



Site Servicing and Stormwater Management Report for
Site Plan Control Application

**C&C Transportation
8015 Russell Road
Ottawa, Ontario**

Prepared for

The C and C Group of Companies

Attention:
Mr. Bob Cousins

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1 INTRODUCTION

LRL Associates Ltd. (LRL) has been retained by C&C Transportation to prepare a site servicing and stormwater management report in support of their site plan control application for a proposed new building development at 8015 Russell Road in Ottawa. This report presents the proposed servicing plan of the new development for water and sanitary services, as well as stormwater management.

This report has been prepared in consideration of the survey carried out by Dutrisac Surveying Inc. in May 2014. Should there be any discrepancies in the existing infrastructure which may relate to the site servicing considerations, LRL should be advised in order to review the report recommendations. This report should be read in conjunction with the grading and drainage, site servicing, and stormwater management plans prepared by LRL.

2 SITE DESCRIPTION

The subject property is located within the boundaries of the City of Ottawa, Ontario. As illustrated in Figure 1, the development will be located at the corner of Frank Kenny Road and Russell Road.

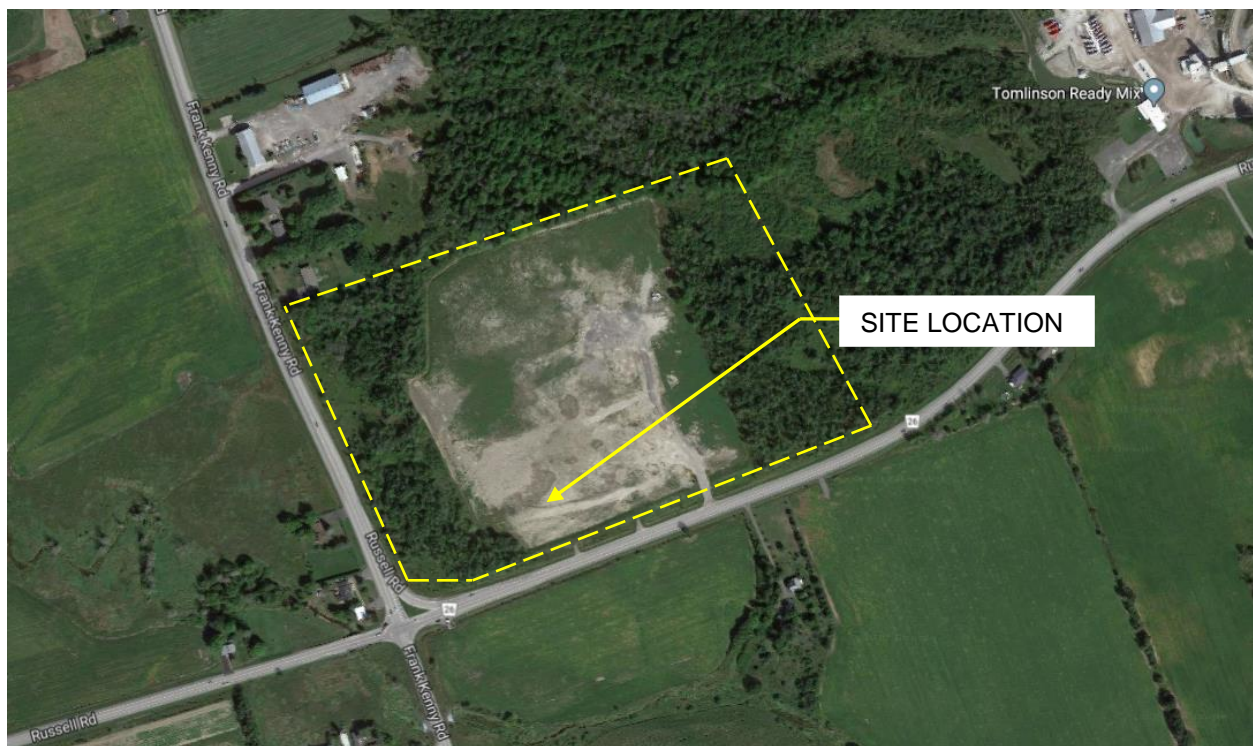


Figure 1 - Aerial view of the location of the proposed development (Google Earth)

The proposed development is located in the Rural Industrial (RH) zoning area bounded by farm lands, other industrial sites and residential homes. The site is presently a green field and has a land surface of 2.636ha with minimal grade change elevations ranging between 71.11m and 72.46m.

The proposed development includes the construction of a new building with a total footprint of 1,895m² and a future Phase 2 development of 1,675m², on the east side of the property.

3 SCOPE OF WORK

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

Water services

- Calculate the expected domestic water demand, average and peak conditions.
- Calculate the fire flow prescribed by the Ontario Building Code (2012).
- Describe the proposed water distribution network on the subject property.

Sanitary services

- Describe the existing sanitary sewer.
- Describe the proposed sanitary septic system.

Stormwater management

- Calculate the allowable stormwater release rate.
- Calculate the anticipated post-development stormwater release rates.
- Demonstrate how the target quality and quantity objectives will be achieved.
- Verify the capacity of the existing lateral storm sewer

4 DOMESTIC WATER SUPPLY AND FIRE PROTECTION

4.1 Existing Water Supply Services

Currently, the proposed site has no existing services. The surrounding properties are being serviced by private wells.

4.2 Water Supply Demand

The proposed water service must serve the new 1,895m² building on the property and any future development. The respective water demands for the proposed development were calculated according to the method prescribed by the Ministry of Environment (MOE) Design



Guidelines for Drinking Water Systems (2008). The water supply system was designed to satisfy the maximum day peak flow rate.

According to the MOE guidelines, for industrial areas (Section 3.4.4), an allowance of $28\text{m}^3/\text{ha-day}$, average flow rate should be used in the absence of reliable flow data.

$$Q_{\text{allowance}} = 28\text{m}^3/\text{ha-day} \times 2.636 \text{ ha} = 73.80 \text{ m}^3/\text{day} = 73,808 \text{ L/day}$$

Time factoring

Using the above unit demand, maximum day factors must be developed. Since the site will operate only from 6h to 18h (12 hours per day) and that the water demand will drop to residual usage during the rest of the day, thus, the following demand is the adjusted sum of the daily flow rate for the site:

$$Q_{\text{avg}} = (73,808 \text{ L/d}) \times (12\text{h} / 24\text{h}) = 36,904 \text{ L/day} (0.43 \text{ L/s})$$

$$Q_{\text{peak}} = 0.43 \text{ L/s} \times \text{peaking factor}$$

$$Q_{\text{peak}} = 0.43 \text{ L/s} \times 2.5 = 1.07 \text{ L/s}$$

4.3 Water supply servicing design

The proposed building will be serviced by a new well located on the north side of the property. The well will connect to the north side of the new building with a new 50mmØ HDPE pipe water service. Refer to LRL drawing C401 – Servicing Plan & Stormwater Management Plan for the location of the proposed well and water service.

4.4 On-Site Fire Protection Water Supply

The proposed building will be serviced by two (2) x 65,000 Liters and one (1) x 60,000 Liters underground water reservoir tanks which have been sized as per the Ontario Building Code (2012) for fire protection. The three (3) water reservoir tanks will be located on the north side of the proposed building. Based on the Ontario Building Code (2012) calculations, the minimum tank size storage volume required is evaluated at 189,000 Liters and the minimum fire flow rate is 6,300 L/min. The three (3) reservoirs will provide 190,000 Liters which exceed the requirements. Refer to Appendix A – Domestic Water Demand and Fire Flow Calculations for the tank sizing calculations.

5 SANITARY SERVICE

The proposed sanitary services must be able to discharge sewer flows from the new 1,895m² building. Since there are no sanitary sewers in this rural area, the proposed sanitary service will



outlet into a proposed septic system located at the southeast corner of the property. Based on the Ontario Building Code (2012) (Section 8.2.2.3), the system must be sized to treat sewage for 2,850 L/day (see Schedule 4 – Proposed Services).

6 STORMWATER MANAGEMENT

6.1 Existing Stormwater Infrastructure

Presently, the existing site has no storm service connections. There is an existing rural ditch running along Russell Road at the south limit of the property that drains to the west towards Frank Kenny Road. Drainage from existing catchment area EWS-01 currently runs uncontrolled towards the existing ditch on Russell Road and the municipal drain southwest of the property. Refer to LRL drawing C701 – Pre-development Watershed Plan for the existing drainage pattern.

6.2 Stormwater Management Concept

The site post-development conditions consist of adding a new building with asphalt and gravel parking and loading area that will increase the runoff coefficient. In order to regulate the increase in the total runoff, stormwater quantity control will be implemented. The stormwater generated by the proposed building, WS-09, and the future building, WS-10, will runoff and drain on the proposed driving area before being directed towards the proposed stormwater dry pond located at the southeast corner of the property. Stormwater from catchment areas WS-01, WS-02, WS-03, WS-04, WS-05, WS-06, WS-07, WS-08 and WS-011 (areas of 0.167ha, 0.272ha, 0.279ha, 0.246ha, 0.266ha, 0.179ha, 0.144ha, 0.068ha and 0.117ha respectively) which consist mainly of asphalt and gravel parking areas, grass and future development will be captured by a number of catchbasins before being conveyed to the proposed dry pond. Catchment areas WS-03 and WS-10 (0.279ha and 0.168ha), which will remain as grassed areas until future Phase 2 development have been accounted for in the stormwater calculation as future development in order to size the dry pond.

The overall overland grading surrounding the building has been designed to convey the water southeast into the stormwater dry pond. The overland flow route of the site has also been designed to convey the stormwater towards the dry pond. It should be noted that for this design, the future Phase 2 expansion work was taken in consideration in order to size the dry pond.

In order to throttle the 100-year storm flow, the stormwater will be controlled by an undersized 450mm diameter pipe located downstream of the proposed dry pond. This undersized storm sewer pipe will act as an orifice, providing the required flow rate control to meet the 5-year pre-development runoff value of 128.23 L/s. With the outlet throttled with the 450mm diameter pipe, the stormwater dry pond has been designed to retain the stormwater runoff volume quantity that



will be generated during the 100-year storm event. An emergency outlet is designed at the southwest corner of the dry pond which will direct the stormwater towards the existing south ditch running along Russell Road.

Refer to LRL drawings C301 and C702 for the grading and drainage plan and post-development stormwater management plan and refer to Appendix B for stormwater management design sheets.

6.3 Design Criteria

Stormwater quantity and quality control measures are proposed for this site to reduce post development stormwater runoff to the allowable levels.

6.3.1 Water Quality

On-site stormwater quality will be implemented with a downstream treatment unit which is capable of filtration up to 80% Total Suspended Solids.

6.3.2 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 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 existing ditch at the northeast corner of the property. The minor system (storm sewer and overland grading) within the site is sized to convey the 5-year storm event flows from the site to the existing ditch on the south side of the property.

6.4 Method of Analysis

The Rational Method was used to calculate the runoff from the development. The Intensity-Duration-Frequency (IDF) curve formulas of the MacDonald-Cartier International Airport, in the city of Ottawa, were used to calculate the peak storm flows for all the catchment areas.

6.5 Allowable Release Rate

The maximum allowable release rate was calculated from the rational method for the 5-year pre-development. Runoff from post-development conditions must be controlled to the pre-development runoff coefficient equivalent to 0.3, for both minor and major storms (5 year up to 100-year storms), using a time of concentration of 15 minutes. The pre-development runoff coefficient was determined based on Section 5.4.5.2.1, Table 5.7 of the City of Ottawa Sewer Design Guidelines.



for EWS-01

$$C = 0.30$$

$$I = 83.6 \text{ mm/hr calculated with } T_c = 15 \text{ min.}$$

$$A_{\text{EWS-01}} = 2.636 \text{ Ha}$$

$$Q_{\text{peak}} = 2.78 \times 0.30 \times 83.6 \times 2.636 = \mathbf{183.79 \text{ L/s}}$$

6.6 Stormwater Quantity Controls

The proposed stormwater management quantity control for this development will be accomplished through the use of a storm water dry pond. The proposed storm sewer and stormwater management system are shown on LRL drawing C401 – Servicing Plan & Stormwater Management Plan and detailed calculations, including the design sheet, are attached in Appendix B.

WS-01, WS-02, WS-03, WS-04, WS-05, WS-06, WS-07, WS-08 and WS-011 consist of a new and future building roof area, asphalt, gravel and landscaped areas. Phase 2 development has been considered when assigning a weighted runoff coefficient to these watersheds. Phase 2 development includes a new building and the extension of the parking area to the east of the proposed building creating catchment areas WS-03 and WS-10. These catchments will be captured through a series of catchbasins and overland grading. Again, the stormwater will be controlled using an undersized 450mm diameter pipe installed at the downstream end of the proposed dry pond. The 450mm diameter pipe will release a total of **128.23 L/s** with a maximum head of 1.07m (HWL = 71.60m) during the 100-year event. In order to control the 100-year storm event, **698.3 m³** of on-site storage will be required. This storage will be provided through the proposed stormwater dry pond and with some pipe and structure storage. The 698.3 m³ will be fully provided as follows: 645 m³ from the stormwater dry pond and 60 m³ from on-site pipes and structures. Consideration has been given to the future site development, Phase 2 conditions. Refer to LRL drawing C401 – Servicing Plan & Stormwater Management Plan and Appendix B for stormwater management design details. Thus, the outlet to the existing ditch along Russell Road is capable of achieving the required stormwater quantity control.

6.7 Stormwater Quality Management

Enhanced 80% TSS removal will be provided with a stormwater treatment unit which will be installed at the downstream end of the stormwater dry pond. The sediments at the bottom of the stormwater treatment unit will need to be cleaned as required per the manufacturer's instructions. Refer to Appendix D for the Echelon Environmental analysis and information.



7 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 entire site where runoff has the potential of leaving the site. Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification OPSS 577. Refer to LRL drawing C101 for erosion and sediment control details.

8 CONCLUSIONS

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

Water Service

- The anticipated peak domestic water demand for the proposed development is 1.07 L/s.
- The on-site fire protection water reservoir tanks have been sized to store 189,000 Liters using the Ontario Building Code (2012) prescriptions.
- The new development and future expansion will be serviced with a new 50mm dia. HDPE (high density polyethylene) watermain connected to the proposed well.

Sanitary Service

- The anticipated sanitary flow from the proposed development is 2,850 L/day.
- The proposed building will be serviced by a new septic tank and leaching field.

Stormwater Management

- The stormwater release rates from the proposed development will meet the pre-development allowable release rate of 128.23 L/s onto Russell Road existing ditch.
- Stormwater quantity control objectives will be met through on-site stormwater storage.
- Stormwater quality control objectives will be achieved on-site through the use of a stormwater treatment unit.

9 LIMITATIONS AND USE OF REPORT

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



Guillaume Brunet, P.Eng
Civil Engineer

A handwritten signature in blue ink that reads "Jean-Claude Lalonde".

Jean-Claude Lalonde, P.Eng
Senior Civil Engineer



APPENDIX A
Domestic Water Demand and Fire Flow
Calculations



Water Service Calculations

LRL File No. : 170254
Project : New Garage and Office, 8015 Russell Road
Date : August 31, 2018
Designed by : Guillaume Brunet

1.0 Water Service

The proposed water service must serve:

☒ Industrial type building

☐ Other

Specify other:

1.1 Maximum Day Peak Flow Rate

Total site area: ha

$Q_{allowance} = 28m^3 / ha \cdot day$ (As per MOE guidelines)

$Q_{allowance} = 73.808 \text{ m}^3 / day$

$Q_{allowance} = 73,808 \text{ L / day}$

Adjusted $Q_{allowance} = 73,808 \text{ L / day}$

Maximum day factors:

Hours of operation: hrs

$Q_{average} = (Q_{allowance}) \cdot (Hours\ of\ operation / 24hrs)$

$Q_{average} = 36,904 \text{ L / day}$

Average daily flow rate = 0.427 L / s

Peak flow rate = 1.07 L / s

1.2 Water Service Pipe Sizing

$$Q = VA$$

Where: V = velocity (1.1 m/s)

A = area of watermain pipe

Q = water supply flow rate

By deriving the above formula, obtain the required diameter of the pipe:

Minimum pipe diameter:

$$d \geq (4Q/\pi V)^{1/2}$$

$$d \geq 0.035 \text{ m}$$

$$d \geq 35 \text{ mm}$$

Proposed pipe diameter:

50 mm

1.3 On-Site Fire Protection Water Supply Calculations

$$Q = KVS_{\text{Tot}}$$

Where: Q = minimum supply of water in litres

K = water supply coefficient from Table 1 of the OFM guidelines

V = total building volume in cubic metres

S_{Tot} = total spacial coefficient values from property line exposures on all sides

(Note: if property line runs parallel to road; measure from building to CL of road)

$$K = 27$$

$$V = 9,475 \text{ m}^3$$

$$S_{\text{Tot}} = 1.0 = 1.0$$

S _{Side1} =	0
S _{Side2} =	0
S _{Side3} =	0
+ S _{Side4} =	0
	1.0

$$Q = 255,825 \text{ L}$$

Minimum water supply flow rate:

6,300 L / min

(as per OFM Table 2)

Minimum water supply duration:

30 min

(as per OFM guidelines)

Therefore, minimum tank size required:

189,000 L Tank

APPENDIX B
Stormwater Management Design Sheets

LRL Associates Ltd.

Storm Watershed Summary




LRL File No. 170254
Project: New Garage and Office
Location: 8015 Russell Road
Date: August 31, 2018
Designed: G. Brunet
Checked: J.C. Lalonde
Drawing Reference: C701, C702

Pre-Development Catchments

WATERSHED	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
EWS-01	2.286	0.350	0.000	2.636	0.28
TOTAL	2.286	0.350	0.000	2.636	0.28

Post-Development Catchments

WATERSHED	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
WS-01	0.000	0.167	0.000	0.167	0.80
WS-02	0.000	0.272	0.000	0.272	0.80
WS-03	0.000	0.279	0.000	0.279	0.80
WS-04	0.000	0.246	0.000	0.246	0.80
WS-05	0.000	0.266	0.000	0.266	0.80
WS-06	0.000	0.179	0.000	0.179	0.80
WS-07	0.000	0.063	0.081	0.144	0.86
WS-08	0.000	0.000	0.068	0.068	0.90
WS-09 (Roof)	0.000	0.000	0.190	0.190	0.90
WS-10 (F. Roof)	0.000	0.000	0.168	0.168	0.90
WS-11	0.117	0.000	0.000	0.117	0.20
WS-12	0.447	0.000	0.000	0.447	0.20
WS-13	0.095	0.000	0.000	0.095	0.20
TOTAL	0.658	1.471	0.506	2.636	0.67



LRL File No.

170254

Project:

New Office/ Garage

Location:

8015 Russell Road

Date:

August 31, 2018

Average Daily Flow = 350 L/p/day

Commercial & Institutional Flow = 50000 L/ha/day

Light Industrial Flow = 35000 L/ha/day

Heavy Industrial Flow = 55000 L/ha/day

Maximum Residential Peak Factor = 4.0

Commercial & Institutional Peak Factor = 1.5

Sanitary Design Parameters

Industrial Peak Factor = as per Appendix 4-B = 7

Extraneous Flow = 0.28 L/s/gross ha

Pipe Design Parameters

Minimum Velocity = 0.60 m/s

Manning's n = 0.013

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE						MANHOLE	
STREET	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)		LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERAIL	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	UP INVERT (m)	DOWN INVERT (m)
SITE	PROP. BLDG	MH01	0.074	19.6	0.07	19.6	4.0	0.32	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.07	0.07	0.02	0.34	5.8	150	4.00%	PVC	30.46	1.72	59.70	59.47
SITE	MH01	TRUNK	0.000	0.0	0.1	19.6	4.0	0.32	0.000	0.000	0.00	0.00	7.0	0.0	0.0	0.00	0.00	0.07	0.02	0.34	8.0	150	4.00%	PVC	30.46	1.72	56.40	56.08
NOTES														Designed:		PROJECT:												
Existing inverts and slopes are estimated. They are to be confirmed on-site.														G.B.		New Office/ Garage												
														Checked:		LOCATION:												
														M.G.		8015 Russell Road												
														Dwg. Reference:		File Ref.:				Date:				Sheet No.				
														C.401		170254				August 31, 2018				1 of 1				



LRL File No. 170254
Project: New Garage and Office
Location: 8015 Russell Road
Date: August 31, 2018
Designed: G. Brunet
Checked: J.C. Lalonde
Drawing Ref.: C401

Stormwater Management
Design Sheet

STORM - 5 YEAR

Runoff Equation

$Q = 2.78CIA$ (L/s)
 C = Runoff coefficient
 $I = \text{Rainfall intensity (mm/hr)} = A / (T_d + C)^B$
 A = Area (ha)
 $T_c = \text{Time of concentration (min)}$

Pre-Development Catchments within Development Area

Un-Controlled	Total Area =	2.636	ha	$\Sigma R =$	0.28
	EWS-01	2.636	ha	R =	0.28
	Total Uncontrolled =	2.636	ha	$\Sigma R =$	0.28

Allowable Release Rate

5 Year Pre-Development Flow Rate

$$I_s = 998.071 / (T_d + 6.053)^{0.814} \quad a = 998.071 \quad b = 0.814 \quad C = 6.053$$

C = 0.30 max of 0.5 as per City of Ottawa
 I = 83.6 mm/hr
 T_c = 15 min
 Total = 2.636 ha
Allowable Release Rate = 183.69 L/s

Post-development Stormwater Management

Controlled	Total Site Area =	2.636	ha	$\Sigma R =$	0.67	$\Sigma R_{100} =$	0.84
	WS-01	0.167	ha	R =	0.80	1.00	
	WS-02	0.272	ha	R =	0.80	1.00	
	WS-03	0.279	ha	R =	0.80	1.00	
	WS-04	0.246	ha	R =	0.80	1.00	
	WS-05	0.266	ha	R =	0.80	1.00	
	WS-06	0.179	ha	R =	0.80	1.00	
	WS-07	0.144	ha	R =	0.86	1.00	
	WS-08	0.068	ha	R =	0.90	1.00	
	WS-09	0.190	ha	R =	0.90	1.00	
	WS-10	0.168	ha	R =	0.90	1.00	
	WS-11	0.117	ha	R =	0.20	0.25	
	Total Controlled =	2.094	ha	$\Sigma R =$	0.79	0.96	
Un-controlled	WS-12	0.447	ha	R =	0.20	0.25	
	WS-13	0.095	ha	R =	0.20	0.25	
	Total Un-Controlled =	0.541	ha	$\Sigma R =$	0.20	0.21	

Post-development Stormwater Management

$$I_s = 998.071 / (T_d + 6.053)^{0.814} \quad a = 998.071 \quad b = 0.814 \quad C = 6.053$$

Dry Pond Storage						
Time (min)	Intensity (mm/hr)	Controlled Runoff** (L/s)	Storage Volume (m ³)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	104.2	479.64	210.84	128.23	25.89	154.12
15	83.6	384.65	230.77	128.23	20.76	149.00
20	70.3	323.39	234.19	128.23	17.46	145.69
25	60.9	280.33	228.14	128.23	15.13	143.37
30	53.9	248.25	216.03	128.23	13.40	141.63
35	48.5	223.35	199.73	128.23	12.06	140.29
40	44.2	203.40	180.39	128.23	10.98	139.21
45	40.6	187.03	158.75	128.23	10.10	138.33
50	37.7	173.33	135.30	128.23	9.36	137.59
60	32.9	151.65	84.30	128.23	8.19	136.42
70	29.4	135.21	29.30	128.23	7.30	135.53
80	26.6	122.28	0.00	128.23	6.60	134.83
90	24.3	111.81	0.00	128.23	6.04	134.27

Onsite Stormwater Retention

Total Storage Required = 234.19 m³
 Surface Storage = 751.00 m³
 Total Available Storage = 751.00 m³

refer to LRL Plan C301



LRL File No. 170254
Project: New Garage and Office
Location: 8015 Russell Road
Date: August 31, 2018
Designed: G. Brunet
Checked: J.C. Lalonde
Drawing Ref.: C401

**Stormwater Management
Design Sheet**

STORM - 100 YEAR

Runoff Equation

$Q = 2.78CIA$ (L/s)
 C = Runoff coefficient
 I = Rainfall intensity (mm/hr) = $A / (T_d + C)^B$
 A = Area (ha)
 T_c = Time of concentration (min)

Pre-Development Catchments within Development Area

Un-Controlled	Total Area =	2.636	ha	ΣR =	0.28
	EWS-01	2.636	ha	R=	0.28
	Total Uncontrolled =	2.636	ha	ΣR =	0.28

Allowable Release Rate

5 Year Pre-Development Flow Rate

$I_5 = 998.071 / (T_d + 6.053)^{0.814}$ $a = 998.071$ $b = 0.814$ $C = 6.053$

$C = 0.30$ max of 0.5 as per City of Ottawa
 $I = 83.6$ mm/hr
 $T_c = 15$ min
Total = 2.636 ha
Allowable Release Rate = 183.69 L/s

Post-development Stormwater Management

Controlled	Total Site Area =	2.636	ha	ΣR =	ΣR_5 0.67	ΣR_{100} 0.84
	WS-01	0.167	ha	R=	0.80	1.00
	WS-02	0.272	ha	R=	0.80	1.00
	WS-03	0.279	ha	R=	0.80	1.00
	WS-04	0.246	ha	R=	0.80	1.00
	WS-05	0.266	ha	R=	0.80	1.00
	WS-06	0.179	ha	R=	0.80	1.00
	WS-07	0.144	ha	R=	0.86	1.00
	WS-08	0.068	ha	R=	0.90	1.00
	WS-09	0.190	ha	R=	0.90	1.00
	WS-10	0.168	ha	R=	0.90	1.00
	WS-11	0.117	ha	R=	0.20	0.25
	Total Controlled =	2.094	ha	ΣR =	0.79	0.96
Un-controlled	WS-12	0.447	ha	R=	0.20	0.25
	WS-13	0.095	ha	R=	0.20	0.25
	Total Un-Controlled =	0.541	ha	ΣR =	0.20	0.21

Post-development Stormwater Management

$I_{100} = 1735.688 / (T_d + 6.014)^{0.820}$ $a = 1735.688$ $b = 0.82$ $C = 6.014$

Time (min)	Intensity (mm/hr)	Dry Pond Storage			Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff** (L/s)	Storage Volume (m ³)	Controlled Release Rate (L/s)		
10	178.6	996.06	520.70	128.23	55.46	183.69
15	142.9	797.11	601.99	128.23	44.38	172.62
20	120.0	669.13	649.07	128.23	37.26	165.49
25	103.8	579.30	676.59	128.23	32.25	160.49
30	91.9	512.47	691.63	128.23	28.53	156.77
35	82.6	460.65	698.08	128.23	25.65	153.88
40	75.1	419.19	698.29	128.23	23.34	151.57
45	69.1	385.19	693.77	128.23	21.45	149.68
50	64.0	356.76	685.57	128.23	19.86	148.10
60	55.9	311.80	660.83	128.23	17.36	145.60
70	49.8	277.74	627.94	128.23	15.46	143.70
80	45.0	250.98	589.15	128.23	13.97	142.21
90	41.1	229.33	545.92	128.23	12.77	141.00
100	37.9	211.44	499.21	128.23	11.77	140.01
110	35.2	196.37	449.70	128.23	10.93	139.17
120	32.9	183.50	397.90	128.23	10.22	138.45

Onsite Stormwater Retention

Total Storage Required = 698.29 m³
Dry Pond Storage = 751.00 m³ refer to LRL Plan C301
Total Available Storage = 751.00 m³

APPENDIX C

Supporting Documents

Application for a Permit to Construct or Demolish

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

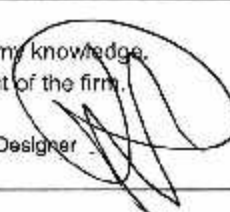
For use by Principal Authority			
Application number:		Permit number (if different):	
Date received:		Roll number:	
OTTAWA SEPTIC SYSTEM OFFICE Application submitted to: _____ <small>(Name of municipality, upper-tier municipality, board of health or conservation authority)</small>			
A. Project information			
Building number, street name 8015 RUSSELL ROAD		Unit number	Lot/con.
Municipality OTTAWA	Postal code	Plan number/other description	
Project value est. \$		Area of work (m ²)	
B. Purpose of application			
<input checked="" type="checkbox"/> New construction	Addition to an existing building	Alteration/repair	Demolition
Proposed use of building COMM.		Current use of building VACANT LAND	
Description of proposed work INSTALL SEPTIC SYSTEM			
C. Applicant			
Applicant is:		Owner or Authorized agent of owner	
Last name	First name	Corporation or partnership	
Street address		Unit number	Lot/con.
Municipality	Postal code	Province	E-mail
Telephone number ()	Fax ()	Cell number ()	
D. Owner (if different from applicant)			
Last name		First name	
Street address		Unit number	Lot/con.
Municipality	Postal code	Province	E-mail
Telephone number ()	Fax ()	Cell number ()	

E. Builder (optional)				
Last name		First name	Corporation or partnership (if applicable)	
Street address			Unit number	Lot/con.
Municipality	Postal code	Province	E-mail	
Telephone number ()	Fax ()	Cell number ()		
F. Tarion Warranty Corporation (Ontario New Home Warranty Program)				
i. Is proposed construction for a new home as defined in the <i>Ontario New Home Warranties Plan Act</i> ? If no, go to section G.			Yes	No
ii. Is registration required under the <i>Ontario New Home Warranties Plan Act</i> ?			Yes	No
iii. If yes to (ii) provide registration number(s): _____				
G. Required Schedules				
i) Attach Schedule 1 for each individual who reviews and takes responsibility for design activities.				
ii) Attach Schedule 2 where application is to construct on-site, install or repair a sewage system.				
H. Completeness and compliance with applicable law				
i) This application meets all the requirements of clauses 1.3.1.3 (5) (a) to (d) of Division C of the Building Code (the application is made in the correct form and by the owner or authorized agent, all applicable fields have been completed on the application and required schedules, and all required schedules are submitted). Payment has been made of all fees that are required, under the applicable by-law, resolution or regulation made under clause 7(1)(c) of the <i>Building Code Act, 1992</i> , to be paid when the application is made.			Yes	No
ii) This application is accompanied by the plans and specifications prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> .			Yes	No
iii) This application is accompanied by the information and documents prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> which enable the chief building official to determine whether the proposed building, construction or demolition will contravene any applicable law.			Yes	No
iv) The proposed building, construction or demolition will not contravene any applicable law.			Yes	No
I. Declaration of applicant				
I _____ declare that: (print name)				
1. The information contained in this application, attached schedules, attached plans and specifications, and other attached documentation is true to the best of my knowledge.				
2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.				
Date		Signature of applicant		

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

Schedule 1: Designer Information

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

A. Project Information			
Building number, street name 8015 RUSSELL ROAD		Unit no.	Lot/con.
Municipality OTTAWA	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name P. SAVARD		Firm DIMENSIONAL ANALYSIS	
Street address 1717 UNIT 3, CORNWALL CENTER ROAD		Unit no.	Lot/con.
Municipality LENG SAULT	Postal code K6C 1P0	Province ON	E-mail
Telephone number (613) 362-8312	Fax number ()	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1. of Division C]			
House	HVAC – House	Building Structural	
Small Buildings	Building Services	Plumbing – House	
Large Buildings	Detection, Lighting and Power	Plumbing – All Buildings	
Complex Buildings	Fire Protection	<input checked="" type="checkbox"/> On-site Sewage Systems	
Description of designer's work DESIGN SEPTIC SYSTEM			
D. Declaration of Designer			
I, <u>PIERRE SAVARD</u> declare that (choose one as appropriate): (print name)			
<p>I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories.</p> <p>Individual BCIN: <u>13527</u></p> <p>Firm BCIN: <u>43452</u></p>			
<p>I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code.</p> <p>Individual BCIN: _____</p> <p>Basis for exemption from registration: _____</p> <p>The design work is exempt from the registration and qualification requirements of the Building Code.</p> <p>Basis for exemption from registration and qualification: _____</p>			
I certify that:			
<p>1. The information contained in this schedule is true to the best of my knowledge.</p> <p>2. I have submitted this application with the knowledge and consent of the firm.</p>			
Date Dec 28, 2017		Signature of Designer 	

NOTE:

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



Do Not Complete

Permit No _____

Revision No _____

Date _____

Schedule 4 Proposed Services Complete Sections 1 thru 7

1. Engineered

☐ Yes

☒ No

3. Type of work proposed

☒ New Installation

☐ Replacement

☐ Alteration

2. Water supply

☒ Proposed

☐ Existing

4. Type of Well

☐ Dug/bored/Sandpoint well

☒ Drilled well

☐ Municipal

☐ Other

5. ~~Residential~~ Sewage Design Flow Info.

~~Bedrooms~~ _____

~~House (floor area)~~ _____ m²

~~People~~ _____

~~Total Fixture Units~~ _____ (Schedule 8)

~~Residential Flow~~ _____ L/day

6. Sewage Design Flow Other Occupancies

Design Flow 2850 L/day

Detailed sewage flow calculations:

38 EMPLOYEES X 75 L/PERSON
= 2850 LITERS/DAY

7. Type of System

☐ Treatment Unit

☐ Class 2 – Leaching Pit

☐ Class 3 – Cesspool

☐ Class 4 – Shallow Buried Trench

☒ Class 4 – Trench (Schedule 9)

☐ Fully raised

☒ Partially raised

☐ In-ground

☐ Class 4 – Filter Media (Schedule 10)

☐ Fully raised

☐ Partially raised

☐ In-ground

☐ Class 4 – BMEC Area Bed (Schedule 11)

☐ Fully raised

☐ Partially raised

☐ In-ground

☐ Class 4 – “Type A” Dispersal (Schedule 13)

☐ Fully raised

☐ Partially raised

☐ In-ground

☐ Class 4 – “Type B” Dispersal (Schedule 14)

☐ Fully raised

☐ Partially raised

☐ In-ground

☐ Class 5 – Holding Tank (9000L min)

☐ Tank/Treatment Unit/Pump Chamber ONLY

☐ Effluent Filter/Risers ONLY



Do Not Complete
Permit No _____
Revision No _____
Date _____

Schedule 5 Sewage System Details

Type of System <u>CLASS 4 TRENCH</u> (Schedule 4)	
Septic/Holding Tank Size: <u>18290</u> Litres	Make: _____
Septic Tank Effluent Filter Make: <u>POLYLOK</u>	Model: <u>PL 525</u>

Treatment Unit – Make & Model _____

Number of Units:

Other: _____

Refer to Typical Drawing # A1

Pump(s) required YLS.

Mantle Information:

Pump Rate 859 L/15min

Native or imported = 15m in 1 direction(s)

Note: Alarm required for all
pumping systems

Slope subgrade 1 % slope

ONE direction(s)

Site to be Scarified (If clay) ☒ YES ☐ NO

Clay Seal Required (If bedrock) YES / NO

☐ **Trench**

Distribution Pipe Length 145.6 m

Loading Area 882.3 m²

Type of Chamber PIPE & GRAVEL

Length of Chamber 18.2 m

☐ **Shallow Buried Trench**

Pipe Length _____ m

☐ **Filter Media Bed**

Stone _____ m²

Extended Base _____ m²

Pipe _____ m

Weight of Filter Media _____ Kg

Loading Area _____ m²

☐ **BMEC Area Bed**

☐ **Type A**

☐ **Type B**

Stone _____ m²

Sand _____ m²

Pipe _____ m

Linear Loading _____ L/m²

☐ **Tank/Treatment Unit/Pump Chamber Replacement ONLY**

☐ **Effluent Filter & Riser ONLY**

Construction Notes:



Do Not Complete
Permit No _____
Revision No _____
Date _____

Schedule 6
Soil and Water Table Information
(Minimum depth of test pit: 2 metres)

Name of Applicant/Agent: _____ Date: _____ Time: _____ Applicant/Agent Signature: _____			Inspector: _____ Date: _____ Time: _____ Inspector Signature: _____								
	EG (.....)	Soil Description	T		EG (.....)	Soil Description					
.5m				.5m							
1.0 m				1.0 m							
1.5m				1.5m							
2.0 m				2.0 m							
<i>SHE ATTACHED GEO TECH STUDY.</i>											
.5m			.5m			.5m			.5m		
1.0 m			1.0 m			1.0 m			1.0 m		
1.5m			1.5m			1.5m			1.5m		
2.0 m			2.0 m			2.0 m			2.0 m		
LEGEND BR = Bedrock HGWT = High ground water table EG = Existing grade GWT = Ground water table M = metres T = percolation rate											



Do Not Complete

Permit No _____

Revision No _____

Date _____

Scale: 1 Block = _____

Schedule 7 Layout Section

N

SEE ATTACHED
SCALED SITE PLAN.

○ Dug Well ● Drilled Well ▲ Neighbouring Homes ◇ Benchmark --- Tile Drainage — Property Line

Elevations (metric only)

B.M. 72.72 m

B.M. Description HORIZONTAL GRIND

MARK IN EASTERLY FACE OF

Exact Location I BEAM

Min. of 5 elevations in proposed system area
(in X pattern)

X ₁ _____	X ₂ _____
X ₃ _____	X ₄ _____
X ₅ _____	X ₆ (top) _____
X ₇ _____	X ₈ _____



Do Not Complete

Permit No _____

Revision No _____

Date _____

Schedule 8 Fixture unit count

Fixtures	# Existing	+ # Proposed	X	unit count	=	Fixture Count
Bathroom						
Bathroom group (toilet, sink and tub or shower) with flush tank		+	X	6	=	
Bathtub with/without overhead shower		+	X	1.5	=	
Shower stall		+	X	1.5	=	
Wash basin (1½ inch trap)		+	X	1.5	=	
Watercloset (toilet) tank operated		+	X	4	=	
Bidet		+	X	1	=	
Kitchen						
Dishwasher		+	X	1	=	
Sink with/without garbage grinder(s), domestic and other small type single, double or 2 single with a common trap		+	X	1.5	=	
Other						
Domestic washing machine		+	X	1.5	=	
Combination sink and laundry tray Single or double (Installed on 1½ trap)		+	X	1.5	=	

***Total:**

***Insert the TOTAL in section 5 of Schedule 4 (O.Reg 151/13 Table 7.4.9.3)**

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

Agent/Owner signature

Date

614346

DATE DEC. 28, 2017
TAX REG. NO. N° DE TAXE 877864223

CUSTOMER'S ORDER COMMANDE DU CLIENT	SOLD BY VENDU PAR	TERMS CONDITIONS	FOB FAB	VIA
--	----------------------	---------------------	------------	-----

QUANTITY QUANTITE	DESCRIPTION	PRICE PRIX	UNIT UNITÉ	AMOUNT MONTANT
1	SEPTIC DESIGN	950	1	950
TVH/HST TPS/GST				123 50
PST/TVP				
TOTAL				1073 50

INVOICE
FACTURE

STAPLES 513



Ottawa Septic Bureau des systèmes
System Office septiques d'Ottawa

3889 Rideau Valley Drive Box 599 Manotick, ON K4M 1A5

Phone: 613-692-3571 1-800-267-3504 Fax: 613-692-1507

Email: 'septic@rvca.ca'

Address of property: 8015 Russell Rd

Township: OSG HUN-GLO-FIT-CUM-NEP-GOU-RID-KAN

Contact for pickup: Bob Cousins

Phone#/Email: 613-833-1917

bob.cousins@candctransportation.ca

INFORMATION FOR OWNER/APPLICANT

Attached is your Sewage System Permit. A minimum of two inspections are required before your proposed sewage system can be approved for use (additional inspections may be required for clay soils/bedrock and/or re-inspections). Inspections must be requested in writing. Please see attached:

- Inspection fax request form (all inspections MUST be requested in writing)
- As-built components and drawing form
- Copy of the approved application and schedule pages
- Approved Part 8 permit (applicant copy – YELLOW)(CITY copy#2 – PINK ** Agent Deliver Direct To City**)

Special Note

- A permit is valid for 12 months from the original date of issuance noted in "permit date". If lapsed, it may be renewed only once for a period of 12 months from the date of expiry.

- No person shall make a material change or cause a material change to be made to a plan, specification, document or other information on the basis of which a permit was issued without notifying, filing details with and obtaining the authorization of the Chief Building Official. (Building Code Act 1992, c.23, s.8(12))

Sewage System Permit Construction Requirements

1. Clay Soils/Bedrock only (if required per issued Approval)

In clay soils/bedrock, a site preparation inspection is required. The total contact area must be properly prepared. Scarification must be done under dry conditions prior to importing leaching bed fill.

2. Installation Inspection – 2nd inspection

When the sewage system is substantially completed (i.e., before the final fill is placed over the septic tank and leaching bed system) an installation inspection is required. Prior to any inspection request, the following must be submitted:

- "as-built components" and "as-built drawings" — see attached form
- "engineer letter" — if the system is engineered
- grain size analysis and weight bills for all Filter Media types of septic systems
- Weight bills for washed septic stone, where applicable
- Maintenance/service contract for treatment unit installed

3. Final Grading Inspection – 3rd inspection

When construction of the sewage system is complete, a final grading inspection is required. Before a Certificate of Completion can be issued, the following must be complete:

- The leaching bed and septic tank must be covered with sand fill and topsoil and graded accordingly
- All conditions of the Sewage System Permit & comments on the installation inspection report must be met
- The depth of cover & material type must be identified by inspection pipes or holes placed over trenches at 4 corners of bed
- The 4 corners of the bed must be staked

May 2016



Ottawa Septic Bureau des systèmes
System Office septiques d'Ottawa

Main Phone: 613-692-3571 x1129

Inspection Request Form

Complete and fax to: 613-692-1507 or e-mail: septic@rvca.ca

SEPTIC APPLICATION
18-239
REQUIRED FOR ALL
INQUIRIES

Section A. Property and General Information

Date Submitted		Septic File Number:	
Civic Address			
Former Township	<input type="checkbox"/> Osgoode <input type="checkbox"/> Cumberland <input type="checkbox"/> Goulbourn <input type="checkbox"/> Torbolton <input type="checkbox"/> Nepean		
Property Owner	<input type="checkbox"/> Huntley <input type="checkbox"/> Rideau <input type="checkbox"/> Gloucester <input type="checkbox"/> Fitzroy <input type="checkbox"/> Kanata <input type="checkbox"/> Ottawa		

Section B. Requestor Information

Name of Requestor		Phone Number:	
E-mail		Fax Number:	
I am the (check one)	<input type="checkbox"/> Installer <input type="checkbox"/> Engineer <input type="checkbox"/> Property Owner		

Section C. I am Requesting the following:

<input type="checkbox"/> 1 st - Subgrade (If required - check one):	<input type="checkbox"/> 2 nd - Installation Inspection (Check all that apply)	<input type="checkbox"/> 3 rd - Final Grade Inspection
<input type="checkbox"/> Scarification	Refer to attached:	Note: Topsoil must be applied unless winter conditions exist at Director's discretion All deficiencies must be addressed from installation report
<input type="checkbox"/> Clay Seal	<input type="checkbox"/> As-Built Components Page	
<input type="checkbox"/> Subgrade	<input type="checkbox"/> As-Built Drawing	
	<input type="checkbox"/> Engineers Letter	
	<input type="checkbox"/> Filter Media Bills	
	<input type="checkbox"/> Grain Size Analysis	
	<input type="checkbox"/> Maintenance Agreement	
	<input type="checkbox"/> ESA Permit Number: _____	
Notes/Comments		

Section D. Re-inspection

<input type="checkbox"/> Re-inspection - 1 st call	<input type="checkbox"/> Re-inspection Request - 2 nd call
	Note: Re-inspection fee applies on requests for same deficiency - Please provide payment information below
	Card Type: <input type="checkbox"/> Mastercard <input type="checkbox"/> Visa
	Card Number: _____
	Cardholder Name: _____
Notes/Comments	

Please Note:

- 3-5 business day turn around for inspections
- OSSO file will be given to inspector upon receipt of this request form
- PRIORITY will be given to requests that have septic file/permit numbers

Submit

Reset

Print

AS-BUILT COMPONENTS

(required prior to installation inspection)

SEPTIC PERMIT NO. _____

SEPTIC APPLICATION
18-239
REQUIRED FOR ALL
INQUIRIES

Elevations of installed system must be supplied with this report (in reference to the TBM).

Exact size and location of all structures, well(s) and system(s) and its components must be shown (including neighbouring lots).

Septic/Holding Tank: _____ L

Manufacturer: _____

☐ concrete ☐ plastic ☐ other

Filter: ☐ no ☐ yes _____ make

Treatment: Make _____

Unit: Model _____

Diameter of pipes _____ mm/inches

Make of pipes: _____

Ends: ☐ capped ☐ interconnected

Number of runs: _____ m

Length of runs: _____ m

Stone area _____ m²

Filter media:

Amount Purchased: _____ kg

Date Purchased: _____

Supplier: _____

Grain/size analysis by: _____

Analysis dated: _____

Stone:

Amount Purchased: _____ kg

Date Purchased: _____

Supplier: _____

Name of owner: _____

Installer: _____

Installer Signature: _____

License Number: _____

Date of Installation: _____

Pump Systems:

ESA Permit #: _____

Volume discharge rates: _____ /15min

Alarm location: _____

Dimension of Pump Chamber: _____

Height of Float Switch: _____

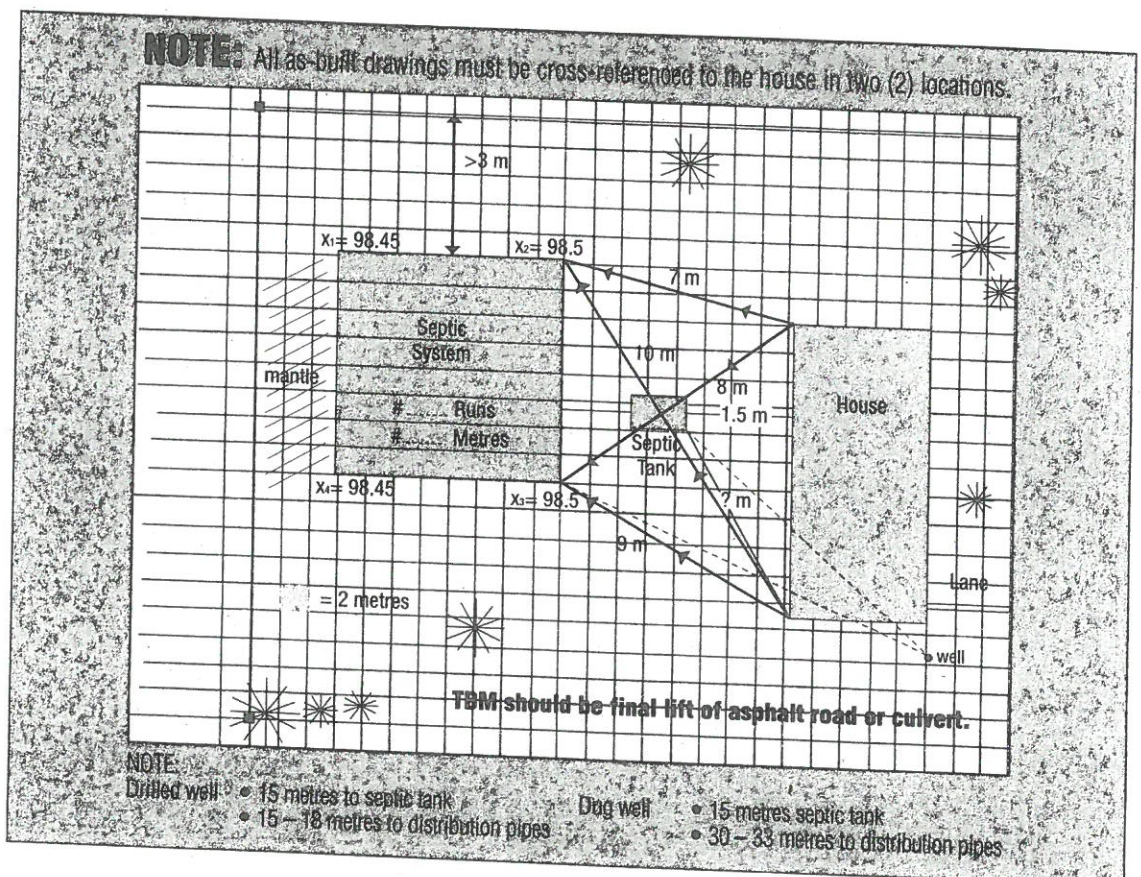
Grease Interceptor:

☐ no ☐ yes Size: _____

Location: _____

*** Grain Size Analysis and weight bills must be supplied with this report.**

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AS-BUILT DRAWING

SEPTIC APPLICATION
18-239
REQUIRED FOR ALL
PROJECTS

N

Scale: 1" = 1 metre

SEPTIC PERMIT NO.

Batch # 11474
Entry #: 12

RECEIPT CONFIRMATION

Rideau Valley C. A.
P.O. Box 599
Manotick, Ontario K4M 1A5
Canada
Phone: (613) 692-3571
Fax: (613) 692-0831

DOCUMENT NO.: PY000030676
DATE: 5/24/2018

AMOUNT RECEIVED 145.00 CAD
FROM Bob Cousins

SIGNATURE

PAID BY: VISA CHECK/RECEIPT NO.: 000011474-00012 DATE RECEIVED: 5/24/2018

DESCRIPTION		AMOUNT
4300-20-20600	8015 Russell (CUM) Septic 18-239	145.00
SUB-TOTAL:		145.00
TOTAL:		145.00

Batch # 11474
Entry #: 11

RECEIPT CONFIRMATION

Rideau Valley C. A.
P.O. Box 599
Manotick, Ontario K4M 1A5
Canada
Phone: (613) 692-3571
Fax: (613) 692-0831

DOCUMENT NO.: PY000030665
DATE: 5/24/2018

AMOUNT RECEIVED 820.00 CAD

FROM Bob Cousins

SIGNATURE 

PAID BY: VISA CHECK/RECEIPT NO.: 000011474-00011 DATE RECEIVED: 5/24/2018

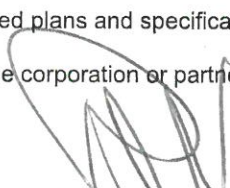
DESCRIPTION		AMOUNT
4300-20-20600	8015 Russell (CUM) Septic 18-239 - Cousins, Bob	820.00
SUB-TOTAL:		820.00
TOTAL:		820.00

2/3

Application for a Permit to Construct or Demolish

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

Application number:		Permit number (if different):	
Date received:		Roll number:	
Application submitted to:			
OTTAWA SEPTIC SYSTEM OFFICE			
Application submitted to: (Name of municipality, upper-tier municipality, board of health or conservation authority)			
A. Project information			
Building number, street name		Unit number	Lot/con.
8015 RUSSELL ROAD		PT LOT 20	7
Municipality	Postal code	Plan number/other description	
OTTAWA		PART 1 ON 4R-30804	
Project value est. \$		Area of work (m ²)	
B. Purpose of application			
<input checked="" type="checkbox"/> New construction	Addition to an existing building	Alteration/repair	Demolition
Proposed use of building		Current use of building	
COMM.		VACANT LAND	
Description of proposed work			
INSTALL SEPTIC SYSTEM			
C. Applicant			
Applicant is:		Owner or	
Last name		First name	
SAVAIRD		PIETRIE	
Street address		Corporation or partnership	
17171 UNIT 3, CORNWALL CENTER ROAD		DIMENSIONAL ANALYSIS	
Municipality	Postal code	Province	E-mail
LENG SAULT	K0C 1P0	ON	PIETRIE.SAVOIR@1250
Telephone number	Fax	Cell number	
(613) 932-9595	()	(613) 362-8312	
D. Owner (if different from applicant)			
Last name		First name	
2572768 ONTARIO INC			
Street address		Unit number	Lot/con.
2930 FRENCH HILL ROAD			
Municipality	Postal code	Province	E-mail
COMBERLAND	K4C 1K7	ON	
Telephone number	Fax	Cell number	
()	()	()	

E. Builder (optional)				
Last name		First name	Corporation or partnership (if applicable)	
Street address		Unit number	Lot/con.	
Municipality	Postal code	Province	E-mail	
Telephone number ()	Fax ()	Cell number ()		
F. Tarion Warranty Corporation (Ontario New Home Warranty Program)				
i. Is proposed construction for a new home as defined in the <i>Ontario New Home Warranties Plan Act</i> ? If no, go to section G.			Yes	No
ii. Is registration required under the <i>Ontario New Home Warranties Plan Act</i> ?			Yes	No
iii. If yes to (ii) provide registration number(s): _____				
G. Required Schedules				
i) Attach Schedule 1 for each individual who reviews and takes responsibility for design activities.				
ii) Attach Schedule 2 where application is to construct on-site, install or repair a sewage system.				
H. Completeness and compliance with applicable law				
i) This application meets all the requirements of clauses 1.3.1.3 (5) (a) to (d) of Division C of the Building Code (the application is made in the correct form and by the owner or authorized agent, all applicable fields have been completed on the application and required schedules, and all required schedules are submitted). Payment has been made of all fees that are required, under the applicable by-law, resolution or regulation made under clause 7(1)(c) of the <i>Building Code Act, 1992</i> , to be paid when the application is made.			Yes	No
ii) This application is accompanied by the plans and specifications prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> .			Yes	No
iii) This application is accompanied by the information and documents prescribed by the applicable by-law, resolution or regulation made under clause 7(1)(b) of the <i>Building Code Act, 1992</i> which enable the chief building official to determine whether the proposed building, construction or demolition will contravene any applicable law.			Yes	No
iv) The proposed building, construction or demolition will not contravene any applicable law.			Yes	No
I. Declaration of applicant				
I, <u>P. SAVATIN</u> <u>DIMENSIONAL ANALYSIS</u> declare that:				
(print name)				
1. The information contained in this application, attached schedules, attached plans and specifications, and other attached documentation is true to the best of my knowledge.				
2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.				
Date <u>MAY 23, 2018</u>		Signature of applicant 		

Personal information contained in this form and schedules is collected under the authority of subsection 8(1.4) of the *Building Code Act, 1992*, and will be used in the administration and enforcement of the *Building Code Act, 1992*. Questions about the collection of personal information may be addressed to: a) the Chief Building Official of the municipality or upper-tier municipality to which this application is being made, or, b) the inspector having the powers and duties of a chief building official in relation to sewage systems or plumbing for an upper-tier municipality, board of health or conservation authority to whom this application is made, or, c) Director, Building and Development Branch, Ministry of Municipal Affairs and Housing 777 Bay St., 2nd Floor. Toronto, M5G 2E5 (416) 585-6666.

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MAY 24 2018

Schedule 1: Designer Information

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

A. Project Information

Building number, street name 8015 RUSSELL RD	Unit no.	Lot/con.
Municipality OTTAWA	Postal code	Plan number/ other description 18-239

B. Individual who reviews and takes responsibility for design activities

Name P. SAVATID	Firm DIMENSIONAL ANALYSIS	Unit no.	Lot/con.
Street address 1771 UNIT 3, CORNWALL CENTER ROAD	Unit no.	Lot/con.	
Municipality LENE SAULT	Postal code K0C 1P0	Province ON	E-mail
Telephone number (613) 362-8312	Fax number ()	Cell number ()	

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

House	HVAC – House	Building Structural
Small Buildings	Building Services	Plumbing – House
Large Buildings	Detection, Lighting and Power	Plumbing – All Buildings
Complex Buildings	Fire Protection	<input checked="" type="checkbox"/> On-site Sewage Systems

Description of designer's work
DESIGN SEPTIC SYSTEM

D. Declaration of Designer

I, PIETRIE SAVATID declare that (choose one as appropriate):
(print name)

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

Individual BCIN: 13527

Firm BCIN: 43452

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

Individual BCIN: _____

Basis for exemption from registration: _____

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

Basis for exemption from registration and qualification: _____

I certify that:

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

Date Dec 28, 2017

Signature of Designer 

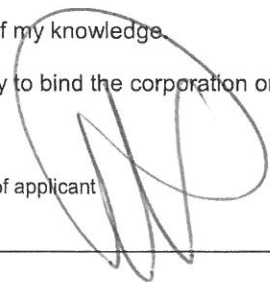
NOTE:

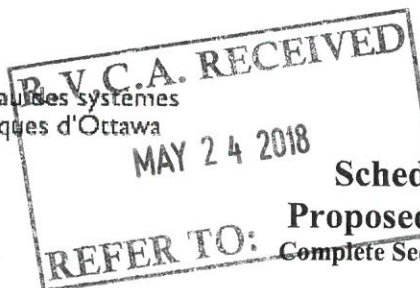
1. For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) (c) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
2. Schedule 1 is not required to be completed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

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Schedule 2: Sewage System Installer Information

A. Project Information			
Building number, street name 8815 REDBELL RD		Unit number PT. LOT 20	Lot/con. 7
Municipality OTTAWA	Postal code	Plan number/ other description PART 1 ON 412-30804	
B. Sewage system installer			
Is the installer of the sewage system engaged in the business of constructing on-site, installing, repairing, servicing, cleaning or emptying sewage systems, in accordance with Building Code Article 3.3.1.1, Division C?			
Yes (Continue to Section C)		<input checked="" type="checkbox"/> No (Continue to Section E) TBT	
Installer unknown at time of application (Continue to Section E)			
C. Registered installer information (where answer to B is "Yes")			
Name		BCIN	
Street address		Unit number	Lot/con.
Municipality	Postal code	Province	E-mail
Telephone number ()	Fax ()	Cell number ()	
D. Qualified supervisor information (where answer to section B is "Yes")			
Name of qualified supervisor(s)		Building Code Identification Number (BCIN)	
E. Declaration of Applicant:			
I, <u>P. SAUARD</u> <u>DIMENSIONAL ANALYSIS</u> declare that: (print name)			
I am the applicant for the permit to construct the sewage system. If the installer is unknown at time of application, I shall submit a new Schedule 2 prior to construction when the installer is known;			
<u>OR</u>			
I am the holder of the permit to construct the sewage system, and am submitting a new Schedule 2, now that the installer is known.			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge.			
2. If the owner is a corporation or partnership, I have the authority to bind the corporation or partnership.			
Date <u>MAY 23, 2018</u>		Signature of applicant 	



1. Engineered

- ☐ Yes
☒ No

3. Type of work proposed

- ☒ New Installation
☐ Replacement
☐ Alteration

5. ~~Residential~~ Sewage Design Flow Info.

~~Bedrooms _____~~
~~House (floor area) _____ m²~~
~~People _____~~
~~Total Fixture Units _____ (Schedule 8)~~
~~Residential Flow _____ L/day~~

7. Type of System

- ☐ Treatment Unit _____
☐ Class 2 – Leaching Pit
☐ Class 3 – Cesspool
☐ Class 4 – Shallow Buried Trench
☒ Class 4 – Trench (Schedule 9)
 ☐ Fully raised
 ☒ Partially raised
 ☐ In-ground
☐ Class 4 – Filter Media (Schedule 10)
 ☐ Fully raised
 ☐ Partially raised
 ☐ In-ground

2. Water supply

- ☒ Proposed
☐ Existing

4. Type of Well

- ☐ Dug/bored/Sandpoint well
☒ Drilled well
☐ Municipal
☐ Other

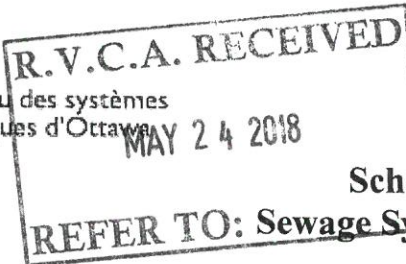
6. Sewage Design Flow Other Occupancies

Design Flow 2850 L/day

Detailed sewage flow calculations:

38 EMPLOYEES X 75 L/PERSON
= 2850 LITERS/DAY

- ☐ Class 4 – BMEC Area Bed (Schedule 11)
 ☐ Fully raised
 ☐ Partially raised
 ☐ In-ground
☐ Class 4 – “Type A” Dispersal (Schedule 13)
 ☐ Fully raised
 ☐ Partially raised
 ☐ In-ground
☐ Class 4 – “Type B” Dispersal (Schedule 14)
 ☐ Fully raised
 ☐ Partially raised
 ☐ In-ground
☐ Class 5 – Holding Tank (9000L min)
☐ Tank/Treatment Unit/Pump Chamber ONLY
☐ Effluent Filter/Risers ONLY



Schedule 5

REFER TO: Sewage System Details

Do Not Complete

Permit No

Revision No

Date 18-239

SEPTIC APPLICATION
REQUIRED FOR ALL
INQUIRIES

Type of System CLASS 4 TRENCH (Schedule 4)

Septic/Holding Tank Size: 18290 Litres

Make:

Septic Tank Effluent Filter Make: POLYLOK

Model:

PL 525

Treatment Unit - Make & Model

Number of Units:

Other:

Refer to Typical Drawing #

A1

Pump(s) required YES.

Mantle Information:

Pump Rate 859 1210 L/15min.

Native or imported =15m in 1 direction(s)

Note: Alarm required for all pumping systems

Slope subgrade 1 % slope

ONE

direction(s)

Site to be Scarified (If clay)

YES NO

Clay Seal Required (If bedrock)

YES / NO

☒ Trench

Distribution Pipe Length 145.6 m

Loading Area 882.3 m²

Type of Chamber PIPE & GRAVEL

Length of Chamber 18.2 m

☐ Shallow Buried Trench

Pipe Length m

☐ Filter Media Bed

Stone m²

Extended Base m²

Pipe m

Weight of Filter Media Kg

Loading Area m²

☐ BMEC Area Bed

☐ Type A

☐ Type B

Stone m²

Sand m²

Pipe m

Linear Loading L/m²

☐ Tank/Treatment Unit/Pump Chamber Replacement ONLY

☐ Effluent Filter & Riser ONLY

Construction Notes:



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Schedule 6
Soil and Water Table Information
(Minimum depth of test pit: 2 metres)

Do Not Complete
Permit No _____
Revision No _____
Date 18-239

REQUIRED FOR ALL
INQUIRIES

Name of Applicant/Agent: D.A. P. S. M. M. D. I. Inspector: Adam Della
Date: MAY 23/18 Time: _____ Date: _____ Time: _____
Applicant/Agent Signature: [Signature] Inspector Signature: _____

EG (.....)	Soil Description	T	EG (.....)	Soil Description	T
.5m	SEE ATTACHED EEO TECH STUDY.		.5	Test pits not available for inspection. Engineer assumes all liability for soil and HGWT info/elev's.	
1.0 m			1.0 m		
1.5m			1.5m		
2.0 m			2.0 m		
EG (.....)	Soil Description	T	EG (.....)	Soil Description	T
.5m			.5m		
1.0 m			1.0 m		
1.5m			1.5m		
2.0 m			2.0 m		

LEGEND
BR = Bedrock HGWT = High ground water table EG = Existing grade
GWT = Ground water table M = metres T = percolation rate



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MAY 24 2018
Schedule 7
Layout Section
REFER TO

Do Not Complete
Permit No _____
Revision No _____
Date 18-239

REQUIRED FOR ALL
INQUIRIES

Scale: 1Block = _____

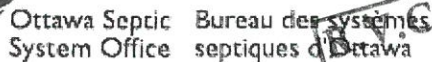
N

SEE ATTACHED
SCALED SITE PLAN.

○Dug Well ●Drilled Well ▲Neighbouring Homes ◇Benchmark ---Tile Drainage —Property Line

Elevations (metric only)
B.M. 72.72 m
B.M Description HORIZONTAL GRIND
MARK IN EASTERLY FACE OF
Exact Location 1 BEAM

Min. of 5 elevations in proposed system area
(in X pattern)
X₁ _____ X₂ _____
X₃ _____ X₄ _____
X₅ _____ X₆ (toe) _____
X₇ _____ X₈ _____



Systems
d Ottawa

RECEIVED
MAY 24 2018
Schedule 8
Fixture unit count
Existing + # New

Date 18-239

REQUIRED FOR ALL
INQUIRIES

Bathroom							
----------	--	--	--	--	--	--	--

Bathroom group (toilet, sink and tub or shower) with flush tank		+		X	6	=	
Bathtub with/without overhead shower		+		X	1.5	=	
Shower stall		+		X	1.5	=	
Wash basin (1½inch trap)		+		X	1.5	=	
Watercloset (toilet) tank operated		+		X	4	=	
Bidet		+		X	1	=	
Kitchen							
Dishwasher		+		X	1	=	
Sink with/without garbage grinder(s), domestic and other small type single, double or 2 single with a common trap		+		X	1.5	=	
Other							
Domestic washing machine		+		X	1.5	=	
Combination sink and laundry tray single or double (Installed on 1½ trap)		+		X	1.5	=	

***Total:**

***Insert the TOTAL in section 5 of Schedule 4 (0.Reg 151/13 Table 7.4.9.3)**

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

Agent/Owner signature

Date _____

CEC TOWING AND RECOVERY
PROPOSED BUILDING

PROPOSED NEW BUILDING
(G.F.A. = ±1895m²)
F.F. = 72.90

DAILY FLOW CALCULATIONS
38 EMPLOYEES AT 75 LITERS / PERSON
2850 LITERS PER DAY

FLOOR DRAINS
12 DRAINS * 375 LITERS PER DRAIN
4500 LITERS PER DAY

WASH BAYS
400 LITERS PER TRUCK * 6 TRUCKS
2400 LITERS PER DAY

TOTAL DAILY DESIGN FLOW
9750 LITERS PER DAY

PROPOSED TANK
34,400 LITERS
MODEL MAC 3400 2P

(DESCRIPTION: HORIZONTAL GRIND MARK)
IN EASTERLY FACE OF I BEAM PAINTED RED
ELEVATION = 72.72 m

11500 LITER PUMP STATION
WITH TIME POSTING
MODEL MAC 1150 1P
slow data monitor

EXISTING DRILLED WELL, TOP OF WELL HEAD CAP 74.146 m
GREATER THAN 120 m FROM DISPOSAL FIELD

LEGEND

100.438	PROPOSED ELEVATION
100.438	EXISTING ELEVATION
----	PROPOSED SEWAGE WORKS
----	PROPERTY LINE
TBM	TEMPORARY BENCH MARK

(DESCRIPTION: HORIZONTAL GRIND MARK)
IN EASTERLY FACE OF I BEAM
ELEVATION = 72.72 m

- NOTE:
1. ALL TREATMENT UNITS AND LEACHING BEDS ARE TO BE INSTALLED IN ACCORDANCE WITH MINIMUM ONTARIO BUILDING CODE CLEARANCE DISTANCES.
 2. CARE IS TO BE EXERCISED DURING CONSTRUCTION ACTIVITIES NEAR OVERHEAD HYDRO WIRES.
 3. EXISTING ELEVATIONS ARE APPROXIMATE, CONTRACTOR MUST VERIFY ALL ELEVATIONS AND DIMENSIONS PRIOR TO CONSTRUCTION.
 4. SOIL CONDITIONS ARE ACCURATE FOR THE LOCATIONS SHOWN, CONTRACTOR MUST CONTACT THE DESIGN ENGINEER OR REGULATORY AUTHORITY SHOULD SOIL CONDITIONS DIFFER.
 5. LOT TO BE SERVICED WITH A DRILLED WELL.

CODES:

HS = HOUSE
CL = CENTER LINE
CD = CENTER LINE OF DITCH
SIB = STEEL IRON BAR
GS = GROUND SHOT
EP = EDGE OF PAVEMENT
OG = ORIGINAL GROUND
TW = TOP OF WELL
HK = HYDRO KIOSK
GD = GRAVEL DRIVEWAY
HP = HYDRO POLE
TS = TOP OF SLOPE
BM = BENCH MARK
FTB = FOUND IRON BAR
ST PI = STAND PIPE
PL = PROPERTY LINE
TP = TEST PIT
DRW = DRILLED WELL
BOT SW = BOTTOM OF SWALE
ST = SEPTIC TANK
CSL = CONCRETE SLAB
GA = GARAGE
ED = EDGE OF DITCH
TOB = TOP OF BANK

10/18

** fill organic & all materials to be removed from existing disposal field & replaced with compacted sand*

*71.239
71.371
71.388
71.571*

PROPOSED DISPOSAL
FIELD 16 RUNS AT 22.86 m
SPACED AT 1.6 m WITH INTERCONNECTED FOOTERS
AND VENTED DISTRIBUTION BOX

31.2000

15m SETBACK

POSITIVE HYDRAULIC OUTLET

EARTH BERMS

AND DRIVEWAY TO BE REMOVED

*East of main
must terminate @
ground surface*

Drawn by: prs	Designed by: prs	Checked by: prs	Approved
1	Description ADDITIONAL GRADES	Date JUNE 14/18	REMOVED
2	ADJUSTED DESIGN FLOW	No.: SD/22/2017	REMOVED
City of Ottawa	Plan#	Lot	Sublot
Civic Address 8015 RUSSELL ROAD		Date: JUNE 21, 2018	Scale: 1:400
DIMENSIONAL ANALYSIS		BCIN 13527, 43452	
ON-SITE SEWAGE TREATMENT PLAN FOR OF: C&C TRANSPORT TOWING AND RECOVERY			

DIMENSIONAL ANALYSIS

BCIN 13527, 43452

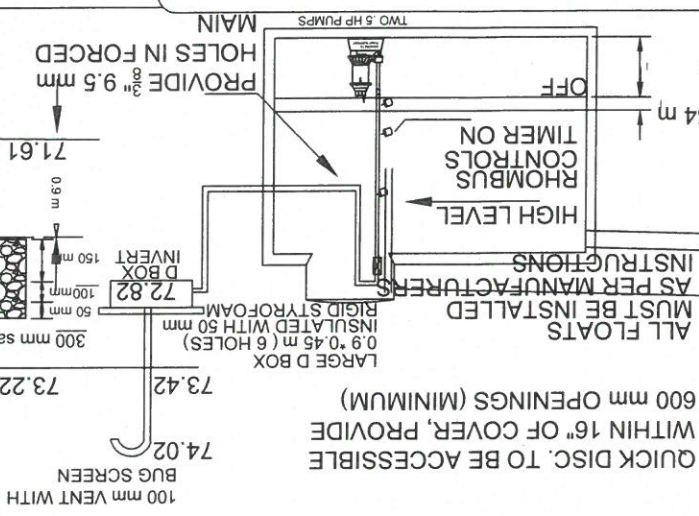
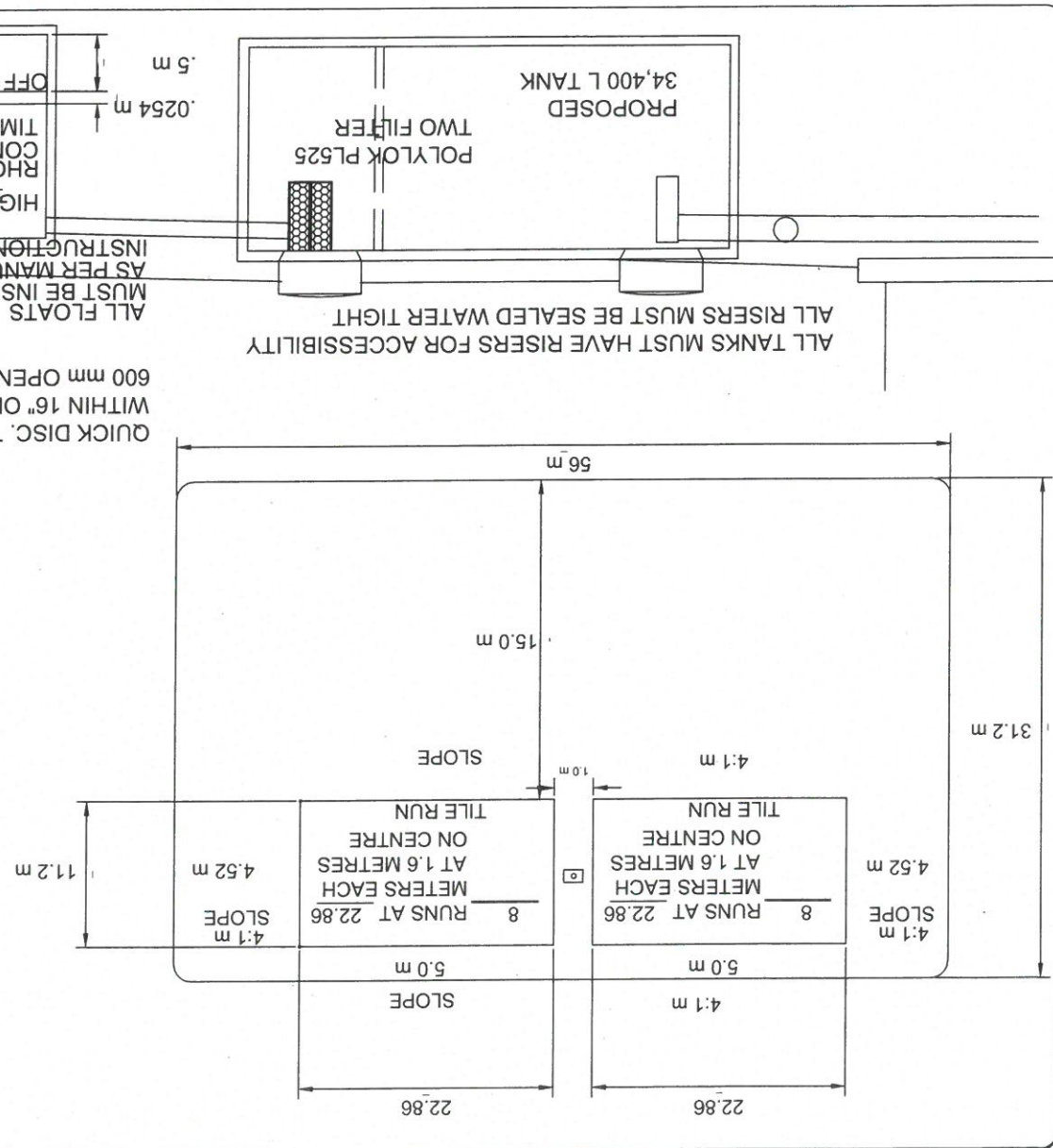
TITLE: PROPOSED SEPTIC SECTION
FOR C&C TOWING AND RECOVERY
8015 RUSSELL ROAD

DATE: JUNE 21, 2018
DRAWN BY: PRS
CHECKED BY: NTS

SCALE: NTS

REVISD
JULY 4, 2018

FILE: A1
DRAWING NO.



As built

ELEVATIONS:

FINISHED GRADE	73.22 m
BOTTOM OF GRAVEL	72.51 m
BOTTOM OF PIPE	71.74 m
1. AT HEADER	71.74 m
2. AT ENDS	72.66 m
BOTTOM OF EXCAVATION	71.61 m
EXISTING GRADE	71.28 m AVG.
1.2 m BELOW EXISTING GRADE est.	
LIMITING DESIGN FACTOR IS FILL SOIL	

TYPICAL DRAWING
FULLY RAISED
ABSORPTION TRENCH SYSTEM

DAILY FLOW CALCULATIONS
Q = 2850 L/DAY + 4500 L/DAY + 2400 L/DAY
A = Q / 6 liters / m³ / d
L = Q * T / 200 where Q = daily flow; T = percolation rate
A = 9750 L/d / 6 L / m³ / d
L = 341.25 meters required
365.76 meters provided

LOADING RATE
1747.2 m²

SCARIFICATION REQUIRED
(Y) / N



Ottawa Septic Bureau des systèmes
System Office septiques d'Ottawa

Permit Part 8 – Sewage System Ontario Building Code

Do Not Complete

Permit No. _____

Revision No. _____

Date _____

Related Application _____

A copy of this permit must be posted on the property at all time during construction. OBC, Division C — Part 1, Section 1.3.2.1

This permit verifies that the on-site sewage system was reviewed and approved for construction under the Ontario Building Code and O.Reg. 323/12 as amended by O.Reg. 151/13.

Inspected & Recommended by: Adam Dillon

Owner: 2572768 Ontario Inc.

Inspection Date & Time: May 30/18 @ 11:15 am

Weather: sun + 26°C

Civic Address: 8015 Russell Rd.

Legal: _____

number of bedrooms: _____

fixture units: _____

finished floor area: _____

Q: 9750 sq. ft.

septic/holding tank/pre-treatment tank 34,400 L

effluent filter as per 8.6.2.1. (2)

pump rate 2158 L (4" pipe) or 1207 L (3" pipe) L/15 min

treatment unit _____

number of units _____

weigh bills for septic sand filter media ☒ yes ☐ no

grain size analysis required ☒ yes ☐ no

site to be scarified ☒ yes ☐ no

clay seal inspection ☐ yes ☒ no

mantle required ☒ yes ☐ no

sub-grade inspection ☒ yes ☐ no

ELEVATION ☐ In Ground ☐ Partially Raised ☒ Fully Raised

TYPE OF SYSTEM

☒ Trench

☒ Pipe and Stone or ☐ Chambers

type of chamber h/c

loading area 1747 m²

total trench length 365.76 m

trench configuration 16 @ 22.86 m

☐ Dispersal Bed

☐ BMEC ☐ Type A ☐ Type B

stone _____ m²

sand _____ m²

pipe _____

linear loading _____ L/m²

☐ Shallow Buried Trench

pipe length _____ m

orifice spacing _____ m

☐ Filter Media Bed

stone _____ m²

extended base _____ m²

pipe _____

weight of filter media _____ kg

loading area _____ m²

☐ Class 5 Holding Tank

☐ Septic Tank Only

Manager, Septic System Approvals: James Gordon

Permit Date: AUGUST 13, 2018

Comments: 1) Flow monitoring/recording device required on both raw

water intake (well) & on sewage effluent discharge (pump chamber)

2) Representative sand sample to be gathered from sewage system

post-construction by P.Eng and analyzed - submitted w/ inspection request.

☐ maintenance/pumping required

☐ ESA permit # required

☒ engineer to verify

☒ subgrade

☐ Class 5 Holding Tank approval only valid for three years from date of issue

☐ skirt height _____

Manager, Septic System Approvals: _____

Revision Date: _____

Comments: _____

NOTE: For further details, refer to corresponding application.

APPENDIX D
CDS Treatment System

February 05, 2018

LRL Associates Ltd.
5430 Canotek Road
Ottawa, ON
K1J 9G2

Attention: Mr. Guillaume Brunet P.Eng.

RE: CDS Unit for 8015 Russell Street, Ottawa

Site Specific Data

The proposed CDS design is based on site-specific data provided by LRL Associates Ltd. The following table provides a summary of the hydrologic parameters specific to the application:

Total Drainage Area (ha):	2.636
Site Imperviousness:	79%
Time of Concentration, t_c (min):	15
Particle Size Distribution:	FINE
Level of Protection Required:	Enhanced (MOE Level 1)
Estimated Peak Flowrate, Q_{100} :	128.23 L/s (100yr)

Selected CDS Model

The selected CDS model and its standard capacities are summarized in the table below:

CDS Model:	PMSU3030_6
Sump Capacity (L):	2,402
Total Holding Capacity (L):	5,284
Oil Capacity (L):	895

Att: A) CDS TSS Calculations
B) CDS General Cut Sheet Drawings
C) MOE NETE Approval Certificate

Appendix A

CDS TSS Calculations

CDS Average Annual Efficiency For TSS Removal & Total Annual Volume Treated

Area = 2.64 ha Impervious: 79 % CDS Model: PMSU3030_6 Flowrate: 85 l/s IDF Data: Ottawa PSD: FINE	Upstream Storage: Storage 698 m ³	Engineer: LRL Associates Ltd. Contact: Guillaume Brunet, P.Eng Date: 5-Feb-18 Project: 8015 Russell Street Location: Ottawa, ON OGS ID: CDS
--	--	--

Return	Period	Peak Flow	TSS Percentage Captured	Treated Flow Volume	Total Flow Volume	Annual Exceedance Probability	System Flow	CDS Flow	By-Pass Flow	Volume Percentage Treated
month / yr	Yr	l/s	%	litres	litres	%	l/s	l/s	l/s	%
1-M	0.08	9.11	96.69	15089	15089	100.00	9.11	9.11	0.00	100.00
2-M	0.17	23.36	93.41	39841	39841	99.75	23.36	23.36	0.00	100.00
3-M	0.25	34.89	90.76	60412	60412	98.17	34.89	34.89	0.00	100.00
4-M	0.33	45.27	88.38	79260	79260	95.04	45.27	45.27	0.00	100.00
5-M	0.42	53.20	86.55	94002	94002	90.91	53.20	53.20	0.00	100.00
6-M	0.50	61.12	84.72	108743	108743	86.47	61.12	61.12	0.00	100.00
7-M	0.58	66.95	83.36	119970	119970	82.01	66.95	66.95	0.00	100.00
8-M	0.67	72.79	82.00	131197	131197	77.67	72.79	72.79	0.00	100.00
9-M	0.75	78.62	80.64	142424	142424	73.64	78.62	78.62	0.00	100.00
10-M	0.83	83.17	79.40	150714	151412	69.90	83.17	83.17	0.00	99.59
11-M	0.92	87.73	78.15	159004	160401	66.40	87.73	84.95	2.78	99.18
1-Yr	1	92.28	76.91	167294	169390	63.21	92.28	84.95	7.33	98.76
2-Yr	2	129.02	63.89	208170	244688	39.35	129.02	84.95	44.07	85.08
5-Yr	5	129.38	63.77	208460	245455	18.13	129.38	84.95	44.43	84.93
10-Yr	10	130.74	63.32	209545	248328	9.52	130.74	84.95	45.79	84.38
25-Yr	25	131.56	63.05	210210	250084	3.92	131.56	84.95	46.61	84.06
50-Yr	50	135.00	61.96	212988	257399	1.98	135.00	84.95	50.04	82.75
100-Yr	100	136.52	61.49	214237	260673	1.00	136.52	84.95	51.57	82.19

Average Annual TSS Removal Efficiency [%]:	83.2	Ave. Ann. T. Volume [%]:	98.8
---	-------------	---------------------------------	-------------

Notes:

- 1) CDS Efficiency based on testing conducted at the University of Central Florida
- 2) CDS design flowrate and scaling based on standard manufacturer model & product specifications



CDS Stormwater Treatment Unit Performance

Table 1. Fine Particle Size Distribution (PSD)

Particle Size (µm)	% of Particle Mass
< 20	20
20 – 40	10
40 – 60	10
60 – 130	20
130 – 400	20
400 – 2000	20

Removal Efficiencies – CDS Unit Testing Under Various Flow Rates

The following performance curves are based on controlled tests using a full scale CDS Model PMSU20_20 (2400 micron screen), 1.1-cfs (494-gpm) capacity treatment unit.

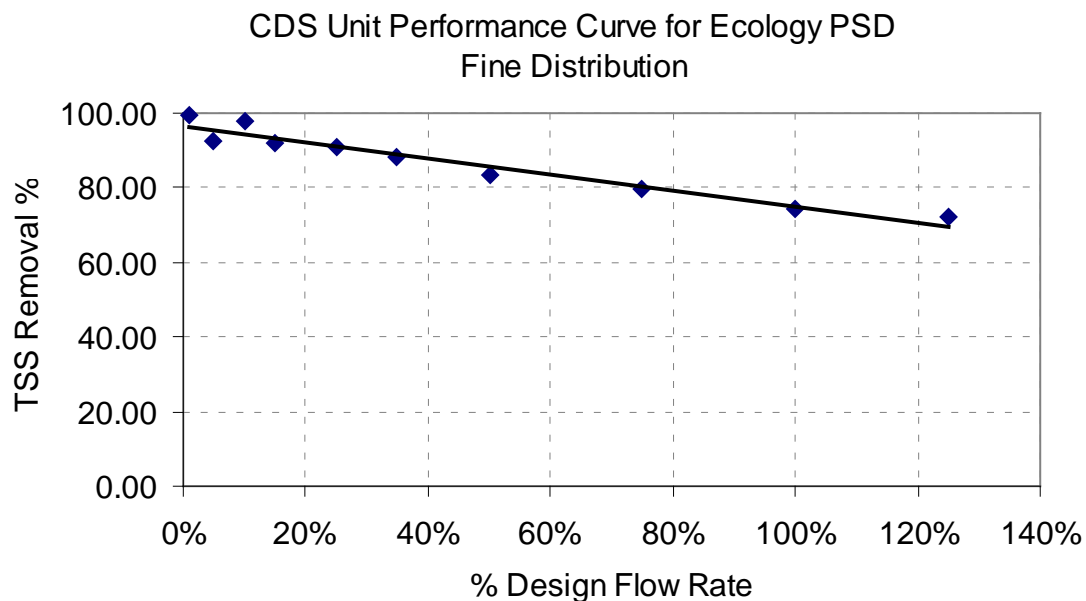


Figure 1. CDS Unit Performance for Fine PSD

CDS Unit Performance Testing Protocol

Tests were conducted using two types of sand – U.S. Silica OK-110 and UF sediment (a mixture of U.S. Silica sands). Particle size gradations for the two types of sand are illustrated in Figure 2.

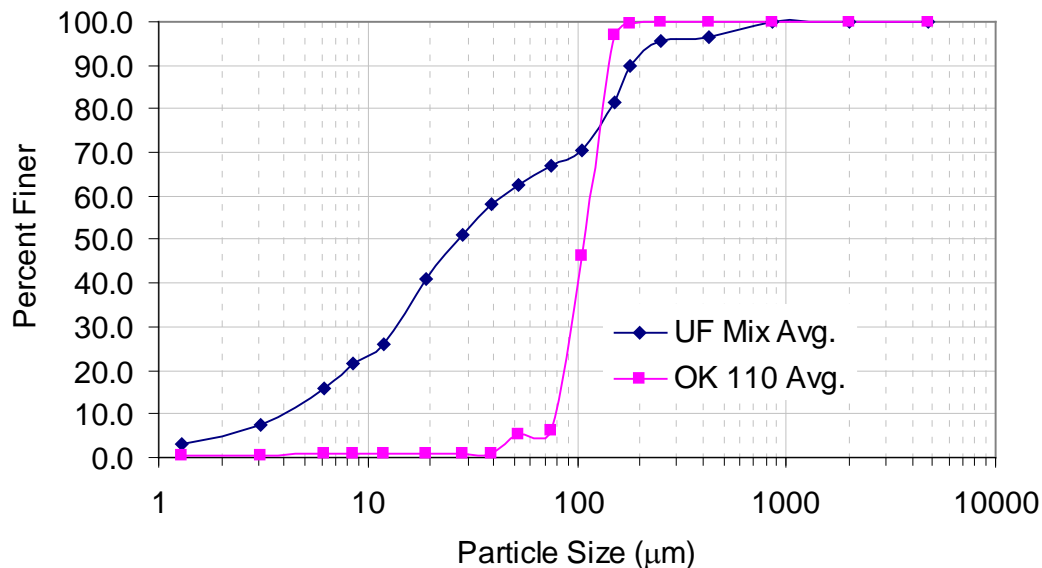


Figure 2. Test material particle size gradations - CDS Model PMSU20_20 test
 (Analytical results provided by MACTEC Engineering and Consulting Inc. FL
 ASTM D-422 with Hydrometer method)

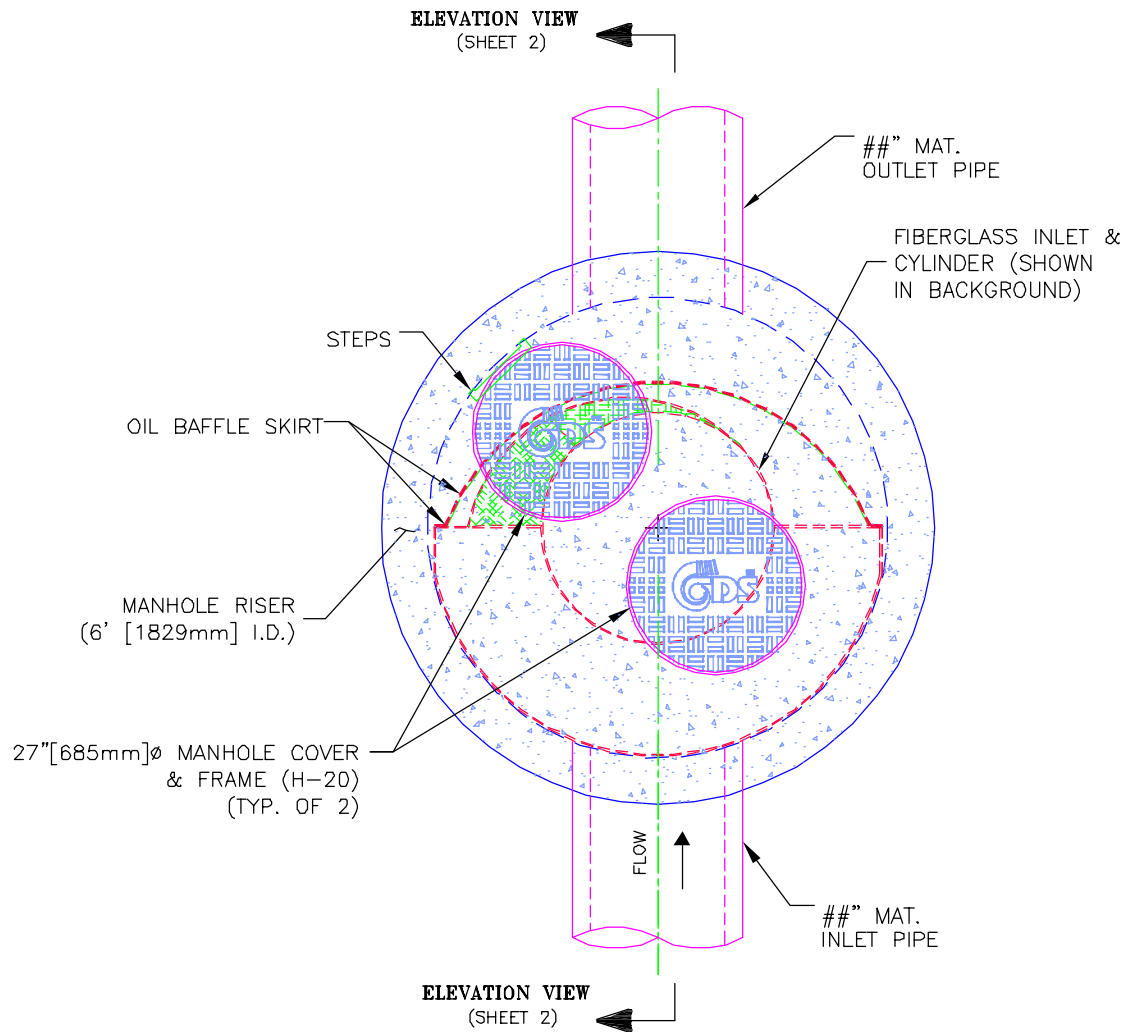
The influent concentration (mg/L) for the test was set at 200-mg/L and verified from slurry feeding. Effluent samples were taken at fixed time intervals during each test run at various flow rates. The composite effluent samples were sent to Test American Analytical Testing Lab, OR for TSS analysis (ASTM D3977-97).

TSS removal rates for the specified PSD (d_{50} of 90 μm) under various flow rates were calculated from Figure 2 shows the removal efficiency as a function of operating flow rate. This removal efficiency curve as a function of percent flow rate can be applied to all CDS unit models.

Appendix B

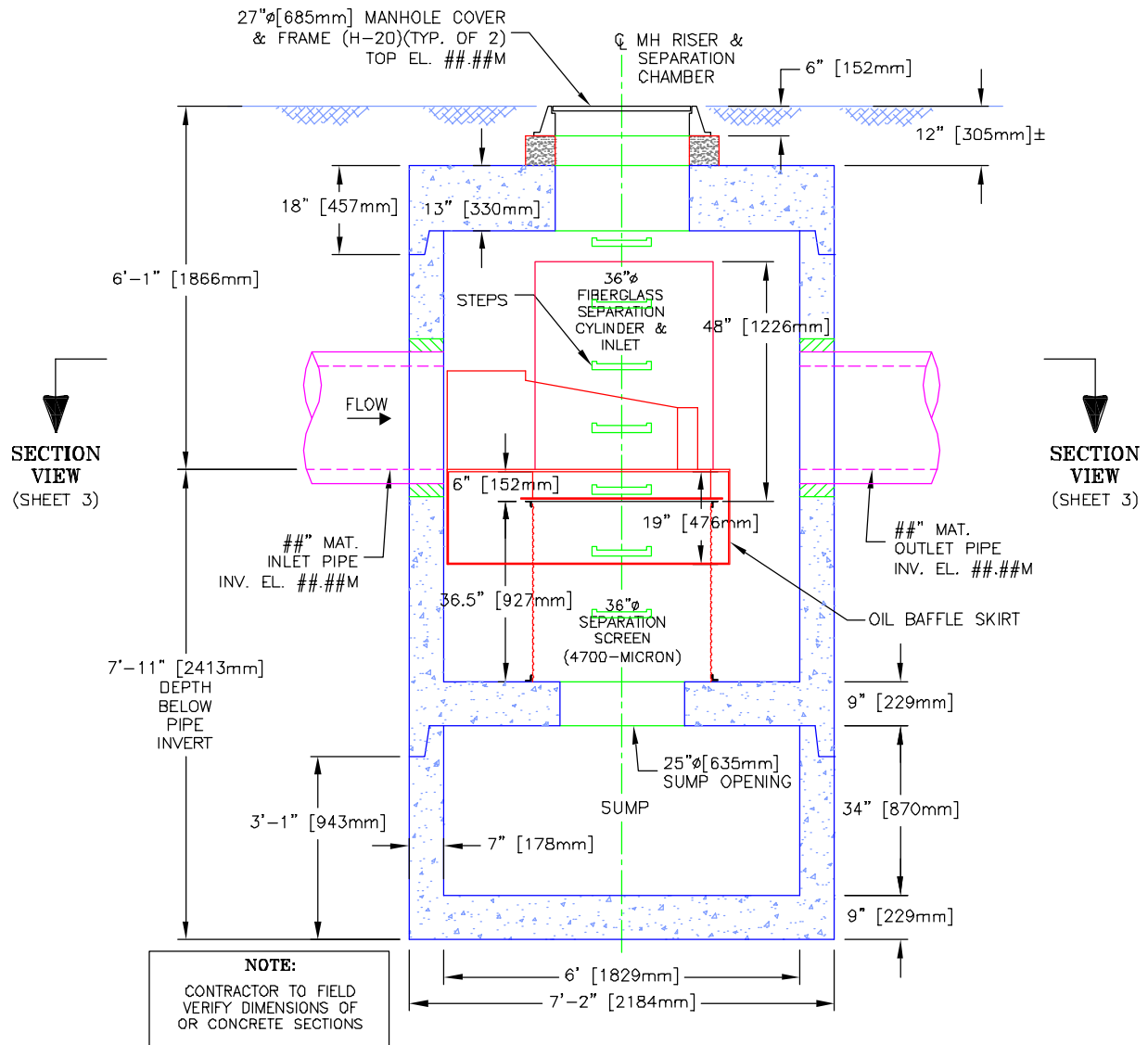
CDS General Cut Sheet Drawings

PLAN VIEW



CDS MODEL PMSU30_30m, 3.0 CFS TREATMENT CAPACITY STORM WATER TREATMENT UNIT

ELEVATION VIEW



CDS MODEL PMSU30_30m, 3.0 CFS TREATMENT CAPACITY STORM WATER TREATMENT UNIT

Appendix C
MOE NETE Approval Certificate

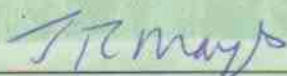
CERTIFICATE

OF TECHNOLOGY ASSESSMENT

CDS™ Technologies

The Ontario Ministry of the Environment has reviewed the solid/liquid separation system developed by CDS™ Technologies. Based on the review of the documentation submitted by the company (see the Notable Aspects section and Appendix), and data from pilot-scale testing and full-scale operations conducted by various agencies, the Ministry concludes that the continuous deflection separation (CDS™) system can provide useful removal of solids and floatables as part of a stormwater management system.

The CDS™ Technologies may be able to provide "basic to enhanced" level of protection when used alone, maintained for effective operation, and when appropriately designed for the development area to be serviced. CDS™ units may also be used for pretreatment in combination with other non-proprietary technologies such as man-made wetlands, treatment ponds and infiltration basins.



John Mayes, (A) Director
Standards Development Branch
Ministry of the Environment
(September 2006)

New Environmental Technology Evaluation Program

Promoting the development and application of new environmental technologies



Ontario





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Service of Ontario
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Monday, April 27, 2015

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Echelon Environmental

Supplier of stormwater treatment systems

Category: **Distributor**

Products

** For product details select the down arrow.*

Info CDS Technologies Precast Manhole Stormwater Unit (PMSU)

Info ChamberMaxx

Products Distributed

Contech Construction Products Inc.

CDS®

Using patented continuous deflective separation technology, the CDS® system, effectively screens, separates and traps debris, sediment, and oil from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material, without blinding. It is available in offline, inline, and grate inlet configurations. The unique inlet design provides more ways to receive stormwater in a single treatment unit. Its unique forebay design allows it to receive single or multiple pipes on a 170° arc. If needed, the system can perform as a catch basin or drop inlet and receive flow from the rest of the drainage collection system ? eliminating the need for additional structures. An oil baffle skirt surrounding the non-blocking screening process traps oil and grease. It separates previously captured oil and grease from high bypass flows, preventing re-entrainment. The CDS® system is available in precast or cast-in-place. Offline units can treat flows from 1 to 300 cfs (30 to 8500 L/s). Inline units can treat up to 7.5 cfs (170 L/s), and internally bypass larger flows in excess of 50 cfs (1420 L/s). The pollutant removal capability of the CDS system has been proven in the lab and field.

Contacts

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Email: rob@echelonenvironmental.ca

Web: <http://www.echelonenvironmental.ca>

APPENDIX E

Engineering Drawings

EROSION AND SEDIMENT CONTROL MEASURES:

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

1. PRIOR TO START OF CONSTRUCTION:

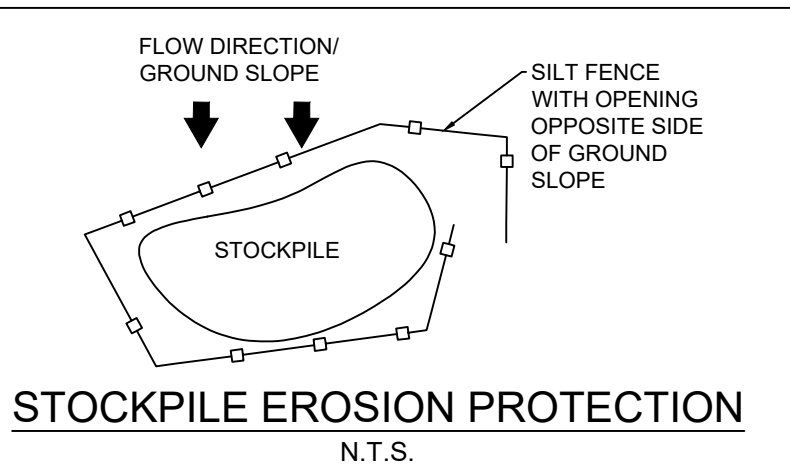
- PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:
- INSTALL SILT FENCE IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL GEOSOCK INSERTS WITH AN OVERFLOW IN ALL THE DOWNSTREAM CATCHBASINS AND MANHOLES.
- INSTALL SILT SACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES.
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY TO SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
- INSPECT SILT FENCES, FILTER CLOTHS AND CATCH BASIN SUMPS WEEKLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- CONSTRUCT SWALES AS PER DETAIL.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED.
- ALL TOPSOIL PILES ARE TO BE SEEDING IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED).
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THIS CONSULTING ENGINEER AND THE CITY DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PREVENT MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 15m LONG, 4M WIDE AND 0.3m DEEP AND SHALL CONSIST OF COARSE (50mm CRUSHER-T-RUN LIMESTONE) MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ADJUTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.



LEGEND:

	EXISTING PROPERTY LINE TO REMAIN
	PROPOSED LIMIT OF CONSTRUCTION
	PROPOSED CURB
	PROPOSED DEPRESSED CURB
	PROPOSED TERRACING (3:1 MIN.)
	PROPOSED DOOR ENTRANCE/EXIT
	PROPOSED GRASS AREA
	PROPOSED CONCRETE FEATURES/SLAB
	PROPOSED HEAVY DUTY ASPHALT
	PROPOSED LIGHT DUTY ASPHALT
	PROPOSED GRAVEL AREA
	PHASE 2 - FUTURE DEVELOPMENT
	PROPOSED RIP RAP AS PER OPSD 810.010
	PROPOSED ELEVATION
	PROPOSED HIGH POINT ELEVATION
	PROPOSED SWALE ELEVATION
	PROPOSED BOTTOM OF CURB ELEVATION
	PROPOSED TOP OF CURB ELEVATION
	PROPOSED BOTTOM OF SIDEWALK ELEVATION
	PROPOSED TOP OF SIDEWALK ELEVATION
	MATCH INTO EXISTING ELEVATION
	EXISTING ELEVATION
	PROPOSED OVERLAND MAJOR FLOW ROUTE
	PROPOSED 100mmØ PERFORATED SUBDRAIN
	PROPOSED STORM SEWER
	PROPOSED SANITARY SEWER
	PROPOSED WATERMAIN
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	EXISTING WATERMAIN
	EXISTING MANHOLE
	EXISTING CATCHBASIN
	PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
	PROPOSED STC300
	PROPOSED CURB STOP
	PROPOSED WELL
	PROPOSED PIPE INSULATION
	PROPOSED 100 YEAR HIGH WATER LEVEL
	STORM WATERSHED EXTENT
	WATERSHED NAME
	RUNOFF COEFFICIENT
	AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

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CLIENT

C&C TRANSPORTATION

DESIGNED BY: G.B. DRAWN BY: M.L. APPROVED BY: J.C.L.

PROJECT

NEW GARAGE AND OFFICE

8015 RUSSELL ROAD, OTTAWA (ON)

DRAWING TITLE

EROSION AND SEDIMENT CONTROL PLAN

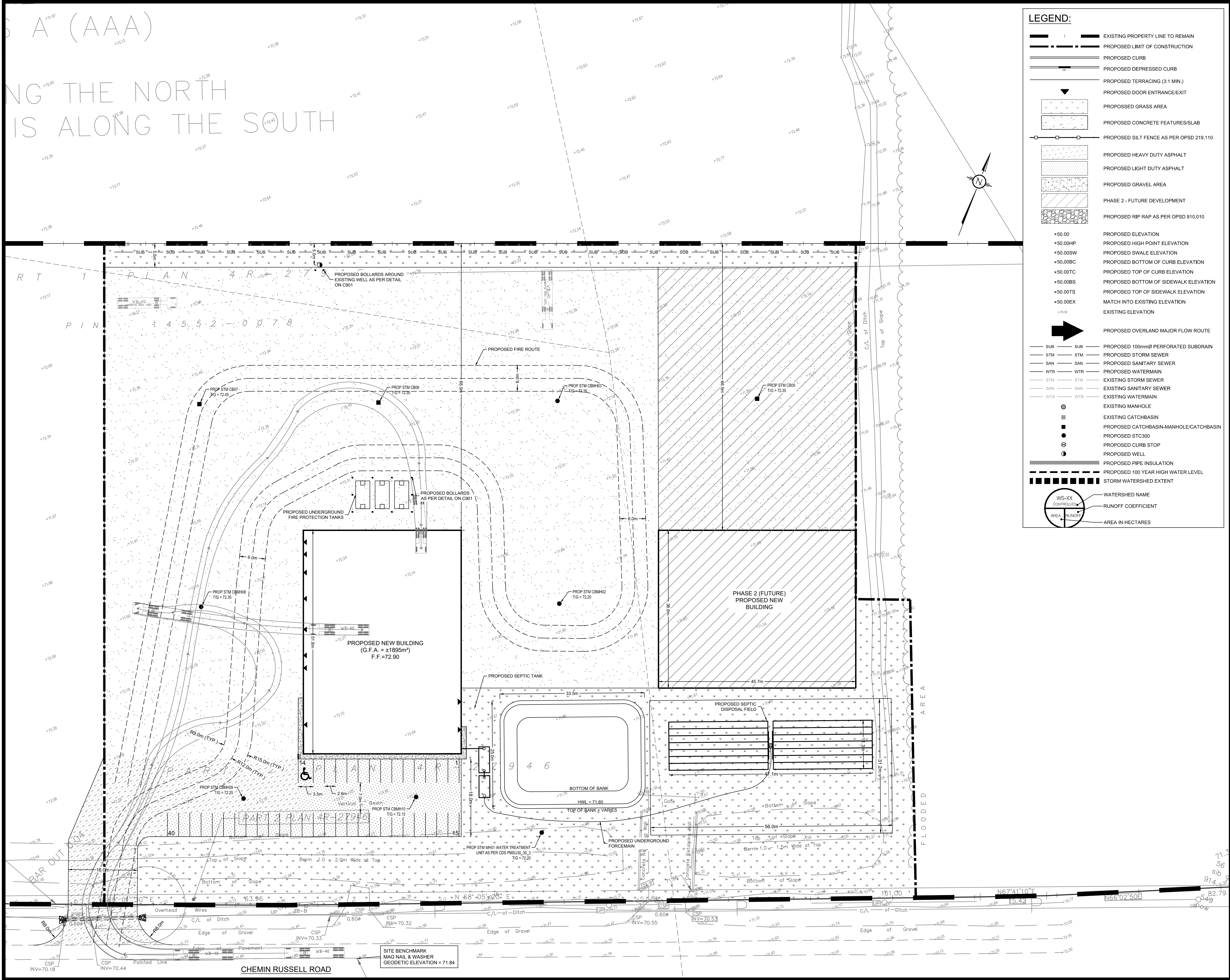
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A.L. BRUNET

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17 FEB 2018

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CLIENT

C&C TRANSPORTATION

DESIGNED BY: G.B. DRAWN BY: M.L. APPROVED BY: J.C.L.

PROJECT

NEW GARAGE AND OFFICE

8015 RUSSELL ROAD, OTTAWA (ON)

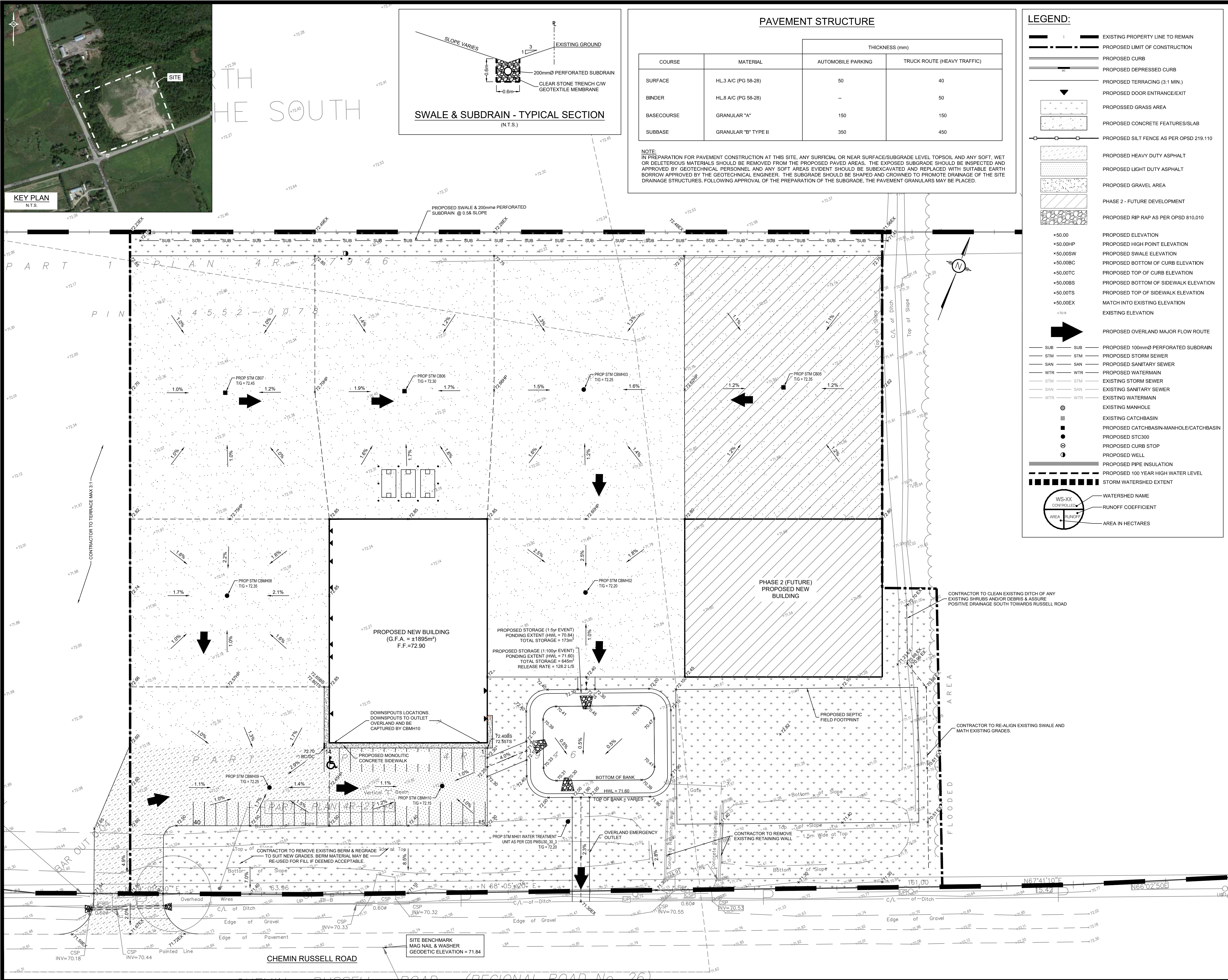
DRAWING TITLE

SITE DEVELOPMENT PLAN

PROJECT NO. 170254

DATE 26 JUNE, 2017

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PROJECT

NEW GARAGE AND OFFICE
8015 RUSSELL ROAD, OTTAWA (ON)

DRAWING TITLE

GRADING AND DRAINAGE PLAN

PROJECT NO.
170254

DATE
26 JUNE, 2017

C301

NOTES: GENERAL

- CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
- ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
- JOB BENCH MARK - CONFIRM WITH LRL PRIOR TO UTILIZATION.
- ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE, CATCH BASIN OUTLETS AND/OR STORM DETENTION AREAS ARE PROVIDED.
- STRIP AND REMOVE ALL TOPSOIL FROM IMPROVED AREAS.
- COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
- ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A CLEAN STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM.
- CURBS TO BE BARRIER, CONSTRUCTED AS PER OPSD 600.110.
- ALL MATERIAL SUPPLIED AND PLACED FOR PARKING LOT AND ACCESS ROAD CONSTRUCTION SHALL BE TO OPSD STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. CONSTRUCTION TO OPSD 206, 310 & 314. MATERIALS TO OPSD 1001, 1003 & 1010.
- ABUTTING PROPERTY GRADE TO BE MATCHED.
- OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL

AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION.

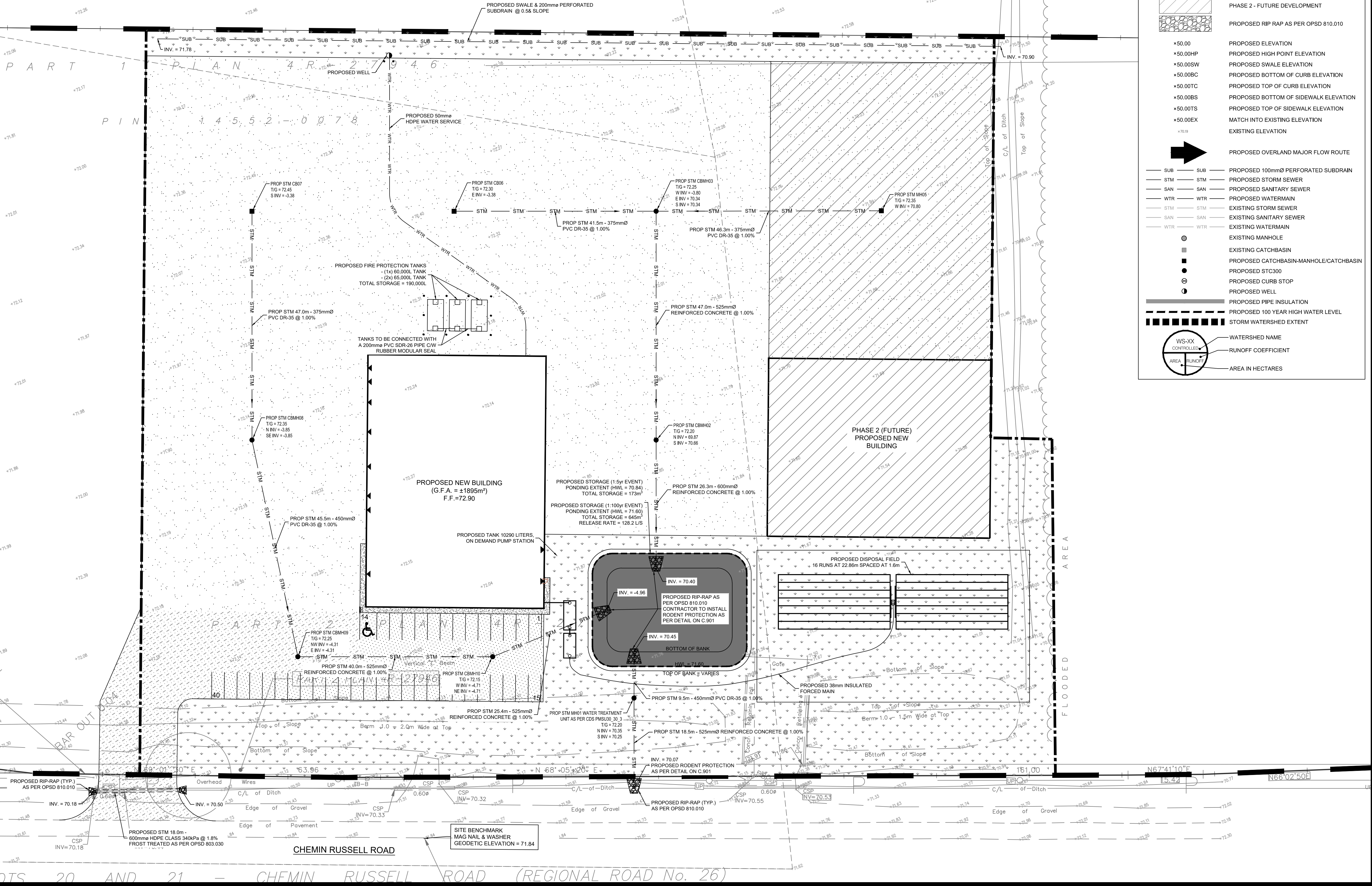
- MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
- FILTER FABRIC TO BE INSTALLED AND MAINTAINED BETWEEN THE FRAME AND COVER OF ALL CATCHBASINS, CATCHBASIN MANHOLES AND MANHOLES DURING THE CONSTRUCTION PERIOD TO MINIMIZE SEDIMENTS ENTERING THE STORM SEWER SYSTEM. ALL GRASSED AREAS MUST BE COMPLETED PRIOR TO THE REMOVAL OF THE FILTER FABRIC IN THE DRAINAGE STRUCTURES.
- REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER, EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS, IF ANY, LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
- THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS BUT NOT LIMITED TO, ROAD CUT PERMITS, SEWER PERMITS, WATER PERMIT, ETC.
- AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
- ALL SIDEWALK CONSTRUCTION TO BE AS PER OPSD 310.010 & OPSD 310.050.

NOTES: SEWERS

- PROPOSED SANITARY SERVICE BETWEEN THE EXISTING BUILDING AND THE PROPOSED BUILDING IS TO BE INSTALLED AS PER THE MECHANICAL PLANS.
- SEWER BEDDING AS PER PIPE TRENCH DETAIL WITH GRANULAR 'A' BEDDING COMPACTED TO 95% OF ITS SPMD.
- ALL WORK SHALL BE PERFORMED, AS APPLICABLE IN ACCORDANCE WITH OPSD 407, AND 410.
- CONTRACTOR TO CONFIRM ELEVATION OF EXISTING SEWERS AT PROPOSED CONNECTION POINTS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE COMMENCING ANY WORK.
- ALL SEWERS WITH LESS THAN 2.0m OF COVER ARE SUBJECT TO INSULATION DETAIL.

NOTES: WATER SERVICE

- PROPOSED WATER SERVICE BETWEEN THE WELL AND THE PROPOSED BUILDING IS TO BE INSTALLED AS PER THE MECHANICAL PLANS.



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED LIMIT OF CONSTRUCTION
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED GRAVEL AREA
- PHASE 2 - FUTURE DEVELOPMENT
- PROPOSED RIP RAP AS PER OPSD 810.010
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- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED 100mmØ PERFORATED SUBDRAIN
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED STC300
- PROPOSED CURB STOP
- PROPOSED WELL
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

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01 ISSUED FOR SPA G.B. 05 FEB 2018

No. REVISIONS BY DATE

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C&C TRANSPORTATION

DESIGNED BY: G.B. DRAWN BY: M.L. APPROVED BY: J.C.L.

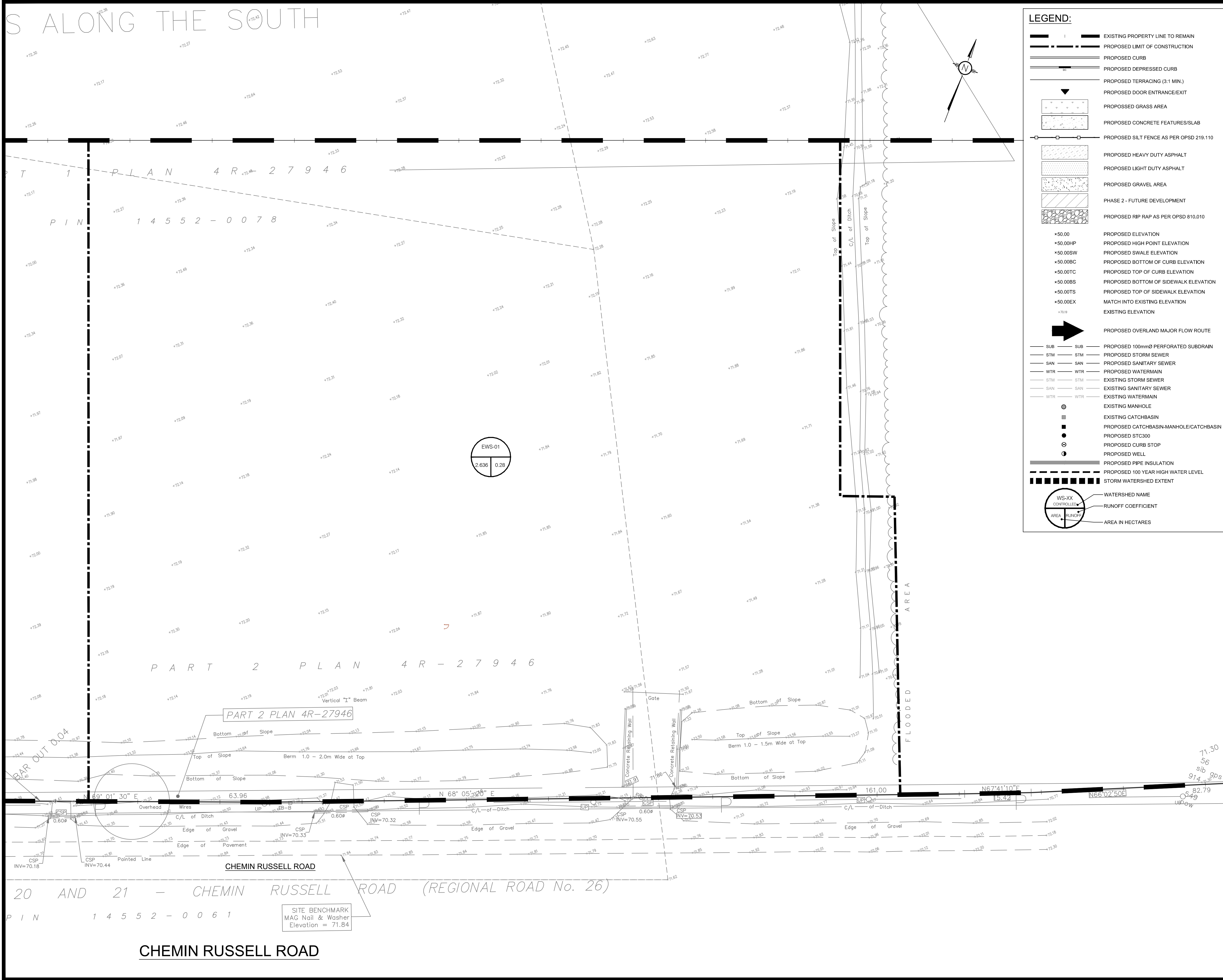
PROJECT
NEW GARAGE AND OFFICE
8015 RUSSELL ROAD, OTTAWA (ON)

DRAWING TITLE
SERVICING PLAN & STORMWATER MANAGEMENT PLAN

PROJECT NO.
170254

DATE
26 JUNE, 2017

C401



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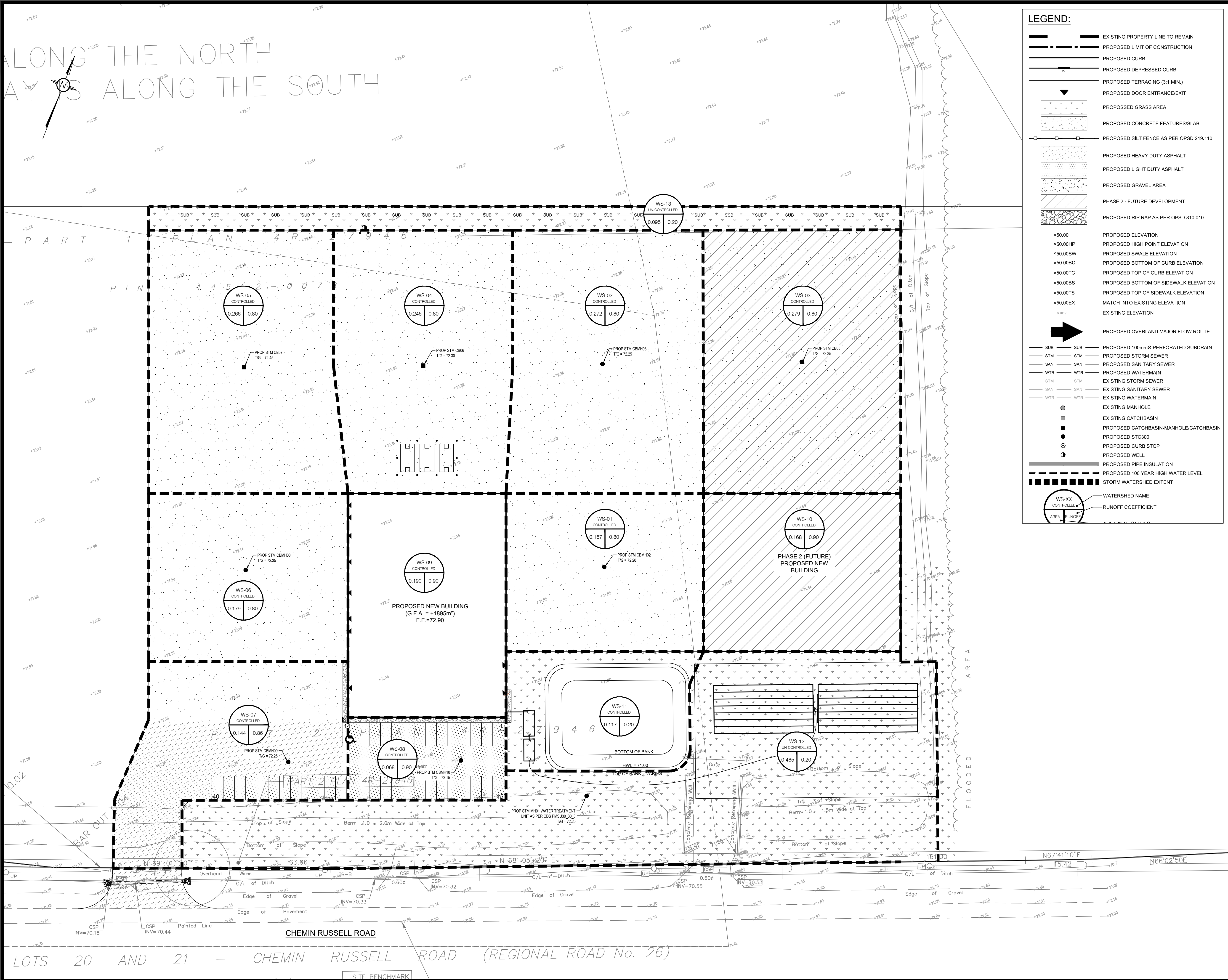
PROJECT

**NEW GARAGE AND OFFICE
8015 RUSSELL ROAD, OTTAWA (ON)**

DRAWING TITLE

**PRE-DEVELOPMENT
WATERSHED PLAN**

PROJECT NO.	C701
170254	
DATE	
26 JUNE, 2017	



LEGEND:

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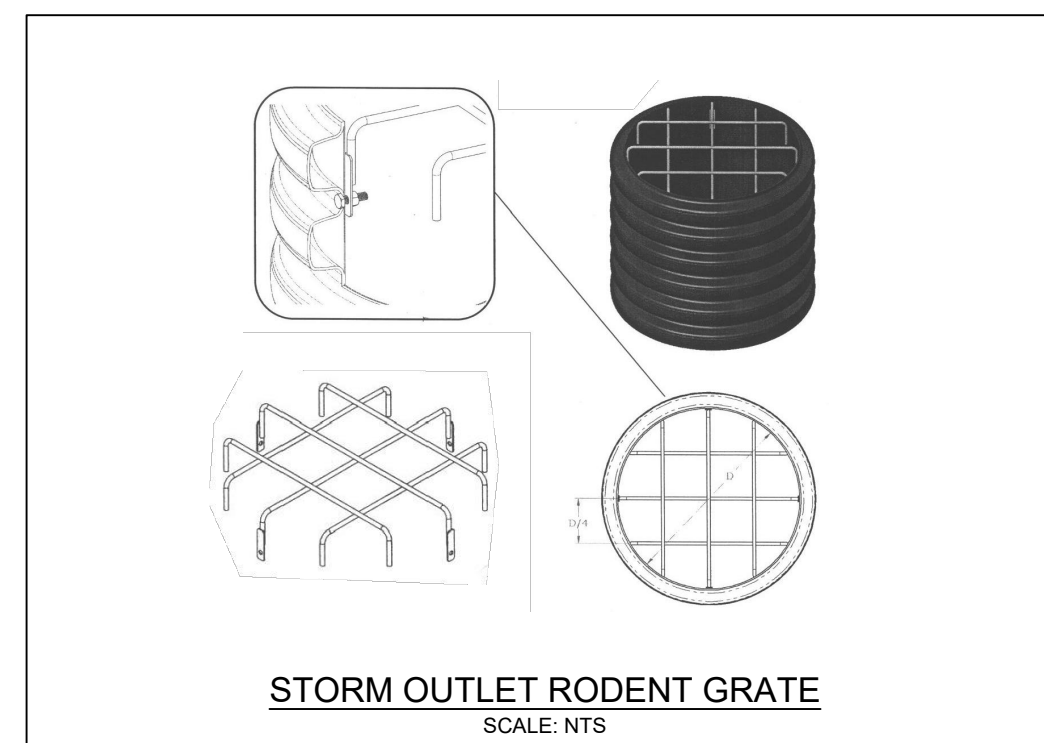
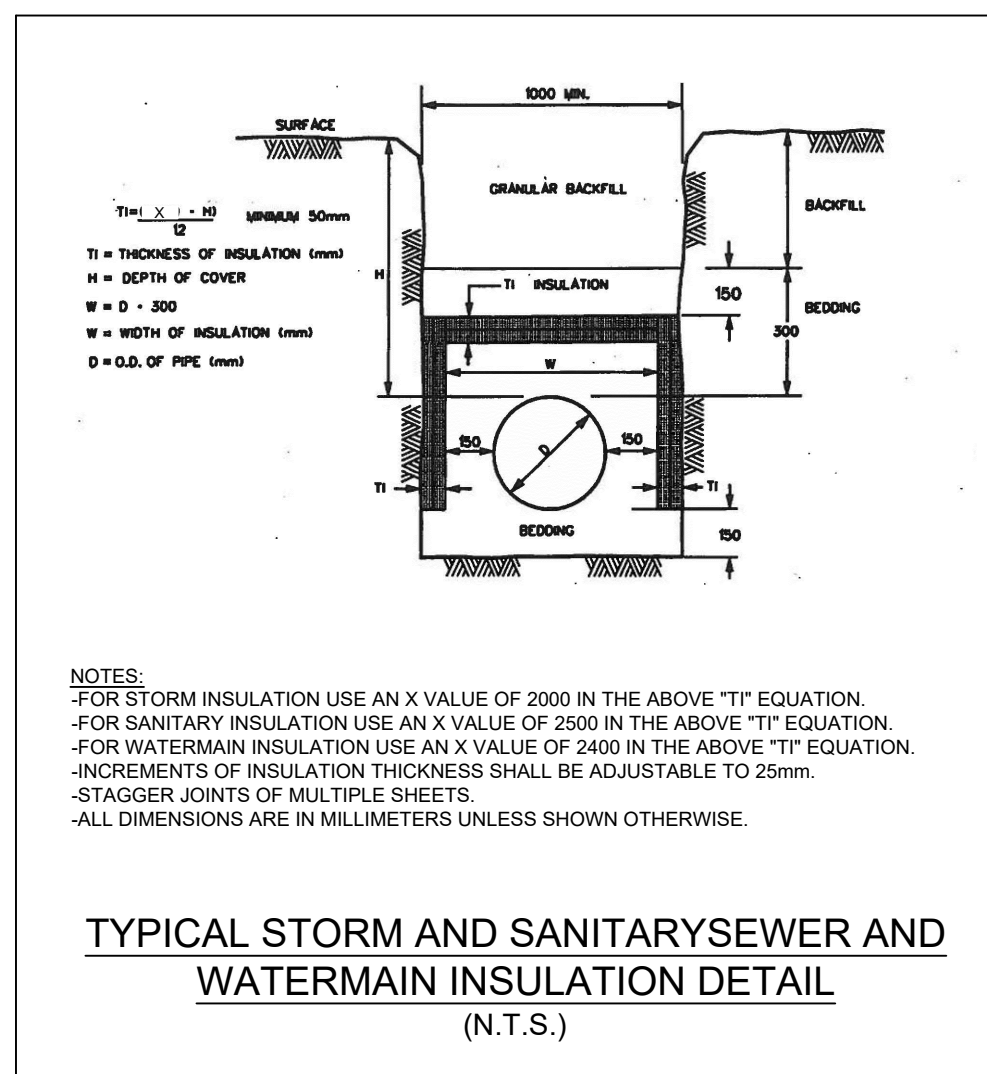
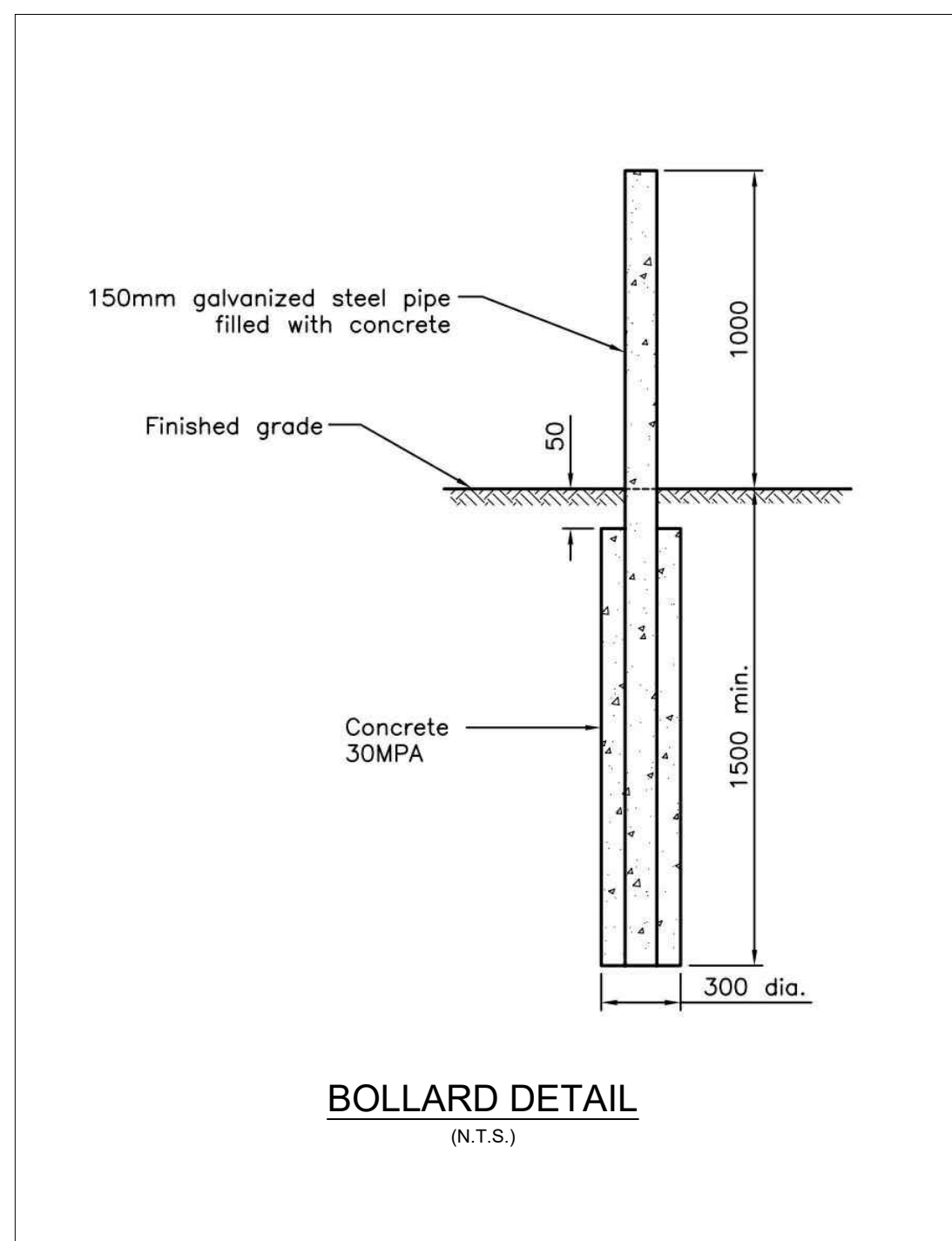
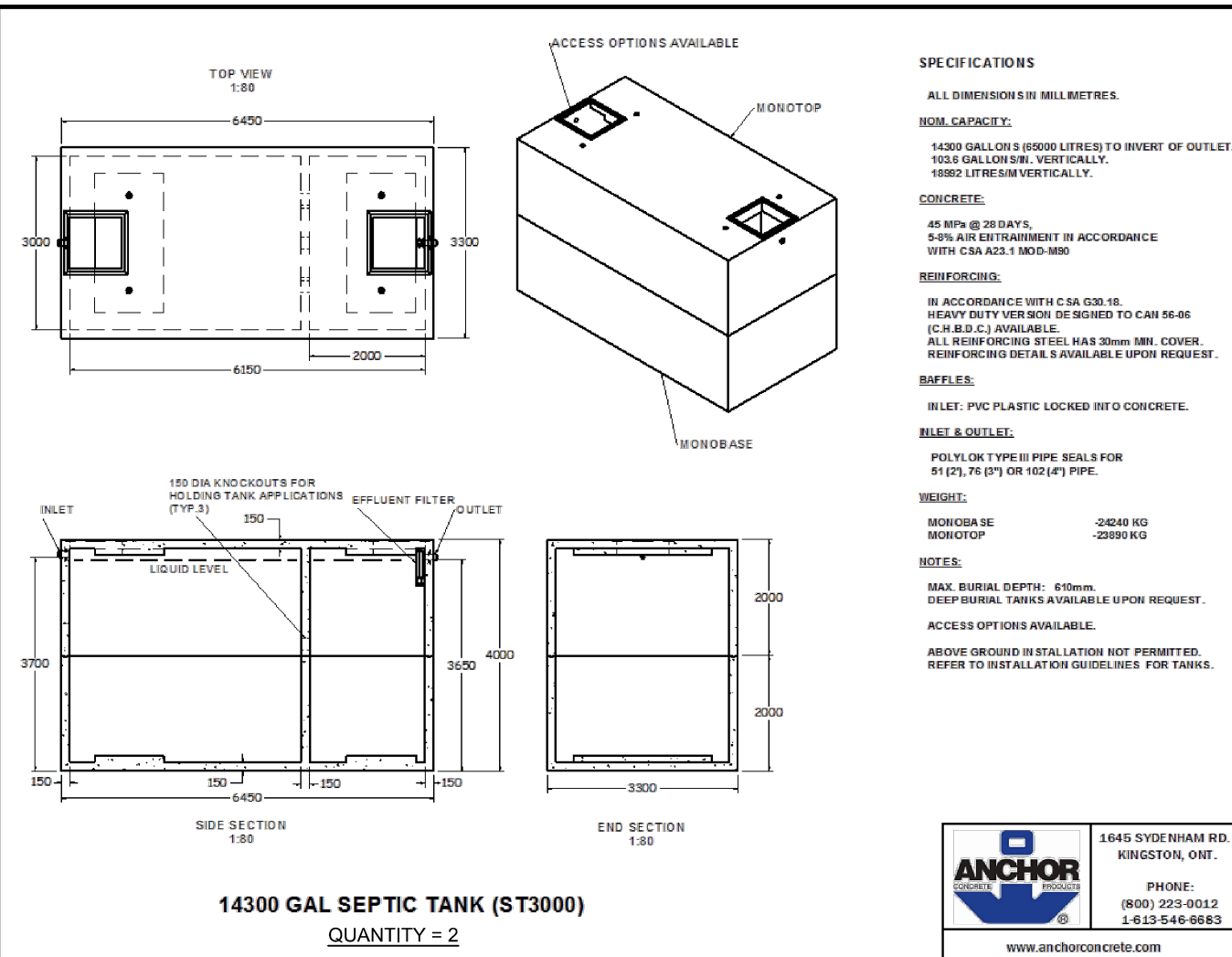
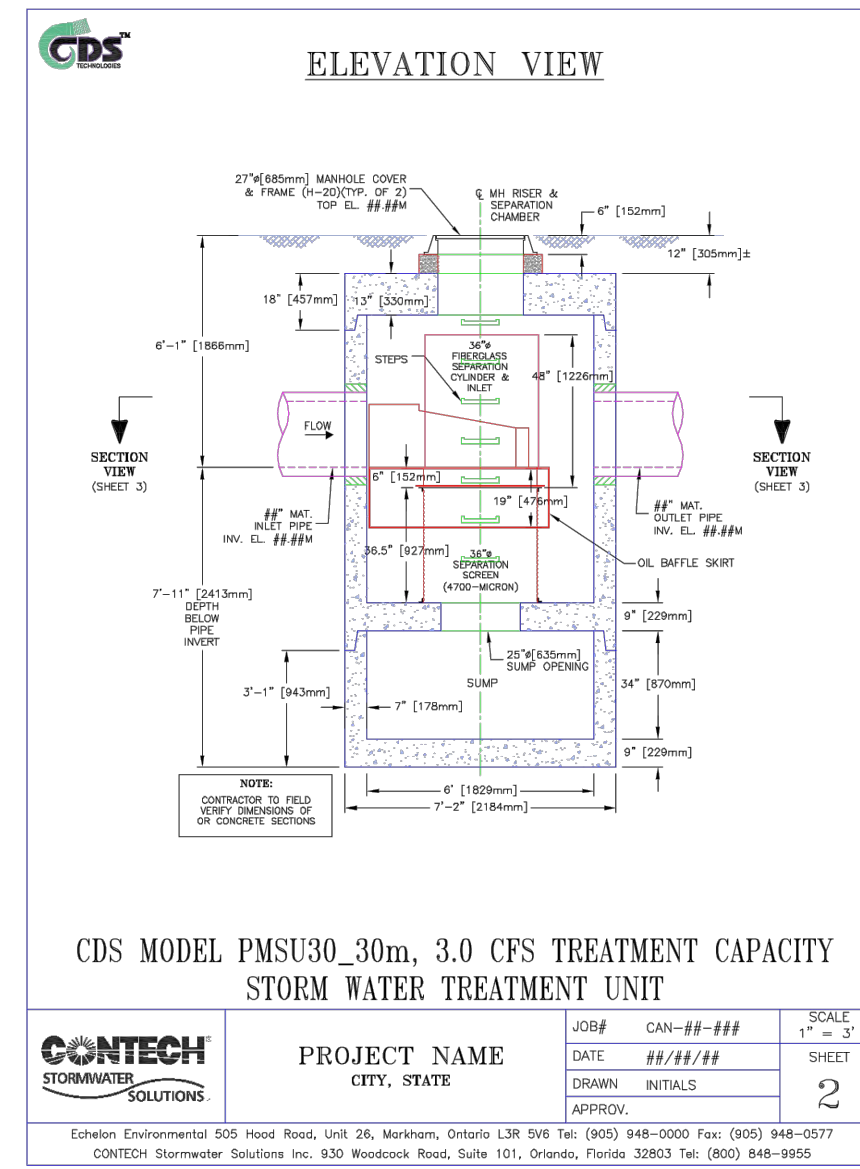
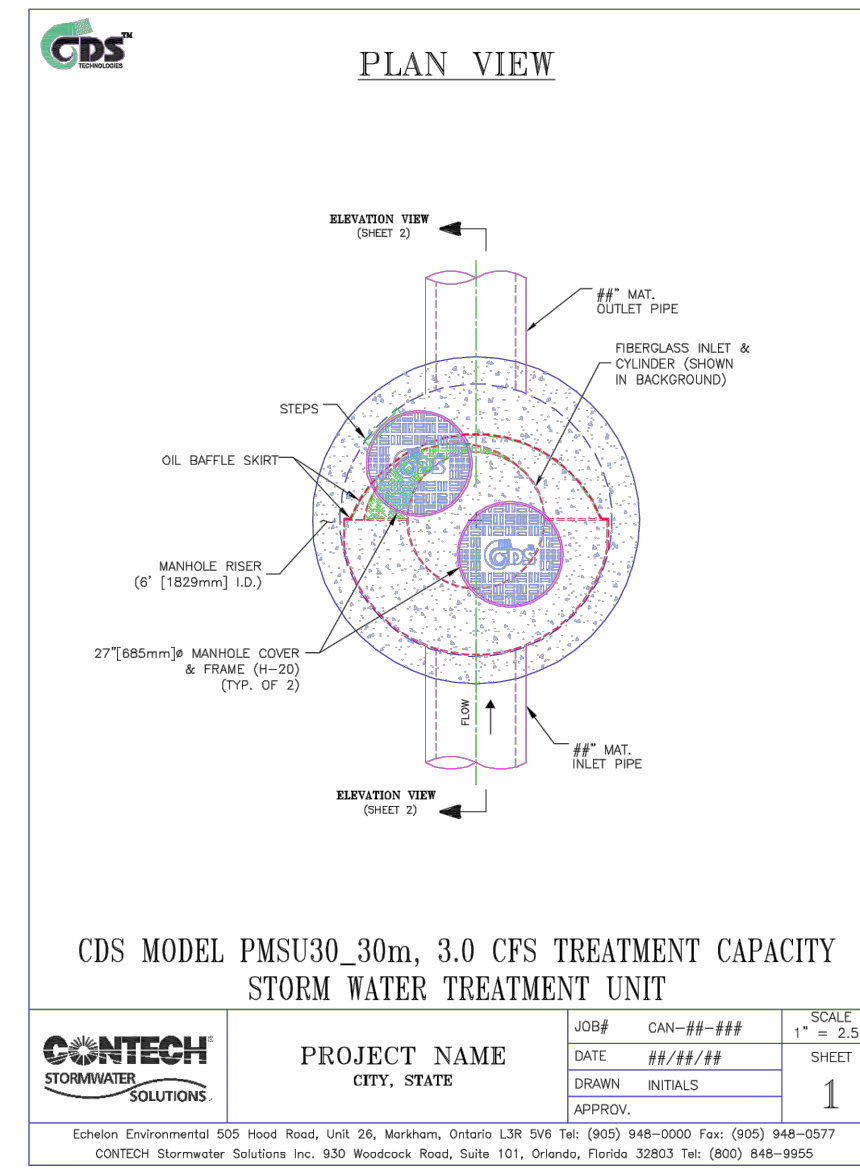
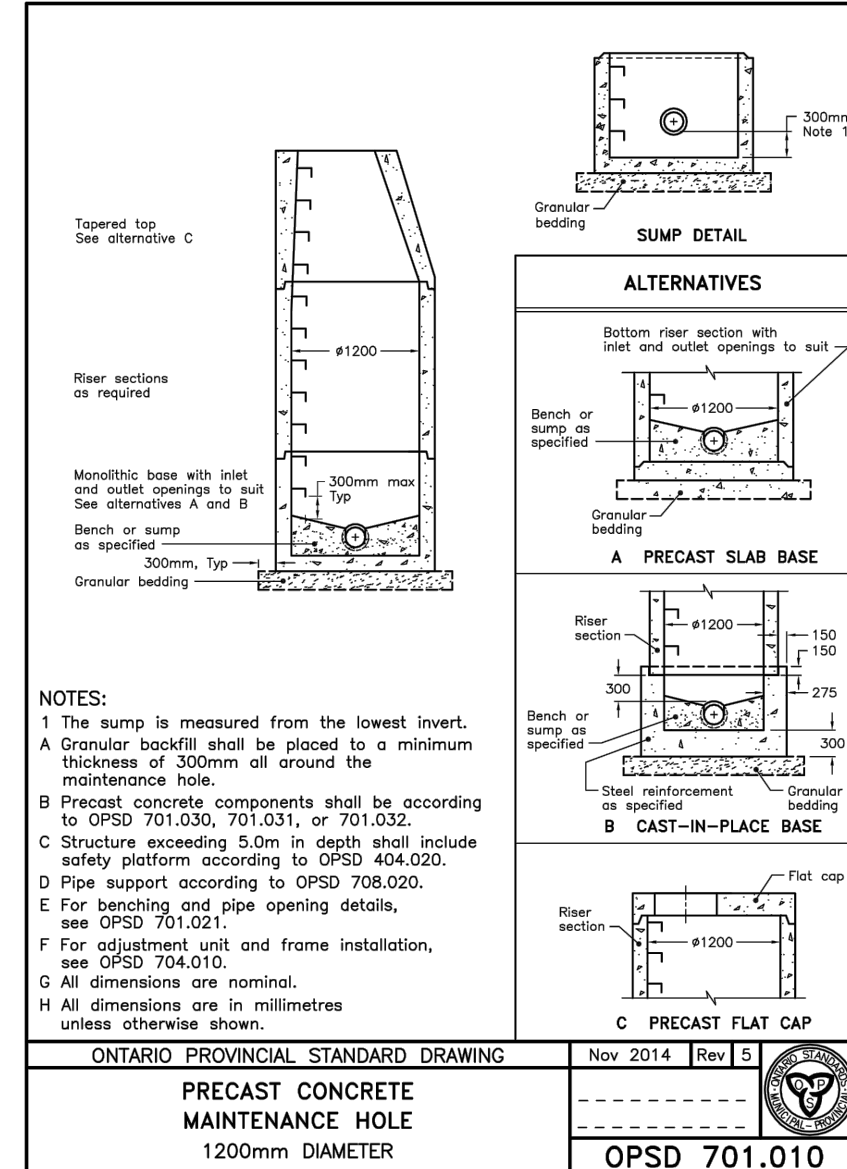
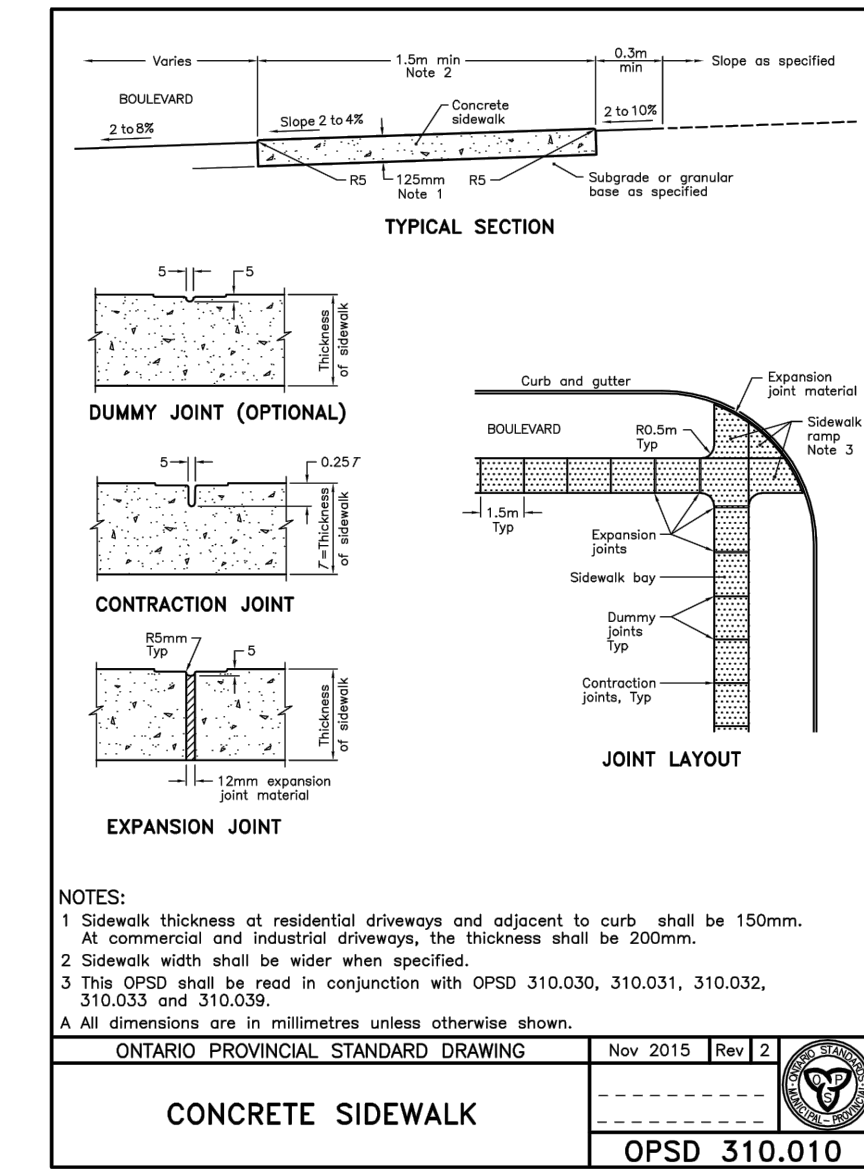
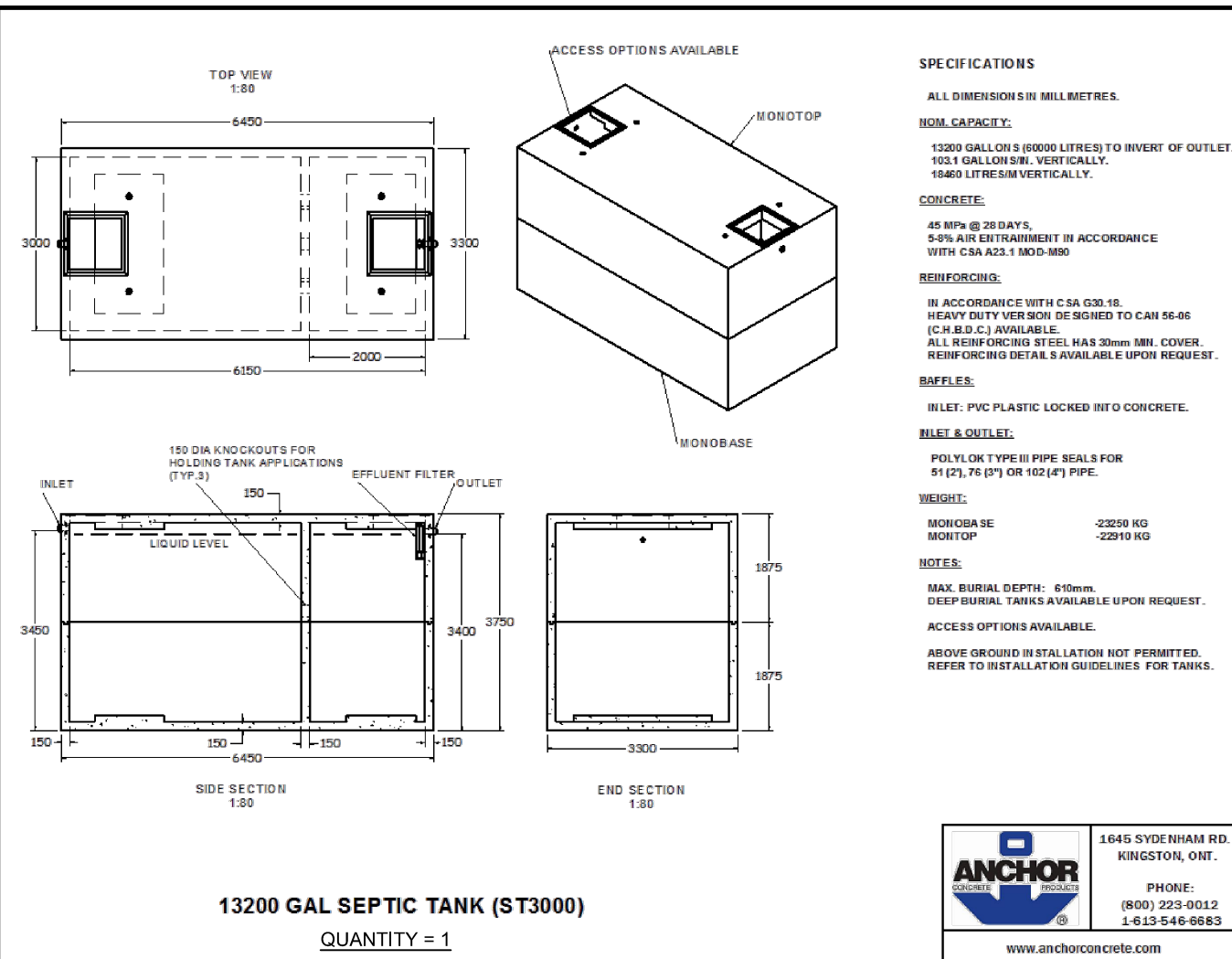
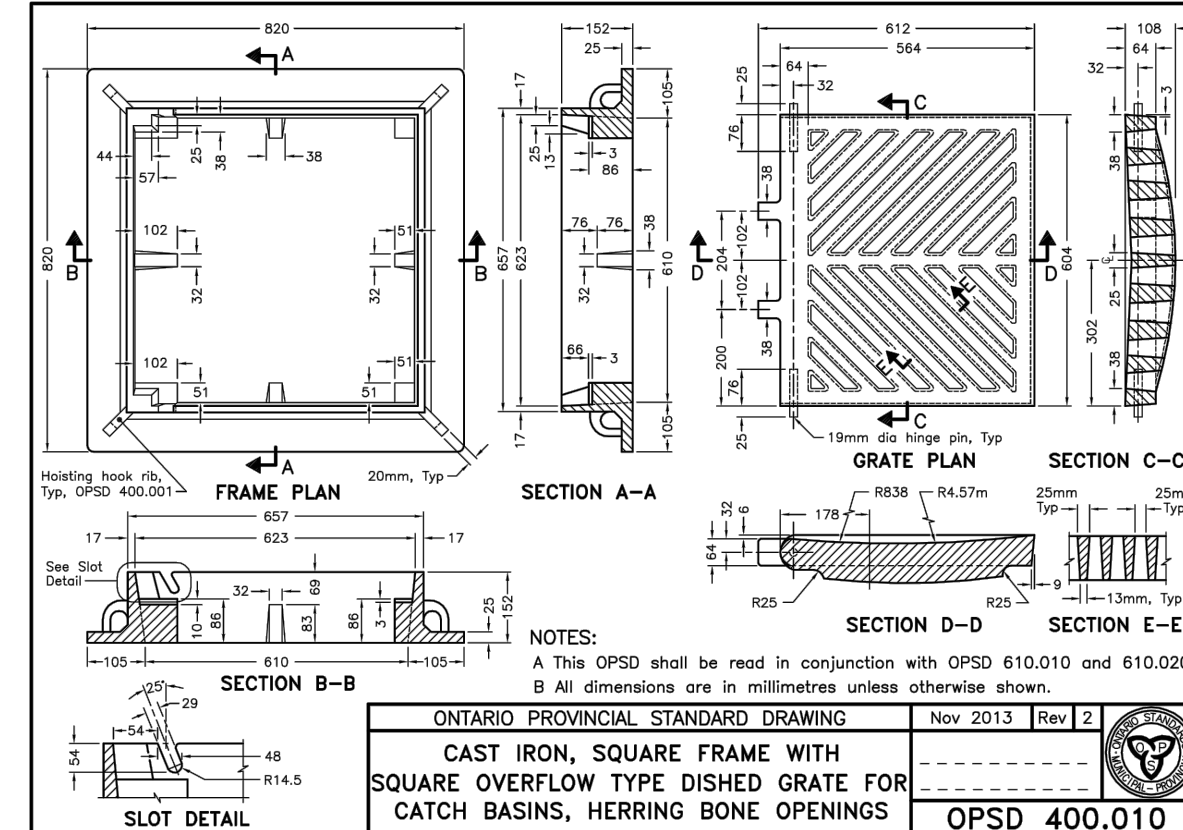
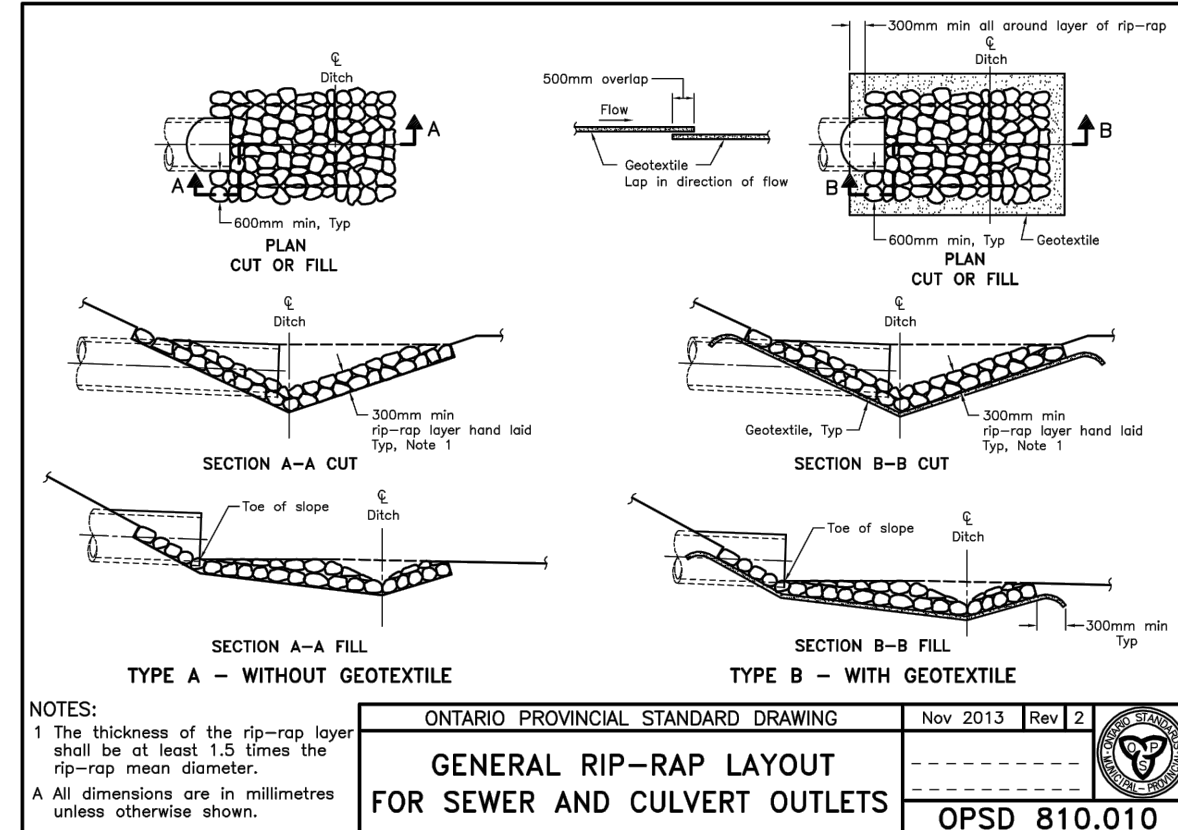
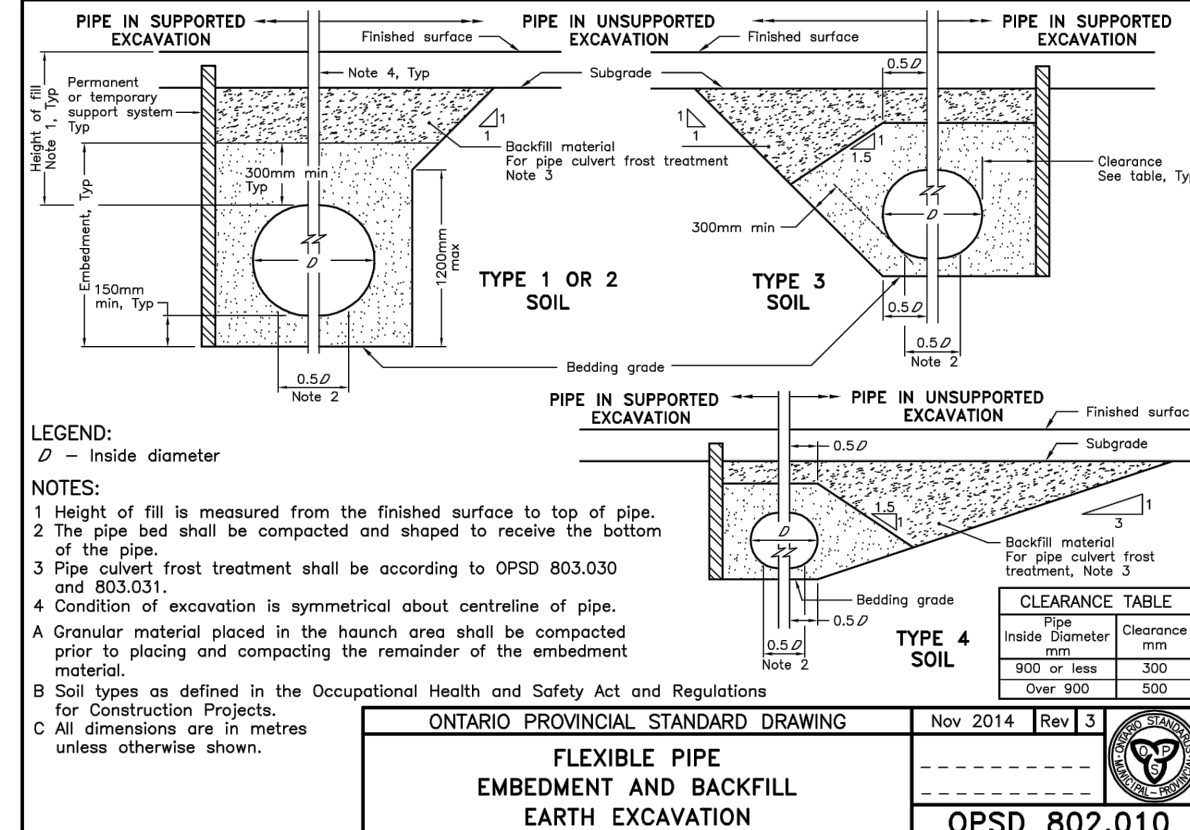
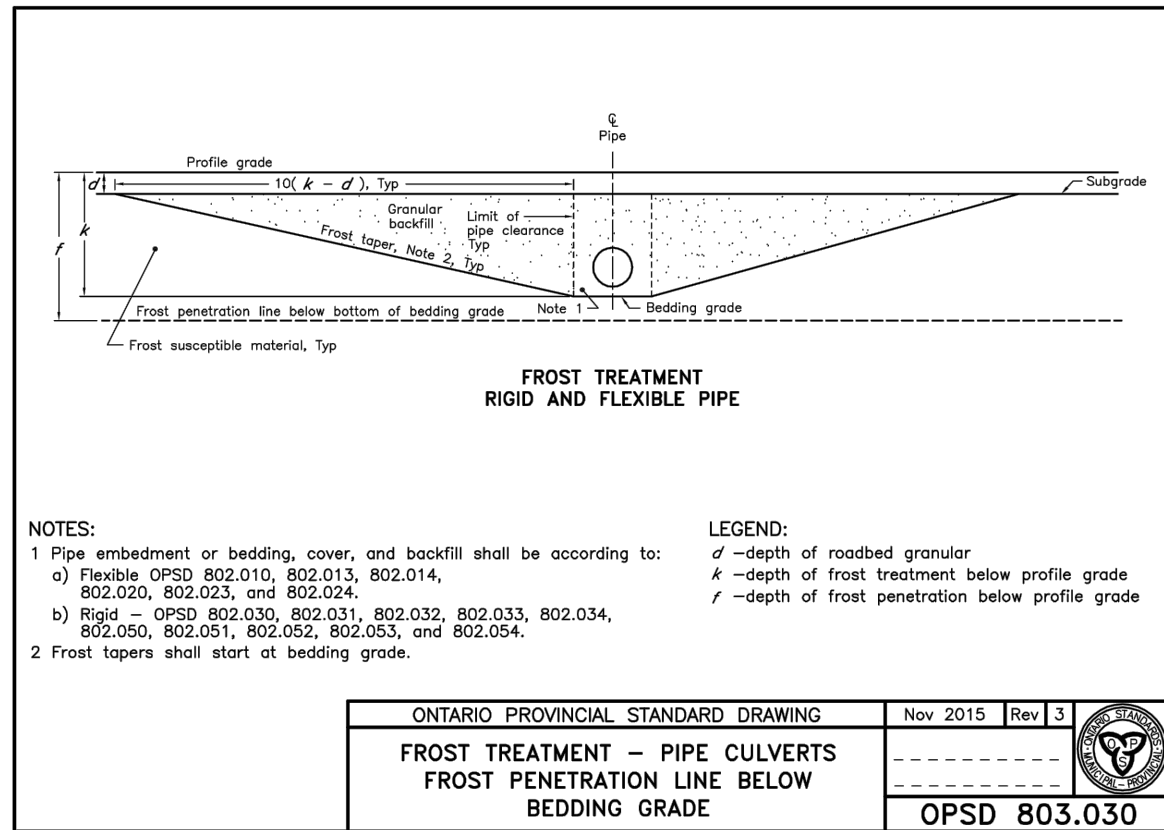
DESIGNED BY: G.B. DRAWN BY: M.L. APPROVED BY: J.C.L.

PROJECT: NEW GARAGE AND OFFICE
8015 RUSSELL ROAD, OTTAWA (ON)

DRAWING TITLE: POST-DEVELOPMENT WATERSHED PLAN

PROJECT NO: 170254
DATE: 26 JUNE, 2017

C702



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01	ISSUED FOR SPA	G.B.	05 FEB 2018
No.	REVISIONS	BY	DATE

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DRAWING TITLE: CONSTRUCTION DETAILS PLAN

PROJECT NO.: 170254
DATE: 26 JUNE, 2017

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