SITE SERVICING & STORMWATER MANAGEMENT REPORT
145 WALGREEN ROAD

Project No.: CCO-25-1370

Prepared for:

Miller Waste Systems
112 Bales Drive East
East Gwillimbury, Ontario

Prepared by:

Egis Canada, Ltd.
115 Walgreen Road
Carp, Ontario

4/25/2025

egis

Table of Contents

1.0 PROJECT DESCRIPTION

1.1 Purpose

Egis Canada Ltd. (Egis) has been retained by White Owl Group to prepare this Servicing & Stormwater Report for the proposed addition to 145 Walgreen Road within the City of Ottawa. This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the City of Ottawa (Municipality), the Ministry of the Environment, Conservation and Parks (MECP), and the Mississippi Valley Conservation Authority (MVCA). This report will address the water, sanitary, and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- C101 – Lot Grading, Drainage, Erosion Control, and Servicing Plan.
- PRE – Pre-Development Drainage Area Plan (Appendix D)
- POST – Post-Development Drainage Area Plan (Appendix E)

1.2 Site Description

The existing parcel is a 1,115 m^2 office and warehouse building on a 2.37 ha property approximately 120m northwest of the Walgreen Road and Westbrook Road intersection. The site drains to a stormwater retention area to the southeast, and then a ditch along the southeast edge of the property line. The site is zoned rural general industrial, subzone 4 (RG4).

See Site Location Plan in Appendix A for more details.

Figure 1: Site Location

1.3 Existing Conditions and Infrastructure

The existing site is currently serviced by a septic tank, leaching bed, and well. Stormwater runoff currently flows overland to the retention pond along the southeast of the site and then into the ditch farther southeast. Water tanks are present for fire flow and a well is utilized for the domestic water demands.

Watermain mapping collected from the City of Ottawa's GIS information, indicate that the following services exist across the property frontages within adjacent municipal rights-of-ways (ROW):

- Walgreen Road:
  - 305mm diameter watermain stubbed +/- 180m northwest from the subject site;

1.4 Proposed Development and Statistics

The proposed development consists of a 520 m^2 extension to an existing warehouse building. Truck parking will be provided on the west side of the existing building and employee parking to the north of the truck parking. The site is to be paved and one of the two existing entrances along Walgreen Road are to be moved. Further details are available in the site plan provided by Deimling Architecture included in Appendix B.

1.5 Approvals

The proposed development is subject to the City of Ottawa site plan control process. Site plan control requires the Municipality to review, provide concurrence, and approve the engineering design package. Permits to construct can be requested once the City has issued a site plan agreement.

An Environmental Compliance Approval (ECA) through the Ministry of Environment, Conservation and Parks (MECP) is anticipated to be required for the development, as the site has industrial usage.

2.0 BACKGROUND STUDIES

2.1 Background Reports / Reference Information

The background studies referenced include:

- 145 Walgreen Road Office & Shop Facility Site – Site Servicing Brief & Stormwater Management Report (Prepared by McIntosh Perry);
- Septic Design (Prepared by Egis); and
- Proposed Site Plan (Prepared by Deimling Architecture & Interior Design)

The reports indicated above were used in developing the civil design within this report and will be referenced throughout.

2.2 Applicable Guidelines and Standards

City of Ottawa:

- Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. (Ottawa Sewer Guidelines)
    - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. (ISTB-2014-01)
    - Technical Bulletin PIEDTB-2016-01 City of Ottawa, September 2016. (PIEDTB-2016-01)
    - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. (ISTB-2018-01)
    - Technical Bulletin ISTB-2018-04 City of Ottawa, March 2018. (ISTB-2018-04)
    - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (ISTB-2019-02)
- Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (Ottawa Water Guidelines)
    - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (ISD-2010-2)
    - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (ISDTB-2014-02)
    - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. (ISTB-2018-02)
    - Technical Bulletin ISTB-2021-03 City of Ottawa, August 2021. (ISTB-2021-03)
    - Technical Bulletin IWSTB-2024-05 City of Ottawa, November 2025. (IWSTB-2024-05)

Ministry of Environment, Conservation and Parks:

- Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. (MECP Stormwater Design Manual)
- Design Guidelines for Sewage Works, Ministry of the Environment, 2008. (MECP Sewer Design Guidelines)

Other:

- Water Supply for Public Fire Protection, Fire Underwriters Survey, 2020. (FUS Guidelines)

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was conducted on May 28, 2024, regarding the proposed site. Specific design parameters to be incorporated within this design include the following:

- Stormwater values are required to reference and discuss the 2008 design, or the post-development 100-year peak flow rate must match the 2-year pre-development flow rate.
- On-site quality control at an enhanced level is required (80% TSS removal).
- Adequacy of existing fire protection tank capacity of 53,000 L to be assessed using FUS and OBC calculations.

Pre-consultation notes can be found in Appendix B.

4.0 WATER SERVICES

4.1 Existing Water Supply

Per the 2008 design, there is an existing well and three fire tanks that currently service the site. An existing 300 mm diameter ductile iron water main is capped approximately 220 m southeast on Walgreen Road. There is currently at minimum 108,000 L of storage volume for fire protection currently on the site, as specified from the approved design included in Appendix B.

Further, an existing 300mm diameter ductile iron water main is capped approximately 220 m southeast on Walgreen Road.

4.2 Water Demand

We have completed evaluation, and confirmation has been received from city staff for extending the 305mm diameter ductile iron water main on Walgreen Road to the proposed site to ensure adequate fire protection.

A new 200 mm diameter water services connected to the 305 mm diameter watermain coming from Walgreen Road is proposed. The water service will contain a water valve located at the property line. The water services are designed to have a minimum of 2.4 m cover.

The Fire Underwriters Survey 2020 (FUS) method was utilized to determine the required fire flow for the site. The 'C' factor (type of construction) for the FUS calculation was determined to be 1.0 (ordinary construction). The building will also to have a supervised sprinkler system. The total floor area ('A' value) for the FUS calculation was determined to be 1816 m^2. The results of the calculations yielded a required fire flow of 6,000 L/min. A fire flow of 9,000 L/min was calculated using the Ontario Building Code (OBC) criteria. The detailed calculations for the FUS and OBC can be found in Appendix C.

The water demands for the proposed building have been calculated to adhere to the Ottawa Design Guidelines – Water Distribution manual and can be found in Appendix C. The results have been summarized in Table 1, below.

Table 1: Water Demands

Design Parameter	Value
Site Area	2.37 ha
Commercial Area (m^2)	627
Industrial Area (m^2)	1165

Industrial – Light	35,000 L/ha/day
Commercial	28,000 L/ha/day
Average Day Demand (L/s)	0.07
Maximum Day Demand (L/s)	0.10
Peak Hour Demand (L/s)	0.18
OBC Fire Flow Requirement (L/s)	150
FUS Fire Flow Requirement (L/s)	100

The detailed calculations for these can be found in Appendix C.

Boundary conditions for the site were requested and received from the city, dated February 26, 2025. The model assumed demands for the property as - Average Day = 0.07 L/s, Maximum Day = 0.10 L/s and Maximum Hourly = 0.18, and the fire flow to be 100 L/s, results are summarized in Table 2 below.

Table 2: Boundary Conditions

Scenario	Total HGL (m)	Head Pressure* (kPa)	Head Pressure (psi)
305mm Diameter Watermain Connection on Mosquito Drive			
Average Day (Maximum HGL)	160.2	319.8	46.4
Maximum Day + Fire Flow	156.8	286.5	41.5
Peak Hourly (Minimum HGL)	146.0	180.5	26.2

The boundary conditions were used to ensure the normal operating pressure range is not less than 275kPa (40psi) or more than 552kPa (80psi). The resultant hydraulic grade line (HGL) shows that the minimum pressure limit is satisfied during the average day and peak hour scenario.

See Appendix C for the Boundary Condition at 145 Walgreen provided by the City of Ottawa Infrastructure & Water Services Department.

In addition to normal operations, the maximum day plus fire flow conditions were reviewed to ensure that there is sufficient fire flow available to meet the required 100 L/sec flow rate, while maintaining a minimum of 20psi (140kPa) within the City's distribution system as per the City of Ottawa Design Guidelines for Water Distribution, 2010. The resulting HGL shows that the minimum pressure is satisfied during a fire scenario.

In addition to the review of the boundary conditions, the available fire flow based on hydrant spacing was analysed as per the City of Ottawa's technical bulletin ISTB 2018-02 Appendix I, Table 1. All existing and proposed municipal hydrants within 150m clear distance to the nearest face of the building were used to find a combined available fire flow to support the site. Existing and proposed hydrants were assumed to be class AA. A total contribution of 5,700 L/min and 3,800 L/min was used for each hydrant within 75m, and between 75m and 150m of the building, respectively. The results are summarized below in Table 3 below.

Table 3: Fire Hydrant Protection

Location	Assumed Class	Status	Distance	Flow Contribution (L/min)
Walgreen Road	AA	Proposed	30 m	5,700
Walgreen Road	AA	Proposed	26 m	5,700
Total				11,400

Based on City guidelines (ISTB-2018-02), the proposed hydrants on Walgreen Road can provide adequate fire protection to the proposed development.

5.0 SANITARY DESIGN

An existing Class 4 private sewage system consisting of a pre-treatment tank, two (2) Clearstream 500N advanced treatment units, and an area bed leaching bed is located immediately north of the existing building which was approved and constructed in 2008 per Ottawa Septic System Office (OSSO) # 08-681.

Total Daily Design Sanitary Sewage Flow (TDDSSF) for the facility was calculated by Houle Chevrier in 2008 to be 3,750 L/day, and therefore the existing sewage system is rated to that capacity. As part of the proposed redevelopment of the subject site, a revised TDDSSF of 3,675 L/day was calculated in accordance with the Ontario Building Code (OBC). Accordingly, a Part 10/11 Renovation application, for the reuse of the existing sewage, was submitted to the OSSO. Refer to the final permit by the Ottawa Septic System Office (OSSO) for the required permits and approvals in Appendix B.

In summary, the system has been designed using a Class 4 – fully-raised area bed leaching bed, in combination with a 3,750 L pre-treatment tank and two (2) Clearstream 500N advanced treatment unit capable of providing tertiary effluent quality to 3,750 L/day of effluent. This exceeds the expected sanitary demands associated with the proposed redeveloped facility, and as such, it is expected that the redeveloped facility will continue to the serviced by the existing approved Class 4 sewage system currently in place.

For further design information pertaining to the on-site sewage system, please refer to the sewage system permit.

6.0 STORM SEWER DESIGN

6.1 Existing Storm Sewers

There are no existing storm sewers on the subject property. Water runoff from the site is currently draining towards an existing retention pond along the southeast of the property line and toward the roadside ditch along Walgreen Road.

Refer to Appendix D for the pre-development drainage plan.

6.2 Proposed Storm Sewers

Storm sewers and drainage swales are proposed to convey storm flow from the catch basins in the parking areas west of the building to the retention area along and partially within the 12 m easement at the south of the property and then outlet to the existing drainage ditch along the south property line. The stormwater retention area for the subject site is proposed to be kept separate from the ditch serving the properties to the west until it has gone through the quality and quantity controls proposed. An outlet pipe with an orifice plate is specified for quantity control. An approved oil-grit separator is proposed and has been sized to provide quality control.

Refer to Appendix Efor the post-development drainage plan.

7.0 PROPOSED STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

Stormwater management for the proposed development will be maintained through positive drainage away from the existing building and proposed addition and into the retention pond. The emergency overland flow route for the site will be directed to the ditching along the southeast property line. The quantitative properties of the storm runoff for both the pre- and post-development flows are further detailed below.

In summary, the following design criteria has been employed in development the stormwater management design for the site:

Quantity Control

- Post-development flows for the 100-Year to be restricted to a maximum of 66.7 L/s towards the drainage ditch in the rear yard easement, per the approved 2008 design.
- The 100-Year post-development runoff to be restricted to the 2-Year pre-development rates toward the ROW.

Quality Control

- 80% removal of Total Suspended Solids (TSS)

7.2 Runoff Calculations

Runoff calculations presented in this report are derived using the Rational Method, given as:

$$Q = 2.78CIA \text{ (L/s)}$$

Where: C = Runoff coefficient

I = Rainfall intensity in mm/hr (City of Ottawa IDF curves)

A = Drainage area in ha

It is recognized that the Rational Method tends to overestimate runoff rates. As a result, the conservative calculation of runoff ensures that any SWM facility sized using this method is expected to function as intended.

The following coefficients were used to develop an average C for each area, summarized in Table 4:

Table 4: Runoff Coefficients

Land Cover	C
Roofs/Concrete/Asphalt	0.90
Gravel	0.60
Undeveloped/Grass	0.20

As per the City of Ottawa – Sewer Design Guidelines (2012), the 5-Year balanced C-value must be increased by 25% for a 100-Year storm event to a maximum of 1.0.

7.3 Pre-Development Drainage

The existing site drainage limits are demonstrated on the Pre-Development Drainage Area Plan. A summary of the Pre-Development Runoff Calculations can be found in Table 5.

Table 5: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Runoff Coefficient (2/5-Year)	Runoff Coefficient (100-Year)	2-Year Peak Flow (L/s)	5-Year Peak Flow (L/s)	100-Year Peak Flow (L/s)
A1	1.35	0.61	0.74	146.73	199.80	414.28
A2	0.92	0.61	0.70	98.39	133.98	264.35
A3	0.10	0.19	0.24	3.35	4.56	9.75
Total				245.11	333.78	678.63

See the SWM Calculations in Appendix F.

The required restricted flow to the existing drainage ditch (A1) is proposed to meet the previously accepted pre-development release rates from the Site Servicing Brief and Stormwater Management Report (McIntosh Perry, 2008). The flow to the roadside ditch (A2) is proposed to meet the pre-development 2-Year flow and the drainage ditch is proposed to remain unchanged. The portion of the property that will remain unchanged (A3), is not proposed to have any restrictions. The required post-development flow values are summarized below in Table 6.

Table 6: Required Restricted Flow

Drainage Area	Required Release Rate
A1	66.70
A2	98.39
A3	9.75

7.4 Post-Development Drainage

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan found in Appendix E of this report. A summary of the Post-Development Runoff Calculations for the site are shown in Table 7.

Table 7: Post-Development Runoff Summary

Area	Unrestricted Flow (L/S)			Restricted Flow (L/S)			Storage Required (m^3)			Storage Provided (m^3)		
	2-Yr	5-Yr	100-Yr	2-Yr	5-Yr	100-Yr	2-Yr	5-Yr	100-Yr	2-Yr	5-Yr	100-Yr
B1	312.18	425.10	815.82	48.80	54.60	66.70	201.68	301.8	677.1	204.6	314.5	680.5
B2	17.17	23.38	47.89	17.17	23.38	47.89						
B3	3.35	4.56	9.75	3.35	4.56	9.75						
Total	332.70	453.04	873.46	69.32	82.54	124.34	201.68	301.76	677.13	204.55	314.53	680.49

See Appendix F for detailed calculations.

7.5 Quantity Control

The total post-development runoff for this site has been restricted to match the required release rates outlined in Table 6. Reducing site flows will be achieved using flow restrictions and the existing onsite storage.

Area B1 conveys water via catch basins, pipes, swales and overland flow to a stormwater retention area along the south of the property, where the release rate to the drainage ditch along the rear property line is controlled to the previously accepted value of 66.70 L/s via a 177.5 mm ICD orifice plug as specified on the drawing C101,

in a 100-Year event. This release rate is also less than the 2-Year flow to the ditch of 146.73 L/s per area A1. The proposed stormwater retention area is partially located within the drainage easement on the south of the site, where a storm ditch is currently conveying water from neighboring properties. Area B2 conveys water via swales and overland flow to the existing drainage ditch within the Walgreen Road right-of-way, the post-development 100-Year runoff are to be less than the 2-year release rate of 98.39 L/s under existing conditions. Area B3 is the portion of the property where there is an existing drainage ditch that is conveying stormwater from neighbouring properties, and that area B1 will be contributing a control flow to.

See Appendix F for SWM calculations.

7.6 Quality Control

The following methods will be utilized to provide quality controls for the site:

The 80% TSS removal as required is achieved as Area B2 and Area B3 collect water predominantly from the landscape areas and a portion of the roof so this water does not interact with areas that would require TSS removal. Therefore, quality control via an OGS (Oil & Grit Separator) is to be provided to Area B1 which collects over 85% of the stormwater onsite.

The development of this lot will employ Best Management Practices (BMP's) wherever possible. The intent of implementing stormwater BMP's is to ensure that water quality and quantity concerns are addressed at all stages of development. Lot level BMPs typically include temporary retention of the parking lot runoff, minimizing ground slopes and maximizing landscaped areas. Some of these BMP's cannot be provided for this site due to site constraints and development requirements.

A quality treatment unit has been proposed to provide a TSS removal rate of 80% as per the requirements. The OGS (Oil & Grit Separator) unit will provide a water quality of at least 80% TSS. The OGS Unit shall be placed downstream of the parking area storm structures and sewers to provide the required water quality treatment for the site runoff before discharging to the ditch in the adjacent easement.

Detailed OGS sizing is provided within Appendix F. The OGS was sized to achieve a TSS removal of 80% or greater under the Fine PSD criteria. The result of the sizing generated a Stormceptor EFO8, providing 86% under fine PSD. An approved equivalent will be acceptable for the site as well.

8.0 SUMMARY

- A 520 m^2 addition to the existing office/warehouse building at 145 Walgreen is proposed.
- Watermain to be extended from stub along Walgreen Road, to service and provide fire protection to the existing building and the proposed addition.
- Sanitary servicing is to continue via the existing approved Class 4 sewage system.
- Post-development flows for the 100-Year are to be restricted to be no greater than 66.7 L/s toward the easement, and no greater than the pre-development 2-Year flows to the ROW. Storage to occur in retention area on south property line and partially in the stormwater easement.
- Quality control to be provided by the proposed OGS unit to achieve 80% TSS removal.

9.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that City of Ottawa approve this Servicing and Stormwater Management Report in support of the proposed 145 Walgreen Road.

This report is respectfully being submitted for approval.

Regards,

EGIS CANADA LTD.

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613-796-0829

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Practice Area Lead, ESC-Septics
613-229-5863

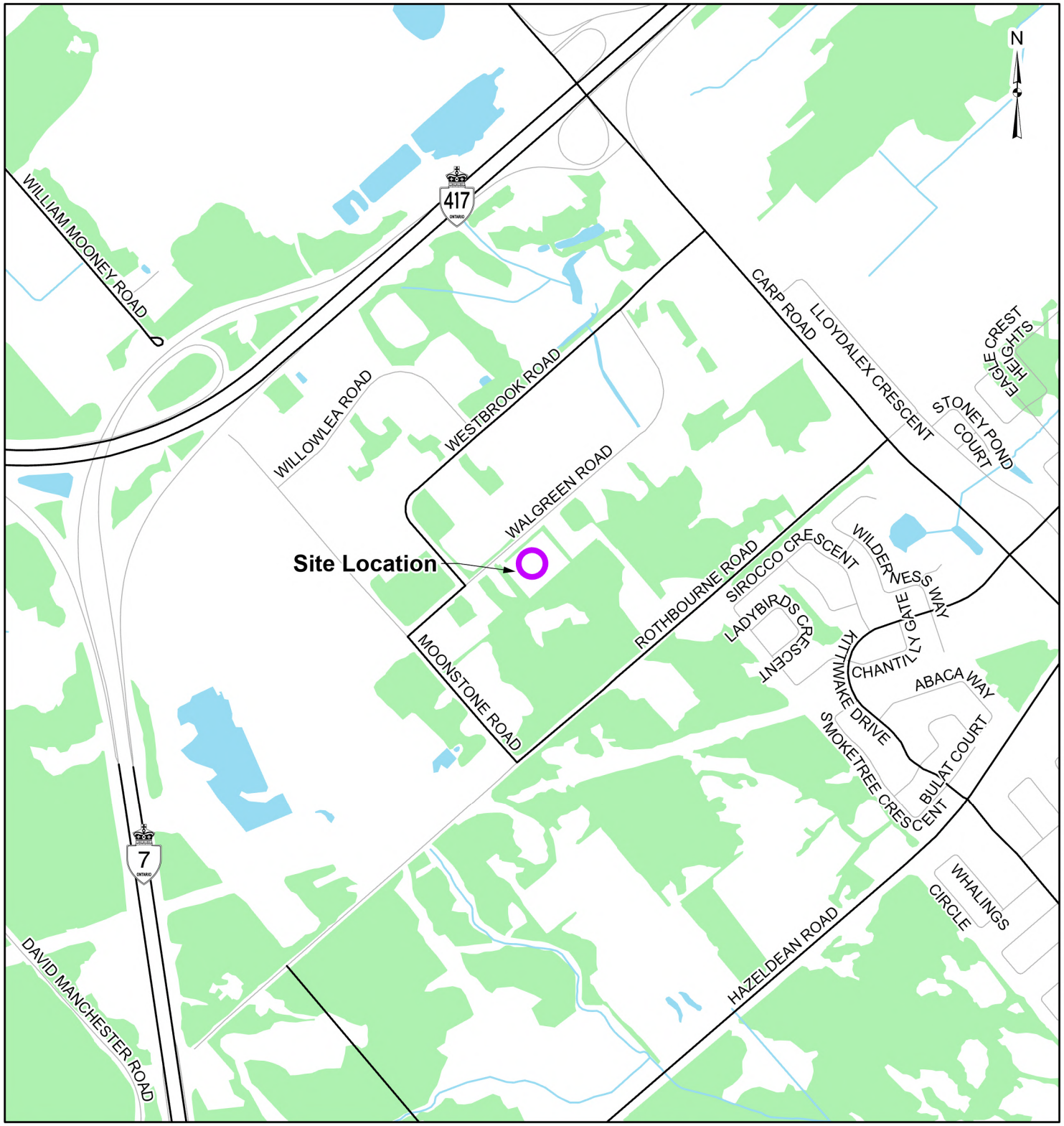
10.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of Miller Waste Systems. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, City of Ottawa and local approval agencies. Egis Canada reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by Egis Canada and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. Egis Canada accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, Egis Canada should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
LOCATION PLAN



LEGEND

- Site Location
- Local Road
- Major Road
- Watercourse
- Waterbody
- Wooded Area

500 250 0 500

Scale 1:15,000 Metres

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2024.

CLIENT: W.O M.W REALTY LIMITED

PROJECT: GEOTECHNICAL INVESTIGATION OF THE PROPOSED BUILDING ADDITION AND SITE DEVELOPMENT 145 WALGREEN ROAD

TITLE: SITE LOCATION

egis
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742

PROJECT NO:	CCO-25-1370-01
Date	Sep., 19, 2024
GIS	AH
Checked By	JP

FIGURE: 1

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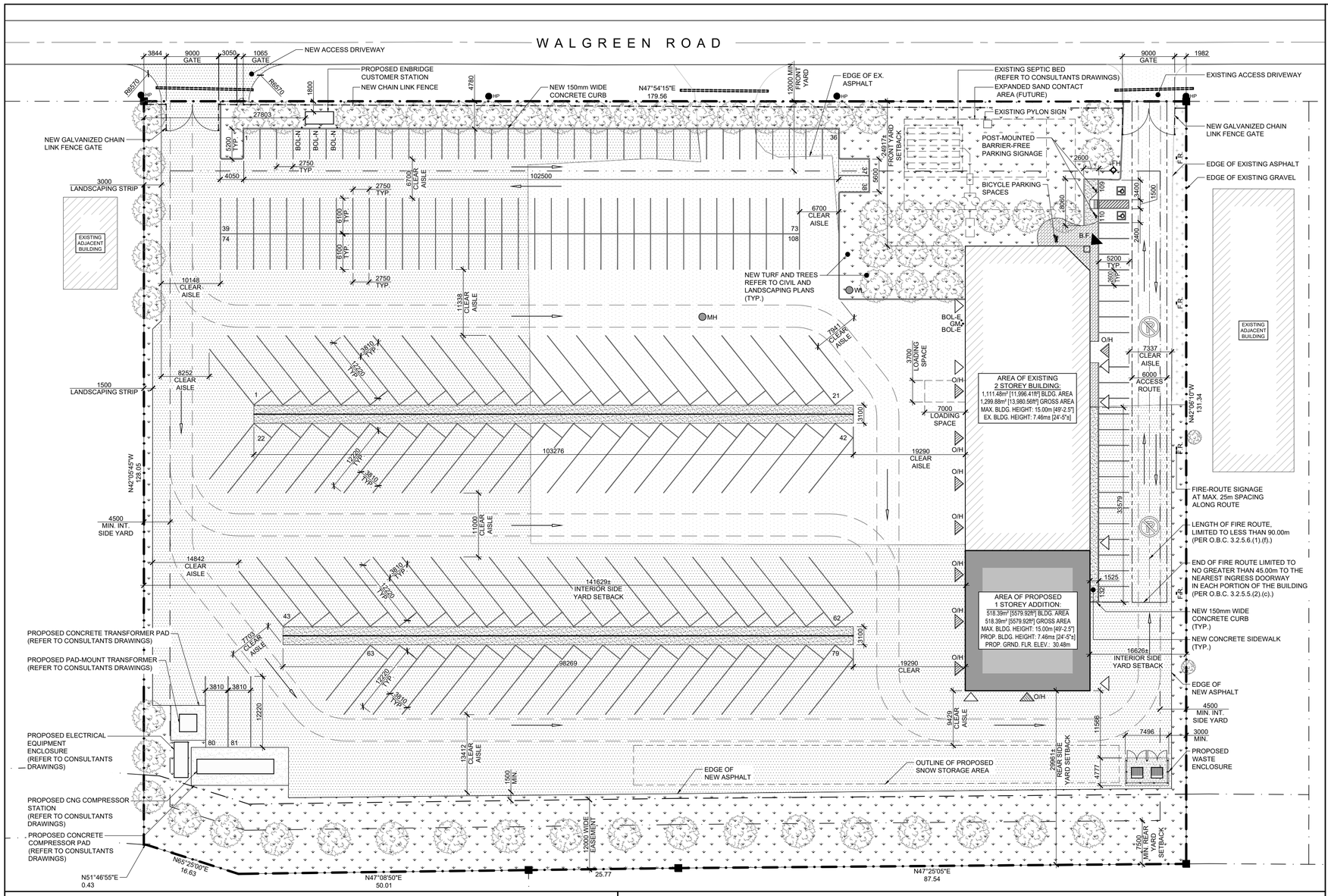
APPENDIX B
BACKGROUND DOCUMENTS



ZONING INFORMATION

1.0 GENERAL INFORMATION:

LEGAL DESCRIPTION:
PART OF BLOCK 5 REGISTERED PLAN 4M-300, THE CITY OF OTTAWA

BUILDING AREA (B.A.):
1,627.31m²

GROSS FLOOR AREA (G.F.A.):
1,815.71m²

PROPOSED USE:
HEAVY EQUIPMENT & VEHICLE SALES, RENTAL & SERVICING

2.0 ZONING PROVISIONS:

DESIGNATION:
RURAL GENERAL INDUSTRIAL ZONE (RG4)

LOT AREA:		
REQUIRED:	1,800.00m² (MIN.)	
PROPOSED:	23,696.64m²	
LOT FRONTAGE:		
REQUIRED:	30.00m	
PROPOSED:	179.56m	
SETBACKS:		
FRONT YARD:		
REQUIRED:	12.00m (MIN.)	
PROPOSED:	24.91m	
CORNER SIDE YARD:		
REQUIRED:	12.00m (MIN.)	
PROPOSED:	N/A	
INTERIOR SIDE YARD:		
REQUIRED:	4.50m (MIN.)	
PROPOSED:	16.62m	
REAR YARD:		
REQUIRED:	7.50m (MIN.)	
PROPOSED:	29.96m	
LOT COVERAGE:		
REQUIRED:	50% (MAX.)	
PROPOSED:	7%	
BUILDING HEIGHT		
REQUIRED:	15.00m (MAX.)	
PROPOSED:	7.46m	

3.0 PARKING (PER SECTIONS 3.30 & 3.41):

STANDARD SPACES:

PROVISION:	HEAVY EQUIPMENT AND VEHICLE SALES, RENTAL AND SERVICING 0.75 SPACE PER 100m² G.F.A. OFFICE 2.4 SPACE PER 100m² G.F.A.
REQUIRED:	=(1134±m² x 0.75/100m²) + (713±m² x 2.4/100m²) ≈27 SPACES
PROVIDED:	132 STANDARD SPACES

BARRIER-FREE SPACES:

PROVISION:	1-19 STANDARD = 1 SPACE
REQUIRED:	2 SPACE
PROVIDED:	2 SPACE

LOADING SPACES:

PROVISION:	1000m²-1,999m² G.F.A.≈ 1 SPACE
REQUIRED:	1 SPACE
PROVIDED:	1 SPACE

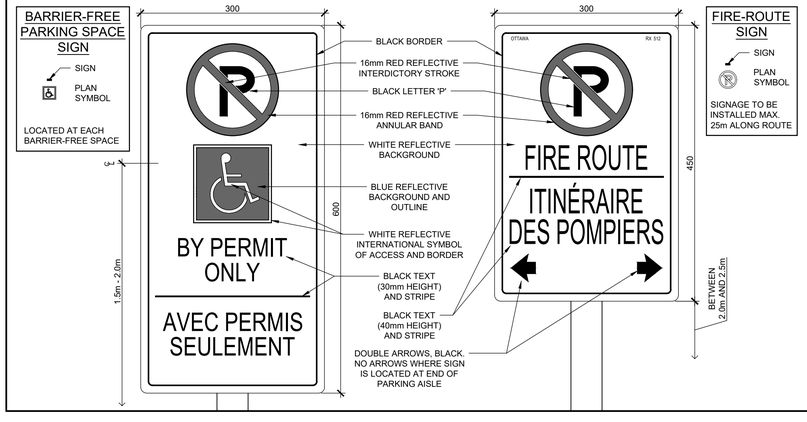
BICYCLE SPACES:

	LIGHT INDUSTRIAL USE 1 PER 1000m² G.F.A.≈ 2 SPACE
REQUIRED:	2 SPACE
PROVIDED:	2 SPACE

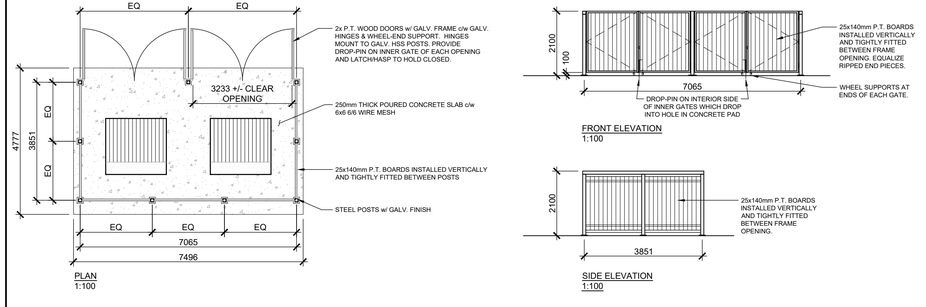
SYMBOL LEGEND

- SITE PROPERTY LINE
- ADJACENT PROPERTY LINE
- SETBACK LINE
- ROAD CENTRELINE
- FIRE ROUTE LINE
- NEW CHAIN LINK FENCE
- MUNICIPAL ROAD BOUNDARY
- SNOW STORAGE AREA BOUNDARY
- TRUCK AISLE OUTLINE
- DIRECTION OF TRAVEL
- EXISTING BUILDING
- PROPOSED BUILDING
- EXISTING HEAVY DUTY ASPHALT
- PROPOSED HEAVY DUTY ASPHALT
- EXISTING GRAVEL
- EXISTING INTERLOCK
- PROPOSED CONCRETE SIDEWALK AREA
- LANDSCAPED AREA
- NEW CULVERT
- EXISTING UTILITY POLE
- PRIMARY BUILDING ENTRANCE OR BARRIER-FREE ENTRANCE
- SECONDARY ENTRANCES / EXITS OR BARRIER-FREE ENTRANCE / EXITS
- OVERHEAD DOOR
- BARRIER-FREE CURB RAMP w/ TACTILE ATTENTION INDICATORS
- FIRE HYDRANT (EXISTING)
- EXISTING WELL
- EXISTING MANHOLE
- EXISTING HYDRO POLE
- EXISTING GAS METER
- EXISTING BOLLARD
- NEW BOLLARD

VERTICAL PARKING LOT SIGNAGE (POST OR WALL MOUNTED)



WASTE ENCLOSURE DETAILS



01 PROPOSED SITE PLAN
SP-A01 SCALE: 1:400

DEIMLING
ARCHITECTURE & INTERIOR DESIGN

North

Revisions

No.	By	Description	Date
07	W.P.	ISSUED FOR SITE PLAN CONTROL APPLICATION	25 FEB 2025
06	W.P.	ISSUED FOR COORDINATION	19 FEB 2025
05	W.P.	ISSUED FOR SITE PLAN CONTROL APPLICATION	20 DEC 2024
04	W.P.	ISSUED FOR COORDINATION	11 DEC 2024
03	T.D.	ISSUED FOR COORDINATION	02 DEC 2024
02	T.D.	ISSUED FOR COORDINATION	13 NOV 2024
01	T.D.	ISSUED FOR COORDINATION	08 NOV 2024

Project
EGIS
SITE PLAN DEVELOPMENT

145 WALGREEN RD, OTTAWA, ON

Drawing
PROPOSED SITE PLAN

Scale: AS NOTED
Drawn: T.D.
Checked: W.P.

Stamp
ONTARIO ASSOCIATION OF ARCHITECTS
CHRISTOPHER LEE DEIMLING
LICENCE
6238

Project No.: 24-138
Date: SEPTEMBER, 2024

Drawing No.: SP-A01

Reno Part 10,11
Change of Use

Application for a Permit to Construct or Demolish

This form is authorized under subsection 8(1.1) of the *Building Code Act, 1992*

For use by Principal Authority

Application number:	Permit number (if different):
Date received: 24-086 PART 10 & 11	Roll number: 080-77-0

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Application submitted to: OTTAWA SEPTIC SYSTEM OFFICE
(Name of municipality, upper-tier municipality, board of health or conservation authority)

A. Project information

Building number, street name	Unit number	Lot/con.
145 Walgreen Road		**Part of Lot 1 /Conc. 3 (Huntley)**

Municipality	Postal code	Plan number/other description
City of Ottawa	**K0A 1L0**	

Project value est. $	Area of work (m^2)

B. Purpose of application

New construction | (Addition to an existing building) | Alteration/repair | Demolition | Conditional Permit

Proposed use of building	Current use of building
Residential (Commercial) Other: .	Residential (Commercial) Other: .

Description of proposed work Check ALL that apply

Add BEDROOMS Y (N)
Add FIXTURES (Y) N
Add FINISHED FLOOR AREA (Y) N
CHANGE of USE (Y) N

If OTHER, please describe project here: _____

Proposed re-use of existing approved Class 4 sewage system (OSSO Permit 08-681) to service proposed re-development of property, including interior retrofits within existing building and building expansion.

C. Applicant

Applicant is: ☐ Owner or ☒ Authorized agent of owner

Last name	First name	Corporation or partnership
Leblanc	**Patrick**	**Egis Canada Ltd.**

Street address	Unit number	Lot/con.
115 Walgreen Road		

Municipality	Postal code	Province	E-mail
Carp	**K0A 1L0**	**ON**	**patrick.leblanc@egis-group.com**

Telephone number	Fax	Cell number
(613) 714-4586	**(613) 836-3742**	**(613) 229-5863**

D. Owner (if different from applicant)

Last name	First name	Corporation or partnership
		WO MW Realty Limited

Street address	Unit number	Lot/con.
180 Renfrew Drive, Suite 230		

Municipality	Postal code	Province	E-mail
Markham	**L3R 9Z2**	**Ontario**	**Christine.yee@whiteowlgroup.ca**

Telephone number	Fax	Cell number
( )	**(289) 818-2406**	**(647) 225-7021**

E. Builder (optional)

Last name	First name	Corporation or partnership (if applicable)	
Street address -24-0863			Unit number / Lot/con.
Municipality PART 10 & 11	Postal code	Province	E-mail
Telephone number ( )	Fax ( )		Cell number ( )

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F. Tarion Warranty Corporation (Ontario New Home Warranty Program)

i. Is proposed construction for a new home as defined in the *Ontario New Home Warranties Plan Act*? If no, go to section G.	Yes	No x
ii. Is registration required under the *Ontario New Home Warranties Plan Act*?	Yes	No x

iii. If yes to (ii) provide registration number(s): _____

G. Required Schedules

i) Attach Schedule 1 for each individual who reviews and takes responsibility for design activities.

ii) Attach Schedule 2 where application is to construct on-site, install or repair a sewage system.

H. Completeness and compliance with applicable law

i) This application meets all the requirements of clauses 1.3.1.3 (5) (a) to (d) of Division C of the Building Code (the application is made in the correct form and by the owner or authorized agent, all applicable fields have been completed on the application and required schedules, and all required schedules are submitted).	Yes x	No
Payment has been made of all fees that are required, under the applicable by-law, resolution or regulation made under clause 7(1)(c) of the *Building Code Act, 1992*, to be paid when the application is made.	Yes x	No
ii) This application is accompanied by the plans and specifications prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the *Building Code Act, 1992*.	Yes x	No
iii) This application is accompanied by the information and documents prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the *Building Code Act, 1992* which enable the chief building official to determine whether the proposed building, construction or demolition will contravene any applicable law.	Yes x	No
iv) The proposed building, construction or demolition will not contravene any applicable law.	Yes x	No

I. Declaration of applicant

I **Patrick Leblanc** (print name) declare that:

1. The information contained in this application, attached schedules, attached plans and specifications, and other attached documentation is true to the best of my knowledge.
2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.

Date **December 19, 2024** Signature of applicant

Personal information contained in this form and schedules is collected under the authority of subsection 8(1.1) of the *Building Code Act, 1992*, and will be used in the administration and enforcement of the *Building Code Act, 1992*. Questions about the collection of personal information may be addressed to: a) the Chief Building Official of the municipality or upper-tier municipality to which this application is being made, or, b) the inspector having the powers and duties of a chief building official in relation to sewage systems or plumbing for an upper-tier municipality, board of health or conservation authority to whom this application is made, or, c) Director, Building and Development Branch, Ministry of Municipal Affairs and Housing 777 Bay St., 2nd Floor. Toronto, M5G 2E5 (416) 585-6666.

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

E24-0869

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A. Project Information

Building number, street name		Unit no.	Lot/con.
145 Walgreen Road PART 10 & 11			Part of Lot 1 /Conc. 3 (Huntley)
Municipality: City of Ottawa	Postal code: K0A 1L0	Plan number/ other description	

B. Individual who reviews and takes responsibility for design activities

Name	Firm	
Patrick Leblanc, P.Eng.	Egis Canada Ltd. (Egis)	
Street address: 115 Walgreen Road, R.R.3	Unit no.	Lot/con.
Municipality: Carp (City of Ottawa)	Postal code: K0A 1L0 / Province	E-mail: patrick.leblanc@egis-group.com
Telephone number: (613) 714-4586	Fax number: (613) 836-3742	Cell number: (613) 229-5863

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1. of Division C]

House	HVAC – House	Building Structural
Small Buildings	Building Services	Plumbing – House
Large Buildings	Detection, Lighting and Power	Plumbing – All Buildings
Complex Buildings	Fire Protection	[x] On-site Sewage Systems

Description of designer's work

Obtain approval for proposed re-use of existing approved Class 4 sewage system (OSSO Permit 08-681) to service proposed re-development of property, including interior retrofits within existing building and building expansion.

D. Declaration of Designer

I **Patrick Leblanc, P.Eng.** declare that (choose one as appropriate):

(print name)

I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4.of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories.

Individual BCIN: _____

Firm BCIN: _____

I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5.of Division C, of the Building Code.

Individual BCIN: _____

Basis for exemption from registration: **P.Eng. (Licence # 100141438)**

The design work is exempt from the registration and qualification requirements of the Building Code.

Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

Date **December 19, 2024** Signature of Designer

NOTE:

1. For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) (c).of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
2. Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of practice, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Schedule 2: Sewage System Installer Information

A. Project Information

Building number, street name		Unit number	Lot/con.
145 Walgreen Road (B-24-086)			Part of Lot 1 /Conc. 3 (Huntley)
Municipality: City of Ottawa	Postal code: K0A 1L0	Plan number/ other description	

PART 10 & 11

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B. Sewage system installer

Is the installer of the sewage system engaged in the business of constructing on-site, installing, repairing, servicing, cleaning or emptying sewage systems, in accordance with Building Code Article 3.3.1.1, Division C?

Yes (Continue to Section C) No (Continue to Section E) [x] Installer unknown at time of application (Continue to Section E)

C. Registered installer information (where answer to B is "Yes")

Name			BCIN	
Street address			Unit number	Lot/con.
Municipality	Postal code	Province	E-mail	
Telephone number ( )	Fax ( )		Cell number ( )	

D. Qualified supervisor information (where answer to section B is "Yes")

Name of qualified supervisor(s)	Building Code Identification Number (BCIN)

E. Declaration of Applicant:

I **Patrick Leblanc** (print name) declare that:

I am the applicant for the permit to construct the sewage system. If the installer is unknown at time of application, I shall submit a new Schedule 2 prior to construction when the installer is known;

OR

I am the holder of the permit to construct the sewage system, and am submitting a new Schedule 2, now that the installer is known.

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.

Date **December 19, 2024** Signature of applicant

Ottawa Septic System Office | Bureau des systèmes septiques d'Ottawa

6-24-0865

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PART 10 & 11

Schedule 13
Part 10 & 11 Site Amendment
Check All that apply to project

Site Amendment/Description of Proposed Change/Renovation

☐ Residential

☒ Commercial Property

Vehicle Service Bays	#Existing	5	+ #Proposed	4	=	9	@ 2 factory workers (no showers) per service bay =18x75 L/day = 1,350 L/day
Fixture Units	#Existing	22.5	+ #Proposed	49.5	=	72.0	Schedule 8
Office Floor Area	#Existing	372	+ #Proposed	-85.96	=	286.04 m2	@ 75 L/day per 9.3 m2 of floor space = 2325 L/day

Total Q = 1,350 + 2325
= **3,675 L/day**

☒ Exceeding 15% of the gross area of the dwelling units for proposed addition

☒ Change in Use:
- Major occupancy (e.g. residential to commercial)
- Occupant load (e.g. Office to warehouse)

Please describe proposed use:

Internal retrofits to office space, restrooms, and storage areas. Building addition to increase number of vehicle service bays.

☐ Installation of a POOL not meeting O.B.C Regulation setback distances

☐ Installation of a DECK not meeting O.B.C Regulation setback distances

Required attachments

To be supplied by applicant/agent at applicant's expense:

1. **One** of the following documents to **DESCRIBE CURRENT SEPTIC SYSTEM** (ONE x1 copy):
   - ☒ A. Copy of current sewage system approval (Use permit/ Certificate of Completion)
   - ☐ B. Professional engineer's report indicating size and location of system

2. **Each** of these documents to **DESCRIBE PROPOSED RENOVATION** (ONE x1 copy)
   - ☒ A. Copy of site plan: Drawn to scale, indicating the layout of the existing building, well, other structures i.e shed,workshop,cabana
   - ☒ B. Completed Reno 10,11 Application Form
   - ☒ C. Copy of Building Plans: Drawn to scale, showing the changes/additions as proposed

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4-24-0865

PART 10 & 11

Do Not Complete
Permit #

Revision #_____
Date:

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Schedule 8
Fixture unit count

Fixtures	# Existing	+	# Proposed	X	unit count	=	Fixture Count
Bathroom Bathroom group (toilet, sink and tub **or** shower) installed in the **same** room		+		X	6	=	
Bathtub with/without overhead shower		+		X	1.5	=	
Shower stall		+		X	1.5	=	
Wash basin (SINK) (1½inch trap)	3	+	6	X	1.5	=	13.5
Watercloset (TOILET) tank operated	3	+	9	X	4	=	48
Urinal		+	5	X	1.5	=	
Kitchen Dishwasher		+		X	1	=	
Sink with/without garbage grinder(s), domestic and other small type single, double or 2 single with a common trap	3	+	-1	X	1.5	=	3.0
Other Domestic washing machine		+		X	1.5	=	
Combination sink and laundry tray single or double (Installed on 1½ trap)	1	+	-1	X	1.5	=	

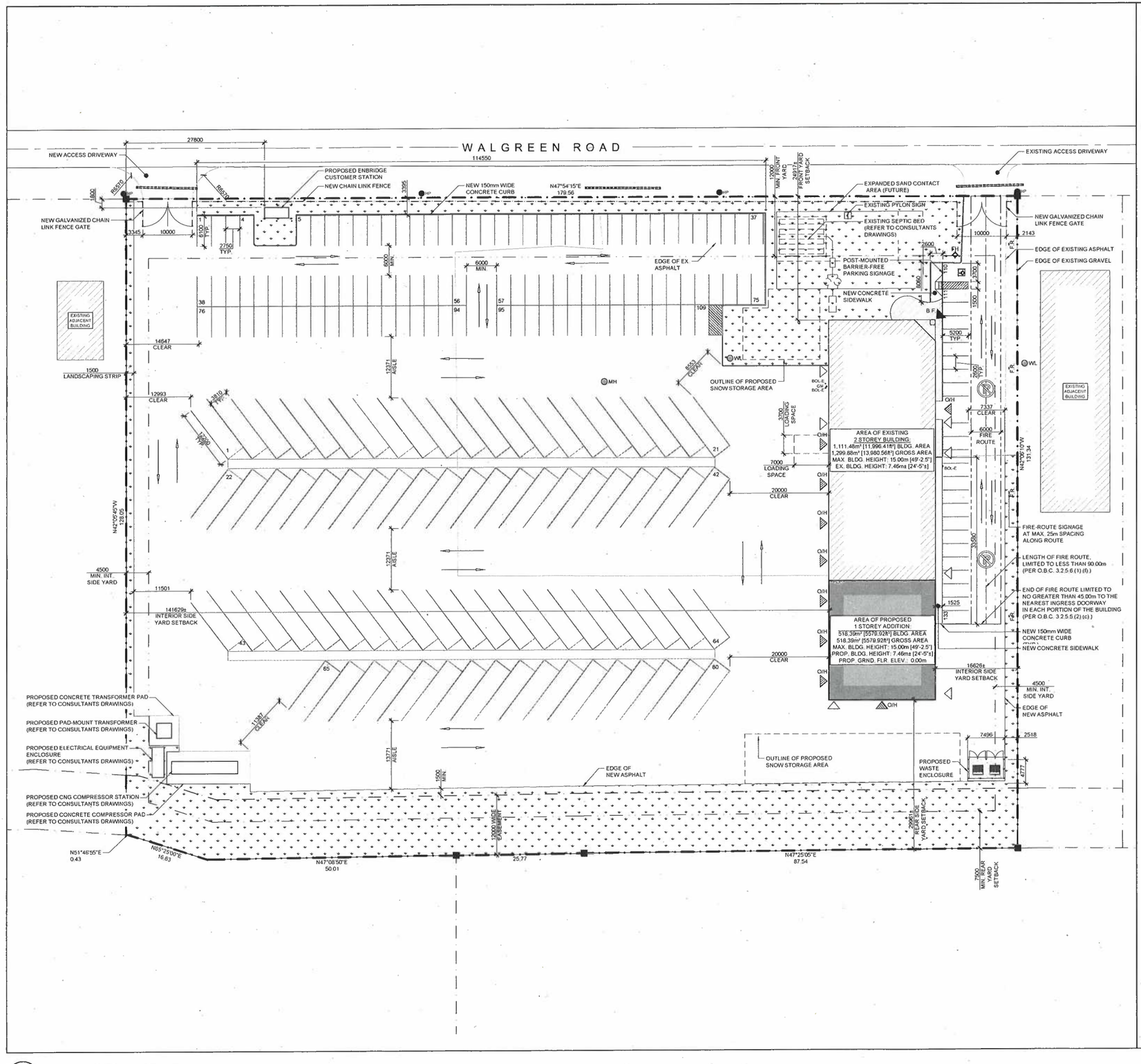
***Total:** 72.0

***Insert the TOTAL in Schedule 13** (0.Reg 151/13 Table 7.4.9.3)

1. **Sump pumps and floor drains are not to be connected to the sewage system.** Connection of such fixtures to a sewage system may lead to a hydraulic failure of the said system. The above mentioned fixtures should be discharged separately to an approved Class 2 (leaching pit) sewage system.
2. Where laundry waste is not more than 20% of the total daily design sanitary sewage flow, it may discharge to a sewage system (Part 8, OBC, 8.1.3.1(2)).

Agent/Owner signature

December 19, 2024
Date



01 PROPOSED SITE PLAN

ZONING INFORMATION

1.0 GENERAL INFORMATION:

LEGAL DESCRIPTION:
PART OF BLOCK 5 REGISTERED PLAN 4M-300, THE CITY OF OTTAWA

BUILDING AREA (B.A.):
1,627.31m²

GROSS FLOOR AREA (G.F.A.):
1,815.71m²

PROPOSED USE:
LIGHT INDUSTRIAL USE

2.0 ZONING PROVISIONS:

DESIGNATION:
RURAL GENERAL INDUSTRIAL ZONE (RG4)

LOT AREA:		
REQUIRED:	1,800.00m² (MIN.)	
PROPOSED:	23,696.64m²	
LOT FRONTAGE:		
REQUIRED:	0.00m	
PROPOSED:	24.92m	
SETBACKS:		
FRONT YARD:		
REQUIRED:	12.00m (MIN.)	
PROPOSED:	24.92m	
CORNER SIDE YARD:		
REQUIRED:	12.00m (MIN.)	
PROPOSED:	N/A	
INTERIOR SIDE YARD:		
REQUIRED:	4.50m (MIN.)	
PROPOSED:	16.63m	
REAR YARD:		
REQUIRED:	7.50m (MIN.)	
PROPOSED:	29.96m	
LOT COVERAGE:		
REQUIRED:	50% (MAX.)	
PROPOSED:	7%	
BUILDING HEIGHT		
REQUIRED:	15.00m (MAX.)	
PROPOSED:	7.46m	

3.0 PARKING (PER SECTIONS 3.30 & 3.41):

STANDARD SPACES:	
PROVISION:	0.8 SPACE PER 100m² G.F.A.
REQUIRED:	15 SPACES
PROVIDED:	109 PRIVATE SPACES 24 PUBLIC SPACES 80 TRUCK PARKING SPACES
BARRIER-FREE SPACES:	
PROVISION:	1-19 STANDARD = 1 SPACE
REQUIRED:	1 SPACE
PROVIDED:	1 SPACE
LOADING SPACES:	
PROVISION:	1000m² - 1,999m² G.F.A. = 1 SPACE
REQUIRED:	1 SPACE
PROVIDED:	1 SPACE (EXISTING)

SYMBOL LEGEND

- SITE PROPERTY LINE
- ADJACENT PROPERTY LINE
- SETBACK LINE
- ROAD CENTRELINE
- FIRE ROUTE LINE
- NEW CHAIN LINK FENCE
- MUNICIPAL ROAD BOUNDARY
- SNOW STORAGE AREA BOUNDARY LINE
- DIRECTION OF TRAVEL
- EXISTING BUILDING
- PROPOSED BUILDING
- EXISTING HEAVY DUTY ASPHALT
- PROPOSED HEAVY DUTY ASPHALT
- EXISTING GRAVEL
- EXISTING INTERLOCK
- PROPOSED CONCRETE SIDEWALK AREA
- LANDSCAPED AREA
- NEW CULVERT
- EXISTING UTILITY POLE
- PRIMARY BUILDING ENTRANCE OR BARRIER-FREE ENTRANCE
- SECONDARY ENTRANCES / EXITS OR BARRIER-FREE ENTRANCE / EXITS
- OVERHEAD DOOR
- BARRIER-FREE CURB RAMP w/ TACTILE ATTENTION INDICATORS
- FIRE ROUTE/NO PARKING SIGNAGE INSTALLED 25m MAX. ALONG ROUTE
- BARRIER-FREE PARKING SIGN
- FIRE HYDRANT (EXISTING)
- EXISTING WELL
- EXISTING MANHOLE
- EXISTING HYDRO POLE
- EXISTING GAS METER
- EXISTING BOLLARD

DEIMLING
ARCHITECTURE & INTERIOR DESIGN

D-24-086
PART 10 & 11

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DEC 19 2024

North

Revisions

No.	By	Description	Date
02	T.D.	ISSUED FOR COORDINATION	13 NOV 2024
01	T.D.	ISSUED FOR COORDINATION	08 NOV 2024

Project
EGIS
SITE PLAN DEVELOPMENT

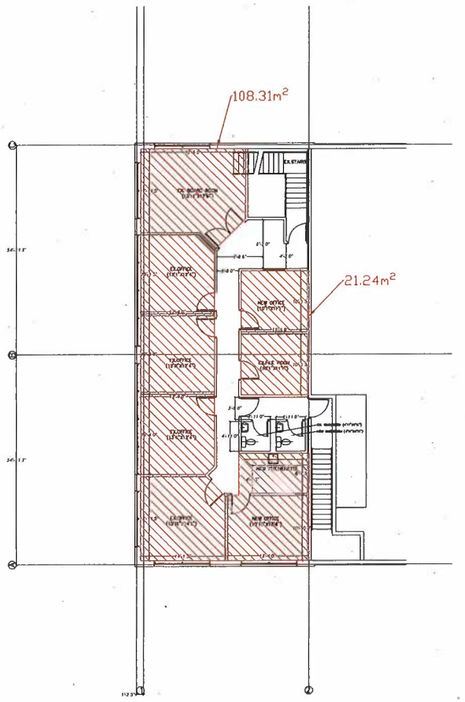
145 WALGREEN RD, OTTAWA, ON

Drawing
PROPOSED
SITE PLAN

Scale: AS NOTED
Drawn: T.D.
Checked: W.P.
Stamp

Project No.: 24-138
Drawing No.: SP-A01

TOTAL FLOOR OFFICE FLOOR SPACE = 156.49 m^2 + 129.55 m^2 = 286.04 m^2



LEVEL 2 – PLAN VIEW
2ND FLOOR OFFICE FLOOR SPACE =129.55 m^2

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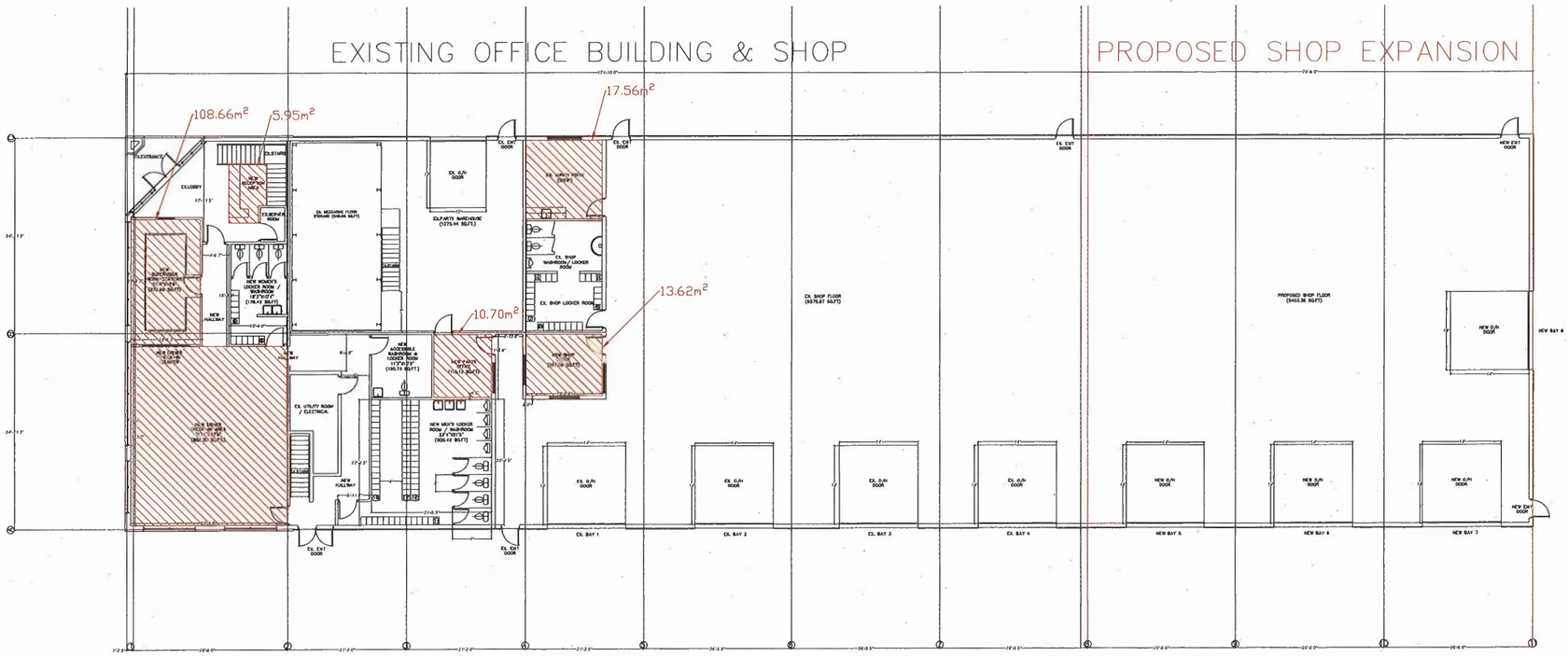
DEC 19 2024

-24-086
PART 10 & 11



LEVEL 1 – PLAN VIEW
1ST FLOOR OFFICE FLOOR SPACE =159.49 m^2

LEGEND:

NO.	REVISIONS/ISSUE	BY	DATE
6.	REVISION 05 (L-1NEW SHOP OFC)	SV	15 JULY
5.	REVISION 04 (L-2 ROOM DOOR)	SV	08 JULY
4.	REVISION 03 (RECP. H/C W/R)	SV	04 JULY
3.	REVISION 02 (SUP'S ROOM MOD.)	SV	28 JUNE
2.	REVISION 01 (HATCH & STAIRS)	SV	28 JUNE
1.	ISSUE 01	SV	26 JUNE

STAMP

STAMP

CLIENT

OPERATOR
Miller Waste Systems

BUILDER

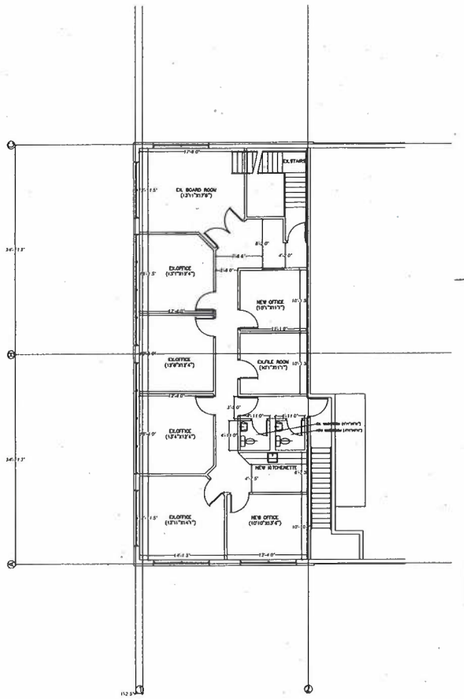
PROJECT
BUILDING RENOVATION

CONSULTANT

BUILDING
145 WALGREEN RD.
OTTAWA

DRAWING TITLE:
BUILDING PLAN VIEW
(MAIN FLOOR PLAN)

PROJECT NO.	SCALE: N.T.S
DATE: 2024-06-28	SHEET: OW1
DESIGNED BY:	
DRAWN BY: SV	



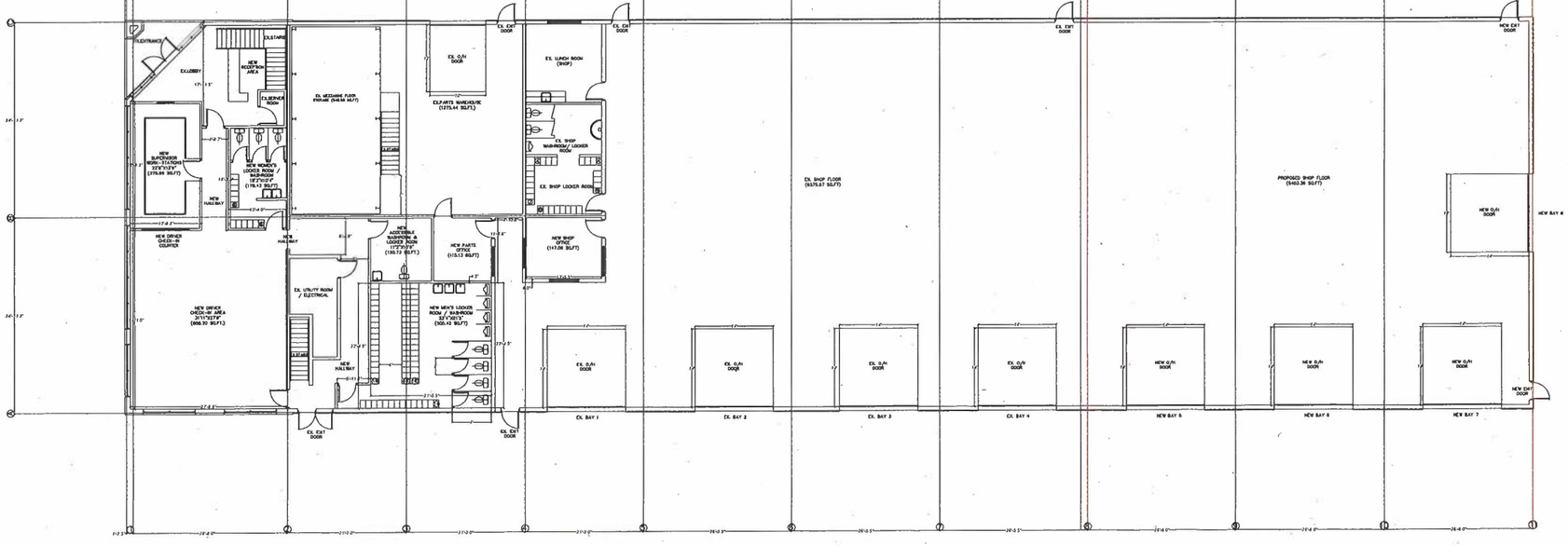
PART 10 & 11

-24-086-

LEVEL 2 – PLAN VIEW

EXISTING OFFICE BUILDING & SHOP

PROPOSED SHOP EXPANSION



LEVEL 1 – PLAN VIEW

LEGEND:

NO.	REVISIONS/ISSUE	BY	DATE
6.	REVISION 05 (L-1NEW SHOP OFC)	SV	15 JULY
5.	REVISION 04 (L-2 ROOM DOOR)	SV	08 JULY
4.	REVISION 03 (RECP. H/C W/R)	SV	04 JULY
3.	REVISION 02 (SUP'S ROOM MOD.)	SV	28 JUNE
2.	REVISION 01 (HATCH & STAIRS)	SV	28 JUNE
1.	ISSUE 01	SV	28 JUNE

STAMP

STAMP

CLIENT

OPERATOR

Miller Waste Systems

BUILDER

PROJECT

BUILDING RENOVATION

CONSULTANT

BUILDING

145 WALGREEN RD.
OTTAWA

DRAWING TITLE:

BUILDING PLAN VIEW
(MAIN FLOOR PLAN)

PROJECT NO.	SCALE: N.T.S
DATE: 2024-06-28	SHEET: OW1
DESIGNED BY:	
DRAWN BY: SV	

Rideau Valley Conservation Authority

Do Not Complete
Permit No B-24-086
Revision No _____
Date _____

Permit

Part 10/11- Change of Use/Renovation
Ontario Building Code

This permit verifies that the on-site sewage system was reviewed under the *Ontario Building Code* and *Ontario Regulation 350/06* as amended by *Ontario Regulation 503/09*

Reviewed & Recommended by: Ryan Hiemstra Owner: WO MW Realty Limited

Civic Address: 145 Walgreen Road Legal: Lot 1, Con 3

Roll #: _____

Commercial Property:
Factory area (75 L/day/employee x 18 employees = 1350 L/day)
Office area (286.04 m2 x 75 L/day/9.3 m2 = 2325 L/day)

Total Daily Design Flow Rate = 3675 L/day

Bed Configuration 8 runs at 9m m Type A bed w/ 2x Clearstream 600NC

Tank size 4500 L

Permit Refused By:

_____ _____
Terry K. Davidson, P.Eng., Manager Septic System Approvals Date

Permit Refused for the following reasons:

_____
_____
_____
_____

- ☐ Contact a licensed installer
- ☐ Must obtain a permit for tank replacement
- ☐ Must obtain a permit for new sewage system
- ☐ Must obtain a permit for effluent filter and riser
- ☐ Building plans required
- ☐ Septic system records required
- ☐ Engineer's assessment of septic system required

Permit Approved and Issued By:

Jason Hunter
_____
~~Terry K. Davidson~~, P.Eng., Manager - Septic System Approvals

December 20, 2024
Permit Date

Details and Conditions of Approval:

_____
_____
_____

_____ _____
Terry K. Davidson, P.Eng., Manager - Septic System Approvals Revision Date

Details and Conditions of Approval:

_____
_____
_____

Note: this permit is valid for 12 months from the date of signing. It is not renewable.

File No.: PC2024-0258

July 8, 2024

Rachel MacKnight
Parsons Inc.
Via email: rachel.macknight@parsons.com

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Amendment Application – 145 Walgreen Road

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on July 2, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. As *Bill 185, Cutting Red Tape to Build More Home Acts*, *2024* has received Royal Assent on Monday, June 6, 2024, and is now law, please note that changes to the City's development review process have come into effect. As a result of these changes, applicants are no longer required to partake in pre-consultation with the City, but they may choose to participate if they wish.

2. As City Staff continue to wait to hear instructions regarding new procedure, we kindly ask that you follow-up with your File Lead next week for further details.

3. In the meantime, City Staff recommend the applicant proceeds to a Phase 2 Pre-consultation meeting to discuss the comments detailed below, but this will be at the discretion of the applicant.

Next Steps

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. Official Plan

    a. The subject property is designated as Industrial and Logistics as per *Schedule C17 – Urban Expansion Areas of the Official Plan.*

        i. The Official Plan Section 3.5 (7) states: Lands designated as Industrial and Logistics and Rural Industrial and Logistics are considered employment areas under the Provincial Policy Statement and should be protected and preserved primarily for current and future manufacturing, storage, distribution and logistics uses. These are lands that may come under pressure for development with other land uses, are necessary to serve the population and to diversify the local economy and contain uses that generally cannot be integrated with sensitive land uses.

        ii. As per Section 6.4.1 (2) of the Official Plan the following uses are permitted within the Industrial and Logistics designation:

            - a) Traditional heavy and light industrial uses such as manufacturing, warehousing, distribution, storage, utilities and construction.

            - b) Uses that store most products outdoors and require large land areas devoted to external storage, sale, or service of goods.

            - c) Auto service and body shops, heavy equipment and vehicle sales and service.

            - f) Offices that are accessory to a primary use.

        iii. Industrial and Logistic lands on Schedule C17 shall be included in the supporting background studies to the secondary planning process of adjacent future neighbourhood lands.

    b. The subject property is within the 3km influence area of an active landfill. As per Section 10.1.7 (5) of the Official Plan, development within the influence area of an operating Solid Waste Disposal Site shall demonstrate that the Solid Waste Disposal Site shall not have any unacceptable adverse effects on the proposed development and will not pose any risks to human health and safety.

2. Zoning By-law

a. The subject property is zoned RG4 – Rural General Industrial Zone Subzone 4 (Carp Road Corridor).

i. Heavy equipment and vehicle sales, rental and servicing and storage yard uses are permitted within the RG4 Zone.

ii. Under Section 220 (2) an office is a permitted as a conditional use subject to the use being located on the same lot as a primary permitted use (By-law 2014-166).

iii. A gas bar is prohibited in the RG4 Subzone, please see the definition below:

- A gas bar is defined by the City's Zoning By-law as a place that retails automotive fuel along with small amounts of other automotive-related products such as pre-packaged motor oil or windshield washer anti-freeze, and may include the accessory sale of convenience items or food. For the purpose of this definition, an electric vehicle charging station accessory to a parking space is not a Gas Bar (By-law 2020-299).

- Refuelling tanks, including the proposed compressed natural gas (CNG) tanks, used for the property's own use is confirmed to be an accessory use. It will be up to TSSA to approve the proposed CNG compressor on site.

iv. Please refer to Table 220B – RG4 and RG5 Zone provisions below:

TABLE 220B – RG4 AND RG5 SUBZONE PROVISIONS

I ZONING MECHANISMS		PROVISIONS	
		II RG4	III RG5
(a) Minimum lot width (m)		30	30
(b) Minimum lot area (m^2)		1800	4000
(c) Minimum front yard setback (m)		12	12
(d) Minimum rear yard setback (m)	(i) Abutting a RG, RH or RC zone	7.5	7.5
	(ii) Other cases	10	10
(e) Minimum interior side yard	(i) Abutting a RG, RH or RC zone	4.5	4.5

setback (m)	(ii) Other cases	10	10
(f) Minimum corner side yard setback (m)		12	12
(g) Maximum principal building height (m)		15	15
(h) Maximum lot coverage (%)		50	50
(i) Outdoor storage		(a) outside storage is not permitted within any required front yard or corner side yard (b) outside storage must be screened from abutting residential uses or zones and public streets by an opaque screen at least 1.8 m in height from finished grade	

3. Parking Requirements:

    a. Please refer to Section 101- Table 101A to view minimum parking requirements:

        i. N41 – Heavy Equipment and Vehicle Sales Rental and Servicing – Area D (Rural):

            - 0.75 parking spaces are required per 100 m^2 of gross floor area.

        ii. N59 – Office space – Area D (Rural):

            - 2.4 parking spaces are required per 100 m^2 of gross floor area.

4. Loading Space Rates and Provisions

    a. Please refer to Section 113 – Table 113A to view the minimum number of vehicle loading spaces required.

        i. Refer to Table 113B for regulations for vehicle loading spaces. It should be noted, where a loading space is required by the By-law, it must comply with the regulations set out in Table 113B:

Table 113B- Regulations for Vehicle Loading Spaces

I Zoning Mechanism		Regulations	
		II Standard Size Space	III Oversized Space (see Table 113C for Number of Oversized Spaces Required)
(a) Minimum Width in metres of Driveway Accessing Loading Space		(i) Single traffic lane - 3.5 (ii) Double traffic lane - 6	
(b) Minimum Width in metres of Aisle Accessing Loading Space, by Angle of Loading Space	(i) 45° or less	5	11
	(ii) Between 45° and 60°	6.3	14
	(iii) 60° to 90°	9	17
(c) Minimum Width in metres of Loading Space		3.5	4.3
(d) Minimum Length in metres of Loading Space	(i) Parallel	9	13
	(ii) Other cases	7	13
(e) Minimum Vertical Clearance in metres for Loading Space		4.2	
(f) Permitted Location of Loading Space		Permitted in all locations other than in a required front yard or required corner side yard, or in a required yard abutting a residential zone	

5. Discussion

    a. The subject property is designated as Industrial and Logistics under *Schedule C17 - Urban Expansion Areas* of the Official Plan. As such, the subject property is inside the Urban Boundary. However, as the lands are still compliant with the current Rural zoning (RG4), the application will be reviewed by Development Review Rural.

    b. The registered Site Plan Agreement (2008) is used to as the site's current condition. Therefore, anything that deviates from the approved site plan (2008) will have to demonstrate that the alteration is appropriate throughout the new Site Plan process.

    c. When/if a new Site Plan Agreement is registered, the previous Site Plan will be removed from the property title and the new register agreement will be added.

6. Submission Requirements

    a. The required plans and reports listed below must meet the City's Terms of Reference.

        i. Landscape Plan – please identify any existing landscaping elements and natural features that will be preserved and illustrate the proposed landscaping elements to support the proposed development.

- A new landscape plan will be required as the existing site does not seem to be meeting the Landscape Plan approved with the previous Site Plan.

ii. Plan of Survey – please include a Plan of Survey to depict legal boundaries.

iii. Site Plan – please be sure to include dimensions of all proposed buildings, roads, radii of turns, overhead clearance, parking areas with defined parking spaces as well as labelled loading spaces, drive aisles and private approaches, in addition to all the City's Terms of Reference components

iv. Zoning Confirmation Report – to be used to identify potential zoning compliance issues.

Feel free to contact Jaime Mallory (jaime.mallory@ottawa.ca), Planner I, for follow-up questions.

Urban Design

Comments:

7. As part of a complete application, staff require detailed architectural plans and a Landscape Plan. An Urban Design Brief is not required.

8. Please provide a planted landscape buffer along the perimeter of the property.

9. Trees should be planted along Walgreen Road.

Feel free to contact Nader Kadri (nader.kadri@ottawa.ca), Urban Design, for follow-up questions.

Engineering

Comments:

10. General

a. For a complete description of the Terms of Reference and application submission requirements, please reference the City's web site: Planning application submission information and materials | City of Ottawa.

b. All drawings and reports submitted for engineering review must be stamped and dated by a Professional Civil Engineer, Civil Engineering

Technologist registered in the Province of Ontario, or Ontario Land Surveyor.

c. All drawings and reports submitted to the City must be in metric units.

11. Geotechnical Study

a. A Geotechnical Report is required to support the design and construction of this project.

b. The Geotechnical Report should provide sufficient soils and engineering information to confirm that the site(s) are suitable or can be made suitable for development. The Geotechnical Report shall adequately discuss the fill requirements, grade raise restrictions, and other limitations and earthworks required for development within a floodplain or adjacent to a watercourse, and wetland.

c. A Geotechnical Report might typically include borehole logs, Atterberg limits, consolidation testing, shear strength testing, grade raise restrictions, or a sieve analysis as required.

d. The report should clearly state whether sensitive marine clays or organic soils are present on this site, or not.

e. The report should clearly state whether soil liquefaction is a risk on this site, or not.

f. The report should clearly state whether thin soils or karst topography are present on this site, or not.

g. If the proposal intends to include infiltration or soak-away areas as part of the stormwater management design, be advised that:

- The soil must be tested and proved to have an infiltration rate in excess of 15mm/hr. ref: Low Impact Development Technical Guidance Report (Feb 2021), Section 3.5.1 page 23).

- Depth to groundwater should be measured over a considerable amount of time that includes the Spring freshet. Low Impact Development Technical Guidance Report (Feb 2021), Section 3.5.3, page 26). (Also, ref: Ottawa Sewer Design Guidelines (2012), update: ISTB 2018-04 Section 8.2)

- The seasonal groundwater level must be at least 1.0 metre below the bottom of the trench or infiltration structure. (ref: MOECP SWM Planning and Design Manual (March 2003) page 164 of 379). (Also ref: Low Impact Development Technical Guidance Report (Feb 2021) Section 3.5.3 pages 25 of 68).

12. Grading and Drainage Plan

    a. A Grading Plan and Drainage Plan is required to support the design and construction of this project.

    b. A Grading and Drainage Plan establishes the grading relationships between connecting (or abutting) properties. It serves as the basis for controlling surface runoff. A Grading Plan directs water from the building. The focus is on the landscaping around the house and soil elevation. The goal is to provide proper yard grading for drainage away from buildings.

    c. Grading Plans provided to the City of Ottawa should include:

        i. All elevations must be referenced to a geodetic reference point.

        ii. Please indicate the Site Benchmark and the external reference that provides the horizontal and vertical datum of the reference used to set this benchmark.

        iii. All measurements must be in metric units, imperial measurements may be provided as a secondary measurement.

        iv. Provide top of curb (TC) and bottom of curb (BC) elevations.

        v. Please maintain a minimum 150 mm difference between the proposed finished floor elevation and the finished grade at the structure. Maintain positive surface drainage away from the foundation wall.

        vi. A 0.3m freeboard should be provided between the 100-year water elevation and the finished floor elevation.

        vii. Please include the Pavement Design provided in the Geotechnical Report. Typically, this should include a low-density and a heavy-duty pavement design.

13. Hydrogeological Report and Terrain Analysis (Rural).

    a. A Hydrogeological and Terrain Analysis (HGTA) will be required to establish that there is an adequate quantity and quality of groundwater to support the Site Plan Control application and that the proposed activities (including the septic system) will not negatively impact the underlying aquifers and the natural environment.

    b. The report must meet the requirements of the City's Hydrogeological and Terrain Analysis Guideline Guidelines (March 2021); requirements related to Site Plan Control applications are listed in Section 5.0 – Site Plans.

    c. The supply well(s) must be tested to confirm that the water quality and quantity are suitable for the proposed use prior to approval. A pumping

test is required to confirm that the well(s) on-site can supply the required amount of water and the quality of water meets Ontario Drinking Water Standards, Objectives and Guidelines.

i. If an existing well is proposed to be used, then a well inspection is required to confirm it meets the Wells Regulations (O.Reg.903); specifically, please confirm that the well casing and grouting are sound, grading around the wellhead, and that the casing height above ground details meets the regulations. Note that the supply well(s) must be shown in all plans.

ii. The pump test rate must be justified, and the maximum day rate should be used. It is recommended to conduct the pump test based on the pumping rate required for the final development plan at the property, to sufficiently supply the shop and office areas, considering both phases.

iii. As per the City Guidelines, water quality sampling will be required during the pumping test, minimum parameters to sample include the subdivision suite, trace metals, and volatile organic compounds (VOCs), in addition it is recommended that sampling include hydrocarbon and BTEX due to nearby automotive activity land uses. Additional sampling parameters should also be assessed based on land uses, such as chemicals used in the car wash.

d. Water Quantity and Quality

i. Support must be provided for the pump test rate, which should be the maximum day rate. For commercial/industrial operations, an 8-hour pump test is normally recommended.

ii. Water quality parameters that must be tested include the “subdivision suite” known to local well testing companies, as well as trace metals and VOCs. The report should also provide an assessment of on-site, adjacent, and historic land uses and determine if any other parameters need to be tested (i.e., petroleum hydrocarbons, BTEX, etc.).

14. Site Servicing Study

a. A Site Servicing Study is required to support the design and construction of this project.

b. Applications for new development are required to demonstrate, to the City’s satisfaction, that adequate services are available and can be allocated to support the proposal.

c. Both the existing well and septic must be inspected and/or tested to ensure that they have the necessary capacity to support the increased demand from the enlarged building.

d. An Erosion and Sediment Control Plan is required in support of the design and construction of this project.

e. If required, please include servicing insulation details as per drawing 'W22 - 'Thermal Insulation for Watermains in Shallow Trenches', S35 – 'Insulations for Shallow Sewers', and/or OPSD 1109.030 – 'Insulation for Sewers and Watermains in Shallow Trenches'.

f. 'Letter of Continued Use' from the TSSA

- The City requires a 'Letter of Continued Use' from the Technical Standards and Safety Authority (TSSA), verifying that based on the information provided by the proponent, the property is in compliance with GA1/99 "Environmental Management Protocol for Operating Fuel Handling Facilities in Ontario".

g. Septic System Review and Approval

i. The consultant should discuss whether the building addition will require an upgrade to the existing septic system, or not.

ii. If the existing septic system is being replaced or modified, the City will require septic approval before we can issue Site Plan Approval.

iii. If the sanitary sewage daily design flow is less than 10,000 L/day, the septic permit from the Ottawa Septic System Office (OSSO) must be issued prior to future Site Plan Approval being granted.

iv. If the sanitary sewage daily design flow is greater than 10,000 L/day, the septic system(s) is regulated by the Ministry of the Environment, Conservation and Parks (MECP) and requires a direct submission Environmental Compliance Approval (ECA) application.

v. Be advised that a Groundwater Impact Assessment will be required if the site-wide daily design flow is greater than 10,000 L/day.

vi. Please ensure that the OSSO office is aware if an oil/grit separator or car wash runoff is contributing flows to the septic system.

vii. As per the OSSO office, the septic system must be at least 3.0 metres from the property lines.

viii. Technical consultation with the City's hydrogeologist is encouraged, please contact the City hydrogeologist, Tessa Di Iorio (Tessa.diiorio@ottawa.ca) and copy the assigned Infrastructure Project Manager to schedule a technical consultation.

h. Stormwater Management Report

i. A Stormwater Management Report is required in support of the design and construction of this project.

ii. Stormwater design must adhere to the City's 'Ottawa Design Guidelines -Sewer', Second Edition, document no. SDG002, October 2012, City of Ottawa, including technical bulletins: ISDTB-2014-01, PIEDTB-2016-01, ISTB 2018-01, ISTB-2018-04, ISTB-2019-02.

iii. The approved drawings from 2008 indicate that the stormwater pond was intended to be located well outside of the drainage easement. According to the recent application, it was constructed within the easement. Why was this? The new Stormwater Management Report should discuss the original design of the stormwater pond, and how the redesign of the site will impact this design.

iv. The quantity criteria for the development are that the 100-yr post development peak flow rate must match the 2-year pre-development peak flow rate.

v. The stormwater management quality criteria for this site are 80% total suspended solids (TSS) removal.

vi. A calculated time of concentration (cannot be less than 10 minutes) is required.

vii. Runoff volumes must be calculated using the 'C' values found in the Ottawa Design Guidelines (Sewer), Section 5.4.5.2.1 page 5.26. There are no standard or maximum 'C' values in the Rural area.

viii. Stormwater must outlet to a legal and sufficient outlet.

ix. A 0.3m freeboard should be provided between the 100-year high-water elevation and the finished floor elevation.

x. Stormwater or Drainage Plans must include the ponding depth, volume, and ponding extent for 2-year and 100-year storm events.

- Please provide pre- & post- development drainage plans clearly identifying the sub-drainage zones, their areas, and 'C' values.

- In regard to proposed Low Impact Development (LID) development, please reference the City's 'Low Impact Development Technical Guidance Report', in particular 'Section 2.0 Hydrological Constraints', Section 3.3 Geotechnical Investigations, and 'Section 3.5 Current Approaches and Guidance'.

15. Fire Services

a. Is the existing 53,000 L fire protection tank adequate to service the proposed building expansion? The consultant should provide fire flow calculations using both the Fire Underwriters Survey (FUS), and the Ontario Building Code methodologies. The Engineer, Fire Protection (Ottawa Fire Services), will review the proposal and determine the criteria that will govern. Contact Allan Evans in Fire Services (allan.evans@ottawa.ca).

b. Fire Services requires an access point or draft hydrant to be located some distance from the building itself. Trucks must be able to physically draft water from a safe distance. For more information contact Allan Evans in Fire Services. allan.evans@ottawa.ca.

c. The consultant should consider the placement of any on-site storage tanks, ensuring that sufficient area and clearances are provided. The designer must also consider the location of the access to the on-site water supply and ensure it can be accessed safely during a fire event.

d. Fire truck routes should be shown on civil plans. Fire Routes now require designation with By-law through the Site Plan application process by contacting fireroutes@ottawa.ca.

16. Ministry of the Environment, Conservation and Parks Review (MECP)

a. An MECP Environmental Compliance Approval (ECA) may be required for the proposed development. Is there an existing ECA approval? If yes, should it be updated to reflect the new use? Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office for more information.

b. It is the applicant's responsibility to determine which of the several types of ECA approvals may be required for this application. If a Direct Submission is by the nature of the application required by the MECP, the applicant can request a Transfer of Review in its place by contacting Charles Warnock.

c. Industrial sites will likely require an additional ECA approval from the MECP regardless.

d. For any water taking of volumes greater than 50,000 L/day, either Environmental Activity and Sector Registration (EASR) or a Permit To Take Water (PTTW) is required from the MECP, dependent on dewatering requirements.

e. MECP/ECA Contact Information

- Patrick Lalonde at (613) 363-1652 patrick.Lalonde@ontario.ca (Site Plans).
- Shannon Hamilton-Browne at (613) 880-4255 or shannon.hamiltonbrowne@ontario.ca (subdivisions).
- Charles Warnock at 613-580-2424 x27809 or Charles.warnock@ottawa.ca.

17. Site Lighting Certificate

a. The City will require an Exterior Lighting Certificate certified by a qualified engineer before issuing Site Plan Approval.

b. Any exterior lighting proposed for the site is required by the City of Ottawa to be certified by a qualified engineer confirming the design complies with the following criteria:

i. It must be designed using only fixtures that meet the criteria for Full-Cut-Off (Sharp cut-off) Classification, as recognized by the Illuminating Engineering Society of North America (IESNA or IES).

ii. It must result in minimal light spillage onto adjacent properties. As a guide, 0.5 foot-candle is normally the maximum allowable spillage.

iii. The location of the fixtures, fixture types (make, model, and part number) and the mounting heights must be provided.

18. Retaining Wall

a. Retaining walls over 1.0 metre in height requires a drawing and report, stamped and signed by an engineer licensed in the Province of Ontario.

Feel free to contact Brian Morgan (Brian.Morgan@ottawa.ca), Project Manager, for follow-up questions.

Transportation

Comments:

19. Right-of-Way protection

    a. See Schedule C16 of the Official Plan.

    b. Any requests for exceptions to the Right-of-Way (ROW) protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

20. A Transportation Impact Assessment (TIA) is not required for the 510 square metre shop expansion.

21. Review on-site turning movements for the largest design vehicle.

Feel free to contact Mike Giampa (mike.giampa@ottawa.ca), Transportation Project Manager, for follow-up questions.

Environment

Comments:

22. The site is within 120 m of a natural feature and there are species at risk known from the area and mapped which indicates regulated species habitat for the Blanding's turtle. As such an Environmental Impact Study (EIS) is required.

    a. The EIS will be scoped to address impacts on the species at risk and impact on the adjacent natural feature. Of particular concern is keeping turtles out of the site through fencing and demonstrating that the proposal will not have a negative impact on the Blanding's turtle habitat – Environmental Impact Study Guidelines | City of Ottawa.

23. Blanding's turtle – further information

    a. Blanding's Turtle | Ontario.ca

    b. Wildlife and Plants | City of Ottawa

24. Bird-Safe Design Guidelines - Please review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, and light pollution. More guidance and solutions are available in the guidelines which can be found here: Bird-Safe Design Guidelines | City of Ottawa.

Feel free to contact Matthew Hayley (matthew.hayley@ottawa.ca), Environmental Planner, for follow-up questions.

Forestry

Tree Protection and Planting Comments:

25. This site is within the Expansion Lands, and as such, Part IV of the Tree Protection By-law applies to any proposed Site Plans. A Tree Conservation Report and Tree Removal Permit are required for any on-site works or development that would necessitate removal of trees >10cm in diameter on private property or trees of any size on City property. Plans should be designed to retain as many existing trees as possible, prioritizing those on property lines and City land.

26. Sections of this property (primarily around the north and west property lines) are forested, and it is strongly recommended to design to allow for retention of these areas, as much as possible, including consideration of reducing parking.

27. Section 4.8.2 of the Official Plan provides strong direction to maintain the urban forest canopy and it's ecosystem services during intensification noting when considering the impacts on individual trees, planning and development decisions, including Committee of Adjustment decisions, shall give priority to the retention and protection of large, healthy trees over replacement plantings and compensation. Applications must address the cumulative impacts on the urban forest, over time and space, with the goal of 40% urban forest canopy cover in mind. Further, that the City and the Committee of Adjustment may refuse a development application where it deems the loss of a tree(s) avoidable or where an application fails to provide adequate soil volume for existing and/or new trees.

28. A Landscape Plan will be required with the Site Plan application, showing the planting locations and species of all proposed trees, in accordance with the Landscape Plan Terms of Reference and guidelines included below:

    a. It is strongly recommended to plant trees along the Walgreen frontage (in the areas where there are currently no trees), to improve the streetscape, canopy cover, and screening of the site.

    b. To improve the climate change resiliency of new developments, the City recommends that the following details are provided on the Landscape Plan, as a Best Management Practice:

        i. For parking lots, provide 1 new tree for every 5 parking spaces to help cool the landscape of the site.

ii. Confirm sufficient soil volumes to support canopy cover on the site (30m^3 for street trees).

iii. Proposed species must not include invasive species and target a minimum of 50% native species.

29. The following are requirements with the submission for either property, further detail can be found in Schedule E of the Tree Protection By-law and the Landscape Plan Terms of Reference.

a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City.

i. An approved TCR is a requirement of Site Plan approval.

ii. The TCR may be combined with the Landscape Plan provided all information is supplied.

b. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection By-law (By-law 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

c. Compensation may be required for the removal of city owned trees.

d. The TCR must contain 2 separate plans:

i. Plan/Map 1 - show existing conditions with tree cover information.

ii. Plan/Map 2 - show proposed development with tree cover information.

e. The TCR must list all trees on the site, as well as off-site trees if the critical root zone (CRZ) extends into the developed area, by species, diameter and health condition.

i. Please identify trees by ownership – private on-site, private on adjoining site, city owned, co-owned (trees on a property line).

f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.

g. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca.

i. The location of tree protection fencing must be shown on the plan.

ii. Show the critical root zone of the retained trees.

h. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

i. For more information on the process or help with tree retention options, contact Nancy Young (nancy.young@ottawa.ca) or on City of Ottawa.

30. Landscape Plan Tree Planting Requirements

a. Minimum Setbacks

i. Maintain 1.5 metres from sidewalk or MUP/cycle track or water service laterals.

ii. Maintain 2.5 metres from curb.

iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.

iv. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization/afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

b. Tree Specifications

i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

iii. Tree planting on City property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).

iv. Plant native trees whenever possible.

v. No root barriers, dead-man anchor systems, or planters are permitted.

vi. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree).

c. Hard Surface Planting

   i. Curb style planter is highly recommended.

   ii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

   iii. Trees are to be planted at grade.

d. Soil Volume

   i. Please document on the Lanscape Plan that adequate soil volumes can be met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

e. Sensitive Marine Clay

   i. Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.

31. Tree Canopy

a. The Landscape Plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.

b. At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate. Indicate on the plan the projected future canopy cover at 40 years for the site.

Feel free to contact Nancy Young (nancy.young@ottawa.ca), Forester, for follow-up questions.

Parkland

32. Parkland Dedication is required in accordance with By-law No. 2022-280.

33. The applicable parkland dedication rate for industrial and commercial uses is 2% of the gross land area. For commercial and industrial redevelopment, gross land area means the portion of the property that is impacted by the development.

34. The applicant is advised that they must identify on the survey, site plan or supporting plan the portion of the property impacted by the development, for the purpose of calculating gross land area. The portion of the site impacted includes the parking lot, drive aisles, snow storage and amenity areas to the satisfaction of the Parks Planner.

35. Parks & Facilities Planning is requesting payment of **Cash-in-lieu-of-Parkland** for this development. The value of the land, equivalent to the Parkland Dedication requirement, will be determined as of the day before planning approval is given for the development. The applicant shall bear the cost of any appraisal costs incurred by the City.

Feel free to contact Anissa McAlpine (anissa.mcalpine@ottawa.ca), Parks Planner, for follow-up questions.

Conservation Authority

Comments:

36. The subject property is not regulated by the Mississippi Valley Conservation Authority (MVCA) under Ontario Regulation 41/24. A permit from the Conservation Authority will not be required for the proposed development.

37. MVCA may review the Stormwater Management Plan with a focus on water quantity, with respect to natural hazards from the receiving watercourse perspective.

Feel free to contact Mercedes Liedtke (mliedtke@mvc.on.ca), Mississippi Conservation Authority, for follow-up questions.

Submission Requirements and Fees

- Regarding the formal Site Plan Control process, City staff has determined that this proposal will fall under the application type of Standard Rural.
    - Additional information regarding fees related to planning applications can be found here.

- The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    - The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
- All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Jaime Mallory

Encl. Study and Plan Identification List (SPIL)
List of Technical Agencies to Consult
Pre-con Supplementary Development Information

c.c. Erica Ogden-Fedak
Leah Dykstra
Nader Kadri
Brian Morgan
Kevin Hall
Mike Giampa
Matthew Hayley
Amy MacPherson
Nancy Young
Anissa McAlpine
Mercedes Liedtke

145 WALGREEN ROAD
OFFICE & SHOP FACILITY
SITE SERVICING BRIEF &
STORMWATER MANAGEMENT REPORT

June 11, 2008

Project No. P06-043
City File: D07-12-07-0062

PREPARED BY: MCINTOSH PERRY CONSULTING ENG.
115 Walgreen Road
Carp, Ontario
K0A 1L0

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(613) 836-3742 Fax

TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION

1.1 Purpose

This report will address the servicing and stormwater management issues associated with the development of a new office building and welding shop to be constructed at 145 Walgreen Road. The proposed phased project consists of developing two buildings, asphalt parking areas, as well as an open gravel storage area. Phase 1 of the construction will consist of building 600m^2 of office and shop space. Phase 2 will add an additional 515m^2 of shop space to the building. Phase 3 will involve building the second building which will add another 585m^2 of work shop area.

1.2 Site Description

The property is located on Walgreen Road, west of Carp Road, in the former Township of Goulbourn, now the City of Ottawa. The land in question covers approximately 2.37 ha. The adjacent properties are made up of commercial buildings along the east and west sides. Walgreen Road runs along the north side of the site while the south side is bordered by vacant land.

Existing site drainage is via overland sheet flow across the vacant land to the existing drainage ditch located in the drainage easement south of the proposed development. The stormwater presently runs unrestricted to the property lines before entering into the drainage ditches.

2.0 EXISTING SERVICES

Water service will be made available from a drilled well located between the proposed buildings. Municipal piped services such as storm and sanitary are not available from Walgreen Road. A joint use septic system will be constructed to the north of the proposed Phase 1 building. The final detailed septic design will be done by others.

Hydro, gas, bell and cable services are available on Walgreen Road, the exact sizes of these services are unknown at this time.

4.0 SITE DRAINAGE

The proposed site is currently undeveloped and consists of mostly grassed and bushed surfaces with some areas of stocked piled fill. Stormwater runoff is presently unrestricted and the north portion of the property sheet drains north while the south portion drains south via sheet flow runoff. Stormwater from the north portion enters the

Walgreen Road roadside ditch, the south portion drains into the drainage ditch south of the site.

The site is being designed to direct stormwater flow away from the new building and into the proposed stormwater management swale on site. The proposed swale along the south side property line is designed to provide the required storage for the 5- and 100- year storm events, to ensure post-development flows to Walgreen Road do not exceed the limits specified by the City. Under direction by City staff, the site is being designed to limit post-development flows to coincide with pre-development flow rates.

In order to determine the appropriate volume of water to be stored, we have referenced the SWM Storage Guidelines published as per Appendix 'F', Storage Sizing Procedure Based on Rational Method, Guidelines for the Preparation of Stormwater Site Management Plans in the Region of Ottawa-Carleton, March 24, 2000 and 2005 City Sewer Design Guidelines.

4.1 Pre-Development Drainage

Drawing No. P06-043 C-PRE (Appendix B) indicates the limits of the site under consideration by this report. The total pre-development area that is within the influence zone of the project is 2.15 ha and is denoted as area A1.

Currently, drainage area A1 is mostly covered in a mixture of grass and bush giving a balanced 'C' value of 0.20. For the 100-year storm event the balanced 'C' value of 0.20 is increased by 25% to 0.25. Estimates of maximum runoff rates for typical 5- and 100-year rainfall events are 84 l/s and 180 l/s respectively.

The drainage easement located at the rear of the property and is denoted as A2. This area is outside the developable area of the site and will remain covered in vegetation and as such will not increase surface runoff from the site.

Complete calculations are attached in Appendix A.

4.2 Post-Development Drainage

Planned development consists of the construction of a two new buildings, asphalt parking areas, as well as a gravel open storage area.

As indicated on Drawing No. P06-043 C-POST (Appendix B) the total post-development area of interest is 2.15 ha and is denoted as areas B1 and B2.

Drainage area B1 consists of gravel, asphalt and roof top surfaces. The balanced 'C' value for B1 is 0.42. For the 100-year storm event the balanced 'C' value of 0.42 is increased to 0.51. Estimates of maximum runoff rates for typical 5 and 100-year rainfall

events are 149 l/s and 310 l/s respectively. The runoff from B1 drains into the proposed stormwater management swale at the rear of the site where it is restricted before entering into the municipal drain south east of the proposed building area.

Drainage area B2 consists of the asphalt and grass surfaces. The balanced 'C' value for B2 is 0.27. For the 100-year storm event the balanced 'C' value of 0.27 is increased to 0.33. Estimates of maximum runoff rates for typical 5 and 100-year rainfall events are 18 l/s and 37 l/s respectively. The runoff from B2 will continue to drain unrestricted into the existing roadside ditch on Walgreen Road, north of the site. Therefore, outlet control, using an orifice plug in the pipe inlet, will be sized to accommodate further restrict the exiting flow rate to 66.7 l/s for the five year event.

The outlet control will result in water ponding during more significant rainfall events. The site has been designed to accommodate the required storage for both the 5 and 100-year events as illustrated in the Stormwater Calculations, attached as Appendix A.

Downstream of the outlet control is area B3 as it represents the drainage easement located at the rear of the property. As noted earlier, this area will remain covered in vegetation and as such will not impact downstream outlet conditions as surface runoff will continue to match pre-developed rates for this area.

However, in order to accommodate future development in the subdivision, the City has requested that a rear yard ditch be engineered in order to provide future outlet if required for neighbouring property owners further south west towards Moonstone Road. A potential catchment area has been mapped out by way of field inspections, and the ditch has been sized accordingly to accommodate the 1:100 year storm event. For the catchment area plan and support calculations, see Appendix A.

4.3 Quality Control

The development of this lot will employ Best Management Practices (BMP's) wherever possible. The intent of implementing stormwater BMP's is to ensure that water quality and quantity concerns are addressed at all stages of development. BMP's at this site will be implemented at the lot levels.

Lot level BMP's include the roof water onto grassed areas, minimizing ground slopes and maintaining as much of the lot as possible in a natural state. This will provide an opportunity for initial filtration of any sediment, and provide an opportunity for absorption and groundwater recharge.

An orifice plug will restrict flows from the site, causing temporary ponding. There will be an opportunity for particle settlement during this process, but the full benefits of a larger scale end-of-pipe facility will not be fully realized at this site.

5.0 SEDIMENT & EROSION CONTROL

The site-grading contractor is responsible for ensuring sediment control structures are installed in accordance with the Site Servicing and Site Grading and Drainage Plan as indicated.

Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences or straw bale check dams without prior removal of the sediments shall not be permitted.

At the discretion of the project manager or municipal staff, additional silt control devices shall be installed at designated locations.

6.0 DESIGN METHODOLOGY

Runoff calculations presented in this report are derived using the Rational Method, given as:

$$Q = 2.78\ CIA\ (l/s)$$

Where,
C = runoff coefficient
I = rainfall intensity in mm/hr
A = drainage area in hectares

It is recognized that the rational method tends to overestimate runoff rates. As a by-product of using extremely conservative prediction method, any facilities that are sized using these results are expected to function as intended in real world conditions.

The following runoff coefficients were used to develop a balanced 'C' for each drainage area:

Building roofs, Asphalt, Concrete	0.90
Gravel	0.60
Grass, undeveloped areas	0.20

As per the City of Ottawa Sewer Design Guidelines the balanced 'C' value must increase by 25% when going from a 5-year storm event to a 100-year storm event. This new balanced 'C' value should not exceed a value of 1.0

Rainfall intensity-duration curves for the City of Ottawa were used in this report.

7.0 SUMMARY

The development, consisting of two new buildings, asphalt parking areas, as well as a gravel parking area, is planned for the noted site.

Phase 1 includes a 600m^2 building to be used for both office space as well as miscellaneous shop and storage facilities.

Phase 2 will add an additional 515m^2 of space to the Phase 1 building to expand the storage and shop facilities.

Phase 3 includes the second 585m^2 building which will provide more space for storage and repair shop capabilities.

For services, the owner plans to use a common drilled well as well as a joint use septic system to service both buildings.

With respect to stormwater management, surface runoff will being restricted in a proposed storage swale at the rear of the property and released at the pre-development level.

Utilities will be extended underground from the existing connections to Walgreen Road.

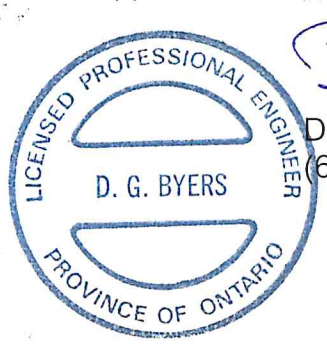
8.0 RECOMMENDATIONS

We respectfully recommend that:

1. This report, dated June 11, 2008 and associated site grading, drainage and servicing plans be approved for engineering details.

2. The Sediment and Erosion Control Plan outlined in Section 5.0 and detailed in the site plan notes are to be implemented by the contractor.

This report is respectfully submitted for approval on June 11, 2008.



Denton Byers, P.Eng.
(613) 836-2184 Ext. 22

Encl.
P06-043

APPENDIX A

STORMWATER CALCULATIONS

Meyknecht-Lischer - 145 Walgreen Road

Area B1					
Type	**C (5-yr)**	**C (100-yr)**	**Area**	**Product (5-yr)**	**Product (100-yr)**
asphalt	0.9	1.00	999.0	899.1	999.0
roof	0.9	1.00	1700.0	1530.0	1700.0
gravel	0.6	0.75	5480.0	3288.0	4110.0
grass	0.2	0.25	10040.0	2008.0	2510.0
Avg C (5 yr / 100 yr)	0.42	0.51			

Area B2					
Type	**C (5-yr)**	**C (100-yr)**	**Area**	**Product**	**Product**
asphalt	0.9	1.00	337.0	303.3	337.0
roof	0.9	1.00	0.0	0.0	0.0
gravel	0.6	0.75	31.0	18.6	23.3
grass	0.2	0.25	2962.0	592.4	740.5
Avg C (5 yr / 100 yr)	0.27	0.33			

	5 year (mm/hr)	**100 year (mm/yr)**
Intensity (20 min)	70.3	120

Pre-Development Runoff					
Basin	**Drainage Area (ha)**	**Balanced Runoff Coefficient (C) 5- yr**	**Balanced Runoff Coefficient (C) 100-yr**	**5-year flow rate (l/s)**	**100-year flow rate (l/s)**
A1	2.15	0.20	0.25	84.2	179.7
Total				**84.2**	**179.7**

Post-Development Runoff					
Basin	**Drainage Area (ha)**	**Balanced Runoff Coefficient (C) 5-yr**	**Balanced Runoff Coefficient (C) 100-yr**	**5-year flow rate (l/s)**	**100-year flow rate (l/s)**
B1	1.82	0.42	0.51	149.5	310.0
B2	0.33	0.27	0.33	17.6	36.7
Total	**2.15**	**0.42**	**0.51**	**167.1**	**346.6**

Maximum Allowable Stormwater Runoff (l/s) from Pond

	=	**Pre-Developed**	**-** **Unrestricted**		
Maximum Outflow	=	84.2	17.6	***66.7***	***5 Year***
Maximum Outflow	=	179.7	36.7	***143.1***	***100 Year***

As we are in an rural setting, we have assumed half the maximum allowable release as the outflow rate for pond.

Average Outflow	=	66.7	divided by 2	***33.3***	***5 Year***
Average Outflow	=	143.1	Use 5-Yr Release Rate	***66.7***	***100 Year***

Storage Requirements for Area B1					
5 Year Storm Event					
Tc	I (mm/hr)	Runoff (l/s)	Outflow (l/s)	Runoff To Be Stored (l/s)	Storage Required (m^3)
5	141.2	300.4	33.3	267.0	80.1
10	104.2	221.7	33.3	188.3	113.0
15	83.6	177.8	33.3	144.5	130.1
20	70.3	149.5	33.3	116.2	139.5
25	60.9	129.5	33.3	96.2	144.3
30	53.9	114.7	33.3	81.3	146.4
35	48.5	103.2	33.3	69.8	**146.7** *
40	44.2	94.0	33.3	60.7	145.7
45	40.6	86.4	33.3	53.0	143.2
50	37.7	80.2	33.3	46.9	140.6
55	35.1	74.7	33.3	41.3	136.4
60	32.9	70.0	33.3	36.7	132.0

Maximum storage required	**146.7**

Storage Requirements for Area B1					
100 Year Storm Event					
Tc	I (mm/hr)	Runoff (l/s)	Outflow (l/s)	Runoff To Be Stored (l/s)	Storage Required (m^3)
5	242.7	626.9	66.7	560.3	168.1
10	178.6	461.3	66.7	394.7	236.8
15	142.9	369.1	66.7	302.5	272.2
20	120	310.0	66.7	243.3	292.0
25	103.8	268.1	66.7	201.5	302.2
30	91.9	237.4	66.7	170.7	307.3
35	82.6	213.4	66.7	146.7	**308.1** *
40	75.1	194.0	66.7	127.3	305.6
45	69.1	178.5	66.7	111.8	302.0
50	64	165.3	66.7	98.7	296.0
55	59.6	154.0	66.7	87.3	288.1
60	55.9	144.4	66.7	77.7	279.9
65	52.6	135.9	66.7	69.2	269.9
70	49.8	128.6	66.7	62.0	260.3
75	47.3	122.2	66.7	55.5	249.9
80	45	116.2	66.7	49.6	238.0
85	43	111.1	66.7	44.4	226.5
90	41.1	106.2	66.7	39.5	213.3

Maximum storage required	**308.1**

Meyknecht-Lischer - 145 Walgreen Road

Swale #1 Storage Calculations

Pond Length	155.00	m
Invert at bottom end	125.87	m
Slope on pond bottom	0.30%	
Bottom width	3.00	m
Side slope	3	:1

Water level (m)	Depth (m)	Dist to "0" height (m)	Lower Wedge End Area	Avg. Upper Trapezoid Area	Total Volume (m^3)	
125.87	0.00	0.0	0.00	0.000	0.0	
125.91	0.04	13.3	0.12	0.000	0.6	
125.95	0.08	26.7	0.26	0.000	2.3	
125.99	0.12	40.0	0.40	0.000	5.4	
126.03	0.16	53.3	0.56	0.000	9.9	
126.07	0.20	66.7	0.72	0.000	16.0	
126.11	0.24	80.0	0.89	0.000	23.8	
126.15	0.28	93.3	1.08	0.000	33.5	
126.19	0.32	106.7	1.27	0.000	45.1	
126.23	0.36	120.0	1.47	0.000	58.8	
126.26	0.39	130.0	1.63	0.000	70.5	
126.30	0.43	143.3	1.84	0.000	88.1	
126.34	0.47	155.0	2.07	0.000	107.1	
126.38	0.51	155.0	2.07	0.171	133.6	
126.40	**0.53**	**155.0**	**2.07**	**0.260**	**147.5**	**5-yr**
126.44	0.57	155.0	2.07	0.446	176.2	
126.48	0.61	155.0	2.07	0.641	206.5	
126.52	0.65	155.0	2.07	0.846	238.2	
126.56	0.69	155.0	2.07	1.060	271.5	
126.60	**0.73**	**155.0**	**2.07**	**1.284**	**306.2**	**100-yr**
126.61	0.74	155.0	2.07	1.342	315.1	

Sizing Orifice Plate

Release rates vary as a function of head, so we have used as a typical release rate of 33.3 l/s (half the five year event) to help size an appropriate ICD. We then checked the ICD against the 100 year allowable release rate.

To store 146.7 cu.m, top of water will be at approxiamtely 126.40
Therefore H= (126.40 - 125.87) - 0.1 = 0.43m

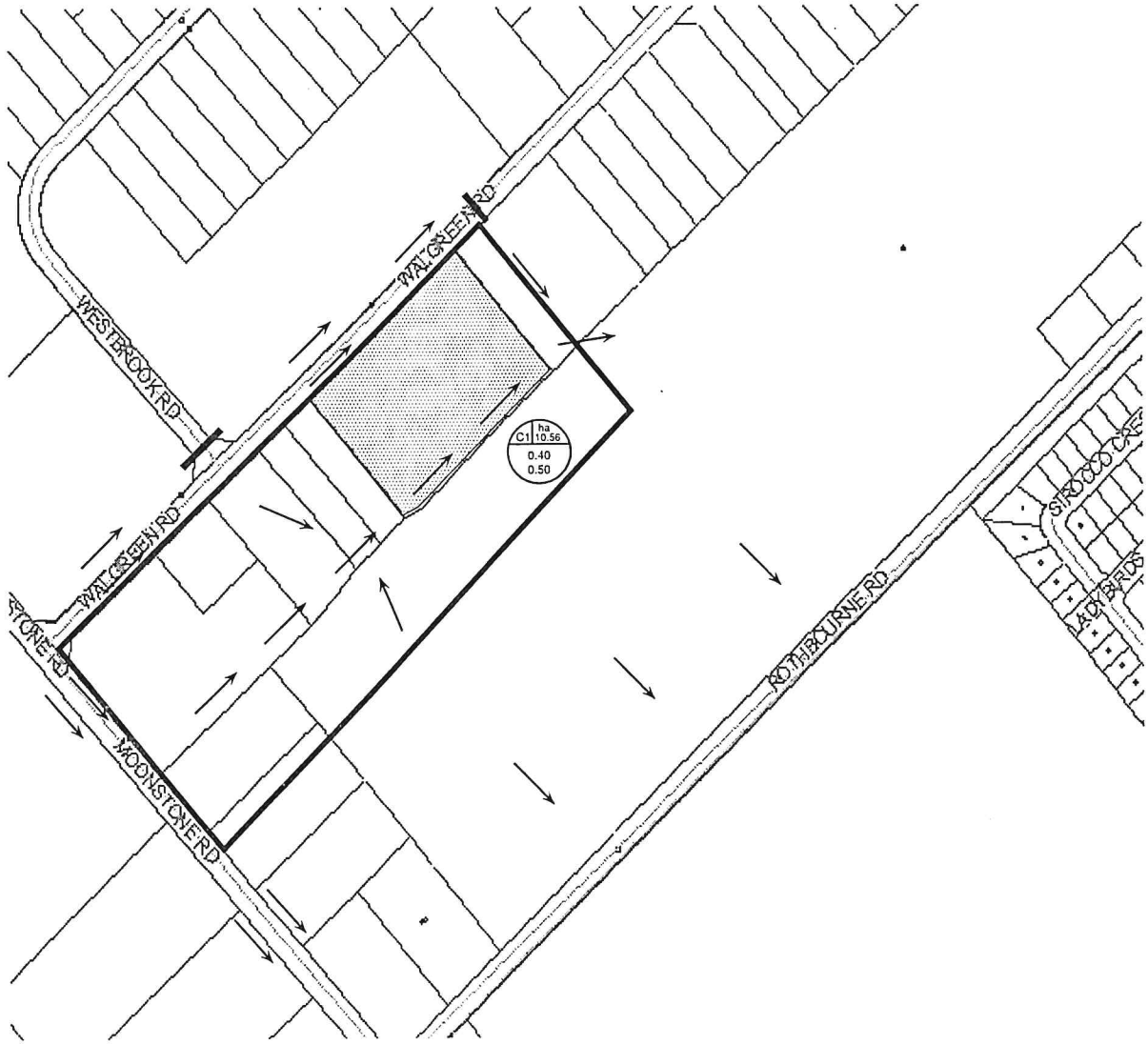
Inlet Control Device		
Project:	P06-043	
Description	Walgreen Road Lischer Facility	
Date:	17-Apr-08	
H=	0.43	Head (m)
C=	0.61	Opening Coef.
Q=	0.0667	Flow (m^3/s)
A=	0.037645431	Opening (m^2)
D=	0.219	Diametre (m)

Use 219mm ICD Orifice Plug.

For ther 100 year event, top of water is estimated at 126.60, which gives a head water of
H= (126.60 - 125.87) - 0.11m = 0.62m

ICD Check - 100 Year Event		
Project:	P06-043	
Description	Walgreen Road Lischer Facility	
Date:	15-Jan-08	
H=	0.62	Head (m)
C=	0.61	Opening Coef.
D=	0.219	Diametre (m)
R=	0.1095	Radius (m)
A=	0.037649385	Opening (m2)
Q=	0.080	Flow (m3/s)

The ICD, for the 100 year event, will have a release rate of 80 l/s which is greater than our assumed release rate of 66.7, yet less than the 100 Year Allowable release rate of 143.1 l/s. Therefore, the pond and ICD are adequate for the 100 year event.



SCALE

50m 0 50m

LEGEND

SUBJECT PROPERTY

DIRECTION OF SURFACE WATER

LIMIT OF CATCHMENT AREA

REAR YARD CATCHMENT AREA
145 WALGREEN ROAD, OTTAWA

P06-043
MAY 22 2008

Rear Yard Ditch Calculations

New Office/Work Building – 145 Walgreen Road, Ottawa

Area C1

Area = 10.56 ha.
C = 0.50 (100 year event)

Time of Concentration =

$$t_c = \frac{(3.26\,(1.1 - C)\,L^{0.5})}{S_w^{0.33}} + \left(\frac{L_d}{V} \div 60\right)$$

C = 0.50
L = 120 m
S_w = 0.5%
L_d = 480m
V = 0.5 m/s

Therefore, T_c = 27 + 16
= 43 min.

Therefore, I_{100} = 71 mm/hr.

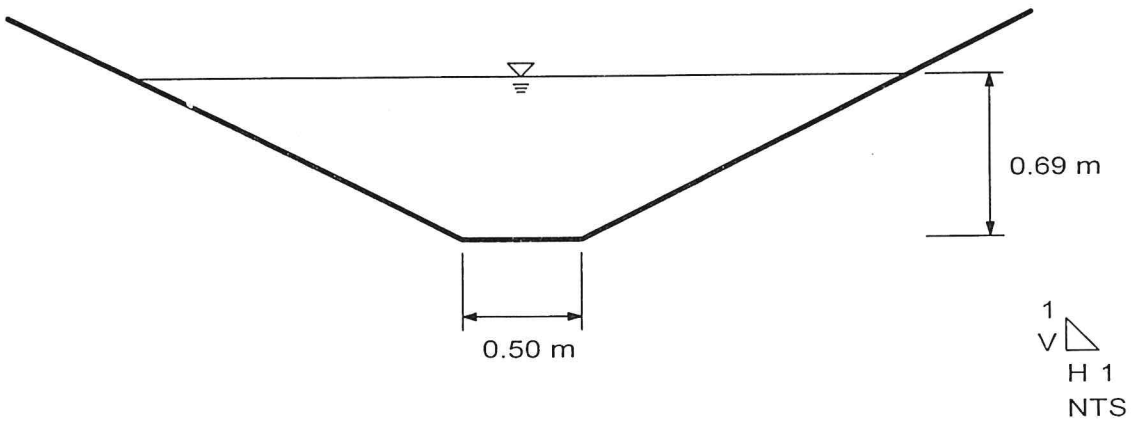
Q_{100} = 2.78 CIA
= 2.78 x 0.5 x 71 x 10.56
= 1,042 l/s (1.042 m^3/s)

Using a flat bottom ditch (0.5m) at 0.5% with 2:1 side slopes, height of water in ditch, d = 0.69m.
Minimum depth of ditch is 0.775m.

145 Walgreen Road - Rear Yard Swale
Cross Section for Trapezoidal Channel

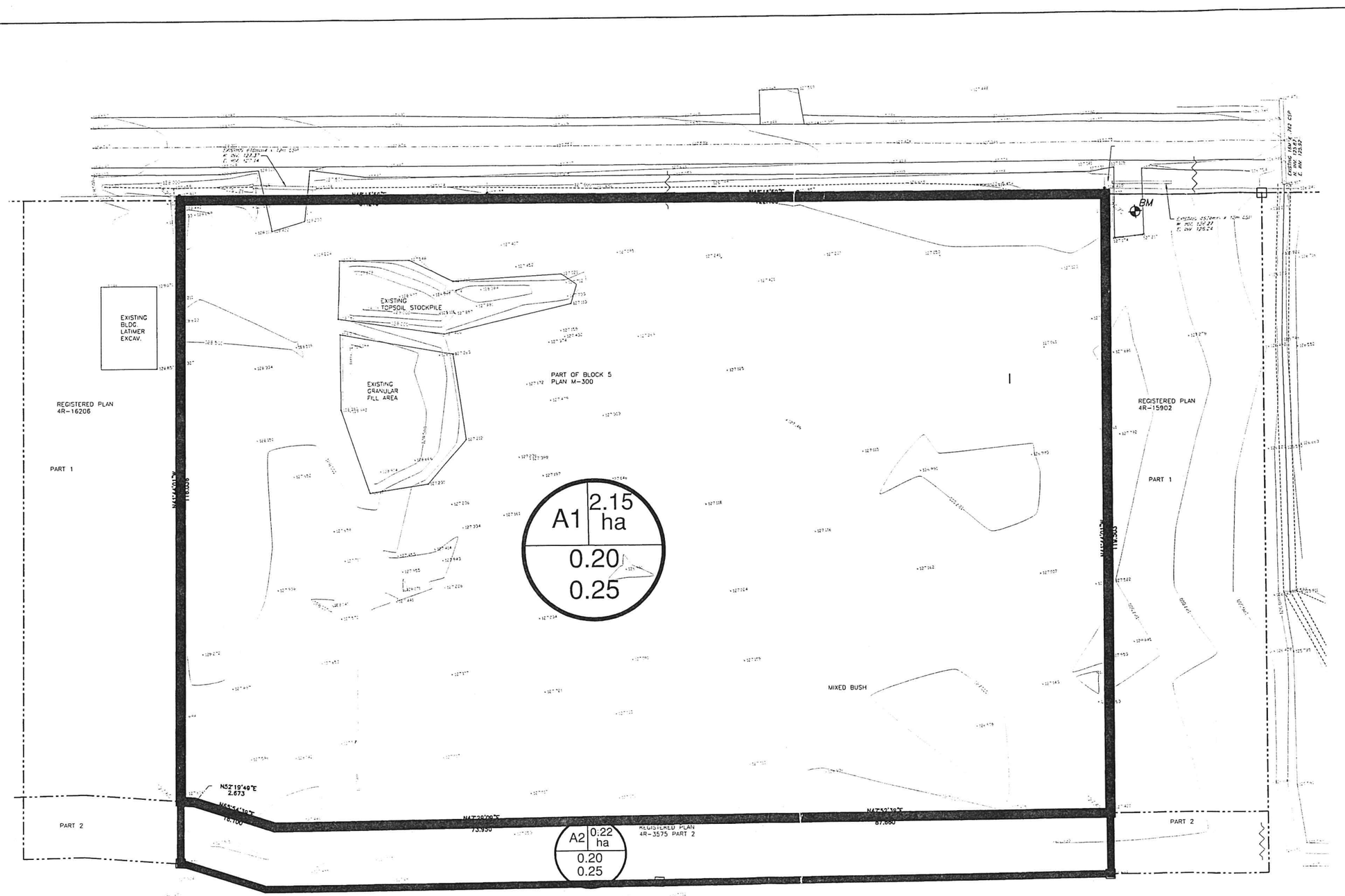
Project Description	
Project File	c:\haestad\fmw\calculat.fm2
Worksheet	145 Walgreen Road - Rear Yard Swale
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.045	
Channel Slope	0.005000	m/m
Depth	0.69	m
Left Side Slope	2.000000	H : V
Right Side Slope	2.000000	H : V
Bottom Width	0.50	m
Discharge	1,042	l/s

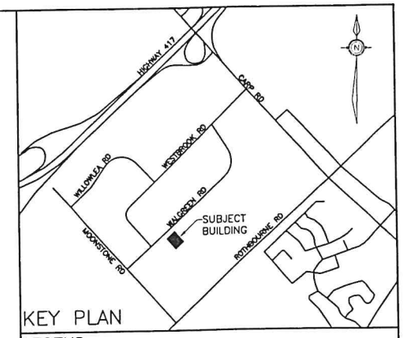


APPENDIX B

PRE- & POST-DEVELOPMENT DRAINAGE PLANS

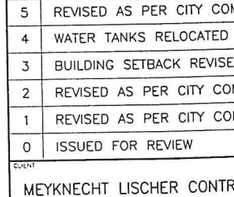


Pre-Development Plan



KEY PLAN

LEGEND



REVISIONS

No.	DESCRIPTION	DATE	BY
5	REVISED AS PER CITY COMMENTS	APR 16/08	DB
4	WATER TANKS RELOCATED	MAR 5/08	DB
3	BUILDING SETBACK REVISED	FEB 4/08	DB
2	REVISED AS PER CITY COMMENTS	JAN 15/08	DB
1	REVISED AS PER CITY COMMENTS	AUG 24/07	DB
0	ISSUED FOR REVIEW	FEB 20/07	DB

CLIENT: MEYKNECHT LISCHER CONTRACTING

DESIGNED AO
DRAWN dmw
CHECKED DB

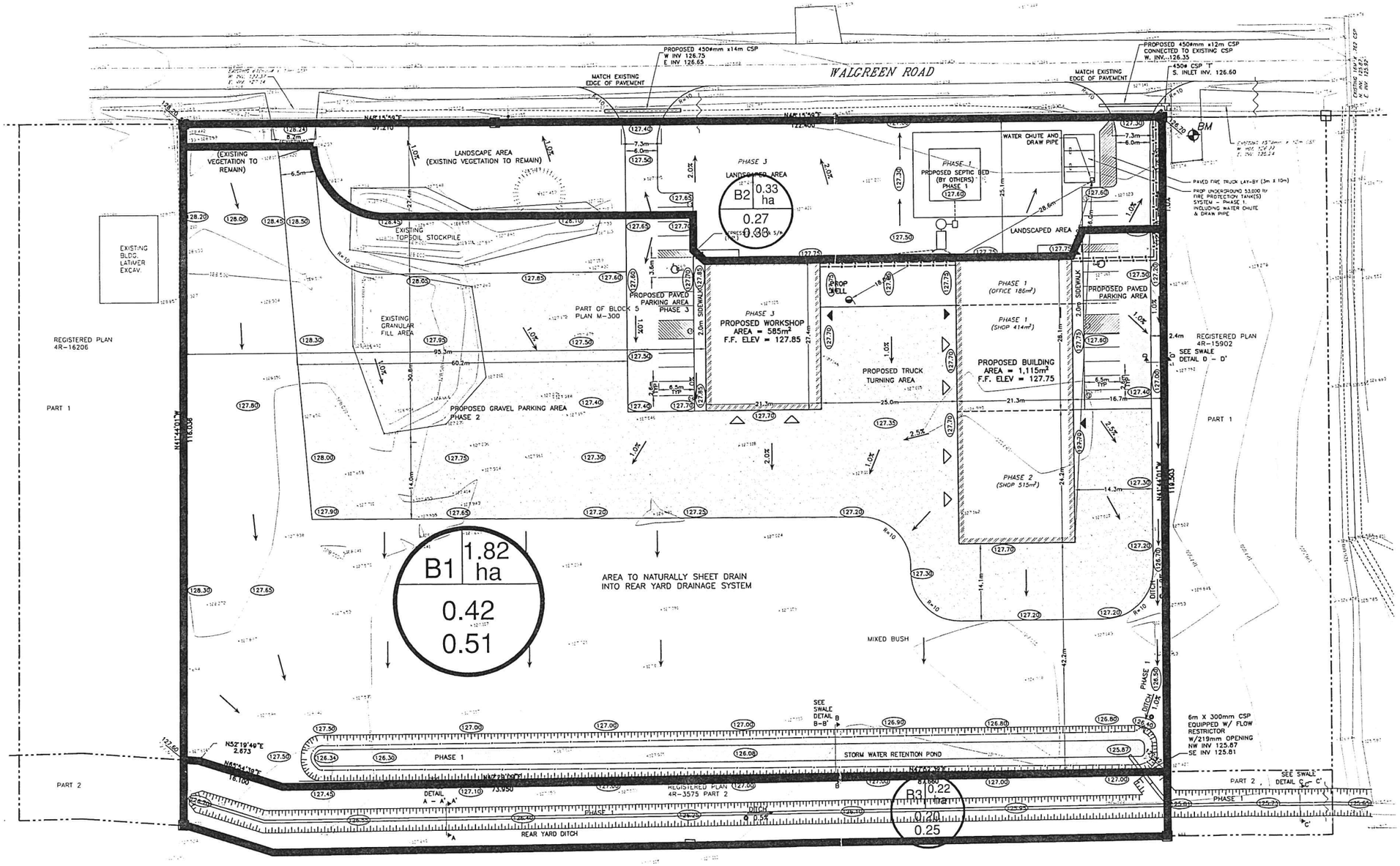
PROJECT: NEW OFFICE & SHOP FACILITY
145 WALGREEN ROAD, CARP, ONTARIO

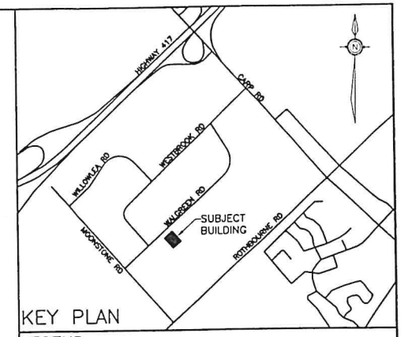
TITLE: PRE-DEVELOPMENT PLAN

Consulting Engineers of Ontario

McINTOSH PERRY Consulting Engineers Ltd.

DATE: APRIL 11, 2006 | SCALE: 1:800 metric | PROJECT No.: P06-043 | DRAWING No.: PRE





KEY PLAN

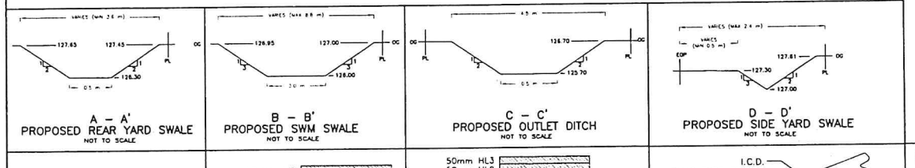
LEGEND

AREA — AREA SIZE (HECTARES)

B1 | 1.84 ha. | 0.20 | 0.25

5 YEAR RUNOFF COEFFICIENT — 100 YEAR RUNOFF COEFFICIENT

Post-Development Plan



LEGEND

- 1.0% — DIRECTION OF SURFACE WATER
- (86.58) — PROPOSED GRADES
- PROPOSED BARRIER CURB
- PARKING SPOT NUMBERS
- PROPOSED SILT FENCE
- PROPOSED HEAVY DUTY PAVEMENT
- 5 YR PONDING (EL. 126.40)
- 100 YR PONDING (EL. 126.60)
- DENOTES EXISTING TREELINE
- DENOTES EXISTING GATE
- DENOTES PROPOSED RIP-RAP
- DENOTES 50ømm CALIPER SPRUCE SEE DOUG FOUNTAIN LANSCAPE DESIGN FOR MORE INFORMATION
- DENOTES HYDRO/BELL POLE
- DENOTES HYDRO/BELL POLE/LAMP SANDARD
- BM — DENOTES BENCHMARK LOCATION
- 127.42 / 127.42 — PROP LOT CORNER GRADE
- PROPOSED HYDRO
- PROPOSED BELL
- PROPOSED FIRE ROUTE SIGN (NO PARKING)
- ENTRANCE DOORS
- OVERHEAD DOORS

BENCH MARK
T/NAIL IN HYDRO/BELL POLE
ELEV. 127.482 (GEODETIC)

1:400 — 10 0 10 20 30m

REVISIONS

No.	DESCRIPTION	DATE	BY
5	REVISED AS PER CITY COMMENTS	APR 16/08	DB
4	WATER TANKS RELOCATED	MAR 5/08	DB
3	BUILDING SETBACK REVISED	FEB 4/08	DB
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1	REVISED AS PER CITY COMMENTS	AUG 24/07	DB
0	ISSUED FOR REVIEW	FEB 20/07	DB

CLIENT: MEYKNECHT LISCHER CONTRACTING

DESIGNED AO
DRAWN dmw
CHECKED DB

PROJECT: NEW OFFICE & SHOP FACILITY
145 WALGREEN ROAD, CARP, ONTARIO

TITLE: POST-DEVELOPMENT PLAN

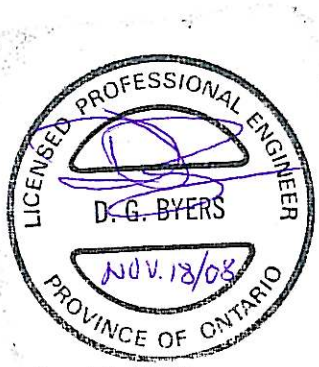
Consulting Engineers of Ontario

McINTOSH PERRY Consulting Engineers Ltd.

APRIL 11, 2006 | 1:800 metric | P06-043 | POST

McINTOSH PERRY Consulting Engineers Ltd.

Helping shape better communities



Project: Lischer Holdings
145 Walgreen Road
Stittsville, Ontario

November 18, 2008
Denton Byers, P.Eng.

Re: Fire Fighting Storage Tank Calculations

---

1. Building Occupancy

   D (Office Facilities)
   F-3 (Low Hazard Industrial Occupancy – Equipment Storage)

2. $Q = KVS_{TOT}$

   Office Facility

   K = 16 (Building Code Appendix A – Vol.2, Pg A-31, Table 1)
   V = (8.73m x 21.3m x 6.047m)
   = 1,125 m^3 (Building Volume - finished floor to second floor ceiling)
   S_{TOT} = 1.0 + [S1 + S2 + ….etc]
   = 1.0 + 0 (Exposure distance to adjoining building greater than 12m)
   = 1.0

   Q_D = 16 x 1,125 x 1.0
   = 18,000 L

   Equipment Storage

   K = 19 (Building Code Appendix A – Vol.2, Pg A-31, Table 1)
   V = (43.57m x 21.3m x 6.55m)
   = 6,079 m^3 (Building Volume - finished floor to under side of deck)
   S_{TOT} = 1.0 + [S1 + S2 + ….etc]
   = 1.0 + 0 (Exposure distance to adjoining building greater than 12m)
   = 1.0

   Q_{F-3} = 19 x 6,079 x 1.0
   = 115,501 L

   Q = 18,000 + 115,501 (Total for both building uses)
   = 133,501 L

As 133,501 L < 135,000 L, the minimum allowable flow rate is 3,600 L/min.
Therefore Min Size Tanks = 3,600 x 30 min. = 108,000 L (See Vol.2, Pg A-32, Table 2)

115 Walgreen Road, R.R.3 Carp, Ontario K0A 1L0 Tel.: 613.836.2184 Fax: 613.836.3742
info@mcintoshperry.com www.mcintoshperry.com

APPENDIX C
WATER SERVICE CALCULATIONS

CO-25-1370 - 145 Walgreen - Water Demands

Project:	145 Walgreen
Project No.:	CO-25-1370
Designed By:	RP
Checked By:	CM
Date:	April 25, 2025
Site Area:	2.37 gross ha

Commercial	627 m2
Industrial - Light	1165 m2

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	
Residential	280	L/c/d	
Industrial - Light	35,000	L/gross ha/d	
Industrial - Heavy	55,000	L/gross ha/d	
Shopping Centres	2,500	L/(1000m² /d	
Hospital	900	L/(bed/day)	
Schools	70	L/(Student/d)	
Trailer Park with no Hook-Ups	340	L/(space/d)	
Trailer Park with Hook-Ups	800	L/(space/d)	
Campgrounds	225	L/(campsite/d)	
Mobile Home Parks	1,000	-40%	
Motels	150	L/(bed-space/d)	
Hotels	225	L/(bed-space/d)	
Tourist Commercial	28,000	L/gross ha/d	
Other Commercial	28,000	L/gross ha/d	
AVERAGE DAILY DEMAND	Residential	0.00	L/s
	Commercial/ Industrial/ Institutional	0.07	L/s

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	9.5	x avg. day	L/c/d
Industrial	1.5	x avg. day	L/gross ha/d
Commercial	1.5	x avg. day	L/gross ha/d
Institutional	1.5	x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	Residential	0.00	L/s
	Commercial/ Industrial/ Institutional	0.10	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	14.3	x avg. day	L/c/d
Industrial	1.8	x max. day	L/gross ha/d
Commercial	1.8	x max. day	L/gross ha/d
Institutional	1.8	x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	Residential	0.00	L/s
	Commercial/ Industrial/ Institutional	0.18	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT
CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

AVERAGE DAILY DEMAND	0.07	L/s
MAXIMUM DAILY DEMAND	0.10	L/s
MAXIMUM HOUR DEMAND	0.18	L/s

CO-25-1370 - 145 Walgreen - Water Demands

Project:	145 Walgreen
Project No.:	CO-25-1370
Designed By:	RP
Checked By:	CM
Date:	April 25, 2025

Ontario 2006 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting - Low Hazard Industrial

Building is classified as Group : F2 (from table 3.2.2.55)
Building is of combustible construction with fire separations and fire resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

Stot = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

Stot = 1.0 + [Sside1+Sside2+Sside3+..etc.]

K	31	(from Table 1 pg A-31)
V	10,595	(Total building volume in m³.)
Stot	1.0	(From figure 1 pg A-32)
Q =	328,445.00 L	

From Figure 1 (A-32)

Snorth	130	m	0.0
Seast	21	m	0.0
Ssouth	100	m	0.0
Swest	145	m	0.0

* approximate distances

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

9,000 L/min if Q > 270,000 L
2378 gpm

-40%

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CO-25-1370 - 145 Walgreen - Fire Underwriters Survey

Project:	145 Walgreen
Project No.:	CO-25-1370
Designed By:	RP
Checked By:	CM
Date:	April 25, 2025

From the Fire Underwriters Survey (2020)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
City of Ottawa Technical Bulletin ISTB-2018-02 Applied Where Applicable

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type: Ordinary Construction

C	1.0	A	1,630.0	m^2
	Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area)		1,816.0	m^2

* Unprotected Vertical Openings

Calculated Fire Flow	9,375.2 L/min
	9,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:

Combustible	0%
Fire Flow	9,000.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Standard Water Supply Sprinklered	-40%
Reduction	-3,600.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons. of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
Exposure 2	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
Exposure 3	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
Exposure 4	10.1 to 20	Ordinary - Mass Timber (Unprotected)	33.0	2	66.0	8%
					% Increase*	8%

Increase*	720.0 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow	6,120.0 L/min
Fire Flow Required**	6,000.0 L/min

* In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%
** In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

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info.north-america@egis-group.com | www.egis-group.com

CO-25-1370 - 145 Walgreen - Boundary Condition Unit Conversion

Project:	145 Walgreen
Project No.:	CO-25-1370
Designed By:	RP
Checked By:	CM
Date:	April 25, 2025

Boundary Conditions Unit Conversion

Walgreen Road

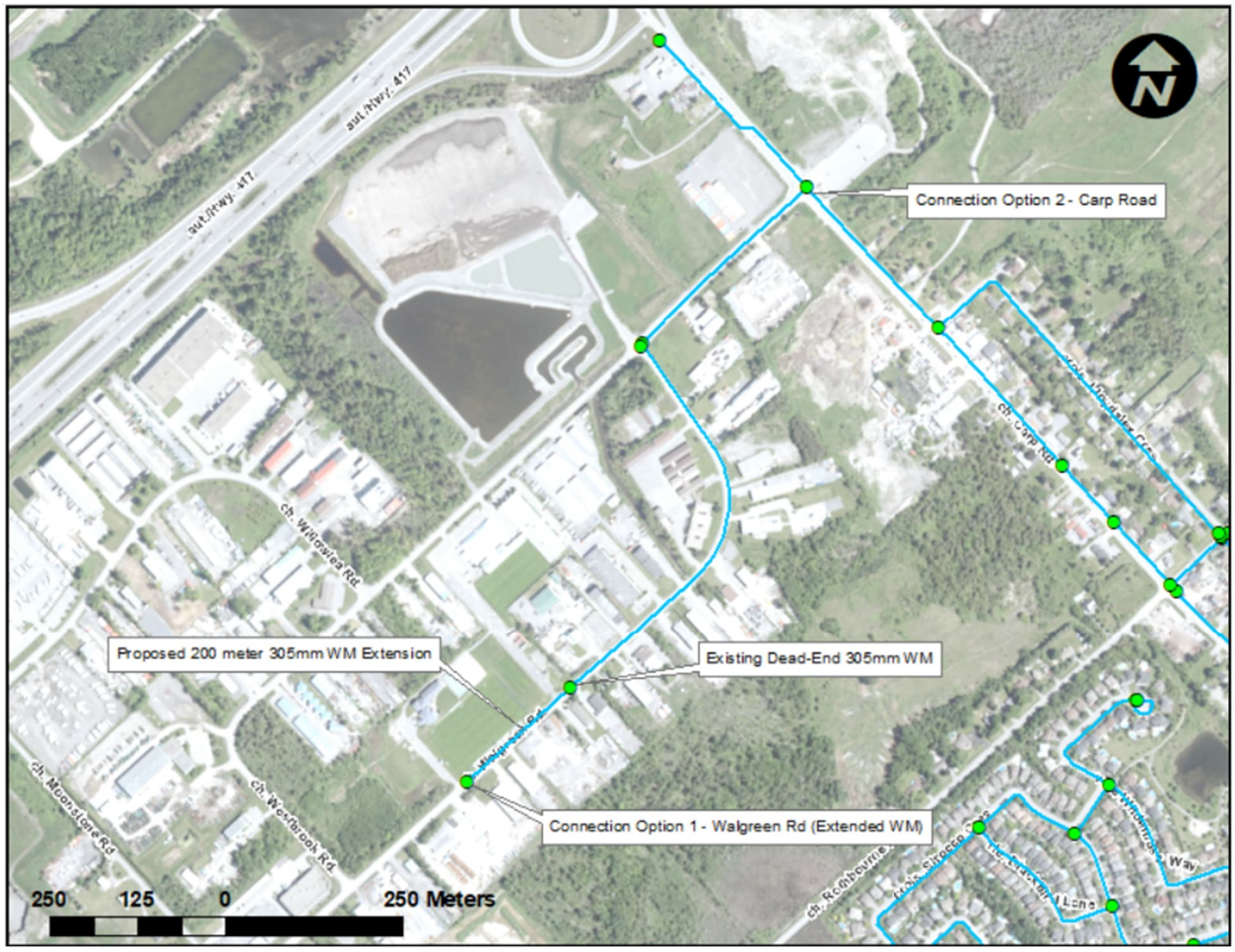
Scenario	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	160.2	127.6	32.6	46.4	319.8
Fire Flow (267 L/s or 16,000 L/min)	156.8	127.6	29.2	41.5	286.5
Peak Hour	146.0	127.6	18.4	26.2	180.5

Boundary Conditions
R1 – 145 Walgreen Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	4	0.07
Maximum Daily Demand	6	0.10
Peak Hour	11	0.18
Fire Flow Demand #1	6,000	100.00
Fire Flow Demand #2	9,000	150.00

Location



Results

Connection Option 1 – Walgreen Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.2	46.4
Peak Hour	156.8	41.6
Max Day plus Fire Flow #1	146.0	26.2
Max Day plus Fire Flow #2	133.8	8.8

[1] Ground Elevation = 127.6 m

Connection Option 2 – Carp Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.2	47.1
Peak Hour	156.8	42.3
Max Day plus Fire Flow #1	154.4	38.8
Max Day plus Fire Flow #2	151.2	34.3

[1] Ground Elevation = 127.1 m

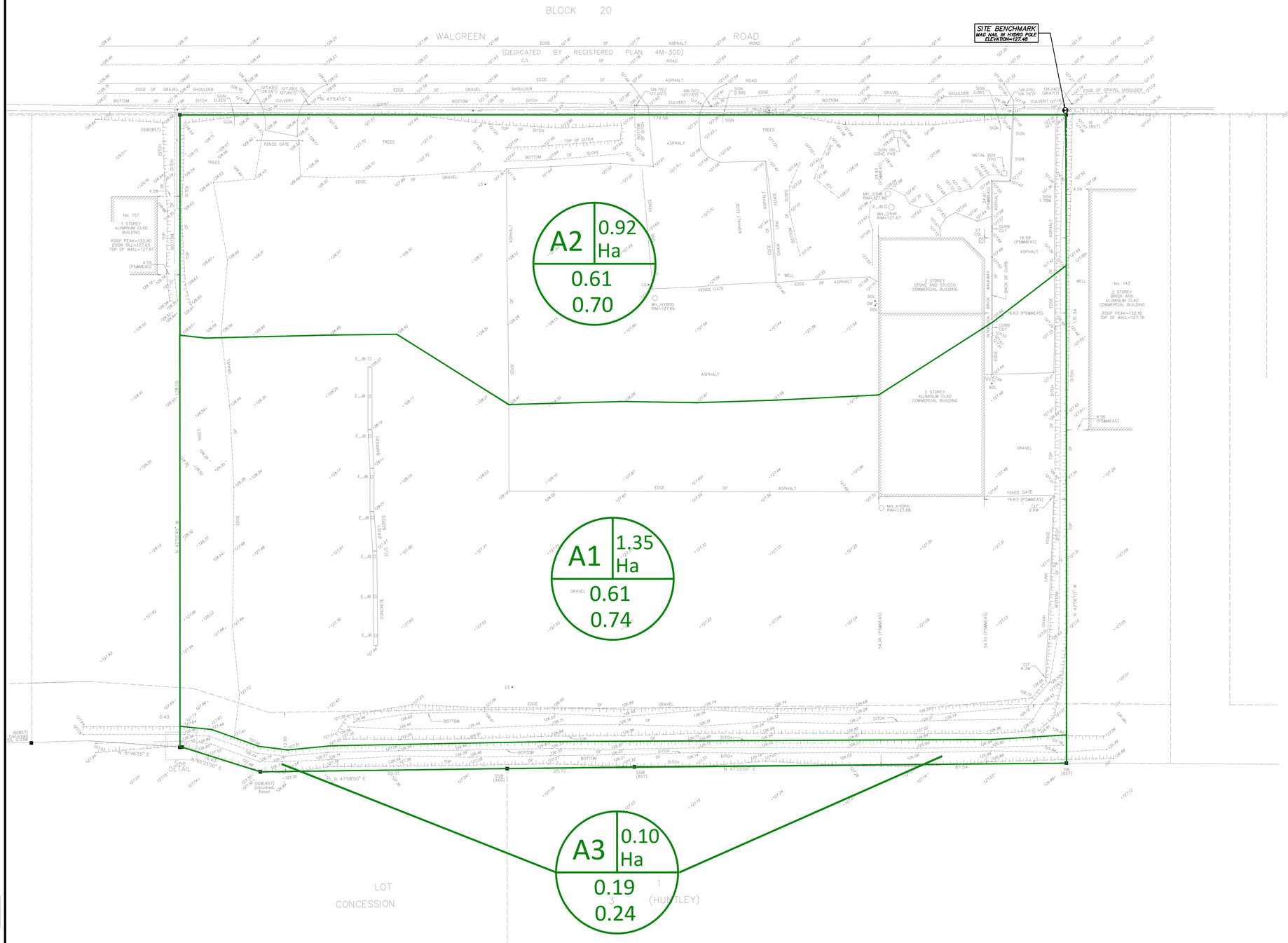
Notes

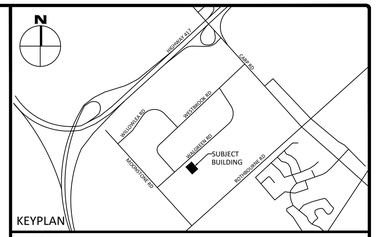
1. Per the OWDG Section 4.2.2:
    - During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 20 psi.

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
PRE-DEVELOPMENT DRAINAGE PLAN





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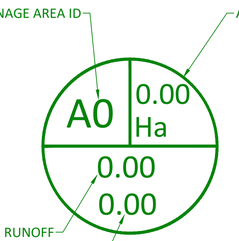

No.	Revisions	Date

Check and verify all dimensions before proceeding with the work — Do not scale drawings

SCALE 1 : 400

0 10 20 30 40 Metres

egis

Stamp:

Client:

MILLER WASTE SYSTEMS
112 BALES DRIVE EAST
EAST GWILLIMBURY, ON

Project:

PROPOSED ADDITION
145 WALGREEN ROAD
CARP, ON

Drawing Title:

PRE-DEVELOPMENT DRAINAGE AREAS

Scale: 1:400	Project Number: CO-25-1370
Drawn By:	
Checked By:	Drawing Number: PRE
Designed By:	

FOR REVIEW ONLY
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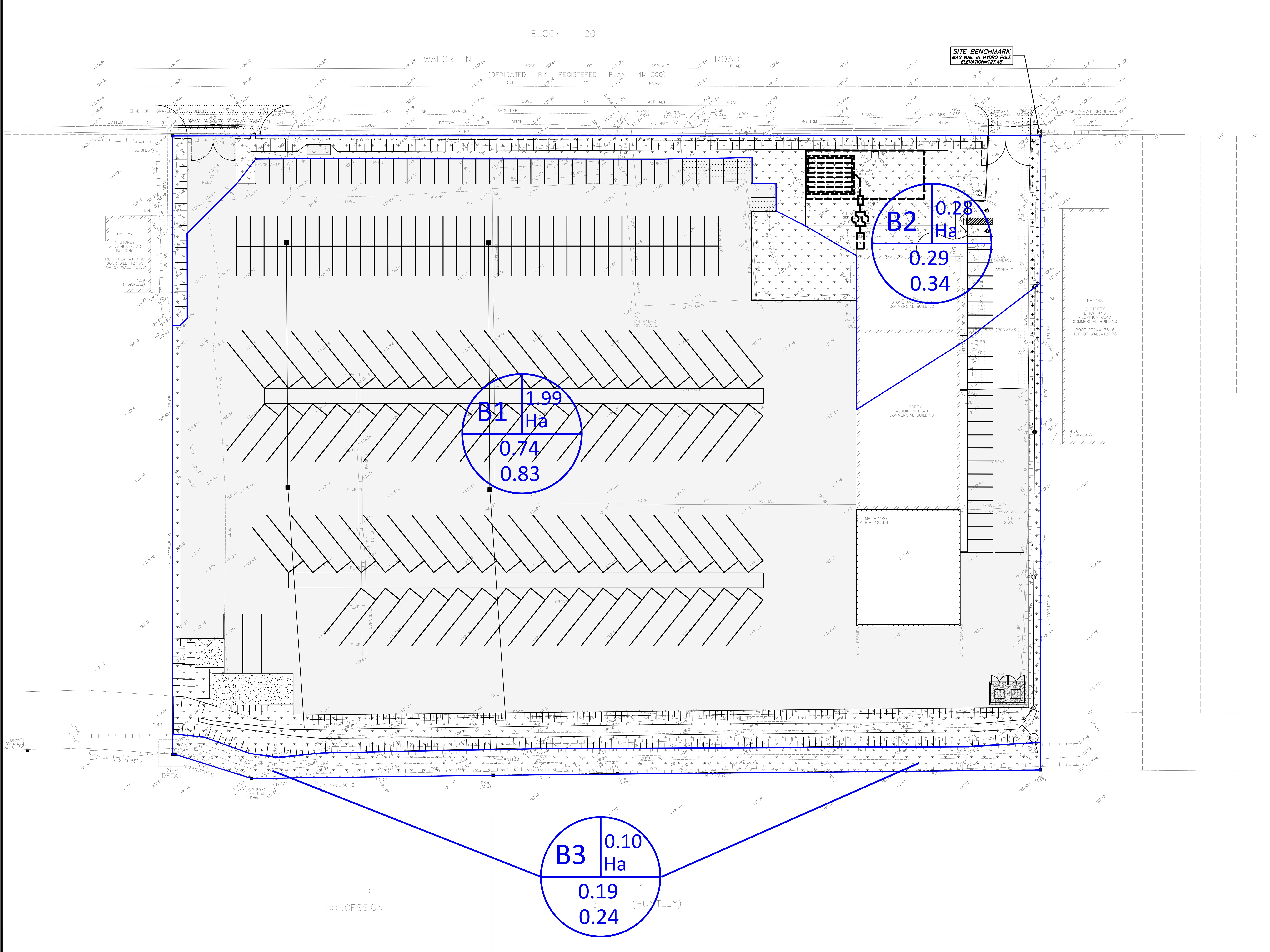
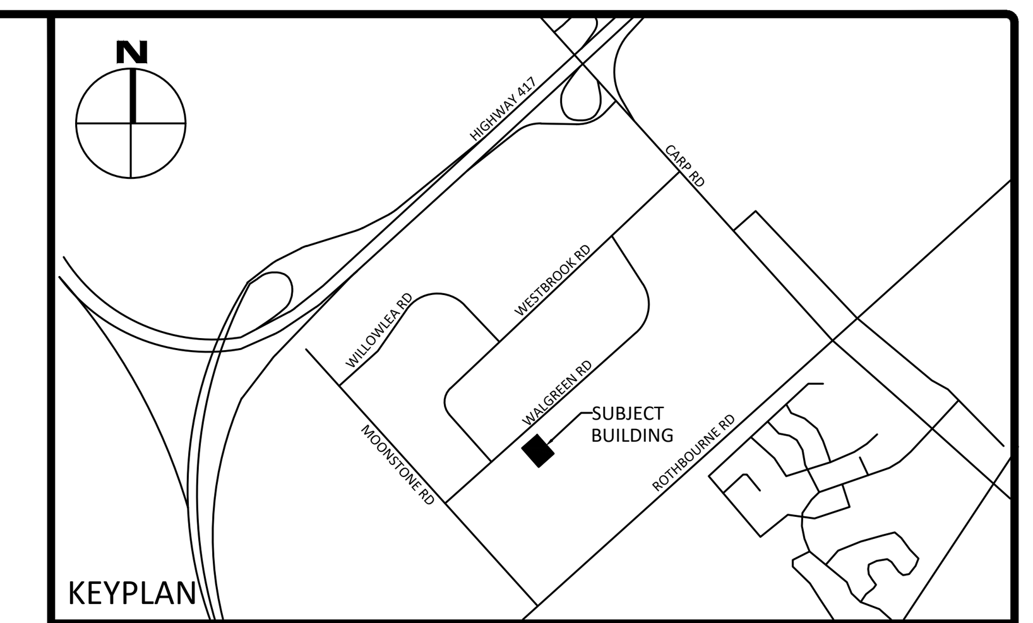
D07-00-000
#XXXXX

FILENAME: I:\Ottawa\01 Project - Proposal\2025 Jobs\PCO\PCO-25-1370 White Owl Group_Building Expansion_145 Walgreen Road\12 - Drawings\CO-25-1370 - Design-1.dwg
LAST SAVED: Wednesday, February 26, 2025 LAST SAVED BY: r.pickard
LAST PLOTTED: Wednesday, March 05, 2025 CTB FILE USED: —

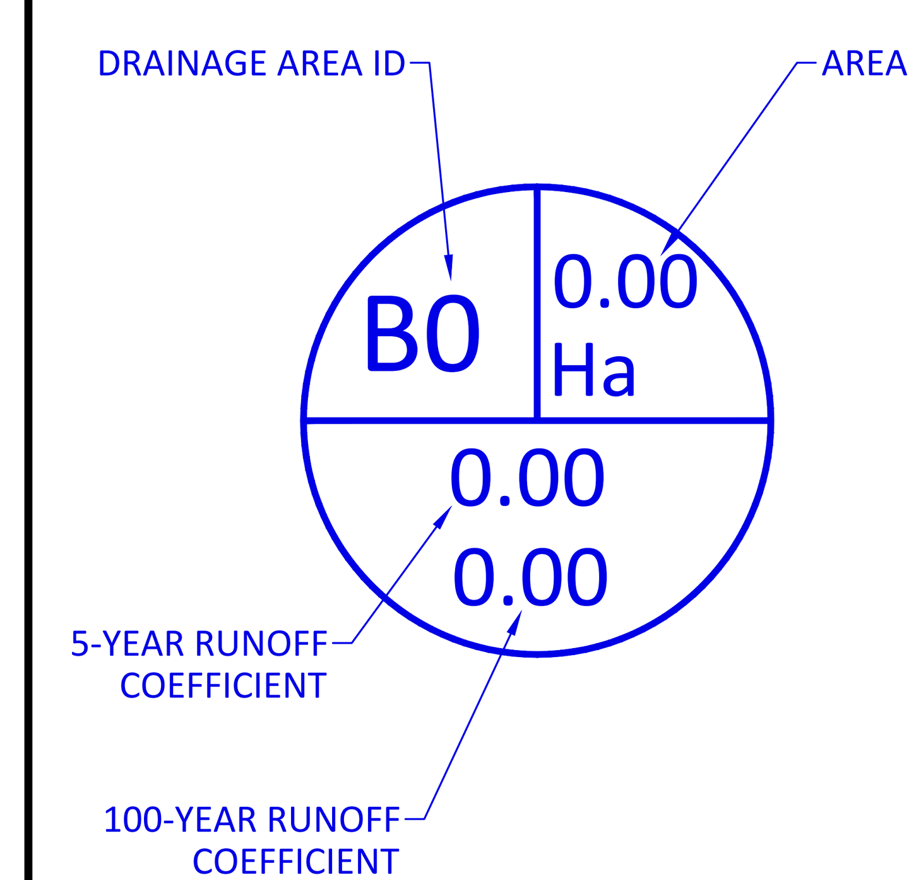
APPENDIX E
POST-DEVELOPMENT DRAINAGE PLAN





KEYPLAN

LEGEND



No.	Revisions	Date

Check and verify all dimensions before proceeding with the work

Do not scale drawings

SCALE 1 : 400
0 10 20 30 40 Metres

egis

Stamp:

Client:
MILLER WASTE SYSTEMS
112 BALES DRIVE EAST
EAST GWILLIMBURY, ON

Project:
PROPOSED ADDITION
145 WALGREEN ROAD
CARP, ON

Drawing Title:
POST-DEVELOPMENT DRAINAGE AREAS

Scale: 1:400
Drawn By:
Checked By:
Designed By:

Project Number: CO-25-1370
Drawing Number: POST

D07-00-000

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LAST SAVED BY: rpickard
LAST PLOTTED: Wednesday, March 05, 2025 CTB FILE USED: ---

APPENDIX F
STORMWATER CALCULATIONS

CO-25-1370 - 145 Walgreen - SWM Calculations

Tc (min)	Intensity (mm/hr)			
	2-Year	5-Year	100-Year	
14	63.8	86.9	148.7	PRE-DEVELOPMENT
10	76.5	104.2	178.6	POST-DEVELOPMENT

C-Values	
Impervious	0.90
Gravel	0.60
Pervious	0.20

Pre-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (2-year)	Average C (5-year)	Average C (100-year)
A1	2,512	9,500	1,532	0.61	0.61	0.74
A2	4,287	1,779	3,090	0.61	0.61	0.70
A3	0	0	943	0.19	0.19	0.24

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 2-Year	C 5-Year	C 100-Year	Tc (min)	Q (L/s)			
						2-Year	5-Year	100-Year	
A1	1.35	0.61	0.61	0.74	10	146.73	199.80	414.28	Directed to retention area
A2	0.92	0.61	0.61	0.70	10	98.39	133.98	264.35	Directed to Walgreen Road ROW
A3	0.10	0.19	0.19	0.24	10	3.35	4.56	9.75	Existing ditch along south PL
Total	2.37					245.11	333.78	678.63	

Post-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (2-year)	Average C (5-year)	Average C (100-year)
B1	15,280	0	4,620	0.74	0.74	0.83
B2	353	0	2,447	0.29	0.29	0.34
B3	0	0	943	0.19	0.19	0.24

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 2-Year	C 5-Year	C 100-Year	Tc (min)	Q (L/s)			
						2-Year	5-Year	100-Year	
B1	1.99	0.74	0.74	0.83	10	312.18	425.10	815.82	Directed to retention area
B2	0.28	0.29	0.29	0.34	10	17.17	23.38	47.89	Directed to Walgreen Road ROW
B3	0.10	0.19	0.19	0.24	10	3.35	4.56	9.75	Existing ditch along south PL (Area Unchanged)
Total	2.37					332.70	453.04	873.46	

Required Post-Development Flow

Drainage Area	Q (L/s)	
A1	66.70	* To match previously accepted flow rate
A2	98.39	* To be less than pre-development 2-year flow
A3	9.75	* Area to not be disturbed during development

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow			Restricted Flow			Storage Required (m^3)			Storage Provided (m^3)		
	2-year	5-year	100-Year	2-Year	5-Year	100-Year	2-Year	5-Year	100-Year	2-Year	5-Year	100-Year
B1	312.18	425.10	815.82	48.80	54.60	66.70	201.68	301.8	677.1	204.6	314.5	680.5
B2	17.17	23.38	47.89	17.17	23.38	47.89						
B3	3.35	4.56	9.75	3.35	4.56	9.75						
Total	332.70	453.04	873.46	69.32	82.54	124.34	201.68	301.76	677.13	204.55	314.53	680.49

CO-25-1370 - 145 Walgreen - SWM Calculations

Storage Requirements for Area B1

2-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
5	102.6	418.60	48.80	369.80	110.94
15	61.0	248.88	48.80	200.08	180.07
25	44.5	181.56	48.80	132.76	199.14
35	35.5	144.84	48.80	96.04	201.68
45	29.8	121.58	48.80	72.78	196.51

Maximum Storage Required 2-year =	202 m^3

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	425.13	54.60	370.53	222.32
20	70.3	286.82	54.60	232.22	278.66
30	53.9	219.91	54.60	165.31	297.55
40	44.2	180.33	54.60	125.73	301.76
50	37.7	153.81	54.60	99.21	297.64

Maximum Storage Required 5-year =	302 m^3

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	816.01	66.70	749.31	449.59
30	91.9	419.88	66.70	353.18	635.73
50	64.0	292.41	66.70	225.71	677.13
70	49.8	227.53	66.70	160.83	675.50
90	41.1	187.78	66.70	121.08	653.85
110	35.2	160.83	66.70	94.13	621.23
130	30.9	141.18	66.70	74.48	580.94
150	27.6	126.10	66.70	59.40	534.62
170	25.0	114.22	66.70	47.52	484.74
190	22.9	104.63	66.70	37.93	432.38

Maximum Storage Required 100-year =	677 m^3

2-Year Storm Event Storage Summary

		Water Elev. (m) =		126.44		
Location	INV. (in)	INV. (out)	Area (m^2)	Depth (m)	Head (m)	Volume (m^3)
X	X	125.80	714.6	X	0.55	204.6

Storage Available (m^3) = 204.6 *
Storage Required (m^3) = 201.7

5-Year Storm Event Storage Summary

		Water Elev. (m) =		126.58		
Location	T/G	INV. (out)	Area (m^2)	Depth (m)	Head (m)	Volume (m^3)
X	X	125.80	856.1	X	0.69	314.5

Storage Available (m^3) = 314.5 *
Storage Required (m^3) = 301.8

100-Year Storm Event Storage Summary

		Water Elev. (m) =		126.92		
Location	T/G	INV. (out)	Area (m^2)	Depth (m)	Head (m)	Volume (m^3)
X	X	125.80	1267.2	X	1.03	680.5

Storage Available (m^3) = 680.5 *
Storage Required (m^3) = 677.1

* Available Storage calculated from AutoCAD

For Orifice Flow, C= 0.6
For Weir Flow, C= 3.33

	Orifice 1	Orifice 2	Weir 1	Weir 2
Invert Elevation	125.80	NA		
Center of Crest Elevation	125.89	NA		
Orifice Width / Weir Length	177.50	NA		
Orifice Height	NA	NA		
Orifice Area (m^2)	0.025	NA		

Table E9 Elevation Discharge Table - Storm Routing

Elevation	Orifice 1		Orifice 2		Weir 1		Weir 2		Total
(m)	H (m)	Q (m^3/s)	H (m)	Q (m^3/s)	H (m)	Q (m^3/s)	H (m)	Q (m^3/s)	Q (L/s)
125.89	x	x	x	x	x	x	x	x	0.0
125.92	0.03	0.011	x	x	x	x	x	x	11.4
125.95	0.06	0.016	x	x	x	x	x	x	16.1
125.98	0.09	0.020	x	x	x	x	x	x	19.7
126.01	0.12	0.023	x	x	x	x	x	x	22.8
126.04	0.15	0.025	x	x	x	x	x	x	25.5
126.07	0.18	0.028	x	x	x	x	x	x	27.9
126.10	0.21	0.030	x	x	x	x	x	x	30.1
126.13	0.24	0.032	x	x	x	x	x	x	32.2
126.16	0.27	0.034	x	x	x	x	x	x	34.2
126.19	0.30	0.036	x	x	x	x	x	x	36.0
126.22	0.33	0.038	x	x	x	x	x	x	37.8
126.25	0.36	0.039	x	x	x	x	x	x	39.5
126.28	0.39	0.041	x	x	x	x	x	x	41.1
126.31	0.42	0.043	x	x	x	x	x	x	42.6
126.34	0.45	0.044	x	x	x	x	x	x	44.1
126.37	0.48	0.046	x	x	x	x	x	x	45.6
126.40	0.51	0.047	x	x	x	x	x	x	47.0
126.43	0.54	0.048	x	x	x	x	x	x	48.3
126.44	0.55	0.049	x	x	x	x	x	x	48.8
126.46	0.57	0.050	x	x	x	x	x	x	49.7
126.49	0.60	0.051	x	x	x	x	x	x	50.9
126.52	0.63	0.052	x	x	x	x	x	x	52.2
126.55	0.66	0.053	x	x	x	x	x	x	53.4
126.58	0.69	0.055	x	x	x	x	x	x	54.6
126.61	0.72	0.056	x	x	x	x	x	x	55.8
126.64	0.75	0.057	x	x	x	x	x	x	57.0
126.67	0.78	0.058	x	x	x	x	x	x	58.1
126.70	0.81	0.059	x	x	x	x	x	x	59.2
126.73	0.84	0.060	x	x	x	x	x	x	60.3
126.76	0.87	0.061	x	x	x	x	x	x	61.3
126.79	0.90	0.062	x	x	x	x	x	x	62.4
126.82	0.93	0.063	x	x	x	x	x	x	63.4
126.85	0.96	0.064	x	x	x	x	x	x	64.4
126.88	0.99	0.065	x	x	x	x	x	x	65.4
126.92	1.03	0.067	x	x	x	x	x	x	66.7

1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.
2. Orifice Equation: $Q = cA(2gh)^{1/2}$
3. Weir Equation: $Q = cLH^{3/2}$
4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.
5. H for orifice equations is depth of water above the centroide of the orifice.
6. H for weir equations is depth of water above the weir crest.

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	75	1.00	14	10

Therefore, a Tc of 10 can be used

Tc= (3.26(1.1-c)L^0.5/S^0.33)

c = Balanced Runoff Coefficient

L = Length of drainage area

S = Average slope of watershed

STORM SEWER DESIGN SHEET

PROJECT: CCO-25-1370
LOCATION: 145 Walgreen
CLIENT: Miller Waste Systems

LOCATION				CONTRIBUTING AREA (ha)				RATIONAL DESIGN FLOW										SEWER DATA								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
STREET	AREA ID	FROM M.H	TO M.H	C-VALUE	AREA	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)	
																					DIA	W	H			(L/s)	(%)
South Easement	B1	CB1	CBMH3	0.90	0.22	0.20	0.20	10.00	0.51	10.51	104.19	122.14	178.56	57.35	67.23	98.29		57.35	66.15	27.57	300			0.43	0.907	8.80	13.30%
South Easement	B1	CBMH3	RETENTION AREA	0.90	0.19	0.17	0.36	10.51	0.66	11.16	101.59	119.08	174.05	102.94	120.66	176.37		102.94	106.65	36.86	375			0.34	0.935	3.71	3.48%
South Easement	B1	CB2	CBMH4	0.90	0.22	0.19	0.19	10.00	0.51	10.51	104.19	122.14	178.56	56.18	65.86	96.28		56.18	66.15	27.57	300			0.43	0.907	9.97	15.08%
South Easement	B1	CBMH4	RETENTION AREA	0.90	0.16	0.15	0.34	10.51	0.66	11.16	101.59	119.08	174.05	96.46	113.06	165.27		96.46	106.65	36.86	375			0.34	0.935	10.19	9.56%
South Easement	B1	RETENTION AREA	OGS1	0.76	2.03	1.54	1.54	10.00	0.12	10.12	104.19	122.14	178.56	446.88	523.86	765.84	66.70	66.70	71.33	6.840	300			0.50	0.978	4.63	6.50%
South Easement	B1	OGS1	DITCH			0.00	1.54	10.12	0.09	10.20	103.58	121.42	177.50	444.26	520.77	761.29	66.70	66.70	142.67	10.20	300			2.00	1.955	75.97	53.25%
South Easement	B1	LCB1	LCB2	0.85	0.03	0.03	0.03	10.00	0.51	10.51	104.19	122.14	178.56	7.39	8.66	12.66	68.70	7.39	71.33	30.00	300			0.50	0.978	63.95	89.65%
South Easement	B1	LCB2	LCB3	0.85	0.04	0.03	0.03	10.51	0.51	11.02	101.57	119.05	174.01	9.60	11.25	16.45	69.70	9.60	71.33	30.00	300			0.50	0.978	61.73	86.54%
South Easement	B1	LCB3	LCB4	0.85	0.06	0.05	0.05	11.02	0.51	11.53	99.08	116.12	169.72	14.05	16.46	24.06	70.70	14.05	71.33	30.00	300			0.50	0.978	57.29	80.31%
South Easement	B1	LCB4	RETENTION AREA	0.85	0.05	0.04	0.04	11.53	0.05	11.59	96.73	113.35	165.65	11.43	13.39	19.57	71.70	11.43	71.33	3.00	300			0.50	0.978	59.91	83.98%

Definitions:
Q = 2.78CIA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed:
R.P.
Checked:
A.G.
Project No.:
CCO-25-1370

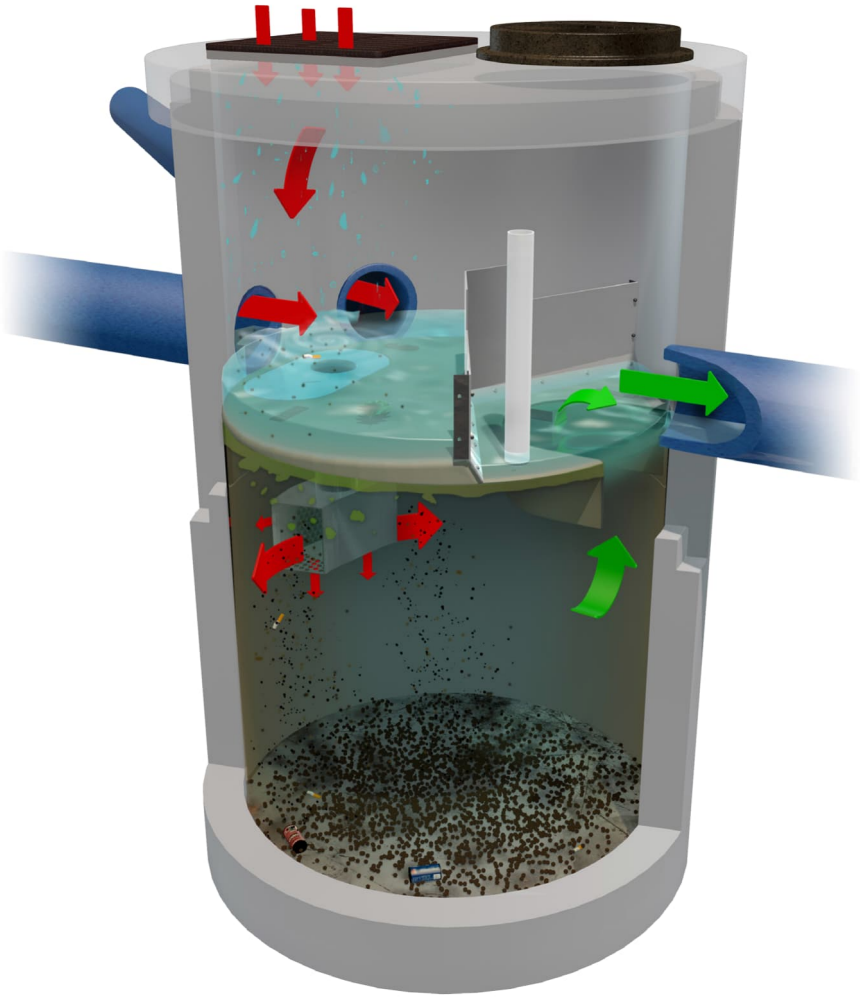
No.	Revision	Date
1.	Submission	2025.3.6

Date:
2023.01.12

Sheet No:
1 of 1

Stormceptor® EF

Owner's Manual



imbrium®

STORMCEPTOR® EF IS PATENT-PENDING.

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OVERVIEW

The **Stormceptor® EF** is a continuation and evolution of the most globally recognized oil-grit separator (OGS) stormwater treatment technology **- *Stormceptor®***. Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil-grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at higher flow rates as compared to the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF's patent-pending treatment and scour prevention technology and internal bypass ensures sediment is retained during all rainfall events..

Stormceptor EF offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe, multiple inlet pipes, and/or from the surface through an inlet grate. Stormceptor EF can also serve as a junction structure, accommodate a 90-degree inlet to outlet bend angle, and be modified to ensure performance in submerged conditions. With its scour prevention technology and internal bypass, Stormceptor EF can be installed online, eliminating the need for costly additional bypass structures.

OPERATION

- Stormwater enters the Stormceptor upper chamber through the inlet pipe(s) or a surface inlet grate. A specially designed insert reduces the influent velocity by creating a pond upstream of the insert's weir. Sediment particles immediately begin to settle. Swirling flow sweeps water, sediment, and floatables across the sloped surface of the insert to the inlet opening of the drop pipe, where a strong vortex draws water, sediment, oil, and debris down the drop pipe cone.
- Influent exits the cone into the drop pipe duct. The duct has two large rectangular outlet openings as well as perforations in the backside and floor of the duct. Influent is diffused through these various opening in multiple directions and at low velocity into the lower chamber.
- Free oils and floatables rise up and are trapped beneath the insert, while sediment settles to the sump. Pollutants are retained for later removal during maintenance cleaning.
- Treated effluent enters the outlet riser, moves upward, and discharges to the top side of the insert downstream of the weir, where it flows out the outlet pipe.
- During intense storm events with very high influent flow rates, the pond height on the upstream side of the weir may exceed the height of the weir, and the excess flow passes over the top of the weir to the downstream side of the insert, and exits through the outlet pipe. This internal bypass feature allows for online installation, avoiding the cost of additional bypass structures. During bypass, the pond separates sediment from all incoming flows, while full treatment in the lower chamber continues at the maximum flow rate.
- Stormceptor EF's patent-pending enhanced flow and scour prevention technology ensures pollutants are captured and retained, allowing excess flows to bypass during infrequent, high intensity storms.

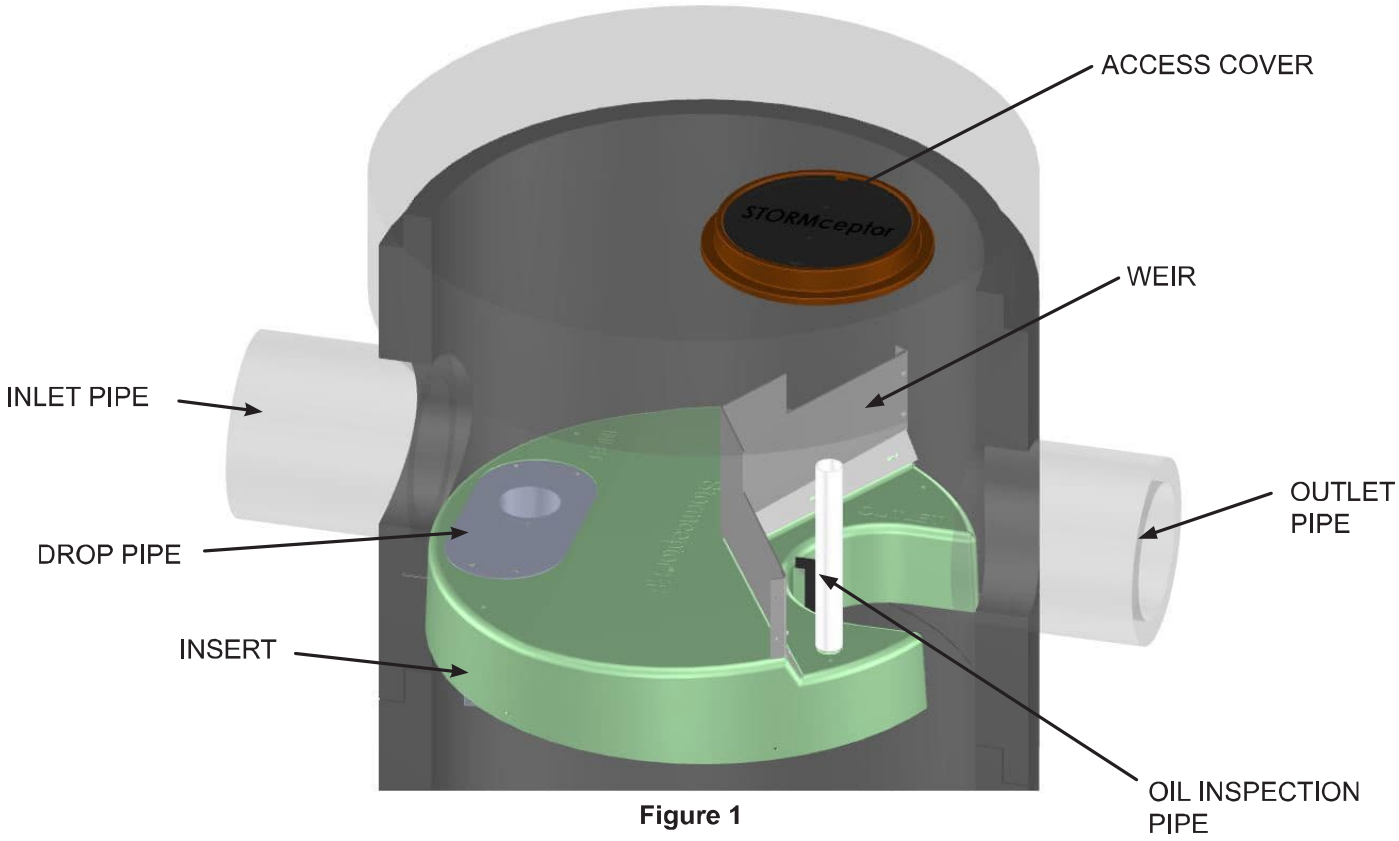


Figure 1

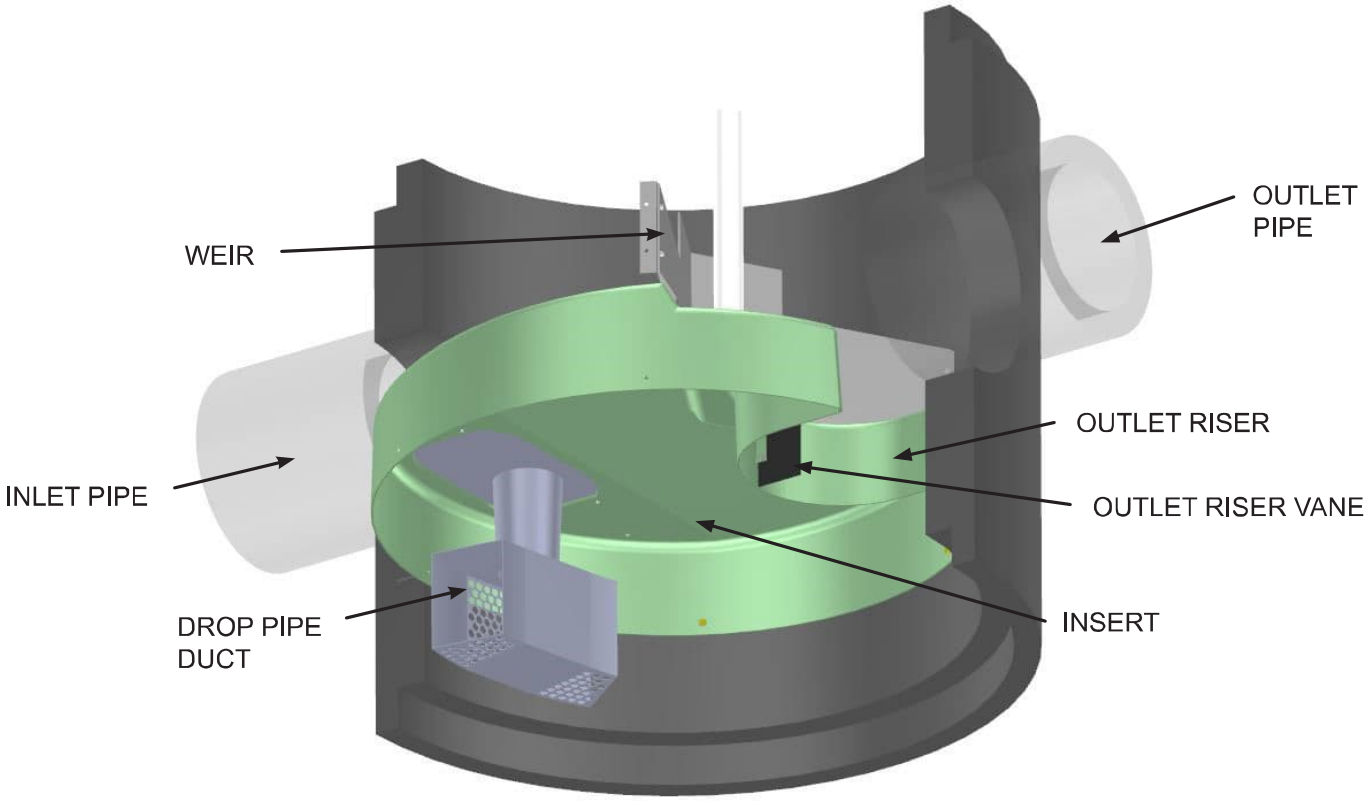


Figure 2

- Insert – separates vessel into upper and lower chambers, and provides double-wall containment of hydrocarbons
- Weir – creates stormwater ponding and driving head on top side of insert
- Drop pipe – conveys stormwater and pollutants into the lower chamber
- Outlet riser – conveys treated stormwater from the lower chamber to the outlet pipe, and provides primary inspection and maintenance access into the lower chamber
- Outlet riser vane – prevents formation of a vortex in the outlet riser during high flow rate conditions
- Oil inspection pipe – primary access for measuring oil depth, and oil removal

IDENTIFICATION

Each Stormceptor EF/EFO unit is easily identifiable by the trade name ***Stormceptor***® embossed on the access cover at grade as shown in **Figure 3.** The tradename ***Stormceptor***® is also embossed on the top of the insert upstream of the weir as shown in **Figure 3.**

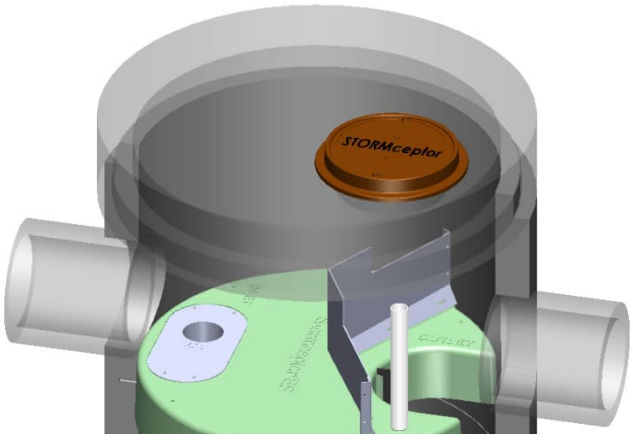


Figure 3

The unit serial number is identified on the top of the insert upstream of the weir as shown in **Figure 4.**

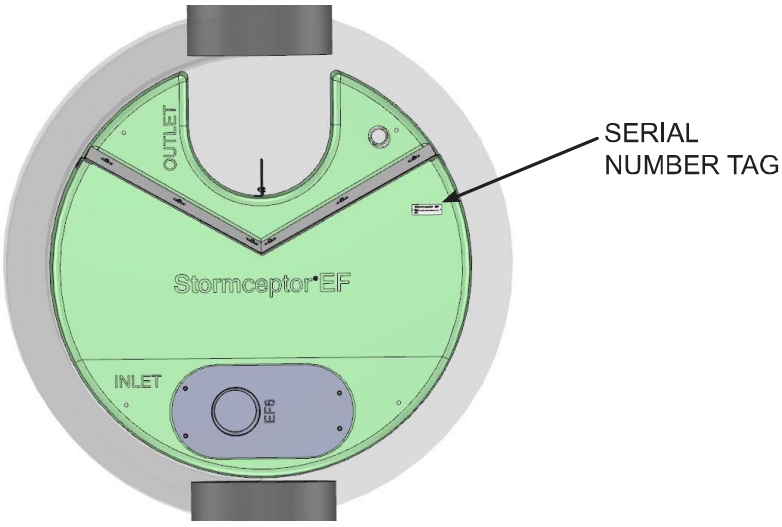


Figure 4

MODEL DETAILS

TABLE 1. METRIC DIMENSIONS AND CAPACITIES								
Stormceptor Model	Inside Diameter	Minimum Surface to Outlet Invert Depth	Depth Below Outlet Pipe Invert	Wet Volume	Sediment Capacity[1]	Hydrocarbon Storage Capacity[2]	Maximum Flow Rate into Lower Chamber[3]	Peak Conveyance Flow Rate[4]
	(m)	(mm)	(mm)	(L)	(m^3)	(L)	(L/s)	(L/s)
EF4 / EFO4	1.22	915	1524	1780	1.19	265	22.1 / 10.4	425
EF6 / EFO6	1.83	915	1930	5070	3.47	610	49.6 / 23.4	990
EF8 / EFO8	2.44	1219	2591	12090	8.78	1070	88.3 / 41.6	1700
EF10 / EFO10	3.05	1219	3251	23700	17.79	1670	138 / 65	2830
EF12 / EFO12	3.66	1524	3886	40800	31.22	2475	198.7 / 93.7	2830

TABLE 2. U.S. DIMENSIONS AND CAPACITIES								
Stormceptor Model	Inside Diameter	Minimum Surface to Outlet Invert Depth	Depth Below Outlet Pipe Invert	Wet Volume	Sediment Capacity[1]	Hydrocarbon Storage Capacity[2]	Maximum Flow Rate into Lower Chamber[3]	Peak Conveyance Flow Rate[4]
	(ft)	(in)	(in)	(gal)	(ft^3)	(gal)	(cfs)	(cfs)
EF4 / EFO4	4	36	60	471	42	70	0.78 / 0.37	15
EF6 / EFO6	6	36	76	1339	123	160	1.75 / 0.83	35
EF8 / EFO8	8	48	102	3194	310	280	3.12 / 1.47	60
EF10 / EFO10	10	48	128	6261	628	440	4.87 / 2.30	100
EF12 / EFO12	12	60	153	10779	1103	655	7.02 / 3.31	100

1. Sediment Capacity is measured from the floor to the bottom of the drop pipe cone. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
2. Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
3. EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 1135 L/min/m^2 (27.9 gpm/ft^2). EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 535 L/min/m^2 (13.1 gpm/ft^2).
4. Peak Conveyance Flow Rate is limited by a maximum velocity of 1. m/s (5 fps).

INSPECTION AND MAINTENANCE

It is important to perform regular inspection and maintenance. Regular inspection and maintenance ensures maximum operation efficiency, keeps maintenance costs low, and provides continued protection of natural waterways.

Quick Reference

- Typical inspection and maintenance is performed from grade
- Remove manhole cover(s) or inlet grate to access insert and lower chamber
  NOTE: If an inlet grate is present, EF4/EFO4 requires the removal of a flow deflector beneath inlet grate
- Use Sludge Judge® or similar sediment probe to check sediment depth through the outlet riser
- Oil dipstick can be inserted through the oil inspection pipe
- Visually inspect the insert for debris, remove debris if present
- Visually inspect the drop pipe opening for blockage, remove blockage if present
- Visually inspect insert and weir for damage, schedule repair if needed
- Insert vacuum hose and jetting wand through the outlet riser and extract sediment and floatables
- Replace flow deflector (EF4/EFO4), inlet grate, and cover(s)

When is inspection needed?

- Post-construction inspection is required prior to putting the Stormceptor into service.
- Routine inspections are recommended during the first year of operation to accurately assess pollutant accumulation.
- Inspection frequency in subsequent years is based on the maintenance plan developed in the first year.
- Inspections should also be performed immediately after oil, fuel, or other chemical spills.

What equipment is typically required for inspection?

- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones and caution tape
- Hard hat, safety shoes, safety glasses, and chemical-resistant gloves

When is maintenance cleaning needed?

- If the post-construction inspection indicates presence of construction sediment of a depth greater than a few inches, maintenance is recommended at that time. For optimum performance and normal operation the unit should be cleaned out once the sediment depth reaches the recommended maintenance sediment depth, see **Table 3.**
- Maintain immediately after an oil, fuel, or other chemical spill.

TABLE 3
RECOMMENDED SEDIMENT DEPTHS FOR MAINTENANCE SERVICE*

MODEL	Sediment Depth	
	in	mm
EF4 / EFO4	8	203
EF6 / EFO6	12	305
EF8 / EFO8	24	610
EF10 / EFO10	24	610
EF12 / EFO12	24	610

* Based on a minimum distance of 40 inches (1,016 mm) from bottom of outlet riser to top of sediment bed

The frequency of inspection and maintenance may need to be adjusted based on site conditions to ensure the unit is operating and performing as intended. Maintenance costs will vary based on the size of the unit, site conditions, local requirements, disposal costs, and transportation distance.

What equipment is typically required for maintenance?

- Vacuum truck equipped with water hose and jet nozzle
- Small pump and tubing for oil removal
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones
- Hard hats, safety shoes, safety glasses, chemical-resistant gloves, and hearing protection for service providers
- Gas analyzer, respiratory gear, and safety harness for specially trained personnel if confined space entry is required (adhere to all OSHA / CCOSH standards)

What conditions can compromise Stormceptor performance?

- Presence of construction sediment and debris in the unit prior to activation
- Excessive sediment depth beyond the recommended maintenance depth
- Oil spill in excess of the oil storage capacity
- Clogging or restriction of the drop pipe inlet opening with debris
- Downstream blockage that results in a backwater condition

MAINTENANCE PROCEDURES

- Maintenance should be conducted during dry weather conditions when no flow is entering the unit.
- Stormceptor is maintained from grade through a standard surface manhole access cover or inlet grate.
- In the case of submerged or tailwater conditions, extra measures are likely required, such as plugging the inlet and outlet pipes prior to conducting maintenance.
- Inspection and maintenance of upstream catch basins and other stormwater conveyance structures is also recommended to extend the time between future maintenance cycles.
- Sediment depth inspections are performed through the **Outlet Riser** and oil presence can be determined through the **Oil Inspection Pipe** (**see Figures 6 and 7**).
- Oil presence and sediment depth are determined by inserting a Sludge Judge® or measuring stick to quantify the pollutant depths.
- Visually inspect the insert, weir, and drop pipe inlet opening to ensure there is no damage or blockage.

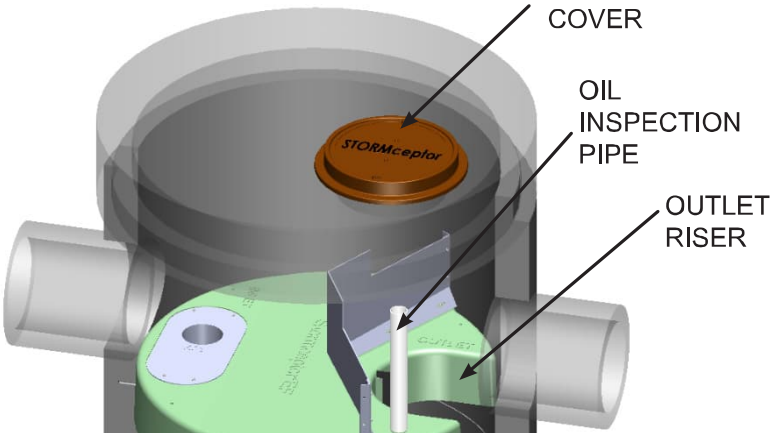


Figure 5

Figure 6

- When maintenance is required, a standard vacuum truck is used to remove the pollutants from the lower chamber of the unit through the **Outlet Riser** (**see Figure 7**).

Figure 7

- The Outlet Riser Vane is durable and flexible and designed to allow maintenance activities with minimal, if any, interference (**see Figure 8**).

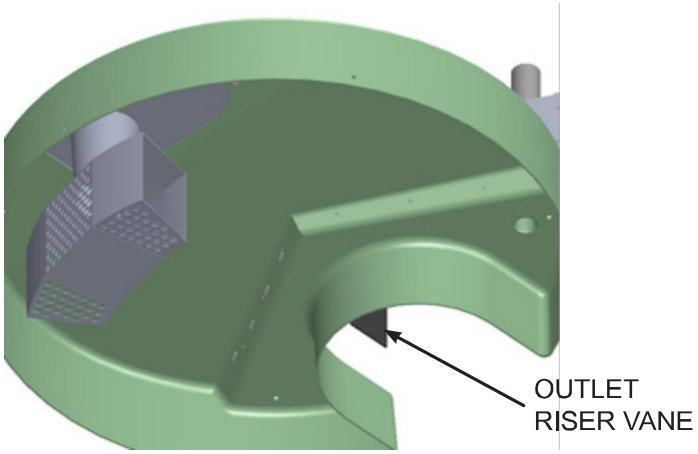


Figure 8

REMOVABLE FLOW DEFLECTOR

- Grated inlets for the Stormceptor EF4/EFO4 model requires a removable flow deflector staged underneath a 24-inch x 24-inch (600 mm x 600 mm) square inlet grate to direct flow towards the inlet side of the insert, and avoid flow and pollutants from entering the outlet side of the insert from grade **(See Figure 9).** The EF6/EFO6 and larger models do not require the flow deflector.

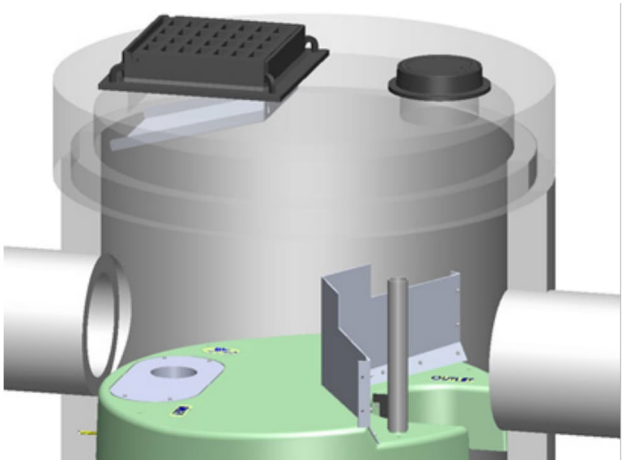
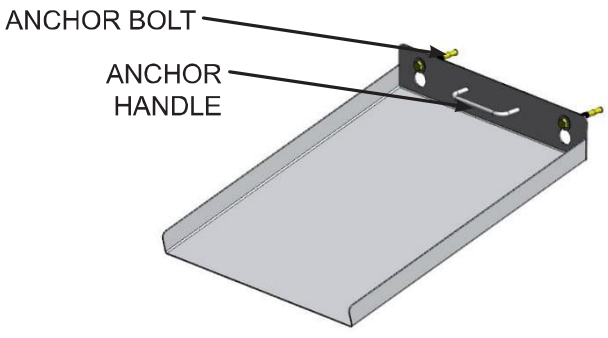


Figure 9



Removable Flow Detector

HYDROCARBON SPILLS

Stormceptor is often installed on high pollutant load hotspot sites with vehicular traffic where hydrocarbon spill potential exists. Should a spill occur, or presence of oil be identified within a Stormceptor EF/EFO, the unit should be cleaned immediately by a licensed liquid waste hauler.

Disposal

Maintenance providers are to follow all federal, state/ provincial, and local requirements for disposal of material.

Oil Sheens

When oil is present in stormwater runoff, a sheen may be noticeable at the Stormceptor outlet. An oil rainbow or sheen can be noticeable at very low oil concentrations (< 10 mg/L). Despite the appearance of a sheen, Stormceptor EF/EFO may still be functioning as intended.

Oil Level Alarm

To mitigate spill liability with 24/7 detection, an electronic Oil Level Alarm monitoring system can be employed to trigger a visual and audible alarm when a pre-set level of oil is captured within the lower chamber or when an oil spill occurs. The oil level alarm is available as an optional feature to include with Stormceptor EF/EFO as shown in **Figure 10.**

For additional details about the Oil Level Alarm, please visit www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-systems.

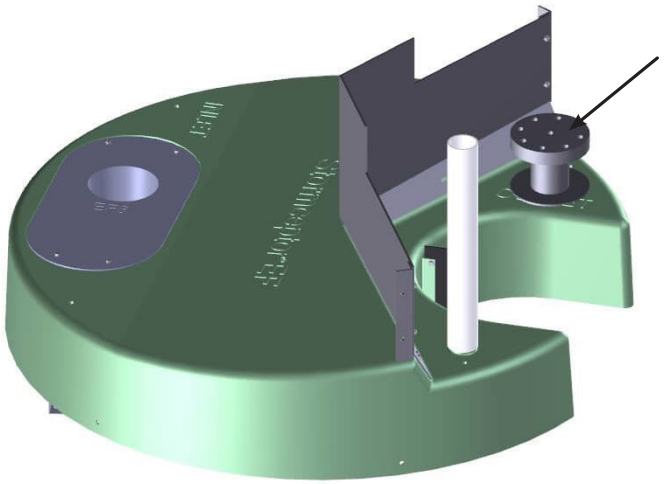


Figure 10

Optional Oil Alarm

REPLACEMENT PARTS

Stormceptor has no moving parts. Therefore, inspection and maintenance activities are generally focused on pollutant removal. Since there are no moving parts during operation in a Stormceptor, broken, damaged, or worn parts are not typically encountered. However, if replacement parts are necessary, they may be purchased by contacting your local Stormceptor representative.

STORMCEPTOR INSPECTION AND MAINTENANCE LOG

Stormceptor Model No: _____

Serial Number: _____

Installation Date: _____

Location Description of Unit: _____

Recommended Sediment Maintenance Depth: _____

DATE	SEDIMENT DEPTH	OIL DEPTH (inches or mm)	SERVICE REQUIRED (Y/N)	MAINTENANCE PERFORMED	MAINTENANCE PROVIDER	COMMENTS

Other Comments: _____

CONTACT INFORMATION

Questions regarding Stormceptor EF/EFO can be addressed by contacting your local Stormceptor representative.

Imbrium Systems Inc.
1-416-960-9900 / 1-800-565-4801 / 888-279-8826

www.imbriumsystems.com
www.stormceptor.com
info@imbriumsystems.com

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

12/17/2024

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	

Drainage Area (ha):	2.01
% Imperviousness:	81.00

Runoff Coefficient 'c': 0.78

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	50.99
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	66.70
Peak Conveyance (maximum) Flow Rate (L/s):	66.70
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	1905
Estimated Average Annual Sediment Volume (L/yr):	1549

Project Name:	Garage addition
Project Number:	1
Designer Name:	ROBBIE PICKARD
Designer Company:	EGIS
Designer Email:	robert.pickard@egis-group.com
Designer Phone:	613-808-3427
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	63
EFO6	78
EFO8	86
EFO10	91
EFO12	95

Recommended Stormceptor EFO Model: EFO8

Estimated Net Annual Sediment (TSS) Load Reduction (%): 86

Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

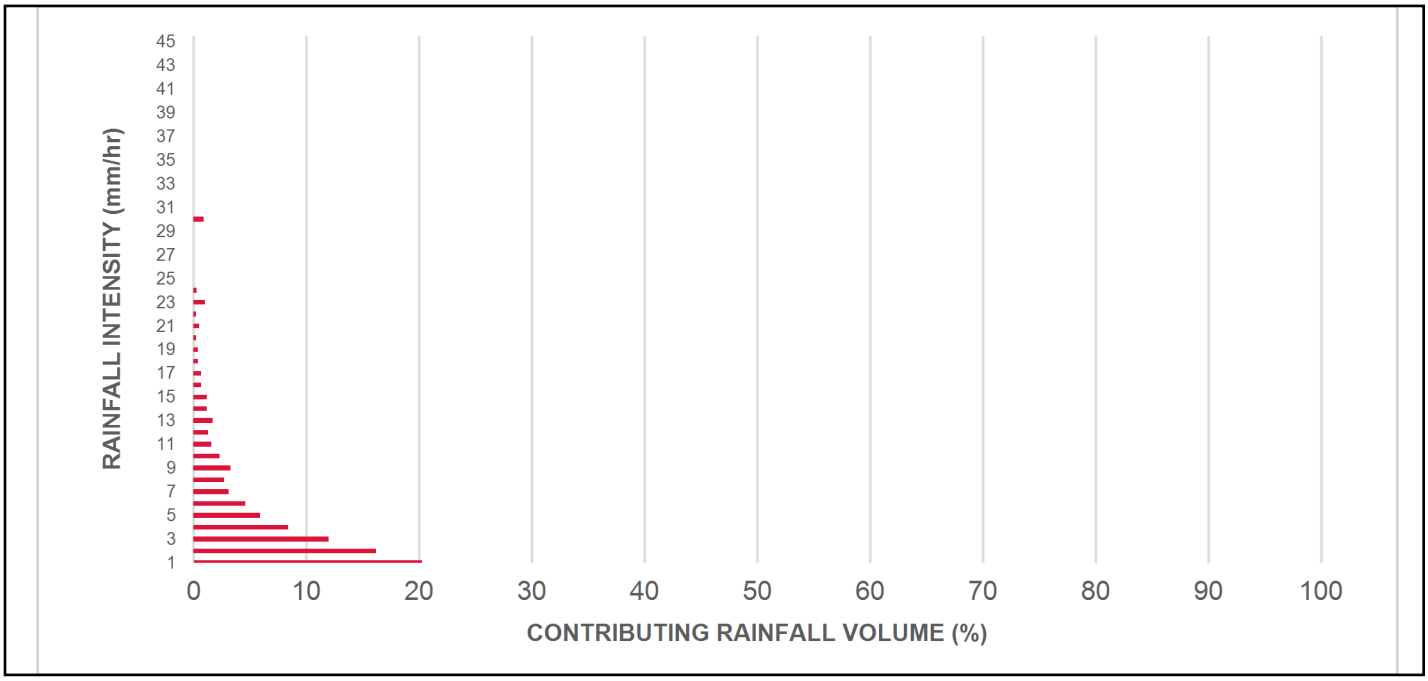
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Upstream Flow Controlled Results

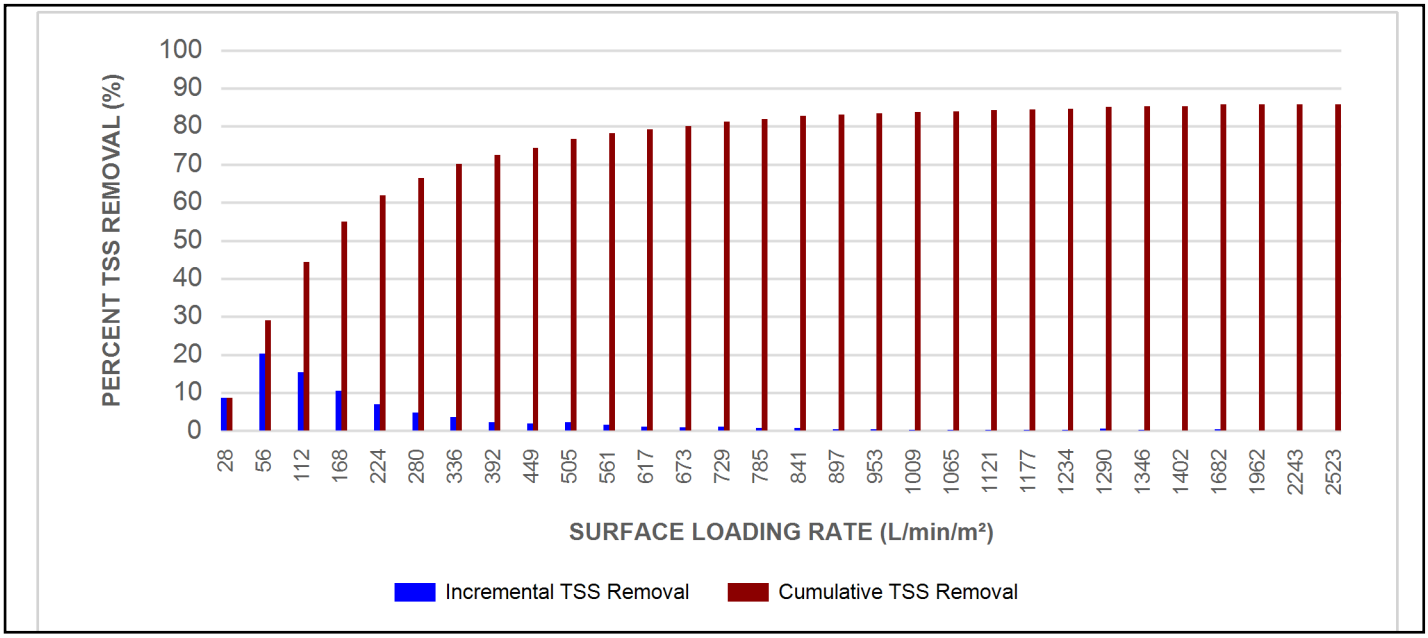
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	2.20	132.0	28.0	100	8.6	8.6
1.00	20.3	29.0	4.39	264.0	56.0	100	20.3	29.0
2.00	16.2	45.2	8.78	527.0	112.0	95	15.3	44.3
3.00	12.0	57.2	13.18	791.0	168.0	88	10.6	54.9
4.00	8.4	65.6	17.57	1054.0	224.0	82	6.9	61.8
5.00	5.9	71.6	21.96	1318.0	280.0	79	4.7	66.5
6.00	4.6	76.2	26.35	1581.0	336.0	77	3.6	70.1
7.00	3.1	79.3	30.74	1845.0	392.0	74	2.3	72.4
8.00	2.7	82.0	35.14	2108.0	449.0	72	2.0	74.4
9.00	3.3	85.3	39.53	2372.0	505.0	69	2.3	76.7
10.00	2.3	87.6	43.92	2635.0	561.0	66	1.5	78.2
11.00	1.6	89.2	48.31	2899.0	617.0	65	1.0	79.2
12.00	1.3	90.5	52.70	3162.0	673.0	64	0.8	80.1
13.00	1.7	92.2	57.10	3426.0	729.0	64	1.1	81.2
14.00	1.2	93.5	61.49	3689.0	785.0	63	0.8	81.9
15.00	6.5	100.0	65.88	3953.0	841.0	63	4.1	86.0
16.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
17.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
18.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
19.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
20.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
21.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
22.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
23.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
24.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
25.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
30.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
35.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
40.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
45.00	0.0	100.0	67.00	4020.0	855.0	63	0.0	86.0
Estimated Net Annual Sediment (TSS) Load Reduction =								**86 %**

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

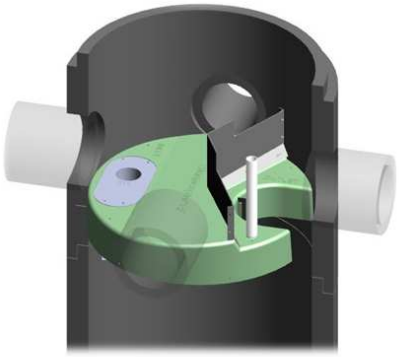
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

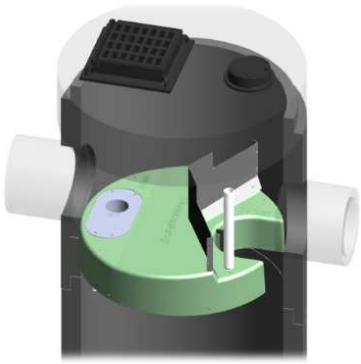
DESIGN FLEXIBILITY

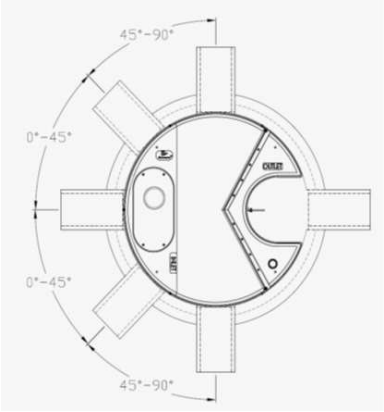
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** S**eparators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

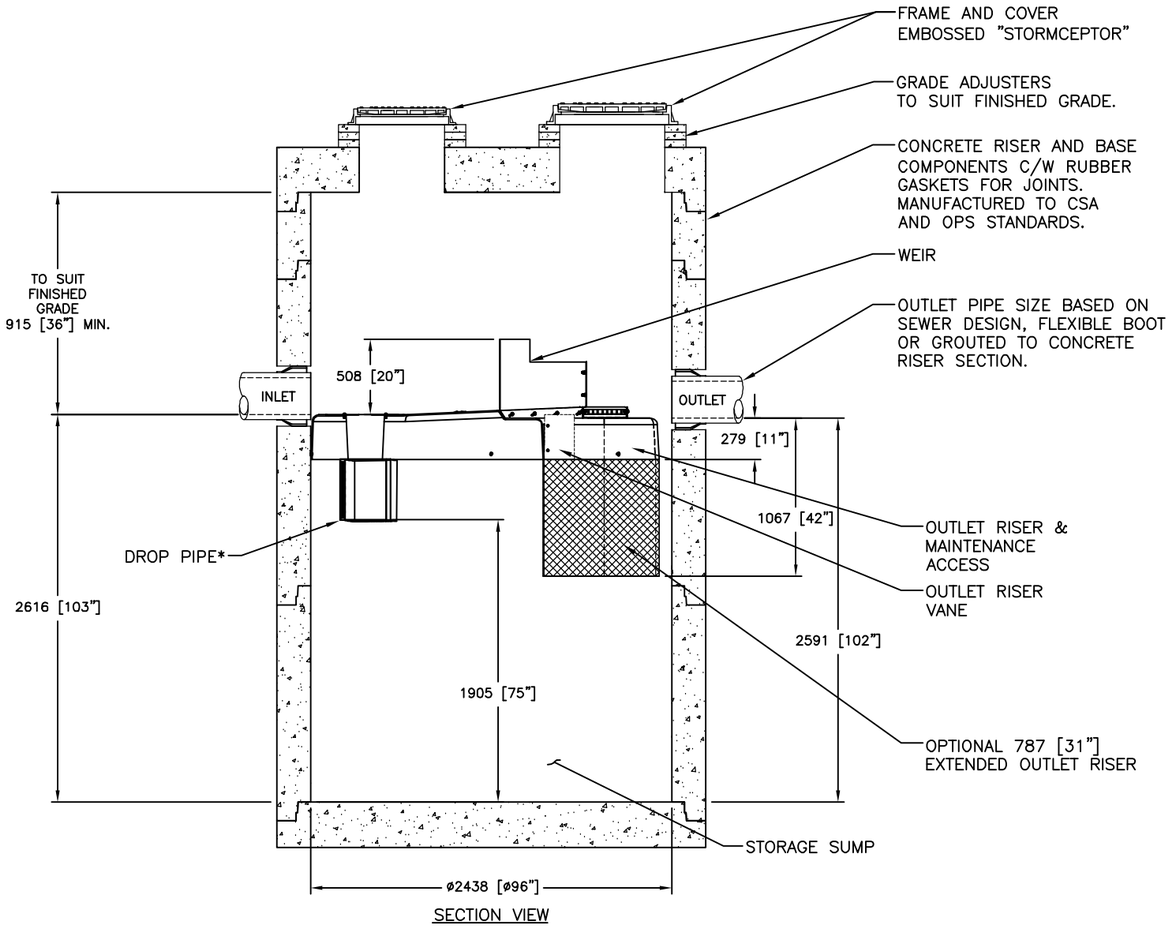
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

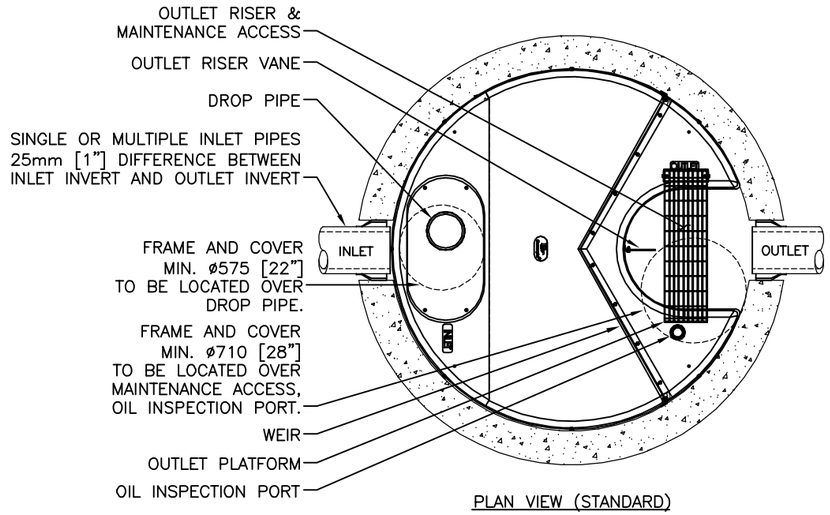
The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

assess whether light liquids captured after a spill are effectively retained at high flow rates.

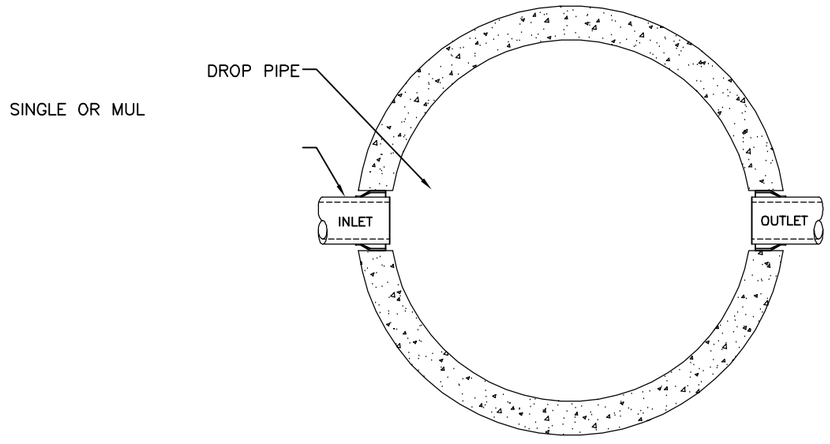
3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

Inlet Control Device

The IPEX Inlet Control Device (ICD) is used to control flow into storm sewers during peak flow events.

It is designed to allow a specified flow volume out of a catchbasin at a specified head. This causes the excess stormwater to be temporarily stored above ground. This approach conserves pipe capacity so that catchbasins upstream do not become uncontrollably surcharged, which could lead to flooding. IPEX ICD's incorporate a special design that prevents clogging, particularly during low flow conditions. IPEX ICDs can also be fabricated to fit any type of pipe – PVC, concrete, clay or a host of other products.

ADVANTAGES

- Controls flow into storm sewers during peak flow events.
- Designed to allow a specified flow volume out of a catchbasin at a specified head.
- Conserves pipe capacity so that catchbasins upstream do not become uncontrollably surcharged, which could lead to flooding.
- Special design that prevents clogging, which can be a problem for some orifice plates, particularly during low flow conditions.

ICDS FOR STORMWATER SYSTEMS

PRODUCT INFORMATION BULLETIN

Inlet Control Device

The IPEX Inlet Control Device (ICD) is used to control flow into storm sewers during peak flow events. It is designed to allow a specified flow volume out of a catchbasin at a specified head. This causes the excess stormwater to be temporarily stored above ground. This approach conserves pipe capacity so that catchbasins upstream do not become uncontrollably surcharged, which could lead to flooding.

IPEX ICD's incorporate a special design that prevents clogging, particularly during low flow conditions.

IPEX ICDs can also be fabricated to fit any type of pipe – PVC, concrete, clay or a host of other products.

Dimensions

ICD's are available both as standard (Types A, B, C, D, & F) and custom designed configurations. In addition, there are specific designs for different types of pipe, including smooth wall PVC, profile wall and concrete pipe.

The main advantage of specifying standard ICD's is that they are readily available and can be delivered immediately. However, there are definite advantages to specifying custom sized units as they allow tremendous design flexibility because the allowable flow can be matched directly to the topography of the pavement surface.

Types Available

'Plug' ICD

A short, slightly tapered plug is inserted in the outlet pipe from the catchbasin. Held in place by friction and hydrostatic pressure, plug ICDs are made to fit 200mm, 250mm and 3mm (8", 10" & 12") pipe made from any material (i.e. PVC, concrete, clay, etc.). The orifice plate sits flush with the inside of the catchbasin.

'Framed' ICD

A plate containing the orifice is held in channels in the frame. The ICD frame is bolted over the outlet pipe inside the catchbasin. Framed ICDs can be fabricated for any size and type of pipe.

Applications & Benefits

Storm water flow control for:

- parking lots
- roads
- where main line storm sewer capacity must be managed
- alleviates basement flooding

IPEX

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

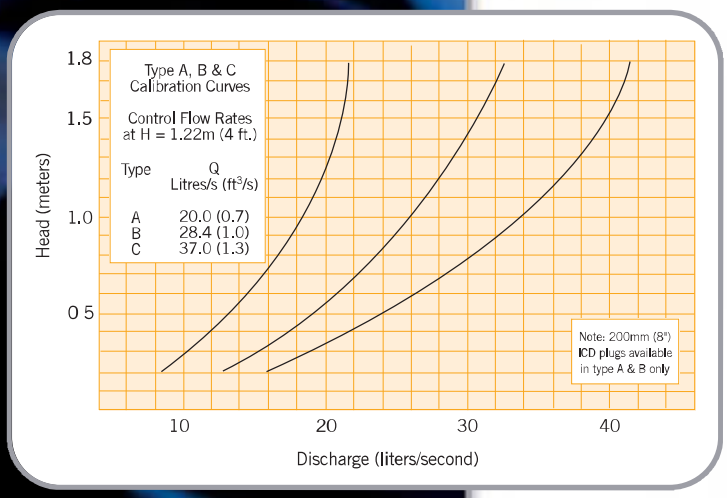
Canadian Customers call IPEX Inc.
Toll Free: (866) 473-9462
www.ipexinc.com

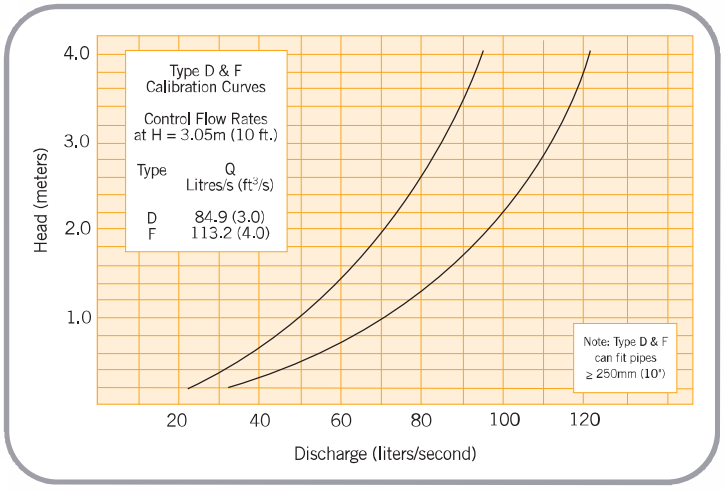
US Customers call IPEX USA LLC
Toll Free: (800) 463-9572
www.ipexamerica.com

PIMNNAIP050813R

Sump Scouring Action

The rectangular slot at the bottom of the orifice works effectively in two ways. First, during dry periods it draws the water level below the main orifice area, keeping it clear of floating debris. Second, it generates strong vortex action in the approach flow during heavy rainfalls, vigorously scouring sediment from the sump of the catchbasin.





Specifications

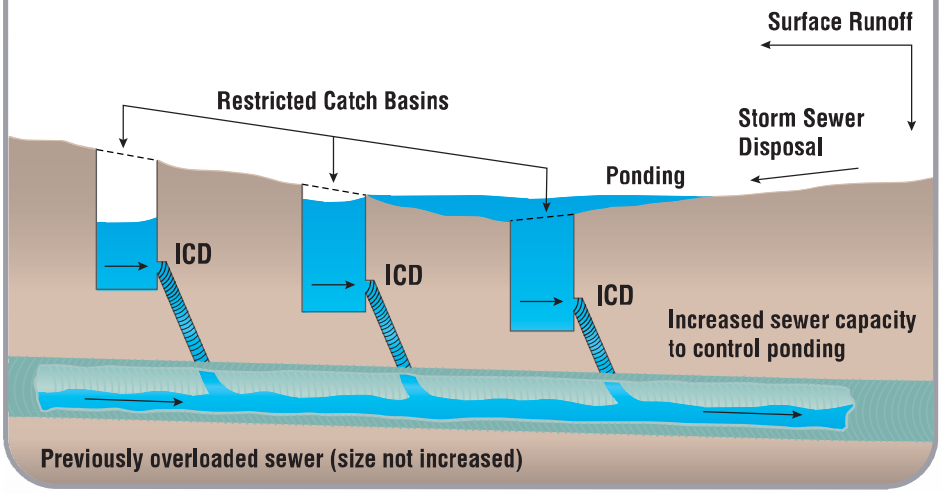
IPEX Inlet Control Devices are manufactured from Polyvinyl Chloride (PVC) to be supplied according to the type (i.e. A, B, C, D, or F) as shown in the above graphs.

IPEX Plug ICDs are to be machined to provide a friction fit into the outlet pipe.

Framed ICDs are to be bolted in position over appropriate outlet pipe in the catchbasin/maintenance hole.

Note: IPEX can also design and fabricate I.C.D's with custom curves, in order to match specific site requirements.

DUAL DRAINAGE SYSTEM



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www.ipexinc.com

US Customers call IPEX USA LLC
Toll Free: (800) 463-9572
www.ipexamerica.com

APPENDIX G
CITY OF OTTAWA DESIGN CHECKLIST

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

Criteria	Location (if applicable)
☐ Executive Summary (for larger reports only).	N/A
☐ Date and revision number of the report.	On Cover
☐ Location map and plan showing municipal address, boundary, and layout of proposed development.	Appendix A
☐ Plan showing the site and location of all existing services.	N/A
☐ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	1.1 Purpose 1.2 Site Description 6.0 Storm Sewer Design
☐ Summary of pre-consultation meetings with City and other approval agencies.	Appendix B
☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	1.1 Purpose 1.2 Site Description 6.0 Storm Sewer Design
☐ Statement of objectives and servicing criteria.	3.0 Pre-Consultation Summary

☐ Identification of existing and proposed infrastructure available in the immediate area.	N/A
☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/A
☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐ Proposed phasing of the development, if applicable.	N/A
☐ Reference to geotechnical studies and recommendations concerning servicing.	N/A
☐ All preliminary and formal site plan submissions should have the following information: o Metric scale o North arrow (including construction North) o Key plan o Name and contact information of applicant and property owner o Property limits including bearings and dimensions o Existing and proposed structures and parking areas o Easements, road widening and rights-of-way o Adjacent street names	N/A

4.2 Development Servicing Report: Water

Criteria	Location (if applicable)
☐ Confirm consistency with Master Servicing Study, if available	N/A
☐ Availability of public infrastructure to service proposed development	N/A
☐ Identification of system constraints	N/A
☐ Identify boundary conditions	Appendix C
☐ Confirmation of adequate domestic supply and pressure	N/A
☐ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Appendix C
☐ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐ Address reliability requirements such as appropriate location of shut-off valves	N/A
☐ Check on the necessity of a pressure zone boundary modification.	N/A
☐ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Appendix C, Section 4.2 Proposed Water Servicing

☐ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Site Servicing Plan (C101)
☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☐ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Appendix C
☐ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Criteria	Location (if applicable)
☐ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	N/A
☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☐ Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 5.2 Proposed Sanitary Servicing

☐ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 5.2 Proposed Sanitary Servicing
☐ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N/A
☐ Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 5.2 Proposed Sanitary Servicing
☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐ Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

Criteria	Location (if applicable)
☐ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management
☐ Analysis of available capacity in existing public infrastructure.	N/A
☐ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Pre & Post-Development Plans
☐ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5-year event (dependent on the receiving sewer design) to 100-year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management
☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management
☐ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management
☐ Set-back from private sewage disposal systems.	N/A
☐ Watercourse and hazard lands setbacks.	N/A
☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☐ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).	Appendix G

☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Site Grading Plan (C101)
☐ Calculate pre-and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Appendix G, Section 7.0 Proposed Stormwater Management
☐ Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management
☐ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management
☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐ Identification of potential impacts to receiving watercourses	N/A
☐ Identification of municipal drains and related approval requirements.	N/A
☐ Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 6.0 Storm Sewer Servicing & Section 7.0 Proposed Stormwater Management
☐ 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Site Grading Plan (C101)
☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A

☐ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 8.0 Sediment & Erosion Control
☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐ Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

Criteria	Location (if applicable)
☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	N/A
☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐ Changes to Municipal Drains.	N/A
☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

Criteria	Location (if applicable)
☐ Clearly stated conclusions and recommendations	Section 9.0 Summary Section 10.0 Recommendations
☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	All are stamped
☐ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	All are stamped