Kollaard Associates
Engineers
210 Prescott Street, Unit 1
P.O. Box 189
Kemptville, Ontario K0G 1J0

Civil • Geotechnical •
Structural • Environmental •
Hydrogeology •

(613) 860-0923
FAX: (613) 258-0475

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

Prepared For:
1763295 Ontario Inc.
17 Taunton Place
Ottawa, Ontario
K1J 7J7

PROJECT #: 250848

DISTRIBUTION
1 pdf – City of Ottawa
1 pdf – 1763295 Ontario Inc.
1 pdf – Kollaard Associates Inc.

Rev 0 – Issued for Site Plan Approval — May 14, 2026

TABLE OF CONTENTS

LIST OF APPENDICES 2
LIST OF DRAWINGS 2
1 INTRODUCTION 3
2 BACKGROUND 3
3 STORMWATER DESIGN 4
3.1 Introduction 4
3.2 Stormwater Management Design Criteria 4
3.3 Stormwater Quantity Control 5
3.3.1 Methodology 5
3.3.2 Runoff Coefficients 6
3.3.3 Time of Concentration 6
3.3.4 Pre-development Site Conditions 6
3.3.5 Pre-development Runoff Coefficient 7
3.3.6 Pre-development Flow Rate 7
3.3.7 Post-Development Site Conditions 8
3.3.8 Unrestricted Runoff Rate 9
3.3.9 Allowable Release Rate 10
3.3.10 Post Development Restricted Flow and Storage 10
3.3.10.1 Underground Storage Modules (CA1) 10
3.3.10.2 Control Structure (CA1) 11
3.3.11 Summary 12
3.4 Storm Sewer Design 12
3.5 Infiltration Targets 13
3.6 Stormwater Quality Control 14
3.7 Stormwater System Operation and Maintenance 15
3.7.1 Control Structure 15
3.7.2 Catchbasins and Manholes 15
3.7.3 Underground Storage Modules 15
3.7.4 Inspections 16
4 SANITARY SEWER DESIGN 16
4.1 Design Flows 17
4.2 Sanitary Sewer 18
4.2.1 Proposed Sanitary Service Lateral 18
4.2.2 Sizing Confirmation of Existing Private Sanitary Main 19
4.2.3 CCTV Inspection of Existing Private Sanitary Main 19
5 WATERMAIN DESIGN 20
5.1 Water Demand 20
5.2 Water Required for Fire Protection 21
5.3 Existing Fire Hydrants 21
5.4 Boundary Conditions 22
5.5 Water Service Requirements 24
6 EROSION AND SEDIMENT CONTROL 24
7 CONCLUSIONS 25

LIST OF APPENDICES

Appendix A: Storm Design Information
Appendix B: Product Information
Appendix C: Fire Flow Calculations and Boundary Conditions
Appendix D: Drawings

LIST OF DRAWINGS

250848– PRE – Pre-Development Water Flows

250848 – POST – Controlled and Uncontrolled Areas

250848 – GR – Site Grading Plan

250848 – SER – Site Servicing 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 watermains 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 0.43ha. 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 in front of building#4.
- 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 the swale within the right of way along Terry Fox Drive. When runoff enters the swale from this 0.48ha 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)
CA1	**0.1064**				
Roof/Building	0.0014	0.90	1.00	0.73	0.82
Asphalt/Concrete	0.0794	0.90	1.00		
Grass	0.0256	0.20	0.25		
CA2	**0.1235**				
Roof/Building	0.0000	0.90	1.00	0.80	0.89
Asphalt/Concrete	0.1056	0.90	1.00		
Grass	0.0179	0.20	0.25		
Total Limit of Development	**0.2299**				
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 year = 2.78 x 0.50 x 104.19 x 0.1064 = 15.4 L/s
100 year = 2.78 x 0.50 x 178.56 x 0.1064 = 26.4 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 year = 2.78 x 0.80 x 104.19 x 0.1235 = 28.6 L/s
100 year = 2.78 x 0.89 x 178.56 x 0.1235 = 54.6 L/s

3.3.7 Post-Development Site Conditions

The catchment areas under post-development conditions 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.

The post-development CA2 contains the proposed commercial building and new sidewalk areas surrounding the building. The existing grass area between the front parking and the swale on Terry Fox Drive is 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 6m^2.

The area within the limit of development is comprised of one catchment (CA2) from which runoff will be conveyed by means of overland flow without restriction to the Terry Fox Drive right of way and one catchment (CA1) from which runoff will be directed to private sewers.

The location of the new building in CA2 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 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.

Run-off from CA2 will continue to be directed to the existing swale along Terry Fox Drive, following the existing drainage patterns. Run-off from the roof of the proposed building will be directed to the surface on the west side of the building via roof drains. The total impervious area for the catchment will remain the same as the existing conditions, with the existing asphalt surface now being occupied by the new building. 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)
CA1	**0.1064**				
Roof/Building	0.0014	0.90	1.00	0.68	0.76
Asphalt/Concrete	0.0711	0.90	1.00		
Grass	0.0339	0.20	0.25		
CA2	**0.1235**				
Roof/Building	0.0410	0.90	1.00	0.80	0.89
Asphalt/Concrete	0.0640	0.90	1.00		
Grass	0.0185	0.20	0.25		
Total Limit of Development	**0.2299**				
Roof/Building	0.0424	0.90	1.00	0.74	0.83
Asphalt/Concrete	0.1351	0.90	1.00		
Grass	0.0524	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 x 0.80 x 104.19 x 0.1235 = 28.6 L/s
100 year = 2.78 x 0.89 x 178.56 x 0.1235 = 54.6 L/s

3.3.9 Allowable Release Rate

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

A control device will be used to control the release rate from the CA1 area of the site. Calculations are summarized in Appendix A.

The allowable release rate from CA1 (for storm events up to the 100-year event) is equal to 5-year pre-development flow rate of 15.9 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.

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 0.10m in the modules (elevation of 101.15). The 100-year ponding will result in a water depth of 0.29m in the modules (elevation of 101.37).

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

3.3.11 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^3)	Available Storage (m^3)	Release Rate (L/s)	Required Storage (m^3)	Available Storage (m^3)
Allowable Discharge Rate from Area Directing Runoff to Private Sewers (L/s)							
CA1	0.1064	15.4	N/A	N/A	15.4	N/A	N/A
Total Actual Controlled Area Release Rate (L/s)							
CA1	0.1064	9.5	7.0	17.9	14.8	16.0	17.9
Pre-Development Runoff Rate							
CA2	0.1235	28.6	N/A	N/A	54.6	N/A	N/A
Post-Development Unrestricted Area Runoff Rate							
CA2	0.1235	28.6	N/A	N/A	54.6	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 equal to or 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 road allowance remains unchanged from 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 14.8L/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 CA1 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:

Table 8.3.11
Water Balance Components - Carp River Subwatershed

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 0.81. In section 3.3.7 of the report, the post-development runoff coefficient was calculated to be 0.80, where 100m^2 of the previous asphalt area has been replaced with grass with the new development. 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 will be 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^3. (Robinson Report page 3)

The middle pond has a surface area of approximately 8,000 m^2 and an average permanent pond depth of 1.5 m (estimated permanent volume of 8,000 x 1.5 = 12,000 m^3). The estimated volume of excavation for the middle pond was 31,000 m^3 resulting in an active storage volume of significantly more than 1,200 m^3. (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 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 L/day x 4 people
75L/day x 4 people
25L/day x 20 people
= 1900L/day ÷(9hrs/day x 60min/hr x60sec/min)
= 0.06 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 L/day x 2 water closets
= 2,460 L/day ÷(11hrs/day x 60min/hr x60sec/min)
= 0.06 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
Unit 2B: Average daily demand = 275 L/day x 3 people
75L/day x 1 people
25L/day x 25 people
= 1525L/day ÷(9hrs/day x 60min/hr x60sec/min)
= 0.05 L/s

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 L/sec

Peaking Factor = 1.5

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

Infiltration

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

Total Peak Sanitary Flow = 4.53 + 0.48 = 5.01 L/sec

4.2 Sanitary Sewer

4.2.1 Proposed Sanitary Service Lateral

The maximum peak sanitary flow for the proposed commercial building is 0.34L/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 x 49.8 L/s = 32.4 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 5th, 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 L/s x 1.5 = 0.26 L/s
- Peak hourly demand (factor of 1.8) = 0.26 L/s x 1.8 = 0.47 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 L/s x 1.5 = 4.53 L/s
- Peak hourly demand (factor of 1.8) = 4.53 L/s x 1.8 = 8.15 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): 179m^2
- Building #2 Existing (East Side Mario's Restaurant): 571m^2
- Building #3 Existing (Swiss Chalet Restaurant): 527m^2
- Building #4 Existing (Previously D'Arcy McGee's): 497m^2
- Building #5 Proposed Dental Office, Pharmacy and Medical Clinic: 410m^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. Hyrdrant 2 is 140m to the principle entrance of the builing. 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 L/sec x 60 sec/min = 6996 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.

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

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

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

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

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

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

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							
Start	Along	End	Start m	End* m	Start** m	End m	Ps kPa	Pe kPa	Q m³/sec	V m/sec	D m	A m²
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 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 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: May 12, 2026

PRE-DEVELOPEMNT CATCHMENT AREA 1 - CA1

Runoff Coefficient Equation

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

Pre- Dev run-off Coefficient "C"

Area	Surface	Ha	"C"	5 yr C_{avg}
Total	Roof	0.0014	0.90	**0.73**
0.1064	Asphalt/Concrete	0.0794	0.90	
	Grass	0.0256	0.20	

5 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.50	104.19	0.11
2.78CIA= 15.41			

**Use a 10 minute time of concentration for 5 year

Total Runoff Rate: **15.41 L/s**

Area	Surface	Ha	"C"	100 yr C_{avg}
Total	Roof	0.0014	1.00	**0.82**
0.1064	Asphalt/Concrete	0.0794	1.00	
	Grass	0.0256	0.25	

100 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.50	178.56	0.11
2.78CIA= 26.41			

**Use a 10 minute time of concentration for 100 year

Total Runoff Rate: **26.41 L/s**

APPENDIX A: STORMWATER MANAGEMENT MODEL
PRE-DEVELOPMENT FLOW

Client: 1763295 Ontario Inc.
Job No.: 250848
Location: 41 Edgewater Street, Kanata ON
Date: May 12, 2026

PRE-DEVELOPEMNT CATCHMENT AREA 2 - CA2

Runoff Coefficient Equation

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

Pre- Dev run-off Coefficient "C"

Area	Surface	Ha	"C"	5 yr C_{avg}
Total	Roof	0.0000	0.90	**0.80**
0.1235	Asphalt/Concrete	0.1056	0.90	
	Grass	0.0179	0.20	

5 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.80	104.19	0.12
2.78CIA= 28.62			

**Use a 10 minute time of concentration for 5 year

Total Runoff Rate: **28.62 L/s**

Area	Surface	Ha	"C"	100 yr C_{avg}
Total	Roof	0.0000	1.00	**0.89**
0.1235	Asphalt/Concrete	0.1056	1.00	
	Grass	0.0179	0.25	

100 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.89	178.56	0.12
2.78CIA= 54.56			

**Use a 10 minute time of concentration for 100 year

Total Runoff Rate: **54.56 L/s**

Kollaard Associates Engineers

Civil ●Geotechnical ●Hydrogeological ●Inspection Testing ●Septic Systems Grading ●Structural ● Environmental ●

210 Prescott Street, Unit 1 P.O. Box 189 Kemptville, Ontario K0G 1J0

APPENDIX A: STORMWATER MANAGEMENT MODEL

REQUIRED STORAGE VS. RELEASE RATE

Client: 1763295 Ontario Inc.
Job No.: 250848
Location: 41 Edgewater Street, Kanata ON
Date: May 12, 2026

Post Dev run-off Coefficient "C" - CA1

			5 Year Event		100 Year Event	
Area (ha)	Surface	Area (ha)	"C"	C_{avg}	"C" x 1.25	$C_{100\ avg}$
Total	Roof	0.0014	0.90	**0.68**	1.00	**0.76**
	Asphalt/Concrete	0.0711	0.90		1.00	
0.1064	Grass	0.0339	0.20		0.25	

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

Runoff Coeffcient, C = **0.68** 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 (L/sec)	Storage Required (m^3)									
0	230.5	46.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	141.2	28.4	8.5	7.0	5.5	4.0	2.5	1.0	-0.5	-2.0	-3.5	-5.0
10	104.2	21.0	12.6	9.6	6.6	3.6	0.6	-2.4	-5.4	-8.4	-11.4	-14.4
15	83.6	16.8	15.1	10.6	6.1	1.6	-2.9	-7.4	-11.9	-16.4	-20.9	-25.4
20	70.3	14.1	17.0	11.0	5.0	-1.0	-7.0	-13.0	-19.0	-25.0	-31.0	-37.0
25	60.9	12.2	18.4	10.9	3.4	-4.1	-11.6	-19.1	-26.6	-34.1	-41.6	-49.1
30	53.9	10.8	19.5	10.5	1.5	-7.5	-16.5	-25.5	-34.5	-43.5	-52.5	-61.5
35	48.5	9.8	20.5	10.0	-0.5	-11.0	-21.5	-32.0	-42.5	-53.0	-63.5	-74.0
40	44.2	8.9	21.3	9.3	-2.7	-14.7	-26.7	-38.7	-50.7	-62.7	-74.7	-86.7
45	40.6	8.2	22.1	8.6	-4.9	-18.4	-31.9	-45.4	-58.9	-72.4	-85.9	-99.4
50	37.7	7.6	22.7	7.7	-7.3	-22.3	-37.3	-52.3	-67.3	-82.3	-97.3	-112.3
55	35.1	7.1	23.3	6.8	-9.7	-26.2	-42.7	-59.2	-75.7	-92.2	-108.7	-125.2
60	32.9	6.6	23.9	5.9	-12.1	-30.1	-48.1	-66.1	-84.1	-102.1	-120.1	-138.1
65	31.0	6.2	24.4	4.9	-14.6	-34.1	-53.6	-73.1	-92.6	-112.1	-131.6	-151.1
70	29.4	5.9	24.8	3.8	-17.2	-38.2	-59.2	-80.2	-101.2	-122.2	-143.2	-164.2
75	27.9	5.6	25.2	2.7	-19.8	-42.3	-64.8	-87.3	-109.8	-132.3	-154.8	-177.3
80	26.6	5.3	25.6	1.6	-22.4	-46.4	-70.4	-94.4	-118.4	-142.4	-166.4	-190.4
85	25.4	5.1	26.0	0.5	-25.0	-50.5	-76.0	-101.5	-127.0	-152.5	-178.0	-203.5
90	24.3	4.9	26.4	-0.6	-27.6	-54.6	-81.6	-108.6	-135.6	-162.6	-189.6	-216.6
95	23.3	4.7	26.7	-1.8	-30.3	-58.8	-87.3	-115.8	-144.3	-172.8	-201.3	-229.8
Maximum Storage Rate =			26.7	11.0	6.6	4.0	2.5	1.0	0.0	0.0	0.0	0.0

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

Runoff Coeffcient, C = **0.76** 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 (L/sec)	Storage Required (m^3)									
0	398.6	89.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	242.7	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	40.1	24.1	21.1	18.1	15.1	12.1	9.1	6.1	3.1	0.1	-2.9
15	142.9	32.1	28.9	24.4	19.9	15.4	10.9	6.4	1.9	-2.6	-7.1	-11.6
20	120.0	27.0	32.4	26.4	20.4	14.4	8.4	2.4	-3.6	-9.6	-15.6	-21.6
25	103.8	23.3	35.0	27.5	20.0	12.5	5.0	-2.5	-10.0	-17.5	-25.0	-32.5
30	91.9	20.7	37.2	28.2	19.2	10.2	1.2	-7.8	-16.8	-25.8	-34.8	-43.8
35	82.6	18.6	39.0	28.5	18.0	7.5	-3.0	-13.5	-24.0	-34.5	-45.0	-55.5
40	75.1	16.9	40.5	28.5	16.5	4.5	-7.5	-19.5	-31.5	-43.5	-55.5	-67.5
45	69.1	15.5	41.9	28.4	14.9	1.4	-12.1	-25.6	-39.1	-52.6	-66.1	-79.6
50	64.0	14.4	43.1	28.1	13.1	-1.9	-16.9	-31.9	-46.9	-61.9	-76.9	-91.9
55	59.6	13.4	44.2	27.7	11.2	-5.3	-21.8	-38.3	-54.8	-71.3	-87.8	-104.3
60	55.9	12.6	45.2	27.2	9.2	-8.8	-26.8	-44.8	-62.8	-80.8	-98.8	-116.8
65	52.6	11.8	46.2	26.7	7.2	-12.3	-31.8	-51.3	-70.8	-90.3	-109.8	-129.3
70	49.8	11.2	47.0	26.0	5.0	-16.0	-37.0	-58.0	-79.0	-100.0	-121.0	-142.0
75	47.3	10.6	47.8	25.3	2.8	-19.7	-42.2	-64.7	-87.2	-109.7	-132.2	-154.7
80	45.0	10.1	48.5	24.5	0.5	-23.5	-47.5	-71.5	-95.5	-119.5	-143.5	-167.5
85	43.0	9.7	49.2	23.7	-1.8	-27.3	-52.8	-78.3	-103.8	-129.3	-154.8	-180.3
90	41.1	9.2	49.9	22.9	-4.1	-31.1	-58.1	-85.1	-112.1	-139.1	-166.1	-193.1
95	39.4	8.9	50.5	22.0	-6.5	-35.0	-63.5	-92.0	-120.5	-149.0	-177.5	-206.0
100	37.9	8.5	51.1	21.1	-8.9	-38.9	-68.9	-98.9	-128.9	-158.9	-188.9	-218.9
Maximum Storage Rate =			51.1	28.5	20.4	15.4	12.1	9.1	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: May 12, 2026

GRAF Storage Modules

number of modules in layer 1 (EcoBlock Inspect Smart)	76
storage volume per module (m^3)	0.2
Height of modules (m)	0.33
Module invert	101.05
Top of module	101.38

Concrete Storm Manhole

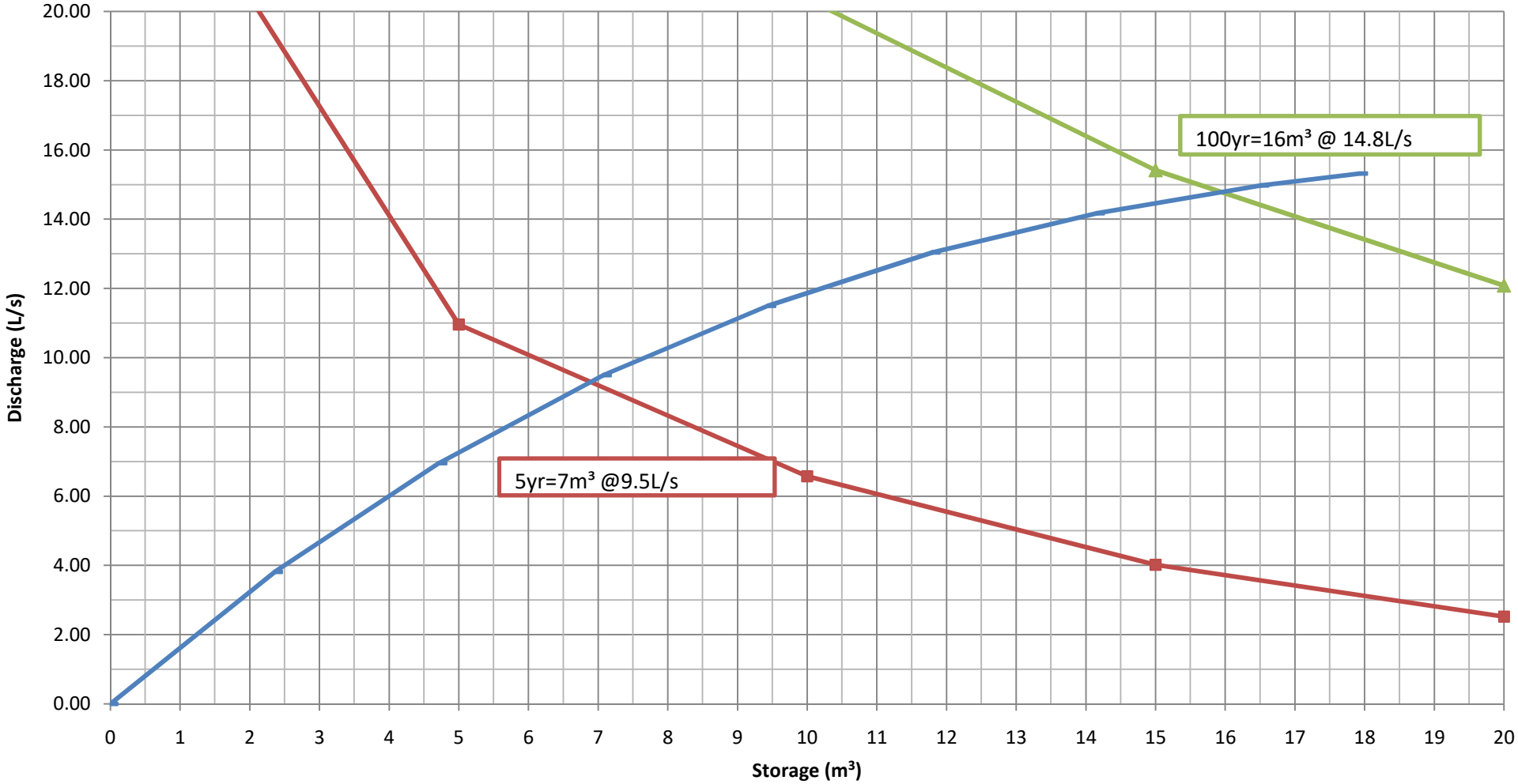
Top of Grate Elevation	102
Outlet Invert Elevation	101
manhole diameter (m)	1.2

Tempest MHF

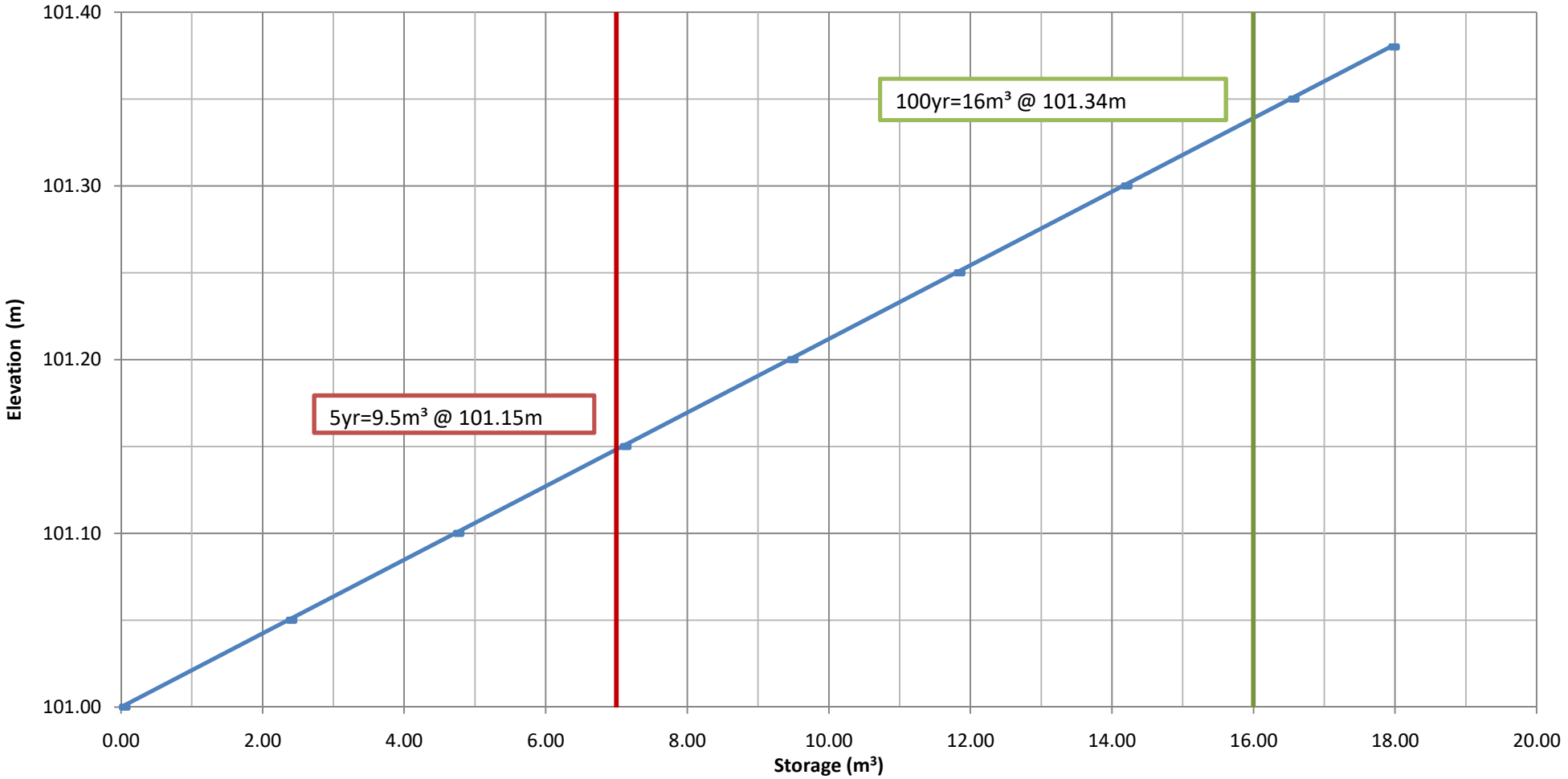
Pipe invert	101.00

Stage, WSE Elev (m)	Comments	Layer Increment (m)	GRAF Storage Modules Layer 1			Manhole Storage (STM-MH01)		Tempest MHF ICD		Cummulative Storage Volume (m^3)	Total ICD Flow (L/s)
			Module height (m)	Layer Thickness (m)	Layer Volume (m^3)	Head (m)	Layer Volume (m^3)	Head (m)	ICD Flow (L/sec)		
101.380	Top of Module	0.030	0.330	0.030	1.382	0.38	0.03	0.38	15.32	17.93	15.3
101.350		0.050	0.300	0.050	2.303	0.35	0.06	0.35	14.97	16.52	15.0
101.300		0.050	0.250	0.050	2.303	0.30	0.06	0.30	14.17	14.16	14.2
101.250		0.050	0.200	0.050	2.303	0.25	0.06	0.25	13.04	11.80	13.0
101.200		0.050	0.150	0.050	2.303	0.20	0.06	0.20	11.50	9.44	11.5
101.150		0.050	0.100	0.050	2.303	0.15	0.06	0.15	9.49	7.08	9.5
101.100		0.050	0.050	0.050	2.303	0.10	0.06	0.10	6.95	4.72	7.0
101.050	Module Invert	0.050	0.000	0.050	2.303	0.05	0.06	0.05	3.81	2.36	3.8
101.000	Top of stone base elevation	0.050	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0

APPENDIX A: STORMWATER MANAGEMENT MODEL
Storage-Discharge Curve
CA1



APPENDIX A: STORMWATER MANAGEMENT MODEL
Stage-Storage Curve
CA1



APPENDIX A: STORMWATER MANAGEMENT MODEL
POST-DEVELOPMENT FLOW

Client: 1763295 Ontario Inc.
Job No.: 250848
Location: 41 Edgewater Street, Kanata ON
Date: May 12, 2026

POST-DEVELOPEMNT CATCHMENT AREA 2 - CA2

Runoff Coefficient Equation

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

Pre- Dev run-off Coefficient "C"

Area	Surface	Ha	"C"	5 yr C_{avg}
Total	Roof	0.0410	0.90	**0.80**
0.1235	Asphalt/Concrete	0.0640	0.90	
	Grass	0.0185	0.20	

5 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.80	104.19	0.12
2.78CIA= 28.62			

**Use a 10 minute time of concentration for 5 year

Total Runoff Rate: **28.62 L/s**

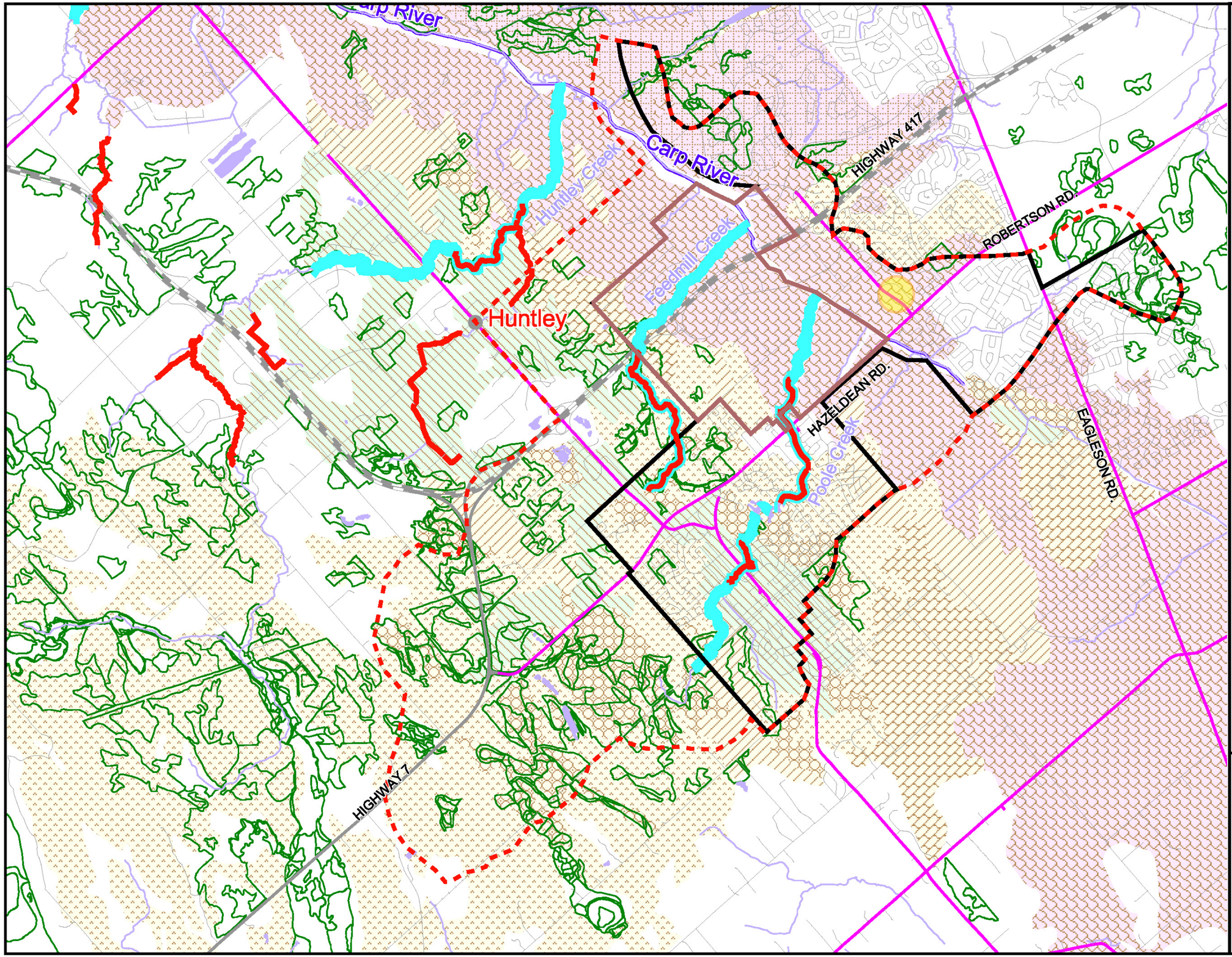
Area	Surface	Ha	"C"	100 yr C_{avg}
Total	Roof	0.0410	1.00	**0.89**
0.1235	Asphalt/Concrete	0.0640	1.00	
	Grass	0.0185	0.25	

100 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.89	178.56	0.12
2.78CIA= 54.56			

**Use a 10 minute time of concentration for 100 year

Total Runoff Rate: **54.56 L/s**

262 mm/yr Infiltration for High GW Recharge areas • 104 mm/yr Infiltration for Moderate GW Recharge areas • 73 mm/yr infiltration for Low GW Recharge areas



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

N

500 0 500 1000 1500 Meters

CARP RIVER WATERSHED

Ottawa

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: May 12, 2026

PRE-DEVELOPEMNT TOTAL AREA - TOTAL CA

Runoff Coefficient Equation

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

Pre- Dev run-off Coefficient "C"

Area	Surface	Ha	"C"	5 yr C_{avg}
Total	Roof	0.0014	0.90	**0.77**
0.2299	Asphalt/Concrete	0.1850	0.90	
	Grass	0.0435	0.20	

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**	

Area	Surface	Ha	"C"	100 yr C_{avg}
Total	Roof	0.0014	1.00	**0.86**
0.2299	Asphalt/Concrete	0.1850	1.00	
	Grass	0.0435	0.25	

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: May 12, 2026

POST-DEVELOPEMNT TOTAL AREA - TOTAL CA

Runoff Coefficient Equation

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

Pre- Dev run-off Coefficient "C"

Area	Surface	Ha	"C"	5 yr C_{avg}
Total	Roof	0.0424	0.90	**0.74**
0.2299	Asphalt/Concrete	0.1351	0.90	
	Grass	0.0524	0.20	

5 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
5 Year	0.74	104.19	0.23
2.78CIA= 49.28			
**Use a	10	minute time of concentration for 5 year	
Total Runoff Rate:		**49.28 L/s**	

Area	Surface	Ha	"C"	100 yr C_{avg}
Total	Roof	0.0424	1.00	**0.83**
0.2299	Asphalt/Concrete	0.1351	1.00	
	Grass	0.0524	0.25	

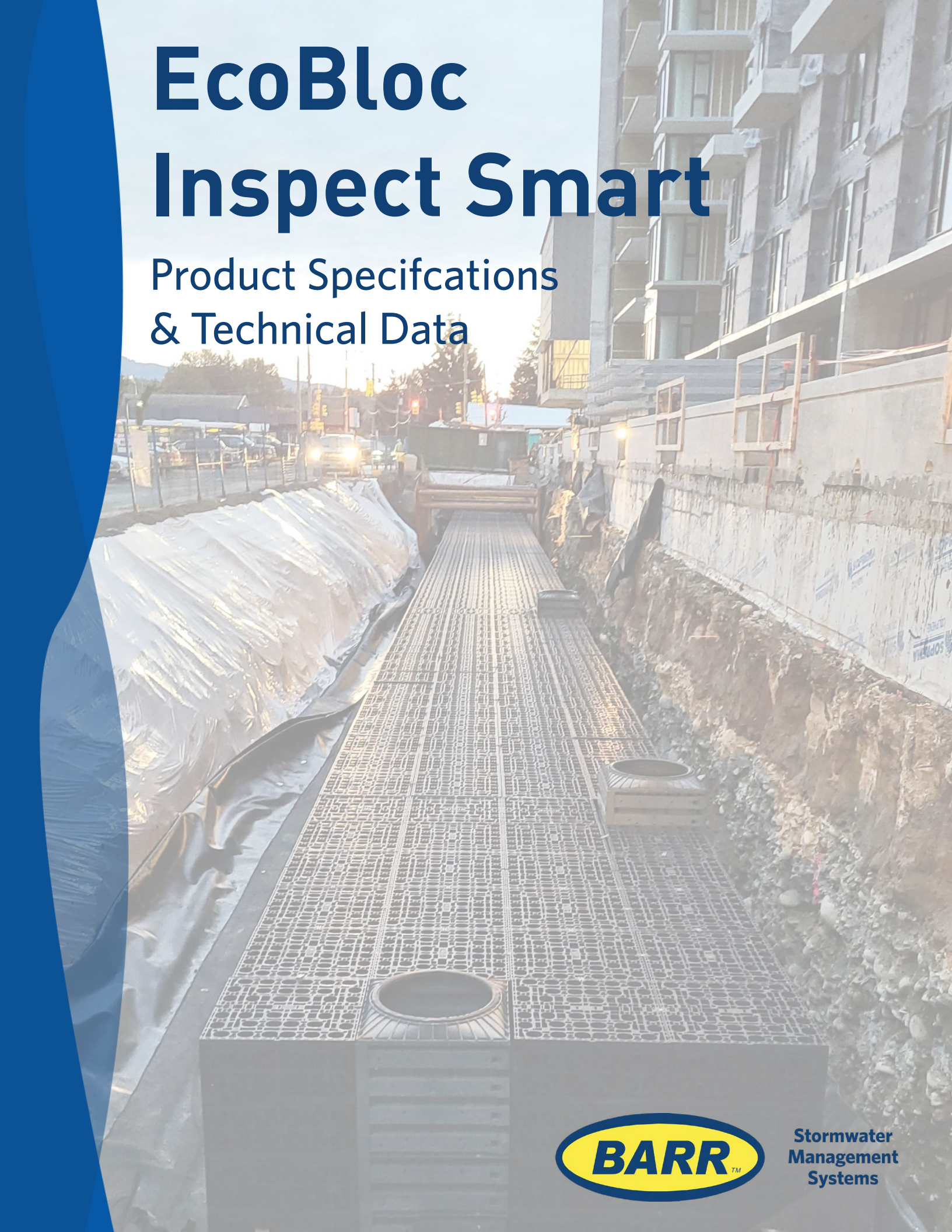
100 Year Event			
Pre Dev.	**C**	**Intensity**	**Area**
100 Year	0.83	178.56	0.23
2.78CIA= 94.72			
**Use a	10	minute time of concentration for 100 year	
Total Runoff Rate:		**94.72 L/s**	

Appendix B:Product Information

- GRAF Module Information
- Tempest Inlet Control Device

EcoBloc Inspect Smart

Product Specifcations & Technical Data

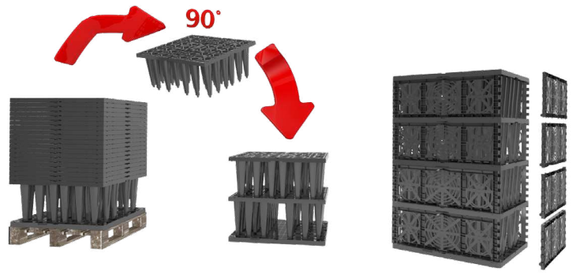


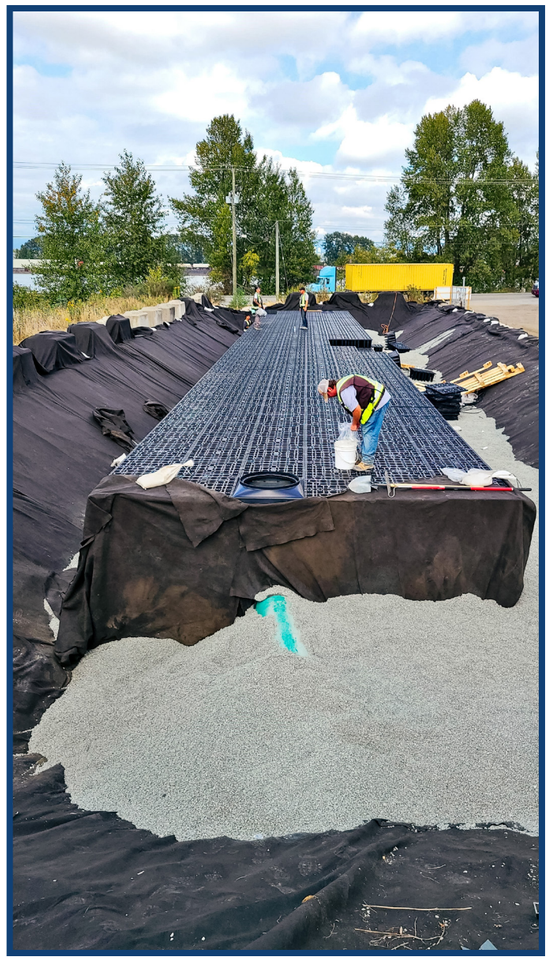
BARR™ Stormwater Management Systems

GRAF EcoBloc Inspect Smart Series

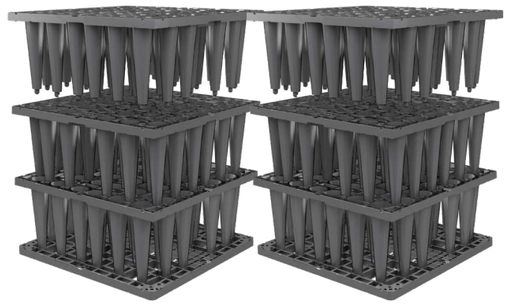
The next generation of GRAF Infiltration & Detention modules

Space Savings





Labour Savings



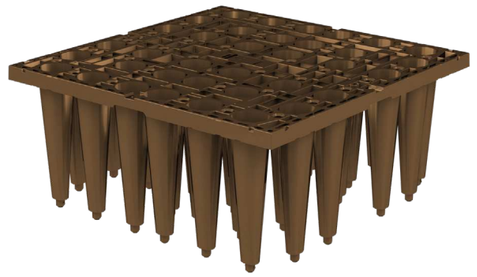
Infiltration & Detention Modules

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

Accesories

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.

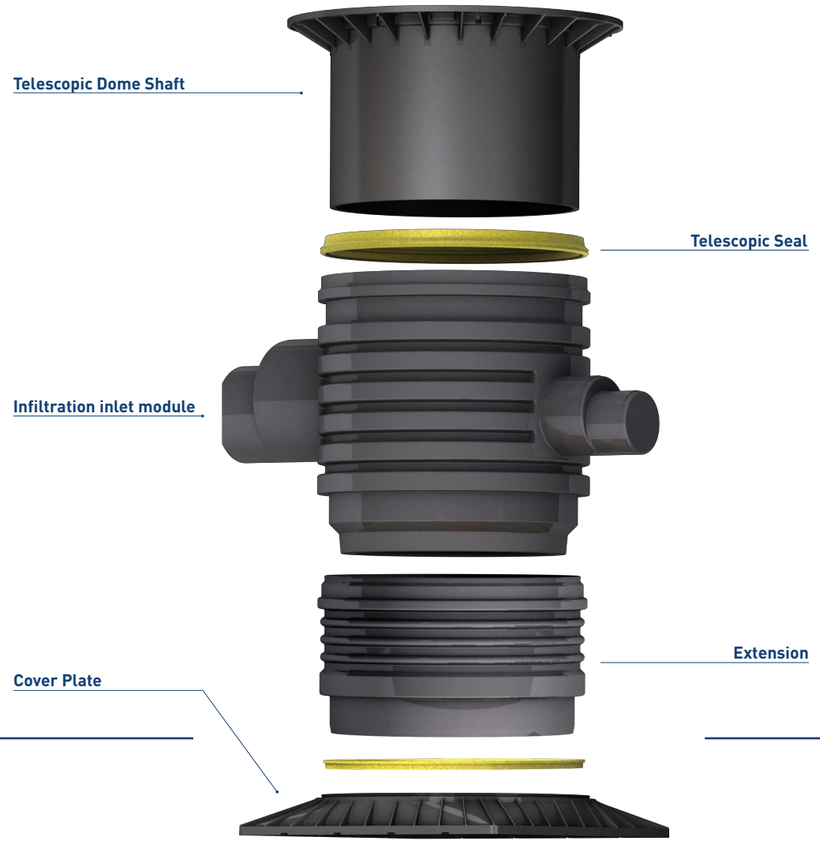
EPA04	4" Dia.	EPA12	12" Dia.
EPA06	6" Dia.	EPA15-PVC	15" Dia.
EPA08	8" Dia.	EPA18-PVC	18" Dia.
EPA10	10" Dia.	EPA21-PVC	21" Dia.

Shaft Systems

Innovative & Flexible design

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



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

EcoBloc Inspect Smart Plus shaft

EcoBloc Inspect Smart Plus shaft cover plate

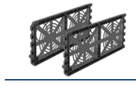
Universal component that forms the top connection to all EcoBloc Inspect Smart Plus Shafts.

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.

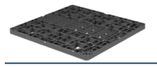
Volume [litres/gallons]	Length [mm/in]	Width [mm/in]	Height [mm/in]	Weight [kg/lbs]	Colour	Item no.
211/ 55.74	800/31.5	800/31.5	330/13	8.5/18.74	Black	450151



EcoBloc Inspect Smart end plates

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

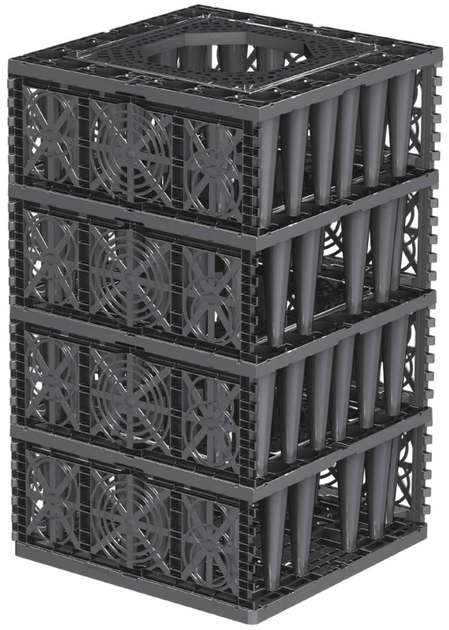
Item	Colour	Item no.
EcoBloc Inspect Smart end plates (set of 2)	Black	402503

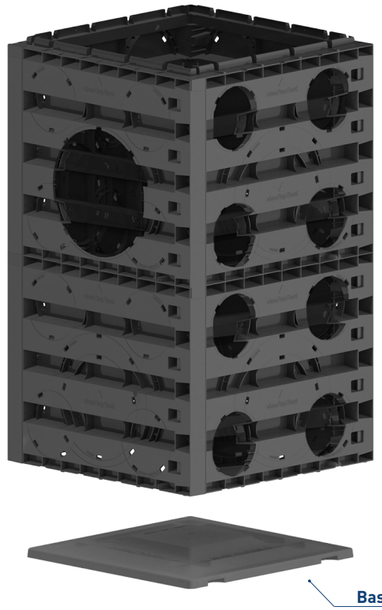


EcoBloc Inspect Smart base plate

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

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

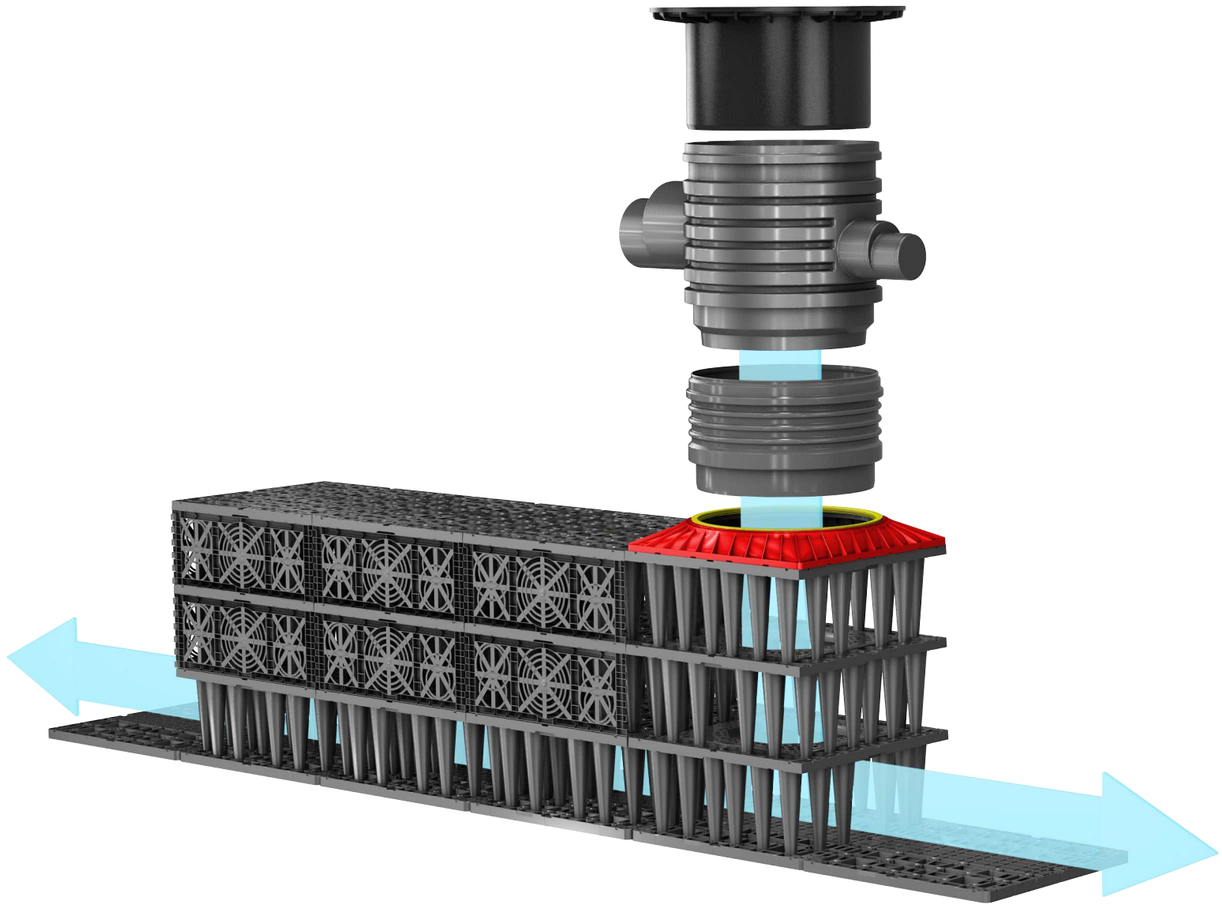
Vario 800 Flex cover & base plate set

Base and cover plate for Vario 800 Flex shaft.

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

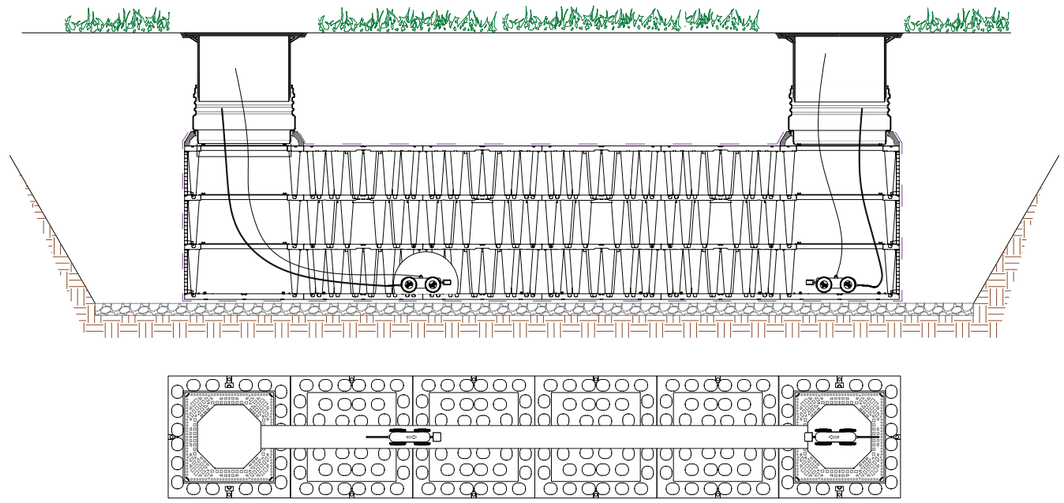
Inspectable and Cleanable

Open internal structure for inspection & cleaning



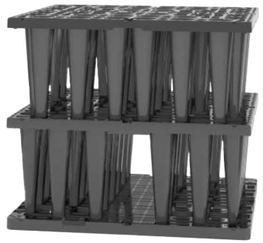
Orientation of the inspection channels

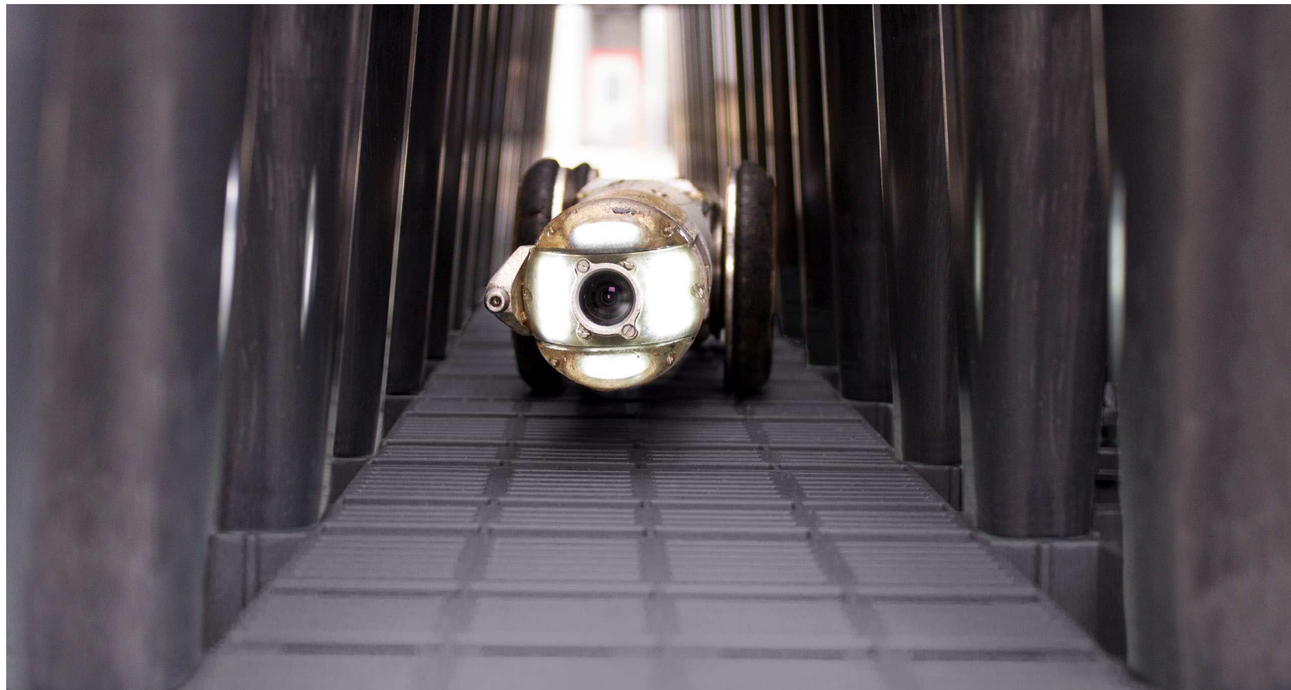
The inspection channels enable comprehensive inspection and flushing of the entire system. For this purpose, the inspection channels should run parrallel to the long side of the system and form a continuous tunnel. Access is usually gained via the inspection shaft end-face for both flushing nozzles and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



Cleanability of the Inspect Smart System

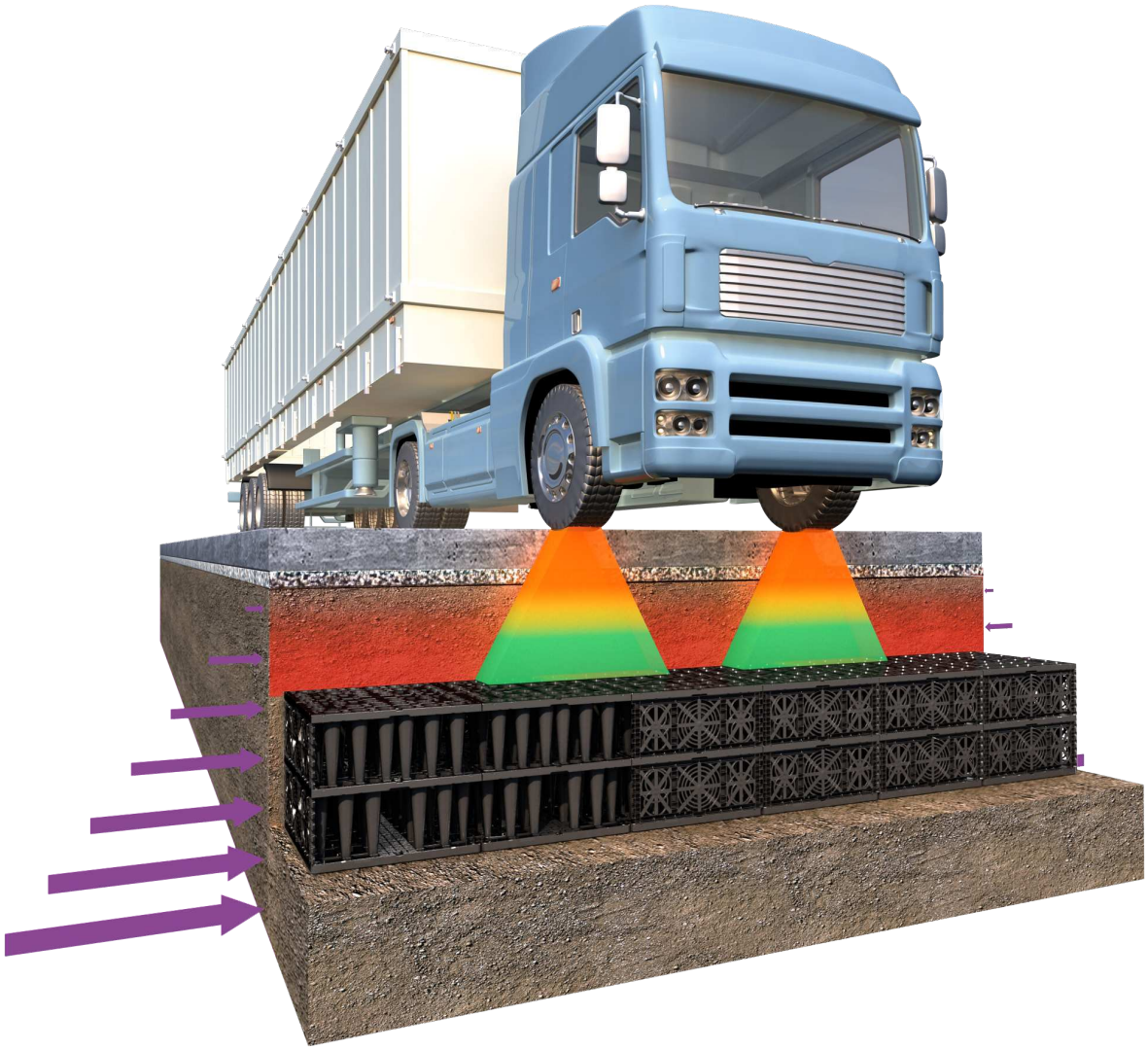
EcoBloc Inspect Smart systems have an integrated inspection channels that allow for easy inspection and maintenance. Flushing the entire system is accomplished by introducing washing nozzles into the system on one side of the tank and flushing any dirt and debris towards a suction hose on the opposite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





Load Distribution

Vertical & Lateral Resistances



Patented design

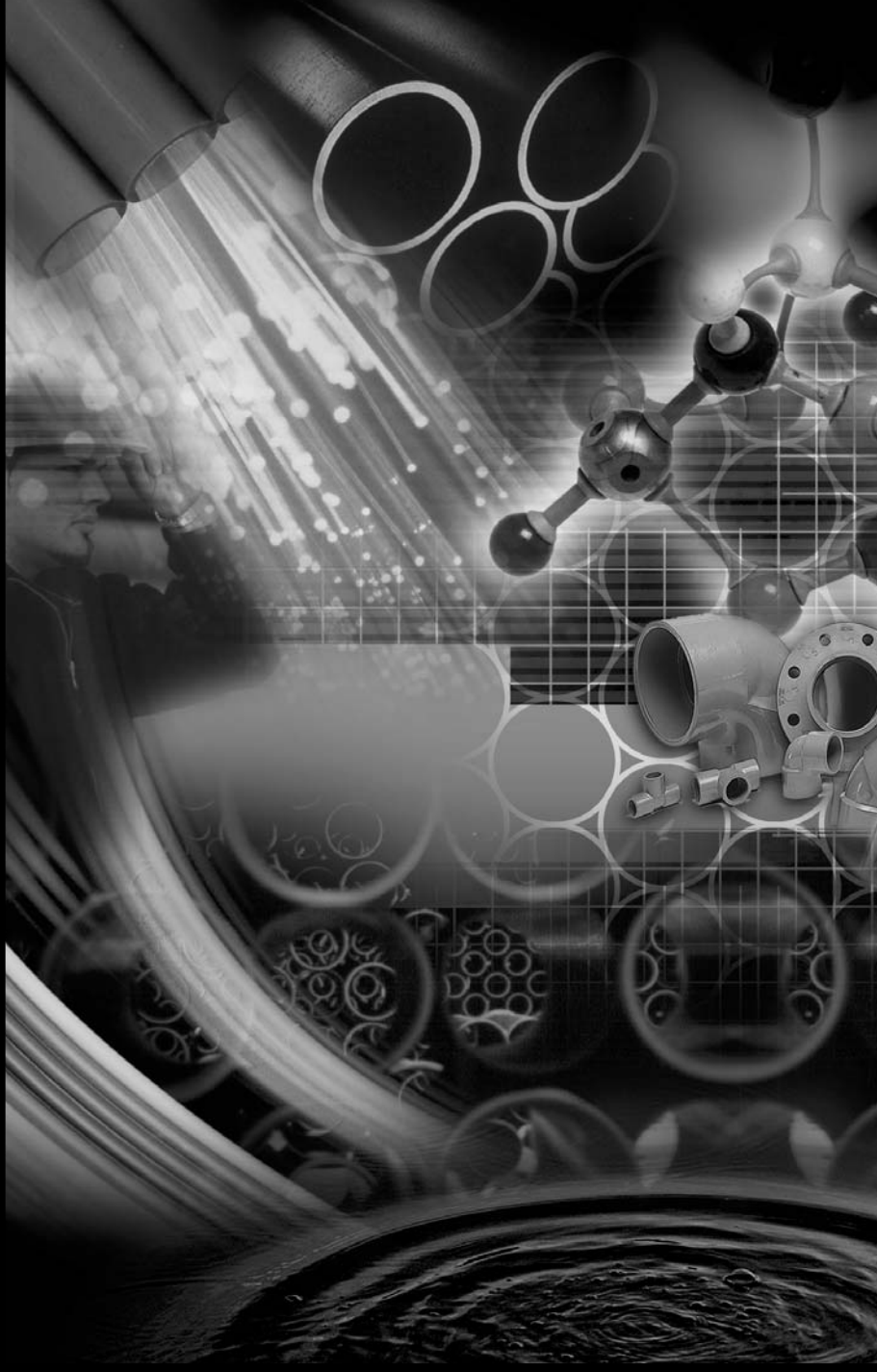
The design of Ecobloc Inspect Smart, Plus and Ultra is optimized for use as an underground structure for stormwater infiltration and detention. The patented pillar arrangement and the deck structure is optimized to spread vertical pressure evenly and precisely throughout the entire system.

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.

BARR™
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

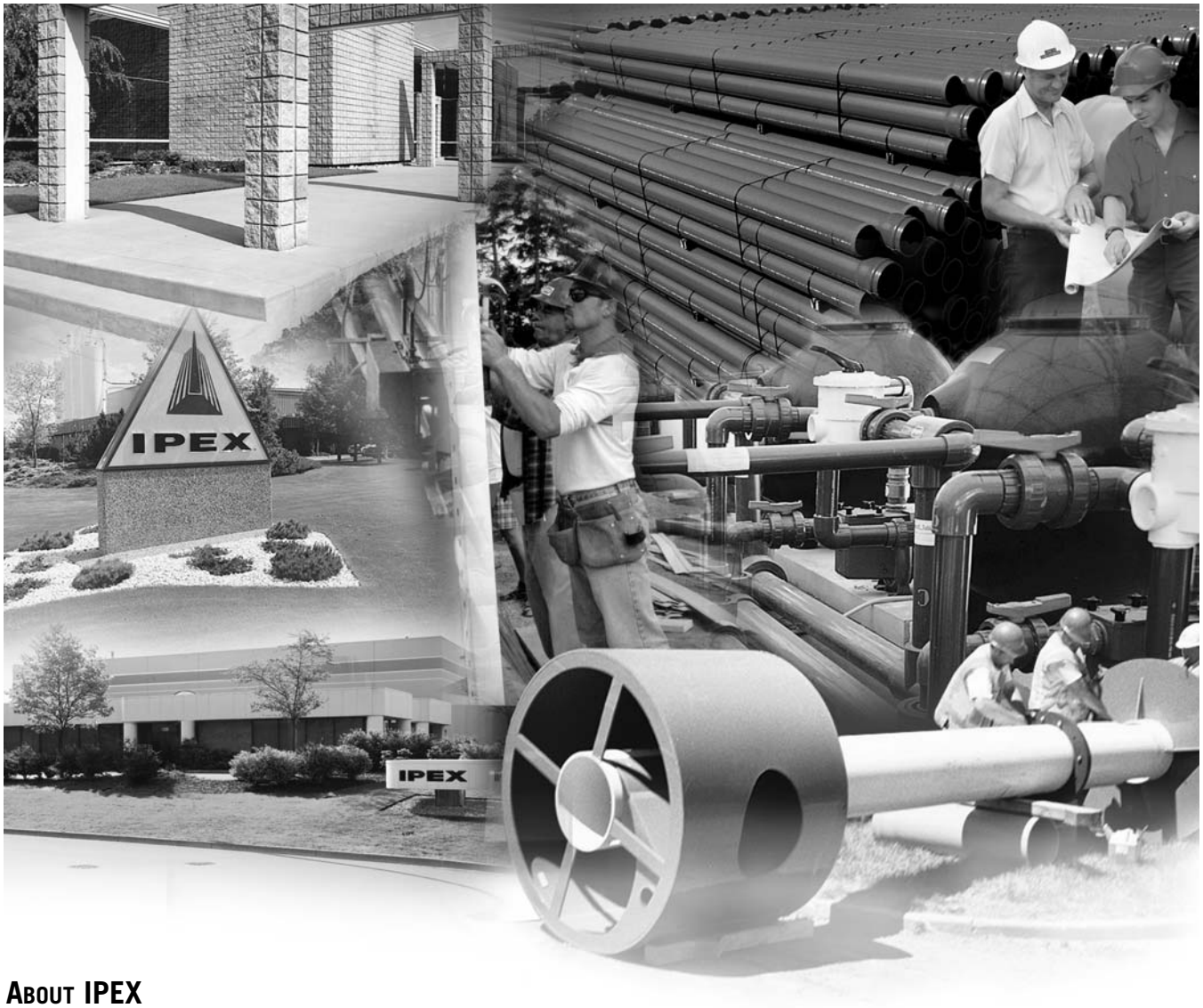
MHF (Medium to High Flow) ICD

IPEX

IPEX Tempest™ Inlet Control Devices

Municipal Technical Manual Series

Vol. I, 2nd Edition



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.

CONTENTS

TEMPEST INLET CONTROL DEVICES Technical Manual

About IPEX

Section One: **Product Information: TEMPEST Low, Medium Flow (LMF) ICD**

Purpose 4
Product Description 4
Product Function 4
Product Construction 4
Product Applications 4
Chart 1: LMF 14 Preset Flow Curves 5
Chart 2: LMF Flow Vs. ICD Alternatives 5

Product Installation

Instructions to assemble a TEMPEST LMF ICD into a square catch basin: 6
Instructions to assemble a TEMPEST LMF ICD into a round catch basin: 6

Product Technical Specification

General 7
Materials 7
Dimensioning 7
Installation 7

Section Two: **Product Information: TEMPEST High Flow (HF) & Medium, High Flow (MHF) ICD**

Product Description 8
Product Function 8
Product Construction 8
Product Applications 8
Chart 3: HF & MHF Preset Flow Curves 9

Product Installation

Instructions to assemble a TEMPEST HF or MHF ICD into a square catch basin: 10
Instructions to assemble a TEMPEST HF or MHF ICD into a round catch basin: 10
Instructions to assemble a TEMPEST HF Sump into a square or round catch basin: . . . 11

Product Technical Specification

General 11
Materials 11
Dimensioning 11
Installation 11

NOTE: Do not use or test the products in this manual with compressed air or other gases including air-over-water-boosters

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

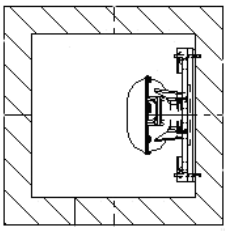
Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

Product Applications

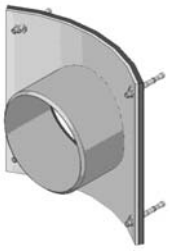
Will accommodate both square and round applications:

Square Application

Universal Mounting Plate



Round Application



+

Spigot CB Wall Plate

=

Universal Mounting Plate Hub Adapter

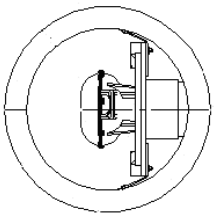


Chart 1: LMF 14 Preset Flow Curves

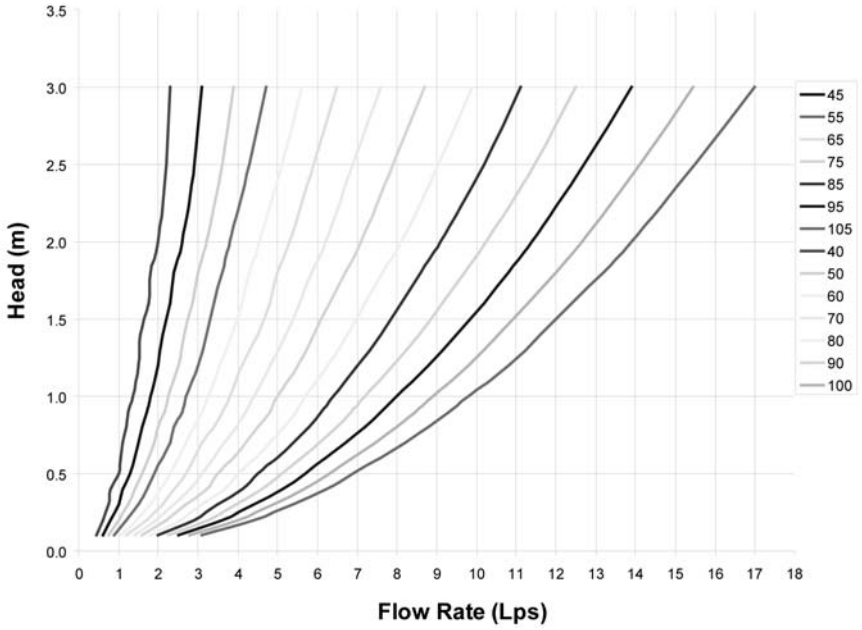
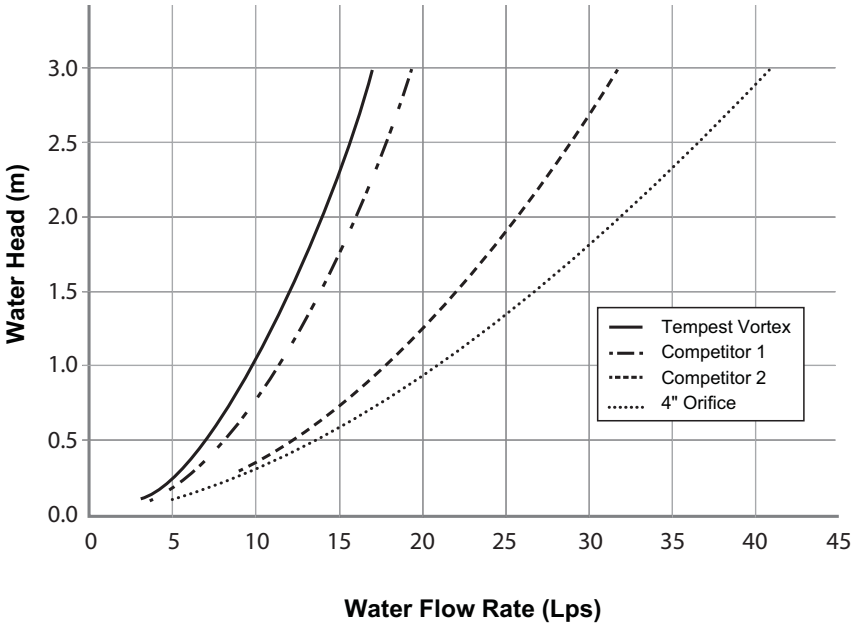


Chart 2: LMF Flow vs. ICD Alternatives



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.
- 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.

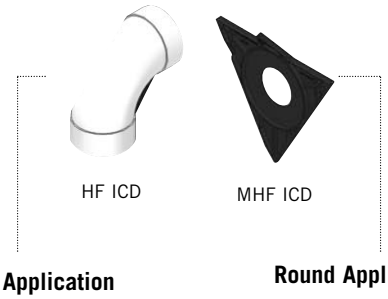
TEMPEST MHF (Medium to High Flow):
The MHF plate or plug is designed to control flow rates 9 L/s (143 gpm) or greater. It is not designed to prevent the propagation of odour and floatables.

Product Construction

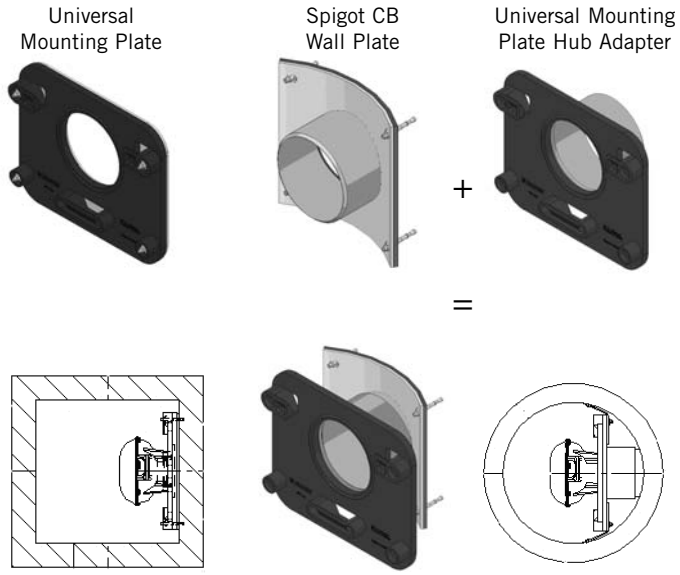
The HF, HF Sump and MHF ICDs are built to be light weight at a maximum weight of 6.8 Kg (14.6 lbs).

Product Applications

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



Square Application **Round Application**



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

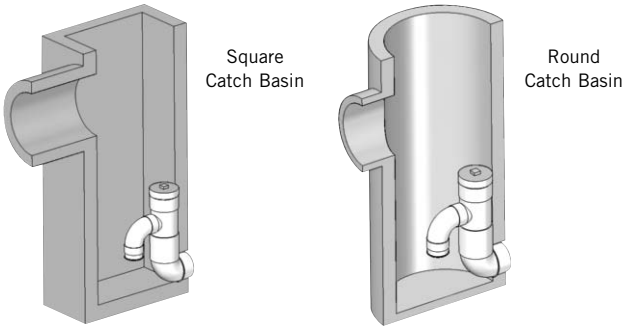
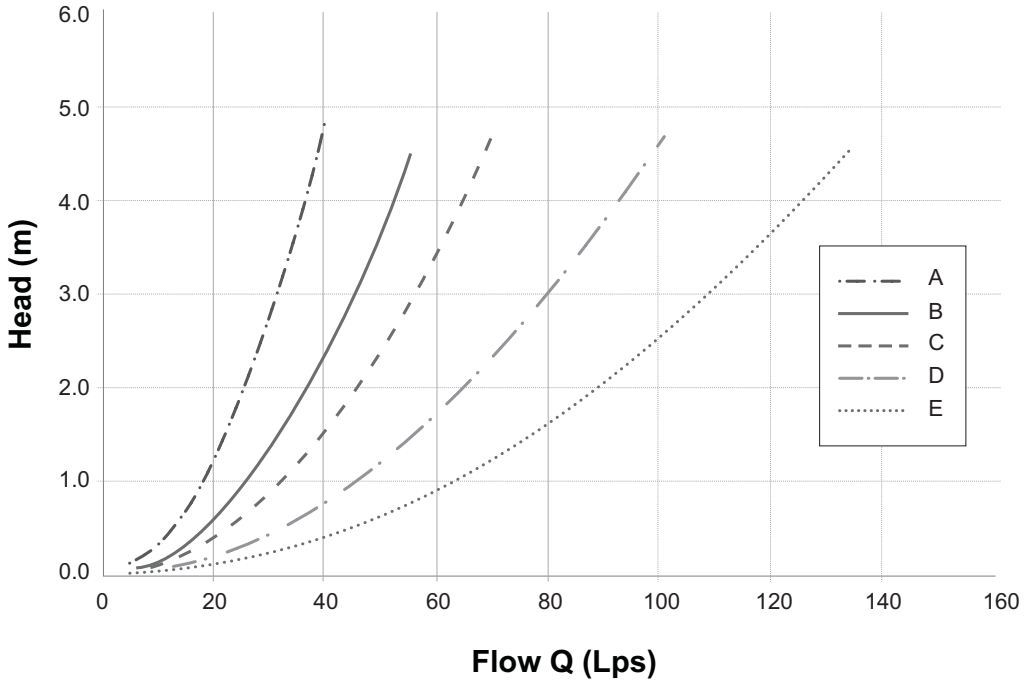


Chart 3: HF & MHF Preset Flow Curves



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 adapter, 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.
- Call your IPEX representative for more information or if you have any questions about our products.

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.
- 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 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.

NOTE: Do not use or test the products in this manual with compressed air or other gases including air-over-water-boosters

SALES AND CUSTOMER SERVICE

Canadian Customers call IPEX Inc.

Toll free: (866) 473-9462

www.ipexinc.com

U.S. Customers call IPEX USA LLC

Toll free: (800) 463-9572

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.

MNMNTPIP110817

IPEX

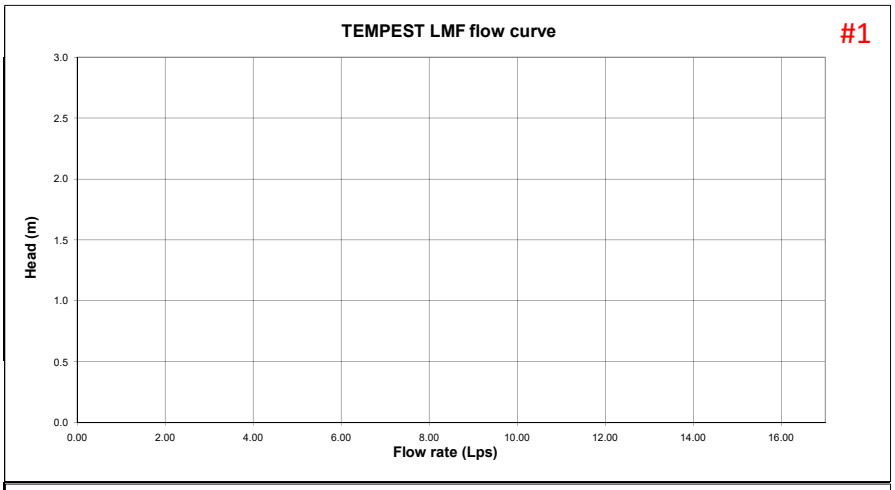
IPEX

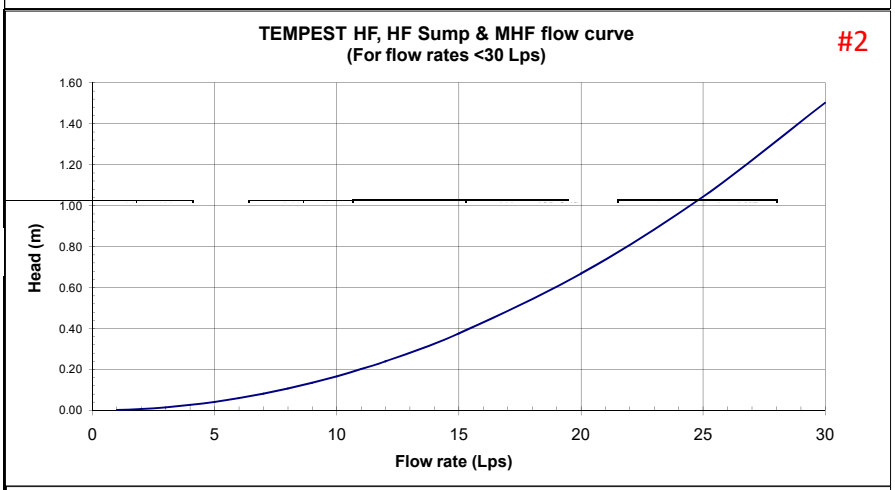
TEMPEST INLET CONTROL DEVICES

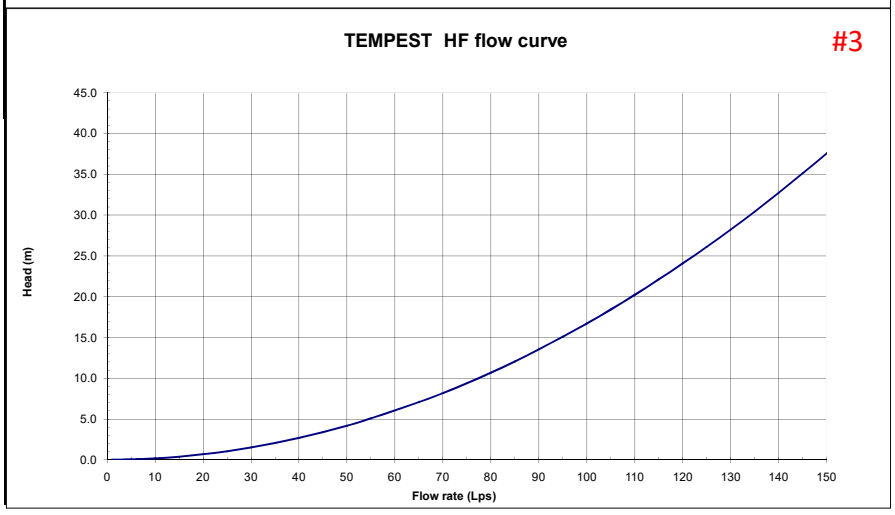
Flow Parameters

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.







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.

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

Kollaard Associates
Engineers

210 Prescott Street, Unit 1
P.O. Box 189
Kemptville, Ontario K0G 1J0

Civil • Geotechnical •
Structural • Environmental •
Materials Testing •

(613) 860-0923

FAX: (613) 258-0475

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

1. Exisiting 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 x60sec/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.

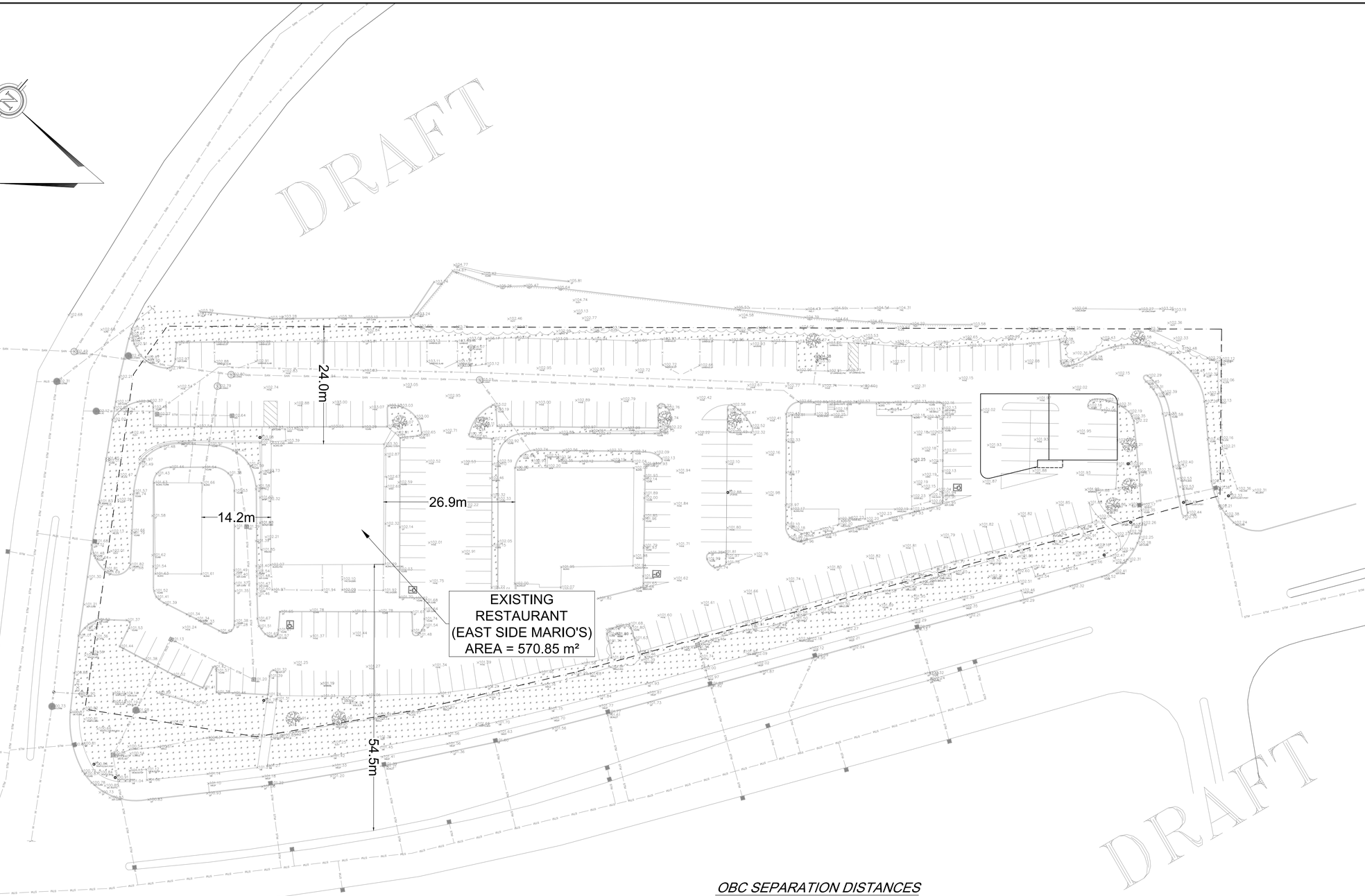
Formulae:

$$Q = KVS_{Tot}$$

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

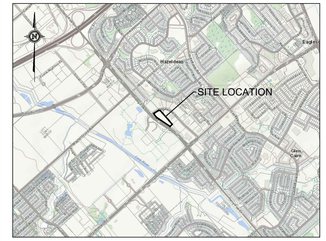
OBC Classification of Building Use	Group, Division	A,2 (OBC T-3.1.2.1)		
Assumed Type of Construction	(Most Protective Type)	Building is of limited-combustible construction. Floor		
Water Supply Coefficient (Table 1, OBC)	K	10		
Exposure Distance 1	7.1	<10	m	
Exposure Distance 2	54.5	>10	m	
Exposure 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	*per Table 2 on A-3.2.5.7 of the OBC*
		45	L/s	

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



OBC SEPARATION DISTANCES

SCALE = 1:400



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 — PROPOSED CATCHBASIN
- PR-MH — PROPOSED MAINTENANCE HOLE
- PR. RYCB — PROPOSED REAR YARD CATCHBASIN
- 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
- PROPOSED ENTRANCE

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION:
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

No.	REVISION	DATE	BY
1	FOR CCTV INSPECTION	2025.11.04	BM

CONSULTANTS

Kollaard Associates
Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

DESIGN: AVB
DRAWN: BM
CHECKED: AVB
APPROVED: AVB

STAMP

CLIENT NAME: 1763295 ONTARIO INC.
PROJECT NAME: PROPOSED COMMERCIAL DEVELOPMENT
PROJECT LOCATION: 41 EDGEWATER STREET, KANATA ON
DRAWING: OBC SEPARATION DISTANCES

PROJECT No.: 250848
DATE: 2026.04.06
SCALE: AS_NOTED
DRAWING No.: 2 OF 2

ARCH D

Kollaard Associates
Engineers
210 Prescott Street, Unit 1
P.O. Box 189
Kemptville, Ontario K0G 1J0

Civil • Geotechnical •
Structural • Environmental •
Hydrogeology

(613) 860-0923
FAX: (613) 258-0475

APPENDIX C: CALCULATION OF FIRE FLOW REQURIEMENTS - 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, masonary or metal walls)
0.6	for fire-resistive construction (fully protected frame, floors, roof)

Building#1

100% of floor 1 = 570.9 m^2

A = 571.0 m^2 (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 my be reduced by up to 50% for automatic sprinlker system

Reduction due to automatic sprinker 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)	Condtion	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)	Condtion		Charge
Side 1	14.2	3	-------->	15%
Side 2	98.1	5	-------->	0%
Side 3	26.9	4	-------->	10%
Side 4	29.2	4	-------->	10%
				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**

FUS SEPARATION DISTANCES

SCALE = 1:400

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 — PROPOSED CATCHBASIN
- PR-MH — PROPOSED MAINTENANCE HOLE
- PR. RYCB — PROPOSED REAR YARD CATCHBASIN
- EXISTING BOTTOM OF SLOPE
- EXISTING CENTERLINE OF FLOW
- EXISTING TOP OF SLOPE
- STM — EXISTING STORM SEWER
- SAN — EXISTING SANITARY SEWER
- W — EXISTING WATERMAIN
- 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
- LP — EXISTING LIGHT POST
- TEMPORARY BENCHMARK
- PROPOSED ENTRANCE

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

No.	REVISION	DATE	BY
1	FOR CCTV INSPECTION	2025.11.04	BM

CONSULTANTS

Kollaard Associates
Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

DESIGN	AVB
DRAWN	BM
CHECKED	AVB
APPROVED	AVB
STAMP	
CLIENT NAME	1763295 ONTARIO INC.
PROJECT No.	250848
PROJECT NAME	PROPOSED COMMERCIAL DEVELOPMENT
DATE	2026.04.06
PROJECT LOCATION	41 EDGEWATER STREET, KANATA ON
SCALE	AS_NOTED
DRAWING	FUS SEPARATION DISTANCES
DRAWING No.	1 OF 2

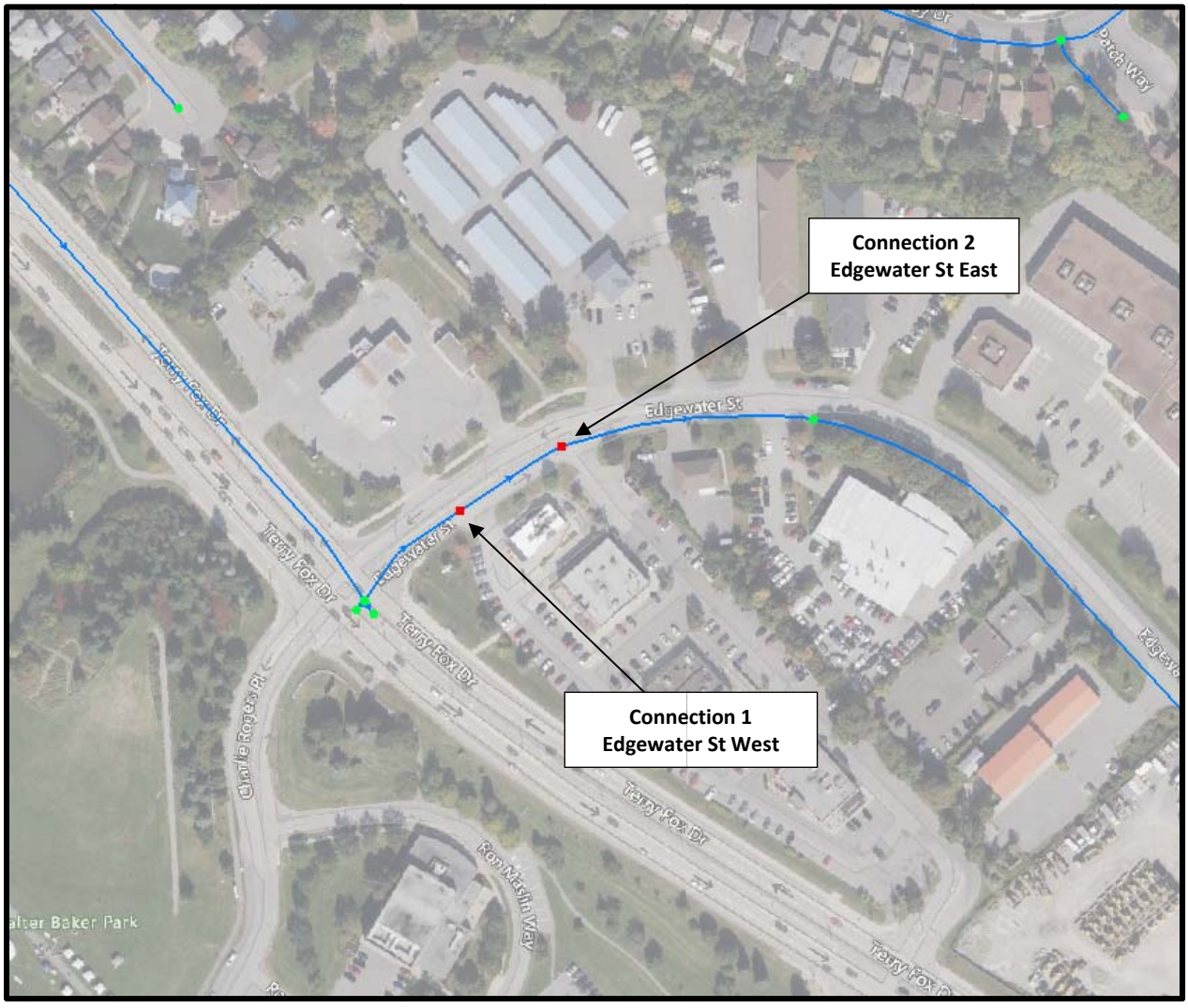
ARCH D

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

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.9	86.1
Peak Hour	155.7	77.1
Max Day plus Fire Flow #1	155.7	77.1

[1] Ground Elevation = 101.4 m

Connection 2 –Edgewater Street East

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.9	84.6
Peak Hour	155.7	75.7
Max Day plus Fire Flow #1	155.7	75.7

[1] Ground Elevation = 102.4 m

Notes

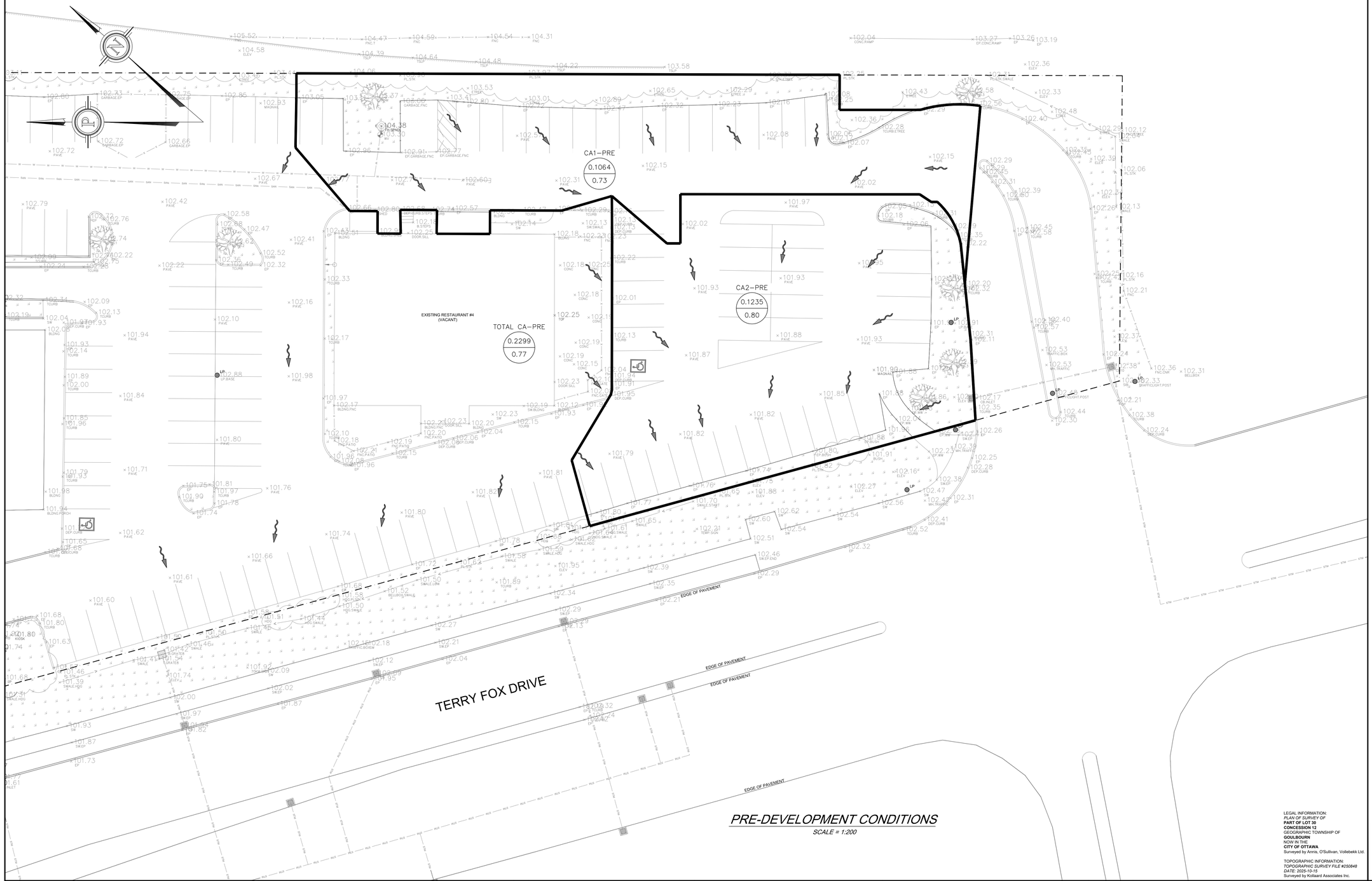
1. Any connection to a watermain 400 mm or larger should be approved by DWS as per the Water Design Guidelines Section 2.4 Review by Drinking Water Services.
2. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure 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 theisolation 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 Water Flows
- 250848 – POST – Controlled and Uncontrolled Areas
- 250848– GRD – Site Grading Plan
- 250848 – SER – Site Servicing Plan



PRE-DEVELOPMENT CONDITIONS

SCALE = 1:200

KEY PLAN

NOT TO SCALE

0 10 20
1:200 METRES

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
- EX FH — EXISTING HYDRANT
- EXISTING ROOF DRAIN
- LP — EXISTING LIGHT POST
- CATCHMENT AREA BOUNDARY
- CA — CATCHMENT LABEL
- AREA / C= — CATCHMENT AREA (HECTARES) / CATCHMENT 5-YEAR RUN-OFF COEFFICIENT
- PRE-DEVELOPMENT OVERLAND DRAINAGE ARROW

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION:
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

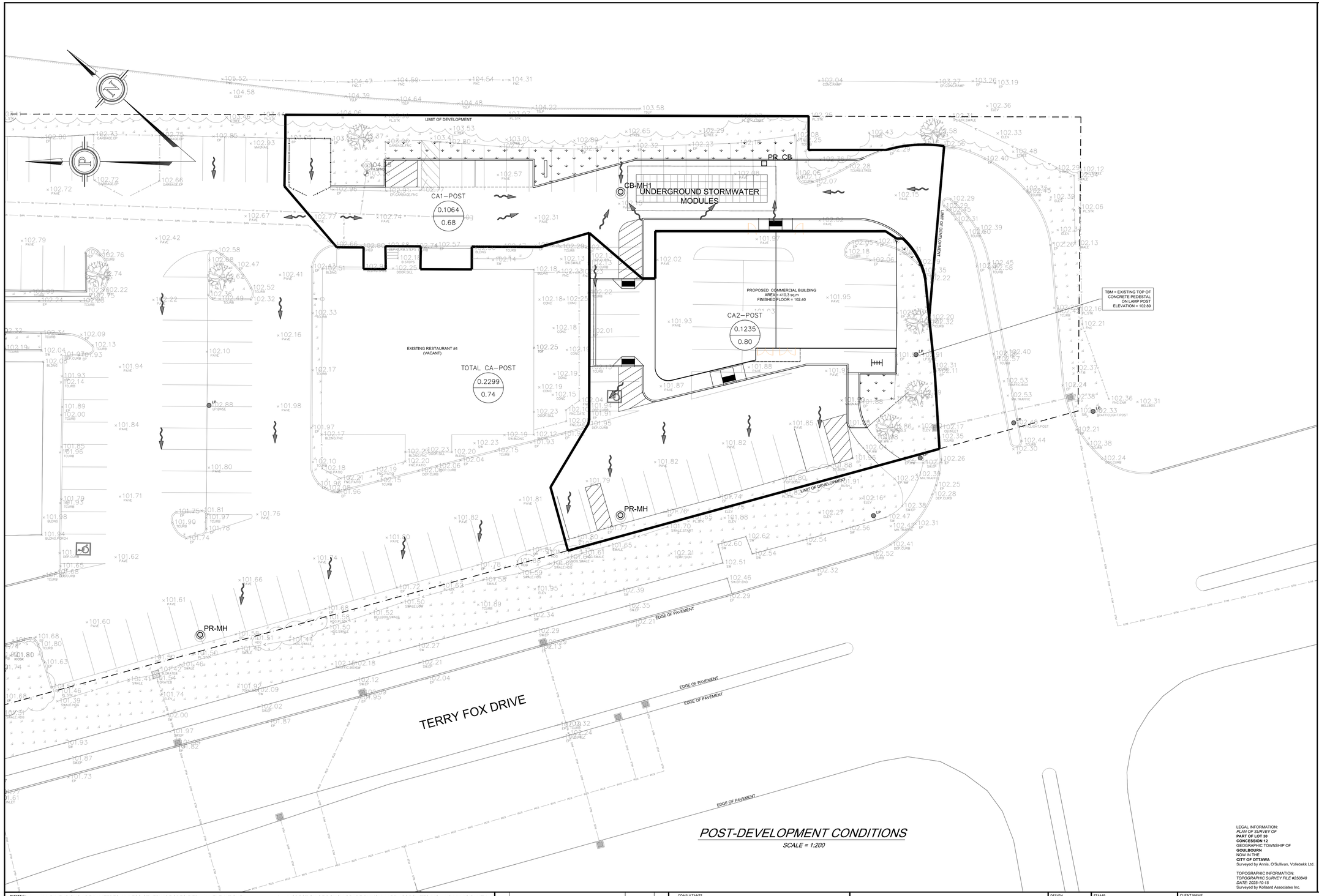
No.	REVISION	DATE	BY
##	COMMENT	2025.XXX.XX	XX

CONSULTANTS

Kollaard Associates
Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

DESIGN	AVB
DRAWN	BM
CHECKED	AVB
APPROVED	AVB
STAMP	
CLIENT NAME	1763295 ONTARIO INC.
PROJECT NAME	PROPOSED COMMERCIAL DEVELOPMENT
PROJECT LOCATION	41 EDGEWATER STREET, KANATA ON
DRAWING	PRE-DEVELOPMENT CONDITIONS
PROJECT No.	250848
DATE	2026.03.25
SCALE	AS_NOTED
DRAWING No.	1 OF 2

ARCH D



POST-DEVELOPMENT CONDITIONS

SCALE = 1:200

KEY PLAN

NOT TO SCALE

0 10 20

1:200 METRES

LEGEND

- PROPERTY BOUNDARY
- PROPOSED TOP OF SLOPE
- PROPOSED BOTTOM OF SLOPE
- PROPOSED CENTERLINE OF FLOW
- PR. CB — PROPOSED CATCHBASIN
- PR-MH — PROPOSED MAINTENANCE HOLE
- PR. RYCB — PROPOSED REAR YARD CATCHBASIN
- 74.50 — EXISTING ELEVATION
- EXISTING BOTTOM OF SLOPE
- EXISTING CENTERLINE OF FLOW
- EXISTING TOP OF SLOPE
- STM — EXISTING STORM SEWER
- SAN — EXISTING SANITARY SEWER
- W — EXISTING WATERMAIN
- 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
- LP — EXISTING LIGHT POST
- TEMPORARY BENCHMARK
- DC — DEPRESSED CURB
- CONTROLLED CATCHMENT AREA
- UNCONTROLLED CATCHMENT AREA
- CA / AREA / C= — CATCHMENT LABEL / AREA (HECTARES) / 5-YEAR RUN-OFF COEFFICIENT
- POST-DEVELOPMENT OVERLAND DRAINAGE ARROW

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION:
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

No.	REVISION	DATE	BY
##	COMMENT	2025.XXX.XX	XX

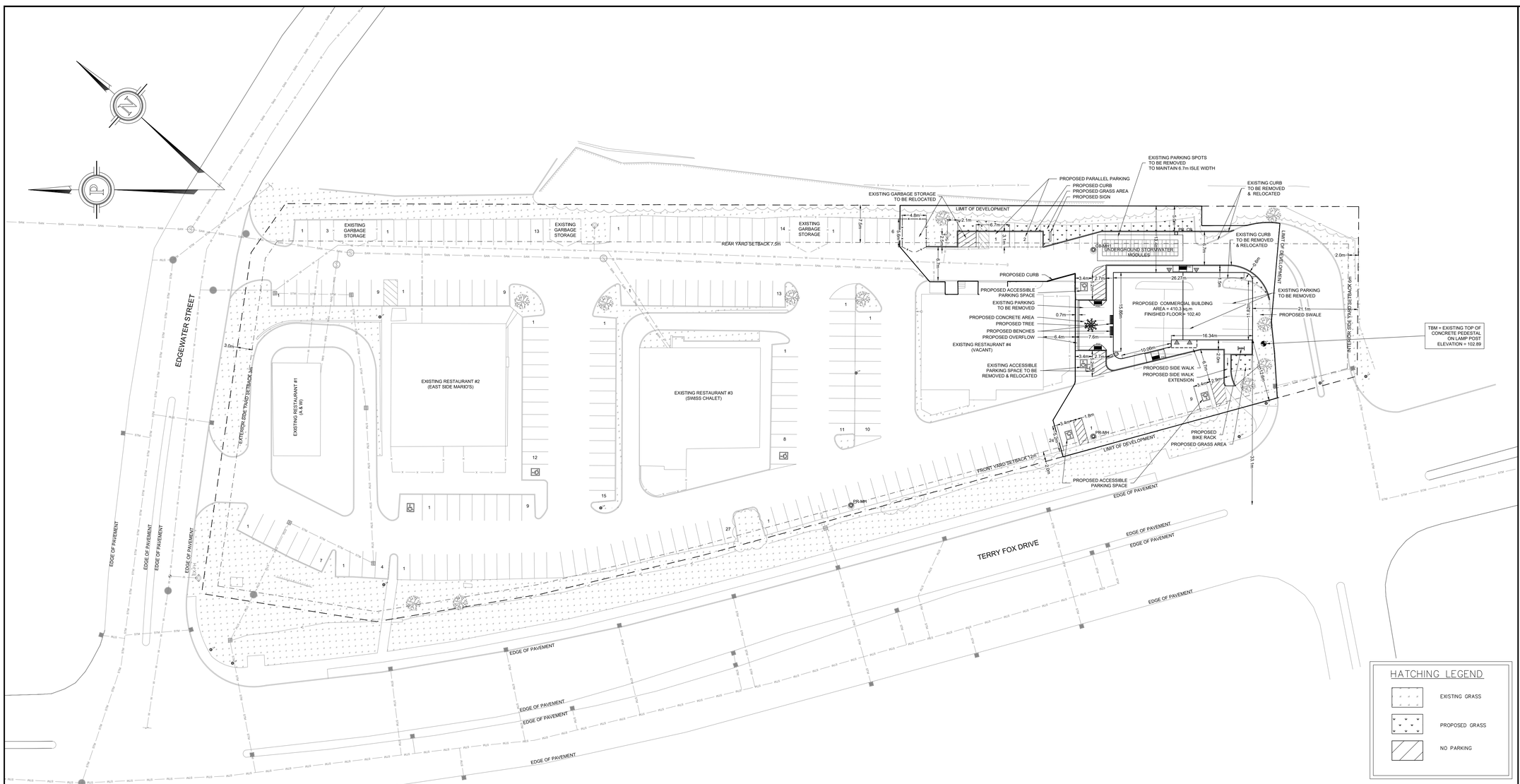
CONSULTANTS

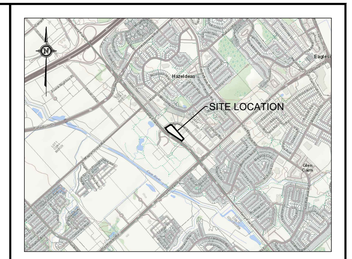
Kollaard Associates
Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

DESIGN	AVB
DRAWN	BM
CHECKED	AVB
APPROVED	AVB
STAMP	

CLIENT NAME	1763295 ONTARIO INC.
PROJECT No.	250848
PROJECT NAME	PROPOSED COMMERCIAL DEVELOPMENT
DATE	2026.03.25
PROJECT LOCATION	41 EDGEWATER STREET, KANATA ON
SCALE	AS_NOTED
DRAWING	POST–DEVELOPMENT CONDITIONS
DRAWING No.	2 OF 2

ARCH D





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 — PROPOSED CATCHBASIN
- PR-MH — PROPOSED MAINTENANCE HOLE
- PR. RYCB — PROPOSED REAR YARD CATCHBASIN
- EXISTING BOTTOM OF SLOPE
- EXISTING CENTERLINE OF FLOW
- EXISTING TOP OF SLOPE
- STM — EXISTING STORM SEWER
- SAN — 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
- PROPOSED ENTRANCE

HATCHING LEGEND

- EXISTING GRASS
- PROPOSED GRASS
- NO PARKING

SITE PLAN LAYOUT
SCALE = 1:400

PARKING REQUIREMENTS:

MINIMUM VEHICULAR PARKING SPACES	REQUIRED	PROVIDED
PROPOSED MEDICAL FACILITY AREA C 385.7 m² @ 4/100m²	16	18
EXISTING RESTAURANT #1 AREA C 179.2m² @ 10/100m²	18	20
EXISTING RESTAURANT #2 AREA C 570.9m² @ 10/100m²	58	60
EXISTING RESTAURANT #3 AREA C 527.0m² @ 10/100m²	53	55
EXISTING RESTAURANT #4 AREA C 496.8m² @ 10/100m²	50	52
DESIGNATED ACCESSIBLE PARKING – 195 SPACES @ 7/(167–250)	7	7
TOTAL PARKING SPACES =	195+7=202	205+7=212

Table 907–Minor Corridor Zone 2 (CM2) Provisions

Zoning Mechanism		Provisions	Provided
(a) Minimum lot area (m²)		No minimum	14379.2
(b) Minimum lot width (m)		No minimum	34.1
(c) Minimum front yard setbacks (m)	(i) Non–residential use buildings	2	12.6
(d) Minimum interior side yard setbacks (m)		2	21.1
(e) Minimum exterior side yard setbacks (m)	(i) Non–residental use buildings or mixed–use buildings	3	174.0
	(ii) Residential use buildings	3	174.0
(f) Minimum rear yard setbacks (m)	(i) Where abutting a street	4.5	13.4
	(ii) All other cases	7.5	13.4
(g) Minimum building height (m)		6	4.8
(h) Maximum building height	(i) In Area C on Schedule A1–Transects	1. 20m 2. For areas up to and including 10m from a lot line abutting an N1, N2, N3 or N4 Zone: 15m	4.8
	(ii) In Area E on Schedule A1–Transects	15m	4.8

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION:
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

No.	REVISION	DATE	BY
##	COMMENT	2025.XXX.XX	XX

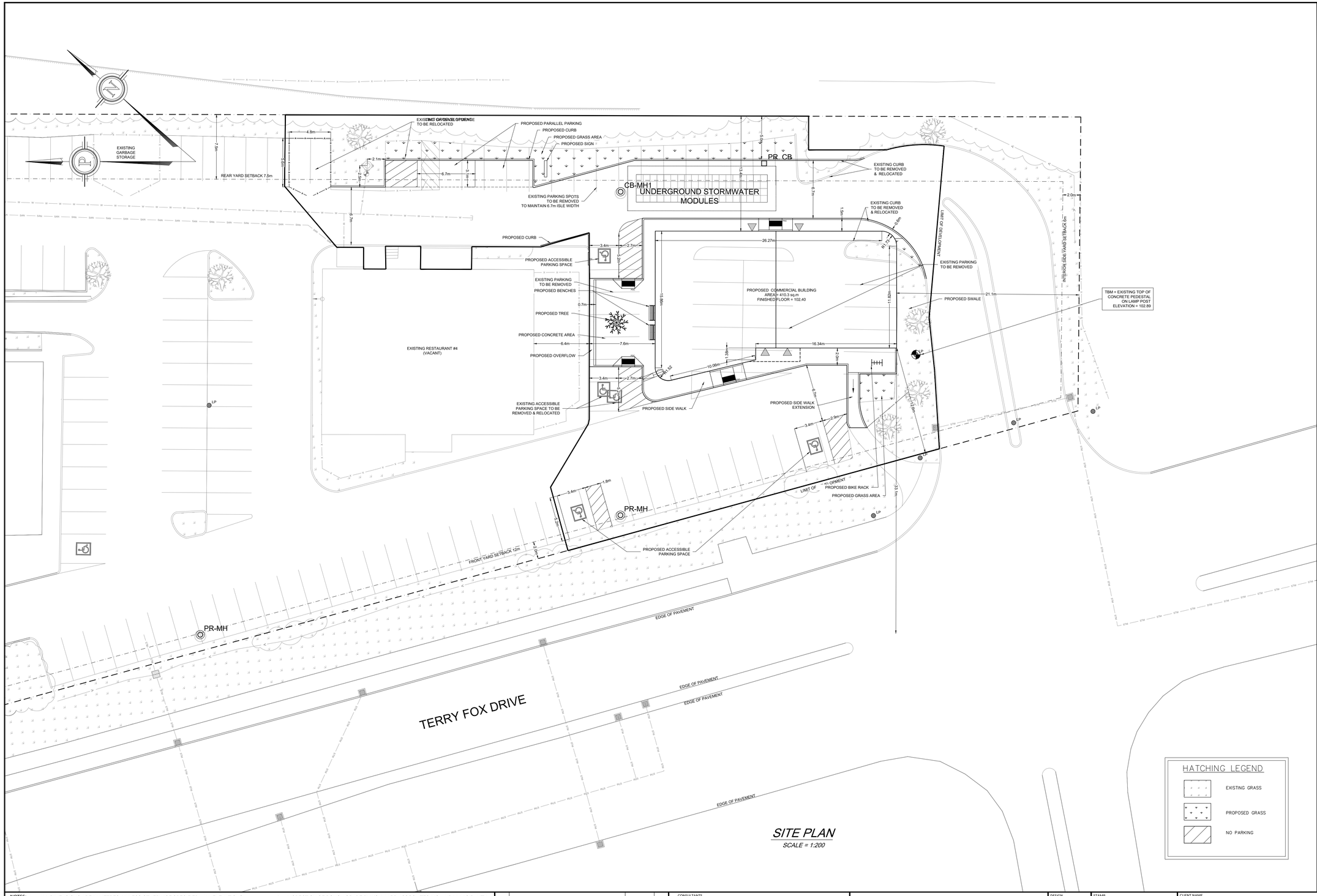
CONSULTANTS

Kollaard Associates Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

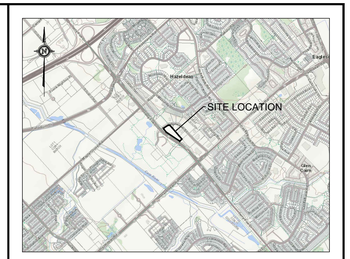
DESIGN	AVB
DRAWN	BM
CHECKED	AVB
APPROVED	AVB
STAMP	

CLIENT NAME	1763295 ONTARIO INC.
PROJECT NAME	PROPOSED COMMERCIAL DEVELOPMENT
PROJECT LOCATION	41 EDGEWATER STREET, KANATA ON
DRAWING	SITE PLAN LAYOUT
PROJECT No.	250848
DATE	2026.03.27
SCALE	AS_NOTED
DRAWING No.	2 OF 6

ARCH D



SITE PLAN
SCALE = 1:200



KEY PLAN
NOT TO SCALE

0 10 20
1:200 METRES

LEGEND

- PROPERTY BOUNDARY
- ZONING SETBACK
- PROPOSED TOP OF SLOPE
- PROPOSED BOTTOM OF SLOPE
- PROPOSED CENTERLINE OF FLOW
- PR. CB — PROPOSED CATCHBASIN
- PR-MH — PROPOSED MAINTENANCE HOLE
- PR. RYCB — PROPOSED REAR YARD CATCHBASIN
- EXISTING BOTTOM OF SLOPE
- EXISTING CENTERLINE OF FLOW
- EXISTING TOP OF SLOPE
- STM — EXISTING STORM SEWER
- SAN — EXISTING SANITARY SEWER
- W — EXISTING WATERMAIN
- 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
- LP — EXISTING LIGHT POST
- TEMPORARY BENCHMARK
- PROPOSED ENTRANCE

HATCHING LEGEND

- EXISTING GRASS
- PROPOSED GRASS
- NO PARKING

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION:
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

No.	REVISION	DATE	BY
##	COMMENT	2025.XXX.XX	XX

CONSULTANTS

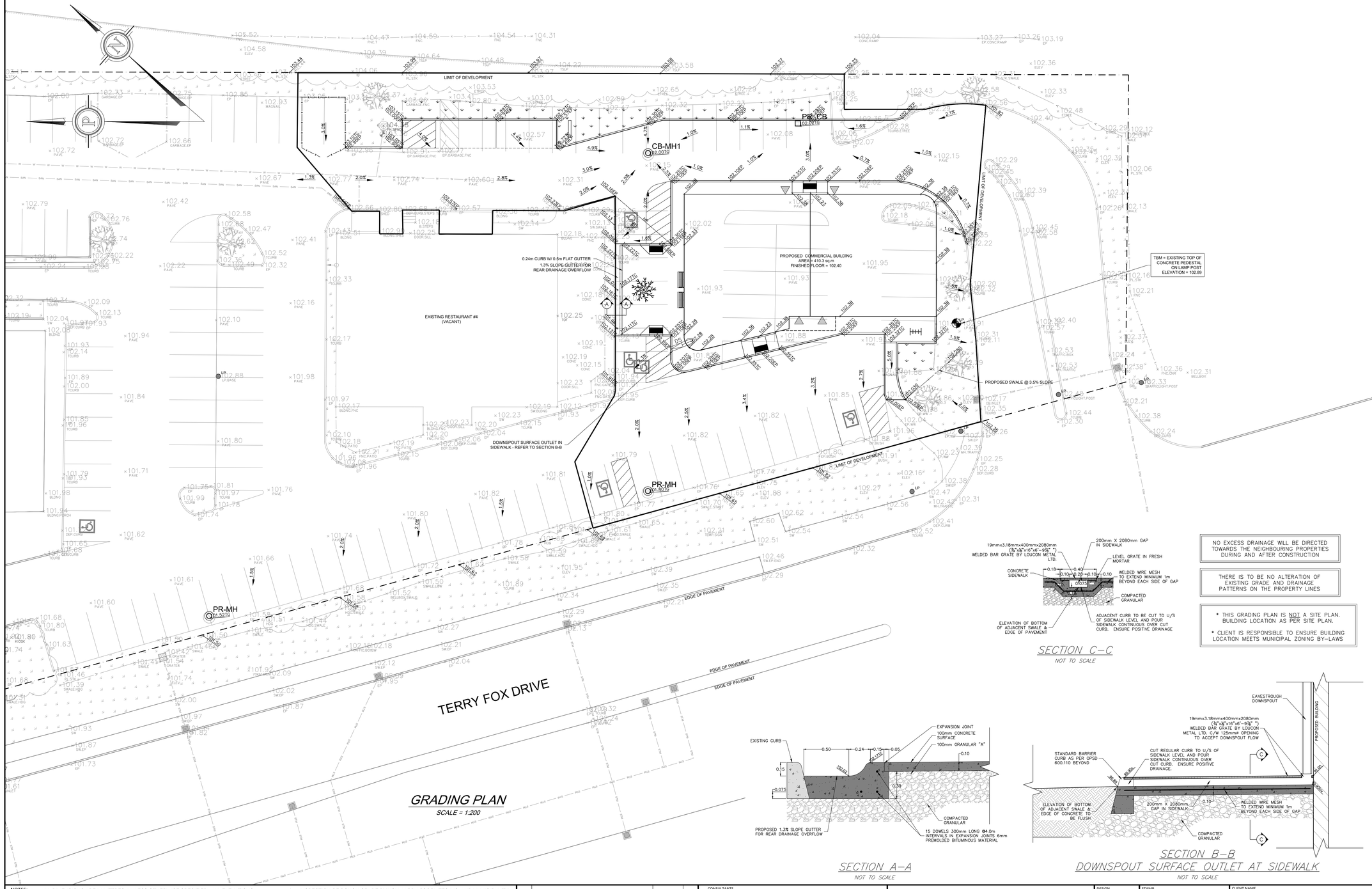
Kollaard Associates Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

DESIGN: AVB
DRAWN: BM
CHECKED: AVB
APPROVED: AVB

STAMP

CLIENT NAME	1763295 ONTARIO INC.
PROJECT NAME	PROPOSED COMMERCIAL DEVELOPMENT
PROJECT LOCATION	41 EDGEWATER STREET, KANATA ON
DRAWING	SITE PLAN
PROJECT No.	250848
DATE	2026.03.27
SCALE	AS_NOTED
DRAWING No.	3 OF 6

ARCH D



GRADING PLAN
SCALE = 1:200

SECTION C–C
NOT TO SCALE

NO EXCESS DRAINAGE WILL BE DIRECTED TOWARDS THE NEIGHBOURING PROPERTIES DURING AND AFTER CONSTRUCTION

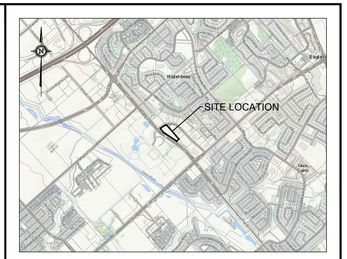
THERE IS TO BE NO ALTERATION OF EXISTING GRADE AND DRAINAGE PATTERNS ON THE PROPERTY LINES

* THIS GRADING PLAN IS NOT A SITE PLAN. BUILDING LOCATION AS PER SITE PLAN.

* CLIENT IS RESPONSIBLE TO ENSURE BUILDING LOCATION MEETS MUNICIPAL ZONING BY–LAWS

SECTION A–A
NOT TO SCALE

SECTION B–B
DOWNSPOUT SURFACE OUTLET AT SIDEWALK
NOT TO SCALE



KEY PLAN
NOT TO SCALE

0 10 20
1:200 METRES

LEGEND

- PROPERTY BOUNDARY
- ZONING SETBACK
- 97.25TG PROPOSED TOP OF GRATE ELEVATION
- 97.25TC PROPOSED TOP OF CURB ELEVATION
- 97.25S PROPOSED SWALE ELEVATION
- 97.25EP PROPOSED EDGE OF PAVEMENT ELEVATION
- 1.0% PROPOSED DRAINAGE SLOPE & ARROW
- PROPOSED TOP OF SLOPE
- PROPOSED BOTTOM OF SLOPE
- PROPOSED CENTERLINE OF FLOW
- PR. CB PROPOSED CATCHBASIN
- PR-MH PROPOSED MAINTENANCE HOLE
- PR. RYCB PROPOSED REAR YARD CATCHBASIN
- 74.50 EXISTING ELEVATION
- EXISTING BOTTOM OF SLOPE
- EXISTING CENTERLINE OF FLOW
- EXISTING TOP OF SLOPE
- STM STM STM STM STM EXISTING STORM SEWER
- SAN SAN SAN SAN SAN EXISTING SANITARY SEWER
- W W W W W EXISTING WATERMAIN
- X 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
- LP EXISTING LIGHT POST
- TEMPORARY BENCHMARK
- DC DEPRESSED CURB

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION:
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

No.	REVISION	DATE	BY
##	COMMENT	2025.XXX.XX	XX

CONSULTANTS

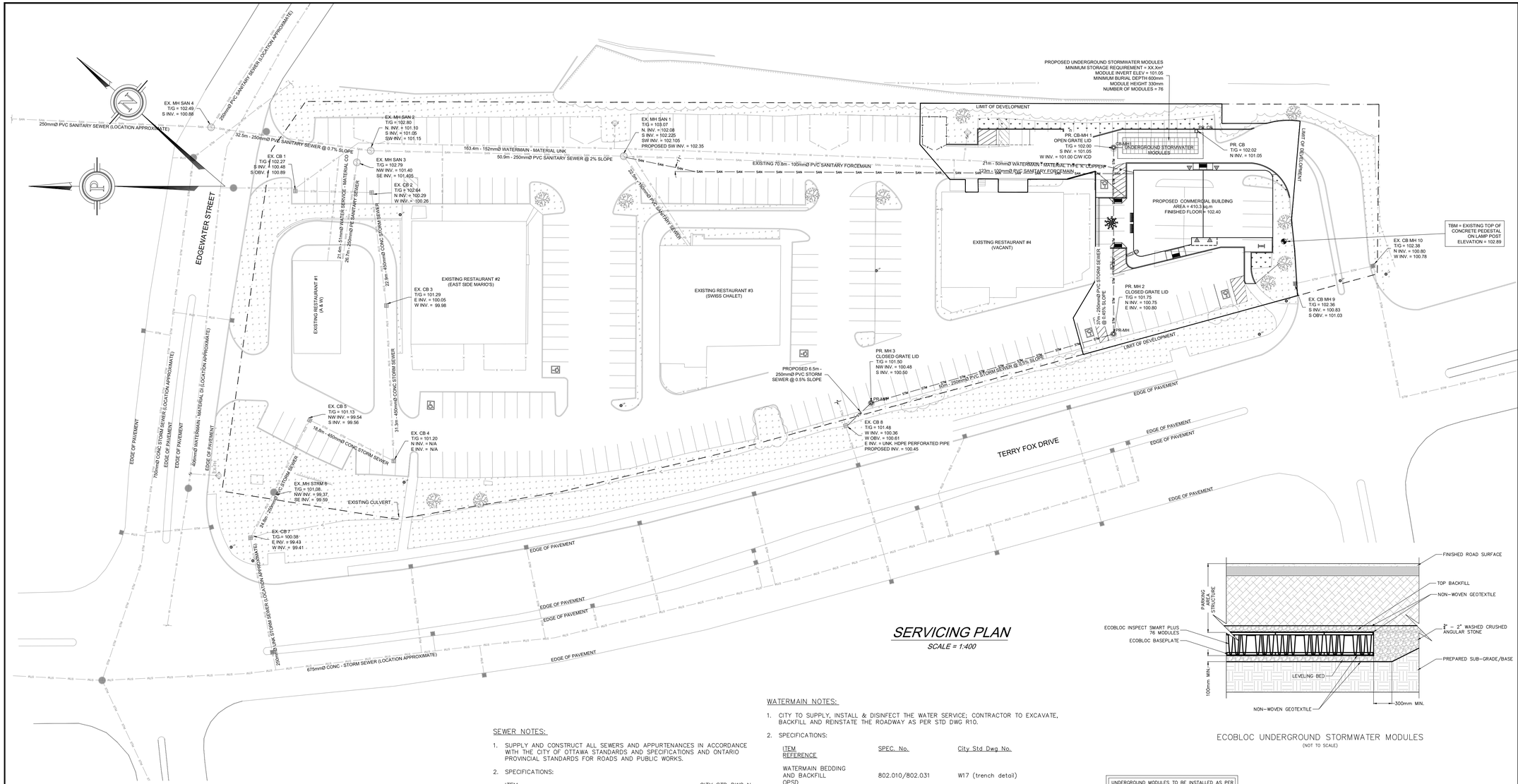
Kollaard Associates
Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

DESIGN AVB
DRAWN BM
CHECKED AVB
APPROVED AVB

STAMP
LICENSED PROFESSIONAL ENGINEER
MAY. 14, 2026
A.L.VAN BRUGGEN
100518079
PROVINCE OF ONTARIO

CLIENT NAME	1763295 ONTARIO INC.
PROJECT NAME	PROPOSED COMMERCIAL DEVELOPMENT
PROJECT LOCATION	41 EDGEWATER STREET, KANATA ON
DRAWING	GRADING PLAN
PROJECT No.	250848
DATE	2026.03.19
SCALE	AS_NOTED
DRAWING No.	4 OF 6

ARCH D



SERVICING PLAN

SCALE = 1:400

SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS AND ONTARIO PROVINCIAL STANDARDS FOR ROADS AND PUBLIC WORKS.
2. SPECIFICATIONS:

ITEM	CITY STD DWG No.
SEWER SERVICE CONNECTION	S11 & S11.1
SEWER TRENCH	S6 & S7

3. INSULATE ALL SANITARY PIPES THAT HAVE LESS THAN 2.0m COVER WITH THERMAL INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTION PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). SANITARY RUBBER GASKET TYPE JOINTS SHALL CONFORM TO CSA (B-182.2,3,4).
6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SERVICES. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
9. CONTRACTOR TO TELEVISE (CCTV) THE SEWER LATERAL AFTER PIPE INSTALLATION AND BACKFILL IS COMPLETED. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES TO MUNICIPAL SATISFACTION.
10. IF THE SANITARY SERVICE CROSSES ABOVE THE WATERMAIN, THE CONTRACTOR IS TO PROVIDE A MINIMUM OF 0.50m VERTICAL SEPARATION, ADEQUATE STRUCTURAL SUPPORT OF THE SEWER TO PREVENT SETTLING AND EXCESSIVE JOINT DEFLECTION AND ENSURE THAT THE LENGTH OF THE WATER PIPE BE CENTERED AT THE POINT OF CROSSING SO THAT THE JOINTS ARE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.

WATERMAIN NOTES:

1. CITY TO SUPPLY, INSTALL & DISINFECT THE WATER SERVICE; CONTRACTOR TO EXCAVATE, BACKFILL AND REINSTATE THE ROADWAY AS PER STD DWG R10.
2. SPECIFICATIONS:

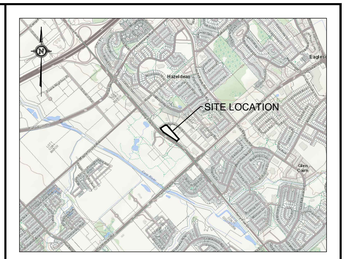
ITEM REFERENCE	SPEC. No.	City Std Dwg No.
WATERMAIN BEDDING AND BACKFILL OPSD	802.010/802.031	W17 (trench detail)
CATHODIC PROTECTION OPSD	1109.010	W40
CHLORINATION AWWA	C-651-05	
WATER LATERAL MATERIAL	TYPE K COPPER	

3. WATER SERVICE SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED. WHERE LESS THAN 2.4m COVER, THERMAL INSULATION IS TO BE PROVIDED AS PER CITY STD DWG W22 (In shallow trenches), W23 (At open structures).
4. METALLIC WARNING TAPE SHALL BE USED OVER THE WATER SERVICE.
5. INSTALL AND TEST TRACER WIRE FOR THE PROPOSED WATER SERVICE IN ACCORDANCE WITH THE CITY OF OTTAWA DESIGN STANDARDS AS SPECIFIED IN SECTION 4.3.12.
6. EXISTING WATERMAIN INFORMATION SHOWN IS BASED ON BEST CURRENT INFORMATION. CONTRACTOR TO VERIFY EXACT LOCATION OF WATERMAIN AND REPORT ANY DISCREPANCIES TO KOLLAARD ASSOCIATES INC.
7. ALL WATER SERVICES SHALL HAVE A SHUT OFF VALVE LOCATED AT THE PROPERTY LINE. TYPICAL PRIVATE SERVICE AS PER STD. DWG. W33. (with the exception that the curb stop is to be located 1.0 m minimum from the foundation wall); SERVICE POST AS PER STD. DWG. W35.
8. ALL CONNECTORS, RODS AND VALVE BOLTS SHALL BE STAINLESS STEEL.
9. VALVES ARE TO BE OPERATED BY CITY OF OTTAWA STAFF ONLY.
10. NO CONNECTION TO EXISTING WATER NETWORK SHALL BE COMPLETED UNTIL A WATER PERMIT IS OBTAINED FROM THE CITY OF OTTAWA AND CITY OF OTTAWA FORCES ARE ON HAND TO MAKE THE CONNECTION.

ECOBLOC UNDERGROUND STORMWATER MODULES
(NOT TO SCALE)

UNDERGROUND MODULES TO BE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS. SHOP DRAWINGS TO BE REVIEWED BY STORMWATER ENGINEER PRIOR TO MANUFACTURING

ELEVATION DETAILS OF UNDERGROUND STORMWATER MODULES
(NOT TO SCALE)



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
- STM STM STM STM STM — PROPOSED STORM SEWER
- SAN SAN SAN SAN SAN — PROPOSED SANITARY SEWER
- W W W W W — PROPOSED WATERMAIN
- PR. CB — PROPOSED CATCHBASIN
- PR-MH — PROPOSED MAINTENANCE HOLE
- PR. RYCB — PROPOSED REAR YARD CATCHBASIN
- 74.50 — EXISTING ELEVATION
- EXISTING BOTTOM OF SLOPE
- EXISTING CENTERLINE OF FLOW
- EXISTING TOP OF SLOPE
- STM STM STM STM STM — EXISTING STORM SEWER
- SAN SAN SAN SAN SAN — EXISTING SANITARY SEWER
- W W W W W — EXISTING WATERMAIN
- X 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
- LP — EXISTING LIGHT POST
- TEMPORARY BENCHMARK
- DC — DEPRESSED CURB

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, Vollebekk Ltd.

TOPOGRAPHIC INFORMATION:
TOPOGRAPHIC SURVEY FILE #250848
DATE: 2025-10-15
Surveyed by Kollaard Associates Inc.

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.
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.
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.

No.	REVISION	DATE	BY
##	COMMENT	2025.XXX.XX	XX

CONSULTANTS

Kollaard Associates
Engineers
BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1J0
FACSIMILE (613) 258-0475
(613) 860-0923

DESIGN: AVB
DRAWN: BM
CHECKED: AVB
APPROVED: AVB

STAMP: LICENSED PROFESSIONAL ENGINEER — MAY. 14, 2026 — AL VAN BRUGGEN — 100518079 — PROVINCE OF ONTARIO

CLIENT NAME	1763295 ONTARIO INC.
PROJECT NAME	PROPOSED COMMERCIAL DEVELOPMENT
PROJECT LOCATION	41 EDGEWATER STREET, KANATA ON
DRAWING	SERVICING PLAN
PROJECT No.	250848
DATE	2026.03.19
SCALE	AS_NOTED
DRAWING No.	5 OF 6

ARCH D