

## Stormwater Management Report and Servicing Brief

Benson Auto Parts  
2020 Bantree Street  
Ottawa, Ontario

Prepared for:

Benson Auto Parts  
700 Education Road  
Cornwall, Ontario  
K6H 6B8

Attention: Mr. Marty Benson

LRL File No.: 180357.10

Revised May 12, 2022  
September 27, 2021



## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2</b>	<b>SCOPE OF WORK .....</b>	<b>2</b>
<b>3</b>	<b>WATER SUPPLY AND FIRE PROTECTION.....</b>	<b>2</b>
<b>3.1</b>	<b>Existing Water Supply Services.....</b>	<b>2</b>
<b>3.2</b>	<b>Water Supply Demand.....</b>	<b>2</b>
<b>3.3</b>	<b>Water Supply Servicing Design .....</b>	<b>3</b>
<b>4</b>	<b>SANITARY DRAINAGE.....</b>	<b>3</b>
<b>4.1</b>	<b>Existing Sanitary Sewer Services.....</b>	<b>3</b>
<b>4.2</b>	<b>Sanitary Sewer Servicing Design .....</b>	<b>4</b>
<b>5</b>	<b>STORMWATER MANAGEMENT .....</b>	<b>4</b>
<b>5.1</b>	<b>Existing Stormwater Infrastructure .....</b>	<b>4</b>
<b>5.2</b>	<b>Stormwater Management Concept .....</b>	<b>4</b>
<b>5.3</b>	<b>Design Criteria .....</b>	<b>5</b>
<b>5.3.1</b>	<b>Water Quality.....</b>	<b>5</b>
<b>5.3.2</b>	<b>Water Quantity .....</b>	<b>5</b>
<b>5.4</b>	<b>Method of Analysis .....</b>	<b>5</b>
<b>5.5</b>	<b>Allowable Release Rate .....</b>	<b>5</b>
<b>6</b>	<b>EROSION AND SEDIMENT CONTROL.....</b>	<b>6</b>
<b>7</b>	<b>CONCLUSIONS .....</b>	<b>6</b>
<b>8</b>	<b>LIMITATIONS AND USE OF REPORT .....</b>	<b>7</b>

## LIST OF FIGURES

Figure 1: Aerial View of Proposed Site..... 1

## APPENDICES

- Appendix A Water Demand and Fire Flow Calculations
- Appendix B Sanitary Sewer Calculation Sheet
- Appendix C Stormwater Management Design Sheets
- Appendix D Inlet Control Device (ICD)
- Appendix E Stormceptor Report
- Appendix F Civil Plans
- Appendix G Boundary Conditions

## 1 INTRODUCTION

LRL Associates Ltd. (LRL) has been retained by De Saulniers Construction Ltd. (DSC) on behalf of Benson Auto Parts to prepare a Site Servicing and Stormwater Management Report in support of their Site Plan Control application for a proposed new auto parts building with a building footprint of approximately 1858 m<sup>2</sup>. This report presents the proposed servicing plan for the proposed development regarding water and sanitary services, as well as stormwater management.

The subject property is located within the urban boundary of the City of Ottawa; Ward 18 Alta Vista, in the Industrial Park. As illustrated in Figure 1, the proposed new development will be part of the Benson Auto Parts property, located at 2020 Bantree Street; South of Bantree Street, and East of Edinburgh Place. The site is comprised of an existing auto service building, office and asphalt parking lot. The total area of the property measures approximately 2.043 ha whereas the watershed to be impacted by the proposed new development is 0.96 ha.



**Figure 1: Aerial View of Proposed Site**

The proposed development will include construction of a new building in the East side of property with a footprint area of approximately 1858 m<sup>2</sup>.

This report has been prepared in consideration of the information above and survey carried out by Fairhall, Moffatt & Woodland Ltd. dated August 25<sup>th</sup>, 2021. Should there be any discrepancies in the existing infrastructure and/or connections to existing services, which may relate to site servicing and stormwater management, LRL should be advised to review the report

recommendations. This report should be read in conjunction with the Civil Plans prepared by LRL.

## **2 SCOPE OF WORK**

As per applicable guidelines, the scope of work includes the following:

### **Water Services**

- Calculate the expected water supply demand at average and peak conditions.
- Calculate the fire flow requirements as per the Fire Underwriter Survey (FUS) method.
- Describe the water distribution network.

### **Sanitary Services**

- Calculate the anticipated peak flow from the proposed development.
- Assess the capacity of the proposed sanitary system.

### **Stormwater Management**

- Calculate the allowable stormwater release rate.
- Calculate the anticipated post-development stormwater release rates.
- Demonstrate how the target quality and quantity control objectives will be achieved.

## **3 WATER SUPPLY AND FIRE PROTECTION**

### **3.1 Existing Water Supply Services**

The site is currently being serviced by a 150 mm dia. water service that is connected to the existing 300 mm dia. watermain extending along Bantree Street. There are three existing fire hydrants nearby: (i) North of the site on Bantree Street, (ii) Northeast of the site on Bantree Street and (iii) on-site hydrant on the inside of the site's West property line off Edinburgh Place. See Appendix A for the location of fire hydrants surrounding the site.

### **3.2 Water Supply Demand**

The water supply demands were calculated using the Ontario Building Code (OBC) and the City of Ottawa Design Guidelines. The demands were calculated only for the proposed new building. The average daily water demand was calculated to 1.67 L/s. A daily and hourly peak factor of 1.5 and 1.8 were applied; resulting in a maximum daily demand of 2.5 L/s, and a maximum hourly demand of 4.5 L/s. Refer to Appendix A for the water demand calculation sheet.

The fire flow demand was estimated in accordance with the Fire Underwriters Survey (FUS). This method is based on the floor area of the building to be protected, type and combustibility of



the structural frame and the separation distances with adjoining buildings. The fire flow demand was calculated to be 150.0 L/s. Refer to Appendix A for the fire flow calculation sheet.

The City of Ottawa has provided boundary conditions to LRL for this project. Refer to Appendix G for the boundary conditions. The HGL provided (minimum, maximum and maximum day + fire flow pressures at the Bantree Street connection) correspond to a pressures of 430.17 kPa (62.39 psi), 516.50 (74.91 psi) and 371.31 kPa (53.85 psi) which show that adequate water supply/pressure is available and meets the City of Ottawa standards as per Section 4.2.2 of the Ottawa Design Guidelines – water distribution. Since the maximum pressure is less than 80 psi, a pressure reducing valve is not required.

Summary Table	
Average Water Demand	144,017 L/day
Total Fixture Units	32
Peak Factors	1.5 (max daily) & 1.8(max hourly)
Average Daily Demand	1.67 L/s
Maximum Daily Demand	2.5 L/s
Peak Hourly Demand	4.5 L/s
FUS Fire Flow Requirement	150 L/s
Maximum Daily + Fire Flow	152.5 L/s

### 3.3 Water Supply Servicing Design

The proposed building will be serviced by a new 150mm dia. PVC watermain to be connected to the existing watermain on Bantree Street. Since the proposed water demand exceeds 50 m<sup>3</sup>/day, to ensure redundancy, the proposed distribution network is looped inside the property via a connection to the existing watermain in the west.

Fire flow protection is to be provided by the proposed sprinkler system, along with the existing fire hydrants in proximity and a proposed new on-site fire hydrant to be located at 32.2 m from the building's Siamese connection.

## 4 SANITARY DRAINAGE

### 4.1 Existing Sanitary Sewer Services

The site is currently being serviced by a 150mm dia. PVC sanitary sewer, located north of the existing building. The sewage is then conveyed easterly through a 300mm dia. sanitary sewer on Bantree Street which eventually reaches the Robert O. Pickard Environmental Centre located at 800 Greens Creek Drive in Gloucester.

## 4.2 Sanitary Sewer Servicing Design

The proposed new building will be serviced by a new 150 mm dia. PVC sanitary sewer to be connected to the existing 300 mm dia. sanitary sewer on Bantree Street.

The parameters used to calculate the site's allowable sanitary flows are: Heavy industrial flow demand of 55,000 L/ha/day, an industrial peaking factor of 4.25 and a total infiltration rate of 0.33 L/s/ha. Based on these parameters and the total site area of 0.96 ha (impacted by new building construction), the total allowable sanitary flow was estimated to be 2.91 L/s. Refer to Appendix B for the sanitary sewer design sheet. The capacity of existing sanitary sewer (300 mm dia., ~0.2% slope) along Bantree Street is calculated at 43.25 L/s. Therefore, the anticipated increase in total wastewater flow in post-development condition is 6.73% of the total capacity, the City is to confirm available capacity.

## 5 STORMWATER MANAGEMENT

### 5.1 Existing Stormwater Infrastructure

The information below should be read in conjunction with LRL drawing C701. Most of the stormwater runoff from EWS-01 appears to flow (uncontrolled) overland to the Southeast corner of the property, and some runoff from EWS-02 appears to flow (uncontrolled) overland onto the Bantree Street in the North.

### 5.2 Stormwater Management Concept

The information below should be read in conjunction with LRL drawings C401, C601, C701, C702 and Appendix C (Stormwater Management Design Sheets). The pervious and impervious runoff coefficients have been increased by 25% for the 100-year event; as per the Ottawa Sewer Design Guidelines.

The pre-development 5-year allowable release rate has been calculated using a C coefficient of 0.5, a time of concentration of 10 minutes as per City of Ottawa guidelines, and a calculated intensity of 104.2 mm/hr for an impacted site area of 0.96 ha. The allowable release rate was calculated to be 138.99 L/s.

The post-development conditions (100-year storm event) were designed using a restricted release flow of 129.91 L/s. The proposed storm system will restrict the flow using an Inlet Control Device (ICD) installed at CBMH04 outlet. During a major storm event (100-year), the ICD will not release more than 129.91 L/s (allowable flow).

As mentioned above, the 100-year storm runoff (from the proposed catchment areas WS-01, WS-02, WS-03 and WS-04) will be controlled at the proposed CBMH04. Runoff above the 100-year storm will back out of the proposed CBMHs and pond around each drainage structure until

it flows overland, making its way to Bantree Street. Stormwater from the 5-year storm event will always remain contained.

The 100-year storage required for this site is 221.02 m<sup>3</sup>. The 100-year storage provided is 229.92 m<sup>3</sup> which is a combination of the overland ponding storage around CBMH01, CBMH03 and CBMH04. Refer to LRL drawing C601 for 5-year and 100-year surface storage.

### **5.3 Design Criteria**

The stormwater quantity control measure will take into account reduction of post-development stormwater runoff to an allowable pre-development level whereas the quality control objective will be met by installing an on-site water quality treatment unit.

Since this is an industrial zone development, it is anticipated that an Environmental Compliance Approval (ECA) is required from the Ministry of the Environment, Conservation and Parks (MECP) for the proposed stormwater management works.

#### **5.3.1 Water Quality**

A Stormceptor EFO6 oil/grit separator (OGS) is proposed as a part of this design. This unit will provide water quality treatment and meets RVCA's minimum requirement of 80% TSS removals. Refer to Appendix E for further details regarding the proposed treatment unit.

#### **5.3.2 Water Quantity**

All storm events up to and including the 100-year event will be controlled to the 5-year pre-development level. The site's major overland flow route has been designed to ensure that storm events beyond the 100-year design storm can be safely conveyed overland towards the Bantree Street right-of-way. The storm sewer within the site is sized to convey the 5-year storm event flows from the site to the municipal storm sewer on Bantree Street. Refer to Appendix C for the Storm Sewer Design Sheet.

### **5.4 Method of Analysis**

The modified Rational Method was used to calculate the runoff from the proposed development. The Intensity-Duration-Frequency (IDF) curve equations for the MacDonald Cartier International Airport, City of Ottawa, were used to calculate the peak flows.

### **5.5 Allowable Release Rate**

The pre-development 5-year allowable release rate has been calculated using a runoff coefficient (C) of 0.5, a time of concentration of 10 minutes as per City of Ottawa guidelines, and a calculated intensity of 104.2 mm/hr for a total site area of 0.96 ha impacted by the proposed

new development. The allowable release rate was calculated to be 138.99 L/s (controlled flow 129.91 L/s + uncontrolled flow 9.08 L/s).

## **6 EROSION AND SEDIMENT CONTROL**

During construction, erosion and sediment controls will be provided primarily via a sediment control fence to be erected along the perimeter of the site where runoff has the potential of leaving the site. Inlet sediment control devices are also to be provided in any catch basin and/or manhole in and around the site that may be impacted by the site during construction. Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification (OPSS). Refer to LRL drawing C101 for erosion and sediment control details.

## **7 CONCLUSIONS**

In accordance with the report objectives, the analyses of the proposed development can be summarized as follows:

### **Water Service**

- The anticipated maximum hourly water demand for this site is 4.50 L/s.
- The maximum required fire flow is calculated at 150.00 L/s using the FUS method.
- For fire protection, one (1) on-site fire hydrant is proposed. Additionally, there are three (3) fire hydrants surrounding the subject site.
- The site will be serviced by a 150 mm dia. PVC water servicing to be connected to the existing watermain along Bantree Street.

### **Sanitary Service**

- The total anticipated sanitary peak design flow is estimated to be 2.91 L/s.
- The site will be serviced by a 150 mm dia. PVC sanitary sewer to be connected to the existing sanitary sewer along Bantree Street.

### **Stormwater Management**

- The 5-year and 100-year post-development stormwater runoff will be controlled to the 5-year pre-development level.
- Stormwater quantity control objectives will be met through on-site stormwater surface storage.
- Stormwater quality control objectives will be met using an on-site treatment unit (Stormceptor EFO6 oil/grit separator or approved equivalent).



## 8 LIMITATIONS AND USE OF REPORT

The report conclusions are applicable only to the project described in this report. Any changes require a review by LRL Associates Ltd. to ensure the compatibility with the recommendations contained in this report.

We trust that the information presented in this report meets your current requirements. Please do not hesitate to contact us should you have any questions or concerns.

Prepared by:

**LRL Associates Ltd.**



Maxime Longtin  
*Civil Engineering Technologist*



Mohan Basnet, P.Eng.  
*Civil Engineer*



## **Pre-Consultation Checklist**

# Development Review – Pre-application consultation Checklist (Municipal Servicing)

Date: 2019-Dec-10

Site Location: 2020 Bantree Street

Type of Development:  Residential ( townhomes,  stacked,  singles,  apartments),  
 Office Space,  Commercial,  Retail,  Institutional,  Industrial,  
Other: N/A

Owner/Agent: De Saulniers Constructions Ltd.

Assigned Planner: Sarah Ezzio

---

## Infrastructure Information – advise applicant/owner that all existing and proposed utilities (municipal pipes) must be shown on the servicing plans

### Water:

District Plan No. 2W2C

Connection point: 305mm DI watermain on Bantree Street.



## Development Review – Pre-application consultation Checklist (Municipal Servicing)

Sanitary Sewers (size and location of connection): 300mm concrete sanitary sewer on Bantree Street



Is a monitoring manhole required on private property?  Yes  No

# Development Review – Pre-application consultation Checklist (Municipal Servicing)

**Storm Sewers:** 1500mm concrete storm sewer on Bantree Street



## Storm Water Management:

### a) Quality Control:

- 80% TSS Removal

### b) Quantity Control:

- Design storm for receiving sewer: 5-year design storm
- Runoff coefficient (C): C=0.5 or C=pre-development, whichever is less
- Time of concentration (Tc): To be calculated, min Tc=10mins
- Allowable flow rate: Control the 100-year event to 5-year event

Submission documents must address/discuss:

- Boundary conditions (civil consultant must request boundary conditions from the City's assigned Project Manager, Development Review)

## **Development Review – Pre-application consultation Checklist (Municipal Servicing)**

- Water boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide all the following information:
  - Location of service
  - Type of development and the amount of fire flow required (as per FUS, 1999).
  - Average daily demand: \_\_\_\_ l/s.
  - Maximum daily demand: \_\_\_\_ l/s.
  - Maximum hourly daily demand: \_\_\_\_ l/s.
- Fire protection (Fire demand, Hydrant Locations)
- a water meter sizing questionnaire [water card] will have to be completed prior to receiving a water permit (water card will be provided post approval)
- a construction management plan is required if crossing 400mm Ø watermain during construction
  - The temporary watermain support shall be as per City of Ottawa Standards, where applicable. A structural support detail drawing prepared by a Structural Engineer licensed in the Province of Ontario is required in all other cases.
  - The permanent support detail drawing shall be provided.
  - Backfill detail drawing shall be provided.
  - Watermain isolation valve locations shall be provided.
  - The operation status of the watermain must be specified (i.e. operational, throttled, or shutdown). The proposed throttle or shutdown of the watermain shall provide reasoning and approved on exceptional basis only.
  - Note: The proposed design detail will be coordinated with the Water Distribution Branch for comment.

### *Ministry of Environment, Conservation and Parks (MECP)*

All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

- a. Consultant determines if an approval for sewage works under Section 53 of OWRA is required. Consultant determines what type of application is required and the City's project manager confirms. (If the consultant is not clear if an ECA is required, they will work with the City to determine what is required. If unclear or there is a difference of opinion the City Project Manager will coordinate requirements with MECP).
- b. The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
- c. Pre-consultation is not required if applying for standard or additional works (schedule A of the Agreement) under Transfer Review.
- d. Pre-consultation with local District office of MECP is recommended for direct submission.
- e. Consultant completes an MECP request form for a pre-consultation. Sends request to [moeccottawasewage@ontario.ca](mailto:moeccottawasewage@ontario.ca).

### **NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent**

Are there are Capital Works Projects scheduled that will impact the application?  Yes

No

**Exterior Site Lighting:**  Yes  No

If yes, require certification by a licensed professional engineer confirming the design complies with the following:

The location of the fixtures, fixture type (make, model, part number and the mounting height) must be shown on one of the approved plans.

1. Lighting must be designed only using fixtures that meet the criteria for Full Cut-off classification, as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and
2. It must result in minimal light spillage onto adjacent properties. As a guideline, 0.5 foot-candle is normally the maximum allowable spillage.

***Refer to following table for the list of required supporting plans and studies required for the infrastructure component of your submission.***

## Legend:

The letter **S** indicates that the study or plan is required with application submission.

The letter **M** indicates that the study or plan may be required with application submission.

For information on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

		ENGINEERING			
S/A	Number of copies			S/A	Number of copies
<b>S</b>	2	1. Site Servicing Plan	2. Site Servicing Study / Brief	<b>S</b>	2
<b>S</b>	2	3. Grade Control and Drainage Plan	4. Geotechnical Study	<b>S</b>	2
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	<b>S</b>	2
<b>S</b>	2	11. Storm water Management Report / Brief	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise Study	<b>S</b>	2
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

### SITE PLAN APPLICATION – MUNICIPAL SERVICING REQUIRED ENGINEERING STUDIES AND ASSESSMENTS

---

**Notes:**

4. Geotechnical Study / Slope Stability Study – required as per Official Plan section 4.8.3. All site plan applications need to demonstrate the soils are suitable for development. A Slope Stability Study may be required with unique circumstances (Schedule K or topography may define slope stability concerns).

10. Erosion and Sediment Control Plan – required with all site plan applications as per Official Plan section 4.7.3.

11. Stormwater Management Report/Brief - required with all site plan applications as per Official Plan section 4.7.6.

14. Noise and Vibration Study – a Noise Study will be required if the noise sensitive development is proposed within 250 metres of an existing or proposed highway or a railway right-of-way, or 100 metres of an arterial or collector roadway or rapid-transit corridor. A Vibration Study will be required if the proposed development is within 75 metres of either an existing or proposed railway ROW. A Noise Study may also be required if the proposed development is adjacent to an existing or proposed stationary noise source..

35. An Impact Assessment of an Adjacent Waste Disposal/Former Landfill Site study is required for development proposals within 500 metres of a solid waste disposal site or other appropriate influence area or former landfill site. For contaminated sites a Record of Site Condition or letter of continued use is required.

39.A Mineral Resource Impact Assessment study is required, as per Official Plan section 3.7.4 adjacent to an unlicensed Limestone Resource or Sand and Gravel Resource Area (very limited uses considered within 500 metres of Limestone Resource Area or 300 metres of Sand and Gravel Resource Area). A study is required

- adjacent to, or within 300 metres of, a licensed pit
- adjacent to, or within 500 metres of, a licensed quarry

## **APPENDIX A**

### **Water Demand and Fire Flow Calculations**



## Water Service Calculations

LRL File No.: 180357

Project: 2020 Bantree St., Ottawa, ON

Date: February 26, 2020

Designed: M. Basnet

Checked: V. Johnson

### Water Demand

Fixtures	Qty.	Fixture Units/Fixture (OBC Table 7.6.3.2.A)	Total
Water closets	4	5	20
Lavatories	6	2	12
<b>Total fixture units</b>			<b>32</b>

Conversion of fixture units to equivalent gpm = 22 gpm (as per PS&D)

Average water demand = 144017.3 L / day  
= **1.67** L/s

Maximum daily peak factor = 1.5  
Maximum daily demand = 216026 L / day  
= **2.50** L/s

Maximum hour peak factor = 1.8  
Maximum hour demand = 388847 L / day  
= **4.50** L/s



### Fire Flow Calculations

LRL File No. : 180357

Project : 2020 Bantree St., Ottawa, ON

Date : February 26, 2020

Method : Fire Underwriters Survey (FUS), 1999

Designed: M. Basnet

Checked: V. Johnson

Step	Task	Term	Options	Multiplier	Choose	Value	Fire Flow	unit		
<b>Type of Construction</b>										
1	Choose frame used for building	Coefficient C related to the type of construction	Wood frame construction (combustible)	1.5						
			Ordinary construction	1.0	Ordinary construction	1				
			Non-combustible construction	0.8						
			Fire resistive construction	0.6						
<b>Floor Space Area</b>										
2	Choose type of housing	Type of housing	Single family dwelling	0	Building - no. of units per floor	1				
			Townhouse - no. of units	0						
			Building - no. of units per floor	1						
3	Enter area of a unit	Enter floor space area of one unit (excluding basement)		1	1858.00			sq.m.		
4	<b>Determine required fire flow (F) to the nearest 1000 L/min, <math>F = 220 \times C \times A^{0.5}</math></b>						9,000	L/min		
<b>Reductions or Surcharge due to Occupancies</b>										
5	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-0.25						
			Limited combustible	-0.15						
			Combustible	0	Combustible	0	9,000	L/min		
			Free burning	0.15						
			Rapid burning	0.25						
6	Choose reduction for sprinklers	Sprinkler reduction	Sprinklers (NFPA13)	-0.30	True	-0.3	-2700	L/min		
			Water supply is standard for both the system and fire department hose lines	-0.10	False	0				
			Fully supervised system	-0.10	False	0				
7	Choose separation	Exposure distance between units	North side	Over 45m	0	0.3	2700	L/min		
			East side	10.1 to 20m	0.15					
			South side	20.1 to 30m	0.10					
			West side	30.1 to 45m	0.05					
<b>Net Required Fire Flow</b>										
8	Obtain fire flow and duration		Minimum required fire flow rate (rounded to nearest 1000)				9,000	L/min		
			Minimum required fire flow rate				150	L/s		
			Required duration of fire flow				2	hr		

**Note:** The above calculations take into account only for the proposed new building



PROJECT

SITE PLAN CONTROL-AUTO PARTS BUILDING  
2020 BANTREE ST, OTTAWA, ON

**LRJ**

ENGINEERING | INGÉNIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2  
www.lrl.ca | (613) 842-3434

DRAWING TITLE

FIRE HYDRANT LOCATION

CLIENT

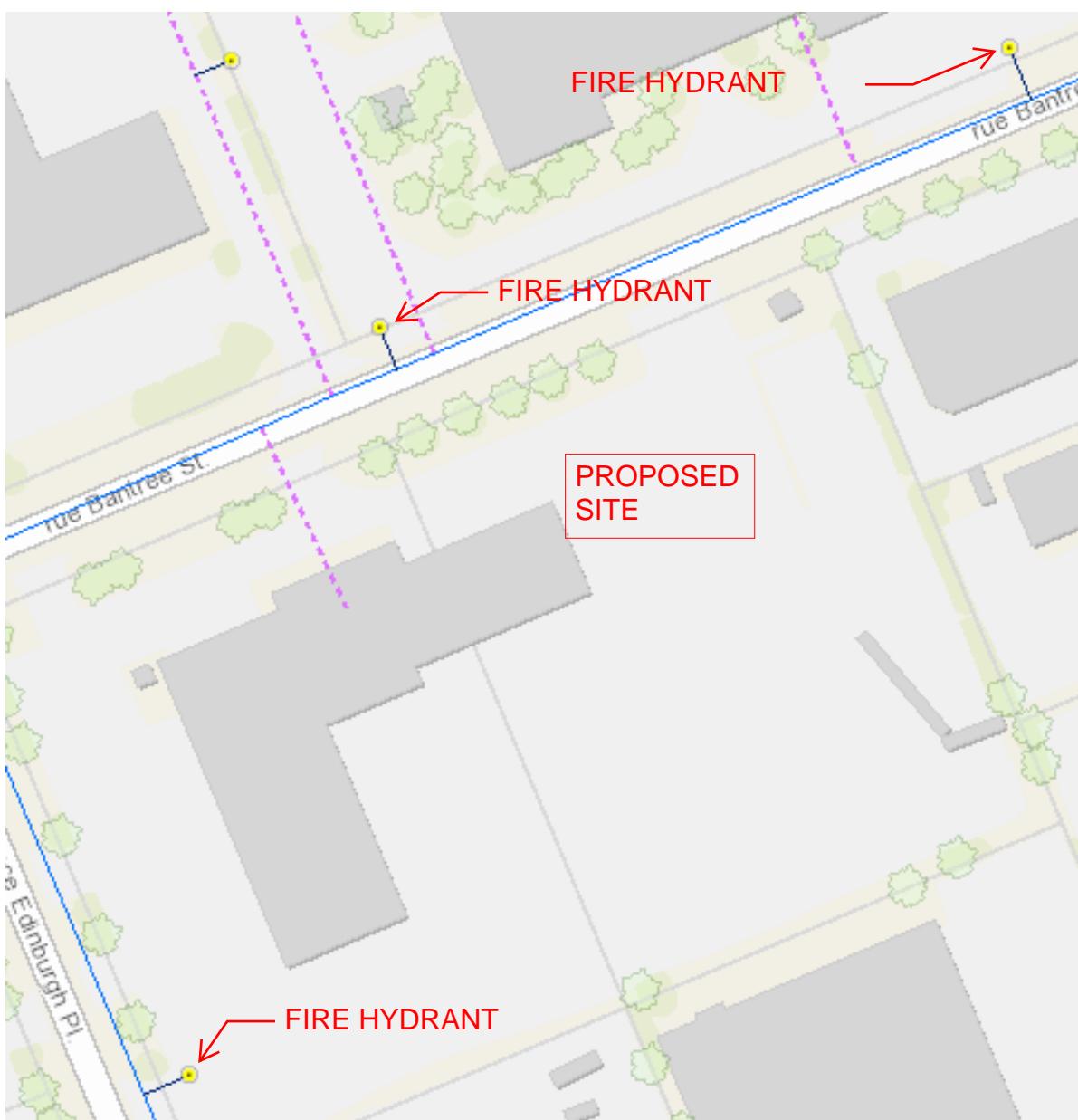
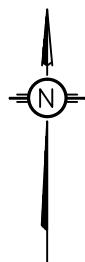
DE SAULNIERS CONSTRUCTION LTD.

DATE

MAY 11, 2020

PROJECT

180357



SCALE : N.T.S.

## **APPENDIX B**

### **Sanitary Calculations**

**LRL Associates Ltd.**  
Sanitary Design Sheet



**LRL File No.:** 180357  
**Project:** Site Plan Control-Auto Parts Building  
**Location:** 2020 Bantree St., Ottawa, ON  
**Date:** 2021-06-21  
**Designed:** M. Basnet  
**Drawing Reference:** C401

**Design Parameters**

Average Daily Flow = 280 L/capita/day	Extraneous Flow = 0.33 L/s/ha
Commercial & Institutional Flow = 28000 L/ha/day	Manning's Coefficient (n) = 0.013
Light Industrial Flow = 35000 L/ha/day	Minimum Velocity = 0.6
Heavy Industrial Flow = 55000 L/ha/day	Maximum Velocity = 3.0
Maximum Residential Peak Factor = 4.0	
Commercial & Institutional Peak Factor = 1.5	
Industrial Peak Factor = as per Appendix 4-B	

Location			Residential				Commercial			Industrial			Institutional		C+I+I	Infiltration			Pipe						
Street/Site	From M.H.	To M.H.	Area (ha)	Pop.	Accu. Area (ha)	Pop.	Peak Factor	Peak Flow (L/s)	Area (ha)	Accu. Area (ha)	Area (ha)	Accu. Area (ha)	Peak Factor	Area (ha)	Accu. Area (ha)	Peak Flow (L/s)	Total Area (ha)	Accu. Area (ha)	Infilt. Flow (L/s)	Total Flow (L/s)	Length (m)	Dia. (mm)	Slope (%)	Full Capacity (L/s)	Velocity (Full) (m/s)
Site	BLDG	SAN MH01								0.960	0.960	4.25			2.60	0.960	0.960	0.32	2.91	15.1	150	2.00%	21.54	1.2	
Site/Street	SAN MH01	Ex Sewer																	2.91	30.1	150	1.60%	19.26	1.1	

**APPENDIX C**  
**Stormwater Management Design Sheets**



LRL File No. 180357

Project: Site Plan Control-Auto Parts Building

Location: 2020 Bantree St., Ottawa, ON

Date: May 6, 2022

Designed: M. Basnet

Drawing Ref.: C601

Stormwater Management  
Design Sheet

## STORM - 100 YEAR

### Runoff Equation

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

C = Runoff coefficient

I = Rainfall intensity (mm/hr) = A / (Td + C)<sup>B</sup>

A = Area (ha)

T<sub>c</sub> = Time of concentration (min)

### Pre-Development Catchments within Development Area (East Catchments)

	Total Area =	0.960	ha	$\Sigma R =$	0.81
Uncontrolled	EWS-01	0.819	ha	R =	0.81
	EWS-02	0.141	ha	R =	0.81
	Total Uncontrolled =	0.960	ha	$\Sigma R =$	0.81

### 100 Year Pre-Development Release Rate

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

$$A = 1735.688$$

$$B = 0.820$$

$$C = 6.014$$

$$C = 0.81$$

$$I = 178.6 \text{ mm/hr}$$

$$T_c = 10 \text{ min}$$

$$A = 0.960 \text{ ha}$$

$$\text{100-year Release Rate} = 387.30 \text{ L/s}$$

### Allowable Release Rate (Max C=0.5, 5-year Pre-Development Flow Rate)

$$I_5 = 998.071 / (Td + 6.053)^{0.814}$$

$$A = 998.071$$

$$B = 0.814$$

$$C = 6.053$$

$$C = 0.50 \text{ max of 0.5 as per City of Ottawa}$$

$$I = 104.2 \text{ mm/hr}$$

$$T_c = 10 \text{ min}$$

$$A = 0.960 \text{ ha}$$

$$\text{Allowable Release Rate} = 138.99 \text{ L/s}$$



**LRL File No.** 180357  
**Project:** Site Plan Control-Auto Parts Building  
**Location:** 2020 Bantree St., Ottawa, ON  
**Date:** May 6, 2022  
**Designed:** M. Basnet  
**Drawing Ref.:** C601

**Stormwater Management**  
**Design Sheet**

**Post-development Stormwater Management**

	Total Site Area =	<b>0.960</b>	ha	$\Sigma R =$	<b>0.82</b>	<b>1.00</b>
Controlled	WS-01 (controlled)	0.212	ha	R =	0.83	1.00
	WS-02 (controlled)	0.169	ha	R =	0.81	1.00
	WS-03 (controlled)	0.439	ha	R =	0.85	1.00
	WS-04 (controlled)	0.122	ha	R =	0.87	1.00
	Total Controlled =	<b>0.942</b>	ha	$\Sigma R =$	<b>0.84</b>	<b>1.00</b>
Uncontrolled	WS-05 (uncontrolled)	0.018	ha	$\Sigma R =$	0.90	1.00
	Total Uncontrolled =	<b>0.018</b>	ha	$\Sigma R =$	<b>0.90</b>	<b>1.00</b>

**100 Year Post-development Stormwater Management**

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

$$A = 1735.688$$

$$B = 0.820$$

$$C = 6.014$$

**Uncontrolled Release Rate = 9.08 L/s**

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m³)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	467.55	202.59	129.91	9.08	138.99
15	142.89	374.17	219.83	129.91	7.27	137.18
20	119.95	314.09	221.02	129.91	6.10	136.01
25	103.85	271.92	213.02	129.91	5.28	135.19
30	91.87	240.56	199.17	129.91	4.67	134.58
35	82.58	216.23	181.28	129.91	4.20	134.11
40	75.15	196.77	160.46	129.91	3.82	133.73
45	69.05	180.81	137.43	129.91	3.51	133.42
50	63.95	167.46	112.66	129.91	3.25	133.16
55	59.62	156.12	86.51	129.91	3.03	132.94
60	55.89	146.36	59.22	129.91	2.84	132.75
65	52.65	137.85	30.99	129.91	2.68	132.59
70	49.79	130.37	1.96	129.91	2.53	132.44
75	47.26	123.74	0.00	129.91	2.40	132.31
80	44.99	117.81	0.00	129.91	2.29	132.20
85	42.95	112.47	0.00	129.91	2.19	132.09
90	41.11	107.65	0.00	129.91	2.09	132.00

**On-site Stormwater Retention**

<b>Total Storage Required =</b>	<b>221.02</b>	<b>m³</b>
<b>Storage Provided</b>		
Available Roof Storage =	0.00	m³
Pipe Storage =	0.00	m³
CB/MH Storage =	0.00	m³
Underground Storage =	0.00	m³
Surface Storage =	229.92	m³
<b>Total Storage Provided =</b>	<b>229.92</b>	<b>m³</b>

no roof storage has been considered

no pipe storage has been considered

no CB/MH storage has been considered

no underground storage structures has been considered

refer to LRL Plan C601



LRL File No. 180357

Project: Site Plan Control-Auto Parts Building

Location: 2020 Bantree St., Ottawa, ON

Date: May 6, 2022

Designed: M. Basnet

Drawing Ref.: C601

Stormwater Management  
Design Sheet

## STORM - 5 YEAR

### Runoff Equation

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

C = Runoff coefficient

$$I = \text{Rainfall intensity (mm/hr)} = A / (Td + C)^B$$

A = Area (ha)

T<sub>c</sub> = Time of concentration (min)

### Pre-Development Catchments within Development Area (East Catchments)

	Total Area =	0.960	ha	$\sum R =$	0.81
Uncontrolled	EWS-01	0.819	ha	R =	0.81
	EWS-02	0.141	ha	R =	0.81
	Total Uncontrolled =	0.960	ha	$\sum R =$	0.81

### 5 Year Pre-Development Release Rate

$$I_5 = 998.071 / (Td + 6.053)^{0.814}$$

$$A = 998.071$$

$$B = 0.814$$

$$C = 6.053$$

$$C = 0.81$$

$$I = 104.2 \text{ mm/hr}$$

$$T_c = 10 \text{ min}$$

$$A = 0.960 \text{ ha}$$

$$\text{5-year Release Rate} = 226.00 \text{ L/s}$$

### Allowable Release Rate (Max C=0.5, 5-year Pre-Development Flow Rate)

$$I_5 = 998.071 / (Td + 6.053)^{0.814}$$

$$A = 998.071$$

$$B = 0.814$$

$$C = 6.053$$

$$C = 0.50 \text{ max of 0.5 as per City of Ottawa}$$

$$I = 104.2 \text{ mm/hr}$$

$$T_c = 10 \text{ min}$$

$$A = 0.960 \text{ ha}$$

$$\text{Allowable Release Rate} = 138.99 \text{ L/s}$$



LRL File No. 180357

**Project:** Site Plan Control-Auto Parts Building

**Location:** 2020 Bantree St., Ottawa, ON

**Date:** May 6, 2022

**Designed:** M. Basnet

**Drawing Ref.:** C601

Stormwater Management  
Design Sheet

#### Post-Development Stormwater Management

	Total Site Area =	0.960	ha	$\Sigma R$ =	$\Sigma R_5$	$\Sigma R_{100}$
Controlled	WS-01	0.212	ha	R =	0.83	1.00
	WS-02	0.169	ha	R =	0.81	1.00
	WS-03	0.439	ha	R =	0.85	1.00
	WS-04	0.122	ha	R =	0.87	1.00
	<b>Total Controlled =</b>	<b>0.942</b>	<b>ha</b>	<b><math>\Sigma R</math> =</b>	<b>0.84</b>	<b>1.00</b>
Un-controlled	WS-05 (uncontrolled)	0.018	ha	R =	0.90	1.00
	<b>Total Un-Controlled =</b>	<b>0.018</b>	<b>ha</b>	<b><math>\Sigma R</math> =</b>	<b>0.90</b>	<b>1.00</b>

#### 5 Year Post-development Stormwater Management

$$I_5 = 998.071 / (Td + 6.053)^{0.814}$$

$$A = 998.071$$

$$B = 0.814$$

$$C = 6.053$$

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m³)	**Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	104.19	228.96	59.43	129.91	4.77	134.68
15	83.56	183.61	48.33	129.91	3.83	133.73
20	70.25	154.37	29.36	129.91	3.22	133.12
25	60.90	133.82	5.86	129.91	2.79	132.70
30	53.93	118.50	0.00	129.91	2.47	132.38
35	48.52	106.61	0.00	129.91	2.22	132.13
40	44.18	97.09	0.00	129.91	2.02	131.93
45	40.63	89.28	0.00	129.91	1.86	131.77
50	37.65	82.74	0.00	129.91	1.72	131.63
55	35.12	77.18	0.00	129.91	1.61	131.52
60	32.94	72.39	0.00	129.91	1.51	131.42
65	31.04	68.22	0.00	129.91	1.42	131.33
70	29.37	64.54	0.00	129.91	1.34	131.25
75	27.89	61.28	0.00	129.91	1.28	131.18
80	26.56	58.37	0.00	129.91	1.22	131.12
85	25.37	55.75	0.00	129.91	1.16	131.07
90	24.29	53.37	0.00	129.91	1.11	131.02

\*\* 100-year control release rate

#### On-site Stormwater Retention

Total Storage Required = 59.43 m³

# LRL Associates Ltd.

## Storm Design Sheet



**LRL File No.** 180357

**Project:** Site Plan Control-Auto Parts Building

**Location:** 2020 Bantree St., Ottawa, ON

**Date:** May 10, 2022

**Designed:** M. Basnet

**Dwg. Reference:** C401,C702

### Rational Method

$Q = 2.78CIA$

$Q = \text{Peak flow (L/s)}$

$A = \text{Drainage area (ha)}$

$C = \text{Runoff coefficient}$

$I = \text{Rainfall intensity (mm/hr)}$

### Design Parameters

**Runoff coefficient (C)**

Grass = 0.2

Gravel = 0.8

Asphalt / rooftop = 0.9

### IDF curve

Ottawa Macdonald-Cartier International Airport

Storm event: 5 Years

Intensity equation:

$$I_5 = 998.071 / (T_c + 6.053)^{0.814} \text{ (mm/hr)}$$

Minimum velocity = 0.80 m/s

Manning's "n" = 0.013

LOCATION			AREA (ha)									STORM SEWER							
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.8	C = 0.9	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Controlled Flow Q <sub>CONT</sub> (L/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full Q <sub>FULL</sub> (L/s)	Velocity Full (m/s)	Time of Flow (min)	Ratio Q/Q <sub>FULL</sub>
WS-02	CB01	CBMH01	0.009	0.099	0.062	0.38	0.38	10.00	104.19	39.53		300	PVC	0.34%	48.4	56.39	0.80	1.01	0.70
WS-03	CBMH01	MH02	0.017	0.109	0.313	1.03	1.41	11.01	99.14	140.14		525	PVC	0.25%	45.0	215.03	0.99	0.76	0.65
	MH02	CBMH04					1.41	11.77	95.71	135.29		525	PVC	0.25%	27.6	215.03	0.99	0.46	0.63
WS-01	CBMH03	CBMH04	0.017	0.024	0.171	0.49	0.49	10.00	104.19	51.19		300	PVC	0.34%	23.7	56.39	0.80	0.50	0.91
WS-05	CB100	MH101	0.000	0.000	0.018	0.05	0.05	10.00	104.19	4.77		250	PVC	0.50%	72.0	42.05	0.86	1.40	0.11
	MH101	Prop. STM					0.05	11.40	97.33	4.46		250	PVC	2.72%	4.4	98.08	2.00	0.04	0.05
WS-04	*CBMH04	OGS	0.006	0.000	0.116	0.29	2.24	12.23	93.73	210.25	129.91	525	PVC	0.25%	9.8	215.03	0.99	0.16	0.98
	OGS	STM MH05					2.24	12.39	93.05	210.24		525	PVC	0.25%	2.0	215.03	0.99	0.03	0.98
	STM MH05	Ex. STM					2.24	12.43	92.91	209.93		525	PVC	0.25%	6.9	215.03	0.99	0.12	0.98

#### Note

\* Proposed ICD to be installed at CBMH04 will control flow at 129.91 L/s

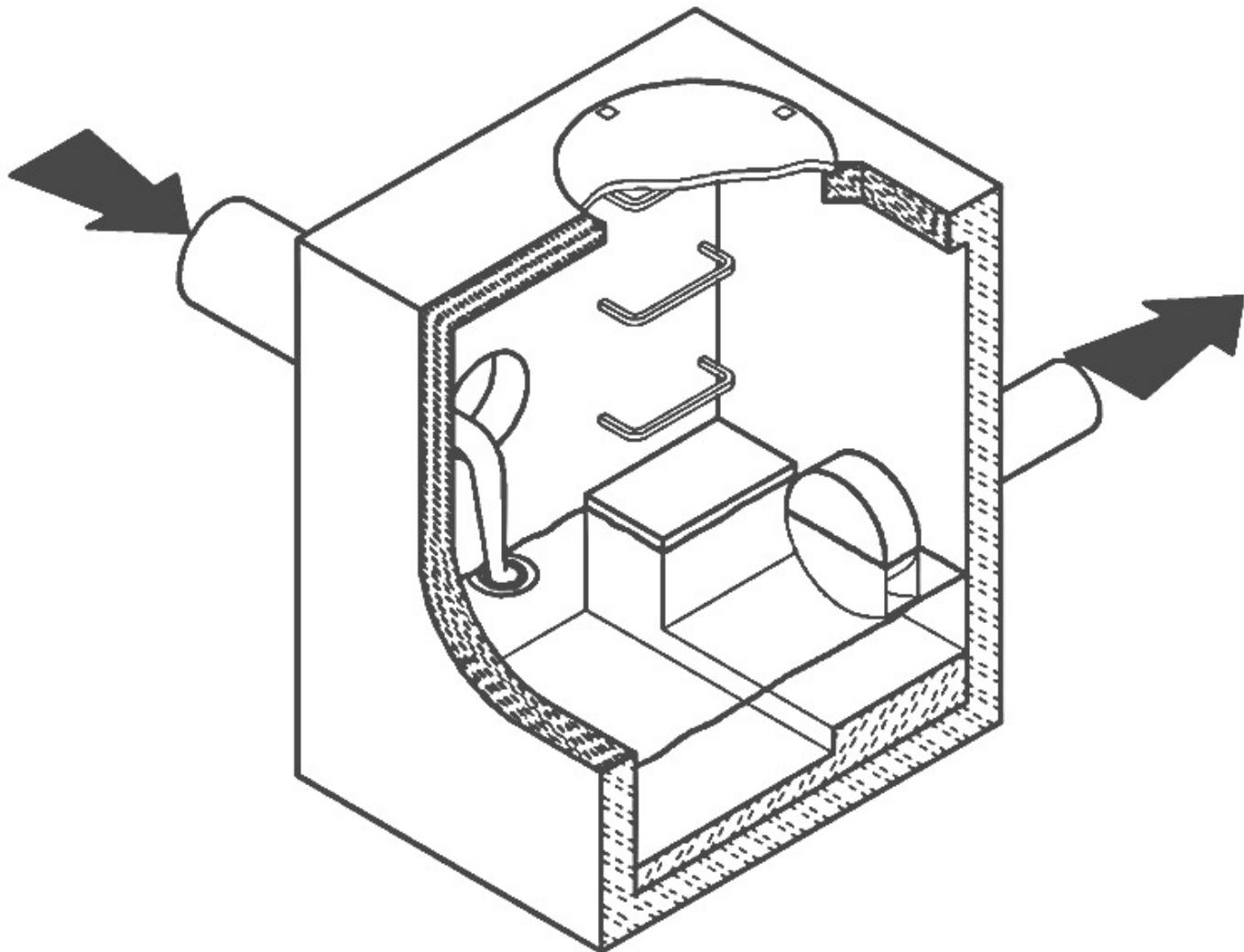
## **APPENDIX D**

### **Inlet Control Device**

# CSO/STORMWATER MANAGEMENT



HYDROVEX® VHV / SVHV  
Vertical Vortex Flow Regulator



**JOHN MEUNIER**

# HYDROVEX® VHV / SVHV VERTICAL VORTEX FLOW REGULATOR

## APPLICATIONS

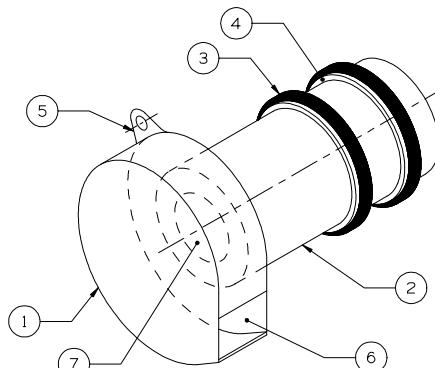
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. In a combined sewer system, the wastewater treatment plant may also experience significant increases in flows during storms, thereby losing its treatment efficiency.

A simple means of controlling excessive water runoff is by controlling excessive flows at their origin (manholes). **John Meunier Inc.** manufactures the **HYDROVEX® VHV / SVHV** line of vortex flow regulators to control stormwater flows in sewer networks, as well as manholes.

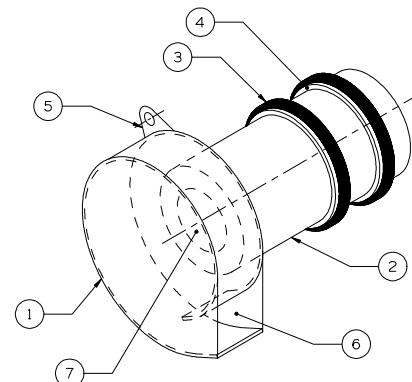
The vortex flow regulator design is based on the fluid mechanics principle of the forced vortex. This grants flow regulation without any moving parts, thus reducing maintenance. The operation of the regulator, depending on the upstream head and discharge, switches between orifice flow (gravity flow) and vortex flow. Although the concept is quite simple, over 12 years of research have been carried out in order to get a high performance.

The **HYDROVEX® VHV / SVHV** Vertical Vortex Flow Regulators (**refer to Figure 1**) are manufactured entirely of stainless steel, and consist of a hollow body (1) (in which flow control takes place) and an outlet orifice (7). Two rubber "O" rings (3) seal and retain the unit inside the outlet pipe. Two stainless steel retaining rings (4) are welded on the outlet sleeve to ensure that there is no shifting of the "O" rings during installation and use.

- 1. BODY
- 2. SLEEVE
- 3. O-RING
- 4. RETAINING RINGS  
(SQUARE BAR)
- 5. ANCHOR PLATE
- 6. INLET
- 7. OUTLET ORIFICE



VHV

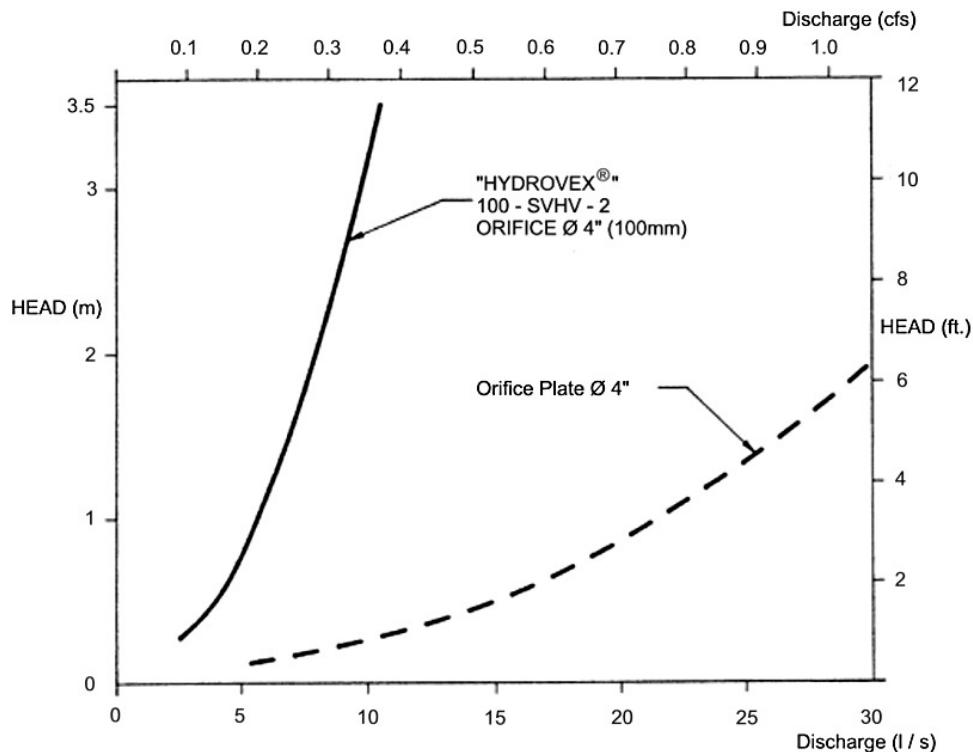


SVHV

**FIGURE 1: HYDROVEX® VHV-SVHV VERTICAL VORTREX FLOW REGULATORS**

## ADVANTAGES

- The **HYDROVEX® VHV / SVHV** line of flow regulators are manufactured entirely of stainless steel, making them durable and corrosion resistant.
- Having no moving parts, they require minimal maintenance.
- The geometry of the **HYDROVEX® VHV / SVHV** flow regulators allows a control equal to an orifice plate, having a cross section area 4 to 6 times smaller. This decreases the chance of blockage of the regulator, due to sediments and debris found in stormwater flows. **Figure 2** illustrates the comparison between a regulator model 100 SVHV-2 and an equivalent orifice plate. One can see that for the same height of water, the regulator controls a flow approximately four times smaller than an equivalent orifice plate.
- Installation of the **HYDROVEX® VHV / SVHV** flow regulators is quick and straightforward and is performed after all civil works are completed.
- Installation requires no special tools or equipment and may be carried out by any contractor.
- Installation may be carried out in existing structures.



**FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE**

## SELECTION

Selection of a **VHV** or **SVHV** regulator can be easily made using the selection charts found at the back of this brochure (see **Figure 3**). These charts are a graphical representation of the maximum upstream water pressure (head) and the maximum discharge at the manhole outlet. The maximum design head is the difference between the maximum upstream water level and the invert of the outlet pipe. All selections should be verified by John Meunier Inc. personnel prior to fabrication.

### Example:

- ✓ Maximum design head                    2m (6.56 ft.)
- ✓ Maximum discharge                    6 L/s (0.2 cfs)
- ✓ Using **Figure 3 - VHV**                model required is a **75 VHV-1**

## INSTALLATION REQUIREMENTS

All **HYDROVEX® VHV / SVHV** flow regulators can be installed in circular or square manholes. **Figure 4** gives the various minimum dimensions required for a given regulator. ***It is imperative to respect the minimum clearances shown to ensure easy installation and proper functioning of the regulator.***

## SPECIFICATIONS

In order to specify a **HYDROVEX®** regulator, the following parameters must be defined:

- The model number (ex: 75-VHV-1)
- The diameter and type of outlet pipe (ex: 6" diam. SDR 35)
- The desired discharge (ex: 6 l/s or 0.21 CFS)
- The upstream head (ex: 2 m or 6.56 ft.) \*
- The manhole diameter (ex: 36" diam.)
- The minimum clearance "H" (ex: 10 inches)
- The material type (ex: 304 s/s, 11 Ga. standard)

\* *Upstream head is defined as the difference in elevation between the maximum upstream water level and the invert of the outlet pipe where the HYDROVEX® flow regulator is to be installed.*

**PLEASE NOTE THAT WHEN REQUESTING A PROPOSAL, WE SIMPLY REQUIRE THAT YOU PROVIDE US WITH THE FOLLOWING:**

- *project design flow rate*
- *pressure head*
- *chamber's outlet pipe diameter and type*



*Typical VHV model in factory*

## OPTIONS



**VHV-1-O (standard model with odour control inlet)**



**FV - SVHV (mounted on sliding plate)**



**FV - VHV-O (mounted on sliding plate with odour control inlet)**



**VHV with Gooseneck assembly in existing chamber without minimum release at the bottom**



**VHV with air vent for minimal slopes**



## VHV Vertical Vortex Flow Regulator

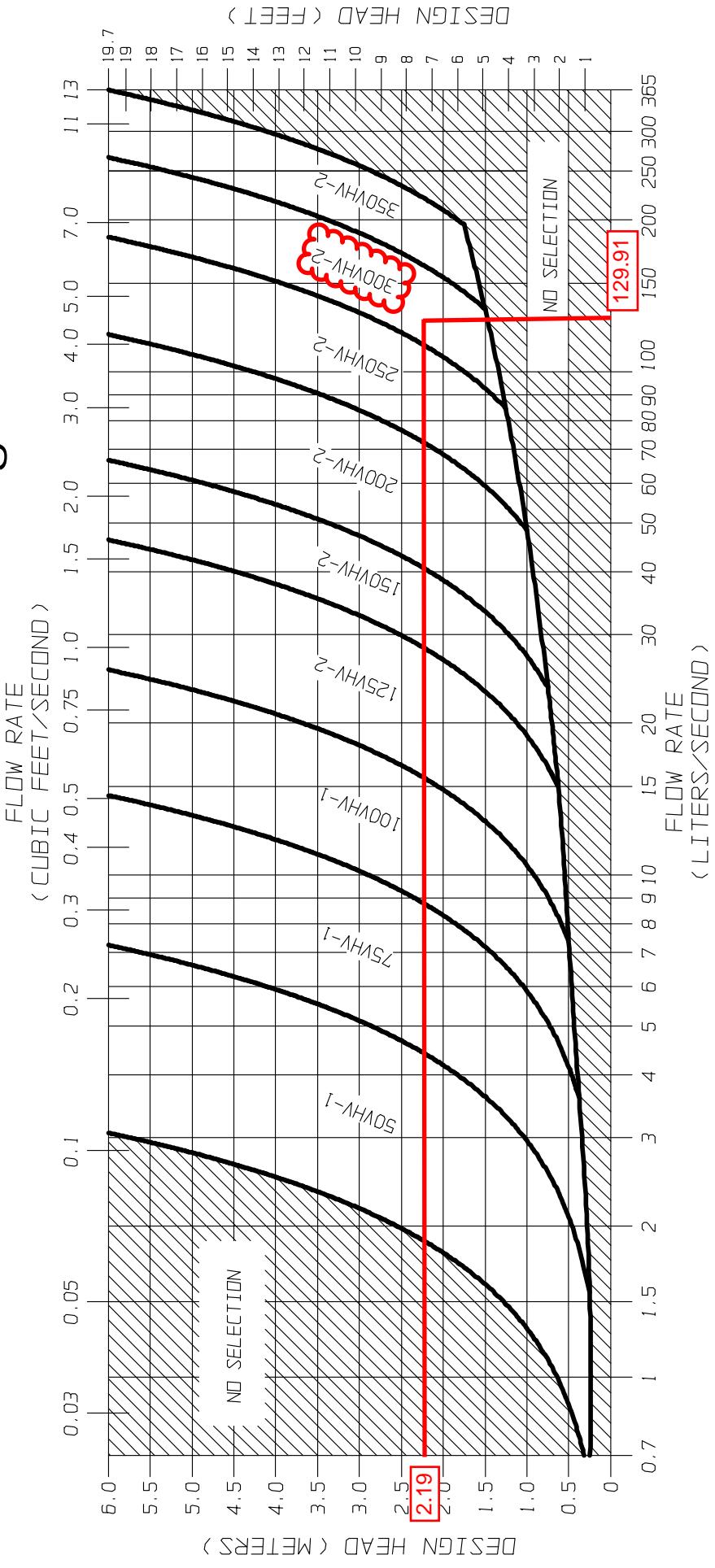
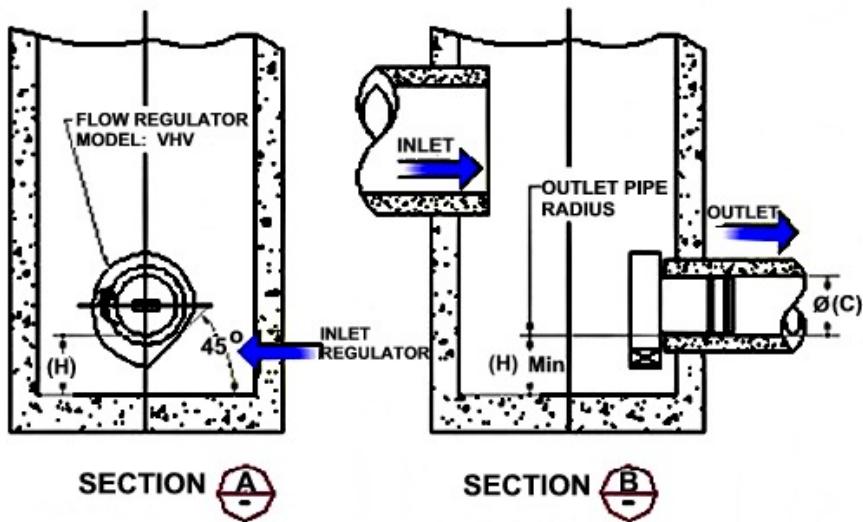
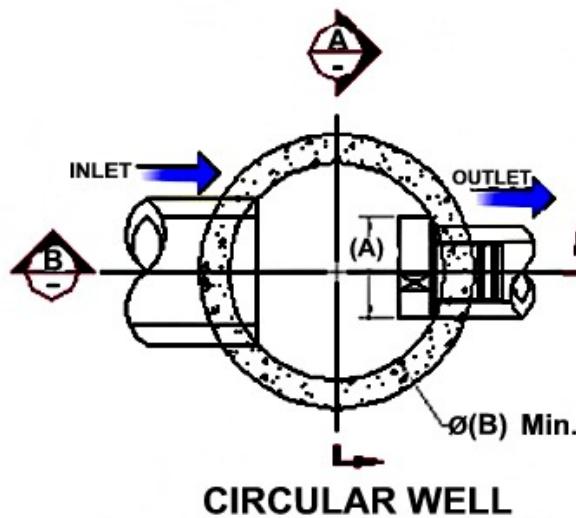


FIGURE 3 - VHV

**JOHN MEUNIER**

**FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE**  
**FIGURE 4 (MODEL VHV)**

Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	A (in.)	B (mm)	B (in.)	C (mm)	C (in.)	H (mm)	H (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	900	36	150	6	200	8
125VHV-2	275	11	900	36	150	6	200	8
150VHV-2	350	14	900	36	150	6	225	9
200VHV-2	450	18	1200	48	200	8	300	12
250VHV-2	575	23	1200	48	250	10	350	14
300VHV-2	675	27	1600	64	250	10	400	16
350VHV-2	800	32	1800	72	300	12	500	20



## INSTALLATION

The installation of a **HYDROVEX®** regulator may be undertaken once the manhole and piping is in place. Installation consists of simply fitting the regulator into the outlet pipe of the manhole. **John Meunier Inc.** recommends the use of a lubricant on the outlet pipe, in order to facilitate the insertion and orientation of the flow controller.

## MAINTENANCE

**HYDROVEX®** regulators are manufactured in such a way as to be maintenance free; however, a periodic inspection (every 3-6 months) is suggested in order to ensure that neither the inlet nor the outlet has become blocked with debris. The manhole should undergo periodically, particularly after major storms, inspection and cleaning as established by the municipality

## GUARANTY

The **HYDROVEX®** line of **VHV / SVHV** regulators are guaranteed against both design and manufacturing defects for a period of 5 years. Should a unit be defective, **John Meunier Inc.** is solely responsible for either modification or replacement of the unit.

### John Meunier Inc.

ISO 9001 : 2008

#### Head Office

4105 Sartelon  
Saint-Laurent (Quebec) Canada H4S 2B3  
Tel.: 514-334-7230 [www.johnmeunier.com](http://www.johnmeunier.com)  
Fax: 514-334-5070 [cso@johnmeunier.com](mailto:cso@johnmeunier.com)

#### Ontario Office

2000 Argentia Road, Plaza 4, Unit 430  
Mississauga (Ontario) Canada L5N 1W1  
Tel.: 905-286-4846 [www.johnmeunier.com](http://www.johnmeunier.com)  
Fax: 905-286-0488 [ontario@johnmeunier.com](mailto:ontario@johnmeunier.com)

#### USA Office

2209 Menlo Avenue  
Glenside, PA USA 19038  
Tel.: 412- 417-6614 [www.johnmeunier.com](http://www.johnmeunier.com)  
Fax: 215-885-4741 [asteale@johnmeunier.com](mailto:asteale@johnmeunier.com)



**APPENDIX E**  
**Stormwater Treatment Unit**

**ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD  
REDUCTION STORMCEPTOR®**

05/06/2020

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA MACDONALD-CARTIER INT'L AP
NCDC Rainfall Station Id:	6000
Years of Rainfall Data:	37
Site Name:	2020 Bantree St.
Drainage Area (ha):	0.96
Runoff Coefficient 'c':	0.79

Project Name:	2020 Bantree St.
Project Number:	180357
Designer Name:	Brandon O'Leary
Designer Company:	Forterra
Designer Email:	brandon.oleary@forterrabp.com
Designer Phone:	(905) 630-0359
EOR Name:	Guillaume Courtois
EOR Company:	LRL Associates Ltd.
EOR Email/Phone:	

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0
Required Water Quality Runoff Volume Capture (%):	90.0
Require Hydrocarbon Spill Capture?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	

**Net Annual Sediment  
(TSS) Load Reduction  
Sizing Summary**

Stormceptor Model	TSS Removal Provided (%)
EFO4	71
EFO6	80
EFO8	85
EFO10	88
EFO12	89

Recommended Stormceptor EFO Model: **EFO6**

Estimated Net Annual Sediment (TSS) Load Reduction (%): **80**

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 ( $\mu\text{m}$ )	Percent Less Than	Particle Size Fraction ( $\mu\text{m}$ )	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 (%)
1	51.3	51.3	2.11	127.0	48.0	93	47.7	47.7
2	8.7	60.0	4.22	253.0	96.0	88	7.6	55.4
3	5.8	65.8	6.33	380.0	144.0	83	4.8	60.1
4	4.6	70.4	8.43	506.0	192.0	77	3.5	63.7
5	4.2	74.6	10.54	633.0	240.0	72	3.0	66.7
6	3.2	77.8	12.65	759.0	289.0	69	2.2	68.9
7	2.6	80.4	14.76	886.0	337.0	64	1.7	70.6
8	2.4	82.8	16.87	1012.0	385.0	60	1.4	72.0
9	1.9	84.7	18.98	1139.0	433.0	57	1.1	73.1
10	1.6	86.3	21.08	1265.0	481.0	56	0.9	74.0
11	1.3	87.6	23.19	1392.0	529.0	54	0.7	74.7
12	1.1	88.7	25.30	1518.0	577.0	53	0.6	75.3
13	1.3	90.0	27.41	1645.0	625.0	52	0.7	76.0
14	1.1	91.1	29.52	1771.0	673.0	52	0.6	76.5
15	0.6	91.7	31.63	1898.0	721.0	51	0.3	76.8
16	0.8	92.5	33.73	2024.0	770.0	51	0.4	77.3
17	0.7	93.2	35.84	2151.0	818.0	51	0.4	77.6
18	0.5	93.7	37.95	2277.0	866.0	51	0.3	77.9
19	0.6	94.3	40.06	2404.0	914.0	50	0.3	78.2
20	0.5	94.8	42.17	2530.0	962.0	50	0.3	78.4
21	0.2	95.0	44.28	2657.0	1010.0	50	0.1	78.5
22	0.4	95.4	46.38	2783.0	1058.0	50	0.2	78.7
23	0.5	95.9	48.49	2910.0	1106.0	49	0.2	79.0
24	0.4	96.3	50.60	3036.0	1154.0	49	0.2	79.2
25	0.1	96.4	52.71	3163.0	1202.0	48	0.0	79.2

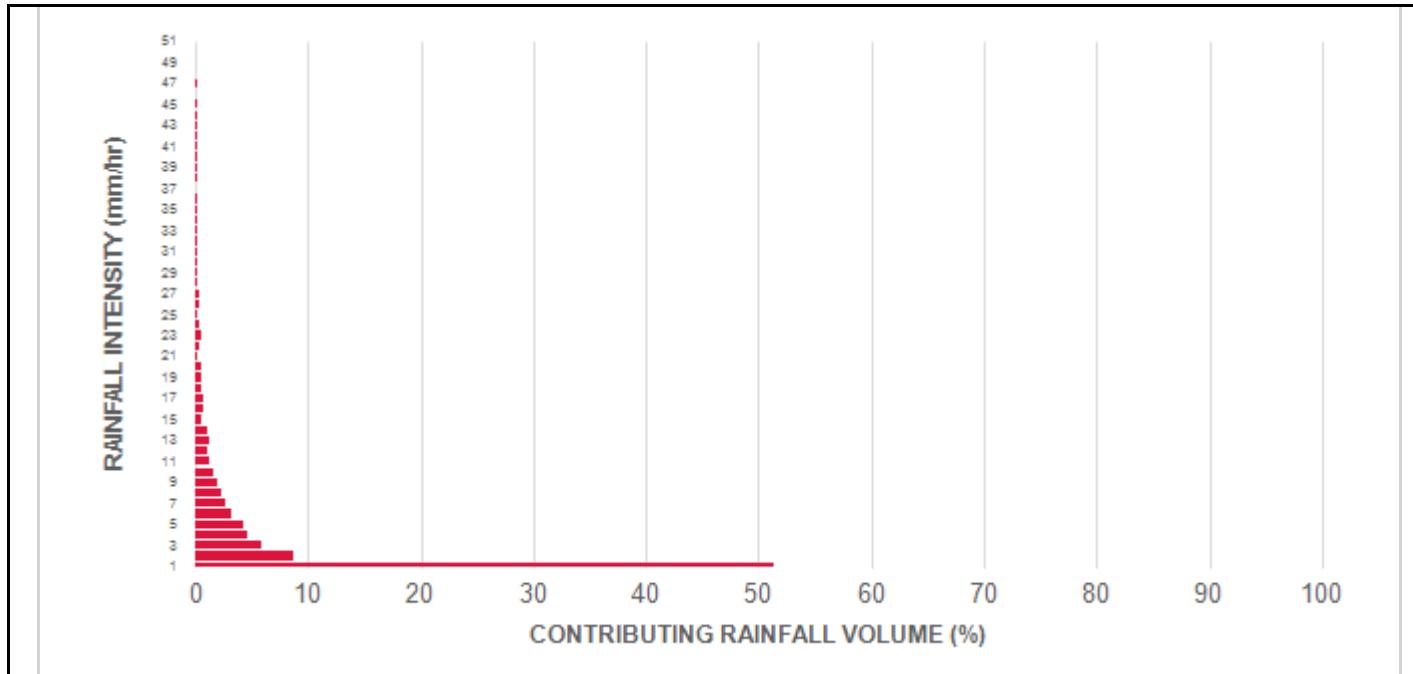
## Stormceptor® EF Sizing Report

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 (%)
26	0.3	96.7	54.82	3289.0	1251.0	48	0.1	79.3
27	0.4	97.1	56.93	3416.0	1299.0	47	0.2	79.5
28	0.2	97.3	59.03	3542.0	1347.0	47	0.1	79.6
29	0.2	97.5	61.14	3669.0	1395.0	46	0.1	79.7
30	0.2	97.7	63.25	3795.0	1443.0	45	0.1	79.8
31	0.1	97.8	65.36	3922.0	1491.0	43	0.0	79.9
32	0.2	98.0	67.47	4048.0	1539.0	42	0.1	79.9
33	0.1	98.1	69.58	4175.0	1587.0	41	0.0	80.0
34	0.1	98.2	71.68	4301.0	1635.0	40	0.0	80.0
35	0.1	98.3	73.79	4428.0	1683.0	38	0.0	80.1
36	0.2	98.5	75.90	4554.0	1732.0	37	0.1	80.1
37	0.0	98.5	78.01	4681.0	1780.0	36	0.0	80.1
38	0.1	98.6	80.12	4807.0	1828.0	35	0.0	80.2
39	0.1	98.7	82.23	4934.0	1876.0	34	0.0	80.2
40	0.1	98.8	84.33	5060.0	1924.0	34	0.0	80.2
41	0.1	98.9	86.44	5187.0	1972.0	33	0.0	80.3
42	0.1	99.0	88.55	5313.0	2020.0	32	0.0	80.3
43	0.2	99.2	90.66	5440.0	2068.0	31	0.1	80.4
44	0.1	99.3	92.77	5566.0	2116.0	31	0.0	80.4
45	0.1	99.4	94.88	5693.0	2164.0	30	0.0	80.4
46	0.0	99.4	96.98	5819.0	2213.0	29	0.0	80.4
47	0.1	99.5	99.09	5946.0	2261.0	28	0.0	80.5
48	0.0	99.5	101.20	6072.0	2309.0	28	0.0	80.5
49	0.0	99.5	103.31	6199.0	2357.0	27	0.0	80.5
50	0.0	99.5	105.42	6325.0	2405.0	27	0.0	80.5
Estimated Net Annual Sediment (TSS) Load Reduction =							80 %	

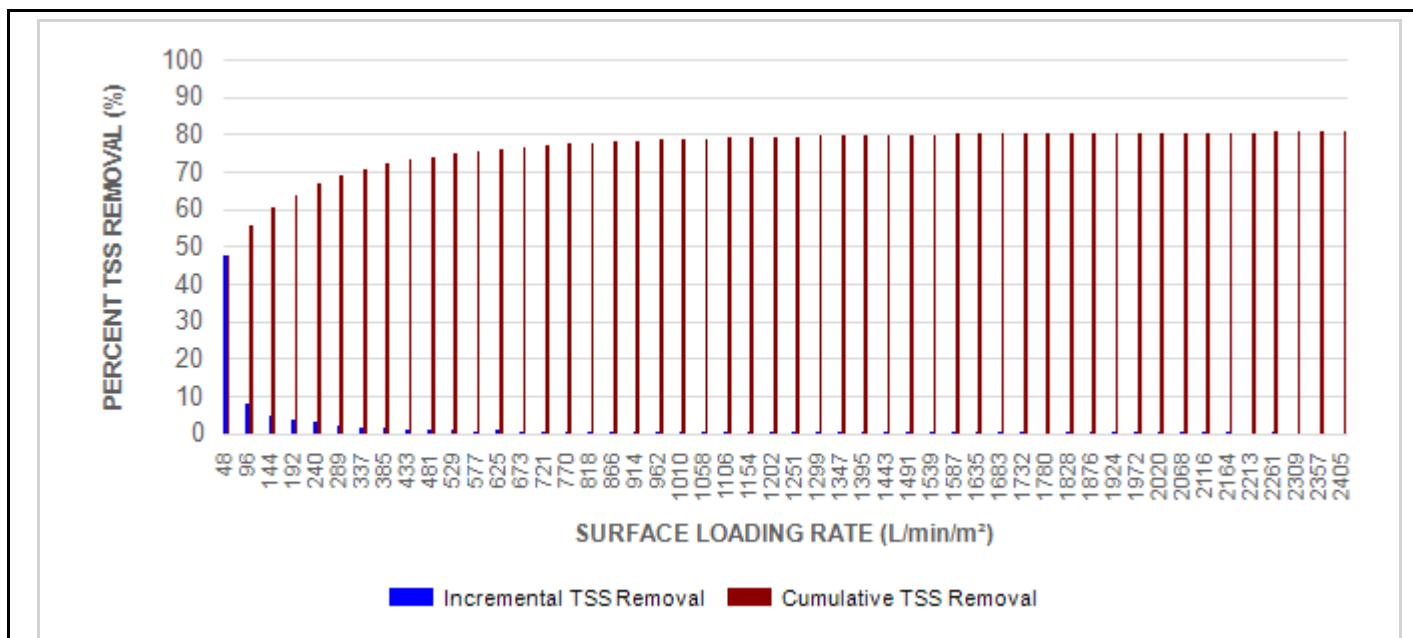


**Stormceptor® EF Sizing Report**

**RAINFALL DATA FROM OTTAWA MACDONALD-CARTIER INT'L AP RAINFALL STATION**



**INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL**



## Stormceptor® EF Sizing Report

### Maximum Pipe Diameter / Peak Conveyance

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

### SCOUR PREVENTION AND ONLINE CONFIGURATION

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

### DESIGN FLEXIBILITY

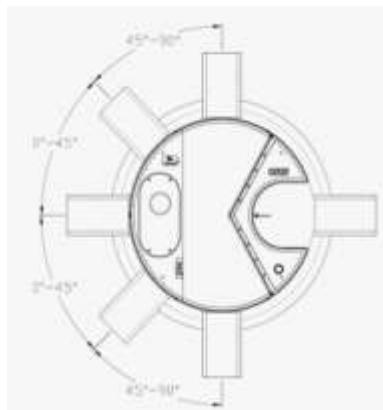
► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle,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

### OIL CAPTURE AND RETENTION

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



## Stormceptor® EF Sizing Report



### INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

### HEAD LOSS

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

### Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	197	52	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	348	92	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	545	144	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	874	231	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	1219	322	610	24	31220	1103	49952	137875

\*Increased sump depth may be added to increase sediment storage capacity

\*\* Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³ )

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

### STANDARD STORMCEPTOR EF/EFO DRAWINGS

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

### STANDARD STORMCEPTOR EF/EFO SPECIFICATION

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



**STANDARD PERFORMANCE SPECIFICATION FOR  
“OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE**

**PART 1 – GENERAL**

**1.1 WORK INCLUDED**

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

**1.2 REFERENCE STANDARDS & PROCEDURES**

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

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit 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 <sup>3</sup> sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m <sup>3</sup> sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m <sup>3</sup> sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m <sup>3</sup> sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m <sup>3</sup> 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 shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. 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<sup>2</sup>.

### 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<sup>2</sup> to 2600 L/min/m<sup>2</sup>) 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.



# STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

## PART 1 – GENERAL

### 1.1 WORK INCLUDED

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

### 1.2 REFERENCE STANDARDS & PROCEDURES

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

Canadian Environmental Technology Verification (ETV) Program’s **Procedure for Laboratory Testing of Oil-Grit 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	4ft (1219mm) Diameter OGS Units:	1.19m <sup>3</sup> sediment / 265L oil
	6ft (1829mm) Diameter OGS Units:	3.48m <sup>3</sup> sediment / 609L oil
	8ft (2438mm) Diameter OGS Units:	8.78m <sup>3</sup> sediment / 1,071L oil
	10ft (3048mm) Diameter OGS Units:	17.78m <sup>3</sup> sediment / 1,673L oil
	12ft (3657mm) Diameter OGS Units:	31.23m <sup>3</sup> sediment / 2,476L 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 shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. 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<sup>2</sup>.

### **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<sup>2</sup> to 2600 L/min/m<sup>2</sup>) 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.

## **APPENDIX F**

### **Civil Plans**

# PROPOSED AUTO PARTS BUILDING

## 2020 BANTREE ST, OTTAWA, ON

REVISION 03

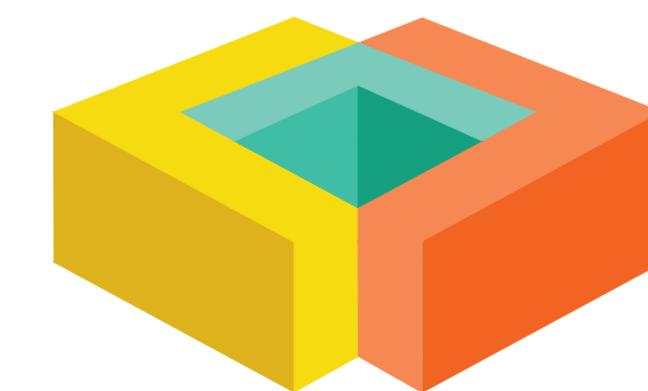


KEY PLAN (N.T.S.)

### DRAWING INDEX

#### TITLE PAGE

SEDIMENT AND EROSION CONTROL PLAN	C101
SITE DEVELOPMENT PLAN	C201
GRADING AND DRAINAGE PLAN	C301
SERVICING PLAN	C401
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901



**LRJ**

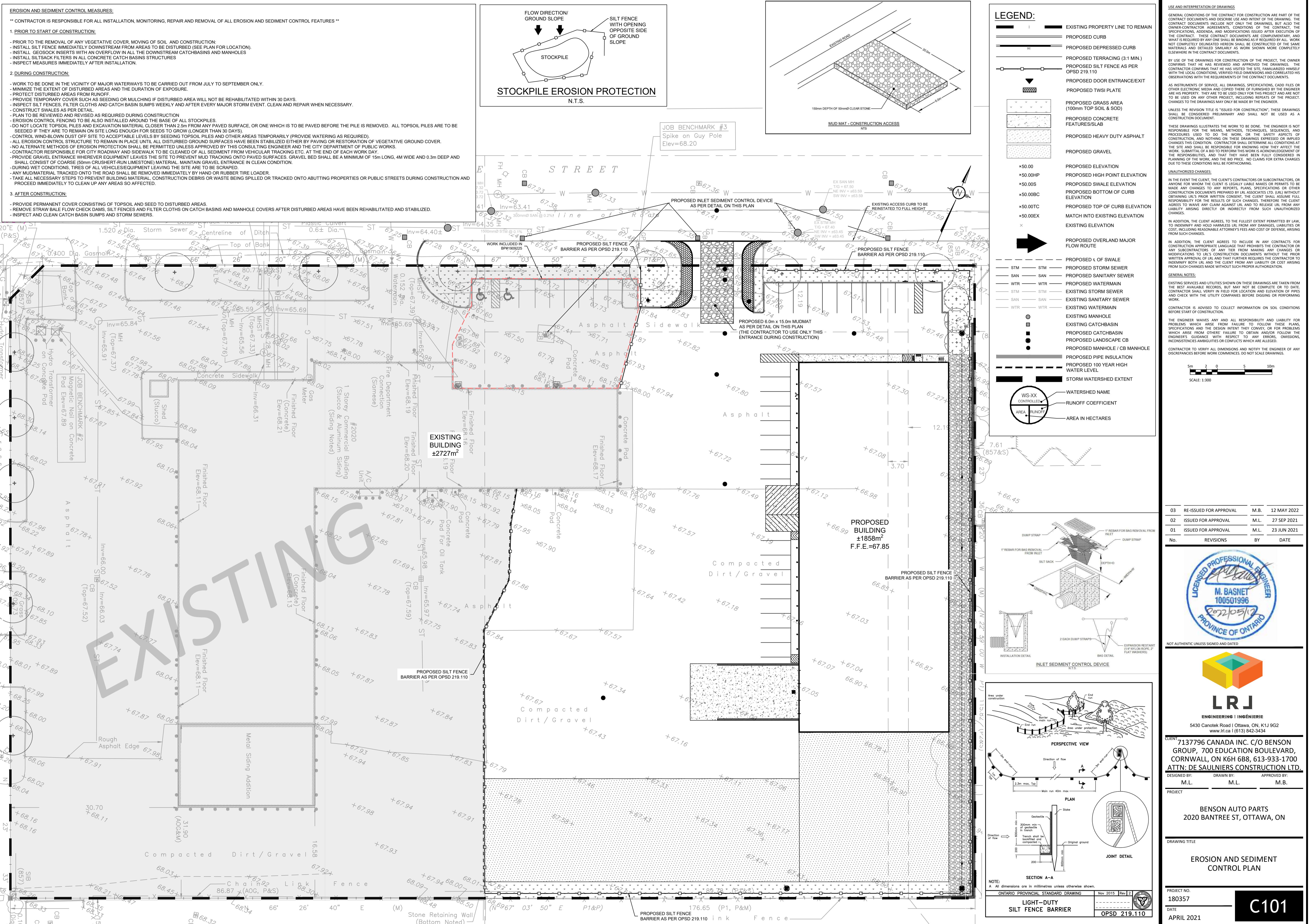
ENGINEERING | INGÉNIERIE

5430 Canotek Road | Ottawa, ON, K1J 9G2  
www.lrl.ca | (613) 842-3434

PROPOSED AUTO PARTS BUILDING  
2020 BANTREE ST., OTTAWA, ON  
REV.03 - RE-ISSUED FOR APPROVAL - MAY 12, 2022  
LRL PROJECT no: 180357



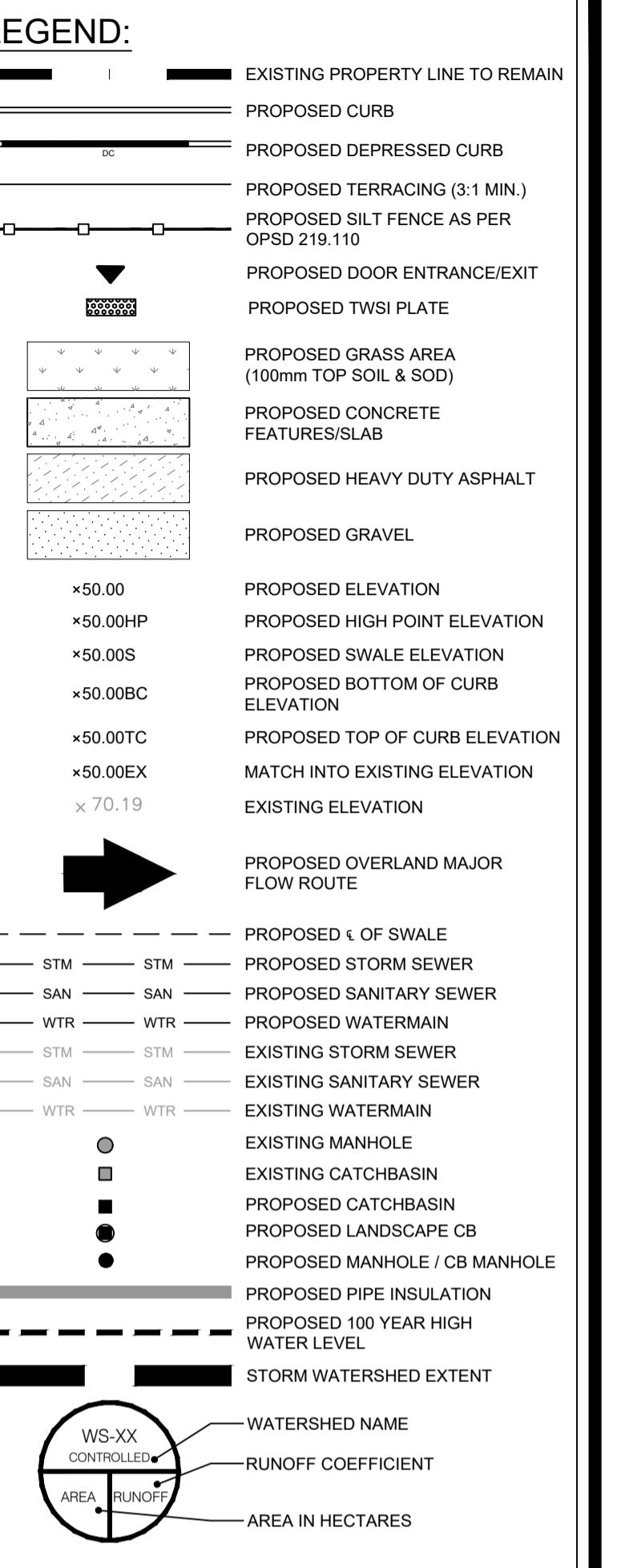
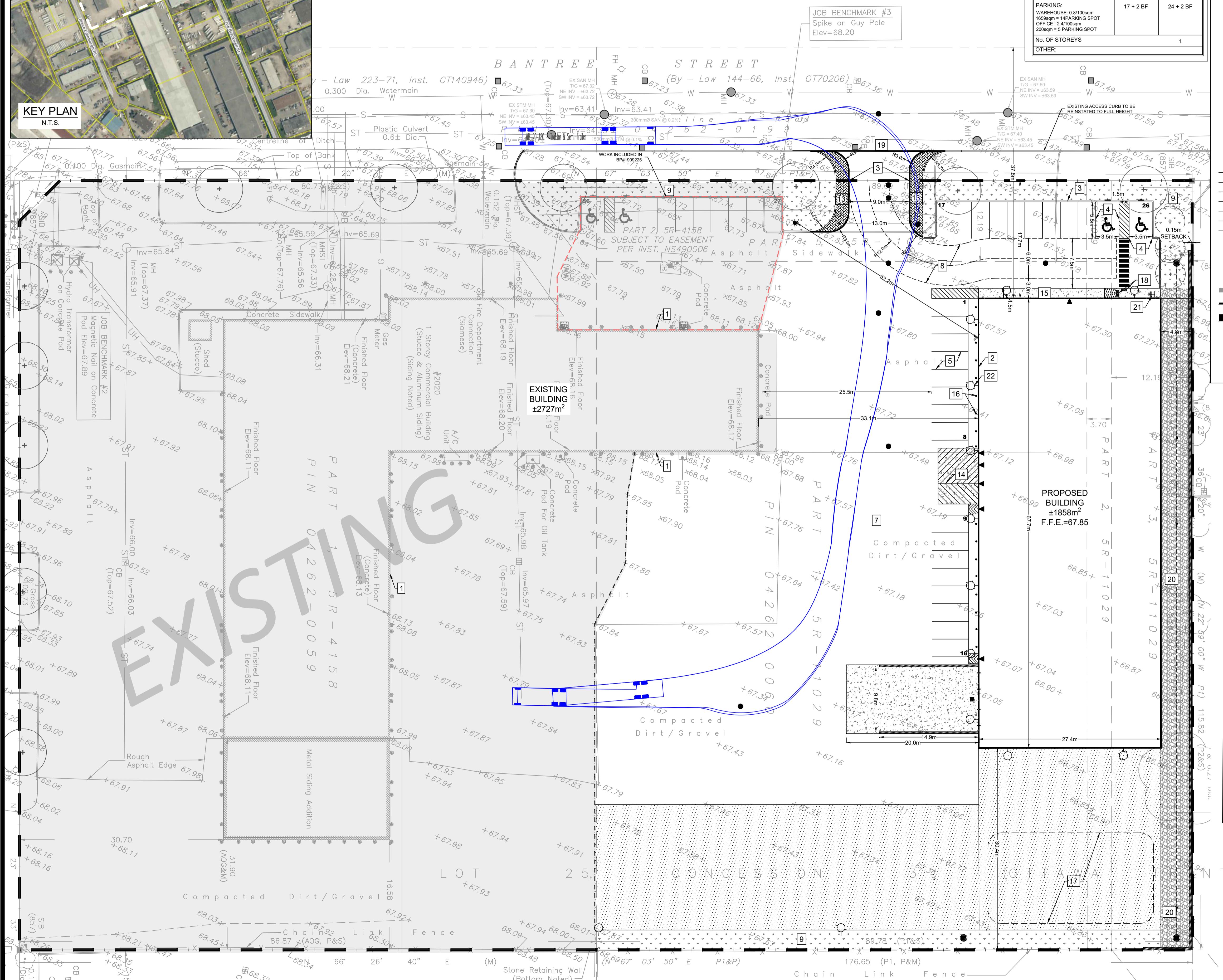
NOT AUTHENTIC UNLESS SIGNED AND DATED





**KEY PLAN**

N.T.S.



**USE AND INTERPRETATION OF DRAWINGS**

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE GENERAL CONDITIONS OF THE CONTRACT, THE CONTRACT DOCUMENTS, THE CONTRACT AGREEMENT, THE CONTRACTOR'S AGREEMENT, THE CONTRACTOR'S SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND IN CASE OF DISCREPANCY, THE CONTRACT DOCUMENTS SHALL PREVAIL. IF ANY PART OF THE CONTRACT DOCUMENTS IS NOT COMPLETELY DELINEATED HERON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE DRAWINGS, AND THAT HE HAS READ AND UNDERSTOOD THE OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS INDICATE THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, SEQUENCES, AND PROCEDURES USED TO DO THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THE DRAWINGS EXPRESS OR IMPLIED CHANGES THE CONTRACTUAL OBLIGATIONS OF THE CONTRACTOR TO THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. THE CONTRACTOR SHALL NOT PERMIT ANY ACT WHICH VIOLATES THE CONTRACTUAL OBLIGATIONS OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR THE RESULTS OF SUCH CHANGES, WHETHER THE CONTRACT AGREES TO WAIVE ANY CLAIM AGAINST LRL FOR RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM CHANGES MADE BY THE CONTRACTOR.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM CHANGES MADE BY THE CONTRACTOR.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE CONTRACTOR'S INFORMATION. THE CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM THE CONTRACTOR'S USE OF THE PLANS. THE CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

**SCALE: 1:300**



**CLIENT:** 7137796 CANADA INC. C/O BENSON GROUP, 700 EDUCATION BOULEVARD, CORNWALL, ON K6H 6B8, 613-933-1700

**ATTN:** DE: BENSON CONSTRUCTION LTD.

**DESIGNED BY:** M.L. **DRAWN BY:** M.L. **APPROVED BY:** M.B.

**PROJECT:** BENSON AUTO PARTS 2020 BANTREE ST, OTTAWA, ON

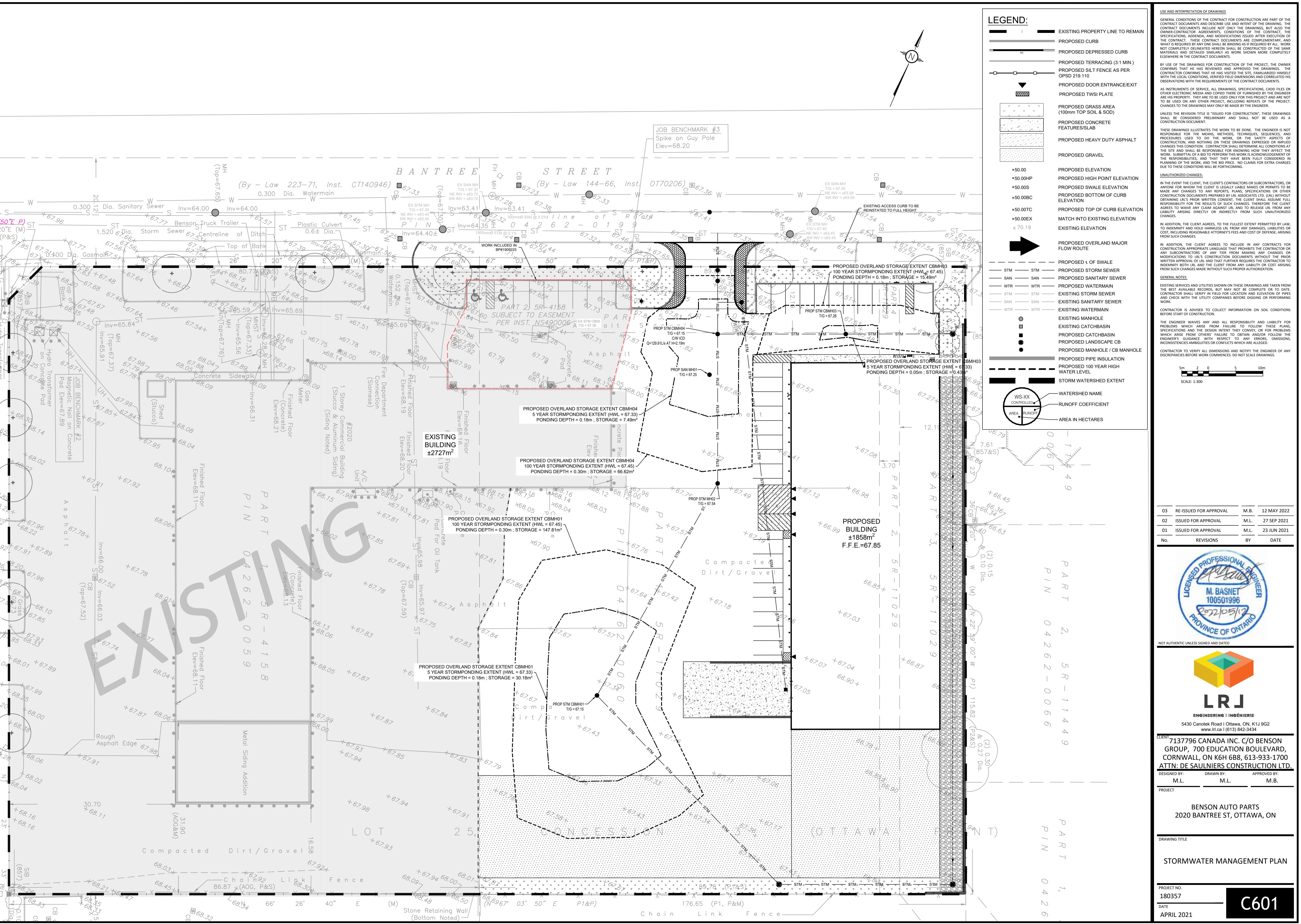
**DRAWING TITLE:**

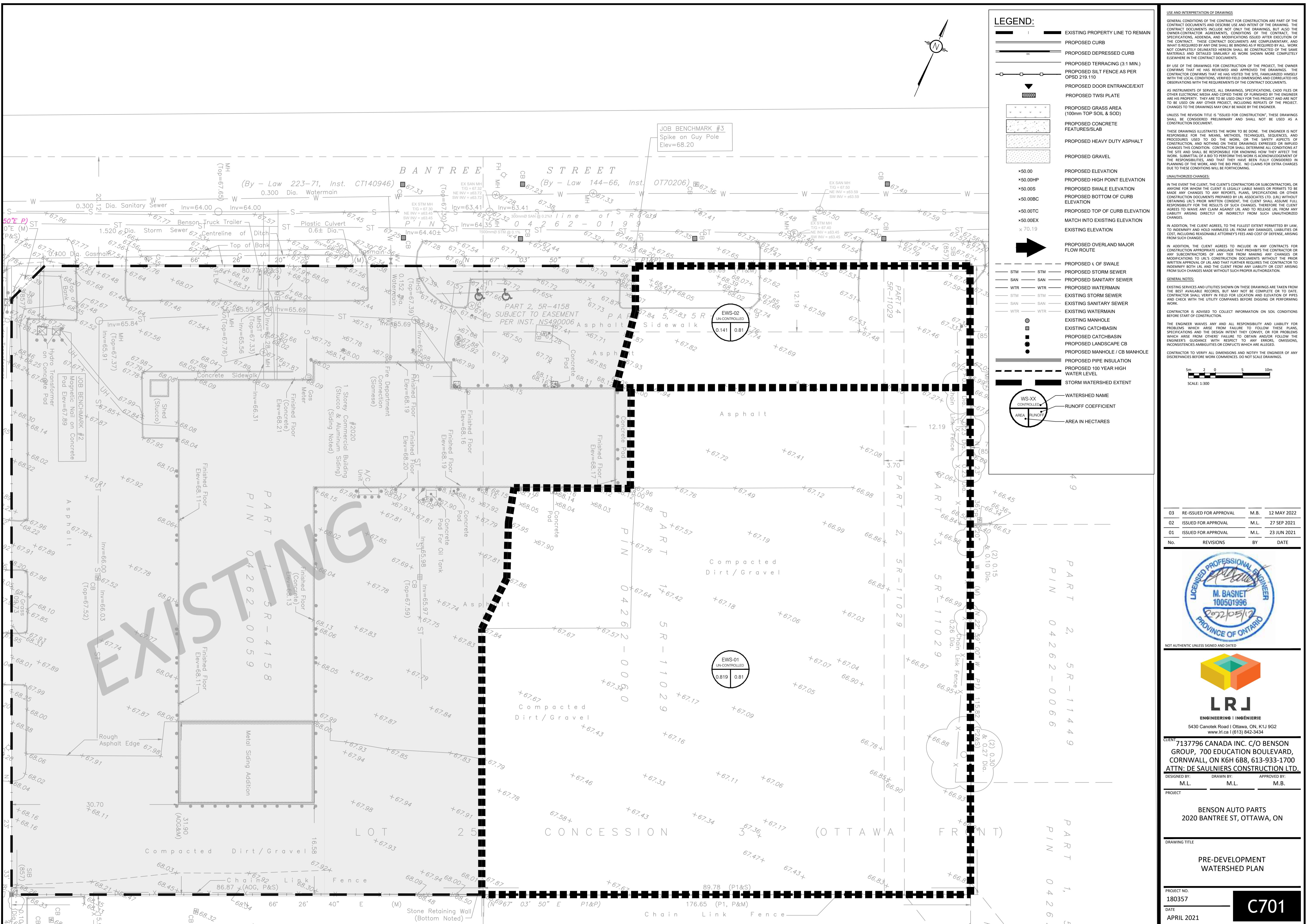
**SITE DEVELOPMENT PLAN**

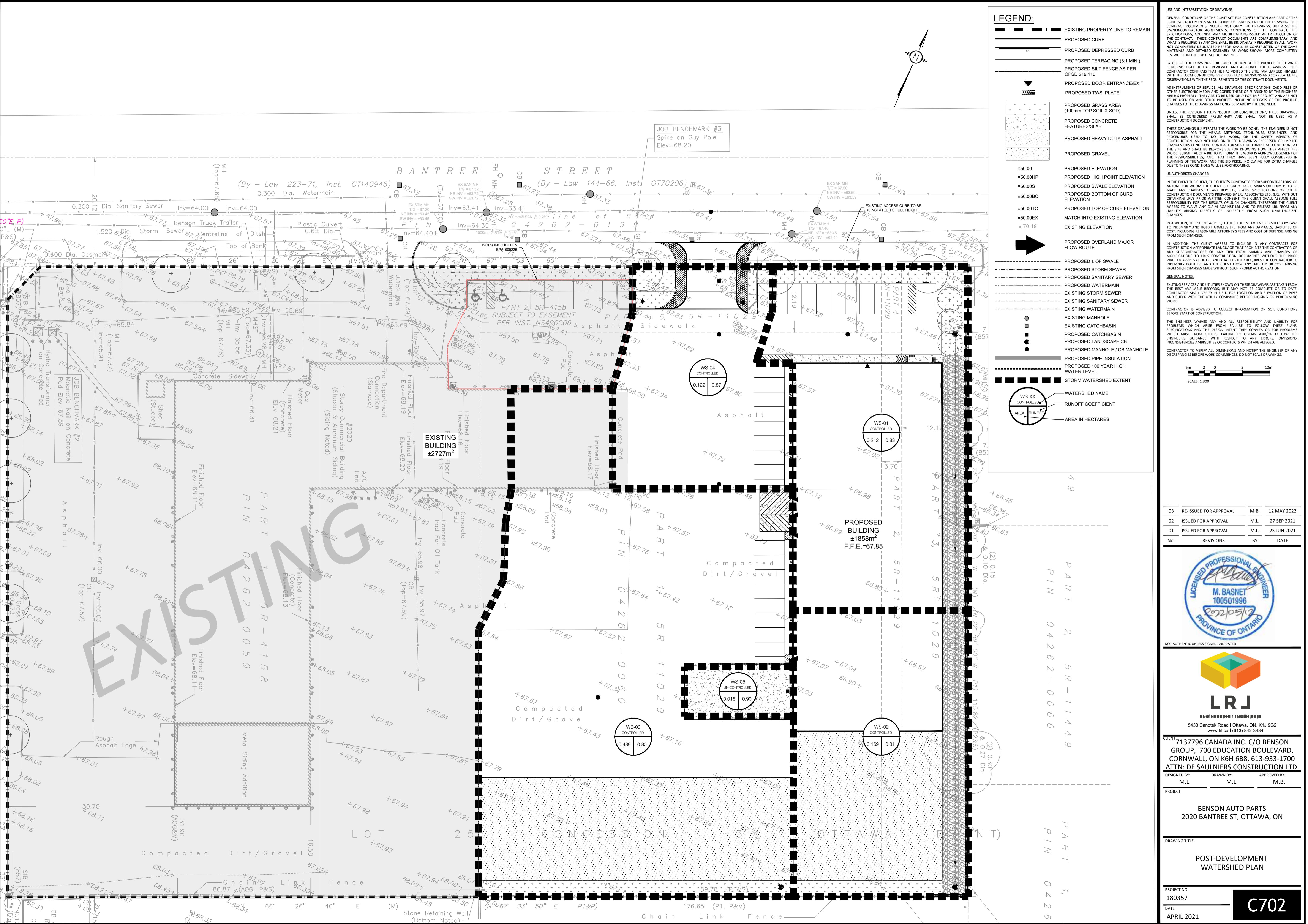
**PROJECT NO.:** 180357 **DATE:** APRIL 2021 **C201**

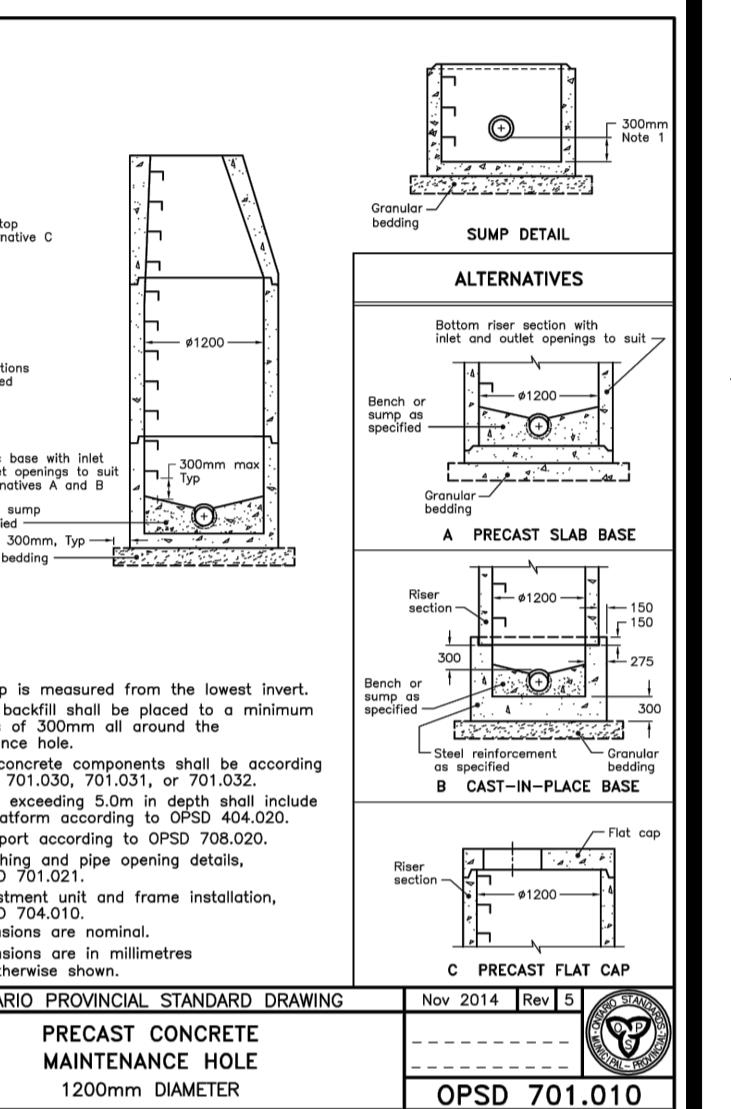
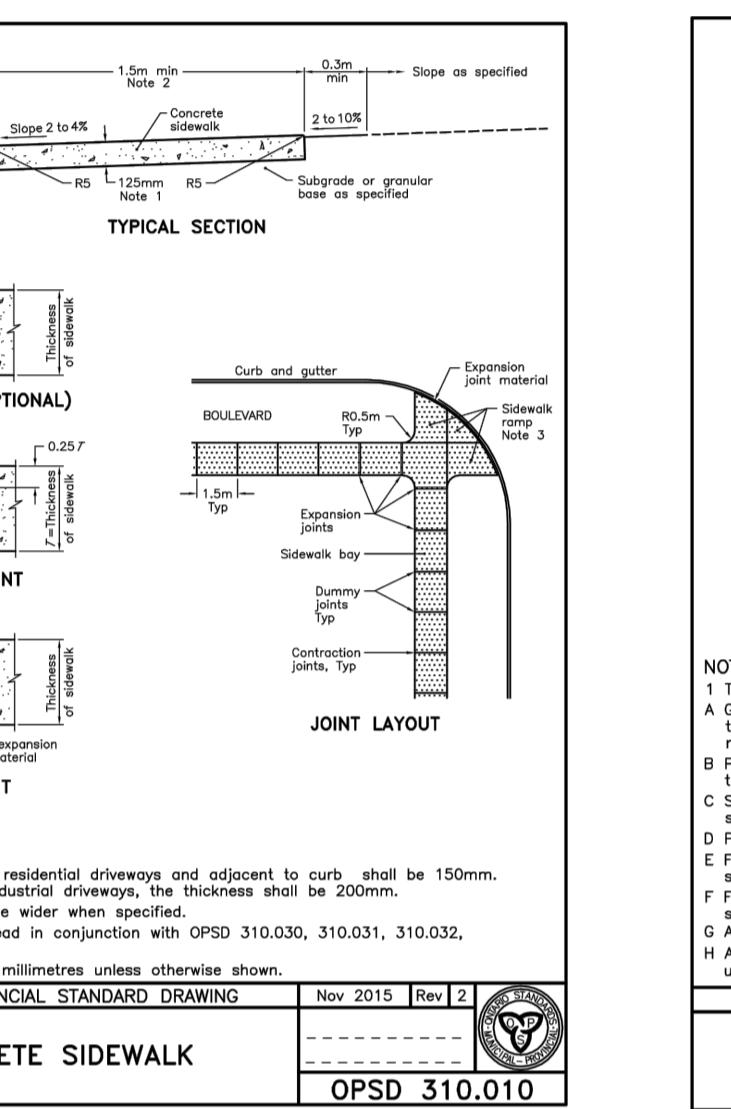
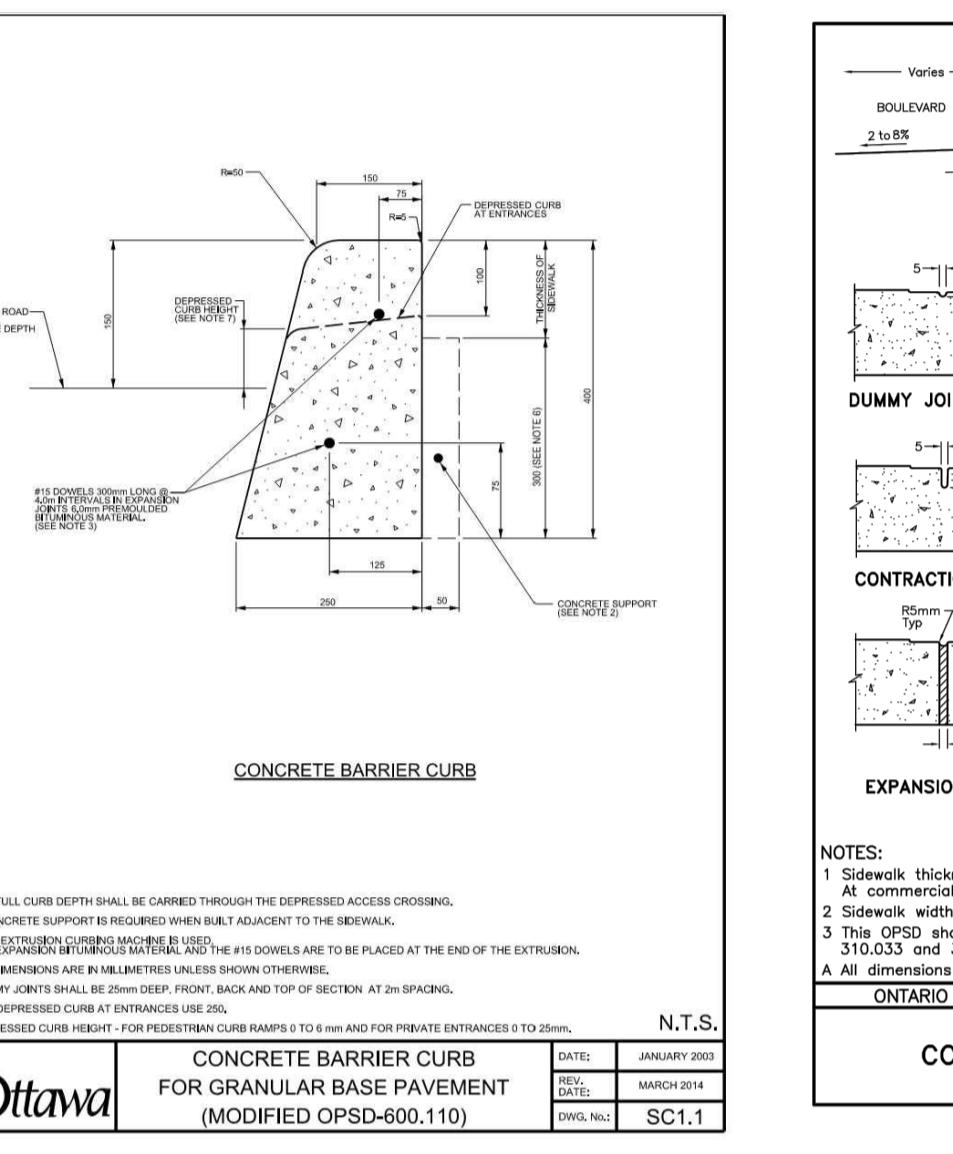
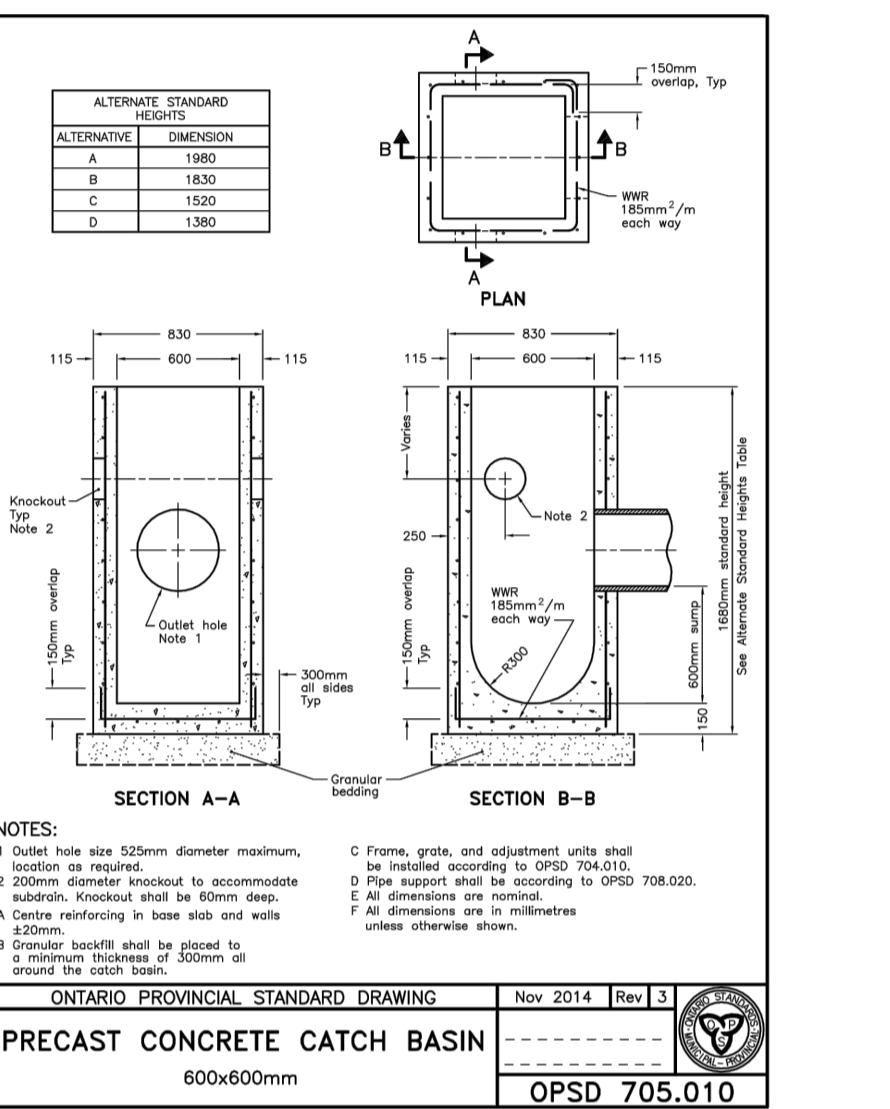
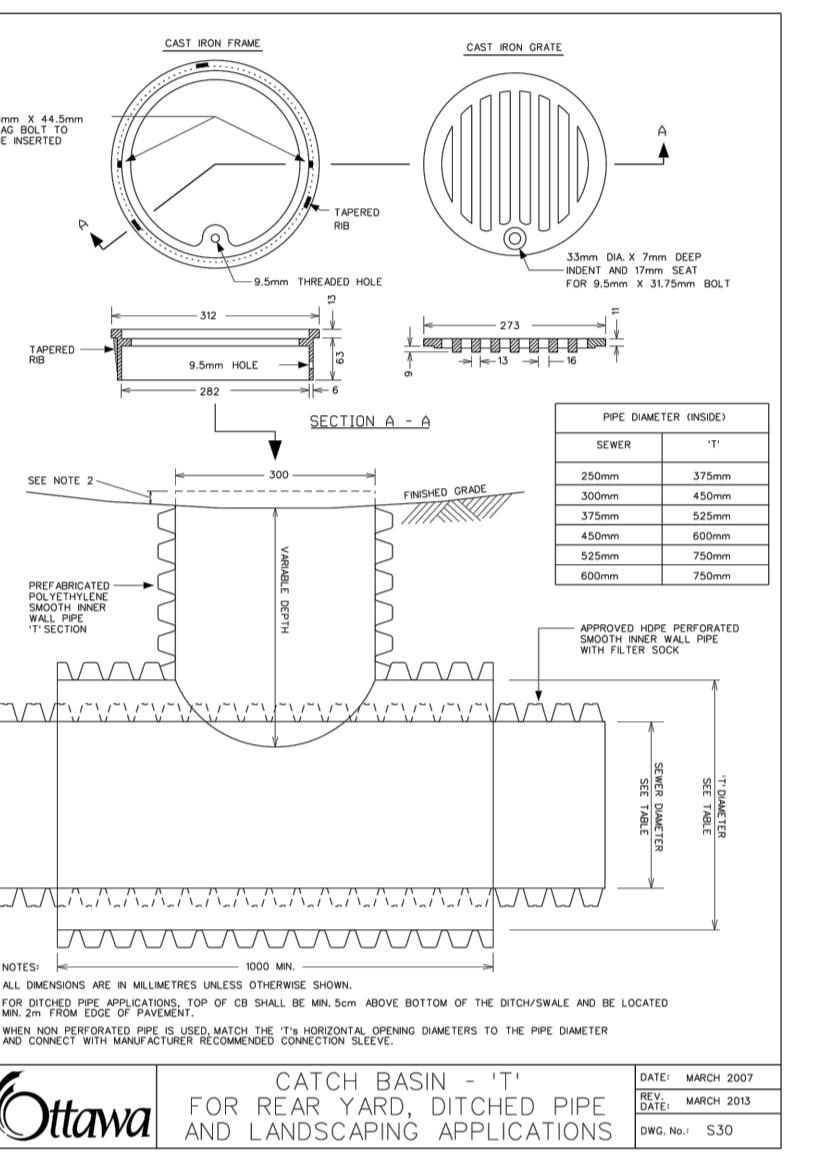
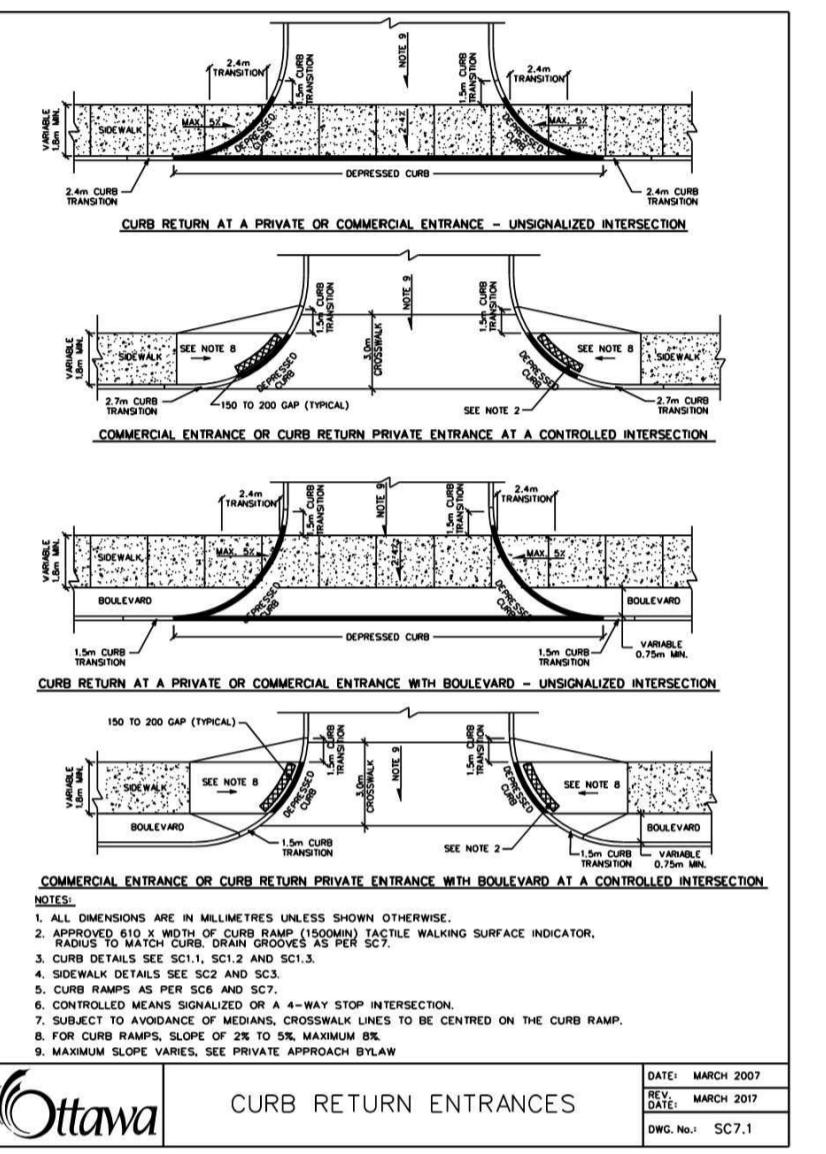
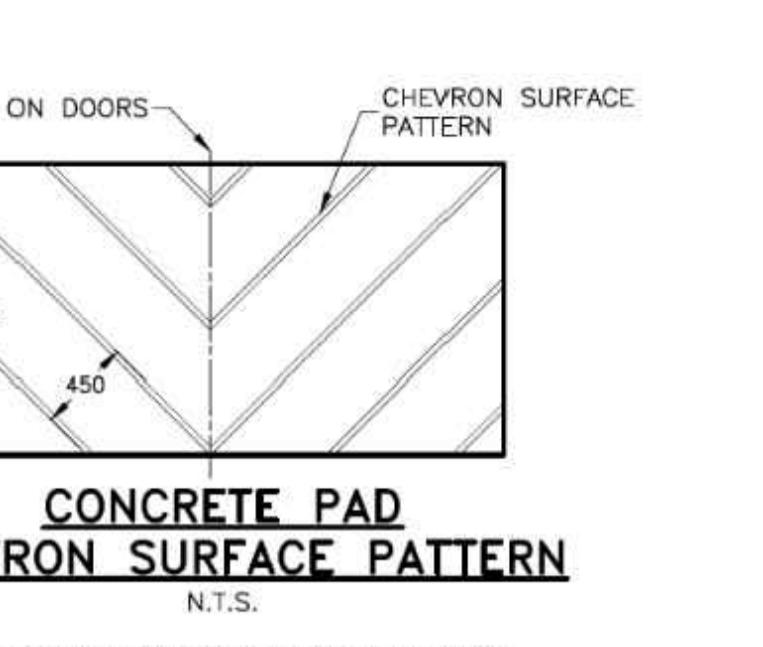
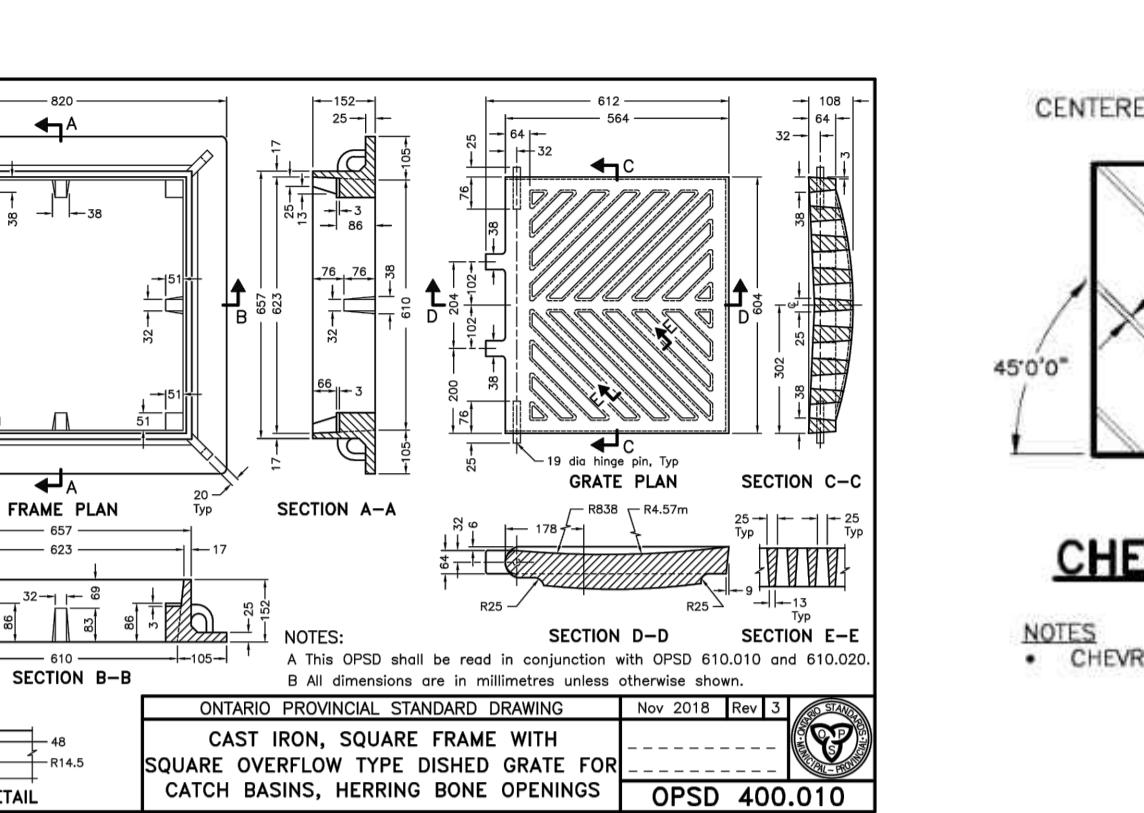
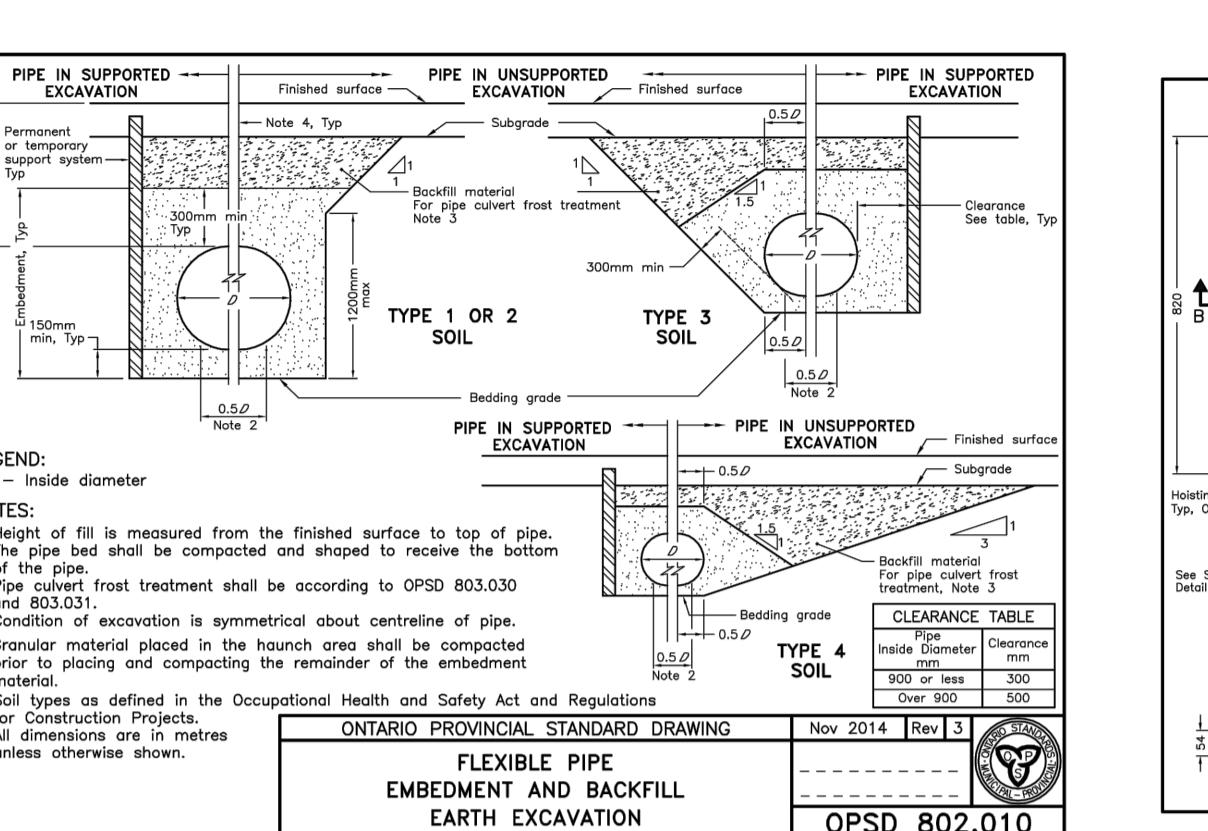
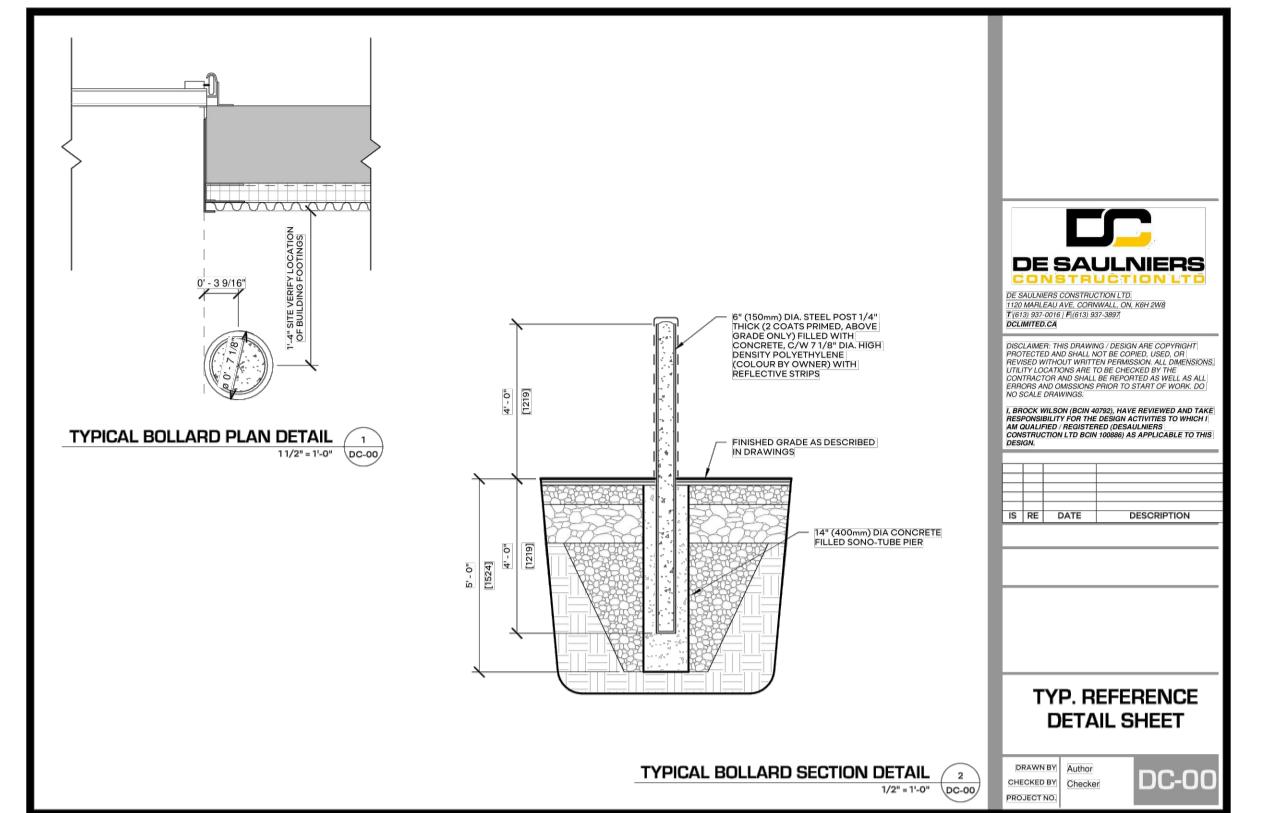




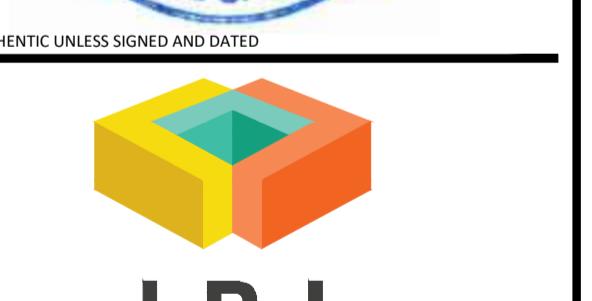








03 RE-ISSUED FOR APPROVAL M.B. 12 MAY 2022  
02 ISSUED FOR APPROVAL M.L. 27 SEP 2021  
01 ISSUED FOR APPROVAL M.L. 23 JUN 2021  
No. REVISIONS BY DATE



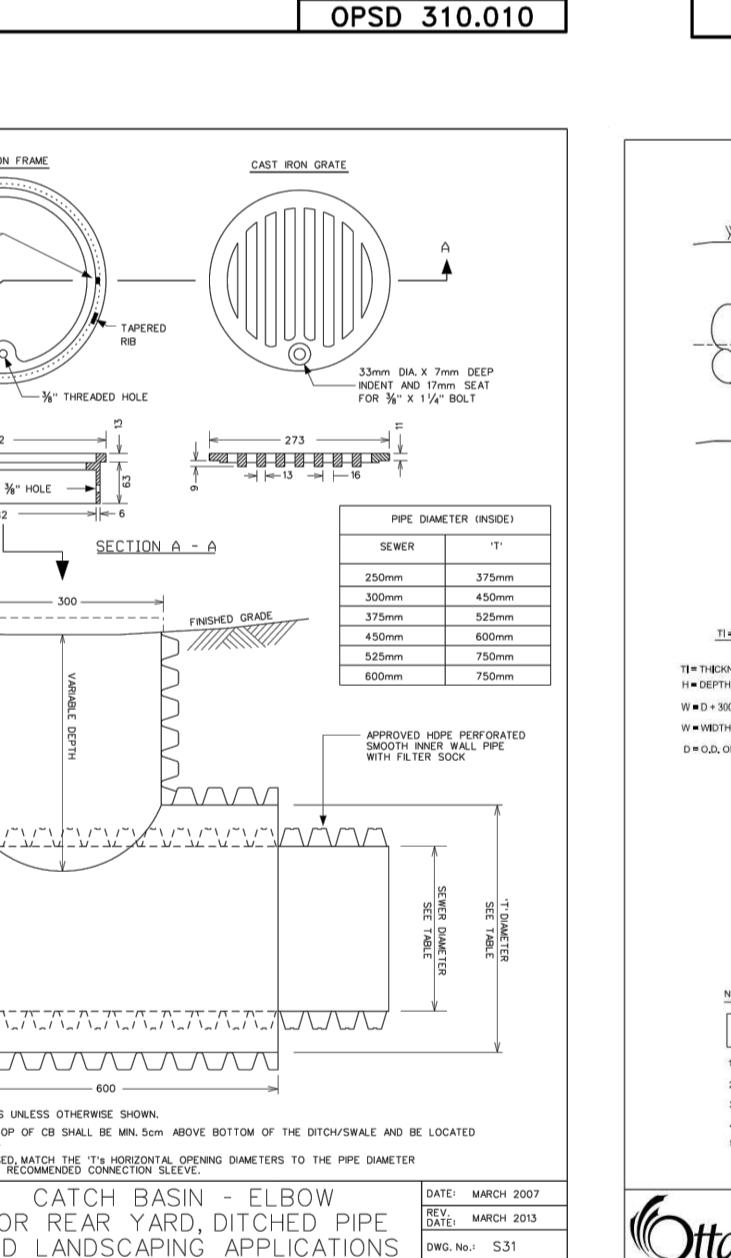
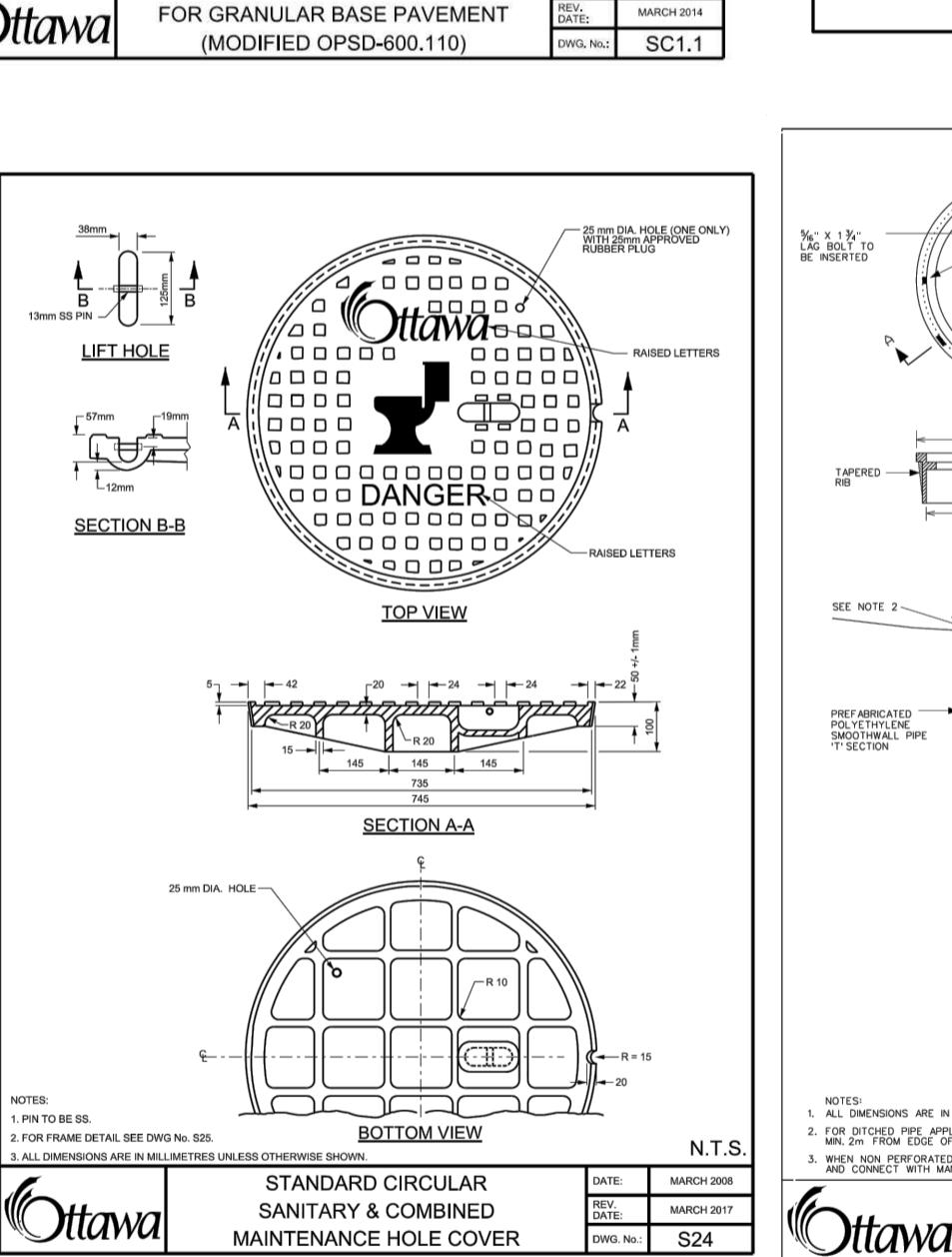
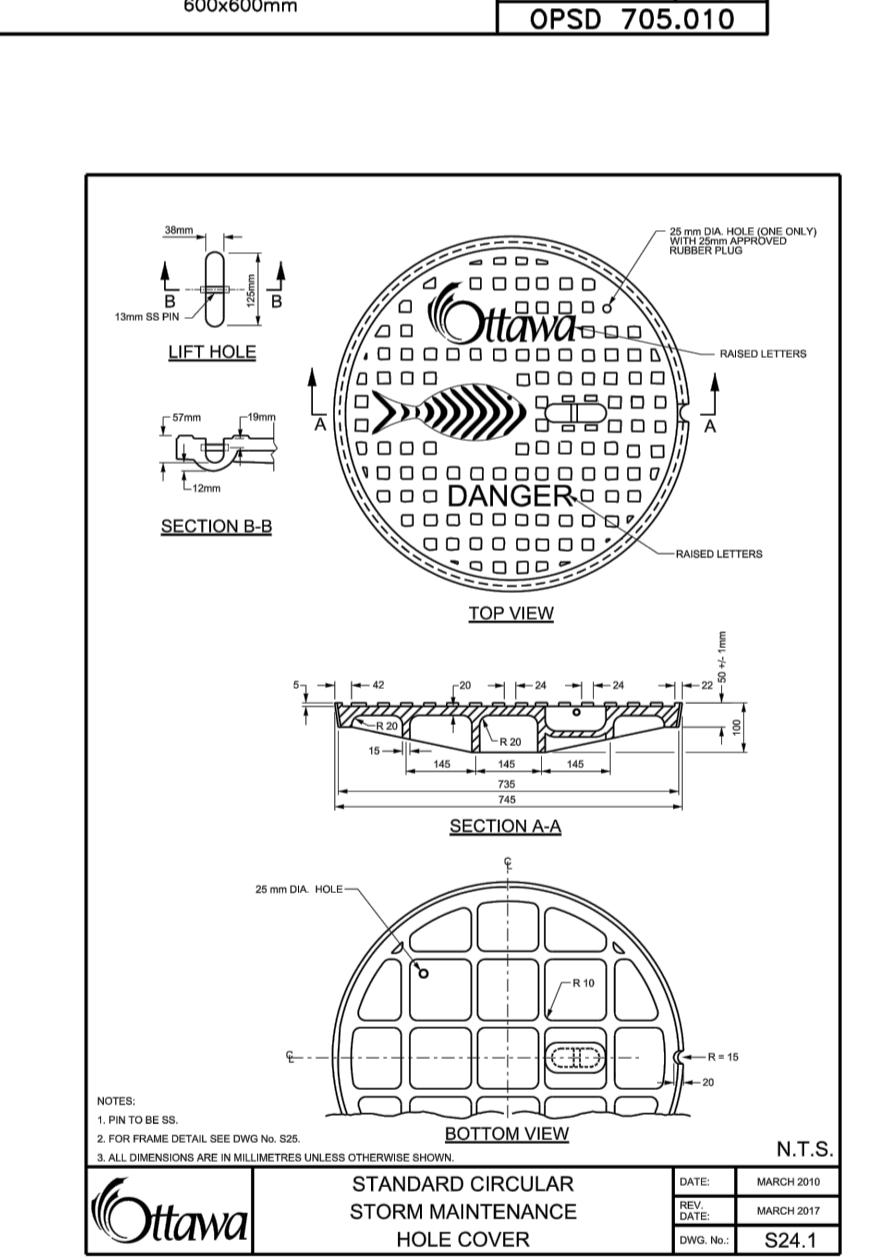
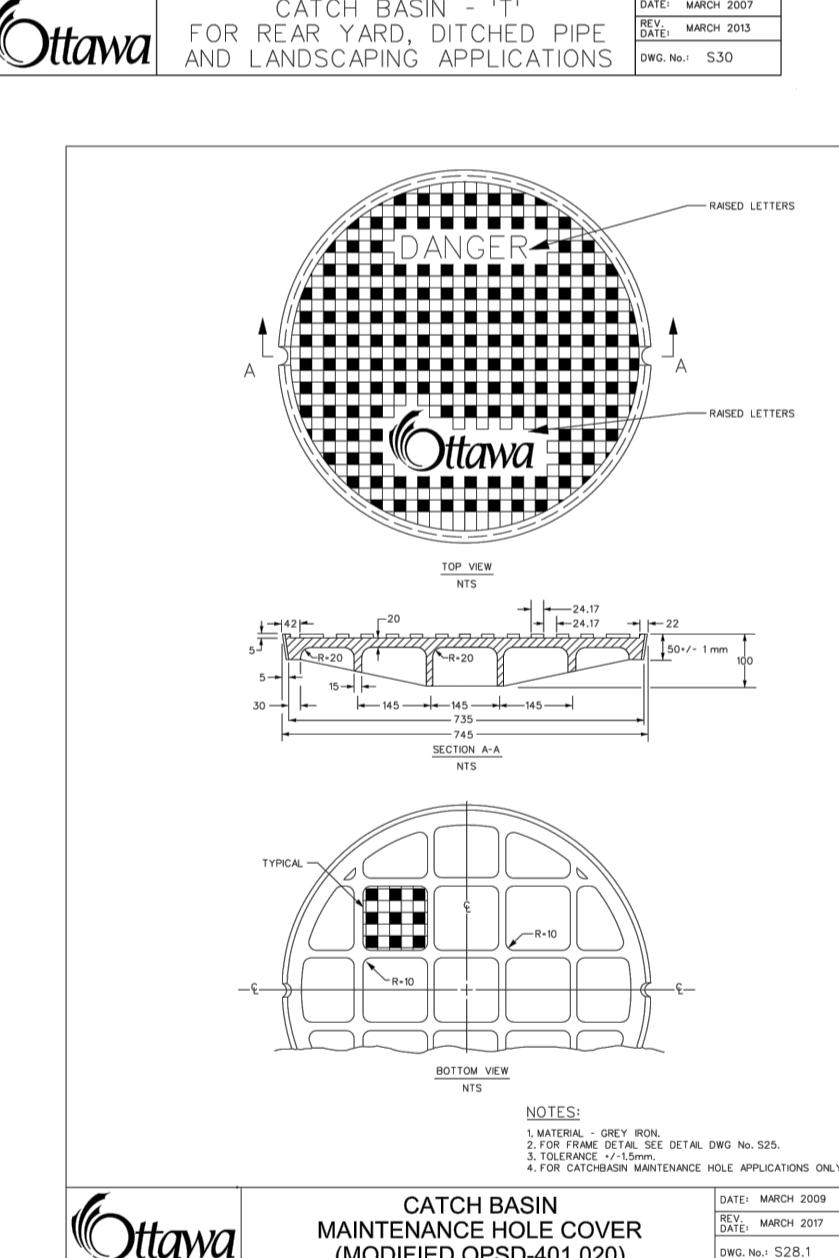
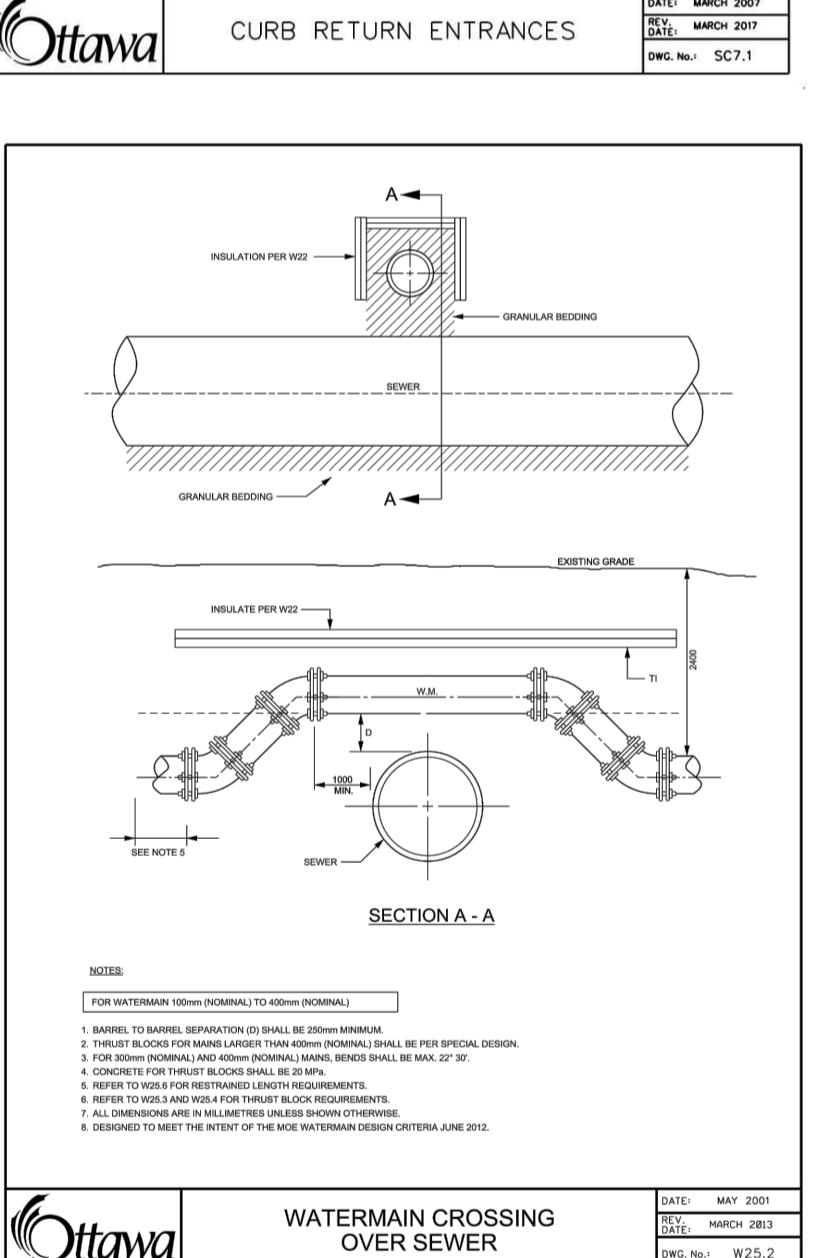
7137796 CANADA INC. C/O BENSON GROUP, 700 EDUCATION BOULEVARD, CORNWALL, ON K6H 6B8, 613-933-1700  
ATTN: DE SAULNIERS CONSTRUCTION LTD.  
DESIGNED BY: DRAWN BY: APPROVED BY:  
M.L. M.L. M.B.  
PROJECT

BENSON AUTO PARTS  
2020 BANTREE ST, OTTAWA, ON

DRAWING TITLE

CONSTRUCTION DETAIL PLAN

PROJECT NO. 180357  
DATE APRIL 2021  
C901



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWINGS. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE CONTRACT AGREEMENT, THE CONTRACTOR'S SPECIFICATIONS, THE CONTRACTOR'S ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHERE THERE IS A DISCREPANCY, THE CONTRACT AGREEMENT SHALL TAKE PRIORITY OVER THE CONTRACTOR'S SPECIFICATIONS. WORK NOT COMPLETELY DELINATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE CONDITIONS AND REQUIREMENTS OF THE DRAWINGS, AND MADE HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CAD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THEREOF FURNISHED BY THE ENGINEER ARE THE PROPERTY OF THE ENGINEER. THEY MAY NOT BE USED OTHER THAN FOR THE PROJECT FOR WHICH THEY WERE PROVIDED AND ARE NOT TO BE USED BY ANY OTHER PERSON OR ENTITY, REFERENCE TO THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THE CONTRACTOR ADJUSTES THE WORK TO BE DONE, THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK. THE DRAWINGS ARE ISSUED AS SPECIFICATIONS, AND NOT AS DRAWINGS. THE DRAWINGS ARE ISSUED AS CONDITIONS OF THE CONTRACT. CONTRACTOR SHALL INTERPRET AND ADHERE TO THE CONDITIONS OF THE CONTRACT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK, AND FOR THE COST OF CHANGES MADE AS A RESULT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR OTHER PERSONS MAKE CHANGES TO THE DRAWINGS, WHETHER MADE IN WRITING OR BY ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRJ ASSOCIATES LTD. (URL) WITHOUT THE WRITTEN APPROVAL OF LRJ, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF CHANGES, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESULTS OF SUCH CHANGES THEREFORE. THE CLIENT AGREES TO WAIVE AND CLAIM AGAINST LRJ AND TO RELEASE URL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS URL FROM ANY DAMAGES, LIABILITIES OR COSTS ARISING FROM ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS, FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTOR OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO THE DRAWINGS, WHETHER MADE IN WRITING OR BY ANY REPORT, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS, WITHOUT THE WRITTEN APPROVAL OF LRJ, AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH URL AND CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE ENGINEER'S INFORMATION. NO DUTY IS IMPOSED ON THE CONTRACTOR TO DATE.

CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THE CONTRACTOR OR THE PROBLEMS WHICH OCCUR DURING CONSTRUCTION. THE CONTRACTOR OBTAINS THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

USE AND INTERPRETATION OF DRAWINGS  
GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE CONTRACT, THE SPECIFICATIONS, THE CONTRACTOR'S BIDDING DOCUMENTS, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHERE THERE IS A DISCREPANCY, THE CONTRACT DOCUMENTS SHALL PREVAIL. THE MATERIALS AND DETAILS SIMILARLY AS WORKED OUT IN THE DRAWINGS WHICH ARE NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORKED OUT IN THE DRAWINGS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE CONDITIONS AND OBSERVED THE WORK, AND MADE HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CAD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THEREOF FURNISHED BY THE ENGINEER ARE THE PROPERTY OF THE ENGINEER AND THE DRAWINGS ARE NOT TO BE USED BY ANY OTHER PERSON, EXCEPT AS PROVIDED IN THE CONTRACT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THE CONTRACTOR AGREES TO DO THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, SEQUENCES, AND PROCEDURES USED TO DO THE WORK. THE DRAWINGS ARE THE EXCLUDED CONDITIONS OF CONTRACT. CONTRACTOR SHALL DETERMINE AND APPROVE AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. THE CONTRACTOR AGREES TO TAKE FULL RESPONSIBILITY FOR THE WORK, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

UNAUTHORIZED CHANGES:  
IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE ELSE MAKES ANY CHANGES, ADDITIONS, OR REMOVALS TO THE DRAWINGS MADE AFTER THE DATE OF THIS AGREEMENT, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRJ ASSOCIATES LTD. (LRJ) WITHOUT OBTAINING WRITTEN APPROVAL FROM LRJ, THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE, THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRJ AND TO RELEASE LRJ FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRJ FROM ANY DAMAGES, LIABILITIES OR COSTS INCURRED BY LRJ ATTORNEYS FEES AND COST OF DEFENSE, ARISING FROM UNAUTHORIZED CHANGES.

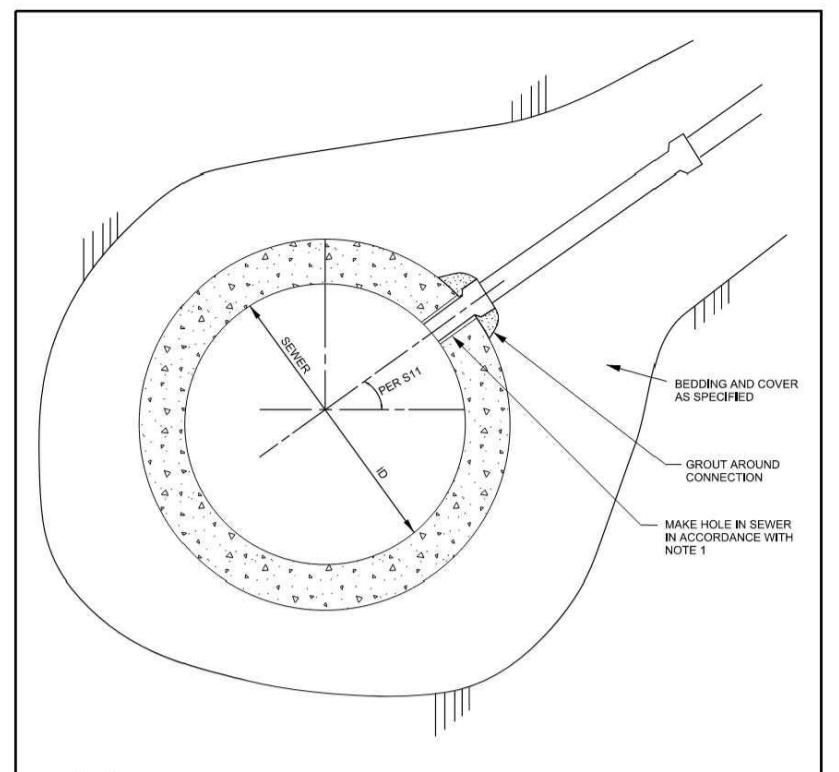
IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR REMOVALS TO THE DRAWINGS, WITHOUT OBTAINING WRITTEN APPROVAL FROM LRJ. THE CONTRACTOR SHALL NOT MAKE ANY CHANGES TO THE DRAWINGS, UNLESS THEY HAVE BEEN APPROVED BY LRJ AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRJ AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

GENERAL NOTES:  
EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE ENGINEER'S INFORMATION. THEY MAY NOT BE CORRECT. THE CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

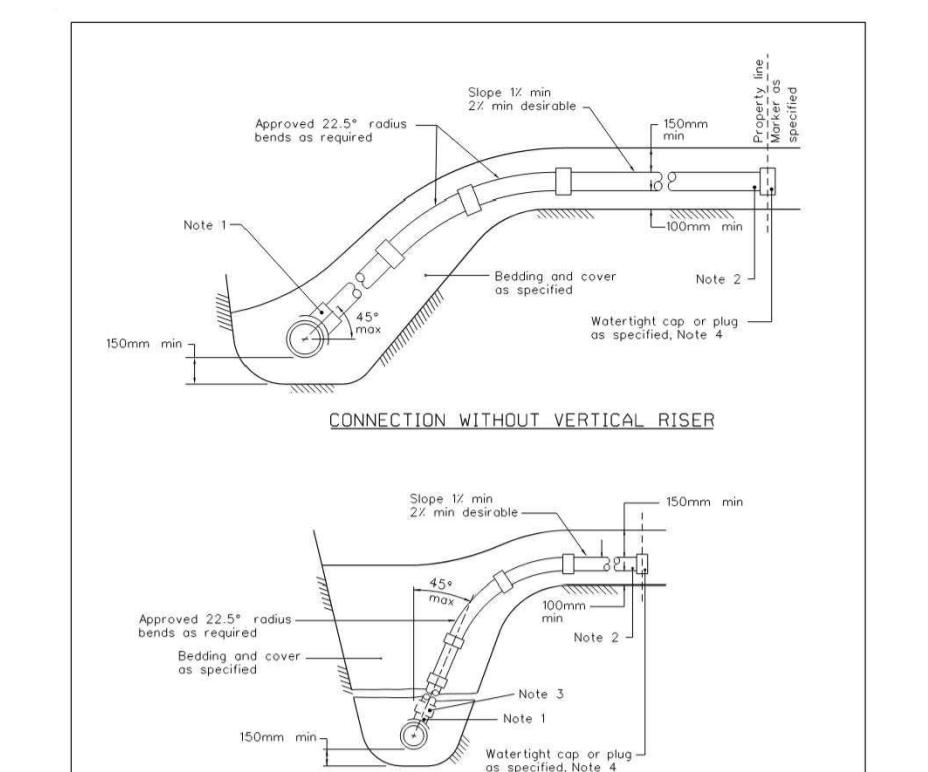
CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND DESIGN INTENT THE CONVENTIONAL PROBLEMS WHICH ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR IS ADVISED TO FOLLOW THE DRAWINGS AND CONSULT THE ENGINEER FOR THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

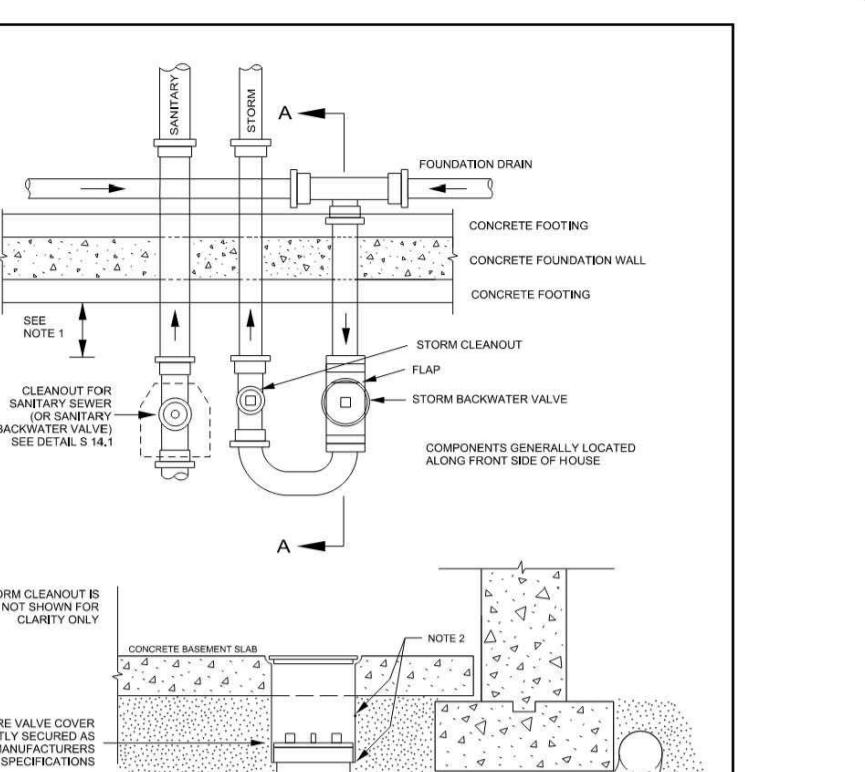
CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.



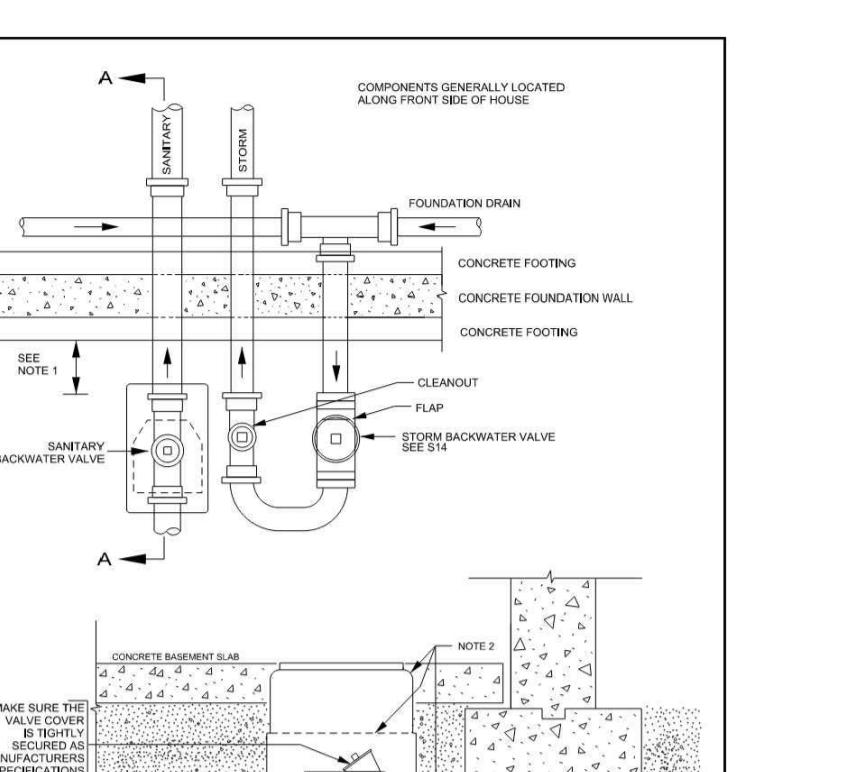
**SEWER SERVICE CONNECTIONS FOR RIGID MAIN SEWER PIPE USING BELL END INSERT METHOD**



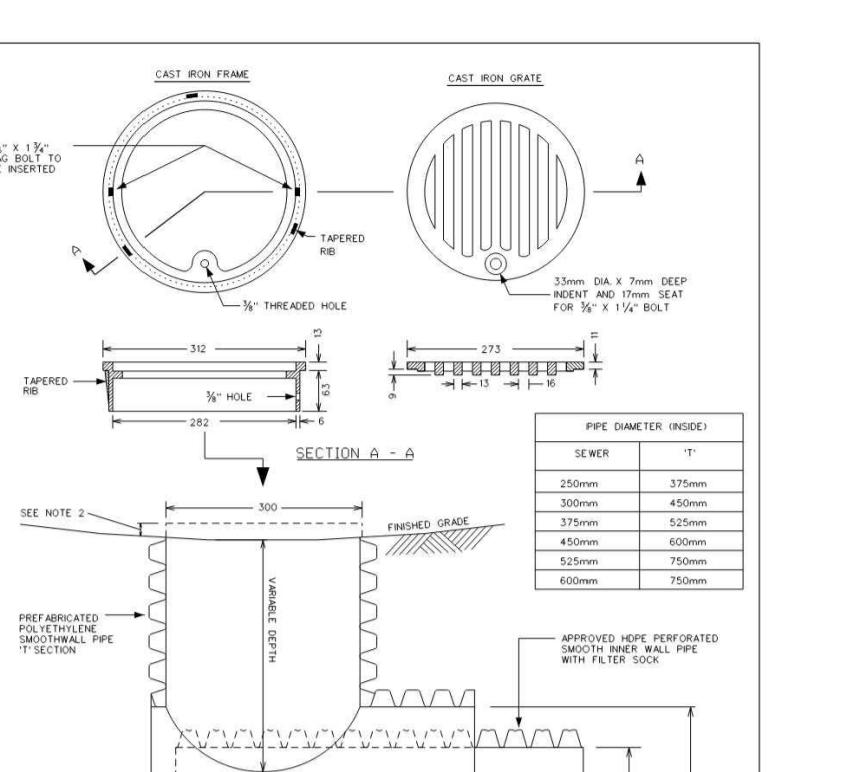
**SEWER SERVICE CONNECTIONS FOR FLEXIBLE MAIN SEWER PIPE (MODIFIED OPSD-1006.020)**



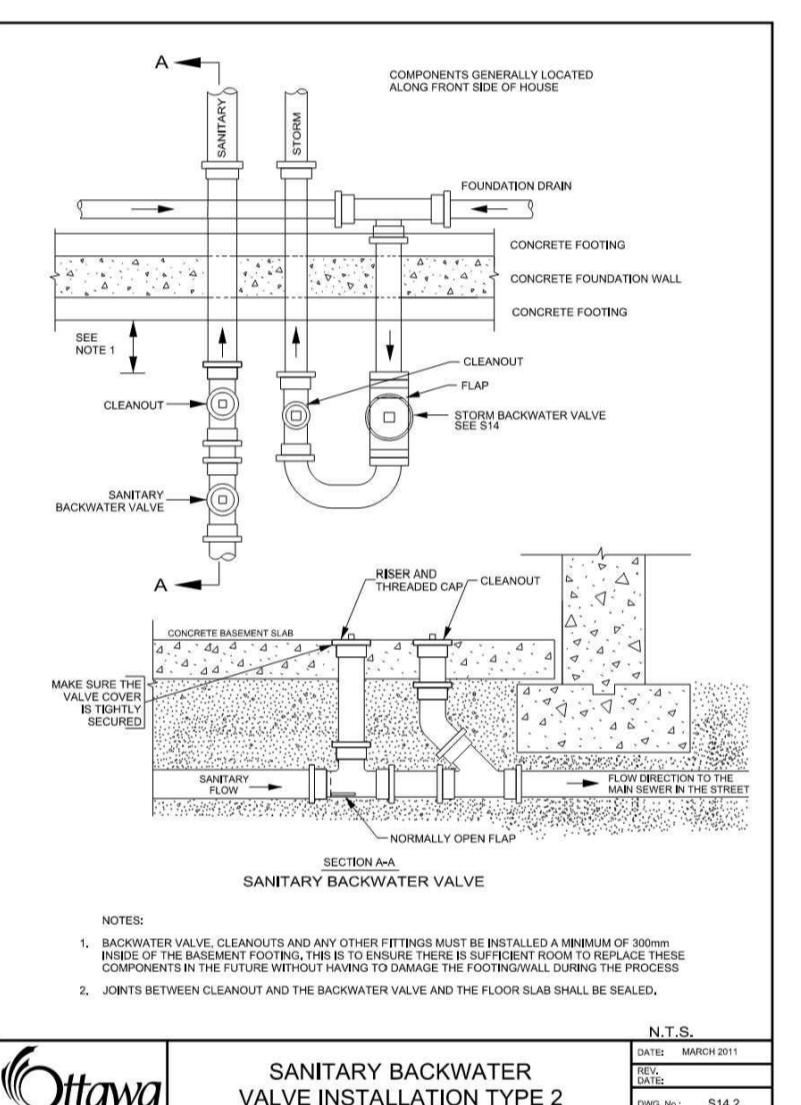
**FOUNDATION DRAIN BACKWATER VALVE INSTALLATION**



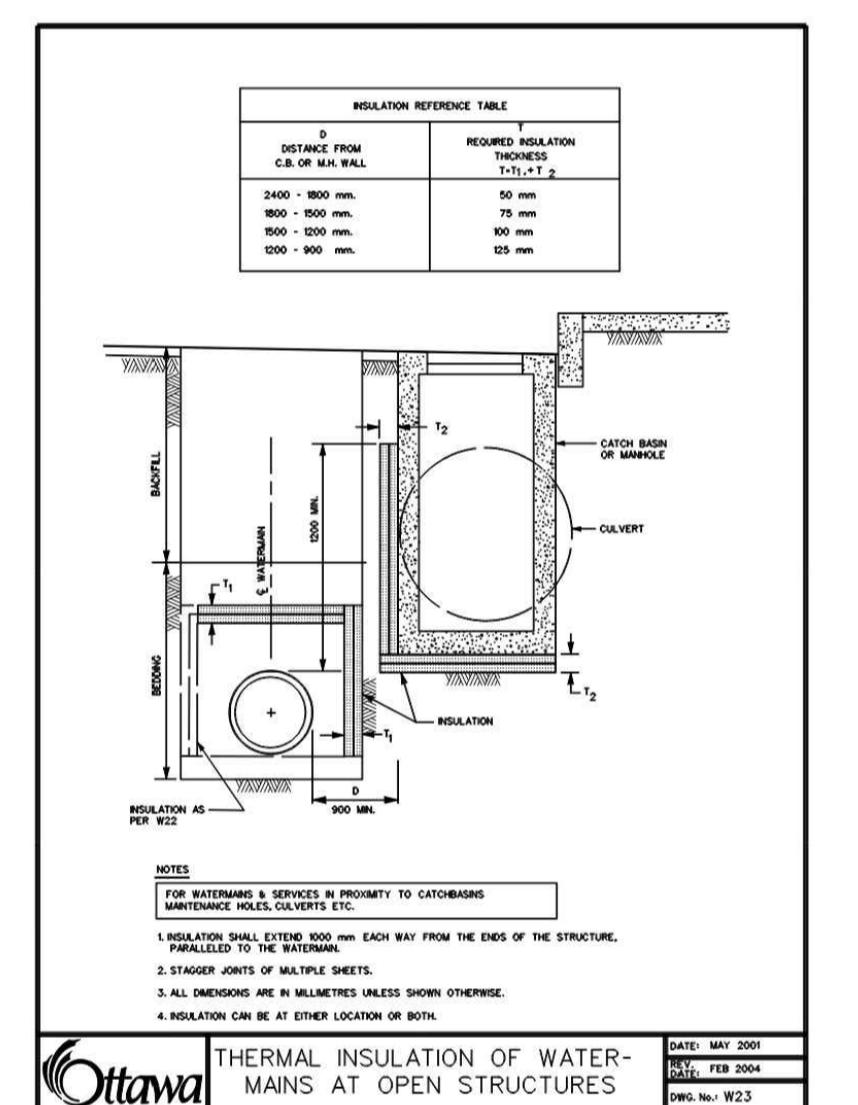
**SANITARY BACKWATER VALVE INSTALLATION TYPE 1**



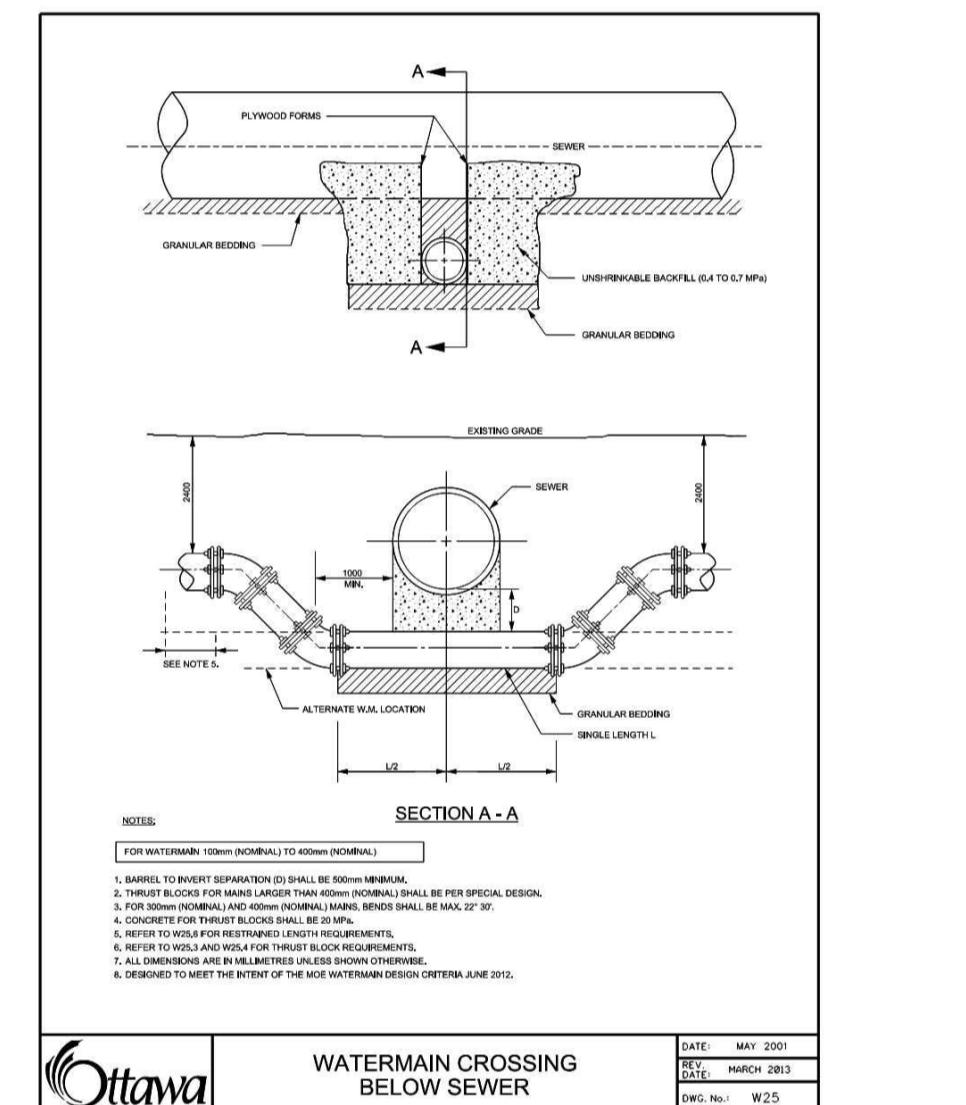
**CATCH BASIN - ELBOW FOR REAR YARD, DITCHED PIPE AND LANDSCAPING APPLICATIONS**



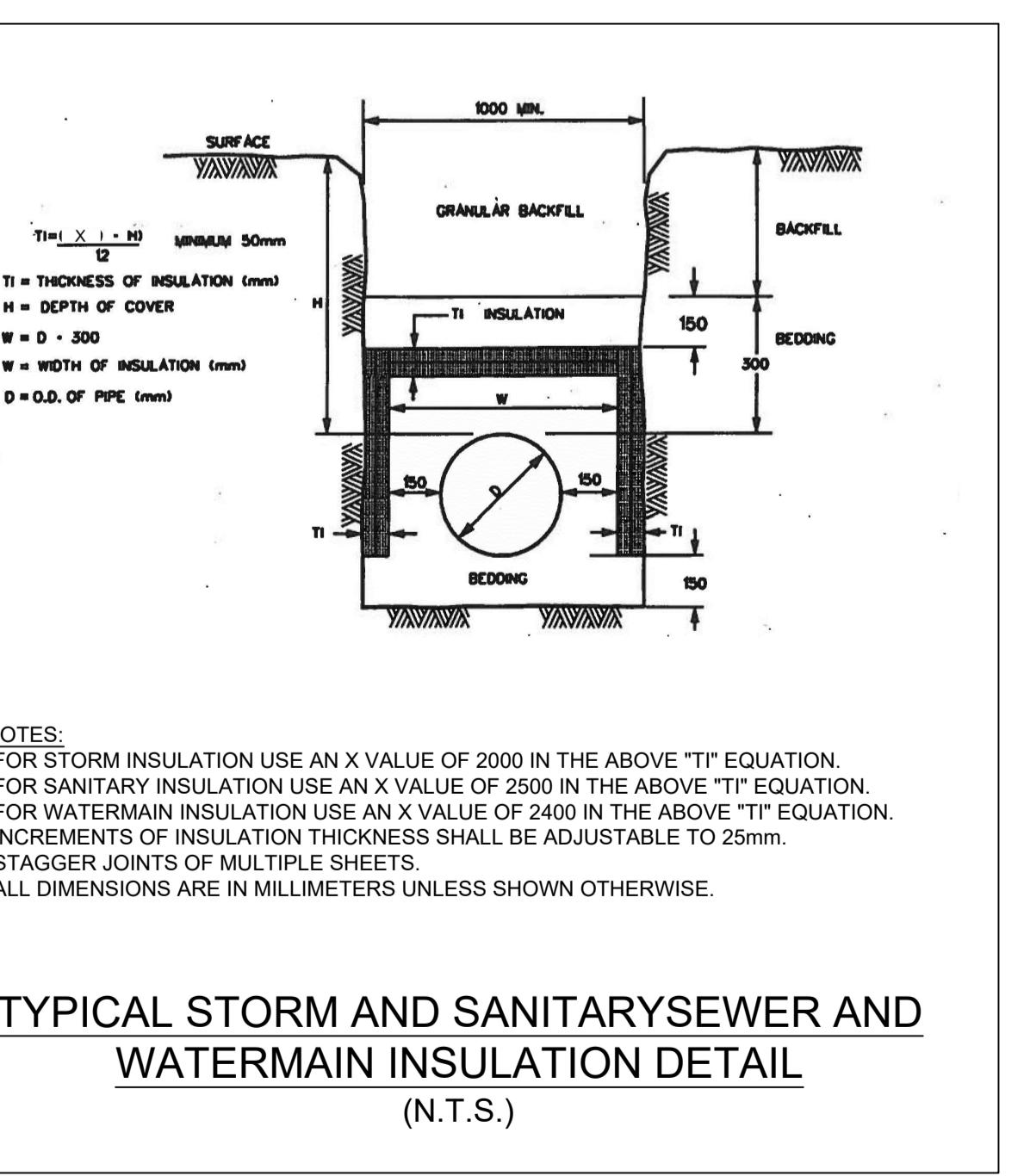
**SANITARY BACKWATER VALVE INSTALLATION TYPE 2**



**Thermal insulation of water mains at open structures**



**WATERMAIN CROSSING BELOW SEWER**



NOTES:  
-FOR STORM INSULATION USE AN X VALUE OF 2000 IN THE ABOVE "TI" EQUATION.  
-FOR SANITARY INSULATION USE AN X VALUE OF 2500 IN THE ABOVE "TI" EQUATION.  
-FOR WATERMAIN INSULATION USE AN X VALUE OF 2400 IN THE ABOVE "TI" EQUATION.  
-INCREMENTS OF INSULATION THICKNESS SHALL BE ADJUSTABLE TO 25mm.  
-STAGGER JOINTS OF MULTIPLE SHEETS.  
-ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.

**TYPICAL STORM AND SANITARYSEWER AND WATERMAIN INSULATION DETAIL (N.T.S.)**

03	RE-ISSUED FOR APPROVAL	M.B.	12 MAY 2022
02	ISSUED FOR APPROVAL	M.L.	27 SEP 2021
01	ISSUED FOR APPROVAL	M.L.	23 JUN 2021
No.	REVISIONS	BY	DATE



NOT AUTHENTIC UNLESS SIGNED AND DATED



**LRJ**  
ENGINEERING | INGÉNIERIE  
5430 Canotek Road | Ottawa, ON, K1J 9G2  
www.lrj.ca | (613) 842-3434

CLIENT: 7137796 CANADA INC. C/O BENSON GROUP, 700 EDUCATION BOULEVARD, CORNWALL, ON K6H 6B8, 613-933-1700  
ATTN: DE SAULNIERS CONSTRUCTION LTD.  
DESIGNED BY: M.L. DRAWN BY: M.L. APPROVED BY: M.B.

PROJECT: BENSON AUTO PARTS  
2020 BANTREE ST, OTTAWA, ON

DRAWING TITLE: CONSTRUCTION DETAIL PLAN

PROJECT NO.: 180357  
DATE: APRIL 2021  
C902

## **APPENDIX G**

### **Boundary Conditions**

**From:** Baker, Adam <[adam.baker@ottawa.ca](mailto:adam.baker@ottawa.ca)>  
**Sent:** March 23, 2020 2:26 PM  
**To:** Maxime Longtin  
**Cc:** Mohan Basnet; Virginia Johnson  
**Subject:** RE: 180357 - 2020 Bantree Street - Boundary Conditions  
**Attachments:** 2020\_Bantree MArch 2020.pdf

Hi Maxime,

Please find below and attached water boundary conditions –

The following are boundary conditions, HGL, for hydraulic analysis at 2020 Bantree (zone 1E) assumed to be connected to the 305mm on Bantree (see attached PDF for location).

Minimum HGL = 109.0m

Maximum HGL = 117.8.0m

MaxDay + FireFlow (150 L/s) = 103.0m

These are for current conditions and are based on computer model simulation.

*Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.*

I'll follow-up with the contact list of senior engineers areas in a separate email.

Thanks,  
Adam

---

**From:** Maxime Longtin <[mlongtin@irl.ca](mailto:mlongtin@irl.ca)>  
**Sent:** March 23, 2020 8:03 AM  
**To:** Baker, Adam <[adam.baker@ottawa.ca](mailto:adam.baker@ottawa.ca)>  
**Cc:** Mohan Basnet <[mbasnet@irl.ca](mailto:mbasnet@irl.ca)>; Virginia Johnson <[vjohnson@irl.ca](mailto:vjohnson@irl.ca)>  
**Subject:** RE: 180357 - 2020 Bantree Street - Boundary Conditions

**CAUTION:** This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

**ATTENTION :** Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hi Adam,

I hope that you are staying safe and healthy.

Just wanted to follow-up on the email below.

Let us know if you need anything else,

**Maxime Longtin**



Civil Engineering Technologist  
**LRL Associates Ltd.**  
5430 Canotek Road  
Ottawa, Ontario K1J 9G2  
**T** (613) 842-3434 or (877) 632-5664 ext 256  
**C** (613) 915-8043  
**F** (613) 842-4338  
**E** [mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)  
**W** [www.lrl.ca](http://www.lrl.ca)

*Given the current COVID-19 situation, please be aware that LRL has implemented alternative working conditions for our team.*

*Many of us have now transitioned to working from home; however, communication and workability remains one of our top priorities.*

*We will continue to be reachable by cell phone or by calling LRL at 613-842-3434 which will prompt you to enter the extension of the person you are trying to reach.*

*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*



---

**From:** Baker, Adam <[adam.baker@ottawa.ca](mailto:adam.baker@ottawa.ca)>  
**Sent:** March 16, 2020 11:41 AM  
**To:** Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Cc:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>; Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>  
**Subject:** RE: 180357 - 2020 Bantree Street - Boundary Conditions

Great thank you. I'll follow-up as soon as I get the boundary results from our modelling group.

For each project you can go directly to the project manager or whoever provided the engineering follow-up comments for the pre-consultation meeting. If you don't have that info you can go to the senior engineer for the area – I will find the list of the ward areas for each senior engineer and follow-up with you on that.

Thanks,  
Adam

---

**From:** Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Sent:** March 16, 2020 11:31 AM  
**To:** Baker, Adam <[adam.baker@ottawa.ca](mailto:adam.baker@ottawa.ca)>  
**Cc:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>; Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>  
**Subject:** RE: 180357 - 2020 Bantree Street - Boundary Conditions

**CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.**

**ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.**

Thanks for getting back to us. I'm attaching the email that was sent by my colleague previously.

Also, would it be possible to have a ward map with who to contact in which sector? This would help LRL a lot when it comes times to request some information for other project down the road.



ENGINEERING | INGÉNIERIE

Thanks, and have yourself a great day.

**Maxime Longtin**

Civil Engineering Technologist

**LRL Associates Ltd.**

5430 Canotek Road  
Ottawa, Ontario K1J 9G2

**T** (613) 842-3434 or (877) 632-5664 ext 256

**C** (613) 915-8043

**F** (613) 842-4338

**E** [mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)

**W** [www.lrl.ca](http://www.lrl.ca)

*We care deeply, so let us know how we did by completing our [Customer Satisfaction Survey](#).*

*Nous nous soucions profondément de votre opinion, nous vous invitons donc à nous faire savoir si nous avons satisfait vos attentes en remplissant notre [sondage sur la satisfaction de la clientèle](#)*



---

**From:** Baker, Adam <[adam.baker@ottawa.ca](mailto:adam.baker@ottawa.ca)>  
**Sent:** Monday, March 16, 2020 10:48 AM  
**To:** Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Cc:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>; Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>  
**Subject:** RE: 180357 - 2020 Bantree Street - Boundary Conditions

Hi Maxime,

Hope you're doing well. I will handle this boundary request. Could you please send me the attachments which Mohan had mentioned in the original email (water supply and FUS calculations).

Thank you,  
Adam

**Adam Baker, EIT**  
Engineering Intern  
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique  
Development Review - South Branch  
City of Ottawa | Ville d'Ottawa  
110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1  
613.580.2424 ext./poste 26552, [Adam.Baker@ottawa.ca](mailto:Adam.Baker@ottawa.ca)

---

**From:** Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Sent:** March 11, 2020 12:55 PM  
**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Cc:** Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>; Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>  
**Subject:** RE: 180357 - 2020 Bantree Street - Boundary Conditions

**CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.**

**ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.**

Hope everything is well with you.  
Could you see the email from my colleague below and advise?

Thanks so much

**Maxime Longtin**

Civil Engineering Technologist  
**LRL Associates Ltd.**  
5430 Canotek Road  
Ottawa, Ontario K1J 9G2  
**T** (613) 842-3434 or (877) 632-5664 ext 256  
**C** (613) 915-8043  
**F** (613) 842-4338  
**E** [mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)  
**W** [www.lrl.ca](http://www.lrl.ca)



We care deeply, so let us know how we did by completing our [Customer Satisfaction Survey](#).

Nous nous soucions profondément de votre opinion, nous vous invitons donc à nous faire savoir si nous avons satisfait vos attentes en remplissant notre [sondage sur la satisfaction de la clientèle](#)



---

**From:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>  
**Sent:** Wednesday, February 26, 2020 3:05 PM  
**To:** [John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)  
**Cc:** Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>; Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Subject:** 180357 - 2020 Bantree Street - Boundary Conditions

Hello John,

We are currently working on a serviceability report for 2020 Bantree Street, and require the boundary conditions at the site to proceed.

Please use the following data to provide the required boundary conditions:

- Average Daily Demand = 1.67 L/s
- Maximum Daily Demand = 2.50 L/s
- Maximum Hourly Demand = 4.50 L/s
- Required Fire Flow = 150.00 L/s

For your reference, I have included copies of the Water Supply Calculations & FUS Fire Flow Calculations along with this email.

Thank you,

Mohan

### **Mohan Basnet, P.Eng.**

Civil Engineering Services

**LRL Associates Ltd.**

5430 Canotek Road  
Ottawa, Ontario K1J 9G2



**T** (613) 842-3434 or (877) 632-5664 ext 213

**F** (613) 842-4338

**E** [mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)

**W** [www.lrl.ca](http://www.lrl.ca)

*We care deeply, so let us know how we did by completing our [Customer Satisfaction Survey](#).*

*Nous nous soucions profondément de votre opinion, nous vous invitons donc à nous faire savoir si nous avons satisfait vos attentes en remplissant notre [sondage sur la satisfaction de la clientèle](#)*



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.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'  
'

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.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'  
'

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.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'

