412 townhomes, 3,243 apartment units and 83.2 ha of commercial and institutional area serviced as part of the development.

The development trunk main network will connect in many locations to the existing City trunk main network. To conduct the hydraulic analysis and to size the proposed development trunk main network, only a few of the major City trunk mains and two (2) connection points were modeled. By simplifying the City network and modeling only two (2) connection points, the analysis results are more conservative. The two (2) connections to the City water system are located on Innes Road at the northwest corner of the development and on Mer Bleue Road at the south end of the development.

The development site is shown in **Figure 1.1** on the following page, with the final recommended pipe diameters.

This report describes the assumptions and results of the hydraulic modeling and capacity analysis using InfoWater (Innovyze), a GIS water distribution system modeling and management software application.

The results presented in this memo are based on the analysis of steady state simulations. The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi at the hydrant. No extended period simulations were completed in this analysis to assess the water quality or to assess the hydraulic impact on storage and pumping.



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis East Urban Community Mixed-Use Centre Development**
Client: **David Schaeffer Engineering Ltd.**
Date: **July 2018**
Created by: **AM**
Reviewed by: **WdS**

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

0 400 800
Meters

Site Layout and Connection Points

Figure 1.1
B5

2 Modeling Considerations

2.1 Water Main Configuration

The water main network was modeled based on the pipe network layout prepared by DSEL (733_Wmain.dwg) and provided to GeoAdvice on May 11, 2018.

2.2 Elevations

Elevations of the modeled junctions in the northwest quadrant of the development were assigned according to a site grading plan prepared by DSEL (733_Grad_Opt1.dwg) and provided to GeoAdvice on May 11, 2018. In the absence of grading plans for the remaining three quadrants of the development, conservative estimates of the elevations were made based on elevations extracted from Google Earth.

2.3 Consumer Demands

The consumer demands were determined based on the factors summarized in **Table 2.1**, as provided by DSEL.

Table 2.1: City of Ottawa Demand Factors

Demand Type	Units
Single Family Residential	
Average Day Demand (ADD)	570 L/unit/day
Outdoor Water Demand (OWD)	1,050 L/unit/day
Maximum Day Demand (MDD)	ADD + OWD L/unit/day
Peak Hour Demand (PHD)	1.5 x ADD + 2.1 x MDD L/unit/day
Minimum Hour Demand (MHD)	0.5 x ADD L/unit/day
Multi-Family Residential	
Average Day Demand (ADD)	560 L/unit/day
Outdoor Water Demand (OWD)	0 L/unit/day
Maximum Day Demand (MDD)	ADD L/unit/day
Peak Hour Demand (PHD)	1.6 x MDD L/unit/day
Minimum Hour Demand (MHD)	0.5 x ADD L/unit/day
Apartment Residential	
Average Day Demand (ADD)	400 L/unit/day
Outdoor Water Demand (OWD)	0 L/unit/day
Maximum Day Demand (MDD)	ADD L/unit/day
Peak Hour Demand (PHD)	1.6 x MDD L/unit/day
Minimum Hour Demand (MHD)	0.5 x ADD L/unit/day

Demand Type	Units
Institutional, Commercial, and Institutional (ICI)	
Average Day Demand (ADD)	8,500 L/ha/day
Outdoor Water Demand (OWD)	0 L/ha/day
Maximum Day Demand (MDD)	ADD L/ha/day
Peak Hour Demand (PHD)	1.3 x MDD L/ha/day
Minimum Hour Demand (MHD)	0.5 x ADD L/unit/day

Table 2.2 and **Table 2.3** summarize the water demand calculations for residential and ICI demands, respectively.

Table 2.2: Residential Demand Calculations

Dwelling Unit		Average Day Demand	Maximum Day Demand	Peak Hour Demand	Minimum Hour Demand
Type	Number of Units	(L/s)	(L/s)	(L/s)	(L/s)
Single Detached	666	4.39	12.48	31.54	2.20
Townhome	1,553	10.07	10.07	16.10	5.03
Apartment Block	3,566	16.51	16.51	26.42	8.26
Total	**5,785**	**30.97**	**39.06**	**74.07**	**15.48**

Table 2.3: ICI Demand Calculations

Land Use Type	Area	Average Day Demand	Maximum Day Demand	Peak Hour Demand	Minimum Hour Demand
	(ha)	(L/s)	(L/s)	(L/s)	(L/s)
Commercial floor space	8.55	0.84	0.84	1.09	0.42
Institutional	11.30	1.11	1.11	1.44	0.56
Employment/Mixed Use	62.11	6.11	6.11	7.94	3.06
Park w/ Splash Pad	9.59	0.94	0.94	1.23	0.47
Total	**91.54**	**9.01**	**9.01**	**11.71**	**4.50**

It is important to note that the unit counts and areas in **Table 2.2** and **Table 2.3** have been increased by 10% to account for potential changes in the proposed land use of the development.

In addition to the demands summarized above, demands from neighbouring developments were included in the following analysis. These developments include:

- The future commercial land to the northeast of the study area;
- The development at 3490 Innes Road;
- The Mer Bleue Expansion development;
- The Trails Edge East development; and
- The Innes Road Commercial to the northwest of the development.

The demands from the additional neighbouring developments were also increased by 10% to account for potential land use changes, with the exception of the 3490 Innes Road and Mer Bleue Expansion developments. The demands from these two developments were included in the analysis but not increased by 10% because these values were considered approved per previous reports.

Demands were grouped into demand polygons then uniformly distributed to the model nodes located within each polygon. The calculation and allocation of the demands is shown in **Appendix A**.

2.4 Fire Flow Demand

At this time, there is not enough information available to calculate the required fire flows of the development. In previous development applications, the City has typically requested a maximum required fire flow of 250 L/s based on their requirement to limit distribution mains to 200 mm in diameter (Technical Bulletin ISDTB-2014-02). As such, a required fire flow of 250 L/s was assumed throughout the development.

Fire flow simulations were completed at each model node in the development. The locations of nodes do not necessarily represent hydrant locations.

2.5 Boundary Conditions

The boundary conditions were provided by the City of Ottawa in the form of Hydraulic Grade Line (HGL) at the following locations:

- Connection 1: Innes Road
- Connection 2: Mer Bleue Road

The above connection points are illustrated in **Figure 1.1**.

Boundary conditions were provided for Peak Hour, Maximum Day plus Fire and Minimum Hour (high pressure check) conditions. Boundary conditions can be found in **Appendix B**.

Table 2.4 summarizes the boundary conditions used to size the development water network.

Table 2.4: Boundary Conditions

Condition	Connection 1 HGL (m)	Connection 2 HGL (m)
Min Hour (max. pressure)	130.3	130.3
Peak Hour (min. pressure)	126.4	125.5
Max Day + Fire Flow (250 L/s)	126.1	124.3

Please note that not all neighbouring developments were included in the boundary conditions; however, the boundary conditions were assumed to be adequate for this study based on discussions with the City of Ottawa staff.

3 Hydraulic Capacity Design Criteria

3.1 Pipe Characteristics

Pipe characteristics of internal diameter (ID) and Hazen-Williams C factors were assigned in the model according to the City of Ottawa Design Guidelines for PVC water main material. Pipe characteristics used for the development are outlined in **Table 3.1** below.

Table 3.1: Model Pipe Characteristics

Nominal Diameter (mm)	ID PVC (mm)	Hazen Williams C-Factor (/)
150	155	100
200	204	110
250	250	110
300	305	120
400	406	120
600	600	120

3.2 Pressure Requirements

As outlined in the City of Ottawa Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 350 kPa (50 psi) and 480 kPa (70 psi). The maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall not exceed 552 kPa (80 psi). Pressure requirements are outlined in **Table 3.2.**

Table 3.2: Pressure Requirements

Demand Condition	Minimum Pressure		Maximum Pressure	
	(kPa)	(psi)	(kPa)	(psi)
Normal Operating Pressure (maximum daily flow)	350	50	480	70
Peak Hour Demand (minimum allowable pressure)	276	40	-	-
Maximum Fixture Pressure (Ontario Building Code)	-	-	552	80
Maximum Distribution Pressure (minimum hour check)	-	-	552	80
Maximum Day Plus Fire	140	20	-	-

4 Hydraulic Capacity Analysis

The proposed water mains within the development were sized to the minimum diameter which would satisfy the greater of maximum day plus fire and peak hour demand. Modeling was carried out for minimum hour, peak hour and maximum day plus fire flow using InfoWater.

Detailed pipe and junction model input data can be found in **Appendix C**.

4.1 Development Pressure Analysis

The modeling results indicate that the development can be adequately serviced by the proposed water main layout shown in **Figure 1.1**. Modeled service pressures for the development are summarized in **Table 4.1** below.

Table 4.1: Summary of Available Service Pressures

Minimum Hour Demand Maximum Pressure	Peak Hour Demand Minimum Pressure
400 kPa (58 psi)	297 kPa (43 psi)

Based on **Table 3.2** and **Table 4.1**, pressures fall within the desired range.

Detailed pipe and junction result tables and maps can be found in **Appendix D**.

4.2 Development Fire Flow Analysis

The minimum allowable pressure under fire flow conditions is 140 kPa (20 psi) at the location of the fire. A summary of the minimum available fire flows is shown below in **Table 4.2**.

Table 4.2: Summary of Minimum Available Fire Flows

Required Fire Flow	Minimum Available Flow	Junction ID
250 L/s	263 L/s	JCT-67

As shown in **Table 4.2**, the model predicts that the fire flow requirements can be met throughout the development with the proposed water trunk main layout shown in **Figure 1.1**. Detailed fire flow results and figures illustrating the fire flow results can be found in **Appendix E**.

5 Conclusions

The hydraulic capacity and modeling analysis of East Urban Community Mixed-Use Centre development yielded the following conclusions:

- The proposed water main network can deliver all domestic flows, with service pressures expected to range between 297 kPa and 400 kPa.
- Available fire flows are predicted to exceed 263 L/s at all modeled nodes. All fire flows are achievable (all residual pressures exceed 140 kPa).

Submission

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Approved by:

July 25, 2018

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Appendix A Domestic Water Demand Calculations and Allocation

NE Domestic Water Demands

10% increase in demand

Dwelling Type	Number of Units	Average Day Demand			Outdoor Water Demand			Max Day Avg. Day+OWD (L/s)	Fire Flow (L/s)	Peak Hour (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/unit/d)	(L/d)	(L/s)	(L/unit/d)	(L/d)	(L/s)				
Single Family	-	570	-	-	1,050	-	-	-	167	-	-
Townhome	-	560	-	-	-	-	-	-	167	-	-
Apartment	1,547	400	618,640	7.16	-	-	-	7.16	167	11.46	3.58
Subtotal:	**1,547**		**618,640**	**7.16**		**-**	**-**	**7.16**		**11.46**	**3.58**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Land Use Type	Area (ha)	Average Day Demand			Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/ha/d)	(L/d)	(L/s)				
Commercial floor space	3.81	8,500	32,415	0.38	0.38	250*	0.49	0.19
Institutional		8,500	-	-	-	250*	-	-
Employment/Mixed Use	28.12	8,500	239,009	2.77	2.77	250*	3.60	1.38
Park w/ Splash Pad*	0.21	8,500	1,806	0.02	0.02	251*	0.03	0.01
Subtotal:	**32.14**		**273,229**	**3.16**	**3.16**		**4.11**	**1.58**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Total:			**10.32**	**10.32**	**15.57**	**5.16**

Future Commercial Land

10% increase in demand

Land Use Type	Area (ha)	Average Day Demand			Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/ha/d)	(L/d)	(L/s)				
Commercial floor space	32.36	8,500	275,077	3.18	3.18	250*	4.14	1.59
Institutional		8,500	-	-	-	250*	-	-
Employment/Mixed Use	-	8,500	-	-	-	250*	-	-
Park w/ Splash Pad*		8,500	-	-	-	250*	-	-
Subtotal:	**32.36**		**275,077**	**3.18**	**3.18**		**4.14**	**1.59**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Total:			**3.18**	**3.18**	**4.14**	**1.59**

North of Hydro Easement, East of Mer Bleue Road					
Land Use	Area (Ha)	Singles	THs	Apt	Employment
Mixed Use/Employment	10.15			1406	536
Employment	15.42				812
Commercial	3.47				147
Park	0.19				
Total	29.22	0	0	1406	1495

Total Demands	L/s
Avg. Day	**13.51**
Max Day	**13.51**
Peak Hour	**19.71**
MHD	**6.75**

SW Domestic Water Demands

10% increase in demand

Dwelling Type	Number of Units	Average Day Demand			Outdoor Water Demand			Max Day Avg. Day+OWD (L/s)	Fire Flow (L/s)	Peak Hour (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/unit/d)	(L/d)	(L/s)	(L/unit/d)	(L/d)	(L/s)				
Single Family	157	570	89,728	1.04	1,050	165,289	1.91	2.95	167	7.46	0.52
Townhome	367	560	205,693	2.38	-	-	-	2.38	167	3.81	1.19
Apartment	907	400	362,867	4.20	-	-	-	4.20	167	6.72	2.10
Subtotal:	**1,432**		**658,289**	**7.62**		**165,289**	**1.91**	**9.53**		**17.99**	**3.81**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Land Use Type	Area (ha)	Average Day Demand			Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/ha/d)	(L/d)	(L/s)				
Commercial floor space	4.73	8,500	40,240	0.47	0.47	250*	0.61	0.23
Institutional	1.10	8,500	9,372	0.11	0.11	250*	0.14	0.05
Employment/Mixed Use	6.92	8,500	58,840	0.68	0.68	250*	0.89	0.34
Park w/ Splash Pad*	0.51	8,500	4,375	0.05	0.05	250*	0.07	0.03
Subtotal:	**13.27**		**112,827**	**1.31**	**1.31**		**1.70**	**0.65**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Total:		**8.92**	**10.84**	**19.69**	**4.46**

Trails Edge East

10% increase in demand

Dwelling Type	Number of Units	Average Day Demand			Outdoor Water Demand			Max Day Avg. Day+OWD (L/s)	Fire Flow (L/s)	Peak Hour (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/unit/d)	(L/d)	(L/s)	(L/unit/d)	(L/d)	(L/s)				
Single Family	275	570	156,750	1.81	1,050	288,750	3.34	5.16	167	13.03	0.91
Townhome	898	560	502,656	5.82	-	-	-	5.82	167	9.31	2.91
Apartment		400	-	-	-	-	-	-	167	-	-
Subtotal:	**1,173**		**659,406**	**7.63**		**288,750**	**3.34**	**10.97**		**22.34**	**3.82**

Total:		**7.63**	**10.97**	**22.34**	**3.82**

South of Hydro Easement, West of Mer Bleue Road

Land Use	Area (Ha)	Singles	THs	Apt	Employment
Mixed Use	6.29			252	265
Medium-High Density Residential	7.16			573	
Low Density Residential	13.87	143	334		
Institutional	1.00				3
Commercial	4.30				183
Park	0.47				
Brian Coburn	6.23				
Total	39.33	143	334	825	451

Total Demands	L/s
Avg. Day	**16.56**
Max Day	**21.81**
Peak Hour	**42.03**
MHD	**8.28**

SE Domestic Water Demands

10% increase in demand

Dwelling Type	Number of Units	Average Day Demand			Outdoor Water Demand			Max Day Avg. Day+OWD (L/s)	Fire Flow (L/s)	Peak Hour (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/unit/d)	(L/d)	(L/s)	(L/unit/d)	(L/d)	(L/s)				
Single Family	-	570	-	-	1,050	-	-	-	167	-	-
Townhome	-	560	-	-	-	-	-	-	167	-	-
Apartment	92	400	36,960	0.43	-	-	-	0.43	167	0.68	0.21
Subtotal:	**92**		**36,960**	**0.43**		**-**	**-**	**0.43**		**0.68**	**0.21**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Land Use Type	Area (ha)	Average Day Demand			Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/ha/d)	(L/d)	(L/s)				
Commercial floor space	-	8,500	-	-	-	250*	-	-
Institutional	10.19	8,500	86,644	1.00	1.00	250*	1.30	0.50
Employment/Mixed Use		8,500	-	-	-	250*	-	-
Park w/ Splash Pad*	0.40	8,500	3,393	0.04	0.04	250*	0.05	0.02
Subtotal:	**10.59**		**90,037**	**1.04**	**1.04**		**1.35**	**0.52**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Total:			**1.47**	**1.47**	**2.04**	**0.73**

South of Hydro Easement, East of Mer Bleue Road

Land Use	Area (Ha)	Singles	THs	Apt	Employment
Institutional	9.27				1500
Park	0.36				
Medium Density Residential	0.99			84	
Total	10.62	0	0	84	1500

Total Demands	**L/s**
Avg. Day	**28.43**
Max Day	**53.99**
Peak Hour	**121.59**
MHD	**14.22**

Mer Bleue Exp.Water Demands

Not showing 10% increase in demand

Dwelling Type	Number of Units	Average Day Demand			Outdoor Water Demand			Max Day Avg. Day+OWD (L/s)	Fire Flow (L/s)	Peak Hour (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/unit/d)	(L/d)	(L/s)	(L/unit/d)	(L/d)	(L/s)				
Single Family	2,103	570	1,198,710	13.87	1,050	2,208,150	25.56	39.43	167	99.67	6.94
Townhome	1,191	560	666,960	7.72	-	-	-	7.72	167	12.35	3.86
Apartment	395	400	158,000	1.83	-	-	-	1.83	167	2.93	0.91
Subtotal:	**3,689**		**2,023,670**	**23.42**		**2,208,150**	**25.56**	**48.98**		**114.95**	**11.71**

Land Use Type	Area (ha)	Average Day Demand			Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
		(L/ha/d)	(L/d)	(L/s)				
Commercial floor space	4.00	8,500	34,000	0.39	0.39	250	0.51	0.20
Institutional*		8,500	-	-	-	250	-	-
Employment/Mixed Use	13.00	8,500	110,500	1.28	1.28	250	1.66	0.64
Park w/ Splash Pad**	19.00	8,500	161,500	1.87	1.87	250	2.43	0.93
Subtotal:	**36.00**		**306,000**	**3.54**	**3.54**		**4.60**	**1.77**

*Institutional assumed as light industiral in absence of population estimate

**Park using the 8500 L/ha/day value like commercial

Total:			**26.96**	**52.52**	**119.55**	**13.48**

NW Domestic Water Demands

10% increase in demand

Dwelling Type	Number of Units	Average Day Demand (L/unit/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Outdoor Water Demand (L/unit/d)	Outdoor Water Demand (L/d)	Outdoor Water Demand (L/s)	Max Day Avg. Day+OWD (L/s)	Fire Flow (L/s)	Peak Hour (L/s)	Min Hour 0.5 x Avg. Day (L/s)
Single Family	508	570	289,637	3.35	1,050	533,541	6.18	9.53	167	24.08	1.68
Townhome	1,186	560	663,962	7.68	-	-	-	7.68	167	12.30	3.84
Apartment	1,020	400	408,112	4.72	-	-	-	4.72	167	7.56	2.36
Subtotal:	**2,714**		**1,361,710**	**15.76**		**533,541**	**6.18**	**21.94**		**43.94**	**7.88**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Land Use Type	Area (ha)	Average Day Demand (L/ha/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
Commercial floor space		8,500	-	-	-	250*	-	-
Institutional		8,500	-	-	-	250*	-	-
Employment/Mixed Use	27.07	8,500	230,068	2.66	2.66	250*	3.46	1.33
Park w/ Splash Pad*	8.47	8,500	71,956	0.83	0.83	250*	1.08	0.42
Subtotal:	**35.53**		**302,024**	**3.50**	**3.50**		**4.54**	**1.75**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Total:			**19.26**	**25.43**		**48.48**	**9.63**

3490 Innes Road

Not showing 10% increase in demand

Dwelling Type	Number of Units	Average Day Demand (L/unit/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Outdoor Water Demand (L/unit/d)	Outdoor Water Demand (L/d)	Outdoor Water Demand (L/s)	Max Day Avg. Day+OWD (L/s)	Fire Flow (L/s)	Peak Hour (L/s)	Min Hour 0.5 x Avg. Day (L/s)
Single Family	330	570	188,100	2.18	1,050	346,500	4.01	6.19	167	15.64	1.09
Townhome	491	560	274,960	3.18	-	-	-	3.18	167	5.09	1.59
Apartment	-	400	-	-	-	-	-	-	167	-	-
Subtotal:	**821**		**463,060**	**5.36**		**346,500**	**4.01**	**9.37**		**20.73**	**2.68**

Land Use Type	Area (ha)	Average Day Demand (L/ha/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
Commercial floor space	5.40	8,500	45,900	0.53	0.53	250*	0.69	0.27
Institutional		8,500	-	-	-	250*	-	-
Employment/Mixed Use	-	8,500	-	-	-	250*	-	-
Park w/ Splash Pad*	1.43	8,500	12,155	0.14	0.14	250*	0.18	0.07
Subtotal:	**6.83**		**58,055**	**0.67**	**0.67**		**0.87**	**0.34**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

Total:			**6.03**	**10.04**		**21.61**	**3.02**

Innes Road Commercial

10% increase in demand

Land Use Type	Area (ha)	Average Day Demand (L/ha/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day Avg. Day (L/s)	Fire Flow (L/s)	Peak Hour 1.3 x Max Day (L/s)	Min Hour 0.5 x Avg. Day (L/s)
Commercial floor space	13.99	8,500	118,932	1.38	1.38	250*	1.79	0.69
Institutional	-	8,500	-	-	-	250*	-	-
Employment/Mixed Use	-	8,500	-	-	-	250*	-	-
Park w/ Splash Pad*	-	8,500	-	-	-	250*	-	-
Subtotal:	**13.99**		**118,932**	**1.38**	**1.38**		**1.79**	**0.69**

*Not enough information at this time to complete FUS calculations. Typical conservative estimate assumed.

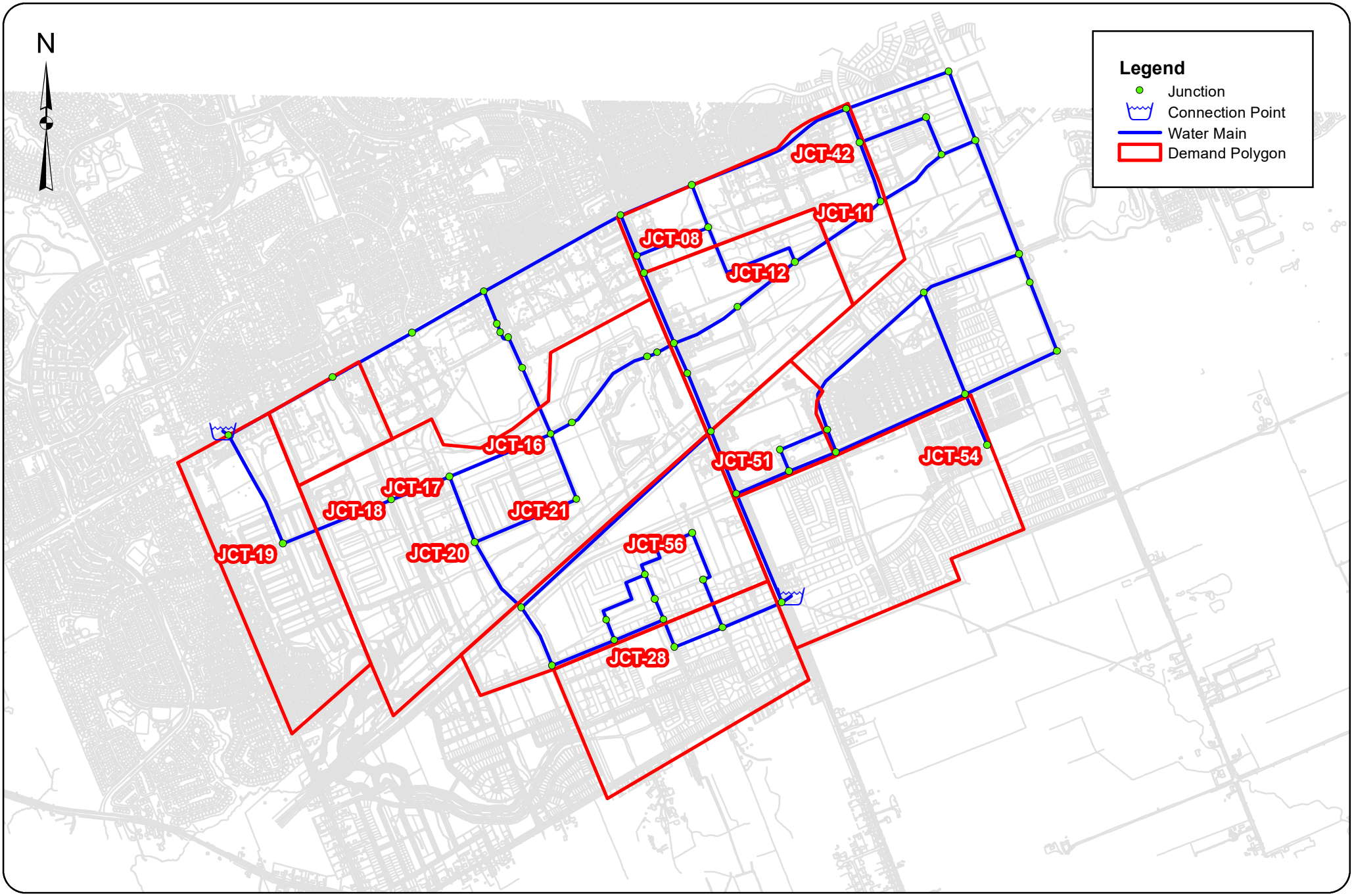
Total:			**1.38**	**1.38**		**1.79**	**0.69**

North of Hydro Easement, West of Mer Bleue Road					
Land Use	Area (Ha)	Singles	THs	Apt	Employment
Low Density Residential	44.76	462	1078		
Medium Density Residential	4.04			250	
Medium-High Density Residential	8.47			677	
Employment	24.61				1431
Park	7.70				
Stormwater Management Facility	1.47				
Rock Barren	5.44				
Total	96.48	462	1078	928	1431

Total Demands	**L/s**	**L/min**
Avg. Day	**26.66**	**1599.848**
Max Day	**36.85**	**2210.987**
Peak Hour	**71.88**	**4312.588**
MHD	**13.33**	**799.9238**

Domestic Demand Calculations and Allocation

Junction ID	Polygon	Quadrant	ADD (L/s)	MDD (L/s)	PHD (L/s)
JCT-8	Future Commercial Land	NE	1.06	1.06	1.38
JCT-11	Future Commercial Land	NE	1.06	1.06	1.38
JCT-12	NE Domestic Water Demands	NE	10.32	10.32	15.57
JCT-16	NW Domestic Water Demands	NW	3.85	5.09	9.70
JCT-17	NW Domestic Water Demands	NW	3.85	5.09	9.70
JCT-18	NW Domestic Water Demands	NW	3.85	5.09	9.70
JCT-19	3490 Innes Road	NW	6.03	10.04	21.61
JCT-20	NW Domestic Water Demands	NW	3.85	5.09	9.70
JCT-21	NW Domestic Water Demands	NW	3.85	5.09	9.70
JCT-54	Mer Bleue Exp.Water Demands	SE	26.96	52.52	119.55
JCT-28	Trails Edge East	SW	7.63	10.97	22.34
JCT-51	SE Domestic Water Demands	SE	1.47	1.47	2.04
JCT-42	Future Commercial Land	NE	1.06	1.06	1.38
JCT-38	Innes Road Commercial	NW	1.38	1.38	1.79
JCT-56	SW Domestic Water Demands	SW	8.92	10.84	19.69
	TOTAL		**85.16**	**126.16**	**255.21**



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis East Urban Community Mixed-Use Centre Development**
Client: **David Schaeffer Engineering Ltd.**
Date: **July 2018**
Created by: **AM**
Reviewed by: **WdS**

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

0 500 1,000
Meters

Demand Allocation

Figure A.1
B20

APPENDIX D

- Sanitary Servicing Design (DSEL, January 2026)
- Sanitary Servicing Design Excerpt from Glenview Homes Site Servicing and SWM report (NOVATECH, March 2022)
- Sanitary Servicing Design Excerpts from MSS (DSEL, Dec 2020)

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	152				0.00		0.00		1.20		2.92	2.92									
Contribution From JARGEAU ROAD, Pipe 50A - 51A						0.30	26				0.00		0.00		0.00		0.30	3.22									
	51A	55A	0.80		70	2.82	248	3.5	2.80		0.00		0.00		1.20	0.19	0.80	4.02	1.33	4.33	83.0	300	0.20	43.25	0.10	0.61	0.39
	55A	61A	0.77		68	3.59	316	3.5	3.54		0.00		0.00		1.20	0.19	0.77	4.79	1.58	5.31	79.0	300	0.20	43.25	0.12	0.61	0.41
	61A	62A	0.79		70	4.38	386	3.4	4.28		0.00		0.00		1.20	0.19	0.79	5.58	1.84	6.32	81.0	300	0.20	43.25	0.15	0.61	0.43
	62A	66A	0.80		70	5.18	456	3.4	5.02		0.00		0.00		1.20	0.19	0.80	6.38	2.11	7.32	82.0	300	0.20	43.25	0.17	0.61	0.45
To FRANK BENDER STREET, Pipe 66A - 76A						5.18	456				0.00		0.00		1.20			6.38									
STREET 5																											
Contribution From JARGEAU ROAD, Pipe 23A - 25A						2.30	204				0.00		0.00		0.00		2.30	2.30									
Contribution From JARGEAU ROAD, Pipe 24A - 25A						0.38	33				0.00		0.00		0.48		0.86	3.16									
	25A	26A	0.56		49	3.24	286	3.5	3.22		0.00		0.00		0.48	0.08	0.56	3.72	1.23	4.52	43.5	200	0.60	25.41	0.18	0.81	0.61
	26A	28A	1.03		91	4.27	377	3.4	4.19		0.00		0.00		0.48	0.08	1.03	4.75	1.57	5.83	79.5	250	0.25	29.73	0.20	0.61	0.47
	28A	30A	0.63		56	4.90	433	3.4	4.78		0.00		0.00		0.48	0.08	0.63	5.38	1.78	6.63	48.5	375	0.15	67.91	0.10	0.61	0.39
	30A	36A	1.02		90	5.92	523	3.4	5.71		0.00		0.00		0.48	0.08	1.02	6.40	2.11	7.90	79.0	375	0.35	103.73	0.08	0.94	0.55
	36A	37A	1.06		93	6.98	616	3.3	6.67		0.00		0.00		0.48	0.08	1.06	7.46	2.46	9.21	82.0	375	0.45	117.62	0.08	1.06	0.63
To FRANK BENDER STREET, Pipe 37A - 38A						6.98	616				0.00		0.00		0.48			7.46									
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		33	0.38	33	3.7	0.39		0.00		0.00	0.48	0.48	0.08	0.86	0.86	0.28	0.75	29.5	200	0.35	19.40	0.04	0.62	0.29
To STREET 5, Pipe 25A - 26A						0.38	33				0.00		0.00		0.48			0.86									
	50A	51A	0.30		26	0.30	26	3.7	0.31		0.00		0.00		0.00	0.00	0.30	0.30	0.10	0.41	31.5	200	0.35	19.40	0.02	0.62	0.25
To FERN CASEY STREET, Pipe 51A - 55A						0.30	26				0.00		0.00		0.00			0.30									
	22A	23A	1.15		102	1.15	102	3.6	1.19		0.00		0.00		0.00	0.00	1.15	1.15	0.38	1.57	88.5	200	1.20	35.93	0.04	1.14	0.57
	23A	25A	1.15		102	2.30	204	3.5	2.32		0.00		0.00		0.00	0.00	1.15	2.30	0.76	3.08	88.5	200	0.35	19.40	0.16	0.62	0.45
To STREET 5, Pipe 25A - 26A						2.30	204				0.00		0.00		0.00			2.30									
	48A	49A	0.86		76	0.86	76	3.6	0.89		0.00		0.00		0.00	0.00	0.86	0.86	0.28	1.18	89.0	200	0.65	26.44	0.04	0.84	0.42
	49A	51A	0.86		76	1.72	152	3.6	1.75		0.00		0.00	1.20	1.20	0.19	2.06	2.92	0.96	2.91	89.0	200	0.35	19.40	0.15	0.62	0.44
To FERN CASEY STREET, Pipe 51A - 55A						1.72	152				0.00		0.00		1.20			2.92									
	95A	96A	1.98		174	1.98	174	3.5	1.99		0.00		0.00		0.00	0.00	1.98	1.98	0.65	2.65	108.0	250	0.25	29.73	0.09	0.61	0.37
	96A	99A				1.98	174	3.5	1.99		0.00		0.00		0.00	0.00	0.00	1.98	0.65	2.65	77.5	300	0.20	43.25	0.06	0.61	0.34
To STREET 4, Pipe 99A - 100A						1.98	174				0.00		0.00		0.00			1.98									
	97A	98A				0.00					0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.00	39.5	250	0.25	29.73	0.00	0.61	0.03
	98A	99A				0.00	0				0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.00	81.0	250	0.25	29.73	0.00	0.61	0.03
To STREET 4, Pipe 99A - 100A						0.00	0				0.00		0.00		0.00			0.00									
			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: C.B.

Checked: S.M.

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

PROJECT: **TRAILSEDGE PHASE 5**

LOCATION: **City of Ottawa**

File Ref: 20-1195

Date: **30 Jan 2026**

Sheet No. 1 of 4

1195_2026-01-29_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		102	1.15	102	3.6	1.19		0.00		0.00		0.00	0.00	1.15	1.15	0.38	1.57	92.5	200	2.80	54.88	0.03	1.75	0.77
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		18	2.96	135	3.6	1.56		18.17		0.00		0.00	8.83	0.21	21.13	6.97	17.36	42.5	300	0.20	43.25	0.40	0.61	0.58
	14A	15A	0.46		40	3.42	175	3.5	2.00		18.17		0.00		0.00	8.83	0.46	21.59	7.12	17.96	94.0	300	0.20	43.25	0.42	0.61	0.58
	15A	17A	0.46		40	3.88	215	3.5	2.45		18.17		0.00		0.00	8.83	0.46	22.05	7.28	18.55	94.0	300	0.20	43.25	0.43	0.61	0.59
	17A	18A	0.36		32	4.24	247	3.5	2.79		18.17		0.00		0.00	8.83	0.36	22.41	7.40	19.02	75.5	300	0.20	43.25	0.44	0.61	0.59
	18A	19A	0.37		33	4.61	280	3.5	3.15		18.17		0.00	4.05	4.05	9.49	4.42	26.83	8.85	21.49	75.5	300	0.20	43.25	0.50	0.61	0.61
	19A	20A	0.07		6	4.68	286	3.5	3.22		18.17		0.00		4.05	9.49	0.07	26.90	8.88	21.58	14.0	300	0.20	43.25	0.50	0.61	0.61
	20A	21A	0.48		42	5.16	328	3.4	3.67		18.17		0.00		4.05	9.49	0.48	27.38	9.04	22.19	100.0	300	0.20	43.25	0.51	0.61	0.61
	21A	37A	0.48		42	5.64	370	3.4	4.11		18.17		0.00		4.05	9.49	0.48	27.86	9.19	22.79	99.5	300	0.20	43.25	0.53	0.61	0.62
Contribution From STREET 5, Pipe 36A - 37A						6.98	616				0.00		0.00		0.48		7.46	35.32									
	37A	38A	0.34		30	12.96	1016	3.2	10.66		18.17		0.00		4.53	9.56	0.34	35.66	11.77	31.99	70.5	450	0.12	98.76	0.32	0.62	0.55
			0.34		30	13.30	1046				18.17		0.00		4.53		0.34	36.00									
	38A	47A	2.18		194	15.48	1240	3.2	12.82		18.17		0.00		4.53	9.56	2.18	38.18	12.60	34.98	70.5	450	0.12	98.76	0.35	0.62	0.57
			0.46		40	15.94	1280				18.17		0.00		4.53		0.46	38.64									
	47A	66A	3.00		264	18.94	1544	3.1	15.69		18.17		0.00		4.53	9.56	3.00	41.64	13.74	39.00	94.0	450	0.12	98.76	0.39	0.62	0.58
Contribution From FERN CASEY STREET, Pipe 62A - 66A						5.18	456				0.00		0.00		1.20		6.38	48.02									
			0.47		41	24.59	2041				18.17		0.00		5.73		0.47	48.49									
	66A	76A	1.83		161	26.42	2202	3.0	21.71		18.17		0.00		5.73	9.76	1.83	50.32	16.61	48.07	97.0	450	0.12	98.76	0.49	0.62	0.62
	76A	77A	0.28		25	26.70	2227	3.0	21.93		18.17		0.00		5.73	9.76	0.28	50.60	16.70	48.39	58.0	525	0.10	136.00	0.36	0.63	0.57
			0.33		29	27.03	2256				18.17		0.00		5.73		0.33	50.93									
	77A	117A	3.30		294	30.33	2550	3.0	24.80		18.17		0.00		5.73	9.76	3.30	54.23	17.90	52.45	69.0	525	0.10	136.00	0.39	0.63	0.59
Contribution From STREET 4, Pipe 109A - 117A						15.14	1340				5.09		0.00		0.00		20.23	74.46									
Contribution From STREET 4, Pipe 116A - 117A						2.21	194				0.00		0.00		0.00		2.21	76.67									
	117A	118A	0.33		29	48.01	4113	2.9	38.09		23.26		0.00		5.73	12.23	0.33	77.00	25.41	75.74	67.5	525	0.10	136.00	0.56	0.63	0.64
	118A	126A	0.16		14	48.17	4127	2.9	38.21		23.26		0.00		5.73	12.23	0.16	77.16	25.46	75.90	33.0	525	0.10	136.00	0.56	0.63	0.64
Contribution From STREET 3, Pipe 122A - 126A						1.23	108				0.00		0.00		0.00		1.23	78.39									
Contribution From STREET 3, Pipe 125A - 126A						0.72	64				0.00		0.00		0.00		0.72	79.11									
	126A	127A	0.20		17	50.32	4316	2.8	39.76		23.26		0.00		5.73	12.23	0.20	79.31	26.17	78.17	41.0	525	0.10	136.00	0.57	0.63	0.65
STREET 3																											
	131A	132A	0.15		9	0.15	9	3.7	0.11		0.00		0.00		0.00	0.00	0.15	0.15	0.05	0.16	26.5	200	0.65	26.44	0.01	0.84	0.23
To STREET 4, Pipe 132A - 135A						0.15	9				0.00		0.00		0.00			0.15									
	124A	125A	0.37		33	0.37	33	3.7	0.39		0.00		0.00		0.00	0.00	0.37	0.37	0.12	0.52	72.5	200	0.35	19.40	0.03	0.62	0.26
	125A	126A	0.35		31	0.72	64	3.6	0.75		0.00		0.00		0.00	0.00	0.35	0.72	0.24	0.99	72.5	200	0.35	19.40	0.05	0.62	0.32
To FRANK BENDER STREET, Pipe 126A - 127A						0.72	64				0.00		0.00		0.00			0.72									

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2026-01-30
PROVINCE OF ONTARIO
PB1421-1195

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: C.B.	PROJECT: TRAILSEDGE PHASE 5		
Checked: S.M.	LOCATION: City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 3	File Ref: 20-1195	Date: 30 Jan 2026	Sheet No. 2 of 4

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)
	119A	120A	0.16		14	0.16	14	3.7	0.17		0.00		0.00		0.00	0.00	0.16	0.16	0.05	0.22	33.0	200	0.35	19.40	0.01	0.62	0.21
	120A	121A	0.05		4	0.21	18	3.7	0.22		0.00		0.00		0.00	0.00	0.05	0.21	0.07	0.29	11.0	200	0.35	19.40	0.01	0.62	0.21
	121A	122A	0.51		45	0.72	63	3.6	0.74		0.00		0.00		0.00	0.00	0.51	0.72	0.24	0.98	106.0	300	0.20	43.25	0.02	0.61	0.25
	122A	126A	0.51		45	1.23	108	3.6	1.26		0.00		0.00		0.00	0.00	0.51	1.23	0.41	1.66	105.5	300	0.20	43.25	0.04	0.61	0.29
To FRANK BENDER STREET, Pipe 126A - 127A						1.23	108				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		23	0.47	27	3.7	0.32		0.00		0.00		0.00	0.00	0.39	0.47	0.16	0.48	70.5	200	0.35	19.40	0.02	0.62	0.26
To STREET 1, Pipe 135A - 136A						0.47	27				0.00		0.00		0.00			0.47									
	128A	129A	0.40		24	0.40	24	3.7	0.29		0.00		0.00		0.00	0.00	0.40	0.40	0.13	0.42	71.0	200	0.65	26.44	0.02	0.84	0.30
	129A	130A	0.06		3	0.46	27	3.7	0.32		0.00		0.00		0.00	0.00	0.06	0.46	0.15	0.47	11.0	200	0.35	19.40	0.02	0.62	0.26
	130A	132A	0.15		9	0.61	36	3.7	0.43		0.00		0.00		0.00	0.00	0.15	0.61	0.20	0.63	26.5	200	0.35	19.40	0.03	0.62	0.28
Contribution From STREET 3, Pipe 131A - 132A						0.15	9				0.00		0.00		0.00		0.15	0.76									
	132A	135A	0.48		29	1.24	74	3.6	0.87		0.00		0.00		0.00	0.00	0.48	1.24	0.41	1.28	85.5	200	0.35	19.40	0.07	0.62	0.34
To STREET 1, Pipe 135A - 136A						1.24	74				0.00		0.00		0.00			1.24									
	110A	111A	0.44		39	0.44	39	3.7	0.46		0.00		0.00		0.00	0.00	0.44	0.44	0.15	0.61	51.5	200	0.65	26.44	0.02	0.84	0.34
	111A	112A	0.10		8	0.54	47	3.7	0.56		0.00		0.00		0.00	0.00	0.10	0.54	0.18	0.74	11.0	200	0.10	10.37	0.07	0.33	0.19
	112A	114A	0.59		52	1.13	99	3.6	1.15		0.00		0.00		0.00	0.00	0.59	1.13	0.37	1.53	69.5	200	0.35	19.40	0.08	0.62	0.36
	114A	116A	0.67		59	1.80	158	3.5	1.82		0.00		0.00		0.00	0.00	0.67	1.80	0.59	2.41	79.0	200	0.35	19.40	0.12	0.62	0.42
	116A	117A	0.41		36	2.21	194	3.5	2.21		0.00		0.00		0.00	0.00	0.41	2.21	0.73	2.94	48.5	200	0.35	19.40	0.15	0.62	0.44
To FRANK BENDER STREET, Pipe 117A - 118A						2.21	194				0.00		0.00		0.00			2.21									
	94A	99A				0.00				5.09	5.09		0.00		0.00	2.47	5.09	5.09	1.68	4.15	102.0	250	0.25	29.73	0.14	0.61	0.42
Contribution From JARGEAU ROAD, Pipe 96A - 99A						1.98	174				0.00		0.00		0.00		1.98	7.07									
Contribution From JARGEAU ROAD, Pipe 98A - 99A						0.00	0				0.00		0.00		0.00		0.00	7.07									
	99A	100A	3.10		273	5.08	447	3.4	4.92		5.09		0.00		0.00	2.47	3.10	10.17	3.36	10.75	81.0	300	0.20	43.25	0.25	0.61	0.50
	100A	106A	3.10		275	8.18	722	3.3	7.74		5.09		0.00		0.00	2.47	3.10	13.27	4.38	14.60	81.0	300	0.20	43.25	0.34	0.61	0.55
	106A	108A	3.03		270	11.21	992	3.2	10.42		5.09		0.00		0.00	2.47	3.03	16.30	5.38	18.28	79.0	375	0.15	67.91	0.27	0.61	0.52
	108A	109A	1.65		147	12.86	1139	3.2	11.85		5.09		0.00		0.00	2.47	1.65	17.95	5.92	20.25	43.0	375	0.15	67.91	0.30	0.61	0.53
	109A	117A	2.28		201	15.14	1340	3.2	13.77		5.09		0.00		0.00	2.47	2.28	20.23	6.68	22.92	59.5	375	0.15	67.91	0.34	0.61	0.55
To FRANK BENDER STREET, Pipe 117A - 118A						15.14	1340				5.09		0.00		0.00			20.23									
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		19	0.31	19	3.7	0.23		0.00		0.00		0.00	0.00	0.31	0.31	0.10	0.33	55.0	200	0.85	30.24	0.01	0.96	0.31
	139A	140A	0.06		3	0.37	22	3.7	0.26		0.00		0.00		0.00	0.00	0.06	0.37	0.12	0.39	10.0	200	1.10	34.40	0.01	1.09	0.35
	140A	141A	0.30		18	0.67	40	3.7	0.48		0.00		0.00		0.00	0.00	0.30	0.67	0.22	0.70	59.5	200	0.35	19.40	0.04	0.62	0.29
To STREET 2, Pipe 141A - 142A						0.67	40				0.00		0.00		0.00			0.67									
Contribution From STREET 4, Pipe 132A - 135A						1.24	74				0.00		0.00		0.00		1.24	1.24									
Contribution From STREET 4, Pipe 134A - 135A						0.47	27				0.00		0.00		0.00		0.47	1.71									
	135A	136A	0.42		25	2.13	126	3.6	1.46		0.00		0.00		0.00	0.00	0.42	2.13	0.70	2.16	76.0	200	0.35	19.40	0.11	0.62	0.41
	136A	137A	0.06		3	2.19	129	3.6	1.49		0.00		0.00		0.00	0.00	0.06	2.19	0.72	2.21	10.5	200	0.35	19.40	0.11	0.62	0.41

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: C.B.

Checked: S.M.

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

PROJECT: **TRAILSEDGE PHASE 5**

LOCATION: **City of Ottawa**

File Ref: 20-1195

Date: **30 Jan 2026**

Sheet No. 3 of 4

LICENSED PROFESSIONAL ENGINEER S. L. MERRICK 100186523 2026-01-30 PROVINCE OF ONTARIO

OB 620-1195

1195_2026-01-29_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)
	137A	141A	0.03		2	2.22	131	3.6	1.51		0.00		0.00		0.00	0.00	0.03	2.22	0.73	2.25	5.5	200	0.35	19.40	0.12	0.62	0.41
To STREET 2, Pipe 141A - 142A						2.22	131				0.00		0.00		0.00			2.22									
STREET 2																											
Contribution From STREET 1, Pipe 137A - 141A						2.22	131				0.00		0.00		0.00		2.22	2.22									
Contribution From STREET 1, Pipe 140A - 141A						0.67	40				0.00		0.00		0.00		0.67	2.89									
	141A	142A	0.06		3	2.95	174	3.5	1.99		0.00		0.00		0.00	0.00	0.06	2.95	0.97	2.97	10.5	200	0.35	19.40	0.15	0.62	0.44

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2026-01-30
PROVINCE OF ONTARIO
DBH 20-1195

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: C.B.	PROJECT: **TRAILSEDGE PHASE 5**		
Checked: S.M.	LOCATION: **City of Ottawa**		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 3	File Ref: 20-1195	Date: **30 Jan 2026**	Sheet No. 4 of 4

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)
TRUNK 2																											
	1203A	1204A	0.36		52	0.36	52	3.6	0.61		0.00		0.00	4.59	4.59	0.74	4.95	4.95	1.63	2.99	81.0	300	0.65	77.96	0.04	1.10	0.52
	1204A	1205A	0.75		108	1.11	160	3.5	1.84		0.00		0.00		4.59	0.74	0.75	5.70	1.88	4.46	111.0	300	0.20	43.25	0.10	0.61	0.39
	1205A	1206A	0.77		111	1.88	271	3.5	3.05		0.00		0.00		4.59	0.74	0.77	6.47	2.14	5.93	74.0	300	0.20	43.25	0.14	0.61	0.43
	1206A	1207A	0.97		140	2.85	411	3.4	4.55		0.00		0.00		4.59	0.74	0.97	7.44	2.46	7.74	75.0	300	0.20	43.25	0.18	0.61	0.46
	1207A	1208A				2.85	411	3.4	4.55		0.00		0.00		4.59	0.74	0.00	7.44	2.46	7.74	100.5	300	0.20	43.25	0.18	0.61	0.46
	1208A	1209A	1.77		255	4.62	666	3.3	7.18		0.00		0.00		4.59	0.74	1.77	9.21	3.04	10.96	14.5	300	0.20	43.25	0.25	0.61	0.51
	1209A	1210A	1.64		237	6.26	903	3.3	9.55		0.00		0.00		4.59	0.74	1.64	10.85	3.58	13.87	112.5	300	0.20	43.25	0.32	0.61	0.54
	1210A	1211A	2.83		408	9.09	1311	3.2	13.50		0.00		0.00		4.59	0.74	2.83	13.68	4.51	18.75	120.0	300	0.20	43.25	0.43	0.61	0.59
	1211A	1212A				9.09	1311	3.2	13.50		0.00		0.00		4.59	0.74	0.00	13.68	4.51	18.75	43.5	300	0.20	43.25	0.43	0.61	0.59
	1212A	1091A				9.09	1311	3.2	13.50		0.00		0.00		4.59	0.74	0.00	13.68	4.51	18.75	10.0	300	0.20	43.25	0.43	0.61	0.59
	1091A	1093A				9.09	1311	3.2	13.50		0.00		0.00		4.59	0.74	0.00	13.68	4.51	18.75	33.5	300	0.20	43.25	0.43	0.61	0.59
	1093A	1094A	1.16		118	10.25	1429	3.2	14.61		0.00		0.00		4.59	0.74	1.16	14.84	4.90	20.25	84.0	450	0.12	98.76	0.21	0.62	0.49
	1094A	1095A	0.52		53	10.77	1482	3.1	15.11		0.00		0.00		4.59	0.74	0.52	15.36	5.07	20.92	81.0	450	0.12	98.76	0.21	0.62	0.49
To TRUNK 1, Pipe 1095A - 1096A						10.77	1482				0.00		0.00		4.59			15.36									
TRUNK 1																											
	1007A	1008A				0.00				1.87	1.87		0.00		0.00	1.14	1.87	1.87	0.62	1.75	58.0	300	0.65	77.96	0.02	1.10	0.44
	1008A	1009A				0.00	0			1.19	3.06		0.00		0.00	1.86	1.19	3.06	1.01	2.87	86.5	300	0.25	48.35	0.06	0.68	0.37
	1009A	1010A				0.00	0			0.90	3.96		0.00		0.00	2.41	0.90	3.96	1.31	3.71	86.5	300	0.25	48.35	0.08	0.68	0.40
	1010A	1011A				0.00	0			2.04	6.00		0.00		0.00	3.65	2.04	6.00	1.98	5.63	46.0	300	0.25	48.35	0.12	0.68	0.46
	1011A	1012A				0.00	0			1.02	7.02		0.00		0.00	4.27	1.02	7.02	2.32	6.58	97.5	375	0.15	67.91	0.10	0.61	0.39
	1012A	1013A				0.00	0			2.12	9.14		0.00		0.00	5.55	2.12	9.14	3.02	8.57	125.5	375	0.15	67.91	0.13	0.61	0.42
	1013A	1014A				0.00	0			2.12	11.26		0.00		0.00	6.84	2.12	11.26	3.72	10.56	88.0	375	0.15	67.91	0.16	0.61	0.45
	1014A	1022A				0.00	0			1.18	12.44		0.00		0.00	7.56	1.18	12.44	4.11	11.66	93.0	375	0.15	67.91	0.17	0.61	0.46
	1022A	1023A				0.00	0			6.81	19.25		0.00		0.00	11.70	6.81	19.25	6.35	18.05	100.5	375	0.15	67.91	0.27	0.61	0.52
	1023A	1024A	0.72		73	0.72	73	3.6	0.86		19.25		0.00		0.00	11.70	0.72	19.97	6.59	19.14	82.0	450	0.12	98.76	0.19	0.62	0.48
	1024A	1025A	0.19		20	0.91	93	3.6	1.09		19.25		0.00		0.00	11.70	0.19	20.16	6.65	19.44	79.0	450	0.12	98.76	0.20	0.62	0.48
	1025A	1026A	0.14		15	1.05	108	3.6	1.26		19.25		0.00		0.00	11.70	0.14	20.30	6.70	19.65	58.0	450	0.12	98.76	0.20	0.62	0.48
	1026A	1027A	0.24		25	1.29	133	3.6	1.54		19.25		0.00		0.00	11.70	0.24	20.54	6.78	20.01	63.5	450	0.12	98.76	0.20	0.62	0.49
	1027A	1028A				1.29	133	3.6	1.54		19.25		0.00		0.00	11.70	0.00	20.54	6.78	20.01	25.0	450	0.12	98.76	0.20	0.62	0.49
	1028A	1029A	0.52		53	1.81	186	3.5	2.13		19.25		0.00		0.00	11.70	0.52	21.06	6.95	20.77	93.0	450	0.12	98.76	0.21	0.62	0.49
	1029A	1037A	0.48		49	2.29	235	3.5	2.66		19.25		0.00		0.00	11.70	0.48	21.54	7.11	21.47	93.0	450	0.12	98.76	0.22	0.62	0.49
	1037A	1040A	3.56		360	5.85	595	3.3	6.45		19.25		0.00		0.00	11.70	3.56	25.10	8.28	26.43	79.0	450	0.12	98.76	0.27	0.62	0.52
	1040A	1049A	1.54		156	7.39	751	3.3	8.03		19.25		0.00		0.00	11.70	1.54	26.64	8.79	28.52	79.0	450	0.12	98.76	0.29	0.62	0.53
	1049A	1058A	4.52		457	11.91	1208	3.2	12.51		19.25		0.00		0.00	11.70	4.52	31.16	10.28	34.49	81.0	450	0.12	98.76	0.35	0.62	0.56
	1058A	1059A	5.68		574	17.59	1782	3.1	17.90		19.25		0.00	1.37	1.37	11.92	7.05	38.21	12.61	42.43	121.5	450	0.12	98.76	0.43	0.62	0.60
	1059A	1090A	0.46		47	18.05	1829	3.1	18.33		19.25		0.00		1.37	11.92	0.46	38.67	12.76	43.01	121.5	450	0.12	98.76	0.44	0.62	0.60
			2.41		348	20.46	2177			5.07	24.32		0.00	0.59	1.96		8.07	46.74									
	1090A	1095A	14.50		1465	34.96	3642	2.9	34.18		24.32		0.00		1.96	15.09	14.50	61.24	20.21	69.48	68.5	450	0.15	110.42	0.63	0.69	0.73
Contribution From TRUNK 1, Pipe 1094A - 1095A						10.77	1482				0.00		0.00		4.59		15.36	76.60									
	1095A	1096A	0.50		51	46.23	5175	2.8	46.71		24.32		0.00		6.55	15.84	0.50	77.10	25.44	87.98	79.5	525	0.12	148.98	0.59	0.69	0.72
	1096A	1107A	1.98		200	48.21	5375	2.8	48.30		24.32		0.00		6.55	15.84	1.98	79.08	26.10	90.23	76.0	525	0.10	136.00	0.66	0.63	0.67
			1.91		276	50.12	5651				24.32		0.00		6.55		1.91	80.99									
			4.43		448	54.55	6099				24.32		0.00		6.55		4.43	85.42									
	1107A	1108A	9.77		987	64.32	7086	2.7	61.57	4.28	28.60		0.00		6.55	18.44	14.05	99.47	32.83	112.83	97.5	525	0.22	201.72	0.56	0.93	0.95
	1108A	1133A	0.31		32	64.63	7118	2.7	61.81		28.60		0.00	1.16	7.71	18.62	1.47	100.94	33.31	113.75	47.5	600	0.22	288.00	0.39	1.02	0.96
	1133A	1A (B.O.)				64.63	7118	2.7	61.81		28.60		0.00		7.71	18.62	0.00	100.94	33.31	113.75	15.5	600	0.10	194.17	0.59	0.69	0.71

LICENSED PROFESSIONAL ENGINEER
W. LIU
100167932
20-09-21
PROVINCE OF ONTARIO

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 =	35000	L/ha/da	0.4051	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 =	0.41	l/s/Ha			Single house coeff=	3.4	

Designed: V.W.

Checked: W.L.

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

PROJECT: **Trailsedge North**

LOCATION: **City of Ottawa**

File Ref: 20-1195

Date: **21 Sep 2020**

Sheet No. 1 of 1

1195_SAN_01.xlsx

SANITARY SEWER DESIGN SHEET

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

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				DEMAND																					DESIGN CAPACITY							
				RESIDENTIAL FLOW												INDUSTRIAL / COMMERICAL / INSTITUIONAL FLOW						EXTRANOUS FLOW AREA METHOD		TOTAL DESIGN FLOW	PROPOSED SEWER PIPE SIZING / DESIGN							
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.)	COMMERICAL / INSTITUIONAL AREA (ha.)	CUMULATIVE COMMERICAL / INSTIUTIONAL 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			168		0.353	0.353	4.00	1.14	3.66	1.96	2.730	2.730	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		14			0.038	0.391	4.00	1.27	4.05	2.17	0.470	3.200	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		4			0.011	0.401	4.00	1.30	4.16	2.23	0.150	3.350	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		28			0.076	0.477	3.98	1.55	4.93	2.64	0.830	4.180	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		27			0.073	0.073	4.00	0.24	0.76	0.41	0.760	0.760	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		4			0.011	0.084	4.00	0.27	0.87	0.47	0.170	0.930	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		10			0.027	0.111	4.00	0.36	1.15	0.62	0.330	1.260	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		8			0.022	0.609	3.93	1.97	6.21	3.32	0.330	5.770	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		14			0.038	0.038	4.00	0.12	0.39	0.21	0.450	0.450	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		25			0.068	0.068	4.00	0.22	0.70	0.38	0.780	0.780	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		9			0.024	0.671	3.90	2.18	6.80	3.64	0.330	6.550	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		2			0.005	0.005	4.00	0.02	0.06	0.03	0.080	0.080	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	20				0.068	0.745	3.88	2.41	7.49	4.01	0.800	7.430	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	2				0.007	0.752	3.88	2.44	7.55	4.05	0.180	7.610	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	6				0.020	0.772	3.87	2.50	7.75	4.15	0.270	7.880	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		6			0.016	0.016	4.00	0.05	0.17	0.09	0.210	0.210	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	3				0.010	0.010	4.00	0.03	0.11	0.06	0.150	0.150	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	7				0.024	0.050	4.00	0.16	0.52	0.28	0.280	0.640	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	14				0.048	0.098	4.00	0.32	1.01	0.54	0.560	1.200	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	6				0.020	0.890	3.83	2.88	8.84	4.74	0.330	9.410	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	10				0.034	0.924	3.82	3.00	9.16	4.91	0.440	9.850	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	2				0.007	0.931	3.82	3.02	9.22	4.94	0.120	9.970	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	3				0.010	0.941	3.82	3.05	9.31	4.99	0.150	10.120	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	15				0.051	0.992	3.80	3.22	9.78	5.24	0.620	10.740	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	17				0.058	0.058	4.00	0.19	0.60	0.32	0.710	0.710	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	2				0.007	0.065	4.00	0.21	0.67	0.36	0.160	0.870	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	7				0.024	0.088	4.00	0.29	0.92	0.49	0.330	1.200	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	6				0.020	1.101	3.77	3.57	10.77	5.77	0.290	12.230	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					0.375	0.375	4.00	1.22	3.89	2.08	3.090	3.090	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	0.375	4.00	1.22	3.89	2.08	3.090	3.090	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	8				0.027	0.402	4.00	1.30	4.17	2.23	0.550	3.640	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	5				0.017	0.419	4.00	1.36	4.35	2.33	0.270	3.910	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	12				0.041	0.041	4.00	0.13	0.42	0.23	0.500	0.500	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	2				0.007	0.048	4.00	0.15	0.49	0.26	0.120	0.620	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	4				0.014	0.061	4.00	0.20	0.63	0.34	0.210	0.830	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				0.000	0.061	4.00	0.20	0.63	0.34	0.000	0.830	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				6.550	5.545	5.545	3.20	17.97	46.05	24.67	54.930	54.930	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	7.066	3.10	22.90	56.84	30.45	0.500	71.570	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	7.066	3.10	22.90	56.84	30.45	0.120	71.690	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	7.066	3.10	22.90	56.84	30.45	0.000	71.690	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				1.000	0.011	7.138	3.10	23.13	57.34	30.72	1.000	73.520	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				151	151	168	7.550		7.138						73.52		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 280 L/per/day (design)
(L/per/day)= 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)

	Singles	Semis/Towns	Apts (2-BR)
K = Harmon Correction Factor			
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		

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

NOTES

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

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)	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

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SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION: STREET	FROM M.H.	TO M.H.	RESIDENTIAL AREA AND POPULATION: AREA (ha)	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)	INFILTRATION: 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)
	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	PROJECT: K. MITIC 100122349	Orleans EUC MUC	
Checked: K.M	LOCATION:	City of Ottawa	
Dwg. Reference:	File Ref: 14-733	Date: October, 2019	Sheet No. 2 of 2

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — OCT. 18, 2019

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D2

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)	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

LICENSED PROFESSIONAL ENGINEER
A. J. TEMELINI
100213887
2020-07-15
PROVINCE OF ONTARIO

APPENDIX E

- Stormwater Servicing Design Sheets (DSEL, January 2026)
- Stormwater HGL Preliminary Analysis (DSEL, January 2026)
- East Urban Community Phase 3 Area – Surface Storage Area (DSEL, January 2026)
- Preliminary HGL PCSWMM Model Output (DSEL, January 2026)
- Preliminary Storage PCSWMM Model Output (DSEL, January 2026)
- Trailsedge Phase 5 Ponding Volume per Ha (DSEL, January 2026)
- Trailsedge Phase 5 Surface Storage Area (DSEL, January 2026)
- Summary of Minor and Major System Flows (DSEL, Feb 2023)
- MSS Excerpt – Storm Sewer Design Sheet (City of Ottawa, Oct 2019)
- Innes Interim Pond (Trinity/IBI Group, Jan 2009)
- Innes ICD Plan (Trinity/IBI Group, May 2013)
- Innes Ponding Plan (Trinity/IBI Group, May 2013)

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 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
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				2.49				0.00				0.00	12.29														
Contribution From JARGEAU ROAD, Pipe 50 - 51						0.00				1.63				0.00				0.00	10.51														
	51	55			0.00	0.00	0.38	0.70	0.74	4.86			0.00	0.00			0.00	0.00	12.29	69.01	93.49	109.53	160.04	454	900	900	CONC	0.10	83.0	572.4707	0.8999	1.5373	0.793
					0.00	0.00	0.37	0.70	0.72	5.58			0.00	0.00			0.00	0.00															
	55	61	2.52	0.70	4.90	4.90			0.00	5.58			0.00	0.00			0.00	0.00	13.82	64.69	87.56	102.56	149.80	805	975	975	CONC	0.25	79.0	1120.5266	1.5008	0.8773	0.719
	61	62			0.00	4.90	0.38	0.70	0.74	6.32			0.00	0.00			0.00	0.00	14.70	62.48	84.53	99.00	144.58	840	975	975	CONC	0.25	82.5	1120.5266	1.5008	0.9162	0.750
	62	66			0.00	4.90	0.37	0.70	0.72	7.04			0.00	0.00			0.00	0.00	15.62	60.35	81.61	95.56	139.54	870	1050	1050	CONC	0.90	84.0	2590.5934	2.9918	0.4679	0.336
To FRANK BENDER STREET, Pipe 66 - 67						4.90				7.04				0.00				0.00	16.09														
STREET 5																																	
Contribution From JARGEAU ROAD, Pipe 23 - 24						0.00				1.53				0.00				0.00	11.12					1439									
	24	25	0.58	0.70	1.13	1.13			0.00	1.53			0.00	0.00			0.00	0.00	11.12	72.75	98.61	115.57	168.90	1672	1200	1200	CONC	0.65	45.0	3143.2568	2.7792	0.2699	0.532
			1.05	0.70	2.04	3.17			0.00	1.53			0.00	0.00			0.00	0.00															
	25	27			0.00	3.17	2.04	0.70	3.97	5.50			0.00	0.00			0.00	0.00	11.39	71.84	97.37	114.10	166.75	2203	1350	1350	CONC	0.35	81.5	3157.6496	2.2060	0.6157	0.698
	27	29	0.59	0.70	1.15	4.32			0.00	5.50			0.00	0.00			0.00	0.00	12.01	69.87	94.66	110.91	162.07	2262	1350	1350	CONC	0.35	45.5	3157.6496	2.2060	0.3438	0.716
	29	35	1.02	0.70	1.98	6.31			0.00	5.50			0.00	0.00			0.00	0.00	12.35	68.82	93.22	109.22	159.58	2386	1350	1350	CONC	0.40	79.0	3375.6694	2.3583	0.5583	0.707
	35	36	1.06	0.70	2.06	8.37			0.00	5.50			0.00	0.00			0.00	0.00	12.91	67.18	90.98	106.58	155.71	2502	1500	1500	CONC	0.55	85.5	5242.4131	2.9666	0.4803	0.477
To FRANK BENDER STREET, Pipe 36 - 37						8.37				5.50				0.00				0.00	13.39					1439									
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
					0.00	0.00			0.00	1.23			0.00	0.00	0.00	0.00	0.00	0.00						251									
					0.00	0.00			0.00	1.23			0.00	0.00	0.00	0.00	0.00	0.00						68									
					0.00	0.00			0.00	1.23			0.00	0.00	0.09	0.40	0.10	0.10															
	11	13			0.00	0.00	0.37	0.70	0.72	1.95			0.00	0.00			0.00	0.10	12.05	69.75	94.50	110.72	161.79	519	600	600	CONC	2.75	87.5	1018.2230	3.6012	0.4050	0.510
Contribution From JARGEAU ROAD, Pipe 12 - 13						0.00				0.29				0.00				0.00	10.24														
Contribution From JARGEAU ROAD, Pipe 8 - 13						40.81				2.72				4.43				0.00	15.39														
	13	14			0.00	40.81	0.19	0.70	0.37	5.33			0.00	4.43			0.00	0.10	15.39	60.85	82.31	96.38	140.74	3682	2250	2250	CONC	0.10	42.0	6590.6247	1.6576	0.4223	0.559
	14	15			0.00	40.81	0.39	0.70	0.76	6.09			0.00	4.43			0.00	0.10	15.82	59.91	81.01	94.86	138.50	3691	2250	2250	CONC	0.10	94.5	6590.6247	1.6576	0.9502	0.560
	15	17			0.00	40.81	0.39	0.70	0.76	6.85			0.00	4.43			0.00	0.10	16.77	57.89	78.25	91.62	133.75	3637	2250	2250	CONC	0.10	94.5	6590.6247	1.6576	0.9502	0.552
	17	18			0.00	40.81	0.32	0.70	0.62	7.47			0.00	4.43			0.00	0.10	17.72	56.02	75.70	88.61	129.34	3576	2250	2250	CONC	0.10	76.0	6590.6247	1.6576	0.7642	0.543
					0.00	40.81	0.32	0.70	0.62	8.10			0.00	4.43			0.00	0.10															
	18	19			0.00	40.81	3.87	0.40	4.30	12.40			0.00	4.43			0.00	0.10	18.48	54.61	73.77	86.35	126.02	3857	2250	2250	CONC	0.10	77.5	6590.6247	1.6576	0.7793	0.585
	19	20			0.00	40.81	0.05	0.70	0.10	12.50			0.00	4.43			0.00	0.10	19.26	53.25	71.92	84.17	122.82	3776	2250	2250	CONC	0.10	15.0	6590.6247	1.6576	0.1508	0.573
	20	21			0.00	40.81	0.42	0.70	0.82	13.31			0.00	4.43			0.00	0.10	19.41	53.00	71.57	83.76	122.23	3818	2250	2250	CONC	0.10	99.5	6590.6247	1.6576	1.0005	0.579

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2026-01-30
PROVINCE OF ONTARIO
JOB#20-1195

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: CB	PROJECT: TRAILSEDGE PHASE 5		
Checked: SLM	LOCATION: City of Ottawa		
Dwg. Reference: 2	File Ref: 20-1195	Date: 29 Jan 2026	Sheet No. SHEET 1 OF 3

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
	21	36			0.00	40.81	0.42	0.70	0.82	14.13			0.00	4.43			0.00	0.10	20.41	51.38	69.36	81.17	118.42	3767	2250	2250	CONC	0.10	100.0	6590.6247	1.6576	1.0055	0.572
Contribution From STREET 5, Pipe 35 - 36						8.37				5.50				0.00				0.00	13.39					1439									
	36	37			0.00	49.18	0.30	0.70	0.58	20.22			0.00	4.43			0.00	0.10	21.42	49.86	67.29	78.73	114.85	5931	2400	2400	CONC	0.10	69.0	7828.3430	1.7304	0.6646	0.758
	37	46			0.00	49.18	0.30	0.70	0.58	20.80			0.00	4.43			0.00	0.10	22.08	48.91	65.99	77.21	112.62	5889	2400	2400	CONC	0.10	72.0	7828.3430	1.7304	0.6935	0.752
	46	47			0.00	49.18	0.12	0.70	0.23	21.04			0.00	4.43			0.00	0.10	22.77	47.96	64.70	75.69	110.39	5824	2400	2400	CONC	0.10	28.0	7828.3430	1.7304	0.2697	0.744
					0.00	49.18	0.28	0.70	0.54	21.58			0.00	4.43			0.00	0.10															
	47	66			0.00	49.18	3.00	0.80	6.67	28.25			0.00	4.43			0.00	0.10	23.04	47.60	64.21	75.11	109.55	6257	2400	2400	CONC	0.10	66.5	7828.3430	1.7304	0.6405	0.799
Contribution From FERN CASEY STREET, Pipe 62 - 66						4.90				7.04				0.00				0.00	16.09														
			0.36	0.70	0.70	54.78			0.00	35.29			0.00	4.43			0.00	0.10															
	66	67	2.34	0.70	4.55	59.34			0.00	35.29			0.00	4.43			0.00	0.10	23.68	46.77	63.08	73.79	107.60	7097	2400	2400	CONC	0.10	65.0	7828.3430	1.7304	0.6260	0.907
	67	76	0.04	0.70	0.08	59.41			0.00	35.29			0.00	4.43			0.00	0.10	24.31	45.99	62.02	72.54	105.78	7011	2700	2700	CONC	0.10	32.5	10717.0825	1.8718	0.2894	0.654
			0.25	0.70	0.49	59.90			0.00	35.29			0.00	4.43			0.00	0.10															
	76	77	1.58	0.70	3.07	62.98			0.00	35.29			0.00	4.43			0.00	0.10	24.60	45.64	61.54	71.98	104.96	7133	2700	2700	CONC	0.10	60.5	10717.0825	1.8718	0.5387	0.666
	77	110	0.30	0.70	0.58	63.56			0.00	35.29			0.00	4.43			0.00	0.10	25.14	45.01	60.68	70.97	103.47	7084	2700	2700	CONC	0.10	69.0	10717.0825	1.8718	0.6144	0.661
To STREET 4, Pipe 110 - 111						63.56				35.29				4.43				0.10	25.75					1758									
JARGEAU ROAD																																	
	12	13			0.00	0.00	0.15	0.70	0.29	0.29			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	30	300	300	PVC	4.00	39.0	193.4015	2.7361	0.2376	0.157
To FRANK BENDER STREET, Pipe 13 - 14						0.00				0.29				0.00				0.00	10.24														
					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	525	525	CONC	0.30	33.0	235.5548	1.0881	0.5055	0.719
To FERN CASEY STREET, Pipe 51 - 55						0.00				1.63				0.00				0.00	10.51														
					0.00	0.00			0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00						1439									
	22	23			0.00	0.00	0.40	0.40	0.44	0.44			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	1485	1050	1050	CONC	0.90	85.0	2590.5934	2.9918	0.4735	0.573
	23	24			0.00	0.00	0.56	0.70	1.09	1.53			0.00	0.00			0.00	0.00	10.47	75.03	101.76	119.27	174.34	1595	1200	1200	CONC	0.40	85.0	2465.7735	2.1802	0.6498	0.647
To STREET 5, Pipe 24 - 25						0.00				1.53				0.00				0.00	11.12					1439									
	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	375	375	PVC	0.65	88.0	141.3557	1.2799	1.1460	0.588
	49	51			0.00	0.00	0.87	0.70	1.69	2.49			0.00	0.00			0.00	0.00	11.15	72.67	98.51	115.44	168.72	245	600	600	CONC	0.35	88.0	363.2541	1.2847	1.1416	0.675
To FERN CASEY STREET, Pipe 51 - 55						0.00				2.49				0.00				0.00	12.29														
					0.00	0.00	0.55	0.70	1.07	1.07			0.00	0.00			0.00	0.00															
	95	96			0.00	0.00	1.98	0.80	4.40	5.47			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	570	975	975	CONC	0.20	106.0	1002.2295	1.3424	1.3161	0.569
					0.00	0.00	0.00	0.00	0.00	5.47			0.00	0.00			0.00	0.00						806									
					0.00	0.00			0.00	5.47			0.00	0.00	0.00	0.00	0.00	0.00						309									
					0.00	0.00	0.59	0.70	1.15	6.62			0.00	0.00			0.00	0.00															
	96	99	2.16	0.70	4.20	4.20			0.00	6.62			0.00	0.00			0.00	0.00	11.32	72.10	97.72	114.52	167.36	2065	1500	1500	CONC	0.20	81.0	3161.2940	1.7889	0.7546	0.653
To STREET 4, Pipe 99 - 100						4.20				6.62				0.00				0.00	12.07					1115									
					0.00	0.00	0.13	0.70	0.25	0.25			0.00	0.00			0.00	0.00															
	97	98	1.77	0.70	3.44	3.44			0.00	0.25			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	291	675	675	CONC	0.35	41.5	497.2987	1.3897	0.4977	0.585
	98	99			0.00	3.44	0.16	0.70	0.31	0.56			0.00	0.00			0.00	0.00	10.50	74.95	101.64	119.13	174.13	315	825	825	CONC	0.15	77.0	555.9418	1.0400	1.2340	0.568
To STREET 4, Pipe 99 - 100						3.44				0.56				0.00				0.00	11.73														
					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

LICENSED PROFESSIONAL ENGINEER
S.L. MERRICK
100186523
2026-01-30
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: CB	PROJECT: TRAILSEDGE PHASE 5		
Checked: SLM	LOCATION: City of Ottawa		
Dwg. Reference: 2	File Ref: 20-1195	Date: 29 Jan 2026	Sheet No. SHEET 2 OF 3

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
					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	2.76	0.80	6.14	40.81			0.00	2.26			0.00	4.43			0.00	0.00	13.70	65.02	88.02	103.10	150.59	3309	1650	1650	CONC	0.20	101.5	4076.1052	1.9063	0.8874	0.812
	8	13			0.00	40.81	0.24	0.70	0.47	2.72			0.00	4.43			0.00	0.00	14.58	62.76	84.92	99.46	145.25	3233	1800	1800	CONC	0.20	98.0	5140.6126	2.0201	0.8085	0.629
To FRANK BENDER STREET, Pipe 13 - 14						40.81				2.72				4.43				0.00	15.39														
STREET 4																																	
			2.53	0.70	4.92	4.92			0.00	0.00			0.00	0.00			0.00	0.00															
	94	99			0.00	4.92	6.47	0.90	16.19	16.19			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	2065	1650	1650	CONC	0.30	100.5	4992.1889	2.3347	0.7174	0.414
Contribution From JARGEAU ROAD, Pipe 96 - 99						4.20				6.62				0.00				0.00	12.07					1115									
Contribution From JARGEAU ROAD, Pipe 98 - 99						3.44				0.56				0.00				0.00	11.73														
	99	100			0.00	12.57	1.38	0.70	2.69	26.06			0.00	0.00			0.00	0.00	12.07	69.67	94.39	110.60	161.61	4451	1950	1950	CONC	0.30	81.0	7793.9831	2.6098	0.5173	0.571
	100	106	1.94	0.70	3.78	16.35			0.00	26.06			0.00	0.00			0.00	0.00	12.59	68.12	92.26	108.09	157.92	4633	1950	1950	CONC	0.20	81.0	6363.7605	2.1309	0.6335	0.728
	106	108	0.94	0.70	1.83	18.18			0.00	26.06			0.00	0.00			0.00	0.00	13.22	66.31	89.78	105.17	153.64	4660	1950	1950	CONC	0.20	79.0	6363.7605	2.1309	0.6179	0.732
	108	109	0.65	0.70	1.26	19.44			0.00	26.06			0.00	0.00			0.00	0.00	13.84	64.65	87.50	102.49	149.71	4652	1950	1950	CONC	0.20	55.0	6363.7605	2.1309	0.4302	0.731
	109	110	0.62	0.70	1.21	20.65			0.00	26.06			0.00	0.00			0.00	0.00	14.27	63.55	85.99	100.72	147.10	4668	1950	1950	CONC	0.35	52.0	8418.4639	2.8189	0.3075	0.554
Contribution From FRANK BENDER STREET, Pipe 77 - 110						63.56				35.29				4.43				0.10	25.75					1758									
	110	111	0.20	0.70	0.39	84.60			0.00	61.35			0.00	4.43			0.00	0.10	25.75	44.30	59.72	69.84	101.82	10604	2700	2700	CONC	0.15	45.0	13125.6918	2.2925	0.3272	0.808
	111	113	0.34	0.70	0.66	85.26			0.00	61.35			0.00	4.43			0.00	0.10	26.08	43.94	59.22	69.26	100.97	10569	2700	2700	CONC	0.15	82.0	13125.6918	2.2925	0.5962	0.805
			0.28	0.70	0.54	85.80			0.00	61.35			0.00	4.43			0.00	0.10															
	113	114			0.00	85.80	3.30	0.80	7.34	68.69			0.00	4.43			0.00	0.10	26.68	43.29	58.34	68.23	99.46	10907	2700	2700	CONC	0.15	67.5	13125.6918	2.2925	0.4907	0.831
	114	115	0.04	0.70	0.08	85.88			0.00	68.69			0.00	4.43			0.00	0.10	27.17	42.78	57.64	67.40	98.25	10814	2700	2700	CONC	0.15	10.0	13125.6918	2.2925	0.0727	0.824
	115	116	0.30	0.70	0.58	86.46			0.00	68.69			0.00	4.43			0.00	0.10	27.24	42.70	57.54	67.28	98.08	10825	2700	2700	CONC	0.15	71.0	13125.6918	2.2925	0.5162	0.825
	116	117	0.29	0.70	0.56	87.03			0.00	68.69			0.00	4.43			0.00	0.10	27.76	42.17	56.82	66.44	96.85	10750	2700	2700	CONC	0.15	70.5	13125.6918	2.2925	0.5125	0.819
	117	118	0.04	0.70	0.08	87.11			0.00	68.69			0.00	4.43			0.00	0.10	28.27	41.67	56.13	65.63	95.66	10658	2700	2700	CONC	0.15	10.0	13125.6918	2.2925	0.0727	0.812
	118	132	0.11	0.70	0.21	87.32			0.00	68.69			0.00	4.43			0.00	0.10	28.34	41.59	56.04	65.52	95.49	10654	2700	2700	CONC	0.15	27.0	13125.6918	2.2925	0.1963	0.812
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	97.75			0.00	68.69			0.00	4.43			0.00	0.10	28.54	41.40	55.78	65.22	95.05	11050	2700	2700	CONC	0.15	85.0	13125.6918	2.2925	0.6180	0.842
	134	135	0.59	0.70	1.15	98.90			0.00	68.69			0.00	4.43			0.00	0.10	29.16	40.82	54.98	64.28	93.67	10980	2700	2700	CONC	0.15	72.5	13125.6918	2.2925	0.5271	0.837
	135	2150			0.00	98.90			0.00	68.69			0.00	4.43			0.00	0.10	29.68	40.33	54.32	63.50	92.54	10883	2700	2700	CONC	0.15	50.0	13125.6918	2.2925	0.3635	0.829
	2150	HW1			0.00	98.90			0.00	68.69			0.00	4.43			0.00	0.10	30.05	40.00	53.87	62.98	91.77	10818	2700	2700	CONC	0.15	19.5	13125.6918	2.2925	0.1418	0.824
STREET 1																																	
	2121	2142	1.22	0.70	2.37	2.37			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	182	1650	1650	CONC	0.10	83.5	2882.2416	1.3479	1.0324	0.063

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2026-01-30
PROVINCE OF ONTARIO
20B1420-1195

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: CB	PROJECT: TRAILSEDGE PHASE 5		
Checked: SLM	LOCATION: City of Ottawa		
Dwg. Reference: 2	File Ref: 20-1195	Date: 29 Jan 2026	Sheet No. SHEET 3 OF 3

Project Name:	Trails Edge
Project Number:	1195
Designed By:	JC
Checked By:	JP
Date	03-Feb-26

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

HGL Preliminary Analysis Based on Rational Method Flow

Name	Invert Elev. (m)	Rim Elev. (m)	Max. HGL (m)	Clearance: Rim-HGL (m)	Baseline (L/s)
1	86.518	91.19	88.05	3.14	1678
10	89.249	92.721	89.54	3.18	113
100	83.252	88.598	86.2	2.40	247
106	83.08	88.477	86.04	2.44	35
108	82.892	88.358	85.88	2.48	-12
109	81.939	88.277	85.77	2.51	21
11	88.045	92.566	88.42	4.15	536
110	81.381	87.949	85.67	2.28	-1597
111	81.303	87.881	85.59	2.29	-47
113	81.17	87.758	85.45	2.31	456
114	81.039	87.656	85.19	2.47	-126
115	80.994	87.641	85.04	2.60	15
116	80.877	88.374	84.91	3.46	-101
117	80.741	88.189	84.65	3.54	-125
118	80.696	88.173	84.51	3.66	-6
119	85.434	89.38	85.66	3.72	56
12	86.115	91.429	86.85	4.58	41
120	85.251	88.789	85.53	3.26	18
121	84.924	88.669	85.4	3.27	166
122	84.639	88.512	85.04	3.47	135
123	83.366	87.977	84.57	3.41	101
124	83.136	88.053	84.4	3.65	28
125	83.106	87.74	84.33	3.41	71
126	82.571	88.109	84.29	3.82	51
128	82.439	88.093	84.23	3.86	92
13	83.579	90.122	86.75	3.37	-136
130	82.342	88.217	84.14	4.08	-3
131	82.283	88.178	84.11	4.07	4
132	80.595	88.145	84.03	4.11	-184
134	80.437	87.765	83.87	3.90	-94
135	80.298	87.84	83.59	4.25	-131
14	83.507	90.055	86.73	3.33	12
15	83.402	89.729	86.68	3.05	-74
17	83.297	89.39	86.62	2.77	-82
18	83.211	89.117	86.58	2.54	380
19	83.103	88.959	86.5	2.46	-110
2	86.055	91.048	87.93	3.12	1278
20	83.058	88.941	86.46	2.48	57

HGL Preliminary Analysis Based on Rational Method Flow

Name	Invert Elev. (m)	Rim Elev. (m)	Max. HGL (m)	Clearance: Rim-HGL (m)	Baseline (L/s)
21	82.948	88.793	86.4	2.39	-68
2121	80.75	87.393	83	4.39	246
2150	80.163	87.84	83.37	4.47	-88
22	87.493	91.994	88.59	3.40	2005
23	86.578	90.817	88.13	2.69	148
24	86.214	90.453	87.62	2.83	104
25	85.273	90.122	87.47	2.65	716
27	84.958	89.448	87.22	2.23	80
29	84.789	89.379	87.07	2.31	168
3	85.867	90.861	87.81	3.05	-51
35	83.225	89.046	86.78	2.27	157
36	82.305	88.64	86.34	2.30	-457
37	82.226	88.54	86.27	2.27	-56
4	85.702	90.734	87.72	3.01	-34
46	82.144	88.432	86.19	2.24	-88
47	82.086	88.39	86.16	2.23	584
48	86.501	90.368	87.57	2.80	112
49	85.691	89.316	87.21	2.11	219
5	85.497	90.649	87.63	3.02	219
50	85.605	89.131	87.03	2.10	229
51	84.951	89.054	86.86	2.19	53
55	84.76	88.93	86.76	2.17	474
6	85.138	90.546	87.5	3.05	901
61	84.552	88.811	86.58	2.23	47
62	83.42	88.558	86.37	2.19	40
66	81.989	88.29	86.09	2.20	-40
67	81.624	88.193	85.99	2.20	-116
7	84.909	90.421	87.34	3.08	475
76	81.561	88.144	85.96	2.18	165
77	81.47	88.053	85.91	2.14	-66
8	84.508	90.269	87.09	3.18	-102
9	89.488	92.75	89.71	3.04	52
94	83.933	88.87	86.44	2.43	2787
95	85.13	89.128	86.77	2.36	770
96	84.378	88.893	86.65	2.24	2018
97	85.289	89.678	86.55	3.13	393
98	84.994	88.835	86.46	2.38	33
99	83.505	88.719	86.35	2.37	57

Project Name:	Trails Edge
Project Number:	1195
Designed By:	AL
Checked By:	JP
Date	27-Jan-26

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

Estimated Storage Volumes for Multi-Residential, Employment, and Park Blocks

Block ID	Total Contributing Area (ha)	Total area excluding 15m frontage (ha)	RC	Allowable Release Rate (L/s) *	Allowable Release Rate (L/s/ha)	Estimated 100-yr Uncontrolled Flow (L/s)**	Estimated Release Rate less Uncontrolled (L/s)	Total Area Peak Inflow 100-yr (L/s)	100-yr Estimated Storage Volume (m³) ***	100-yr Estimated Storage Volume (m³/ha)
Controlled to 2-year										
414B	5.82	5.09	0.8	994	171	312	682	2510	1444	248
413	2.31	1.89	0.8	395	171	183	212	1010	596	258
External 413	1.62	1.62	0.8	277	171	0	277	730	408	252
412A	2.76	2.29	0.8	471	171	211	260	1240	734	266
414A	4.66	4.18	0.8	796	171	211	585	2070	1189	255
412B	1.18	0.91	0.8	202	171	129	73	560	349	296
Controlled to 5-year										
Future Block (lot 4)	6.47	6.11	0.9	1687	261	174	1513	3110	1347	208
373	1.38	1.05	0.7	280	203	130	150	550	247	179
411	3.87	3.87	0.4	448	116	0	448	720	261	67
301	2.04	1.47	0.7	414	203	215	199	770	336	165
300	0.40	0.40	0.4	46	115	0	46	140	72	179
418	1.20	1.20	0.4	138	115	0	138	280	121	101
294	1.98	1.98	0.7	402	203	0	402	780	351	177
410	3.00	2.22	0.8	695	232	353	342	1350	605	202
409	3.30	2.52	0.8	765	232	344	421	1470	637	193

* This is the total allowable release rate from this site. At the detailed design stage, the sum of minor and major system flow rates from each site should be equal or less than these values.
** Prorated flow based on total area peak runoff. For the purpose of estimating the 100-year storage volume, the first 15 m of each Multi-Residential and Employment block is assumed to drain uncontrolled toward the City right-of-way (ROW).
*** Estimation based on the PCSWMM Graphing Tool - Storage Calculator.

Prelim HGL Analysis PCSWMM Model Output Report - 100yr+35%

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

Updated by Justine Craddock
20260203
DSEL

****
Element Count
****
Number of rain gages 0
Number of subcatchments ... 0
Number of nodes 78
Number of links 76
Number of pollutants 0
Number of land uses 0

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
1	JUNCTION	86.52	4.67	0.0	Yes
10	JUNCTION	89.25	3.47	0.0	Yes
100	JUNCTION	83.25	5.35	0.0	Yes
106	JUNCTION	83.08	5.40	0.0	Yes
108	JUNCTION	82.89	5.47	0.0	Yes
109	JUNCTION	81.94	6.34	0.0	Yes
11	JUNCTION	88.05	4.52	0.0	Yes
110	JUNCTION	81.38	6.57	0.0	Yes
111	JUNCTION	81.30	6.58	0.0	Yes
113	JUNCTION	81.17	6.59	0.0	Yes
114	JUNCTION	81.04	6.62	0.0	Yes
115	JUNCTION	80.99	6.65	0.0	Yes
116	JUNCTION	80.88	7.50	0.0	Yes
117	JUNCTION	80.74	7.45	0.0	Yes
118	JUNCTION	80.70	7.48	0.0	Yes
119	JUNCTION	85.43	3.95	0.0	Yes
12	JUNCTION	86.12	5.31	0.0	Yes
120	JUNCTION	85.25	3.54	0.0	Yes
121	JUNCTION	84.92	3.75	0.0	Yes
122	JUNCTION	84.64	3.87	0.0	Yes
123	JUNCTION	83.37	4.61	0.0	Yes
124	JUNCTION	83.14	4.92	0.0	Yes
125	JUNCTION	83.11	4.63	0.0	Yes
126	JUNCTION	82.57	5.54	0.0	Yes
128	JUNCTION	82.44	5.65	0.0	Yes
13	JUNCTION	83.58	6.54	0.0	Yes
130	JUNCTION	82.34	5.88	0.0	Yes
131	JUNCTION	82.28	5.89	0.0	Yes
132	JUNCTION	80.59	7.55	0.0	Yes
134	JUNCTION	80.44	7.33	0.0	Yes
135	JUNCTION	80.30	7.54	0.0	Yes
14	JUNCTION	83.51	6.55	0.0	Yes
15	JUNCTION	83.40	6.33	0.0	Yes
17	JUNCTION	83.30	6.09	0.0	Yes
18	JUNCTION	83.21	5.91	0.0	Yes
19	JUNCTION	83.10	5.86	0.0	Yes
2	JUNCTION	86.05	4.99	0.0	Yes
20	JUNCTION	83.06	5.88	0.0	Yes
21	JUNCTION	82.95	5.84	0.0	Yes
2121	JUNCTION	80.75	6.64	0.0	Yes
2150	JUNCTION	80.16	7.68	0.0	Yes
22	JUNCTION	87.49	4.50	0.0	Yes
23	JUNCTION	86.58	4.24	0.0	Yes
24	JUNCTION	86.21	4.24	0.0	Yes
25	JUNCTION	85.27	4.85	0.0	Yes
27	JUNCTION	84.96	4.49	0.0	Yes
29	JUNCTION	84.79	4.59	0.0	Yes
3	JUNCTION	85.87	4.99	0.0	Yes
35	JUNCTION	83.22	5.82	0.0	Yes
36	JUNCTION	82.31	6.33	0.0	Yes
37	JUNCTION	82.23	6.31	0.0	Yes
4	JUNCTION	85.70	5.03	0.0	Yes
46	JUNCTION	82.14	6.29	0.0	Yes
47	JUNCTION	82.09	6.30	0.0	Yes
48	JUNCTION	86.50	3.87	0.0	Yes
49	JUNCTION	85.69	3.62	0.0	Yes
5	JUNCTION	85.50	5.15	0.0	Yes
50	JUNCTION	85.61	3.53	0.0	Yes
51	JUNCTION	84.95	4.10	0.0	Yes
55	JUNCTION	84.76	4.17	0.0	Yes
6	JUNCTION	85.14	5.41	0.0	Yes
61	JUNCTION	84.55	4.26	0.0	Yes
62	JUNCTION	83.42	5.14	0.0	Yes
66	JUNCTION	81.99	6.30	0.0	Yes
67	JUNCTION	81.62	6.57	0.0	Yes
7	JUNCTION	84.91	5.51	0.0	Yes
76	JUNCTION	81.56	6.58	0.0	Yes
77	JUNCTION	81.47	6.58	0.0	Yes
8	JUNCTION	84.51	5.76	0.0	Yes
9	JUNCTION	89.49	3.26	0.0	Yes
94	JUNCTION	83.93	4.94	0.0	Yes
95	JUNCTION	85.13	4.00	0.0	Yes
96	JUNCTION	84.38	4.51	0.0	Yes
97	JUNCTION	85.29	4.39	0.0	Yes
98	JUNCTION	84.99	3.84	0.0	Yes
99	JUNCTION	83.50	5.21	0.0	Yes
2142	OUTFALL	80.63	1.65	0.0	
HW1	OUTFALL	79.00	3.83	0.0	

****
Link Summary
****

Name	From Node	To Node	Type	Length	% Slope	Roughness
STM-100-106	100	106	CONDUIT	81.0	0.2000	0.0130
STM-10-11	10	11	CONDUIT	103.0	0.9505	0.0130
STM-106-108	106	108	CONDUIT	79.0	0.2000	0.0130
STM-108-109	108	109	CONDUIT	55.0	0.2000	0.0130
STM-109-110	109	110	CONDUIT	52.0	0.3500	0.0130
STM-110-111	110	111	CONDUIT	45.0	0.1511	0.0130
STM-111-113	111	113	CONDUIT	82.0	0.1500	0.0130
STM-11-13	11	13	CONDUIT	87.5	2.7530	0.0130
STM-113-114	113	114	CONDUIT	67.5	0.1496	0.0130
STM-114-115	114	115	CONDUIT	10.0	0.1500	0.0130
STM-115-116	115	116	CONDUIT	71.0	0.1507	0.0130
STM-116-117	116	117	CONDUIT	70.5	0.1504	0.0130
STM-117-118	117	118	CONDUIT	10.0	0.1500	0.0130
STM-118-132	118	132	CONDUIT	27.0	0.1519	0.0130
STM-119-120	119	120	CONDUIT	34.0	0.4500	0.0130
STM-1-2	1	2	CONDUIT	65.5	0.2000	0.0130
STM-120-121	120	121	CONDUIT	12.5	0.4480	0.0130
STM-121-122	121	122	CONDUIT	105.5	0.2502	0.0130
STM-12-13	12	13	CONDUIT	39.0	4.0032	0.0130
STM-122-126	122	126	CONDUIT	108.5	1.5504	0.0130
STM-123-124	123	124	CONDUIT	51.5	0.3010	0.0130
STM-124-126	124	126	CONDUIT	31.5	0.2000	0.0130
STM-125-126	125	126	CONDUIT	42.5	0.2000	0.0130
STM-126-128	126	128	CONDUIT	57.0	0.1000	0.0130
STM-128-130	128	130	CONDUIT	86.5	0.1006	0.0130
STM-130-131	130	131	CONDUIT	29.0	0.1000	0.0130
STM-131-132	131	132	CONDUIT	13.5	0.1037	0.0130
STM-13-14	13	14	CONDUIT	42.0	0.1000	0.0130
STM-132-134	132	134	CONDUIT	85.0	0.1506	0.0130
STM-134-135	134	135	CONDUIT	72.5	0.1503	0.0130
STM-135-2150	135	2150	CONDUIT	50.0	0.1500	0.0130
STM-14-15	14	15	CONDUIT	94.5	0.1005	0.0130
STM-15-17	15	17	CONDUIT	94.5	0.1005	0.0130
STM-17-18	17	18	CONDUIT	76.0	0.1000	0.0130
STM-18-19	18	19	CONDUIT	77.5	0.1006	0.0130
STM-19-20	19	20	CONDUIT	15.0	0.1000	0.0130
STM-20-21	20	21	CONDUIT	99.5	0.1005	0.0130
STM-2121-2142	2121	2142	CONDUIT	83.5	0.1437	0.0130
STM-21-36	21	36	CONDUIT	100.0	0.1000	0.0130
STM-2150-HW1	2150	HW1	CONDUIT	19.5	0.1487	0.0130
STM-22-23	22	23	CONDUIT	85.0	0.9000	0.0130
STM-2-3	2	3	CONDUIT	65.5	0.2000	0.0130
STM-23-24	23	24	CONDUIT	85.0	0.4000	0.0130
STM-24-25	24	25	CONDUIT	45.0	0.6511	0.0130
STM-25-27	25	27	CONDUIT	81.5	0.3497	0.0130
STM-27-29	27	29	CONDUIT	45.5	0.3495	0.0130
STM-29-35	29	35	CONDUIT	79.0	0.4000	0.0130
STM-3-4	3	4	CONDUIT	54.0	0.2000	0.0130
STM-35-36	35	36	CONDUIT	85.5	0.5497	0.0130
STM-36-37	36	37	CONDUIT	69.0	0.1000	0.0130
STM-37-46	37	46	CONDUIT	72.0	0.1000	0.0130
STM-4-5	4	5	CONDUIT	54.5	0.2000	0.0130
STM-46-47	46	47	CONDUIT	28.0	0.1000	0.0130
STM-47-66	47	66	CONDUIT	66.5	0.1008	0.0130
STM-48-49	48	49	CONDUIT	88.0	0.6500	0.0130
STM-49-51	49	51	CONDUIT	88.0	0.3500	0.0130
STM-50-51	50	51	CONDUIT	33.0	0.3000	0.0130
STM-51-55	51	55	CONDUIT	83.0	0.1000	0.0130
STM-55-61	55	61	CONDUIT	79.0	0.2506	0.0130
STM-5-6	5	6	CONDUIT	68.5	0.2000	0.0130
STM-61-62	61	62	CONDUIT	82.5	0.2497	0.0130

```
  STM-62-66        62              66              CONDUIT          84.0
0.9000    0.0130
  STM-66-67        66              67              CONDUIT          65.0
0.1000    0.0130
  STM-6-7          6               7               CONDUIT          83.5
0.2000    0.0130
  STM-67-76        67              76              CONDUIT          32.5
0.1015    0.0130
  STM-76-77        76              77              CONDUIT          60.5
0.1008    0.0130
  STM-77-110       77              110             CONDUIT          69.0
0.1000    0.0130
  STM-7-8          7               8               CONDUIT         101.5
0.2000    0.0130
  STM-8-13         8               13              CONDUIT          98.0
0.2000    0.0130
  STM-9-10         9               10              CONDUIT          45.5
0.3495    0.0130
  STM-94-99        94              99              CONDUIT         100.5
0.3005    0.0130
  STM-95-96        95              96              CONDUIT         106.0
0.2000    0.0130
  STM-96-99        96              99              CONDUIT          81.0
0.5000    0.0130
  STM-97-98        97              98              CONDUIT          41.5
0.3494    0.0130
  STM-98-99        98              99              CONDUIT          77.0
0.1506    0.0130
  STM-99-100       99              100             CONDUIT          81.0
0.3000    0.0130


  **********************
  Cross Section Summary
  **********************
                                      Full     Full     Hyd.     Max.   No. of
Full
  Conduit          Shape              Depth    Area     Rad.     Width  Barrels
Flow
  ---------------------------------------------------------------------------
------
  STM-100-106      CIRCULAR            1.95     2.99     0.49     1.95       1
6.36
  STM-10-11        CIRCULAR            0.38     0.11     0.09     0.38       1
0.17
  STM-106-108      CIRCULAR            1.95     2.99     0.49     1.95       1
6.36
  STM-108-109      CIRCULAR            1.95     2.99     0.49     1.95       1
6.36
  STM-109-110      CIRCULAR            1.95     2.99     0.49     1.95       1
8.42
  STM-110-111      CIRCULAR            2.70     5.73     0.68     2.70       1
13.18
  STM-111-113      CIRCULAR            2.70     5.73     0.68     2.70       1
13.13
  STM-11-13        CIRCULAR            0.60     0.28     0.15     0.60       1
1.02
  STM-113-114      CIRCULAR            2.70     5.73     0.68     2.70       1
13.11
  STM-114-115      CIRCULAR            2.70     5.73     0.68     2.70       1
```

```
  STM-115-116      CIRCULAR            2.70     5.73     0.68     2.70       1
13.16
  STM-116-117      CIRCULAR            2.70     5.73     0.68     2.70       1
13.14
  STM-117-118      CIRCULAR            2.70     5.73     0.68     2.70       1
13.13
  STM-118-132      CIRCULAR            2.70     5.73     0.68     2.70       1
13.21
  STM-119-120      CIRCULAR            0.30     0.07     0.07     0.30       1
0.06
  STM-1-2          CIRCULAR            1.20     1.13     0.30     1.20       1
1.74
  STM-120-121      CIRCULAR            0.30     0.07     0.07     0.30       1
0.06
  STM-121-122      CIRCULAR            0.53     0.22     0.13     0.53       1
0.22
  STM-12-13        CIRCULAR            0.30     0.07     0.07     0.30       1
0.19
  STM-122-126      CIRCULAR            0.53     0.22     0.13     0.53       1
0.54
  STM-123-124      CIRCULAR            0.38     0.11     0.09     0.38       1
0.10
  STM-124-126      CIRCULAR            0.45     0.16     0.11     0.45       1
0.13
  STM-125-126      CIRCULAR            0.45     0.16     0.11     0.45       1
0.13
  STM-126-128      CIRCULAR            0.90     0.64     0.23     0.90       1
0.57
  STM-128-130      CIRCULAR            0.97     0.75     0.24     0.97       1
0.71
  STM-130-131      CIRCULAR            0.97     0.75     0.24     0.97       1
0.71
  STM-131-132      CIRCULAR            0.97     0.75     0.24     0.97       1
0.72
  STM-13-14        CIRCULAR            2.25     3.98     0.56     2.25       1
6.59
  STM-132-134      CIRCULAR            2.70     5.73     0.68     2.70       1
13.15
  STM-134-135      CIRCULAR            2.70     5.73     0.68     2.70       1
13.14
  STM-135-2150     CIRCULAR            2.70     5.73     0.68     2.70       1
13.13
  STM-14-15        CIRCULAR            2.25     3.98     0.56     2.25       1
6.61
  STM-15-17        CIRCULAR            2.25     3.98     0.56     2.25       1
6.61
  STM-17-18        CIRCULAR            2.25     3.98     0.56     2.25       1
6.59
  STM-18-19        CIRCULAR            2.25     3.98     0.56     2.25       1
6.61
  STM-19-20        CIRCULAR            2.25     3.98     0.56     2.25       1
6.59
  STM-20-21        CIRCULAR            2.25     3.98     0.56     2.25       1
6.61
  STM-2121-2142    CIRCULAR            1.65     2.14     0.41     1.65       1
3.46
  STM-21-36        CIRCULAR            2.25     3.98     0.56     2.25       1
6.59
  STM-2150-HW1     CIRCULAR            2.70     5.73     0.68     2.70       1
13.07
```

```
  STM-22-23        CIRCULAR            1.05     0.87     0.26     1.05       1
2.59
  STM-2-3          CIRCULAR            1.50     1.77     0.38     1.50       1
3.16
  STM-23-24        CIRCULAR            1.20     1.13     0.30     1.20       1
2.47
  STM-24-25        CIRCULAR            1.20     1.13     0.30     1.20       1
3.15
  STM-25-27        CIRCULAR            1.35     1.43     0.34     1.35       1
3.16
  STM-27-29        CIRCULAR            1.35     1.43     0.34     1.35       1
3.16
  STM-29-35        CIRCULAR            1.35     1.43     0.34     1.35       1
3.38
  STM-3-4          CIRCULAR            1.50     1.77     0.38     1.50       1
3.16
  STM-35-36        CIRCULAR            1.50     1.77     0.38     1.50       1
5.24
  STM-36-37        CIRCULAR            2.40     4.52     0.60     2.40       1
7.83
  STM-37-46        CIRCULAR            2.40     4.52     0.60     2.40       1
7.83
  STM-4-5          CIRCULAR            1.50     1.77     0.38     1.50       1
3.16
  STM-46-47        CIRCULAR            2.40     4.52     0.60     2.40       1
7.83
  STM-47-66        CIRCULAR            2.40     4.52     0.60     2.40       1
7.86
  STM-48-49        CIRCULAR            0.38     0.11     0.09     0.38       1
0.14
  STM-49-51        CIRCULAR            0.60     0.28     0.15     0.60       1
0.36
  STM-50-51        CIRCULAR            0.53     0.22     0.13     0.53       1
0.24
  STM-51-55        CIRCULAR            0.90     0.64     0.23     0.90       1
0.57
  STM-55-61        CIRCULAR            0.97     0.75     0.24     0.97       1
1.12
  STM-5-6          CIRCULAR            1.50     1.77     0.38     1.50       1
3.16
  STM-61-62        CIRCULAR            0.97     0.75     0.24     0.97       1
1.12
  STM-62-66        CIRCULAR            1.05     0.87     0.26     1.05       1
2.59
  STM-66-67        CIRCULAR            2.40     4.52     0.60     2.40       1
7.83
  STM-6-7          CIRCULAR            1.65     2.14     0.41     1.65       1
4.08
  STM-67-76        CIRCULAR            2.70     5.73     0.68     2.70       1
10.80
  STM-76-77        CIRCULAR            2.70     5.73     0.68     2.70       1
10.76
  STM-77-110       CIRCULAR            2.70     5.73     0.68     2.70       1
10.72
  STM-7-8          CIRCULAR            1.65     2.14     0.41     1.65       1
4.08
  STM-8-13         CIRCULAR            1.80     2.54     0.45     1.80       1
5.14
  STM-9-10         CIRCULAR            0.30     0.07     0.07     0.30       1
0.06
```

```
  STM-94-99        CIRCULAR            1.65     2.14     0.41     1.65       1
5.00
  STM-95-96        CIRCULAR            0.97     0.75     0.24     0.97       1
1.00
  STM-96-99        CIRCULAR            1.50     1.77     0.38     1.50       1
5.00
  STM-97-98        CIRCULAR            0.68     0.36     0.17     0.68       1
0.50
  STM-98-99        CIRCULAR            0.82     0.53     0.21     0.82       1
0.56
  STM-99-100       CIRCULAR            1.95     2.99     0.49     1.95       1
7.80


  ****************
  Transect Summary
  ****************

  Transect test
  Area:
            0.0001    0.0006    0.0013    0.0022    0.0037
            0.0064    0.0102    0.0153    0.0215    0.0290
            0.0376    0.0474    0.0585    0.0707    0.0841
            0.0988    0.1143    0.1300    0.1457    0.1613
            0.1770    0.1927    0.2083    0.2240    0.2397
            0.2555    0.2727    0.2912    0.3109    0.3317
            0.3538    0.3770    0.4015    0.4271    0.4539
            0.4820    0.5112    0.5416    0.5732    0.6060
            0.6401    0.6753    0.7117    0.7493    0.7881
            0.8281    0.8693    0.9116    0.9552    1.0000
  Hrad:
            0.0194    0.0388    0.0582    0.0776    0.0724
            0.0792    0.0933    0.1102    0.1284    0.1472
            0.1666    0.1862    0.2061    0.2261    0.2462
            0.2663    0.2996    0.3401    0.3805    0.4208
            0.4610    0.5011    0.5410    0.5808    0.6206
            0.6598    0.6947    0.7259    0.7537    0.7785
            0.8007    0.8207    0.8386    0.8547    0.8693
            0.8826    0.8948    0.9060    0.9163    0.9260
            0.9350    0.9435    0.9516    0.9592    0.9666
            0.9737    0.9805    0.9872    0.9936    1.0000
  Width:
            0.0062    0.0124    0.0185    0.0247    0.0452
            0.0716    0.0980    0.1244    0.1508    0.1772
            0.2036    0.2300    0.2564    0.2828    0.3092
            0.3356    0.3451    0.3452    0.3452    0.3452
            0.3453    0.3453    0.3454    0.3454    0.3454
            0.3673    0.3936    0.4200    0.4464    0.4727
            0.4991    0.5255    0.5518    0.5782    0.6045
            0.6309    0.6573    0.6836    0.7100    0.7364
            0.7627    0.7891    0.8155    0.8418    0.8682
            0.8945    0.9209    0.9473    0.9736    1.0000


  ****************
  Analysis Options
  ****************
  Flow Units ............... CMS
```

```
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/22/2025 00:00:00
Ending Date .............. 04/23/2025 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 16
Number of Threads ........ 4
Head Tolerance ........... 0.000150 m
```

```
**************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......          0.000          0.000
Wet Weather Inflow .......          0.000          0.000
Groundwater Inflow .......          0.000          0.000
RDII Inflow ..............          0.000          0.000
External Inflow ..........        162.780       1627.818
External Outflow .........        162.780       1627.818
Flooding Loss ............          0.000          0.000
Evaporation Loss .........          0.000          0.000
Exfiltration Loss ........          0.000          0.000
Initial Stored Volume ....          1.220         12.198
Final Stored Volume ......          1.220         12.204
Continuity Error (%) .....         -0.000
```

```
***************************
Time-Step Critical Elements
***************************
None
```

```
********************************
Highest Flow Instability Indexes
********************************
Link STM-19-20 (147)
```

```
*********************************
Most Frequent Nonconverging Nodes
*********************************
Node 2142 (0.01%)
Node HW1 (0.01%)
Node 96 (0.00%)
Node 97 (0.00%)
Node 98 (0.00%)
```

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.39
% of Steps Not Converging   :     0.01
Time Step Frequencies       :
    1.000 -  0.871 sec      :   100.00 %
    0.871 -  0.758 sec      :     0.00 %
    0.758 -  0.660 sec      :     0.00 %
    0.660 -  0.574 sec      :     0.00 %
    0.574 -  0.500 sec      :     0.00 %
```

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
1	JUNCTION	1.53	1.53	88.05	0 00:00	1.53
10	JUNCTION	0.30	0.30	89.54	0 00:00	0.30
100	JUNCTION	2.95	2.95	86.20	0 00:00	2.95
106	JUNCTION	2.96	2.96	86.04	0 00:00	2.96
108	JUNCTION	2.99	2.99	85.88	0 00:00	2.99
109	JUNCTION	3.83	3.84	85.77	0 00:00	3.83
11	JUNCTION	0.38	0.38	88.42	0 00:06	0.38
110	JUNCTION	4.29	4.29	85.67	0 00:01	4.29
111	JUNCTION	4.29	4.29	85.59	0 00:02	4.29
113	JUNCTION	4.27	4.28	85.45	0 00:05	4.27
114	JUNCTION	4.15	4.15	85.19	0 00:00	4.15
115	JUNCTION	4.04	4.05	85.04	0 00:01	4.04
116	JUNCTION	4.03	4.03	84.91	0 00:05	4.03
117	JUNCTION	3.91	3.91	84.65	0 00:04	3.91
118	JUNCTION	3.81	3.81	84.51	0 00:01	3.81
119	JUNCTION	0.23	0.23	85.66	0 07:30	0.23
12	JUNCTION	0.73	0.73	86.85	0 00:01	0.73
120	JUNCTION	0.28	0.28	85.53	0 18:35	0.28
121	JUNCTION	0.47	0.47	85.40	0 00:03	0.47
122	JUNCTION	0.40	0.40	85.04	0 00:02	0.40
123	JUNCTION	1.20	1.21	84.57	0 00:01	1.21
124	JUNCTION	1.26	1.27	84.40	0 00:03	1.26
125	JUNCTION	1.22	1.23	84.33	0 00:04	1.23
126	JUNCTION	1.72	1.72	84.29	0 00:01	1.72
128	JUNCTION	1.78	1.79	84.23	0 00:02	1.79
13	JUNCTION	3.17	3.18	86.75	0 00:01	3.17
130	JUNCTION	1.79	1.79	84.14	0 00:03	1.79
131	JUNCTION	1.82	1.82	84.11	0 00:05	1.82
132	JUNCTION	3.43	3.44	84.03	0 00:00	3.43
134	JUNCTION	3.43	3.43	83.87	0 00:06	3.43
135	JUNCTION	3.29	3.30	83.59	0 00:01	3.29
14	JUNCTION	3.22	3.22	86.73	0 00:06	3.22
15	JUNCTION	3.27	3.27	86.68	0 00:00	3.27
17	JUNCTION	3.32	3.33	86.62	0 00:05	3.33
18	JUNCTION	3.37	3.37	86.58	0 00:02	3.37
19	JUNCTION	3.40	3.40	86.50	0 00:06	3.40
2	JUNCTION	1.87	1.87	87.93	0 00:04	1.87
20	JUNCTION	3.40	3.40	86.46	0 00:00	3.40
21	JUNCTION	3.45	3.45	86.40	0 00:00	3.45
2121	JUNCTION	2.25	2.25	83.00	0 00:00	2.25
2150	JUNCTION	3.20	3.20	83.37	0 00:02	3.20
22	JUNCTION	1.09	1.09	88.59	0 00:00	1.09
23	JUNCTION	1.55	1.55	88.13	0 00:00	1.55
24	JUNCTION	1.41	1.41	87.62	0 00:00	1.41
25	JUNCTION	2.20	2.20	87.47	0 00:03	2.20
27	JUNCTION	2.26	2.26	87.22	0 00:04	2.26
29	JUNCTION	2.28	2.28	87.07	0 00:00	2.28
3	JUNCTION	1.94	1.94	87.81	0 00:00	1.94
35	JUNCTION	3.55	3.56	86.78	0 00:00	3.55
36	JUNCTION	4.03	4.03	86.34	0 00:01	4.03
37	JUNCTION	4.04	4.04	86.27	0 00:03	4.04
4	JUNCTION	2.02	2.02	87.72	0 00:06	2.02
46	JUNCTION	4.05	4.05	86.19	0 00:02	4.05
47	JUNCTION	4.08	4.08	86.16	0 00:00	4.08
48	JUNCTION	1.07	1.07	87.57	0 00:03	1.07
49	JUNCTION	1.52	1.52	87.21	0 00:04	1.52
5	JUNCTION	2.13	2.13	87.63	0 00:04	2.13
50	JUNCTION	1.42	1.42	87.03	0 00:00	1.42
51	JUNCTION	1.91	1.91	86.86	0 00:00	1.91
55	JUNCTION	2.00	2.00	86.76	0 00:00	2.00
6	JUNCTION	2.36	2.36	87.50	0 00:02	2.36
61	JUNCTION	2.02	2.03	86.58	0 00:06	2.02
62	JUNCTION	2.94	2.95	86.37	0 00:04	2.95
66	JUNCTION	4.10	4.10	86.09	0 00:03	4.10
67	JUNCTION	4.36	4.37	85.99	0 00:01	4.36
7	JUNCTION	2.43	2.43	87.34	0 00:01	2.43
76	JUNCTION	4.40	4.40	85.96	0 00:01	4.40
77	JUNCTION	4.44	4.44	85.91	0 00:02	4.44
8	JUNCTION	2.58	2.59	87.09	0 00:01	2.59
9	JUNCTION	0.22	0.22	89.71	0 00:00	0.22
94	JUNCTION	2.50	2.51	86.44	0 00:00	2.51
95	JUNCTION	1.63	1.64	86.77	0 00:00	1.63
96	JUNCTION	2.26	2.27	86.65	0 00:00	2.26
97	JUNCTION	1.26	1.26	86.55	0 00:00	1.26
98	JUNCTION	1.46	1.47	86.46	0 00:00	1.46
99	JUNCTION	2.84	2.85	86.35	0 00:00	2.84
2142	OUTFALL	2.37	2.37	83.00	0 00:00	2.37
HW1	OUTFALL	4.00	4.00	83.00	0 00:00	4.00

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
1	JUNCTION	1.678	1.678	0 00:00	145	145	-0.000
10	JUNCTION	0.113	0.165	0 00:00	9.73	14.2	-0.000
100	JUNCTION	0.247	6.305	0 00:00	21.3	545	-0.000
106	JUNCTION	0.035	6.341	0 00:00	3.07	548	-0.000
108	JUNCTION	-0.012	6.341	0 00:00	-1.05	548	0.000
109	JUNCTION	0.021	6.349	0 00:00	1.78	548	-0.000
11	JUNCTION	0.536	0.701	0 00:00	46.3	60.5	0.000
110	JUNCTION	-1.597	15.913	0 00:01	-138	1.37e+03	-0.000
111	JUNCTION	-0.047	14.316	0 00:00	-4.06	1.24e+03	-0.000
113	JUNCTION	0.456	14.725	0 00:00	39.4	1.27e+03	0.000
114	JUNCTION	-0.126	14.726	0 00:00	-10.8	1.27e+03	0.000
115	JUNCTION	0.015	14.615	0 00:01	1.27	1.26e+03	0.000
116	JUNCTION	-0.101	14.615	0 00:05	-8.72	1.26e+03	0.000
117	JUNCTION	-0.125	14.514	0 00:01	-10.8	1.25e+03	0.000
118	JUNCTION	-0.006	14.390	0 00:01	-0.518	1.24e+03	0.000
119	JUNCTION	0.056	0.056	0 00:00	4.88	4.88	0.000
12	JUNCTION	0.041	0.041	0 00:00	3.55	3.55	0.000
120	JUNCTION	0.018	0.074	0 00:01	1.55	6.43	0.000
121	JUNCTION	0.166	0.240	0 00:00	14.3	20.7	-0.000
122	JUNCTION	0.135	0.375	0 00:04	11.7	32.4	0.000
123	JUNCTION	0.101	0.101	0 00:00	8.72	8.72	-0.000
124	JUNCTION	0.028	0.129	0 00:01	2.42	11.1	-0.000
125	JUNCTION	0.071	0.071	0 00:00	6.1	6.1	0.000
126	JUNCTION	0.051	0.626	0 00:00	4.39	54	0.000
128	JUNCTION	0.092	0.718	0 00:00	7.93	62	-0.000

13	JUNCTION	-0.136	5.107	0	00:01	-11.7	441	-0.000
130	JUNCTION	-0.003	0.718	0	00:03	-0.22	62	0.000
131	JUNCTION	0.004	0.719	0	00:05	0.335	62.1	0.000
132	JUNCTION	-0.184	15.102	0	00:00	-15.9	1.3e+03	0.000
134	JUNCTION	-0.094	14.918	0	00:00	-8.12	1.29e+03	0.000
135	JUNCTION	-0.131	14.824	0	00:00	-11.3	1.28e+03	-0.000
14	JUNCTION	0.012	4.983	0	00:01	1.04	430	-0.000
15	JUNCTION	-0.074	4.983	0	00:03	-6.36	430	0.000
17	JUNCTION	-0.082	4.910	0	00:03	-7.05	424	-0.000
18	JUNCTION	0.380	5.208	0	00:01	32.8	450	0.000
19	JUNCTION	-0.110	5.208	0	00:02	-9.49	450	0.000
2	JUNCTION	1.278	2.956	0	00:04	110	255	-0.000
20	JUNCTION	0.057	5.155	0	00:00	4.89	445	-0.000
21	JUNCTION	-0.068	5.155	0	00:03	-5.92	445	-0.000
2121	JUNCTION	0.246	0.246	0	00:00	21.3	21.3	0.000
2150	JUNCTION	-0.088	14.693	0	00:00	-7.63	1.27e+03	0.000
22	JUNCTION	2.005	2.005	0	00:00	173	173	0.000
23	JUNCTION	0.148	2.153	0	17:01	12.8	186	-0.000
24	JUNCTION	0.104	2.258	0	00:04	9.01	195	-0.000
25	JUNCTION	0.716	2.974	0	00:04	61.9	257	0.000
27	JUNCTION	0.080	3.054	0	00:04	6.88	264	-0.000
29	JUNCTION	0.168	3.221	0	00:05	14.5	278	0.000
3	JUNCTION	-0.051	2.956	0	00:00	-4.38	255	-0.000
35	JUNCTION	0.157	3.378	0	00:04	13.5	292	-0.000
36	JUNCTION	-0.457	8.464	0	00:00	-39.5	731	0.000
37	JUNCTION	-0.056	8.007	0	00:02	-4.83	692	-0.000
4	JUNCTION	-0.034	2.905	0	00:00	-2.9	251	0.000
46	JUNCTION	-0.088	7.951	0	00:03	-7.64	687	0.000
47	JUNCTION	0.584	8.447	0	00:00	50.5	730	0.000
48	JUNCTION	0.112	0.112	0	00:00	9.7	9.7	-0.000
49	JUNCTION	0.219	0.331	0	00:04	18.9	28.6	-0.000
5	JUNCTION	0.219	3.091	0	00:00	18.9	267	0.000
50	JUNCTION	0.229	0.229	0	00:00	19.8	19.8	-0.000
51	JUNCTION	0.053	0.613	0	00:04	4.57	53	-0.000
55	JUNCTION	0.474	1.087	0	00:00	41	93.9	-0.000
6	JUNCTION	0.901	3.992	0	00:06	77.9	345	-0.000
61	JUNCTION	0.047	1.134	0	00:00	4.06	98	0.000
62	JUNCTION	0.040	1.175	0	00:00	3.48	101	0.000
66	JUNCTION	-0.040	9.622	0	00:00	-3.48	831	0.000
67	JUNCTION	-0.116	9.581	0	00:00	-10	828	-0.000
7	JUNCTION	0.475	4.467	0	00:00	41	386	-0.000
76	JUNCTION	0.165	9.631	0	00:00	14.3	832	-0.000
77	JUNCTION	-0.066	9.631	0	00:00	-5.72	832	-0.000
8	JUNCTION	-0.102	4.467	0	00:00	-8.82	386	0.000
9	JUNCTION	0.052	0.052	0	00:00	4.49	4.49	-0.000
94	JUNCTION	2.787	2.787	0	00:00	241	241	-0.000
95	JUNCTION	0.770	0.770	0	00:00	66.5	66.5	-0.000
96	JUNCTION	2.018	2.788	0	00:00	174	241	-0.000
97	JUNCTION	0.393	0.393	0	00:00	33.9	33.9	-0.000
98	JUNCTION	0.033	0.426	0	00:00	2.87	36.8	-0.000
99	JUNCTION	0.057	6.058	0	00:00	4.9	523	-0.000
2142	OUTFALL	0.000	0.246	0	00:00	0	21.3	0.000
HW1	OUTFALL	0.000	14.604	0	00:00	0	1.26e+03	0.000

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
1	JUNCTION	24.00	0.328	3.144
100	JUNCTION	24.00	0.991	2.395
106	JUNCTION	24.00	1.002	2.435
108	JUNCTION	24.00	1.012	2.474
109	JUNCTION	24.00	1.042	2.503
110	JUNCTION	24.00	1.570	2.278
111	JUNCTION	24.00	1.577	2.291
113	JUNCTION	24.00	1.566	2.312
114	JUNCTION	24.00	1.418	2.469
115	JUNCTION	24.00	1.316	2.601
116	JUNCTION	24.00	1.320	3.467
117	JUNCTION	24.00	1.179	3.539
118	JUNCTION	24.00	1.080	3.667
12	JUNCTION	24.00	0.432	4.582
123	JUNCTION	24.00	0.833	3.403
124	JUNCTION	24.00	0.817	3.650
125	JUNCTION	24.00	0.777	3.407
126	JUNCTION	24.00	0.770	3.816
128	JUNCTION	24.00	0.812	3.867
13	JUNCTION	24.00	0.517	3.368
130	JUNCTION	24.00	0.810	4.080
131	JUNCTION	24.00	0.819	4.071
132	JUNCTION	24.00	0.676	4.114
134	JUNCTION	24.00	0.699	3.899
135	JUNCTION	24.00	0.566	4.246
14	JUNCTION	24.00	0.943	3.325
15	JUNCTION	24.00	1.014	3.053
17	JUNCTION	24.00	1.066	2.767
18	JUNCTION	24.00	1.112	2.534
19	JUNCTION	24.00	1.118	2.458
2	JUNCTION	24.00	0.338	3.123
20	JUNCTION	24.00	1.121	2.482
21	JUNCTION	24.00	1.190	2.395
2121	JUNCTION	24.00	0.601	4.392
2150	JUNCTION	24.00	0.445	4.472
22	JUNCTION	24.00	0.042	3.409
23	JUNCTION	24.00	0.349	2.690
24	JUNCTION	24.00	0.184	2.831
25	JUNCTION	24.00	0.350	2.651
27	JUNCTION	24.00	0.880	2.230
29	JUNCTION	24.00	0.920	2.310
3	JUNCTION	24.00	0.387	3.050
35	JUNCTION	24.00	0.959	2.264
36	JUNCTION	24.00	1.240	2.302
37	JUNCTION	24.00	1.630	2.274
4	JUNCTION	24.00	0.461	3.014
46	JUNCTION	24.00	1.638	2.240
47	JUNCTION	24.00	1.649	2.225
48	JUNCTION	24.00	0.693	2.799
49	JUNCTION	24.00	0.904	2.108
5	JUNCTION	24.00	0.537	3.019
50	JUNCTION	24.00	0.898	2.103
51	JUNCTION	24.00	0.828	2.195
55	JUNCTION	24.00	0.996	2.166
6	JUNCTION	24.00	0.639	3.047
61	JUNCTION	24.00	1.041	2.233
62	JUNCTION	24.00	1.046	2.191
66	JUNCTION	24.00	1.667	2.204
67	JUNCTION	24.00	1.666	2.203
7	JUNCTION	24.00	0.717	3.083
76	JUNCTION	24.00	1.673	2.180
77	JUNCTION	24.00	1.715	2.138
8	JUNCTION	24.00	0.738	3.175
94	JUNCTION	24.00	0.688	2.425
95	JUNCTION	24.00	0.666	2.357
96	JUNCTION	24.00	0.752	2.248
97	JUNCTION	24.00	0.590	3.124
98	JUNCTION	24.00	0.643	2.373
99	JUNCTION	24.00	0.647	2.369

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Node Flooding Summary
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No nodes were flooded.

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Outfall Loading Summary
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Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
2142	100.00	0.246	0.246	21.266
HW1	100.00	14.604	14.604	1261.632
System	100.00	14.850	14.851	1282.898

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
STM-100-106	CONDUIT	6.305	0	00:00	2.11	0.99	1.00
STM-10-11	CONDUIT	0.165	0	00:00	1.76	0.96	0.79
STM-106-108	CONDUIT	6.341	0	00:00	2.12	1.00	1.00
STM-108-109	CONDUIT	6.329	0	00:00	2.12	0.99	1.00
STM-109-110	CONDUIT	6.350	0	00:00	2.13	0.75	1.00
STM-110-111	CONDUIT	14.316	0	00:00	2.50	1.09	1.00
STM-111-113	CONDUIT	14.269	0	00:00	2.49	1.09	1.00
STM-11-13	CONDUIT	0.701	0	00:00	2.84	0.69	0.81
STM-113-114	CONDUIT	14.726	0	00:00	2.57	1.12	1.00
STM-114-115	CONDUIT	14.601	0	00:01	2.55	1.11	1.00
STM-115-116	CONDUIT	14.615	0	00:05	2.55	1.11	1.00
STM-116-117	CONDUIT	14.514	0	00:01	2.53	1.10	1.00
STM-117-118	CONDUIT	14.390	0	00:01	2.51	1.10	1.00

STM-118-132	CONDUIT	14.383	0	00:00	2.51	1.09	1.00
STM-119-120	CONDUIT	0.056	0	00:01	0.94	0.87	0.80
STM-1-2	CONDUIT	1.678	0	00:04	1.48	0.96	1.00
STM-120-121	CONDUIT	0.074	0	00:00	1.20	1.15	0.82
STM-121-122	CONDUIT	0.240	0	00:04	1.27	1.12	0.81
STM-12-13	CONDUIT	0.041	0	00:03	0.58	0.21	1.00
STM-122-126	CONDUIT	0.375	0	00:00	1.85	0.70	0.88
STM-123-124	CONDUIT	0.101	0	00:01	0.91	1.05	1.00
STM-124-126	CONDUIT	0.129	0	00:01	0.81	1.01	1.00
STM-125-126	CONDUIT	0.071	0	00:04	0.44	0.55	1.00
STM-126-128	CONDUIT	0.626	0	00:00	0.98	1.09	1.00
STM-128-130	CONDUIT	0.718	0	00:03	0.96	1.01	1.00
STM-130-131	CONDUIT	0.715	0	00:05	0.96	1.01	1.00
STM-131-132	CONDUIT	0.719	0	00:03	0.96	1.00	1.00
STM-13-14	CONDUIT	4.971	0	00:01	1.25	0.75	1.00
STM-132-134	CONDUIT	14.918	0	00:00	2.61	1.13	1.00
STM-134-135	CONDUIT	14.824	0	00:00	2.59	1.13	1.00
STM-135-2150	CONDUIT	14.693	0	00:00	2.57	1.12	1.00
STM-14-15	CONDUIT	4.983	0	00:03	1.25	0.75	1.00
STM-15-17	CONDUIT	4.910	0	00:03	1.23	0.74	1.00
STM-17-18	CONDUIT	4.828	0	00:01	1.21	0.73	1.00
STM-18-19	CONDUIT	5.208	0	00:02	1.31	0.79	1.00
STM-19-20	CONDUIT	5.098	0	00:00	1.28	0.77	1.00
STM-20-21	CONDUIT	5.155	0	00:03	1.30	0.78	1.00
STM-2121-2142	CONDUIT	0.246	0	00:00	0.12	0.07	1.00
STM-21-36	CONDUIT	5.086	0	00:02	1.28	0.77	1.00
STM-2150-HW1	CONDUIT	14.604	0	00:00	2.55	1.12	1.00
STM-22-23	CONDUIT	2.005	0	17:01	2.32	0.77	1.00
STM-2-3	CONDUIT	2.956	0	00:00	1.67	0.93	1.00
STM-23-24	CONDUIT	2.153	0	00:04	1.90	0.87	1.00
STM-24-25	CONDUIT	2.258	0	00:04	2.00	0.72	1.00
STM-25-27	CONDUIT	2.974	0	00:04	2.08	0.94	1.00
STM-27-29	CONDUIT	3.054	0	00:05	2.13	0.97	1.00
STM-29-35	CONDUIT	3.221	0	00:04	2.25	0.95	1.00
STM-3-4	CONDUIT	2.905	0	00:00	1.64	0.92	1.00
STM-35-36	CONDUIT	3.378	0	00:04	1.91	0.64	1.00
STM-36-37	CONDUIT	8.007	0	00:02	1.77	1.02	1.00
STM-37-46	CONDUIT	7.951	0	00:03	1.76	1.02	1.00
STM-4-5	CONDUIT	2.872	0	00:00	1.62	0.91	1.00
STM-46-47	CONDUIT	7.862	0	00:00	1.74	1.00	1.00
STM-47-66	CONDUIT	8.447	0	00:00	1.87	1.07	1.00
STM-48-49	CONDUIT	0.112	0	00:04	1.02	0.79	1.00
STM-49-51	CONDUIT	0.331	0	00:04	1.17	0.91	1.00
STM-50-51	CONDUIT	0.229	0	00:04	1.06	0.97	1.00
STM-51-55	CONDUIT	0.613	0	00:00	0.96	1.07	1.00
STM-55-61	CONDUIT	1.087	0	00:00	1.46	0.97	1.00
STM-5-6	CONDUIT	3.091	0	00:06	1.75	0.98	1.00
STM-61-62	CONDUIT	1.135	0	00:00	1.52	1.01	1.00
STM-62-66	CONDUIT	1.175	0	00:00	1.36	0.45	1.00
STM-66-67	CONDUIT	9.581	0	00:00	2.12	1.22	1.00
STM-6-7	CONDUIT	3.992	0	00:00	1.87	0.98	1.00
STM-67-76	CONDUIT	9.465	0	00:00	1.65	0.88	1.00
STM-76-77	CONDUIT	9.631	0	00:00	1.68	0.89	1.00
STM-77-110	CONDUIT	9.564	0	00:00	1.67	0.89	1.00
STM-7-8	CONDUIT	4.467	0	00:00	2.09	1.10	1.00
STM-8-13	CONDUIT	4.365	0	00:00	1.72	0.85	1.00
STM-9-10	CONDUIT	0.052	0	00:00	0.94	0.91	0.73
STM-94-99	CONDUIT	2.788	0	00:00	1.30	0.56	1.00
STM-95-96	CONDUIT	0.770	0	00:00	1.03	0.77	1.00
STM-96-99	CONDUIT	2.788	0	00:00	1.58	0.56	1.00
STM-97-98	CONDUIT	0.393	0	00:00	1.10	0.79	1.00
STM-98-99	CONDUIT	0.426	0	00:00	0.80	0.76	1.00
STM-99-100	CONDUIT	6.058	0	00:00	2.03	0.78	1.00

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
		Fraction of Time in Flow Class								
STM-100-106	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-10-11	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STM-106-108	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-108-109	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-109-110	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-110-111	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-111-113	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-11-13	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
STM-113-114	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-114-115	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-115-116	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-116-117	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-117-118	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-118-132	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-119-120	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-1-2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-120-121	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
STM-121-122	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-12-13	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-122-126	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-123-124	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-124-126	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-125-126	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-126-128	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-128-130	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-130-131	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-131-132	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-13-14	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-132-134	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-134-135	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-135-2150	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-14-15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-15-17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-17-18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-18-19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-19-20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-20-21	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-2121-2142	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-21-36	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-2150-HW1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-22-23	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-2-3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-23-24	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-24-25	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-25-27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-27-29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-29-35	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-3-4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-35-36	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-36-37	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-37-46	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-4-5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-46-47	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-47-66	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-48-49	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-49-51	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-50-51	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-51-55	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-55-61	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-5-6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-61-62	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-62-66	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-66-67	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-6-7	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-67-76	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-76-77	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-77-110	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-7-8	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-8-13	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-9-10	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-94-99	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-95-96	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-96-99	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-97-98	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-98-99	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
STM-99-100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
STM-100-106	24.00	24.00	24.00	0.01	0.01
STM-106-108	24.00	24.00	24.00	0.01	0.01
STM-108-109	24.00	24.00	24.00	0.01	0.01
STM-109-110	24.00	24.00	24.00	0.01	0.01
STM-110-111	24.00	24.00	24.00	24.00	24.00
STM-111-113	24.00	24.00	24.00	24.00	24.00
STM-11-13	0.01	0.01	24.00	0.01	0.01
STM-113-114	24.00	24.00	24.00	24.00	24.00
STM-114-115	24.00	24.00	24.00	24.00	24.00
STM-115-116	24.00	24.00	24.00	24.00	24.00
STM-116-117	24.00	24.00	24.00	24.00	24.00
STM-117-118	24.00	24.00	24.00	24.00	24.00
STM-118-132	24.00	24.00	24.00	24.00	24.00
STM-1-2	24.00	24.00	24.00	0.01	0.01
STM-120-121	0.01	0.01	0.01	24.00	0.01
STM-121-122	0.01	0.01	0.01	24.00	0.01
STM-12-13	24.00	24.00	24.00	0.01	0.01
STM-122-126	0.01	0.01	24.00	0.01	0.01
STM-123-124	24.00	24.00	24.00	24.00	24.00
STM-124-126	24.00	24.00	24.00	24.00	24.00
STM-125-126	24.00	24.00	24.00	0.01	0.01
STM-126-128	24.00	24.00	24.00	24.00	24.00
STM-128-130	24.00	24.00	24.00	24.00	24.00
STM-130-131	24.00	24.00	24.00	24.00	23.98
STM-131-132	24.00	24.00	24.00	0.01	24.00
STM-13-14	24.00	24.00	24.00	0.01	0.01
STM-132-134	24.00	24.00	24.00	24.00	24.00
STM-134-135	24.00	24.00	24.00	24.00	24.00
STM-135-2150	24.00	24.00	24.00	24.00	24.00
STM-14-15	24.00	24.00	24.00	0.01	0.01
STM-15-17	24.00	24.00	24.00	0.01	0.01
STM-17-18	24.00	24.00	24.00	0.01	0.01
STM-18-19	24.00	24.00	24.00	0.01	24.00
STM-19-20	24.00	24.00	24.00	0.01	24.00
STM-20-21	24.00	24.00	24.00	0.01	0.01
STM-2121-2142	24.00	24.00	24.00	0.01	0.01
STM-21-36	24.00	24.00	24.00	0.01	0.01
STM-2150-HW1	24.00	24.00	24.00	24.00	24.00
STM-22-23	24.00	24.00	24.00	0.01	0.01
STM-2-3	24.00	24.00	24.00	0.01	0.01
STM-23-24	24.00	24.00	24.00	0.01	24.00
STM-24-25	24.00	24.00	24.00	0.01	0.01
STM-25-27	24.00	24.00	24.00	0.01	0.01
STM-27-29	24.00	24.00	24.00	0.01	0.01
STM-29-35	24.00	24.00	24.00	0.01	0.01
STM-3-4	24.00	24.00	24.00	0.01	0.01
STM-35-36	24.00	24.00	24.00	0.01	0.01
STM-36-37	24.00	24.00	24.00	24.00	24.00
STM-37-46	24.00	24.00	24.00	24.00	24.00
STM-4-5	24.00	24.00	24.00	0.01	0.01
STM-46-47	24.00	24.00	24.00	24.00	13.20
STM-47-66	24.00	24.00	24.00	24.00	24.00
STM-48-49	24.00	24.00	24.00	0.01	0.01
STM-49-51	24.00	24.00	24.00	0.01	24.00
STM-50-51	24.00	24.00	24.00	0.01	24.00
STM-51-55	24.00	24.00	24.00	24.00	24.00
STM-55-61	24.00	24.00	24.00	0.01	0.01
STM-5-6	24.00	24.00	24.00	0.01	0.01
STM-61-62	24.00	24.00	24.00	24.00	24.00
STM-62-66	24.00	24.00	24.00	0.01	0.01
STM-66-67	24.00	24.00	24.00	24.00	24.00
STM-6-7	24.00	24.00	24.00	0.01	0.01
STM-67-76	24.00	24.00	24.00	0.01	0.01
STM-76-77	24.00	24.00	24.00	0.01	0.01
STM-77-110	24.00	24.00	24.00	0.01	24.00
STM-7-8	24.00	24.00	24.00	24.00	24.00
STM-8-13	24.00	24.00	24.00	0.01	24.00
STM-94-99	24.00	24.00	24.00	0.01	0.01
STM-95-96	24.00	24.00	24.00	0.01	0.01
STM-96-99	24.00	24.00	24.00	0.01	0.01
STM-97-98	24.00	24.00	24.00	0.01	0.01
STM-98-99	24.00	24.00	24.00	0.01	0.01
STM-99-100	24.00	24.00	24.00	0.01	0.01

Analysis begun on: Tue Feb 3 16:22:08 2026
Analysis ended on: Tue Feb 3 16:22:18 2026
Total elapsed time: 00:00:10

PCSWMM Status Report Chicago_3h_100y - Total Area

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
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Updated by: Andrea L
DSEL
Last Updated January 26, 2026

*************
Element Count
*************
Number of rain gages ...... 3
Number of subcatchments ... 16
Number of nodes ........... 3
Number of links ........... 1
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                   Data       Recording
Name                 Data Source                   Type       Interval
-----------------------------------------------------------------------
Chicago_3h_100y      Chicago_3h_100y               INTENSITY   10 min.
Chicago_3h_2y        Chicago_3h                    INTENSITY   10 min.
Chicago_3h_5y        Chicago_3h_5y                 INTENSITY   10 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage
Outlet
-------------------------------------------------------------------------------
--------------------------
S1                          2.34    200.00     71.40    1.5000 Chicago_3h_100y
SU1
S16_Lot4                    6.47    450.00    100.00    1.5000 Chicago_3h_100y
OF1
S2_Block373                 1.38    110.40     71.40    1.5000 Chicago_3h_100y
OF1
S2_Block411                 3.87    238.89     28.60    1.5000 Chicago_3h_100y
OF1
S26_Block414B               5.82    280.00     85.70    1.5000 Chicago_3h_100y
OF1
S3_Block301                 2.04    107.37     71.40    1.5000 Chicago_3h_100y
OF1
S31_Block300                0.40    190.17     28.60    1.5000 Chicago_3h_100y
OF1
S33_Block418                1.20    160.00     28.60    1.5000 Chicago_3h_100y
OF1
S4_Block294                 1.98    146.67     71.40    1.5000 Chicago_3h_100y
OF1
S41.1_Block413              2.31    121.58     85.70    1.5000 Chicago_3h_100y
OF1
S41.2_BlockExternal413        1.62    108.00     85.70    1.5000 Chicago_3h_100y
OF1
S44_Block412A               2.76    181.86     85.70    1.5000 Chicago_3h_100y
OF1
S81_Block410                3.00    210.00     85.70    1.5000 Chicago_3h_100y
OF1
S84_Block414A               4.66    280.00     85.70    1.5000 Chicago_3h_100y
OF1
S89_Block409                3.30    200.00     85.70    1.5000 Chicago_3h_100y
OF1
S9_Block412B                1.18    180.00     85.70    1.5000 Chicago_3h_100y
OF1


************
Node Summary
************
                                          Invert      Max.    Ponded    External
Name                 Type                  Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------------
MH66                 OUTFALL               0.00      0.00       0.0
OF1                  OUTFALL               0.00      0.00       0.0
SU1                  STORAGE               0.00      1.71       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %
Slope Roughness
-------------------------------------------------------------------------------
------------
Out1             SU1              MH66             OUTLET


*********************
Cross Section Summary
*********************
                                     Full     Full     Hyd.     Max.   No. of
Full
Conduit          Shape               Depth     Area     Rad.    Width  Barrels
Flow
-------------------------------------------------------------------------------
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****************
Transect Summary
****************

Transect test
Area:
            0.0001     0.0006     0.0013     0.0022     0.0037
            0.0064     0.0102     0.0153     0.0215     0.0290
            0.0376     0.0474     0.0585     0.0707     0.0841
            0.0988     0.1143     0.1300     0.1457     0.1613
            0.1770     0.1927     0.2083     0.2240     0.2397
            0.2555     0.2727     0.2912     0.3109     0.3317
            0.3538     0.3770     0.4015     0.4271     0.4539
            0.4820     0.5112     0.5416     0.5732     0.6060
            0.6401     0.6753     0.7117     0.7493     0.7881
            0.8281     0.8693     0.9116     0.9552     1.0000
Hrad:
            0.0194     0.0388     0.0582     0.0776     0.0724
            0.0792     0.0933     0.1102     0.1284     0.1472
            0.1666     0.1862     0.2061     0.2261     0.2462
            0.2663     0.2996     0.3401     0.3805     0.4208
            0.4610     0.5011     0.5410     0.5808     0.6206
            0.6598     0.6947     0.7259     0.7537     0.7785
            0.8007     0.8207     0.8386     0.8547     0.8693
            0.8826     0.8948     0.9060     0.9163     0.9260
            0.9350     0.9435     0.9516     0.9592     0.9666
            0.9737     0.9805     0.9872     0.9936     1.0000
Width:
            0.0062     0.0124     0.0185     0.0247     0.0452
            0.0716     0.0980     0.1244     0.1508     0.1772
            0.2036     0.2300     0.2564     0.2828     0.3092
            0.3356     0.3451     0.3452     0.3452     0.3452
            0.3453     0.3453     0.3454     0.3454     0.3454
            0.3673     0.3936     0.4200     0.4464     0.4727
            0.4991     0.5255     0.5518     0.5782     0.6045
            0.6309     0.6573     0.6836     0.7100     0.7364
            0.7627     0.7891     0.8155     0.8418     0.8682
            0.8945     0.9209     0.9473     0.9736     1.0000


****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... SLOT
Starting Date ............ 04/22/2025 00:00:00
Ending Date .............. 04/23/2025 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 16
Number of Threads ........ 1
Head Tolerance ........... 0.000150 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         3.179        71.708
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.463        10.434
Surface Runoff ...........         2.701        60.928
Final Storage ............         0.041         0.925
Continuity Error (%) .....        -0.808


**************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         2.701        27.010
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         2.701        27.010
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.001


***************************
Time-Step Critical Elements
***************************
None


********************************
Highest Flow Instability Indexes
********************************
All links are stable.


**********************************
Most Frequent Nonconverging Nodes
**********************************
Convergence obtained at all time steps.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.05
% of Steps Not Converging   :     0.00
Time Step Frequencies       :
    1.000 -  0.871 sec      :   100.00 %
    0.871 -  0.758 sec      :     0.00 %
    0.758 -  0.660 sec      :     0.00 %
    0.660 -  0.574 sec      :     0.00 %
```

```
      0.574 -  0.500 sec      :     0.00 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  -------------------------------------------------------------------------------
-------------------------------------------
                            Total      Total      Total      Total     Imperv
Perv      Total       Total      Peak  Runoff
                           Precip      Runon       Evap      Infil     Runoff
Runoff     Runoff      Runoff   Runoff   Coeff
  Subcatchment                mm         mm         mm         mm         mm
mm         mm    10^6 ltr      CMS
  -------------------------------------------------------------------------------
-------------------------------------------
  S1                       71.71       0.00       0.00      13.32      50.79
7.35      58.14        1.36      0.94   0.811
  S16_Lot4                 71.71       0.00       0.00       0.00      71.13
0.00      71.13        4.60      3.11   0.992
  S2_Block373              71.71       0.00       0.00      13.38      50.79
7.29      58.08        0.80      0.55   0.810
  S2_Block411              71.71       0.00       0.00      36.94      20.31
14.40      34.71        1.34      0.72   0.484
  S26_Block414B            71.71       0.00       0.00       6.61      60.94
3.73      64.67        3.76      2.51   0.902
  S3_Block301              71.71       0.00       0.00      13.79      50.79
6.83      57.62        1.18      0.77   0.804
  S31_Block300             71.71       0.00       0.00      32.01      20.21
19.97      40.18        0.16      0.14   0.560
  S33_Block418             71.71       0.00       0.00      34.38      20.25
17.09      37.34        0.45      0.28   0.521
  S4_Block294              71.71       0.00       0.00      13.44      50.80
7.21      58.00        1.15      0.78   0.809
  S41.1_Block413           71.71       0.00       0.00       6.58      60.95
3.77      64.72        1.50      1.01   0.903
  S41.2_BlockExternal413      71.71       0.00       0.00       6.50      60.97
3.87      64.84        1.05      0.73   0.904
  S44_Block412A            71.71       0.00       0.00       6.51      60.97
3.86      64.83        1.79      1.24   0.904
  S81_Block410             71.71       0.00       0.00       6.49      60.97
3.89      64.86        1.95      1.35   0.904
  S84_Block414A            71.71       0.00       0.00       6.54      60.96
3.83      64.79        3.02      2.07   0.903
  S89_Block409             71.71       0.00       0.00       6.53      60.96
3.83      64.79        2.14      1.47   0.904
  S9_Block412B             71.71       0.00       0.00       6.32      60.91
4.15      65.06        0.77      0.56   0.907


  ******************
  Node Depth Summary
  ******************

  -------------------------------------------------------------------------------
                                  Average  Maximum  Maximum  Time of Max    Reported
                                    Depth    Depth      HGL   Occurrence   Max Depth
  Node                  Type       Meters   Meters   Meters  days hr:min      Meters
```

```
  -------------------------------------------------------------------------------
  MH66                  OUTFALL      0.00     0.00     0.00     0  00:00        0.00
  OF1                   OUTFALL      0.00     0.00     0.00     0  00:00        0.00
  SU1                   STORAGE      0.04     1.60     1.60     0  01:14        1.60


  *******************
  Node Inflow Summary
  *******************

  -------------------------------------------------------------------------------
----------------
                                   Maximum  Maximum                    Lateral
Total        Flow
                                   Lateral    Total  Time of Max      Inflow
Inflow     Balance
                                    Inflow   Inflow   Occurrence      Volume
Volume        Error
  Node                  Type           CMS      CMS  days hr:min    10^6 ltr    10^6
ltr     Percent
  -------------------------------------------------------------------------------
----------------
  MH66                  OUTFALL      0.000    0.473     0  01:02           0
1.36       0.000
  OF1                   OUTFALL     17.298   17.298     0  01:10        25.6
25.6       0.000
  SU1                   STORAGE      0.941    0.941     0  01:10        1.36
1.36       0.014


  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  *********************
  Node Flooding Summary
  *********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  -------------------------------------------------------------------------------
---------------
                            Average    Avg   Evap  Exfil     Maximum    Max    Time of
Max    Maximum
                             Volume   Pcnt   Pcnt   Pcnt      Volume   Pcnt
Occurrence    Outflow
  Storage Unit           1000 m³   Full   Loss   Loss     1000 m³   Full    days
hr:min         CMS
  -------------------------------------------------------------------------------
---------------
```

```
  SU1                      0.002    0.5    0.0    0.0       0.203   43.7       0
01:14      0.473


  ************************
  Outfall Loading Summary
  ************************

  ---------------------------------------------------------
                        Flow       Avg       Max       Total
                        Freq      Flow      Flow      Volume
  Outfall Node          Pcnt       CMS       CMS    10^6 ltr
  ---------------------------------------------------------
  MH66                 31.95     0.049     0.473       1.360
  OF1                 100.00     0.297    17.298      25.649
  ---------------------------------------------------------
  System               65.98     0.346    17.771      27.009


  ********************
  Link Flow Summary
  ********************

  ---------------------------------------------------------------------------
                                  Maximum  Time of Max   Maximum    Max/    Max/
                                   |Flow|   Occurrence   |Veloc|    Full    Full
  Link                  Type          CMS  days hr:min     m/sec    Flow   Depth
  ---------------------------------------------------------------------------
  Out1                 DUMMY       0.473     0  01:02


  ****************************
  Flow Classification Summary
  ****************************

  -------------------------------------------------------------------------------
----
                      Adjusted    ---------- Fraction of Time in Flow Class -------
---
                       /Actual         Up    Down  Sub   Sup   Up    Down  Norm
Inlet
  Conduit               Length    Dry  Dry   Dry   Crit  Crit  Crit  Crit  Ltd
Ctrl
  -------------------------------------------------------------------------------
----


  **************************
  Conduit Surcharge Summary
  **************************

  No conduits were surcharged.


  Analysis begun on:  Tue Jan 27 17:41:04 2026
  Analysis ended on:  Tue Jan 27 17:41:04 2026
  Total elapsed time: < 1 sec
```

PCSWMM Status Report Chicago_3h_100y
- Total Area excluding 15 m frontage

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
------------------------------------------------------------

Updated by: AL
DSEL
Subc Added: S2, S4, S3

*************
Element Count
*************
Number of rain gages ...... 3
Number of subcatchments ... 16
Number of nodes ........... 3
Number of links ........... 1
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                   Data       Recording
Name                 Data Source                   Type       Interval
-----------------------------------------------------------------------
Chicago_3h_100y      Chicago_3h_100y               INTENSITY   10 min.
Chicago_3h_2y        Chicago_3h                    INTENSITY   10 min.
Chicago_3h_5y        Chicago_3h_5y                 INTENSITY   10 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage
Outlet
-------------------------------------------------------------------------------
--------------------------
S1                          2.34    200.00     71.40    1.5000 Chicago_3h_100y
SU1
S16_Lot4                    6.11    424.96    100.00    1.5000 Chicago_3h_100y
OF1
S2_Block373                 1.05     84.00     71.40    1.5000 Chicago_3h_100y
OF1
S2_Block411                 3.87    238.89     28.60    1.5000 Chicago_3h_100y
OF1
S26_Block414B               5.09    244.88     85.70    1.5000 Chicago_3h_100y
OF1
S3_Block301                 1.47     77.37     71.40    1.5000 Chicago_3h_100y
OF1
S31_Block300                0.40    190.17     28.60    1.5000 Chicago_3h_100y
OF1
S33_Block418                1.20    160.00     28.60    1.5000 Chicago_3h_100y
OF1
S4_Block294                 1.98    146.67     71.40    1.5000 Chicago_3h_100y
OF1
S41.1_Block413              1.89     99.47     85.70    1.5000 Chicago_3h_100y
OF1
S41.2_BlockExternal413        1.62    108.00     85.70    1.5000 Chicago_3h_100y
OF1
S44_Block412A               2.29    150.89     85.70    1.5000 Chicago_3h_100y
OF1
S81_Block410                2.22    155.40     85.70    1.5000 Chicago_3h_100y
OF1
S84_Block414A               4.18    251.16     85.70    1.5000 Chicago_3h_100y
OF1
S89_Block409                2.52    152.73     85.70    1.5000 Chicago_3h_100y
OF1
S9_Block412B                0.91    138.81     85.70    1.5000 Chicago_3h_100y
OF1


************
Node Summary
************
                                          Invert      Max.    Ponded    External
Name                 Type                  Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
MH66                 OUTFALL               0.00      0.00       0.0
OF1                  OUTFALL               0.00      0.00       0.0
SU1                  STORAGE               0.00      1.71       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %
Slope Roughness
-------------------------------------------------------------------------------
------------
Out1             SU1              MH66             OUTLET


*********************
Cross Section Summary
*********************
                                     Full     Full     Hyd.     Max.   No. of
Full
Conduit          Shape               Depth     Area     Rad.    Width  Barrels
Flow
-------------------------------------------------------------------------------
------


****************
Transect Summary
****************

Transect test
Area:
            0.0001     0.0006     0.0013     0.0022     0.0037
            0.0064     0.0102     0.0153     0.0215     0.0290
            0.0376     0.0474     0.0585     0.0707     0.0841
            0.0988     0.1143     0.1300     0.1457     0.1613
            0.1770     0.1927     0.2083     0.2240     0.2397
            0.2555     0.2727     0.2912     0.3109     0.3317
            0.3538     0.3770     0.4015     0.4271     0.4539
            0.4820     0.5112     0.5416     0.5732     0.6060
            0.6401     0.6753     0.7117     0.7493     0.7881
            0.8281     0.8693     0.9116     0.9552     1.0000
Hrad:
            0.0194     0.0388     0.0582     0.0776     0.0724
            0.0792     0.0933     0.1102     0.1284     0.1472
            0.1666     0.1862     0.2061     0.2261     0.2462
            0.2663     0.2996     0.3401     0.3805     0.4208
            0.4610     0.5011     0.5410     0.5808     0.6206
            0.6598     0.6947     0.7259     0.7537     0.7785
            0.8007     0.8207     0.8386     0.8547     0.8693
            0.8826     0.8948     0.9060     0.9163     0.9260
            0.9350     0.9435     0.9516     0.9592     0.9666
            0.9737     0.9805     0.9872     0.9936     1.0000
Width:
            0.0062     0.0124     0.0185     0.0247     0.0452
            0.0716     0.0980     0.1244     0.1508     0.1772
            0.2036     0.2300     0.2564     0.2828     0.3092
            0.3356     0.3451     0.3452     0.3452     0.3452
            0.3453     0.3453     0.3454     0.3454     0.3454
            0.3673     0.3936     0.4200     0.4464     0.4727
            0.4991     0.5255     0.5518     0.5782     0.6045
            0.6309     0.6573     0.6836     0.7100     0.7364
            0.7627     0.7891     0.8155     0.8418     0.8682
            0.8945     0.9209     0.9473     0.9736     1.0000


****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... SLOT
Starting Date ............ 04/22/2025 00:00:00
Ending Date .............. 04/23/2025 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 16
Number of Threads ........ 1
Head Tolerance ........... 0.000150 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         2.807        71.708
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.425        10.848
Surface Runoff ...........         2.369        60.518
Final Storage ............         0.036         0.916
Continuity Error (%) .....        -0.801


**************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         2.369        23.687
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         2.369        23.687
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.001


***************************
Time-Step Critical Elements
***************************
None


********************************
Highest Flow Instability Indexes
********************************
All links are stable.


**********************************
Most Frequent Nonconverging Nodes
**********************************
Convergence obtained at all time steps.


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.05
% of Steps Not Converging   :     0.00
Time Step Frequencies       :
    1.000 -  0.871 sec      :   100.00 %
    0.871 -  0.758 sec      :     0.00 %
    0.758 -  0.660 sec      :     0.00 %
    0.660 -  0.574 sec      :     0.00 %
```

```
      0.574 -  0.500 sec      :     0.00 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  -------------------------------------------------------------------------------
-------------------------------------------
                          Total      Total      Total      Total     Imperv
Perv      Total       Total      Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff
Runoff     Runoff      Runoff   Runoff   Coeff
  Subcatchment             mm         mm         mm         mm         mm
mm         mm    10^6 ltr      CMS
  -------------------------------------------------------------------------------
-------------------------------------------
  S1                     71.71       0.00       0.00      13.32      50.79
7.35      58.14        1.36      0.94   0.811
  S16_Lot4               71.71       0.00       0.00       0.00      71.13
0.00      71.13        4.35      2.94   0.992
  S2_Block373            71.71       0.00       0.00      13.38      50.79
7.29      58.08        0.61      0.42   0.810
  S2_Block411            71.71       0.00       0.00      36.94      20.31
14.40      34.71        1.34      0.72   0.484
  S26_Block414B          71.71       0.00       0.00       6.61      60.94
3.73      64.67        3.29      2.20   0.902
  S3_Block301            71.71       0.00       0.00      13.79      50.79
6.83      57.62        0.85      0.56   0.804
  S31_Block300           71.71       0.00       0.00      32.01      20.21
19.97      40.18        0.16      0.14   0.560
  S33_Block418           71.71       0.00       0.00      34.38      20.25
17.09      37.34        0.45      0.28   0.521
  S4_Block294            71.71       0.00       0.00      13.44      50.80
7.21      58.00        1.15      0.78   0.809
  S41.1_Block413         71.71       0.00       0.00       6.58      60.95
3.77      64.72        1.22      0.83   0.903
  S41.2_BlockExternal413      71.71       0.00       0.00       6.50      60.97
3.87      64.84        1.05      0.73   0.904
  S44_Block412A          71.71       0.00       0.00       6.51      60.97
3.86      64.83        1.48      1.03   0.904
  S81_Block410           71.71       0.00       0.00       6.49      60.97
3.89      64.86        1.44      1.00   0.904
  S84_Block414A          71.71       0.00       0.00       6.54      60.96
3.83      64.79        2.71      1.86   0.903
  S89_Block409           71.71       0.00       0.00       6.53      60.96
3.83      64.79        1.63      1.12   0.904
  S9_Block412B           71.71       0.00       0.00       6.32      60.91
4.15      65.06        0.59      0.43   0.907


  ******************
  Node Depth Summary
  ******************

  -------------------------------------------------------------------------------
                                  Average  Maximum  Maximum  Time of Max    Reported
                                    Depth    Depth      HGL   Occurrence   Max Depth
  Node                  Type       Meters   Meters   Meters  days hr:min      Meters
```

```
  -------------------------------------------------------------------------------
  MH66                  OUTFALL      0.00     0.00     0.00     0  00:00        0.00
  OF1                   OUTFALL      0.00     0.00     0.00     0  00:00        0.00
  SU1                   STORAGE      0.04     1.60     1.60     0  01:14        1.60


  *******************
  Node Inflow Summary
  *******************

  -------------------------------------------------------------------------------
----------------
                                   Maximum  Maximum                    Lateral
Total        Flow
                                   Lateral    Total  Time of Max      Inflow
Inflow     Balance
                                    Inflow   Inflow   Occurrence      Volume
Volume        Error
  Node                  Type           CMS      CMS  days hr:min    10^6 ltr    10^6
ltr     Percent
  -------------------------------------------------------------------------------
----------------
  MH66                  OUTFALL      0.000    0.473     0  01:02           0
1.36       0.000
  OF1                   OUTFALL     15.027   15.027     0  01:10        22.3
22.3       0.000
  SU1                   STORAGE      0.941    0.941     0  01:10        1.36
1.36       0.014


  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  *********************
  Node Flooding Summary
  *********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  -------------------------------------------------------------------------------
---------------
                            Average    Avg   Evap  Exfil     Maximum    Max    Time of
Max    Maximum
                             Volume   Pcnt   Pcnt   Pcnt      Volume   Pcnt
Occurrence    Outflow
  Storage Unit           1000 m³   Full   Loss   Loss     1000 m³   Full    days
hr:min        CMS
  -------------------------------------------------------------------------------
---------------
```

```
  SU1                     0.002    0.5    0.0    0.0       0.203   43.7       0
01:14      0.473


  ************************
  Outfall Loading Summary
  ************************

  ---------------------------------------------------------
                        Flow       Avg       Max       Total
                        Freq      Flow      Flow      Volume
  Outfall Node          Pcnt       CMS       CMS    10^6 ltr
  ---------------------------------------------------------
  MH66                 31.95     0.049     0.473       1.360
  OF1                  97.33     0.266    15.027      22.326
  ---------------------------------------------------------
  System               64.64     0.315    15.500      23.687


  ********************
  Link Flow Summary
  ********************

  -------------------------------------------------------------------------------
                                  Maximum  Time of Max   Maximum    Max/    Max/
                                   |Flow|   Occurrence   |Veloc|    Full    Full
  Link                  Type          CMS  days hr:min     m/sec    Flow   Depth
  -------------------------------------------------------------------------------
  Out1                  DUMMY       0.473     0  01:02

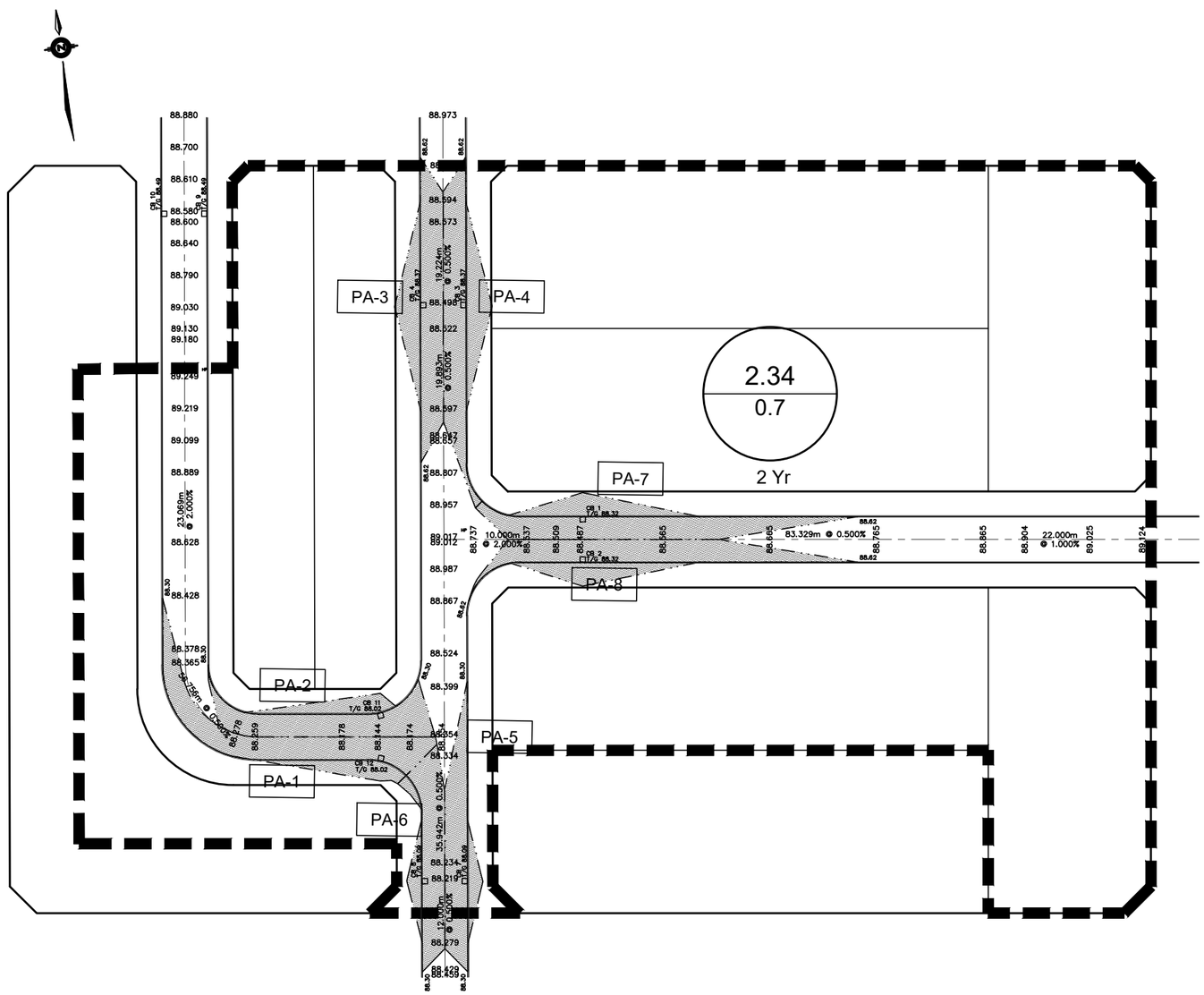

  ****************************
  Flow Classification Summary
  ****************************

  -------------------------------------------------------------------------------
----
                      Adjusted    ---------- Fraction of Time in Flow Class -------
---
                       /Actual         Up    Down  Sub   Sup   Up    Down  Norm
Inlet
  Conduit               Length    Dry  Dry   Dry   Crit  Crit  Crit  Crit  Ltd
Ctrl
  -------------------------------------------------------------------------------
----


  **************************
  Conduit Surcharge Summary
  **************************

  No conduits were surcharged.


  Analysis begun on:  Tue Jan 27 17:49:53 2026
  Analysis ended on:  Tue Jan 27 17:49:54 2026
  Total elapsed time: 00:00:01
```



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) (m^3)
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

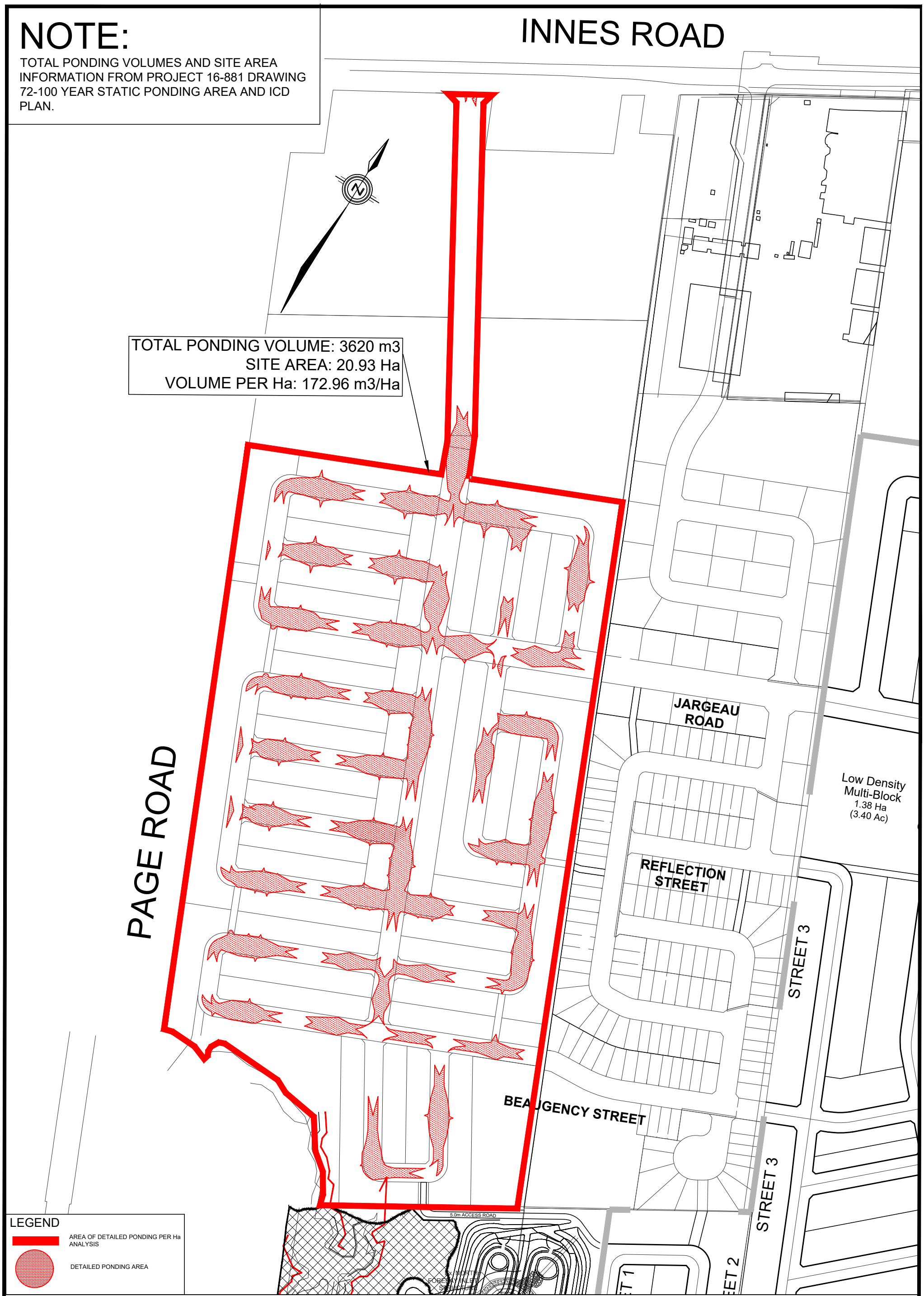
DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

TRAILSEDGE PHASE 5
PONDING VOLUME PER Ha

PROJECT No.:	20-1195
SCALE:	1:1000
DATE:	JANUARY 2026
FIGURE:	4

NOTE:

TOTAL PONDING VOLUMES AND SITE AREA INFORMATION FROM PROJECT 16-881 DRAWING 72-100 YEAR STATIC PONDING AREA AND ICD PLAN.



DSEL

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

EAST URBAN COMMUNITY PHASE 3 AREA
SURFACE STORAGE AREA

PROJECT No.: 20-1195

DATE: JANUARY 2026

SCALE: NTS

FIGURE: 5

Table 3: Summary of Minor and Major System Flows (Ultimate Conditions)

Outlet ID	Outlet	Area (ha)	Imperviousness (%)	Peak Flow (m^3/s)								
				2-Yr SCS	5-Yr SCS	10-Yr SCS	25-Yr SCS	50-Yr SCS	100-Yr SCS	1979	1988	1996
South of Hydro Corridor - Minor Flows												
N/A	*Split Flows Between MH 22 and MH 27 to South Channel*	*15.810*	*67*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
N/A	*Split Flows Between MH 22, MH 27 and MH 57 (Node "N57") to South Channel*	*73.603*	*72*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
1	MH 22 to South Channel (Including Split Flows)	2.177	40	1.461	2.769	3.543	4.167	4.469	4.671	4.508	4.415	3.809
2	MH 27 to South Channel (Including Split Flows)	8.615	51	0.533	0.929	1.204	1.358	1.491	1.628	1.677	1.584	1.256
3	MH 57 (Node "N57") to South Channel (Including Split Flows)	5.730	67	8.771	12.305	13.904	15.382	15.923	16.483	15.758	15.872	14.796
4	MH 111 (Node "EX111") to South Channel	6.544	53	0.518	0.560	0.572	0.578	0.586	0.587	0.585	0.587	0.573
5	MH 407 (Node "N407") to South Channel	14.495	64	0.996	1.475	1.766	2.028	2.373	2.612	2.627	2.470	1.879
6	Brian Coburn Boulevard / Transitway Storm Sewer Outfall to South Main Cell	18.120	86	1.808	2.578	3.100	3.407	3.407	3.407	3.407	3.407	3.407
South of Hydro Corridor - Major Flows												
N/A	*Major Only to South Channel (Minor to Pond 3)*	*1.360*	*51*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
7	Excess Major System Flows from Melodie Street / Tulip Tree Way to South Channel [(1)]	N/A	N/A	0.000	0.000	0.359	0.698	0.901	1.113	0.807	0.887	0.549
8	Excess Major System Flows from Compass Street to South Channel	N/A	N/A	0.000	0.000	0.000	0.009	0.018	0.030	0.007	0.016	0.000
9	Excess Major System Flows from Belcourt Extension to South Channel	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Excess Major System Flows from Shinleaf Crescent to South Channel	N/A	N/A	0.000	0.000	0.012	0.078	0.168	0.273	0.222	0.193	0.011
11	Runoff from South Channel Block East of Compass Street, and Adjacent Rearyards	2.714	72	0.326	0.451	0.537	0.641	0.720	0.804	0.634	0.722	0.600
12	Runoff from Woodlot and South Channel Block West of Compass Street [(1)]	9.519	20	0.383	0.727	1.008	1.371	1.656	1.967	1.634	1.739	1.011
13	Runoff from South Forebay / Main Cell Blocks and Adjacent Existing Residential Lands	4.973	36	0.313	0.492	0.631	0.815	0.956	1.105	0.887	1.000	0.287
North of Hydro Corridor - Minor Flows												
14	MH 2140 to North Forebay C	107.530	74	10.662	14.638	16.021	17.574	18.597	19.245	18.625	17.925	16.763
15	MH 2143 to North Forebay B	21.520	78	2.193	3.055	3.330	3.515	3.542	3.662	3.559	3.435	3.664
16	MH 2144 to North Forebay A	30.377	63	2.597	3.800	4.235	4.644	4.863	5.022	4.862	4.703	4.293
17	Forcemain from Snow Dump to North Main Cell	6.780	99	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022
North of Hydro Corridor - Major Flows												
18	(Node "C13b") Via Headwaters Feature to North Main Cell	4.786	21	0.044	0.078	0.103	0.144	0.192	0.262	0.321	0.268	0.104
19	Ditch on Hydro One Easement to North Main Cell	18.260	14	0.367	0.520	0.639	0.805	0.940	1.090	1.206	1.183	0.013
20	Existing Residential Lands from Nature Trail Crescent Area to North Main Cell [(2)]	6.500	41	0.449	0.661	0.821	1.029	1.190	1.362	1.103	1.218	0.021
21	Excess Major System Flow to North Forebay from Future Park Block	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	Excess Major System Flow to North Forebay from Future Residential Development	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	Excess Major System Flow to North Forebay from Ditch in Hydro One Easement	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24	Runoff from North Forebay / Main Cell Blocks	8.930	47	0.625	0.923	1.129	1.453	1.673	1.908	1.682	5.838	0.015
Total	Total Inflow to Pond 1 (with South Channel and Pond Block Inflows Summed in Model)	368.343	65	27.003	39.351	45.463	51.987	56.076	59.696	59.691	58.124	47.872

[(1)] Including some major only flow contributions (minor flows to Pond 3).

[(2)] Major / minor flow split is unknown.

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	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	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	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (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 0.60 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

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		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
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	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	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

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	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
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)
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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

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: [illegible]
DATE: 05/02/2009
D07-12-08-0001

14252
REVISED

JANUARY 2009

IBI GROUP

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

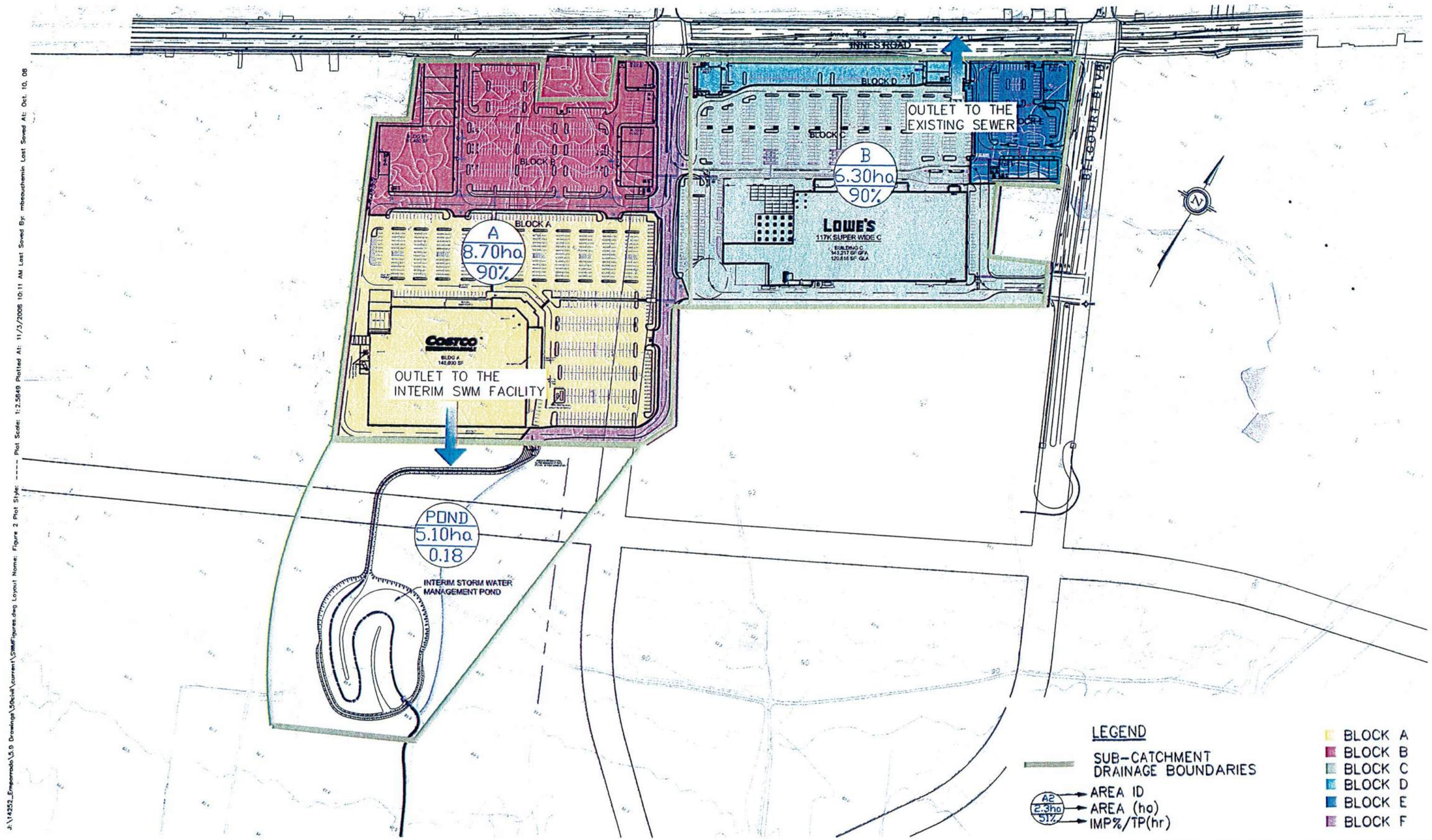
Storm Event	Post-Development Peak Flow (cms)
25 mm 4hr Chicago	0.467
2 Yr 3 hrChicago	0.471
5 Yr 3 hr Chicago	0.476
100 Yr 3hr Chicago	0.493

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**.



J:\14252_Emparrado\3.0 Drawings\3.0civil\current\SWMFigures.dwg Layout Name: Figure 2 Plot Style: ---- Plot Scale: 1:2.5849 Plotted At: 11/3/2008 10:11 AM Last Saved By: mbeauchemin Last Saved At: Oct. 10, 08

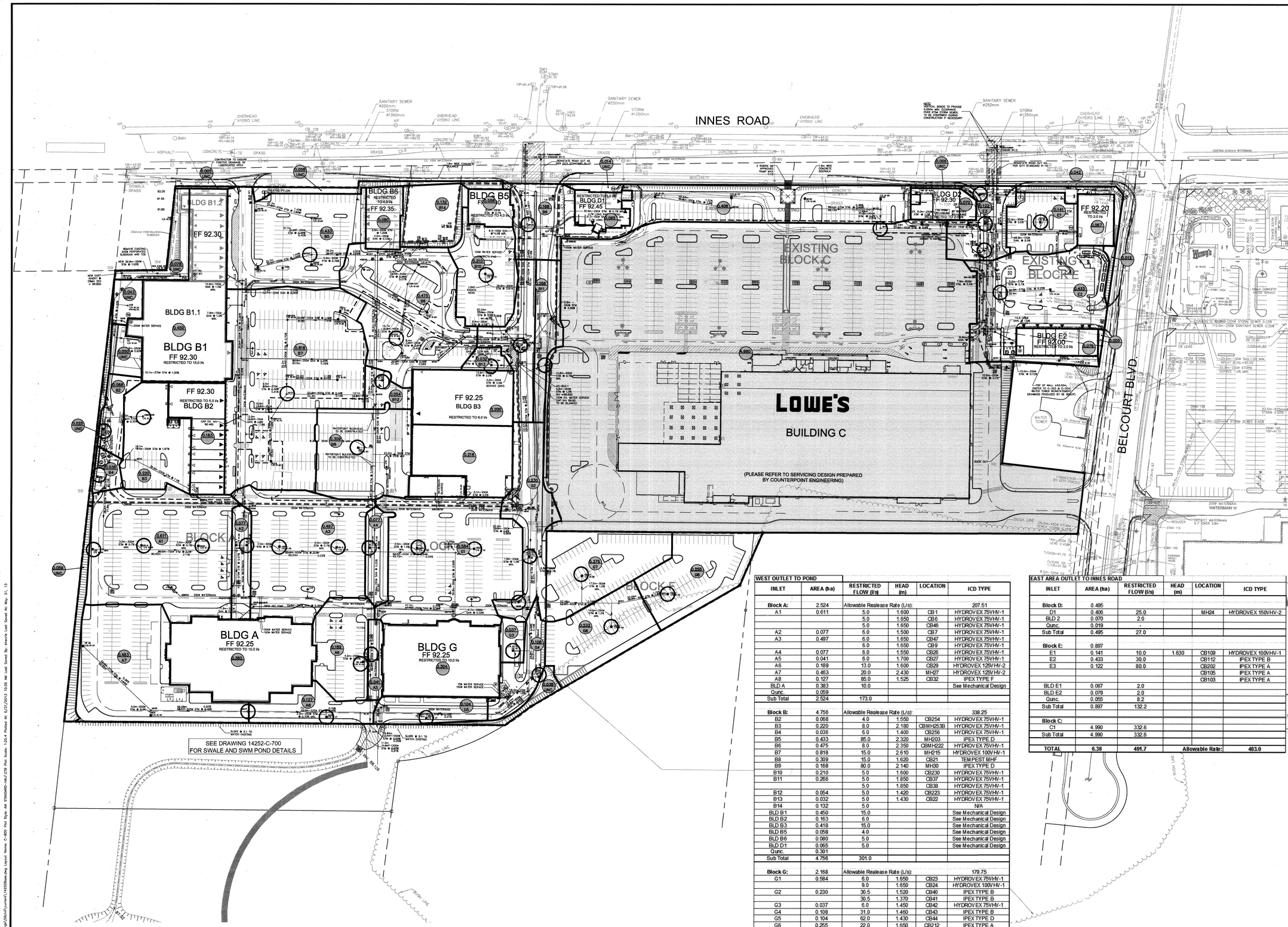
IBI GROUP

Scale: 1:3000

Project Title: EMPARRADO LANDS

Drawing Title: POST - DEVELOPMENT DRAINAGE BOUNDARIES

Sheet No.: FIGURE 2



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
- A.172 / H7 — AREA(ha) BLOCK SUB AREA
- A.172 / UNC — AREA(ha) UNCONTROLLED AREA
- 0.22 — 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

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

Drawing Title

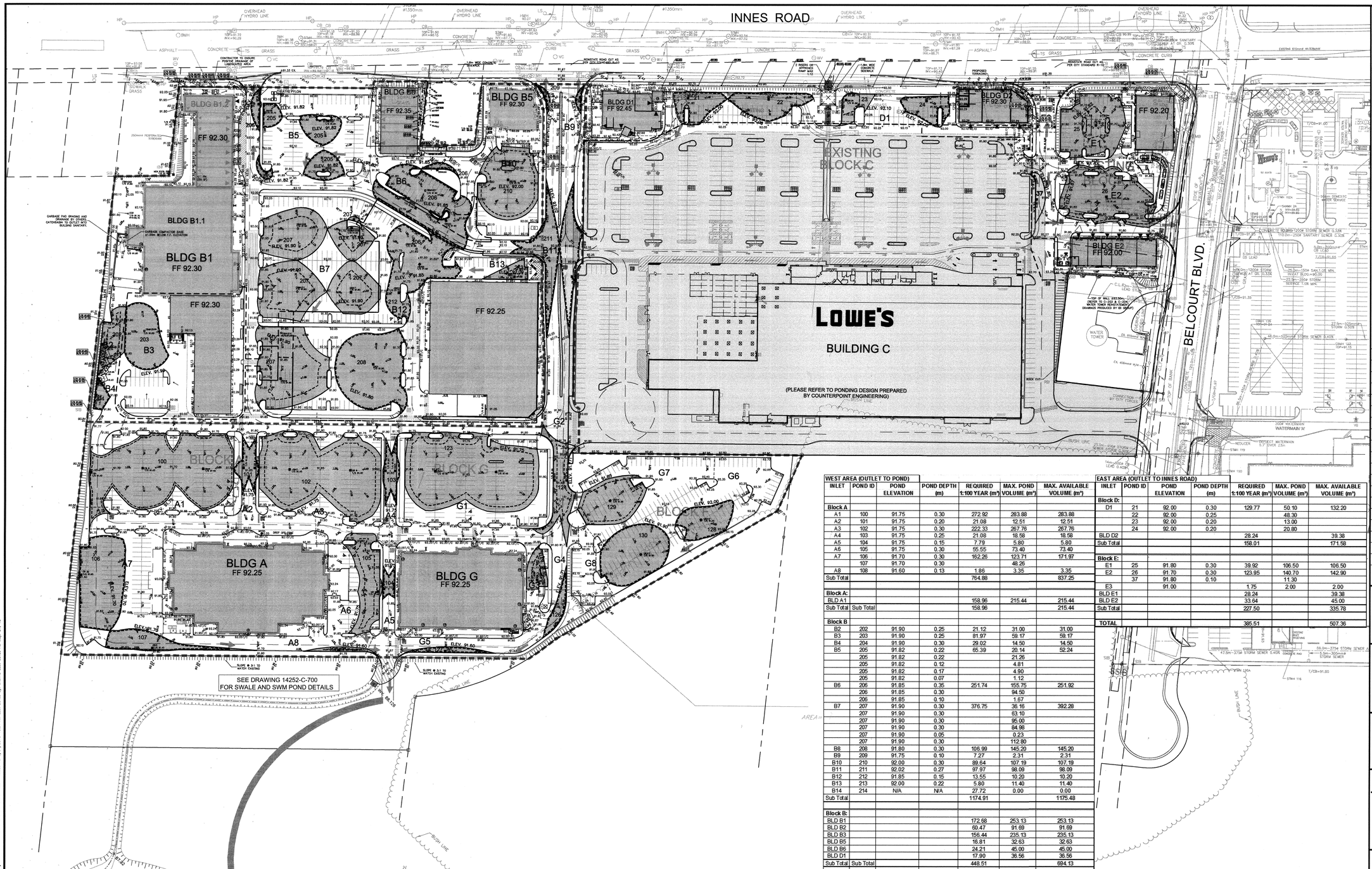
ICD PLAN

Scale 1:1000

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

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 75V/HV-1
		5.0	1.650	CB6	HYDROVEX 75V/HV-1
		5.0	1.650	CB46	HYDROVEX 75V/HV-1
A2	0.077	6.0	1.500	CB7	HYDROVEX 75V/HV-1
A3	0.497	6.0	1.650	CB47	HYDROVEX 75V/HV-1
		6.0	1.650	CB9	HYDROVEX 75V/HV-1
A4	0.077	6.0	1.550	CB26	HYDROVEX 75V/HV-1
A5	0.041	6.0	1.700	CB27	HYDROVEX 75V/HV-1
A6	0.189	13.0	1.600	CB29	HYDROVEX 125V/HV-2
A7	0.463	20.0	2.430	MH27	HYDROVEX 125V/HV-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 75V/HV-1
B3	0.220	8.0	2.180	CBMH253B	HYDROVEX 75V/HV-1
B4	0.036	6.0	1.400	CB256	HYDROVEX 75V/HV-1
B5	0.433	85.0	2.320	MH203	IPEX TYPE D
B6	0.475	8.0	2.350	CBMH222	HYDROVEX 75V/HV-1
B7	0.818	15.0	2.610	MH215	HYDROVEX 100V/HV-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 75V/HV-1
B11	0.266	5.0	1.850	CB37	HYDROVEX 75V/HV-1
		5.0	1.850	CB38	HYDROVEX 75V/HV-1
B12	0.054	5.0	1.420	CB223	HYDROVEX 75V/HV-1
B13	0.032	5.0	1.430	CB22	HYDROVEX 75V/HV-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 75V/HV-1
		9.0	1.650	CB24	HYDROVEX 100V/HV-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 75V/HV-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 75V/HV-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 150V/HV-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 100V/HV-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



WEST AREA (OUTLET TO POND)						
INLET	POND ID	POND ELEVATION	POND DEPTH (m)	REQUIRED 1:100 YEAR (m³)	MAX. POND VOLUME (m³)	MAX. AVAILABLE VOLUME (m³)
Block A						
A1	100	91.75	0.30	272.92	283.88	283.88
A2	101	91.75	0.20	21.08	12.51	12.51
A3	102	91.75	0.30	222.33	267.76	267.76
A4	103	91.75	0.25	21.08	18.58	18.58
A5	104	91.75	0.15	7.79	5.80	5.80
A6	105	91.75	0.30	55.55	73.40	73.40
A7	106	91.70	0.30	162.26	123.71	171.97
	107	91.70	0.30		48.26	
A8	108	91.60	0.13	1.86	3.35	3.35
Sub Total				764.88		837.25
Block A:						
BLD A1				158.96	215.44	215.44
Sub Total	Sub Total			158.96		215.44
Block B						
B2	202	91.90	0.25	21.12	31.00	31.00
B3	203	91.90	0.25	81.97	59.17	59.17
B4	204	91.90	0.30	29.02	14.50	14.50
B5	205	91.82	0.22	65.39	20.14	52.24
	205	91.82	0.22		21.26	
	205	91.82	0.12		4.81	
	205	91.82	0.17		4.90	
	205	91.82	0.07		1.12	
B6	206	91.85	0.35	251.74	155.75	251.92
	206	91.85	0.30		94.50	
	206	91.85	0.10		1.67	
B7	207	91.90	0.30	376.75	36.16	392.28
	207	91.90	0.30		63.10	
	207	91.90	0.30		95.00	
	207	91.90	0.30		84.98	
	207	91.90	0.05		0.23	
	207	91.90	0.30		112.80	
B8	208	91.80	0.30	106.99	145.20	145.20
B9	209	91.75	0.10	7.27	2.31	2.31
B10	210	92.00	0.30	89.64	107.19	107.19
B11	211	92.02	0.27	97.97	98.09	98.09
B12	212	91.85	0.15	13.55	10.20	10.20
B13	213	92.00	0.22	5.80	11.40	11.40
B14	214	N/A	N/A	27.72	0.00	0.00
Sub Total				1174.91		1175.48
Block B:						
BLD B1				172.68	253.13	253.13
BLD B2				60.47	91.69	91.69
BLD B3				156.44	235.13	235.13
BLD B5				16.81	32.63	32.63
BLD B6				24.21	45.00	45.00
BLD D1				17.90	36.56	36.56
Sub Total	Sub Total			448.51		694.13
Block G						
G1	123	91.75	0.30	243.61	280.36	280.36
G2	124	91.77	0.22	25.74	36.69	36.69
G3	125	91.85	0.15	6.53	15.20	15.20
G4	126	91.71	0.16	11.00	8.59	8.59
G5	127	91.60	0.13	4.81	4.96	4.96
G6	128	92.00	0.30	66.38	49.03	49.03
G7	129	91.85	0.30	65.28	78.41	78.41
G8	130	91.90	0.30	114.47	103.56	103.56
Sub Total				537.82		576.79
Block G:						
BLD G1				117.17	171.00	171.00
Sub Total				117.17		171.00
TOTAL				3202.24		3670.09

NOTE: 100yr required and max. pond volumes as shown in modified rational analysis.

EAST AREA (OUTLET TO INNES ROAD)						
INLET	POND ID	POND ELEVATION	POND DEPTH (m)	REQUIRED 1:100 YEAR (m³)	MAX. POND VOLUME (m³)	MAX. AVAILABLE VOLUME (m³)
Block D:						
D1	21	92.00	0.30	129.77	50.10	132.20
	22	92.00	0.25		48.30	
	23	92.00	0.20		13.00	
	24	92.00	0.20		20.80	
BLD D2				28.24		39.38
Sub Total				158.01		171.58
Block E:						
E1	25	91.80	0.30	39.92	106.50	106.50
E2	26	91.70	0.30	123.95	140.70	142.90
	37	91.80	0.10		11.30	
E3		91.00		1.75	2.00	2.00
BLD E1				28.24		39.38
BLD E2				33.64		45.00
Sub Total				227.50		335.78
TOTAL				385.51		507.36

APPROVAL DATE June 28 2013

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

Plan # ~~16200~~ 16433

LEGEND:

- ELEV=114.38 — PONDING AREA C/W MAXIMUM PONDING ELEVATION
- ELEV=114.38 — PONDING AREA C/W 100YR PONDING ELEVATION
- MAJOR STORM ROUTE
- E1 — BLOCK SUB AREA

No.	REVISIONS	By	Date
18	PHASE 2B NEW SITE PLAN	TRB	13:05:31
17	ADDED CITY STAMP	TRB	13:05:29
16	PHASE 2B NEW SITE PLAN	TRB	13:05:22
15	PHASE 2B NEW SITE PLAN	TRB	13:05:02
14	REVISED PHASE 2B	TRB	13:03:27
13	RE-REVISED SITE PLAN BLDG B5 AS PER 11:01:14	TRB	11:05:26
12	REVISED SITE PLAN BLDG B5	TRB	11:01:14
11	REVISED AS PER NEW SITE PLAN	TRB	10:11:01
10	ADDED HYDRANT AT BLDG D1	TRB	10:06:10
9	REVISED AS PER NEW SITE PLAN	TRB	10:05:20
8	ISSUED FOR PH. 2B SPA	TRB	10:03:15
7	REVISED AS PER NEW SITE PLAN	TRB	09:05:12
6	REVISED PHASE 2	TRB	09:02:12
5	RE-ISSUED FOR PRICING	TRB	08:12:18
4	REVISED AS PER CITY COMMENTS	TRB	08:10:10
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

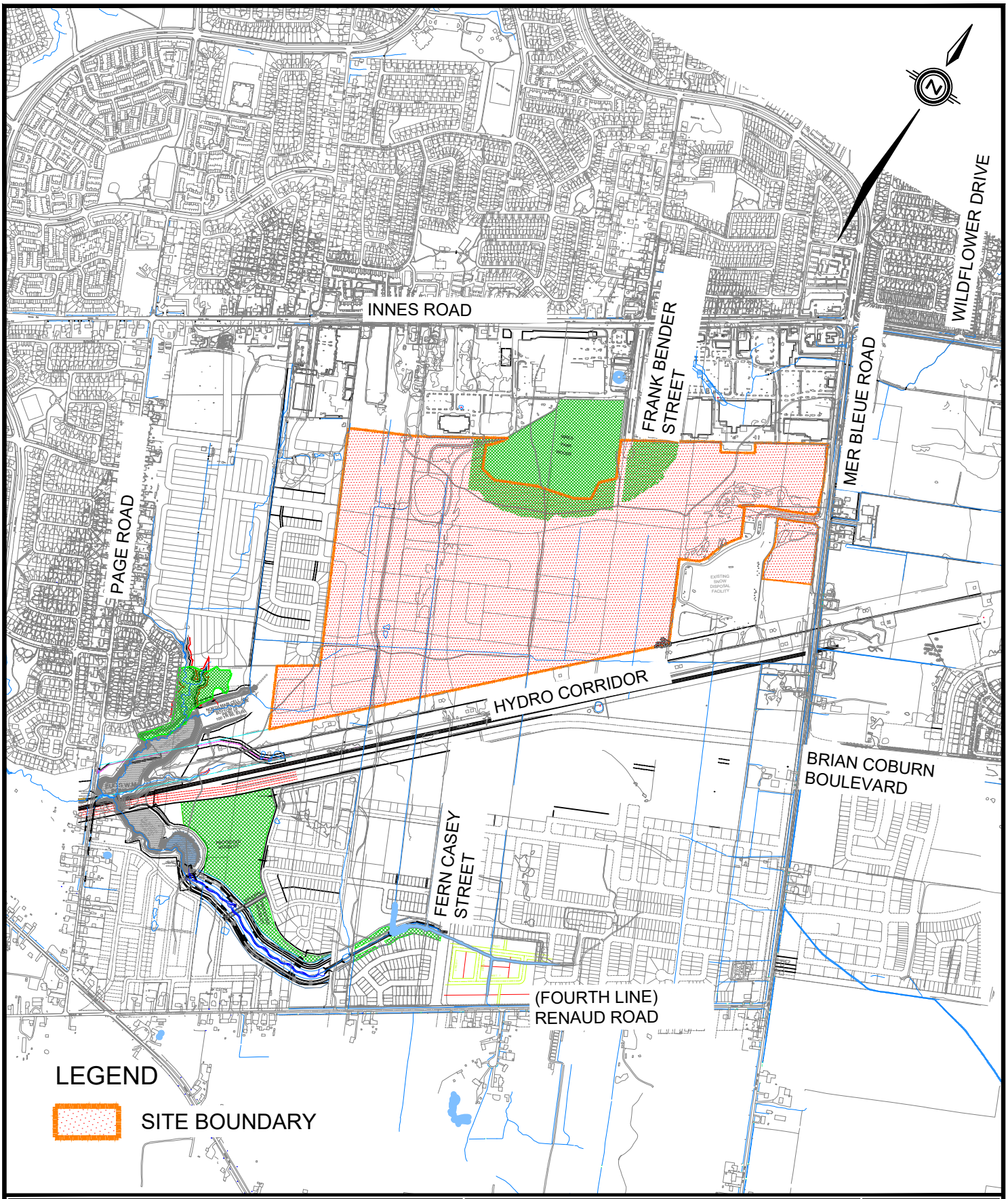
Project Title
INNES RD. AND BELCOURT BLVD.
COMMERCIAL DEVELOPMENT

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

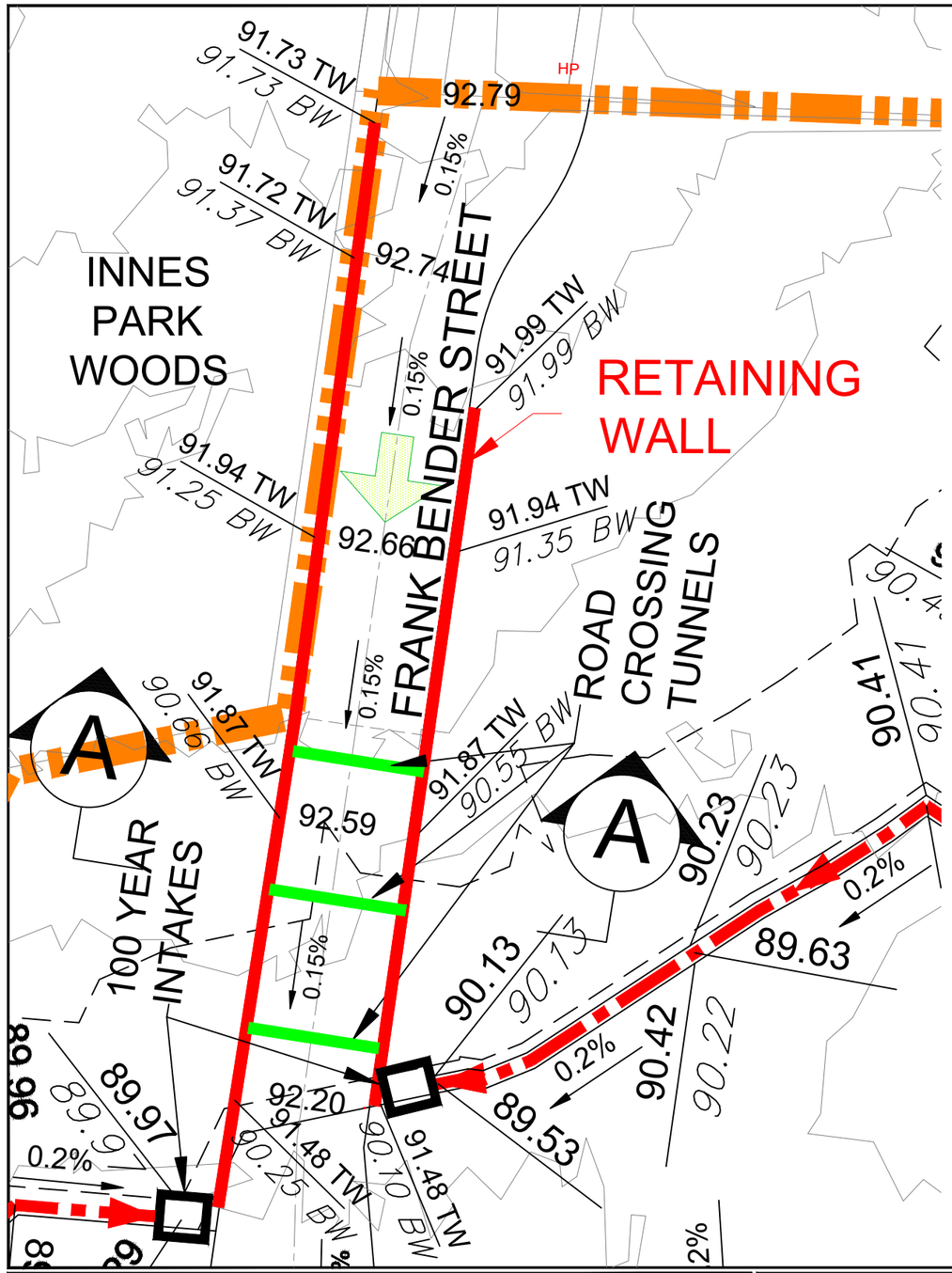
N

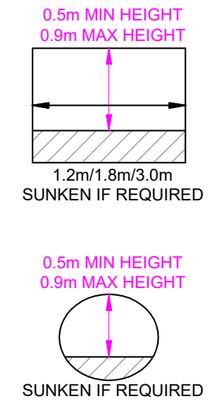
Drawing Title
PONDING PLAN

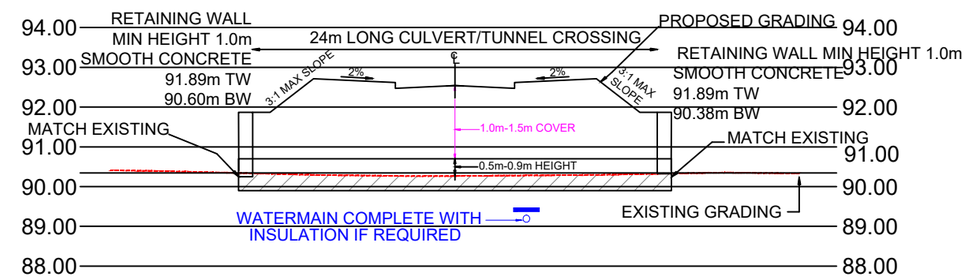
Scale 1:1000	
Design T.R.B.	Date DECEMBER '07
Drawn L.R.	Checked T.R.B.
Project No. 14252	Drawing No. C-400



TRAILSEDGE PHASE 5	SITE LOCATION	DATE: JANUARY 2026
		SCALE: 1:15,000
DSEL	120 Iber Road, Unit 203 Stittsville, ON K2S 1E9 TEL: (613) 836-0856 FAX: (613) 836-7183 www.DSEL.ca	PROJECT No.: 20-1195
		FIGURE: 1







Section A-A Snake Crossing

SCALE HOR. 1:350
VER. 1:150

LEGEND

	ROAD CROSSING/TUNNEL
	SITE BOUNDARY
92.03	PROPOSED ELEVATION
90.06 / 90.06	PROPOSED ELEVATION EXISTING ELEVATION
168.00	EXISTING CONTOUR ELEVATION
	STORM OVERLAND FLOW ARROW

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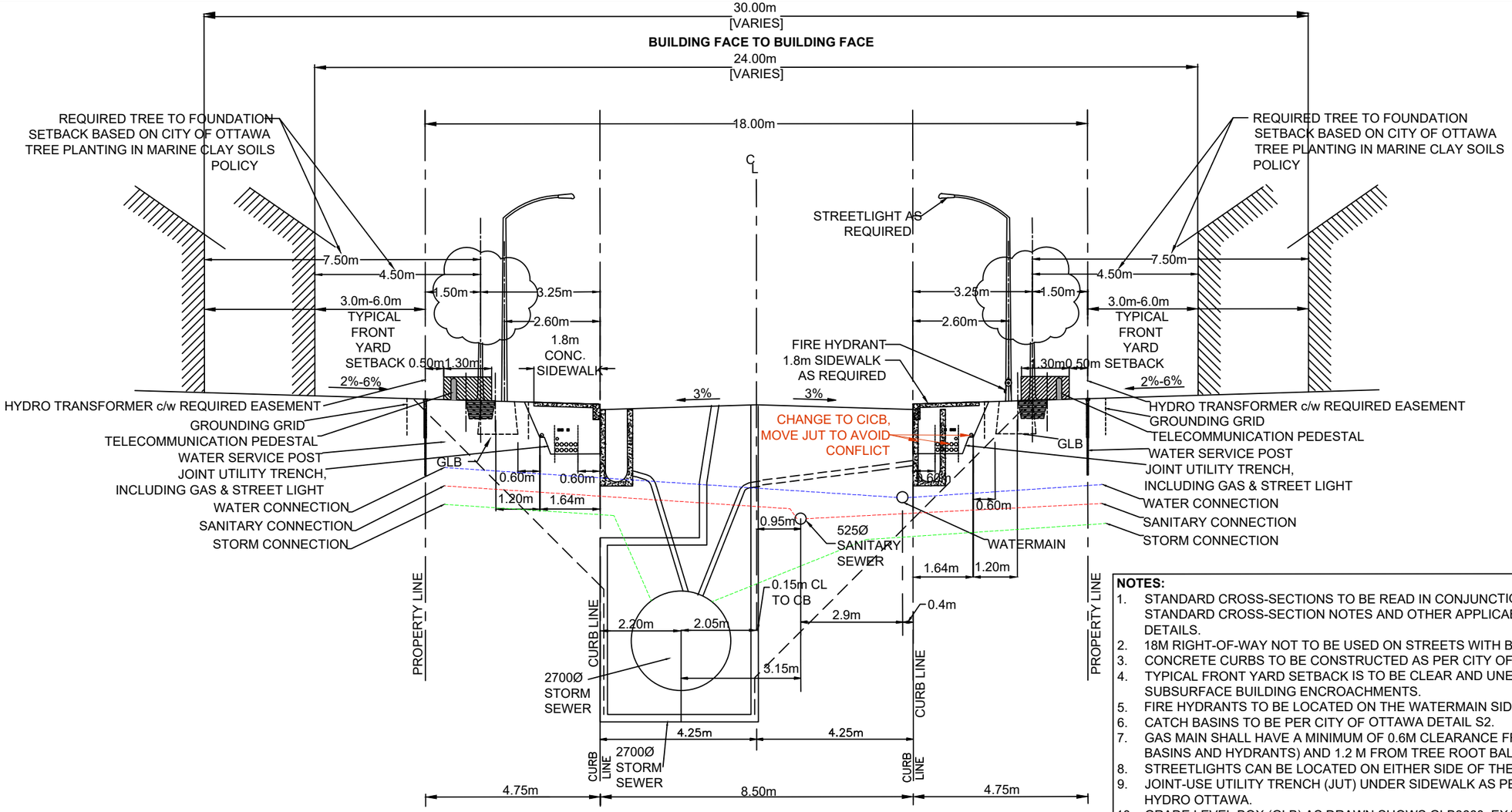
TRAILSEDGE PHASE 5

TYPICAL SNAKE CROSSING

DATE:	JANUARY 2026
SCALE:	1:1000
PROJECT No.:	20-1195
FIGURE	2



NOTES:

1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS.
2. 18M RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH BUS SERVICE.
3. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
4. TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
5. FIRE HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
6. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
7. GAS MAIN SHALL HAVE A MINIMUM OF 0.6M CLEARANCE FROM STRUCTURES E.G. CATCH BASINS AND HYDRANTS) AND 1.2 M FROM TREE ROOT BALL.
8. STREETLIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UDS0049. HELD BY HYDRO OTTAWA.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660. EXACT LOCATION TO BE CONFIRMED.
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED.
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GCS0038.
13. CLEARANCES SHOWN ARE MINIMUMS.

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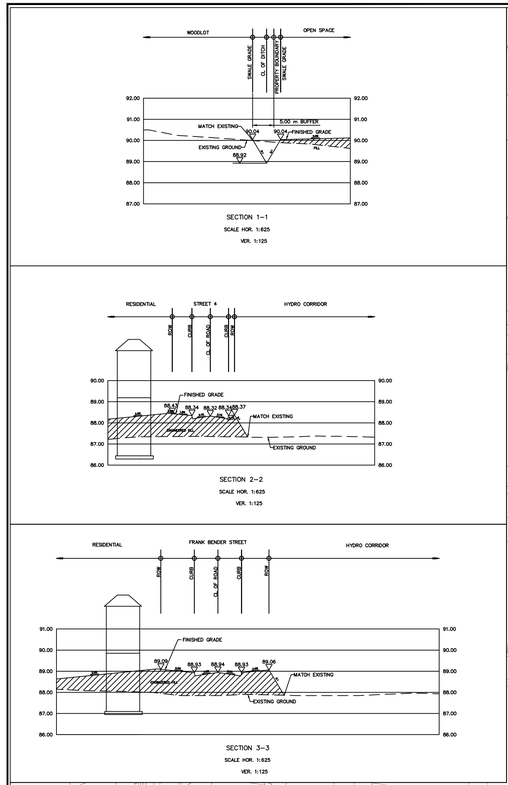
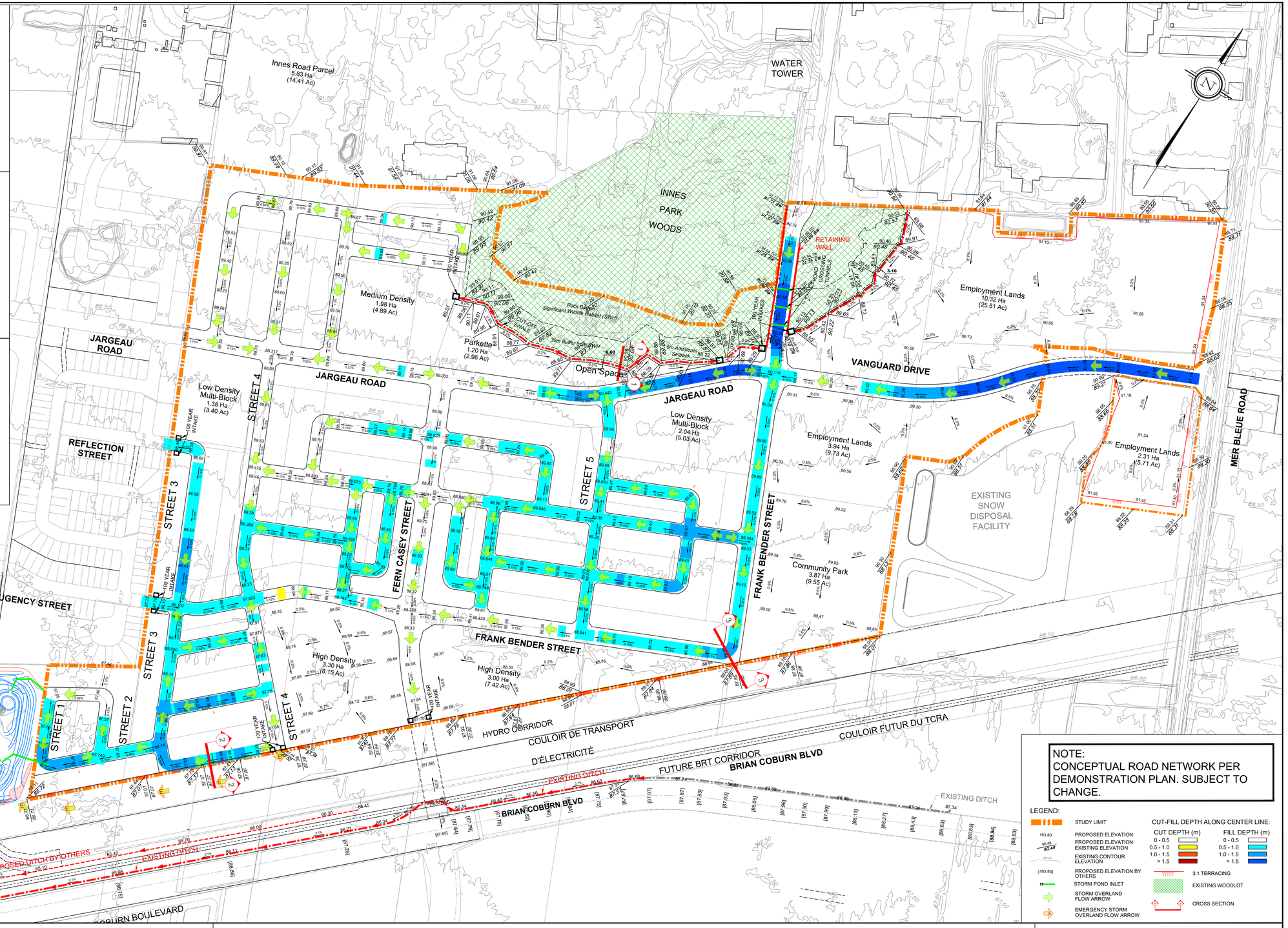
TRAILSEDGE PHASE 5
18.0m ROW SECTION

DATE:	JANUARY 2026
SCALE:	N.T.S.
PROJECT No.:	20-1195
FIGURE	3





NOTE:
CONCEPTUAL ROAD NETWORK PER DEMONSTRATION PLAN. SUBJECT TO CHANGE.

LEGEND:

- STUDY LIMIT
- 163.83 PROPOSED ELEVATION
- 90.48 PROPOSED ELEVATION / EXISTING ELEVATION
- 166.00 EXISTING CONTOUR ELEVATION
- [163.83] PROPOSED ELEVATION BY OTHERS
- STORM POND INLET
- STORM OVERLAND FLOW ARROW
- EMERGENCY STORM OVERLAND FLOW ARROW
- 3:1 TERRACING
- EXISTING WOODLOT
- CROSS SECTION

CUT-FILL DEPTH ALONG CENTER LINE:

CUT DEPTH (m)	FILL DEPTH (m)
0 - 0.5	0 - 0.5
0.5 - 1.0	0.5 - 1.0
1.0 - 1.5	1.0 - 1.5
> 1.5	> 1.5

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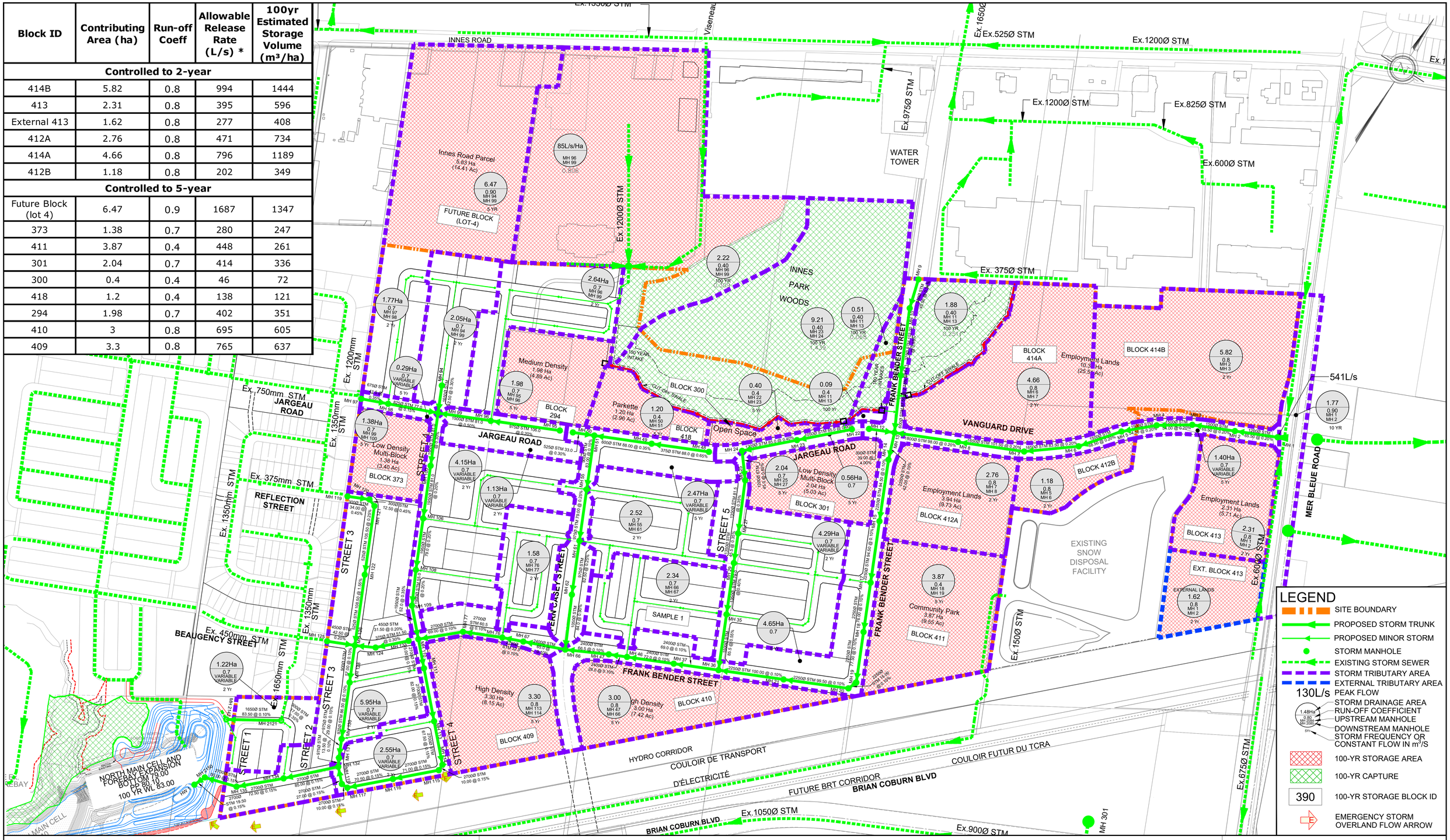
TRAILSEDGE PHASE 5
GRADING PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JANUARY 2026
DRAWING No.	1

Block ID	Contributing Area (ha)	Run-off Coeff	Allowable Release Rate (L/s) *	100yr Estimated Storage Volume (m³/ha)
Controlled to 2-year				
414B	5.82	0.8	994	1444
413	2.31	0.8	395	596
External 413	1.62	0.8	277	408
412A	2.76	0.8	471	734
414A	4.66	0.8	796	1189
412B	1.18	0.8	202	349
Controlled to 5-year				
Future Block (lot 4)	6.47	0.9	1687	1347
373	1.38	0.7	280	247
411	3.87	0.4	448	261
301	2.04	0.7	414	336
300	0.4	0.4	46	72
418	1.2	0.4	138	121
294	1.98	0.7	402	351
410	3	0.8	695	605
409	3.3	0.8	765	637



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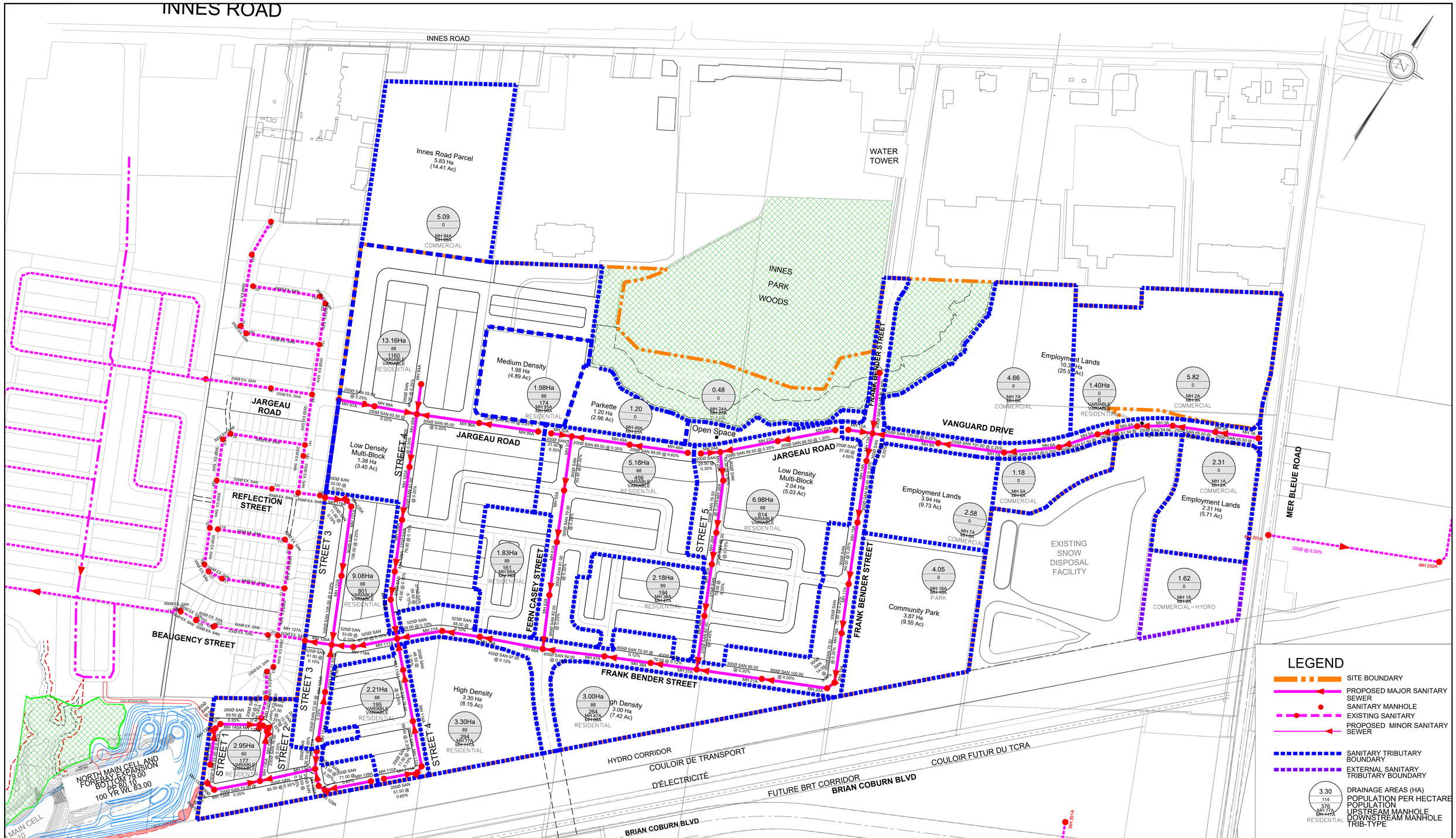
TRAILSEDGE PHASE 5
STORM SERVICING PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JANUARY 2026
DRAWING No.	2



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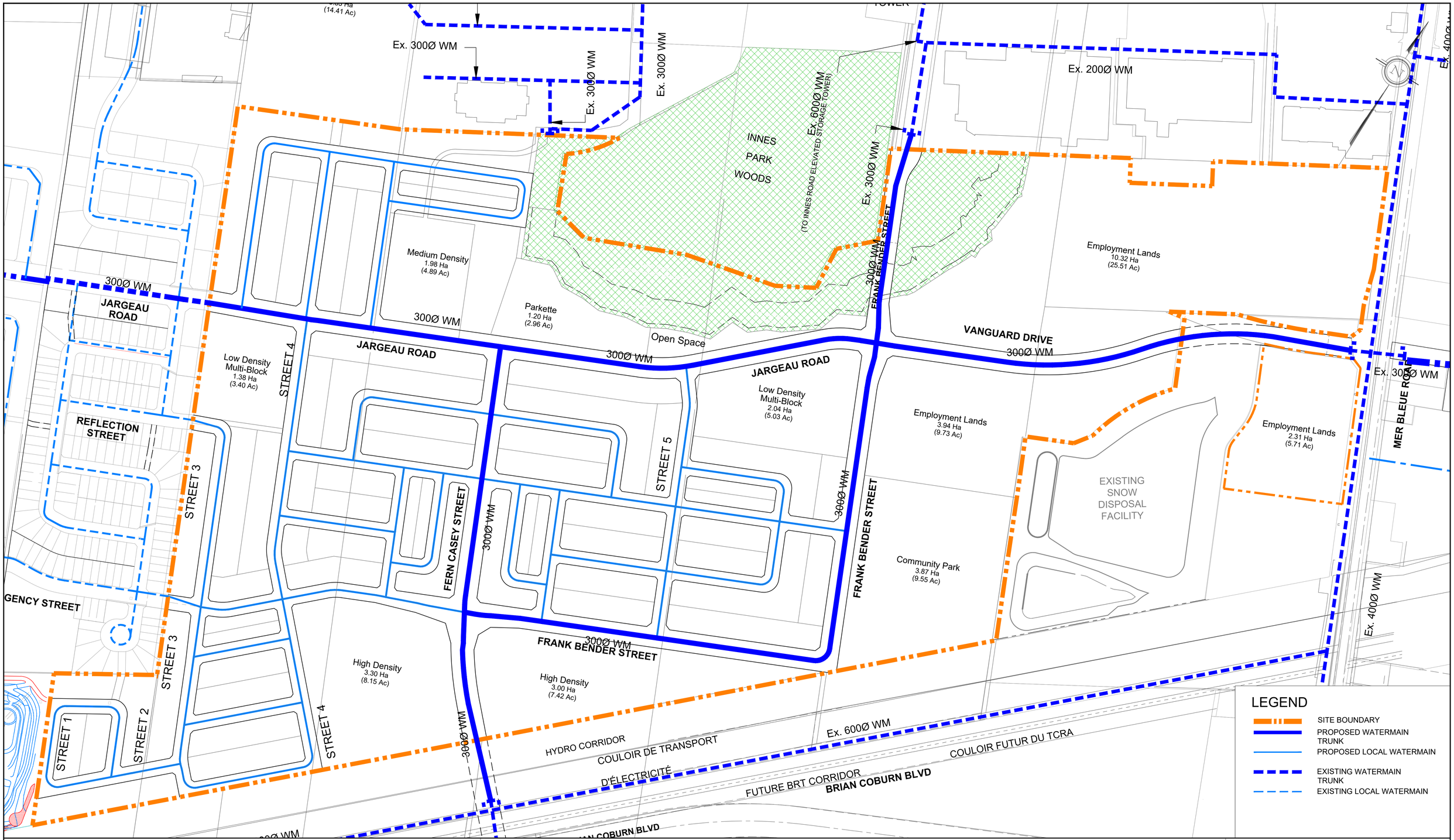
TRAILSEDGE PHASE 5
SANITARY SERVICING PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JANUARY 2026
DRAWING No.	3



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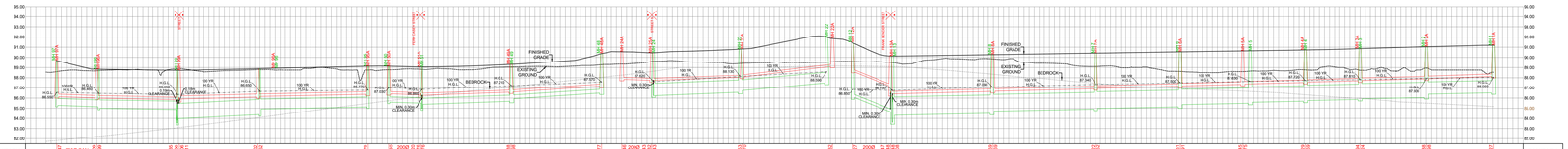
TRAILSEDGE PHASE 5
WATERMAIN SERVICING PLAN

PROJECT No. :	20-1195
SCALE	1:2000
DATE:	JANUARY 2026
DRAWING No.	4

JARGEAU ROAD

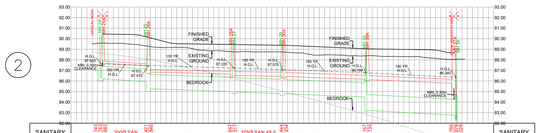
1



SANITARY INVERT	250Ø SAN 39.5 @ 0.25%; 250Ø SAN 81.0 @ 0.25%; 300Ø SAN 77.5 @ 0.20%; 250Ø SAN 106.0 @ 0.25%; 200Ø SAN 89.0 @ 0.35%; 200Ø SAN 89.0 @ 0.65%; 200Ø SAN 31.5 @ 0.35%; 200Ø SAN 29.5 @ 0.35%; 200Ø SAN 86.5 @ 0.35%; 200Ø SAN 88.5 @ 1.20%; 200Ø SAN 37.0 @ 4.00%; 300Ø SAN 30.0 @ 4.00%; 250Ø SAN 100.5 @ 0.25%; 250Ø SAN 101.0 @ 0.25%; 250Ø SAN 83.5 @ 0.25%; 250Ø SAN 61.5 @ 0.25%; 200Ø SAN 61.5 @ 0.25%; 250Ø SAN 54.0 @ 0.25%; 250Ø SAN 65.5 @ 0.25%; 250Ø SAN 65.5 @ 0.35%	SANITARY INVERT
STORM INVERT	675Ø STM 41.5 @ 0.35%; 825Ø STM 77.0 @ 0.15%; 1500Ø STM 81.0 @ 0.50%; 975Ø STM 106.0 @ 0.20%; 600Ø STM 88.0 @ 0.35%; 375Ø STM 88.0 @ 0.65%; 1200Ø STM 85.0 @ 0.40%; 1050Ø STM 85.0 @ 0.90%; 1800Ø STM 98.0 @ 0.20%; 1650Ø STM 101.5 @ 0.20%; 1650Ø STM 83.5 @ 0.20%; 1500Ø STM 68.5 @ 0.20%; 1500Ø STM 54.5 @ 0.20%; 1500Ø STM 54.0 @ 0.20%; 1500Ø STM 65.5 @ 0.20%; 1200Ø STM 65.5 @ 0.20%	STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

STREET 5

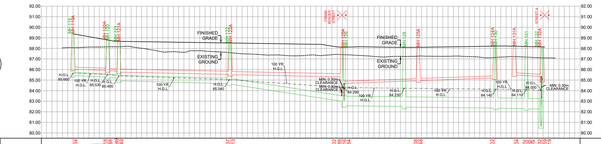
2



SANITARY INVERT	200Ø SAN 43.5 @ 0.60%; 250Ø SAN 79.5 @ 0.20%; 375Ø SAN 48.5 @ 0.15%; 375Ø SAN 79.0 @ 0.35%; 375Ø SAN 82.0 @ 0.45%	SANITARY INVERT
STORM INVERT	1200Ø STM 45.0 @ 0.45%; 1350Ø STM 81.5 @ 0.35%; 1350Ø STM 43.5 @ 0.35%; 1350Ø STM 79.0 @ 0.40%; 1500Ø STM 85.5 @ 0.55%	STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

STREET 3

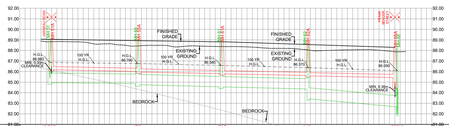
3



SANITARY INVERT	200Ø SAN 33.5 @ 0.35%; 200Ø SAN 106.0 @ 0.20%; 200Ø SAN 11.0 @ 0.35%; 300Ø SAN 105.5 @ 0.20%; 200Ø SAN 72.5 @ 0.35%; 200Ø SAN 28.5 @ 0.65%; 200Ø SAN 31.5 @ 0.65%	SANITARY INVERT
STORM INVERT	1350Ø STM 34.0 @ 0.45%; 525Ø STM 105.5 @ 0.25%; 525Ø STM 108.5 @ 1.55%; 900Ø STM 57.0 @ 0.10%; 975Ø STM 86.5 @ 0.10%; 975Ø STM 33.5 @ 0.10%; 2000Ø STM 13.5 @ 0.45%	STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

FERN CASEY STREET

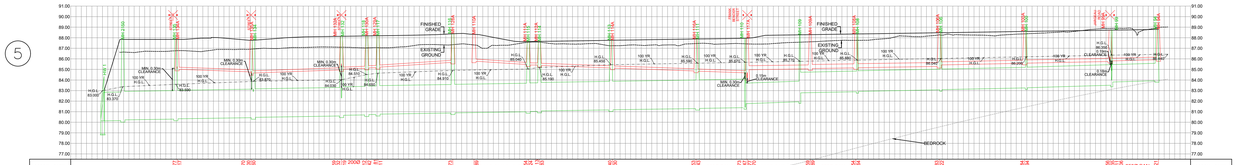
4



SANITARY INVERT	300Ø SAN 83.0 @ 0.20%; 300Ø SAN 79.0 @ 0.20%; 300Ø SAN 81.0 @ 0.20%; 300Ø SAN 82.0 @ 0.20%	SANITARY INVERT
STORM INVERT	900Ø STM 83.0 @ 0.10%; 975Ø STM 79.0 @ 0.25%; 975Ø STM 82.5 @ 0.25%; 1050Ø STM 84.0 @ 0.90%	STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

STREET 4

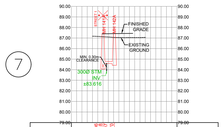
5



SANITARY INVERT	200Ø SAN 70.5 @ 0.35%; 200Ø SAN 85.5 @ 0.35%; 200Ø SAN 71.0 @ 0.60%; 200Ø SAN 51.5 @ 0.60%; 200Ø SAN 69.5 @ 0.35%; 200Ø SAN 79.0 @ 0.35%; 200Ø SAN 48.5 @ 0.35%; 375Ø SAN 59.5 @ 0.15%; 375Ø SAN 43.0 @ 0.15%; 375Ø SAN 79.0 @ 0.15%; 300Ø SAN 81.0 @ 0.20%; 300Ø SAN 81.0 @ 0.20%; 200Ø SAN 46.0 @ 0.20%	SANITARY INVERT
STORM INVERT	2700Ø STM 73.5 @ 0.15%; 2700Ø STM 50.5 @ 0.15%; 2700Ø STM 72.5 @ 0.15%; 2700Ø STM 85.0 @ 0.15%; 2700Ø STM 27.0 @ 0.15%; 2700Ø STM 70.5 @ 0.15%; 2700Ø STM 70.0 @ 0.15%; 2700Ø STM 71.0 @ 0.15%; 2700Ø STM 10.5 @ 0.15%; 2700Ø STM 67.5 @ 0.15%; 2700Ø STM 62.5 @ 0.15%; 2700Ø STM 43.0 @ 0.15%; 1950Ø STM 52.0 @ 0.35%; 1950Ø STM 55.0 @ 0.20%; 1950Ø STM 79.0 @ 0.20%; 1950Ø STM 81.0 @ 0.20%; 1950Ø STM 81.0 @ 0.20%; 1950Ø STM 81.0 @ 0.30%; 1650Ø STM 42.5 @ 0.30%	STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

STREET 2

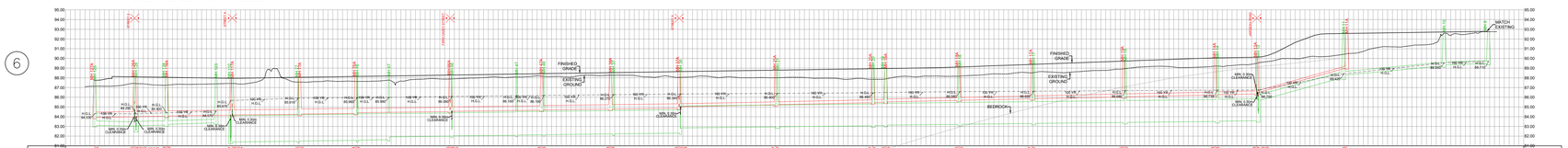
7



SANITARY INVERT	200Ø SAN 10.5 @ 0.35%	SANITARY INVERT
STORM INVERT		STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

FRANK BENDER STREET

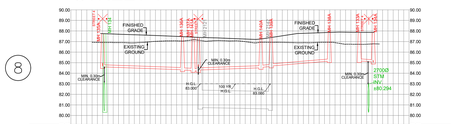
6



SANITARY INVERT	525Ø SAN 41.0 @ 0.10%; 525Ø SAN 67.5 @ 0.10%; 525Ø SAN 69.0 @ 0.10%; 525Ø SAN 58.0 @ 0.10%; 450Ø SAN 97.0 @ 0.12%; 450Ø SAN 94.0 @ 0.12%; 450Ø SAN 70.5 @ 0.12%; 450Ø SAN 70.5 @ 0.12%; 300Ø SAN 99.5 @ 0.20%; 300Ø SAN 100.0 @ 0.20%; 300Ø SAN 14.0 @ 0.20%; 300Ø SAN 75.5 @ 0.20%; 300Ø SAN 75.5 @ 0.20%; 300Ø SAN 94.0 @ 0.20%; 300Ø SAN 94.0 @ 0.20%; 300Ø SAN 42.5 @ 0.20%; 2000Ø SAN 92.5 @ 2.80%	SANITARY INVERT
STORM INVERT	450Ø STM 42.5 @ 0.20%; 375Ø STM 51.5 @ 0.30%; 2700Ø STM 69.0 @ 0.10%; 2700Ø STM 60.5 @ 0.10%; 2700Ø STM 22.5 @ 0.10%; 2400Ø STM 65.0 @ 0.10%; 2400Ø STM 66.5 @ 0.10%; 2400Ø STM 72.0 @ 0.10%; 2400Ø STM 69.0 @ 0.10%; 2400Ø STM 69.0 @ 0.10%; 225Ø STM 100.0 @ 0.10%; 225Ø STM 99.5 @ 0.10%; 225Ø STM 10.0 @ 0.10%; 225Ø STM 77.5 @ 0.10%; 225Ø STM 76.0 @ 0.10%; 225Ø STM 94.5 @ 0.10%; 225Ø STM 94.5 @ 0.10%; 225Ø STM 42.0 @ 0.10%; 6000Ø STM 87.5 @ 2.75%; 375Ø STM 103.0 @ 0.95%; 300Ø STM 45.5 @ 0.35%	STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

STREET 1

8



SANITARY INVERT	200Ø SAN 76.0 @ 0.35%; 200Ø SAN 59.5 @ 0.35%; 200Ø SAN 55.0 @ 0.85%; 200Ø SAN 14.0 @ 0.65%	SANITARY INVERT
STORM INVERT	1650Ø STM 83.5 @ 0.10%; 200Ø SAN 10.5 @ 0.30%; 200Ø SAN 5.5 @ 0.35%; 200Ø SAN 10.0 @ 1.10%	STORM INVERT
PROPOSED GRADES		PROPOSED GRADES
CENTERLINE CHAINAGE		CENTERLINE CHAINAGE

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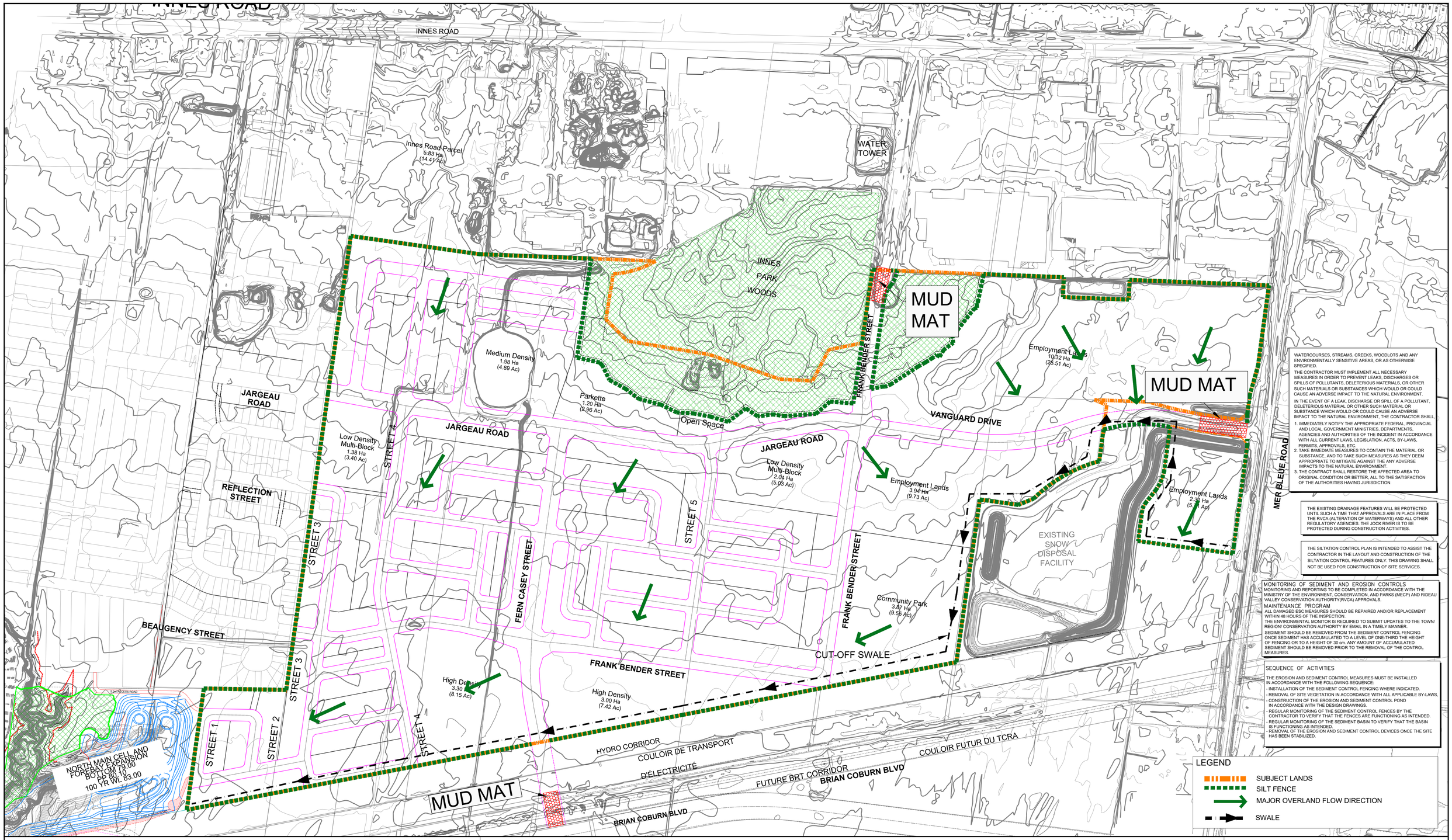
TRAILSEDGE
PHASE 5

CITY OF OTTAWA

PROFILES

SCALE:	H 1:2000 V 1:200	PROJECT No.:	20-1195
DATE:	JANUARY 2026	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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TRAILSEDGE PHASE 5
EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. :	20-1195
SCALE	1:2500
DATE:	JANUARY 2026
DRAWING No.	6