



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

FUNCTIONAL SERVICING REPORT

FOR

RICHCRAFT HOMES TRAILS EDGE NORTH

CITY OF OTTAWA

PROJECT NO.: 20-1195

**JUNE 2026
© DSEL**

FUNCTIONAL SERVICING REPORT

FOR

RICHCRAFT HOMES TRAILS EDGE NORTH

TABLE OF CONTENTS

| | | |
|------------|---------------------------------------------------------|-----------|
| 1.0 | INTRODUCTION..... | 5 |
| 1.1 | Existing Conditions..... | 7 |
| 1.2 | Development Concept..... | 9 |
| 1.3 | Required Permits / Approvals..... | 10 |
| 2.0 | GUIDELINES, PREVIOUS STUDIES, AND REPORTS..... | 12 |
| 2.1 | Existing Studies, Guidelines, and Reports | 12 |
| 3.0 | WATER SUPPLY SERVICING | 13 |
| 3.1 | Existing Water Supply Services | 13 |
| 3.2 | Water Supply Servicing Design..... | 13 |
| 3.3 | Water Supply Conclusion..... | 17 |
| 4.0 | WASTEWATER SERVICING | 18 |
| 4.1 | Existing Wastewater Services..... | 18 |
| 4.2 | Wastewater Design | 18 |
| 4.3 | Wastewater Servicing Conclusions | 21 |
| 5.0 | STORMWATER MANAGEMENT | 22 |
| 5.1 | Existing Stormwater Drainage..... | 22 |
| | 5.1.1 Existing Temporary SWM Pond | 22 |
| 5.2 | Stormwater Design..... | 23 |
| | 5.2.1 Minor System Conveyance..... | 24 |
| | 5.2.2 Major System Conveyance..... | 26 |
| | 5.2.3 Existing Temporary SWM Pond Decommissioning | 27 |
| | 5.2.4 Proposed Quality & Quantity Control | 28 |

| | | |
|-------------|---------------------------------------------|-----------|
| 5.2.5 | Supporting Stormwater Modelling | 28 |
| 5.2.6 | Hydraulic Grade line (HGL) | 28 |
| 5.2.7 | Required Storage Assessment | 29 |
| 5.3 | Infiltration & Water Balance | 31 |
| 5.4 | Stormwater Servicing Conclusions | 32 |
| 6.0 | GRADING AND DRAINAGE | 33 |
| 7.0 | CLI-ECA APPENDIX A CONFORMANCE | 34 |
| 8.0 | EROSION AND SEDIMENT CONTROL..... | 35 |
| 9.0 | UTILITIES | 36 |
| 10.0 | CONCLUSION AND RECOMMENDATIONS | 37 |

FIGURES

FIGURE 1-1: STUDY AREA LOCATION 6

TABLES

TABLE 1-1: DEVELOPMENT PROJECTED POPULATION (UPDATED 2026)..... 9
TABLE 1-2: REQUIRED PERMITS/APPROVALS 10
TABLE 3-1: WATER SUPPLY DESIGN CRITERIA..... 14
TABLE 3-2: WATER DEMAND ESTIMATE & COMPARISON TO EQUIVALENT MSS DEMANDS..... 16
TABLE 4-1: WASTEWATER DESIGN CRITERIA 19
TABLE 4-2: PEAK SANITARY FLOW CONTRIBUTION TO MH1A 20
TABLE 5-1: STORM SEWER DESIGN CRITERIA 23
TABLE 5-2: PEAK RATIONAL METHOD STORM FLOW CONTRIBUTION TO EUC POND 1 AT FOREBAY C 26
TABLE 5-3: EUC POND 1 (FOREBAY C) DRAINAGE AREA COMPARISON 28
TABLE 5-4: ESTIMATED STORAGE VOLUMES FOR BLOCKS 30
TABLE 5-5: ESTIMATED STORAGE VOLUMES FOR RESIDENTIAL UNIT SAMPLE AREA 31

DRAWINGS

DRAWING 1: CONCEPTUAL GRADING PLAN
DRAWING 2: STORM SERVICING PLAN
DRAWING 3: SANITARY SERVICING PLAN
DRAWING 4: WATERMAIN SERVICING PLAN
DRAWING 5: PROFILES
DRAWING 6: EROSION AND SEDIMENT CONTROL PLAN

APPENDICES

- Appendix A
- Trailsedge Phase 5 Concept Plan v17 (NAK, December 2025)
 - Draft Plan (AOV, January 2026)
 - Draft Plan (AOV, July 2022)
 - Servicing Guidelines Checklist (DSEL, November 2025)
- Appendix B
- Excerpts from MSS (DSEL, Dec 2020)
- Appendix C
- City of Ottawa Correspondence for Populations Exceeding 3000 Peak Factors (City of Ottawa, Nov 2024)
 - City of Ottawa Populations Exceeding 3000 Peak Factors Criteria (City of Ottawa, Nov 2024)
 - Water Demand Calculations (DSEL, January 2026)
 - MSS Water Demand Calculations (DSEL, Dec 2020)
 - MSS Hydraulic Capacity and Modeling Analysis (GeoAdvice, July 2018)
- Appendix D
- Sanitary Servicing Design (DSEL, June 2026)
 - Sanitary Servicing Design Excerpts from MSS (DSEL, Dec 2020)
 - Sanitary Servicing Design Excerpt from Glenview Homes Site Servicing and SWM report (NOVATECH, March 2022)
- Appendix E
- Stormwater Servicing Design Sheets (DSEL, January 2026)
 - Woodlot Ditch Sizing and Flow Calculations (DSEL, Nov 2025)
 - Stormwater HGL Preliminary Analysis (DSEL, January 2026)
 - East Urban Community Phase 3 Area – Private Block Surface Storage Requirements (DSEL, January 2026)
 - PCSWMM Model Output (DSEL, January 2026)
 - Preliminary Storage PCSWMM Model Output – Private Blocks (DSEL, January 2026)
 - Trailsedge Phase 5 Ponding Volume per Ha (DSEL, January 2026)
 - EUC Phase 3 Sag Storage Comparison (DSEL, January 2026)
 - MSS Excerpt – Storm Sewer Design Sheet (City of Ottawa, Oct 2019)
 - The Commons - Phase 1 Design Sheet Excerpt (Novatech, March 2022)
 - Summary of Minor and Major System Flows (DSEL, Feb 2023)
 - Figure 4 of the EUC Pond 1 Design Brief (DSEL, 2023)
 - Innes Interim Pond (Trinity/IBI Group, Jan 2009)
 - Innes ICD Plan (Trinity/IBI Group, May 2013)
 - Innes Ponding Plan (Trinity/IBI Group, May 2013)

FUNCTIONAL SERVICING REPORT

FOR

**RICHCRAFT HOMES
TRAILS EDGE NORTH**

JUNE 2026

**CITY OF OTTAWA
PROJECT NO.: 20-1195**

1.0 INTRODUCTION

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

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

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

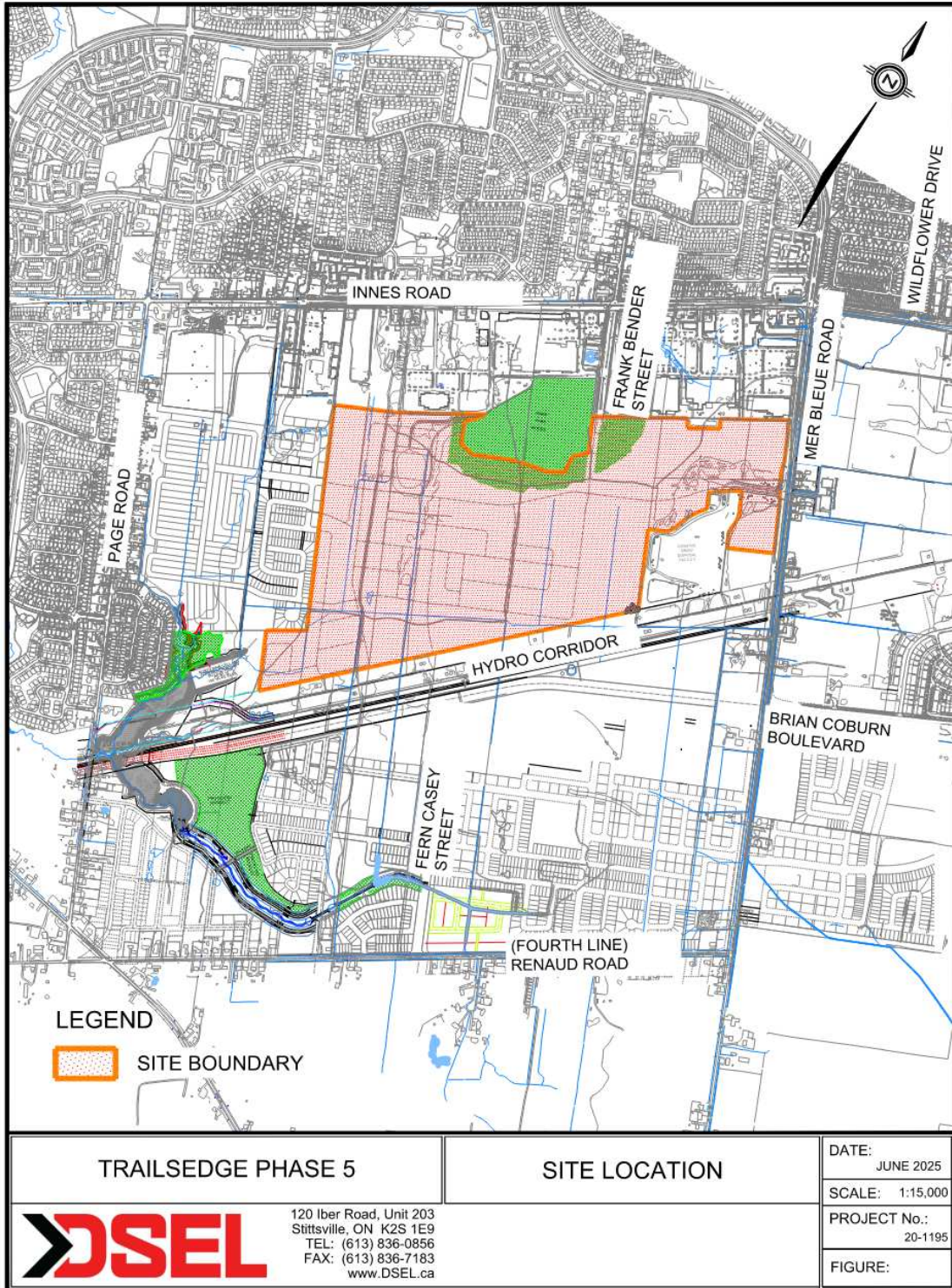


Figure 1-1: Study Area Location

The proposed development includes a mix of residential, employment, and open space uses supported by a local road network with right-of-way widths ranging from 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.

The analysis within this report is based on the current January 2026 Draft Plan. For historical context, the July 2022 and December 2025 versions are also included in Appendix A. The progression of these plans reflects ongoing refinements to the lotting configuration, adjustments to block boundaries, updated land use designations, and revisions to the road alignment and associated servicing blocks.

1.1 Existing Conditions

The Trails Edge North study area consists primarily of Greenfield land, historically cleared for agricultural purposes. The following provides an overview of current site conditions based on available documentation, planning context, and technical studies. Select soil and

groundwater information is summarized from the *Geotechnical – Existing Conditions Report (PG3130-3, Revision 2)*, prepared by Paterson Group, dated April 24, 2025.

Site Description and Topography

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

Drainage and Watershed Context

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

Soil and Groundwater Conditions

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

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

Development Constraints and Adjacent Lands

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

To the west of the study area, Glenview Homes is advancing a residential development at 3610 Innes Road. A preliminary road and servicing network for Trails Edge North has been

coordinated to reflect this adjacent context. Drawings 1–4 illustrate the current development interface and are subject to refinement through subsequent applications

1.2 Development Concept

The proposed development concept for Trails Edge North is illustrated in Appendix A. The plan includes a balanced mix of residential, employment, park, and open space land uses, supported by a structured and interconnected road network. The residential component comprises approximately 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 |

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 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. |
| | Commence Work Notification (CWN) | Start of construction | A formal notification issued by the City allowing construction to proceed following receipt of all applicable approvals and permits. May require coordination with MECP depending on the infrastructure. |
| | Legal access or servicing agreements | Infrastructure outside subject lands | Legal access, easements, or permissions may be required for works located beyond the study area boundary, such as sewer outlets or temporary grading. Coordination with affected landowners is necessary. |

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

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

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

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

City of Ottawa Guidelines and Bulletins

- **Ottawa Sewer Design Guidelines**, City of Ottawa, 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
- **Design Criteria for Sanitary Sewers, Storm Sewers and Force mains for Alterations Authorized under an Environmental Compliance Approval**, Ministry of Environment, Conservation and Parks, v2.0, May 31, 2023.
- **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

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

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

The surrounding municipal water infrastructure includes:

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

The existing watermain infrastructure is shown in Drawing 4.

3.2 Water Supply Servicing Design

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

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

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

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

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

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

Table 3-1 summarizes the water supply design criteria used in the preparation of the preliminary servicing concept. The criteria are consistent with the City of Ottawa 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 |
| 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 |
| <p>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.</p> | |

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.

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.

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

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

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

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

The surrounding municipal wastewater infrastructure includes:

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

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

4.2 Wastewater Design

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

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

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

In accordance with the MSS, the combined peak flow from these contributing areas—directed to maintenance hole MH1A within the Orléans Village development—was

estimated at 113.41 L/s. Refer to Appendix D for the supporting calculations and capacity confirmation.

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

Table 4-1: Wastewater Design Criteria

| Design Parameter | Value |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Residential - Single Family | 3.4p/unit |
| Residential - Townhome/ Semi | 2.7p/unit |
| Average Daily Demand | 280 L/d/per |
| Peaking Factor | Harmon's Peaking Factor, where K=0.8 |
| Commercial / Institutional Flows | 35,000 L/gross ha/day |
| Commercial / Institutional Peak Factor | 1.5 if contribution >20%, otherwise 1.0 |
| Light Industrial Flows | 35,000 L/gross ha/day |
| Industrial Peaking Factor | Per Figure in Appendix 4-B, City of Ottawa Guidelines |
| Infiltration and Inflow Allowance | 0.33 L/s/gross ha for all areas |
| Park Flows | 9,300 L/ha/d (75 p/acre per Sewer Guidelines Appendix 4-A) |
| Park Peaking Factor | 1.0 |
| Sanitary sewers are to be sized employing the Manning's Equation | $Q = \frac{1}{n} AR^{2/3} S^{1/2}$ |
| 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 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.

4.3 Wastewater Servicing Conclusions

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

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

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

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Drainage

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

In the northwestern portion of the site, an existing 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).

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 | $Q = \frac{1}{n} AR^{2/3} S^{1/2}$ |
| Runoff coefficient for paved and roof areas | 0.9 |
| Runoff coefficient for landscaped areas | 0.2 |
| Minimum Sewer Size | 250 mm diameter |
| Minimum Manning's 'n' for pipe flow | 0.013 |

| | |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Minimum Depth of Cover | 2.0m from crown of sewer to grade |
| Minimum Full Flowing Velocity | 0.8 m/s |
| Maximum Full Flowing Velocity | 6.0 m/s (where velocities in excess of 3.0 m/s are proposed, provision shall be made to protect against displacement of sewers by sudden movement) |
| Clearance from 100-Year Hydraulic Grade Line to Building Opening | 0.30 m |
| Max. Allowable Flow Depth on Municipal Roads | 35 cm above gutter (PIEDTB-2016-01) |
| Extent of Major System | To be contained within the municipal right-of-way or adjacent to the right-of-way provided that the water level must not touch any part of the building envelope and must remain below the lowest building opening during the stress test event (100-year + 20%) and 15cm vertical clearance is maintained between spill elevation on the street and the ground elevation at the nearest building envelope (PIEDTB-2016-01) |
| Stormwater Management Model | 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 = $(C - 0.2) / 0.7 \times 100\%$. |
| 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.

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 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 at Forebay C is estimated at

10,818 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 at Forebay C

| Rational Method Peak Flow | Trails Edge North FSR (DSEL, Nov 2025) | MSS (DSEL, Dec 2020) |
|----------------------------------|---------------------------------------------------|---------------------------------|
| North Forebays | 10,818 L/s | 11,844 L/s |

In addition to the above, a small subcatchment is directed to the pipe segment between MH 2121 and MH 2142, which serves as the end segment of the neighboring subdivision's (The Commons - Phase 1) trunk sewer. As shown in the Novatech design sheet excerpt included in Appendix E, the neighboring design originally allocated 1.5ha with an RC of 0.70 from this site. In contrast, the current design contributes a smaller area of 1.22ha at the same 0.70 RC. Our design sheet calculates a peak flow of 2,441 L/s, with the pipe for that segment operating at 85% capacity.

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.

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 m²/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 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.

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

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 |
| 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

Detailed grading, including road sags was undertaken for a 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. 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 calculation for typical roadway sags within the site. 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.

For comparison, Figure 2 – Surface Storage Calculations has been added to Appendix E. This figure illustrates the neighbouring Orleans Village Community 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 m³/ha confirms that the sample estimate of 89.80 m³/ha used in this FSR is conservative.

Given that this is a flat site, it is expected that the 100 year runoff volume will be contained within the street sags and there will be no overland flow directed towards the Hydro Corridor. This will be confirmed during detailed design. If, at detailed design, overland flow towards the Hydro corridor is required, an agreement with Hydro will be required.

It is noted that The Commons - Phase 1 detailed design did not account for any overland flow from the Trails Edge development on Reflection Street. While there is a small area (less than 0.1ha.) at the Reflection Street tie-in directed west towards the existing street, catch basins have been proposed at the property limit to capture the flows.

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.

6.0 GRADING AND DRAINAGE

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

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

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

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

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

7.0 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, erosion control (watershed) 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.

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.

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.

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* 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, employment, commercial, park, medium density residential, and medium-high density residential blocks within the study area are to 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. 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 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.

Reviewed By:

David Schaeffer Engineering Ltd.



Per: Martin Fréchette, P.Eng.



Per: Alexandre Tourigny, P.Eng.

© DSEL

Z:\Projects\20-1195_Richcraft-EUC_North\B_Design\B3_Reports\B3-2_Servicing(DSEL)\2026-04 16_FSR_5th_subm