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**SERVICING AND STORMWATER  
MANAGEMENT REPORT**  
PROPOSED COMMERCIAL DEVELOPMENT  
41 EDGEWATER STREET  
KANATA, ONTARIO

Prepared For:  
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Ottawa, Ontario  
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PROJECT #: 250848

**DISTRIBUTION**

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250848 – SER – Site Servicing Plan

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250848 – ESC – Erosion and Sediment Control Plan



## 1 INTRODUCTION

Kollaard Associates was retained by 1763295 Ontario Inc. to complete a Site Servicing and Stormwater Management Report for a proposed commercial development in Kanata, Ontario.

This report will address the serviceability of the proposed site, specifically relating to the adequacy of the existing sanitary sewer, storm sewer, and watermain to hydraulically convey the necessary storm runoff, sanitary sewage and water demands that will be placed on the existing system. The report shall also summarize the stormwater management (SWM) design requirements and proposed works that will address stormwater flows arising from the site under post-development conditions and will identify any stormwater servicing concerns and also describe any measures to be taken during construction to minimize erosion and sedimentation.

The proposed development is located at 41 Edgewater Street. The drawings associated with this report orientate Terry Fox Drive in the north – south direction. The property is located to the south of the intersection of Terry Fox Drive and Edgewater Street. There are two site entrances, one entrance is from Edgewater Street and the other entrance is from Terry Fox Drive.

The site has a total area of 1.44 hectares and is currently occupied by four existing 1-storey commercial buildings. It is understood that the existing buildings will remain and a new multi-use commercial building with a 410 square meter footprint will be constructed on the property. The building will be located in the existing parking lot of the site, closest to the site entrance on Terry Fox Drive. The new building will be 1-storey, containing two units. The first unit is to contain a dental office. The second unit is to contain a pharmacy and medical clinic.

A limit of development is shown on the site plan. The limit of development is 0.23 hectares. This limit of development surrounds the new building location and extends behind and in front of the existing adjacent building (labelled on the site plan as building #4).

## 2 BACKGROUND

The site contains four commercial buildings originally established between 1991 and 1999 (according to GeoOttawa historic aerial photographs). The four existing buildings are restaurants. The restaurants are serviced by a private 150mm watermain and a 250mm sanitary sewer. The watermain and sanitary sewer are located within the drive isle behind the buildings. They are connected to the 400mm watermain and 750mm sanitary main on Edgewater Street. The drive through and parking area surrounding the restaurant closest to Edgewater Street (labelled on the site plan as building#1), contains a series of catchbasins and underground storm pipes that convey the runoff to the 675mm storm sewer on Terry Fox Drive. The runoff





from building#2, #3, #4 and the surrounding area is directed via overland flows to a swale within the right of way along Terry Fox Drive. The swale contains catchbasins that capture and convey the runoff to the storm sewer on Terry Fox Drive. The swale conveys water from the south to the north.

### **3 STORMWATER DESIGN**

#### **3.1 Introduction**

Design of the storm sewer system was completed in conformance with the City of Ottawa Sewer Design Guidelines (December 2025).

#### **3.2 Stormwater Management Design Criteria**

Quantity and quality control criteria were provided by the City of Ottawa (CoO). The stormwater management criterion consists of the following:

##### **Quantity Control Criteria**

- a) Post-development flows directed to the existing ditch/swale located along the property line fronting Terry Fox Drive must be controlled to pre-development flows for each storm event up to and including the 100-year storm event.
- b) Post-development flows directed to a private storm sewer on the property must be controlled to the 5-year pre-development release rate with a maximum runoff coefficient of 0.5.

##### **Quality Control Criteria**

- a) If quality control is not provided at the downstream stormwater management facility SWF1309 (Walter Baker Park Facility), an enhanced level of treatment must be provided for runoff from the site, corresponding to 80% total suspended solids removal.

##### **Infiltration Targets**

- a) The City is requesting that best efforts be provided to achieve infiltration targets discussed in the City of Ottawa Carp River Watershed/Subwatershed Study Volume 1 by Robinson Consultants (December 2004) .



### 3.3 Stormwater Quantity Control

#### 3.3.1 Methodology

Peak Flow for runoff quantities for the Pre-Development and Post-Development stages of the project were calculated using the rational method. The rational method is a common and straightforward calculation, which assumes that the entire drainage area is subject to uniformly distributed rainfall. The formula is:

$$Q = \frac{CiA}{360}$$

Where

Q is the Peak runoff measured in  $m^3/s$

C is the Runoff Coefficient, **Dimensionless**

A is the runoff area in **hectares**

i is the storm intensity measure in **mm/hr**

All values for intensity, i, for this project were derived from IDF curves provided by the City of Ottawa for data collected at the Ottawa International Airport. For this project two return periods were considered, 5 and 100-year events. The formulas for each are:

#### 5-Year Event

$$i = \frac{998.071}{(t_c + 6.053)^{0.814}}$$

#### 100-Year Event

$$i = \frac{1735.688}{(t_c + 6.014)^{0.82}}$$

Where

$t_c$  is time of concentration in **min**

i is the storm intensity measure in **mm/hr**



### 3.3.2 Runoff Coefficients

Runoff coefficients for impervious surfaces (roofs, asphalt, and concrete) were taken as 0.90, and pervious surfaces (grass) were taken as 0.20.

A 25% increase for the post-development 100-year runoff coefficients was used as per City of Ottawa guidelines.

### 3.3.3 Time of Concentration

In keeping with the City of Ottawa Storm Sewer Guidelines, a minimum time of concentration of 10 minutes is to be used for urban development. As such a time of concentration of 10 minutes was used for pre-development conditions and the unrestricted overland flow post-development conditions.

### 3.3.4 Pre-development Site Conditions

The property has a total area of about 1.44 hectares. The site limit of development area is 0.23ha. As shown on the pre-development drawing, the site has been broken down into the following catchments:

- Catchment Area 1 (CA1): This area includes the rear drive isle and parking area that stretches from the high point of the entrance/exit from Terry Fox Drive to the rear of existing building #4.
- Catchment Area 2 (CA2): This area includes the parking area adjacent to building#4 as well as the parking area facing Terry Fox Drive.
- Limit of Development: This includes both catchment areas.

The majority of the development area contains asphalt surfacing. There are locations within curbed medians, and between the curb and property lines where there are landscaped areas.

Based on the topographic survey the entire development area slopes from east to west, toward a swale within the right of way along Terry Fox Drive. When runoff enters the swale from this 0.23ha area, it is directed to existing catchbasin #8 within the right of way. Overflow from this catchbasin is directed to the next catchbasin (catchbasin #7) downstream in the swale. The pipes from the catchbasins convey the runoff to the storm sewer on Terry Fox Drive.

Drawing 250848-PRE shows the pre-development conditions and pre-development areas determined to be directing runoff to the roadside swale and catchbasin #8 in the Terry Fox Drive right of way.



### 3.3.5 Pre-development Runoff Coefficient

Pre-development site condition are summarised for the site in the following Table 3-0.

Table 3-0 – Pre-Development Site Conditions

| Description                       | Catchment Area (Ha) | Runoff Coefficient (5yr) | Runoff Coefficient (100yr) | Weighted Average C (5yr) | Weighted Average C (100yr) |
|-----------------------------------|---------------------|--------------------------|----------------------------|--------------------------|----------------------------|
| <b>CA1</b>                        | <b>0.1476</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0014              | 0.90                     | 1.00                       | 0.78                     | 0.87                       |
| Asphalt/Concrete                  | 0.1206              | 0.90                     | 1.00                       |                          |                            |
| Grass                             | 0.0256              | 0.20                     | 0.25                       |                          |                            |
| <b>CA2</b>                        | <b>0.0823</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0000              | 0.90                     | 1.00                       | 0.75                     | 0.84                       |
| Asphalt/Concrete                  | 0.0644              | 0.90                     | 1.00                       |                          |                            |
| Grass                             | 0.0179              | 0.20                     | 0.25                       |                          |                            |
| <b>Total Limit of Development</b> | <b>0.2299</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0014              | 0.90                     | 1.00                       | 0.77                     | 0.86                       |
| Asphalt/Concrete                  | 0.1850              | 0.90                     | 1.00                       |                          |                            |
| Grass                             | 0.0435              | 0.20                     | 0.25                       |                          |                            |

### 3.3.6 Pre-development Flow Rate

The storm intensities calculated using the IDF curve equations previously provided yielded 104.19mm/hr for a 5 year storm and 178.56mm/hr for a 100 year storm. Using the Rational Method and the previously calculated runoff coefficients and these storm intensities, the pre-development runoff rate for the 5-year storm and 100- year storms are as follows:

CA1 (pre-development flow)

$$5 \text{ year} = 2.78 \times 0.50 \times 104.19 \times 0.1476 = 21.4 \text{ L/s}$$

$$100 \text{ year} = 2.78 \times 0.50 \times 178.56 \times 0.1476 = 36.6 \text{ L/s}$$

\*\*The runoff in CA1 is to have a maximum runoff coefficient of 0.5 as per the City of Ottawa quantity criteria b) discussed in section 3.2.

CA2 (pre-development flow)

$$5 \text{ year} = 2.78 \times 0.75 \times 104.19 \times 0.0823 = 17.9 \text{ L/s}$$

$$100 \text{ year} = 2.78 \times 0.84 \times 178.56 \times 0.0823 = 34.3 \text{ L/s}$$



### 3.3.7 Post-Development Site Conditions

The post-development CA1 catchment area will have an area of  $1064\text{m}^2$ . There will be two roof catchments under post-development conditions, Roof Catchment A (RC-A) and Roof Catchment B (RC-B). RC-A will have an area of  $163\text{m}^2$ . RC-B will have an area of  $163\text{m}^2$ . The combined area of CA1, RC-A and RC-B is  $1476\text{m}^2$ . Post-development CA2 will have the same boundaries and areas as previously outlined. These catchment areas are also outlined on the drawing 250848-POST.

The post-development CA1 will have a widened grass area between the drive isle and property line. This decreases the asphalt area within the catchment. A garbage enclosure is proposed behind the existing building #4. The garbage enclosure is within this catchment.

Roof catchment RC-A will contain one roof drain. The runoff from the roof drain will be conveyed to the underground stormwater storage area in CA1.

The post-development CA2 contains the new sidewalk areas surrounding the building. The existing grass area between the front parking and the swale on Terry Fox Drive are to remain, with no proposed adjustments. The grass area between the new building and the entrance/exit to Terry Fox Drive is to be increased by  $6\text{m}^2$ .

Roof catchment RC-B will contain one roof drain. The runoff from the roof drain will be conveyed to the private storm sewer on the site.

Runoff from catchment (CA2) will be conveyed by means of overland flow without restriction to the Terry Fox Drive right of way. The runoff from CA1, RC-A and RC-B will be directed to the private storm sewer.

The location of the new building obstructs the existing overland drainage patterns in CA1 from being conveyed to the swale at Terry Fox Drive. The grading in CA1 is to be adjusted to direct runoff to a proposed catchbasin and catchbasin manhole (CB-MH#1) structures in the drive aisle of the catchment. The underground pipes from the structures will be routed through CA2, connecting to the existing catchbasin#8 within the right of way at Terry Fox Drive. Catchbasin#8 is a part of the City of Ottawa's infrastructure and outlets into the existing municipal storm sewer on Terry Fox Drive.

Since the post-development flows are directed to a private storm sewer, runoff in CA1, RC-A and RC-B will follow quantity criteria b) from the City of Ottawa. As discussed in section 3.2, criteria b) involves controlling the post-development release rate to a 5-year pre-development release rate, for all storm events up to and including the 100-year storm event. Runoff from CA1 will be restricted by the use of an inlet control device in CB-MH#1. Stormwater storage will be in the form of underground storage modules that will be connected to the private storm sewer.



Runoff in catchments RC-A and RC-B will be restricted by means of WATTS Accutrol Roof Drains (with adjustable flow control) in each catchment. Stormwater storage in this catchment will be provided on the roof.

Run-off from CA2 will continue to be directed to the existing swale along Terry Fox Drive, following the existing drainage patterns. Majority of drainage in this catchment will continue as overland flow, without restriction to the swale. Runoff from CA2 will be unrestricted overland flow. CA2 will follow quantity criteria a) from the City of Ottawa, where the post-development release rate will be the same or less than the pre-development release rate. Stormwater storage will not be required in this catchment.

The post development site conditions are as follows:

**Table 3-1 – Post-Development Site Conditions**

| Description                       | Catchment Area (Ha) | Runoff Coefficient (5yr) | Runoff Coefficient (100yr) | Weighted Average C (5yr) | Weighted Average C (100yr) |
|-----------------------------------|---------------------|--------------------------|----------------------------|--------------------------|----------------------------|
| <b>CA1</b>                        | <b>0.1064</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0014              | 0.90                     | 1.00                       | 0.66                     | 0.74                       |
| Asphalt/Concrete                  | 0.0678              | 0.90                     | 1.00                       |                          |                            |
| Grass                             | 0.0372              | 0.20                     | 0.25                       |                          |                            |
| <b>RC-A</b>                       | <b>0.0163</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0163              | 0.90                     | 1.00                       | 0.90                     | 1.00                       |
| <b>RC-B</b>                       | <b>0.0249</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0249              | 0.90                     | 1.00                       | 0.90                     | 1.00                       |
| <b>CA2</b>                        | <b>0.0823</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0000              | 0.90                     | 1.00                       | 0.74                     | 0.83                       |
| Asphalt/Concrete                  | 0.0640              | 0.90                     | 1.00                       |                          |                            |
| Grass                             | 0.0183              | 0.20                     | 0.25                       |                          |                            |
| <b>Total Limit of Development</b> | <b>0.2299</b>       |                          |                            |                          |                            |
| Roof/Building                     | 0.0426              | 0.90                     | 1.00                       | 0.73                     | 0.82                       |
| Asphalt/Concrete                  | 0.1318              | 0.90                     | 1.00                       |                          |                            |
| Grass                             | 0.0555              | 0.20                     | 0.25                       |                          |                            |

### 3.3.8 Unrestricted Runoff Rate

Flow from catchment area CA2 will be directed without restriction by means of overland flow towards the swale within the right of way on Terry Fox Drive.



A post-development time of concentration of 10 minutes corresponds to a storm intensity of 104.19 mm/hr and 178.56 mm/hr on the 5-year and 100-year storm IDF curves respectively. The runoff rate from the unrestricted overland flow area (CA2) was therefore calculated using the Rational Method.

$$Q = \frac{CiA}{360}$$

The runoff for CA2 for the 5-year and 100-year design storm events is as follows (calculations are provided in Appendix A):

CA2 (post-development flow)

5 year =  $2.78 \times 0.74 \times 104.19 \times 0.0823 = 17.6$  L/s

100 year =  $2.78 \times 0.83 \times 178.56 \times 0.0823 = 33.9$  L/s

### 3.3.9 Allowable Release Rate

The City of Ottawa requires that storm runoff from CA1, RC-A and RC-B be released in a controlled manner when being conveyed in a private storm sewer as per the quantity criteria provided.

Control devices will be used to control the release rates in catchments CA1, RC-A and RC-B. Calculations are summarized in Appendix A.

The allowable release rate from the combined three catchments (for storm events up to the 100-year event) is equal to 5-year pre-development flow rate of 21.4 L/s.

### 3.3.10 Post Development Restricted Flow and Storage

All surface runoff in CA1 to be captured in catchbasins in the rear drive isle and directed to an underground storage system (GRAF Ecobloc Inspect Smart Modules). From the underground storage system, the stormwater is conveyed by a storm sewer to a catchbasin maintenance holes (MH-STM#1). STM-MH1 contains an inlet control device (ICD) that will restrict the release rate in order to meet the quantity control criteria. Runoff in excess of the allowable release rate will be temporarily stored below grade in underground storage modules. The temporarily stored water will be released at a controlled rate during and following a rainstorm event. The water released from STM-MH#1 will be conveyed by a series of 250mm diameter storm pipes to catchbasin#8 within the right of way on Terry Fox Drive.

In RC-A, run-off will be restricted by means of one WATTS Accutrol Roof Drain (with adjustable flow control). The roof drain will outlet in CA1, to the underground storage modules.



In RC-B, run-off will be restricted by means of one WATTS Accutrol Roof Drain (with adjustable flow control). The roof drain will outlet to a storm pipe to the side of the building, downstream of the underground storage modules.

Further stormwater servicing details are shown in the site servicing plan 250848-SER, found in appendix D.

#### 3.3.10.1 Underground Storage Modules (CA1)

The underground storage will be provided using GRAF Ecobloc Inspect Smart Plus Modules under the proposed drive aisle. An EcoBloc Module is a subsurface storage unit load-rated for HS-20 Traffic under surfaces such as parking lots.

Since the modules are designed for HS-20 traffic loading, the storage area does not require fencing to keep vehicles from driving over the storage area. Product information for the underground modules is provided in Appendix B.

The module parameters are the following:

- The underground storage area is to have a total of 76 modules.
- The storage area is one layer high.
- Each Inspect Smart module is 0.8m long, 0.8m wide and 0.33m high. Each Inspect Smart module has a water storage volume of 200L. All Inspect Smart modules need to contain a base plate at the bottom of the module. Any modules facing the sides of the excavation need to contain end plates.
- The arrangement of the modules is shown on the storm servicing plan 250848-SER.
- The Inspect Smart modules have interior bracing that is spaced such that it can be camera inspected. These modules also allow for high pressure jetting for clearing sediment and debris.

The tanks will be placed with a tank invert elevation of 101.05m.

5 year ponding will result in a water depth of 0.11m in the modules (elevation of 101.16). The 100-year ponding will result in a water depth of 0.30m in the modules (elevation of 101.35).

Please refer to the storm servicing plan 250848-SER for further module arrangement information.

#### 3.3.10.2 Control Structure (CA1)

The ICD in STM-MH#1 will limit the flow rate into the municipal system from the controlled area CA1 during a storm event, detaining any runoff in excess of the design release rate in the proposed underground storage area. The control structure will release water after the storm event has passed until the detained runoff has been completely discharged. The control





structure consists of a maintenance hole STM-MH#1 containing a Tempest MHF inlet control device (ICD). The ICD will limit the 100-year flow to 15L/s at 0.4m of head. The 250mm diameter outlet pipe will consist of PVC SDR 35 pipe.

A Tempest medium to high flow (MHF) ICD or approved alternative is to be used. The Tempest MHF ICD should be ordered to correspond with a pre-set flow curve, as shown in the selection chart in Appendix B. The following parameters should be noted when ordering:

- Tempest MHF
- Outlet pipe specification: 250mm diameter
- Discharge: 15 L/s
- Upstream Head: 0.4m
- Catchbasin Manhole Dimensions: 1200 mm diameter
- 600 mm sump

#### 3.3.10.3 RC-A – Rooftop Storage and Adjustable Flow Control Roof Drain

Runoff generated (on approximately half of the roof area) in excess of the allowable release rate will be temporarily stored on the roof in RC-A. The stored water will be released at a controlled rate during and following the storm event.

In order to achieve the allowable controlled area storm water release rate, storm water runoff from RC-A will be controlled by one roof drain fitted with a one weir slot for flow control. The roof drain information for RC-A is as follows:

- Type of Drain: WATTS Large area roof drains with adjustable flow control RD-100-A1-ADJ
- Number of Drains: 1
- Number of Weirs in each drain: 1
- Weir Setting: Fully Exposed

The roof drain in RC-A will control all storm events up to and including 100yr event to a release of 1.45 L/s.

Rooftop storage will be provided. The roof will be provided with a low slope towards the rooftop drain by means of a tapered roofing system product. The roof will be fitted with overflow scuppers 0.15 meters above the lowest point on the roof. Please refer to the drawings 250848- ROOF in the Appendix E.

The final roof layout will be completed once all mechanical systems are finalized in the building permit submission. Calculations for available rooftop storage are summarized in Appendix A. Roof drain specifications are provided in Appendix B.



Runoff from the roof will be collected by a storm drain pipe inside the building, specified by the mechanical engineer. The roof drainage from RC-A will be directed to one storm drain outlet that will discharge the underground stormwater storage modules in catchment CA1.

5 year ponding will result in a water depth of 0.090m on the roof in catchment RC-A. The 100-year ponding will result in a water depth of 0.120m on the roof in catchment RC-A.

#### 3.3.10.4 RC-B – Rooftop Storage and Adjustable Flow Control Roof Drain

Runoff generated (on the remainder of the roof area) in excess of the allowable release rate will be temporarily stored on the roof in RC-B. The stored water will be released at a controlled rate during and following the storm event.

In order to achieve the allowable controlled area storm water release rate, storm water runoff from RC-B will be controlled by one roof drain fitted with a one weir slot for flow control. The roof drain information for RC-B is as follows:

- Type of Drain: WATTS Large area roof drains with adjustable flow control RD-100-A1-ADJ
- Number of Drains: 1
- Number of Weirs in each drain: 1
- Weir Setting: Fully Exposed

The roof drain in RC-B will control all storm events up to and including 100yr event to a release of 1.55 L/s.

Similar to catchment RC-A, rooftop storage will be provided. The roof will be provided with a low slope towards the rooftop drain. The roof will be fitted with overflow scuppers 0.15 meters above the lowest point on the roof.

The final roof layout will be completed once all mechanical systems are finalized in the building permit submission. Calculations for available rooftop storage are summarized in Appendix A. Roof drain specifications are provided in Appendix B.

Runoff from the roof will be collected by a storm drain pipe inside the building, specified by the mechanical engineer. The roof drainage from RC-B will be directed to one storm drain outlet that will discharge to the storm pipe to the side of the building, downstream of the underground storage modules.

5 year ponding will result in a water depth of 0.095m on the roof in catchment RC-B. The 100-year ponding will result in a water depth of 0.125m on the roof in catchment RC-B.



### 3.3.11 Summary

The following table presents a summary of the controlled and unrestricted runoff for each catchment and the required storage resulting from the restriction in flow rate.

**Table 3-2 – Summary of Runoff Rates and Storage**

| Catchment Area ID.                                        | Area   | 5 – year design Storm |                                    |                                     | 100-year design Storm |                                    |                                     |
|-----------------------------------------------------------|--------|-----------------------|------------------------------------|-------------------------------------|-----------------------|------------------------------------|-------------------------------------|
|                                                           |        | Release Rate (L/s)    | Required Storage (m <sup>3</sup> ) | Available Storage (m <sup>3</sup> ) | Release Rate (L/s)    | Required Storage (m <sup>3</sup> ) | Available Storage (m <sup>3</sup> ) |
| CA1                                                       | 0.1064 | 9.00                  | 7.7                                | 17.9                                | 15.00                 | 16.5                               | 17.9                                |
| RC-A                                                      | 0.0163 | 1.00                  | 2.2                                | 8.5                                 | 1.45                  | 5.5                                | 8.5                                 |
| RC-B                                                      | 0.0249 | 1.25                  | 4.0                                | 13.1                                | 1.55                  | 9.0                                | 13.1                                |
| <b>Total Actual Controlled Area Release Rate (L/s)</b>    |        |                       |                                    |                                     |                       |                                    |                                     |
| CA1, RC-A, RC-B                                           | 0.1476 | 11.25                 |                                    |                                     | 18.0                  |                                    |                                     |
| <b>Total Allowable Controlled Area Release Rate (L/s)</b> |        |                       |                                    |                                     |                       |                                    |                                     |
| CA1, RC-A, RC-B                                           | 0.1476 | 21.4                  |                                    |                                     | 21.4                  |                                    |                                     |
| <b>Pre-Development Unrestricted Runoff Rate</b>           |        |                       |                                    |                                     |                       |                                    |                                     |
| CA2                                                       | 0.0823 | 17.9                  | N/A                                | N/A                                 | 34.3                  | N/A                                | N/A                                 |
| <b>Post-Development Unrestricted Area Runoff Rate</b>     |        |                       |                                    |                                     |                       |                                    |                                     |
| CA2                                                       | 0.0823 | 17.6                  | N/A                                | N/A                                 | 33.9                  | N/A                                | N/A                                 |

The above summary table shows that, the post-development runoff rate from the portion of the site directing runoff to private sewers in post-development conditions is less than the 5-year pre-development runoff assuming a pre-development runoff coefficient of 0.5 (for up to and including the 100 year storm event). Further, the above table shows that the post-development unrestricted runoff rate from the areas of the site discharging by overland flow to the Terry Fox Drive is less than the pre-development runoff rate. As such the stormwater management criteria governing the runoff rate from the site has been met by the proposed design.

## 3.4 Storm Sewer Design

The 100-year controlled release rate in the pipe is 18.0L/s. Storm sewers were sized using Manning's Equation, assuming a roughness coefficient  $N = 0.013$  and pipe slope of 0.45%. The pipe can accommodate a flow of 39.9 L/s when flowing full. Therefore since the release rate



from controlled areas is much less than the capacity of the pipe, a 250mm diameter pipe size is sufficient.

### 3.5 Infiltration Targets

The City is requesting that best efforts be provided to achieve infiltration targets discussed in the City of Ottawa Carp River Watershed/Subwatershed Study Volume 1 by Robinson Consultants (December 2004) . Notably Figure 8.3 of the study was provided by the City, with additional notes added showing the Infiltration rates in mm/hr based on the infiltration potential of various soil types identified in the Study Area. Figure 8.3 is included in the Appendix A with the site location denoted by a yellow circle. The infiltration rates shown on Figure 8.3, are from Table 8.3.11 of the Carp River Watershed/Subwatershed Study. Table 8.3.11 is shown below:

| Infiltration Potential | Soil Type                                                 | Hydrologic Soil Group | Soil Moisture Retention (mm) | Precipn. (mm) | ET (mm) | Runoff (mm) | Equiv. Runoff coeff. | Infiltr. (mm/yr) |
|------------------------|-----------------------------------------------------------|-----------------------|------------------------------|---------------|---------|-------------|----------------------|------------------|
| High                   | Fine sand                                                 | A                     | 100                          | 943           | 559     | 123         | 0.32                 | 262              |
| Moderate               | Fine sand & silt or clay loam - shallow limestone bedrock | C                     | 250                          | 943           | 574     | 268         | 0.72                 | 104              |
| Low or Not Classified  | clay and till - shallow Precambrian bedrock               | D                     | 200                          | 943           | 579     | 292         | 0.80                 | 73               |

**Notes:**

- Monthly precipitation (P) and temperatures from Canadian Climate Normals (1971-2000) for the Ottawa International Airport.
- Soil Types from published geology and soil survey mapping
- Hydrologic Soil Groups from SCS (U.S. Soil Conservation Service)
- Soil Moisture Retention for deeply-rooted vegetation (0.67 -1.25 metres) as defined by Thornthwaite & Mather.
- Evapotranspiration (ET) calculated by the Thornthwaite & Mather method.
- Runoff (RO) and runoff coefficients based, in part, on curve number (CN) in the SCS method.
- Infiltration calculated by difference)  $INF = P - ET - RO$ , assuming changes in soil moisture are zero.
- The values shown in the above table should be used for defining existing (undeveloped) conditions.

Source: City of Ottawa Carp River Watershed/Subwatershed Study by Robinson Consultants (December 2004)

Figure 8.3 shows soil mapping with clay and till soil over shallow Precambrian bedrock in the location of the site. The geotechnical investigation on the site found an average of 1.5m of grey brown silty clay below the existing parking lot, followed by refusal on large boulders or



bedrock. This corresponds with the soil mapping in figure 8.3. Table 8.3.11 shows the soil type, and corresponding infiltration potential, annual infiltration objective and equivalent runoff coefficients. For a clay soil type, there is low or not classified infiltration potential, with a target annual infiltration objective of 73 mm/hr and equivalent runoff coefficient of 0.80.

From section 3.3.5 of the report, the 5-year pre-development runoff coefficient is 0.77. In section 3.3.7 of the report, the post-development runoff coefficient was calculated to be 0.73, where 120m<sup>2</sup> of the previous asphalt area has been replaced with grass. The post-development runoff coefficient is less than the pre-development runoff coefficient and the proposed development layout will reduce the impervious area on the site. Referring to table 8.3.11, since the post-development runoff coefficient is less than 0.80, the proposed development will satisfy the infiltration objective. Increasing the pervious areas within the limit of development will increase infiltration on the site. The post-development layout will improve the site capabilities for infiltration.

### 3.6 Stormwater Quality Control

It has to be confirmed if quality control is provided at the downstream stormwater management facility SWF 1309 Water Baker Park Facility. If quality control is not provided in the downstream stormwater management facility, enhanced treatment (80% TSS removal) would have to be provided on site.

The original stormwater management report for the Walter Baker Park Facility was reviewed. The report is titled Robinson Consultants Inc - Walter Baker Park Stormwater Management, Project No. 93037 May 1994 (Robinson Report).

The Walter Baker Park Stormwater facility was designed to provide both quality and quantity control. The Walter Baker Park Stormwater facility consists of series of three ponds consisting of an upper pond, a middle pond and a lower pond. There are connecting channels between the upper and middle pond and between the middle and lower pond. The connecting channel between the upper pond and middle pond was constructed to contain pools and riffles which will improve water quality through aeration. Both the upper and middle ponds are designed as wet ponds. (Robinson Report page 1). Results of calculations completed by Robinson indicate that the wet ponds are capable of providing an enhanced level of treatment greater than 80% removal of total suspended solids, provided there is an active storage volume of at least 1,200 m<sup>3</sup>. (Robinson Report page 3)

The middle pond has a surface area of approximately 8,000 m<sup>2</sup> and an average permanent pond depth of 1.5 m (estimated permanent volume of 8,000 x 1.5 = 12,000 m<sup>3</sup>). The estimated volume of excavation for the middle pond was 31,000 m<sup>3</sup> resulting in an active storage volume of significantly more than 1,200 m<sup>3</sup>. (Robinson Report pages 5 and 10).



The drainage area plan showing contributing runoff to the Walter Baker Park Storm Facility is delineated on figure 2 in the Robinson Report (Robinson Report page 8). The property at 41 Edgewater is included with this drainage area. A drawing completed by Novatech Engineering Consultants Ltd titled Terry Fox Drive Palladium Drive to Hazeldean Road Storm Drainage Plan Dwg No 100232-STM1, further collaborates that during the Terry Fox Drive expansion, the site at 41 Edgewater is still within the drainage area boundary.

In summary, the middle pond has been designed as a wet pond and has sufficient active and permanent storage volumes to provided an enhanced level of treatment in keeping with the MECP stormwater management manual. There is significant lengths of vegetated channels both upstream and downstream of the middle pond which will provide pre-treatment and effluent polishing. Therefore, it is confirmed that the Water Baker Storm Water management facilities will provide treatment for the runoff from the proposed development upstream of the carp river to an enhanced level of treatment, and that no site specific stormwater management works are required for quality control.

### **3.7 Stormwater System Operation and Maintenance**

#### **3.7.1 Control Structure**

The control structure located in STM-MH1 should be inspected on a semi-annual basis and following major storm events. Any blockages, trash or debris should be removed. If surface ponding occurs in the parking area the control structure should be inspected and cleaned.

#### **3.7.2 Catchbasins and Manholes**

The catchbasin manhole should be cleaned with a hydrovac excavation truck following completion of construction, final grading of the surfaces and establishment of adequate grass cover on the landscaped areas.

Following the initial cleaning the catchbasin manhole should be inspected on a semi-annual basis and following major storm events. Any blockages, trash or debris should be removed. Once the sediment accumulation in the catchbasins manhole has reached a level equal to 0.15 metres below the outlet invert of the structure, the sediment should be removed by hydro excavation.

#### **3.7.3 Underground Storage Modules**

Detailed installation, operation and maintenance guidelines from the GRAF underground module supplier should be followed.

The parking areas and driveway should be inspected. If there is sediment build-up and debris on the asphalt surfaces, it is recommended that those surfaces be cleaned. There is more effort needed to remove sediment and debris from the underground storage area, than removing the debris before it enters the underground system.



In addition to the manufacturer's recommendations and guidelines, the following maintenance practices should be followed.

Inspection:

- Inspect the flex access chamber.
- Identify and log any sediment and debris accumulation, system backup, or discharge rate changes.
- If there is a sufficient need for cleanout, contact a local hydrovac excavation company for assistance.

Cleaning:

- Using a vacuum pump truck, evacuate debris from the inflow and outflow points.
- Flush the system with clean water, removing debris from the system with a vacuum truck.
- Repeat steps 2 and 3 until no debris is evident.

#### 3.7.4 Roof Drains

The accutrol roof drains should be inspected on a semi-annual basis and following major storm events. One inspection should occur once all of the leaves have fallen in the fall of the year. Any blockages or debris should be removed. If surface ponding on the roof areas area does not recede in a normal manner, the drains should be inspected for blockages.

#### 3.7.5 Inspections

The owner or designated property management company is responsible for inspections and maintenance. Records of inspections and maintenance should be kept for each visit. The suggested inspection schedule should be followed until the records indicate a more appropriate site specific schedule.

## 4 SANITARY SEWER DESIGN

The sanitary flow from the proposed building will have to be pumped from the building to the existing maintenance hole. This is the similar process as the conveyance system from neighbouring building #4, where the sewage is also pumped from the building to EX. MH-SAN#1. EX. MH-SAN#1 then connects to an existing 250 mm diameter sanitary sewer that is within the property. This sanitary sewer leads out to the existing 250 mm diameter sanitary sewer along Edgewater Street.





Sewage discharges will be commercial in type and in compliance with the City of Ottawa Sewer Use By-law. The anticipated peak sanitary flow will be a total of approximately 5.0 L/s.

The sanitary sewage flow for the building was calculated based on the City of Ottawa Sewer Design Guidelines (Technical Bulletin ISTB-2018-01.) and the Ontario Building Code (O.B.C Table 8.2.1.3A).

#### 4.1 Design Flows

The proposed building is to contain two commercial units. The first unit is to contain a dental office. The second unit is to contain a pharmacy and medical clinic.

The average daily demand from the proposed commercial building was calculated with the use of O.B.C Table 8.2.1.3A and City of Ottawa Appendix 4A as follows:

##### Proposed Building Unit 1 (Dental Office)

*Open 8:00am to 5:00pm*

*Ottawa Sewer Design Guidelines – Appendix 4-A*

*Dental offices: Medical staff = 275L/day per person*

*Office staff = 75L/day per person*

*Patients = 25L/day per person*

*Medical Staff: 4, Office staff 4, Patients 20*

*Unit 1: Average daily demand*                       $= 275 \text{ L/day} \times 4 \text{ people}$   
                                                                           $75\text{L/day} \times 4 \text{ people}$   
                                                                           $25\text{L/day} \times 20 \text{ people}$   
                                                                           $= 1900\text{L/day} \div (9\text{hrs/day} \times 60\text{min/hr} \times 60\text{sec/min})$   
                                                                           $= 0.06 \text{ L/s}$

##### Proposed Unit 2 (Pharmacy and Medical Clinic)

###### A) Pharmacy

*Open 8:00am to 7:00pm*

*Ontario Building Code table 8.2.1.3B*

*Store: 1,230 L/day per water closet*

*Unit 2A: Average daily demand*                       $= 1,230 \text{ L/day} \times 2 \text{ water closets}$   
                                                                           $= 2,460 \text{ L/day} \div (11\text{hrs/day} \times 60\text{min/hr} \times 60\text{sec/min})$   
                                                                           $= 0.06 \text{ L/s}$

###### B) Medical Clinic

*Open 8:00am to 5:00pm*

*Ottawa Sewer Design Guidelines – Appendix 4-A*

*Medical Clinics: Medical staff = 275L/day per person*

*Office staff = 75L/day per person*

*Patients = 25L/day per person*

*Medical Staff: 3, Office staff 1, Patients 25*





$$\begin{aligned}
 \text{Unit 2B: Average daily demand} &= 275 \text{ L/day} \times 3 \text{ people} \\
 &75 \text{ L/day} \times 1 \text{ people} \\
 &25 \text{ L/day} \times 25 \text{ people} \\
 &= 1525 \text{ L/day} \div (9 \text{ hrs/day} \times 60 \text{ min/hr} \times 60 \text{ sec/min}) \\
 &= 0.05 \text{ L/s}
 \end{aligned}$$

Proposed Building Total

- Average daily demand (ADD) 0.17 L/s
- Commercial Peak (x 1.5) is 0.17 L/s x 1.5 = 0.26 L/s
- Infiltration = 0.33 L/ha/sec x 0.23 ha (limit of development) = 0.08 L/s
- Total Peak Sanitary Flow = 0.34 L/s

The sanitary demand calculations for the existing commercial buildings is shown in Appendix C. The average daily sanitary demand for all four existing buildings is 2.85 L/s. The total sanitary demand for the site is as follows:

Total Site Commercial:

$$Q_{\text{total commercial}} = 0.17 + 2.85 = 3.02 \text{ L/sec}$$

Peaking Factor = 1.5

$$Q_{\text{Peak Commercial}} = 1.5 \times 3.02 \text{ L/sec} = 4.53 \text{ L/sec}$$

Infiltration

$$Q_{\text{Infiltration}} = 0.33 \text{ L/ha/sec} \times 1.44 \text{ ha} = 0.48 \text{ L/sec}$$

$$\text{Total Peak Sanitary Flow} = 4.53 + 0.48 = 5.01 \text{ L/sec}$$

## 4.2 Sanitary Sewer

### 4.2.1 Proposed Sanitary Service Lateral

The maximum peak sanitary flow for the proposed commercial building is 0.34 L/sec. The sanitary lateral from the building will discharge to the existing maintenance hole, EX. MH-SAN#1. The maintenance hole is the end structure of the private gravity sewer on the site. It is located behind building#3, and has a north outlet invert elevation of 102.08. The surface grade in the drive aisle behind the proposed building has a surface elevation of 102.07. Given that the surface grade behind the proposed building is the same elevation as the pipe invert 103m north of the proposed building, the sanitary pipe flow cannot be conveyed under gravity conditions to the existing maintenance hole.



The sanitary flow from the proposed building will have to be pumped from the building to the existing maintenance hole. This is the similar process as the conveyance system from neighbouring building #4, where the sewage is also pumped from the building to EX. MH-SAN#1. Therefore the service lateral will be a forcemain where pump(s) within a pump chamber in the building footprint will pump the sanitary sewage to the existing gravity pipe network on the site.

The pump chamber and pump sizing is to be coordinated with the mechanical engineer. At this time, it is anticipated that the forcemain will be 100mm in diameter. The pipe sizing is to be coordinated with the mechanical & interior plumbing designers. The new forcemain is to be installed at the location indicated on the site servicing drawing 250848– SER.

#### 4.2.2 Sizing Confirmation of Existing Private Sanitary Main

The maximum peak sanitary flow for the proposed development is 5 L/sec. OBC 7.4.10.8 (2) states "Horizontal sanitary drainage pipe shall be designed to carry no more than 65% of its full capacity." The existing section of pipe with the shallowest slope will govern the capacity maximum capacity of the pipe network. The slope of the pipe ranges from 0.7% to 2.0%. The section of pipe from EX. MH-SAN#2 to EX. MH-SAN#4 has a slope of 0.7%. The capacity of the existing 250 mm diameter PVC sanitary sewer lateral at 0.7% slope is 49.8 L/sec. Since  $0.65 \times 49.8 \text{ L/s} = 32.4 \text{ L/s}$  is much greater than 5 L/sec, the capacity of the existing 250mm private gravity sewer is sufficient for the existing and proposed sanitary demands.

#### 4.2.3 CCTV Inspection of Existing Private Sanitary Main

From EX. MH-SAN#1, the sanitary flow is conveyed through a 250mm diameter PVC sanitary sewer.

A CCTV inspection of the private 250mm diameter sanitary sewer was completed on November 20, 2025 by Clean Water Works. The CCTV Inspection Report includes condition ratings on a scale of 1-5, for maintenance and structural anomalies (5 being most severe).

The following items were indicated in the CCTV report.

From EX. MH-SAN#1 to EX. MH-SAN#2,

1. A 10% deformation was shown 36.6m downstream of MH.SAN#1. This was given a structural anomaly condition rating of 4.
2. 43.7m downstream of MH.SAN#1 at the service connection, the service capacity was restricted with grease build up. This was given a maintenance anomaly condition rating of 3. A second crew returned to the site on December 5<sup>th</sup>, 2025 to remove the blockage.

From EX. MH-SAN#2 to EX. MH-SAN#4



3. At 3.7m downstream of MH-SAN#2, the pipe sealing gasket is poorly fitted, and can be partially seen inside the pipe. This was given a structural anomaly condition rating of 2.

There were other slight alignment deformations or sags in the pipe network that were given condition ratings of 2 or less. It is not foreseen that these items will cause significant restriction to the pipe flow. The pipe network has regular cleanings to avoid clogging. During construction of the new building it is recommended that item#1 be repaired. Items numbered 2 and 3 should be monitored during routine cleanings. If their condition worsens or results in more frequent maintenance activities, these areas should be repaired. Further details can be found in the CCTV Inspection reports and footage, available upon request.

## 5 WATERMAIN DESIGN

The existing 152 mm diameter private watermain is to be extended to the proposed building. The new lateral is to be installed at the location indicated on the Site Servicing drawing 250848 – SER.

The proposed 50mm diameter water service is to be used for the proposed building. The service lateral will be connected to the existing 150mm private watermain.

The existing 150mm diameter private watermain services all the existing buildings on the property and connects to the existing 406 mm diameter watermain on Edgewater Street as indicated on the Site Servicing drawing 250848- SER.

### 5.1 Water Demand

The water demand for the proposed development was calculated based on section 4.1 above. The average daily demand average daily demand for the proposed building in L/s is as follows:

#### Proposed Building:

- Proposed Unit 1 (Dental Office): 0.06 L/s
- Proposed Unit 2A (Pharmacy): 0.06 L/s
- Proposed Unit 2B (Medical Clinic): 0.05 L/s
- Total Proposed Average Daily Demand : 0.17L/s

#### Proposed Building Total

- Average daily demand 0.17 L/s
- Maximum daily demand (factor of 1.5) is  $0.17 \text{ L/s} \times 1.5 = 0.26 \text{ L/s}$
- Peak hourly demand (factor of 1.8) =  $0.26 \text{ L/s} \times 1.8 = 0.47 \text{ L/s}$



The water demand for the existing development was calculated based on section 4.1 above. The average daily demand is 2.85L/s.

Total Site Commercial:

Total Average Daily Demand =  $0.17 + 2.85$  = 3.02 L/sec

- Average daily demand 3.02 L/s
- Maximum daily demand (factor of 1.5) is  $3.02 \text{ L/s} \times 1.5 = 4.53 \text{ L/s}$
- Peak hourly demand (factor of 1.8) =  $4.53 \text{ L/s} \times 1.8 = 8.15 \text{ L/s}$

## 5.2 Water Required for Fire Protection

The fire flow protection requirements are calculated as per the Ontario Building Code (O.B.C) and Fire Underwriters Survey (FUS).

All the buildings on site are one storey buildings. The highest fire flow requirement would be from the building with the largest footprint and the smallest separation distances. The buildings on site have the following footprints:

- Building #1 Existing (A&W Restaurant):  $179\text{m}^2$
- Building #2 Existing (East Side Mario's Restaurant):  $571\text{m}^2$
- Building #3 Existing (Swiss Chalet Restaurant):  $527\text{m}^2$
- Building #4 Existing (Previously D'Arcy McGee's):  $497\text{m}^2$
- Building #5 Proposed Dental Office, Pharmacy and Medical Clinic:  $410\text{m}^2$

Detailed calculations were completed according to the O.B.C and FUS methods for Building #2. Calculations can be found in the appendix. Please note that the exposure distances are approximate.

The minimum fire flow requirement for O.B.C is 2700 L/min or 45.0 L/s.

The minimum fire flow requirement for FUS is 7,000 L/min or 116.6 L/s.

## 5.3 Existing Fire Hydrants

The fire hydrants within the vicinity of the proposed building are located as follows:

- Private Hydrant 1 behind building#4: north of the proposed building adjacent to the rear drive aisle.
- Private Hydrant 2 behind building #3: north of the proposed building adjacent to the rear drive aisle.

Both private hydrants have blue caps. This is an indication that they are AA class hydrants.



City of Ottawa Technical Bulletin ISTB-2018-02 Appendix I Table 1 provides guidance with respect to maximum flow from to be considered from a given hydrant. From this table, a Class AA hydrant can contribute a maximum flow of 5,700 L/min when located less than 75 metres from the building and 3,800 L/min when located between 75 and 150 metres from the building.

Hydrant 1 is 68m to the principle entrance of the building. Hydrant 2 is 140m to the principle entrance of the building. These hydrants can be expected to provide a total combined contribution of 9500 L/min to the required fire. As previously indicated, the required fire flow is  $116.6 \text{ L/sec} \times 60 \text{ sec/min} = 6996 \text{ L/min}$ . The existing hydrants are considered to be sufficient to meet the required fire flow without needing an additional hydrant at the site.

#### 5.4 Boundary Conditions

The water demand due to occupancy together with the fire flow requirements were provided to the City of Ottawa in April 2026 as follows:

- Average daily water demand 0.11 L/s
- Maximum daily water demand 0.17 L/s
- Peak hourly water demand 0.31 L/s
- Fire Flow required according to FUS 116.6 L/s

The following are the boundary conditions, HGL, for hydraulic analysis that were provided in April 2026 for the above indicated peak hourly demand and fire flow demand.

Minimum HGL = 155.7

Maximum HGL = 161.9

MaxDay + FireFlow = 155.7

The average water demand is 0.06 L/s less than what is indicated in the section 5.1 of this report. It is considered that the minor change in the average water demand will not have an appreciable effect on the boundary conditions.

In accordance with MOE Design Guidelines for Drinking Water Systems, the distribution system shall be sized so that under maximum hourly demand conditions the pressures are not less than 276 kPa (40 psi.)



The pressure loss to the floor level of the proposed building was calculated using Bernoulli's Equation in Combination with the Darcy – Weisbach Equation and the Colebrook Equation. The equations are shown below.

$$H_P + Z_1 - Z_2 + \frac{P_1 - P_2}{\rho g} + \frac{V_1^2 - V_2^2}{2g} = h_f + h_m \quad \text{where:}$$

$$h_m = K_m \frac{V^2}{2g} \quad Re = \frac{VD}{\nu} \quad Q = VA \quad A = \frac{\pi}{4} D^2$$

$$\text{Darcy – Weisbach Equation: } h_f = f \frac{L}{D} \frac{V^2}{2g} \quad \text{where:}$$

$$\text{If laminar flow } \left( Re < 4000 \text{ and any } \frac{e}{D} \right), \quad f = \frac{64}{Re}$$

$$\text{If turbulent flow } \left( 4000 \leq Re \leq 10^8 \text{ and } 0 \leq \frac{e}{D} < 0.05 \right), \text{ then}$$

$$\text{Colebrook Equation: } \frac{1}{\sqrt{f}} = -2.0 \log \left( \frac{e/D}{3.7} + \frac{2.51}{Re \sqrt{f}} \right)$$

In general conformance with the MOE Guidelines, and City of Ottawa Technical Bulletin ISD-2010-2, the desired range in pressure should be approximately 350KPa (50psi) to 480KPa (70psi) during normal operating conditions. As per the Ontario Building Code, the residual pressure should not exceed 552KPa (80psi). The system should be designed to maintain a minimum pressure of 140kPa (20 psi) at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.

Table 5.1 Water Flow Analysis

| Pipe Sections                                                                               |             |                | Grade Elevation |           | Hydraulic Grade line |          | Ps<br>kPa | Pe<br>kPa | Q<br>m³/sec | V<br>m/sec | D<br>m | A<br>m² |
|---------------------------------------------------------------------------------------------|-------------|----------------|-----------------|-----------|----------------------|----------|-----------|-----------|-------------|------------|--------|---------|
| Start                                                                                       | Along       | End            | Start<br>m      | End*<br>m | Start**<br>m         | End<br>m |           |           |             |            |        |         |
| Calculation of Minimum Available Pressure Starting at Minimum HGL and Maximum Hourly Demand |             |                |                 |           |                      |          |           |           |             |            |        |         |
| Edgewater                                                                                   | Drive Aisle | Service Tee    | 100             | 100.2     | 155.7                | 155.3    | 546       | 541       | 0.0082      | 0.461      | 0.150  | 0.0177  |
|                                                                                             |             |                |                 |           |                      |          |           |           |             |            |        |         |
| Service Tee                                                                                 | Service     | 1 storey bld 1 | 100.2           | 103.6     | 155.3                | 148.8    | 541       | 443       | 0.0082      | 4.151      | 0.050  | 0.0020  |
|                                                                                             |             |                |                 |           |                      |          |           |           |             |            |        |         |
| Calculation of Maximum Pressure Resulting From Maximum HGL and Average Daily Flow Demand    |             |                |                 |           |                      |          |           |           |             |            |        |         |
| Edgewater                                                                                   | Drive Aisle | Service Tee    | 100             | 100.2     | 161.9                | 161.8    | 607       | 604       | 0.0030      | 0.171      | 0.150  | 0.0177  |
|                                                                                             |             |                |                 |           |                      |          |           |           |             |            |        |         |
| Service Tee                                                                                 | Service     | 1 storey bld 1 | 100.2           | 103.6     | 161.8                | 160.9    | 604       | 561       | 0.0030      | 1.538      | 0.050  | 0.0020  |

Based on the results of the analysis as presented in the above table the minimum and maximum HGL provide a water pressure of between 443kPa and 604kPa at the ground floor of the building.



The pressure may exceed 552 Kpa, and therefore a pressure reducing valve is required.

From Table 5.1 above, there is sufficient water supply within the existing system to meet the commercial water demand.

## 5.5 Water Service Requirements

For the proposed development, a 50mm water lateral is proposed from the private watermain to the building.

This size should be verified by the Mechanical Engineer to ensure it is sufficient to meet the system requirements as designed by the Mechanical Engineer.

## 6 EROSION AND SEDIMENT CONTROL

The owner (and/or contractor) agrees to prepare and implement an erosion and sediment control plan at least equal to the stated minimum requirements and to the satisfaction of the the City of Ottawa, appropriate to the site conditions, prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and during all phases of site preparation and construction in accordance with the current best management practices for erosion and sediment control. It is considered to be the owners and/or contractors responsibility to ensure that the erosion control measures are implemented and maintained.

In order to limit the amount of sediment carried in stormwater runoff from the site during construction, it is recommended to install a silt fence along the property, as shown in Kollaard Associates Inc. Drawing #250848 - ESC. The silt fence may be polypropylene, nylon, and polyester or ethylene yarn.

If a standard filter fabric is used, it must be backed by a wire fence supported on posts not over 2.0 m apart. Extra strength filter fabric may be used without a wire fence backing if posts are not over 1.0 m apart. Fabric joints should be lapped at least 150 mm (6") and stapled. The bottom edge of the filter fabric should be anchored in a 300 mm (1 ft) deep trench, to prevent flow under the fence. Sections of fence should be cleaned, if blocked with sediment and replaced if torn.

Filter socks should be installed across existing storm manhole and catch basin lids. As well, filter socks should be installed across the proposed catch basin and manhole lids immediately after the structures are placed. The filter socks should only be removed once the asphaltic concrete is installed and the site is cleaned.



The proposed landscaping works should be completed as soon as possible. The proposed granular and asphaltic concrete surfaced areas should be surfaced as soon as possible.

The silt fences should only be removed once the site is stabilized and landscaping is completed.

These measures will reduce the amount of sediment carried from the site during storm events that may occur during construction.

## 7 CONCLUSIONS

This report addresses the adequacy of the existing municipal storm and sanitary sewer system and watermain to service the proposed development of the commercial building on Edgewater Street. Based on the analysis provided in this report, the conclusions are as follows:

Stormwater management within CA1, RC-A and RC-B for the proposed development will be achieved by restricting the post-development flows to the 5-year pre-development flows for each storm event.

Stormwater management considerations for CA2, will continue as unrestricted overland flows to the swale adjacent to Terry Fox Drive, where post-development flows the same as pre-development flows for each storm event.

The peak sewage flow rate from the site including the proposed development will be 5.0 L/sec. A new 100mm diameter sanitary forcemain on the site will be provided from the proposed building to Existing sanitary maintenance hole#1 (MH-SAN#1) .

The existing private watermain on the site will have adequate capacity to service the proposed development for both domestic and fire protection. A new 50mm diameter water service will be proposed from the proposed building to the existing 150mm private watermain on the site. A pressure reducing valve may be required, to keep the residual pressure below 552 Kpa.

During all construction activities, erosion and sedimentation shall be controlled.





We trust that this report provides sufficient information for your present purposes. If you have any questions concerning this report or if we can be of any further assistance to you on this project, please do not hesitate to contact our office.

Sincerely,  
Kollaard Associates, Inc.



Amanda Van Bruggen, P.Eng.



## Appendix A: Storm Design Information

- Pre-Development CA1
- Pre-Development CA2
- Post-Development Required Storage vs. Release Rate (CA1)
- Outlet Control Structure and Stormwater Storage volume provided (CA1)
- Storage vs. Discharge Graph (CA1)
- Stage vs. Storage Graph (CA1)
- Post-Development Required Storage vs. Release Rate (RC-A)
- Outlet Control Structure and Stormwater Storage volume provided (RC-A)
- Storage vs. Discharge Graph (RC-A)
- Stage vs. Storage Graph (RC-A)
- Post-Development Required Storage vs. Release Rate (RC-B)
- Outlet Control Structure and Stormwater Storage volume provided (RC-B)
- Storage vs. Discharge Graph (RC-B)
- Stage vs. Storage Graph (RC-B)
- Post-Development CA2
- Carp River Watershed Infiltration Target Mapping – Originally from Carp River Watershed Study – approximate site location added
- Total Pre-Development Flows
- Total Post-Development Flows

APPENDIX A: STORMWATER MANAGEMENT MODEL  
PRE-DEVELOPMENT FLOW

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

PRE-DEVELOPEMNT CATCHMENT AREA 1 - CA1

Runoff Coefficient Equation  
 $C = (A_{\text{hard}} \times 0.9 + A_{\text{soft}} \times 0.2) / A_{\text{tot}}$

Pre- Dev run-off Coefficient "C"

| Area            | Surface          | Ha     | "C"  | 5 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-----------------------|
| Total<br>0.1476 | Roof             | 0.0014 | 0.90 | 0.78                  |
|                 | Asphalt/Concrete | 0.1206 | 0.90 |                       |
|                 | Grass            | 0.0256 | 0.20 |                       |
|                 |                  |        |      |                       |

| Area            | Surface          | Ha     | "C"  | 100 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-------------------------|
| Total<br>0.1476 | Roof             | 0.0014 | 1.00 | 0.87                    |
|                 | Asphalt/Concrete | 0.1206 | 1.00 |                         |
|                 | Grass            | 0.0256 | 0.25 |                         |
|                 |                  |        |      |                         |

| 5 Year Event   |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 5 Year         | 0.50 | 104.19    | 0.15 |
| 2.78CIA= 21.38 |      |           |      |

\*\*Use a 10 minute time of concentration for 5 year  
Total Runoff Rate: 21.38 L/s

| 100 Year Event |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 100 Year       | 0.50 | 178.56    | 0.15 |
| 2.78CIA= 36.63 |      |           |      |

\*\*Use a 10 minute time of concentration for 100 year  
Total Runoff Rate: 36.63 L/s

APPENDIX A: STORMWATER MANAGEMENT MODEL  
PRE-DEVELOPMENT FLOW

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

PRE-DEVELOPEMNT CATCHMENT AREA 2 - CA2

Runoff Coefficient Equation  
 $C = (A_{\text{hard}} \times 0.9 + A_{\text{soft}} \times 0.2) / A_{\text{tot}}$

Pre- Dev run-off Coefficient "C"

| Area            | Surface          | Ha     | "C"  | 5 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-----------------------|
| Total<br>0.0823 | Roof             | 0.0000 | 0.90 | 0.75                  |
|                 | Asphalt/Concrete | 0.0644 | 0.90 |                       |
|                 | Grass            | 0.0179 | 0.20 |                       |
|                 |                  |        |      |                       |

| Area            | Surface          | Ha     | "C"  | 100 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-------------------------|
| Total<br>0.0823 | Roof             | 0.0000 | 1.00 | 0.84                    |
|                 | Asphalt/Concrete | 0.0644 | 1.00 |                         |
|                 | Grass            | 0.0179 | 0.25 |                         |
|                 |                  |        |      |                         |

| 5 Year Event   |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 5 Year         | 0.75 | 104.19    | 0.08 |
| 2.78CIA= 17.88 |      |           |      |

\*\*Use a 10 minute time of concentration for 5 year  
Total Runoff Rate: 17.88 L/s

| 100 Year Event |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 100 Year       | 0.84 | 178.56    | 0.08 |
| 2.78CIA= 34.32 |      |           |      |

\*\*Use a 10 minute time of concentration for 100 year  
Total Runoff Rate: 34.32 L/s

APPENDIX A: STORMWATER MANAGEMENT MODEL  
REQUIRED STORAGE VS. RELEASE RATE

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

Post Dev run-off Coefficient "C" - CA1

|                     |                  |           | 5 Year Event |                  | 100 Year Event |                      |
|---------------------|------------------|-----------|--------------|------------------|----------------|----------------------|
| Area (ha)           | Surface          | Area (ha) | "C"          | C <sub>avg</sub> | "C" x 1.25     | C <sub>100 avg</sub> |
| Total<br><br>0.1064 | Roof             | 0.0014    | 0.90         | 0.66             | 1.00           | 0.74                 |
|                     | Asphalt/Concrete | 0.0678    | 0.90         |                  | 1.00           |                      |
|                     | Grass            | 0.0372    | 0.20         |                  | 0.25           |                      |
|                     |                  |           |              |                  |                |                      |

TABLE 3 - REQUIRED STORAGE VERSUS RELEASE RATE FOR 5 YEAR STORM

| Runoff Coefficient, C = |                            |                                       | 0.66                    |                       | Duration Interval (min) =     |       | 5     |       |        |        |        |        |        |
|-------------------------|----------------------------|---------------------------------------|-------------------------|-----------------------|-------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|
| Drainage Area (ha) =    |                            |                                       | 0.106                   |                       | Release Rate Start (L/s) =    |       | 0     |       |        |        |        |        |        |
| Return Period (yrs) =   |                            |                                       | 5                       |                       | Release Rate Interval (L/s) = |       | 5     |       |        |        |        |        |        |
| Release Rate -->        |                            |                                       |                         | 0                     | 5                             | 10    | 15    | 20    | 25     | 30     | 35     | 40     | 45     |
| Duration (min)          | Rainfall Intensity (mm/hr) | Peak Flow from Catchment RC-A (L/sec) | Total Peak Flow (L/sec) | Storage Required (m³) |                               |       |       |       |        |        |        |        |        |
| 0                       | 230.5                      | 1.0                                   | 46.0                    | 0.0                   | 0.0                           | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 5                       | 141.2                      | 1.0                                   | 28.6                    | 8.6                   | 7.1                           | 5.6   | 4.1   | 2.6   | 1.1    | -0.4   | -1.9   | -3.4   | -4.9   |
| 10                      | 104.2                      | 1.0                                   | 21.3                    | 12.8                  | 9.8                           | 6.8   | 3.8   | 0.8   | -2.2   | -5.2   | -8.2   | -11.2  | -14.2  |
| 15                      | 83.6                       | 1.0                                   | 17.3                    | 15.6                  | 11.1                          | 6.6   | 2.1   | -2.4  | -6.9   | -11.4  | -15.9  | -20.4  | -24.9  |
| 20                      | 70.3                       | 1.0                                   | 14.7                    | 17.7                  | 11.7                          | 5.7   | -0.3  | -6.3  | -12.3  | -18.3  | -24.3  | -30.3  | -36.3  |
| 25                      | 60.9                       | 1.0                                   | 12.9                    | 19.3                  | 11.8                          | 4.3   | -3.2  | -10.7 | -18.2  | -25.7  | -33.2  | -40.7  | -48.2  |
| 30                      | 53.9                       | 1.0                                   | 11.5                    | 20.8                  | 11.8                          | 2.8   | -6.2  | -15.2 | -24.2  | -33.2  | -42.2  | -51.2  | -60.2  |
| 35                      | 48.5                       | 1.0                                   | 10.5                    | 22.0                  | 11.5                          | 1.0   | -9.5  | -20.0 | -30.5  | -41.0  | -51.5  | -62.0  | -72.5  |
| 40                      | 44.2                       | 1.0                                   | 9.6                     | 23.1                  | 11.1                          | -0.9  | -12.9 | -24.9 | -36.9  | -48.9  | -60.9  | -72.9  | -84.9  |
| 45                      | 40.6                       | 1.0                                   | 8.9                     | 24.1                  | 10.6                          | -2.9  | -16.4 | -29.9 | -43.4  | -56.9  | -70.4  | -83.9  | -97.4  |
| 50                      | 37.7                       | 1.0                                   | 8.4                     | 25.1                  | 10.1                          | -4.9  | -19.9 | -34.9 | -49.9  | -64.9  | -79.9  | -94.9  | -109.9 |
| 55                      | 35.1                       | 1.0                                   | 7.9                     | 25.9                  | 9.4                           | -7.1  | -23.6 | -40.1 | -56.6  | -73.1  | -89.6  | -106.1 | -122.6 |
| 60                      | 32.9                       | 1.0                                   | 7.4                     | 26.8                  | 8.8                           | -9.2  | -27.2 | -45.2 | -63.2  | -81.2  | -99.2  | -117.2 | -135.2 |
| 65                      | 31.0                       | 1.0                                   | 7.1                     | 27.5                  | 8.0                           | -11.5 | -31.0 | -50.5 | -70.0  | -89.5  | -109.0 | -128.5 | -148.0 |
| 70                      | 29.4                       | 1.0                                   | 6.7                     | 28.3                  | 7.3                           | -13.7 | -34.7 | -55.7 | -76.7  | -97.7  | -118.7 | -139.7 | -160.7 |
| 75                      | 27.9                       | 1.0                                   | 6.4                     | 29.0                  | 6.5                           | -16.0 | -38.5 | -61.0 | -83.5  | -106.0 | -128.5 | -151.0 | -173.5 |
| 80                      | 26.6                       | 1.0                                   | 6.2                     | 29.7                  | 5.7                           | -18.3 | -42.3 | -66.3 | -90.3  | -114.3 | -138.3 | -162.3 | -186.3 |
| 85                      | 25.4                       | 1.0                                   | 6.0                     | 30.4                  | 4.9                           | -20.6 | -46.1 | -71.6 | -97.1  | -122.6 | -148.1 | -173.6 | -199.1 |
| 90                      | 24.3                       | 1.0                                   | 5.7                     | 31.0                  | 4.0                           | -23.0 | -50.0 | -77.0 | -104.0 | -131.0 | -158.0 | -185.0 | -212.0 |
| 95                      | 23.3                       | 1.0                                   | 5.5                     | 31.6                  | 3.1                           | -25.4 | -53.9 | -82.4 | -110.9 | -139.4 | -167.9 | -196.4 | -224.9 |
| Maximum Storage Rate =  |                            |                                       |                         | 31.6                  | 11.8                          | 6.8   | 4.1   | 2.6   | 1.1    | 0.0    | 0.0    | 0.0    | 0.0    |

TABLE 4 - REQUIRED STORAGE VERSUS RELEASE RATE FOR 100 YEAR STORM

| Runoff Coefficient, C = |                            |                                       | 0.74                    |                       | Duration Interval (min) =     |      | 5     |       |       |        |        |        |        |
|-------------------------|----------------------------|---------------------------------------|-------------------------|-----------------------|-------------------------------|------|-------|-------|-------|--------|--------|--------|--------|
| Drainage Area (ha) =    |                            |                                       | 0.106                   |                       | Release Rate Start (L/s) =    |      | 0     |       |       |        |        |        |        |
| Return Period (yrs) =   |                            |                                       | 100                     |                       | Release Rate Interval (L/s) = |      | 5     |       |       |        |        |        |        |
| Release Rate -->        |                            |                                       |                         | 0                     | 5                             | 10   | 15    | 20    | 25    | 30     | 35     | 40     | 45     |
| Duration (min)          | Rainfall Intensity (mm/hr) | Peak Flow from Catchment RC-A (L/sec) | Total Peak Flow (L/sec) | Storage Required (m³) |                               |      |       |       |       |        |        |        |        |
| 0                       | 398.6                      | 1.5                                   | 88.7                    | 0.0                   | 0.0                           | 0.0  | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    | 0.0    |
| 5                       | 242.7                      | 1.5                                   | 54.6                    | 16.4                  | 14.9                          | 13.4 | 11.9  | 10.4  | 8.9   | 7.4    | 5.9    | 4.4    | 2.9    |
| 10                      | 178.6                      | 1.5                                   | 40.5                    | 24.3                  | 21.3                          | 18.3 | 15.3  | 12.3  | 9.3   | 6.3    | 3.3    | 0.3    | -2.7   |
| 15                      | 142.9                      | 1.5                                   | 32.7                    | 29.5                  | 25.0                          | 20.5 | 16.0  | 11.5  | 7.0   | 2.5    | -2.0   | -6.5   | -11.0  |
| 20                      | 120.0                      | 1.5                                   | 27.7                    | 33.2                  | 27.2                          | 21.2 | 15.2  | 9.2   | 3.2   | -2.8   | -8.8   | -14.8  | -20.8  |
| 25                      | 103.8                      | 1.5                                   | 24.2                    | 36.3                  | 28.8                          | 21.3 | 13.8  | 6.3   | -1.2  | -8.7   | -16.2  | -23.7  | -31.2  |
| 30                      | 91.9                       | 1.5                                   | 21.6                    | 38.8                  | 29.8                          | 20.8 | 11.8  | 2.8   | -6.2  | -15.2  | -24.2  | -33.2  | -42.2  |
| 35                      | 82.6                       | 1.5                                   | 19.5                    | 41.0                  | 30.5                          | 20.0 | 9.5   | -1.0  | -11.5 | -22.0  | -32.5  | -43.0  | -53.5  |
| 40                      | 75.1                       | 1.5                                   | 17.9                    | 43.0                  | 31.0                          | 19.0 | 7.0   | -5.0  | -17.0 | -29.0  | -41.0  | -53.0  | -65.0  |
| 45                      | 69.1                       | 1.5                                   | 16.6                    | 44.7                  | 31.2                          | 17.7 | 4.2   | -9.3  | -22.8 | -36.3  | -49.8  | -63.3  | -76.8  |
| 50                      | 64.0                       | 1.5                                   | 15.4                    | 46.3                  | 31.3                          | 16.3 | 1.3   | -13.7 | -28.7 | -43.7  | -58.7  | -73.7  | -88.7  |
| 55                      | 59.6                       | 1.5                                   | 14.5                    | 47.9                  | 31.4                          | 14.9 | -1.6  | -18.1 | -34.6 | -51.1  | -67.6  | -84.1  | -100.6 |
| 60                      | 55.9                       | 1.5                                   | 13.7                    | 49.3                  | 31.3                          | 13.3 | -4.7  | -22.7 | -40.7 | -58.7  | -76.7  | -94.7  | -112.7 |
| 65                      | 52.6                       | 1.5                                   | 13.0                    | 50.6                  | 31.1                          | 11.6 | -7.9  | -27.4 | -46.9 | -66.4  | -85.9  | -105.4 | -124.9 |
| 70                      | 49.8                       | 1.5                                   | 12.3                    | 51.9                  | 30.9                          | 9.9  | -11.1 | -32.1 | -53.1 | -74.1  | -95.1  | -116.1 | -137.1 |
| 75                      | 47.3                       | 1.5                                   | 11.8                    | 53.1                  | 30.6                          | 8.1  | -14.4 | -36.9 | -59.4 | -81.9  | -104.4 | -126.9 | -149.4 |
| 80                      | 45.0                       | 1.5                                   | 11.3                    | 54.2                  | 30.2                          | 6.2  | -17.8 | -41.8 | -65.8 | -89.8  | -113.8 | -137.8 | -161.8 |
| 85                      | 43.0                       | 1.5                                   | 10.9                    | 55.3                  | 29.8                          | 4.3  | -21.2 | -46.7 | -72.2 | -97.7  | -123.2 | -148.7 | -174.2 |
| 90                      | 41.1                       | 1.5                                   | 10.4                    | 56.4                  | 29.4                          | 2.4  | -24.6 | -51.6 | -78.6 | -105.6 | -132.6 | -159.6 | -186.6 |
| 95                      | 39.4                       | 1.5                                   | 10.1                    | 57.5                  | 29.0                          | 0.5  | -28.0 | -56.5 | -85.0 | -113.5 | -142.0 | -170.5 | -199.0 |
| 100                     | 37.9                       | 1.5                                   | 9.7                     | 58.5                  | 28.5                          | -1.5 | -31.5 | -61.5 | -91.5 | -121.5 | -151.5 | -181.5 | -211.5 |
| Maximum Storage Rate =  |                            |                                       |                         | 58.5                  | 31.4                          | 21.3 | 16.0  | 12.3  | 9.3   | 7.4    | 5.9    | 4.4    | 2.9    |

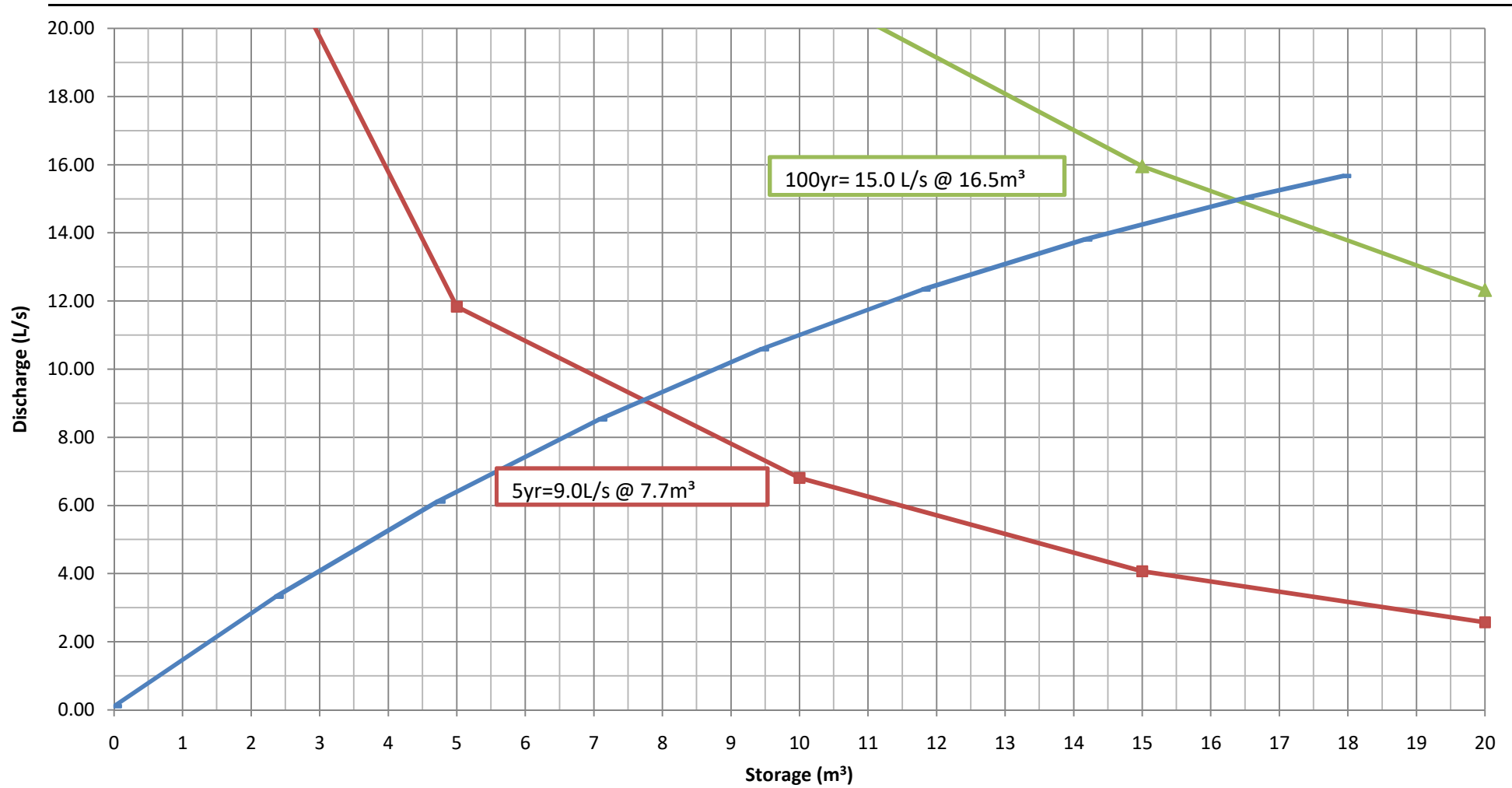
APPENDIX A: STORMWATER MANAGEMENT MODEL  
OUTLET CONTROL STRUCTURE DESIGN SHEET - CA1

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

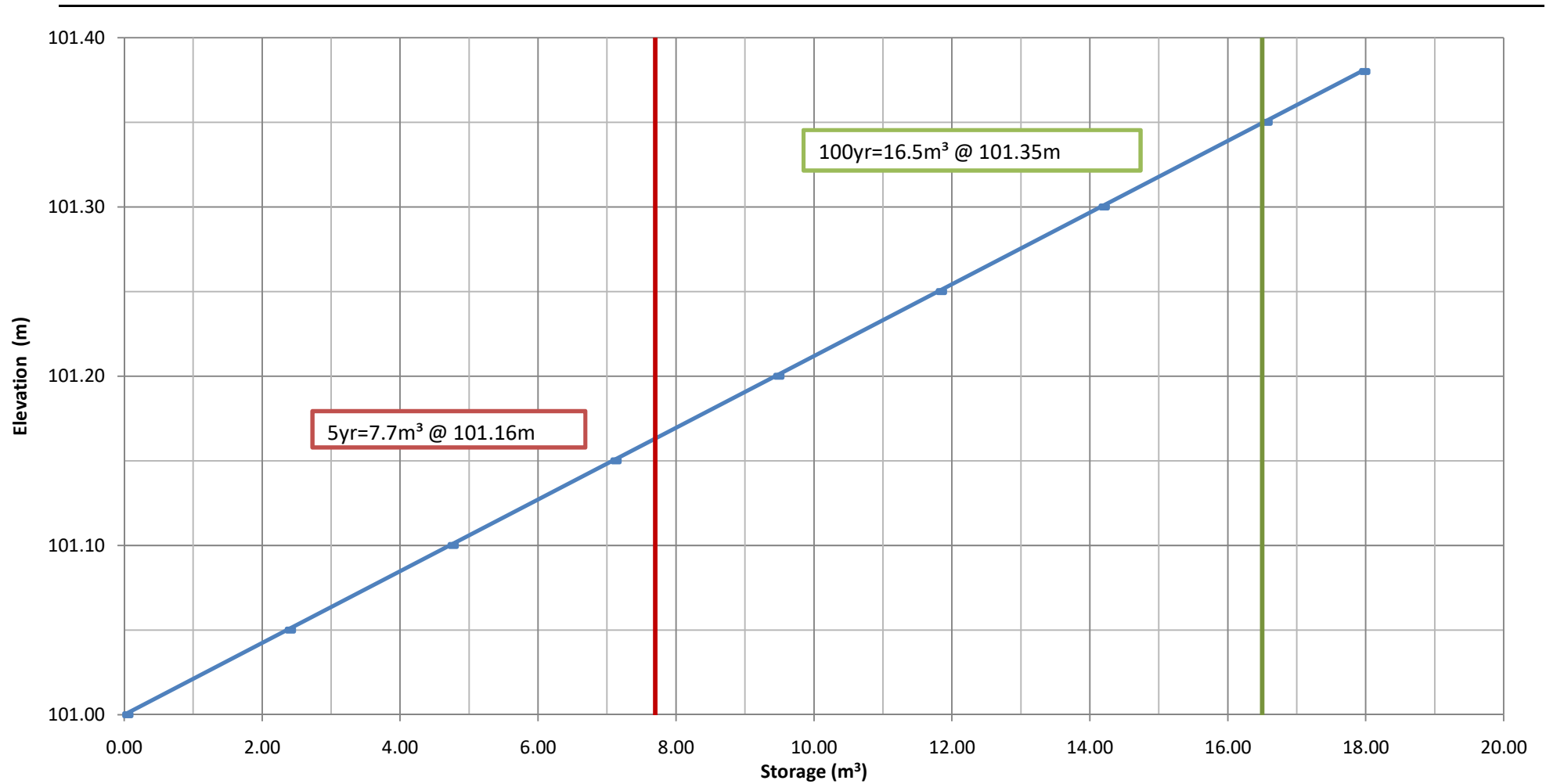
| GRAF Storage Modules                                  |        | Concrete Storm Manhole  |     | Tempest MHF |        |
|-------------------------------------------------------|--------|-------------------------|-----|-------------|--------|
| number of modules in layer 1 (EcoBlock Inspect Smart) | 76     | Top of Grate Elevation  | 102 | Pipe invert | 101.00 |
| storage volume per module (m^3)                       | 0.2    | Outlet Invert Elevation | 101 |             |        |
| Height of modules (m)                                 | 0.33   | manhole diameter (m)    | 1.2 |             |        |
| Module invert                                         | 101.05 |                         |     |             |        |
| Top of module                                         | 101.38 |                         |     |             |        |

| Stage, WSE Elev (m) | Comments                    | Layer Increment (m) | GRAF Storage Modules Layer 1 |                     |                    | Manhole Storage (STM-MH01) |                    | Tempest MHF ICD |                  | Cummulative Storage Volume (m³) |                      |
|---------------------|-----------------------------|---------------------|------------------------------|---------------------|--------------------|----------------------------|--------------------|-----------------|------------------|---------------------------------|----------------------|
|                     |                             |                     | Module height (m)            | Layer Thickness (m) | Layer Volume (m^3) | Head (m)                   | Layer Volume (m^3) | Head (m)        | ICD Flow (L/sec) |                                 | Total ICD Flow (L/s) |
| 101.380             | Top of Module               | 0.030               | 0.330                        | 0.030               | 1.382              | 0.38                       | 0.03               | 0.38            | 15.67            | 17.93                           | 15.7                 |
| 101.350             |                             | 0.050               | 0.300                        | 0.050               | 2.303              | 0.35                       | 0.06               | 0.35            | 15.03            | 16.52                           | 15.0                 |
| 101.300             |                             | 0.050               | 0.250                        | 0.050               | 2.303              | 0.30                       | 0.06               | 0.30            | 13.81            | 14.16                           | 13.8                 |
| 101.250             |                             | 0.050               | 0.200                        | 0.050               | 2.303              | 0.25                       | 0.06               | 0.25            | 12.34            | 11.80                           | 12.3                 |
| 101.200             |                             | 0.050               | 0.150                        | 0.050               | 2.303              | 0.20                       | 0.06               | 0.20            | 10.59            | 9.44                            | 10.6                 |
| 101.150             |                             | 0.050               | 0.100                        | 0.050               | 2.303              | 0.15                       | 0.06               | 0.15            | 8.52             | 7.08                            | 8.5                  |
| 101.100             |                             | 0.050               | 0.050                        | 0.050               | 2.303              | 0.10                       | 0.06               | 0.10            | 6.11             | 4.72                            | 6.1                  |
| 101.050             | Module Invert               | 0.050               | 0.000                        | 0.050               | 2.303              | 0.05                       | 0.06               | 0.05            | 3.32             | 2.36                            | 3.3                  |
| 101.000             | Top of stone base elevation | 0.050               | 0.000                        | 0.000               | 0.000              | 0.00                       | 0.00               | 0.00            | 0.11             | 0.00                            | 0.1                  |

**APPENDIX A: STORMWATER MANAGEMENT MODEL**  
**Storage-Discharge Curve**  
**CA1**



**APPENDIX A: STORMWATER MANAGEMENT MODEL**  
**Stage-Storage Curve**  
**CA1**





APPENDIX A: STORMWATER MANAGEMENT MODEL  
REQUIRED STORAGE VS. RELEASE RATE

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

Post Dev run-off Coefficient "C" - Roof Control A (RC-A)

| Area (ha)               | Surface          | Area (ha) | 5 Year Event |                  | 100 Year Event |                      |
|-------------------------|------------------|-----------|--------------|------------------|----------------|----------------------|
|                         |                  |           | "C"          | C <sub>avg</sub> | "C" x 1.25     | C <sub>100 avg</sub> |
| Total<br><br><br>0.0163 | Roof             | 0.0163    | 0.90         | 0.90             | 1.00           | 1.00                 |
|                         | Asphalt/Concrete | 0.0000    | 0.90         |                  | 1.00           |                      |
|                         | Grass            | 0.0000    | 0.20         |                  | 0.25           |                      |
|                         |                  |           |              |                  |                |                      |

TABLE 3 - REQUIRED STORAGE VERSUS RELEASE RATE FOR 5 YEAR STORM

| Runoff Coefficient, C = |                            |                   | 0.90                  |      | Duration Interval (min) =     |       | 5     |       |       |       |       |       |
|-------------------------|----------------------------|-------------------|-----------------------|------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Drainage Area (ha) =    |                            |                   | 0.016                 |      | Release Rate Start (L/s) =    |       | 0     |       |       |       |       |       |
| Return Period (yrs) =   |                            |                   | 5                     |      | Release Rate Interval (L/s) = |       | 1     |       |       |       |       |       |
| Release Rate -->        |                            |                   | 0                     | 1    | 2                             | 3     | 4     | 5     | 6     | 7     | 8     | 9     |
| Duration (min)          | Rainfall Intensity (mm/hr) | Peak Flow (L/sec) | Storage Required (m³) |      |                               |       |       |       |       |       |       |       |
| 0                       | 230.5                      | 9.4               | 0.0                   | 0.0  | 0.0                           | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 5                       | 141.2                      | 5.8               | 1.7                   | 1.4  | 1.1                           | 0.8   | 0.5   | 0.2   | -0.1  | -0.4  | -0.7  | -1.0  |
| 10                      | 104.2                      | 4.2               | 2.5                   | 1.9  | 1.3                           | 0.7   | 0.1   | -0.5  | -1.1  | -1.7  | -2.3  | -2.9  |
| 15                      | 83.6                       | 3.4               | 3.1                   | 2.2  | 1.3                           | 0.4   | -0.5  | -1.4  | -2.3  | -3.2  | -4.1  | -5.0  |
| 20                      | 70.3                       | 2.9               | 3.4                   | 2.2  | 1.0                           | -0.2  | -1.4  | -2.6  | -3.8  | -5.0  | -6.2  | -7.4  |
| 25                      | 60.9                       | 2.5               | 3.7                   | 2.2  | 0.7                           | -0.8  | -2.3  | -3.8  | -5.3  | -6.8  | -8.3  | -9.8  |
| 30                      | 53.9                       | 2.2               | 4.0                   | 2.2  | 0.4                           | -1.4  | -3.2  | -5.0  | -6.8  | -8.6  | -10.4 | -12.2 |
| 35                      | 48.5                       | 2.0               | 4.2                   | 2.1  | 0.0                           | -2.1  | -4.2  | -6.3  | -8.4  | -10.5 | -12.6 | -14.7 |
| 40                      | 44.2                       | 1.8               | 4.3                   | 1.9  | -0.5                          | -2.9  | -5.3  | -7.7  | -10.1 | -12.5 | -14.9 | -17.3 |
| 45                      | 40.6                       | 1.7               | 4.5                   | 1.8  | -0.9                          | -3.6  | -6.3  | -9.0  | -11.7 | -14.4 | -17.1 | -19.8 |
| 50                      | 37.7                       | 1.5               | 4.6                   | 1.6  | -1.4                          | -4.4  | -7.4  | -10.4 | -13.4 | -16.4 | -19.4 | -22.4 |
| 55                      | 35.1                       | 1.4               | 4.7                   | 1.4  | -1.9                          | -5.2  | -8.5  | -11.8 | -15.1 | -18.4 | -21.7 | -25.0 |
| 60                      | 32.9                       | 1.3               | 4.8                   | 1.2  | -2.4                          | -6.0  | -9.6  | -13.2 | -16.8 | -20.4 | -24.0 | -27.6 |
| 65                      | 31.0                       | 1.3               | 4.9                   | 1.0  | -2.9                          | -6.8  | -10.7 | -14.6 | -18.5 | -22.4 | -26.3 | -30.2 |
| 70                      | 29.4                       | 1.2               | 5.0                   | 0.8  | -3.4                          | -7.6  | -11.8 | -16.0 | -20.2 | -24.4 | -28.6 | -32.8 |
| 75                      | 27.9                       | 1.1               | 5.1                   | 0.6  | -3.9                          | -8.4  | -12.9 | -17.4 | -21.9 | -26.4 | -30.9 | -35.4 |
| 80                      | 26.6                       | 1.1               | 5.2                   | 0.4  | -4.4                          | -9.2  | -14.0 | -18.8 | -23.6 | -28.4 | -33.2 | -38.0 |
| 85                      | 25.4                       | 1.0               | 5.3                   | 0.2  | -4.9                          | -10.0 | -15.1 | -20.2 | -25.3 | -30.4 | -35.5 | -40.6 |
| 90                      | 24.3                       | 1.0               | 5.3                   | -0.1 | -5.5                          | -10.9 | -16.3 | -21.7 | -27.1 | -32.5 | -37.9 | -43.3 |
| 95                      | 23.3                       | 1.0               | 5.4                   | -0.3 | -6.0                          | -11.7 | -17.4 | -23.1 | -28.8 | -34.5 | -40.2 | -45.9 |
| Maximum Storage Rate =  |                            |                   | 5.4                   | 2.2  | 1.3                           | 0.8   | 0.5   | 0.2   | 0.0   | 0.0   | 0.0   | 0.0   |

TABLE 4 - REQUIRED STORAGE VERSUS RELEASE RATE FOR 100 YEAR STORM

| Runoff Coefficient, C = |                            |                   | 1.00                  |     | Duration Interval (min) =     |      | 5     |       |       |       |       |       |
|-------------------------|----------------------------|-------------------|-----------------------|-----|-------------------------------|------|-------|-------|-------|-------|-------|-------|
| Drainage Area (ha) =    |                            |                   | 0.016                 |     | Release Rate Start (L/s) =    |      | 0     |       |       |       |       |       |
| Return Period (yrs) =   |                            |                   | 100                   |     | Release Rate Interval (L/s) = |      | 1     |       |       |       |       |       |
| Release Rate -->        |                            |                   | 0                     | 1   | 2                             | 3    | 4     | 5     | 6     | 7     | 8     | 9     |
| Duration (min)          | Rainfall Intensity (mm/hr) | Peak Flow (L/sec) | Storage Required (m³) |     |                               |      |       |       |       |       |       |       |
| 0                       | 398.6                      | 18.1              | 0.0                   | 0.0 | 0.0                           | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 5                       | 242.7                      | 11.0              | 3.3                   | 3.0 | 2.7                           | 2.4  | 2.1   | 1.8   | 1.5   | 1.2   | 0.9   | 0.6   |
| 10                      | 178.6                      | 8.1               | 4.9                   | 4.3 | 3.7                           | 3.1  | 2.5   | 1.9   | 1.3   | 0.7   | 0.1   | -0.5  |
| 15                      | 142.9                      | 6.5               | 5.8                   | 4.9 | 4.0                           | 3.1  | 2.2   | 1.3   | 0.4   | -0.5  | -1.4  | -2.3  |
| 20                      | 120.0                      | 5.4               | 6.5                   | 5.3 | 4.1                           | 2.9  | 1.7   | 0.5   | -0.7  | -1.9  | -3.1  | -4.3  |
| 25                      | 103.8                      | 4.7               | 7.1                   | 5.6 | 4.1                           | 2.6  | 1.1   | -0.4  | -1.9  | -3.4  | -4.9  | -6.4  |
| 30                      | 91.9                       | 4.2               | 7.5                   | 5.7 | 3.9                           | 2.1  | 0.3   | -1.5  | -3.3  | -5.1  | -6.9  | -8.7  |
| 35                      | 82.6                       | 3.7               | 7.9                   | 5.8 | 3.7                           | 1.6  | -0.5  | -2.6  | -4.7  | -6.8  | -8.9  | -11.0 |
| 40                      | 75.1                       | 3.4               | 8.2                   | 5.8 | 3.4                           | 1.0  | -1.4  | -3.8  | -6.2  | -8.6  | -11.0 | -13.4 |
| 45                      | 69.1                       | 3.1               | 8.4                   | 5.7 | 3.0                           | 0.3  | -2.4  | -5.1  | -7.8  | -10.5 | -13.2 | -15.9 |
| 50                      | 64.0                       | 2.9               | 8.7                   | 5.7 | 2.7                           | -0.3 | -3.3  | -6.3  | -9.3  | -12.3 | -15.3 | -18.3 |
| 55                      | 59.6                       | 2.7               | 8.9                   | 5.6 | 2.3                           | -1.0 | -4.3  | -7.6  | -10.9 | -14.2 | -17.5 | -20.8 |
| 60                      | 55.9                       | 2.5               | 9.1                   | 5.5 | 1.9                           | -1.7 | -5.3  | -8.9  | -12.5 | -16.1 | -19.7 | -23.3 |
| 65                      | 52.6                       | 2.4               | 9.3                   | 5.4 | 1.5                           | -2.4 | -6.3  | -10.2 | -14.1 | -18.0 | -21.9 | -25.8 |
| 70                      | 49.8                       | 2.3               | 9.5                   | 5.3 | 1.1                           | -3.1 | -7.3  | -11.5 | -15.7 | -19.9 | -24.1 | -28.3 |
| 75                      | 47.3                       | 2.1               | 9.6                   | 5.1 | 0.6                           | -3.9 | -8.4  | -12.9 | -17.4 | -21.9 | -26.4 | -30.9 |
| 80                      | 45.0                       | 2.0               | 9.8                   | 5.0 | 0.2                           | -4.6 | -9.4  | -14.2 | -19.0 | -23.8 | -28.6 | -33.4 |
| 85                      | 43.0                       | 1.9               | 9.9                   | 4.8 | -0.3                          | -5.4 | -10.5 | -15.6 | -20.7 | -25.8 | -30.9 | -36.0 |
| 90                      | 41.1                       | 1.9               | 10.1                  | 4.7 | -0.7                          | -6.1 | -11.5 | -16.9 | -22.3 | -27.7 | -33.1 | -38.5 |
| 95                      | 39.4                       | 1.8               | 10.2                  | 4.5 | -1.2                          | -6.9 | -12.6 | -18.3 | -24.0 | -29.7 | -35.4 | -41.1 |
| 100                     | 37.9                       | 1.7               | 10.3                  | 4.3 | -1.7                          | -7.7 | -13.7 | -19.7 | -25.7 | -31.7 | -37.7 | -43.7 |
| Maximum Storage Rate =  |                            |                   | 10.3                  | 5.8 | 4.1                           | 3.1  | 2.5   | 1.9   | 1.5   | 1.2   | 0.9   | 0.6   |

**APPENDIX B: STORMWATER MANAGEMENT MODEL**  
**STORAGE VOLUME PROVIDED ROOF**

**Client:** 1763295 Ontario Inc.  
**Job No.:** 250848  
**Location:** 41 Edgewater Street, Kanata ON  
**Date:** August 28, 2026

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**Storage Provided for Roof Control A (RC-A)**

| Storage Depth (m) | Layer Thickness (m) | Top Layer Area (m <sup>2</sup> ) | Bottom Layer Area (m <sup>2</sup> ) | Incremental Volume (m <sup>3</sup> ) | Cumulative Storage Volume (m <sup>3</sup> ) | Release Rate Per Slot (L/sec) | Release Rate Per Drain (L/sec) | Total Outflow (L/sec) | Draw Down Incremental (hrs) | Draw Down Cumulative (hrs) |
|-------------------|---------------------|----------------------------------|-------------------------------------|--------------------------------------|---------------------------------------------|-------------------------------|--------------------------------|-----------------------|-----------------------------|----------------------------|
| 0.15              | 0.01                | 149.6                            | 143.1                               | 1.46                                 | 9.29                                        | 1.86                          | 1.86                           | 1.86                  | 1.39                        | 8.5                        |
| 0.14              | 0.01                | 143.1                            | 137.7                               | 1.40                                 | 7.82                                        | 1.74                          | 1.74                           | 1.74                  | 1.25                        | 7.2                        |
| 0.13              | 0.01                | 137.7                            | 118.5                               | 1.28                                 | 6.42                                        | 1.61                          | 1.61                           | 1.61                  | 1.11                        | 5.9                        |
| 0.12              | 0.01                | 118.5                            | 101.0                               | 1.10                                 | 5.14                                        | 1.49                          | 1.49                           | 1.49                  | 0.96                        | 4.8                        |
| 0.11              | 0.01                | 101.0                            | 84.9                                | 0.93                                 | 4.04                                        | 1.36                          | 1.36                           | 1.36                  | 0.82                        | 3.8                        |
| 0.10              | 0.01                | 84.9                             | 70.3                                | 0.77                                 | 3.12                                        | 1.24                          | 1.24                           | 1.24                  | 0.70                        | 3.0                        |
| 0.09              | 0.01                | 70.3                             | 57.0                                | 0.64                                 | 2.34                                        | 1.12                          | 1.12                           | 1.12                  | 0.58                        | 2.3                        |
| 0.08              | 0.01                | 57.0                             | 45.0                                | 0.51                                 | 1.71                                        | 0.99                          | 0.99                           | 0.99                  | 0.48                        | 1.7                        |
| 0.07              | 0.01                | 45.0                             | 34.5                                | 0.40                                 | 1.20                                        | 0.87                          | 0.87                           | 0.87                  | 0.38                        | 1.3                        |
| 0.06              | 0.01                | 34.5                             | 25.4                                | 0.30                                 | 0.80                                        | 0.74                          | 0.74                           | 0.74                  | 0.30                        | 0.9                        |
| 0.05              | 0.01                | 25.4                             | 17.7                                | 0.21                                 | 0.50                                        | 0.62                          | 0.62                           | 0.62                  | 0.22                        | 0.6                        |
| 0.04              | 0.01                | 17.7                             | 11.4                                | 0.14                                 | 0.29                                        | 0.50                          | 0.50                           | 0.50                  | 0.16                        | 0.4                        |
| 0.03              | 0.01                | 11.4                             | 6.5                                 | 0.09                                 | 0.14                                        | 0.37                          | 0.37                           | 0.37                  | 0.11                        | 0.2                        |
| 0.02              | 0.01                | 6.5                              | 2.9                                 | 0.05                                 | 0.06                                        | 0.25                          | 0.25                           | 0.25                  | 0.06                        | 0.1                        |
| 0.01              | 0.01                | 2.9                              | 0.0                                 | 0.01                                 | 0.01                                        | 0.12                          | 0.12                           | 0.12                  | 0.02                        | 0.0                        |
| 0.00              | 0.00                | 0.0                              | 0.0                                 | 0.00                                 | 0.00                                        | 0.00                          | 0.00                           | 0.00                  | 0.00                        | 0.0                        |

Roof Drain Type - WATTS Large Area Roof Drain with Adjustable Flow Control. RD-100-A-ADJ - Fully Exposed.

Number of Weirs 1

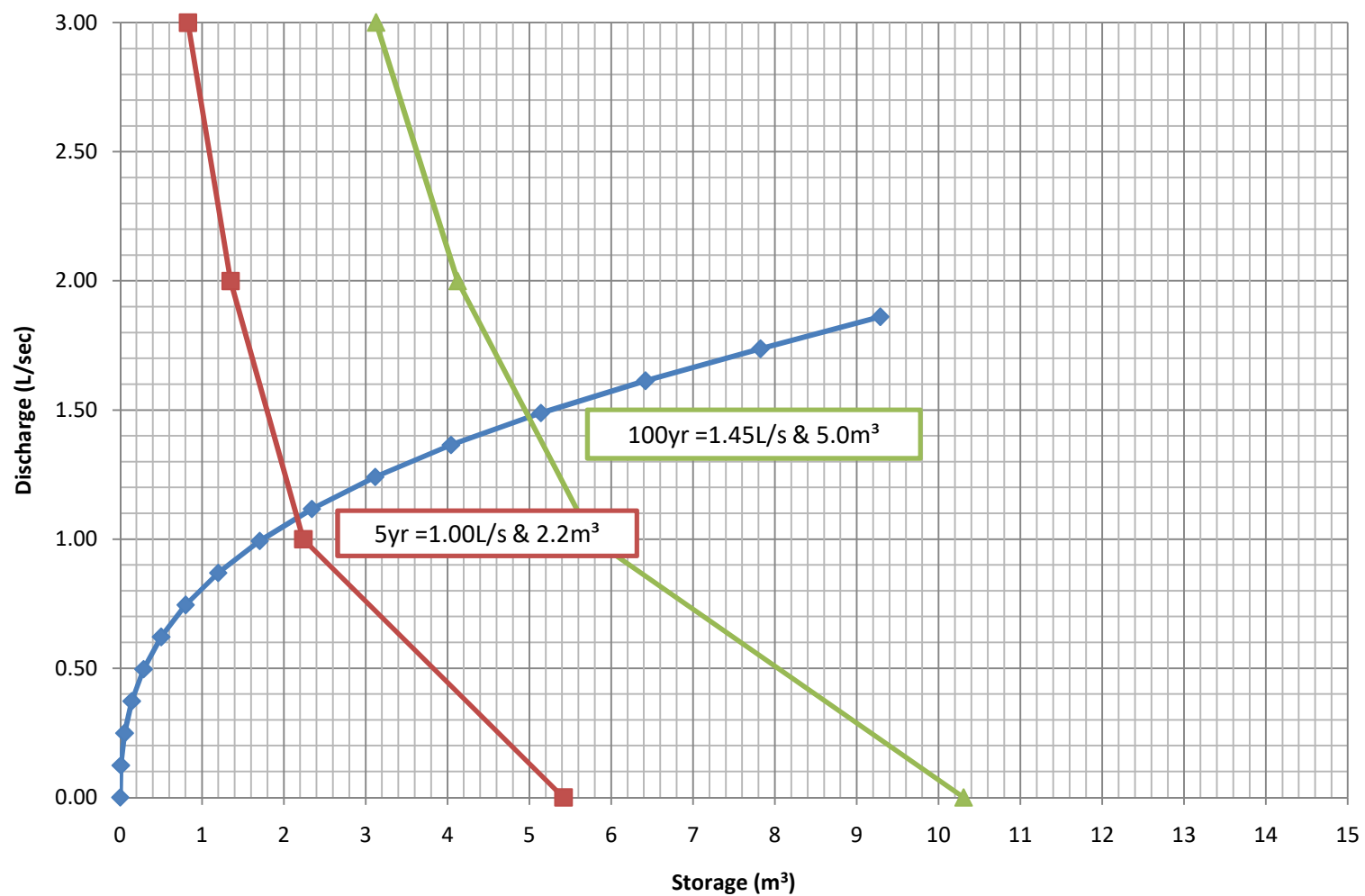
Number of Slots per Weir 1

|                                                |      |     |
|------------------------------------------------|------|-----|
| Maximum Discharge for the 5 year Storm Event   | 1.00 | L/s |
| Maximum Discharge for the 100 year Storm Event | 1.45 | L/s |

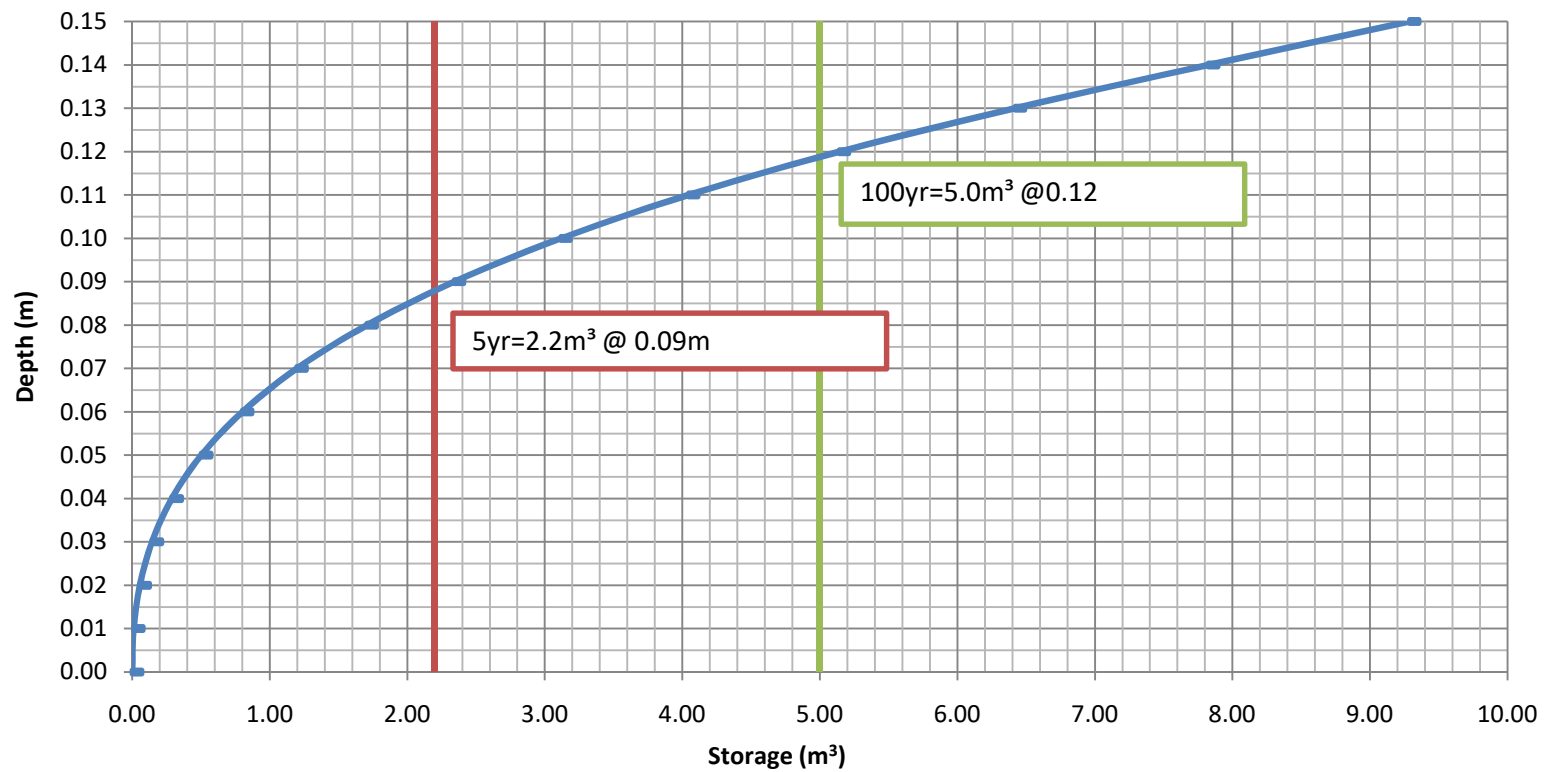
|                                                       |     |                   |
|-------------------------------------------------------|-----|-------------------|
| Maximum Storage required for the 5 year Storm Event   | 2.2 | (m <sup>3</sup> ) |
| Maximum Storage required for the 100 year Storm Event | 5.5 | (m <sup>3</sup> ) |

|                                            |     |    |
|--------------------------------------------|-----|----|
| Storage Depth for the 5 year Storm Event   | 90  | mm |
| Storage Depth for the 100 year Storm Event | 120 | mm |

**CA1 - Storage Discharge Curve**  
**Roof Top Storage (RC-A)**



**APPENDIX B: STORMWATER MANAGEMENT MODEL**  
**Stage-Storage Curve RC-A**



APPENDIX A: STORMWATER MANAGEMENT MODEL  
REQUIRED STORAGE VS. RELEASE RATE

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

Post Dev run-off Coefficient "C" - Roof Control A (RC-A)

| Area (ha) | Surface          | Area (ha) | 5 Year Event |                  | 100 Year Event |                      |
|-----------|------------------|-----------|--------------|------------------|----------------|----------------------|
|           |                  |           | "C"          | C <sub>avg</sub> | "C" x 1.25     | C <sub>100 avg</sub> |
| Total     | Roof             | 0.0249    | 0.90         | 0.90             | 1.00           | 1.00                 |
|           | Asphalt/Concrete | 0.0000    | 0.90         |                  | 1.00           |                      |
|           | Grass            | 0.0000    | 0.20         |                  | 0.25           |                      |
|           |                  |           |              |                  |                |                      |

TABLE 3 - REQUIRED STORAGE VERSUS RELEASE RATE FOR 5 YEAR STORM

| Runoff Coefficient, C = |                            |                   | 0.90                  |     | Duration Interval (min) =     |      | 5     |       |       |       |       |       |
|-------------------------|----------------------------|-------------------|-----------------------|-----|-------------------------------|------|-------|-------|-------|-------|-------|-------|
| Drainage Area (ha) =    |                            |                   | 0.025                 |     | Release Rate Start (L/s) =    |      | 0     |       |       |       |       |       |
| Return Period (yrs) =   |                            |                   | 5                     |     | Release Rate Interval (L/s) = |      | 1     |       |       |       |       |       |
| Release Rate -->        |                            |                   | 0                     | 1   | 2                             | 3    | 4     | 5     | 6     | 7     | 8     | 9     |
| Duration (min)          | Rainfall Intensity (mm/hr) | Peak Flow (L/sec) | Storage Required (m³) |     |                               |      |       |       |       |       |       |       |
| 0                       | 230.5                      | 14.4              | 0.0                   | 0.0 | 0.0                           | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 5                       | 141.2                      | 8.8               | 2.6                   | 2.3 | 2.0                           | 1.7  | 1.4   | 1.1   | 0.8   | 0.5   | 0.2   | -0.1  |
| 10                      | 104.2                      | 6.5               | 3.9                   | 3.3 | 2.7                           | 2.1  | 1.5   | 0.9   | 0.3   | -0.3  | -0.9  | -1.5  |
| 15                      | 83.6                       | 5.2               | 4.7                   | 3.8 | 2.9                           | 2.0  | 1.1   | 0.2   | -0.7  | -1.6  | -2.5  | -3.4  |
| 20                      | 70.3                       | 4.4               | 5.3                   | 4.1 | 2.9                           | 1.7  | 0.5   | -0.7  | -1.9  | -3.1  | -4.3  | -5.5  |
| 25                      | 60.9                       | 3.8               | 5.7                   | 4.2 | 2.7                           | 1.2  | -0.3  | -1.8  | -3.3  | -4.8  | -6.3  | -7.8  |
| 30                      | 53.9                       | 3.4               | 6.0                   | 4.2 | 2.4                           | 0.6  | -1.2  | -3.0  | -4.8  | -6.6  | -8.4  | -10.2 |
| 35                      | 48.5                       | 3.0               | 6.3                   | 4.2 | 2.1                           | 0.0  | -2.1  | -4.2  | -6.3  | -8.4  | -10.5 | -12.6 |
| 40                      | 44.2                       | 2.8               | 6.6                   | 4.2 | 1.8                           | -0.6 | -3.0  | -5.4  | -7.8  | -10.2 | -12.6 | -15.0 |
| 45                      | 40.6                       | 2.5               | 6.8                   | 4.1 | 1.4                           | -1.3 | -4.0  | -6.7  | -9.4  | -12.1 | -14.8 | -17.5 |
| 50                      | 37.7                       | 2.3               | 7.0                   | 4.0 | 1.0                           | -2.0 | -5.0  | -8.0  | -11.0 | -14.0 | -17.0 | -20.0 |
| 55                      | 35.1                       | 2.2               | 7.2                   | 3.9 | 0.6                           | -2.7 | -6.0  | -9.3  | -12.6 | -15.9 | -19.2 | -22.5 |
| 60                      | 32.9                       | 2.1               | 7.4                   | 3.8 | 0.2                           | -3.4 | -7.0  | -10.6 | -14.2 | -17.8 | -21.4 | -25.0 |
| 65                      | 31.0                       | 1.9               | 7.5                   | 3.6 | -0.3                          | -4.2 | -8.1  | -12.0 | -15.9 | -19.8 | -23.7 | -27.6 |
| 70                      | 29.4                       | 1.8               | 7.7                   | 3.5 | -0.7                          | -4.9 | -9.1  | -13.3 | -17.5 | -21.7 | -25.9 | -30.1 |
| 75                      | 27.9                       | 1.7               | 7.8                   | 3.3 | -1.2                          | -5.7 | -10.2 | -14.7 | -19.2 | -23.7 | -28.2 | -32.7 |
| 80                      | 26.6                       | 1.7               | 7.9                   | 3.1 | -1.7                          | -6.5 | -11.3 | -16.1 | -20.9 | -25.7 | -30.5 | -35.3 |
| 85                      | 25.4                       | 1.6               | 8.1                   | 3.0 | -2.1                          | -7.2 | -12.3 | -17.4 | -22.5 | -27.6 | -32.7 | -37.8 |
| 90                      | 24.3                       | 1.5               | 8.2                   | 2.8 | -2.6                          | -8.0 | -13.4 | -18.8 | -24.2 | -29.6 | -35.0 | -40.4 |
| 95                      | 23.3                       | 1.5               | 8.3                   | 2.6 | -3.1                          | -8.8 | -14.5 | -20.2 | -25.9 | -31.6 | -37.3 | -43.0 |
| Maximum Storage Rate =  |                            |                   | 8.3                   | 4.2 | 2.9                           | 2.1  | 1.5   | 1.1   | 0.8   | 0.5   | 0.2   | 0.0   |

TABLE 4 - REQUIRED STORAGE VERSUS RELEASE RATE FOR 100 YEAR STORM

| Runoff Coefficient, C = |                            |                   | 1.00                  |      | Duration Interval (min) =     |      | 5    |       |       |       |       |       |
|-------------------------|----------------------------|-------------------|-----------------------|------|-------------------------------|------|------|-------|-------|-------|-------|-------|
| Drainage Area (ha) =    |                            |                   | 0.025                 |      | Release Rate Start (L/s) =    |      | 0    |       |       |       |       |       |
| Return Period (yrs) =   |                            |                   | 100                   |      | Release Rate Interval (L/s) = |      | 1    |       |       |       |       |       |
| Release Rate -->        |                            |                   | 0                     | 1    | 2                             | 3    | 4    | 5     | 6     | 7     | 8     | 9     |
| Duration (min)          | Rainfall Intensity (mm/hr) | Peak Flow (L/sec) | Storage Required (m³) |      |                               |      |      |       |       |       |       |       |
| 0                       | 398.6                      | 27.6              | 0.0                   | 0.0  | 0.0                           | 0.0  | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 5                       | 242.7                      | 16.8              | 5.0                   | 4.7  | 4.4                           | 4.1  | 3.8  | 3.5   | 3.2   | 2.9   | 2.6   | 2.3   |
| 10                      | 178.6                      | 12.4              | 7.4                   | 6.8  | 6.2                           | 5.6  | 5.0  | 4.4   | 3.8   | 3.2   | 2.6   | 2.0   |
| 15                      | 142.9                      | 9.9               | 8.9                   | 8.0  | 7.1                           | 6.2  | 5.3  | 4.4   | 3.5   | 2.6   | 1.7   | 0.8   |
| 20                      | 120.0                      | 8.3               | 10.0                  | 8.8  | 7.6                           | 6.4  | 5.2  | 4.0   | 2.8   | 1.6   | 0.4   | -0.8  |
| 25                      | 103.8                      | 7.2               | 10.8                  | 9.3  | 7.8                           | 6.3  | 4.8  | 3.3   | 1.8   | 0.3   | -1.2  | -2.7  |
| 30                      | 91.9                       | 6.4               | 11.4                  | 9.6  | 7.8                           | 6.0  | 4.2  | 2.4   | 0.6   | -1.2  | -3.0  | -4.8  |
| 35                      | 82.6                       | 5.7               | 12.0                  | 9.9  | 7.8                           | 5.7  | 3.6  | 1.5   | -0.6  | -2.7  | -4.8  | -6.9  |
| 40                      | 75.1                       | 5.2               | 12.5                  | 10.1 | 7.7                           | 5.3  | 2.9  | 0.5   | -1.9  | -4.3  | -6.7  | -9.1  |
| 45                      | 69.1                       | 4.8               | 12.9                  | 10.2 | 7.5                           | 4.8  | 2.1  | -0.6  | -3.3  | -6.0  | -8.7  | -11.4 |
| 50                      | 64.0                       | 4.4               | 13.3                  | 10.3 | 7.3                           | 4.3  | 1.3  | -1.7  | -4.7  | -7.7  | -10.7 | -13.7 |
| 55                      | 59.6                       | 4.1               | 13.6                  | 10.3 | 7.0                           | 3.7  | 0.4  | -2.9  | -6.2  | -9.5  | -12.8 | -16.1 |
| 60                      | 55.9                       | 3.9               | 13.9                  | 10.3 | 6.7                           | 3.1  | -0.5 | -4.1  | -7.7  | -11.3 | -14.9 | -18.5 |
| 65                      | 52.6                       | 3.6               | 14.2                  | 10.3 | 6.4                           | 2.5  | -1.4 | -5.3  | -9.2  | -13.1 | -17.0 | -20.9 |
| 70                      | 49.8                       | 3.4               | 14.5                  | 10.3 | 6.1                           | 1.9  | -2.3 | -6.5  | -10.7 | -14.9 | -19.1 | -23.3 |
| 75                      | 47.3                       | 3.3               | 14.7                  | 10.2 | 5.7                           | 1.2  | -3.3 | -7.8  | -12.3 | -16.8 | -21.3 | -25.8 |
| 80                      | 45.0                       | 3.1               | 14.9                  | 10.1 | 5.3                           | 0.5  | -4.3 | -9.1  | -13.9 | -18.7 | -23.5 | -28.3 |
| 85                      | 43.0                       | 3.0               | 15.2                  | 10.1 | 5.0                           | -0.1 | -5.2 | -10.3 | -15.4 | -20.5 | -25.6 | -30.7 |
| 90                      | 41.1                       | 2.8               | 15.4                  | 10.0 | 4.6                           | -0.8 | -6.2 | -11.6 | -17.0 | -22.4 | -27.8 | -33.2 |
| 95                      | 39.4                       | 2.7               | 15.6                  | 9.9  | 4.2                           | -1.5 | -7.2 | -12.9 | -18.6 | -24.3 | -30.0 | -35.7 |
| 100                     | 37.9                       | 2.6               | 15.7                  | 9.7  | 3.7                           | -2.3 | -8.3 | -14.3 | -20.3 | -26.3 | -32.3 | -38.3 |
| Maximum Storage Rate =  |                            |                   | 15.7                  | 10.3 | 7.8                           | 6.4  | 5.3  | 4.4   | 3.8   | 3.2   | 2.6   | 2.3   |

**APPENDIX B: STORMWATER MANAGEMENT MODEL**  
**STORAGE VOLUME PROVIDED ROOF**

**Client:** 1763295 Ontario Inc.  
**Job No.:** 250848  
**Location:** 41 Edgewater Street, Kanata ON  
**Date:** August 28, 2026

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**Storage Provided for Roof Control A (RC-B)**

| Storage Depth (m) | Layer Thickness (m) | Top Layer Area (m <sup>2</sup> ) | Bottom Layer Area (m <sup>2</sup> ) | Incremental Volume (m <sup>3</sup> ) | Cumulative Storage Volume (m <sup>3</sup> ) | Release Rate Per Slot (L/sec) | Release Rate Per Drain (L/sec) | Total Outflow (L/sec) | Draw Down Incremental (hrs) | Draw Down Cumulative (hrs) |
|-------------------|---------------------|----------------------------------|-------------------------------------|--------------------------------------|---------------------------------------------|-------------------------------|--------------------------------|-----------------------|-----------------------------|----------------------------|
| 0.15              | 0.01                | 230.0                            | 222.0                               | 2.26                                 | 14.36                                       | 1.86                          | 1.86                           | 1.86                  | 2.14                        | 13.1                       |
| 0.14              | 0.01                | 222.0                            | 215.0                               | 2.18                                 | 12.10                                       | 1.74                          | 1.74                           | 1.74                  | 1.94                        | 10.9                       |
| 0.13              | 0.01                | 215.0                            | 184.8                               | 2.00                                 | 9.92                                        | 1.61                          | 1.61                           | 1.61                  | 1.71                        | 9.0                        |
| 0.12              | 0.01                | 184.8                            | 157.2                               | 1.71                                 | 7.92                                        | 1.49                          | 1.49                           | 1.49                  | 1.48                        | 7.3                        |
| 0.11              | 0.01                | 157.2                            | 131.9                               | 1.44                                 | 6.21                                        | 1.36                          | 1.36                           | 1.36                  | 1.26                        | 5.8                        |
| 0.10              | 0.01                | 131.9                            | 108.7                               | 1.20                                 | 4.77                                        | 1.24                          | 1.24                           | 1.24                  | 1.07                        | 4.5                        |
| 0.09              | 0.01                | 108.7                            | 87.8                                | 0.98                                 | 3.57                                        | 1.12                          | 1.12                           | 1.12                  | 0.89                        | 3.5                        |
| 0.08              | 0.01                | 87.8                             | 69.1                                | 0.78                                 | 2.58                                        | 0.99                          | 0.99                           | 0.99                  | 0.72                        | 2.6                        |
| 0.07              | 0.01                | 69.1                             | 52.7                                | 0.61                                 | 1.80                                        | 0.87                          | 0.87                           | 0.87                  | 0.58                        | 1.9                        |
| 0.06              | 0.01                | 52.7                             | 38.5                                | 0.45                                 | 1.19                                        | 0.74                          | 0.74                           | 0.74                  | 0.45                        | 1.3                        |
| 0.05              | 0.01                | 38.5                             | 26.5                                | 0.32                                 | 0.74                                        | 0.62                          | 0.62                           | 0.62                  | 0.33                        | 0.8                        |
| 0.04              | 0.01                | 26.5                             | 16.7                                | 0.21                                 | 0.42                                        | 0.50                          | 0.50                           | 0.50                  | 0.23                        | 0.5                        |
| 0.03              | 0.01                | 16.7                             | 9.2                                 | 0.13                                 | 0.20                                        | 0.37                          | 0.37                           | 0.37                  | 0.15                        | 0.3                        |
| 0.02              | 0.01                | 9.2                              | 3.8                                 | 0.06                                 | 0.08                                        | 0.25                          | 0.25                           | 0.25                  | 0.08                        | 0.1                        |
| 0.01              | 0.01                | 3.8                              | 0.0                                 | 0.01                                 | 0.01                                        | 0.12                          | 0.12                           | 0.12                  | 0.03                        | 0.0                        |
| 0.00              | 0.00                | 0.0                              | 0.0                                 | 0.00                                 | 0.00                                        | 0.00                          | 0.00                           | 0.00                  | 0.00                        | 0.0                        |

Roof Drain Type - WATTS Large Area Roof Drain with Adjustable Flow Control. RD-100-A-ADJ - Fully Exposed.

Number of Weirs 1

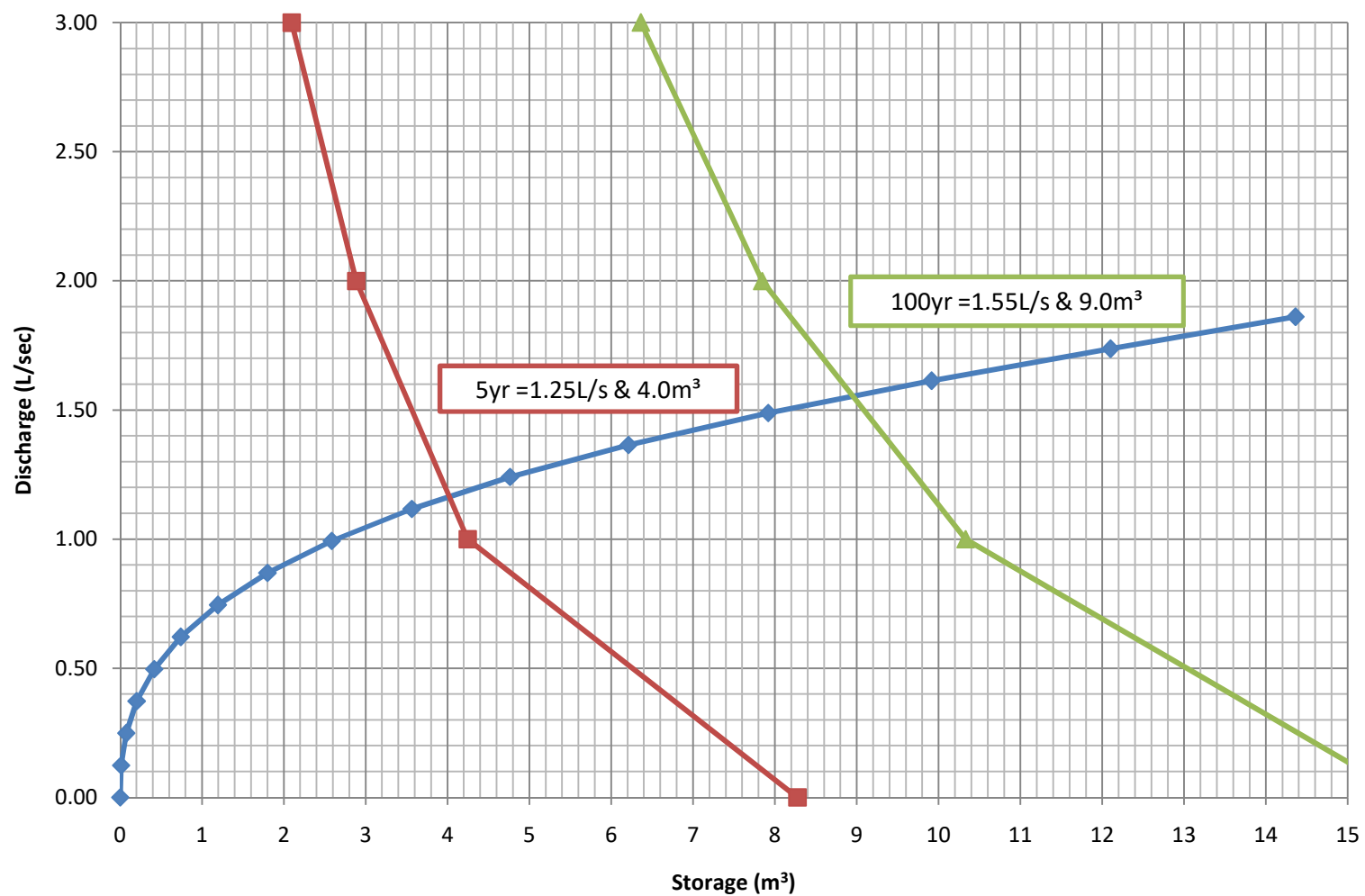
Number of Slots per Weir 1

Maximum Discharge for the 5 year Storm Event 1.25 L/s  
Maximum Discharge for the 100 year Storm Event 1.55 L/s

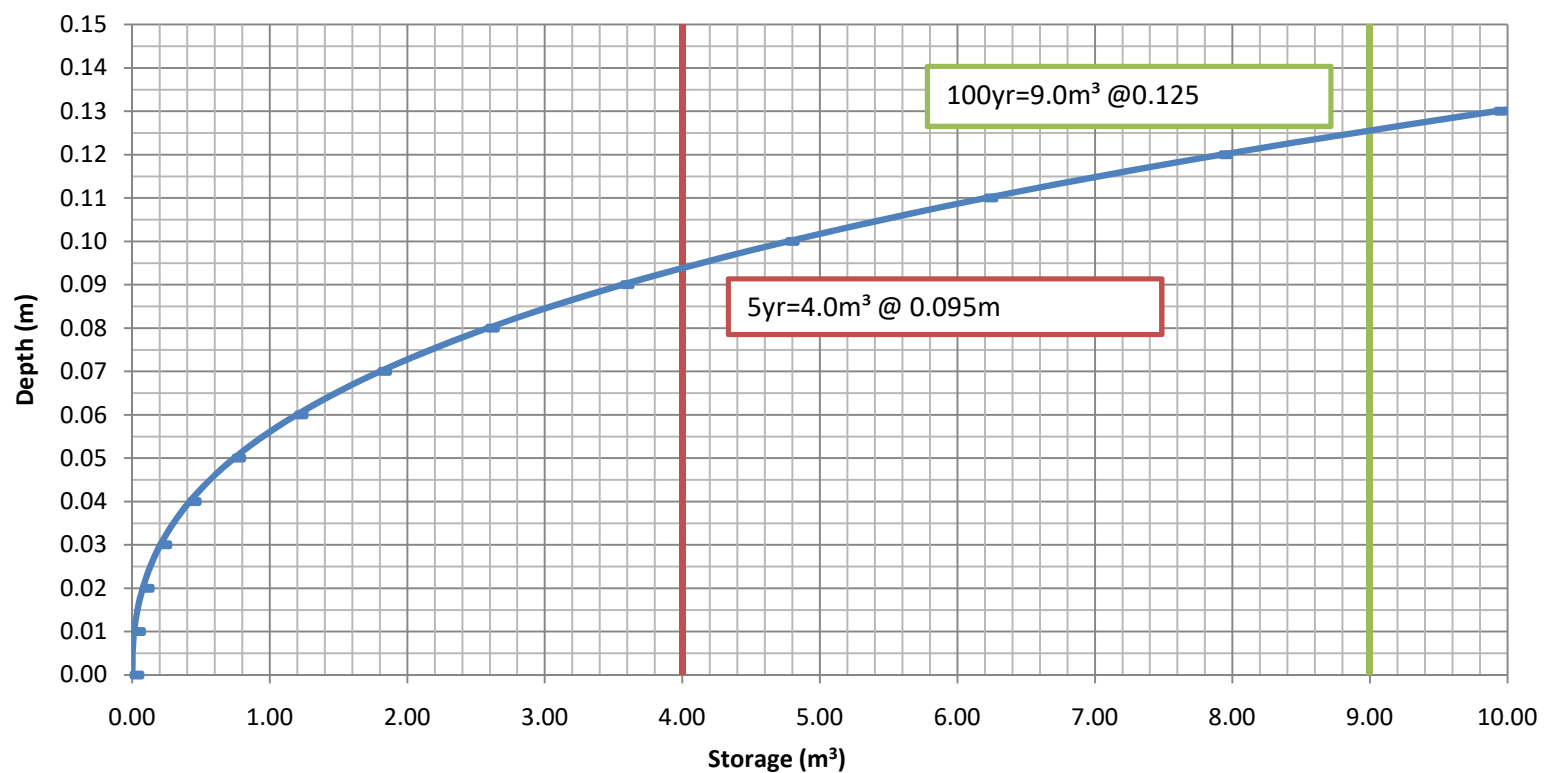
Maximum Storage required for the 5 year Storm Event 4.0 (m<sup>3</sup>)  
Maximum Storage required for the 100 year Storm Event 9.0 (m<sup>3</sup>)

Storage Depth for the 5 year Storm Event 95 mm  
Storage Depth for the 100 year Storm Event 125 mm

**CA1 - Storage Discharge Curve**  
**Roof Top Storage (RC-B)**



**APPENDIX B: STORMWATER MANAGEMENT MODEL**  
**Stage-Storage Curve RC-B**





APPENDIX A: STORMWATER MANAGEMENT MODEL  
POST-DEVELOPMENT FLOW

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

POST-DEVELOPEMNT CATCHMENT AREA 2 - CA2

Runoff Coefficient Equation  
 $C = (A_{\text{hard}} \times 0.9 + A_{\text{soft}} \times 0.2) / A_{\text{tot}}$

Pre- Dev run-off Coefficient "C"

| Area            | Surface          | Ha     | "C"  | 5 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-----------------------|
| Total<br>0.0823 | Roof             | 0.0000 | 0.90 | 0.74                  |
|                 | Asphalt/Concrete | 0.0640 | 0.90 |                       |
|                 | Grass            | 0.0183 | 0.20 |                       |
|                 |                  |        |      |                       |

| Area            | Surface          | Ha     | "C"  | 100 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-------------------------|
| Total<br>0.0823 | Roof             | 0.0000 | 1.00 | 0.83                    |
|                 | Asphalt/Concrete | 0.0640 | 1.00 |                         |
|                 | Grass            | 0.0183 | 0.25 |                         |
|                 |                  |        |      |                         |

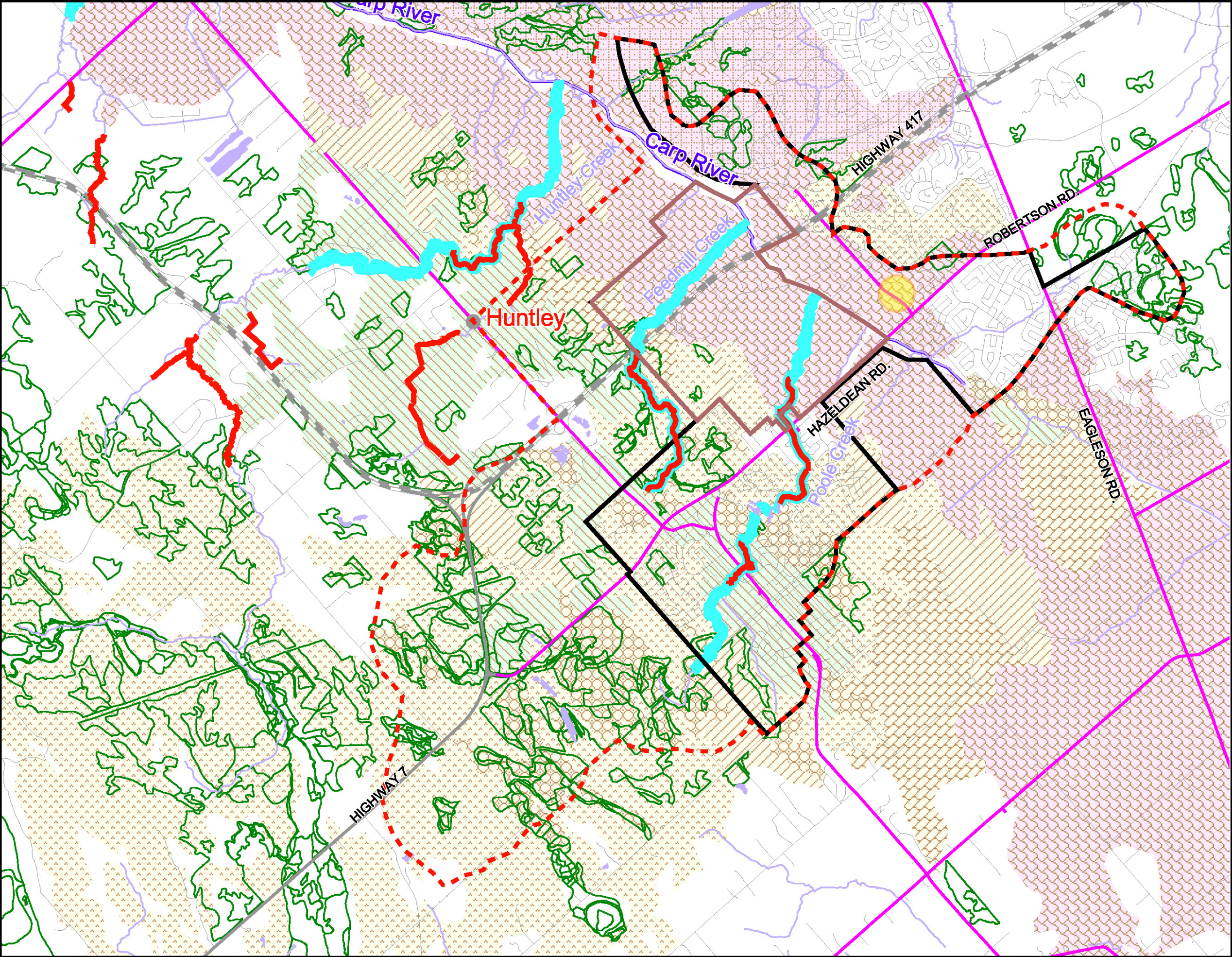
| 5 Year Event   |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 5 Year         | 0.74 | 104.19    | 0.08 |
| 2.78CIA= 17.64 |      |           |      |

\*\*Use a 10 minute time of concentration for 5 year  
Total Runoff Rate: 17.64 L/s

| 100 Year Event |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 100 Year       | 0.83 | 178.56    | 0.08 |
| 2.78CIA= 33.91 |      |           |      |

\*\*Use a 10 minute time of concentration for 100 year  
Total Runoff Rate: 33.91 L/s





# Carp River Watershed Study

## Subwatershed Plan Groundwater Component

Figure 8.3

### LEGEND:

- Subwatershed Study Area
- Carp River
- Drainage
- Town
- Planning Area
- Kanata West Planning Area
- Roads
  - Secondary
  - 4 Lane Highway
  - Highway
  - Main
  - Rail Road

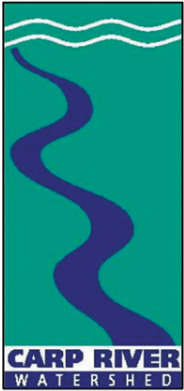
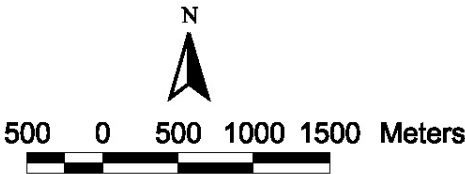
### Potential Discharge Indicators

- High Quality Fishery
- Seasonal Discharge Area

### Natural Runoff Detention Areas

- Woodlands / Woodland

| Type                | Recharge |
|---------------------|----------|
| Sand And Gravel     | High     |
| Fine Sand           | Moderate |
| Peat                | Moderate |
| Till                | Moderate |
| Paleozoic Bedrock   | Moderate |
| Precambrian Bedrock | Low      |
| Clay                | Low      |



Robinson  
Consultants

Aquafor  
Beech  
Limited



APPENDIX A: STORMWATER MANAGEMENT MODEL  
PRE-DEVELOPMENT FLOW

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

PRE-DEVELOPEMNT TOTAL AREA - TOTAL CA

Runoff Coefficient Equation  
 $C = (A_{\text{hard}} \times 0.9 + A_{\text{soft}} \times 0.2) / A_{\text{tot}}$

Pre- Dev run-off Coefficient "C"

| Area            | Surface          | Ha     | "C"  | 5 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-----------------------|
| Total<br>0.2299 | Roof             | 0.0014 | 0.90 | 0.77                  |
|                 | Asphalt/Concrete | 0.1850 | 0.90 |                       |
|                 | Grass            | 0.0435 | 0.20 |                       |
|                 |                  |        |      |                       |

| Area            | Surface          | Ha     | "C"  | 100 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-------------------------|
| Total<br>0.2299 | Roof             | 0.0014 | 1.00 | 0.86                    |
|                 | Asphalt/Concrete | 0.1850 | 1.00 |                         |
|                 | Grass            | 0.0435 | 0.25 |                         |
|                 |                  |        |      |                         |

| 5 Year Event   |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 5 Year         | 0.77 | 104.19    | 0.23 |
| 2.78CIA= 51.28 |      |           |      |

\*\*Use a 10 minute time of concentration for 5 year  
Total Runoff Rate: 51.28 L/s

| 100 Year Event |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 100 Year       | 0.86 | 178.56    | 0.23 |
| 2.78CIA= 98.14 |      |           |      |

\*\*Use a 10 minute time of concentration for 100 year  
Total Runoff Rate: 98.14 L/s

APPENDIX A: STORMWATER MANAGEMENT MODEL  
POST-DEVELOPMENT FLOW

Client: 1763295 Ontario Inc.  
Job No.: 250848  
Location: 41 Edgewater Street, Kanata ON  
Date: August 28, 2026

POST-DEVELOPEMNT TOTAL AREA - TOTAL CA

Runoff Coefficient Equation  
 $C = (A_{\text{hard}} \times 0.9 + A_{\text{soft}} \times 0.2) / A_{\text{tot}}$

Pre- Dev run-off Coefficient "C"

| Area            | Surface          | Ha     | "C"  | 5 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-----------------------|
| Total<br>0.2299 | Roof             | 0.0426 | 0.90 | 0.73                  |
|                 | Asphalt/Concrete | 0.1318 | 0.90 |                       |
|                 | Grass            | 0.0555 | 0.20 |                       |
|                 |                  |        |      |                       |

| Area            | Surface          | Ha     | "C"  | 100 yr C <sub>avg</sub> |
|-----------------|------------------|--------|------|-------------------------|
| Total<br>0.2299 | Roof             | 0.0426 | 1.00 | 0.82                    |
|                 | Asphalt/Concrete | 0.1318 | 1.00 |                         |
|                 | Grass            | 0.0555 | 0.25 |                         |
|                 |                  |        |      |                         |

| 5 Year Event   |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 5 Year         | 0.73 | 104.19    | 0.23 |
| 2.78CIA= 48.61 |      |           |      |

\*\*Use a 10 minute time of concentration for 5 year  
Total Runoff Rate: 48.61 L/s

| 100 Year Event |      |           |      |
|----------------|------|-----------|------|
| Pre Dev.       | C    | Intensity | Area |
| 100 Year       | 0.82 | 178.56    | 0.23 |
| 2.78CIA= 93.58 |      |           |      |

\*\*Use a 10 minute time of concentration for 100 year  
Total Runoff Rate: 93.58 L/s



## Appendix B: Product Information

- GRAF Module Information
- Accutrol Weir Flow Control and Roof Drains
- Tempest Inlet Control Device

# EcoBloc Inspect Smart

Product Specifications  
& Technical Data



Stormwater  
Management  
Systems

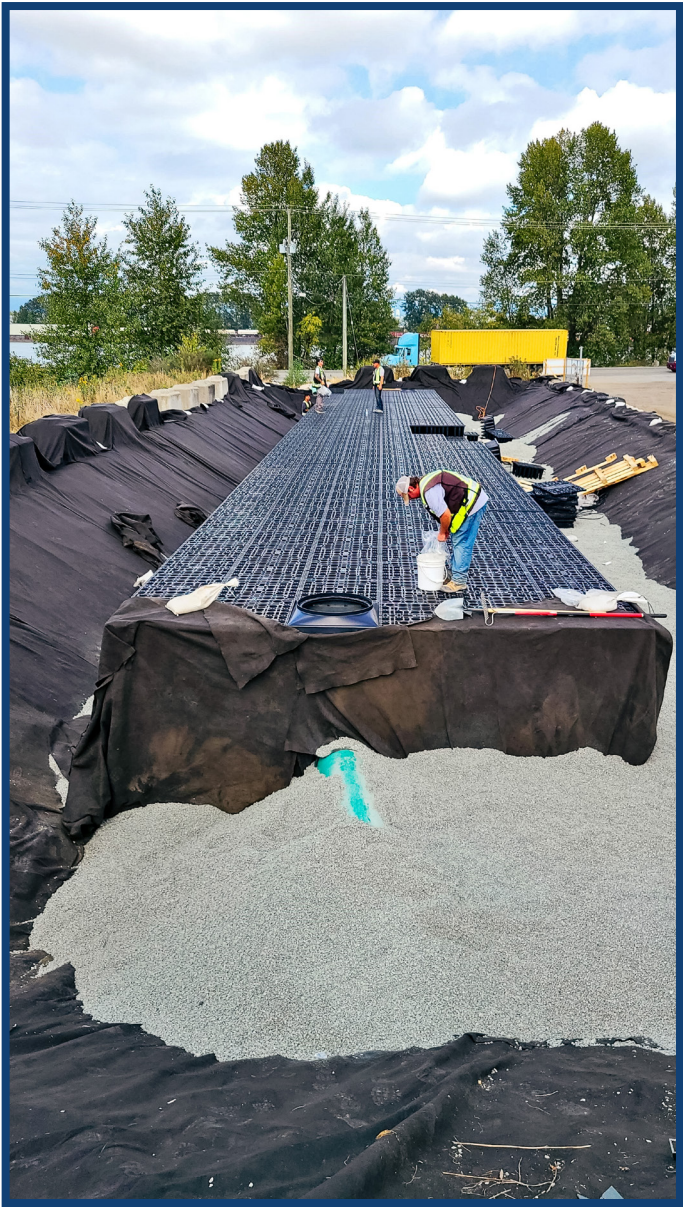
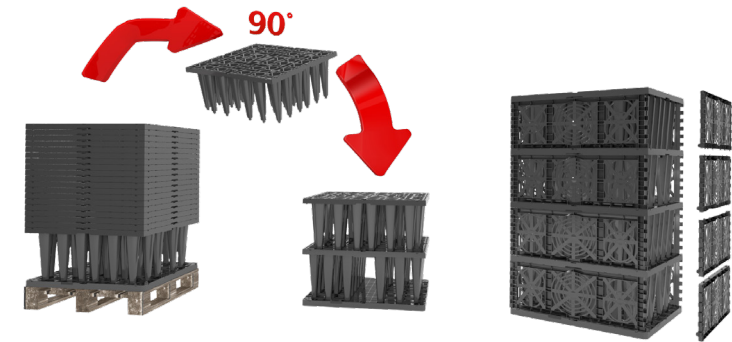


# GRAF EcoBloc Inspect Smart Series

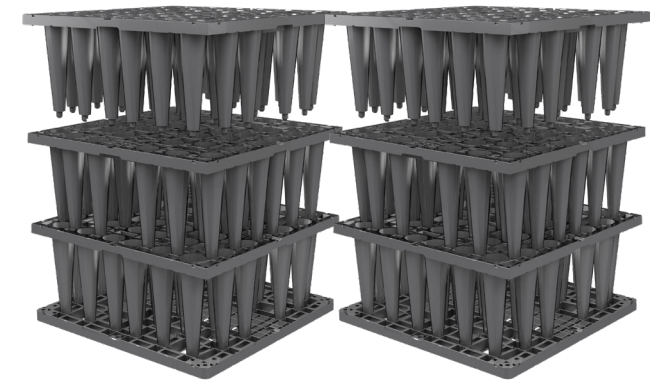
The next generation of GRAF Infiltration & Detention modules



## Space Savings



## Labour Savings



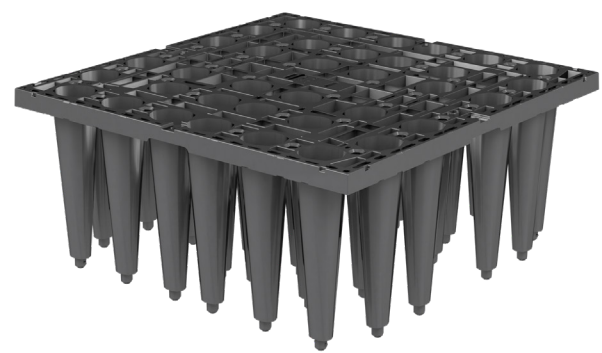
## Infiltration & Detention Modules

### GRAF EcoBloc Inspect Smart

The standard module for implementing large storage volumes in a typical installation window.

- Suitable for HGV loading up to HS-25 as per AASHTO standards.
- 96% storage coefficients.
- Can be inspected.
- Can be cleaned at high pressure.
- Maximum installation depth of up to 5.0m/16.4ft.

| Volume<br>[litres/gallons] | Length<br>[mm/in] | Width<br>[mm/in] | Height<br>[mm/in] | Weight<br>[kg/lb] | Colour | Item no. |
|----------------------------|-------------------|------------------|-------------------|-------------------|--------|----------|
| 211/55.7                   | 800/31.5          | 800/ 31.5        | 330/13            | 10/22             | Black  | 402500   |

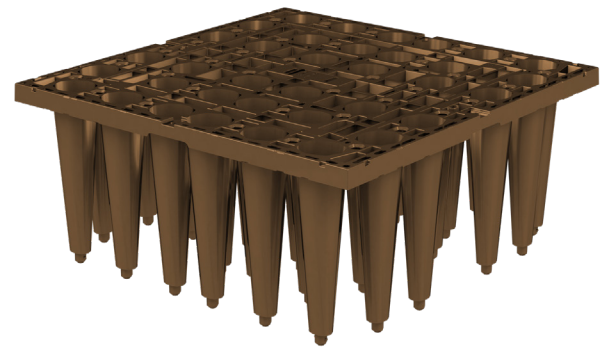


### GRAF EcoBloc Inspect Smart Plus

The reinforced module for implementing large storage volumes with shallow earth coverings or deep installation depths.

- Suitable for HGV loading up to HS-25 as per AASHTO standards.
- 95% storage coefficients.
- Can be inspected.
- Can be cleaned at high pressure.
- Maximum installation depth of up to 6.0m/19.6ft.

| Volume<br>[litres/gallons] | Length<br>[mm/in] | Width<br>[mm/in] | Height<br>[mm/in] | Weight<br>[kg/lb] | Colour | Item no. |
|----------------------------|-------------------|------------------|-------------------|-------------------|--------|----------|
| 211/55.7                   | 800/31.5          | 800/ 31.5        | 330/13            | 11.5/25.4         | Brown  | 402530   |

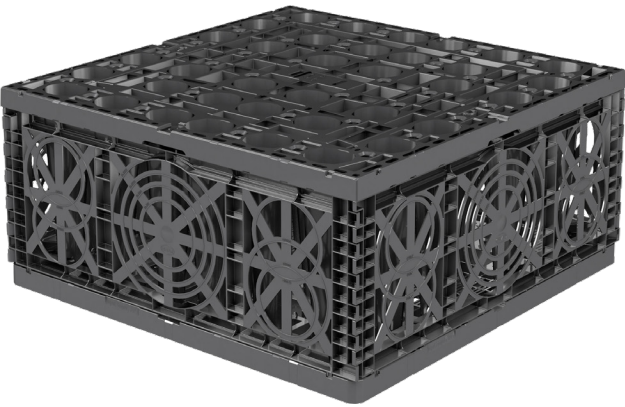


### GRAF EcoBloc Inspect Smart Ultra

The high-performance module for storage volumes with very deep earth coverings or installation depths.

- High load areas over HS-25 loading or installation with deep earth covering.
- 95% storage coefficients.
- Can be inspected.
- Can be cleaned at high pressure.
- Maximum installation depth of up to 7.5m/24.6ft.

| Volume<br>[litres/gallons] | Length<br>[mm/in] | Width<br>[mm/in] | Height<br>[mm/in] | Weight<br>[kg/lb] | Colour | Item no. |
|----------------------------|-------------------|------------------|-------------------|-------------------|--------|----------|
| 211/55.7                   | 800/31.5          | 800/ 31.5        | 330/13            | 12/26.5           | Black  | 402560   |



## Accessories

### EcoBloc Connectors

For the horizontal connection of multiple EcoBloc modules and base plates to one another.

|                 |           |
|-----------------|-----------|
| Item no. 402015 | 10 Units  |
| Item no. 402018 | 25 Units  |
| Item no. 402020 | 50 Units  |
| Item no. 402025 | 200 Units |



### EcoBloc Pipe Adapter Plates

Pipe adapter plates for pipe connections.

|       |          |           |          |
|-------|----------|-----------|----------|
| EPA04 | 4" Dia.  | EPA12     | 12" Dia. |
| EPA06 | 6" Dia.  | EPA15-PVC | 15" Dia. |
| EPA08 | 8" Dia.  | EPA18-PVC | 18" Dia. |
| EPA10 | 10" Dia. | EPA21-PVC | 21" Dia. |





### EcoBloc Inspect Smart Plus shaft

|                               |              |
|-------------------------------|--------------|
| Connection Surfaces           | up to DN 250 |
| Clear Width                   | 400 mm       |
| Inspection Crossways Possible | No           |
| Fully Integrated Shaft System | Yes          |
| Compatibility                 | Smart   Plus |
| Usable as Choke Drain Shaft   | No           |

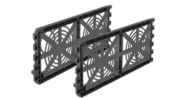
### EcoBloc Inspect Smart Plus shaft

 **EcoBloc Inspect Smart Plus shaft cover plate**  
Universal component that forms the top connection to all EcoBloc Inspect Smart Plus Shafts.

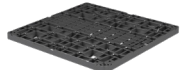
| Item                                         | Weight [kg/lbs] | Colour | Item no. |
|----------------------------------------------|-----------------|--------|----------|
| EcoBloc Inspect Smart Plus shaft cover plate | 5/11            | Black  | 450160   |

 **EcoBloc Inspect Smart Plus shaft**  
The reinforced module for implementing large storage volumes with shallow earth coverings or deep installation depths.

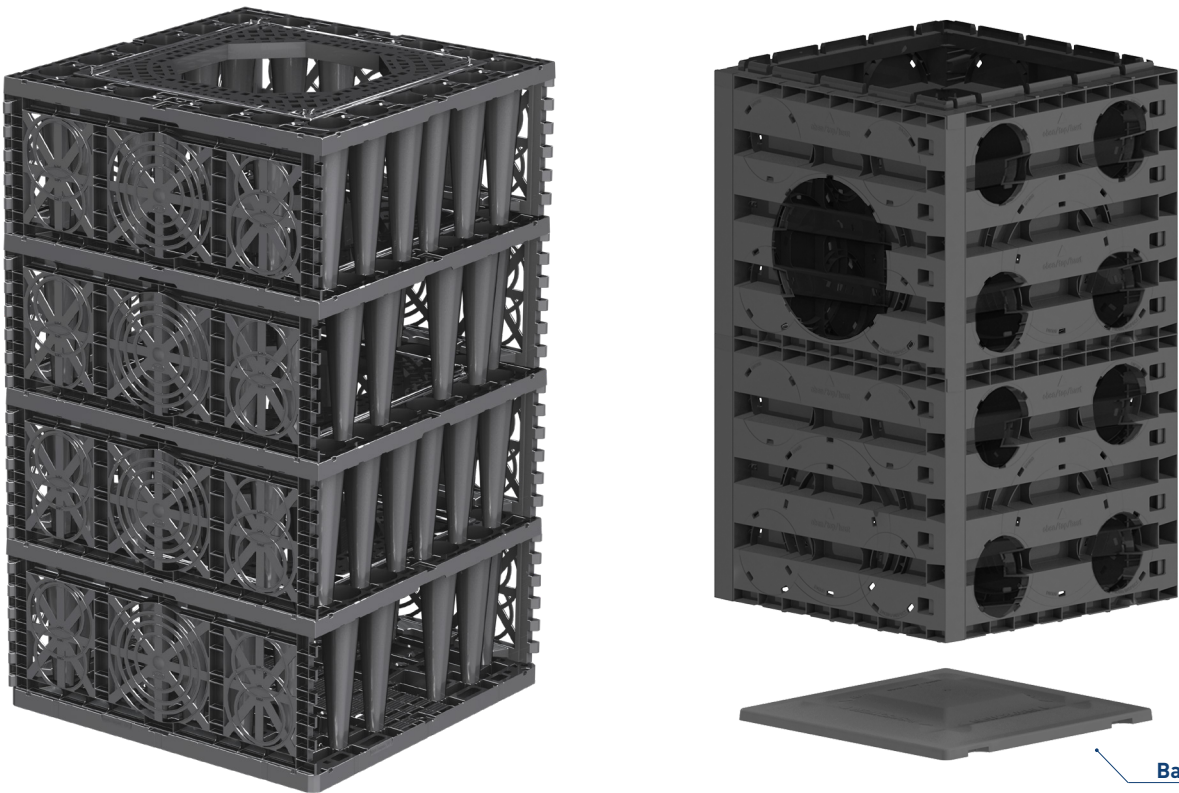
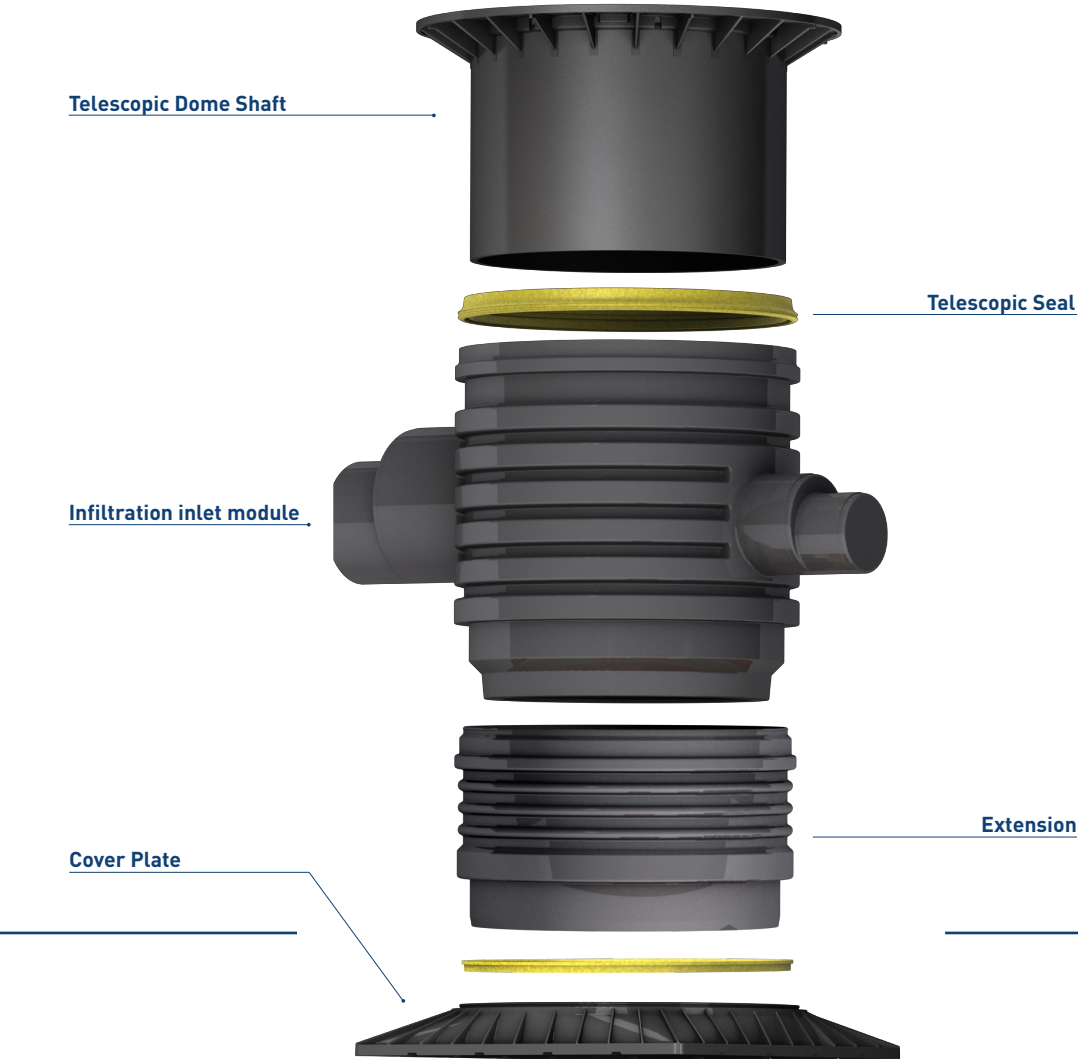
| Volume [litres/gallons] | Length [mm/in] | Width [mm/in] | Height [mm/in] | Weight [kg/lbs] | Colour | Item no. |
|-------------------------|----------------|---------------|----------------|-----------------|--------|----------|
| 211/ 55.74              | 800/31.5       | 800/31.5      | 330/13         | 8.5/18.74       | Black  | 450151   |

 **EcoBloc Inspect Smart end plates**  
The reinforced module for implementing large storage volumes with shallow earth coverings or deep installation depths.

| Item                                        | Colour | Item no. |
|---------------------------------------------|--------|----------|
| EcoBloc Inspect Smart end plates (set of 2) | Black  | 402503   |

 **EcoBloc Inspect Smart base plate**  
Base plate for constructing a system using the EcoBloc Inspect Smart family.

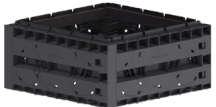
| Volume [litres/gallons] | Length [mm/in] | Width [mm/in] | Height [mm/in] | Weight [kg/lbs] | Colour | Item no. |
|-------------------------|----------------|---------------|----------------|-----------------|--------|----------|
| 24/6.34                 | 800/31.5       | 800/31.5      | 40/1.6         | 4/8.82          | Black  | 402501   |



### Vario 800 Flex Shaft

|                               |                      |
|-------------------------------|----------------------|
| Connection Surfaces           | up to DN 400         |
| Clear Width                   | 600 mm               |
| Inspection Crossways Possible | Yes                  |
| Fully Integrated Shaft System | Yes                  |
| Compatibility                 | Smart   Plus   Ultra |
| Usable as Choke Drain Shaft   | Yes                  |

### Vario 800 Flex shaft

 **Vario 800 Flex | Type 1**  
Shaft body for one or more layers of an EcoBloc system.

| Volume [litres/gallons] | Length [mm/in] | Width [mm/in] | Height [mm/in] | Weight [kg/lbs] | Colour | Item no. |
|-------------------------|----------------|---------------|----------------|-----------------|--------|----------|
| 230/60.76               | 800/31.5       | 800/31.5      | 355/14         | 16/35.27        | Grey   | 450050   |

 **Vario 800 Flex | Type 2**  
Shaft body for two or more layers of an EcoBloc system.

| Volume [litres/gallons] | Length [mm/in] | Width [mm/in] | Height [mm/in] | Weight [kg/lbs] | Colour | Item no. |
|-------------------------|----------------|---------------|----------------|-----------------|--------|----------|
| 420/111                 | 800/31.5       | 800/31.5      | 660/26         | 27/59.52        | Grey   | 450051   |

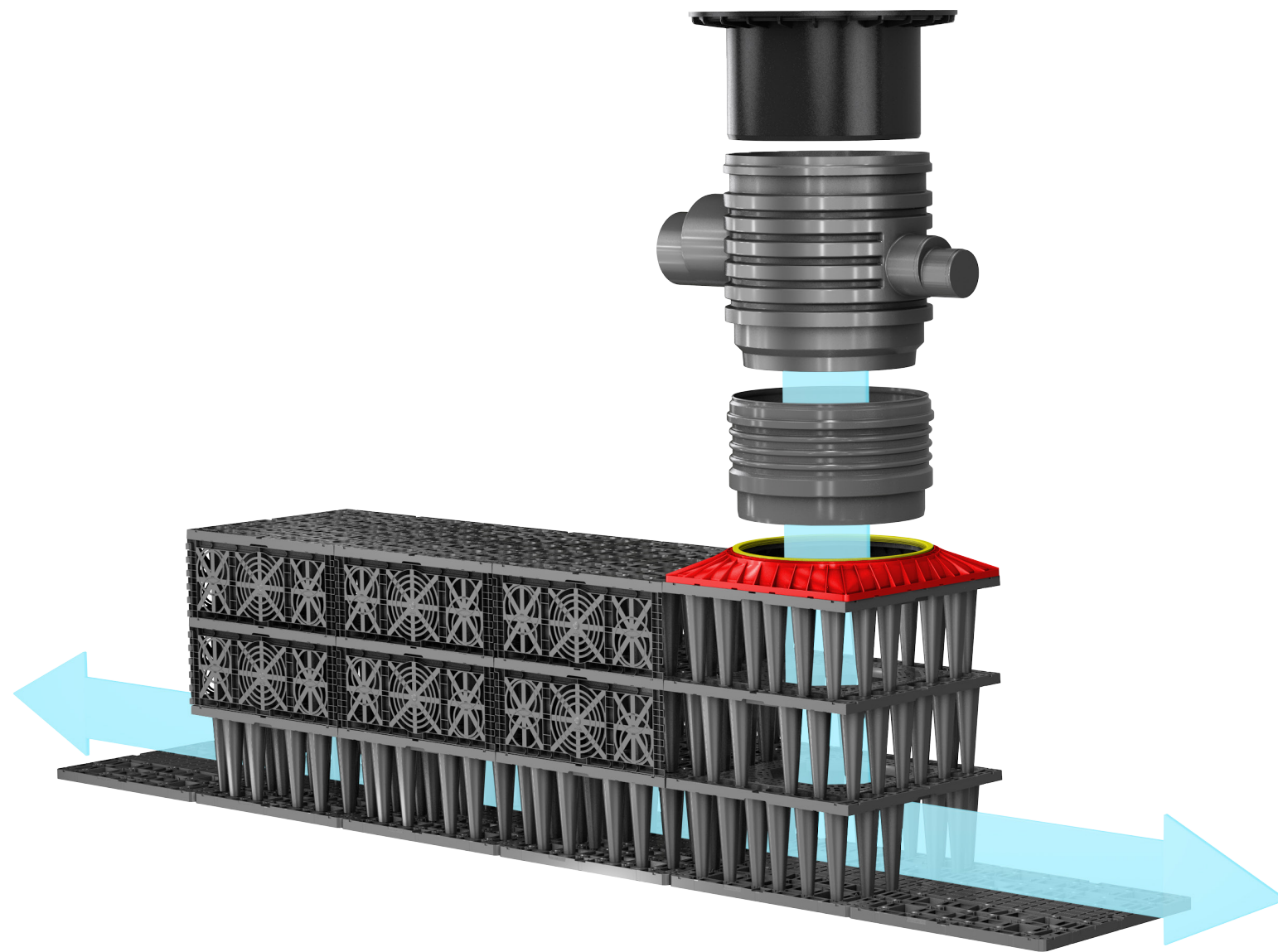
 **Vario 800 Flex cover & base plate set**  
Base and cover plate for Vario 800 Flex shaft.

| Item                                    | Colour | Item no. |
|-----------------------------------------|--------|----------|
| Vario 800 Flex cover and base plate set | Grey   | 450052   |



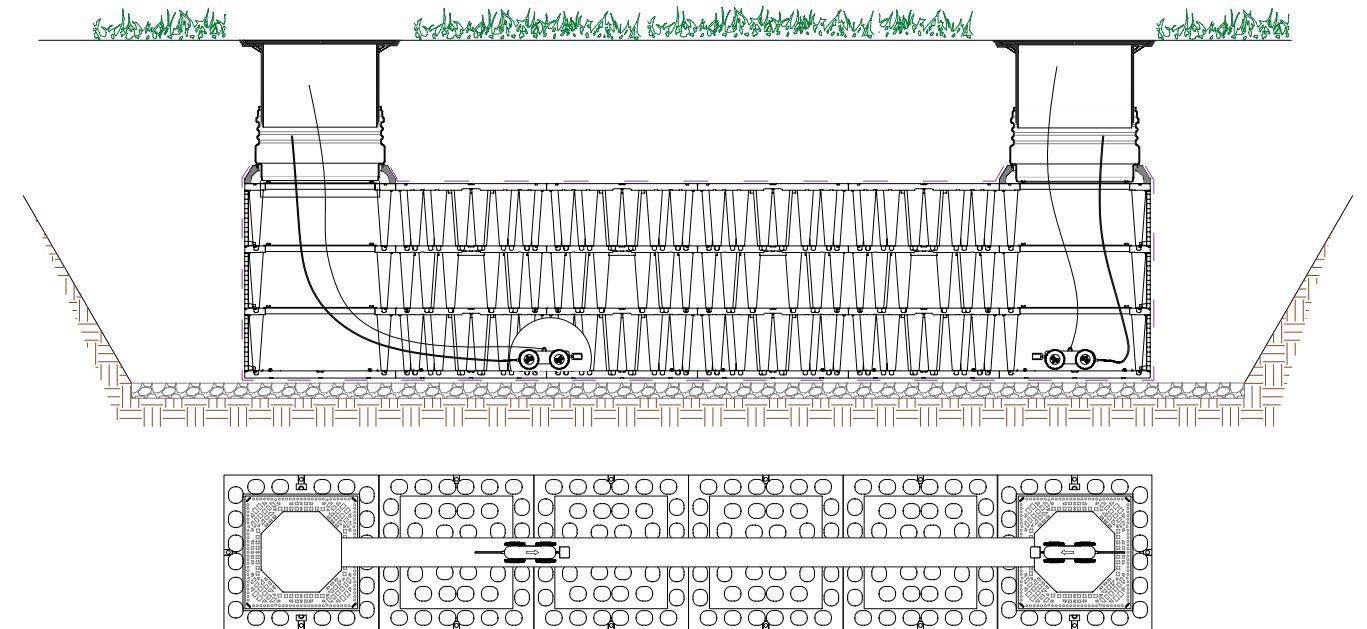
# Inspectable and Cleanable

Open internal structure for inspection & cleaning



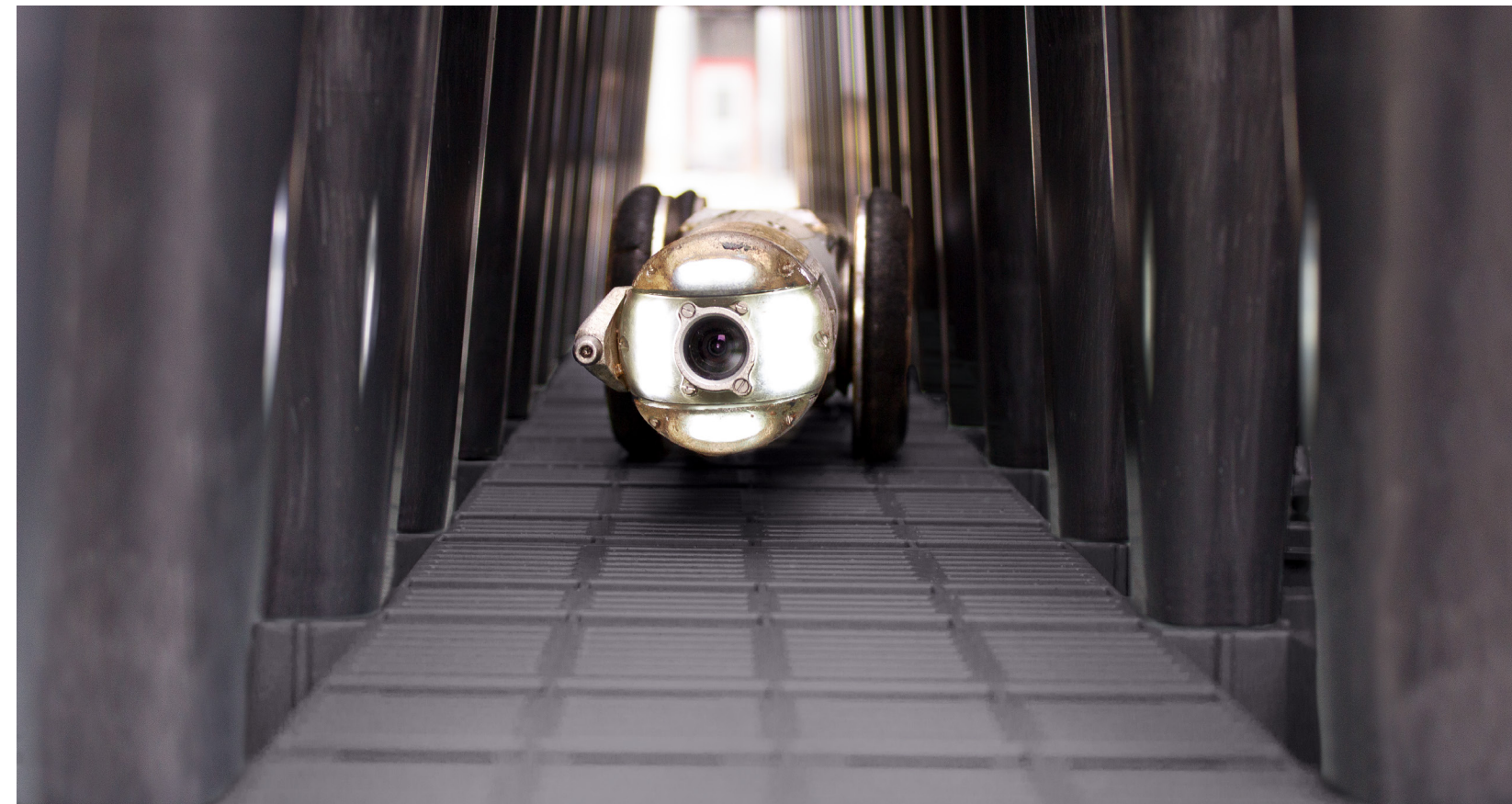
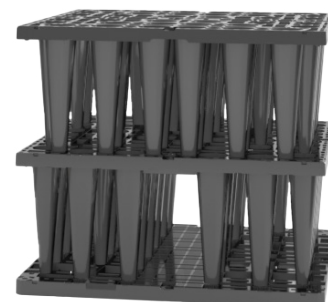
## Orientation of the inspection channels

The inspection channels enable comprehensive inspection and flushing of the entire system. For this purpose, the inspection channels should run parallel to the long side of the system and form a continuous tunnel. Access is usually gained via the inspection shaft end-face for both flushing nozzles and inspection cameras.



## Cleanability of the Inspect Smart System

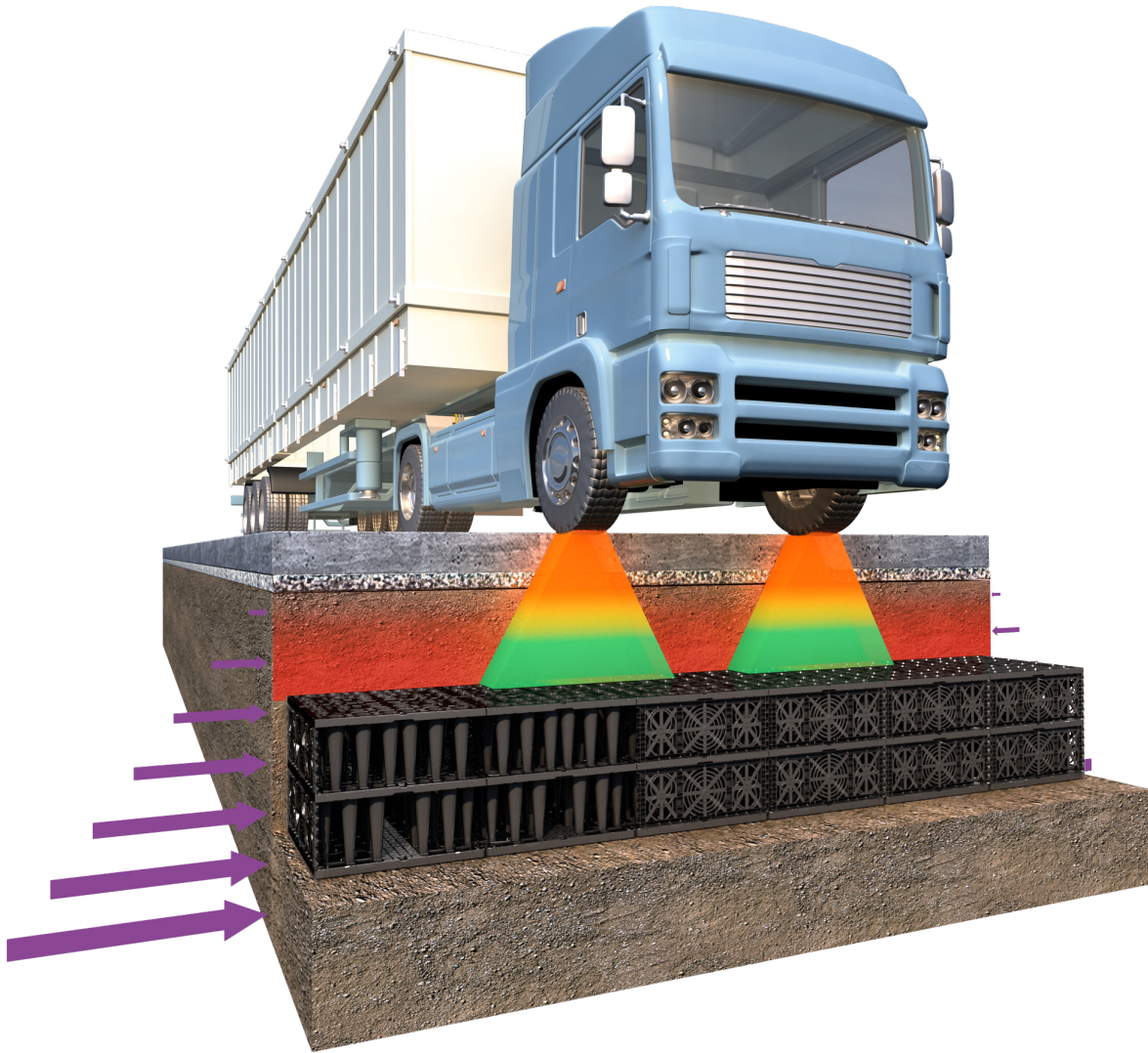
EcoBloc Inspect Smart systems have an integrated inspection channels that allow for easy inspection and maintenance. Flushing the entire system is accomplished by introducing washing nozzles into the system on one side of the tank and flushing any dirt and debris towards a suction hose on the opposite side of the system.





# Load Distribution

## Vertical & Lateral Resistances



### Patented design

The design of Ecobloc Inspect Smart, Plus and Ultra is optimized for use as an underground structure for stormwater infiltration and detention. The patented pillar arrangement and the deck structure is optimized to spread vertical pressure evenly and precisely throughout the entire system.

### Repeating Pattern

The recurring constant pattern of the EcoBloc Inspect Smart Modules provide a stability advantage in terms of lateral resistance. Each layer provides a suitable deck structure at the same intervals. This becomes extremely important in deep installation depths where considerable lateral forces can occur.



1.800.665.4499  
barrplastics.com

# Volume III: **TEMPEST™** INLET CONTROL DEVICES

Municipal Technical  
Manual Series



SECOND EDITION

**LMF (Low to Medium Flow) ICD**

**HF (High Flow) ICD**

**MHF (Medium to High Flow) ICD**



**IPEX**

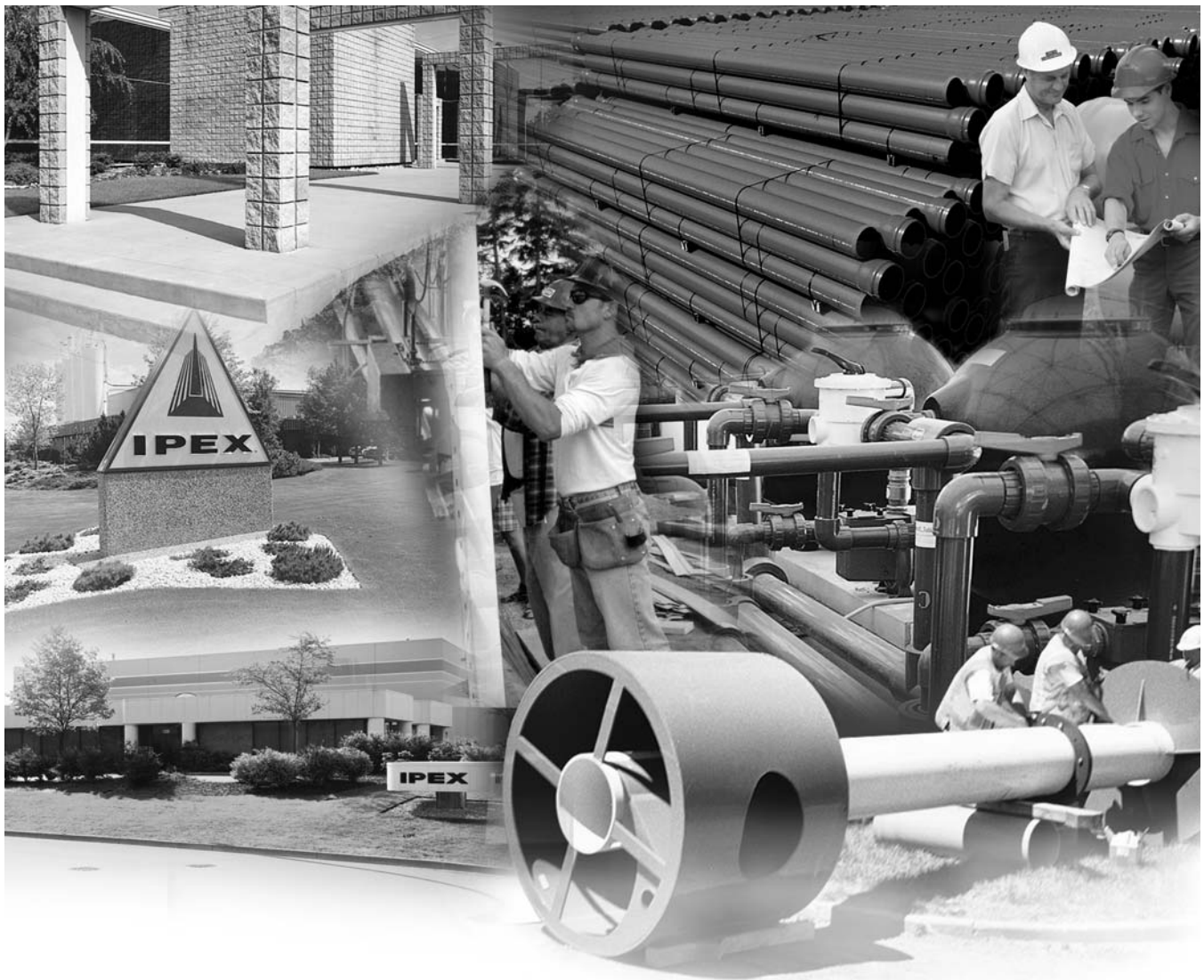
# IPEX Tempest™ Inlet Control Devices

Municipal Technical Manual Series

Vol. I, 2nd Edition

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## ABOUT IPEX

At IPEX, we have been manufacturing non-metallic pipe and fittings since 1951. We formulate our own compounds and maintain strict quality control during production. Our products are made available for customers thanks to a network of regional stocking locations throughout North America. We offer a wide variety of systems including complete lines of piping, fittings, valves and custom-fabricated items.

More importantly, we are committed to meeting our customers' needs. As a leader in the plastic piping industry, IPEX continually develops new products, modernizes manufacturing facilities and acquires innovative process technology. In addition, our staff take pride in their work, making available to customers their extensive thermoplastic knowledge and field experience. IPEX personnel are committed to improving the safety, reliability and performance of thermoplastic materials. We are involved in several standards committees and are members of and/or comply with the organizations listed on this page.

For specific details about any IPEX product, contact our customer service department.



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## PRODUCT INFORMATION: TEMPEST LOW, MEDIUM FLOW (LMF) ICD

### Purpose

To control the amount of storm water runoff entering a sewer system by allowing a specified flow volume out of a catch basin or manhole at a specified head. This approach conserves pipe capacity so that catch basins downstream do not become uncontrollably surcharged, which can lead to basement floods, flash floods and combined sewer overflows.

### Product Description

Our LMF ICD is designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter and larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 14 preset flow curves, the LMF ICD has the ability to provide flow rates: 2lps – 17lps (31gpm – 270gpm)

### Product Function

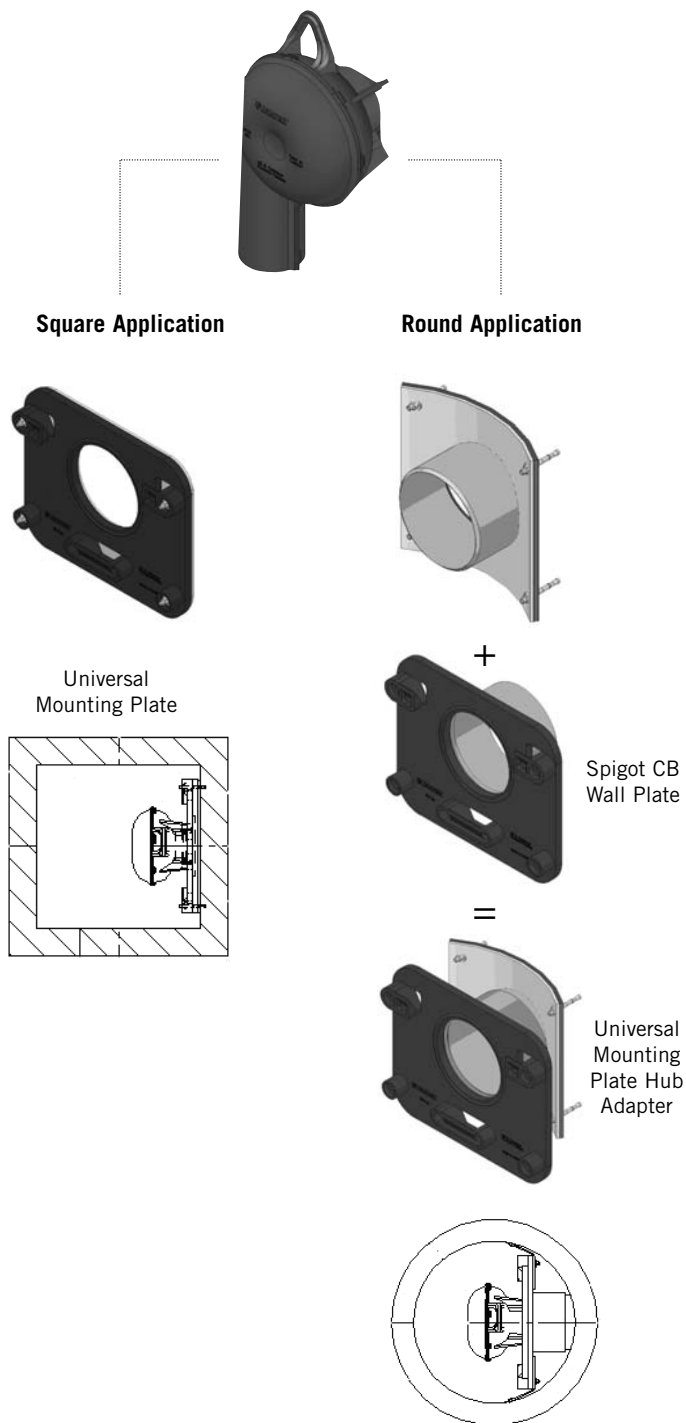
The LMF ICD vortex flow action allows the LMF ICD to provide a narrower flow curve using a larger orifice than a conventional orifice plate ICD, making it less likely to clog. When comparing flows at the same head level, the LMF ICD has the ability to restrict more flow than a conventional ICD during a rain event, preserving greater sewer capacity.

### Product Construction

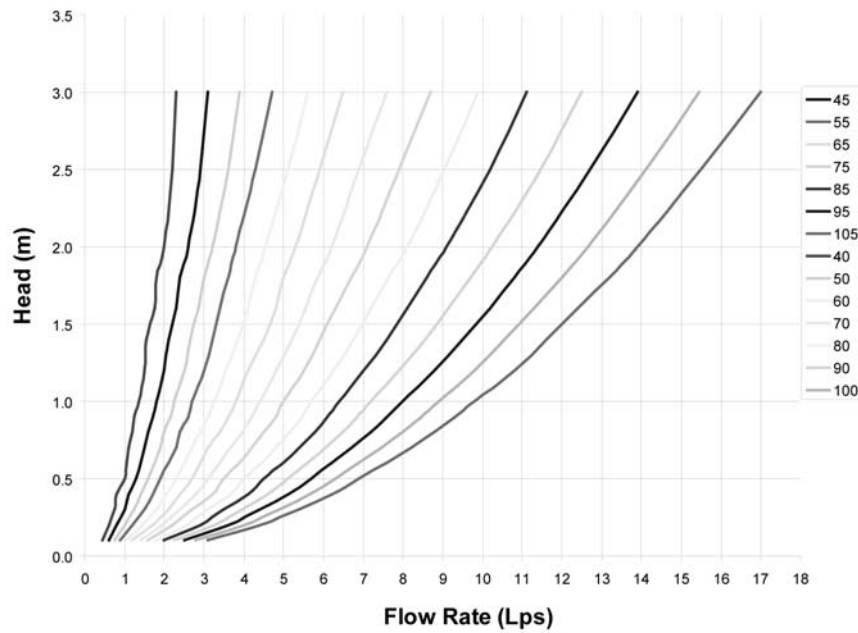
Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

### Product Applications

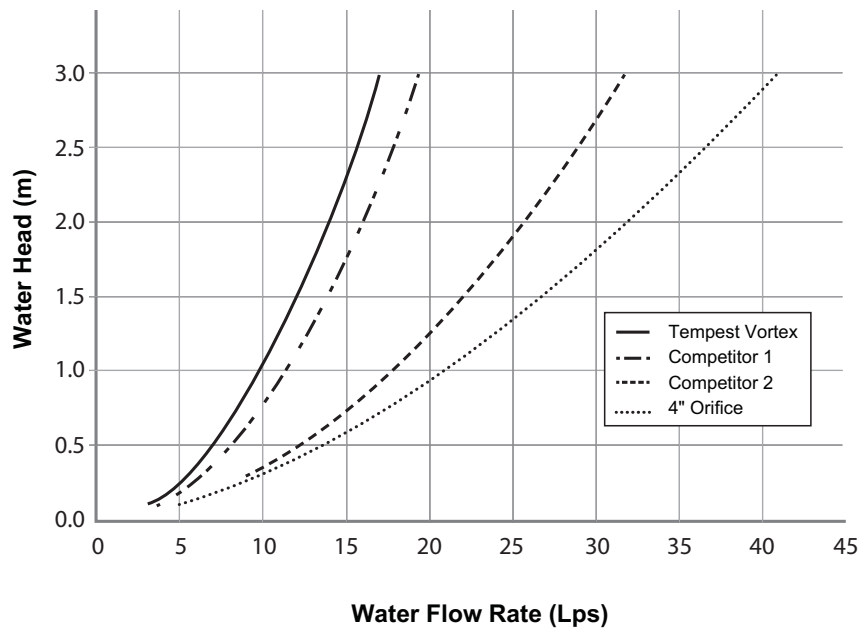
Will accommodate both square and round applications:



**Chart 1: LMF 14 Preset Flow Curves**



**Chart 2: LMF Flow vs. ICD Alternatives**



## PRODUCT INSTALLATION

### Instructions to assemble a TEMPEST LMF ICD into a Square Catch Basin:

#### STEPS:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device.
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

### Instructions to assemble a TEMPEST LMF ICD into a Round Catch Basin:

#### STEPS:

1. Materials and tooling verification.
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut back the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [www.ipexinc.com](http://www.ipexinc.com).
- Call your IPEX representative for more information or if you have any questions about our products.

## PRODUCT TECHNICAL SPECIFICATION

### General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

### Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

### Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

### Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.



## PRODUCT INFORMATION: TEMPEST HF & MHF ICD

### Product Description

Our HF, HF Sump and MHF ICD's are designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter or larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

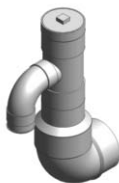
Available in 5 preset flow curves, these ICDs have the ability to provide constant flow rates: 9lps (143 gpm) and greater

### Product Function

**TEMPEST HF (High Flow):** designed to manage moderate to higher flows 15 L/s (240 gpm) or greater and prevent the propagation of odour and floatables. With this device, the cross-sectional area of the device is larger than the orifice diameter and has been designed to limit head losses. The HF ICD can also be ordered without flow control when only odour and floatable control is required.



**TEMPEST HF (High Flow) Sump:** The height of a sewer outlet pipe in a catch basin is not always conveniently located. At times it may be located very close to the catch basin floor, not providing enough sump for one of the other TEMPEST ICDs with universal back plate to be installed. In these applications, the HF Sump is offered. The HF Sump offers the same features and benefits as the HF ICD; however, is designed to raise the outlet in a square or round catch basin structure. When installed, the HF sump is fixed in place and not easily removed. Any required service to the device is performed through a clean-out located in the top of the device which can be often accessed from ground level.



### TEMPEST MHF (Medium to High Flow):

The MHF plate or plug is designed to control flow rates 9 L/s (143 gpm) or greater. It is not designed to prevent the propagation of odour and floatables.

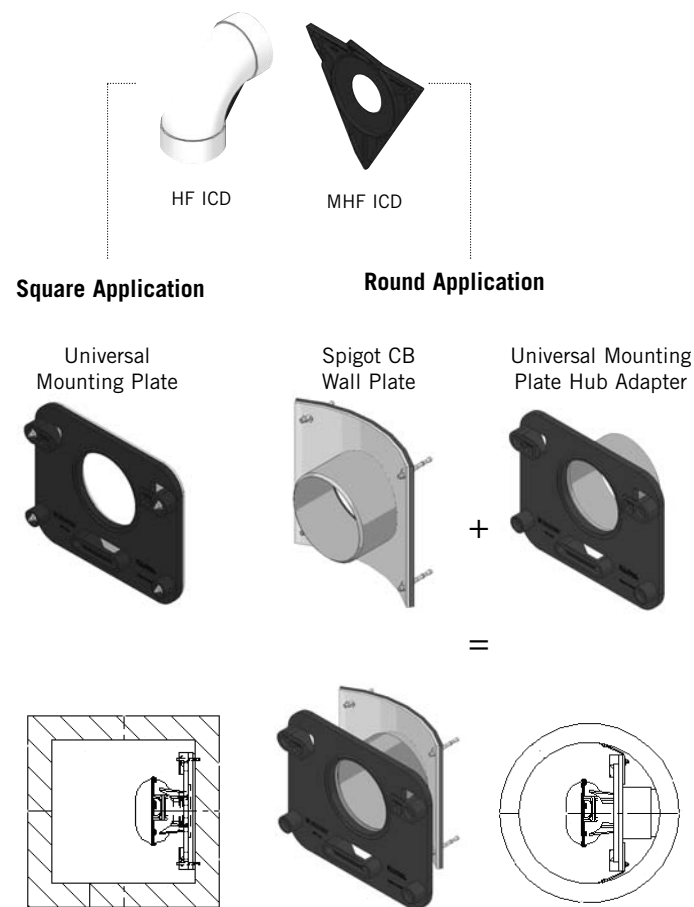


### Product Construction

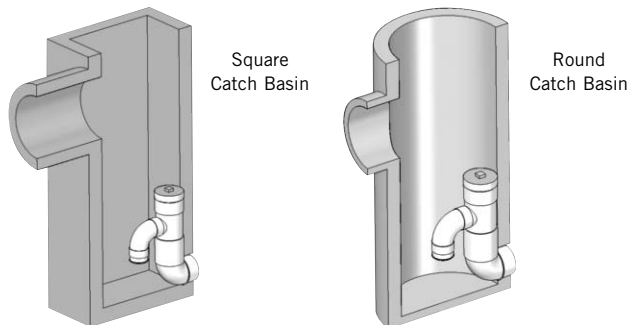
The HF, HF Sump and MHF ICDs are built to be light weight at a maximum weight of 6.8 Kg (14.6 lbs).

### Product Applications

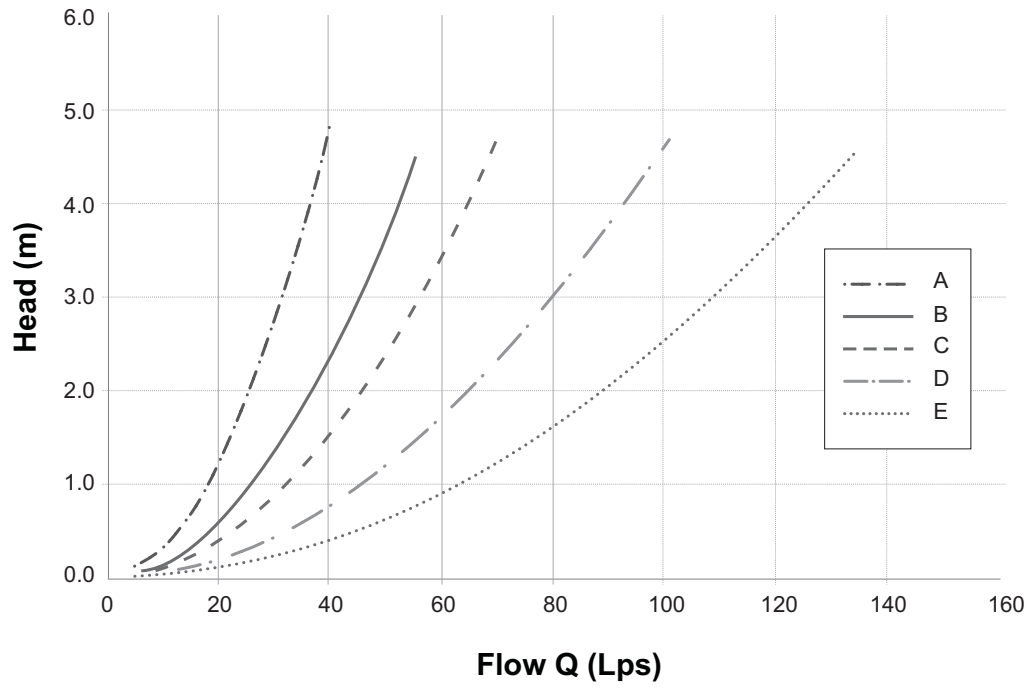
The HF and MHF ICD's are available to accommodate both square and round applications:



The HF Sump is available to accommodate low to no sump applications in both square and round catch basins:



**Chart 3: HF & MHF Preset Flow Curves**



## PRODUCT INSTALLATION

### Instructions to assemble a TEMPEST HF or MHF ICD into a Square Catch Basin:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal wall mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal wall mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

### Instructions to assemble a TEMPEST HF or MHF ICD into a Round Catch Basin:

#### STEPS:

1. Materials and tooling verification.
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
  - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adaptor, ICD device.
2. Use the round catch basin spigot adaptor to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the spigot CB wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot CB wall plate and the catch basin wall.
6. Put solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [www.ipexinc.com](http://www.ipexinc.com).
- Call your IPEX representative for more information or if you have any questions about our products.

## PRODUCT TECHNICAL SPECIFICATION

### Instructions to assemble a TEMPEST HF Sump into a Square or Round Catch Basin:

#### STEPS:

1. Materials and tooling verification:
  - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, mastic tape and metal strapping
  - Material: (2) concrete anchor 3/8 x 3-1/2, (2) washers, (2) nuts, HF Sump pieces (2).
2. Apply solvent cement to the spigot end of the top half of the sump. Apply solvent cement to the hub of the bottom half of the sump. Insert the spigot of the top half of the sump into the hub of the bottom half of the sump.
3. Install the 8" spigot of the device into the outlet pipe. Use the mastic tape to seal the device spigot into the outlet pipe. You should use a level to be sure that the fitting is standing at the vertical.
4. Use an impact drill with a 3/8" concrete bit to make a series of 2 holes along each side of the body throat. The depth of the hole should be between 1-1/2" to 2-1/2". Clean the concrete dust from the 2 holes.
5. Install the anchors (2) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you hit the anchors. Remove the nuts from the ends of the anchors.
6. Cut the metal strapping to length and connect each end of the strapping to the anchors. Screw the nuts in place with a maximum torque of 40 N.m (30 lbf-ft). The device should be completely flush with the catch basin wall.



#### WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at [www.ipexinc.com](http://www.ipexinc.com).
- Call your IPEX representative for more information or if you have any questions about our products.

#### General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control where specified. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook shall be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above shall not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices shall consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

#### Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

#### Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

#### Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.





# SALES AND CUSTOMER SERVICE

Canadian Customers call IPEX Inc.

**Toll free: (866) 473-9462**

**[www.ipexinc.com](http://www.ipexinc.com)**

U.S. Customers call IPEX USA LLC

**Toll free: (800) 463-9572**

**[www.ipexamerica.com](http://www.ipexamerica.com)**

## About the IPEX Group of Companies

As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have established a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX group products are:

- Electrical systems
- Telecommunications and utility piping systems
- PVC, CPVC, PP, ABS, PEX, FR-PVDF and PE pipe and fittings (1/4" to 48")
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- PE Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

Products manufactured by IPEX Inc. and distributed in the United States by IPEX USA LLC.

Tempest™ is a trademark of IPEX Branding Inc.

This literature is published in good faith and is believed to be reliable. However it does not represent and/or warrant in any manner the information and suggestions contained in this brochure. Data presented is the result of laboratory tests and field experience.

A policy of ongoing product improvement is maintained. This may result in modifications of features and/or specifications without notice.

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#### Flow Parameters

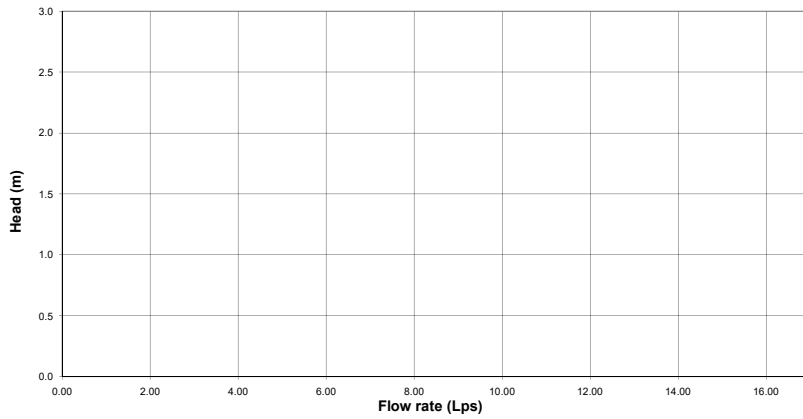
|            |      |
|------------|------|
| Head (m)   | 0.4  |
| Flow (Lps) | 15.5 |

Input desired parameters in green boxes at left and then refer to graphs below for corresponding flow curves. If your design criteria fall outside the maximum parameters of this flow curve calculator please contact your IPEX representative for your TEMPEST design.



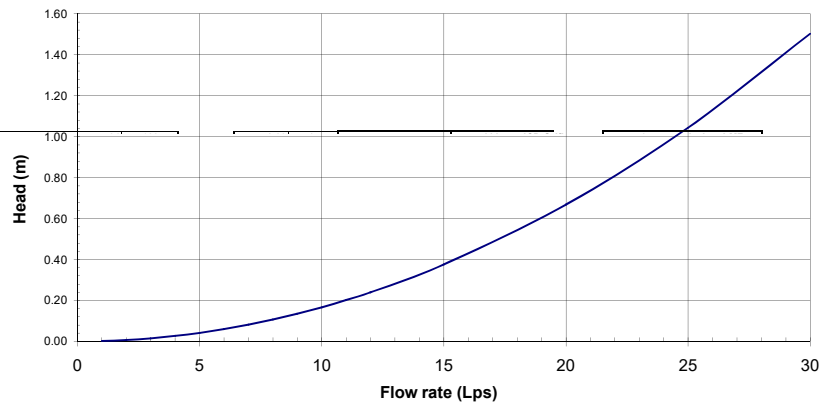
TEMPEST LMF flow curve

#1



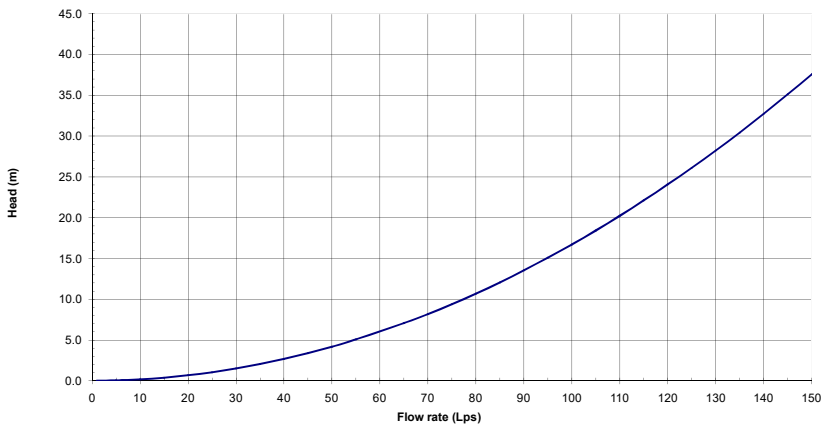
TEMPEST HF, HF Sump & MHF flow curve  
(For flow rates <30 Lps)

#2



TEMPEST HF flow curve

#3



NOTE: GRAPH #3 IS AN EXPANDED VERSION OF GRAPH #2  
TO BE USED FOR FLOW RATES ABOVE 30 Lps.

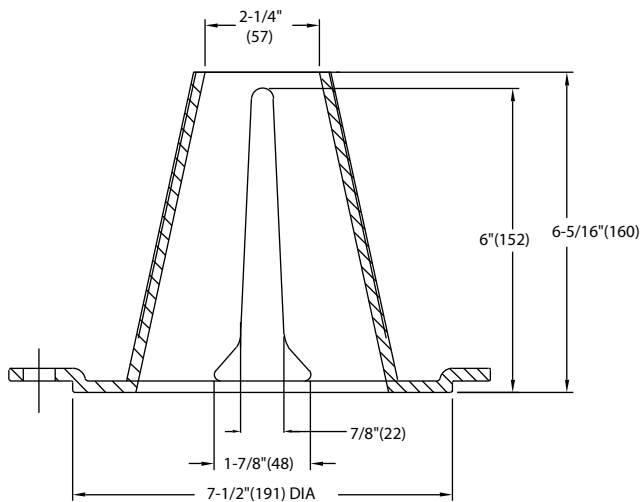
The following results are best estimates and subject to change upon review by an IPEX design representative.

### ACCUTROL WEIR FLOW CONTROL

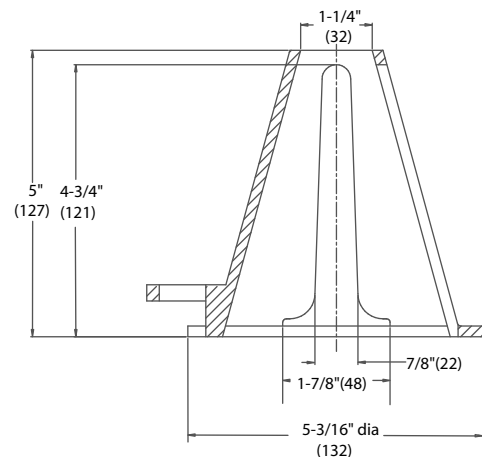
**SPECIFICATION:** Watts Drainage Products epoxy coated cast iron Accutrol Weir is designed with parabolic openings which limit the flow of rain water off a roof. Each weir slot controls flow to 5 gpm per inch of head to a maximum of 30 gpm at 6" head (for large sump), 25 gpm at 5" head (for small sump). The Accutrol Weir is secured to the flashing clamp of the roof drain. The Accutrol Weir is available with 1 to 4 slots for the large sump drain and up to 3 slots for the small sump drain.

**For Large Sump Roof Drains Specify the "-A" option and number of slots required. (ie. "RD-100-A2" for two slot weir)**

**For Small Sump Roof Drains Specify the "-A" option and number of slots required. (ie. "RD-200-A1" for one slot weir)**



**LARGE SUMP ACCUTROL WEIR**



**SMALL SUMP ACCUTROL WEIR**

Job Name \_\_\_\_\_ Contractor \_\_\_\_\_

Job Location \_\_\_\_\_ Contractor's P.O. No. \_\_\_\_\_

Engineer \_\_\_\_\_ Representative \_\_\_\_\_

WATTS Drainage reserves the right to modify or change product design or construction without prior notice and without incurring any obligation to make similar changes and modifications to products previously or subsequently sold. See your WATTS Drainage representative for any clarification. Dimensions are subject to manufacturing tolerances.



## Adjustable Accutrol Weir

Tag: \_\_\_\_\_

## Adjustable Flow Control for Roof Drains

### ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

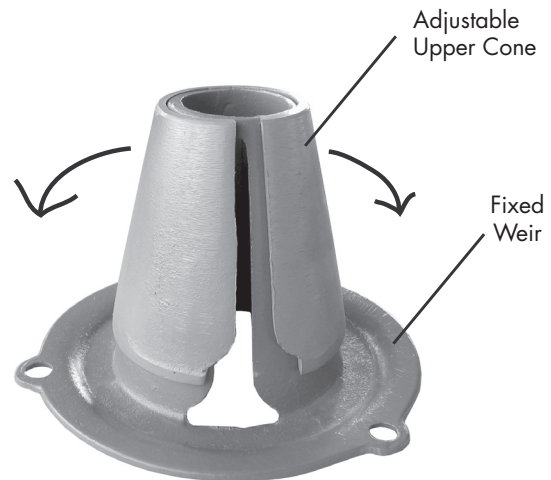
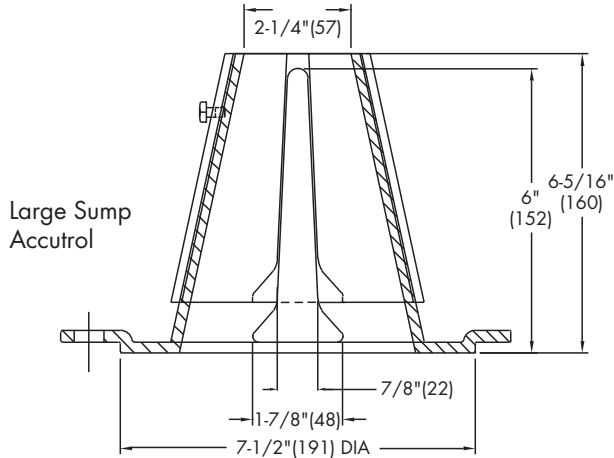
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.

Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

#### EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2" of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3" of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:  
[ 5 gpm (per inch of head) x 2 inches of head ] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.



1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

| Weir Opening Exposed | 1"                             | 2" | 3"    | 4"   | 5"    | 6" |
|----------------------|--------------------------------|----|-------|------|-------|----|
|                      | Flow Rate (gallons per minute) |    |       |      |       |    |
| Fully Exposed        | 5                              | 10 | 15    | 20   | 25    | 30 |
| 3/4                  | 5                              | 10 | 13.75 | 17.5 | 21.25 | 25 |
| 1/2                  | 5                              | 10 | 12.5  | 15   | 17.5  | 20 |
| 1/4                  | 5                              | 10 | 11.25 | 12.5 | 13.75 | 15 |
| Closed               | 5                              | 5  | 5     | 5    | 5     | 5  |

Job Name \_\_\_\_\_

Contractor \_\_\_\_\_

Job Location \_\_\_\_\_

Contractor's P.O. No. \_\_\_\_\_

Engineer \_\_\_\_\_

Representative \_\_\_\_\_

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

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A Watts Water Technologies Company



## Appendix C: Servicing Design Information

- Sanitary Demands – Existing Buildings
- Fireflow Calculation – OBC
- OBC Separation Distance Drawing
- Fireflow Calculation – FUS
- FUS Separation Distance Drawing
- Boundary Conditions Received



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Materials Testing •

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Kollaard File # 250848  
City of Ottawa File # PC2025-0237

## **1. Existing Commercial Buildings on Site – Sanitary Demand**

The sanitary demand for the existing buildings as follows:

### Building #1 Existing (A&W Restaurant)

*Open 24 hours/day*

*Seats outside: 9, Seats inside: 42, Total Seats: 51*

*Ottawa Sewer Design Guidelines – Appendix 4-A*

*24hour Restaurant = 200 L/day per seat*

*Building #1: Average daily demand (ADD) = 200L/day x 51 seats*  
*= 10,200L/day ÷ (24 hrs/day x 60min/hr x 60sec/min)*  
*= 0.12 L/s*

### Building #2 Existing (East Side Mario's Restaurant)

*Open 11:00am to 10:00pm*

*Seats outside: 107, Seats inside: 270, Total Seats: 377*

*Ottawa Sewer Design Guidelines – Appendix 4-A*

*Ordinary (not 24 hour) Restaurant = 125 L/day per seat*

*Building #2: Average daily demand (ADD) = 125 L/day x 377 seats*  
*= 47,125 L/day ÷ (11 hrs/day x 60min/hr x 60sec/min)*  
*= 1.19 L/s*

### Building #3 Existing (Swiss Chalet Restaurant)

*Open 11:00am to 10:00pm*

*Seats outside: 33, Seats inside: 187, Total Seats: 220*

*Ottawa Sewer Design Guidelines – Appendix 4-A*

*Ordinary (not 24 hour) Restaurant = 125 L/day per seat*

*Building #3: Average daily demand (ADD) = 125 L/day x 220 seats*  
*= 27,500 L/day ÷ (11 hrs/day x 60min/hr x 60sec/min)*  
*= 0.69 L/s*





---

Building #4 Existing (Previously D'Arcy McGee's)

*Open 11:30am to 1:00am*

*Seats outside: 94, Seats inside: 235, Total Seats: 329*

*Ottawa Sewer Design Guidelines – Appendix 4-A*

*Ordinary (not 24 hour) Restaurant = 125 L/day per seat*

*Building #4: Average daily demand (ADD) = 125 L/day x 329 seats*

*= 41,125 L/day ÷ (13.5hrs/day x 60min/hr x 60sec/min)*

*= 0.85L/s*

## Fire Water Storage and Supply Flow Rate Requirements

The following equation from the latest version of the Ontario Building Code (2012) was used for calculation of the on-site supply rates required to be supplied by the hydrants.

Formulae:

$$Q = KVS_{Tot}$$

$$S_{Tot} = 1.0 + [S_{side1} + S_{side2} + S_{side3} + S_{side4} + \dots]$$

| OBC Classification of Building Use      | Group, Division        | A,2 (OBC T-3.1.2.1)                                    |       |
|-----------------------------------------|------------------------|--------------------------------------------------------|-------|
| Assumed Type of Construction            | (Most Protective Type) | Building is of limited-combustible construction. Floor |       |
| Water Supply Coefficient (Table 1, OBC) | K                      | 10                                                     |       |
| Exposure Distance 1                     | 7.1                    | <10                                                    | m     |
| Exposure Distance 2                     | 54.5                   | >10                                                    | m     |
| Exposure Distance 3                     | 13.4                   | >10                                                    | m     |
| Exposure Distance 4                     | 24                     | >10                                                    | m     |
| Spatial Coefficient 1                   | Sside                  | 0.3                                                    |       |
| Spatial Coefficient 2                   | Sside                  | 0                                                      |       |
| Spatial Coefficient 3                   | Sside                  | 0                                                      |       |
| Spatial Coefficient 4                   | Sside                  | 0                                                      |       |
| Total Spatial Coefficient               | Stot                   | 1.3                                                    |       |
| Average Building Height                 | H                      | 6.5                                                    | m     |
| Building Footprint                      | A                      | 571                                                    | sq.m  |
| Total Building Volume                   | V                      | 3,711                                                  | cu.m  |
| Minimum Supply of Water                 | Q                      | 48,237                                                 | L     |
| Required Fire Flow                      | Qf                     | 2700                                                   | L/min |
|                                         |                        | <b>45</b>                                              | L/s   |

per Table 2 on A-3.2.5.7 of the OBC

OBC - Table 2 of A-3.2.5.7.

REQUIRE MINIMUM WATER SUPPLY FLOW RATE (L/min)

|      |      |                          |
|------|------|--------------------------|
| Qf = | 2700 | If Q ≤ 108 000 L         |
| Qf = | 3600 | 108 000L < Q ≤ 135 000 L |
| Qf = | 4500 | 135 000L < Q ≤ 162 000 L |
| Qf = | 5400 | 162 000L < Q ≤ 190 000 L |
| Qf = | 6300 | 190 000L < Q ≤ 270 000 L |
| Qf = | 9000 | Q > 270 000 L            |









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## APPENDIX C: CALCULATION OF FIRE FLOW REQUIREMENTS - 41 Edgewater Street, Kanata Calculation Based on Fire Underwriters Survey, 2020

- 1) An estimate of the Fire Flow required for a given fire area may be estimated by:

$$RFF = 220 \times C \times \sqrt{A}$$

where RFF = required fire flow in litres per minute  
A = Consider area of first and second floors

C = coefficient related to the type of construction:

- 1.5 for wood construction (structure essentially combustible)
- 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
- 0.8 for noncombustible construction (unprotected metal structural components, masonry or metal walls)
- 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Building#1

100% of floor 1 = 570.9 m<sup>2</sup>

A = 571.0 m<sup>2</sup> (Ordinary Construction)

C = 1.0

F = 5,257 L/min

----->

Rounded to nearest 1000 = **5,000** L/min

- 2) The value obtained in 1. may be reduced by as much as 25% for occupancies having a low

- Non-combustible = -25%
- Limited Combustible = -15%
- Combustible = 0%
- Free Burning = 15%
- Rapid Burning = 25%

Reduction due to low occupancy hazard = 0% x 5,000 = **5,000** L/min

- 3) The value above may be reduced by up to 50% for automatic sprinkler system

Reduction due to automatic sprinkler system = 0% x 5,000 = **0**

- 4) The value obtained in 2. may be increased for structures exposed within 45 metres by the fire

| Separation (metres) | Condition | Charge |
|---------------------|-----------|--------|
| 0m to 3.0m          | 1         | 25%    |
| 3.1m to 10.0m       | 2         | 20%    |
| 10.1m to 20.0m      | 3         | 15%    |
| 20.1m to 30.0m      | 4         | 10%    |
| 30.1m to            | 5         | 0%     |

| Exposures | Distance(m) | Condition | Charge |
|-----------|-------------|-----------|--------|
| Side 1    | <u>14.2</u> | 3         | 15%    |
| Side 2    | <u>98.1</u> | 5         | 0%     |
| Side 3    | <u>26.9</u> | 4         | 10%    |
| Side 4    | <u>29.2</u> | 4         | 10%    |
| <hr/>     |             |           |        |
| 35%       |             |           |        |

Increase due to separation = 35% x 5,000 = **1,750** L/min

The fire flow requirement is =

**5,000**  
Reduction due to Sprinkler = **0**  
Increase due to Separation = **1,750**

The Total fire flow requirement is =

6,750  
or **112.5** L/sec





**KEY PLAN**  
NOT TO SCALE

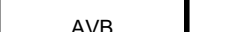
0 20 40  
1:400 METRES

**LEGEND**

|                                     |                             |
|-------------------------------------|-----------------------------|
| ---                                 | PROPERTY BOUNDARY           |
| - - -                               | ZONING SETBACK              |
|                                     | PROPOSED TOP OF SLOPE       |
| - - - - -                           | PROPOSED BOTTOM OF SLOPE    |
| → → →                               | PROPOSED CENTERLINE OF FLOW |
| □                                   | PR. CB                      |
| ⊙                                   | PR-MH                       |
| ⊙                                   | PR. RYCB                    |
| - - -                               | EXISTING BOTTOM OF SLOPE    |
| → → →                               | EXISTING CENTERLINE OF FLOW |
|                                     | EXISTING TOP OF SLOPE       |
| --- STM --- STM --- STM --- STM --- | EXISTING STORM SEWER        |
| --- SAN --- SAN --- SAN --- SAN --- | EXISTING SANITARY SEWER     |
| --- W --- W --- W --- W ---         | EXISTING WATERMAIN          |
| --- X --- X --- X --- X ---         | EXISTING FENCE LINE         |
| ~~~~~                               | EXISTING EDGE OF TREE/BUSH  |
| ●                                   | EXISTING STORM MANHOLE      |
| ⊙                                   | EXISTING SANITARY MANHOLE   |
| ⊞                                   | EXISTING CATCHBASIN         |
| ⊞                                   | EXISTING CATCHBASIN INLET   |
| ⊞                                   | EXISTING WATER VALVE        |
| ⊞                                   | EXISTING HYDRANT            |
| ⊞                                   | EXISTING ROOF DRAIN         |
| ⊞                                   | EXISTING LIGHT POST         |
| ⊞                                   | TEMPORARY BENCHMARK         |
| ▽                                   | PROPOSED ENTRANCE           |

LEGAL INFORMATION:  
PLAN OF SURVEY OF  
PART OF LOT 36  
CONCESSION 12  
GEOGRAPHIC TOWNSHIP OF  
GOULBOURN  
NOW IN THE  
CITY OF OTTAWA  
Surveyed by Annis, O'Sullivan, Vollebek Ltd.  
TOPOGRAPHIC INFORMATION:  
TOPOGRAPHIC SURVEY FILE #250848  
DATE: 2025-10-15  
Surveyed by Kollaard Associates Inc.

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|                                                                                                                                                                            |  |                                                                                                                                     |  |                       |  |             |  |                                                                                                                        |  |                 |  |       |  |                                                    |  |                       |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|--|-------------|--|------------------------------------------------------------------------------------------------------------------------|--|-----------------|--|-------|--|----------------------------------------------------|--|-----------------------|--|
| NOTES: 1. ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SPECIFIED; ALL ELEVATIONS ARE IN METRES.                                                                          |  | 9. INSPECTION OF ROUGH GRADE BY KOLLAARD ASSOCIATES INC. AND MUNICIPALITY MUST BE CONDUCTED PRIOR TO PLACEMENT OF TOPSOIL OR SOD.   |  |                       |  | CONSULTANTS |  |  Kollaard Associates<br>Engineers |  | DESIGN<br>AVB   |  | STAMP |  | CLIENT NAME<br>176-3295 ONTARIO INC.               |  | PROJECT No.<br>250848 |  |
| 2. THIS IS NOT A LEGAL SURVEY.                                                                                                                                             |  | 10. HYDRO SERVICE TO BE INSTALLED ACCORDING TO THE SPECIFICATIONS OF SERVICE PROVIDER AND THE MECHANICAL ENGINEER.                  |  |                       |  |             |  | (613) 860-0923                                                                                                         |  | DRAWN<br>BM     |  |       |  | PROJECT NAME<br>PROPOSED COMMERCIAL DEVELOPMENT    |  | DATE<br>2026.04.06    |  |
| 3. EXISTING SERVICES INFORMATION SHOWN ARE BASED ON BEST CURRENT INFORMATION. CONTRACTOR TO VERIFY EXACT LOCATION AND REPORT ANY DISCREPANCIES TO KOLLAARD ASSOCIATES INC. |  | 11. ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH MUNICIPAL STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS |  |                       |  |             |  |                                                                                                                        |  | CHECKED<br>AVB  |  |       |  | PROJECT LOCATION<br>41 EDGEWATER STREET, KANATA ON |  | SCALE<br>AS NOTED     |  |
| 4. CLIENT IS RESPONSIBLE FOR ACQUIRING ALL NECESSARY PERMITS.                                                                                                              |  | 12. ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES, INC.                                        |  |                       |  |             |  |                                                                                                                        |  | APPROVED<br>AVB |  |       |  | DRAWING NO.                                        |  | 1 OF 2                |  |
| 5. CONTRACTOR TO VERIFY THAT APPROPRIATE PERMITS HAVE BEEN ACQUIRED PRIOR TO ANY CONSTRUCTION.                                                                             |  | 13. THIS DRAWING IS PART OF KOLLAARD ASSOCIATES DESIGN REPORT #250848.                                                              |  |                       |  |             |  |                                                                                                                        |  |                 |  |       |  | FUS SEPARATION DISTANCES                           |  |                       |  |
| 6. CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF UTILITIES.                                                                                                     |  |                                                                                                                                     |  | 1 FOR CCTV INSPECTION |  | 2025.11.04  |  | BM                                                                                                                     |  |                 |  |       |  |                                                    |  |                       |  |
| 7. ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION.                                                                                              |  |                                                                                                                                     |  | No.                   |  | REVISION    |  | DATE                                                                                                                   |  | BY              |  |       |  |                                                    |  |                       |  |
| 8. THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL ALL APPROVALS HAVE BEEN GRANTED.                                                                                             |  |                                                                                                                                     |  |                       |  |             |  |                                                                                                                        |  |                 |  |       |  |                                                    |  |                       |  |

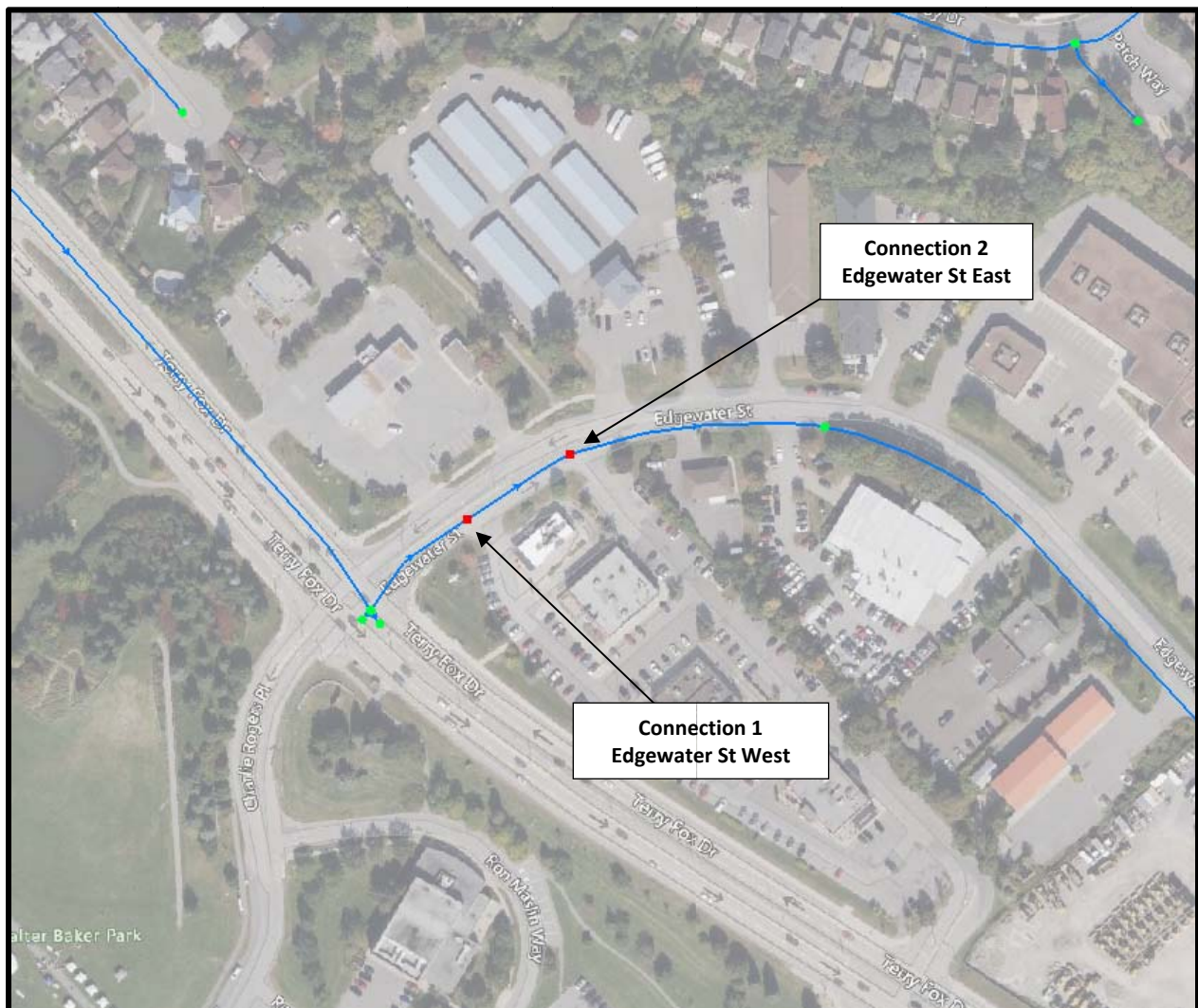


## Boundary Conditions 41 Edgewater Street

### Provided Information

| Scenario             | Demand |        |
|----------------------|--------|--------|
|                      | L/min  | L/s    |
| Average Daily Demand | 7      | 0.11   |
| Maximum Daily Demand | 10     | 0.17   |
| Peak Hour            | 19     | 0.31   |
| Fire Flow Demand #1  | 7,000  | 116.67 |

### Location





## **Results**

### **Connection 1 –Edgewater Street West**

| <b>Demand Scenario</b>    | <b>Head (m)</b> | <b>Pressure<sup>1</sup> (psi)</b> |
|---------------------------|-----------------|-----------------------------------|
| Maximum HGL               | 161.9           | 86.1                              |
| Peak Hour                 | 155.7           | 77.1                              |
| Max Day plus Fire Flow #1 | 155.7           | 77.1                              |

<sup>1</sup> Ground Elevation = 101.4 m

### **Connection 2 –Edgewater Street East**

| <b>Demand Scenario</b>    | <b>Head (m)</b> | <b>Pressure<sup>1</sup> (psi)</b> |
|---------------------------|-----------------|-----------------------------------|
| Maximum HGL               | 161.9           | 84.6                              |
| Peak Hour                 | 155.7           | 75.7                              |
| Max Day plus Fire Flow #1 | 155.7           | 75.7                              |

<sup>1</sup> Ground Elevation = 102.4 m

## **Notes**

1. Any connection to a watermain 400 mm or larger should be approved by DWS as per the Water Design Guidelines Section 2.4 Review by Drinking Water Services.
2. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
  - If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
  - Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

## **Disclaimer**

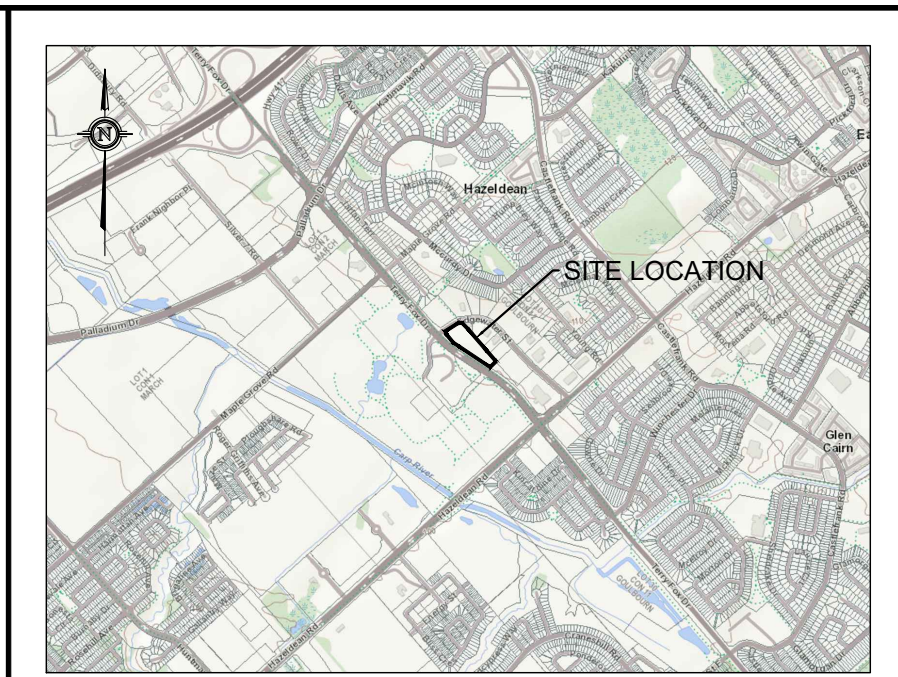
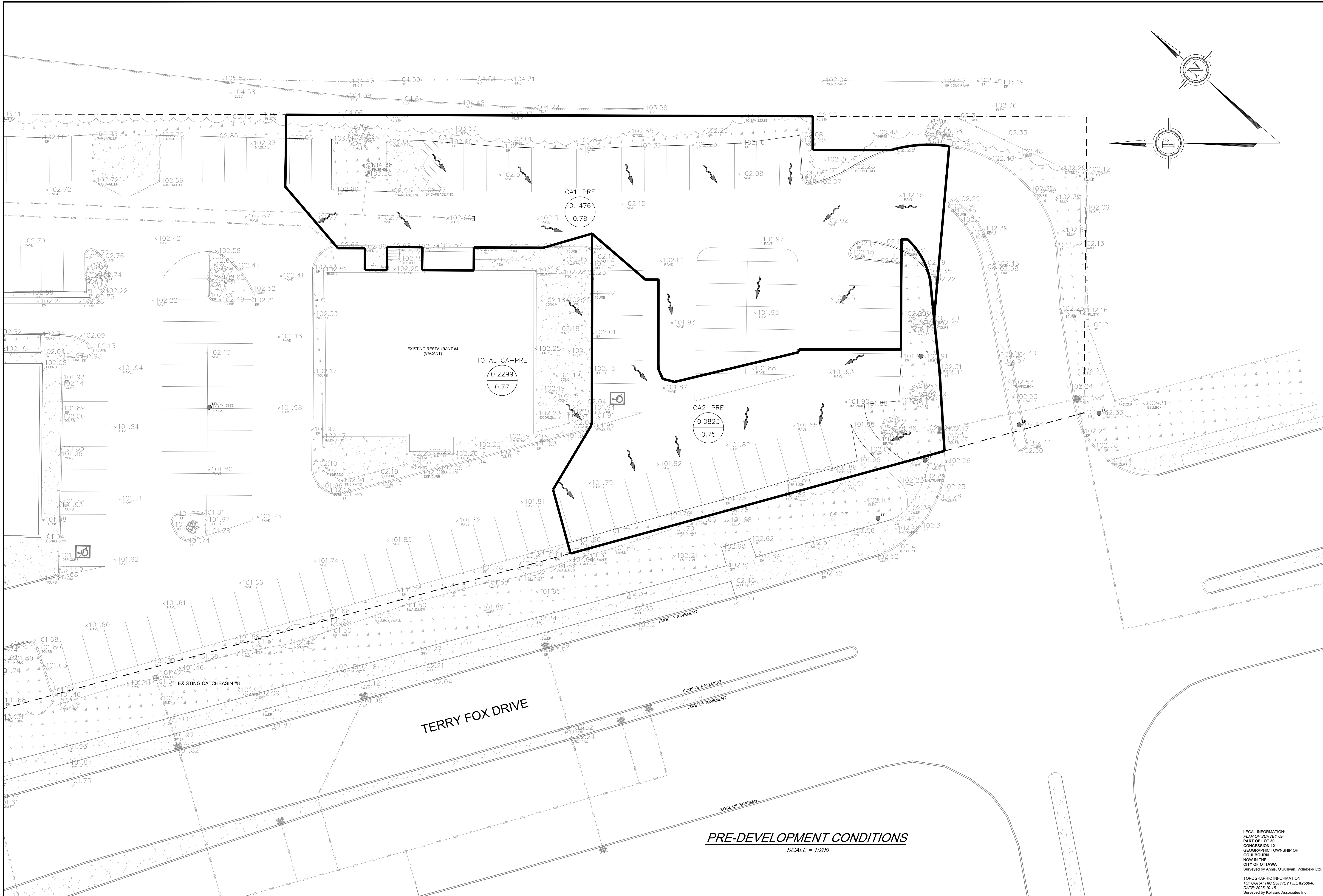
*The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.*



## Appendix D: Drawings

- 250848 – PRE – Pre-Development Drainage Plan
- 250848 – POST – Post-Development Drainage Plan
- 250848 – GRD – Site Grading Plan
- 250848 – SER – Site Servicing Plan
- 250848 – ROOF – Roof Stormwater Plan
- 250848 – ESC – Erosion and Sediment Control Plan





**KEY PLAN**  
NOT TO SCALE

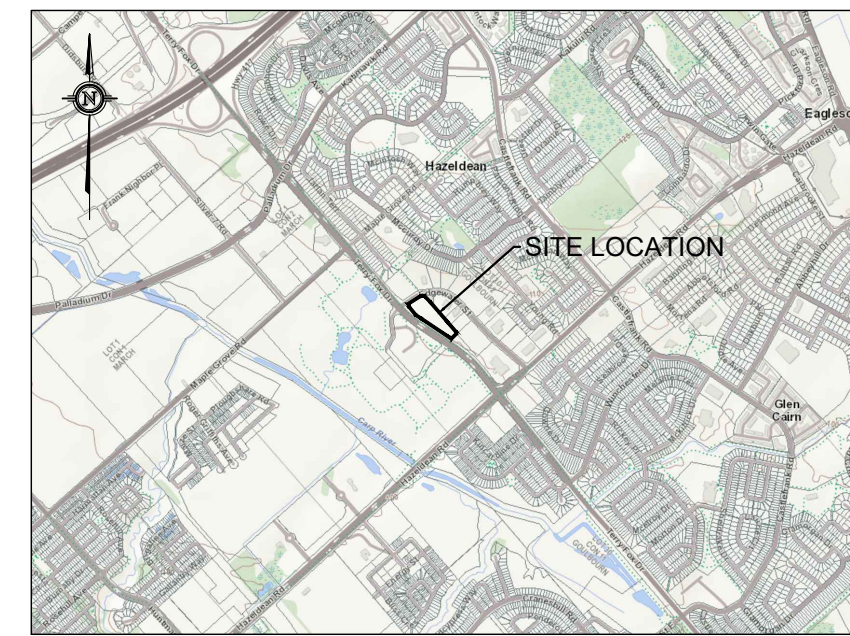
| LEGEND |                                         |
|--------|-----------------------------------------|
|        | EXISTING ELEVATION                      |
|        | PROPERTY BOUNDARY                       |
|        | EXISTING BOTTOM OF SLOPE                |
|        | EXISTING CENTERLINE OF FLOW             |
|        | EXISTING TOP OF SLOPE                   |
|        | EXISTING STORM SEWER                    |
|        | EXISTING SANITARY SEWER                 |
|        | EXISTING WATERMAIN                      |
|        | EXISTING FENCE LINE                     |
|        | EXISTING EDGE OF TREE/BUSH              |
|        | EXISTING STORM MANHOLE                  |
|        | EXISTING SANITARY MANHOLE               |
|        | EXISTING CATCHBASIN                     |
|        | EXISTING CATCHBASIN INLET               |
|        | EXISTING WATER VALVE                    |
|        | EXISTING HYDRANT                        |
|        | EXISTING ROOF DRAIN                     |
|        | EXISTING LIGHT POST                     |
|        | CATCHMENT AREA BOUNDARY                 |
|        | CATCHMENT LABEL                         |
|        | CATCHMENT AREA (HECTARES)               |
|        | 5-YEAR RUN-OFF COEFFICIENT              |
|        | PRE-DEVELOPMENT OVERLAND DRAINAGE ARROW |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |             |  |                                                                                                  |  |                                                                   |       |                                                                                                                                                                                       |                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|--|--------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>NOTES:</b><br>1. ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SPECIFIED. ALL ELEVATIONS ARE IN METRES.<br>2. THIS IS NOT A LEGAL SURVEY.<br>3. EXISTING SERVICES INFORMATION SHOWN ARE BASED ON BEST CURRENT INFORMATION. CONTRACTOR TO VERIFY EXACT LOCATION AND REPORT ANY DISCREPANCIES TO KOLLAARD ASSOCIATES INC.<br>4. CLIENT IS RESPONSIBLE FOR ACQUIRING ALL NECESSARY PERMITS.<br>5. CONTRACTOR TO VERIFY THAT APPROPRIATE PERMITS HAVE BEEN ACQUIRED PRIOR TO ANY CONSTRUCTION.<br>6. CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF UTILITIES.<br>7. ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION.<br>8. THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL ALL APPROVALS HAVE BEEN GRANTED. |  | 9. INSPECTION OF ROUGH GRADE BY KOLLAARD ASSOCIATES INC. AND MUNICIPALITY MUST BE CONDUCTED PRIOR TO PLACEMENT OF TOPSOIL OR SOD.<br>10. HYDRO SERVICE TO BE INSTALLED ACCORDING TO THE SPECIFICATIONS OF SERVICE PROVIDER AND THE MECHANICAL ENGINEER.<br>11. ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH MUNICIPAL STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.<br>12. ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES, INC.<br>13. THIS DRAWING IS PART OF KOLLAARD ASSOCIATES DESIGN REPORT #250848. |  | CONSULTANTS |  | <br>BOX 189<br>210 PRESCOTT STREET<br>KEMPTVILLE, ONTARIO<br>K0G 1J0<br>FACSIMILE (613) 258-0475 |  | DESIGN<br>AVB<br>DRAWN<br>BM<br>CHECKED<br>AVB<br>APPROVED<br>AVB | STAMP | CLIENT NAME<br>1763295 ONTARIO INC.<br>PROJECT NAME<br>PROPOSED COMMERCIAL DEVELOPMENT<br>PROJECT LOCATION<br>41 EDGEWATER STREET, KANATA ON<br>DRAWING<br>PRE-DEVELOPMENT CONDITIONS | PROJECT No.<br>250848-PRE<br>DATE<br>2026.03.25<br>SCALE<br>AS_NOTED<br>DRAWING No.<br>1 OF 1 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|--|--------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|









|                                                                                       |                                    |
|---------------------------------------------------------------------------------------|------------------------------------|
|    | PROPERTY BOUNDARY                  |
|    | ZONING SETBACK                     |
|    | PROPOSED TOP OF SLOPE              |
|    | PROPOSED BOTTOM OF SLOPE           |
|    | PROPOSED CENTERLINE OF FLOW        |
|    | PROPOSED CATCH BASIN               |
|    | PROPOSED STORM MAINTENANCE HOLE    |
|    | EXISTING BOTTOM OF SLOPE           |
|    | EXISTING CENTERLINE OF FLOW        |
|    | EXISTING TOP OF SLOPE              |
|    | EXISTING FENCE LINE                |
|   | EXISTING EDGE OF TREE/BUSH         |
|  | EXISTING STORM MAINTENANCE HOLE    |
|  | EXISTING SANITARY MAINTENANCE HOLE |
|  | EXISTING CATCH BASIN               |
|  | EXISTING INLET CATCH BASIN         |
|  | EXISTING WATER VALVE               |
|  | EXISTING HYDRANT                   |
|  | EXISTING ROOF DRAIN                |
|  | EXISTING LIGHT POST                |
|  | TEMPORARY BENCHMARK                |
|  | PROPOSED ENTRANCE                  |

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| <u>PARKING REQUIREMENTS:</u>                                                     |           |           |
|----------------------------------------------------------------------------------|-----------|-----------|
| MINIMUM VEHICULAR PARKING SPACES                                                 | REQUIRED  | PROVIDED  |
| PROPOSED MEDICAL FACILITY AREA C 385.7<br>m <sup>2</sup> @ 4/100m <sup>2</sup> * | 16        | 17        |
| EXISTING RESTAURANT #1 AREA C 179.2m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 18        | 20        |
| EXISTING RESTAURANT #2 AREA C 570.9m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 58        | 60        |
| EXISTING RESTAURANT #3 AREA C 527.0m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 53        | 55        |
| EXISTING RESTAURANT #4 AREA C 496.8m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 50        | 52        |
| DESIGNATED ACCESSIBLE PARKING - 195<br>SPACES @ 7/(167-250)                      | 7         | 7         |
| TOTAL PARKING SPACES =                                                           | 195+7=202 | 204+7=211 |

|                                                                                       |                          |
|---------------------------------------------------------------------------------------|--------------------------|
|  | EXISTING GRASS           |
|  | PROPOSED GRASS           |
|  | EXISTING CONCRETE        |
|  | PROPOSED CONCRETE        |
|  | EXISTING ASPHALT WALKWAY |
|  | PROPOSED ASPHALT WALKWAY |
|  | FIRE LANE                |
|  | NO PARKING HATCH         |

SNOW IS TO BE REMOVED AND  
STORED OFFSITE

| <u>PARKING REQUIREMENTS:</u>                                                     |           |           |
|----------------------------------------------------------------------------------|-----------|-----------|
| MINIMUM VEHICULAR PARKING SPACES                                                 | REQUIRED  | PROVIDED  |
| PROPOSED MEDICAL FACILITY AREA C 385.7<br>m <sup>2</sup> @ 4/100m <sup>2</sup> * | 16        | 17        |
| EXISTING RESTAURANT #1 AREA C 179.2m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 18        | 20        |
| EXISTING RESTAURANT #2 AREA C 570.9m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 58        | 60        |
| EXISTING RESTAURANT #3 AREA C 527.0m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 53        | 55        |
| EXISTING RESTAURANT #4 AREA C 496.8m <sup>2</sup> @<br>10/100m <sup>2</sup> *    | 50        | 52        |
| DESIGNATED ACCESSIBLE PARKING - 195<br>SPACES @ 7/(167-250)                      | 7         | 7         |
| TOTAL PARKING SPACES =                                                           | 195+7=202 | 204+7=211 |

- |        |                                                                                                                                                                            |                                                                                                                                      |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| NOTES: | 1. ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SPECIFIED. ALL ELEVATIONS ARE IN METRES.                                                                                 | 9. INSPECTION OF ROUGH GRADE BY KOLLAARD ASSOCIATES INC. AND MUNICIPALITY MUST BE CONDUCTED PRIOR TO PLACEMENT OF TOPSOIL OR SOD.    |
|        | 2. THIS IS NOT A LEGAL SURVEY.                                                                                                                                             | 10. HYDRO SERVICE TO BE INSTALLED ACCORDING TO THE SPECIFICATIONS OF SERVICE PROVIDER AND THE MECHANICAL ENGINEER.                   |
|        | 3. EXISTING SERVICES INFORMATION SHOWN ARE BASED ON BEST CURRENT INFORMATION. CONTRACTOR TO VERIFY EXACT LOCATION AND REPORT ANY DISCREPANCIES TO KOLLAARD ASSOCIATES INC. | 11. ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH MUNICIPAL STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. |
|        | 4. CLIENT IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.                                                                                                              | 12. ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES, INC.                                         |
|        | 5. CONTRACTOR TO VERIFY THAT APPROPRIATE PERMITS HAVE BEEN ACQUIRED PRIOR TO ANY CONSTRUCTION.                                                                             | 13. THIS DRAWING IS PART OF KOLLAARD ASSOCIATES DESIGN REPORT #250848.                                                               |
|        | 6. CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF UTILITIES.                                                                                                     |                                                                                                                                      |
|        | 7. ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION.                                                                                              |                                                                                                                                      |
|        | 8. THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL ALL APPROVALS HAVE BEEN GRANTED.                                                                                             |                                                                                                                                      |

|    |     |                                            |             |     |
|----|-----|--------------------------------------------|-------------|-----|
| CE |     |                                            |             |     |
|    |     |                                            |             |     |
|    |     |                                            |             |     |
|    |     |                                            |             |     |
|    |     |                                            |             |     |
| RD |     |                                            |             |     |
|    |     |                                            |             |     |
|    |     |                                            |             |     |
|    |     |                                            |             |     |
|    | 1   | RESPONSE TO CITY OF OTTAWA REVIEW COMMENTS | 2026.AUG.28 | AVB |
|    | 0   | FOR SITE PLAN CONTROL SUBMISSION           | 2026.JUL.08 | AVB |
|    | No. | REVISION                                   | DATE        | BY  |

## CONSULTANTS



(613) 860-0923

|          |       |
|----------|-------|
| DESIGN   | STAMP |
| AVB      |       |
| DRAWN    |       |
| BM       |       |
| CHECKED  |       |
| AVB      |       |
| APPROVED |       |
| AVB      |       |

|                  |                                 |             |            |
|------------------|---------------------------------|-------------|------------|
| CLIENT NAME      | 1763295 ONTARIO INC.            | PROJECT No. | 250848-SPL |
| PROJECT NAME     | PROPOSED COMMERCIAL DEVELOPMENT | DATE        | 2026.08.28 |
| PROJECT LOCATION | 41 EDGEWATER STREET, KANATA ON  | SCALE       | AS_NOTED   |
| DRAWING          | SITE PLAN LAYOUT                | DRAWING No. | 1 OF 6     |



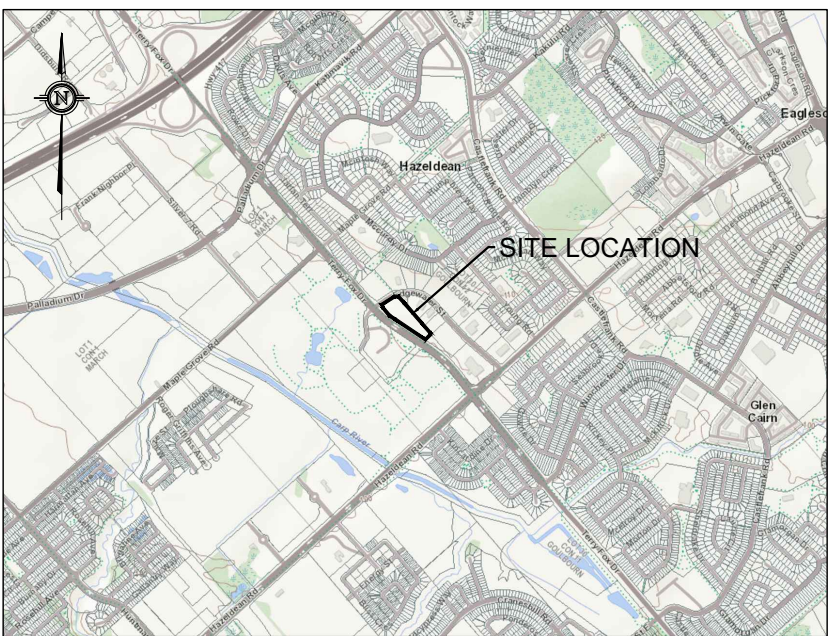
FILE No. 007-12-26-0059 PLAN No. 19487





|             |           |
|-------------|-----------|
| PROJECT No. | 250848-GF |
| DATE        | 2026.08.2 |
| SCALE       | AS_NOTE   |
| DRAWING No. | 3 OF 6    |



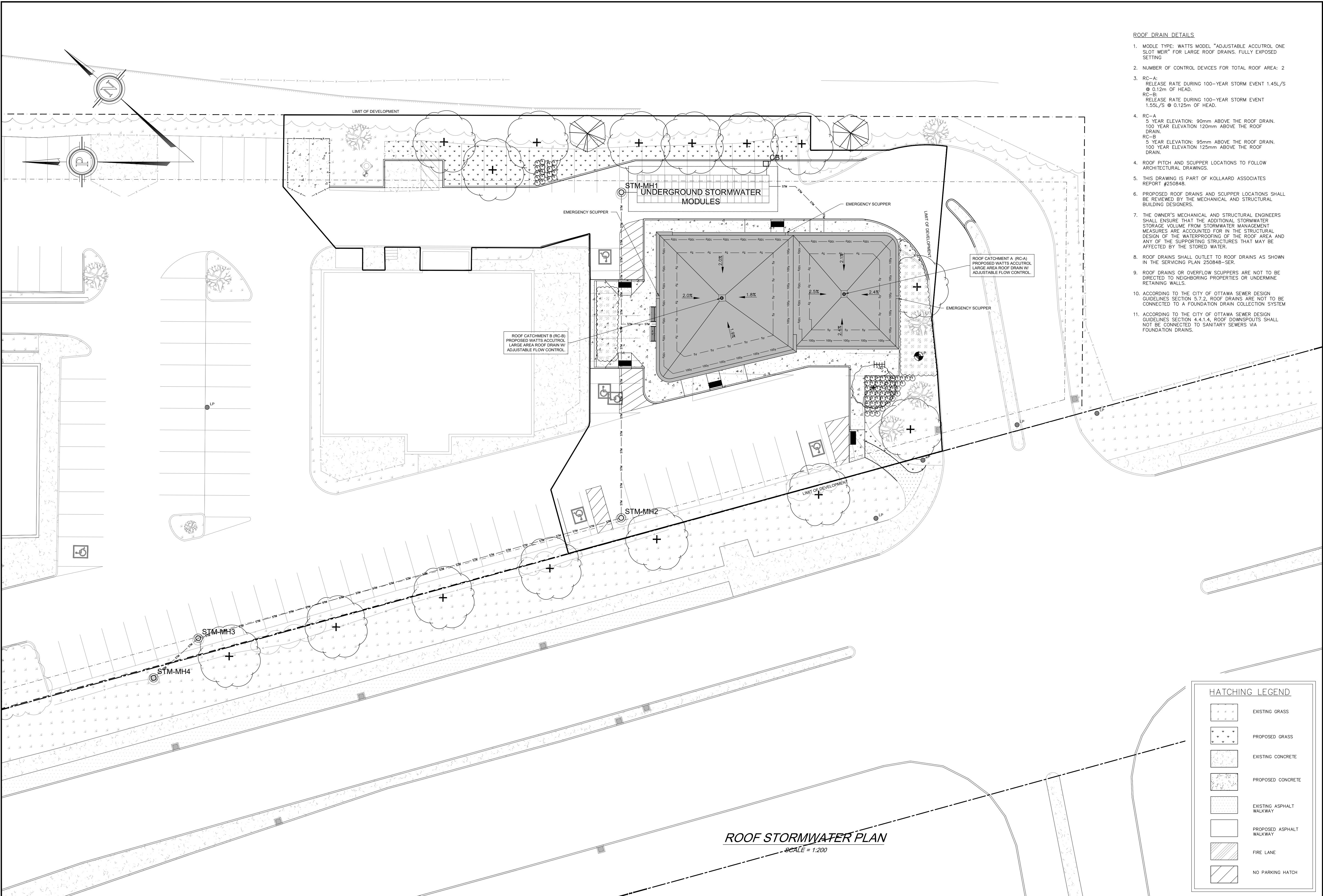


|    |                                 |
|----|---------------------------------|
|    | PROPERTY BOUNDARY               |
|    | ZONING SETBACK                  |
|    | PROPOSED TOP OF SLOPE           |
|    | PROPOSED BOTTOM OF SLOPE        |
|    | PROPOSED CENTERLINE OF FLOW     |
|    | PROPOSED STORM SEWER            |
|    | PROPOSED SANITARY SEWER         |
|    | PROPOSED WATERMAIN              |
|    | PROPOSED CATCH BASIN            |
|    | PROPOSED STORM MAINTENANCE HOLE |
|    | EXISTING BOTTOM OF SLOPE        |
|    | EXISTING CENTERLINE OF FLOW     |
|    | EXISTING TOP OF SLOPE           |
|    | EXISTING STORM SEWER            |
|    | EXISTING SANITARY SEWER         |
|    | EXISTING WATERMAIN              |
|    | EXISTING FENCE LINE             |
|    | EXISTING EDGE OF TREE/BUSH      |
|    | EXISTING STORM MANHOLE          |
|    | EXISTING SANITARY MANHOLE       |
|    | EXISTING CATCHBASIN             |
|    | EXISTING CATCHBASIN INLET       |
|    | EXISTING WATER VALVE            |
|    | EXISTING HYDRANT                |
|    | EXISTING ROOF DRAIN             |
| LP | EXISTING LIGHT POST             |
|    | TEMPORARY BENCHMARK             |
|    | DEPRESSED CURB                  |
|    | PROPOSED ENTRANCE               |

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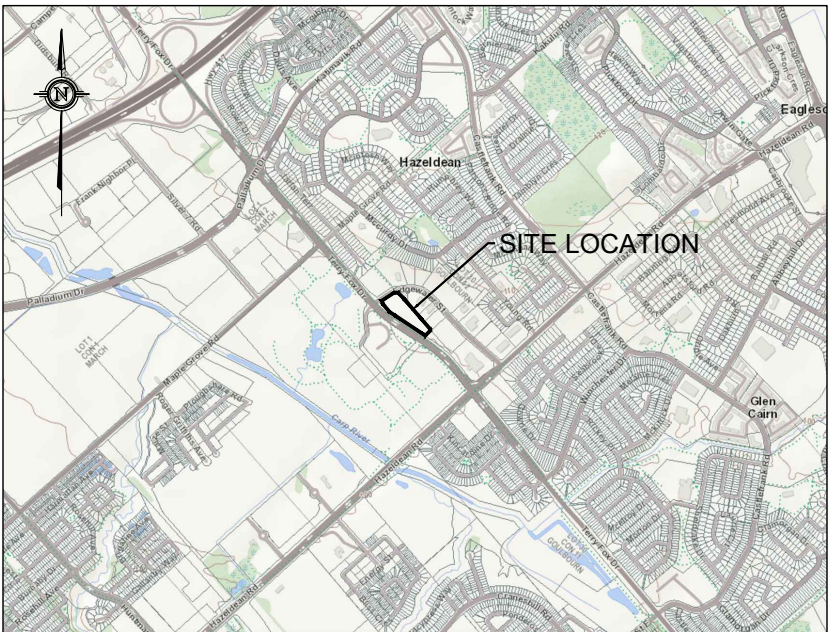
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|------------------|---------------------------------|
| CLIENT NAME      | 1763295 ONTARIO INC.            |
| PROJECT NAME     | PROPOSED COMMERCIAL DEVELOPMENT |
| PROJECT LOCATION | 41 EDGEWATER STREET, KANATA ON  |
| DRAWING          | SITF SERVICING PLAN             |



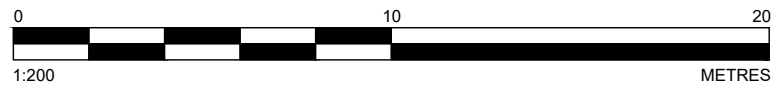


ROOF DRAIN DETAILS

1. MODEL TYPE: WATTS MODEL "ADJUSTABLE ACCUTROL ONE SLOT WEIR" FOR LARGE ROOF DRAINS. FULLY EXPOSED SETTING
2. NUMBER OF CONTROL DEVICES FOR TOTAL ROOF AREA: 2
3. RC-A:  
RELEASE RATE DURING 100-YEAR STORM EVENT 1.45L/S @ 0.12m OF HEAD.  
RC-B:  
RELEASE RATE DURING 100-YEAR STORM EVENT 1.35L/S @ 0.125m OF HEAD.
4. RC-A  
5 YEAR ELEVATION: 90mm ABOVE THE ROOF DRAIN.  
100 YEAR ELEVATION 120mm ABOVE THE ROOF DRAIN.  
RC-B  
5 YEAR ELEVATION: 95mm ABOVE THE ROOF DRAIN.  
100 YEAR ELEVATION 125mm ABOVE THE ROOF DRAIN.
4. ROOF PITCH AND SCUPPER LOCATIONS TO FOLLOW ARCHITECTURAL DRAWINGS.
5. THIS DRAWING IS PART OF KOLLAARD ASSOCIATES REPORT #250848.
6. PROPOSED ROOF DRAINS AND SCUPPER LOCATIONS SHALL BE REVIEWED BY THE MECHANICAL AND STRUCTURAL BUILDING DESIGNERS.
7. THE OWNER'S MECHANICAL AND STRUCTURAL ENGINEERS SHALL ENSURE THAT THE ADDITIONAL STORMWATER STORAGE VOLUME FROM STORMWATER MANAGEMENT MEASURES ARE ACCOUNTED FOR IN THE STRUCTURAL DESIGN OF THE WATERPROOFING OF THE ROOF AREA AND ANY OF THE SUPPORTING STRUCTURES THAT MAY BE AFFECTED BY THE STORED WATER.
8. ROOF DRAINS SHALL OUTLET TO ROOF DRAINS AS SHOWN IN THE SERVING PLAN 250848-SER.
9. ROOF DRAINS OR OVERFLOW SCUPPERS ARE NOT TO BE DIRECTED TO NEIGHBORING PROPERTIES OR UNDERMINE RETAINING WALLS.
10. ACCORDING TO THE CITY OF OTTAWA SEWER DESIGN GUIDELINES SECTION 5.7.2, ROOF DRAINS ARE NOT TO BE CONNECTED TO A FOUNDATION DRAIN COLLECTION SYSTEM
11. ACCORDING TO THE CITY OF OTTAWA SEWER DESIGN GUIDELINES SECTION 4.4.1.4, ROOF DOWNSPOUTS SHALL NOT BE CONNECTED TO SANITARY SEWERS VIA FOUNDATION DRAINS.



KEY PLAN  
NOT TO SCALE



LEGEND

- PROPERTY BOUNDARY
- ZONING SETBACK
- PROPOSED TOP OF SLOPE
- PROPOSED BOTTOM OF SLOPE
- PROPOSED CENTERLINE OF FLOW
- PROPOSED CATCH BASIN
- PROPOSED STORM MAINTENANCE HOLE
- EXISTING BOTTOM OF SLOPE
- EXISTING CENTERLINE OF FLOW
- EXISTING TOP OF SLOPE
- EXISTING FENCE LINE
- EXISTING EDGE OF TREE/BUSH
- EXISTING STORM MAINTENANCE HOLE
- EXISTING SANITARY MAINTENANCE HOLE
- EXISTING CATCH BASIN
- EXISTING INLET CATCH BASIN
- EXISTING WATER VALVE
- EXISTING HYDRANT
- EXISTING ROOF DRAIN
- EXISTING LIGHT POST
- TEMPORARY BENCHMARK
- PROPOSED ENTRANCE

HATCHING LEGEND

- EXISTING GRASS
- PROPOSED GRASS
- EXISTING CONCRETE
- PROPOSED CONCRETE
- EXISTING ASPHALT WALKWAY
- PROPOSED ASPHALT WALKWAY
- FIRE LANE
- NO PARKING HATCH

LEGAL INFORMATION  
PLAN OF SURVEY OF  
PART OF LOT 30  
CONCESSION 12  
GEOGRAPHIC TOWNSHIP OF  
GOULBOURN  
NOW IN THE  
CITY OF OTTAWA  
Surveyed by Annis, O'Sullivan, Vollebek Ltd.  
TOPOGRAPHIC INFORMATION:  
TOPOGRAPHIC SURVEY FILE #250848  
DATE: 2025-10-15  
Surveyed by Kollaard Associates Inc.

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KOLLAARD ASSOCIATES INCORPORATED

- NOTES:
1. ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SPECIFIED; ALL ELEVATIONS ARE IN METRES.
  2. THIS IS NOT A LEGAL SURVEY.
  3. EXISTING SERVICES INFORMATION SHOWN ARE BASED ON BEST CURRENT INFORMATION. CONTRACTOR TO VERIFY EXACT LOCATION AND REPORT ANY DISCREPANCIES TO KOLLAARD ASSOCIATES INC.
  4. CLIENT IS RESPONSIBLE FOR ACQUIRING ALL NECESSARY PERMITS.
  5. CONTRACTOR TO VERIFY THAT APPROPRIATE PERMITS HAVE BEEN ACQUIRED PRIOR TO ANY CONSTRUCTION.
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  8. THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL ALL APPROVALS HAVE BEEN GRANTED.

9. INSPECTION OF ROUGH GRADE BY KOLLAARD ASSOCIATES INC. AND MUNICIPALITY MUST BE CONDUCTED PRIOR TO PLACEMENT OF TOPSOIL OR SOD.
10. HYDRO SERVICE TO BE INSTALLED ACCORDING TO THE SPECIFICATIONS OF SERVICE PROVIDER AND THE MECHANICAL ENGINEER.
11. ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH MUNICIPAL STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS
12. ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES, INC.
13. THIS DRAWING IS PART OF KOLLAARD ASSOCIATES DESIGN REPORT #250848.

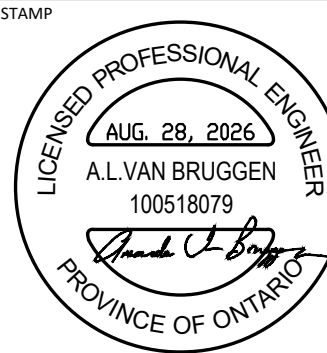
| CONSULTANTS |                                            |             |     |
|-------------|--------------------------------------------|-------------|-----|
| No.         | REVISION                                   | DATE        | BY  |
| 1           | RESPONSE TO CITY OF OTTAWA REVIEW COMMENTS | 2026.AUG.28 | AVB |
| 0           | SHEET NOT INCLUDED                         | 2026.JUL.08 | AVB |

**Kollaard Associates**  
Engineers

BOX 188  
210 PRESCOTT STREET  
KEMP TOWN, ONTARIO  
K0C 1J0  
FACSIMILE: (613) 258-0475

(613) 860-0923

DESIGN  
AVB  
DRAWN  
BM  
CHECKED  
AVB  
APPROVED  
AVB



|                  |                                 |             |             |
|------------------|---------------------------------|-------------|-------------|
| CLIENT NAME      | 1763295 ONTARIO INC.            | PROJECT No. | 250848-ROOF |
| PROJECT NAME     | PROPOSED COMMERCIAL DEVELOPMENT | DATE        | 2026.08.28  |
| PROJECT LOCATION | 41 EDGEWATER STREET, KANATA ON  | SCALE       | AS NOTED    |
| DRAWING          | ROOF STORMWATER PLAN            | DRAWING No. | 5 OF 6      |



