# FUNCTIONAL SERVICING REPORT

## MILANI GROUP

## PROPOSED RESIDENTIAL DEVELOPMENT

**1489 HURONTARIO STREET**
**CITY OF MISSISSAUGA**

**Project No.: 21-0007MI** **February 2025**

**Urbanworks Engineering Corporation**
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# 1.0 INTRODUCTION

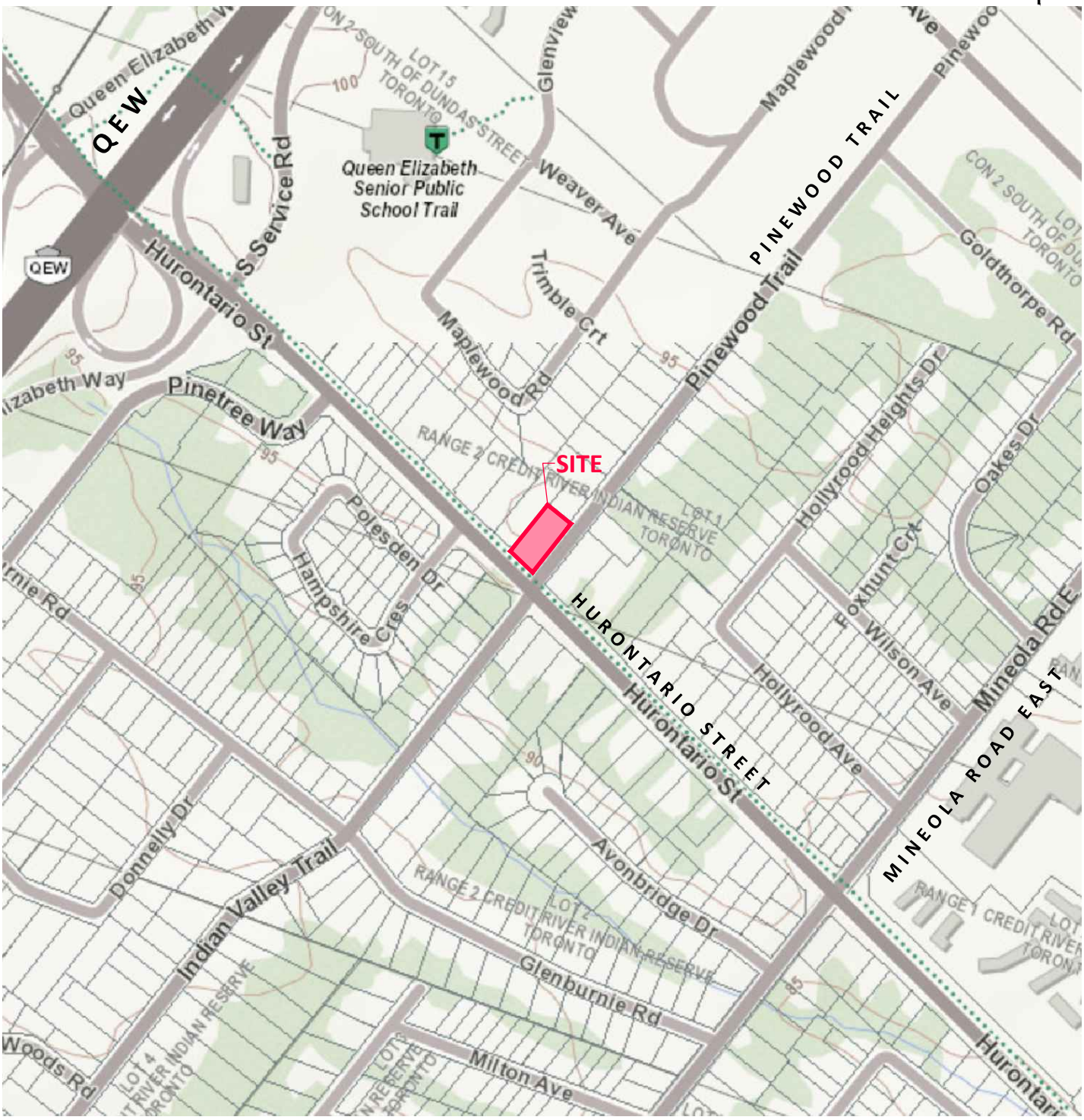
Urbanworks Engineering Corporation has been retained by the Milani Group to complete a Functional Servicing Report for a proposed 0.17 ha residential development located at 1489 Hurontario Street, in the City of Mississauga and Regional Municipality of Peel. The legal description is Part Lot 1, Range 2, CIR and Part 2, 43R38695.

As shown in Figure 1-1, the subject property is located on the northeast corner of Hurontario Street and Pinewood Trail. The site is within the boundaries of Queen Elizabeth Way (QEW) to the north, Hurontario Street to the west, Pinewood Trail to the south, and Cooksville Creek to the east. The site is in an area that is generally developed for residential purposes, except for the Pinewood Medical Centre opposite Pinewood Trail.

The subject property lies within the limits of the Credit River Watershed, under the Credit Valley Conservation (CVC) jurisdiction. More specifically the site is located in the Norval to Port Credit sub-watershed.

The Site Plan for the proposed development was prepared by RN Design, on January 19, 2024, and revised on July 4, 2024. The proposed development consists of one townhouse block with a total of nine (9) residential units fronting on Pinewood Trail; 8 of which are 18 ft, 3-storey units. A copy of the Site Plan is included in Appendix A.

The purpose of this report is to outline the servicing details for the proposed storm drainage, sanitary and water distribution systems required to service the subject development. The recommended servicing plans have been prepared in accordance with design criteria and requirements of the City of Mississauga (City), Regional Municipality of Peel (Region) and Credit Valley Conservation (CVC). The information in this report is intended to assist the municipality and other regulatory agencies in their review of the site plan application for the proposed development.

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LEGEND

SITE BOUNDARY

FIGURE 1-1
SITE LOCATION PLAN

| 21-0007MI | FEB. 2025 | N.T.S. |
|---|---|---|

# 2.0 REFERENCES

The background information pertaining to the recommended servicing plans for the subject development has been obtained from the following documents:

- *Detailed Site Plan*, RN Design, July 4, 2024.
- *"Development Requirements Manual"*, **City of Mississauga**, September 2017.
- *"Low Impact Development Stormwater Management Planning and Design Guideline"* Version 1.0, **Credit Valley Conservation**, 2010.
- *"Stormwater Management Criteria"*, **Credit Valley Conservation**, August 2012.
- *"Erosion & Sediment Control Guideline for Urban Construction"*, **GGHACA**, December 2006.

# 3.0 PROPOSED DEVELOPMENT

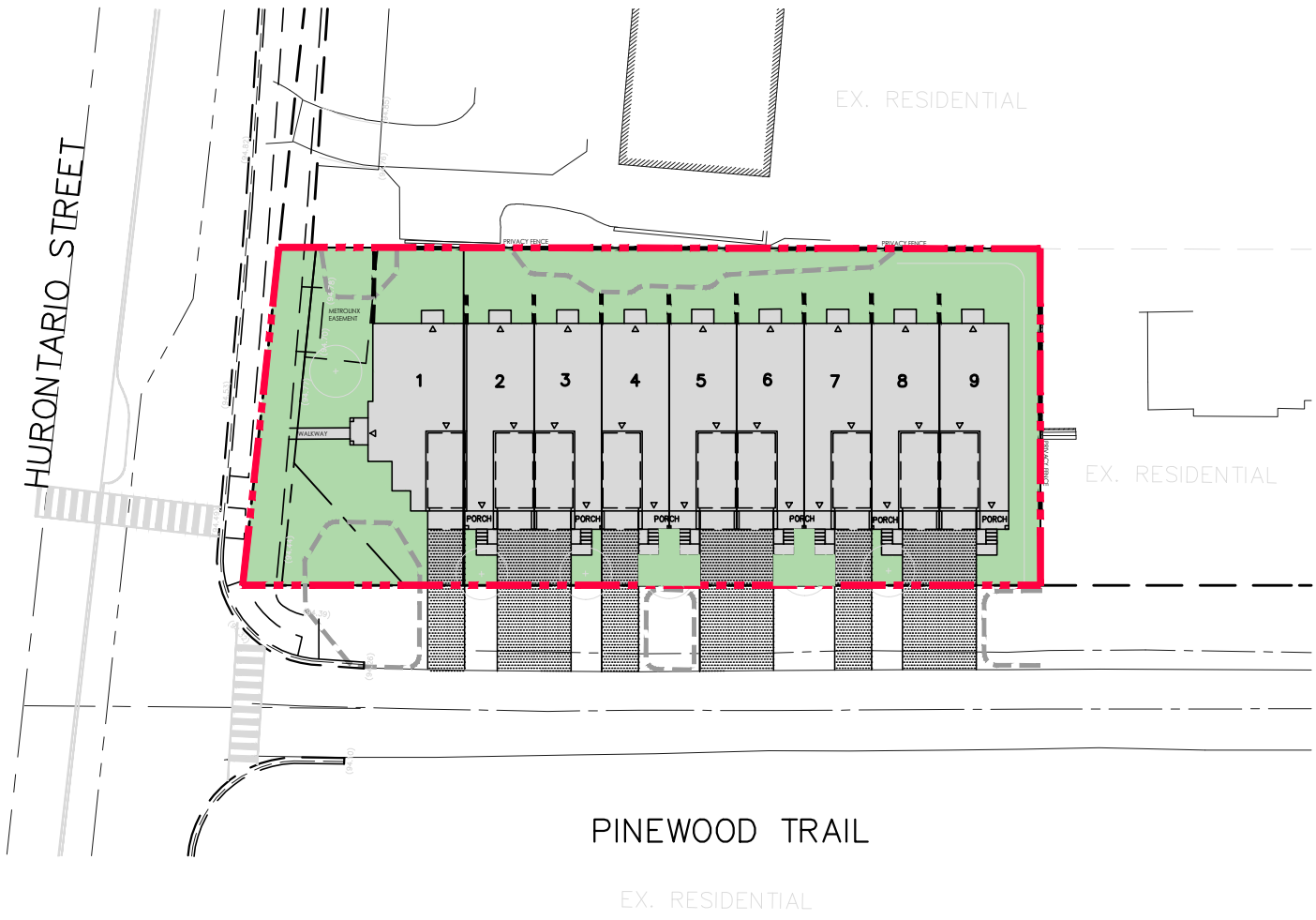
The Site Plan for the proposed 0.17 ha development was prepared by RN Design on February 12, 2025. The proposed development consists of one townhouse block with nine townhouse units. Table 1 provides a population summary for the proposed development. The population summary is based on Region of Peel criteria and is used to estimate preliminary sanitary flows and water supply demands. The actual population may differ. The layout of the proposed residential development is shown on Figure 3-1.

**Table 1: Summary of Proposed Population**

| Land Use | Area (ha) | Units | Population Density (Persons/ha) | Population |
|---|---|---|---|---|
| Townhouse | 0.17 | 9 | 3.4 | 31 |

The access to each unit will be provided via Pinewood Trail.

Municipal servicing for the proposed development will be provided via connections to the existing services along Pinewood Trail.

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LEGEND

SITE BOUNDARY

FIGURE 3-1
PROPOSED SITE PLAN

| 20-0007MI | FEB. 2025 | SCALE: 1:750 |
|---|---|---|

# 4.0 EXISTING CONDITIONS

## 4.1 Topography and Drainage

A review of the site conditions was carried out using topographic mapping and a site inspection. Topographic information for the property was obtained from a detailed survey completed by RS Surveying Limited on March of 2021.

The topography of the subject property is characterized by slopes ranging from 0% to 4% across the site. The property is presently occupied by a two-storey residential building. There is an existing paved area located in the southern and western portions of the property providing access to Pinewood Trail and Hurontario Street, respectively.

According to available topo and information provided by the City of Mississauga, the following existing storm services are in the vicinity of the site:

- A culvert and ditch system along the north side of Pinewood Trail. The system includes a 500 mm diameter culvert beneath the site's driveway to Pinewood Trail
- A 375 mm diameter storm sewer along Pinewood Trail.
- A 525 mm diameter storm sewer along Pinewood Trail.
- A 900 mm diameter storm sewer along an easement between 40 and 52 Pinewood Trail.

As shown in Figure 4-1, the entire site generally drains in a southerly direction towards the existing ditch and culvert system along Pinewood Trail. The ditch and culvert system conveys flow easterly towards the existing 375 mm storm sewer. The 375 mm storm sewer conveys flow easterly to the 900 mm storm sewer. The 900 mm storm sewer conveys flow southerly along an easement between 40 and 52 Pinewood Trail. The existing 525 mm storm sewer conveys flow westerly to the 900 mm diameter line.

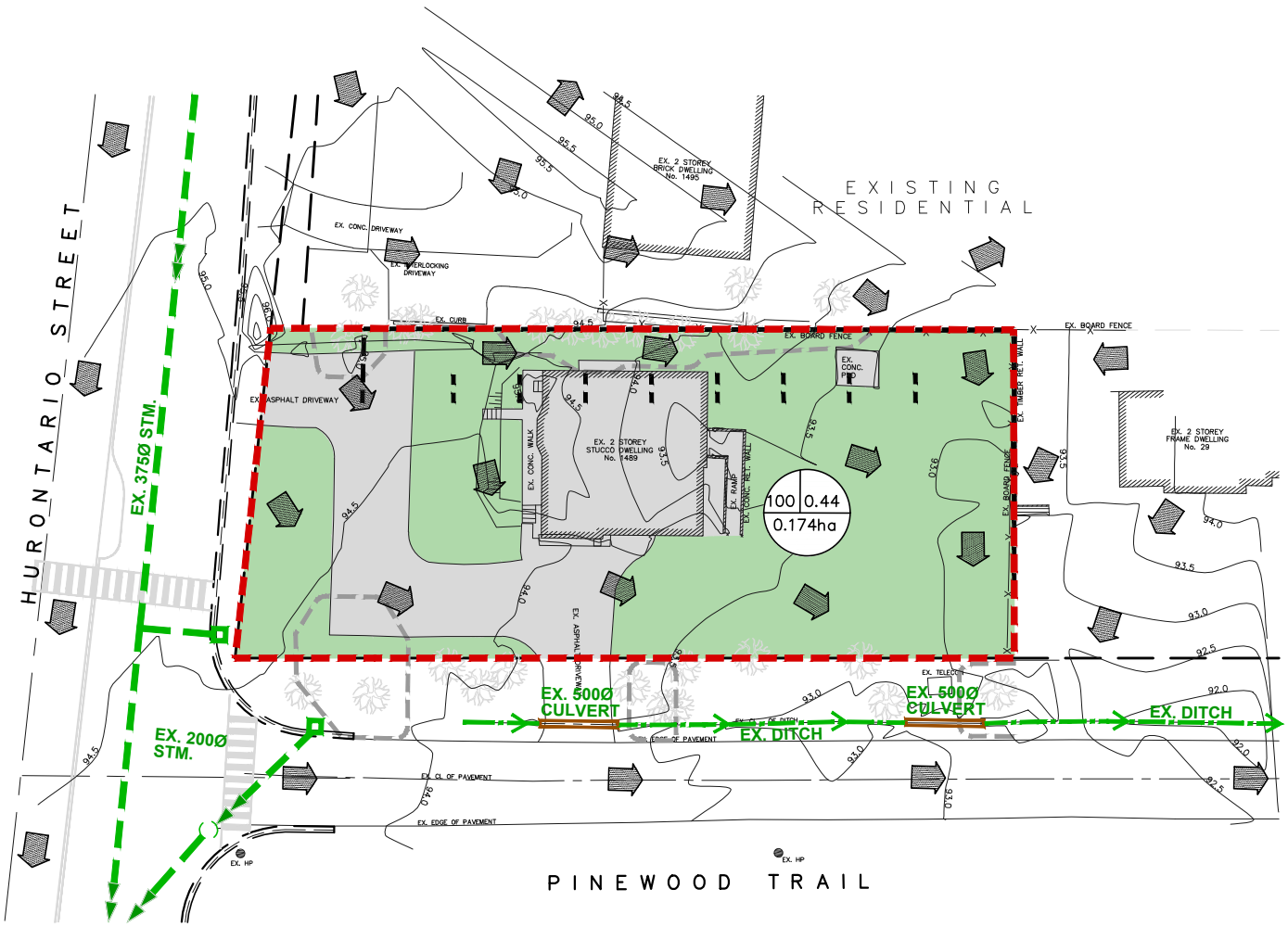
The weighted runoff coefficient for the site is approximately 0.44. With an area of 0.17 ha, the existing peak flows are as summarized in Table 2.

**Table 2: Summary of Existing Peak Flows**

| Return Period | Area (ha) | Runoff Coeff. | Flow ($m^3/s$) |
|---|---|---|---|
| 2-yr | 0.17 | 0.47 | 0.014 |
| 5-yr | | 0.47 | 0.018 |
| 10-yr | | 0.47 | 0.023 |
| 25-yr | | 0.52 | 0.029 |
| 50-yr | | 0.56 | 0.035 |
| 100-yr | | 0.59 | 0.041 |

## 4.2 Soil Conditions

A geotechnical report was not available at the time this report was prepared. Soil conditions were therefore determined using a Soil Map of Peel County. Based on the map the underlying soils in the vicinity of the site consist of a Fox Sand. This type of soil is generally sufficient for LID measures. Soil conditions on site will be verified during the detailed design stage of the project.




## RUNOFF COEFFICIENTS – EXISTING AREAS

| AREA ID | PERVIOUS AREA (ha) | IMPERVIOUS AREA (ha) | TOTAL AREA (ha) | IMP. RATIO ($I = A_I / A_T$) | RUNOFF COEFF. (C)* |
|---|---|---|---|---|---|
| 100 | 0.115 | 0.059 | 0.174 | 0.339 | 0.44 |

*Where: C = 0.70 x I + 0.20

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LEGEND

- EXISTING STM. SEWER
- SITE BOUNDARY
- EXISTING CULVERT
- 188.5 EXISTING CONTOUR
- OVERLAND FLOW ROUTE

DRAINAGE AREA
AREA I.D. 100 | 0.50 RUNOFF COEFF.
1.00ha DRAINAGE AREA

- PERVIOUS AREA
- IMPERVIOUS AREA

FIGURE 4-1
EXISTING DRAINAGE PLAN

| 21-0007MI | FEB. 2025 | 1:750 |
|---|---|---|

# 5.0 STORMWATER MANAGEMENT PLAN

The stormwater management plan for the development has been prepared in accordance with the standards and requirements of the City of Mississauga and CVC. The general layout of the stormwater conveyance network servicing the development is shown schematically in Figure 5-1. The details of the storm drainage system for the site are shown on Drawing GP-01 – Preliminary Servicing Plan, included in Appendix D.

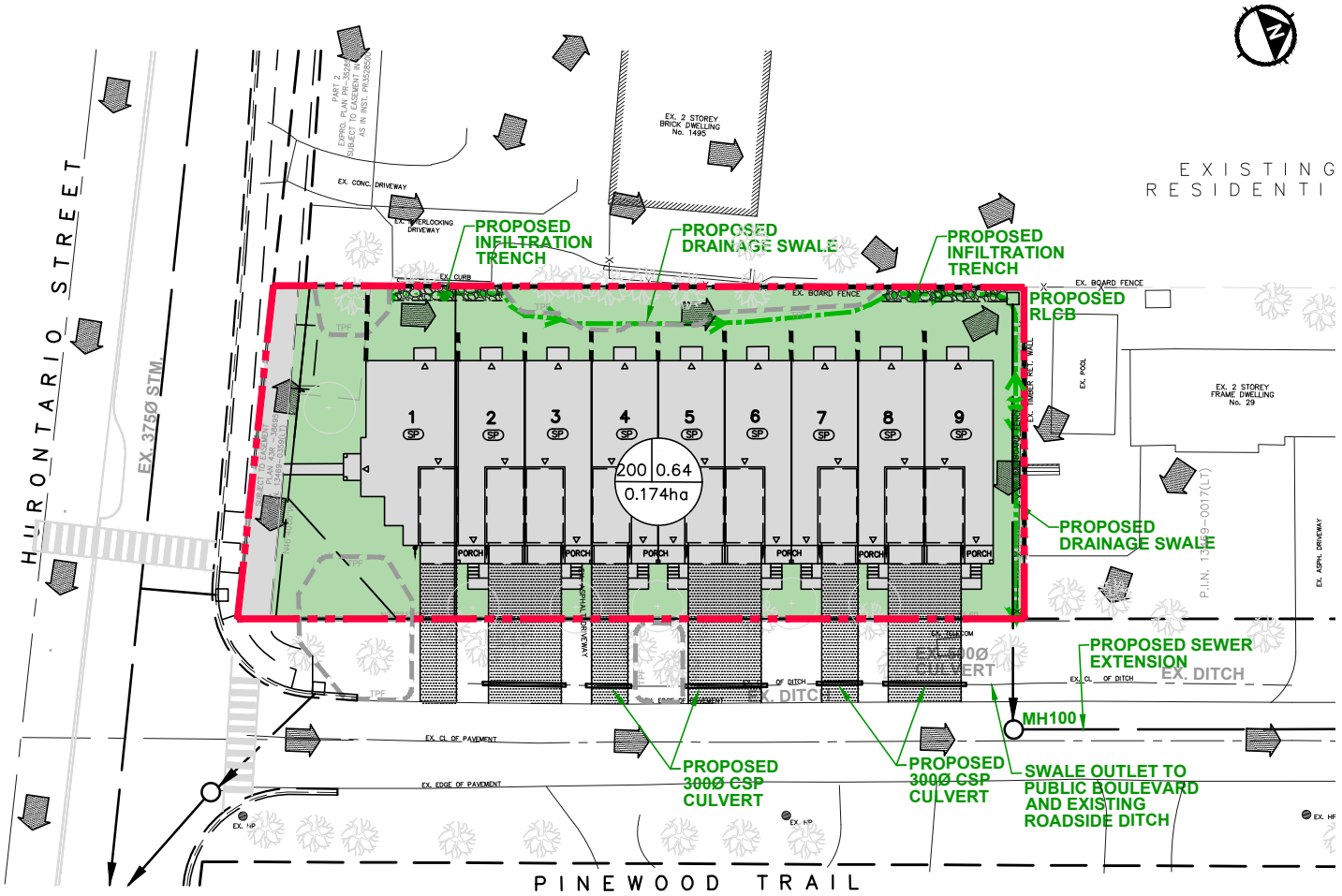
## 5.1 Storm Drainage Design Criteria

The following storm drainage criteria have been adopted for the stormwater conveyance system within the proposed development:

- The minor drainage system should be designed for the 10-year storm event flows, calculated using the Rational Method and City of Mississauga IDF curves.
- The major system should be designed to accommodate runoff exceeding the capacity of the minor system for flows up to and including the 100-year storm event. The major system should be contained within road allowances and designated easements.
- Based on Table 3-1 of the CVC SWM Criteria, dated August 2012, no quantity control is required in Sub-Watershed 9 – Norval to Port Credit.
- On-site detention of 5 mm of precipitation over the entire site impervious area is required to address the CVC erosion control target requirement.
- Infiltration of the first 3 mm of precipitation is required to address the CVC water balance target requirement.

## 5.2 Proposed Storm Drainage Plan

The general layout of the stormwater conveyance network servicing the development is shown in Figure 5-1. The design details of the drainage system are shown on Drawing GP-01 – Preliminary Servicing Plan.




## RUNOFF COEFFICIENTS – PROPOSED AREAS

| AREA ID | PERVIOUS AREA (ha) | IMPERVIOUS AREA (ha) | TOTAL AREA (ha) | IMP. RATIO ($I = A_I / A_T$) | RUNOFF COEFF. (C)* |
|---|---|---|---|---|---|
| 200 | 0.065 | 0.109 | 0.174 | 0.626 | 0.64 |

*Where: $C = 0.70 \times I + 0.20$

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LEGEND

- EXISTING STM. SEWER
- EXISTING CULVERT
- EXISTING DITCH
- PROPOSED CULVERT
- PROPOSED SWALE
- SITE BOUNDARY
- OVERLAND FLOW ROUTE

DRAINAGE AREA
AREA I.D. 100 | 0.50 RUNOFF COEFF.
1.00ha DRAINAGE AREA

- PERVIOUS AREA
- IMPERVIOUS AREA

FIGURE 5-1
PROPOSED DRAINAGE PLAN

| 21-0007MI | FEB. 2025 | 1:750 |
|---|---|---|

As shown in Figure 5-1, the existing 375 mm diameter storm sewer along Pinewood Trail will be extended approximately 29 m towards the site, with a maintenance hole (MH 100) proposed near the southeast corner of the property.

The drainage from the southern (front) portion of the site will be conveyed directly towards the existing roadside ditch along Pinewood Trail. The roadside ditch system will convey runoff easterly towards the existing storm sewer network.

The northern (rear) portion of the site will drain to infiltration trenches and swales along the north and east property boundaries towards a rear lot catchbasin (RLCB). The RLCB will convey runoff towards MH 100 and the storm sewer extension.

## 5.3 Quantity Control

No quantity controls are required as per CVC SWM guidelines. Post-Development peak flows were estimated for comparison purposes are as summarized in Table 3.

**Table 3: Summary of Proposed Peak Flows**

| Return Period | Area (ha) | Runoff Coeff. | Flow ($m^3/s$) |
|---|---|---|---|
| 2-yr | 0.17 | 0.64 | 0.019 |
| 5-yr | | 0.64 | 0.025 |
| 10-yr | | 0.64 | 0.031 |
| 25-yr | | 0.70 | 0.039 |
| 50-yr | | 0.77 | 0.048 |
| 100-yr | | 0.80 | 0.055 |

## 5.4 Quality Control

In general, the only source of “dirty” runoff are the driveways. There are limited options to provide treatment for the driveways. The proposed driveway area is approximately 135 $m^2$, which represents approximately 8% of the site area. Therefore 92% of the site generates clean runoff. Based on this, it can be concluded that the runoff from the site is generally clean in nature. Furthermore, the proposed driveway area is a reduction from the existing condition. Currently, there is 330 $m^2$ of driveway area on site.

Additionally, LIDs are proposed on site and will reduce the volume of runoff discharged from the site, especially during smaller rainfall events. A reduction in runoff volume from the site implies that there will also be a reduction in TSS from the site as well.

## 5.5 On-Site 5 mm Runoff Retention

In accordance with the CVC requirements pertaining to water balance and erosion control criteria for the site, the development plan has been evaluated with respect to the retain/infiltration of first 5 mm of precipitation over the entire site impervious areas. The volume of runoff generated from a 5 mm rainfall event is approximately 5.5 $m^3$ (0.174 ha x 5 mm x 62.6 % imp. x 10 = 5.5 $m^3$).

Recognizing the limited space within the development plan to promote the on-site infiltration, the following LID measures shall be proposed to maximize the water balance within the development limits:

- The topsoil depth within the landscape areas will be increased from a typical 150 mm to 300 mm to increase runoff retention and promote infiltration in the landscape areas. This will provide an additional 39.0 $m^3$ of storage (650 $m^2$ x 0.15 m x 0.4 = 39.0 $m^3$)
- Runoff from roof leaders will be discharged to surface pre-cast splash pads and directed toward landscape areas.
- Implementation of infiltration trenches in the rear yards that will provide 8.2 $m^3$ of on-site runoff retention (19 m length x 1.2 m width x 0.9 m depth x 0.4 porosity = 8.2 $m^3$).

It should be noted that it was initially proposed to provide 74 m length of infiltration trench. The length had to be reduced however to respect the tree protection areas and accommodate the RLCB lead. While the proposed LID measures mentioned above satisfy the water balance requirements, additional measures such as rain barrels can be implemented instead of the infiltration trenches.

## 5.6 Sump Pumps

Since there is no existing or proposed storm sewer available for the future foundation drains to connect to, it is proposed to utilize sump pumps. The proposed sump pumps will discharge groundwater to grade and eventually be conveyed towards the roadside ditch. Sumps pumps are proposed for each unit as shown on Drawing GP-01.

# 6.0 SANITARY SERVICING PLAN

The proposed development lies within the sanitary tributary area of the GE Booth Lakeview Sewage Treatment Plant. Based on the information provided by Region of Peel, there are existing 250 mm diameter sanitary sewers along Pinewood Trail, east of the site. The existing sewer conveys wastewater easterly, and then south along a servicing easement between 40 and 52 Pinewood Trail.

The existing sanitary sewer line will need to be extended westerly towards the site to service the proposed development. The proposed sanitary sewer network will be designed as a conventional gravity system, conveying flows to the existing sewers along Pinewood Trail via a proposed 250 mm sewer. The proposed units will each have 125 mm diameter connections to the new sanitary sewer along Pinewood Trail.

Additional details of the proposed sanitary servicing system for the site are shown on Drawing GP-01 - Preliminary Servicing Plan, included in Appendix D.

## 6.1 Population Density

Based on the Region of Peel design criteria, the equivalent population for the development will be 31 people, as shown on Table 1.

Where:3.4 p.p.u. – Population density in persons per unit for townhouses

## 6.2 Design Flow

Anticipated sanitary sewage flow for the development is provided in Table 4 as per Region of Peel design criteria.

**Table 4: Summary of Sanitary Flows**

| Type | Site Area | Density | Population | Average Flow | Harmon Peaking Factor | Peak Sewage Flow | Infiltration | Peak Flow |
|---|---|---|---|---|---|---|---|---|
| | (ha) | (p.p.u.) | (Person) | (L/s) | | (L/s) | (L/s) | (L/s) |
| Townhouse | 0.17 | 3.4 | 31 | 0.10 | 4.35 | 0.45 | 0.04 | 0.49 |

Based on the above, the design flow rate will be 0.49 L/s.

The design calculations for the proposed development are included in Appendix C.

# 7.0 WATER SUPPLY AND DISTRIBUTION PLAN

The Proposed development lies within Pressure Zone 1 of the Region of Peel's Lake-Based Transmission System. As shown on Drawing GP-01 - Preliminary Servicing Plan, water servicing for the development will be provided via connections to the existing 150 mm diameter watermain along Pinewood Trail. Individual 25 mm diameter connections are proposed to supply water to each unit. The design calculations for the proposed development are found in Appendix C.

The expected water demand for the development is determined in accordance with Region of Peel criteria. The water demand of the development is shown in Table 5.

**Table 5 - Water Demand**

| Type | Area | Avg. Consumption Rate (Typical / Short-Term) | Max. Day Factor | Peak Hour Factor | Population | Max. Day Flow (Typical / Short-Term) | Peak Hour Flow (Typical / Short-Term) | Fire Flow Demand* |
|---|---|---|---|---|---|---|---|---|
| | (ha) | (Lpcd) | | | (Person) | (L/s) | (L/s) | (L/s) |
| Residential | 0.17 | 280 / 409 | 2.0 | 3.0 | 31 | 0.1 / 0.15 | 0.3 / 0.44 | 150.0 |

* Fire Flow Demand = Fire Protection Demand of 150 L/s (as required by Ontario Building Code) + Max Daily Demand (Short-Term)

The water supply system design flow should be the greater of the following demands:

- Maximum day demand plus fire protection demand (150 L/s, as required by Ontario Building Code); or
- Peak hour demand.

Based on the results shown in the above table, the short-term peak hour water demand will be 0.4 L/s. The fire flow + maximum day demand will be 150.2 L/s (typical) or 150.3 (short term). Therefore, the water supply system has been designed to provide 150.3 L/s, that is, the maximum daily demand of the development plus the fire protection demand requirement. A flow test at the fire hydrants on Pinewood Trail shall be performed to verify that the required residual pressure in the street watermain will be met, in the event of a fire.

# 8.0 GRADING PLAN

A grading plan for the subject property has been prepared in conjunction with the storm, sanitary, and water servicing system design for the subject development. The site grading plan has been prepared with a consideration of the adjacent property boundaries. The grading information for the development is provided on Drawing No. GR-01 enclosed in Appendix D.

# 9.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures to be implemented during and following construction are outlined below. These measures will comply with the December 2006 *"Erosion and Sediment Control Guideline for Urban Construction"* and recommendations by the City and CVC engineering staff. The proposed erosion and sediment control works during construction will consist of the following:

- sediment control fencing;
- granular mud mat(s) for construction access;
- immediate reinstatement of all disturbed areas with topsoil and sod;
- all catch basins will be protected with traps immediately after installation;
- all topsoil stockpiles intended to remain in place for more than 30 days will be seeded or tarped to prevent wind erosion;

The recommended erosion and sediment control measures for the development shall be detailed on the Erosion and Sediment Control Plan, to be prepared at the detailed design stage.

# 10.0 CONCLUSIONS

This report identifies the stormwater, sanitary and water distribution systems required to support the proposed residential development. Based on the findings of this report, it is concluded that:

1. A technical assessment of the municipal servicing requirements indicates that the site can be adequately serviced by the existing stormwater, sanitary, and water distribution systems.

2. Stormwater quantity and quality control is not required for the proposed development.

3. Erosion control for the development will be provided by an implementation of LID measures on site.

4. The existing 375 mm diameter storm sewer will be extended 29 m westerly towards the southeast corner of the site.

5. Sump pumps are proposed in each unit to convey foundation drainage to the existing roadside ditch.

This report is being submitted to the City of Mississauga, Regional Municipality of Peel, and Credit Valley Conservation for approval of the site plan application for the subject development.

Respectfully Submitted,

**Urbanworks Engineering Corporation**


**Marcin Maslej, C.E.T.**
Principal

**Michael Paulo, P.Eng.**
Principal

# APPENDIX A

STORMWATER MANAGEMENT CALCULATIONS

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Prepared By: M.P.

**Rational Method**
**Pre-Development Flow Calculation**

1489 Hurontario Street, Mississauga
File No.: 21-0007MI
Date: February 2025

**Time of Concentration Calculation**

| Area Number | Area (ha) | C | A*C | Tc Town Min (min) |
|---|---|---|---|---|
| Pervious | 0.115 | 0.25 | 0.02875 | |
| Impervious | 0.059 | 0.9 | 0.0531 | |
| TOTAL | 0.17 | 0.47 | 0.08185 | 15 |

**Rational Method Calculation**

Event 2 yr
IDF Data Set City of Mississauga
a = 610.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.47 | 0.08 | 15.0 | 59.9 | 0.014 | 13.7 |

Event 5 yr
IDF Data Set City of Mississauga
a = 820.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.47 | 0.08 | 15.0 | 80.5 | 0.018 | 18.5 |

Event 10 yr
IDF Data Set City of Mississauga
a = 1010.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.47 | 0.08 | 15.0 | 99.2 | 0.023 | 22.7 |

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Prepared By: M.P.

**Rational Method**
**Pre-Development Flow Calculation**

1489 Hurontario Street, Mississauga
File No.: 21-0007MI
Date: February 2025

**Time of Concentration Calculation**

| Area Number | Area (ha) | C | Tc Town Min (min) |
|---|---|---|---|
| TOTAL | 0.17 | 0.47 | 15 |

**Rational Method Calculation**

Event 25 yr
IDF Data Set City of Mississauga
a = 1160.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.52 | 0.09 | 15.0 | 113.9 | 0.029 | 28.7 |

Event 50 yr
IDF Data Set City of Mississauga
a = 1300.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.56 | 0.10 | 15.0 | 127.6 | 0.035 | 35.1 |

Event 100 yr
IDF Data Set City of Mississauga
a = 1450.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.59 | 0.10 | 15.0 | 142.4 | 0.041 | 40.8 |

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Prepared By: M.P.

**Rational Method**
**Post-Development Flow Calculation**

1489 Hurontario Street, Mississauga
File No.: 21-0007MI
Date: February 2025

**Time of Concentration Calculation**

| Area Number | Area (ha) | C | A*C | Tc Town Min (min) |
|---|---|---|---|---|
| TOTAL | 0.17 | 0.64 | 0.11136 | 15 |

**Rational Method Calculation**

Event 2 yr
IDF Data Set City of Mississauga
a = 610.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.64 | 0.11 | 15.0 | 59.9 | 0.019 | 18.7 |

Event 5 yr
IDF Data Set City of Mississauga
a = 820.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.64 | 0.11 | 15.0 | 80.5 | 0.025 | 25.1 |

Event 10 yr
IDF Data Set City of Mississauga
a = 1010.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.64 | 0.11 | 15.0 | 99.2 | 0.031 | 30.9 |

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Prepared By: M.P.

**Rational Method**
**Post-Development Flow Calculation**

1489 Hurontario Street, Mississauga
File No.: 21-0007MI
Date: February 2025

**Time of Concentration Calculation**

| Area Number | Area (ha) | C | Tc Town Min (min) |
|---|---|---|---|
| TOTAL | 0.17 | 0.64 | 15 |

**Rational Method Calculation**

Event 25 yr
IDF Data Set City of Mississauga
a = 1160.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.70 | 0.12 | 15.0 | 113.9 | 0.039 | 39.1 |

Event 50 yr
IDF Data Set City of Mississauga
a = 1300.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.77 | 0.13 | 15.0 | 127.6 | 0.048 | 47.8 |

Event 100 yr
IDF Data Set City of Mississauga
a = 1450.00
b = 4.60
c = 0.7800

| Area Number | A (ha) | C | AC | Tc (min) | I (mm/h) | Q (m3/s) | Q (L/s) |
|---|---|---|---|---|---|---|---|
| TOTAL | 0.17 | 0.80 | 0.14 | 15.0 | 142.4 | 0.055 | 55.5 |

**Project:** 1489 Hurontario Street - Mississauga
**Proj. No.:** 21-0007MI
**Date:** February 12, 2025

## DETERMINE MAX. ALLOWABLE GALLERY DEPTH

| | | | |
|---|---|---|---|
| Infiltration Rate (i) | 20 | mm/hr | (typical for sandy loam soils) |
| Factor of Safety (FS) | 2.5 | | |
| Void Ratio ($V_r$) | 0.4 | | |
| Time to drain ($t_s$) | 48 | hrs | (max allowed) |

$Dr_{max}$ = max stone depth (mm)

$Dr_{max} = i * t_s / V_r$ (From LID Manual)

$Dr_{max}$ = 960 mm

or 0.96 m

## DETERMINE MINIMUM GALLERY FOOTPRINT AREA REQUIREMENTS

Determine Footprint Area ($A_f$)

$A_f = Vol / (D_r * V_r)$ (From LID Manual)

| | | |
|---|---|---|
| Vol = | 6 | $m^3$ |
| Dr = | 0.9 | m |
| Vr = | 0.4 | |
| $A_f$ = | 16 | $m^2$ |

## PROVIDED INFILTRATION VOLUMES

| | | |
|---|---|---|
| Trench Length | 19.0 | m |
| Trench Width | 1.2 | m |
| Trench Depth | 0.90 | m |
| Gravel Porosity | 0.4 | |
| Footprint Area | 22.8 | $m^2$ |
| Volume | 8.2 | $m^3$ |

# APPENDIX B

SANITARY CALCULATIONS

# SANITARY FLOW CALCULATION

ESTIMATED SITE DISCHARGE

**PROJECT:** 1489 Hurontario Street
**FILE No.:** 21-0007MI
**DATE:** February 2025
**PREPARED BY:** MM

| | | |
|---|---|---|
| Site Area | 0.17 | ha |
| Infiltration Rate | 0.26 | L/s/ha * |
| Sewage Generation Rate | 290 | L/cap/day * |

* Per Region of Peel Criteria

| Land Use | Units | Area (ha) | Density (ppu or p/ha) | Population | Avg. Flow (L/s) | Peaking Factor | Peak Flow (L/s) | Infilt. (L/s) | Total Flow (L/s) |
|---|---|---|---|---|---|---|---|---|---|
| Townhomes | 9 | 0.17 | 3.4 | 31 | 0.10 | 4.35 | 0.45 | 0.04 | 0.49 |
| Total | | | | 31 | 0.10 | 4.35 | 0.45 | 0.04 | 0.49 |

# APPENDIX C

WATER SUPPLY CALCULATIONS

# WATER SUPPLY CALCULATION

urbanworks
ENGINEERING CORPORATION

**PROJECT:** 1489 Hurontario Street
**FILE No.:** 21-0007MI
**DATE:** February 2025
**PREPARED BY:** MM

| | | | |
|---|---|---|---|
| Fire Flow (residential) | 150.00 | L/s | |
| Fire Flow (commercial) | N/A | L/s | |
| Demand (residential) | 280 | L/cap/day * | 409 L/cap/day * (short term) |
| Demand (commercial) | 300 | L/cap/day * | 300 L/cap/day * (short term) |

* Per Region of Peel Criteria

## AVERAGE-DAY DEMAND

| Land Use | Units | Area (ha) | Density (ppu or p/ha) | Population | Avg. Day Demand (L/s) |
|---|---|---|---|---|---|
| Residential | 9 | | 3.4 | 31 | 0.10 |
| | | | | | |
| Total | | | | **31** | **0.10** |

## SHORT TERM DEMAND (for new development)

| Land Use | Units | Area (ha) | Density (ppu or p/ha) | Population | Avg. Day Demand (L/s) |
|---|---|---|---|---|---|
| Residential | 9 | | 3.4 | 31 | 0.15 |
| | | | | | |
| Total | | | | **31** | **0.15** |

## MAXIMUM-DAY DEMAND + FIRE FLOW (typical scenario)

| Land Use | Avg. Day Demand (L/s) | Peak Hour Demand Factor* | Peak Hour Demand (L/s) | Max. Day Demand Factor* | Max. Day Demand (L/s) | Max. Day Demand + Fire Flow (L/s) |
|---|---|---|---|---|---|---|
| Residential (typical) | 0.10 | 3.0 | 0.30 | 2.0 | 0.20 | **150.20** |
| | | | | | | |
| Total | **0.10** | | **0.30** | | **0.20** | |

* Per Region of Peel Criteria

## MAXIMUM-DAY DEMAND + FIRE FLOW (short term / new development scenario)

| Land Use | Avg. Day Demand (L/s) | Peak Hour Demand Factor* | Peak Hour Demand (L/s) | Max. Day Demand Factor* | Max. Day Demand (L/s) | Max. Day Demand + Fire Flow (L/s) |
|---|---|---|---|---|---|---|
| Residential (short term) | 0.15 | 3.0 | 0.44 | 2.0 | 0.29 | **150.29** |
| | | | | | | |
| Total | **0.15** | | **0.44** | | **0.29** | |

* Per Region of Peel Criteria

# FIRE FLOW CALCULATION

**PROJECT:** 1489 Hurontario Street
**FILE No.:** 21-0007MI
**DATE:** September 2024
**PREPARED BY:** MM

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Calculation of required fire flow is based on the Fire Underwriters Survey (FUS), Water Supply for Fire Protection publication, 1999.

$$F = 220C\sqrt{A}$$

Where: F = Requied fire flow (L/min.)

C = Coefficient related to the type of construction

- 1.5 for wood frame construction (combustible)
- 1.0 for ordinary construction (brick/masonry walls, with combustible floor & interior)
- 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)
- 0.6 for fire-resistive construction (fully protected frame, floors, roof)

A = Total floor area ($m^2$)

Includes all storeys, but excluding basements at least 50% below grade.

For fire-resistive buildings, consider the 2 largest adjoining floors plus 50% of each of any floors immediately above up to 8, when vertical openings are inadequately protected.

If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25% of eachh of the 2 immediately adjoining floors.

## BASE FIRE FLOW CALCULATION

| Floor Area Statistics | | | | | A ($m^2$) | C | (1) F (L/min.) | |
|---|---|---|---|---|---|---|---|---|
| Target Floor | | Adjoining Floors | | | | | | |
| Area | No. | Area | No. | Factor | | | | |
| 740 | 1 | 740 | 2 | 0.25 | 1,110 | 1 | 7,330 | **7,000*** |

* Rounded to nearest 1,000 L/min.

## OCCUPANCY ADJUSTMENT FACTOR

Apply to flow calcuated for (1)

| | Type | Adjustment Factor | ΔFlow | (2) Flow† |
|---|---|---|---|---|
| | Non-Combustible | -25% | -1,050 | **5,950** |
| X | Limited Combustible | -15% | | |
| | Combustible | 0% | | |
| | Free Burning | +15% | | |
| | Rapid Burning | +25% | | |

† Min. flow = 2,000 L/min.

# FIRE FLOW CALCULATION

**PROJECT:** 1489 Hurontario Street
**FILE No.:** 21-0007MI
**DATE:** September 2024
**PREPARED BY:** MM

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## SPRINKLER SYSTEM ADJUSTMENT FACTOR

Apply to flow calcuated for (2)

| Type | | Adjustment Factor | (3) ΔFlow |
|---|---|---|---|
| | Automatic Sprinker System | -30% | +0 |
| | Standard Water Supply | -10% | |
| | Fully Supervised System | -10% | |

## (4) EXPOSED STRUCTURE ADJUSTMENT FACTOR

Apply to flow calcuated for (2)

| Separation Diatance | | Adjustment Factor | (4) ΔFlow |
|---|---|---|---|
| X | 0 to 3m | +25% | +1,488 |
| | 3.1 to 10m | +20% | |
| | 10.1 to 20m | +15% | |
| | 20.1 to 30m | +10% | |
| | 30.1 to 45m | +5% | |

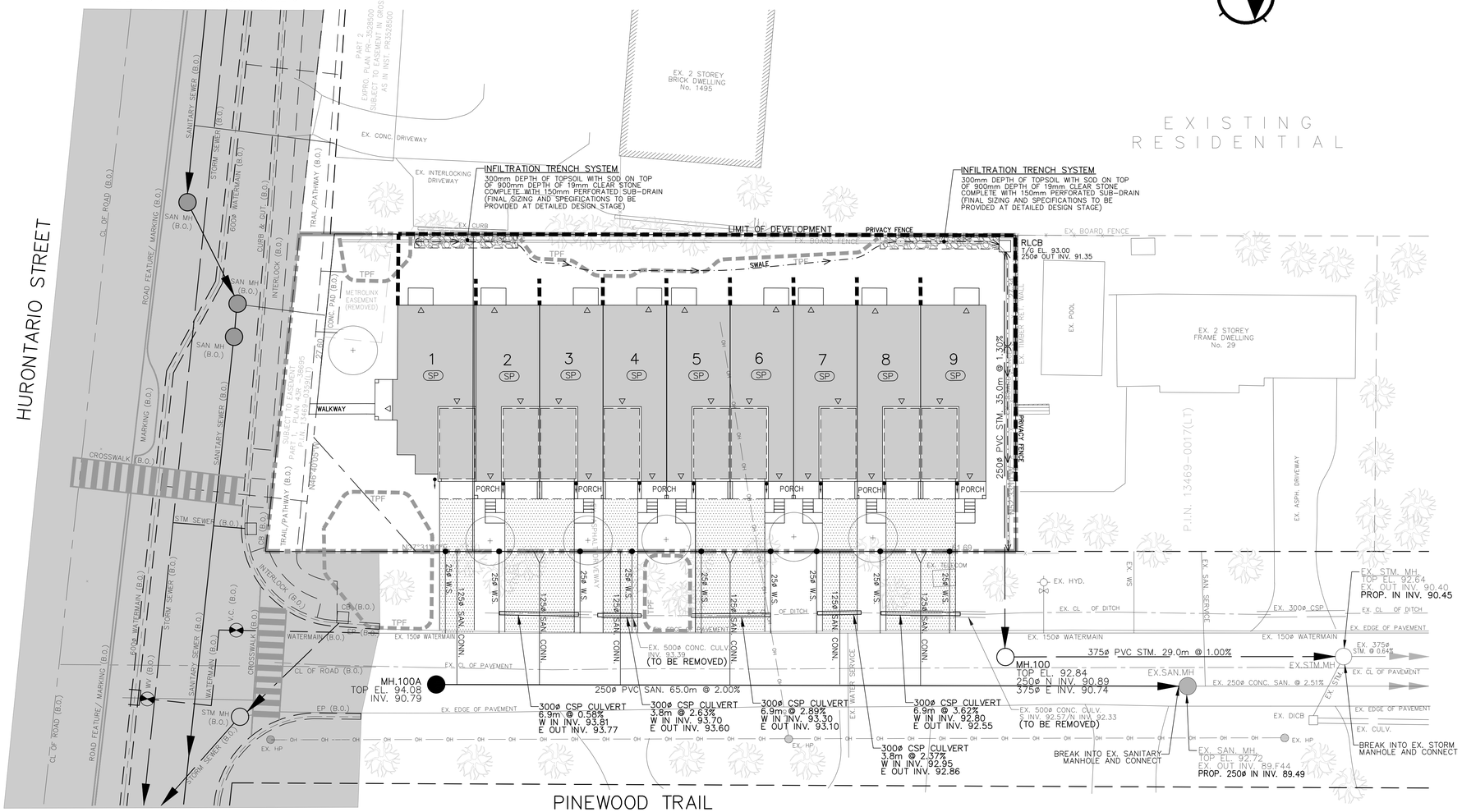
## (5) ADJUSTED FIRE FLOW

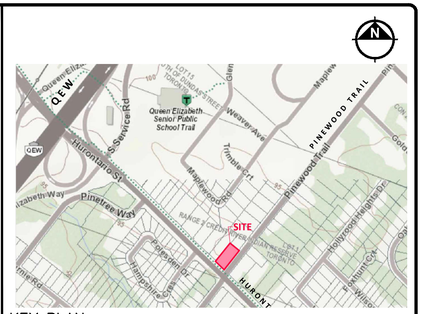
| Flow Adjustment (2) + (3) + (4) | | | Adjusted F (L/min.) | |
|---|---|---|---|---|
| = 5,950 | +0 | + 1,488 | 7,438 | **7,000*** |

* Rounded to nearest 1,000 L/min.

# APPENDIX D

ENGINEERING DRAWINGS




KEY PLAN
N.T.S.

# FUNCTIONAL DESIGN
NOT FOR CONSTRUCTION

## LEGEND

- DENOTES VALVE AND CHAMBER
- DENOTES VALVE AND BOX
- DENOTES HYDRANT
- DENOTES SINGLE CATCHBASIN
- DENOTES DOUBLE CATCHBASIN
- DENOTES SANITARY MANHOLE
- DENOTES STORM MANHOLE
- DENOTES PROPOSED TREE
- DENOTES DRIVEWAY
- (SP) DENOTES LOTS WITH FOUNDATION DRAIN CONNECTED TO SUMP PUMP
- DENOTES LIMIT OF DEVELOPMENT
- DENOTES MAX. BUILDING ENVELOPE
- DENOTES INFILTRATION TRENCH
- DENOTES TREE PROTECTION FENCE
- DENOTES PRIVACY FENCE
- DENOTES PROPOSED WORKS BY OTHERS
- DENOTES SUMP PUMP DISCHARGE LOCATION

## GENERAL NOTES:

1. THE LOCATION OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON ENGINEERING DRAWINGS, AND WHERE SHOWN THE ACCURACY OF THE LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY EXACT LOCATION AND ELEVATION OF SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITIES OF DAMAGE.
2. ALL AREAS DISTURBED DURING CONSTRUCTION TO BE RESTORED TO ORIGINAL CONDITION OR BETTER, TO THE SATISFACTION OF THE CITY OF MISSISSAUGA AND REGION OF PEEL.

## SUBMISSION HISTORY

| No. | ISSUED FOR | DATE |
|---|---|---|
| 1. | ISSUED FOR 1st SUBMISSION | AUG.26,2022 |
| 2. | ISSUED FOR 2nd ENGINEERING SUBMISSION | SEP.12,2024 |

## REVISIONS

| No. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 1. | REVISED PER SITE PLAN UPDATE DATED JUNE 2024 | M.M. | AUGUST 2024 |
| 2. | REVISED PER COORDINATION WITH METROLINX | M.M. | SEP. 12, 2024 |
| 3. | REVISED PER CITY T/W DEPT. COMMENTS OF JANUARY 2025 | M.M. | SEP. 12, 2024 |

**BENCHMARK NOTE:**
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No.709, HAVING AN ELEVATION OF 98.279 METRES.

CONSULTANT

LICENSED PROFESSIONAL ENGINEER
M.M. PAULO
100074327
FEB.18,2025
PROVINCE OF ONTARIO

MUNICIPAL APPROVAL

urbanworks
ENGINEERING CORPORATION
Toronto, Ontario, CANADA | tel. 416-503-4500
e. general@urbanworkseng.com | w. www.urbanworkseng.com

PROPOSED TOWNHOUSE DEVELOPMENT
1489 HURONTARIO STREET

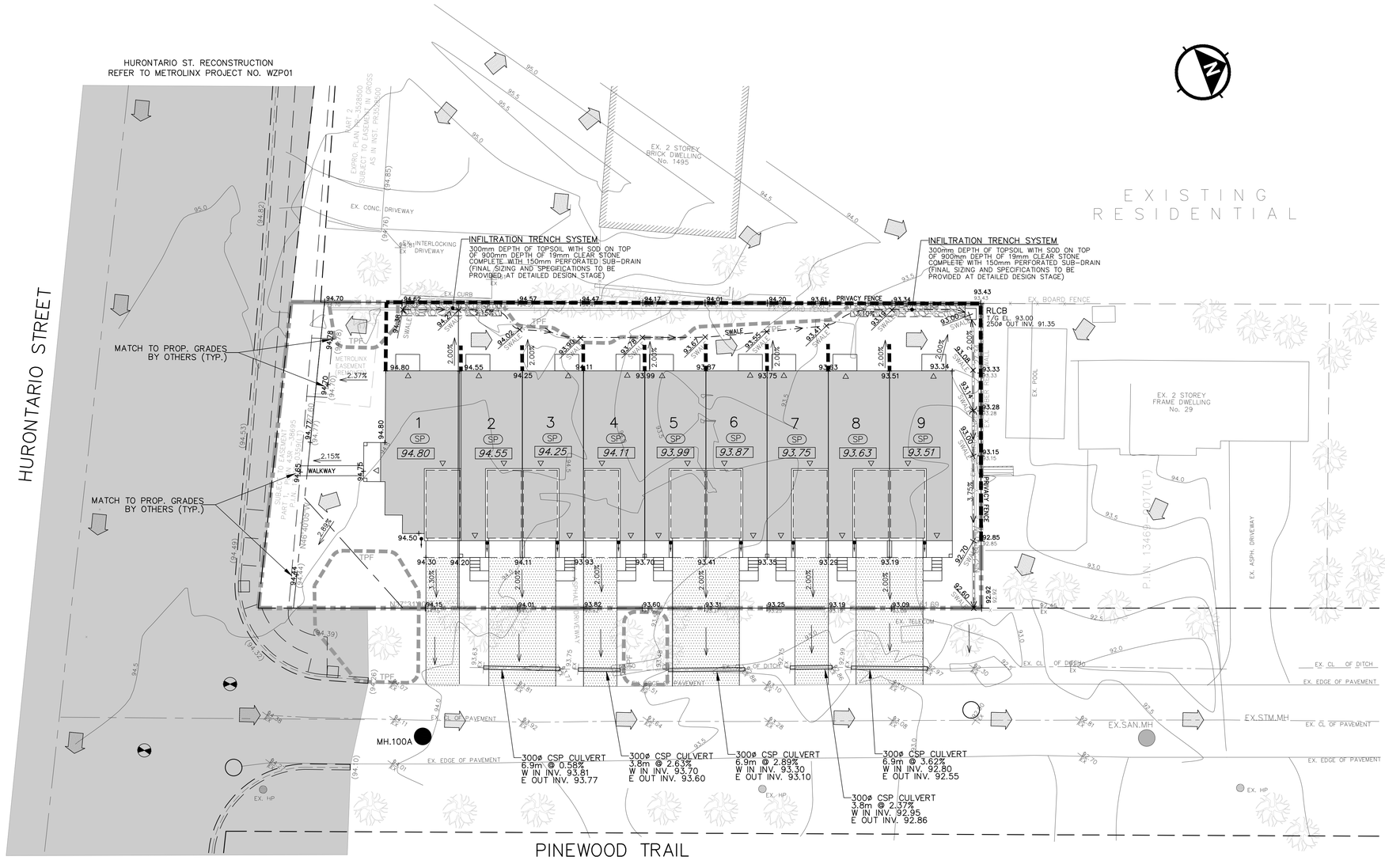
Region of Peel working with you

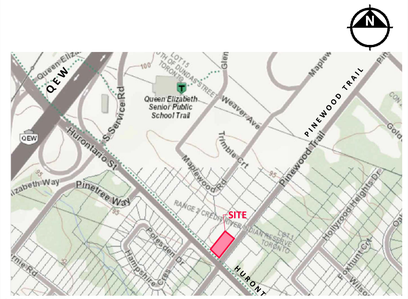
MISSISSAUGA

SCALE 0 5 10 15 20 25m

FUNCTIONAL SERVICING PLAN

| | | |
|---|---|---|
| CITY FILE: | | PROJECT No. 21-0007MI |
| REGION FILE: | | |
| DATE: AUGUST 26, 2022 | DESIGNED BY: M.M. | DWG. No. GP-01 |
| SCALE: 1:200 | DRAWN BY: M.M. | |
| | CHECKED BY: T.D. | |




KEY PLAN
N.T.S.

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- DENOTES STORM MANHOLE
- DENOTES DRIVEWAY
- (SP) DENOTES LOTS WITH FOUNDATION DRAIN CONNECTED TO SUMP PUMP
- DENOTES MAX. BUILDING ENVELOPE
- 189.52 DENOTES PROPOSED ELEVATION
- 190.14 EX. DENOTES EXISTING ELEVATION
- 300.61 DENOTES SPECIFIED LOT ELEVATION
- 188.5 DENOTES EXISTING CONTOUR
- DENOTES OVERLAND FLOW ROUTE
- DENOTES INFILTRATION TRENCH
- DENOTES TREE PROTECTION FENCE
- DENOTES PRIVACY FENCE
- DENOTES PROPOSED WORKS BY OTHERS

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PROPOSED TOWNHOUSE DEVELOPMENT
1489 HURONTARIO STREET

Region of Peel working with you

MISSISSAUGA

SCALE 0 5 10 15 20 25m

FUNCTIONAL GRADING PLAN

| | | |
|---|---|---|
| CITY FILE: | | PROJECT No. 21-0007MI |
| REGION FILE: | | |
| DATE: AUGUST 26, 2022 | DESIGNED BY: M.M. | DWG. No. GR-01 |
| SCALE: 1:200 | DRAWN BY: M.M. | |
| | CHECKED BY: T.D. | |