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Project Number 2111-001-24

FUNCTIONAL SERVICING REPORT

Regarding:

1316 Carling Avenue
Ottawa, Ontario

Prepared on behalf of:

Homestead Land Holdings Limited
80 Johnson Street
Kingston, ON K7L 1X7

By:

GERRITS ENGINEERING LIMITED
623 Fortune Crescent, Suite 230
Kingston, ON K7P 0L5

Date:

March 27, 2026

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1. Introduction

Gerrits Engineering Ltd. (GEL) has been retained by Homestead Land Holdings Limited (Client) to provide engineering services for a new 20-storey residential apartment building development located within the site identified as 1316 Carling Avenue, in the City of Ottawa (City). Included in the engineering services to be provided by GEL is this Functional Servicing Report (FSR), which is to be submitted to the City of Ottawa and other required agencies in support of Zoning By-law Amendment Approval for the subject land. The FSR will demonstrate how the proposed development will connect to the existing municipal infrastructure and manage stormwater runoff from the site. In particular, this FSR will examine the property's functional servicing with relation to:

- Water Supply
- Sanitary Sewerage
- Storm Sewerage
- Utilities

1.1. Supporting & Reference Documents

The following documents have been referenced in the preparation of this report:

- City of Ottawa Sewer Design Guidelines (2012) & technical bulletins
- City of Ottawa Design Guidelines – Water Distribution (2010) & technical bulletins
- MECP Design Guidelines for Drinking Water Systems (2008)
- MECP, Guidelines for the Design of Sanitary Sewage Works and Water Works (2008)
- MECP, Stormwater Management Planning and Design Manual (2003)
- Ontario Building Code (2024)
- Fire Underwriters Survey – "Water Supply for Public Fire Protection" (2020)

1.2. Subject Property

The property is located within the Carlington Neighbourhood in the City of Ottawa and has been assigned a civic address of 1316 Carling Avenue. The site is approximately 0.865 ha in size and is bound by Carling Avenue to the north, mixed use development and residential development to the east, Thames Street to the south, residential and commercial development to the west. The site has approximately 63 m of frontage along Carling Avenue with entrances established to provide vehicular and pedestrian access to the site from Carling Avenue at the east and west limits of the site. The legal description of the property is Part of Block 8, Part of Lot 23 and Lots 26 and 27 on the Registered Plan 221 in the City of Ottawa. A Survey Plan prepared by Annis, O'Sullivan, Vollebekk Ltd. is attached in Appendix B.

The site is currently developed with an existing 21-storey residential apartment building, which is serviced by private connections to municipal infrastructure located within the Carling Avenue right-of-way. The property is predominantly comprised of impervious surfaces, including building roof area, concrete walkways, asphalt laneways, and parking areas.

A sketch of the subject site and property boundary is provided in Figure 1 below. The base imaging for Figure 1 is provided from the City of Ottawa GeoOttawa website using the 2022 Basemap Imagery.

Figure 1 – Subject Property

1.3. Proposed Land Use

The proposed development consists of the construction of a 20-storey residential apartment building within the southern portion of the property. The building will contain a total of 201 dwelling units, including 58 one-bedroom units, 11 one-bedroom plus den units, 109 two-bedroom units, and 23 two-bedroom plus den units, with a total gross floor area of approximately 16,362 m². The development will provide approximately 2,240 m² of amenity space, including private balconies, indoor amenity areas, and outdoor terraces. In addition, approximately 826 m² of land is proposed to be conveyed to the City of Ottawa for parkland purposes. A site plan prepared by Alexander Wilson Architect Inc., dated March 24, 2026, is included in Appendix B.

Table 1 – Residential Building Unit Count

Unit Type	Unit Count
One Bedroom	58
One Bedroom + Den	11
Two Bedroom	109
Two Bedroom + Den	23
Total	**201**

2. Servicing

2.1. Overview

Reference documents and record drawings have been collected from the City of Ottawa for review to determine the existing municipal infrastructure adjacent to the site available to provide servicing for the proposed development. Review of City of Ottawa Drawings for Carling Avenue and Thames Street indicates that there is existing infrastructure available to provide services for the development, which is to be confirmed through analysis and calculations in subsequent sections of this report.

It is proposed to retain the existing services provided to the existing 20-storey residential building from the infrastructure within the Carling Avenue right-of-way and to construct new services for the proposed development by connections to the infrastructure within the Thames Street right-of-way.

The Development's internal water distribution and wastewater collection systems will be constructed as per the City of Ottawa, Ontario Building Code (OBC) and Ministry of Environment, Conservation and Parks (MECP) design guidelines. It is proposed to service the Development by completing connections to the City's water and sanitary distribution & collection systems adjacent to the site as per City of Ottawa standards. The site's internal water distribution system will be designed to account for domestic and fire protection requirements, and the internal wastewater collection system will be designed to convey the calculated design peak flows.

2.2. Design Criteria

The City of Ottawa Design Guidelines as referenced in Section 1.1, provide estimated per capita flows for domestic water and sanitary demand calculations including max day and peak hour factors. A summary of the water and wastewater design criteria is as follows:

Serviced Population

- Density – Apartments One Bedroom = 1.4 ppu
- Density – Apartments Two Bedroom = 2.1 ppu
- Development residential population = 374 pers

Wastewater Criteria

- Average Day Flow (ADF) Residential = 280 L/c/d
- Peak Hour Factor = Harmon
- Infiltration Allowance = 0.33 L/s/ha

Water Criteria

- Average Day Demand (ADD) Residential = 280 L/c/d
- Max Day Demand (MDD) = 2.5 x ADD
- Max Hour Demand (MHD) = 2.2 x MDD
- Minimum pressure in system = 345 kPa
- Maximum pressure in system = 552 kPa

- Minimum pressure in system at Peak Hour demand = 280 kPa
- Minimum pressure in system at Fire + MDD = 140 kPa

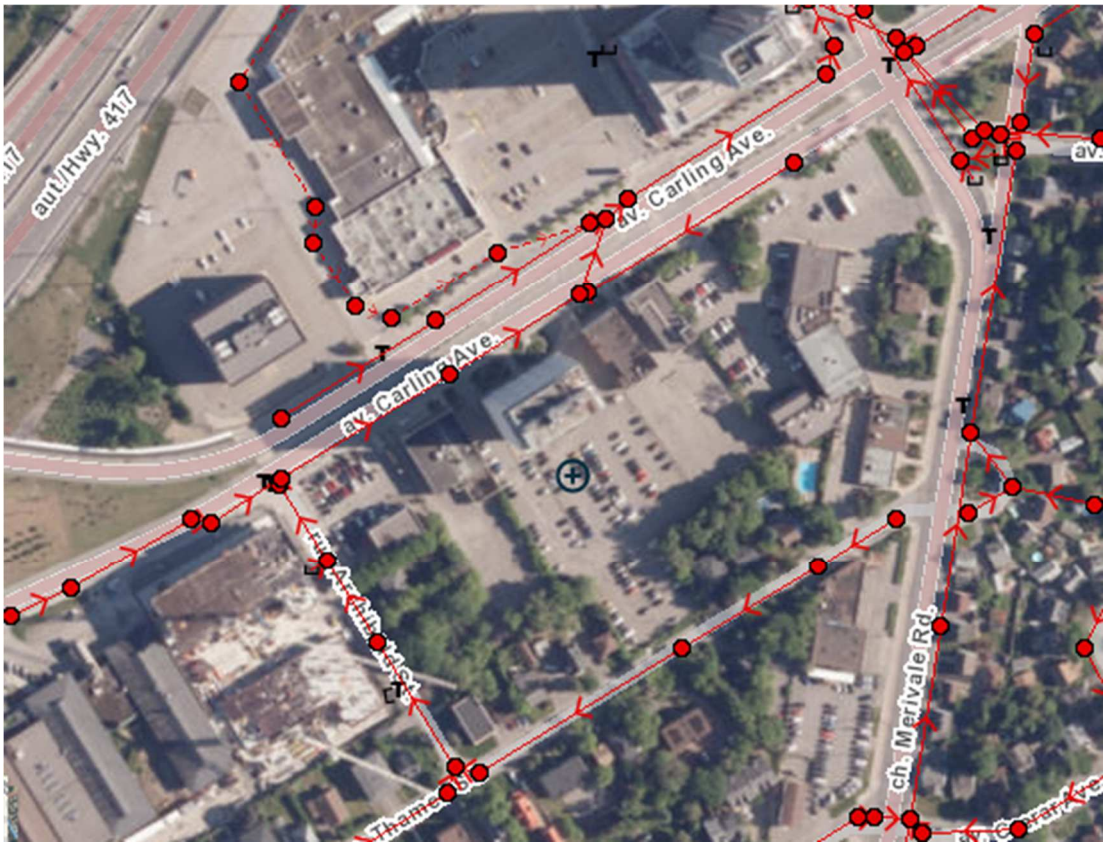
2.3. Sanitary Servicing

The projected average day (including extraneous flows) and peak sanitary sewage flow from the proposed development is calculated in Appendix A and summarized in Table 2 below.

Table 2 – Design Wastewater Flows

Average Day Demand (Design)	1.5	L/s
Peak Hour Flow (Design)	4.4	L/s

The anticipated peak wastewater design flows for the proposed development are to be reviewed by City of Ottawa Staff and incorporated into the municipal sanitary sewer system model to determine that there is sufficient capacity within the receiving sewer system downstream of the site. A depiction of the municipal infrastructure adjacent to the site is provided below. The site wastewater will be discharged to the existing Thames Street municipal sanitary sewer, which conveys flow west along Thames Street, north along Archibald Street and finally discharging to the 900 mm Concrete Trunk Sewer within the Carling Avenue right-of-way.



2.3.1. Proposed Sanitary Connection Point

It is proposed that sanitary servicing for the 20-storey residential building be provided via a pre-manufactured tee connection to the existing municipal 300 mm diameter PVC sanitary sewer located within the Thames Street right-of-way. The proposed works include the construction approximately 8.3 m of 150 mm diameter PVC sanitary sewer to a new sanitary monitoring manhole located at the property line.

The City of Ottawa drawings indicate that the existing 300 mm PVC municipal sanitary sewer is sloping at 1%, which has capacity to convey up to 96.7 L/s when flowing full. The peak sanitary flows from the site, calculated as 4.4 L/s, represents 4% of the total municipal sanitary pipe capacity and it is anticipated that the additional sanitary loading from the site will have no adverse effects on the municipal sanitary sewer system.

2.3.2. Internal Sanitary Collection System

The proposed internal sanitary sewer piping consists of 150 mm diameter PVC DR 35 installed at a gradient of 1% with a minimum ground cover of 2 m. The calculated full-flow capacity of the sewer is 15.2 L/s, which exceeds the peak sanitary demand of 4.4 L/s. The peak sanitary flow represents approximately 29% of the full-flow capacity, corresponding to a velocity of 0.75 m/s under design flow conditions.

A full port type backwater valve will be required within the building in an area that is accessible and permits room for maintenance, in accordance with Section 4.4.5 “Sanitary Backwater Valves” of the City of Ottawa Sewer Design Guidelines (2012) & technical bulletins. The backwater valve will be designed and specified by the mechanical engineer.

Sanitary sewers are proposed to be constructed in accordance with the City of Ottawa, the Ontario Building Code and the MECP guidelines to service the Development. Pipe materials are specified to meet approved materials having CSA approval such that PVC DR 35 pipe is used for gravity sewers. The proposed sewers are designed such that they meet minimum (0.6 m/s) and maximum (3.0 m/s) velocities under design flow and full flow conditions. Additionally, the Ontario Building Code Subsection 7.4.7.2 “Size and Spacing of Cleanouts” specifies that the developed length of a building sewer between the building and the first manhole shall not exceed 30 m. The minimum manhole diameter will be 1200 mm, with larger structures being incorporated as required in accordance with Ontario Provincial Standard Specifications (OPSS).

2.4. Water Supply and Distribution

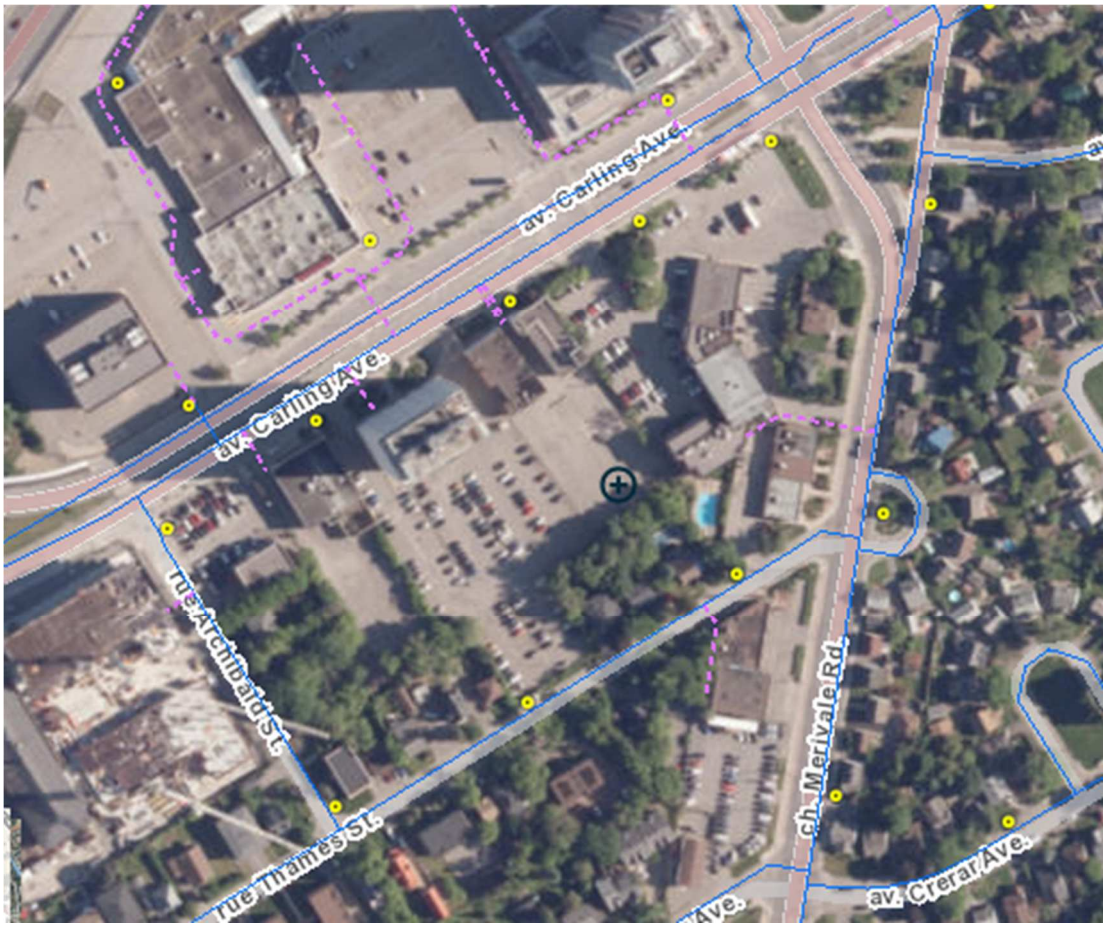
2.4.1. Domestic Water Analysis

The projected daily average, maximum day, and peak hourly water demand flows from the subject property are calculated in Appendix A and summarized in Table 3 below.

Table 3 – Design Water Flows

Average Daily Demand (Design)	1.2	L/s
Maximum Day Demand (Design)	3	L/s
Peak Hour Flow (Design)	6.7	L/s

The water demand design flows for the proposed development are to be reviewed by City of Ottawa Staff and incorporated into the municipal watermain system model to determine that there is sufficient capacity within existing system. A depiction of the municipal infrastructure adjacent to the site is provided below. There is an existing 200 mm PVC municipal watermain on Thames Avenue, which is looped from Archibald Street (150 mm) and Merivale Road (300 mm) to the Carling Avenue watermain (400 mm). It is requested that the boundary conditions be provided by the City of Ottawa to assist in the evaluation of the pressures anticipated within the water services for both the domestic and fire service.



2.4.2. Fire Flow Analysis

The fire flow analysis and demand calculations are completed in accordance with the 2020 version of "Water Supply for Public Fire Protection" prepared by the Fire Underwriters Survey (FUS). The subject building is 20-storeys in height with a residential occupancy. The subject building will be constructed such that it will be classified as non-combustible construction (Type II) with protected vertical openings. In addition, the building will be equipped with a standard water supply and a fully supervised sprinkler system designed and constructed in accordance with NFPA 13 standards as well as tested and maintained in accordance with NFPA 25 standards. The Effective Area for Type II buildings is to be calculated as 25% of the largest floor area plus the area of the two immediately adjoining floors. This results in a Total Effective Area of approximately 3,202 m^2. The minimum fire flows for this specific building and projected occupancy are calculated in Appendix A and summarized as 83 L/s at 20 Psi.

The closest municipal hydrant to the proposed building is Hydrant 364027H246, located at the southwest property corner within the municipal right-of-way on the north side of Thames Street. The 150 mm hydrant lead is connected to the 200 mm PVC DR 18 municipal watermain within the Thames Street right-of-way and is representative of the available flows from the water distribution system to service the proposed development. The hydrant has a light blue bonnet indicating available flows of 94.6 L/s or greater but is limited to a maximum capacity of 94.6 L/s in accordance with Table 18.5.4.3 of the City of Ottawa Design Guidelines – Water Distribution (2010) & technical bulletins for hydrants with distances less than 76 m to the building. The anticipated flow of 94.6 L/s is larger than the calculated minimum fire flow requirement and therefore it is anticipated that the adjacent infrastructure has capacity to service the development. A hydrant flow test will be required at the Site Plan Control application stage to confirm available fire flows at Hydrant 364027H246.

The building is to be sprinklered and equipped with a Siamese fire department connection at the main entrance along the eastern wall. A private hydrant for the site is required to meet the Ontario Building Code Section 3.2.5.16 requirements with respect to distance from the hydrant to the fire department connection such that the distance is less than 45 m. The hydrant is required to be tested and rated prior to occupancy. Refer to the servicing plans attached in Appendix B for the proposed hydrant location and details.

2.4.3. Proposed Water Connection Point

It is proposed that water servicing to the 20-storey residential building be made by providing two connections (domestic and fire) to the existing municipal 200 mm PVC DR 18 watermain within the Thames Street right-of-way via live tap and sleeve in accordance with City of Ottawa requirements. The domestic water line will be 100 mm in size with a gate valve at the property line and the fire line will be a 150 mm service with a gate valve at the property line as per the City of Ottawa requirements.

2.4.4. Internal Water Distribution System

As per section 10 of the MECP Design Guidelines for Drinking-Water Systems 2008, the watermain or large diameter service is to be sized based on the larger calculated flow of the max day demand plus fire flow or the peak hour flow alone. For this specific site, the larger flow is the resultant of the max day demand plus fire flow which is equal to 86 L/s. It is proposed to connect to the 200 mm PVC DR 18 Municipal watermain within the Thames Street right-of-way and install new 100 mm (domestic) and 150 mm (fire) PVC water services with a minimum ground cover of 2.4m. The 100 mm domestic water service ensures that the maximum velocity under normal operating conditions (average and maximum day demands) will not exceed 1.5 m/s and the turnover time will be less than 2.5 minutes. All water servicing systems will be constructed and tested in accordance with the City of Ottawa, Ontario Building Code, NFPA 24 and MECP Guidelines.

3. Storm Drainage and Stormwater Management

A key component of the Development is the need to address environmental and related Stormwater Management (SWM) issues. These are examined in a framework aimed at meeting the City of Ottawa, Rideau Valley Conservation Authority (RVCA), and MECP requirements. SWM parameters have evolved from an understanding of the location and sensitivity of the site's natural systems.

It is understood that the objectives of the SWM plan are to:

- Protect life and property from flooding and erosion.
- Maintain water quality for ecological integrity, recreational opportunities etc.
- Protect and maintain groundwater flow regime(s).
- Protect aquatic and fishery communities and habitats.
- Maintain and protect significant natural features.
- Protect and provide diverse recreational opportunities that are in harmony with the environment.

3.1. Existing Drainage Conditions

The subject site is approximately 0.865 ha in size and can be characterized as a single catchment. The majority of the site consists of impermeable surface areas comprised of building roofs, concrete walkways, paved asphalt laneways and asphalt parking lot. The site is generally sloped from south to north, with stormwater captured and conveyed by on-site catchbasins and storm sewers, which is ultimately discharged to the municipal storm sewer located in the Carling Avenue right-of-way. In the event the storm sewers are blocked, or the design capacity is exceeded, flows are conveyed by overland and shallow concentrated flows to the Carling Avenue right-of-way via the paved laneways to the west and east of the site. The pre-development drainage areas are described below and depicted in drawing STM-1 attached in Appendix B.

Referring to the MECP Stormwater Management Planning and Design Manual (2003), we determine the runoff coefficient for the existing drainage conditions as follows:

Subject Site

Building	=	848 m^2	R	=	0.90	AR	=	763
Concrete	=	282 m^2	R	=	0.90	AR	=	254
Asphalt	=	6,389 m^2	R	=	0.90	AR	=	5,750
Grass	=	1,134 m^2	R	=	0.25	AR	=	284
					Total	AR	=	7,051

Site Area = 8,653 m^2 AR = 7,051 m^2 Weighted R = 0.86

3.2. Proposed Drainage Conditions

Post-development imperviousness will be reduced relative to existing conditions; however, in accordance with City of Ottawa Pre-Consultation Meeting feedback, site runoff is to be controlled to a rate less than the 5-year peak flow based on an equivalent runoff coefficient of 0.50. The majority of the site (7,762 m^2) will drain via overland and shallow concentrated flow to the proposed on-site drainage system and be conveyed through the storm sewer network to the stormwater management facilities, consisting of quantity control (orifice and subsurface storage) and quality control (oil-grit separator), prior to discharge to the Carling Avenue municipal storm sewer. The parkland block (891 m^2) located south of the proposed building will drain to the Thames Street right-of-way and be collected by the municipal storm system. Detailed stormwater management design for the parkland block will be completed separately by the City. Post-development drainage areas are illustrated on Drawing STM-2 in Appendix B.

Area P-1

The sub catchment Area P-1 consists of approximately 0.13 ha and has a corresponding runoff coefficient equivalent to 0.90. The roof drainage from each roof level will be conveyed to Zurn ZCF130 roof drains equipped with weirs to restrict a maximum flow rate of 1.55 L/s when the maximum ponding height of 150 mm is reached. The roofs will be equipped with scuppers to provide an emergency overflow route in the event the design storm event is exceeded, or a roof drain becomes blocked.

Area P-2

The sub catchment Area P-2 consists of approximately 0.10 ha and has a corresponding runoff coefficient equivalent to 0.72. The area consists of asphalt, concrete sidewalk and landscape area that drains by overland flows to Storm Inlet 1. The storm inlet collects and conveys flow through the internal building storm sewer system, which is tributary to the on-site quantity and quality control infrastructure prior to discharging to Carling Avenue municipal storm sewer system.

Area P-3

The sub catchment Area P-3 consists of approximately 0.06 ha and has a corresponding runoff coefficient equivalent to 0.85. The area consists of asphalt, concrete sidewalk and landscape area that drains by overland flows to Storm Inlet 2. The storm inlet collects and conveys flow through the internal building storm sewer system, which is tributary to the on-site quantity and quality control infrastructure prior to discharging to Carling Avenue municipal storm sewer system.

Area P-4

The sub catchment Area P-4 consists of approximately 0.15 ha and has a corresponding runoff coefficient equivalent to 0.79. The area consists of asphalt, concrete sidewalk and landscape area that drains by overland flows to Storm Inlet 3. The storm inlet collects and conveys flow through the internal building storm sewer system, which is tributary to the on-site quantity and quality control infrastructure prior to discharging to Carling Avenue municipal storm sewer system.

Area P-5

The sub catchment Area P-5 consists of approximately 0.03 ha and has a corresponding runoff coefficient equivalent to 0.90. The area consists of asphalt, concrete sidewalk and landscape area that drains by overland flows to an existing catchbasin on the site. The existing catchbasins collects and conveys flow through the existing on-site sewer system that ultimately discharges to Carling Avenue municipal storm sewer system.

AREA P-6

The sub catchment Area P-6 consists of approximately 0.03 ha and has a corresponding runoff coefficient equivalent to 0.78. The area consists of asphalt and landscape area that drains by overland flows to the sewer trench drain at the bottom of the ramp down to the underground parking structure. The trench drain collects and conveys flow through the internal building storm sewer system, which will be pumped to the outlet storm sewer, which drains by gravity to the on-site quantity and quality control infrastructure prior to discharging to Carling Avenue municipal storm sewer system.

AREA P-7

The sub catchment Area P-7 consists of approximately 0.07 ha and has a corresponding runoff coefficient equivalent to 0.44. The area consists of concrete sidewalk and landscape area that drains by overland flows to Storm Inlet 4. The storm inlet collects and conveys flow through the internal building storm sewer system, which is tributary to the on-site quantity and quality control infrastructure prior to discharging to Carling Avenue municipal storm sewer system.

AREA P-8

The sub catchment Area P-8 consists of approximately 0.006 ha and has a corresponding runoff coefficient equivalent to 0.63. The area consists of concrete patio and landscape area that drains by overland flows to Storm Inlet 5. The storm inlet collects and conveys flow through the internal building storm sewer system, which is tributary to the on-site quantity and quality control infrastructure prior to discharging to Carling Avenue municipal storm sewer system.

AREA P-9

The sub catchment Area P-9 consists of approximately 0.26 ha and has a corresponding runoff coefficient equivalent to 0.26. The area is to be conveyed to the City of Ottawa as a parkland block and will be designed and subjected to stormwater management as part of a future development application. The area as conveyed is entirely landscaped area and is not subject to quantity or quality control. The area conveys stormwater drainage by overland flows and is tributary to the Thames Street right-of-way, where it will be collected by curbline catchbasins and conveyed through the municipal storm sewer infrastructure.

AREA P-10

The sub catchment Area P-10 consists of approximately 0.21 ha and has a corresponding runoff coefficient equivalent to 0.78. The area is presently developed, and no further development is proposed. The area consists of an existing high-rise apartment building, concrete walkways, asphalt lanes/parking and landscaped area. There is an existing system of catchbasins and storm sewers that collect runoff from the area and convey flows through the on-site storm sewer system prior to discharging to the Carling Avenue municipal storm sewer system.

As per the proposed site's statistics, the post development weighted runoff coefficient is:

Subject Site

Grass	=	2,773 m^2	R	=	0.25	AR	=	693
Asphalt	=	2,669 m^2	R	=	0.90	AR	=	2,402
Building	=	2,048 m^2	R	=	0.90	AR	=	1,843
Concrete	=	1,163 m^2	R	=	0.90	AR	=	1,047

Site Area = 8,653 m^2 AR = 5,985 m^2 Weighted R = 0.69

3.3. Hydrology Model Results

Given the size of the site (less than 12 ha), the Rational Method will be used to determine the existing and anticipated SWM release rates:

Catchment Area	= 0.865 ha
Runoff Coefficient	= 0.86 (*existing condition*)
	= 0.69 (*proposed condition*)
Time of Concentration (t_c)	= 10 minutes
Rainfall Intensity	= MacDonald Cartier Airport (1966-1997)
Peaking Factor (C_i)	= 1.00 (2 to 10 year design periods)
	= 1.10 (25 year design period)
	= 1.20 (50 year design period)
	= 1.25 (100 year design period)
Peak Runoff Rate (Q_r)	= C x I x A x 360^{-1}

The detailed stormwater calculations for the subject site tributary to Carling Avenue and Thames Street stormwater infrastructure are provided in Appendix A and summarized in Table 4 and 5, respectively, below:

Table 4 – Existing & Post Development Release Rates to Carling Avenue

	2 year (L/s)	5 year (L/s)	10 year (L/s)	25 year (L/s)	50 year (L/s)	100 year (L/s)
Existing Condition	158	215	252	328	400	460
Post Development	128	173	203	265	322	371

Table 5 – Existing & Post Development Release Rates to Thames Street

	2 year (L/s)	5 year (L/s)	10 year (L/s)	25 year (L/s)	50 year (L/s)	100 year (L/s)
Existing Condition	0	0	0	0	0	0
Post Development	5	7	8	10	12	14

The parkland area is to be designed and developed by the City of Ottawa in future. The stormwater infrastructure and control systems will be designed and specified at the discretion of the City of Ottawa and are not included in the proposed development works or stormwater management calculations.

3.4. Stormwater Quantity Control

Although post-development peak runoff rates are reduced relative to existing conditions, they exceed the allowable release rates in accordance with City of Ottawa criteria. Accordingly, quantity control is required to limit post-development discharge to the 5-year peak runoff rate based on an equivalent runoff coefficient of 0.50. Site quantity controls are proposed to be implemented through the following measures:

- Controlled roof drains and rooftop storage
- A storm sewer network directed to an underground GreenStorm Chamber System that provides subsurface attenuation storage, and discharges at a controlled rate through a pipe orifice.

The stormwater runoff from the new roof areas (1,331 m^2) will be conveyed to the controlled roof drains, each equipped with 1 weir and having a maximum release rate of 1.55 L/s. The roof drains are preliminary at this stage, and it is anticipated that a maximum of 10 roof drains is to be permitted. No single drain is collecting an area larger than 255 m^2 and a maximum ponding height of 0.15 m at the drain location. Calculations of available storage capacities and a rating curve reflecting the controlled roof system are provided in Appendix A.

Stormwater runoff from the remainder of the controlled site area (4,383 m^2) is directed to on-site drains and catchbasins by overland flows. The stormwater runoff is then conveyed through the on-site storm sewer network to the proposed subsurface quantity control system. The GreenStorm system is approximately 1 m in height with a base area of 96 m^2, which provides approximately 95 m^3 of subsurface storage upstream of the proposed pipe orifice discharge.

The outlet pipe orifice is sized using the following equation:

$Q = cA\sqrt{2gh}$

Q = allowable release rate
A = orifice area = 0.012 m^2 (125 mm dia)
c = orifice coefficient = 0.82
g = gravitational constant = 9.81m/s^2
h = high water level over center of orifice

Applying the above equation, we find that a 125 mm orifice pipe will restrict the flows such that the controlled stormwater flows from the site are at a rate of less than the allowable release rates for all storm events up to the 100-year event. The Allowable and Post Development controlled release rates for the subject site are provided in Appendix A and summarized in Table 6 below.

Table 6: Controlled Post Development Release Rates

	2 year (L/s)	5 year (L/s)	10 year (L/s)	25 year (L/s)	50 year (L/s)	100 year (L/s)
Allowable	125	125	125	125	125	125
Post Development (Controlled SWM)	46	62	71	90	108	123
Storage Required (m^3)	29	40	47	63	78	91

The required storage volume to attenuate runoff to the specified release rates is 91 m^3, while the proposed subsurface GreenStorm storage system provides a total storage volume of 95.6 m^3, thereby meeting and exceeding the design requirement. The attenuation of peak flow release rates to the Carling Avenue municipal storm sewer infrastructure is not anticipated to result in any adverse impacts.

Further investigation of the existing on-site storm sewer system is required to identify any infrastructure providing quantity or quality control. Proposed connections to existing infrastructure will be reviewed through field observations for feasibility and confirmed through the Site Plan Approval process. Should suitable connections not be available, alternative connections to the municipal storm sewer system will be identified to facilitate discharge from the proposed development.

3.5. Stormwater Quality Control During Construction

To ensure stormwater quality control during construction, it is imperative that effective environmental and sedimentation controls be in place throughout the entire area subject to construction activities. With the requirement of earth grading, there will be a potential of soil erosion. It is therefore recommended that the following be implemented to assist in achieving acceptable stormwater runoff quality:

- Restoration of exposed surfaces with vegetation and non-vegetative material as soon as construction schedules permit;
- Installation of filter strips, silt fences and rock check dams or other similar facilities throughout the site, and specifically during all construction activities;
- Reduce stormwater drainage velocities where possible;

- Ensure that disturbed areas that are left inactive for more than 45 days shall be vegetated and stabilized as instructed by the Engineer;
- Minimize the amount of existing vegetation removed.

3.6. Permanent Quality Control

The objective of the permanent SWM quality controls will be to ensure MECP's Enhanced Protection as per comments provided by the City of Ottawa in the Pre-Consultation Meeting feedback. As per the site's statistics, the post development Total Imperviousness is calculated as follows:

Impervious Area = 5,880 m^2
Total Area = 8,653 m^2

$TIMP = A_{IMP} / A_{Total}$
$= (A_{ASPH} + A_{BLDG} + A_{CONC}) / A_{Total}$
$= 5,880\ m^2 / 8,653\ m^2$
$= 68\%$

To appropriately represent the distribution of pollutant loading across the site, an equivalent effective Total Suspended Solids (TSS) removal rate has been assigned to the various surface areas. This approach recognizes that TSS loading is not uniformly distributed across the entire site, and that treatment efficiencies should reflect the relative pollutant contribution of each drainage surface (i.e., TSS cannot be removed from areas that are not significantly loaded).

Pervious surface areas are not typically subjected to direct TSS loading and are considered to generate clean runoff not subject to quality control measures. For the purposes of the water quality calculations for the site runoff, pervious areas are assigned an equivalent effective TSS removal rate of 100%.

Approximately one-third of the site consists of impermeable surface area made up of asphalt and concrete. These areas are typically subject to winter maintenance and operations including salting and sanding, which generates significant TSS loading. These areas do not naturally provide TSS removal and are assigned an equivalent effective TSS removal rate of 0%. It is proposed to provide quality control for a large portion of the impervious site area through the implementation of an oil and grit separator downstream of the on-site sewer system prior to discharging to the municipal storm sewer system within the Carling Avenue right-of-way.

The roof areas of the two buildings total approximately 2,048 m^2. Runoff from roof area is generally considered relatively clean as it is primarily exposed to atmospheric deposition and not typically subject to vehicular contaminants or winter maintenance operations such as salting and sanding. As noted in Section 3.4 of the MECP Stormwater Management Planning and Design Guidelines, roof drainage is commonly treated as low-contaminant runoff. The roof areas are assigned an equivalent effective TSS removal rate of 95%.

The resulting calculations are summarized in Table 7.

Table 7 – Water Quality

Surface	Control Measure	Area (m2)	$A_{surface}/A_{total}$ (%)	Equivalent Effective TSS Removal (%)	Total TSS Removal (%)
Impervious	Uncontrolled	842	9.7	0	0
Impervious	OGS	2,990	34.6	65	22.5
Pervious	Uncontrolled	2,773	32	100	32
Building Roof	Uncontrolled	2,048	23.7	95	22.5
Total	Uncontrolled	8,653	100		77

As summarized in Table 7, the proposed site surface areas and quality control measures achieve an overall TSS removal efficiency of approximately 77%, representing a minor shortfall relative to the MECP Enhanced Level Protection target. This assessment includes existing developed areas of the site that are not subject to redevelopment. Given the limited opportunity to implement additional quality control measures without significant disruption to these areas, no further quality control is proposed or recommended.

3.7. Erosion and Sediment Control

To ensure Stormwater runoff quality is controlled during construction, an erosion and sediment control strategy will be implemented to mitigate transportation of silt off-site to the existing roads, sewers and waterbodies. It is imperative that effective controls be put in place and maintained until all areas are stabilized with surface cover. All erosion and sediment control Best Management Practices (BMP) shall be designed, constructed and maintained where possible. Items that will be addressed for both temporary and permanent erosion and sediment controls are based on the following:

- Site location description, area and vegetative cover;
- Existing and proposed land use and drainage routes;
- Proposed site works and outlets;
- Permits required;
- Sediment filters and barriers - silt fences, catchbasin covers and ditch protection;
- Construction entrance location;

To prevent construction generated sediments from entering the storm sewers or leaving the site by overland flow, the following measures should be implemented during the construction phase:

- Temporary sediment control fencing should be erected around the perimeter of the grading activities.
- Temporary sediment fabric and stone filters should be installed on existing and proposed catch basins until surface cover has been stabilized.
- A temporary construction access mud mat should be implemented to reduce the amount of materials that may be transported off site.
- Construction during drier months should be monitored for wind-borne transport of sediments. At the direction of the engineer, the contractor may be directed to water down exposed earth areas with an aqueous solution of calcium chloride.
- All disturbed areas not under immediate construction for 45 days, or not intended for building activities within a 3-month time period, should be stabilized with seeding.
- Built up sediment should be removed and disposed off-site at least once a month, or more frequently as directed by the engineer.

Details have been provided on drawing ESC-1 and can be found in Appendix B.

4. Conclusions

A summary of the servicing recommendations are as follows:

- **Water Servicing** – The proposed development will be serviced via connection to the existing 200 mm PVC municipal watermain on Thames Street. A new 100 mm diameter PVC DR18 domestic water service and a 150 mm diameter PVC DR18 fire service are proposed to satisfy both domestic and fire flow demands. A private hydrant will be provided on-site in accordance with applicable standards.

- **Sanitary Servicing** – The proposed development will be serviced via connection to the existing 300 mm PVC municipal sanitary sewer on Thames Street. Approximately 8.3 m of 150 mm diameter PVC DR35 sanitary service is proposed from the municipal connection to a sanitary monitoring manhole at the property line, with an additional 17 m of 150 mm diameter PVC DR35 service extending to the building for connection to the internal mechanical system.

- **Stormwater Drainage and Management** – The site grading and servicing design has been developed to generally maintain existing drainage patterns and flow regimes. Runoff will be conveyed to the on-site storm sewer system and directed through proposed quantity and quality control measures to ensure controlled discharge to the municipal storm sewer system with no anticipated adverse impacts.

The analysis and conceptual design outlined in this report demonstrates that the servicing of this proposed Development is feasible, is based on sound engineering principles and, the development will become a cohesive part of the City of Ottawa.

All of which is respectfully submitted,

Gerrits Engineering Ltd.

Dan LeBlanc, P.Eng.
Civil Engineer

Appendix A
Design Calculations

Gerrits ENGINEERING

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

SANITARY SEWER DESIGN SHEET

Reference Documents

MECP Design Guidelines for Sewage Works, 2008
Ontario Building Code, 2024

Site Information

Residential Site	
Total Site Area (ha)	0.865
Units	201
Persons per unit	varies
Total Population	374

Commecial Site	
Total Site Area (ha)	0.00
Commercial GFA (m^2)	0

Parameters

Minimum Velocity= 0.6 m/s
Maximum Velocity= 3 m/s
Minimum Lateral Size= 100 mm
Minimum Main Size= 200 mm
Sewers ≤ 375 mm: d/D < 0.50
Sewers > 375 mm: d/D < 0.85
Residential q= 350 L/cap/day
Commercial q= 0.58 L/ha/sec
Infiltration q= 0.28 L/ha/sec
Harmon Formula Peaking Factor: $2 \leq M \geq 4$

Formulae

Domestic Sanitary Sewage Flows

Average Daily Demand= $P*q_r$

Where: P= population
q_r= Average Daily per capita domestic flow (L/cap*d)

Commercial Sanitary Sewage Flows

Average Daily Demand= $A*q_c$

Where: A= Gross Area Tributary (ha)
q_c= Average Daily commercial flow (L/ha/sec)
Peak factor to be determined by engineer

Extraneous Sanitary Sewage Flow

Extraneous Flow= I * A

Where: I= Peak extraneous flows (L/ha*s)
A= Gross Area tributary in hectares

Total Sanitary Sewage Flow

Peak Demand, $Q= ((P*q_r*M) / 86.4) + Q_c + I*A$

Where: Q= Total Peak Flow
Peaking Factor, $M= 1 + (14 / (4+(P/1000)^{0.5}))$
Q_c= Peak Commercial Flow

DESCRIPTION					RESIDENTIAL FLOW									COMMERCIAL FLOW				EXTRANEOUS FLOW			DESIGN DATA											
Location	From MH	To MH	Sub Basin ID	Sub Basin Area	Incremental Residential Area (ha)	Total Residential Area (ha)	Number of Units	Person Per Units	Incremental Population	Total Population	Harmon Factor	Per Capita Flow (L/cap/day)	Domestic Flow (L/s)	Incremental Commercial Area (ha)	Total Commercial Area (ha)	Commercial Rate (L/ha/sec)	Commercial Flow (L/s)	Total Area (ha)	Extraneous Rate (L/s/ha)	Extraneous Flow (L/s)	Total Flow (L/s)	Length (m)	Pipe Size (mm)	Upstream Invert (m)	Downstream Invert (m)	Gradient (%)	Mannings "n"	Capacity (L/s)	Velocity Flowing Full (m/s)	Percentage of Full Flow	d/D	Percentage of Full Velocity	Velocity at Design Flow (m/s)
Subject Site	BLDG	Monitor MH	N/A	N/A	0.865	0.865	201	VARIES	374	374	3.4	280	4.16	0.00	0.00	N/A	0.00	0.865	0.33	0.29	4.4	15.00	150	72.72	72.57	1.0	0.013	15.23	0.86	29%	37%	87%	0.75
Subject Site	Monitor MH	TEE	N/A	N/A	0.865	0.865	0	VARIES	0	374	3.4	280	4.16	0.00	0.00	N/A	0.00	0.865	0.33	0.29	4.4	8.30	150	72.52	72.43	1.0	0.013	15.41	0.87	29%	37%	86%	0.75

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

SANITARY SERVICING DEMAND

Reference Documents

MECP Design Guidelines for Sewage Works (2008)
City of Ottawa Sewer Design Guidelines (2012) & technical bulletins
Ontario Building Code (2024)

Design Criteria

Total Site Area (ha)	0.865

Residential Site

Residential Area (ha)	0.865
Units	201
Persons per unit	Varies
Total Population	374
Per Capita Flow (L/cap/day)	280

Formulae

Total Sewage Flows

Average Daily Demand= P*q
Peak Demand, Q= ((P*q_r*M) / 86.4) +Q_c+ I*A
Harmon Peaking Factor, M= 1 + (14 / (4+(P/1000)$^{0.5}$)*K)

Where:
P= population in thousands
q= Average Daily per capita domestic flow (L/cap*d)
Q_r= Peak domestic flow (L/s)
Q_c= Peak commercial flow (L/s)
K= correction factor (0.8)
I= Peak extraneous flows (L/ha*s)
A= Gross Area tributary in hectares
M= Harmon Formula Peaking Factor (2 ≤ M ≥ 4)

PEAK SANITARY SERVICING DEMAND

DESCRIPTION		DOMESTIC FLOW				COMMERCIAL FLOW				INFILTRATION			TOTAL
Location	Occupancy	Total Population	Harmon Factor	Per Capita Flow (l/cap/day)	Domestic Flow (L/s)	Total Commercial Area (m^2)	Commercial Rate (L/m^2/day)	Peaking Factor	Commercial Flow (L/s)	Total Area (ha)	Infiltration Rate (L/ha/sec)	Infiltration Flow (L/s)	Total Flow (L/s)
Building 1	Residential	374	3.4	280	4.2	0.00	N/A	N/A	N/A	0.865	0.33	0.3	4.4

Project Name: 1316 Carling Avenue
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WATER SERVICING DEMAND

Reference Documents

MECP Design Guidelines for Drinking Water Systems (2008)
City of Ottawa Design Guidelines – Water Distribution (2010)
& technical bulletins

Ontario Building Code (2024)

Design Criteria

Total Site Area (ha)	0.865

Residential Site

Residential Area (ha)	0.865
Units	201
Persons per unit	Varies
Total Population	374
Per Capita Flow (L/cap/day)	280

Formulae

Water Demand

$ADD = (P*q_r) + (q_c*A)$
$MDD = (MDF_r*P*q_r) + (MDF_c*q_c*A)$
$PHD = (PHF_r*P*q_r) + (PHF_c*q_c*A)$

Where:
P= population (persons)
q= flow rate (units vary)
A= Area (ha)
MDF= Max Day Factor
PHF= Peak Hour Factor

AVERAGE DAY DEMAND

DESCRIPTION		DOMESTIC FLOW				COMMERCIAL FLOW				TOTAL
Location	Occupancy	Total Population	Factor	Per Capita Flow (l/cap/day)	Domestic Flow (L/s)	Total Commercial Area (m^2)	Factor	Commercial Rate (L/s)	Commercial Flow (L/s)	Total Flow (L/s)
Building 1	Residential	374	1.0	280	1.2	0.00	N/A	N/A	0.00	1.2

MAX DAY DEMAND

DESCRIPTION		DOMESTIC FLOW				COMMERCIAL FLOW				TOTAL
Location	Occupancy	Total Population	Factor	Per Capita Flow (l/cap/day)	Domestic Flow (L/s)	Total Commercial Area (m^2)	Factor	Commercial Rate (L/s)	Commercial Flow (L/s)	Total Flow (L/s)
Building 1	Residential	374	2.50	280	3.0	0.00	N/A	N/A	0.00	3.0

PEAK HOUR DEMAND

DESCRIPTION		DOMESTIC FLOW				COMMERCIAL FLOW				TOTAL
Location	Occupancy	Total Population	Factor	Per Capita Flow (l/cap/day)	Domestic Flow (L/s)	Total Commercial Area (m^2)	Factor	Commercial Rate (L/s)	Commercial Flow (L/s)	Total Flow (L/s)
Building 1	Residential	374	2.2 x MDD	280	6.7	0.00	N/A	N/A	0.00	6.7

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Gerrits ENGINEERING

FIRE UNDERWRITERS SURVEY (2020) FIRE FLOW DEMAND

Reference Documents

Fire Underwriters Survey (2020)
Site Plan Completed by AWA Inc. dated March 24, 2026
Note: Building information collected from site plan

Building Information

Building Classification	Residential Group C
Number of Storeys	20
Total GFA	16362
Largest Floor Area	1139
Floor Area Above	1139
Floor Area Below	924

1. BASE RFF

Parameters

Construction Type	Coefficient
Type II Noncombustible Construction	0.8

Total Effective Area	
A= Single largest floor plus 25% of each adjoining floor	3202

Required Fire Flow

RFF= 220*C*√A

Where:
RFF= Required fire flow in litres per minute (L/min)
C= The construction coefficient related to the type of building construction
A= The total effective floor area (m^2)

10000	Required Fire Flow (L/min)
167	Required Fire Flow (L/s)

2. OCCUPANCY & CONTENTS ADJUSTMENT

Parameters

Occupancy and Contents	Adjustment
Limited Combustible Contents	-15%

Required Fire Flow Adjusted

RFF_2= 220*C*√A+a1

Where:
RFF_2= Adjusted required fire flow in litres per minute (L/min)
C= The construction coefficient related to the type of building construction
A= The total effective floor area (m^2)
a1= Flow adjustment for occupancy & contents (L/min)

-1500	Flow Adjustment (L/min)
8500	Adjusted Required Fire Flow (L/min)
142	Adjusted Required Fire Flow (L/s)

3. SPRINKLER ADJUSTMENT

Parameters

NFPA 13 Sprinkler Standard	Adjustment
YES	-30%

Standard Water Supply	Adjustment
YES	-10%

Fully Supervised System	Adjustment
YES	-10%

Fire Flow Adjustments

a2= RFF_2 * TSA1

Where:
RFF_2= Adjusted required fire flow in litres per minute (L/min) from step 2
a2= Flow adjustment for sprinklers (L/min)
TSA1= Total sprinkler adjustment (%)

-4250	Flow Adjustment (L/min)
-71	Flow Adjustment (L/s)

4. EXPOSURE ADJUSTMENT

Parameters

North Separation Distance	Adjustment
20.1 m to 30 m	0%
Length to Height Ratio= Over 100	

East Separation Distance	Adjustment
10.1 m to 20 m	0%
Length to Height Ratio= 21-40	

South Separation Distance	Adjustment
Greater than 30 m	0%
Length to Height Ratio= Over 100	

West Separation Distance	Adjustment
10.1 m to 20 m	0%
Length to Height Ratio= 0-20	

Fire Flow Adjustments

a3= RFF_2 * TSA2

Where:
RFF_2= Adjusted required fire flow in litres per minute (L/min) from step 2
a3= Flow adjustment for exposure (L/min)

TSA2= Total separation adjustment (%) up to a maximum of 75%

0	Flow Adjustment (L/min)
0	Flow Adjustment (L/s)

REQUIRED FIRE FLOW DEMAND

TOTAL REQUIRED FIRE FLOW	TARGET DURATION	MINIMUM VOLUME
5000 L/min 83 L/s 1321 USGPM	1.8 Hours	525000 L 525 m3 138689 USG

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Project Name: 1316 Carling Avenue
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RUNOFF COEFFICIENT CALCULATIONS

Reference Material

MECP Stormwater Management Planning & Design Manual (2003)

Parameters

Surface Area	Runoff Coefficient
Undeveloped	0.25
Predevelopment Gravel	0.60
Post Development Gravel	0.90
Asphalt	0.90
Concrete	0.90
Building Roof	0.90

WEIGHTED RUNOFF COEFFICIENTS

Area ID	Total Area (m^2)	Undeveloped	Gravel	Asphalt	Concrete	Building	Weighted Runoff Coefficient
Predevelopment Sub Areas							0.81
X-1	8653	1134	0	6389	282	848	0.81
Total	**8653**	**1134**	**0**	**6389**	**282**	**848**	**0.81**
Post Development Sub Areas							0.69
P-1	1331	0	0	0	0	1331	0.90
P-2	985	329	0	539	117	0	0.68
P-3	563	77	0	396	90	0	0.81
P-4	1466	337	0	723	406	0	0.75
P-5	298	21	0	219	58	0	0.85
P-6	275	65	0	210	0	0	0.75
P-7	738	542	0	0	196	0	0.42
P-8	58	22	0	0	36	0	0.65
P-9	891	882	0	0	9	0	0.26
P-10	2048	498	0	582	251	717	0.74
Total	**8653**	**2773**	**0**	**2669**	**1163**	**2048**	**0.69**
Controlled Roof Area (P-1)							0.90
Total	**1331**	**0**	**0**	**0**	**0**	**1331**	**0.90**
Controlled Area Subsurface (P-2 to P-8)							0.69
Total	**4383**	**1393**	**0**	**2087**	**903**	**0**	**0.69**
Uncontrolled Sub Areas (P-10)							0.74
Total	**2048**	**498**	**0**	**582**	**251**	**717**	**0.74**

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Project Name: 1316 Carling Avenue
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CONTROLLED ROOF DRAINS AND ROOFTOP STORAGE

Parameters

Number of Drains	10	Max Storage (m^3)	31.96
Number of Weirs	10	Equivalent Radius (m)	20.58
Discharge/weir (L/s)	1.55	New Radius (m)	7.48
Total Discharge (L/s	15.5	Ponding Depth (m)	0.05
Max Ponding Depth	0.15		
Tributary Area (m^2)	1331	Total Storage	199.65
Roof Runoff Coeffic	0.95 (100-year Event)		

$I = A/(t_c+B)^C$

Where: t=Time of Concentration (hours)
A= 1735.688
B= 6.014
C=0.820

Rating Curve

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
0.00	0.000	0.00
0.03	0.003	13.30
0.06	0.006	26.60
0.09	0.009	39.90
0.12	0.012	53.20
0.15	0.016	66.50

1055 Innovation Drive

Time (minutes)	Intensity (mm/hr)	Q_{total} (m^3/s)	$Q_{discharge}$ (m^3/s)	$Q_{storage}$ (m^3/s)	Volume Required (m^3)	Volume Available (m^3)	Sufficient Storage
5	242.70	0.085	0.0155	0.0697	20.92	66.50	PASS
10	178.56	0.063	0.0155	0.0472	28.33	66.50	PASS
15	142.89	0.050	0.0155	0.0347	31.22	66.50	PASS
20	119.95	0.042	0.0155	0.0266	31.96	66.50	PASS
30	91.87	0.032	0.0155	0.0168	30.18	66.50	PASS
40	75.15	0.026	0.0155	0.0109	26.14	66.50	PASS
50	63.95	0.022	0.0155	0.0070	20.89	66.50	PASS
60	55.89	0.020	0.0155	0.0041	14.88	66.50	PASS

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Project Name: 1316 Carling Avenue
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PRE AND POST DEVELOPMENT RELEASE RATES

IDF Curve Parameters

Storm Event	Coeff A	Coeff B	Coeff C
2-Year	732.951	6.199	0.810
5-Year	998.071	6.053	0.814
10-Year	1174.184	6.014	0.816
25-Year	1402.884	6.018	0.819
50-Year	1569.58	6.014	0.820
100-Year	1735.688	6.014	0.820

Site Statistics

Allowable	
Total Site Area (ha)	0.87
Runoff Coefficient, C	0.50
Time of Concentration (mins)	10

Post Development	
Total Site Area (ha)	0.87
Runoff Coefficient, C	0.69
Time of Concentration (mins)	10

Formulae

Rainfall Intensity, I (mm/hr)= A/(tc+B)^C
Release Rate, Q (m^3/s)=C_iCIA/360

Where:
t_c=Time of Concentration (min)
C_i= Peaking Coefficient
C= Runoff Coefficient
I= Rainfall Intesity (mm/hr)
A= Area (ha)

ALLOWABLE RELEASE RATES

Return Rate	Peaking Coefficient, C_i	Runoff Coefficient, C	Rainfall Intensity (mm/hr)	Release Rate (m^3/s)
2-Year	1	0.50	104.19	0.125
5-Year	1	0.50	104.19	0.125
10-Year	1	0.50	104.19	0.125
25-Year	1	0.50	104.19	0.125
50-Year	1	0.50	104.19	0.125
100-Year	1	0.50	104.19	0.125

POST DEVELOPMENT RELEASE RATES

Return Rate	Peaking Coefficient, C_i	Runoff Coefficient, C	Rainfall Intensity (mm/hr)	Release Rate (m^3/s)
2-Year	1	0.69	76.81	0.128
5-Year	1	0.69	104.19	0.173
10-Year	1	0.69	122.14	0.203
25-Year	1.1	0.69	144.69	0.265
50-Year	1.2	0.69	161.47	0.322
100-Year	1.25	0.69	178.56	0.371

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Project Name: 1316 Carling Avenue
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SUB AREA POST DEVELOPMENT RELEASE RATES

IDF Curve Parameters

Storm Event	Coeff A	Coeff B	Coeff C
2-Year	732.951	6.199	0.810
5-Year	998.071	6.053	0.814
10-Year	1174.184	6.014	0.816
25-Year	1402.884	6.018	0.819
50-Year	1569.58	6.014	0.820
100-Year	1735.688	6.014	0.820

Site Statistics

Controlled Area Subsurface (P-2 to P-8)	
Total Site Area (ha)	0.44
Runoff Coefficient, C	0.69
Time of Concentration (mins)	10

Controlled Roof Area (P-1)	
Total Site Area (ha)	0.13
Runoff Coefficient, C	0.90
Time of Concentration (mins)	15

Uncontrolled Sub Areas (P-10)	
Total Site Area (ha)	0.20
Runoff Coefficient, C	0.74
Time of Concentration (mins)	10

Uncontrolled to Thames Street (P-9)	
Total Site Area (ha)	0.09
Runoff Coefficient, C	0.26
Time of Concentration (mins)	10

Formulae

Rainfall Intensity, I (mm/hr)= A/(tc+B)^C
Release Rate, Q (m^3/s)=C,CIA/360

Where: t_c=Time of Concentration (min)
C_i= Peaking Coefficient
C= Runoff Coefficient
I= Rainfall Intesity (mm/hr)
A= Area (ha)

Controlled Area Subsurface (P-2 to P-8)

Return Rate	Peaking Coefficient, C_i	Runoff Coefficient, C	Rainfall Intensity (mm/hr)	Release Rate (m^3/s)
2-Year	1	0.69	76.81	0.065
5-Year	1	0.69	104.19	0.088
10-Year	1	0.69	122.14	0.103
25-Year	1.1	0.69	144.69	0.134
50-Year	1.2	0.69	161.47	0.164
100-Year	1.25	0.69	178.56	0.188

Controlled Roof Area (P-1)

Return Rate	Peaking Coefficient, C_i	Runoff Coefficient, C	Rainfall Intensity (mm/hr)	Release Rate (m^3/s)
2-Year	1	0.90	76.81	0.026
5-Year	1	0.90	104.19	0.035
10-Year	1	0.90	122.14	0.041
25-Year	1.1	0.90	144.69	0.053
50-Year	1.2	0.90	161.47	0.064
100-Year	1.25	0.90	178.56	0.074

Uncontrolled (P-10)

Return Rate	Peaking Coefficient, C_i	Runoff Coefficient, C	Rainfall Intensity (mm/hr)	Release Rate (m^3/s)
2-Year	1	0.74	76.81	0.032
5-Year	1	0.74	104.19	0.044
10-Year	1	0.74	122.14	0.052
25-Year	1.1	0.74	144.69	0.067
50-Year	1.2	0.74	161.47	0.082
100-Year	1.25	0.74	178.56	0.094

Uncontrolled to Thames Street (P-9)

Return Rate	Peaking Coefficient, C_i	Runoff Coefficient, C	Rainfall Intensity (mm/hr)	Release Rate (m^3/s)
2-Year	1	0.26	76.81	0.005
5-Year	1	0.26	104.19	0.007
10-Year	1	0.26	122.14	0.008
25-Year	1.1	0.26	144.69	0.010
50-Year	1.2	0.26	161.47	0.012
100-Year	1.25	0.26	178.56	0.014

Project Name: 1316 Carling Avenue
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Gerrits ENGINEERING

STAGE STORAGE DISCHARGE FOR DRY POND

Formulae

Quantity Control Orifice

Release Rate, Q (m^3/s)=c*A*(2*g*h)^0.5
Where:
c= Orifice Constant (0.8 pipe, 0.63 plate)
A= Area (m^2)
g= gravitational constant (m/s^2)
h= Head loss across orifice (m)

Over Flow Weir

Release Rate, Q (m^3/s)= C*($h^{3/2}$)*w
Where:
C= Rectangular C
h=Depth of flow above weir (m)
w=width of weir (m)

Rectangular C Equation

y=(a+bx)/(1+cx+dx^2)
Where:

a	-10383.48985
b	3418997.012
c	2131595.078
d	-235014.2466

Quantity Control Systems

Quantity Control Orifice 1

Diameter (mm):	125.000
Elevation (m):	71.85
Constant:	0.82
Centroid (m):	71.91

Quantity Control Orifice 2

Diameter (mm):	N/A
Elevation (m):	N/A
Constant:	N/A
Centroid (m):	N/A

Over Flow Weir

Width (m):	3
Side Slopes:	3H:1V
Bottom Elevation (m):	109.5
Length of Weir (m):	3.00

Rating Curve Data Points

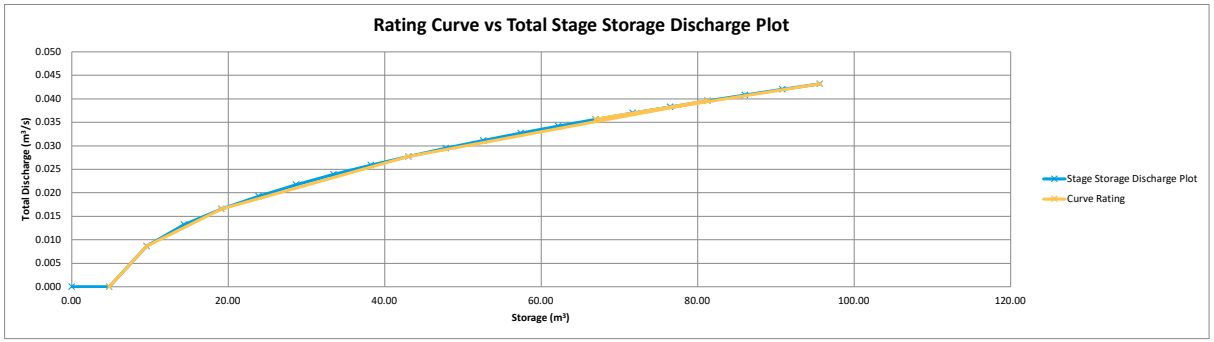
Elevation (m)	Outflow (m^3/s)	Storage (m^3)
71.90	0.000	4.78
71.95	0.009	9.56
72.05	0.017	19.13
72.30	0.028	43.04
72.70	0.040	81.29
72.55	0.036	66.94
72.85	0.043	95.64

Notes:

Check

Storm Event	Allowable (m^3/s)	Controlled (m^3/s)	Storage (m^3)	Release	Storage
2-Year	0.125	0.046	29	PASS	PASS
5-Year	0.125	0.062	40	PASS	PASS
10-Year	0.125	0.071	47	PASS	PASS
25-Year	0.125	0.090	63	PASS	PASS
50-Year	0.125	0.108	78	PASS	PASS
100-Year	0.125	0.123	91	PASS	PASS

Elevation (m)	Incremental Depth (m)	Area (m^2)	Active Storage Volume (m^3)	Head Loss Across Orifice (m)	Calculated Release from Orifice (m^3/s)	Head Loss Across Orifice (m)	Calculated Release from Orifice (m^3/s)	Depth of Flow Above Weir (m)	Overflow (x)	Rectangular 'C'	Calculated Release from Weir (m^3/s)	Total Flow (m^3/s)
71.85	0.00	99.62	0.00	0.00	0.000	0.00	0.000	0.00	0.00	0.00	0.00	0.000
71.90	0.05	99.62	4.78	0.00	0.000	0.00	0.000	0.00	0.00	0.00	0.00	0.000
71.95	0.05	99.62	9.56	0.04	0.009	0.00	0.000	0.00	0.00	0.00	0.00	0.009
72.00	0.05	99.62	14.35	0.09	0.013	0.00	0.000	0.00	0.00	0.00	0.00	0.013
72.05	0.05	99.62	19.13	0.14	0.017	0.00	0.000	0.00	0.00	0.00	0.00	0.017
72.10	0.05	99.62	23.91	0.19	0.019	0.00	0.000	0.00	0.00	0.00	0.00	0.019
72.15	0.05	99.62	28.69	0.24	0.022	0.00	0.000	0.00	0.00	0.00	0.00	0.022
72.20	0.05	99.62	33.47	0.29	0.024	0.00	0.000	0.00	0.00	0.00	0.00	0.024
72.25	0.05	99.62	38.25	0.34	0.026	0.00	0.000	0.00	0.00	0.00	0.00	0.026
72.30	0.05	99.62	43.04	0.39	0.028	0.00	0.000	0.00	0.00	0.00	0.00	0.028
72.35	0.05	99.62	47.82	0.44	0.029	0.00	0.000	0.00	0.00	0.00	0.00	0.029
72.40	0.05	99.62	52.60	0.49	0.031	0.00	0.000	0.00	0.00	0.00	0.00	0.031
72.45	0.05	99.62	57.38	0.54	0.033	0.00	0.000	0.00	0.00	0.00	0.00	0.033
72.50	0.05	99.62	62.16	0.59	0.034	0.00	0.000	0.00	0.00	0.00	0.00	0.034
72.55	0.05	99.62	66.94	0.64	0.036	0.00	0.000	0.00	0.00	0.00	0.00	0.036
72.60	0.05	99.62	71.73	0.69	0.037	0.00	0.000	0.00	0.00	0.00	0.00	0.037
72.65	0.05	99.62	76.51	0.74	0.038	0.00	0.000	0.00	0.00	0.00	0.00	0.038
72.70	0.05	99.62	81.29	0.79	0.040	0.00	0.000	0.00	0.00	0.00	0.00	0.040
72.75	0.05	99.62	86.07	0.84	0.041	0.00	0.000	0.00	0.00	0.00	0.00	0.041
72.80	0.05	99.62	90.85	0.89	0.042	0.00	0.000	0.00	0.00	0.00	0.00	0.042
72.85	0.05	99.62	95.64	0.94	0.043	0.00	0.000	0.00	0.00	0.00	0.00	0.043



Gerrits ENGINEERING

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

2-YEAR RELEASE RATES AND HYDROGRAPHS

Site Statistics

Controlled Area Subsurface (P-2 to P-8)	
Total Site Area (ha)	0.44
Runoff Coefficient, C	0.69
Storm Duration (mins)	20
2-Year Release Rate (m^3/s)	0.065

Controlled Roof Area (P-1)	
Total Site Area (ha)	0.13
Runoff Coefficient, C	0.90
Storm Duration (mins)	20
2-Year Release Rate (m^3/s)	0.026

Uncontrolled Sub Areas (P-10)	
Total Site Area (ha)	0.20
Runoff Coefficient, C	0.74
Storm Duration (mins)	20
2-Year Release Rate (m^3/s)	0.032

Rating Curve Data Points - Roof

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
0.00	0.000	0.00
0.03	0.003	13.30
0.06	0.006	26.60
0.09	0.009	39.90
0.12	0.012	53.20
0.15	0.016	66.50

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
71.90	0.000	4.78
71.95	0.009	9.56
72.05	0.017	19.13
72.30	0.028	43.04
72.70	0.040	81.29
72.55	0.036	66.94
72.85	0.043	95.64

Formulae

$Q_{in}=Q_p/(t_d/2)*t_i$

Q_{out}=Computer Generated using rating curve data points

Storage (m^3)= Cumulative $storage_{(i-1)}$+Δ $Storage_i$

Δ Storage (m^3)= $(Q_{in}-Q_{out})(t_i-t_{(i-1)})*60$

Where:

Q_{in}= Flow rate tributary to the system at a given time (m^3/s)

Q_{out}=Flow rate out of the system at a given time (m^3/s)

T_d= Storm Duration (min)

T_i= Time(min)

Hydrograph Data (Controlled Roof Area)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.000	0.00	0.00	
1	0.003	0.000	0.15	0.15	
2	0.005	0.000	0.30	0.46	
3	0.008	0.000	0.45	0.91	
4	0.010	0.000	0.60	1.51	
5	0.013	0.000	0.75	2.26	
6	0.015	0.001	0.89	3.15	
7	0.018	0.001	1.03	4.18	
8	0.020	0.001	1.17	5.34	
9	0.023	0.001	1.31	6.65	
10	0.026	0.002	1.44	8.09	
11	0.023	0.002	1.27	9.36	
12	0.020	0.002	1.10	10.45	
13	0.018	0.002	0.93	11.38	
14	0.015	0.003	0.76	12.14	
15	0.013	0.003	0.60	12.74	
16	0.010	0.003	0.44	13.17	
17	0.008	0.003	0.28	13.45	
18	0.005	0.003	0.12	13.57	Max Storage
19	0.003	0.003	-0.04	13.53	
20	0.000	0.003	-0.19	13.34	
21	0.000	0.003	-0.19	13.15	
22	0.000	0.003	-0.18	12.97	
23	0.000	0.003	-0.18	12.79	
24	0.000	0.003	-0.18	12.61	
25	0.000	0.003	-0.18	12.43	
26	0.000	0.003	-0.17	12.26	
27	0.000	0.003	-0.17	12.09	
28	0.000	0.003	-0.17	11.92	
29	0.000	0.003	-0.17	11.75	
30	0.000	0.003	-0.16	11.59	
31	0.000	0.003	-0.16	11.43	
32	0.000	0.003	-0.16	11.27	
33	0.000	0.003	-0.16	11.11	
34	0.000	0.003	-0.16	10.95	
35	0.000	0.003	-0.15	10.80	
36	0.000	0.003	-0.15	10.65	
37	0.000	0.002	-0.15	10.50	
38	0.000	0.002	-0.15	10.35	
39	0.000	0.002	-0.14	10.21	
40	0.000	0.002	-0.14	10.07	

Hydrograph Data (Controlled Subsurface)

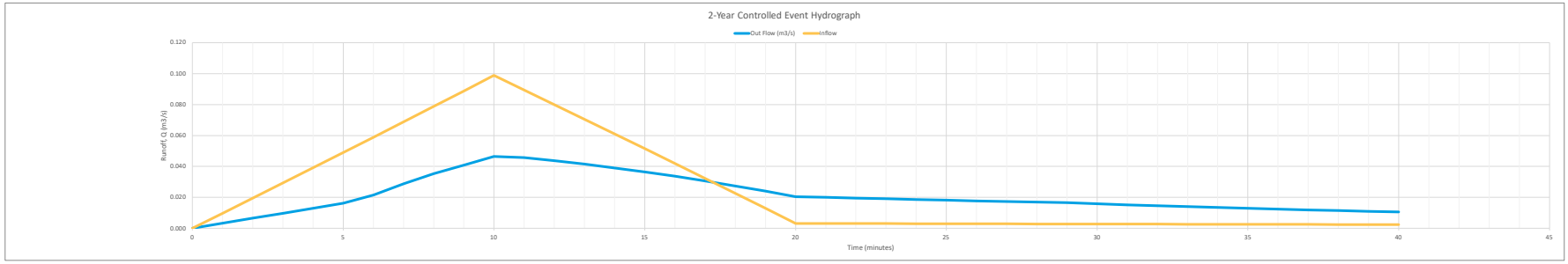
Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.0000	0.00	0.00	
1	0.006	0.0000	0.39	0.39	
2	0.013	0.0000	0.78	1.17	
3	0.020	0.0000	1.17	2.34	
4	0.026	0.0000	1.57	3.91	
5	0.033	0.0000	1.97	5.88	
6	0.039	0.0020	2.25	8.13	
7	0.046	0.0060	2.41	10.53	
8	0.053	0.0094	2.60	13.14	
9	0.060	0.0116	2.88	16.02	
10	0.066	0.0140	3.15	19.16	
11	0.060	0.0165	2.62	21.78	
12	0.054	0.0178	2.18	23.96	
13	0.048	0.0188	1.74	25.70	
14	0.042	0.0196	1.32	27.02	
15	0.035	0.0202	0.90	27.92	
16	0.029	0.0207	0.50	28.42	
17	0.023	0.0209	0.10	28.51	Max Storage
18	0.016	0.0209	-0.29	28.22	
19	0.010	0.0208	-0.67	27.56	
20	0.003	0.0205	-1.04	26.52	
21	0.003	0.0200	-1.01	25.50	
22	0.003	0.0195	-0.99	24.52	
23	0.003	0.0191	-0.96	23.55	
24	0.003	0.0186	-0.94	22.62	
25	0.003	0.0182	-0.91	21.70	
26	0.003	0.0177	-0.89	20.81	
27	0.003	0.0173	-0.87	19.94	
28	0.003	0.0169	-0.85	19.10	
29	0.003	0.0165	-0.82	18.28	
30	0.003	0.0158	-0.79	17.49	
31	0.003	0.0152	-0.75	16.74	
32	0.003	0.0146	-0.71	16.03	
33	0.003	0.0140	-0.68	15.35	
34	0.003	0.0134	-0.65	14.70	
35	0.003	0.0129	-0.62	14.08	
36	0.003	0.0124	-0.59	13.49	
37	0.002	0.0119	-0.56	12.93	
38	0.002	0.0114	-0.54	12.39	
39	0.002	0.0110	-0.51	11.87	
40	0.002	0.0105	-0.49	11.38	

Hydrograph Data (Uncontrolled)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)
0	0.000	0.000	0.000	0.000
1	0.003	0.003	0.000	0.000
2	0.006	0.006	0.000	0.000
3	0.010	0.010	0.000	0.000
4	0.013	0.013	0.000	0.000
5	0.016	0.016	0.000	0.000
6	0.019	0.019	0.000	0.000
7	0.023	0.023	0.000	0.000
8	0.026	0.026	0.000	0.000
9	0.029	0.029	0.000	0.000
10	0.032	0.032	0.000	0.000
11	0.029	0.029	0.000	0.000
12	0.026	0.026	0.000	0.000
13	0.023	0.023	0.000	0.000
14	0.019	0.019	0.000	0.000
15	0.016	0.016	0.000	0.000
16	0.013	0.013	0.000	0.000
17	0.010	0.010	0.000	0.000
18	0.006	0.006	0.000	0.000
19	0.003	0.003	0.000	0.000
20	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000
31	0.000	0.000	0.000	0.000
32	0.000	0.000	0.000	0.000
33	0.000	0.000	0.000	0.000
34	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000
36	0.000	0.000	0.000	0.000
37	0.000	0.000	0.000	0.000
38	0.000	0.000	0.000	0.000
39	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000

Total Release from Site

Minute	Out Flow (m^3/s)	
0	0.000	
1	0.003	
2	0.006	
3	0.010	
4	0.013	
5	0.016	
6	0.021	
7	0.029	
8	0.035	
9	0.041	
10	0.045	Max Release
11	0.046	
12	0.044	
13	0.041	
14	0.039	
15	0.036	
16	0.034	
17	0.031	
18	0.027	
19	0.024	
20	0.020	
21	0.020	
22	0.020	
23	0.019	
24	0.019	
25	0.018	
26	0.018	
27	0.017	
28	0.017	
29	0.017	
30	0.016	
31	0.015	
32	0.015	
33	0.014	
34	0.013	
35	0.013	
36	0.012	
37	0.012	
38	0.011	
39	0.011	
40	0.011	



Gerrits ENGINEERING

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

5-YEAR RELEASE RATES AND HYDROGRAPHS

Site Statistics

Controlled Area Subsurface (P-2 to P-8)	
Total Site Area (ha)	0.00
Runoff Coefficient, C	0.69
Storm Duration (mins)	20
5-Year Release Rate (m^3/s)	0.088

Controlled Roof Area (P-1)	
Total Site Area (ha)	0.13
Runoff Coefficient, C	0.90
Storm Duration (mins)	20
5-Year Release Rate (m^3/s)	0.035

Uncontrolled Sub Areas (P-10)	
Total Site Area (ha)	0.20
Runoff Coefficient, C	0.74
Storm Duration (mins)	20
5-Year Release Rate (m^3/s)	0.044

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
0.00	0.000	0.00
0.03	0.003	13.30
0.06	0.006	26.60
0.09	0.009	39.90
0.12	0.012	53.20
0.15	0.016	66.50

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
71.90	0.00000	4.78
71.95	0.00863	9.56
72.05	0.01653	19.13
72.30	0.02775	43.04
72.70	0.03955	81.29
72.55	0.03559	66.94
72.85	0.04316	95.64

Formulae

$Q_{in}=Q_p/(t_d/2)*t_i$

Q_{out}=Computer Generated using rating curve data points

Storage (m^3)= Cumulative $storage_{(i-1)}$+Δ $Storage_i$

Δ Storage (m^3)= $(Q_{in}-Q_{out})(t_i-t_{(i-1)})*60$

Where:

Q_{in}= Flow rate tributary to the system at a given time (m^3/s)

Q_{out}=Flow rate out of the system at a given time (m^3/s)

T_d= Storm Duration (min)

T_i= Time(min)

Hydrograph Data (Controlled Roof Area)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.000	0.00	0.00	
1	0.003	0.000	0.21	0.21	
2	0.007	0.000	0.41	0.62	
3	0.010	0.000	0.62	1.24	
4	0.014	0.000	0.81	2.05	
5	0.017	0.000	1.01	3.06	
6	0.021	0.001	1.21	4.27	
7	0.024	0.001	1.40	5.66	
8	0.028	0.001	1.58	7.25	
9	0.031	0.002	1.77	9.02	
10	0.035	0.002	1.95	10.97	
11	0.031	0.003	1.72	12.69	
12	0.028	0.003	1.49	14.18	
13	0.024	0.003	1.26	15.44	
14	0.021	0.004	1.03	16.47	
15	0.017	0.004	0.81	17.28	
16	0.014	0.004	0.59	17.87	
17	0.010	0.004	0.37	18.24	
18	0.007	0.004	0.16	18.41	Max Storage
19	0.003	0.004	-0.05	18.36	
20	0.000	0.004	-0.26	18.10	
21	0.000	0.004	-0.25	17.85	
22	0.000	0.004	-0.25	17.60	
23	0.000	0.004	-0.25	17.35	
24	0.000	0.004	-0.24	17.11	
25	0.000	0.004	-0.24	16.87	
26	0.000	0.004	-0.24	16.63	
27	0.000	0.004	-0.23	16.40	
28	0.000	0.004	-0.23	16.17	
29	0.000	0.004	-0.23	15.94	
30	0.000	0.004	-0.22	15.72	
31	0.000	0.004	-0.22	15.50	
32	0.000	0.004	-0.22	15.28	
33	0.000	0.004	-0.21	15.07	
34	0.000	0.004	-0.21	14.86	
35	0.000	0.003	-0.21	14.65	
36	0.000	0.003	-0.20	14.45	
37	0.000	0.003	-0.20	14.25	
38	0.000	0.003	-0.20	14.05	
39	0.000	0.003	-0.20	13.85	
40	0.000	0.003	-0.19	13.66	

Hydrograph Data (Controlled Subsurface)

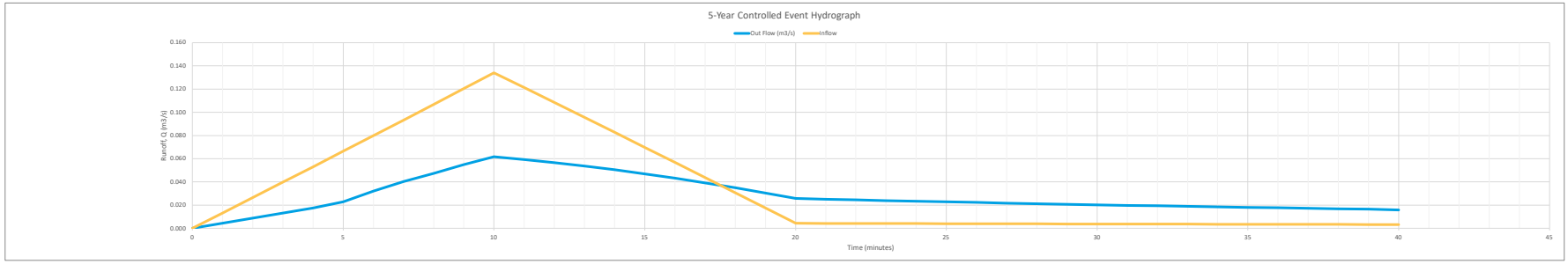
Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.0000	0.00	0.00	
1	0.009	0.0000	0.53	0.53	
2	0.018	0.0000	1.06	1.59	
3	0.027	0.0000	1.59	3.18	
4	0.035	0.0000	2.13	5.31	
5	0.044	0.0009	2.61	7.92	
6	0.053	0.0057	2.87	10.79	
7	0.063	0.0096	3.18	13.96	
8	0.072	0.0123	3.57	17.53	
9	0.081	0.0152	3.94	21.47	
10	0.090	0.0176	4.35	25.81	
11	0.082	0.0197	3.72	29.54	
12	0.073	0.0214	3.11	32.65	
13	0.065	0.0229	2.52	35.17	
14	0.056	0.0241	1.94	37.11	
15	0.048	0.0250	1.37	38.48	
16	0.039	0.0256	0.82	39.30	
17	0.031	0.0260	0.27	39.57	Max Storage
18	0.022	0.0261	-0.26	39.32	
19	0.013	0.0260	-0.77	38.54	
20	0.004	0.0256	-1.28	37.26	
21	0.004	0.0250	-1.25	36.01	
22	0.004	0.0245	-1.22	34.79	
23	0.004	0.0239	-1.19	33.61	
24	0.004	0.0233	-1.16	32.45	
25	0.004	0.0228	-1.13	31.32	
26	0.004	0.0223	-1.10	30.22	
27	0.004	0.0217	-1.07	29.15	
28	0.004	0.0212	-1.04	28.11	
29	0.004	0.0207	-1.02	27.09	
30	0.004	0.0203	-0.99	26.10	
31	0.004	0.0198	-0.97	25.13	
32	0.004	0.0193	-0.94	24.18	
33	0.004	0.0189	-0.92	23.26	
34	0.004	0.0185	-0.90	22.37	
35	0.003	0.0180	-0.88	21.49	
36	0.003	0.0176	-0.85	20.64	
37	0.003	0.0172	-0.83	19.81	
38	0.003	0.0168	-0.81	18.99	
39	0.003	0.0164	-0.79	18.21	
40	0.003	0.0158	-0.75	17.45	

Hydrograph Data (Uncontrolled)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)
0	0.000	0.000	0.000	0.000
1	0.004	0.004	0.000	0.000
2	0.009	0.009	0.000	0.000
3	0.013	0.013	0.000	0.000
4	0.018	0.018	0.000	0.000
5	0.022	0.022	0.000	0.000
6	0.026	0.026	0.000	0.000
7	0.031	0.031	0.000	0.000
8	0.035	0.035	0.000	0.000
9	0.040	0.040	0.000	0.000
10	0.044	0.044	0.000	0.000
11	0.040	0.040	0.000	0.000
12	0.035	0.035	0.000	0.000
13	0.031	0.031	0.000	0.000
14	0.026	0.026	0.000	0.000
15	0.022	0.022	0.000	0.000
16	0.018	0.018	0.000	0.000
17	0.013	0.013	0.000	0.000
18	0.009	0.009	0.000	0.000
19	0.004	0.004	0.000	0.000
20	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000
31	0.000	0.000	0.000	0.000
32	0.000	0.000	0.000	0.000
33	0.000	0.000	0.000	0.000
34	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000
36	0.000	0.000	0.000	0.000
37	0.000	0.000	0.000	0.000
38	0.000	0.000	0.000	0.000
39	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000

Total Release from Site

Minute	Out Flow (m^3/s)	
0	0.000	
1	0.004	
2	0.009	
3	0.013	
4	0.018	
5	0.023	
6	0.032	
7	0.040	
8	0.047	
9	0.055	
10	0.062	Max Release
11	0.059	
12	0.057	
13	0.054	
14	0.050	
15	0.047	
16	0.043	
17	0.039	
18	0.035	
19	0.030	
20	0.026	
21	0.025	
22	0.024	
23	0.024	
24	0.023	
25	0.023	
26	0.022	
27	0.022	
28	0.021	
29	0.021	
30	0.020	
31	0.020	
32	0.019	
33	0.019	
34	0.018	
35	0.018	
36	0.018	
37	0.017	
38	0.017	
39	0.016	
40	0.016	



Gerrits ENGINEERING

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

10-YEAR RELEASE RATES AND HYDROGRAPHS

Site Statistics

Controlled Area Subsurface (P-2 to P-8)	
Total Site Area (ha)	0.00
Runoff Coefficient, C	0.69
Storm Duration (mins)	20
10-Year Release Rate (m^3/s)	0.103

Controlled Roof Area (P-1)	
Total Site Area (ha)	0.13
Runoff Coefficient, C	0.90
Storm Duration (mins)	20
10-Year Release Rate (m^3/s)	0.041

Uncontrolled Sub Areas (P-10)	
Total Site Area (ha)	0.20
Runoff Coefficient, C	0.74
Storm Duration (mins)	20
10-Year Release Rate (m^3/s)	0.052

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
0.00	0.000	0.00
0.03	0.003	13.30
0.06	0.006	26.60
0.09	0.009	39.90
0.12	0.012	53.20
0.15	0.016	66.50

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
71.90	0.00000	4.78
71.95	0.00863	9.56
72.05	0.01653	19.13
72.30	0.02775	43.04
72.70	0.03955	81.29
72.55	0.03559	66.94
72.85	0.04316	95.64

Formulae

$Q_{in}=Q_p/(t_c/2)*t_i$

Q_{out}=Computer Generated using rating curve data points

Storage (m^3)= Cumulative $storage_{(t-1)}$+Δ $Storage_t$

Δ Storage (m^3)= $(Q_{in}-Q_{out})(t_i-t_{(i-1)})*60$

Where:

Q_{in}= Flow rate tributary to the system at a given time (m^3/s)

Q_{out}=Flow rate out of the system at a given time (m^3/s)

T_d= Storm Duration (min)

T_i= Time(min)

Hydrograph Data (Controlled Roof Area)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.000	0.00	0.00	
1	0.004	0.000	0.24	0.24	
2	0.008	0.000	0.48	0.73	
3	0.012	0.000	0.72	1.45	
4	0.016	0.000	0.96	2.40	
5	0.020	0.001	1.19	3.59	
6	0.024	0.001	1.41	5.00	
7	0.028	0.001	1.64	6.64	
8	0.033	0.002	1.86	8.50	
9	0.037	0.002	2.08	10.57	
10	0.041	0.002	2.29	12.86	
11	0.037	0.003	2.01	14.88	
12	0.033	0.003	1.74	16.62	
13	0.028	0.004	1.47	18.10	
14	0.024	0.004	1.21	19.31	
15	0.020	0.005	0.95	20.26	
16	0.016	0.005	0.69	20.95	
17	0.012	0.005	0.44	21.39	
18	0.008	0.005	0.19	21.58	Max Storage
19	0.004	0.005	-0.06	21.52	
20	0.000	0.005	-0.30	21.22	
21	0.000	0.005	-0.30	20.92	
22	0.000	0.005	-0.29	20.63	
23	0.000	0.005	-0.29	20.34	
24	0.000	0.005	-0.28	20.05	
25	0.000	0.005	-0.28	19.77	
26	0.000	0.005	-0.28	19.50	
27	0.000	0.005	-0.27	19.22	
28	0.000	0.004	-0.27	18.96	
29	0.000	0.004	-0.27	18.69	
30	0.000	0.004	-0.26	18.43	
31	0.000	0.004	-0.26	18.17	
32	0.000	0.004	-0.25	17.92	
33	0.000	0.004	-0.25	17.67	
34	0.000	0.004	-0.25	17.42	
35	0.000	0.004	-0.24	17.18	
36	0.000	0.004	-0.24	16.94	
37	0.000	0.004	-0.24	16.70	
38	0.000	0.004	-0.23	16.47	
39	0.000	0.004	-0.23	16.24	
40	0.000	0.004	-0.23	16.01	

Hydrograph Data (Controlled Subsurface)

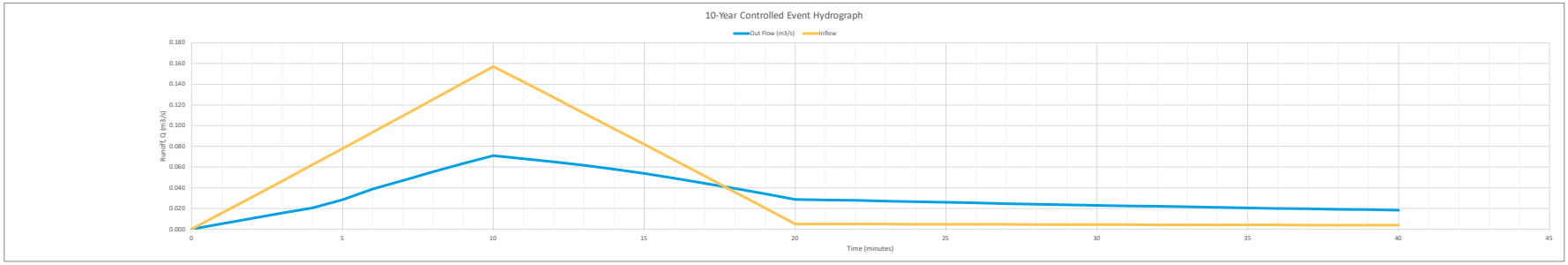
Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.0000	0.00	0.00	
1	0.010	0.0000	0.62	0.62	
2	0.021	0.0000	1.24	1.86	
3	0.031	0.0000	1.87	3.73	
4	0.042	0.0000	2.50	6.22	
5	0.052	0.0026	2.97	9.19	
6	0.063	0.0080	3.28	12.48	
7	0.073	0.0110	3.74	16.22	
8	0.084	0.0141	4.20	20.41	
9	0.095	0.0171	4.66	25.07	
10	0.106	0.0193	5.18	30.25	
11	0.096	0.0217	4.44	34.69	
12	0.086	0.0238	3.73	38.42	
13	0.076	0.0256	3.03	41.45	
14	0.066	0.0270	2.35	43.79	
15	0.056	0.0280	1.68	45.48	
16	0.046	0.0285	1.05	46.52	
17	0.036	0.0288	0.42	46.94	Max Storage
18	0.026	0.0290	-0.20	46.74	
19	0.015	0.0289	-0.81	45.93	
20	0.005	0.0286	-1.42	44.51	
21	0.005	0.0282	-1.40	43.12	
22	0.005	0.0278	-1.37	41.74	
23	0.005	0.0271	-1.34	40.40	
24	0.005	0.0265	-1.31	39.10	
25	0.005	0.0259	-1.27	37.82	
26	0.005	0.0253	-1.24	36.58	
27	0.005	0.0247	-1.21	35.37	
28	0.004	0.0242	-1.18	34.19	
29	0.004	0.0236	-1.15	33.04	
30	0.004	0.0231	-1.12	31.92	
31	0.004	0.0225	-1.09	30.82	
32	0.004	0.0220	-1.07	29.76	
33	0.004	0.0215	-1.04	28.72	
34	0.004	0.0210	-1.01	27.70	
35	0.004	0.0206	-0.99	26.71	
36	0.004	0.0201	-0.97	25.75	
37	0.004	0.0196	-0.94	24.81	
38	0.004	0.0192	-0.92	23.89	
39	0.004	0.0188	-0.90	22.99	
40	0.004	0.0183	-0.87	22.12	

Hydrograph Data (Uncontrolled)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)
0	0.000	0.000	0.000	0.000
1	0.005	0.005	0.000	0.000
2	0.010	0.010	0.000	0.000
3	0.015	0.015	0.000	0.000
4	0.021	0.021	0.000	0.000
5	0.026	0.026	0.000	0.000
6	0.031	0.031	0.000	0.000
7	0.036	0.036	0.000	0.000
8	0.041	0.041	0.000	0.000
9	0.046	0.046	0.000	0.000
10	0.052	0.052	0.000	0.000
11	0.046	0.046	0.000	0.000
12	0.041	0.041	0.000	0.000
13	0.036	0.036	0.000	0.000
14	0.031	0.031	0.000	0.000
15	0.026	0.026	0.000	0.000
16	0.021	0.021	0.000	0.000
17	0.015	0.015	0.000	0.000
18	0.010	0.010	0.000	0.000
19	0.005	0.005	0.000	0.000
20	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000
31	0.000	0.000	0.000	0.000
32	0.000	0.000	0.000	0.000
33	0.000	0.000	0.000	0.000
34	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000
36	0.000	0.000	0.000	0.000
37	0.000	0.000	0.000	0.000
38	0.000	0.000	0.000	0.000
39	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000

Total Release from Site

Minute	Out Flow (m^3/s)	
0	0.000	
1	0.005	
2	0.010	
3	0.015	
4	0.021	
5	0.028	
6	0.039	
7	0.047	
8	0.055	
9	0.064	
10	0.071	Max Release
11	0.068	
12	0.065	
13	0.062	
14	0.058	
15	0.054	
16	0.049	
17	0.044	
18	0.039	
19	0.034	
20	0.029	
21	0.028	
22	0.028	
23	0.027	
24	0.027	
25	0.026	
26	0.025	
27	0.025	
28	0.024	
29	0.024	
30	0.023	
31	0.023	
32	0.022	
33	0.022	
34	0.021	
35	0.021	
36	0.020	
37	0.020	
38	0.019	
39	0.019	
40	0.018	



Gerrits ENGINEERING

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

25-YEAR RELEASE RATES AND HYDROGRAPHS

Site Statistics

Controlled Area Subsurface (P-2 to P-8)	
Total Site Area (ha)	0.00
Runoff Coefficient, C	0.69
Storm Duration (mins)	20
25-Year Release Rate (m^3/s)	0.134

Controlled Roof Area (P-1)	
Total Site Area (ha)	0.13
Runoff Coefficient, C	0.90
Storm Duration (mins)	20
25-Year Release Rate (m^3/s)	0.053

Uncontrolled Sub Areas (P-10)	
Total Site Area (ha)	0.20
Runoff Coefficient, C	0.74
Storm Duration (mins)	20
25-Year Release Rate (m^3/s)	0.067

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
0.00	0.000	0.00
0.03	0.003	13.30
0.06	0.006	26.60
0.09	0.009	39.90
0.12	0.012	53.20
0.15	0.016	66.50

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
71.90	0.00000	4.78
71.95	0.00863	9.56
72.05	0.01653	19.13
72.30	0.02775	43.04
72.70	0.03955	81.29
72.55	0.03559	66.94
72.85	0.04316	95.64

Formulae

$Q_{in}=Q_p/(t_c/2)*t_i$

Q_{out}=Computer Generated using rating curve data points

Storage (m^3)= Cumulative $storage_{(t-1)}$+Δ $Storage_t$

Δ Storage (m^3)= $(Q_{in}-Q_{out})(t_i-t_{(i-1)})*60$

Where:

Q_{in}= Flow rate tributary to the system at a given time (m^3/s)

Q_{out}=Flow rate out of the system at a given time (m^3/s)

T_d= Storm Duration (min)

T_i= Time(min)

Hydrograph Data (Controlled Roof Area)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.000	0.00	0.00	
1	0.005	0.000	0.32	0.32	
2	0.011	0.000	0.63	0.95	
3	0.016	0.000	0.94	1.89	
4	0.021	0.000	1.24	3.13	
5	0.026	0.001	1.55	4.68	
6	0.032	0.001	1.84	6.52	
7	0.037	0.002	2.13	8.65	
8	0.042	0.002	2.42	11.07	
9	0.048	0.003	2.71	13.78	
10	0.053	0.003	2.98	16.76	
11	0.048	0.004	2.63	19.39	
12	0.042	0.005	2.27	21.66	
13	0.037	0.005	1.92	23.58	
14	0.032	0.005	1.58	25.16	
15	0.026	0.006	1.24	26.40	
16	0.021	0.006	0.90	27.30	
17	0.016	0.006	0.57	27.87	
18	0.011	0.006	0.25	28.12	Max Storage
19	0.005	0.007	-0.08	28.04	
20	0.000	0.007	-0.39	27.65	
21	0.000	0.006	-0.39	27.26	
22	0.000	0.006	-0.38	26.88	
23	0.000	0.006	-0.38	26.50	
24	0.000	0.006	-0.37	26.13	
25	0.000	0.006	-0.37	25.77	
26	0.000	0.006	-0.36	25.41	
27	0.000	0.006	-0.36	25.05	
28	0.000	0.006	-0.35	24.70	
29	0.000	0.006	-0.35	24.36	
30	0.000	0.006	-0.34	24.02	
31	0.000	0.006	-0.34	23.68	
32	0.000	0.006	-0.33	23.35	
33	0.000	0.005	-0.33	23.02	
34	0.000	0.005	-0.32	22.70	
35	0.000	0.005	-0.32	22.38	
36	0.000	0.005	-0.31	22.07	
37	0.000	0.005	-0.31	21.76	
38	0.000	0.005	-0.30	21.46	
39	0.000	0.005	-0.30	21.16	
40	0.000	0.005	-0.30	20.86	

Hydrograph Data (Controlled Subsurface)

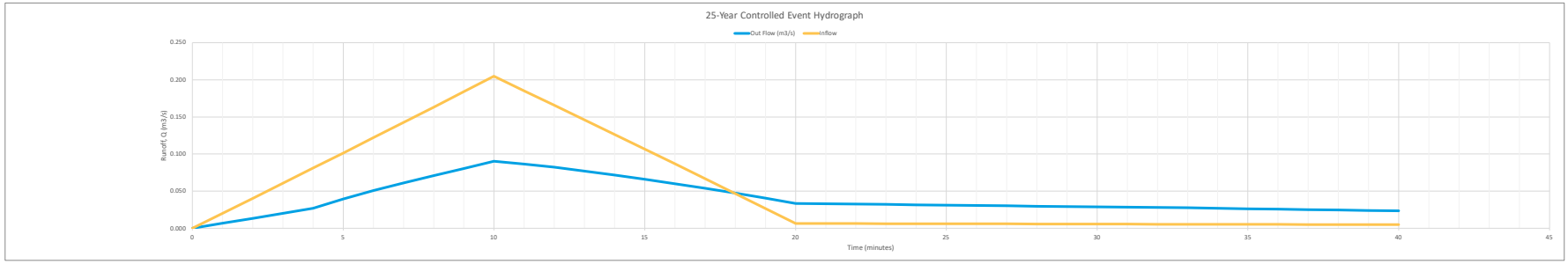
Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.0000	0.00	0.00	
1	0.013	0.0000	0.81	0.81	
2	0.027	0.0000	1.62	2.42	
3	0.041	0.0000	2.43	4.86	
4	0.054	0.0001	3.24	8.10	
5	0.068	0.0060	3.72	11.81	
6	0.082	0.0105	4.27	16.09	
7	0.096	0.0140	4.89	20.98	
8	0.110	0.0174	5.53	26.51	
9	0.124	0.0200	6.21	32.72	
10	0.138	0.0229	6.88	39.60	
11	0.125	0.0261	5.92	45.52	
12	0.112	0.0285	5.01	50.53	
13	0.099	0.0301	4.14	54.68	
14	0.086	0.0313	3.29	57.96	
15	0.073	0.0324	2.44	60.40	
16	0.060	0.0331	1.61	62.01	
17	0.047	0.0336	0.78	62.80	Max Storage
18	0.033	0.0338	-0.03	62.77	
19	0.020	0.0338	-0.83	61.94	
20	0.007	0.0336	-1.62	60.31	
21	0.006	0.0331	-1.60	58.72	
22	0.006	0.0326	-1.57	57.14	
23	0.006	0.0321	-1.55	55.59	
24	0.006	0.0316	-1.53	54.06	
25	0.006	0.0312	-1.50	52.56	
26	0.006	0.0307	-1.48	51.08	
27	0.006	0.0302	-1.46	49.62	
28	0.006	0.0298	-1.44	48.19	
29	0.006	0.0293	-1.41	46.77	
30	0.006	0.0289	-1.39	45.38	
31	0.006	0.0285	-1.37	44.00	
32	0.006	0.0280	-1.35	42.65	
33	0.005	0.0276	-1.33	41.33	
34	0.005	0.0269	-1.29	40.03	
35	0.005	0.0263	-1.26	38.77	
36	0.005	0.0257	-1.23	37.54	
37	0.005	0.0252	-1.20	36.34	
38	0.005	0.0246	-1.17	35.16	
39	0.005	0.0241	-1.14	34.02	
40	0.005	0.0235	-1.12	32.91	

Hydrograph Data (Uncontrolled)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)
0	0.000	0.000	0.000	0.000
1	0.007	0.007	0.000	0.000
2	0.013	0.013	0.000	0.000
3	0.020	0.020	0.000	0.000
4	0.027	0.027	0.000	0.000
5	0.034	0.034	0.000	0.000
6	0.040	0.040	0.000	0.000
7	0.047	0.047	0.000	0.000
8	0.054	0.054	0.000	0.000
9	0.060	0.060	0.000	0.000
10	0.067	0.067	0.000	0.000
11	0.060	0.060	0.000	0.000
12	0.054	0.054	0.000	0.000
13	0.047	0.047	0.000	0.000
14	0.040	0.040	0.000	0.000
15	0.034	0.034	0.000	0.000
16	0.027	0.027	0.000	0.000
17	0.020	0.020	0.000	0.000
18	0.013	0.013	0.000	0.000
19	0.007	0.007	0.000	0.000
20	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000
31	0.000	0.000	0.000	0.000
32	0.000	0.000	0.000	0.000
33	0.000	0.000	0.000	0.000
34	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000
36	0.000	0.000	0.000	0.000
37	0.000	0.000	0.000	0.000
38	0.000	0.000	0.000	0.000
39	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000

Total Release from Site

Minute	Out Flow (m^3/s)	
0	0.000	
1	0.007	
2	0.013	
3	0.020	
4	0.027	
5	0.040	
6	0.051	
7	0.061	
8	0.071	
9	0.080	
10	0.090	Max Release
11	0.087	
12	0.082	
13	0.077	
14	0.072	
15	0.066	
16	0.060	
17	0.054	
18	0.047	
19	0.041	
20	0.034	
21	0.033	
22	0.033	
23	0.032	
24	0.032	
25	0.031	
26	0.031	
27	0.030	
28	0.030	
29	0.029	
30	0.029	
31	0.028	
32	0.028	
33	0.028	
34	0.027	
35	0.026	
36	0.026	
37	0.025	
38	0.025	
39	0.024	
40	0.024	



Gerrits ENGINEERING

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

50-YEAR RELEASE RATES AND HYDROGRAPHS

Site Statistics

Controlled Area Subsurface (P-2 to P-8)	
Total Site Area (ha)	0.00
Runoff Coefficient, C	0.69
Storm Duration (mins)	20
50-Year Release Rate (m^3/s)	0.164

Controlled Roof Area (P-1)	
Total Site Area (ha)	0.13
Runoff Coefficient, C	0.90
Storm Duration (mins)	20
50-Year Release Rate (m^3/s)	0.064

Uncontrolled Sub Areas (P-10)	
Total Site Area (ha)	0.20
Runoff Coefficient, C	0.74
Storm Duration (mins)	20
50-Year Release Rate (m^3/s)	0.082

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
0.00	0.000	0.00
0.03	0.003	13.30
0.06	0.006	26.60
0.09	0.009	39.90
0.12	0.012	53.20
0.15	0.016	66.50

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
71.90	0.00000	4.78
71.95	0.00863	9.56
72.05	0.01653	19.13
72.30	0.02775	43.04
72.70	0.03955	81.29
72.55	0.03559	66.94
72.85	0.04316	95.64

Formulae

$Q_{in}=Q_p/(t_c/2)*t_i$

Q_{out}=Computer Generated using rating curve data points

Storage (m^3)= Cumulative $storage_{(t-1)}$+Δ $Storage_t$

Δ Storage (m^3)= $(Q_{in}-Q_{out})(t_i-t_{(i-1)})*60$

Where:

Q_{in}= Flow rate tributary to the system at a given time (m^3/s)

Q_{out}=Flow rate out of the system at a given time (m^3/s)

T_d= Storm Duration (min)

T_i= Time(min)

Hydrograph Data (Controlled Roof Area)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.000	0.00	0.00	
1	0.006	0.000	0.39	0.39	
2	0.013	0.000	0.77	1.16	
3	0.019	0.000	1.14	2.30	
4	0.026	0.001	1.52	3.81	
5	0.032	0.001	1.88	5.70	
6	0.039	0.001	2.24	7.94	
7	0.045	0.002	2.60	10.53	
8	0.052	0.002	2.95	13.48	
9	0.058	0.003	3.29	16.77	
10	0.064	0.004	3.63	20.41	
11	0.058	0.005	3.20	23.60	
12	0.052	0.006	2.76	26.37	
13	0.045	0.006	2.34	28.71	
14	0.039	0.007	1.92	30.63	
15	0.032	0.007	1.51	32.13	
16	0.026	0.007	1.10	33.23	
17	0.019	0.008	0.70	33.93	
18	0.013	0.008	0.30	34.23	Max Storage
19	0.006	0.008	-0.09	34.14	
20	0.000	0.008	-0.48	33.66	
21	0.000	0.008	-0.47	33.19	
22	0.000	0.008	-0.46	32.72	
23	0.000	0.008	-0.46	32.27	
24	0.000	0.008	-0.45	31.81	
25	0.000	0.007	-0.44	31.37	
26	0.000	0.007	-0.44	30.93	
27	0.000	0.007	-0.43	30.50	
28	0.000	0.007	-0.43	30.07	
29	0.000	0.007	-0.42	29.65	
30	0.000	0.007	-0.41	29.24	
31	0.000	0.007	-0.41	28.83	
32	0.000	0.007	-0.40	28.42	
33	0.000	0.007	-0.40	28.03	
34	0.000	0.007	-0.39	27.64	
35	0.000	0.006	-0.39	27.25	
36	0.000	0.006	-0.38	26.87	
37	0.000	0.006	-0.38	26.49	
38	0.000	0.006	-0.37	26.12	
39	0.000	0.006	-0.37	25.76	
40	0.000	0.006	-0.36	25.40	

Hydrograph Data (Controlled Subsurface)

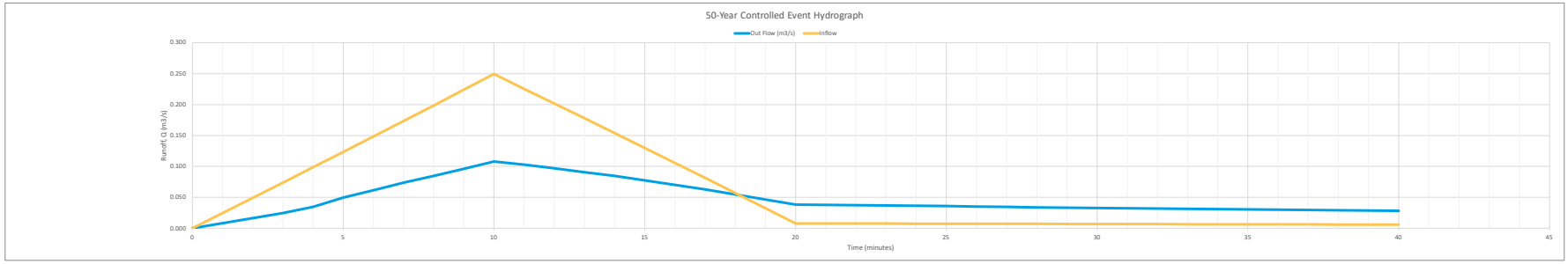
Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.0000	0.00	0.00	
1	0.016	0.0000	0.98	0.98	
2	0.033	0.0000	1.97	2.95	
3	0.049	0.0000	2.96	5.91	
4	0.066	0.0020	3.84	9.75	
5	0.083	0.0088	4.43	14.18	
6	0.099	0.0124	5.22	19.40	
7	0.116	0.0167	5.98	25.38	
8	0.133	0.0195	6.83	32.22	
9	0.150	0.0227	7.66	39.88	
10	0.167	0.0263	8.47	48.35	
11	0.152	0.0294	7.36	55.71	
12	0.136	0.0317	6.28	61.99	
13	0.121	0.0336	5.22	67.21	
14	0.105	0.0357	4.15	71.36	
15	0.089	0.0368	3.13	74.49	
16	0.073	0.0376	2.12	76.62	
17	0.057	0.0381	1.12	77.74	
18	0.041	0.0384	0.13	77.87	Max Storage
19	0.024	0.0385	-0.85	77.02	
20	0.008	0.0382	-1.82	75.20	
21	0.008	0.0378	-1.80	73.41	
22	0.008	0.0373	-1.77	71.63	
23	0.008	0.0368	-1.75	69.88	
24	0.008	0.0364	-1.73	68.15	
25	0.007	0.0359	-1.71	66.44	
26	0.007	0.0350	-1.66	64.78	
27	0.007	0.0345	-1.63	63.15	
28	0.007	0.0340	-1.61	61.54	
29	0.007	0.0335	-1.59	59.95	
30	0.007	0.0330	-1.56	58.39	
31	0.007	0.0325	-1.54	56.85	
32	0.007	0.0320	-1.52	55.33	
33	0.007	0.0315	-1.49	53.83	
34	0.007	0.0311	-1.47	52.36	
35	0.006	0.0306	-1.45	50.91	
36	0.006	0.0302	-1.43	49.48	
37	0.006	0.0297	-1.41	48.07	
38	0.006	0.0293	-1.39	46.68	
39	0.006	0.0289	-1.37	45.32	
40	0.006	0.0285	-1.35	43.97	

Hydrograph Data (Uncontrolled)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)
0	0.000	0.000	0.000	0.000
1	0.008	0.008	0.000	0.000
2	0.016	0.016	0.000	0.000
3	0.025	0.025	0.000	0.000
4	0.033	0.033	0.000	0.000
5	0.041	0.041	0.000	0.000
6	0.049	0.049	0.000	0.000
7	0.057	0.057	0.000	0.000
8	0.065	0.065	0.000	0.000
9	0.074	0.074	0.000	0.000
10	0.082	0.082	0.000	0.000
11	0.074	0.074	0.000	0.000
12	0.065	0.065	0.000	0.000
13	0.057	0.057	0.000	0.000
14	0.049	0.049	0.000	0.000
15	0.041	0.041	0.000	0.000
16	0.033	0.033	0.000	0.000
17	0.025	0.025	0.000	0.000
18	0.016	0.016	0.000	0.000
19	0.008	0.008	0.000	0.000
20	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000
31	0.000	0.000	0.000	0.000
32	0.000	0.000	0.000	0.000
33	0.000	0.000	0.000	0.000
34	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000
36	0.000	0.000	0.000	0.000
37	0.000	0.000	0.000	0.000
38	0.000	0.000	0.000	0.000
39	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000

Total Release from Site

Minute	Out Flow (m^3/s)	
0	0.000	
1	0.008	
2	0.016	
3	0.025	
4	0.035	
5	0.050	
6	0.062	
7	0.074	
8	0.085	
9	0.096	
10	0.108	Max Release
11	0.103	
12	0.097	
13	0.091	
14	0.085	
15	0.078	
16	0.070	
17	0.063	
18	0.055	
19	0.047	
20	0.038	
21	0.038	
22	0.037	
23	0.037	
24	0.036	
25	0.036	
26	0.035	
27	0.034	
28	0.034	
29	0.033	
30	0.033	
31	0.032	
32	0.032	
33	0.032	
34	0.031	
35	0.031	
36	0.030	
37	0.030	
38	0.029	
39	0.029	
40	0.028	



Gerrits ENGINEERING

Project Name: 1316 Carling Avenue
Project Number: 2300-001-25
Date: 3/27/2026

100-YEAR RELEASE RATES AND HYDROGRAPHS

Site Statistics

Controlled Area Subsurface (P-2 to P-8)	
Total Site Area (ha)	0.00
Runoff Coefficient, C	0.69
Storm Duration (mins)	20
100-Year Release Rate (m^3/s)	0.188

Controlled Roof Area (P-1)	
Total Site Area (ha)	0.13
Runoff Coefficient, C	0.90
Storm Duration (mins)	20
100-Year Release Rate (m^3/s)	0.074

Uncontrolled Sub Areas (P-10)	
Total Site Area (ha)	0.20
Runoff Coefficient, C	0.74
Storm Duration (mins)	20
100-Year Release Rate (m^3/s)	0.094

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
0.00	0.000	0.00
0.03	0.003	13.30
0.06	0.006	26.60
0.09	0.009	39.90
0.12	0.012	53.20
0.15	0.016	66.50

Rating Curve Data Points

Elevation (m)	Outflow (m^3/s)	Storage (m^3)
71.90	0.00000	4.78
71.95	0.00863	9.56
72.05	0.01653	19.13
72.30	0.02775	43.04
72.70	0.03955	81.29
72.55	0.03559	66.94
72.85	0.04316	95.64

Formulae

$Q_{in}=Q_p/(t_c/2)*t_i$

Q_{out}=Computer Generated using rating curve data points

Storage (m^3)= Cumulative $storage_{(i-1)}$+Δ $Storage_i$

Δ Storage (m^3)= $(Q_{in}-Q_{out})(t_i-t_{(i-1)})*60$

Where:

Q_{in}= Flow rate tributary to the system at a given time (m^3/s)

Q_{out}=Flow rate out of the system at a given time (m^3/s)

T_d= Storm Duration (min)

T_i= Time(min)

Hydrograph Data (Controlled Roof Area)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.000	0.00	0.00	
1	0.007	0.000	0.45	0.45	
2	0.015	0.000	0.89	1.33	
3	0.022	0.000	1.32	2.65	
4	0.030	0.001	1.75	4.39	
5	0.037	0.001	2.17	6.56	
6	0.045	0.002	2.58	9.14	
7	0.052	0.002	2.99	12.13	
8	0.059	0.003	3.40	15.53	
9	0.067	0.004	3.79	19.32	
10	0.074	0.005	4.19	23.51	
11	0.067	0.005	3.68	27.19	
12	0.059	0.006	3.18	30.38	
13	0.052	0.007	2.69	33.07	
14	0.045	0.008	2.21	35.28	
15	0.037	0.008	1.73	37.02	
16	0.030	0.009	1.26	38.28	
17	0.022	0.009	0.80	39.08	
18	0.015	0.009	0.34	39.43	Max Storage
19	0.007	0.009	-0.11	39.32	
20	0.000	0.009	-0.55	38.77	
21	0.000	0.009	-0.54	38.23	
22	0.000	0.009	-0.53	37.69	
23	0.000	0.009	-0.53	37.17	
24	0.000	0.009	-0.52	36.65	
25	0.000	0.009	-0.51	36.13	
26	0.000	0.008	-0.51	35.63	
27	0.000	0.008	-0.50	35.13	
28	0.000	0.008	-0.49	34.64	
29	0.000	0.008	-0.48	34.16	
30	0.000	0.008	-0.48	33.68	
31	0.000	0.008	-0.47	33.21	
32	0.000	0.008	-0.46	32.74	
33	0.000	0.008	-0.46	32.28	
34	0.000	0.008	-0.45	31.83	
35	0.000	0.007	-0.45	31.39	
36	0.000	0.007	-0.44	30.95	
37	0.000	0.007	-0.43	30.52	
38	0.000	0.007	-0.43	30.09	
39	0.000	0.007	-0.42	29.67	
40	0.000	0.007	-0.41	29.25	

Hydrograph Data (Controlled Subsurface)

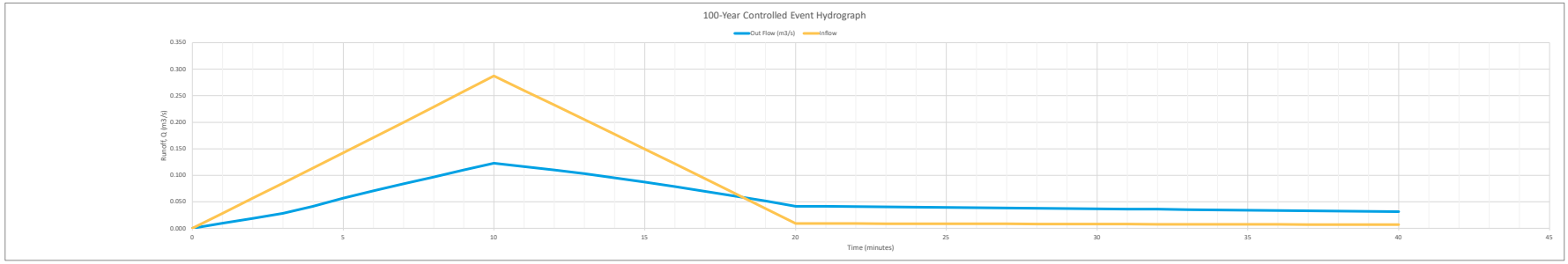
Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)	
0	0.000	0.0000	0.00	0.00	
1	0.019	0.0000	1.13	1.13	
2	0.038	0.0000	2.27	3.40	
3	0.057	0.0000	3.41	6.81	
4	0.076	0.0037	4.34	11.15	
5	0.095	0.0099	5.12	16.27	
6	0.115	0.0142	6.03	22.29	
7	0.134	0.0180	6.96	29.25	
8	0.154	0.0213	7.94	37.19	
9	0.173	0.0250	8.89	46.08	
10	0.193	0.0287	9.85	55.94	
11	0.175	0.0317	8.60	64.54	
12	0.157	0.0344	7.36	71.90	
13	0.139	0.0369	6.13	78.03	
14	0.121	0.0385	4.94	82.96	
15	0.102	0.0398	3.76	86.72	
16	0.084	0.0408	2.59	89.31	
17	0.065	0.0415	1.44	90.75	
18	0.047	0.0419	0.30	91.04	Max Storage
19	0.028	0.0419	-0.83	90.21	
20	0.009	0.0417	-1.95	88.25	
21	0.009	0.0412	-1.93	86.32	
22	0.009	0.0407	-1.91	84.42	
23	0.009	0.0402	-1.88	82.53	
24	0.009	0.0397	-1.86	80.67	
25	0.009	0.0392	-1.84	78.83	
26	0.008	0.0387	-1.82	77.01	
27	0.008	0.0382	-1.80	75.22	
28	0.008	0.0378	-1.77	73.44	
29	0.008	0.0373	-1.75	71.69	
30	0.008	0.0368	-1.73	69.95	
31	0.008	0.0364	-1.71	68.24	
32	0.008	0.0359	-1.69	66.55	
33	0.008	0.0350	-1.64	64.91	
34	0.008	0.0345	-1.62	63.29	
35	0.007	0.0340	-1.59	61.70	
36	0.007	0.0335	-1.57	60.12	
37	0.007	0.0330	-1.55	58.58	
38	0.007	0.0325	-1.53	57.05	
39	0.007	0.0321	-1.50	55.55	
40	0.007	0.0316	-1.48	54.06	

Hydrograph Data (Controlled Subsurface)

Minute	In Flow (m^3/s)	Out Flow (m^3/s)	Delta-Storage (m^3)	Cummulative Storage (m^3)
0	0.000	0.000	0.000	0.000
1	0.009	0.009	0.000	0.000
2	0.019	0.019	0.000	0.000
3	0.028	0.028	0.000	0.000
4	0.038	0.038	0.000	0.000
5	0.047	0.047	0.000	0.000
6	0.057	0.057	0.000	0.000
7	0.066	0.066	0.000	0.000
8	0.075	0.075	0.000	0.000
9	0.085	0.085	0.000	0.000
10	0.094	0.094	0.000	0.000
11	0.085	0.085	0.000	0.000
12	0.075	0.075	0.000	0.000
13	0.066	0.066	0.000	0.000
14	0.057	0.057	0.000	0.000
15	0.047	0.047	0.000	0.000
16	0.038	0.038	0.000	0.000
17	0.028	0.028	0.000	0.000
18	0.019	0.019	0.000	0.000
19	0.009	0.009	0.000	0.000
20	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000
31	0.000	0.000	0.000	0.000
32	0.000	0.000	0.000	0.000
33	0.000	0.000	0.000	0.000
34	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000
36	0.000	0.000	0.000	0.000
37	0.000	0.000	0.000	0.000
38	0.000	0.000	0.000	0.000
39	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000

Total Release from Site

Minute	Out Flow (m^3/s)	
0	0.000	
1	0.009	
2	0.019	
3	0.028	
4	0.041	
5	0.057	
6	0.071	
7	0.084	
8	0.097	
9	0.110	
10	0.123	Max Release
11	0.117	
12	0.110	
13	0.103	
14	0.095	
15	0.087	
16	0.078	
17	0.070	
18	0.061	
19	0.051	
20	0.042	
21	0.041	
22	0.041	
23	0.040	
24	0.040	
25	0.039	
26	0.039	
27	0.038	
28	0.038	
29	0.037	
30	0.037	
31	0.036	
32	0.036	
33	0.035	
34	0.034	
35	0.034	
36	0.034	
37	0.033	
38	0.033	
39	0.032	
40	0.032	



Appendix B
Drawing & Figures

TOPOGRAPHIC PLAN OF SURVEY OF

PART OF BLOCK 8 AND PART OF LOT 23 AND LOTS 26 AND 27 REGISTERED PLAN 221 CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 200

8.0 6.0 4.0 2.0 0 4 8 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the regulations made under them.
2. The survey was completed on the 4th day of August, 2025.

AUGUST 15, 2025
Date

Mirel Aradau
Ontario Land Surveyor

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-110925

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29 (3).

Notes & Legend

—□—	Denotes	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
CP	"	Concrete Pin
CC	"	Cut Cross
(WIT)	"	Witness
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	"	Registered Plan 221
(P2)	"	(AOG) Plan dated May 16, 2025
(P3)	"	Plan 4R-27050
(P4)	"	(AOG) Plan dated September 7, 2012
(P5)	"	(725) Plan dated January 30, 1991
(P6)	"	(857) Plan dated February 25, 1985
(P7)	"	(JDB) plan dated November 11, 2022
(DI)	"	Inst. CR677427
(D2)	"	Inst. N353603
CLF	"	Chain Link Fence
BF	"	Board Fence
PWF	"	Post and Wire Fence
RWS	"	Stone Retaining Wall
RWT	"	Timber Retaining Wall
C/L	"	Centreline
T/G	"	Top of Grate
CB	"	Catch Basin
CBI	"	Catch Basin Inlet
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-S	"	Maintenance Hole (Sanitary)
MH-T	"	Maintenance Hole (Traffic)
MH-H	"	Maintenance Hole (Hydro)
MH	"	Maintenance Hole (Unidentified)
HH	"	Handhole
FH	"	Fire Hydrant
WV	"	Water Valve
SP	"	Water Stand Post
TSL	"	Traffic Light
UP	"	Utility Pole
AN	"	Anchor
LS	"	Light Standard
OHW	"	Overhead Wires
P	"	Underground Power
GM	"	Gas Meter
HM	"	Hydro Meter
AC	"	Air Conditioner
MB	"	Mail Box
	"	Gate
D	"	Drain
B	"	Bollard
S	"	Sign
MP	"	Metal Post
	"	Deciduous Tree
	"	Coniferous Tree
ø	"	Diameter
+ 65.00	"	Location of Elevations
+ 65.00	"	Location of Top of Curb Elevations
+ 65.00	"	Location of Top of Wall Elevations

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations and are referenced to Specified Control Points 01919680005 and 01919680105, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

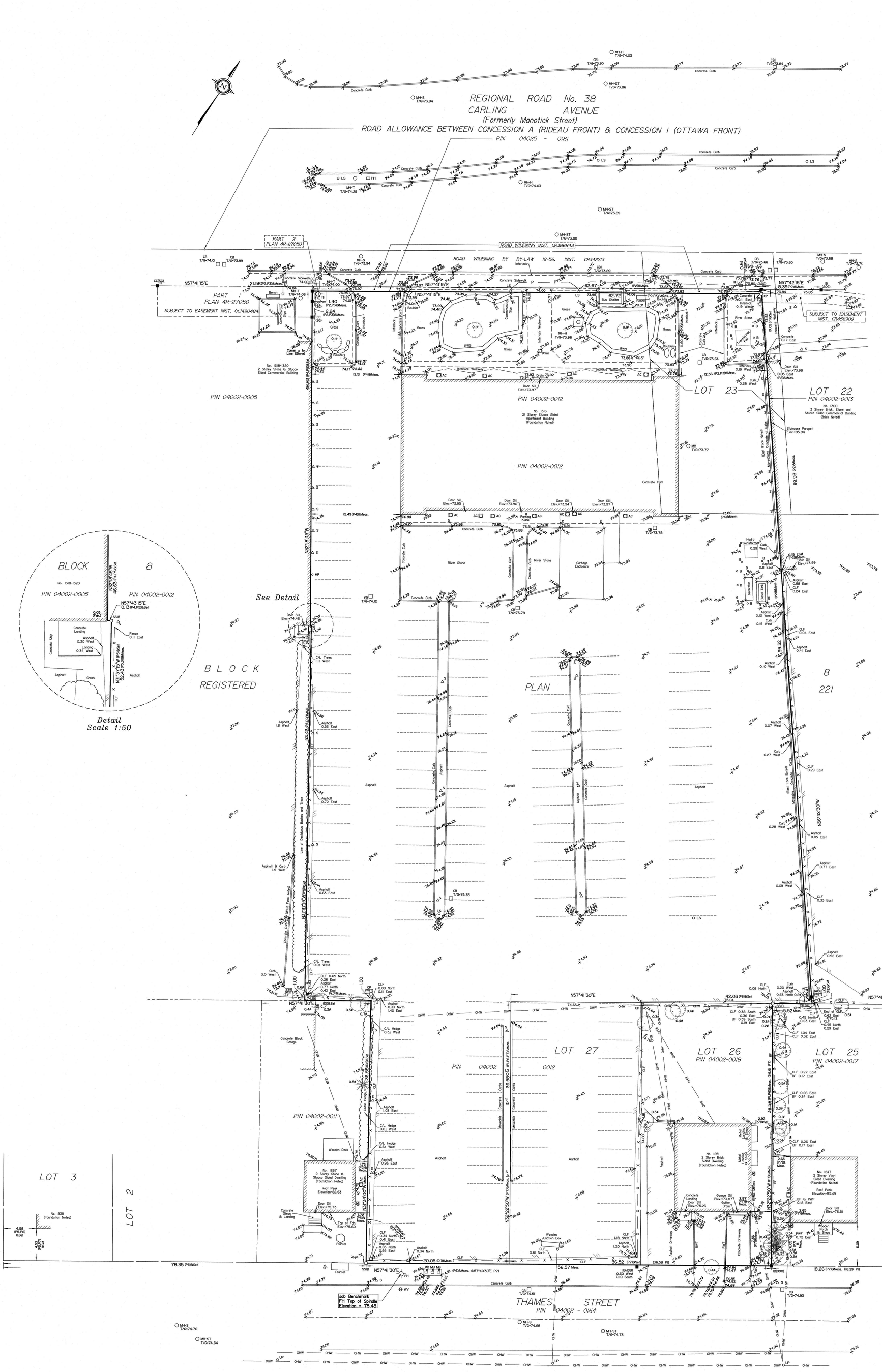
For comparison purposes, a rotation of 0°32'45" counter-clockwise was applied to bearings on plans (P4) and (P5), a rotation of 0°32'40" counter-clockwise was applied to bearings on plan (P6).

ELEVATION NOTES

1. Elevations shown are geodetic, derived from City of Ottawa Vertical Control Monument No. N-29 (Index No. 86), having a published elevation of 77.347 metres, and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.



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ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Job No. 22851-25 Homestead L126,27 PIB98, L123 RP22(0 DI ISW

UNIT MIX	
Area	Count
1 BEDROOM	
640 ft²	19
700 ft²	1
710 ft²	27
730 ft²	1
	48
1 BEDROOM + DEN	
800 ft²	10
890 ft²	1
	11
1 BEDROOM BF	
710 ft²	10
	10
2 BEDROOM	
830 ft²	5
950 ft²	18
980 ft²	8
990 ft²	1
1010 ft²	3
1030 ft²	5
1040 ft²	16
1060 ft²	16
1170 ft²	5
1180 ft²	3
1200 ft²	1
1220 ft²	3
1250 ft²	3
	87
2 BEDROOM + DEN	
990 ft²	5
1070 ft²	3
1080 ft²	1
1110 ft²	10
1120 ft²	1
1130 ft²	3
1220 ft²	1
	24
2 BEDROOM BF	
950 ft²	19
960 ft²	2
	21
	201

UNIT MIX/ FLOOR- OBC...	1 BDRM		1 BDRM +DEN		2 BDRM		2 BDRM +DEN		TOTAL		TOTAL
UNIT AREA	**(59-68m²)**		**(74-83m²)**		**(77-116m²)**		**(92-105m²)**				
		B.F.		B.F.		B.F.		B.F.		B.F.	
LEVEL 1	1	0	1	0	5	1	2	0	9	1	10
LEVEL 2 -4 (X3 floors)	3X3=9	0	0	0	7X3=21	1X3=3	2X3=6	0	12X3=36	1X3=3	13X3=39
LEVEL 5 -9 (X5 floors)	3X5=15	0	0	0	6X5=30	1X5=5	1X5=5	0	10X5=50	1X5=5	11X5=55
LEVEL 10	3	0	0	0	2	2	0	0	5	2	7
LEVEL 11 -20 (X10 floors)	2X10=20	1X10=10	1X10=10	0	3X10=30	1X10=10	1X10=10	0	7X10=70	2X10=20	9X10=90
TOTAL	**48**	**10**	**11**	**0**	**88**	**21**	**23**	**0**	**170**	**31 (15%)**	**201**
TOTAL	**58**		**11**		**109**		**23**		**201**		**201**

LOT COVERAGE		
GROUND FLOOR AREA (Building footprint)	1,332.5 m²	
LANDSCAPE AREA	4,567.5 m² (including 825 m² PARKLAND + 76.75 m² Patios + 531 m² Hardscape + 208 m² Ramp enclosure + 1,453 m² Softscape + 1473.75 m² Asphalt)	
TOTAL DEVELOPED AREA	5,900 m²	
UNDEVELOPED (Existing building) AREA	2,752.8 m²	
TOTAL LOT AREA	8,652.8 m² (including 825 m² PARKLAND)	

BUILDING AREAS

	GROSS FLOOR AREA	AMINETIES (INDOOR)	BALCONIES	TERRACES (OUTDOOR)
UNDERGROUND PARKING GARAGE L3 & L2	-	-	-	-
UNDERGROUND PARKING GARAGE L1	-	232.25 m² (Communal)	-	-
GROUND FLOOR AREA	924.5 m² (9,951.23 ft²)	-	76.75 m²	600 m² (6458.35 ft²) (Communal)
2ND - 4TH FLOOR AREA (X3 STOREYS)	(1,139 m² X3 =) 3,417 m² (12,260.1 X3 = 36,780.3 ft²)		(91.72m² X 3 =) 275.16 m²	-
5TH FLOOR AREA	867 m² (9,332.3 ft²)		34.23 m²	258 m²
6TH - 9TH FLOOR AREA (X4 STOREYS)	(867 m² X4 =) 3,468 m² (9,332.3 X4 = 37,329.2 ft²)		(76.88 m² X 4 =) 307.52 m²	-
10TH FLOOR AREA	711 m² (7,653.14 ft²)	175.05 m² (Communal)	36.48 m²	193.93 m² (2087.44 ft²) (Communal)
TYPICAL FLOOR AREA (11TH - 20TH) (X10 STOREYS)	(697.45 m² X10 =) 6,974.5 m² (7507.3 X10= 75,073 ft²)		57.12 m²	-
SUM GROSS AREA	16362 m² (176,119.17 ft²)	407.3 m²	780.52m²	1,051.93 m²
SUM AMENITIES (Indoor, Balconies and Terraces)		2,239.75 m² (Including 1,200.93 m² communal)		
NUMBER OF STOREYS (above grade)		20 storeys		

City of Ottawa Zoning By-Law 2008-250			
ZONING MECHANISM	REQUIRED /PERMITTED	PROPOSED	RELIEF REQ'D

AMENITIES

Amenity Area for Residential Development (MIN.)	6 m² for every Residential Unit 6 x 201 = 1206 m²	2,238.5 m²	-
Amenity Area Provided as Commonal Space	MIN. 50 % X 1206 m² = 603 m²	1,200.93 m² (99.5%)	-

Parking Schedule

Level	Type	Count
PARKING P3	Small Space 2400x4600	1
PARKING P3	Small Space 2400x5200	25
PARKING P3	Small Space 2600x4600	5
PARKING P3	Standard Space 2600x5200	89
PARKING P2	Small Space 2400x4600	1
PARKING P2	Small Space 2400x5200	25
PARKING P2	Small Space 2600x4600	5
PARKING P2	Standard Space 2600x5200	87
PARKING P1	BF Space Type A 3400x5200	2
PARKING P1	BF Space Type B 2750x6000	2
PARKING P1	Small Space 2400x4600	1
PARKING P1	Small Space 2400x5200	23
PARKING P1	Small Space 2600x4600	5
PARKING P1	Standard Space 2600x5200	83
GROUND FLOOR	BF Space Type A 3400x5200	3
GROUND FLOOR	BF Space Type B 2750x6000	3
GROUND FLOOR	Standard Space 2600x5200	17
		377

SMALL SPACES : 97
STANDARD SPACES : 270
B.F. SPACES : 10

REQUIRED: TABLE 101 R12 HIGH-RISE AREA X/Y
0.5 RESIDENT / DWELLING + 0.1 VISITOR = 0.6
(No parking for first 12 units)
189 UNITS x 0.6 = 113 SPACES REQUIRED
(19 VISITOR + 94 RESIDENTIAL)

PROPOSED : 377 SPACES
169 SPACES TO REPLACE THE EXISTING SPACES
208 NEW SPACES FOR 201 UNITS = 1.03 PARKING RATE

BARRIER-FREE PARKING
OTTAWA BY-LAW 2017-301
TYPE A: 3400mm WIDE
TYPE B: 2400mm WIDE

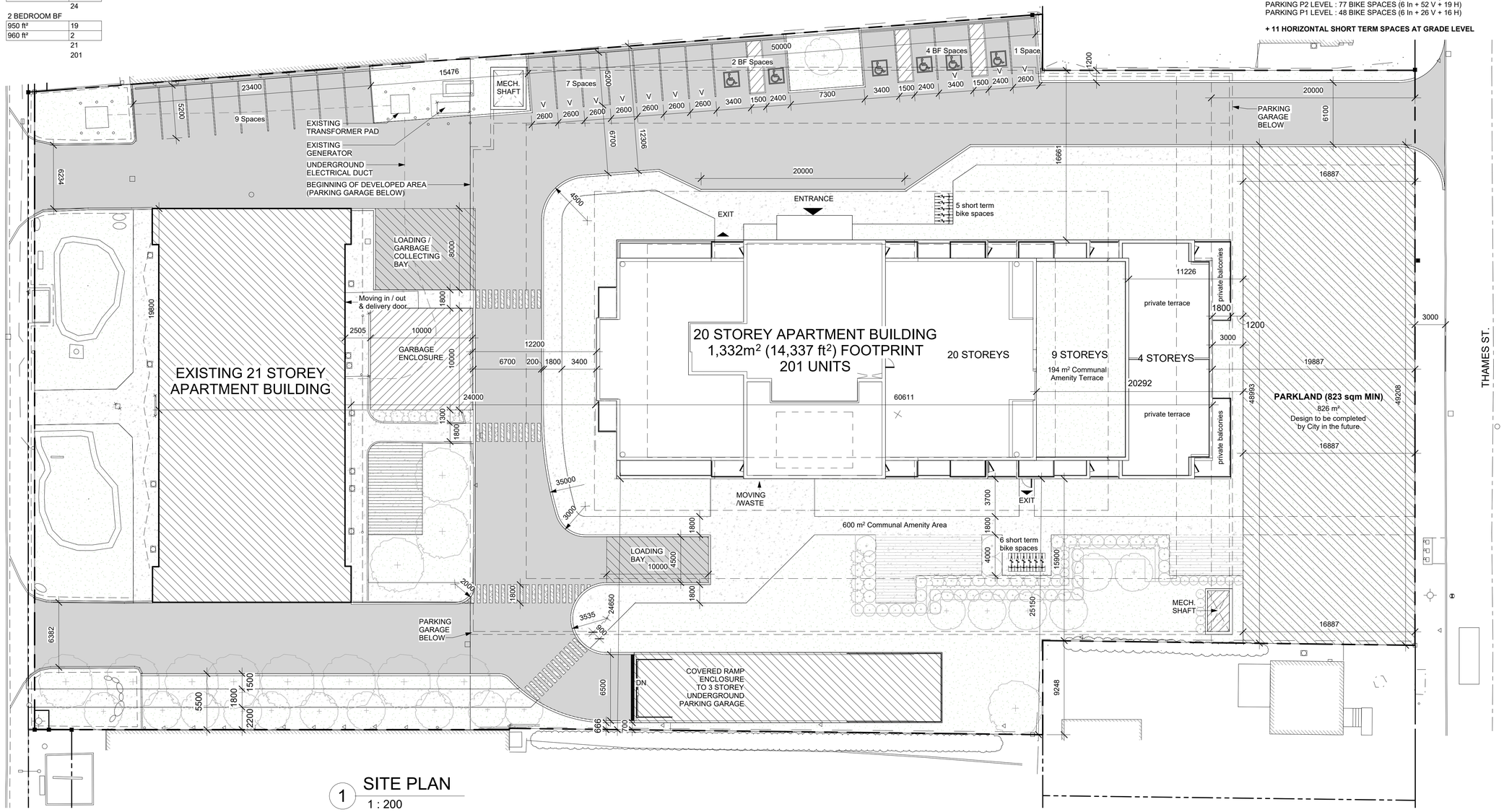
# SPACES	A	B	TOTAL
251-300	4	4	8
301-350	4	5	9
351-400	***5***	***5***	***10***

BICYCLE SPACES :

REQUIRED : 201 LONG TERM SPACES
+ 11 SHORT TERM SPACES

PROPOSED : 205 LONG TERM SPACES (UNDERGROUND)
(12 Inclusive spaces + 130 Vertical spaces + 63 Horizontal spaces)
PARKING P3 LEVEL : 80 BIKE SPACES (52 V + 28 H)
PARKING P2 LEVEL : 77 BIKE SPACES (6 In + 52 V + 19 H)
PARKING P1 LEVEL : 48 BIKE SPACES (6 In + 26 V + 16 H)

+ 11 HORIZONTAL SHORT TERM SPACES AT GRADE LEVEL



1 SITE PLAN
1 : 200

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THESE DRAWINGS HAVE BEEN DESIGNED IN COMFORMANCE WITH THE ONTARIO BUILDING CODE.

Revisions		
No.	Date	Description
2	24-03-2026	Issued for ZBA

HOMESTEAD

Alexander Wilson Architect Inc
Admiralty Place
103-20 Gore Street
Kingston, Ontario, K7L 2L1
t: 613-545-3744
f: 613-545-1411

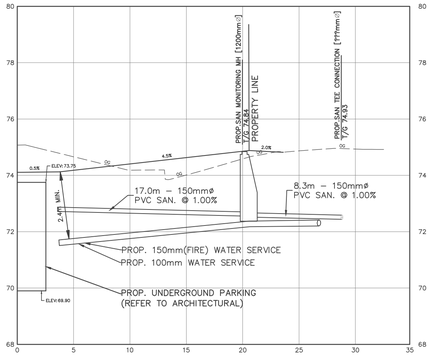
Stamp

Project
1316 CARLING AVE APARTMENTS

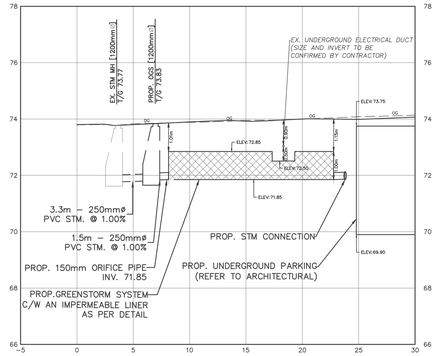
1316 CARLING AVE.,
OTTAWA, ON

Drawing
SITE PLAN

Drawn By	Checked By
FAHD A.Z.	-
Scale	Date
1 : 200	05/13/25
Project No.	Revision
2513	2
Drawing No.	A010
	1:1



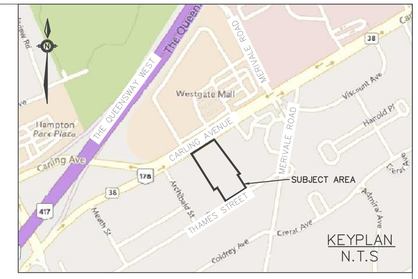
SECTION A-A
H 1:250
V 1:100

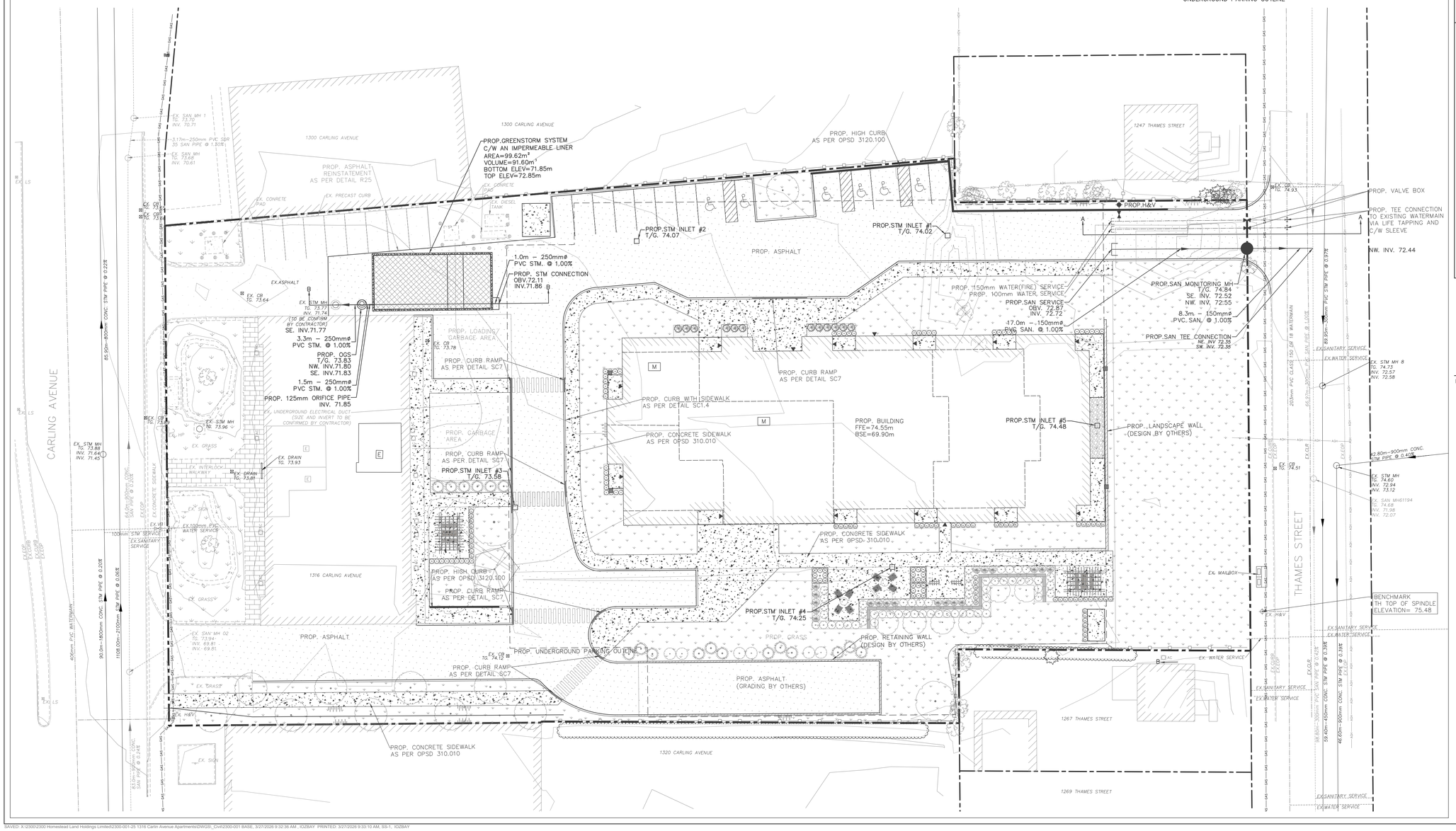


SECTION B-B
H 1:250
V 1:100

LEGEND

- RETAINING WALL
- PRIVACY FENCE
- ACOUSTIC FENCE
- CHAIN LINK FENCE
- SILT FENCE
- GAS LINE
- ABOVE HYDRO LINE
- HYDRO LINE
- BELL LINE
- EXISTING SANITARY MAINTENANCE HOLE
- PROPOSED SANITARY MAINTENANCE HOLE
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING STORM MAINTENANCE HOLE
- PROPOSED STORM MAINTENANCE HOLE
- SERVICE CAP
- DOWN SPOUTS
- FIRE DEPT CONNECTION
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING VALVE BOX
- PROPOSED VALVE BOX
- PROPOSED SIGN
- EXISTING LIGHT POLE
- EXISTING WALL MOUNT LIGHT
- MANDOOR
- OVERHEAD DOOR
- UNDERGROUND PARKING OUTLINE
- LANDSCAPE AREA
- EXISTING ASPHALT AREA
- PROPOSED ASPHALT AREA
- CONCRETE AREA





Gerrits ENGINEERING

Barrie, ON Tel.: 705.737.3303
Kingston, ON Tel.: 613.217.8246

www.gerreng.com

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0 5 10 20 30 40 50mm
0" 1/4" 1/2" 1" 1 1/2" 2"

No.	Issuance Description	YY/MM/DD
1.	CLIENT REVIEW	26/03/11
2.	ZONING BY-LAW AMENDMENT	26/03/27

BENCHMARK
ELEVATIONS SHOWN ARE GEODETIC, DERIVED FROM CITY OF OTTAWA VERTICAL CONTROL MONUMENT NO. N-29 (INDEX NO. 86), HAVING A PUBLISHED ELEVATION OF 77.347 METRES, AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.

Issued For:

ZONING BY-LAW AMENDMENT

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Client

HOMESTEAD LAND HOLDINGS LIMITED
80 Johnson Street
Kingston, ON, K7L 1X7

Project

RESIDENTIAL APARTMENTS
1316 Carling Avenue, Ottawa, ON

Drawing:

SITE SERVICING PLAN

Project No.	2300-001-25	Designed by: IO	Checked by: KF
Scale:	1:250	Drawn by: IO	Approved by: DL

Orientation

Stamp

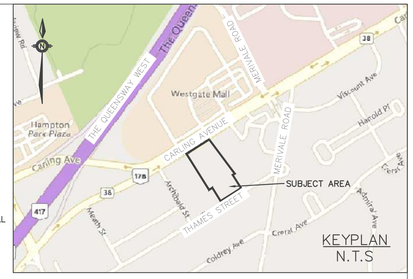
LICENSED PROFESSIONAL ENGINEER
LP. LE BLANC
100535337
03/27/2026
PROVINCE OF ONTARIO

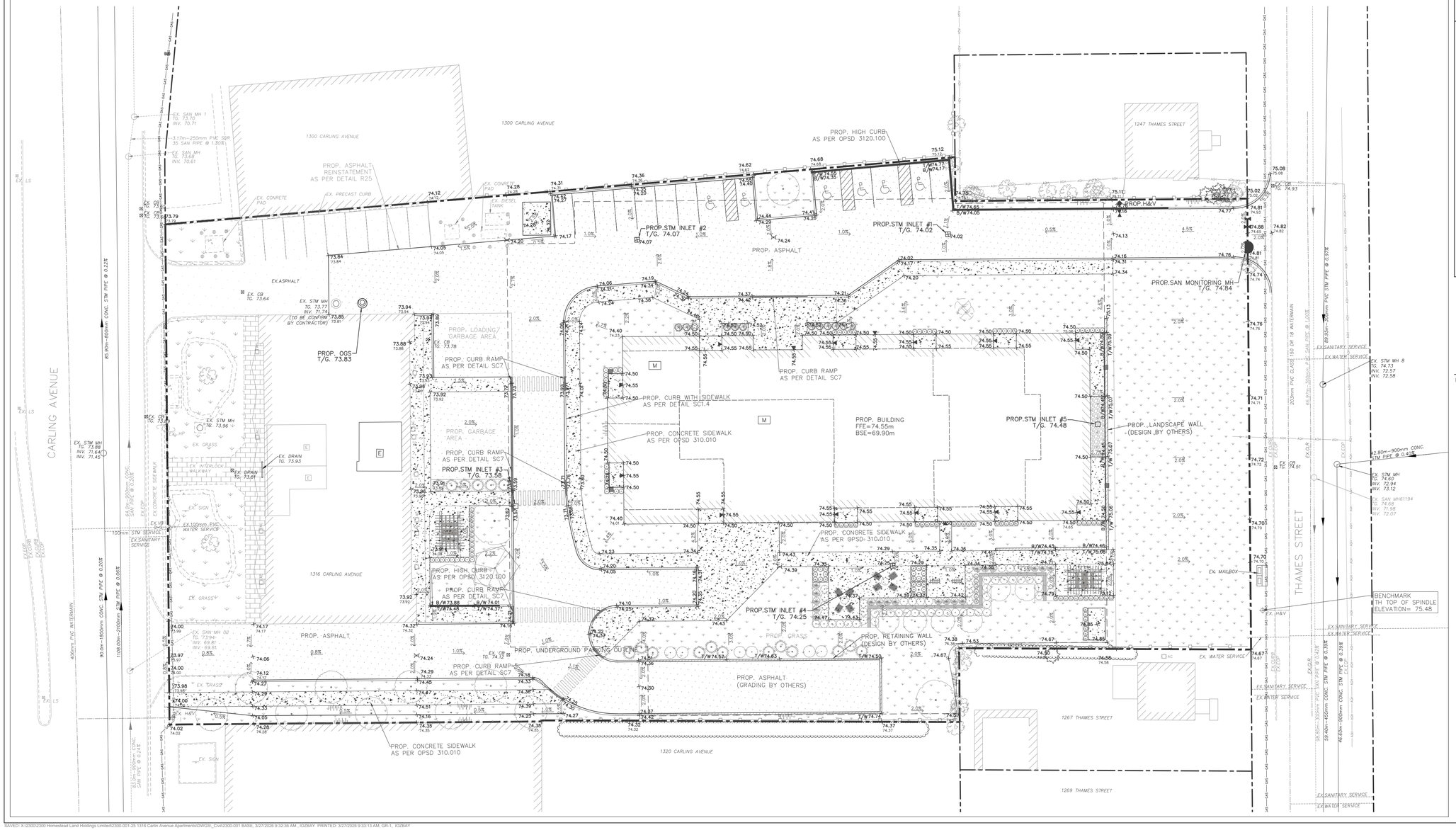
Drawing No.

SS-1

LEGEND

- RETAINING WALL
- PRIVACY FENCE
- ACOUSTIC FENCE
- CHAIN LINK FENCE
- SILT FENCE
- GAS LINE
- ABOVE HYDRO LINE
- HYDRO LINE
- BELL LINE
- EXISTING SANITARY MAINTENANCE HOLE
- PROPOSED SANITARY MAINTENANCE HOLE
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING STORM MAINTENANCE HOLE
- PROPOSED STORM MAINTENANCE HOLE
- SERVICE CAP
- DOWN SPOUTS
- FIRE DEPT CONNECTION
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING VALVE BOX
- PROPOSED VALVE BOX
- PROPOSED SIGN
- EXISTING LIGHT POLE
- EXISTING WALL MOUNT LIGHT
- MANDOOR
- OVERHEAD DOOR
- UNDERGROUND PARKING OUTLINE
- LANDSCAPE AREA
- EXISTING ASPHALT AREA
- PROPOSED ASPHALT AREA
- CONCRETE AREA
- 220.75 PROPOSED ELEVATION / 220.75 EXISTING ELEVATION — T/W–TOP WALL, B/W–BOTTOM WALL
- 2.0% PROPOSED GRADE
- OVERLAND FLOW ROUTE
- 3:1 SLOPE (OR AS LABELED)
- SWALE
- HIGH POINT
- RISERS





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Kingston, ON Tel.: 613.217.8246

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ZONING BY-LAW AMENDMENT

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Client

HOMESTEAD LAND HOLDINGS LIMITED
80 Johnson Street
Kingston, ON, K7L 1X7

Project

RESIDENTIAL APARTMENTS
1316 Carling Avenue, Ottawa, ON

Drawing:

GRADING PLAN

Project No.	2300-001-25	Designed by: IO	Checked by: KF
Scale:	1:250	Drawn by: IO	Approved by: DL

Orientation

Stamp

LICENSED PROFESSIONAL ENGINEER
LE BLANC
100535337
03/27/2026
PROVINCE OF ONTARIO

Drawing No.

GR-1

SAVED: X:\2300\2300 Homestead Land Holdings Limited\2300-001-25 1316 Carlin Avenue Apartments\DWG\R_Civil\2300-001 BASE, 3/27/2026 9:32:36 AM , IOZBAY PRINTED: 3/27/2026 9:33:13 AM, GR-1, IOZBAY

LEGEND

ID — P–X | CO — RUNOFF COEFFICIENT

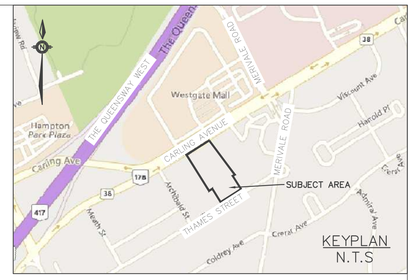
AREA

AREA (ha)

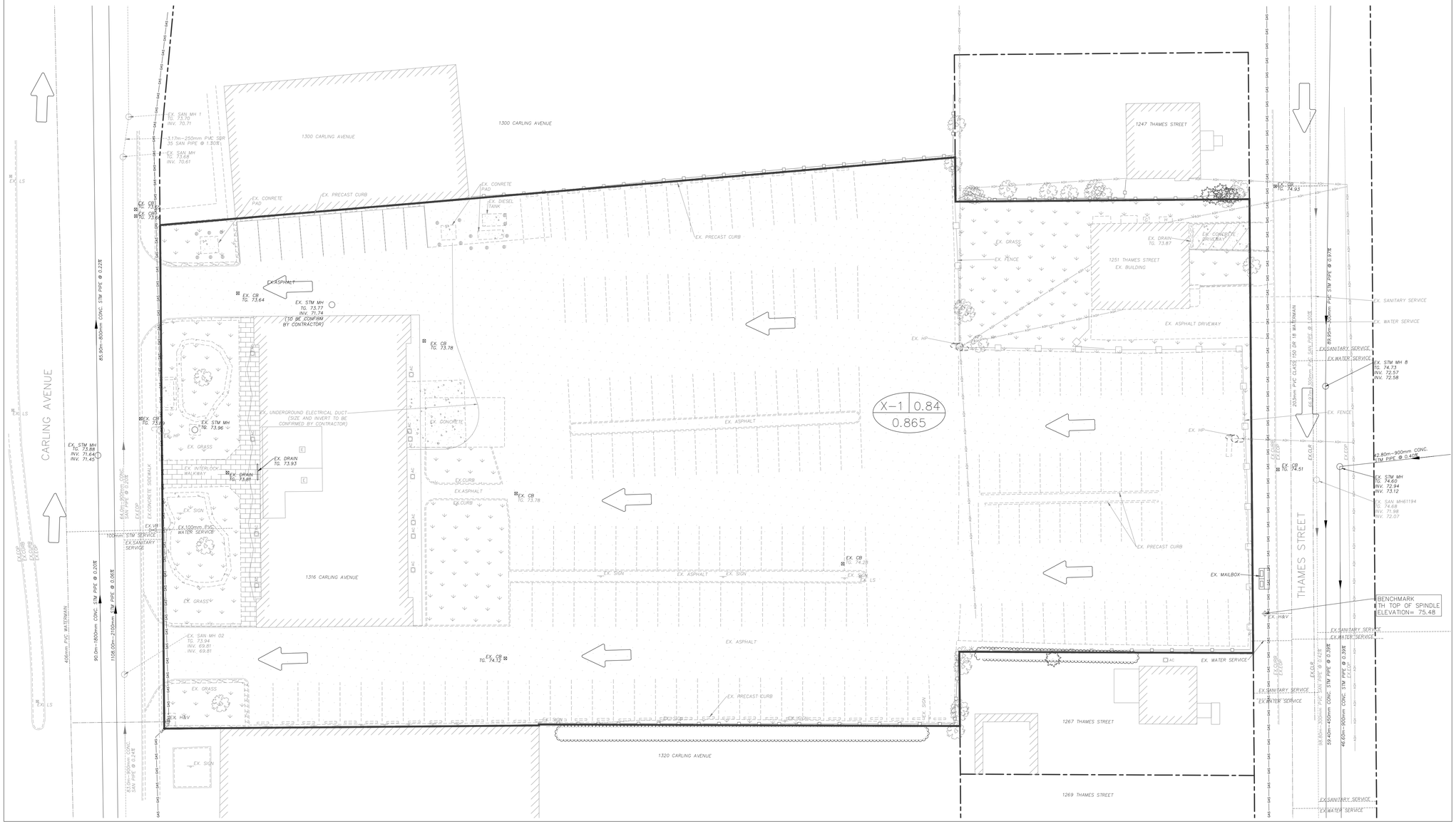
CATCHMENT BOUNDARY

OVERLAND FLOW ROUTE

100 YEAR PONDING AREA



KEYPLAN
N.T.S



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Kingston, ON
Tel.: 613.217.8246

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0 5 10 20 30 40 50mm
0" 1/4" 1/2" 1" 1 1/2" 2"

No.	Issuance Description	YY/MM/DD
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2.	ZONING BY-LAW AMENDMENT	26/03/27

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Issued For:

ZONING BY-LAW AMENDMENT

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Client

HOMESTEAD LAND HOLDINGS LIMITED
80 Johnson Street
Kingston, ON, K7L 1X7

Project

RESIDENTIAL APARTMENTS
1316 Carling Avenue, Ottawa, ON

Drawing:

PRE-STORM WATER MANAGEMENT PLAN

Project No.	2300-001-25	Designed by: IO	Checked by: KF
Scale:	1:250	Drawn by: IO	Approved by: DL

Orientation

Stamp

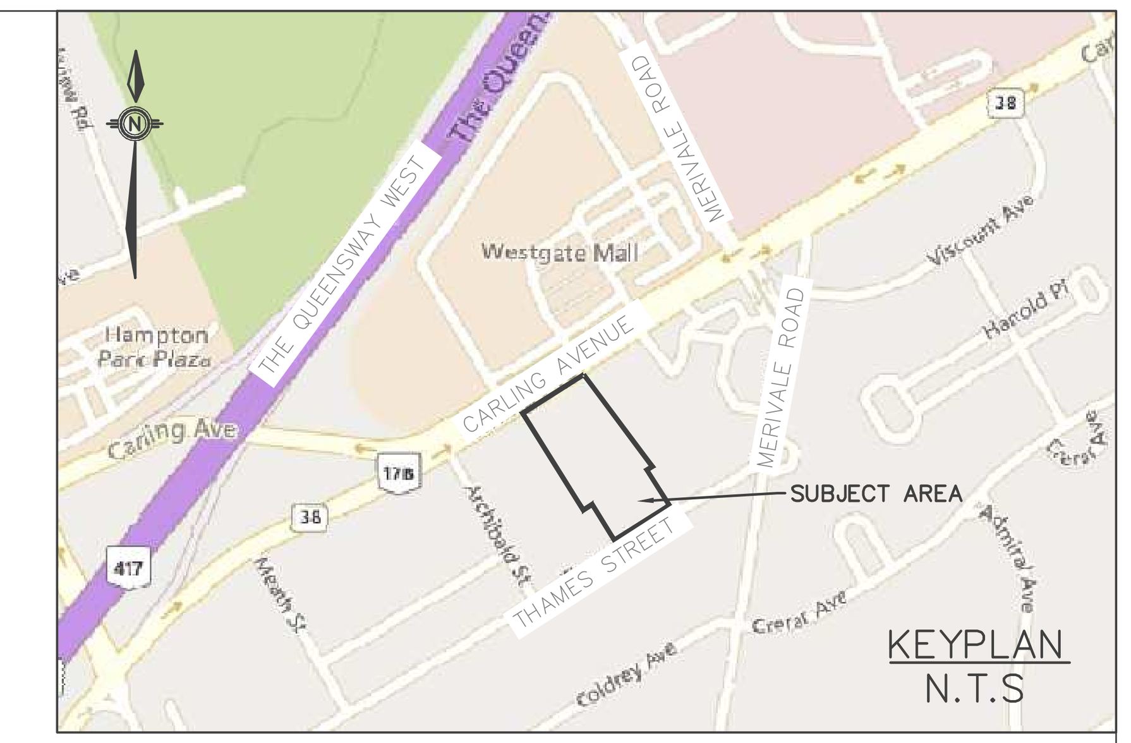
LICENCED PROFESSIONAL ENGINEER
O. LE BLANC
100535337
03/27/2026
PROVINCE OF ONTARIO

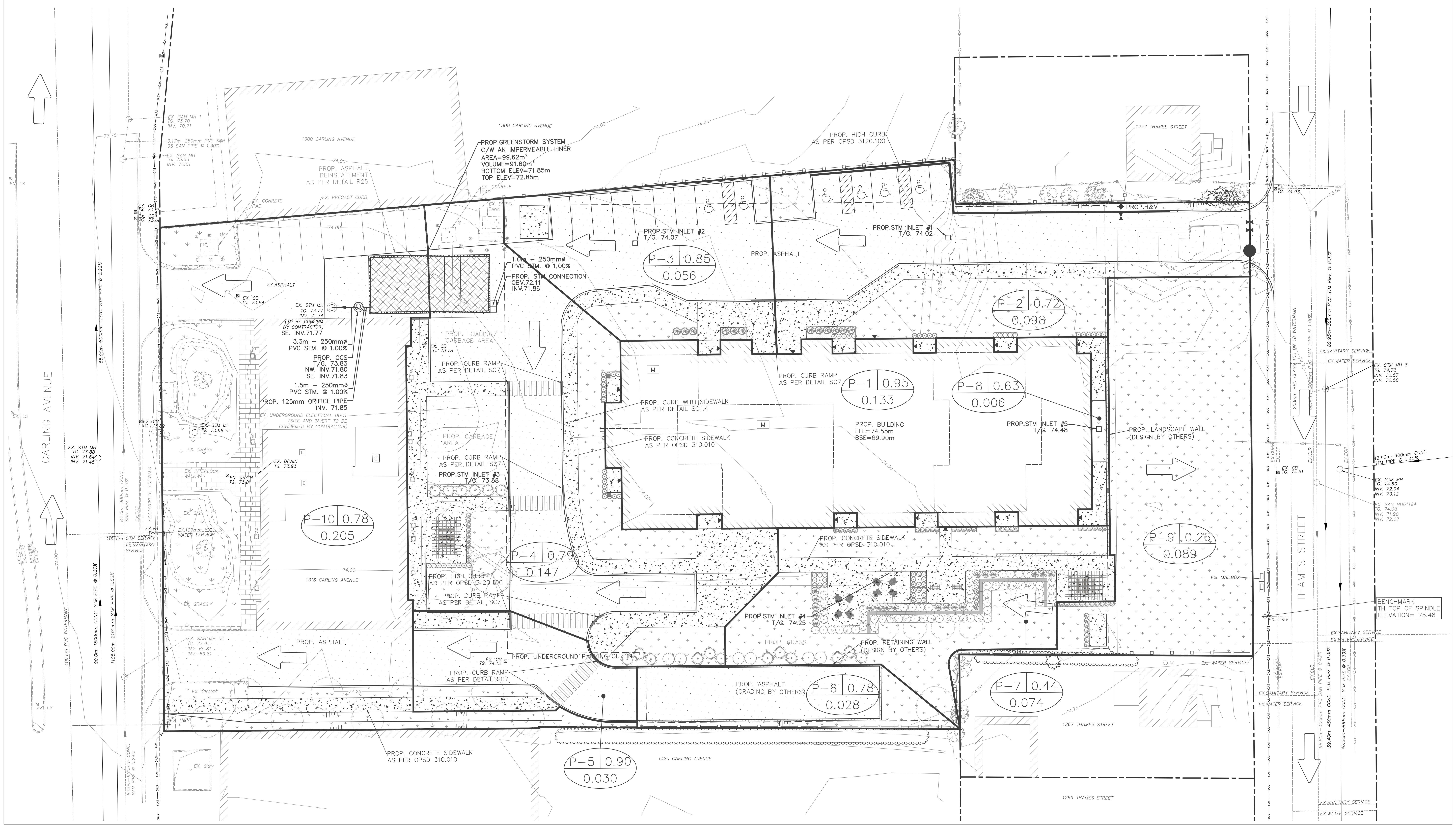
Drawing No.

STM-1

LEGEND

- ID / RUNOFF COEFFICIENT: P–X | CO / AREA — AREA (ha)
- CATCHMENT BOUNDARY
- OVERLAND FLOW ROUTE
- 100 YEAR PONDING AREA





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Gerrits ENGINEERING

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No.	Issuance Description	YY/MM/DD
1.	CLIENT REVIEW	26/03/11
2.	ZONING BY-LAW AMENDMENT	26/03/27

BENCHMARK
ELEVATIONS SHOWN ARE GEODETIC, DERIVED FROM CITY OF OTTAWA VERTICAL CONTROL MONUMENT NO. N-29 (INDEX NO. 86), HAVING A PUBLISHED ELEVATION OF 77.347 METRES, AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.

Issued For:

ZONING BY-LAW AMENDMENT

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Client
HOMESTEAD LAND HOLDINGS LIMITED
80 Johnson Street
Kingston, ON, K7L 1X7

Project
RESIDENTIAL APARTMENTS
1316 Carling Avenue, Ottawa, ON

Drawing:
POST-STORM WATER MANAGEMENT PLAN

Project No.	2300-001-25	Designed by: IO	Checked by: KF
Scale:	1:250	Drawn by: IO	Approved by: DL

Orientation

Stamp: LICENSED PROFESSIONAL ENGINEER D. LE BLANC 100535337 03/27/2026 PROVINCE OF ONTARIO

Drawing No.
STM-2

SAVED: X:\2300\2300 Homestead Land Holdings Limited\2300-001-25 1316 Carlin Avenue Apartments\DWGS_Civil\2300-001 BASE, 3/27/2026 9:32:36 AM , IOZBAY PRINTED: 3/27/2026 9:33:17 AM, STM-2, IOZBAY

NOTES FOR SEDIMENT & EROSION CONTROL

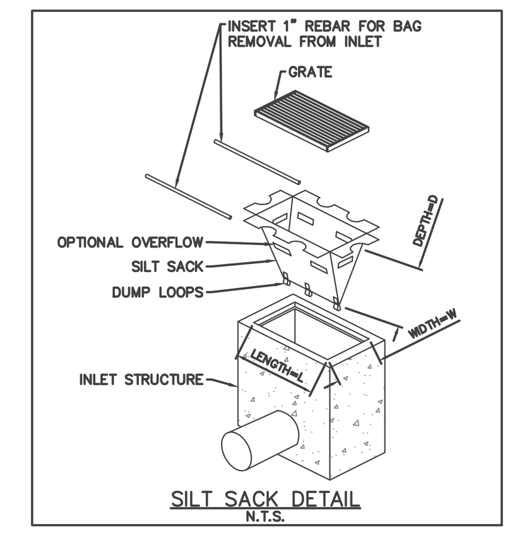
1. DISTURBED AREAS THAT HAVE FAILED TO HAVE STABLE GROUND COVER ESTABLISHED BY OCTOBER 30TH SHALL BE PROTECTED WITH A SILTATION CONTROL FENCE OR STRAW MULCH ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION BECOMES ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
2. ANY DEWATERING WASTE SHALL BE DISCHARGED TO A VEGETATED AREA AT LEAST 30 M FROM ANY WATERCOURSE AND FILTERED. FILTERING METHODS MUST BE APPROVED BY THE SITE ADMINISTRATOR.
3. SILT FENCE SHALL BE PUT IN PLACE PRIOR TO AND MAINTAINED DURING ALL GRADING. SILT FENCE SHALL COMPLY WITH OPSD 219.110 FOR LIGHT DUTY AND / OR OPSD 219.130 FOR HEAVY DUTY; UNLESS NOTED OTHERWISE. SILT FENCE TO BE INSPECTED PRIOR TO COMMENCEMENT OF EARTH GRADING ACTIVITIES. SILT FENCE TO BE INSPECTED AND REPAIRED OR REPLACED IF DAMAGED AS DIRECTED BY THE SITE ADMINISTRATOR. SILT CONTROLS TO BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN EVENT. INSTALLATION SHALL BE TO THE MANUFACTURER'S SUGGESTED SPECIFICATIONS.
4. THE CONTRACTOR SHALL BE PREPARED FOR UNEXPECTED CONDITIONS AND ACCORDINGLY HAVE STOCKPILED MATERIALS ON SITE FOR NECESSARY REPAIRS AS A RESULT OF FAILED OR INADEQUATE CONTROL MEASURES. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK, AND AFTER EVERY RAINFALL EVENT.
5. MUD MATS WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES THE SITE SHALL BE USED. MUD MATS TO BE 300mm IN DEPTH, 6.0m WIDE BY 20.0m LONG, FIRST 10.0m TO 150mmø CLEAR STONE WITH THE REMAINING 10.0m CONSISTING OF 50mmø CLEAR STONE; OR MEET MUNICIPAL STANDARDS WHERE IDENTIFIED.
6. CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSS 805, CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS WELL AS ALL APPLICABLE MUNICIPAL STANDARDS.
7. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES SHOULD BE PRESENTED IN WRITING FOR APPROVAL OF THE SITE ADMINISTRATOR AND MUST BE APPROVED IN WRITING BY THE CONSERVATION AUTHORITY.
8. THE TOPS OF ALL FILTER FABRIC MUST BE A MINIMUM OF 1.0 METRES ABOVE THE GROUND LEVEL AND ATTACHED TO THE FENCE WITH A CONTINUOUS STEEL WIRE. ALTERNATIVELY, THE FILTER FABRIC MUST BE FOLDED OVER THE TOP OF THE FENCE AND ATTACHED TO THE FENCE WITH WIRE LOOPED THROUGH THE FABRIC ON BOTH SIDES OF THE FENCE. FILTER FABRIC IS TO BE TERRAFIX 270R OR EQUIVALENT.
9. ALL DISTURBED GROUND LEFT INACTIVE SHALL BE STABILIZED BY SEEDING, SODDING, MULCHING, OR COVERING OR OTHER EQUIVALENT CONTROL MEASURES. THIS PERIOD OF INACTIVITY SHALL BE AT THE DISCRETION OF THE MUNICIPAL DIRECTOR OF ENGINEERING BUT SHALL NOT EXCEED (30) DAYS OR SUCH LONGER PERIOD DEEMED ADVISABLE BY THE MUNICIPAL DIRECTOR OF ENGINEERING.
10. CONTRACTOR SHALL INSTALL AND MAINTAIN CATCHBASIN SEDIMENT BARRIERS THROUGHOUT THE SITE DURING ALL CONSTRUCTION ACTIVITIES IN ORDER TO MITIGATE SEDIMENT ENTERING THE STORM STORM SEWERS.
11. NO FUEL TO BE STORED ON SITE. IN CASE OF A SPILL PLEASE CONTACT: MOECC SPILLS ACTION CENTER 1-800-268-6060.
12. SEDIMENT CONTROLS ARE TO REMAIN IN PLACE UNTIL WRITTEN DIRECTION IS RECEIVED FROM THE ENGINEER REGARDING THEIR REMOVAL.
13. EROSION AND SEDIMENT CONTROLS WILL BE INSPECTED ON AS PER MUNICIPAL REQUIREMENTS OR AFTER SIGNIFICANT RAINFALL EVENTS.

SEQUENCE OF CONSTRUCTION

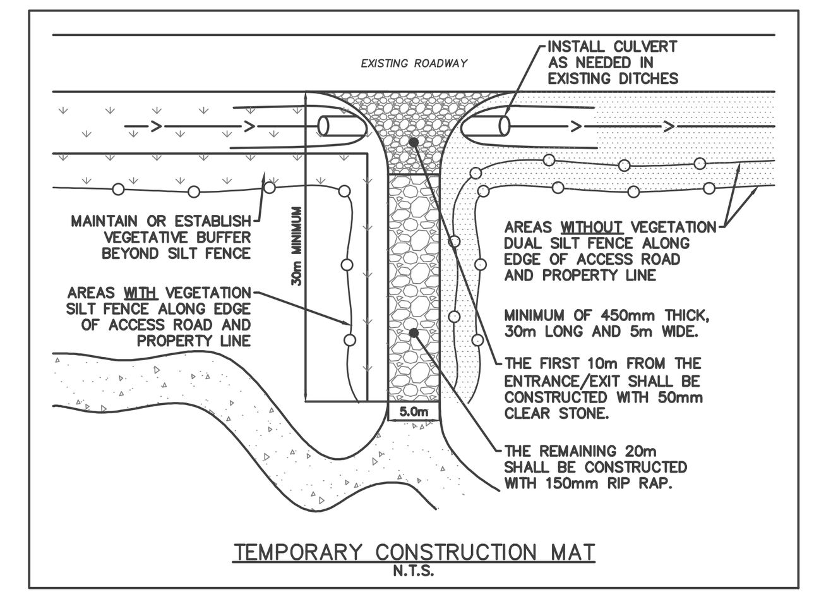
1. ENGINEER AND MUNICIPALITY TO BE NOTIFIED PRIOR TO INITIATION OF ANY ON SITE WORKS.
2. SILT FENCE AND CONSTRUCTION ACCESS MATS TO BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORKS ONSITE.
3. VEGETATION REMOVAL MAY COMMENCE AFTER ALL SILT FENCE IS INSTALLED AND APPROVED BY THE ENGINEER.
4. COMMENCE WITH EARTH EXCAVATION AND SITE SERVICING (TO BE REMOVED FROM SITE – NO STOCKPILE).
5. EROSION CONTROL MEASURES TO BE MAINTAINED AS DIRECTED BY THE ENGINEER DURING THE CONSTRUCTION PERIOD. ADDITIONAL CONTROL MEASURES MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
6. ALL DISTURBED GROUND LEFT INACTIVE FOR MORE THAN 30 DAYS SHALL BE STABILIZED WITH SEED, SOD, MULCH OR OTHER ADEQUATE COVERING, AS INSTRUCTED BY THE ENGINEER.
7. ALL CONSTRUCTION VEHICLES TO ACCESS THE SITE VIA THE DESIGNATED CONSTRUCTION ENTRANCES AS SHOWN.

LEGEND

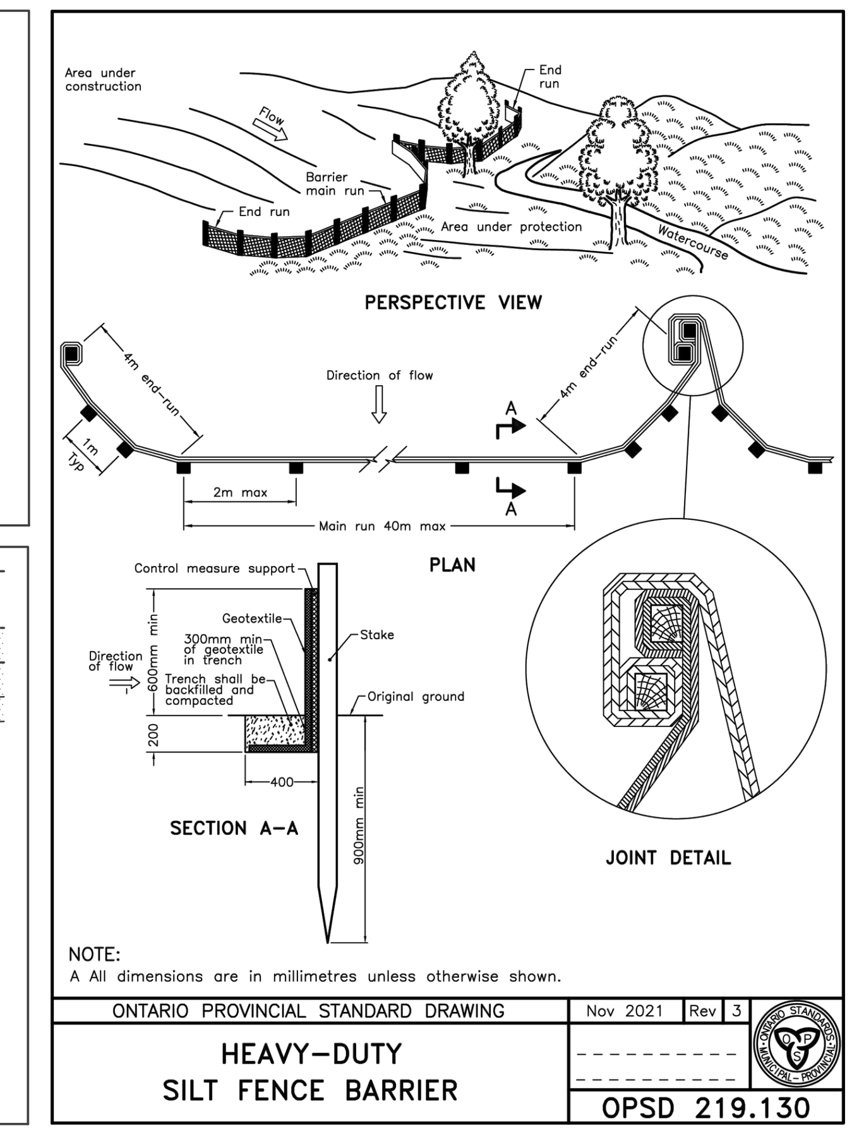
- SILT FENCE
- ROCK CHECK DAM
- STRAW BALE
- SAND BAG BARRIER
- TEMPORARY SWALE
- DIRECTION OF INTERIM OVERLAND FLOW
- ASPHALT REMOVAL AREA
- DECIDUOUS TREE
- CONIFEROUS TREE

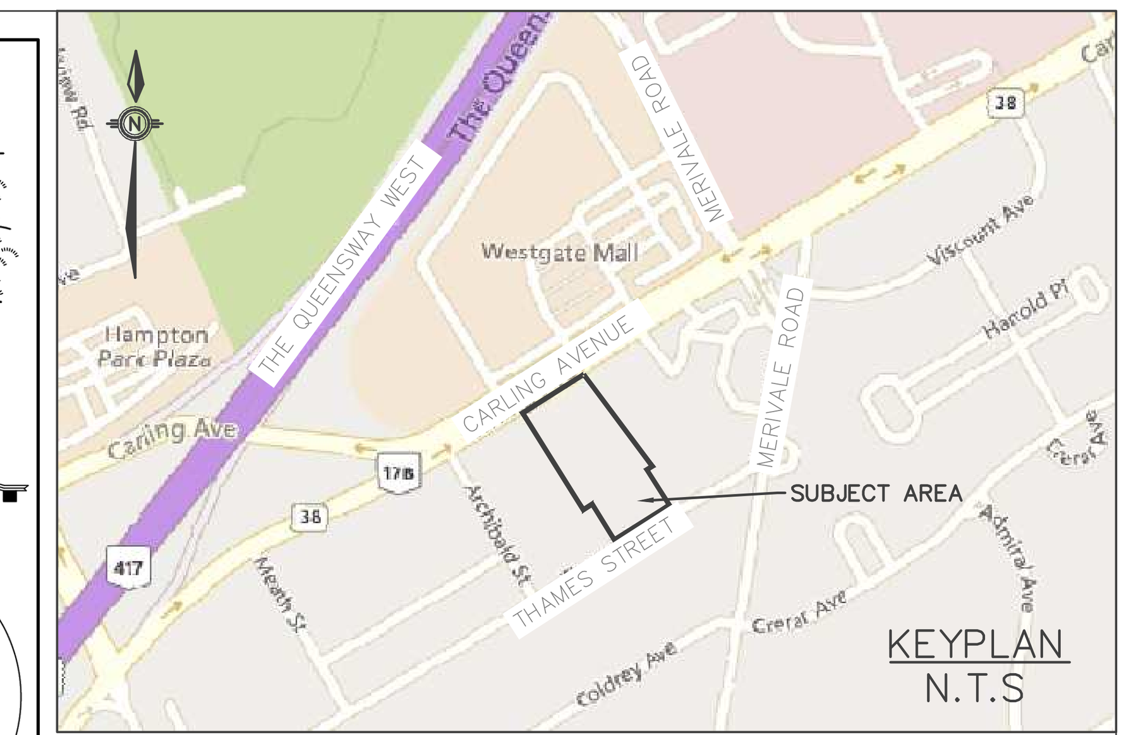


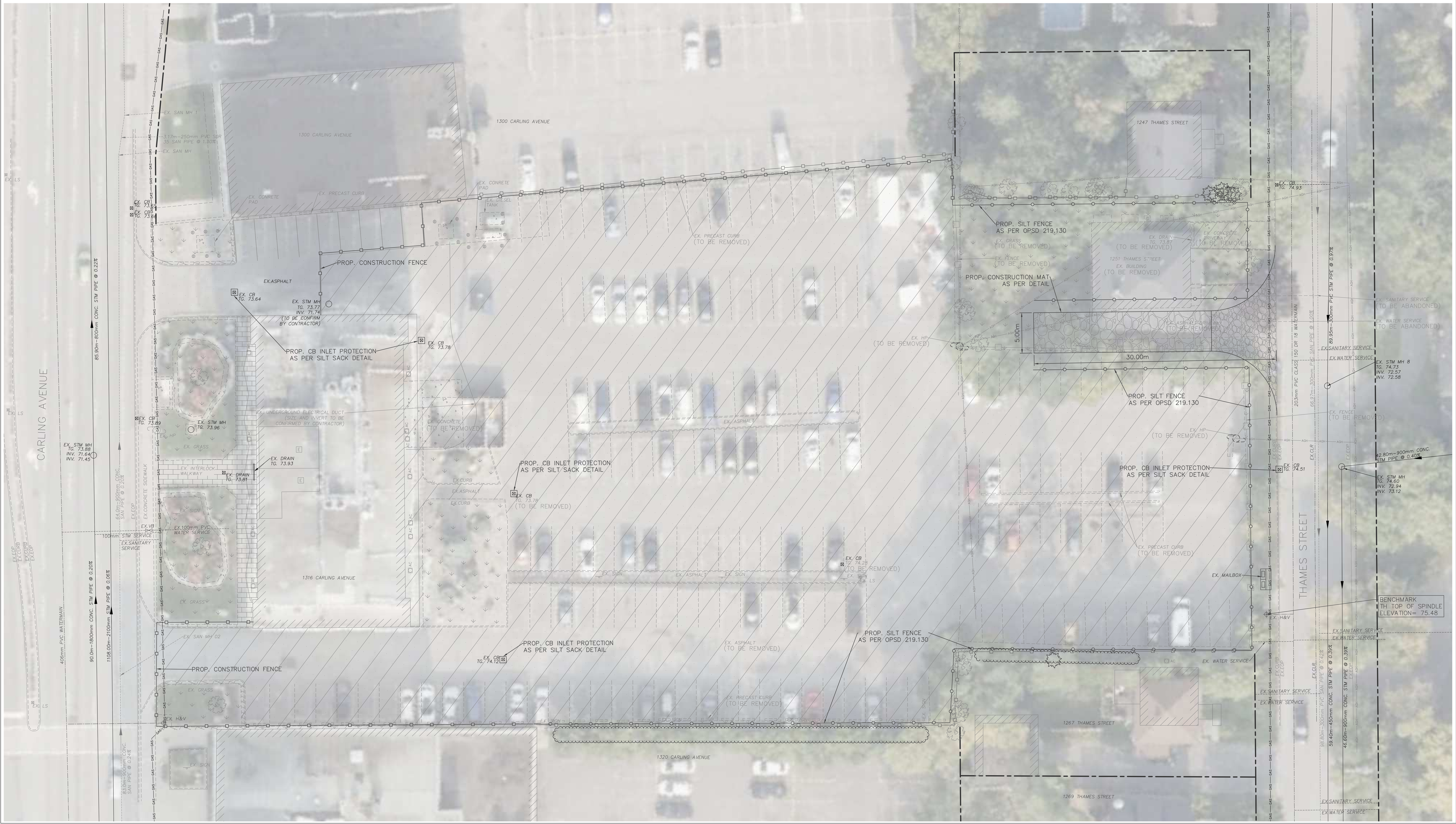
SILT SACK DETAIL
N.T.S.



TEMPORARY CONSTRUCTION MAT
N.T.S.







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0 5 10 20 30 40 50mm
0" 1/4" 1/2" 1" 1 1/2" 2"

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LICENSED PROFESSIONAL ENGINEER
D. LE BLANC
100535337
03/27/2026
PROVINCE OF ONTARIO

Drawing No.
ESC-1