2742 DUNROBIN ROAD
CITY OF OTTAWA

STORM WATER MANAGEMENT & SERVICING BRRIEF REPORT

Temporary Proposed Development

Project No. NTE201202

Prepared for:

Mr. Omar Alnader
2742 Dunrobin Rd, Ottawa ON
Tel: 613-204-1771

NorthTown Engineering Inc.
212 - 430 Hazeldean Road,
Kanata, ON. K2L 1T9

June 2021

- **INTRODUCTION**

NorthTown Engineering Inc. was appointed by Mr. Omar Al Nader to provide Architectural & engineering services for the proposed Car Dealership at 2742 Dunrobin Road. The site is located near the Intersection of Dunrobin Road and Thomas A. Dolan Parkway in the City of Ottawa, Ontario.

This report should be read in conjunction with the Site Plan, Grading Plan and other design drawings prepared by NorthTown Engineering Inc, and Permeameter Testing and Geotechnical Assessment prepared by Paterson group Consulting Engineers.

- **SITE OVERVIEW**

The majority of the site consists of native vegetation. The proposed development is approximately 0.1 ha in area and it is mainly on the west side of the property at Dunrobin Road. A trailer on wheels 9m x 3m will be used as an office for 1 attendant on the site. A gravel lot (439 sq.m) will be used for car display and customer parking. Landscaping and other improvements are detailed on the Site Plan.

I. STORMWATER MANAGEMENT

1. Water Quality:

The Mississippi Valley Conservation Authority (MVCA) requires a stormwater quality controls in place to maintain an enhanced level of protection (80% Total Suspended Solids (TSS) Removal) Rainfall runoff from the developed and hard surfaces will drain to drainage pond. The grassed detention areas will have minimal slopes that will keep flow velocities low making them effective for pollutant removal and they will tend to increase the removal of TSS. The low flow conditions in this area will filter out coarse sediment from runoff.

Infiltration rate is from Permeameter Testing and Geotechnical Assessment prepared by Paterson group Consulting Engineers.

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Infiltration trench located at the bottom of each stormwater detention area have been sized to remove 80% TSS as per the MOE Design Manual. As per the geotechnical report the underlying soil has an estimated design infiltration rate of 8.0 to 10 mm /hr. To be conservative 8 mm/hr was used. The water table is estimated to be 5m deep and the bedrock >18m so neither will be an issue with respect to the proposed infiltration trenches. Infiltration trench: depth 0.11 m, area (30 m x 2 m) 60 sq.m and total volume 6.6 cu.m. The time to draw down is 110/8 = 13.75 hr

2. Drainage Criteria

The site consists of native vegetation and naturally draining East, away from the Municipal ditch on Dunrobin Road. The total site area is 4020 sq.m (0.402 ha) with proposed development area of 1070 sq.m (0.107 ha) on the west side of the property at Dunrobin Road.

Stormwater from the site will be conveyed via sheet flow to a proposed ditch northeast of the new parking area. The proposed ditch is designed to intercept, store and infiltrate the surface drainage from the contributing developed area on the site.

Part of the property located north of the site is naturally draining to the development area, the flow from that part is added to the contributing area. The added part is measured to be 480 sq.m (0.048 ha).

Pre-Development Release Rate

The maximum release rate is calculated for the site as follows:

Q = 2.78 CIA

Where,
Q = Peak Runoff (L/s)
2.78 = Unit conversion factor (from ha-mm/hr. to L/s)
C = Runoff Coefficient (unitless)
I = Rainfall Intensity (mm/hr.) (From Ottawa IDF Curve Equations below)
A = Drainage Area (ha)

A = Total Drainage Area = 1,070 + 480 m^2 (0.155 Ha)
Runoff Coefficient for the 5-Year for Grass Area: **C = 0.2**

IDF Equations
The following Intensity-Duration-Frequency Curve equations were used in order to Correctly model the storm events common to the City of Ottawa.

$I_{(5\text{-}yr)} = 998.071 / (Tc + 6.053)^{0.814}$
$I_{(100\ year)} = 1735.688 / (Tc + 6.014)^{0.820}$
Tc = 10min

$I_{(5\text{-}yr,\ 10min)}$ = 104.19mm/hr
$I_{(100\ year,\ 10min)}$ = 178.56 mm/hr

Allowable release rate for the 5-Year Storm Event:
$Q_{(5\text{-}year)}$ = 2.78 CiA = 2.78 x 0.2 x 104.19 x 0.155 = **9.0 L/s**
Allowable release rate for the 100-year Storm Event :
$Q_{(100\text{-}year)}$ = 2.78 CiA = 2.78 x 0.2 x 178.56 x 0.155 = **15.4 L/s**

3. Post Development Release Rate

Total Developed Area = 1,070 + 480 m^2 (0.107 + 0.048 Ha)

Post Development runoff coefficient:

	Area (m^2)	**'C'**
Landscaped Areas	604 + 480	0.20
Trailer Roof	27	0.90
Gravel	439	0.50

$$C_{avg} = \frac{[(0.0604 \times 0.2) + (0.048 \times 0.2) + (0.0027 \times 0.90) + (0.0439 \times 0.5)]}{[0.0604+0.048+0.0027+0.0439]}$$

C_{avg} = 0.30

Time of concentration = Tc = 10 min

5 year release rate, at intensity I = 104.19 mm/hr.
Q_5 = 2.78CiA = 2.78 x 0.30 x I x 0.155 **= 13.5 L/s**

100 year release rate, at intensity $I_{(100\ year,\ 24.3min)}$ = 178.56 mm/hr
Q_{100} = 2.78CiA = 2.78 x 0.30 x I x 0.155 = **23.1 L/s**

4. Storage Requirements and Allocation

Storage Requirements:
The storage requirements for the five years and one hundred years design storms for various rainfall intensities and times of concentration are included in the attached sheet.
The following table summarizes the five year and one hundred year design storm flows and storage requirements for the development:

Design Storm (return period)	Pre-Development flow rate (L/s)	Post-Development flow rate (L/s)	Storage Required (m3)
5 year	9.0	13.5	3.0
100 year	15.4	23.1	5.2

See Storage Volume Requirements Calculation in Appendix A

Storage Allocation:
A drainage ditch is proposed to receive the flow by intercepting the surface drainage from the contributing area. The ditch will provide a minimum of 18.9m^3 of quantity storage (quality storage requirements are determined in the next section). The storage volume available is sufficient to store the post-development peak flow for a 100-year event. The calculated storage volume required for a 5-year event is 8.4 cu.m and for the 100-year event is 14.4 cu.m (see attached calculation sheet).

5. Quality Control Measures

Quality considerations of the storm water were analyzed according to "Stormwater Management Practice Planning and Design Manual", Ontario the Ministry of Environment, Conservation and Parks. Water Quality Storage Requirements based on Receiving Waters defines storage volumes based on an Enhanced Level Protection status is suitable for the development.

Protection Level	SWMP Type	Storage Volume (m3/ha) for Impervious Level)			
		35%	55%	70%	85%
Enhanced Level	Infiltration	25	30	35	40
80% long-term	Wetlands	80	105	120	140
S.S. removal	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250

SWMPPDM excerpt

By interpolation the storage volume required is **40 m^3/ha** for the Infiltration category.
Using the catchment area of 0.155 hectares the total storage volume required is **6.2m^3**.
The drainage ditch storage volume is **18.9m^3** which meets the storage required for quality control measures.
The required Infiltration trench: area 126 m2, volume 14.4 m3, depth 0.11 m. The underlying soil has an estimated infiltration rate of 8 to 10.8 mm/hr. To be conservative, 8 mm/hr was used. The time to draw down is 110/8 = 13.75 hours.

6. EROSION AND SEDIMENT CONTROL

The following best management practices for erosion and sediment control will be employed in the proposed development:

1- The extent of exposed soils shall be kept to a minimum at all times to achieve re-vegetation of exposed areas as soon as possible.
2- Controls shall be installed during construction in accordance with the erosion and sediment controls indicated on the Erosion and Sediment Control Plan.
3- Stockpiles shall be located away from the Municipal Ditch and stabilized against erosion as soon as possible.
4- Construction entrances shall be constructed of gravel to prevent erosion of the entrance and sediment migration offsite.
5- Disturbed areas should be stabilized against erosion as soon as possible.
6- Runoff should be diverted around disturbed areas whenever possible.
7- Runoff should be directed to existing grassed areas where possible.

7. CONCLUSION

- The development has been designed to be serviced with a proposed shallow retention ditch facility.
- Additional Stormwater flow from the developed area will be stored within the proposed facility.
- The natural flow from the neighboring property will be stored within the proposed facility.
- Sediment control measures will be implemented and maintained during construction.

II. SERVICING BRRIEF

1. WATER SUPPLY FOR FIREFIGHTING:

There is no need for on-site water storage for fire protection. Building Code Services indicates that you would not require a fire route for this type of temporary structure.

2. ON-SITE WELL AND SEPTIC SYSTEM:

An existing drilled well at the northwest corner, located approximately 3.3 m from the west façade (Dunrobin Road) and 2 m from the north border with (2744 Dunrobin) lot. It is 0.5 m from ground with casing.

Due to the temporary use of the facilities, a functioning and permanent well and on-site sewage system are not proposed at this time. It is understood that permanent water and sewer amenities must be provided to permanent service facilities if permanent facilities are located on the site in the future.

3. TEMPORARY TRAILER:

The trailer is 10’x30’, 3’ above the ground and 10’ total height. Colour is white with red accent. The trailer will be used as a temporary sales office for up to two years. Depending on the business success, the trailer will be:

- replaced with a permanent structure or
- kept and a new permit will be obtained from the city or
- Business will be closed.

4. SANITARY AND WATER SERVICING

The sales trailer is temporary and will remain for up to two (2) years. Plumbing facilities for the site are a chemical port-a-potty toilet serviced by the toilet leasing company (please see Appendix B). and a portable sink with a water storage tank. A water cooler will also be provided. The port-a-potty is located beside the site trailer, and the hand wash sink and water cooler are located in the sales trailer.
Water cooler Size: 13.39" x 13.39" x 52.95" (L*W*H) Weight: 11.18lbs. (Please see Appendix B).

III. Miscellaneous

1. The on-site benchmark for this site on the plans include CSRS Monument number please see Appendix C.
2. The culvert under the entrance drive inverts is -135 m from top central Dunrobin Road, and its size 2 foot.
3. The depth of storage for 5-yr is 0.06 m, and 100-yr storm events depth 0.11.

Prepared by:
Abed Oniesy, P.Eng.

June 18. 2021

Appendix A

Storage Volume Calculations: Storage Requirements
Area = 0.155 ha
Cavg. = 0.3 Storage provided ;

Return Period	Time (min)	Intensity (mm/hr)	Total Flow Q in l/s	Allowable Runoff in l/s	Net Runoff To Be Stored in l/s	Storage Req'd m3
5 Year	5	145	18.8	9	9.8	2.9
	10	**108**	**14.0**	**9**	**5.0**	**3.0**
	15	87	11.2	9	2.2	2.0
	20	73	9.4	9	0.4	0.5
100 Year	5	249	32.2	15.4	16.8	5.0
	10	**186**	**24.0**	**15.4**	**8.6**	**5.2**
	15	149	19.3	15.4	3.9	3.5
	20	125	16.2	15.4	0.8	1.0

Storage Volume Calculations: Storage Provided
Area = 0.155 ha
Cavg. = 0.3 Storage provided ;

Return Period	Time (min)	Intensity (mm/hr)	Total Flow Q in l/s	Allowable Runoff in l/s	Net Runoff To Be Stored in l/s	Storage Req'd m3
5 Year	5	145	18.8	0	18.8	5.6
	10	**108**	**14.0**	**0**	**14.0**	**8.4**
	15	87	11.2	0	11.2	10.1
	20	73	9.4	0	9.4	11.3
100 Year	5	249	32.2	0	32.2	9.7
	10	**186**	**24.0**	**0**	**24.0**	**14.4**
	15	149	19.3	0	19.3	17.4
	20	125	16.2	0	16.2	19.4

Appendix B

ANCASTER FOOD EQUIPMENT

NEXT DAY SHIPPING FOR UNITS IN STOCK

GET INSTANT QUOTE: 855-790-7482

Home | True® Commercial Refrigerators | True ® Commercial Freezers | Novelty Freezers | Portable Sinks | Gallery | About Us | Contact Us

- 1 YEAR WARRANTY ON ALL PARTS
- INSTANT HOT AND COLD WATER
- LARGEST SINK BASINS ON THE MARKET
- FULLY ASSEMBLED AND READY TO USE

Intertek Intertek

ONE BASIN – PORTABLE SINKS

- Largest water tanks on the market.
- 16 gal (60L) fresh water and 21 gal (80L) waste water.
- Gravity water dish located on side of unit for easy filling.
- Quick drainage valves located underneath unit – No heavy lifting!
- 304 stainless steel construction – 18 gauge commercial grade.
- Fully assembled and ready to use – Just unpack, add water & plug in!
- Includes towel bar and soap dispenser.
- Locking door & heavy duty casters.
- Fully self contained with 3/4" direct water connection hose included.
- Only fully certified portable sink on the market – UL, CSA & ETL Sanitation Listed.

OVERALL DIMENSIONS: 30" D x 32" W x 38" H (ADD 9" FOR BACKSPLASH)

AXXIS

The most innovative model in the PolyPortables fleet

With a team of industry experts, we are excited to deliver what we consider to be a significant innovation to our line of portable restrooms and the industry as a whole. Introducing the Axxis. Featuring revolutionary, self-closing hinges, a heavy-duty rotary latch, deep ambidextrous door pull and a re-engineered door frame.

Features Include:

- Self-closing hinges that operate from an internal stainless steel spring
- Heavy-duty rotary latch
- Multiple strapping recesses
- Rotationally molded plastic skid
- 60-gallon waste tank which boasts a smooth interior and deep sump
- Urinal
- Three-roll toilet paper holder with rod and padlock
- Stainless steel locking brackets
- Coat hook
- Choose the Axxis-1 with a standard, low-profile roof or the Axxis-2 with the higher, Keystone roof
- Modular, all-common wall construction for easy and inexpensive repairs
- High molecular-weight material with extra UV protections

Standard Colors: Gray, Blue, Green, Tan

Specialty Colors: White, Silver, Lime, Aqua, Grass Green, Yellow, Orange, Turbo Blue, Dark Blue, Maroon, Purple, Pink, Red

Specifications	U.S. Standard	Metric
Length	47"	1.19 m
Width	43"	1.09 m
Height with Standard roof	89.25"	2.27 m
Height with Keystone roof	92"	2.34 m
Weight	165 lbs	74.84 kg
Weight with Ambassador Upgrade	210 lbs	95.25 kg

Optional Items:

- Any or all of the amenities included with the Ambassador upgrade package
- Recirculating flush system. Foot pump or hand pump operation. Includes a 40-gallon, flip-top waste tank
- Fresh flush system. Foot pump or hand pump operation. Includes a 40-gallon flip-top waste tank. (A Pro-22 internal hand wash station is required for fresh flush operation)
- Pro-12 or Pro-22 internal hand wash station
- Hand sanitizer

Orders or questions? Call (800) 241-7951 | www.polyportables.com

Appendix C

Station - 0011968U009 (Page 1 of 1)

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2021-May-06

Station: **0011968U009**

AKA Names: 00168U009, 68U009, CP84205

Number of Ref Sketches: 0

Networks [usage]:

Known Status: Existing

Last Reported Visit:

Monument Type: -

Station Type: SPIR

Location Description:

Township: CONSTANCE BAY ROAD ST. PAUL'S ANGLICAN CHURCH, 105 M SOUTHWEST OF ROAD INTERSECTION IN VILLAGE OF DUNROBIN, TABLET IN WEST STONE WALL, 21 CM FROM NORTHWEST CORNER, 52 CM FROM GROUND LEVEL.

No Photo

Horizontal (Ellipsoidal) Control Data

Datum: **NAD-1927:SCAL**	Horiz Order: Unclassified	Ellipsoidal Order: Unclassified
Latitude: N45° 25′ 19.0xxxxx″	Longitude: W76° 1′ 08.0xxxxx″	Ellipsoidal elev: 68.xxx

*UTM Zone: 18	E: E420285.xxx	N: N5030112.xxx	C. S. F.: 0.99966746	Mrdl Convg: -0° 43′ 32.8″
*MTM Zone: 9	E: E342451.xxx	N: N5031229.xxx	C. S. F.: 0.99990676	Mrdl Convg: 0° 20′ 33.7″

Vertical (Geoidal) Control Data

Datum: **CGVD2013**	Vert Order: First Order	Elevation: 67.367
Meridional defl:	Prime vert defl:	Undulation:

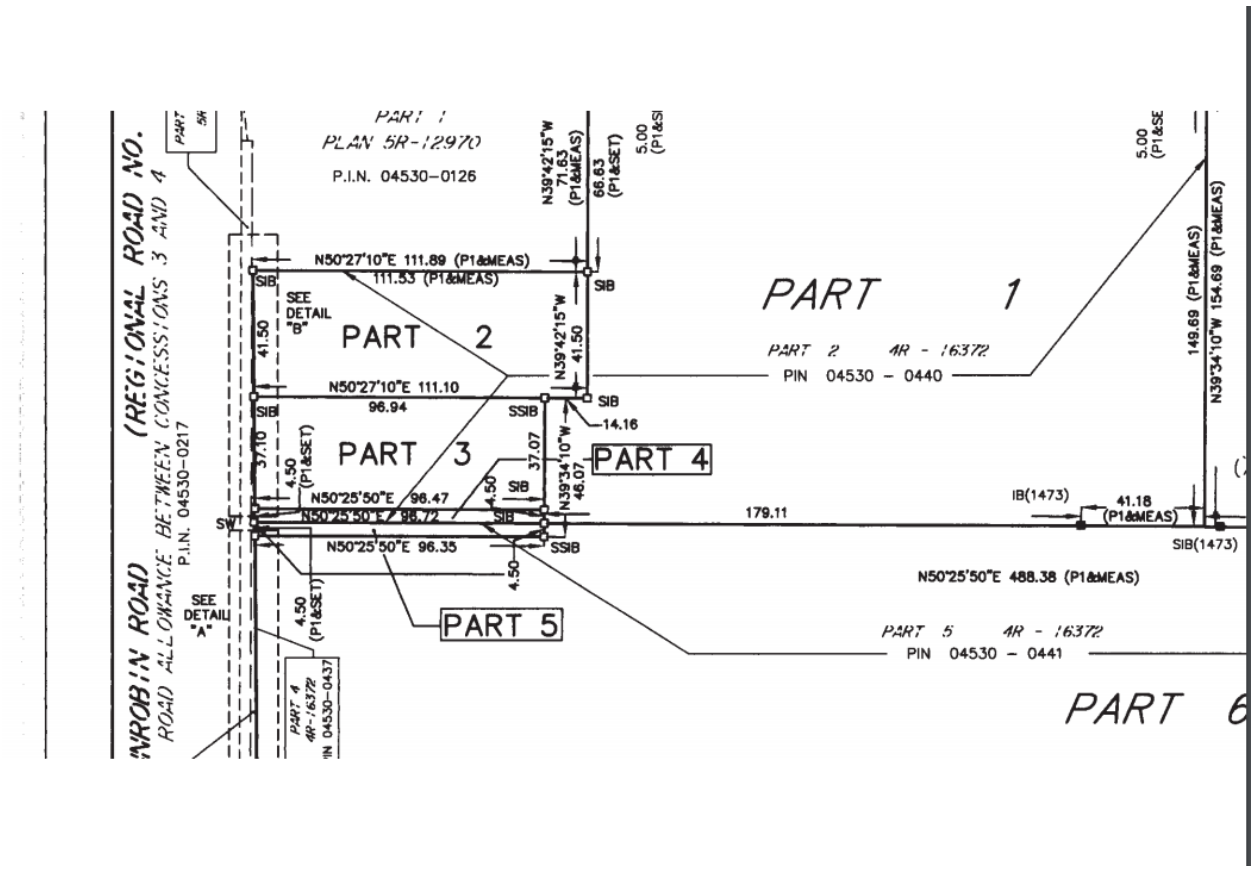
Datum: **CGVD28:78**	Vert Order: First Order	Elevation: 67.668
Meridional defl:	Prime vert defl:	Undulation:

Maintenance / History

Date	Description
2019-Mar-20	GSC; last inspected: 1984

Reference Sketches

Reference sketch for 0011968U009 is not available.


PART 1
PLAN 5R-12970
P.I.N. 04530-0126
N50°27'10"E 111.89 (P1&MEAS)
111.53 (P1&MEAS)
N39°42'15"W 71.63 (P1&MEAS)
66.63 (P1&SET)
5.00 (P1&SE
PART 1
PART 2 4R - 16372
PIN 04530 - 0440
149.69 (P1&MEAS)
N39°34'10"W 154.69 (P1&MEAS)
SEE DETAIL "B"
PART 2
41.50
N39°42'15"W 41.50
N50°27'10"E 111.10
96.94
SIB
SSIB
14.16
PART 3
PART 4
37.10
4.50 (P1&SET)
37.07
N39°34'10"W 46.07
N50°25'50"E 96.47
N50°25'50"E 96.72
N50°25'50"E 96.35
179.11
IB(1473)
41.18 (P1&MEAS)
SIB(1473)
N50°25'50"E 488.38 (P1&MEAS)
SEE DETAIL "A"
PART 5
PART 5 4R - 16372
PIN 04530 - 0441
PART 6
(REGIONAL ROAD NO.
ROAD ALLOWANCE BETWEEN CONCESSIONS 3 AND 4
P.I.N. 04530-0217
NROBIN ROAD
PART 4 4R-16372 PIN 04530-0437