MR. ABDO EL-ARAB

VARS GAS STATION REDEVELOPMENT

SITE SERVICING AND STORMWATER MANAGEMENT REPORT

JULY 16, 2026
4TH SUBMISSION

wsp

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SITE SERVICING AND STORMWATER MANAGEMENT REPORT

MR. ABDO EL-ARAB

PERMIT APPLICATION
4TH SUBMISSION

PROJECT NO.: CA0008077.7007
DATE: JULY 16, 2026

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1 INTRODUCTION

1.1 DATE OF REPORT REVISIONS

FIRST ISSUE

July 13, 2018	Site Plan Application
Prepared by:	Approved by:
Michael Jans, P. Eng	Ishaque Jafferjee, P. Eng

SECOND ISSUE

March 24, 2026	Revised per City, MTO and MECP Comments
Prepared by:	Approved by:
Wanzhi (Amy) Zhuang, P.Eng.	Ishaque Jafferjee, P. Eng

THIRD ISSUE

April 24, 2026	Site Plan Application
Prepared by:	Approved by:
Wanzhi (Amy) Zhuang, P.Eng.	Ishaque Jafferjee, P. Eng

FOURTH ISSUE

July 16, 2026	Site Plan Application
Prepared by:	Approved by:
Wanzhi (Amy) Zhuang, P.Eng.	Ishaque Jafferjee, P. Eng

1.2 SIGNATURES

PREPARED BY

Wanzhi (Amy) Zhuang
Senior Civil Engineer, P. Eng

REVIEWED BY

Ishaque Jafferjee
Manager, P. Eng

2 GENERAL INFORMATION

2.1 DESCRIPTION OF THE CATCHMENT AREA

WSP Canada Inc. has been retained by Mr. Abdo El-Arab to complete a detailed stormwater management design for a mixed-use catchment area, including a gas station redevelopment and car sales lot in Vars, Ontario. This Stormwater Management Report outlines the proposed stormwater collection system and management approach for the 0.912-hectare development.

The existing catchment area crowns near the center of the site, with runoff draining toward the surrounding open ditches located along both the east and west property limits. These ditches convey flows southward before directing them eastward toward the north side of Highway 417. The site spans approximately 190 metres from its northernmost point to the southeast corner and consists of a mix of asphalt, maintained grass, and dense vegetation.

2.2 LOCATION MAP AND PLAN

The proposed development is located on the property known as 6175 Rockdale Road, of the Municipality of Ottawa located within ward 19. The property is located on the East Side of Rockdale Road immediately North of highway 417, approximately 2km south of the Village of Vars, see location shown in **Figure 2-1** below.

Figure 2-1 Site Location

2.3 SITE ASSESSMENT

2.3.1 PROPOSED ACTIVITY

The proposed development includes a gas station redevelopment and a car dealership, an activity prescribed under Section 2 of O. Reg. 137/25. The site will be privately owned. No processing, repair, or maintenance of goods or

materials will occur indoors, and no discharge of process water, cooling water, wash water, or sanitary sewage will be received by, or proposed to be received by the works.

2.3.2 POTENTIAL CONTAMINANTS

The typical contaminants associated with gas station operations include suspended solids, sediments, road salts, and occasional oil or fuel spills. To mitigate these potential contaminants, an oil grit separator (OGS) is proposed as part of the stormwater management strategy for the site.

2.3.3 DESIGN CRITERIA

Design criteria obtained from the City of Ottawa and MOE for 6175 Rockdale Road are as follows:

→ **Stormwater Quantity**

- No requirement regarding quantity control considering the location of the site, see correspondence included in **Appendix A**.

→ **Stormwater Quality**

- Enhanced level of protection is required (80% TSS Removal).

2.3.4 PRECIPITATION PATTERNS

The rainfall intensity is calculated in accordance with the MTO IDF data for the project Site:

$$i = AT_D^B$$

Where;

- A, B = regression constants for each return period
- i = rainfall intensity (mm/hour)
- Td = storm duration (hour)

The IDF regression coefficients are as presented in **Table 2-1**. A copy of the MTO IDF data obtained from the MTO IDF Lookup tool is included in **Appendix B**.

Table 2-1: MTO IDF Regression Coefficients

RETURN PERIOD	A	B
2-year	19.9	-0.699
5-year	26.4	-0.699
10-year	30.7	-0.699
25-year	36.2	-0.699
50-year	40.2	-0.699
100-year	44.2	-0.699

The modified rational method was used to compare the pre-development and post-development runoff for storm events with return periods of 2 year, 5 years, 10 years, 25 years, 50 years and 100 years. The modified rational method is a valid approximation of the peak flow generated by a storm event, provided it is used for drainage areas smaller than 100 hectares.

2.3.5 DRAINAGE PATTERNS, SURVEY AND HYDROLOGICAL CONDITIONS

The existing drainage patterns were established based on the topographical survey completed by Farley, Smith & Denis Surveying LTD; The site is relatively flat and consists primarily of open paved surfaces. As shown in C1.5 – "Pre-Development Stormwater Catchment Areas" and C1.1, catchment A-101 currently crowns near the center of the property, with runoff draining into the open ditches located along both the east and west boundaries. These ditches convey flows southward before directing toward the north side of Highway 417. The site extends approximately 190 metres from its northernmost point to the southeast corner and is composed of asphalt, maintained grass, and areas of dense vegetation.

2.3.6 IDENTIFICATION OF PROTECTED AREA

The subject site is not located in any of the following:

A. The Lake Simcoe watershed as defined in the *Lake Simcoe Protection Act, 2008*.

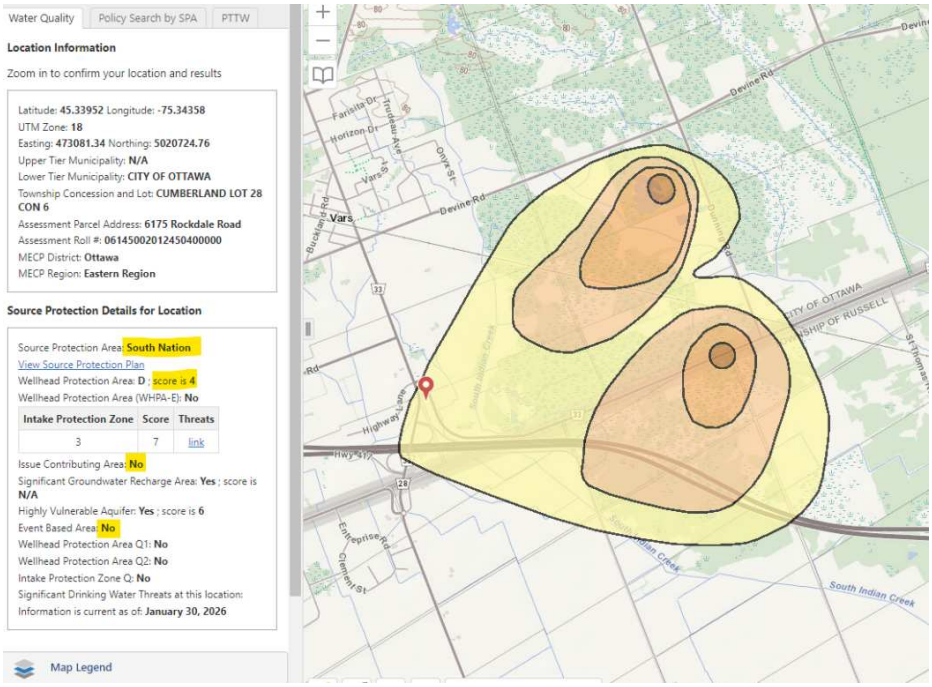
B. The Niagara Escarpment Planning Area.

C. The portion of the Oak Ridges Moraine Area as defined in the *Oak Ridges Moraine Conservation Act, 2001* to which the Oak Ridges Moraine Conservation Plan established under that Act applies.

D. An area designated as Protected Countryside in the Greenbelt Plan established under the *Greenbelt Act, 2005*.

2.3.7 IDENTIFICATION OF DRINKING WATER THREAT

The subject catchment area is located within the South Nation Source Protection Area. Based on the information on the Source Protection Information Atlas, the site is located in a well head protection area with score of 4. It's not within an issue contributing area associated with a chemical parameter nor an event based area associated with stormwater management works activities and a chemical parameter. Thus, this SWM works would not be a source drinking water threat (SDWT) activity.



3 DESIGN

There are currently no municipal sanitary sewers or watermains servicing the subject area. Potable water will be provided via a newly constructed well, and sanitary wastewater will be managed through an on-site septic system. For detailed information, refer to the well and septic system designs prepared by Paterson Group. A copy of the sewage system layout plan is included in **Appendix A**.

3.1 DESIGN CRITERIA

As mentioned in Section 2.3, design criteria obtained from the City of Ottawa and MOE are as follows:

→ **Stormwater Quantity**

- No requirement regarding quantity control considering the location of the site, see correspondence included in **Appendix A**.

→ **Stormwater Quality**

- Enhanced level of protection is required (80% TSS Removal).

3.2 PRE-DEVELOPMENT CONDITIONS

The existing drainage patterns were established based on the topographical survey completed by Farley, Smith & Denis Surveying LTD; the site was observed to be relatively flat, open paved land. As shown in **C1.5** – "Pre-Development Stormwater Catchment Areas", catchment A-101 currently crowns, draining into the surrounding open ditches which run southwards along both sides of the property. These open ditches convey the water to the north side of Highway 417, going eastward. The site is comprised of a mix of asphalt, average grass and dense grass.

3.2.1 RUNOFF COEFFICIENT

The pre-development runoff coefficients were calculated based on runoff coefficients of 0.20 for vegetation, 0.70 for gravel areas and 0.90 for asphalt, concrete, and roof areas. A post development weighted runoff coefficient of **0.53** for the entire site was calculated using the above noted runoff coefficients and their respective areas, as shown in **Table 3-1** Pre-development Runoff Coefficients.

The pre-development runoff coefficient was taken as C = **0.5** as per the City of Ottawa Sewer Design Guidelines (2025), Section 5.4.5.2 on page 5.26:

"Commercial, Institutional and Industrial areas are to use on-site detention techniques to limit the runoff from the subject site to a maximum equivalent C coefficient of 0.5. Flows more than the 5-year storm release rate into the storm sewer must be detained on site. Release rates into the sewer system should not be less than that used for residential areas."

Table 3-1: Pre-development Runoff Coefficient

Total Area (ha)	Surface Type	Area (ha)	Runoff Coefficient "C"	Average "C"
0.911	Gravel	0.155	0.70	0.53 (0.5 is used)
	Asphalt	0.313	0.90	
	Soft	0.442	0.20	

3.2.2 TIME OF CONCENTRATION

The time of concentration for the pre-development conditions were determined based on City of Ottawa Sewer Design Guidelines (2025) Appendix 5D, Inlet Time Graph for Various Slopes and Imperviousness. With the longest travel distance of approximately 123m and an average slope of 1.9%, the Tc was determined to be 10 minutes.

An inlet time of 10 minutes is also recommended as per the City of Ottawa Sewer Design Guidelines (2025), Section 5.4.5.2 on page 5.25:

"The selection of inlet times based on calculations vs. the prescribed standard values such as 20minutes formerly used throughout the City was reviewed. Given the challenges faced in Greenfields developments with low grades and lack of conveyance of the major system (street network), an Inlet time of 10 minutes is to be used for all land uses and lot grading configurations."

3.2.3 WATER QUANTITY

Using the runoff coefficient and time of concentration chosen, the runoff generated from the site are calculated using Rational Method. A detailed calculation is included in **Appendix B** – Pre-development Runoff Calculation. Table 3-2 below summarize the pre-development uncontrolled scenarios for the entire site for storm events with return periods of 2, 5, 10, 25, 50 and 100 years respectively.

Table 3-2: Pre-development Flow

Return Period	Site Area (ha)	Runoff Coefficient C	Pre-development Flow (L/s)
2 Year	0.91	0.50	88.1
5 Year	0.91	0.50	116.9
10 Year	0.91	0.50	136.0
25 Year	0.91	0.58	186.0
50 Year	0.91	0.60	213.7
100 Year	0.91	0.61	238.9

** Pre-development for 2, 5 and 10 years flows used a C value of 0.5 per City of Ottawa Sewer Design Guidelines.*

3.3 POST-DEVELOPMENT CONDITIONS

3.3.1 RUNOFF COEFFICIENT

C1.5 – "Post-Development Stormwater Catchment Areas" illustrates the proposed overall post-development stormwater catchment areas for the site. Runoff from Area A1 of the proposed development (including the proposed building and vehicle parking areas) will be collected though three catch basins, and treated through an OGS before released into the roadside swale in between two site entrances from the east side.

The post-development runoff coefficients were calculated based on runoff coefficients of 0.20 for vegetation, 0.70 for gravel areas and 0.90 for asphalt, concrete, and roof areas. A post development weighted runoff coefficient of **0.46** for the entire site was calculated using the above noted runoff coefficients and their respective areas, which is lower than the pre-development C of 0.53 (0.5). The proposed hard surface area is reduced compared to pre-development conditions.

Post development drainage areas and runoff coefficients are shown in Drawing **C1.5**, **Appendix C** and summarized in **Table 3-3**.

Table 3-3: Post-development Runoff Coefficient

Catchment ID	Surface Type	Area (ha)	Runoff Coefficient "C"	Average "C"
A1 0.364 ha	Gravel	0.099	0.70	**0.81**
	Asphalt	0.248	0.90	
	Soft	0.017	0.20	
A2 0.463 ha	Gravel	0.024	0.70	**0.23**
	Asphalt	-	0.90	
	Soft	0.439	0.20	
A3 0.058 ha	Gravel	-	0.70	**0.20**
	Asphalt	-	0.90	
	Soft	0.058	0.20	
A4 0.025 ha	Gravel	-	0.70	**0.20**
	Asphalt	-	0.90	
	Soft	0.025	0.20	
Overall Site 0.911 ha	Gravel	0.123	0.70	**0.46**
	Asphalt	0.248	0.90	
	Soft	0.540	0.20	

3.3.2 TIME OF CONCENTRATION

An inlet time of 10 minutes is used for the post-development conditions as per the City of Ottawa Sewer Design Guidelines (2025), Section 5.4.5.2 on page 5.25:

"The selection of inlet times based on calculations vs. the prescribed standard values such as 20minutes formerly used throughout the City was reviewed. Given the challenges faced in Greenfields developments with low grades and lack of conveyance of the major system (street network), an Inlet time of 10 minutes is to be used for all land uses and lot grading configurations."

3.3.3 WATER QUANTITY

As outlined in **Section 3.1**, quantity control is not required for the site. Therefore, no rooftop storage is provided for the proposed building and the gas bar. The roof drain will be connected to the storm sewer system uncontrolled. A courtesy review of the post-development runoff quantity calculation is performed. **Table 3-4** below summarizes the post-development uncontrolled scenarios for the entire site for the return periods of 2 year, 5 years, 10 years, 25 years, 50 years and 100 years respectively.

As previously discussed in 3.3.1, the overall runoff coefficient is decreased for the post-development conditions, therefore the total flow is decreased compared to the existing conditions predevelopment. A copy of the Post-development Runoff Calculations is included in **Appendix B**.

Table 3-4: Post-development Flow

Return Period	Site Area (ha)	Runoff Coefficient C	Post-development Flow (L/s)
2 Year	0.91	0.46	84.1
5 Year	0.91	0.46	107.6
10 Year	0.91	0.46	125.1
25 Year	0.91	0.50	160.4
50 Year	0.91	0.53	188.8
100 Year	0.91	0.54	211.5

The post-development runoffs are reduced compared to pre-development conditions.

3.4 WATER QUALITY

As outlined in **Section 3.1**, it is required that post development runoff be treated to achieve 80% TSS removal.

The areas at risk of introducing contaminants to the surface runoff include the pump station apron and car sales parking area. These areas are proposed to be graded such that they drain exclusively into the proposed Stormceptor. It is recommended that the Stormceptor be equipped with the "Smartpro" remote monitoring system. This monitor triggers an alarm when the Stormceptor unit has reached 85% of its oil storage capacity, thus ensuring that spills do not go unnoticed.

Proposed features to achieve these targets include:

→ Suitably sized oil and grit separator (OGS) unit (Stormceptor EFO4 or equivalent)

Sizing documentation for the proposed OGS device is included in **Appendix B**.

3.5 DRAINAGE DRAWING

Pre- and post-development drainage sub-area plans for the Site are shown in plan **C1.5**. Drawings **C1.3** and **C1.4** as provided in **Appendix C** outline the proposed Site grading and servicing layout including the proposed and receiving storm infrastructure.

3.6 PROPOSED MINOR SYSTEM AND MAJOR STORM

The proposed stormwater drainage system connects to the roadside swale along Russland Road through a 300mm outlet pipe. All water from the parking lot and driveways will be directed to the OGS before released to the ditch. The existing roadside ditch surrounding the site will be regraded to ensure positive drainage is maintained.

Major flows exceeding the capacity of the minor system will generally travel from west to east across the site and enter the open ditches along Russland Road. These ditches ultimately convey flows south towards Highway 417.

4 ASSESSMENT OF MONITORING

4.1 MONITORING AND INSPECTION

Regular inspection and monitoring are essential to ensure the system operates efficiently and continues to perform as intended. Ongoing maintenance helps maximize operational efficiency, reduce long-term costs, and protect the quality of natural waterways.

Post-construction inspection is required before the Stormceptor OGS unit is placed into service. During the first year of operation, routine inspections are recommended to accurately assess pollutant accumulation and establish an appropriate maintenance schedule. In subsequent years, inspection frequency should follow the maintenance plan developed based on first-year observations. Inspections should also be conducted immediately following any oil, fuel, or chemical spill to ensure the unit continues to operate effectively and safely.

4.2 SAMPLING AND ANALYSIS METHODS

Typical inspection is performed from grade, following the steps below -

- Remove manhole cover(s) or inlet grate to access insert and lower chamber

  NOTE: 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

5 OPERATION AND MAINTENANCE MANUAL

5.1 OGS OPERATION

Stormwater enters the Stormceptor upper chamber through the inlet pipe or surface grate, where a specially designed insert reduces influent velocity by creating an upstream ponding area. As flow is slowed, sediment particles begin to settle. Swirling flow then directs water, sediment, floatables, and oils across the sloped surface of the insert toward the inlet of the drop pipe, where a strong vortex draws these materials down the cone. The influent exits the cone into the drop pipe duct, which contains two large rectangular outlet openings as well as additional perforations along its backside and base, diffusing flow into the lower chamber at low velocity. Within this chamber, free oils and other floatables rise through the channel surrounding the central riser pipe and become trapped beneath the insert, while sediment settles into the sump for later removal during maintenance. Treated effluent then enters the outlet riser, rises upward, and discharges on the downstream side of the insert's weir before exiting through the outlet pipe.

During intense storm events, when influent rates exceed the weir height, excess flow passes over the weir and directly to the outlet pipe through the internal bypass, allowing in-line installation without the need for additional bypass structures. Even during bypass conditions, the upstream ponding effect continues to separate sediment, while full treatment in the lower chamber proceeds at the maximum treatment flow rate. Stormceptor EF's enhanced flow and scour prevention technology ensures effective pollutant capture and retention while accommodating excess flow during infrequent, high-intensity storms.

5.2 OGS MAINTENANCE

If the post-construction inspection identifies construction sediment deeper than a few inches, maintenance should be conducted at that time. For optimal performance under normal operating conditions, the unit should be cleaned once sediment accumulation reaches the recommended maintenance depth (8in for EFO4). Maintenance should also be performed immediately following any oil, fuel, or chemical spill.

The required frequency of inspection and maintenance may be adjusted based on site-specific conditions to ensure the unit continues to function as intended. Maintenance costs will vary depending on unit size, site conditions, local requirements, disposal fees, and transportation distance.

5.3 MAINTENANCE PROCEDURE

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.
- 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.
- 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.

A complete user's manual can be found in **Appendix B**, which includes detailed information for Stormceptor OGS operation, model installation, inspection and maintenance.

6 SEDIMENT AND EROSION CONTROL

6.1 GENERAL

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction. Silt fences will be installed around the perimeter of the Site and will be cleaned and maintained throughout construction. Silt fences will remain in place until the working areas have been stabilized or re-vegetated. Catch basins and manholes will have filter fabric installed under the grate during construction to protect from silt entering the storm sewer system. A mud mat will be installed at the construction access in order to prevent mud from tracking onto adjacent roads.

Erosion and sediment controls must be in place during construction. Recommendations to the contractor are included in the erosion and sediment control plan **C1.4** (**Appendix C)** and are summarized below.

During all construction activities, erosion and sedimentation shall be controlled by the following techniques:

Prior to Construction

→ Install silt fence along the perimeter of the property line.

- → Install filter fabric or silt sack filters in all catchbasins and manholes that exist within the vicinity of the Site.

During Construction

- → Minimize the extent disturbed areas and the duration of exposure and impacts to existing grading.
- → Perimeter vegetation to remain in place until permanent storm water management is in place; otherwise, immediately install silt fence when the existing Site is disturbed at the perimeter.
- → Protect disturbed areas from overland flow by providing temporary swales to the satisfaction of the field engineer. Tie-in temporary swale to existing catchbasins as required.
- → Provide temporary cover such as seeding or mulching if disturbed area will not be rehabilitated within 30 days.
- → Inspect silt fences, fabric filters, and catchbasin sumps weekly and within 24 hours after a storm event. Clean and repair when necessary.
- → Drawing to be reviewed and revised as required during construction.
- → Erosion control fencing to be installed around the base of all stockpiles.
- → Do not locate topsoil piles and excavation material closer than 2.5m from any paved surface, or one which is to be paved before the pile is removed. All topsoil piles are to be seeded if they are to remain on Site long enough for seeds to grow (longer than 30 days).
- → Control wind blown off-site dust by seeding topsoil piles and other areas temporarily (provide watering as required and to the satisfaction of the engineer).
- → No alternate methods of erosion protection shall be permitted unless approved by the field engineer.
- → City roadway and sidewalk to be cleaned of all sediment from vehicular traffic as required.
- → Provide gravel entrance (mud mat) wherever equipment leaves the Site to prevent mud tracking onto paved surfaces.
- → During wet conditions, tires of all vehicles/equipment leaving the Site are to be scraped.
- → Any mud/material tracked onto the road shall be removed immediately by hand or rubber tire loader.
- → Take all necessary steps to prevent building material, construction debris, or waste being spilled or tracked onto adjacent properties or public streets during construction and proceed immediately to clean up any areas which are affected.
- → All erosion control structures to remain in place until all disturbed ground surfaces have been stabilized either by paving or restoration of vegetative ground cover.
- → During the course of construction, if the engineer believes that additional prevention methods are required to control erosion and sedimentation, the contractor will install additional silt fences or other methods as required to the satisfaction of the engineer.
- → The contractor shall implement best management practices during construction activities to provide protection to all drainage systems and potential receiving watercourse. The contractor acknowledges that failure to implement appropriate erosion and sediment control measures may be subject to penalties imposed by any applicable regulatory agency.

7 PERMITS, CONCLUSIONS, AND RECOMMENDATIONS

7.1 PERMITS AND APPROVALS

The proposed development is subject to City of Ottawa Site Plan Approval and Ontario Ministry of Transportation.

This Stormwater Management Report is prepared in support of the application to MOE. The owner intends on proceeding with the construction of the stormwater collection and management systems as soon as Environmental Activity and Sector Registry (EASR) is registered and all comments have been addressed.

No permits or approvals are anticipated to be required from National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or Federal Regulatory Agency.

7.2 CONCLUSIONS AND RECOMMENDATIONS

This site servicing and stormwater management report has been prepared for the gas station redevelopment at 6175 Rockdale Drive in Vars. The conclusions for this proposed Site development can be summarized as follows:

- → Well design and septic design are provided by Paterson Group.
- → The proposed stormwater system consisting only quality control measures is designed to meet 80% TSS removal.
- → Erosion and sediment control measures will be provided both prior to and throughout all construction activities.

It is concluded that the proposed development can meet all Site servicing, drainage, and stormwater management constraints. It is recommended that this report be submitted for Site Plan Approval application.

APPENDIX

A

- CORRESPONDENCE WITH AUTHORITIES
- ARCHITECTUAL SITE PLAN
- SEWAGE SYSTEM LAYOUT PLAN – PATERSON
- EASR – CONFIRMATION OF REGISTRATION

Zhuang, Amy

From: Katie Spithoff <kspithoff@brydengibson.ca>
Sent: August 7, 2025 10:57 AM
To: Jafferjee, Ishaque
Cc: Suzanne Gibson; Zhuang, Amy; Manoryk, Spencer
Subject: FW: 6175 Rockdale Road - MTO update

Follow Up Flag: Follow up
Flag Status: Flagged

Good morning Ishaque,

Please see below from the city planner. Looks like we are good to go with simply updating the drawings and report.

Regards,

Katie Spithoff (she / her)
Architectural Technician
CADD Manager

TEL : (613) 724-9914 ext.252

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Ottawa Ontario, K1Y4T3

Website : www.brydengibson.com

From: McCormick, Sarah <sarah.mccormick@ottawa.ca>
Sent: August 7, 2025 10:54 AM
To: Katie Spithoff <kspithoff@brydengibson.ca>
Cc: Suzanne Gibson <gibson@brydengibson.ca>
Subject: RE: 6175 Rockdale Road - MTO update

Hi Katie,

After a quick review and discussion with engineering staff, generally speaking there are no concerns with flipping the site. I would note that a full review would be conducted once a complete submission package has been received. Engineering staff has reviewed and confirmed that the original SWM requirements would remain valid, with an updated report with similar discussion to what was originally approved required for the re-circulation.

Please note that while I was looking at the site plan, I noted 2 things that should be addressed. Please note that when the full package is received a more fulsome review will be conducted on the site plan.

- The dimensions of the loading space should be as per the minimum requirements in the Zoning By-law
- Please ensure dimensions are provided on the accessible parking space.
- A connection should be provided between the new proposed building and the garbage area. I would recommend some painted linework across the drive-thru aisle and some permeable pavers used as a pathway through the landscaped area.

- Drawing details will be require for the garbage enclosure as well as for the accessible parking signage.

If you have any questions, please do not hesitate to contact me.

Regards,
Sarah

Sarah McCormick **MCIP, RPP**
Planner III / Urbaniste III
Development Review, Rural Services / Examen des projets d'aménagement, Service ruraux
Planning, Development, and Building Services Department
Direction générale des services de la planification, de l'aménagement et du bâtiment

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613.580.2424 ext./poste 24487

From: Katie Spithoff <kspithoff@brydengibson.ca>
Sent: August 06, 2025 8:47 AM
To: McCormick, Sarah <sarah.mccormick@ottawa.ca>
Cc: Suzanne Gibson <gibson@brydengibson.ca>
Subject: RE: 6175 Rockdale Road - MTO update

Good morning Ms. McCormick,

In regard to the above-mentioned application, we have discussed with the MTO their requirements and have made some changes to the site plan to accommodate these requirements. I have attached this updated plan for you, and am hoping that you can provide a confirmation that this new design will not trigger any issue upon resubmission of the plans with our response letter.

In order to maintain the MTO's required setback we have mirrored where the gas storage and new building will be situated, but have addressed all comments from previous reviews and ensured they are incorporated into the new plan.

Once the site plan is confirmed, we will have WSP update their drawings for resubmission. Please also confirm whether the original SWM requirements remain valid, as per your attached email confirmation.

We are looking forward to getting our complete response submitted with your assistance.

Regards,

Jans, Michael

From: McCormick, Sarah <sarah.mccormick@ottawa.ca>
Sent: Wednesday, November 01, 2017 3:10 PM
To: Jans, Michael
Cc: Morgan, Brian
Subject: RE: 6175 Rockdale Road, Vars

Good afternoon Michael,

While a full stormwater management report is not required in this circumstance, a brief will need to be submitted. The stormwater brief will need to address water quality and will need to include an oil/grit separator. Given the location of the property, water quantity does not need to be controlled.

If there are any additional questions regarding the engineering requirement, you can contact Brian Morgan directly. Please copy me on all correspondence so I remain up to date on the discussions.

Thank you,

Sarah McCormick **MCIP, RPP**
Planner / Urbaniste
Development Review, Rural Services / Examen des projets d'aménagement, Service ruraux
Planning, Infrastructure and Economic Development Department
Services de planifications, d'infrastructure et de développement économique

City of Ottawa / Ville d'Ottawa
110 av Laurier Avenue West/ouest - 4th Floor/4e étage
Ottawa, ON, K1P 1J1

613.580.2424 ext./poste 24487

From: Jans, Michael [mailto:michael.jans@wsp.com]
Sent: Monday, October 30, 2017 8:20 AM
To: McCormick, Sarah <sarah.mccormick@ottawa.ca>
Cc: Morgan, Brian <Brian.Morgan@ottawa.ca>
Subject: RE: 6175 Rockdale Road, Vars

Hi Sarah,

Ok, thanks for the heads up.

Regards,

Regards,

Michael J. Jans, P.Eng.
T +1 613-933-5602 #296

From: McCormick, Sarah [mailto:sarah.mccormick@ottawa.ca]
Sent: Friday, October 27, 2017 10:25 AM
To: Jans, Michael <michael.jans@wsp.com>
Cc: Morgan, Brian <Brian.Morgan@ottawa.ca>
Subject: 6175 Rockdale Road, Vars

Good morning Michael,

Melanie is now working in another area of the City and I have now been assigned to this file. I have reached out to the engineer on the file to clarify the engineering requirements, and we will get back to you as soon as possible.

Regards,

Sarah McCormick **MCIP, RPP**
Planner / Urbaniste
Development Review, Rural Services / Examen des projets d'aménagement, Service ruraux
Planning, Infrastructure and Economic Development Department
Services de planifications, d'infrastructure et de développement économique

City of Ottawa / Ville d'Ottawa
110 av Laurier Avenue West/ouest - 4th Floor/4e étage
Ottawa, ON, K1P 1J1

613.580.2424 ext./poste 24487

From: webform@ottawa.ca [mailto:webform@ottawa.ca]
Sent: Tuesday, October 24, 2017 3:14 PM
To: Gervais, Melanie <Melanie.Gervais@ottawa.ca>
Cc: Morgan, Brian <Brian.Morgan@ottawa.ca>
Subject: 6175 Rockdale Road, Vars

A visitor to ottawa.ca website has sent you this message through the employee directory online contact form.

Sender's Full Name *
Michael Jans

Sender's E-mail *
michael.jans@wsp.com

Daytime phone number
613-935-0539

CC
Brian Morgan

Message *
Hi Melanie, We've been retained by Mr. El-Arab to complete the site works design for his proposed gas station redevelopment at the above captioned address. I met with Mr. El-Arab and his architect, Ewald, yesterday to hold a kickoff meeting. I learned that at least one preconsultation meeting had taken place and recieved a copy of the Applicant's Study and Plan Identification List. The purpose of this email is to confirm the design criteria conveyed to me during yesterday's meeting. According to the owner and his architect, the City has expressed that stormwater management is not required for this site and that sheet drainage to any or all of the surrounding ditches is permissible. Please confirm. Following your response, further questions may arise. Regards, Michael Jans

Mailval
'

'

-LAEmHhHzdJzBlTWfa4Hgs7pbKI

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

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'

Jans, Michael

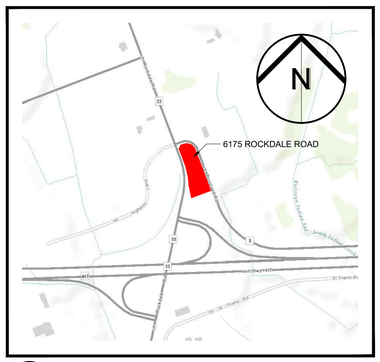
From: Leavoy, Jena (MOECC) <Jena.Leavoy@ontario.ca>
Sent: Monday, October 30, 2017 10:05 AM
To: Jans, Michael
Subject: gas station redevelopment - vars
Attachments: ODO - Pre-Submission Consultation Request Fill-in Form-May 2017 v4r.docx

Hello Michael,

Please fill out the pre-submission application form attached. Once this information been submitted then the Environmental Officer (me) assigned to your file will contact you. As discussed, this gas station redevelopment would require an industrial sewage works ECA for stormwater management.

Thank you,

Jena Leavoy
Senior Environmental Officer
Ontario Ministry of the Environment and Climate Change
Operation Division, Eastern Region
Ottawa District Office
2430 Don Reid Drive
Ottawa, ON K1H 1E1
Phone: (613)521-3450 x236
Fax: (613) 521-5437



1 A0 **Location Plan**
Scale = N/A

LEGAL DESCRIPTION: LOT 27 & LOT 28 PIN14557-0136

PROPERTY:

PROPERTY AREA:	9115.9 sq.m
FRONTAGE:	48.77 m
DEPTH:	172.86 m
PROPOSED BUILDING FOOT PRINT:	336 sq.m
EXISTING BUILDING FOOT PRINT:	94.84 sq.m
PROPOSED LOT COVERAGE:	4.7%

SITE BOUNDRY INFORMATION DERIVED FROM SURVEY OF PROPERTY. PART OF LOTS 27 & 28 CONCESSIONS 6 AND CONCESSION 7 (CLOSED BY INST. No. RR83392). GEOGRAPHIC TOWNSHIP OF CUMBERLAND. CITY OF OTTAWA. SURVEYED BY FARLEY, SMITH & DENIS SURVEYING LTD. MAY 17, 2024.
PLAN 50R-5729

ZONING:

MINIMUM LOT WIDTH:	30 m
MINIMUM LOT AREA:	4000 sq.m
MINIMUM FRONT YARD SETBACK:	10 m
MINIMUM REAR YARD SETBACK:	10 m
MINIMUM INTERIOR SIDE YARD SETBACK:	ABUTTING RESIDENTIAL 4.5 m ALL OTHER 3 m
MINIMUM CORNER YARD SETBACK:	6 m
MAXIMUM BUILDING HEIGHT:	11 m
MAXIMUM LOT COVERAGE:	25%

PARKING REQUIREMENTS:

USE	RATE	AREA	SPACES REQUIRED	SPACES PROVIDED
FAST FOOD	10 PER 100 SQ.M	80 SQ.M	8	9
RETAIL STORE	3.4 PER 100 SQ.M	256.6 SQ.M	8.72	9
CAR DEALERSHIP	2 PER 100 SQ.M	38.16 SQ.M	1.89	2 EMPLOYEE 13 DISPLAY
ACCESSORY STORAGE TO CAR DEALERSHIP	N/A	56.49 SQ.M	0	N/A
GAS BAR	N/A	N/A	N/A	N/A
LOADING SPACE TABLE 113A LAND USE (d)	350-999 SQ.M	336 SQ.M	0	1
			TOTAL:	32 PARKING SPACES 1 LOADING SPACE

BARRIER FREE SPACES PROVIDED: 1
BICYCLE PARKING SPACES PROVIDED: 2

GENERAL NOTES FOR DRAWING A0:

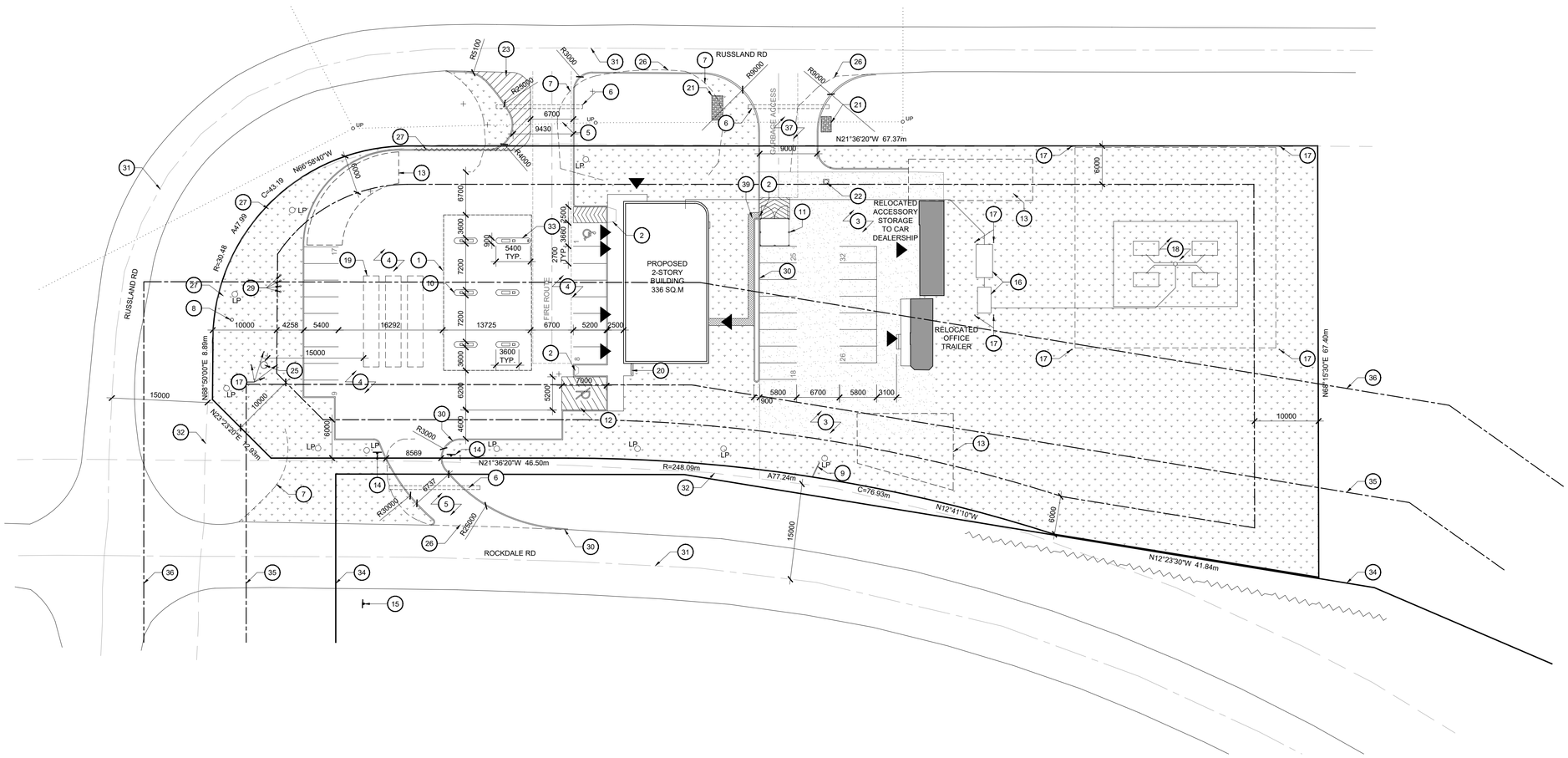
A. REFER TO L1.1 FOR PLANT LIST.

NOTES FOR DRAWING A0:

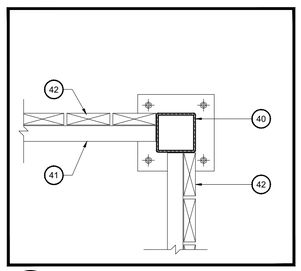
1. CANOPY ABOVE. CONCRETE PAD AT GRADE.
2. DEPRESSED CURB
3. GRAVEL TO REMAIN. REGRADED AS REQUIRED. REFER TO CIVIL.
4. ASPHALT.
5. PAVED ENTRY.
6. CULVERT.
7. EXISTING ENTRY TO BE REMOVED.
8. EXISTING WELL TO BE DECOMMISSIONED.
9. EXISTING SIGN TO REMAIN.
10. TYPICAL GAS PUMP STATION ON CONCRETE CURB.
11. GARBAGE STORAGE.
12. LOADING SPACE.
13. SNOW STORAGE.
14. DO NOT ENTER SIGN.
15. NO LEFT TURN SIGN.
16. SEPTIC TANKS.
17. BOLLARD.
18. SEPTIC FIELD.
19. UNDERGROUND GAS TANKS.
20. BICYCLE RACK.
21. DRAINAGE RIP RAP.
22. STORM DRAIN. REFER TO CIVIL.
23. MOUNTABLE CURB FOR LARGE VEHICLES.
24. RESERVED.
25. PROPOSED LOCATION OF NEW WELL. FOUR BOLLARDS TO BE PLACED EQUALLY AROUND.
26. EXISTING EXTENT OF PAVEMENT, TO BE MODIFIED TO SUIT NEW LAYOUT.
27. WOODEN FENCE. REFER TO LANDSCAPING PLAN FOR DETAIL.
28. RESERVED.
29. GAS TANK VENTS.
30. RAISED CONCRETE CURB.
31. APPROXIMATE CENTER LINE OF ROAD.
32. PROTECTED RIGHT-OF-WAY.
33. EXTENDED CURB FOR FIRE ROUTE SIGNAGE.
34. MTO HIGHWAY PROPERTY LINE.
35. MTO HIGHWAY PROPERTY LINE 14m STRUCTURE SETBACK.
36. MTO HIGHWAY PROPERTY LINE 30m WELL SETBACK.
37. GRAVEL ENTRY.
38. RESERVED.
39. SEMI PERMEABLE LANDSCAPING PAVERS.
40. 127 x 127 x 6mm H.S.S. STEEL POST.
41. 102 x 50 x 5mm H.S.S. STEEL FRAME - TYPICAL.
42. 38 x 140mm PRESSURE TREATED LUMBER SPACED @150mm O.C. FINISHES TO MATCH EXISTING.
43. GATE CONSTRUCTION:
76.2 x 76.2 x 6.35mm. H.S.S. ALL 4 SIDES AND DIAGONAL.
44. 250mm SONO TUBE TO EXTEND 1500mm BELOW GRADE.
45. 12mm. DIA. x 200mm LONG STAINLESS STEEL SURFACE BOLT.
46. GATE LATCH.
47. 50 x 50 x 6mm. BOLT GUIDES WELDED TO GATE FRAMES.
48. LOCKING DEVICE.
49. 100 x 200 x 10mm. STEEL PLATE FASTENED TO PRESSURE TREATED LUMBER FACING.
50. 50 x 50 x 6mm BOLT REST.
51. HEAVY DUTY CUSTOM PIVOT HINGE.
52. 1/4" TAPCON FASTENER BY ENGINEER.
53. BASE PLATE WELDED TO UNDERSIDE OF POST; 250 x 250 x 12mm STEEL PLATE ON 25mm SETTING BED C/W 4-12M DIA. ANCHOR BOLTS.
54. BARRIER FREE PARKING SIGNAGE (BILINGUAL FRENCH/ENGLISH).
55. METAL POST.
56. FIRE ROUTE SIGNAGE.

LEGEND FOR DRAWING A0:

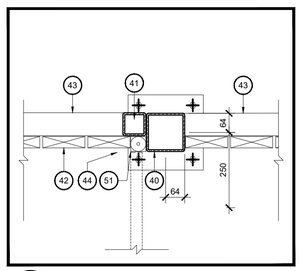
- (X) DRAWING NOTE ANNOTATION.
- NEW DOOR
- BUILDING ENTRANCE
- LP LIGHT POST
- UP UTILITY POST
- SOD
- GRAVEL
- PLANTINGS
- PROPERTY LINE
- SET BACK
- OVERHEAD WIRE
- FENCE
- SANITARY



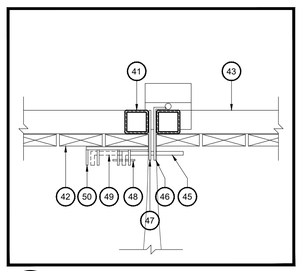
2 A0 **Site Plan**
Scale = 1:400



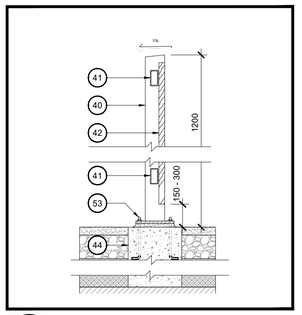
3 A0 **Enclosure Corner Detail**
Scale = 1:10



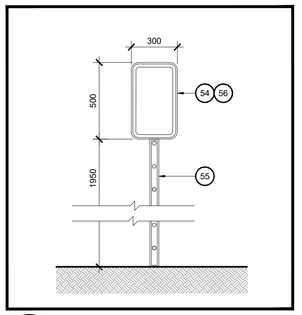
4 A0 **Enclosure Gate Hinge Detail**
Scale = 1:10



5 A0 **Enclosure Latch Detail**
Scale = 1:10



6 A0 **Enclosure Section Detail**
Scale = 1:20



7 A0 **Signage Elevation**
Scale = 1:20

No Nº	ISSUE/REVISION ÉMISSION/RÉVISION	DATE DD/MM/YY
5	Reissued for Site Plan Control	22.04.26
4	Reissued for Site Plan Control / MTO	17.02.26
3	Issued for Site Plan Control / MTO	25.09.25
2	Issued for Site Plan Control	24.06.24
1	Issued for Coordination	03.06.24

CONSTRUCTION NORTH — TRUE NORTH

DRAFT

BRYDEN GIBSON ARCHITECTS INCORPORATED
1066 Somerset Street West, Suite 200, Ottawa Ontario, K1Y 4T3
Telephone: 613.724.9914 E-mail: architecture@brydengibson.ca

PROJECT NAME / NOM DU PROJET
6175 Rockdale Rd
6175 Rockdale Rd. Vars ON. K0A 3H0

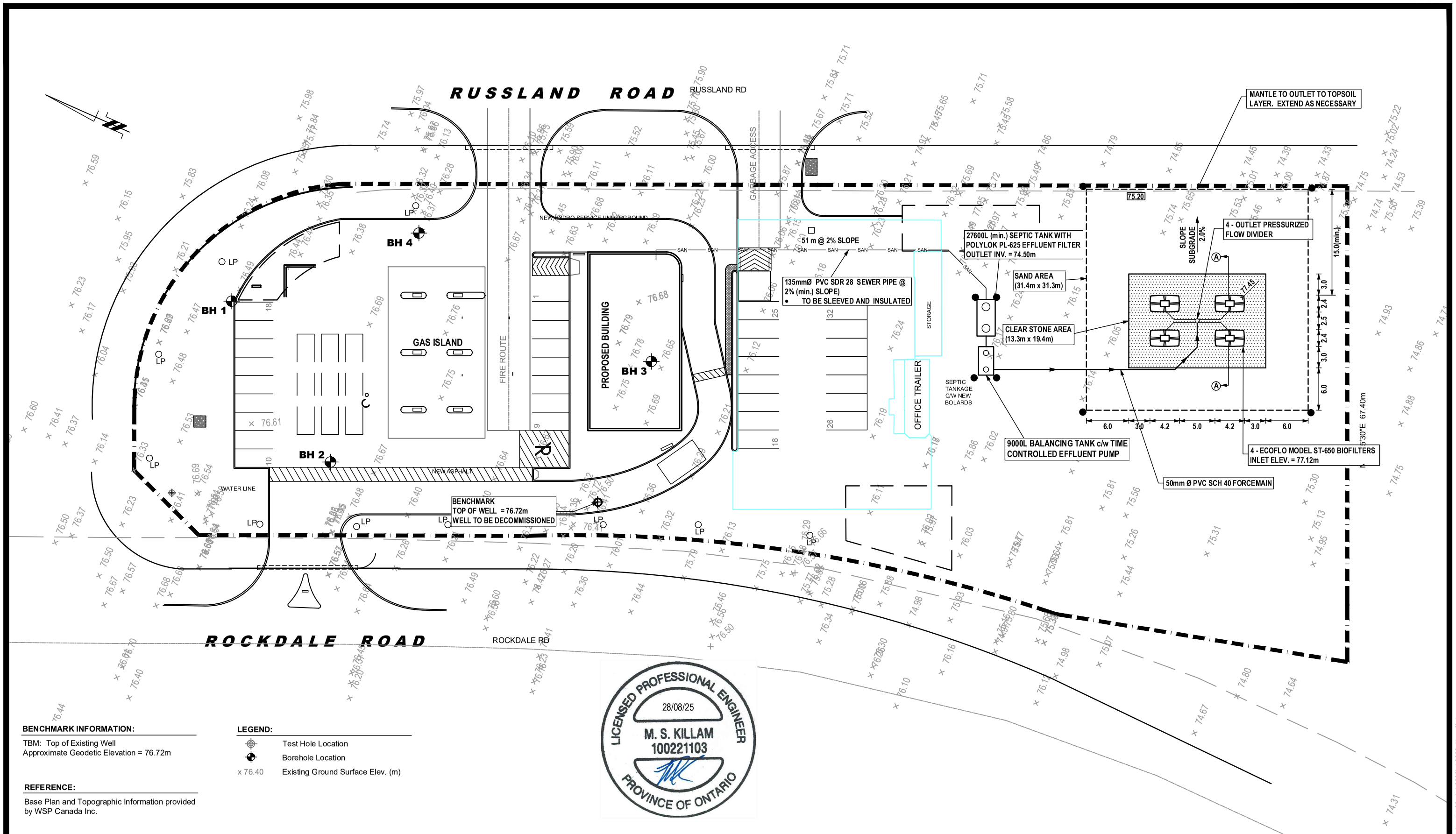
DRAWING TITLE / TITRE DU DESSIN
Site Plan
Location Plan
Site Details

JOB No / N° DE PROJET: 810-24	DATE / DATE: May 2024
SCALE / ECHELLE: As Noted	PRINTING SCALE/ ÉCHELLE D'IMPRESSION
CONCEPTION BY / CONÇUS PAR: SG	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PRINTING SCALE.
DRAWN BY / DESSINÉ PAR: KS	SI CETTE LIGNE NE MESURE PAS 25mm, AJUSTER VOTRE ÉCHELLE D'IMPRESSION.
CHECKED BY / VÉRIFIÉ PAR: SG	

ARCHITECT'S STAMP / SCEAU D'ARCHITECTE

DRAWING No / DESSIN N°: A0

REVISION No / RÉVISION N°: 5



BENCHMARK INFORMATION:

TBM: Top of Existing Well
Approximate Geodetic Elevation = 76.72m

REFERENCE:

Base Plan and Topographic Information provided by WSP Canada Inc.

LEGEND:

⊕	Test Hole Location
◆	Borehole Location
x 76.40	Existing Ground Surface Elev. (m)

LICENSED PROFESSIONAL ENGINEER
28/08/25
M. S. KILLAM
100221103
PROVINCE OF ONTARIO

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

DD/MM/YY	Description	
14/08/25	Issued for Revised Site Plan	6
16/01/24	Re-Issued for Sewage System Permit	5
03/09/19	Updated to latest base plan	4
14/06/19	Issued with PH3333-LET.01-Rev.01	3
DD/MM/YY	Description	0

Client: **ABDO EL-ARAB**

Project: **PROPOSED GAS BAR/CONVENIENCE STORE**
6175 ROCKDALE ROAD
OTTAWA (VARS), ONTARIO

Drawing: **SEWAGE SYSTEM LAYOUT PLAN**

Scale: 1:500 | Drawn by: HV
Date: 08/2025 | Checked by: MK
Drawing no.: **PH3333-1(rev.6)**

p:\autocad drawings\hydrogeology\ph33xx\ph3333\ph3333-1(rev.6).dwg

Ontario

Ministry of the Environment, Conservation and Parks
Environmental Assessment and Permissions Division

Confirmation of Registration

Registration Number: R-014-1379817190
Version Number: 1.0
Date Registration Filed: September 29, 2025 14:58:14

VARS GAS BAR LTD.

6175 Rockdale RD
Ottawa ON K0A 3H0

You have registered, in accordance with Section 20.21 (1) of the *Environmental Protection Act*, for the use, operation, establishment, alteration, extension or replacement of any new or existing storm water management works located at:

6175 ROCKDALE Road
VARS ON K0A 3H0

Ministry District Office: Ottawa District Office

The activity requirements for your storm water management works are summarized in schedule ‘A’ however refer to Ontario Regulation 137/25 for the legal requirements.The activity related information provided during the registration process is included as part of the confirmation of registration as schedule ‘B’.

Dated on September 29, 2025 14:58:14

Director
Client Services and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor Toronto ON M4V 1P5

Any questions related to this registration and the Environmental Activity and the Sector Registry should be directed to:

Client Services and Permissions Branch
Ministry of the Environment, Conservation and Parks
Phone:(416) 314-8001
Toll free: 1-800-461-6290
Email: enviropermissions@ontario.ca

APPENDIX

B

- FLOW CALCULATION USING RATIONAL METHOD
- STORM SEWER SIZING CALCULATIONS
- MTO IDF CURVE DATA
- STORMCEPTOR OGS SIZING SUMMARY
- STORMCEPTOR OGS ETV REPORT
- STORMCEPTOR OGS OWNER'S MANUAL

Vars Gas Station Redevelopment
6175 Rockdale Road
Project: CA0008077.7007
Date: Apr-26
Revised: Jul-26

TABLE 1 - Pre-Development Runoff Calculation

Pre-development Runoff Coefficient "C"

			2, 5 & 10 Year		25 Year		50 Year		100 Year	
Area	Surface	Ha	"C"	C_{avg}	"C"	C_{avg}	"C"	C_{avg}	"C"	C_{avg}
Total	Gravel	0.155	0.70		0.77		0.84		0.88	
0.911	Asphalt	0.313	0.90	0.53	0.99	0.58	1.00	0.60	1.00	0.61
	Soft	0.442	0.20		0.22		0.24		0.25	
				0.50		**0.58**		**0.60**		**0.61**

* For 2, 5 & 10 Year storms, use a maximum C valune of 0.5
* For 25 year storms add 10% to C value, up to a maximum value of 1.0
* For 50 year storms add 20% to C value, up to a maximum value of 1.0
* For 100 year storms add 25% to C value, up to a maximum value of 1.0

Pre Dev Free Flow - 2 Year Event

Pre Dev.	C	Intensity	Area
2 Year	0.50	69.63	0.911
2.78CIA=	88.15		
88.10	L/S		

**Use a 10.0 minute time of concentration for 2 year

Pre Dev Free Flow - 5 Year Event

Pre Dev.	C	Intensity	Area
5 Year	0.50	92.37	0.911
2.78CIA=	116.94		
116.90	L/S		

**Use a 10.0 minute time of concentration for 5 year

Pre Dev Free Flow - 10 Year Event

Pre Dev.	C	Intensity	Area
10 Year	0.50	107.42	0.911
2.78CIA=	135.99		
136.00	L/S		

**Use a 10.0 minute time of concentration for 10 year

Pre Dev Free Flow - 25 Year Event

Pre Dev.	C	Intensity	Area
25 Year	0.58	126.66	0.911
2.78CIA=	186.01		
186.00	L/S		

**Use a 10.0 minute time of concentration for 25 year

Pre Dev Free Flow - 50 Year Event

Pre Dev.	C	Intensity	Area
50 Year	0.60	140.65	0.911
2.78CIA=	213.68		
213.70	L/S		

**Use a 10.0 minute time of concentration for 50 year

Pre Dev Free Flow - 100 Year Event

Pre Dev.	C	Intensity	Area
100 Year	0.61	154.65	0.911
2.78CIA=	238.86		
238.90	L/S		

**Use a 10.0 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, MTO IDF

i = 19.9 x (Td)^(-0.699)	2-year
i = 26.4 x (Td)^(-0.699)	5-year
i = 30.7 x (Td)^(-0.699)	10-year
i = 36.2 x (Td)^(-0.699)	25-year
i = 40.2 x (Td)^(-0.699)	50-year
i = 44.2 x (Td)^(-0.699)	100-year

A is the total drainage area

Vars Gas Station Redevelopment
6175 Rockdale Road
Project: CA0008077.7007
Date: Apr-26
Revised: Jul-26

TABLE 2 - Post-Development Runoff Calculation

Post-development Runoff Coefficient "C"

			2, 5 & 10 Year		25 Year		50 Year		100 Year	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"**	**C_{avg}**	**"C"**	**C_{avg}**	**"C"**	**C_{avg}**
Total	Gravel	0.123	0.70		0.77		0.84		0.88	
0.911	Asphalt	0.248	0.90	0.46	0.99	0.50	1.00	0.53	1.00	0.54
	Soft	0.540	0.20		0.22		0.24		0.25	
				0.46		**0.50**		**0.53**		**0.54**

* For 25 year storms add 10% to C value, up to a maximum value of 1.0
* For 50 year storms add 20% to C value, up to a maximum value of 1.0
* For 100 year storms add 25% to C value, up to a maximum value of 1.0

Post-development Flow - 2 Year Event

Pre Dev.	C	Intensity	Area
2 Year	0.46	69.63	0.911
2.78CIA=	81.12		
81.10	L/S		

**Use a 10.0 minute time of concentration for 2 year

Post-development - 5 Year Event

Pre Dev.	C	Intensity	Area
5 Year	0.46	92.37	0.911
2.78CIA=	107.61		
107.60	L/S		

**Use a 10.0 minute time of concentration for 5 year

Post-development Flow - 10 Year Event

Pre Dev.	C	Intensity	Area
10 Year	0.46	107.42	0.911
2.78CIA=	125.14		
125.10	L/S		

**Use a 10.0 minute time of concentration for 10 year

Post-development Flow - 25 Year Event

Pre Dev.	C	Intensity	Area
25 Year	0.50	126.66	0.911
2.78CIA=	160.39		
160.40	L/S		

**Use a 10.0 minute time of concentration for 25 year

Post-development Flow - 50 Year Event

Pre Dev.	C	Intensity	Area
50 Year	0.53	140.65	0.911
2.78CIA=	188.80		
188.80	L/S		

**Use a 10.0 minute time of concentration for 50 year

Post-development Flow - 100 Year Event

Pre Dev.	C	Intensity	Area
100 Year	0.54	154.65	0.911
2.78CIA=	211.50		
211.50	L/S		

**Use a 10.0 minute time of concentration for 100 year

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, MTO IDF

i = 19.9 x (Td)^(-0.699)	2-year
i = 26.4 x (Td)^(-0.699)	5-year
i = 30.7 x (Td)^(-0.699)	10-year
i = 36.2 x (Td)^(-0.699)	25-year
i = 40.2 x (Td)^(-0.699)	50-year
i = 44.2 x (Td)^(-0.699)	100-year

A is the total drainage area

STORM SEWER DESIGN SHEET
6175 Rockdale Road
Vars Gas Station Redevelopment
City of Ottawa
Project: CA0033920.1056
Date: August 2025
Revised: July 2026

LOCATION				AREA (Ha)						RATIONAL DESIGN FLOW											PROPSOED SEWER DATA								
BLDG FLOW	AREA ID	FROM	TO	C= 0.20	C= 0.23	C= 0.32	C= 0.50	C= 0.81	C= 1.00	IND 2.78AC	CUM 2.78 AC	INLET (min)	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (100) (mm/hr)	BLDG FLOW (L/s)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	ICD FIXED FLOW (L/s)	DESIGN FLOW (L/s)	MODIFIED DESIGN FLOW (L/s)	MATERIAL PIPE	SIZE (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME IN PIPE	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
	A1	OGS	Swale					0.364		0.820	0.820	10.00	10.14	69.63	92.37	154.65		57.07	75.71	126.76		75.71	75.71	PVC	300.0	1.10	11.70	101.52	1.43	0.14	25.81	25.42%

Definition:
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 = 732.951/(TC+6.199)^0.810 2 Year
i = 1174.184/(TC+6.014)^0.816 5 Year
i = 1735.688/(TC+6.014)^0.820 100 Year

Notes:
1. Mannings coefficient (n) = 0.013

*Note 2: refer to C1.5 for catchment areas and associated paramenters

Designed: Wanzhi (Amy) Zhuang, P.Eng.
Checked: Ishaque Jafferjee, P.Eng
Dwg. Reference: C1.3

No.	Revision	Date
1	Issued for Site Plan Application	2025-08-22
2	Issued for Site Plan Application	2026-04-23
3	Issued for Site Plan Application	2026-07-16

File Reference: CA0008077.7007
Date: 2025-08-22
Sheet No: 1 of 1

Active coordinate

45° 20' 15" N, 75° 20' 44" W (45.337500,-75.345833)

Retrieved: Wed, 10 Dec 2025 15:23:10 GMT

Location summary

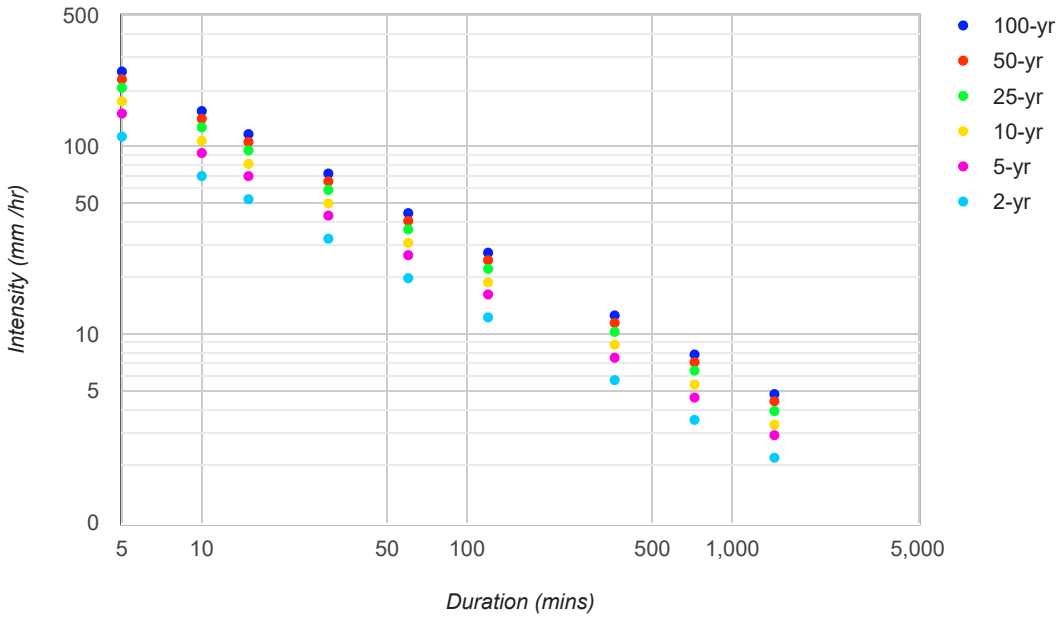
These are the locations in the selection.

IDF Curve: 45° 20' 15" N, 75° 20' 44" W (45.337500,-75.345833)

Results

An IDF curve was found.

Coordinate: 45.337500, -75.345833
IDF curve year: 2010



Coefficient summary

IDF Curve: 45° 20' 15" N, 75° 20' 44" W (45.337500,-75.345833)

Retrieved: Wed, 10 Dec 2025 15:23:10 GMT

Data year: 2010
IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	19.9	26.4	30.7	36.2	40.2	44.2
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr^{-1})

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	113.0	69.6	52.4	32.3	19.9	12.3	5.7	3.5	2.2
5-yr	150.0	92.4	69.6	42.9	26.4	16.3	7.5	4.6	2.9
10-yr	174.4	107.4	80.9	49.8	30.7	18.9	8.8	5.4	3.3
25-yr	205.6	126.7	95.4	58.8	36.2	22.3	10.3	6.4	3.9
50-yr	228.3	140.7	105.9	65.3	40.2	24.8	11.5	7.1	4.4
100-yr	251.1	154.6	116.5	71.8	44.2	27.2	12.6	7.8	4.8

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	9.4	11.6	13.1	16.2	19.9	24.5	34.1	42.0	51.8
5-yr	12.5	15.4	17.4	21.4	26.4	32.5	45.3	55.8	68.7
10-yr	14.5	17.9	20.2	24.9	30.7	37.8	52.6	64.9	79.9
25-yr	17.1	21.1	23.9	29.4	36.2	44.6	62.1	76.5	94.2
50-yr	19.0	23.4	26.5	32.6	40.2	49.5	68.9	84.9	104.6
100-yr	20.9	25.8	29.1	35.9	44.2	54.5	75.8	93.4	115.0

Terms of Use

Stormceptor® EF Sizing Report

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

08/20/2025

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

Site Name:	OGS

Drainage Area (ha):	0.38
Runoff Coefficient 'c':	0.87

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

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	10.67
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	432
Estimated Average Annual Sediment Volume (L/yr):	351

Project Name:	6175 Rockdale Rd.
Project Number:	171-14602
Designer Name:	Jessica Steffler
Designer Company:	Forterra Pipe & Precast
Designer Email:	jessica.steffler@RinkerPipe.com
Designer Phone:	519-239-6958
EOR Name:	Amy Zhuang
EOR Company:	WSP Canada Group Ltd.
EOR Email:	Amy.Zhuang@wsp.com
EOR Phone:	519-760-2335

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	88
EFO5	92
EFO6	95
EFO8	98
EFO10	99
EFO12	100

Recommended Stormceptor EFO Model:	EFO4
Estimated Net Annual Sediment (TSS) Load Reduction (%):	88
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 waterways.

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.

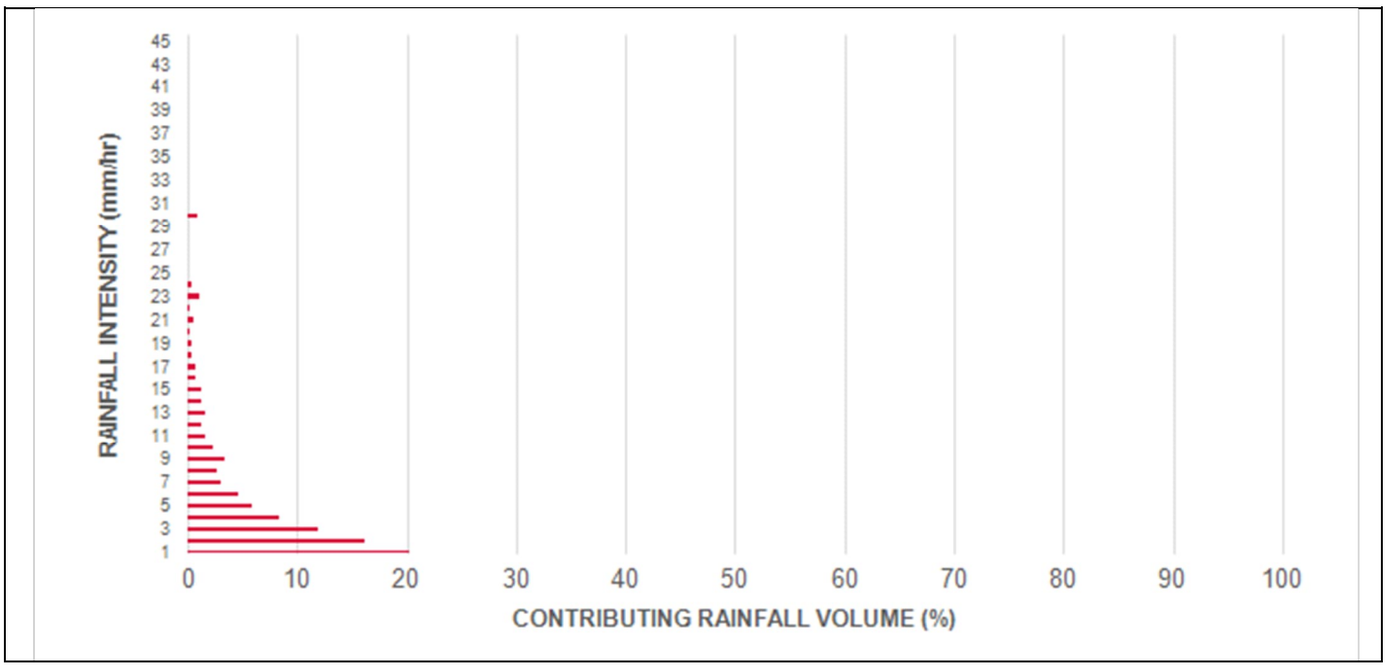
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

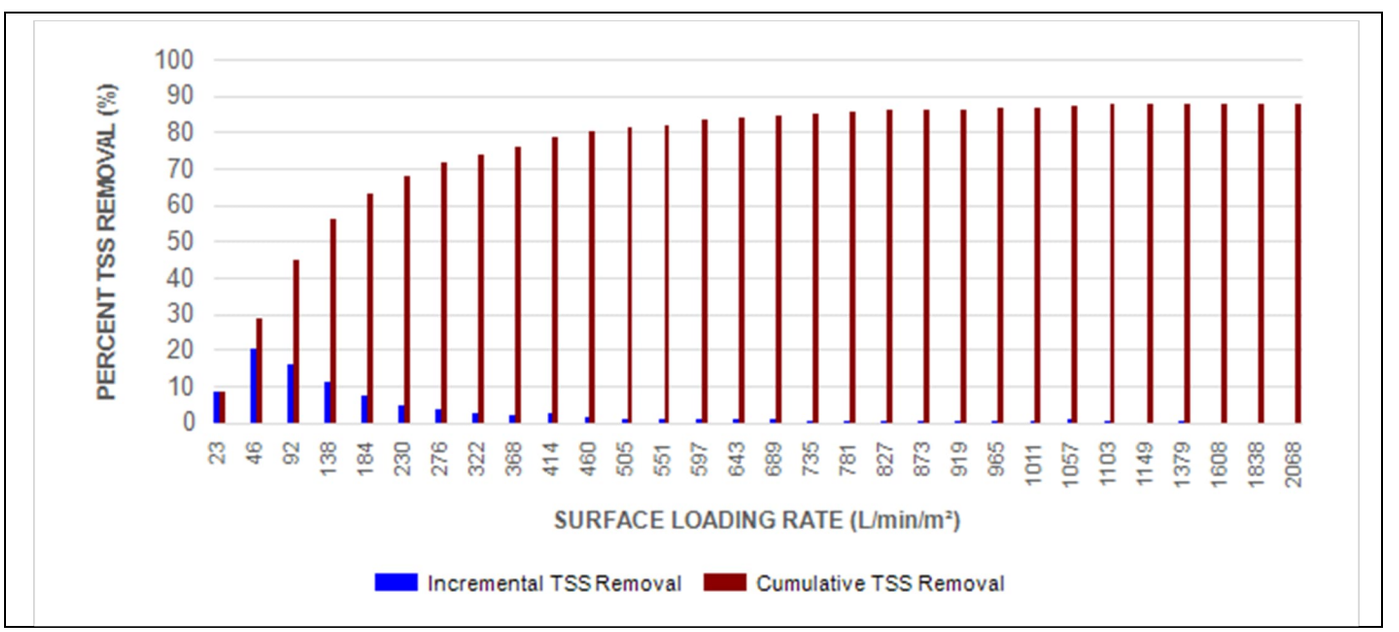
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	0.46	28.0	23.0	100	8.6	8.6
1.00	20.3	29.0	0.92	55.0	46.0	100	20.3	29.0
2.00	16.2	45.2	1.84	110.0	92.0	97	15.8	44.7
3.00	12.0	57.2	2.76	165.0	138.0	92	11.0	55.8
4.00	8.4	65.6	3.68	221.0	184.0	86	7.2	63.0
5.00	5.9	71.6	4.60	276.0	230.0	82	4.9	67.9
6.00	4.6	76.2	5.51	331.0	276.0	80	3.7	71.6
7.00	3.1	79.3	6.43	386.0	322.0	78	2.4	73.9
8.00	2.7	82.0	7.35	441.0	368.0	76	2.1	76.0
9.00	3.3	85.3	8.27	496.0	414.0	73	2.4	78.5
10.00	2.3	87.6	9.19	551.0	460.0	71	1.6	80.1
11.00	1.6	89.2	10.11	607.0	505.0	69	1.1	81.2
12.00	1.3	90.5	11.03	662.0	551.0	67	0.9	82.0
13.00	1.7	92.2	11.95	717.0	597.0	65	1.1	83.2
14.00	1.2	93.5	12.87	772.0	643.0	64	0.8	84.0
15.00	1.2	94.6	13.79	827.0	689.0	64	0.7	84.7
16.00	0.7	95.3	14.71	882.0	735.0	64	0.4	85.1
17.00	0.7	96.1	15.62	937.0	781.0	63	0.5	85.6
18.00	0.4	96.5	16.54	993.0	827.0	63	0.3	85.9
19.00	0.4	96.9	17.46	1048.0	873.0	63	0.3	86.1
20.00	0.2	97.1	18.38	1103.0	919.0	62	0.1	86.2
21.00	0.5	97.5	19.30	1158.0	965.0	62	0.3	86.5
22.00	0.2	97.8	20.22	1213.0	1011.0	61	0.2	86.7
23.00	1.0	98.8	21.14	1268.0	1057.0	60	0.6	87.3
24.00	0.3	99.1	22.06	1323.0	1103.0	59	0.2	87.5
25.00	0.0	99.1	22.98	1379.0	1149.0	58	0.0	87.5
30.00	0.9	100.0	27.57	1654.0	1379.0	53	0.5	87.9
35.00	0.0	100.0	32.17	1930.0	1608.0	46	0.0	87.9
40.00	0.0	100.0	36.76	2206.0	1838.0	40	0.0	87.9
45.00	0.0	100.0	41.36	2481.0	2068.0	36	0.0	87.9
Estimated Net Annual Sediment (TSS) Load Reduction =								88 %

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
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
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

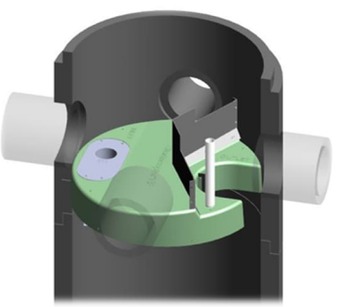
► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance 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.

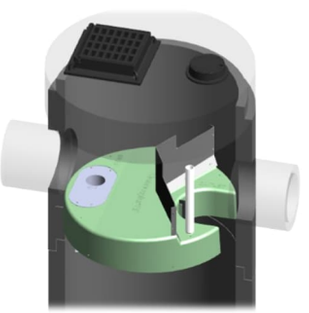
DESIGN FLEXIBILITY

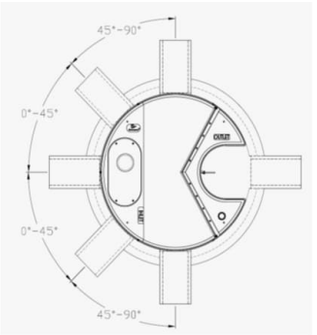
► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, 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)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
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/ft^3)

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

imbrium

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT 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 Separators**

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
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 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.

◆ Verification Statement ◆ Verification Statement ◆ Verification Statement ◆

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

Stormceptor® EF and EFO Oil-Grit Separators

Developed by Imbrium Systems, Inc.,
Whitby, Ontario, Canada

Registration: GPS-ETV_VR2023-11-15_Imbrium-SC

In accordance with

ISO 14034:2016

Environmental management —
Environmental technology verification (ETV)

John D. Wiebe, PhD
Executive Chairman
GLOBE Performance Solutions

November 15, 2023
Vancouver, BC, Canada

Verification Body
GLOBE Performance Solutions
404 – 999 Canada Place | Vancouver, B.C | Canada |V6C 3E2

Technology description and application

The Stormceptor® EF and EFO are treatment devices designed to remove oil, sediment, trash, debris, and pollutants attached to particulates from Stormwater and snowmelt runoff. The device takes the place of a conventional manhole within a storm drain system and offers design flexibility that works with various site constraints. The EFO is designed with a shorter bypass weir height, which accepts lower surface loading rate into the sump, thereby reducing re-entrainment of captured free floating light liquids.

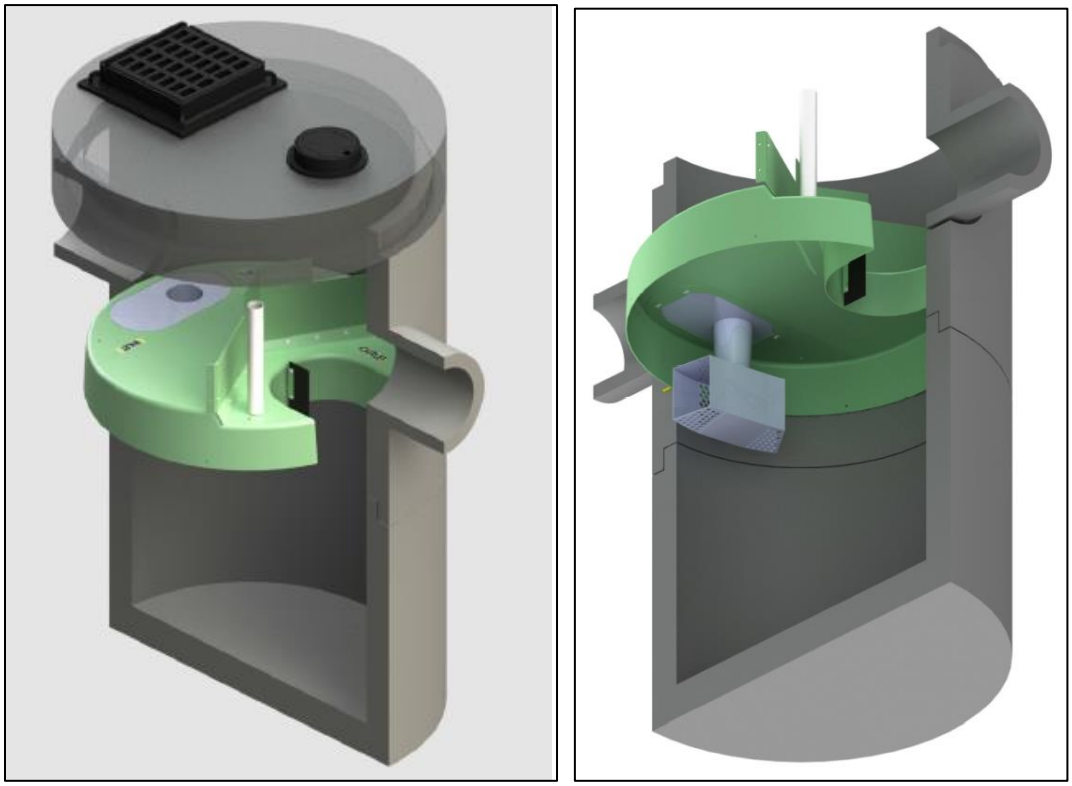


Figure 1. Graphic of typical inline Stormceptor® unit and core components.

Stormwater and snowmelt runoff enters the Stormceptor® EF/EFO's upper chamber through the inlet pipe(s) or a surface inlet grate. An insert divides the unit into lower and upper chambers and incorporates a weir to reduce influent velocity and separate influent (untreated) from effluent (treated) flows. Influent water ponds upstream of the insert's weir providing driving head for the water flowing downwards into the drop pipe where a vortex pulls the water into the lower chamber. The water diffuses at lower velocities in multiple directions through the drop pipe outlet openings. Oil and other floatables rise up and are trapped beneath the insert, while sediments undergo gravitational settling to the sump's bottom. Water from the sump can exit by flowing upward to the outlet riser onto the top side of the insert and downstream of the weir, where it discharges through the outlet pipe.

Maximum flow rate into the lower chamber is a function of weir height and drop pipe orifice diameter. The Stormceptor® EF and EFO are designed to allow a surface loading rate of 1135 L/min/m^2 (27.9 gal/min/ft^2) and 535 L/min/m^2 (13.1 gal/min/ft^2) into the lower chamber, respectively. When prescribed surface loading rates are exceeded, ponding water can overtop the weir height and bypass the lower treatment chamber, exiting directly through the outlet pipe. Hydraulic testing and scour testing demonstrate that the internal bypass effectively prevents scour at all bypass flow rates. Increasing the bypass flow rate does not increase the orifice-controlled flow rate into the lower treatment chamber where sediment is stored. This internal bypass feature allows for in-line installation, avoiding the cost of

additional bypass structures. During bypass, treatment continues in the lower chamber at the maximum flow rate. The Stormceptor® EFO's lower design surface loading rate is favorable for minimizing re-entrainment and washout of captured light liquids. Inspection of Stormceptor® EF and EFO devices is performed from grade by inserting a sediment probe through the outlet riser and an oil dipstick through the oil inspection pipe. The unit can be maintained by using a vacuum hose through the outlet riser.

Performance conditions

The data and results published in this Technology Fact Sheet were obtained from the testing program conducted on the Imbrium Systems Inc.'s Stormceptor® EF4 and EFO4 Oil-Grit Separators, in accordance with the Procedure for Laboratory Testing of Oil-Grit Separators (Version 3.0, June 2014). The Procedure was prepared by the Toronto and Region Conservation Authority (TRCA) for Environment Canada's Environmental Technology Verification (ETV) Program. A copy of the Procedure may be accessed on the Canadian ETV website at www.etvcanada.ca.

Performance claim(s)

Capture test [a]:

During the capture test, the Stormceptor® EF4 OGS device, with a false floor set to 50% of the manufacturer's recommended maximum sediment storage depth and a constant influent test sediment concentration of 200 mg/L, removes 70, 64, 54, 48, 46, 44, and 49 percent of influent sediment by mass at surface loading rates of 40, 80, 200, 400, 600, 1000, and 1400 L/min/m^2, respectively.

Stormceptor® EFO4, with a false floor set to 50% of the manufacturer's recommended maximum sediment storage depth and a constant influent test sediment concentration of 200 mg/L, removes 70, 64, 54, 48, 42, 40, and 34 percent of influent sediment by mass at surface loading rates of 40, 80, 200, 400, 600, 1000, and 1400 L/min/m^2, respectively.

Scour test [a]:

During the scour test, the Stormceptor® EF4 and Stormceptor® EFO4 OGS devices, with 10.2 cm (4 inches) of test sediment pre-loaded onto a false floor reaching 50% of the manufacturer's recommended maximum sediment storage depth, generate corrected effluent concentrations of 4.6, 0.7, 0, 0.2, and 0.4 mg/L at 5-minute duration surface loading rates of 200, 800, 1400, 2000, and 2600 L/min/m^2, respectively.

Light liquid re-entrainment test[a]:

During the light liquid re-entrainment test, the Stormceptor® EFO4 OGS device with surrogate low-density polyethylene beads preloaded within the lower chamber oil collection zone, representing a floating light liquid volume equal to a depth of 50.8 mm over the sedimentation area, retained 100, 99.5, 99.8, 99.8, and 99.9 percent of loaded beads by mass during the 5-minute duration surface loading rates of 200, 800, 1400, 2000, and 2600 L/min/m^2.

[a] The claim can be applied to other units smaller or larger than the tested unit as long as the untested units meet the scaling rule specified in the Procedure for Laboratory of Testing of Oil Grit Separators (Version 3.0, June 2014)

Performance results

The test sediment consisted of ground silica (1 – 1000 micron) with a specific gravity of 2.65, uniformly mixed to meet the particle size distribution specified in the testing procedure. The *Procedure for Laboratory Testing of Oil Grit Separators* requires that the three sample average of the test sediment particle size distribution (PSD) meet the specified PSD percent less than values within a boundary threshold of 6%. The comparison of the average test sediment PSD to the CETV specified PSD in Figure 2 indicates that the test sediment used for the capture and scour tests met this condition.

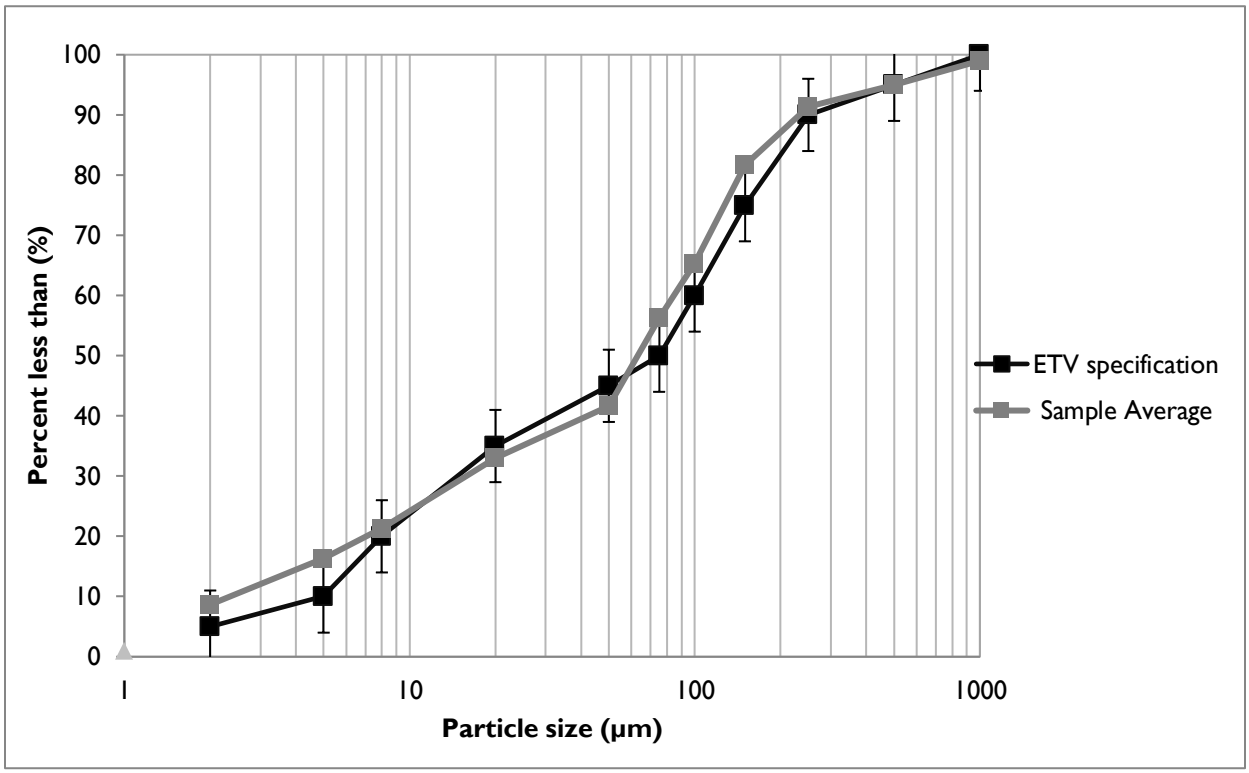


Figure 2. The three sample average particle size distribution (PSD) of the test sediment used for the capture and scour test compared to the specified PSD.

The capacity of the device to retain sediment was determined at seven surface loading rates using the modified mass balance method. This method involved measuring the mass and particle size distribution of the injected and retained sediment for each test run. Performance was evaluated with a false floor simulating the technology filled to 50% of the manufacturer's recommended maximum sediment storage depth. The test was carried out with clean water that maintained a sediment concentration below 20 mg/L. Based on these conditions, removal efficiencies for individual particle size classes and for the test sediment as a whole were determined for each of the tested surface loading rates (Table 1). Since the EF and EFO models are identical except for the weir height, which bypasses flows from the EFO model at a surface loading rate of 535 L/min/m^2 (13.1 gpm/ft^2), sediment capture tests at surface loading rates from 40 to 400 L/min/m^2 were only performed on the EF unit. Surface loading rates of 600, 1000, and 1400 L/min/m^2 were tested on both units separately. Results for the EFO model at these higher flow rates are presented in Table 2.

In some instances, the removal efficiencies were above 100% for certain particle size fractions. These discrepancies are not unique to any one test laboratory and may be attributed to errors relating to the blending of sediment, collection of representative samples for laboratory submission, and laboratory

analysis of PSD. Due to these errors, caution should be exercised in applying the removal efficiencies by particle size fraction for the purposes of sizing the tested device (see Bulletin # CETV 2016-11-0001). The results for "all particle sizes by mass balance" (see Table 1 and 2) are based on measurements of the total injected and retained sediment mass, and are therefore not subject to blending, sampling or PSD analysis errors.

Table 1. Removal efficiencies (%) of the EF4 at specified surface loading rates

Particle size fraction (µm)	**Surface loading rate (L/min/m²)**						
	40	80	200	400	600	1000	1400
>500	90	58	58	100*	86	72	100*
250 - 500	100*	100*	100	100*	100*	100*	100*
150 - 250	90	82	26	100*	100*	67	90
105 - 150	100*	100*	100*	100*	100*	100*	100
75 - 105	100*	92	74	82	77	68	76
53 - 75	Undefined [a]	56	100*	72	69	50	80
20 - 53	54	100*	54	33	36	40	31
8 - 20	67	52	25	21	17	20	20
5 – 8	33	29	11	12	9	7	19
<5	13	0	0	0	0	0	4
All particle sizes by mass balance	**70.4**	**63.8**	**53.9**	**47.5**	**46.0**	**43.7**	**49.0**

[a] An outlier in the feed sample sieve data resulted in a negative removal efficiency for this size fraction.
* Removal efficiencies were calculated to be above 100%. Calculated values ranged between 101 and 171% (average 128%). See text and Bulletin # CETV 2016-11-0001 for more information.

Table 2. Removal efficiencies (%) of the EFO4 at surface loading rates above the bypass rate of 535 L/min/m²

Particle size fraction (µm)	**Surface loading rate (L/min/m²)**		
	600	1000	1400
>500	89	83	100*
250 - 500	90	100*	92
150 - 250	90	67	100*
105 - 150	85	92	77
75 - 105	80	71	65
53 - 75	60	31	36
20 - 53	33	43	23
8 - 20	17	23	15
5 – 8	10	3	3
<5	0	0	0
All particle sizes by mass balance	**41.7**	**39.7**	**34.2**

* Removal efficiencies were calculated to be above 100%. Calculated values ranged between 103 and 111% (average 107%). See text and Bulletin # CETV 2016-11-0001 for more information.

Figure 3 compares the particle size distribution (PSD) of the three sample average of the test sediment to the PSD of the sediment retained by the EF4 at each of the tested surface loading rates. Figure 4 shows the same graph for the EFO4 unit at surface loading rates above the bypass rate of 535 L/min/m².

As expected, the capture efficiency for fine particles in both units was generally found to decrease as surface loading rates increased.

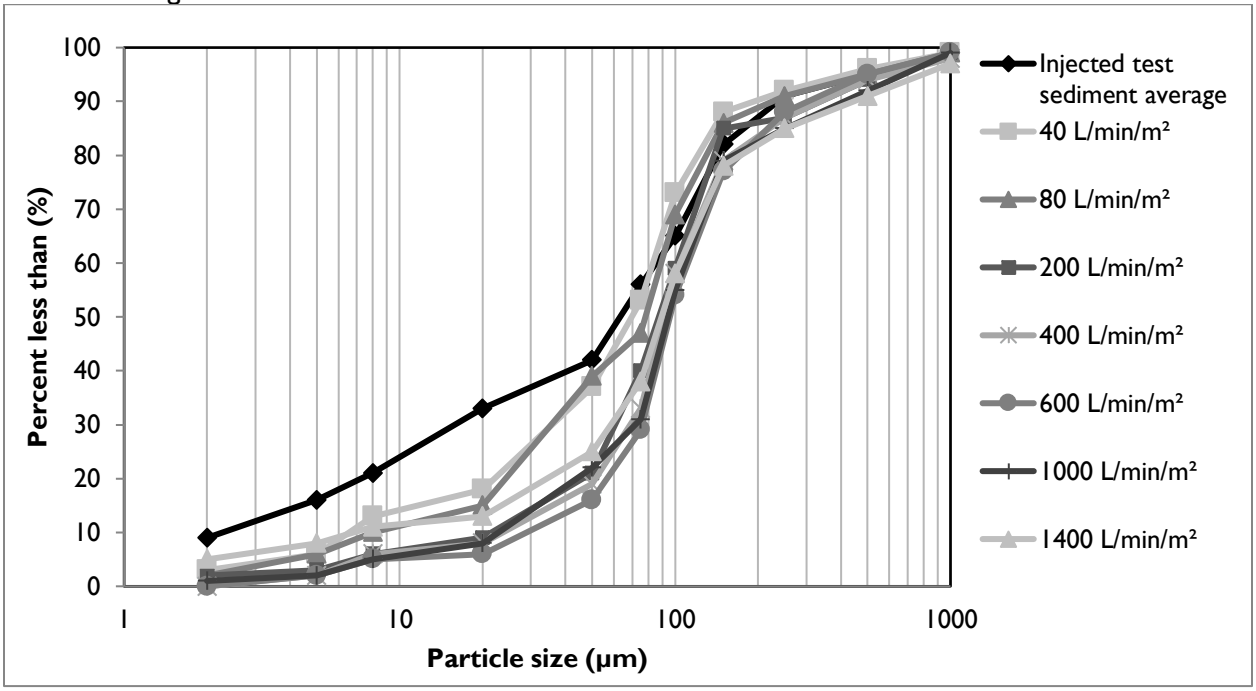


Figure 3. Particle size distribution of sediment retained in the EF4 in relation to the injected test sediment average.

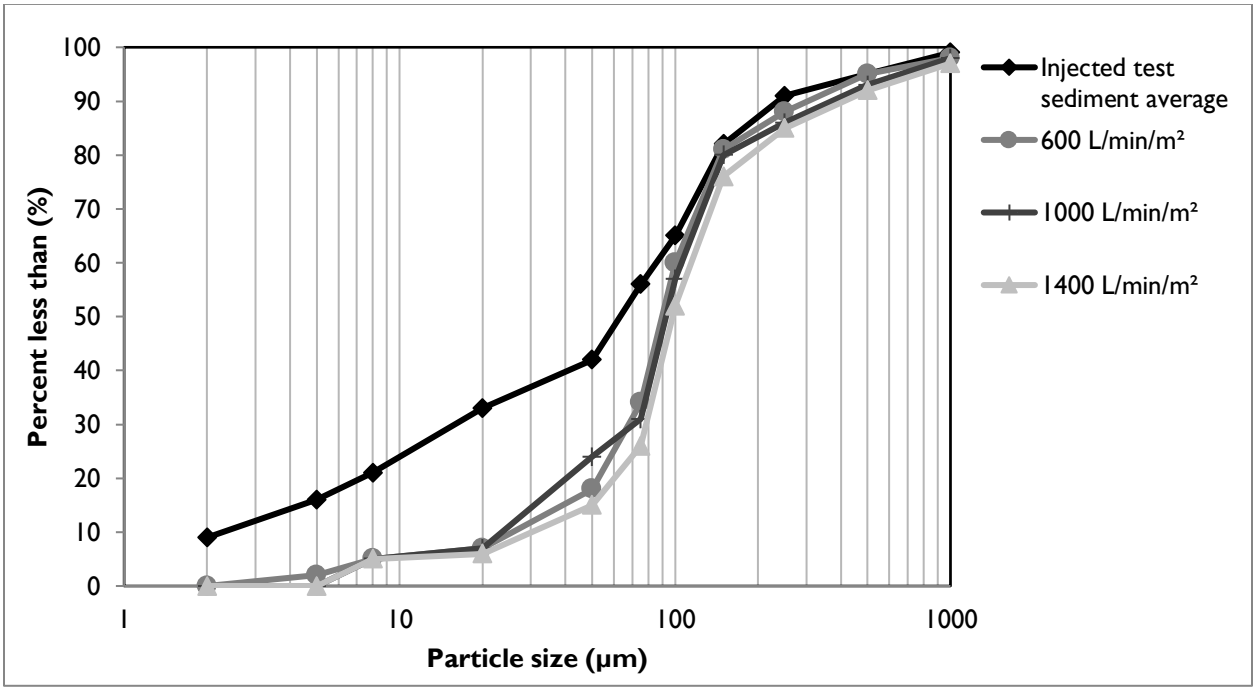


Figure 4. Particle size distribution of sediment retained in the EFO4 in relation to the injected test sediment average at surface loading rates above the bypass rate of 535 L/min/m²

Table 4 shows the results of the sediment scour and re-suspension test for the EF4 unit. The EFO4 was not tested as it was reasonably assumed that scour rates would be lower given that flow bypass occurs at a lower surface loading rate. The scour test involved preloading 10.2 cm of fresh test sediment into

the sedimentation sump of the device. The sediment was placed on a false floor to mimic a device filled to 50% of the maximum recommended sediment storage depth. Clean water was run through the device at five surface loading rates over a 30 minute period. Each flow rate was maintained for 5 minutes with a one minute transition time between flow rates. Effluent samples were collected at one minute sampling intervals and analyzed for Suspended Sediment Concentration (SSC) and PSD by recognized methods. The effluent samples were subsequently adjusted based on the background concentration of the influent water. Typically, the smallest 5% of particles captured during the 40 L/min/m^2 sediment capture test is also used to adjust the concentration, as per the method described in Bulletin # CETV 2016-09-0001. However, since the composites of effluent concentrations were below the Reporting Detection Limit of the Laser Diffraction PSD methodology, this adjustment was not made. Results showed average adjusted effluent sediment concentrations below 5 mg/L at all tested surface loading rates.

It should be noted that the EF4 starts to internally bypass water at 1135 L/min/m^2, potentially resulting in the dilution of effluent concentrations, which would not normally occur under typical field conditions because the field influent concentration would contain a much higher sediment concentration than during the lab test. Recalculation of effluent concentrations to account for dilution at surface loading rates above the bypass rate showed sediment effluent concentrations to be below 1.6 mg/L.

Table 4. Scour test adjusted effluent sediment concentration.

Run	Surface loading rate (L/min/m^2)	Run time (min)	Background sample concentration (mg/L)	Adjusted effluent suspended sediment concentration (mg/L) [a]	Average (mg/L)
1	200	1:00	<RDL	11.9	4.6
		2:00		7.0	
		3:00		4.4	
		4:00		2.2	
		5:00		1.0	
		6:00		1.2	
2	800	7:00	<RDL	1.1	0.7
		8:00		0.9	
		9:00		0.6	
		10:00		1.4	
		11:00		0.1	
		12:00		0	
3	1400	13:00	<RDL	0	0
		14:00		0.1	
		15:00		0	
		16:00		0	
		17:00		0	
		18:00		0	
4	2000	19:00	1.2	0.2	0.2
		20:00		0	
		21:00		0	
		22:00		0.7	
		23:00		0	
		24:00		0.4	

5	2600	25:00	1.6	0.3	0.4
		26:00		0.4	
		27:00		0.7	
		28:00		0.4	
		29:00		0.2	
		30:00		0.4	

[a] The adjusted effluent suspended sediment concentration represents the actual measured effluent concentration minus the background concentration. For more information see Bulletin # CETV 2016-09-0001.

The results of the light liquid re-entrainment test used to evaluate the unit's capacity to prevent re-entrainment of light liquids are reported in Table 5. The test involved preloading 58.3 L (corresponding to a 5 cm depth over the collection sump area of 1.17m^2) of surrogate low-density polyethylene beads within the oil collection skirt and running clean water through the device continuously at five surface loading rates (200, 800, 1400, 2000, and 2600 L/min/m^2). Each flow rate was maintained for 5 minutes with approximately 1 minute transition time between flow rates. The effluent flow was screened to capture all re-entrained pellets throughout the test.

Table 5. Light liquid re-entrainment test results for the EFO4.

Surface Loading Rate (L/min/m2)	Time Stamp	Amount of Beads Re-entrained			
		Mass (g)	Volume (L)[a]	% of Pre-loaded Mass Re-entrained	% of Pre-loaded Mass Retained
200	62	0	0	0.00	100
800	247	168.45	0.3	0.52	99.48
1400	432	51.88	0.09	0.16	99.83
2000	617	55.54	0.1	0.17	99.84
2600	802	19.73	0.035	0.06	99.94
Total Re-entrained		295.60	0.525	0.91	--
Total Retained		32403	57.78	--	99.09
Total Loaded		32699	58.3	--	--

[a] Determined from bead bulk density of 0.56074 g/cm^3

Variances from testing Procedure

The following minor deviations from the *Procedure for Laboratory Testing of Oil-Grit Separators* (Version 3.0, June 2014) have been noted:

1. During the capture test, the 40 L/min/m^2 and 80 L/min/m^2 surface loading rates were evaluated over 3 and 2 days respectively due to the long duration needed to feed the required minimum of 11.3 kg of test sediment into the unit at these lower flow rates. Pumps were shut down at the end of each intermediate day, and turned on again the following morning. The target flow rate was re-established within 30 seconds of switching on the pump. This procedure may have allowed sediments to be captured that otherwise may have exited the unit if the test was continuous. On the basis of practical considerations, this variance was approved by the verifier prior to testing.

2. During the scour test, the coefficient of variation (COV) for the lowest flow rate tested (200 L/min/m^2) was 0.07, which exceeded the specified limit of 0.04 target specified in the OGS Procedure. A pump capable of attaining the highest flow rate of 3036 L/min had difficulty maintaining the lowest flow of 234 L/min but still remained within +/- 10% of the target flow and is viewed as having very little impact on the observed results. Similarly, for the light liquid re-entrainment test the COV for the flow rate of the 200 L/min/m^2 run was 0.049, exceeding the limit of 0.04, but is believed to introduce negligible bias.

3. Due to pressure build up in the filters, the runs at 1000 L/min/m^2 for the Stormceptor® EF4 and 1000 and 1400 L/min/m^2 for the Stormceptor® EFO4 were slightly shorter than the target. The run times were 54, 59 and 43 minutes respectively, versus targets of 60 and 50 minutes. The final feed samples were timed to coincide with the end of the run. Since >25 lbs of sediment was fed, the shortened time did not invalidate the runs.

Verification

The verification was completed by the Verification Expert, Toronto and Region Conservation Authority, contracted by GLOBE Performance Solutions, using the International Standard ***ISO 14034:2016 Environmental management -- Environmental technology verification (ETV)***. Data and information provided by Imbrium Systems Inc. to support the performance claim included the following: Performance test report prepared by Good Harbour Laboratories, and dated September 8, 2017; the report is based on testing completed in accordance with the Procedure for Laboratory Testing of Oil-Grit Separators (Version 3.0, June 2014).

What is ISO14034:2016 Environmental management – Environmental technology verification (ETV)?

ISO 14034:2016 specifies principles, procedures and requirements for environmental technology verification (ETV), and was developed and published by the *International Organization for Standardization (ISO)*. The objective of ETV is to provide credible, reliable and independent verification of the performance of environmental technologies. An environmental technology is a technology that either results in an environmental added value or measures parameters that indicate an environmental impact. Such technologies have an increasingly important role in addressing environmental challenges and achieving sustainable development.

For more information on the Stormceptor® EF and EFO OGS please contact:

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V6C 3E2 Canada
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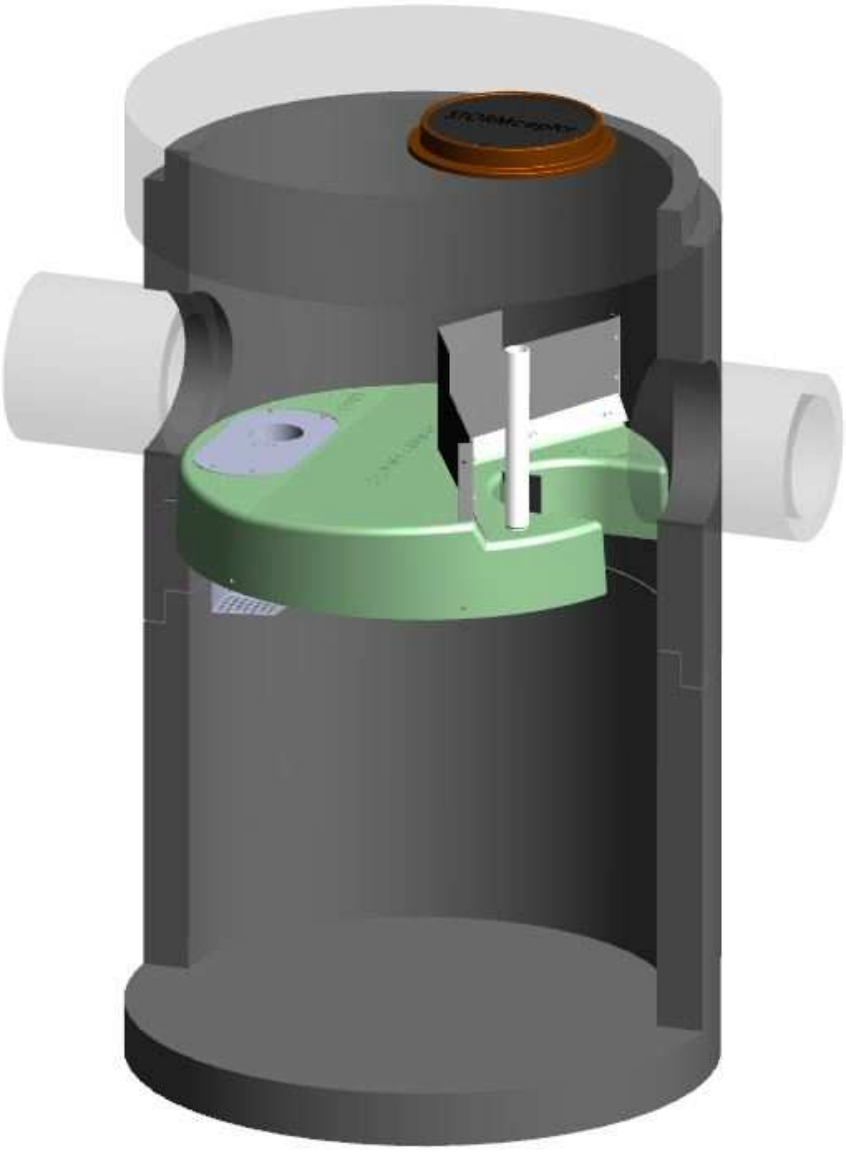
etv@globeperformance.com

Stormceptor® EF

Owner's Manual



Stormceptor is protected by one or more of the following patents:

Canadian Patent No. 2,137,942
Canadian Patent No. 2,180,305
Canadian Patent No. 2,327,768
Canadian Patent No. 2,694,159
Canadian Patent No. 2,697,287
U.S. Patent No. 6,068,765
U.S. Patent No. 6,371,690
U.S. Patent No. 7,582,216
U.S. Patent No. 7,666,303
Australia Patent No. 693.164
Australia Patent No. 729,096
Australia Patent No. 2008,279,378
Australia Patent No. 2008,288,900
Japanese Patent No. 5,997,750
Japanese Patent No. 5,555,160
Korean Patent No. 0519212
Korean Patent No. 1451593
New Zealand Patent No. 583,008
New Zealand Patent No. 583,583
South African Patent No. 2010/00682
South African Patent No. 2010/01796
Patent pending

Table of Contents:

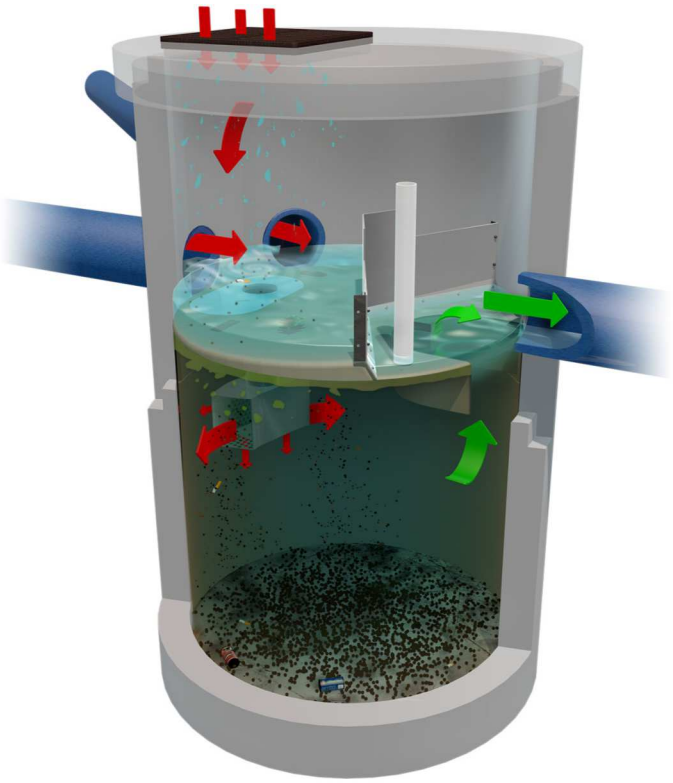
OVERVIEW

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 flow rates higher than 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 platform 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 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 other floatables rise up within the channel surrounding the central riser pipe 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 in-line 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.



COMPONENTS

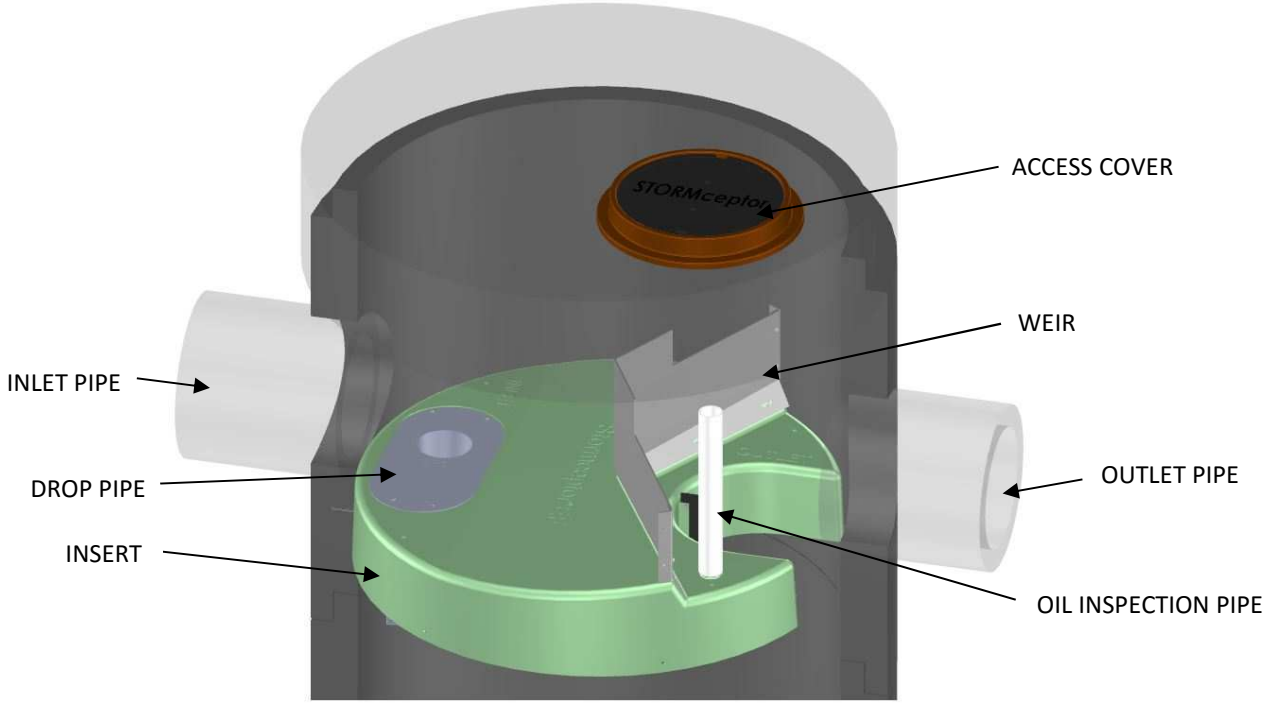


Figure 1

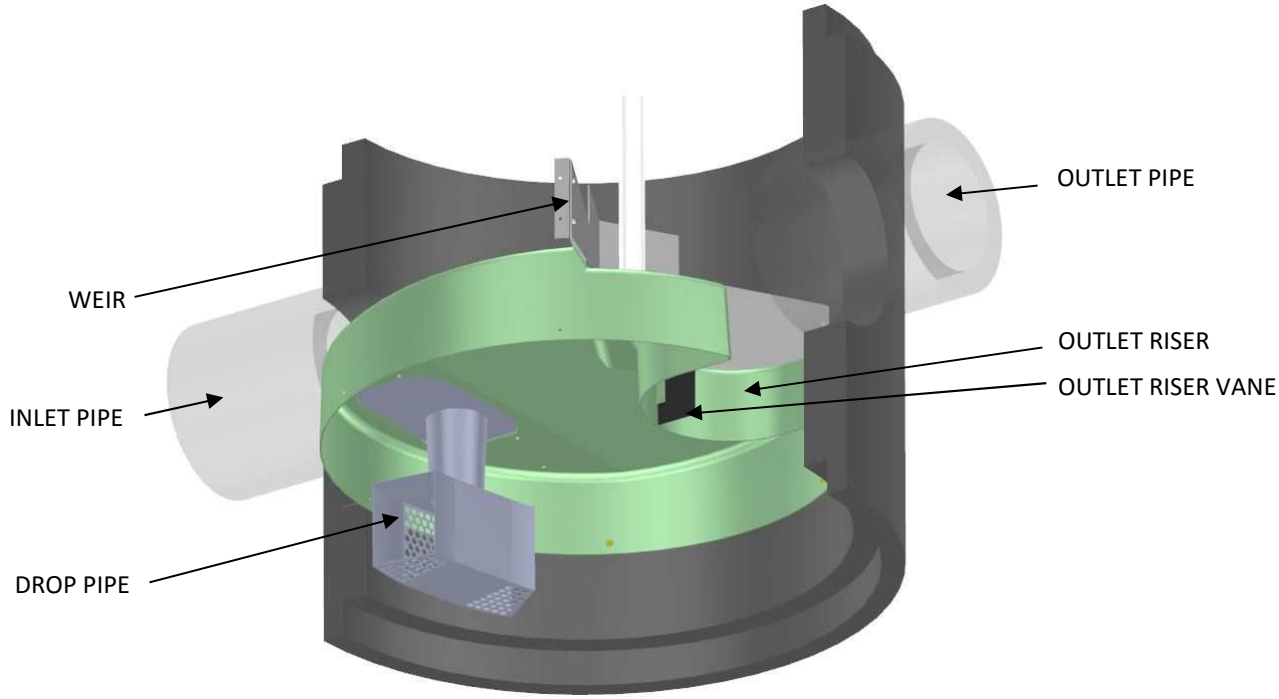


Figure 2

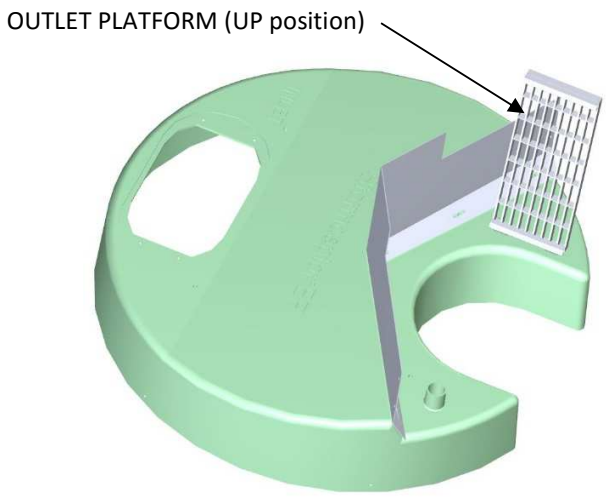


Figure 3A

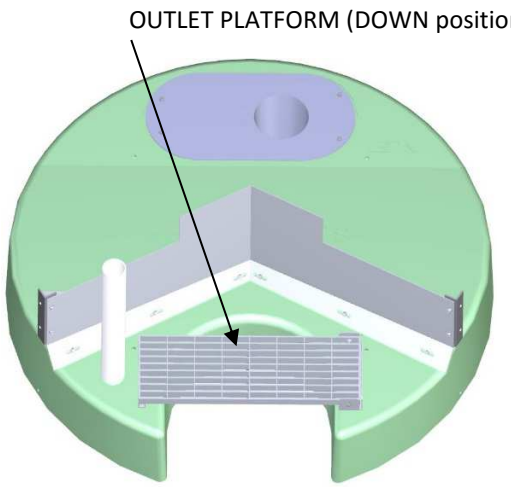


Figure 3B

- **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
- **Outlet platform (optional)** – safety platform in the event of manned entry into the unit
- **Oil inspection pipe** – primary access for measuring oil depth

PRODUCT DETAILS

METRIC DIMENSIONS AND CAPACITIES

Table 1

Stormceptor Model	Inside Diameter (m)	Minimum Surface to Outlet Invert Depth (mm)	Depth Below Outlet Pipe Invert (mm)	Wet Volume (L)	Sediment Capacity [1] (m^3)	Hydrocarbon Storage Capacity [2] (L)	Maximum Flow Rate into Lower Chamber [3] (L/s)	Peak Conveyance Flow Rate [4] (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

[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.
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.
[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 1.5 m/s.

U.S. DIMENSIONS AND CAPACITIES

Table 2

Stormceptor Model	Inside Diameter (ft)	Minimum Surface to Outlet Invert Depth (in)	Depth Below Outlet Pipe Invert (in)	Wet Volume (gal)	Sediment Capacity [1] (ft^3)	Hydrocarbon Storage Capacity [2] (gal)	Maximum Flow Rate into Lower Chamber [3] (cfs)	Peak Conveyance Flow Rate [4] (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 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 13.1 gpm/ft^2.
[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 5 fps.

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**.

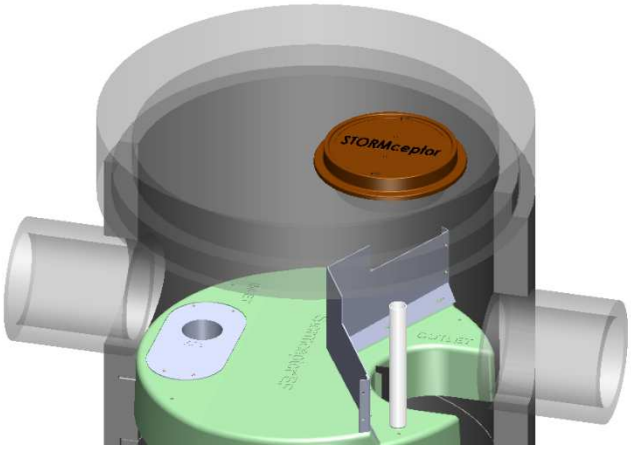


Figure 4

The specific Stormceptor EF/EFO model number is identified on the top of the aluminum Drop Pipe as shown in **Figure 4**. The unit serial number is identified on the top of the insert upstream of the weir as shown in **Figure 4**.

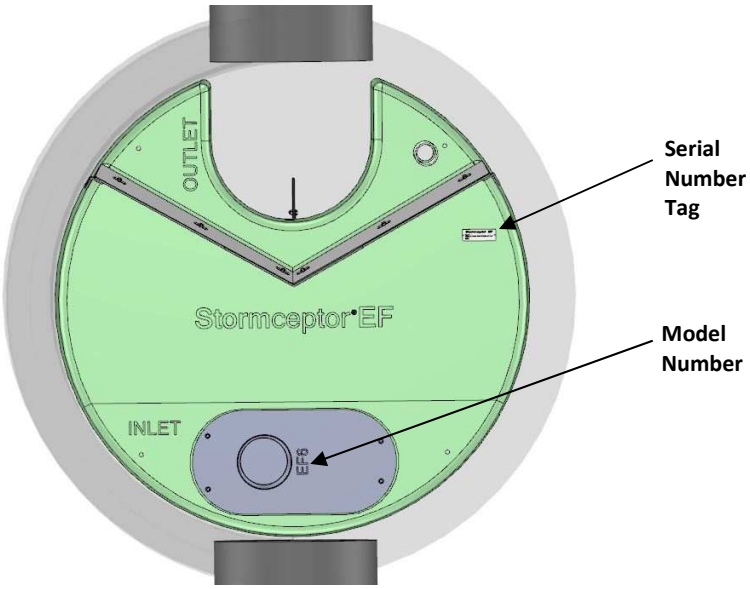


Figure 5

INSPECTION AND MAINTENANCE

It is very important to perform regular inspection and maintenance. Regular inspection and maintenance ensures maximum operation efficiency, keeps maintenance costs low, and provides continued 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: 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)
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

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.

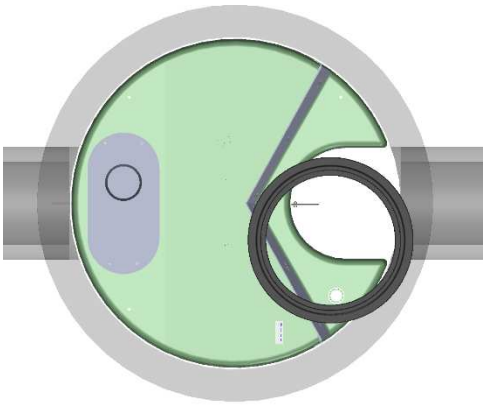


Figure 6

- Sediment depth inspections are performed through the **Outlet Riser** and oil presence can be determined through the **Oil Inspection Pipe**.
- Oil presence and sediment depth are determined by inserting a Sludge Judge® or measuring stick to quantify the pollutant depths.

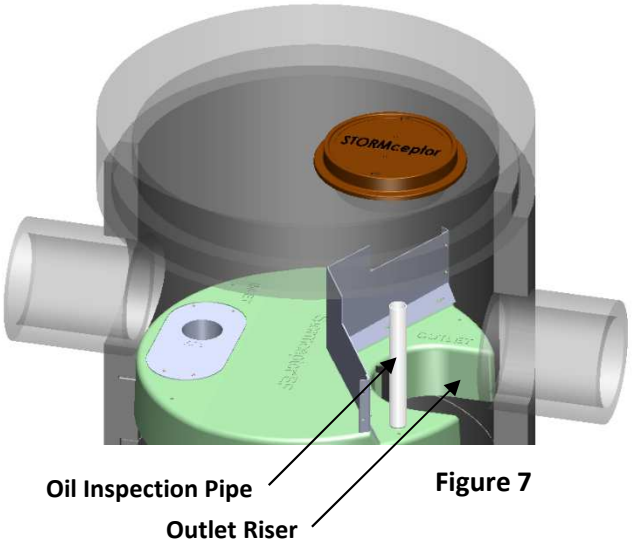


Figure 7

Figure 8

- Visually inspect the insert, weir, and drop pipe inlet opening to ensure there is no damage or blockage.
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

- 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**.

Figure 9

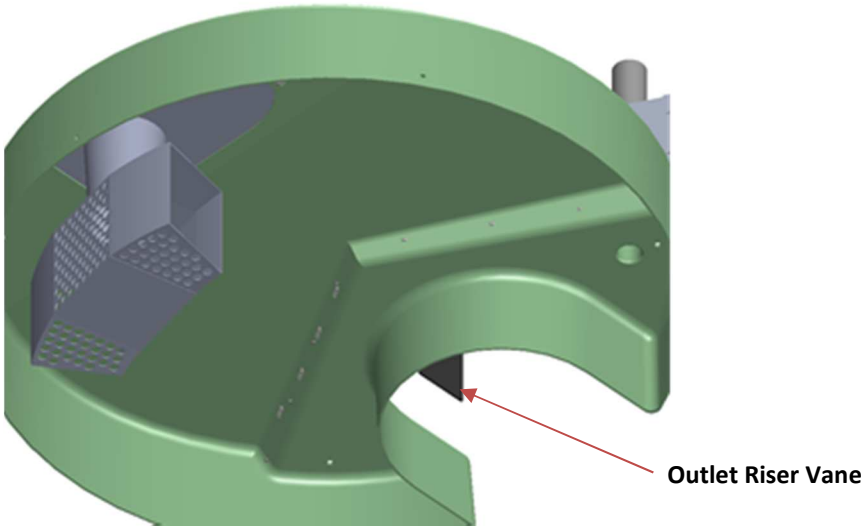
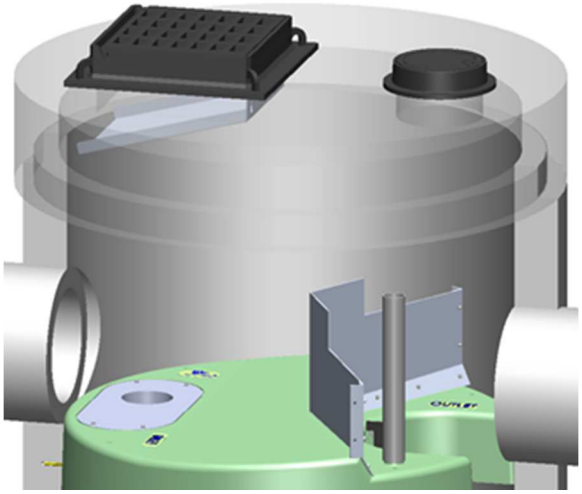


Figure 10

NOTE: The Outlet Riser Vane is durable and flexible and designed to allow maintenance activities with minimal, if any, interference.

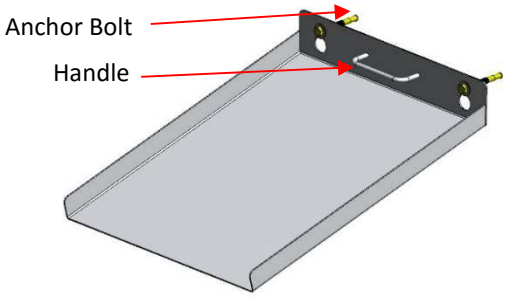
Removable Flow Deflector

- Top 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. The EF6/EFO6 and larger models do not require the flow deflector.



How to Remove:

1. Loosen anchor bolts
2. Pull up and out using the handle



Removable Flow Deflector

Figure 11

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, it 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 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 11**. For additional details about the Oil Level Alarm please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-systems.

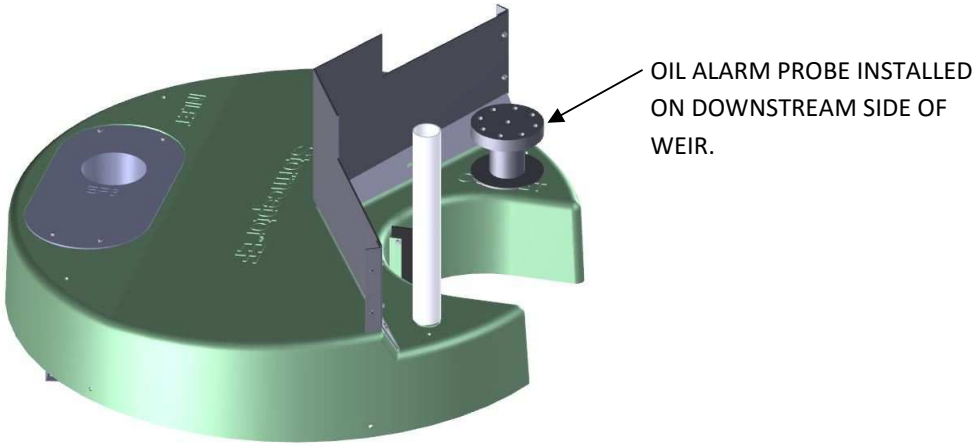


Figure 12

Replacement Parts

Stormceptor has no moving parts to wear out. 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 (inch or mm)	OIL DEPTH (inch or mm)	SERVICE REQUIRED (Yes / No)	MAINTENANCE PERFORMED	MAINTENANCE PROVIDER	COMMENTS

Other Comments:

Contact Information

Questions regarding Stormceptor EF/EFO can be addressed by contacting your local Stormceptor representative or by visiting our website at **www.stormceptor.com.**

Imbrium Systems Inc. & Imbrium Systems LLC

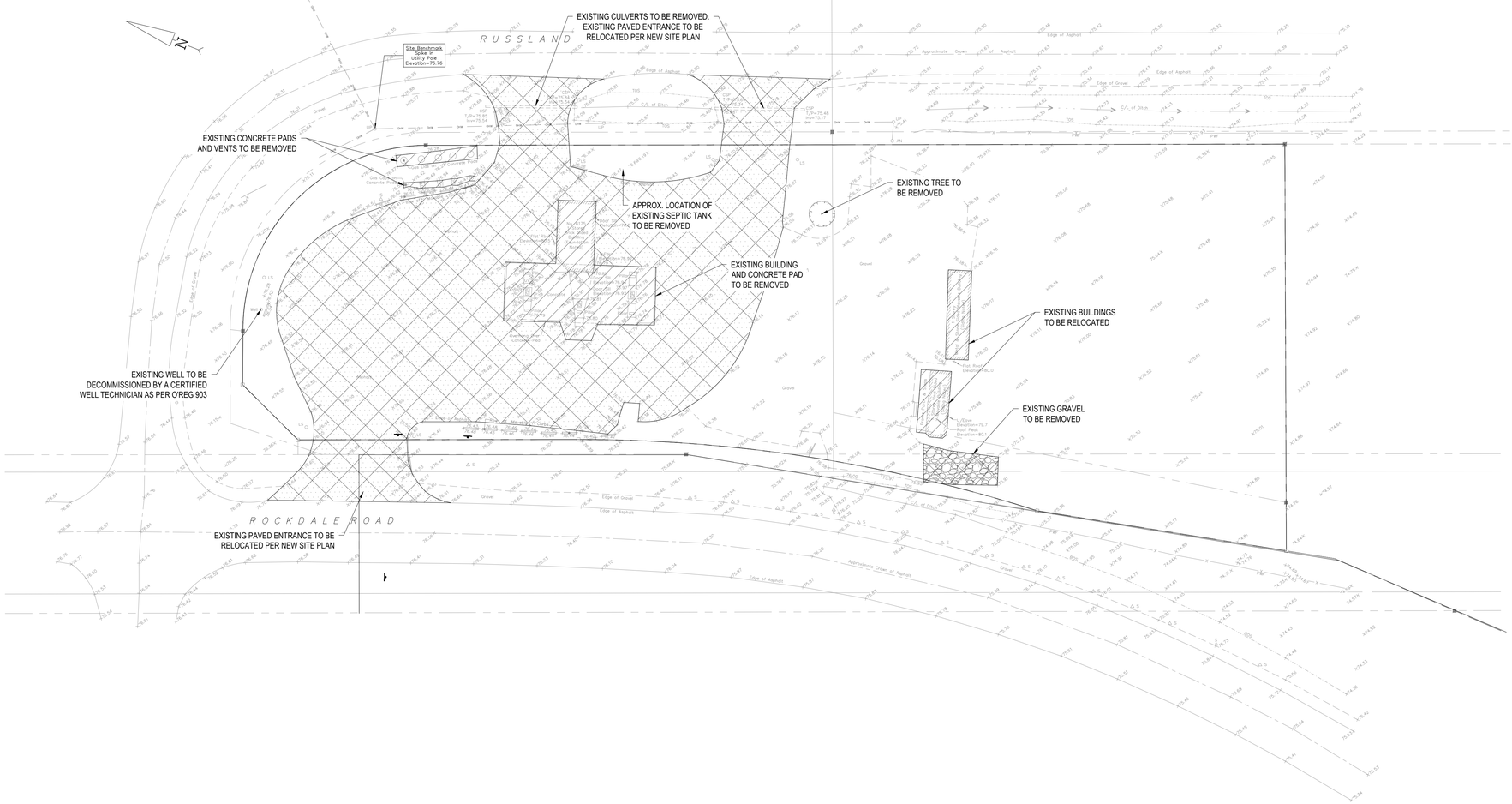
Canada	1-416-960-9900 / 1-800-565-4801
United States	1-301-279-8827 / 1-888-279-8826
International	+1-416-960-9900 / +1-301-279-8827

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

APPENDIX

C

- C1.1 REMOVAL
- C1.3 SERVICING PLAN
- C1.4 GRADING, EROSION AND SEDIMENT CONTROL PLAN
- C1.5 PRE-DEVELOPMENT AND POST-DEVELOPMENT CATCHMENT AREAS
- C5.1 DETAILS



1. CONTRACTOR TO VERIFY LOCATION OF ALL BURIED SERVICES PRIOR TO START OF CONSTRUCTION. OBTAIN A LOCATE AND PROVIDE A COPY TO ENGINEER FOR REVIEW PRIOR TO COMMENCING ANY CONSTRUCTION.
2. TOPOGRAPHIC SURVEY COMPLETED AND PROVIDED BY FARLEY, SMITH & DENIS SURVEYING LTD. DATED MAY 17 2024. CONTRACTOR TO VERIFY IN THE FIELD PRIOR TO CONSTRUCTION OF ANY WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. SITE BENCHMARK: SPIKE IN UTILITY POLE AT ELEVATION 76.76
4. REFER TO SITE PLAN BY BRYDEN GIBSON ARCHITECTS INCORPORATED FOR SITE LAYOUT DESIGN, DIMENSION, SETBACK REQUIREMENTS AND SITE DATA.

—□—	Survey Monument Planted
—▣—	Survey Monument Found
SIB	Standard Iron Bar
SSIB	Short Standard Iron Bar
IB	Iron Bar
Meas	Measured
(P1)	Plan by (1287) dated February 11, 1988
(P2)	Plan 50R-5729
——— ▭ ———	Overhead Wires
UP	Utility Pole
AN	Anchor
LS	Light Standard
CSP	Corrugated Steel Pipe
GV	Gas Valve
B	Bollard
S	Sign
Ø	Diameter
P&W	Post and Wire Fence
Inv.	Invert
T/P	Top of Pipe
U/Eave	Underside of Eave
TpFdn	Top of Foundation
C/L	Centreline
TOS	Top of Slope
BOS	Bottom of Slope
GP	Gas Pump
+ 65.00	Location of Elevations
+ 65.00	Top of Concrete Curb
——— ▭ ———	Property Line
	Deciduous Tree
	EXISTING BUILDING TO BE REMOVED/RELOCATED
	EXISTING GRAVEL TO BE REMOVED
	EXISTING ASPHALT TO BE REMOVED

wsp
2611 Queensview Dr. Ottawa, ON Canada K2B 8K2
t: 613.829.2800 f: 613.829.8299 www.wspgroup.com

CONSULTANT:

SEAL:

LICENSED PROFESSIONAL ENGINEER
W. ZHUANG
100231427
2026-07-16
PROVINCE OF ONTARIO

NORTH

CLIENT:

MR. ABDO EL-ARAB
6175 ROCKDALE RD.
VARS, ONTARIO
K0A 3H0
PHONE NUMBER:
(613) 835-3525

CLIENT REF. #: --

PROJECT:

GAS STATION
REDEVELOPMENT
6175 ROCKDALE RD., CONC. 6
PT. LOT 27 RP 50R-5729 PART
1,2 & 3 (IRREG.)

KEY PLAN:

ISSUED FOR - REVISION:

15		JULY 16, 2026	REVISED PER CITY COMMENTS
14		APRIL 24, 2026	ISSUED FOR SITE PLAN APPLICATION
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4		APRIL 26/18	ISSUED FOR REVIEW
3		MAR 20/18	ISSUED FOR REVIEW
2		DEC 20/17	ISSUED FOR REVIEW

IS	RE	DATE	DESCRIPTION

PROJECT NO.: CA0008077.7007
DATE: 2026-07-16
ORIGINAL SCALE: 1:400
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DESIGNED BY: AZ
DRAWN BY: JT
CHECKED BY: IJ

DISCIPLINE: CIVIL

TITLE: REMOVALS

SHEET NUMBER: C1.1
SHEET #: 1 OF 5

ISSUE: REVISED PER CITY COMMENTS
REV #: 15
DATE OF: 2026-07-16

NOTES: GENERAL

1. DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND LANDSCAPE DRAWINGS.
2. ALL SERVICES, MATERIALS, CONSTRUCTION METHODS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND REGULATIONS OF THE: CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS, ONTARIO PROVINCIAL SPECIFICATION STANDARD SPECIFICATION (OPSS) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), UNLESS OTHERWISE SPECIFIED, TO THE SATISFACTION OF THE CITY AND THE CONSULTANT.
3. THE POSITION OF EXISTING POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES, STRUCTURES AND APPURTENANCES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SATISFY HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM DURING THE COURSE OF CONSTRUCTION. ANY RELOCATION OF EXISTING UTILITIES REQUIRED BY THE DEVELOPMENT OF SUBJECT LANDS IS TO BE UNDERTAKEN AT CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR MUST NOTIFY ALL EXISTING UTILITY COMPANY OFFICIALS FIVE (5) BUSINESS DAYS PRIOR TO START OF CONSTRUCTION AND HAVE ALL EXISTING UTILITIES AND SERVICES LOCATED IN THE FIELD OR EXPOSED PRIOR TO THE START OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO POWER, COMMUNICATION AND GAS LINES.
5. ALL TRENCHING AND EXCAVATIONS TO BE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS AND AS PER THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL REPORT.
6. REFER TO ARCHITECTS PLANS FOR BUILDING DIMENSIONS, LAYOUT AND REMOVALS. REFER TO LANDSCAPE PLAN FOR LANDSCAPED DETAILS AND OTHER RELEVANT INFORMATION. ALL INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. TOPOGRAPHIC SURVEY COMPLETED AND PROVIDED BY FARLEY, SMITH & DENIS SURVEYING LTD ON MAY 17, 2024. CONTRACTOR TO VERIFY IN THE FIELD PRIOR TO CONSTRUCTION OF ANY WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
8. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS. VERIFY THAT JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED.
9. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
10. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM.
11. ALL DISTURBED AREAS OUTSIDE PROPOSED GRADING LIMITS TO BE RESTORED TO ORIGINAL ELEVATIONS AND CONDITIONS UNLESS OTHERWISE SPECIFIED. ALL RESTORATION SHALL BE COMPLETED WITH THE GEOTECHNICAL REQUIREMENTS FOR BACKFILL AND COMPACTION.
12. ABUTTING PROPERTY GRADES TO BE MATCHED UNLESS OTHERWISE SHOWN.
13. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION, INCLUDING WATER PERMIT AND ROAD CUT PERMIT.
14. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
15. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
16. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
17. CONTRACTOR TO OBTAIN POST-CONSTRUCTION TOPOGRAPHIC SURVEY, COMPLETED BY OLS OR P.ENG CONFIRMING COMPLIANCE WITH DESIGN GRADING AND SERVICING. SURVEY IS TO INCLUDE LOCATION AND INVERTS FOR BURIED UTILITIES.
18. ABIDE BY THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT. REPORT ANY VARIATIONS IN OBSERVED CONDITIONS FROM THOSE DESCRBED IN THE GEOTECHNICAL REPORT.
19. REPORT REFERENCES
    i. GEOTECHNICAL INVESTIGATION, PREPARED BY PATERSON GROUP PG4132-1 REVISION 2, DATED AUGUST 22, 2019.
20. PROVIDE CCTV INSPECTION REPORT FOR ALL SEWERS AND CATCHBASIN LEADS 200mm DIAMETER AND LARGER. REPEAT CCTV INSPECTION FOLLOWING RECTIFICATION OF ANY DEFICIENCIES.

STORM SEWERS AND STRUCTURES

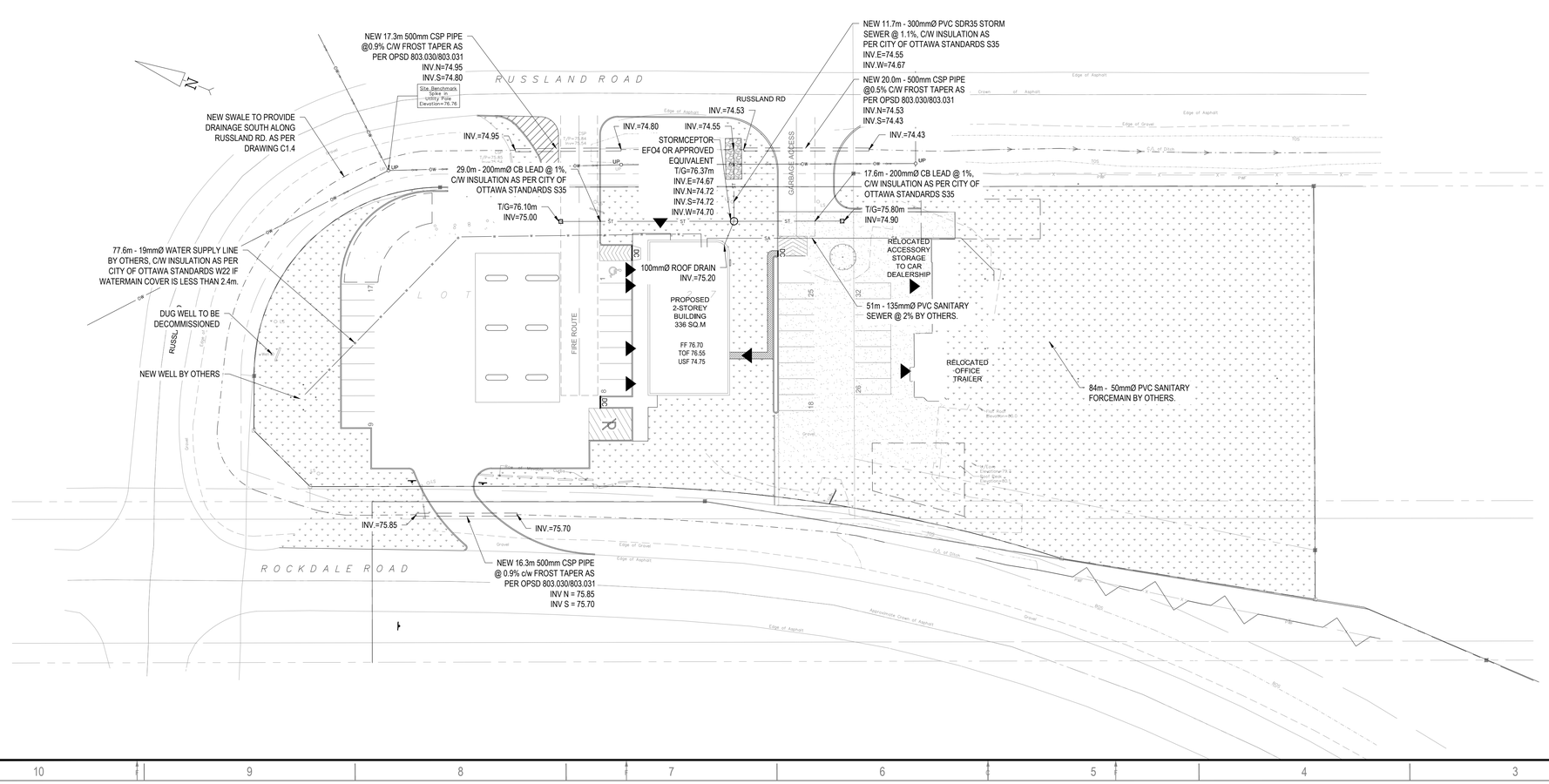
1. ALL STORM SEWER MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. PROVIDE CCTV INSPECTION REPORTS FOR ALL NEW STORM SEWERS, SERVICES AND CB LEADS.
2. STORM SEWERS 450mm DIAMETER AND SMALLER SHALL BE PVC SDR-35, WITH RUBBER GASKET PER CSA A-257.3.
3. STORM SEWER LARGER THAN 450mm SHALL BE REINFORCED CONCRETE CLASS 100D. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE ACCORDANCE WITH CSA A257.2. PIPE SHALL BE JOINTED WITH STD. RUBBER GASKETS AS PER CSA A257.3.
4. SEWER BEDDING AS PER CITY OF OTTAWA DETAIL S6.
5. ANY NEW OR EXISTING STORM SEWER WITH LESS THAN 2.0m COVER REQUIRES THERMAL INSULATION AS PER CITY OF OTTAWA STANDARD S35, OR APPROVED BY THE ENGINEER.
6. ALL CATCHBASIN LEADS TO BE MINIMUM 200mm DIAMETER AT MINIMUM 1.0% SLOPE UNLESS OTHERWISE SPECIFIED.
7. STORM SEWER MANHOLES SERVICING LOCAL SEWERS LESS THAN 900mm SHALL BE CONSTRUCTED WITH A 300mm SUMP. FOR STORM SEWERS 900mm AND OVER USE BENCHING IN ACCORDANCE WITH OPSD 701.021.
8. STORM CATCHBASINS AS PER OPSD 705.010 AND FRAME/COVER AS PER CITY STANDARD DRAWINGS S19. STORM CBMH'S AS INDICATED IN TABLE WITH SUMP, ADJUSTMENT SECTIONS SHALL BE AS PER OPSD 704.010.
9. PROVIDE BACKWATER VALVE ON FOUNDATION DRAIN, STORM DISCHARGE, AND OVERFLOW DISCHARGE PER S14.
10. ALL CATCHBASINS EXCLUDING LANDSCAPE CATCHBASINS TO HAVE 150 MMØ PERFORATED PIPE FOR 3.0M ON ALL AVAILABLE SIDES AT AN ELEVATION OF 300mm BELOW SUBGRADE LEVEL AS PER CITY OF OTTAWA STANDARD DRAWING 'R1'.

PARKING LOT AND WORK IN PUBLIC RIGHTS OF WAY

1. CONTRACTOR TO REINSTATE ROAD CUTS AS PER CITY OF OTTAWA DETAIL R10.
2. CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.
3. FILL TO BE PLACED AND COMPACTED PER THE GEOTECHNICAL REPORT REQUIREMENTS.
4. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR B MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR B MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
5. GRANULAR A MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR B PLACEMENT.
6. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR A MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR A MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
7. ASPHALT MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR A PLACEMENT.
8. CONTRACTOR TO SUPPLY, PLACE AND COMPACT ASPHALT MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF ASPHALT MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
9. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING LINE AND GRADE IN ACCORDANCE WITH THE PLANS, AND FOR PROVIDING THE CONSULTANT WITH VERIFICATION PRIOR TO PLACEMENT.
10. ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED OF AT AN APPROVED DUMP SITE. SHOULD THE CONTRACTOR DISCOVER ANY HAZARDOUS MATERIAL, CONTRACTOR IS TO NOTIFY CONSULTANT. CONSULTANT TO DETERMINE APPROPRIATE DISPOSAL METHOD/LOCATION.
11. PAVEMENT STRUCTURE (MATERIAL TYPES AND THICKNESS) FOR HEAVY DUTY, LIGHT DUTY AND BASKETBALL COURT AREAS TO BE AS SPECIFIED IN THE GEOTECHNICAL REPORT AND SHOWN ON THE PLANS.

LEGEND:

- Survey Monument Planted
- Survey Monument Found
- SIB — Standard Iron Bar
- SSIB — Short Standard Iron Bar
- IB — Iron Bar
- Meas — Measured
- (P1) — Plan by (1287) dated February 11, 1988
- (P2) — Plan 50R-5729
- Overhead Wires
- UP — Utility Pole
- AN — Anchor
- LS — Light Standard
- CSP — Corrugated Steel Pipe
- GV — Gas Valve
- B — Bollard
- S — Sign
- Ø — Diameter
- P&W — Post and Wire Fence
- Inv. — Invert
- T/P — Top of Pipe
- U/Eave — Underside of Eave
- TpFdn — Top of Foundation
- C/L — Centreline
- TOS — Top of Slope
- BOS — Bottom of Slope
- GP — Gas Pump
- +65.00 — Location of Elevations
- +65.00 — Top of Concrete Curb
- Property Line
- Deciduous Tree
- WELL BY OTHERS
- LP — LIGHT POST BY OTHERS
- BUILDING ENTRANCE
- STRAW BALE CHECK DAM
- SF — SILT FENCE
- SWALE
- BOTTOM OF SLOPE
- HP — HIGH POINT
- ST — STORM SEWER
- SA — SAN SEWER BY OTHERS
- HYD — HYDRO BY OTHERS
- W — NEW WATER LINE BY OTHERS
- TERRACING (MAX 3:1 SLOPE)
- HEAVY DUTY ASPHALT
- LIGHT DUTY ASPHALT
- CONCRETE
- LANDSCAPING



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2611 Queensview Dr. Ottawa, ON Canada K2B 8K2
t: 613.829.2800 f: 613.829.8299 www.wspgroup.com

CONSULTANT:

SEAL:

LICENSED PROFESSIONAL ENGINEER
W. ZHUANG
100231427
2026-07-16
PROVINCE OF ONTARIO

NORTH

CLIENT:

MR. ABDO EL-ARAB
6175 ROCKDALE RD.
VARS, ONTARIO
K0A 3H0
PHONE NUMBER:
(613) 835-3525

CLIENT REF. #: --

PROJECT:

GAS STATION
REDEVELOPMENT
6175 ROCKDALE RD., CONC. 6
PT. LOT 27 RP 50R-5729 PART
1,2 & 3 (IRREG.)

KEY PLAN:

ISSUED FOR - REVISION:

15		JULY 16, 2026	REVISED PER CITY COMMENTS
14		APRIL 24, 2026	ISSUED FOR SITE PLAN APPLICATION
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9		JULY 15, 2020	ISSUED FOR REVIEW
8		JUNE 8, 2020	ISSUED FOR REVIEW
7		AUGUST 29/19	ISSUED FOR REVIEW
6	1	APRIL 8/19	ISSUED FOR REVIEW
5		MAY 28/18	ISSUED FOR REVIEW
4		APRIL 26/18	ISSUED FOR REVIEW
3		MAR 20/18	ISSUED FOR REVIEW
2		DEC 20/17	ISSUED FOR REVIEW
IS	RE	DATE	DESCRIPTION

PROJECT NO: CA0008077.7007
DATE: 2026-07-16
ORIGINAL SCALE: 1:400
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DESIGNED BY: IJ/AZ
DRAWN BY: SM/JT
CHECKED BY: IJ

DISCIPLINE: CIVIL

TITLE: SERVICING PLAN

SHEET NUMBER: C1.3
SHEET #: 2 OF 5

ISSUE: REVISED PER CITY COMMENTS
DATE OF: 2026-07-16
REV #: 15

V:\01-3 ME 2021 Projects\177-14600 Vars Gas Station\3. Drawings\Working drawings\2026 Submission\CA0008077.7007_2026.06.dwg Jul 16, 2026 - 1:19pm BY: (CA1705412)

NOTES: EROSION AND SEDIMENT CONTROL

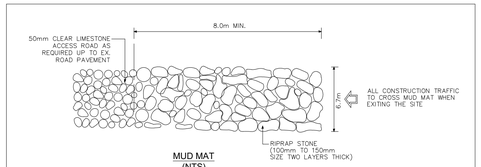
** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES. **

1. PRIOR TO START OF CONSTRUCTION:

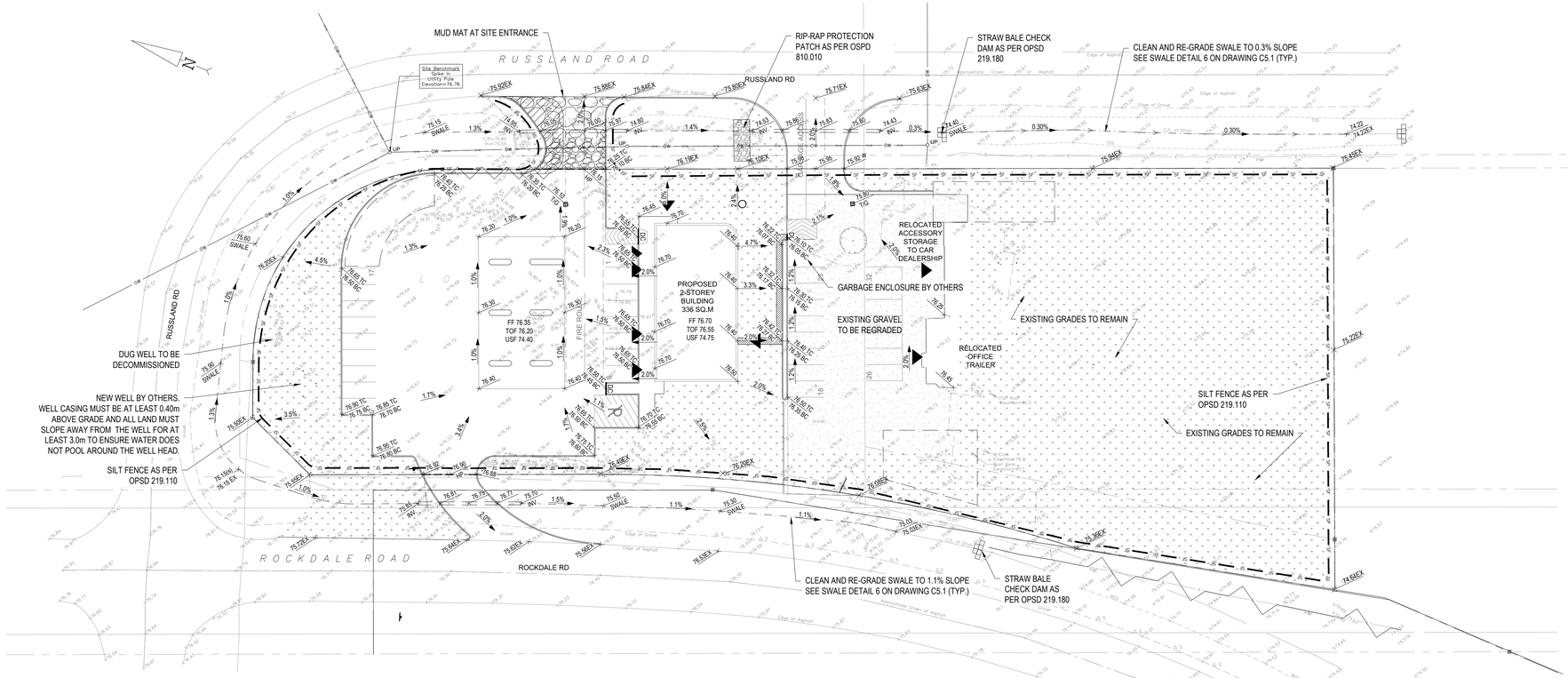
1.1. INSTALL SILT FENCE IN LOCATION SHOWN ON DWG C07.
1.2. INSTALL FILTER FABRIC OR SILT SACK FILTERS IN ALL THE CATCHBASINS AND MANHOLES TO REMAIN DURING CONSTRUCTION WITHIN THE SITE (SEE TYPICAL DETAIL).
1.3. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

2.1. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE AND IMPACTS TO EXISTING GRADING.
2.2. PERIMETER VEGETATION TO REMAIN IN PLACE UNTIL PERMANENT STORM WATER MANAGEMENT IS IN PLACE. OTHERWISE, IMMEDIATELY INSTALL SILT FENCE WHEN THE EXISTING SITE IS DISTURBED AT THE PERIMETER.
2.3. PROTECT DISTURBED AREAS FROM OVERLAND FLOW BY PROVIDING TEMPORARY SWALES TO THE SATISFACTION OF THE FIELD ENGINEER. TIE-IN TEMPORARY SWALE TO EXISTING CB'S AS REQUIRED.
2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
2.5. INSPECT SILT FENCES, FILTER FABRIC FILTERS AND CATCH BASIN SUMPS WEEKLY AND WITHIN 24 HOURS AFTER A STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
2.6. DRAWING TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
2.7. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
2.8. DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
2.9. CONTROL WIND-BLOWN DUST OFF SITE BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED AND TO THE SATISFACTION OF THE ENGINEER).
2.10. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE FIELD ENGINEER.
2.11. CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING AS REQUIRED.
2.12. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
2.13. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
2.14. TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
2.15. ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
2.16. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.



1 C1.4 MUD MAT DETAIL
SCALE / ÉCHELLE = NTS



LEGEND:

	Survey Monument Planted
	Survey Monument Found
SIB	Standard Iron Bar
SSIB	Short Standard Iron Bar
IB	Iron Bar
Meas	Measured
(P1)	Plan by (1287) dated February 11, 1988
(P2)	Plan 50R-5729
UP	Utility Pole
AN	Anchor
LS	Light Standard
CSP	Corrugated Steel Pipe
GV	Gas Valve
B	Bollard
S	Sign
Ø	Diameter
P&W	Post and Wire Fence
Inv.	Invert
T/P	Top of Pipe
U/Eave	Underside of Eave
T/Fdn	Top of Foundation
C/L	Centreline
TOS	Top of Slope
BOS	Bottom of Slope
GP	Gas Pump
+ 65.00	Location of Elevations
+ 65.00	Top of Concrete Curb
	Property Line
	Deciduous Tree
	WELL BY OTHERS
UP	LIGHT POST BY OTHERS
	BUILDING ENTRANCE
	STRAW BALE CHECK DAM
SF	SILT FENCE
	SWALE
	BOTTOM OF SLOPE
HP	HIGH POINT
ST	STORM SEWER
SA	SAN SEWER BY OTHERS
HYD	HYDRO BY OTHERS
W	NEW WATER LINE BY OTHERS
	TERRACING (MAX 3:1 SLOPE)
	HEAVY DUTY ASPHALT
	LIGHT DUTY ASPHALT
	CONCRETE
	LANDSCAPING
	RIP-RAP PROTECTION

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SEAL:

LICENSED PROFESSIONAL ENGINEER
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100231427
2026-07-16
PROVINCE OF ONTARIO

NORTH

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MR. ABDO EL-ARAB
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VARS, ONTARIO
K0A 3H0
PHONE NUMBER:
(613) 835-3525

CLIENT REF. #: --

PROJECT:
GAS STATION
REDEVELOPMENT
6175 ROCKDALE RD., CONC. 6
PT. LOT 27 RP 50R-5729 PART
1,2 & 3 (IRREG.)

KEY PLAN:

ISSUED FOR - REVISION:

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PROJECT NO: CA0008077.7007
DATE: 2026-07-16
ORIGINAL SCALE: 1:400
IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
25mm
DESIGNED BY: AZ
DRAWN BY: JT
CHECKED BY: IJ

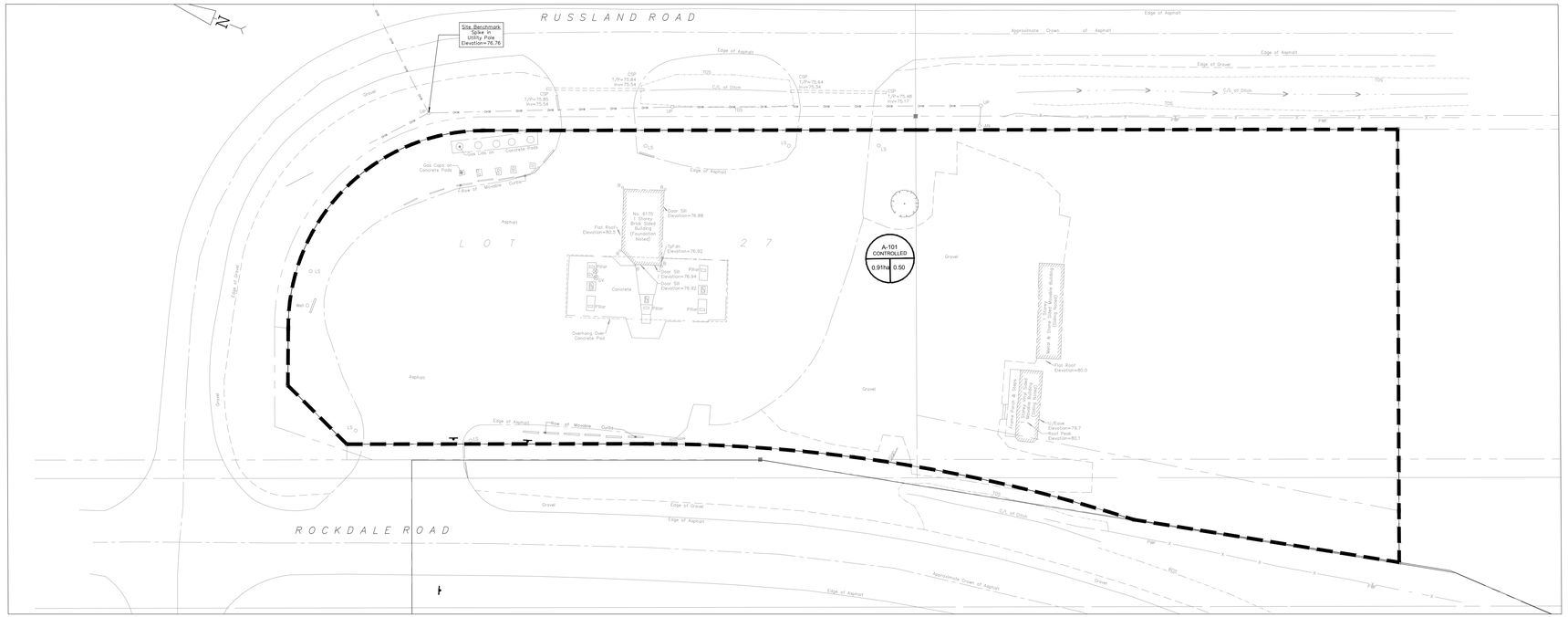
DISCIPLINE: CIVIL

TITLE:
GRADING, EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER: C1.4
SHEET #: 3 OF 5

ISSUE: REVISED PER CITY COMMENTS
DATE OF: 2026-07-16
REV #: 15

V:\01\3.ME.2021 Projects\171-14602 Vars Gas Station\3. Drawings\Working drawings\2026 Submission\CA0008077.7007_2026.06.dwg, Jul 16, 2026 1:21pm BY: (CA1700412)



1 C1.5 **PRE-DEVELOPMENT CATCH AREAS**
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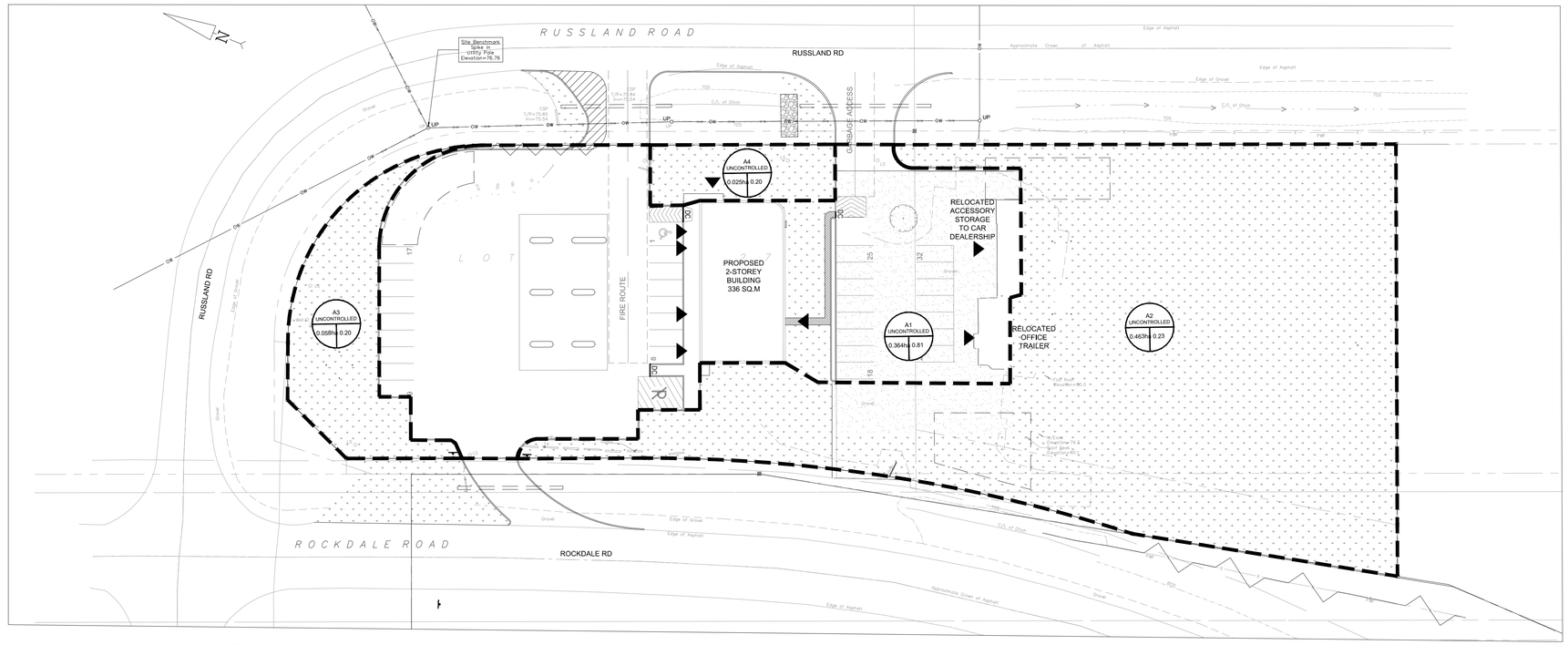

2 C1.5 **POST-DEVELOPMENT CATCH AREAS**
SCALE: 1:400

LEGEND:

DRAINAGE BOUNDARY

DRAINAGE AREA SYMBOL

AREA ID — A2 UNCONTROLLED — 0.463ha 0.32 — RUNOFF COEFFICIENT

CATCHMENT AREA

A1 - Runoff Coefficient Calculation

Area	Surface	Ha	"C"	C_{avg}
Total	Gravel	0.099	0.70	
0.364	Asphalt	0.248	0.90	**0.81**
	Soft	0.017	0.20	

A2 - Runoff Coefficient Calculation

Area	Surface	Ha	"C"	C_{avg}
Total	Gravel	0.024	0.70	
0.463	Asphalt	0.000	0.90	**0.23**
	Soft	0.439	0.20	

A3 - Runoff Coefficient Calculation

Area	Surface	Ha	"C"	C_{avg}
Total	Gravel	0.000	0.70	
0.058	Asphalt	0.000	0.90	**0.20**
	Soft	0.058	0.20	

A4 - Runoff Coefficient Calculation

Area	Surface	Ha	"C"	C_{avg}
Total	Gravel	0.000	0.70	
0.025	Asphalt	0.000	0.90	**0.20**
	Soft	0.025	0.20	

Overall Site - Runoff Coefficient Calculation

Area	Surface	Ha	"C"	C_{avg}
Total	Gravel	0.123	0.70	
0.911	Asphalt	0.248	0.90	**0.46**
	Soft	0.540	0.20	

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25mm

DISCIPLINE: CIVIL

TITLE:
PRE-DEVELOPMENT AND POST-DEVELOPMENT CATCHMENT AREAS

SHEET NUMBER: C1.5
SHEET #: 4 OF 5

ISSUE: REVISED PER CITY COMMENTS
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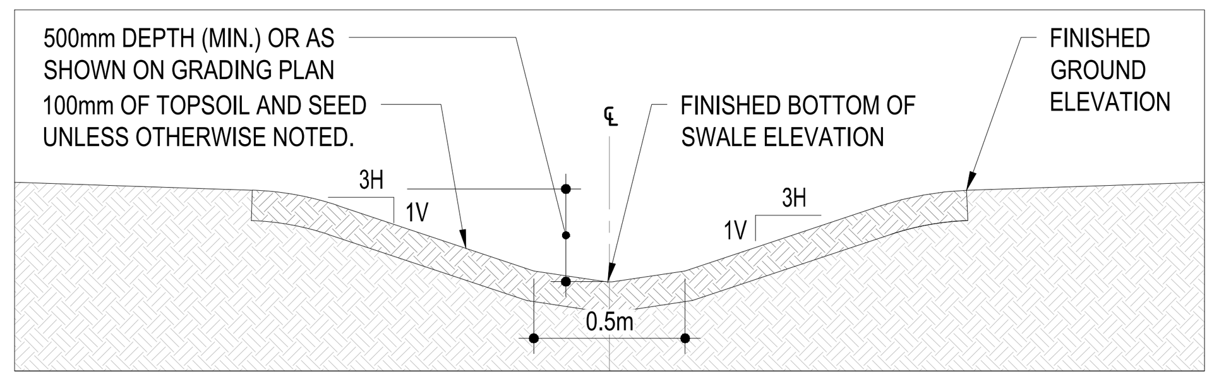

6 C5.1 TYPICAL SWALE DETAIL
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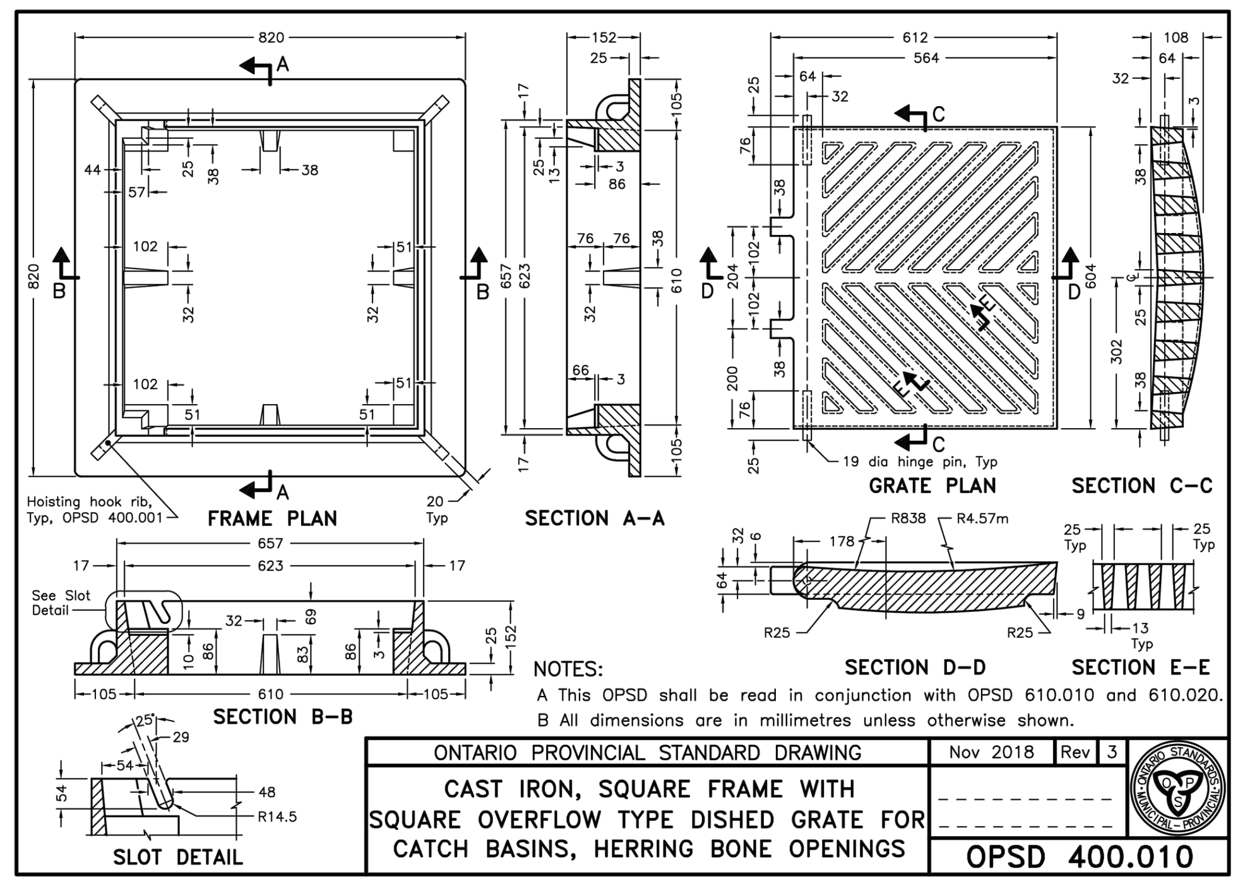

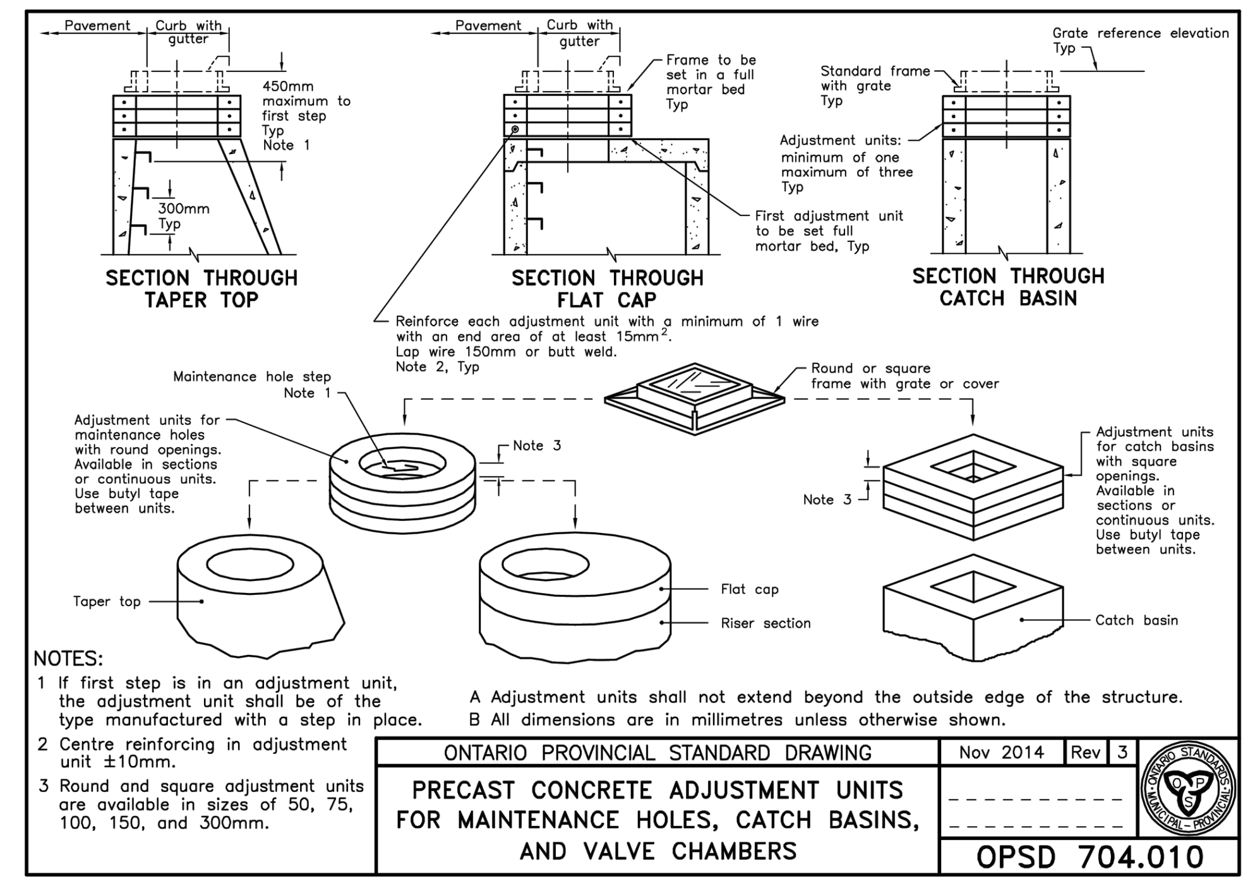

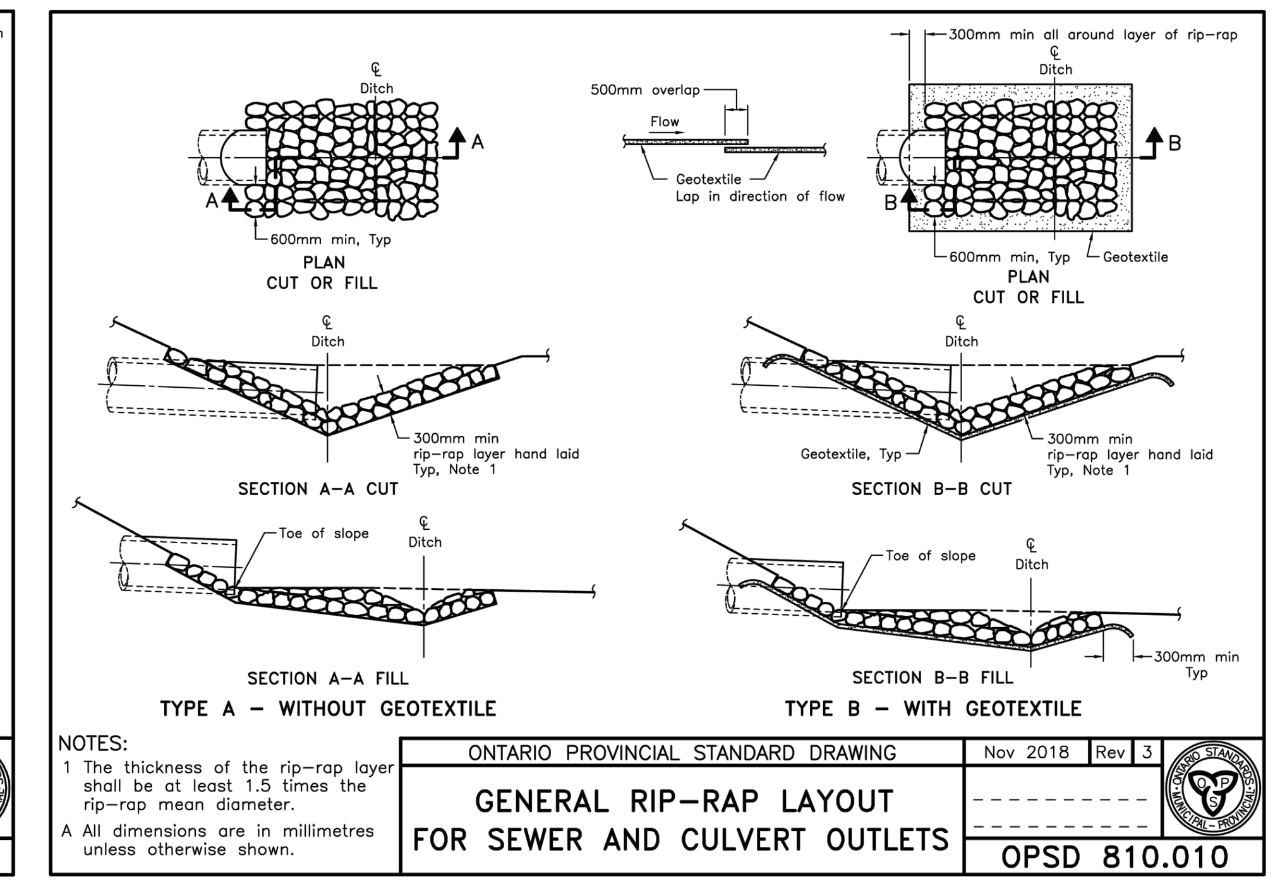

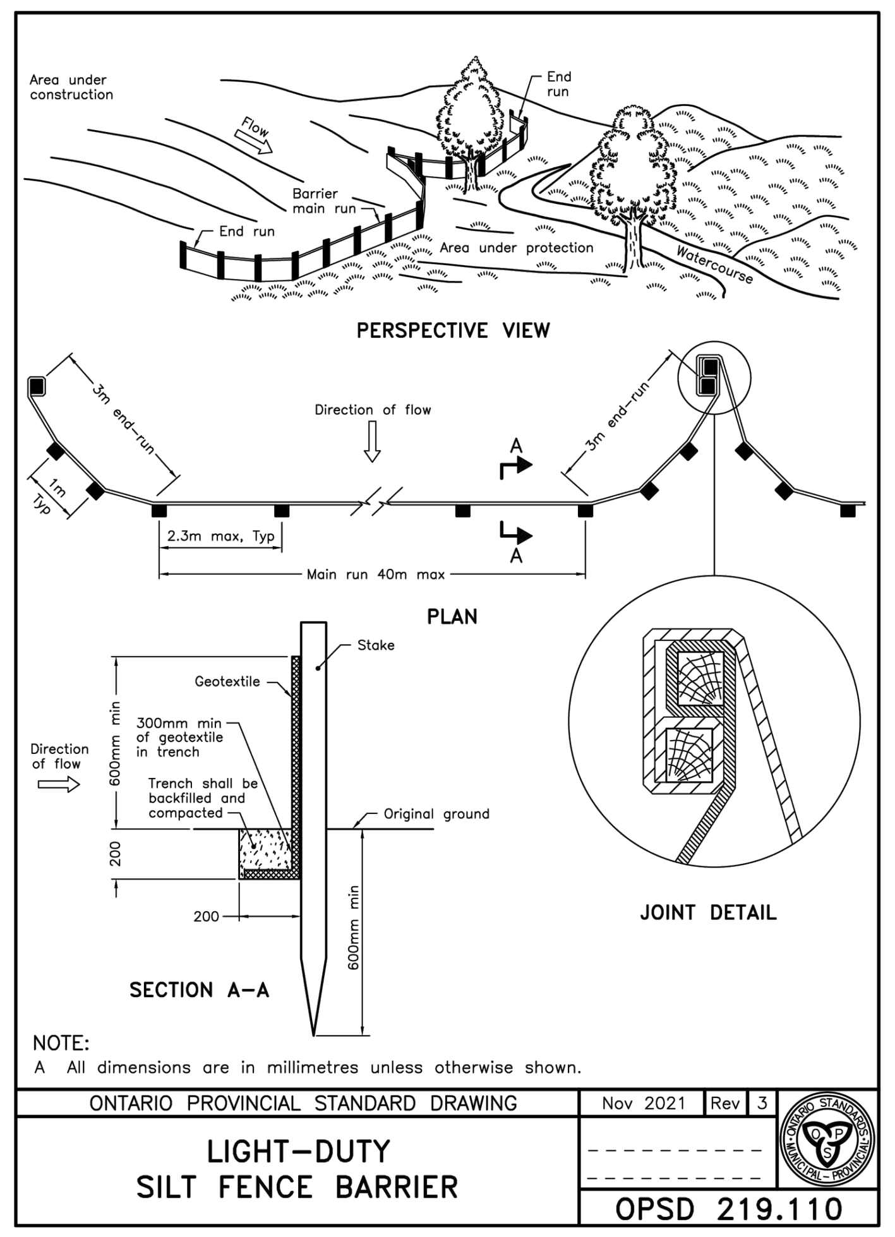

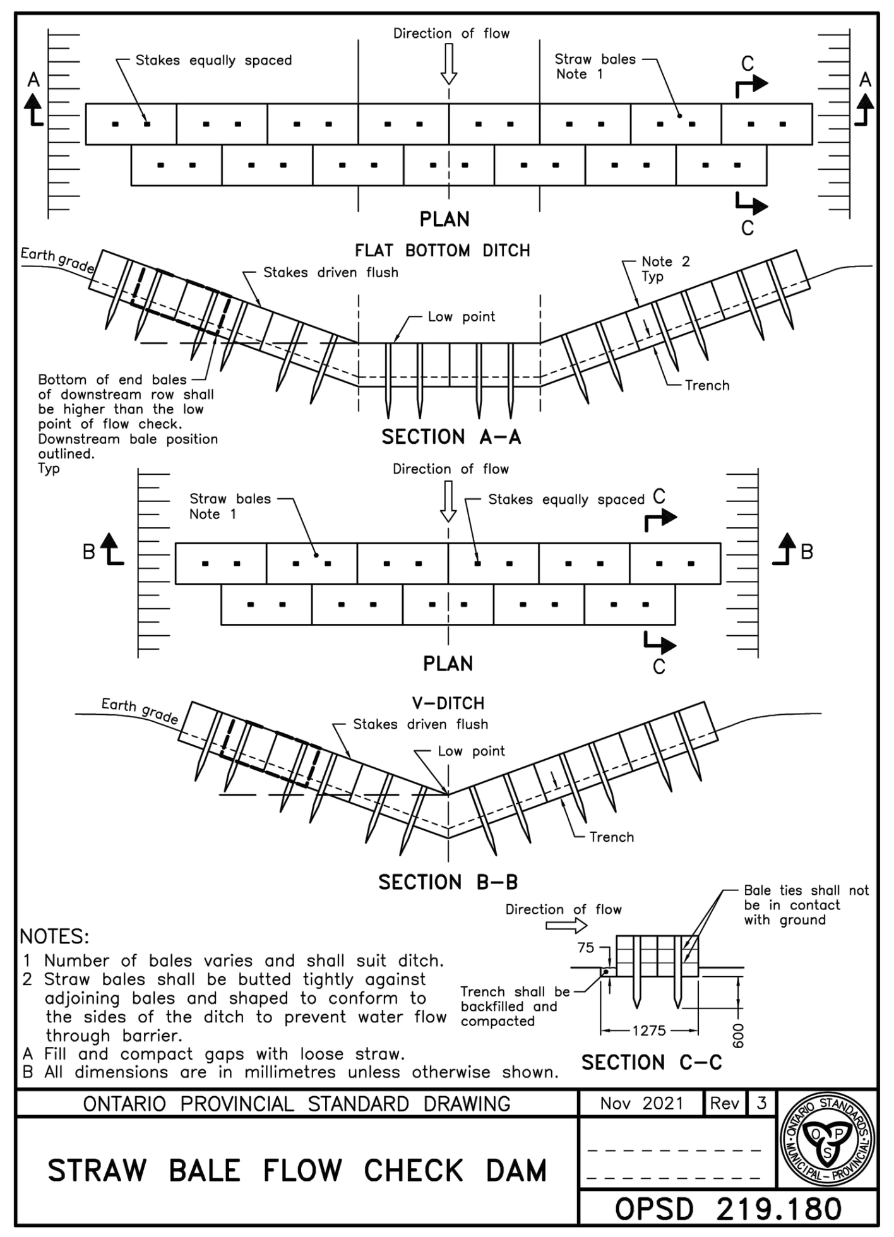

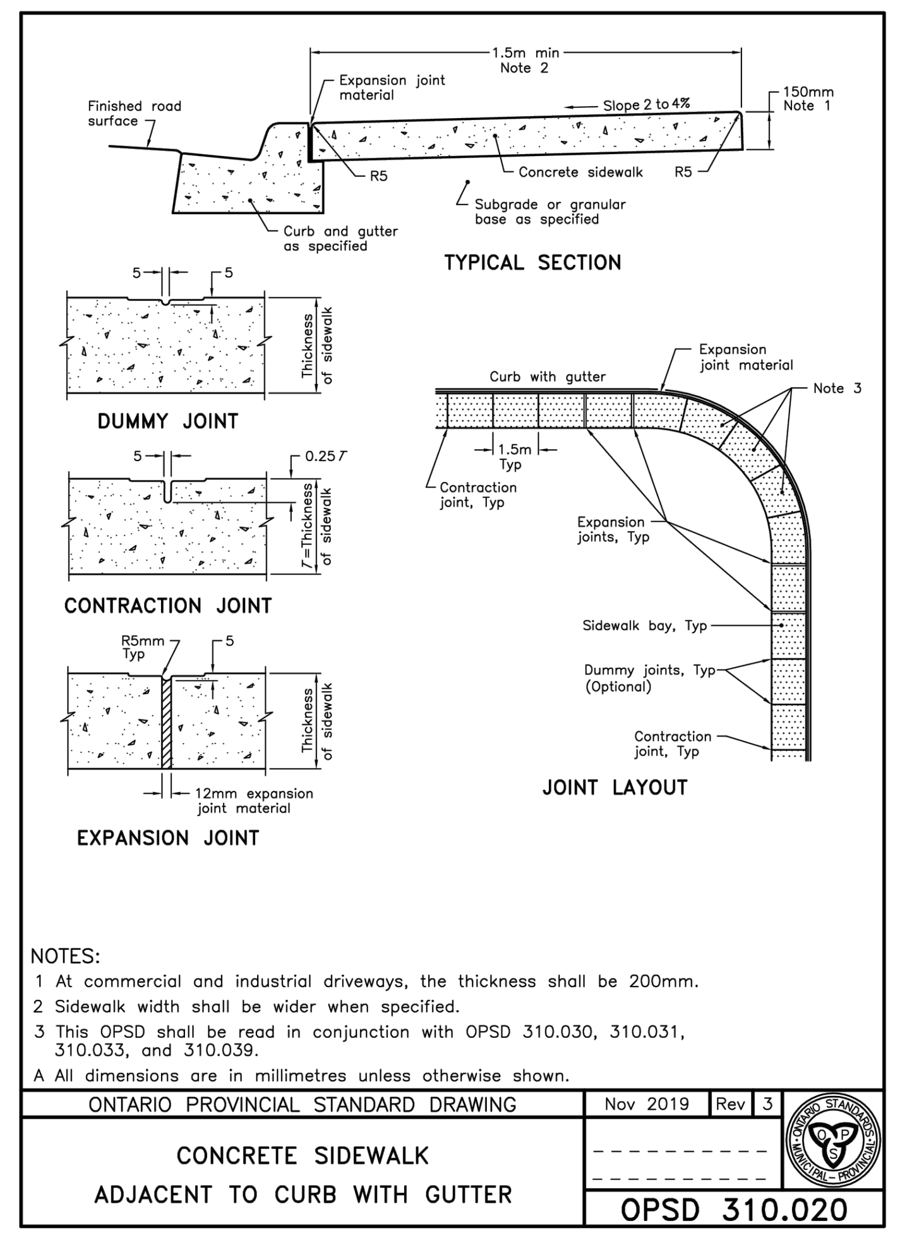

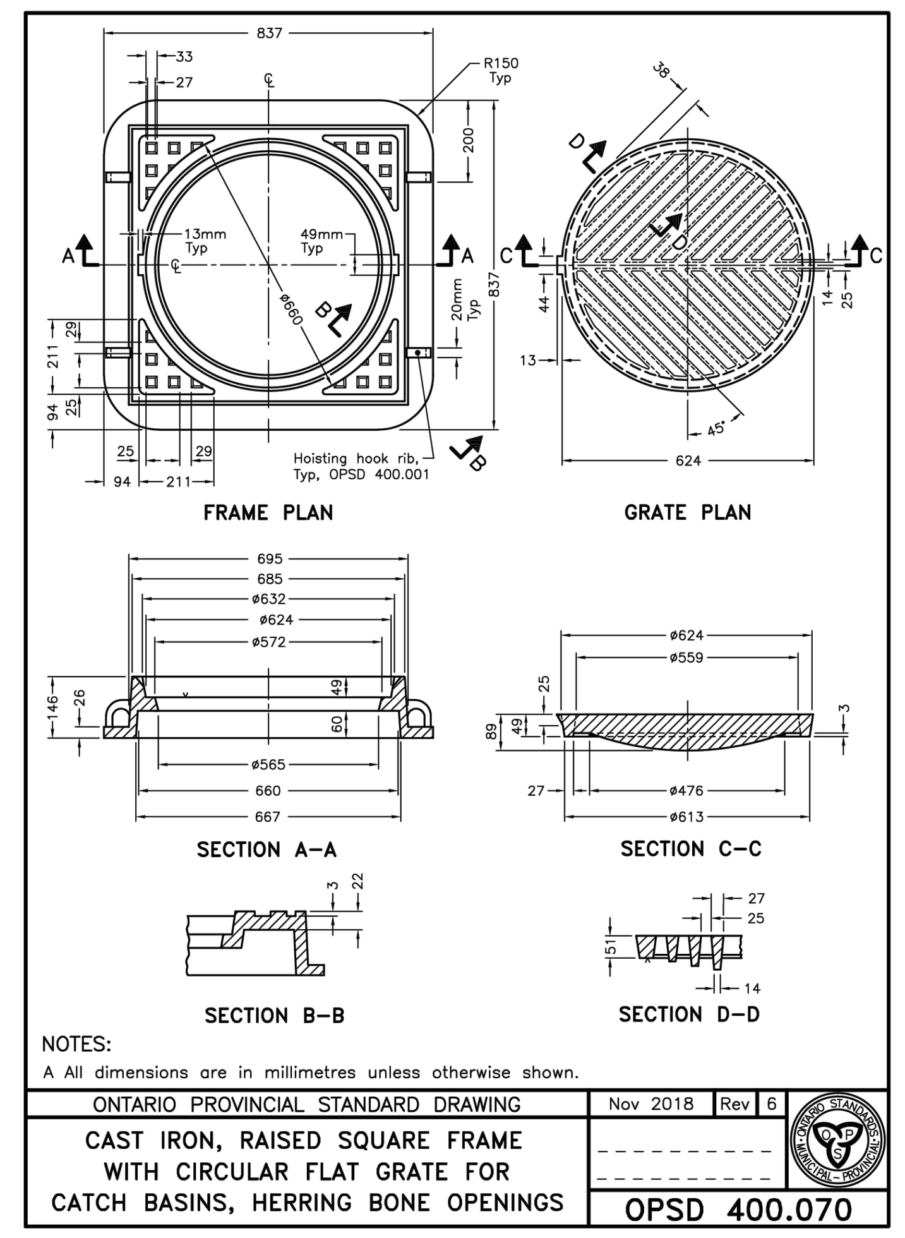

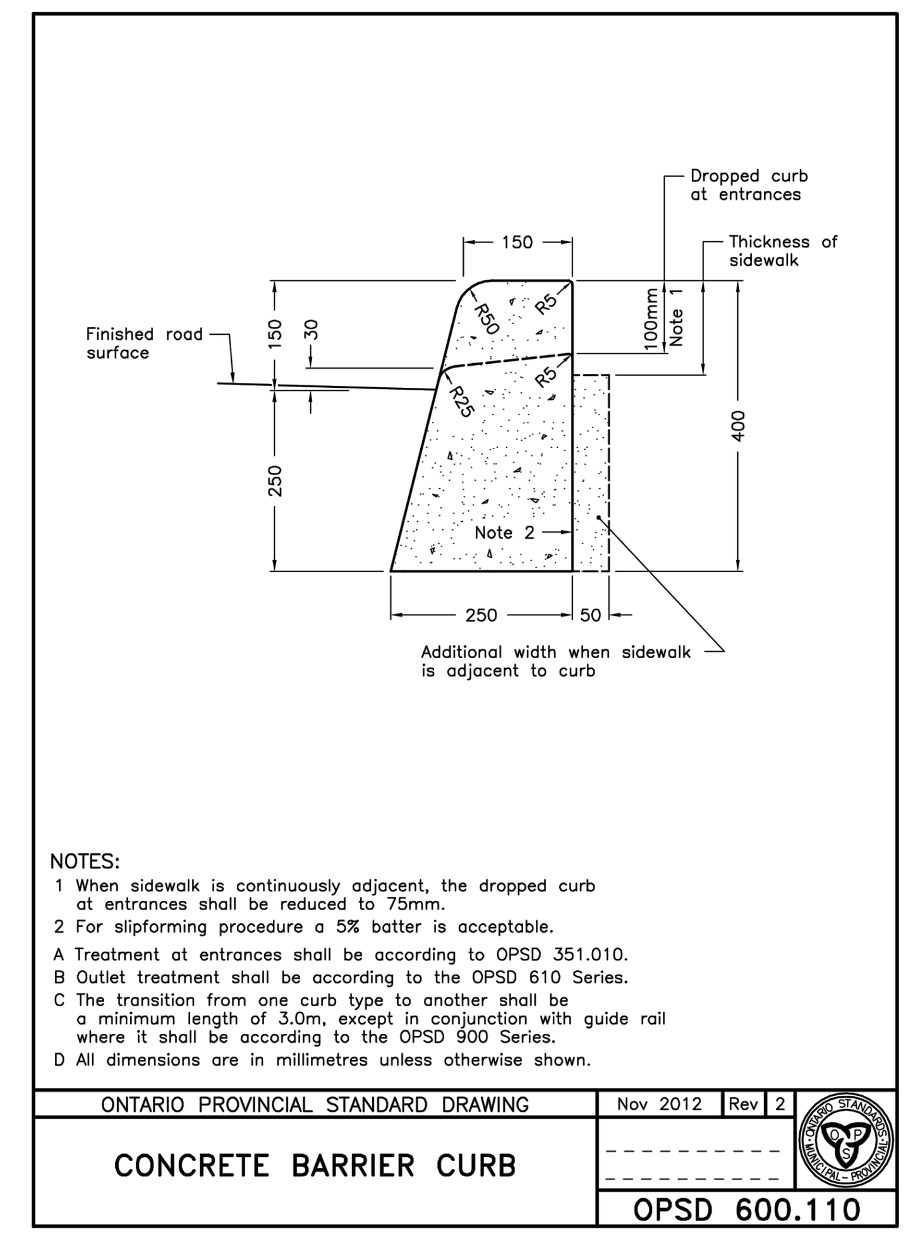

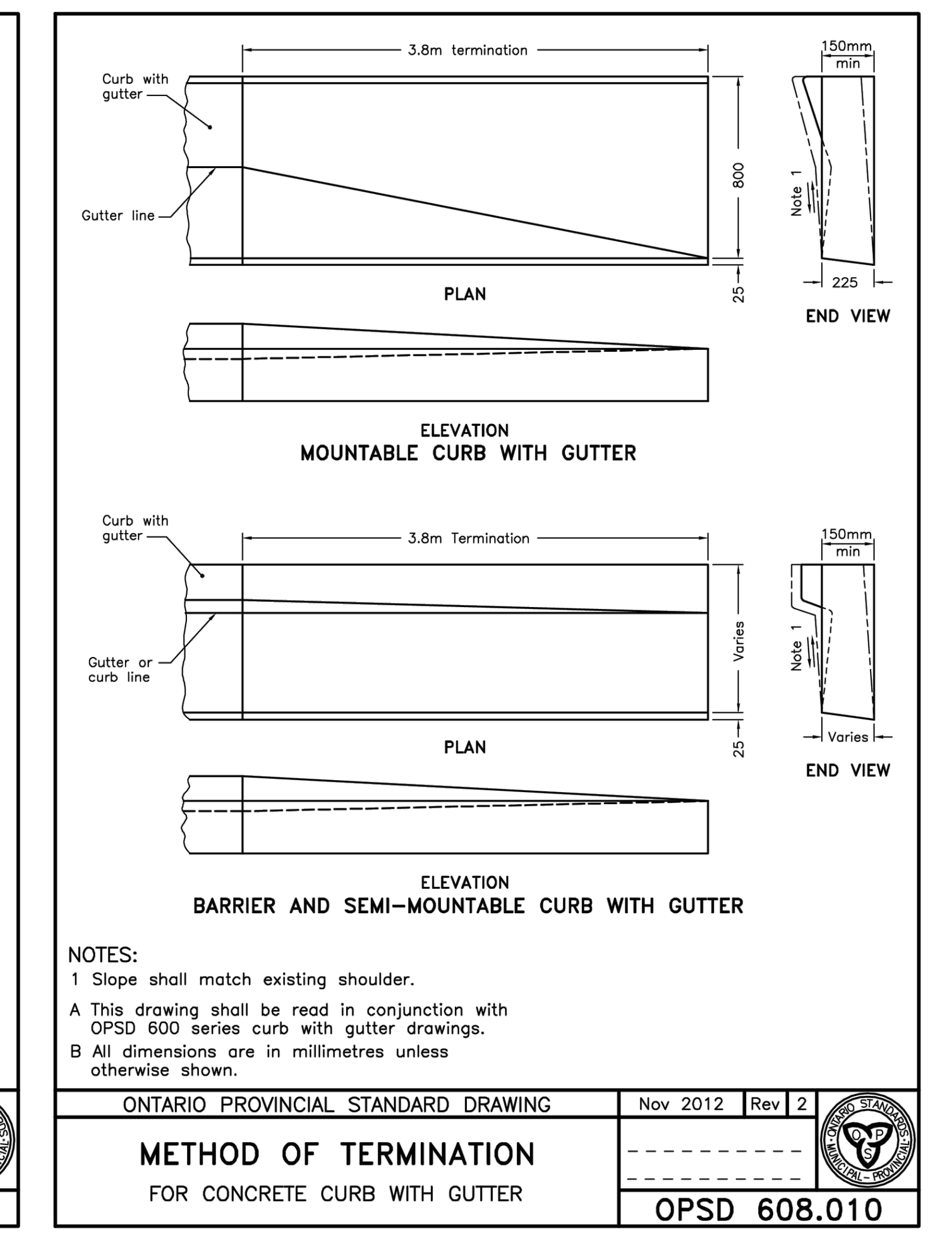

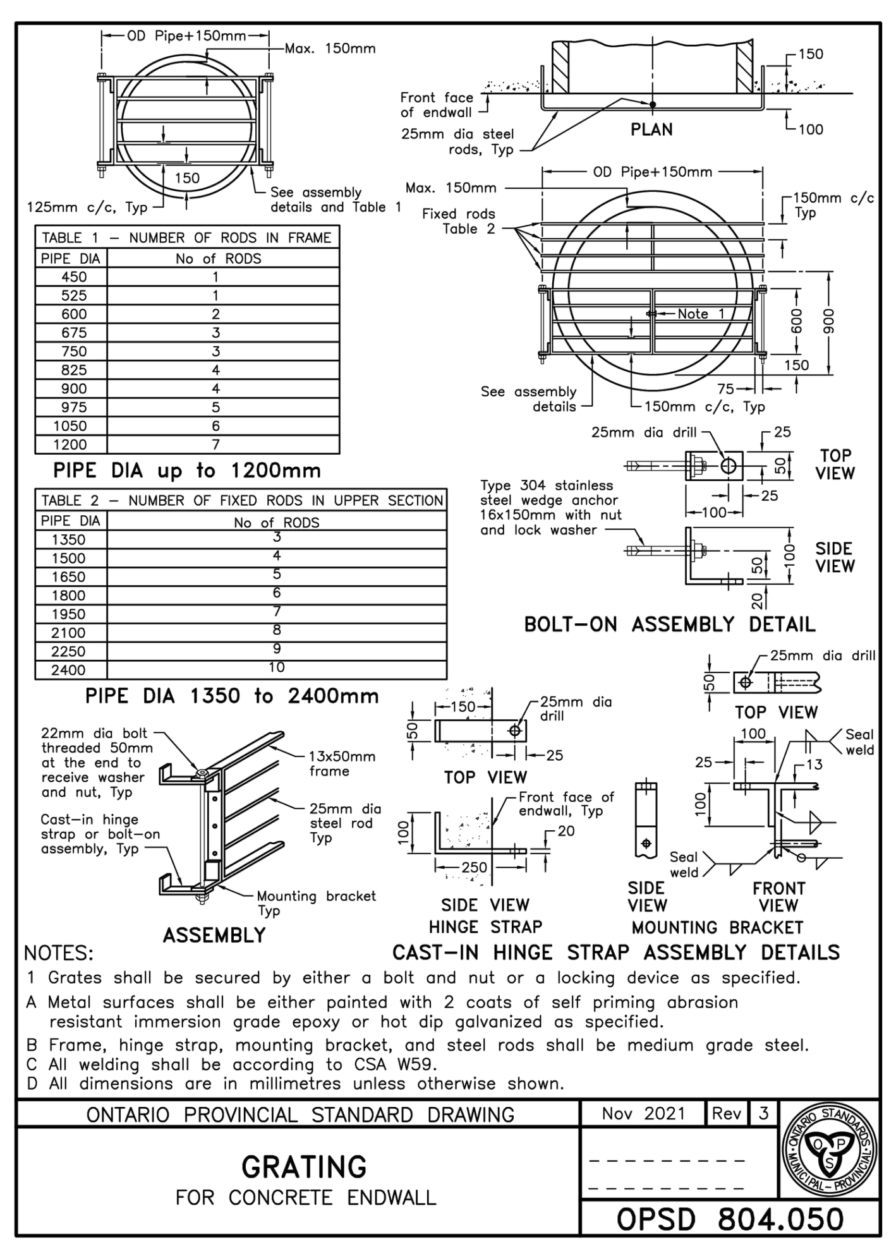

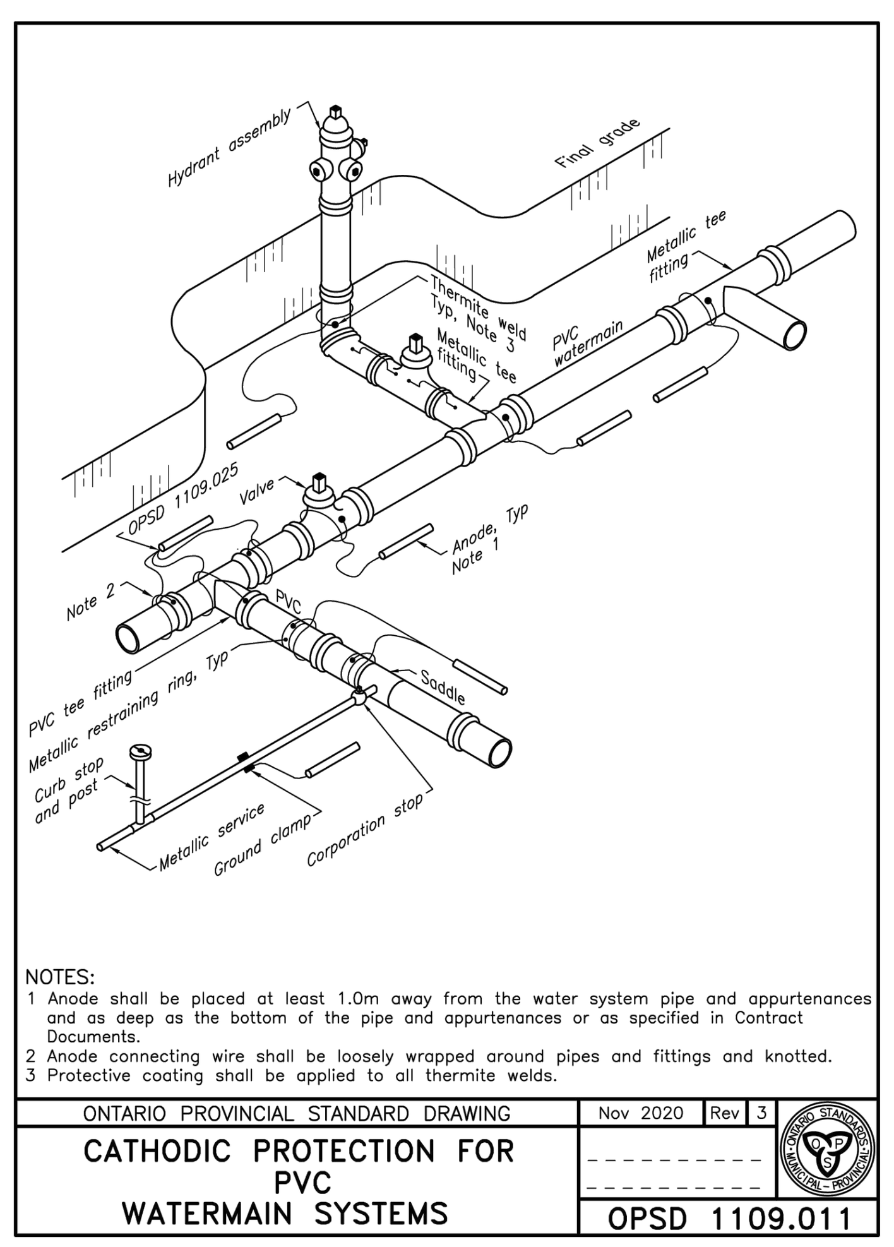

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25mm
DESIGNED BY: IJ/AZ
DRAWN BY: SM/JT
CHECKED BY: IJ

DISCIPLINE: CIVIL

TITLE: DETAILS

SHEET NUMBER: C5.1

SHEET # 6 OF 6

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