



**Site Servicing & Stormwater Management Report  
IBPS Temple – 6688 Franktown Road, Ottawa, ON.**

**Client:**  
GRC Architects

**Project Number:**  
OTT-22027645-A0

**Application Stage:**  
Site Plan Control

**Prepared By:** Aaditya Jariwala, M.Eng, P.Eng.

EXP Services Inc.  
100-2650 Queensview Drive  
Ottawa, ON K2B 8H6

**Date Submitted:**  
December 18, 2024

## Site Servicing & Stormwater Management Report IBPS Temple – 6688 Franktown Road, Ottawa, ON.

**Client:**

GRC Architects  
47 Clarence Street, Suite 401  
Ottawa, ON K1N 9K1

**Submitted for:**

Site Plan Control Application

**Project Name:**

IBPS Temple

**Project Number:**

OTT-22027645-A0

**Prepared By:**

EXP  
2650 Queensview Drive  
Ottawa, ON K2B 8H8  
t: +1.613.688.1899  
f: +1.613.225.7337

**Prepared by:**



---

Aaditya Jariwala, M.Eng, P.Eng.  
Project Manager  
Infrastructure Services

**Approved by:**



---

Alam Ansari, M.Sc, P.Eng.  
Director of Operations – Eastern Ontario  
Infrastructure Services

**Date Submitted:**

December 18, 2024



## **Legal Notification**

This report was prepared by **EXP** Services Inc. for the account of GRC Architects. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **EXP** Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
<b>2</b>	<b>Existing Conditions.....</b>	<b>1</b>
<b>3</b>	<b>References .....</b>	<b>1</b>
<b>4</b>	<b>Pre-Consultation / Permits / Approvals.....</b>	<b>2</b>
<b>5</b>	<b>Watermain Design .....</b>	<b>2</b>
5.1	Existing Water Servicing.....	2
5.2	Required Fire Flow .....	2
5.3	Proposed Domestic Water Demands .....	3
5.4	Proposed Water Servicing Design .....	4
<b>6</b>	<b>Sanitary Sewer Design.....</b>	<b>4</b>
6.1	Peak Design Flow.....	4
<b>7</b>	<b>Stormwater Management.....</b>	<b>5</b>
7.1	Storm Design Criteria .....	5
7.2	Pre-Development Conditions .....	5
7.3	Allowable Release Rate.....	6
7.4	Post-Development Stormwater Management Design.....	6
<b>8</b>	<b>Erosion and Sediment Control.....</b>	<b>7</b>
<b>9</b>	<b>Conclusions.....</b>	<b>8</b>

## List of Appendices

Appendix A – Figures

Appendix B – Water Servicing

Appendix C – Stormwater Management Design Sheet

Appendix D – Additional Information

Appendix E – Drawings

# 1 Introduction

EXP Services Inc. (EXP) was retained by GRC Architects on behalf of International Buddhist Progress Society (IBPS) to provide Site Servicing and Stormwater Management report for Fo Guang Shan Temple of Ottawa located in Ottawa, ON.

The property located at 6688 Franktown Road is approx. 39.87 hectares. and located just outside the village of Richmond in the City of Ottawa. The property is surrounded by farm lands along the north-east and south-west property lines, a residential development on the south-east corner and Franktown road along the frontage of the property. Refer to **Figure A1** in **Appendix A** for the site location.

The proposed Fo Guang Shan Temple is intended to be developed in two phases. Under phase one, a small temple building with approx. 360m<sup>2</sup> footprint was constructed in 2020 along with a septic system, private water well, 10,000 Gallon underground water tank for fire fighting and a gravel access road. The current site plan control application is for the phase two development where a new temple building with approx. 1400 m<sup>2</sup> footprint along with stormwater management infrastructure, extension of the ex. septic system, new water well, asphalt parking lots and asphalt driveways are intended to be added. The subject development will be concentrated in approx. 3.2 hectares of the property near Franktown road, while the remainder of the property will remain as forested/vegetated lands.

This servicing and stormwater management design report will address the Servicing requirements for the proposed phase two development including the domestic and fire water, sanitary and storm servicing. The report will also cover the storm water management requirements and proposed methods to meet those requirements.

# 2 Existing Conditions

There is an existing temple building constructed under phase one along with a septic system, water well, underground water tank for fire fighting, an existing electrical transformer, asphalt parking lot, concrete patio and a gravel access road. The remainder of the site is forested or vegetated.

The topography of the site is fairly flat, with some depressed areas within the property. The topography is assumed to be gradually sloping to the northeast towards Franktown Road.

There is a municipal 200mm dia. sanitary force main within the Franktown Road ROW. No other known municipal infrastructure is present within the City ROW near the subject property. The stormwater runoff from the subject property is currently carried by the existing roadside ditch along Franktown Road.

# 3 References

Various documents were referred to in preparing the current report including:

- Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa (Guidelines) including:
  - Technical Bulletin ISDTB-2012-4 (20 June 2012)
  - Technical Bulletin ISDTB-2014-01 (05 February 2014)
  - Technical Bulletin PIEDTB-2016-01 (September 6, 2016)

- Technical Bulletin ISDTB-2018-01 (21 March 2018)
- Technical Bulletin ISDTB-2018-04 (27 June 2018)
- Technical Bulletin ISDTB-2019-02 (08 July 2019)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
  - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
  - Technical Bulletin ISTB-2018-02 (21 March 2018)
  - Technical Bulletin ISTB-2021-03 (18 August, 2021)
- Ontario Ministry of Transportation (MTO) Drainage Manual, 1995-1997
- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).
- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 2020
- Ontario Building Code 2012, Ministry of Municipal Affairs and Housing
- Servicing and Stormwater Management Report prepared by McIntosh Perry dated, July 30, 2018
- Geotechnical Report prepared by McIntosh Perry dated July 2018.
- Hydrogeological Study prepared by McIntosh Perry dated July 2018.

## 4 Pre-Consultation / Permits / Approvals

A pre-consultation meeting was held with the City prior to design commencement for phase 1. The notes from this meeting outlined the submission requirements and provided information to assist with the development proposal. Please refer to the meeting notes included in **Appendix D**.

Since the stormwater flows from the proposed development will discharge to the road side ditch which ultimately outlets into Jock River to the east, a direct submission to MECP for an Environmental Compliance Approval (ECA) application will be required. Additionally, an ECA application for the on-site private septic system will be required. The preparations for these ECA application are currently underway and will be submitted to MECP directly once completed.

## 5 Watermain Design

### 5.1 Existing Water Servicing

The existing temple building is serviced by a 64mm dia. watermain from a private water well. The well yield was noted as 92 L/min (1.53 L/sec) during a 6-hour pump test.

Additionally, there is an existing 10,000 Gallons underground water tank for fire fighting purposes.

### 5.2 Required Fire Flow

Since the new building will have a greater area and volume, the required fire flow demands were calculated for the new building only.

The required fire flow for the proposed building was estimated based on OBC Div B A-3.2.5.7. The following equation was used.

$$Q = K \times V \times S_{tot}$$

where:

Q = Minimum supply of water in liters

K = water supply coefficient from Table 1 OBC Div B A-3.2.5.7.

V = total building volume in cubic meters

S<sub>tot</sub> = total of spatial coefficient values from property line exposures on all sides as obtained from the formula:

$$S_{tot} = 1.0 + [S_{side1} + S_{side2} + S_{side3} + \dots \text{etc.}]$$

*Spatial coefficients are a function of exposure distance and can be found in Figure 1 OBC Div B A-3.2.5.7.*

The required minimum water supply flow rate is a function of Q and is given in Table 2 OBC Div B A-3.2.5.7. Table 5.1 below summarizes the parameters used for estimating the Required Fire Flows (RFF) based on the Ontario Building Code (OBC) and the latest City of Ottawa Technical Bulletins.

**Table 5.1: Summary of Design Parameters Used in Calculating Required Fire Flows (RFF) Using OBC**

Item	Design Value
Floors Above Grade	1 floor
Sprinklered	No
North Exposure Distance, Spatial Coefficient	>10.0m, 0.0
East Exposure Distance, Spatial Coefficient	>10.0m, 0.0
South Exposure Distance, Spatial Coefficient	>10.0m, 0.0
West Exposure Distance, Spatial Coefficient	>10.0, 0.0
S <sub>tot</sub>	1.0
V(m <sup>3</sup> )	1397 m <sup>2</sup> x 3.0m = 4191.0m <sup>3</sup>
K	Based on Non-Combustible Construction and Occupancy Group A, Division 2 C, K=16
Q	67,056.00 L
Required Minimum Water Supply Flow Rate (L/min)	2700 L/min (45 L/sec) (if Q ≤ 108,000 L)

The estimated required fire flows (RFF) based on the OBC method is 45.0 L/sec for the proposed temple building.

### 5.3 Proposed Domestic Water Demands

Domestic water demands were calculated for the existing building and new building. The existing building has a gross floor area of 347.45 m<sup>2</sup> and the proposed building will have a gross floor area of 1397.9 m<sup>2</sup>. With these floor areas and average demands for institutional development of 50,000 L/ha/day, the total average day demand, max day demand and peak hour demand were calculated as 0.10 L/sec, 0.15 L/sec and 0.273 L/sec, respectively. Refer to **Table B1** in **Appendix B** for detailed information.

## 5.4 Proposed Water Servicing Design

The existing building is serviced by an existing private water well. Based on the Hydrogeological assessment study and site servicing and storm water management report prepared by McIntosh Perry during the phase 1 site plan application, the existing water well can sufficiently service the existing building and new building.

However, the existing water well is located approx. 140m from the new building. To avoid major pressure losses and to ensure sufficient water supply, a new water well is proposed near the new building to service the new building for domestic water demands. A new 100mm dia. water service is proposed for the new building. A hydrogeological assessment is currently underway to confirm if the water supply rates remain unchanged from the previous study. Further details on the new water well will be provided once the hydro geological assessment is completed.

Additionally, mechanical engineer will have to provide booster pumps to ensure that the serviceability within the building remains between the range of 40psi and 80psi for water service.

For fire fighting purposes, at 2,700 L/min rate for a 2-hour fire water storage volume of 324,000 L would be required. McIntosh Perry had reached out to the local fire marshal regarding on-site water storage requirements. There is a fire station 2km from the subject site. A 10,000 Gallon capacity water tank was installed during phase 1 construction. A new 10,000 Gallon capacity underground fire tank has been proposed near the new building to provide water for fire fighting purposes. EXP will reach out to the local fire marshal to confirm if the proposed fire water storage volume is sufficient to service the new building.

## 6 Sanitary Sewer Design

### 6.1 Peak Design Flow

Peak sanitary design flows were estimated for the existing building and proposed building using the events list and expected guest numbers received from the client. Please refer to the table included in **Appendix D**.

Based on this events list, an average number of attendances was calculated as 147 persons and max. number of attendance was 560 persons. There were two events on the list which had 1000 and 5000 attendees which were excluded from the demand calculations. Sewage flows during these events will be stored in a sewage holding tank.

#### Design Flows

Sewage design flows for Assembly:	36 L/person/day
Max. Attendance:	560 people
Peak Factor:	1.5
Extraneous Flow:	0.33 L/s/ha
Area Considered for Extraneous Flow:	493.6 m <sup>2</sup> (length of gravity sewer 123.4m x 4.0m trench)

#### Peak Design Flow:

$$\begin{aligned} &= (36\text{L/person/day})(560\text{ persons})(1.5)(1/86400) + (0.04936\text{ ha})(0.33\text{ L/s/ha}) \\ &= \underline{\underline{0.37\text{ L/s or }31,647.35\text{ L/day}}} \end{aligned}$$

As per the previous site servicing and stormwater management report prepared by McIntosh Perry, the septic system and septic bed installed during phase 1 construction were designed for sewage flows of 9,999 L/day. In their report, a maximum sewage flow of 40,320 L/day was calculated by the septic designer for phase 1 and phase 2. EXP will coordinate the revised sewage demands of 31,647.35 L/day with the septic designer and confirm any changes required for the existing septic system and expansion required to the septic system as well as the septic bed to accommodate phase 2 development. Previously designed septic system prepared by Waterloo Biofilter Systems is included on drawings C100 – Site Servicing Plan for information.

As part of the phase 1 construction, a septic bed was constructed at the northeast corner of the property. As part of phase 2 development, this septic bed will require expansion to accommodate increased sewage flows. The extent of proposed expansion and supporting calculations will be provided when available. A revised hydrogeological assessment study is currently underway which will provide key information needed for the septic bed sizing.

The existing temple building is serviced by a 100mm dia. gravity sanitary sewer discharging into the anaerobic digester. The proposed building will be serviced by a 200mm dia. sanitary sewer at 0.6% having a full flow capacity of 25.8 L/sec and will discharge into a new sewage holding tank. The holding tank will be connected to the existing anaerobic digester. Size and location of the new holding tank is still to be finalized. The existing septic system includes an anaerobic digester followed by Waterloo biofilter tanks followed by a pump tank. The sewage flows through the septic system in above mentioned order in a loop and then finally pumped to the existing raised bed Type A septic bed. The proposed expansion of the septic system is anticipated to follow the same treatment train.

Since the design sewage flow under phase 2 development are anticipated to exceed 10,000 L/day, an ECA application will be required for the proposed septic system. This will be submitted directly to MECP once the proposed septic system design is complete.

## 7 Stormwater Management

### 7.1 Storm Design Criteria

The storm sewer system was designed in conformance with the City of Ottawa Sewer Design Guidelines (October 2012). The stormwater servicing design criteria for the proposed development are as follows:

- Post-development peak run-off for each storm events up to and including 100-year storm event to match pre-development run-off.
- Maximum allowable ponding depth is 300 mm for surface ponding and 150mm for roof ponding.
- Minimum freeboard of 300mm between the 100-year overland spill elevation and finished floor elevation. Minimum freeboard of 150mm between the 100-year overland spill elevation and lowest grades against the building foundation.
- Quality control criteria of 80% TSS removal (Enhanced level treatment) as noted by RVCA in the pre-consultation meeting notes.

### 7.2 Pre-Development Conditions

The subject site was a forested/vegetated parcel before the phase 1 development. During the phase 1 development, a new temple building was added along with asphalt parking lot and concrete patio. To determine the post-development allowable release rates from the subject site, pre-development landcovers before phase 1 development were used to calculate pre-development runoff coefficient. Refer to topographic survey plan prepared by McIntosh Perry dated, February 21, 2018 included in **Appendix E**.

### 7.3 Allowable Release Rate

To calculate allowable release rates, pre-development average run-off coefficient was calculated for the 3.25 ha of development area. An average time of concentration was also calculated. With the pre-development average runoff coefficient of 0.25 and time of concentration of 34.88 mins; pre-development runoff rates during 2-year, 5-year and 100-year storm events were estimated using rational method.

Therefore, the allowable release rates from the subject development (phase 1 and phase 2) were calculated as 82.76 L/sec, 111.36 L/sec and 236.92 L/sec during 2-year, 5-year and 100-year storm events, respectively. Refer to **Table C1 – Table C3** in **Appendix C** for detailed calculations.

### 7.4 Post-Development Stormwater Management Design

In post-development conditions the existing temple building constructed under phase 1 development along with the proposed temple building, asphalt areas and landscaping within the 3.25 ha development area were considered. Using the area-weighted average method, post-development average run-off coefficients were calculated. The proposed stormwater management and drainage strategy includes sheet drainage, low slope-flat bottom vegetated swales and ditches, culverts and an extended detention dry pond equipped with a sediment forebay. Based on the proposed storm drainage strategy, the development area was divided into two post-development catchment areas A1 and A2.

Drainage area A1 consists of 1.76 ha of the site on western portion of the development with a calculated average runoff coefficient of 0.52. Area A2 consists of 1.49 ha of the site on eastern portion of the development and includes the existing temple building and surrounding areas developed during phase 1 construction. Average runoff coefficient for catchment A2 was calculated as 0.57. The total post-development average runoff coefficient for the proposed 3.25ha development was calculated as 0.55. Increase in the post-development runoff coefficient is due to increase in the impervious areas such as asphalt driveways and parking lots, building roof, concrete etc.

With a time of concentration of 10mins and calculated runoff coefficients, post-development runoff rates were estimated using rational method. Post development uncontrolled runoff during 2-year, 5-year and 100-year storm events were estimated at 380.03 L/sec, 515.55 L/sec and 1104.39 L/sec, respectively. Required storage volumes during each storm events were estimated using the Modified Rational Method. Which were estimated at 211.1 m<sup>3</sup>, 289.7 m<sup>3</sup> and 618.4 m<sup>3</sup> during 2-year, 5-year and 100-year storm events, respectively. These estimates were based on the allowable release rates specified in **Section 7.3** above.

A detailed stormwater management pond sizing and pond outlet structure design was carried out as per MECP SMPDM. With a drainage area of 3.25 ha and 52% imperviousness, water quality volume requirement was calculated at 110.8 m<sup>3</sup>/ha. This equates to a total water quality volume of 360 m<sup>3</sup>. This volume calculation was based on a normal protection level (70% TSS removal). Additionally, extended detention volume of 130 m<sup>3</sup> was calculated based on 40 m<sup>3</sup>/ha. For a dry pond, extended detention volume is included in the water quality volume. With the estimated quality and quantity control volumes, the proposed dry pond was designed to have a maximum depth of 1.0m with 4:1 side slopes. Additionally, a sediment forebay was designed to provide initial treatment to the stormwater runoff from the subject development. The total designed stormwater storage volume is 1,037 m<sup>3</sup> out of which 134 m<sup>3</sup> will be provided in the sediment forebay and 903 m<sup>3</sup> will be provided in the dry pond. Refer to Civil drawings for further details.

With the target drawdown time/detention time of minimum 24hours, the stormwater management pond outlet structure was designed. The outlet structure will be a pre-cast or a cast-in-place concrete weir wall with a 75mm square orifice for quality control and a rectangular 0.5m wide weir for quantity control. With



75mm square orifice, the calculated drawdown time during water quality flow rate was estimated at 27 hours. The quantity control weir will restrict the peak flow rates during WQF, 2-year, 5-year and 100-year storm events to 15.03 L/sec, 82.76 L/sec, 108.19 L/sec and 230 L/sec, utilizing storage volume of 376 m<sup>3</sup>, 458 m<sup>3</sup>, 504 m<sup>3</sup> and 707 m<sup>3</sup>, respectively. During 100year + 20% storm events (check for climate change), expected peak flowrate will be 284.30 L/sec and utilized storage will be 811 m<sup>3</sup>. The proposed stormwater management pond will outlet into the road side ditch along Franktown Road and eventually flow to Jock River towards the east.

In addition to extended detention dry-pond, low slope flat bottom vegetated ditches were also designed to further improve the quality of stormwater and promote infiltration and TSS removal by maintaining flow velocities less than 0.5 m/sec. The proposed ditches will be bottom width of 0.8m and depth of 0.5m with min. 3:1 side slopes. The average longitudinal slopes were kept less than 1.0% with majority of the ditch sections at 0.5%. Based on various literature review on TSS removal efficiency of a vegetated swale, a conservative 50% TSS removal was assumed for the proposed design. Therefore, the effective TSS removal from the proposed vegetated ditches and extended detentions dry pond will 85%.

Refer to **Table C4 to C14** in **Appendix C** for detailed stormwater management design calculations. **Table C15 and C16** provides detailed ditch capacity and flow velocity calculations.

With the above presented stormwater management design and supporting calculations, stormwater management quantity and quality criteria set for the subject site (phase 1 and 2 development) can be met successfully.

## 8 Erosion and Sediment Control

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

- Extent of exposed soils shall be limited at any given time;
- Exposed areas shall be re-vegetated as soon as possible;
- Minimize the area to be cleared and disruption of adjacent areas;
- Visual inspection shall be completed daily on sediment control barriers and any damage will be repaired immediately. Care will be taken to prevent damage during construction operations;
- In some cases, barriers may be removed temporarily to accommodate the construction operations. The affected barriers will be reinstated at night when construction is completed;
- Sediment control devices will be cleaned of accumulated silt as required. The deposits will be disposed of as per the requirements of the contract;
- During construction, if the engineer believes that additional prevention methods are required to control erosion and sedimentation, the contractor will install additional silt fences or other methods as required to the satisfaction of the engineer; and,
- Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification (OPSS) 805.

## 9 Conclusions

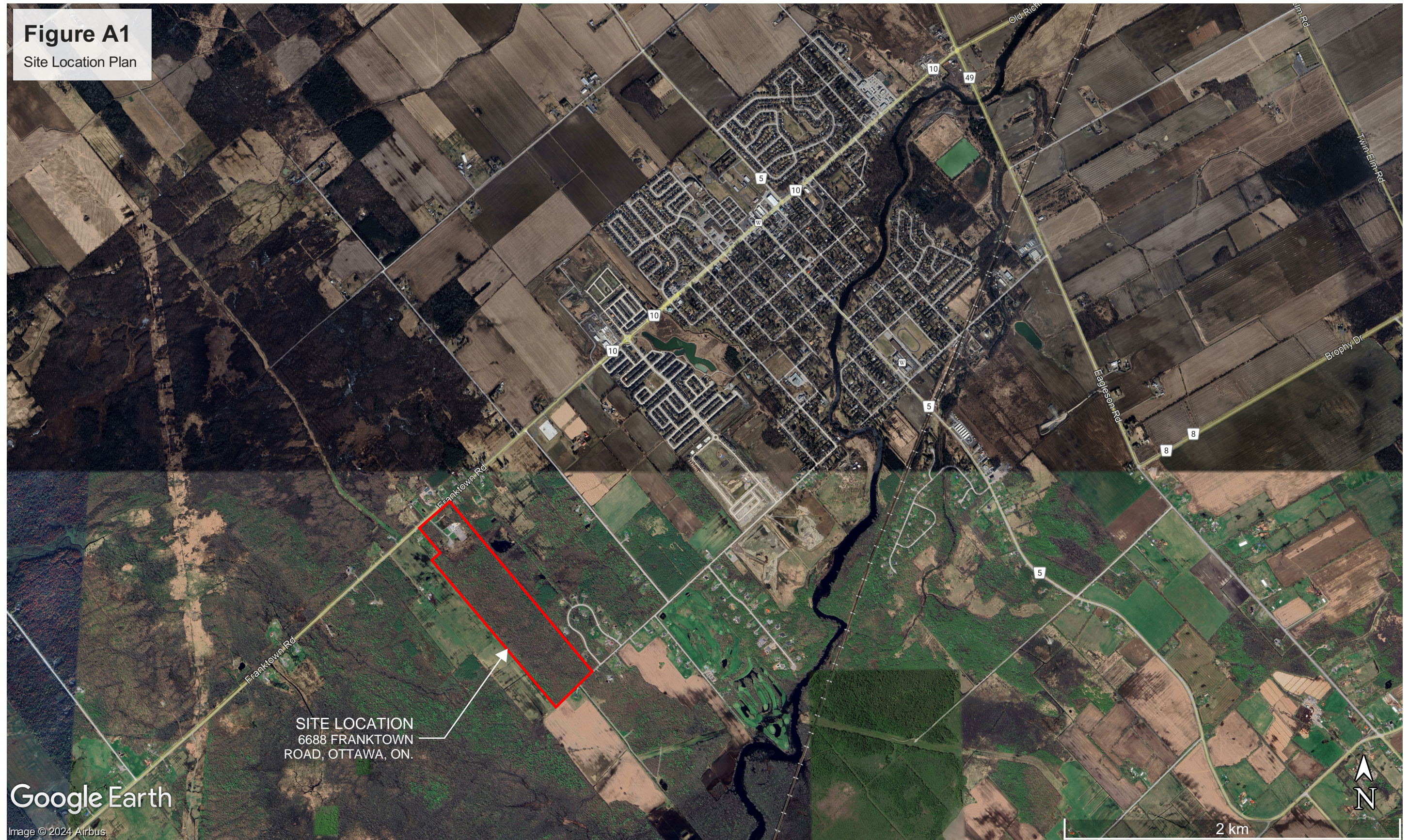
This report addresses the site servicing and stormwater management requirements for the site plan control application for the proposed development. Based on the analysis provided in this report, the conclusions are as follows:

- Proposed phase 2 development will be serviced by a separate private water well for domestic demands and a separate 10,000 Gal underground water tank for fire demands. A revised hydrogeological study is currently underway which will confirm the expected well yield and quality requirements. Additionally, it remains to confirm with the local fire marshal if a new 10,000 Gal tank will be acceptable for this development.
- The proposed building will be serviced by a 200mm diameter sanitary sewer, which will discharge into a new sewage holding tank. The holding tank will be connected to the existing aerobic digester that was installed during phase 1 construction. It is understood that the existing septic system has a treatment capacity of 9,999 L/day. Therefore, coordination will be required with the septic designer to expand the existing septic system to treat the anticipated sewage flows of 31,647 L/day. Additionally, a revised hydrogeological study is currently underway which will provide the necessary information to size the expansion of the existing septic bed to accommodate the increased demand from the proposed development.
- Stormwater Management criteria for the proposed development will be achieved by restricting the post-development stormwater discharge rates up to and including the 100-year to the allowable release rates.
- Additionally, quality control criteria of 80% TSS removal will be achieved by low slope and flat bottom vegetated ditches as well as the proposed extended detention dry pond. The anticipated TSS removal efficiency of the proposed stormwater management system will be 85%.
- Temporary erosion and sediment control measures for the subject site have been identified.

## **Appendix A – Figures**



**Figure A1**  
Site Location Plan



SITE LOCATION  
6688 FRANKTOWN  
ROAD, OTTAWA, ON.

Google Earth

Image © 2024 Airbus



2 km



## **Appendix B – Water Servicing**

**TABLE B1**  
**Water Demand Chart**

Junction Number (Building)	No. of Units										Total Pop	Residential Demands					Commercial/Institutional					Total Demands in (L/sec)			
	Singles/Semis/Towns					Apartments						Avg Day Demand (L/day)	Max Day Peaking Factor	Max Hour Peaking Factor	Max Day Demand (L/day)	Peak Hourly Demand (L/day)	Area (m <sup>2</sup> )	Avg Demand (L/day)	Peaking Factors (x Avg Day)		Max Day Demand (L/day)	Peak Hour Demand (L/day)	Avg Day (L/s)	Max Day (L/s)	Peak Hour (L/s)
	Single Family	Semi	Duple x	Townh ome	Bach elor	1- Bed Apt	2-Bed Apt	3-Bed Apt	4- Bed Apt	Avg Apt.									Max Day	Peak Hour					
Ex. Bldg																	347.4500	1,737	1.5	2.7	2,606	4,691	0.020	0.030	0.054
Proposed Bldg																	1398	6,989	1.5	2.7	10483.2	18869.8	0.081	0.121	0.218
Totals =																	1397.8				13,089	23,560	0.101	0.151	0.273

Unit Densities	Persons/Unit
Singles	3.4
Semi-Detached	2.7
Duplex	2.3
Townhome	2.7
Bachelor Apt Unit	1.4
1-Bed Apt Unit	1.4
2-Bed Apt Unit	2.1
3-Bed Apt Unit	3.1
4-Bed Apt Unit	4.1
Avg. Apt Unit	1.8

Residential	
Residential Consumption (L/pers/day) =	325
Max Day Peaking Factor (* avg day) =	2.5
Peak Hour Factor (* avg day) =	5.5
	<b>9.50</b>
	<b>14.30</b>

Based on MECP-GDWS Table 3-3. Less than 500 persons

Industrial/Commercial/Institutional Water Consumption	
Light Industrial (L/gross ha/day) =	35,000
Heavy Industrial (L/gross ha/day) =	55,000
Commer/Institit (L/m <sup>2</sup> floor/day) =	5
Max Day Peaking Factor (* avg day) =	1.5
Peak Hour Factor (* avg day) =	2.7

Project:	
IBPS Temple	
Designed:	Location:
Aaditya Jariwala, M.Eng., P.Eng	6688 Franktown Road, Ottawa, ON.
Checked:	
Alam Ansari, M.Sc., P.Eng	
File Reference:	Page No:
22027645 - Water - Demand Chart.xlsx	1 of 1

## **Appendix C – Stormwater Management Design Sheet**

**TABLE C1**  
**CALCULATION OF AVERAGE RUNOFF COEFFICIENTS FOR PRE-DEVELOPMENT CONDITONS**

Area No.	Roof Areas		Asphalt Areas		Gravel		Grassed Areas		Sum AC	Total Area (m <sup>2</sup> )	C <sub>AVG</sub>
	C=0.90		C=0.90		C=0.70		C=0.20				
	Area (m <sup>2</sup> )	A * C	Area (m <sup>2</sup> )	A * C	Area (m <sup>2</sup> )	A * C	Area (m <sup>2</sup> )	A * C			
E1	0	0	0	0	3394	2376	29303.020	5860.604	8236.502	32697.160	0.25
<b>Site</b>									<b>8236.502</b>	<b>32697.160</b>	<b>0.25</b>

**TABLE C2**  
**CALCULATION OF CATCHMENT TIME OF CONCENTRATION FOR PRE-DEVELOPMENT CONDITIONS**

Catchment No.	Area (ha)	High Elev (m)	Low Elev (m)	Flow Path Length (m)	Indiv Slope	Avg. C	Time of Conc. Tc (mins)	Description
E1	3.2697	100.60	99.98	109.4	0.6	0.25	34.88	See Note 2

**Notes**  
1) For Catchments with Runoff Coefficient less than C=0.40, Time of Concentration Based on Federal Aviation Formula (Airport Method), from MTO Drainage Manual Equation 8.16, where:  $T_c = 3.26 * (1.1-C) * L^{0.5} / S_w^{0.33}$   
2) For Catchments with Runoff Coefficient greater than C=0.40, Time of Concentration Based on Bransby Williams Equation, from MTO Drainage Manual Equation 8.15, where:  $T_c = 0.057 * L / (S_w^{0.2} * A^{0.1})$

**TABLE C3**  
**CALCULATION OF PEAK RUNOFF FOR PRE-DEVELOPMENT CONDITONS**

Area No	Outlet Location	Area (ha)	Time of Conc, Tc (min)	Storm = 2 yr			Storm = 5 yr			Storm = 100 yr		
				I <sub>2</sub> (mm/hr)	Cavg	Q <sub>2</sub> (L/sec)	I <sub>5</sub> (mm/hr)	Cavg	Q <sub>5</sub> (L/sec)	I <sub>100</sub> (mm/hr)	Cavg	Q <sub>100</sub> (L/sec)
E1	Franktown Road	3.2697	34.88	36.14	0.25	<b>82.76</b>	48.63	0.25	<b>111.36</b>	82.78	0.31	<b>236.92</b>
<b>Total</b>						<b>82.76</b>			<b>111.36</b>			<b>236.92</b>

**Notes**  
1) Intensity,  $I = 732.951 / (Tc + 6.199)^{0.810}$  (2-year)  
2) Intensity,  $I = 998.071 / (Tc + 6.053)^{0.814}$  (5-year)  
3) Intensity,  $I = 1735.688 / (Tc + 6.014)^{0.820}$  (100-year)  
4) Cavg for 100-year is increased by 25% to a maximum of 1.0  
5) The standard minimum Time of Concentraion of 10 minutes was used, rather than the calaculted time, since calaculted time was less than 10 minutes.



**TABLE C4**  
**AVERAGE RUNOFF COEFFICIENTS FOR POST-DEVELOPMENT CONDITIONS**

$C_{ASPH/CONC} = 0.90$ $C_{ROOF} = 0.90$ $C_{SLA} = 0.20$ $C_{GRAVEL} = 0.70$												
Area No.	Asphalt & Conc Areas (m <sup>2</sup> )	A * C <sub>ASPH</sub>	Roof Areas (m <sup>2</sup> )	A * C <sub>ROOF</sub>	Soft Landscaped Areas (m <sup>2</sup> )	A * C <sub>SLA</sub>	Gravel Areas (m <sup>2</sup> )	A * C <sub>GRAVEL</sub>	Sum AC	Total Area (m <sup>2</sup> )	C <sub>AVG</sub> (see note)	Comment
A1	6095.4	5485.8	511.9	460.7	8821	1764.3	2171.3	1519.9	9230.7	17600	0.52	West portion of the site
A2	6613.0	5951.7	1233.4	1110.0	6888	1377.6	183.8	128.7	8567.9	14918	0.57	East portion of the site
<b>Totals</b>									<b>17799</b>	<b>32518</b>	<b>0.55</b>	

Notes: Areas for each land-use are taken from CAD

**TABLE C5**  
**SUMMARY OF POST-DEVELOPMENT PEAK FLOWS (Uncontrolled and Controlled)**

Area No	Area (ha)	Time of Conc, Tc (min)	Storm = WQF				Storm = 2 yr				Storm = 5 yr				Storm = 100 yr				Storm = 100 yr+20%				Comments
			C <sub>AVG</sub>	I <sub>5</sub> (mm/hr)	Q (L/sec)	Q <sub>CAP</sub> (L/sec)	C <sub>AVG</sub>	I <sub>5</sub> (mm/hr)	Q (L/sec)	Q <sub>CAP</sub> (L/sec)	C <sub>AVG</sub>	I <sub>5</sub> (mm/hr)	Q (L/sec)	Q <sub>CAP</sub> (L/sec)	C <sub>AVG</sub>	I <sub>5</sub> (mm/hr)	Q (L/sec)	Q <sub>CAP</sub> (L/sec)	C <sub>AVG</sub>	I <sub>5</sub> (mm/hr)	Q (L/sec)	Q <sub>CAP</sub> (L/sec)	
A1	1.7600	10	0.52	28.45	73.01	<b>15.03</b>	0.52	76.81	197.09	<b>82.76</b>	0.52	104.19	267.37	<b>108.19</b>	0.66	178.56	572.76	<b>230.00</b>	0.66	214.27	687.31	<b>284.30</b>	West portion of the site
A2	1.4918	10	0.57	30.60	72.88		0.57	76.81	182.94		0.57	104.19	248.17		0.72	178.56	531.63		0.72	214.27	637.96		East portion of the site
<b>Total</b>	<b>3.2518</b>				<b>145.89</b>	15.03			<b>380.03</b>	82.76			<b>515.55</b>	108.19			<b>1104.39</b>	230.00			<b>1325.27</b>	284.30	
<b>Allowable Release Rates</b>						<b>82.76</b>				<b>82.76</b>				<b>111.36</b>				<b>236.92</b>				<b>236.92</b>	

**Notes**

- 1) Intensity,  $I = 43C+5.9$  (Water Quality Flowrate based on MECP SMPDM)
- 2) Intensity,  $I = 732.951/(Tc+6.199)^{0.810}$  (2-year)
- 3) Intensity,  $I = 998.071/(Tc+6.053)^{0.814}$  (5-year)
- 4) Intensity,  $I = 1735.688/(Tc+6.014)^{0.820}$  (100-year)
- 5) Cavg for 100-year is increased by 25% to a maximum of 1.0
- 6) Time of Concentration, Tc = **10 mins**
- 7) Controlled release rate is indicated by, **49.53**

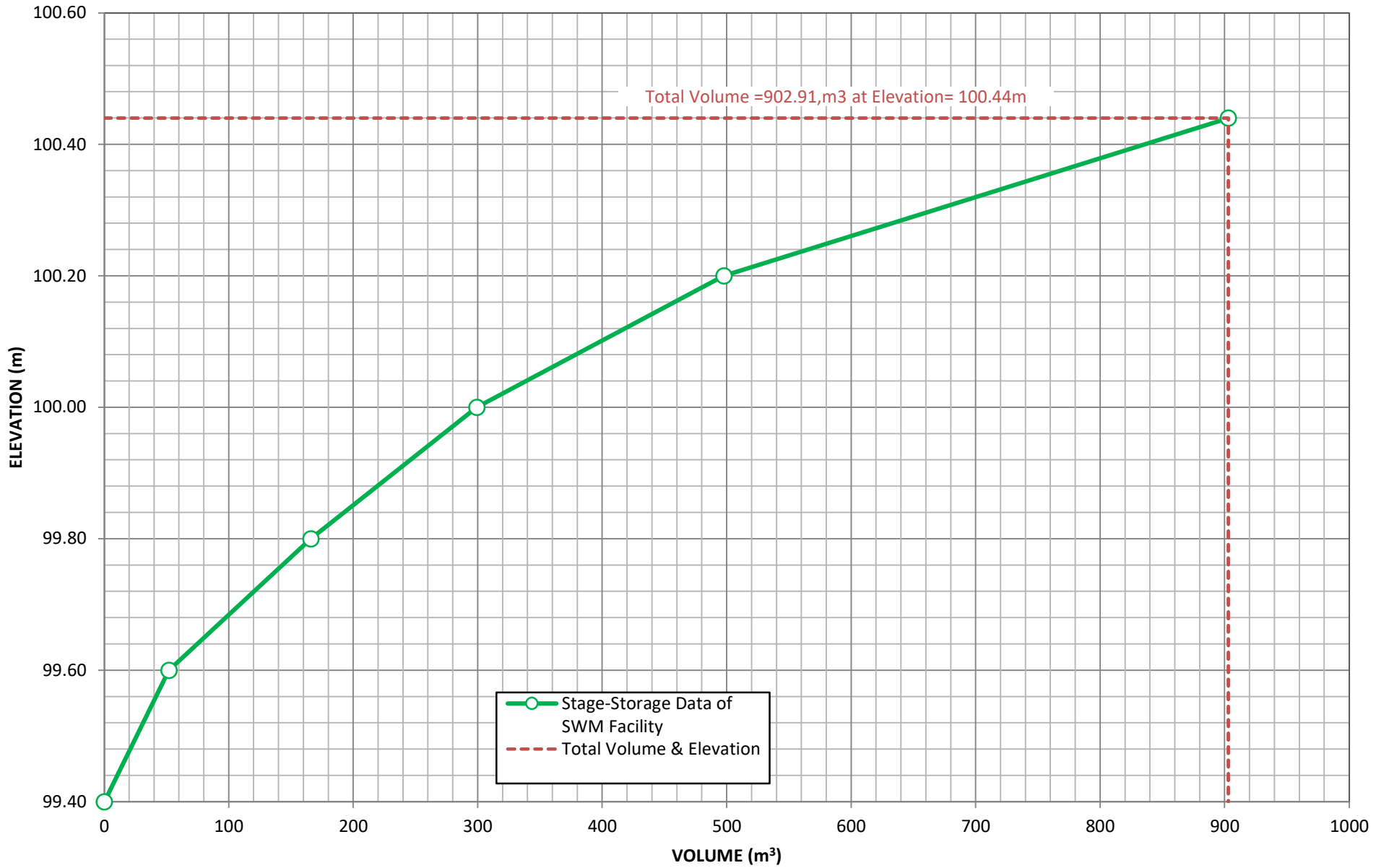
**Table C6 Storage Volumes for 2-year, 5-Year and 100-Year Storms (MRM)**

Area No: <b>A1, A2</b> $C_{AVG} = \frac{0.55}{(2\text{-yr})}$ $C_{AVG} = \frac{0.55}{(5\text{-yr})}$ $C_{AVG} = \frac{0.68}{(100\text{-yr, Max 1.0})}$ Time Interval = <u>5.00</u> (mins) Drainage Area = <u>3.2518</u> (hectares)															Actual Release Rate (L/sec) = <u>230.00</u> Percentage of Actual Rate (City of Ottawa requirement) = <u>100%</u> (Set to 50% when U/G storage used) Release Rate Used for Estimation of 100-year Storage (L/sec) = <u>230.00</u>					Intensity Incr (%) = <u>20%</u> Use 20% for Climate Change				
Duration (mins)	Release Rate = <u>82.76</u> (L/sec) Return Period = <u>2</u> (years) IDF Parameters, A = <u>733.0</u> , B = <u>0.810</u> $(I = A/(T_c+C)$ , C = <u>6.199</u>					Release Rate = <u>108.19</u> (L/sec) Return Period = <u>5</u> (years) IDF Parameters, A = <u>998.1</u> , B = <u>0.814</u> $(I = A/(T_c+C)$ , C = <u>6.053</u>					Release Rate = <u>230.00</u> (L/sec) Return Period = <u>100</u> (years) IDF Parameters, A = <u>1735.7</u> , B = <u>0.820</u> $(I = A/(T_c+C)$ , C = <u>6.014</u>					Release Rate = <u>284.30</u> (L/sec) Return Period = <u>100+20%</u> (years) IDF Parameters, A = <u>1735.7</u> , B = <u>0.820</u> $(I = A/(T_c+C)$ , C = <u>6.014</u>								
	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m <sup>3</sup> )	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m <sup>3</sup> )	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m <sup>3</sup> )	Rainfall Intensity, I (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m <sup>3</sup> )				
0	167.2	827.4	82.8	744.7	0.0	230.5	1140.4	108.2	1032.2	0.0	398.6	2465.5	230.0	2235.5	0.0	478.3	2958.6	284.3	2674.3	0.0				
5	103.6	512.5	82.8	429.7	128.9	141.2	698.6	108.2	590.4	177.1	242.7	1501.1	230.0	1271.1	381.3	291.2	1801.4	284.3	1517.1	455.1				
10	76.8	380.0	82.8	297.3	178.4	104.2	515.5	108.2	407.4	244.4	178.6	1104.4	230.0	874.4	524.6	214.3	1325.3	284.3	1041.0	624.6				
15	61.8	305.6	82.8	222.9	200.6	83.6	413.4	108.2	305.3	274.7	142.9	883.8	230.0	653.8	588.4	171.5	1060.6	284.3	776.3	698.6				
20	52.0	257.5	82.8	174.7	209.6	70.3	347.6	108.2	239.4	287.3	120.0	741.9	230.0	511.9	614.3	143.9	890.3	284.3	606.0	727.2				
25	45.2	223.5	82.8	140.7	211.1	60.9	301.3	108.2	193.1	289.7	103.8	642.3	230.0	412.3	618.4	124.6	770.8	284.3	486.5	729.7				
30	40.0	198.1	82.8	115.4	207.7	53.9	266.8	108.2	158.6	285.6	91.9	568.2	230.0	338.2	608.8	110.2	681.8	284.3	397.5	715.6				
35	36.1	178.4	82.8	95.7	200.9	48.5	240.1	108.2	131.9	276.9	82.6	510.8	230.0	280.8	589.6	99.1	612.9	284.3	328.6	690.1				
40	32.9	162.6	82.8	79.9	191.6	44.2	218.6	108.2	110.4	265.0	75.1	464.8	230.0	234.8	563.5	90.2	557.7	284.3	273.4	656.2				
45	30.2	149.6	82.8	66.9	180.5	40.6	201.0	108.2	92.8	250.7	69.1	427.1	230.0	197.1	532.1	82.9	512.5	284.3	228.2	616.1				
50	28.0	138.7	82.8	56.0	168.0	37.7	186.3	108.2	78.1	234.4	64.0	395.6	230.0	165.6	496.7	76.7	474.7	284.3	190.4	571.1				
55	26.2	129.5	82.8	46.7	154.2	35.1	173.8	108.2	65.6	216.5	59.6	368.8	230.0	138.8	458.0	71.5	442.5	284.3	158.2	522.2				
60	24.6	121.5	82.8	38.8	139.5	32.9	163.0	108.2	54.8	197.3	55.9	345.7	230.0	115.7	416.6	67.1	414.9	284.3	130.6	470.0				
65	23.2	114.6	82.8	31.8	124.0	31.0	153.6	108.2	45.4	177.1	52.6	325.6	230.0	95.6	372.9	63.2	390.7	284.3	106.4	415.1				
70	21.9	108.4	82.8	25.7	107.8	29.4	145.3	108.2	37.1	156.0	49.8	308.0	230.0	78.0	327.4	59.7	369.5	284.3	85.2	358.0				
75	20.8	103.0	82.8	20.2	91.0	27.9	138.0	108.2	29.8	134.1	47.3	292.3	230.0	62.3	280.2	56.7	350.7	284.3	66.4	298.9				
80	19.8	98.1	82.8	15.4	73.7	26.6	131.4	108.2	23.2	111.6	45.0	278.3	230.0	48.3	231.7	54.0	333.9	284.3	49.6	238.2				
85	18.9	93.7	82.8	11.0	56.0	25.4	125.5	108.2	17.3	88.4	43.0	265.7	230.0	35.7	181.9	51.5	318.8	284.3	34.5	176.0				
90	18.1	89.8	82.8	7.0	37.9	24.3	120.2	108.2	12.0	64.7	41.1	254.3	230.0	24.3	131.1	49.3	305.1	284.3	20.8	112.5				
95	17.4	86.2	82.8	3.4	19.4	23.3	115.3	108.2	7.1	40.6	39.4	243.9	230.0	13.9	79.3	47.3	292.7	284.3	8.4	47.8				
100	16.7	82.9	82.8	0.1	0.6	22.4	110.9	108.2	2.7	16.1	37.9	234.4	230.0	4.4	26.6	45.5	281.3	284.3	-3.0	-17.9				
Max =					<b>211.1</b>						<b>289.7</b>						<b>618.4</b>						<b>729.7</b>	
<b>Notes</b> 1) Peak flow is equal to the product of 2.78 x C x I x A 2) Rainfall Intensity, I = A/(Tc+C) <sup>b</sup> 3) Release Rate = Min (Release Rate, Peak Flow) 4) Storage Rate = Peak Flow - Release Rate 5) Storage = Duration x Storage Rate 6) Maximum Storage = Max Storage Over Duration 7) Parameters a,b,c are for City of Ottawa															<b>City of Ottawa IDF Data (from SDG002)</b> <b>IDF curve equations (Intensity in mm/hr)</b> 100 year Intensity = 1735.688 / (Time in min + 6.014) <sup>0.820</sup> 50 year Intensity = 1569.580 / (Time in min + 6.014) <sup>0.820</sup> 25 year Intensity = 1402.884 / (Time in min + 6.018) <sup>0.819</sup> 10 year Intensity = 1174.184 / (Time in min + 6.014) <sup>0.816</sup> 5 year Intensity = 998.071 / (Time in min + 6.053) <sup>0.814</sup> 2 year Intensity = 732.951 / (Time in min + 6.199) <sup>0.810</sup>									

**TABLE C7**  
**Stage-Storage Data of SWM Facility**

	Elev	Incr. Elev	Total Depth Above NWL	End Area	Volume
	(m)	(m)	(m)	(m2)	(m3)
<b>Active Storage (Dry Pond)</b>					
Top of Pond	100.44	0.24	1.04	2097	903
Interim	100.20	0.20	0.80	1379	498
Interim	100.00	0.20	0.60	716	299
Interim	99.80	0.20	0.40	618	166
Interim	99.60	0.20	0.20	521	52
Bottom	99.40	0.00	0.00	0	0
<b>Sediment Forebay/Ditch</b>					
Top of Forebay Berm	100.17	0.50	1.00	465	134
Interm	99.67	0.50	0.50	87	27
Bottom of sediment forebay	99.17	0.00	0.00	2	0
Maximum Active Storage =					903
Forebay Storage =					134
Total Pond Storage (Pond + Ditch + Sediment Forebay) =					1,037
Forebay Area as percent of total area =					15%

### Chart C8: Stage-Storage Curve of SWM Facility



**TABLE C9**  
**Storage-Outflow Data of SWM Facility**

811	100-year +20% Storm Volume (Forecasted from stage storage)
100.394	100-year+20% Storm Elev. (Forecasted based on design outflow from Table D6)
707	100-year Storm Volume (Forecasted from stage storage)
100.336	100-year Storm Elev. (Forecasted based on design outflow from Table D6)
504	5 -year Storm Volume (Forecasted from stage storage)
100.204	5-year Storm Elev. (Forecasted based on design outflow from Table D6)
458	2 -year Storm Volume (Forecasted from stage storage)
100.177	2-year Storm Elev. (Forecasted based on design outflow from Table D6)
376	Water Quality Volume (Forecasted from stage storage)
100.104	Water Quality Volume Elev. (Forecasted based on design outflow from Table D6)

1		2	
Vertical Rectangular Orifice		Broad-Crested Weir	
Width (m)	0.075	Length (m)	0.50
Height (m)	0.08	Height (m)	0.34
Area (m2):	0.00563	Area (m2):	0.17000
Coeff, C:	0.61	Coeff, C:	1.837
Orifice Inv:	99.50 m	Weir Inv:	100.10 m
Orifice Cen:	99.538 m		

WSE Elev (m)	Comments	Quantity Volume (Note 1) (m3)	Head (Note 4) (m)	Outflow (L/sec)	Head, H (m)	Outflow (L/sec)	Total Flow (L/sec)	Storage (m3)
100.44	Top of Pond	902.91	0.903	14.44	0.3400	312.2900	326.73	902.910
100.40		822.61	0.863	14.12	0.3000	275.5500	289.67	822.610
100.35		731.09	0.813	13.70	0.2500	229.6250	243.32	731.090
100.30		647.10	0.763	13.27	0.2000	183.7000	196.97	647.100
100.25		569.47	0.713	12.83	0.1500	137.7750	150.60	569.470
100.20		497.69	0.663	12.37	0.1000	91.8500	104.22	497.690
100.15		412.41	0.613	11.89	0.0500	45.9250	57.82	412.410
100.10		373.42	0.563	11.40			11.40	373.420
100.05		335.71	0.513	10.88			10.88	335.710
100.00		299.26	0.463	10.34			10.34	299.260
99.95		264.07	0.413	9.76			9.76	264.070
99.90		230.11	0.363	9.15			9.15	230.110
99.85		197.39	0.313	8.50			8.50	197.390
99.80		165.90	0.263	7.79			7.79	165.900
99.75		135.62	0.213	7.01			7.01	135.620
99.70		106.56	0.163	6.13			6.13	106.560
99.65		78.71	0.113	5.10			5.10	78.710
99.60		52.06	0.063	3.80			3.80	52.060
99.55		27.50	0.013	1.70			1.70	27.500
99.50		10.05						10.050
99.45		2.07						2.070
99.40	Bottom of Pond							

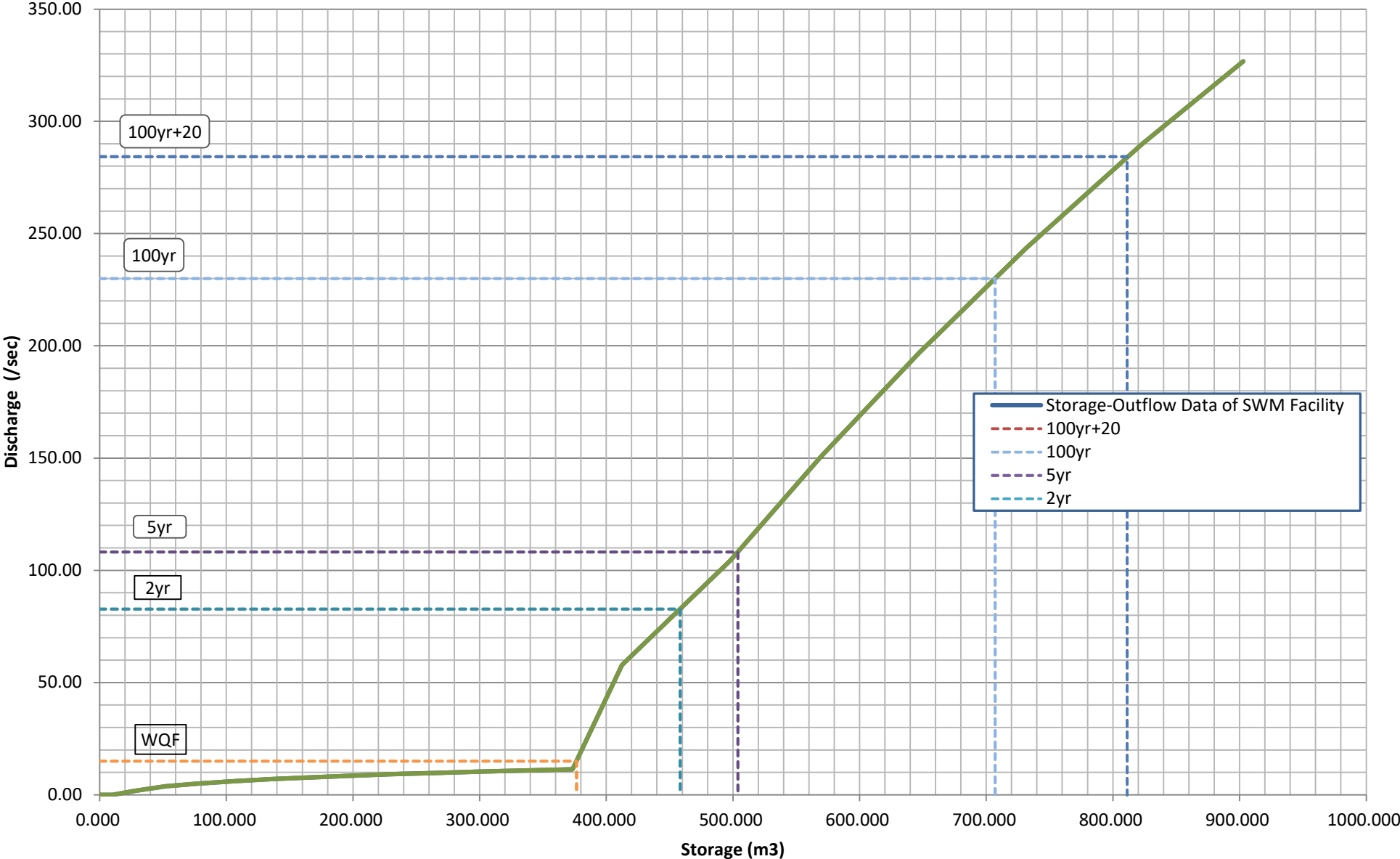
**NOTES:**

1) Quantity Storage values based on pond geometry and stage-storage data at 0.05m increments

2) Top of Pond = 100.44 m

3) WSE Interval = 0.050 m

### Chart D10: Storage-Outflow Curves of SWM Facility



**TABLE C11  
SUMMARY OF WATER QUALITY VOLUMES OF SWM FACILITY**

Item	Units	Pond 1		Comment
		Required	Provided	
Facility type		Extended Detention Dry Pond		
Drainage Area to Facility, A	ha	3.25		
Percent Imperviousness	%	52%		
Water Quality Volume Requirements, WQVV	m3/ha	110.8		Based on MOE Table 3.2
Extended Detention Volume Requirements	m3/ha	40.0		Based on 40 m3/ha
Extended Detention Volume Requirements	m3/ha	27.7		Based on 25% of WQCV
Extended Detention Volume Requirements	m3/ha	40.0		Maximum of 40 m3/h or 25% of WQCV
Permanent Pool Volume Requirements	m3/ha	0.0		WQCV - 40m3/ha for Wet Ponds, 0 for Dry Ponds
Permanent Pool Volume Req'd	m3	0	27	(WQCV - 40m3/ha) * A
Water Quality Volume Requirements	m3	360	605	Water Quality Volume = WQCV * A. Provided Volume Based on Permanent Pool + Extended Detention Volume
Extended Detention Volume, EDV	m3	130	605	Based on: 40m3/ha * A OR 25%*WQCV*A
Flood (or Quantity) Control Volume	m3	707	903	Based on City of Ottawa 100-year storm event
Extended Detention + Flood Control Vol		837	903	Extended Detention Is Included in Flood Control Volume for Wet Ponds
Forebay Volume	m3	0	134	Based on 20% of the Permanent Pool Volume per MOE, 0 for drypond
Main Cell Volume	m3	0	1037	Main Cell Volume = Permanent Pool - Forebay Volume

**WATER QUALITY REQUIREMENTS FOR DRY PONDS BASED ON MOE REQUIREMENTS (From Table 3.2)**

Protection Level	TSS Removal Target (%)	Drainage Area %IMP	Storage Required (m3/ha)	Stormwater Management Plan Type
Normal	70%	0	55	Dry Pond. Same Level of Protection as Wet Pond
		35	90	
		55	110	
		70	130	
		85	150	
		100	170	

*Note: Storage Requirements for 0% and 100% are extrapolated*

**TABLE C12**  
**Area-Depth Data of SWM Facility**

Elev (m)	Depth of Ponding (m)	End Area (m <sup>2</sup> )	Comments
100.44	1.04	2,097	Top of Pond
100.10	0.70	1,158	Interim
99.60	0.20	600	Interim
99.40			Bottom
Slope coefficient from the area-depth linear regression, C2 =			2762.0
Intercept from the area-depth linear regression, C3 =			377.3



**TABLE C13  
Drawdown Data of SWM Facility**

Top of Pond Elev (m) =	100.44
Bottom of Pond Elev (m) =	99.40
WQCV (m3) =	360
WQCE (m) =	100.03
WCD (m) =	0.63
Orifice Type =	Vertical Rectangular Orifice
Orifice Area (m2) =	0.0056
Orifice Invert Elev (m) =	99.50
Orifice Centroid Elev (m) =	99.538
Orifice Discharge Coefficient =	0.61
Weir Type =	Broad-Crested Weir
Weir Area (m2) =	0.1700
Weir Invert Elev (m) =	100.10
Weir Width (m) =	0.50
Weir Side Slopes (Z) =	1.00
Weir Discharge Coefficient =	1.84
C2 =	2,762
C3 =	377

**Comments**

Water Quality Control Volume Based on MOE Criteria (Table 3.2)  
Water Surface Elevation for Storage of WQCV.  
Depth (or height) of Water Control Volume.

LOWER ORIFICE

UPPER ORIFICE

Slope coefficient from the area-depth linear regression  
Intercept from the area-depth linear regression

WSE Elev (m)	Active Storage Above NWL			Quality Orifice (Lower)			Quantity Orifice (Upper)			Drawdown Time		Outflow (L/sec)	Comments
	VOLUME (m3)	AREA (m2)	TOTAL DEPTH ABOVE NWL (m)	Height (m)	Area (m2)	Indiv Drawdown Time (hrs)	Height (m)	Area (m2)	Indiv Drawdown Time (hrs)	HOURS	DAYS		
100.44	903	2,097	0.94	0.94	0.0056	43.0	0.34	0.170	0.48	26.19	1.09	289.665	Top of Pond
100.40	823	1,914	0.90	0.90	0.0056	40.8	0.30	0.170	0.42	26.13	1.09	243.325	
100.35	731	1,746	0.85	0.85	0.0056	38.1	0.25	0.170	0.36	26.07	1.09	196.972	
100.30	647	1,613	0.80	0.80	0.0056	35.5	0.20	0.170	0.30	26.01	1.08	150.604	
100.25	569	1,492	0.75	0.75	0.0056	33.0	0.15	0.170	0.24	25.95	1.08	104.221	
100.20	498	1,379	0.70	0.70	0.0056	30.5	0.10	0.170	0.18	25.88	1.08	57.820	
100.15	412	1,258	0.65	0.65	0.0056	28.1	0.05	0.170	0.11	25.82	1.08	11.399	
100.10	373	1,158	0.60	0.60	0.0056	25.7		0.170		25.71	1.07	10.880	
100.05	336	1,067	0.55	0.55	0.0056	23.4		0.170		23.40	0.98	10.336	
100.00	299	986	0.50	0.50	0.0056	21.2		0.170		21.15	0.88	9.761	
99.95	264	912	0.45	0.45	0.0056	19.0		0.170		18.97	0.79	9.151	
99.90	230	846	0.40	0.40	0.0056	16.9		0.170		16.85	0.70	8.496	
99.85	197	791	0.35	0.35	0.0056	14.8		0.170		14.79	0.62	7.787	
99.80	166	742	0.30	0.30	0.0056	12.8		0.170		12.80	0.53	7.006	
99.75	136	701	0.25	0.25	0.0056	10.9		0.170		10.87	0.45	6.127	
99.70	107	665	0.20	0.20	0.0056	9.0		0.170		8.99	0.37	5.098	
99.65	79	632	0.15	0.15	0.0056	7.1		0.170		7.15	0.30	3.800	
99.60	52	600	0.10	0.10	0.0056	5.3		0.170		5.32	0.22	1.699	
99.55	28	534	0.05	0.05	0.0056	3.4		0.170		3.40	0.14		
99.50	10	304			0.0056			0.170					
99.45	2	144			0.0056			0.170					
99.40		60			0.0056			0.170					Bottom of Pond

**NOTES:**

2) Top of Pond = 100.44 m  
3) WSE Interval = 0.05 m

Elev of WQ Volume = 100.034  
Depth of WQ Volume = 0.634  
Drawdown for WQ Volume = 27

$$t = \frac{0.66 C_2 h^{1.5} + 2 C_3 h^{0.5}}{2.75 A_o}$$

Equation 4.11 Drawdown Time.  
(Page 4-58 MOE Stormwater Management Planning and Design Manual)

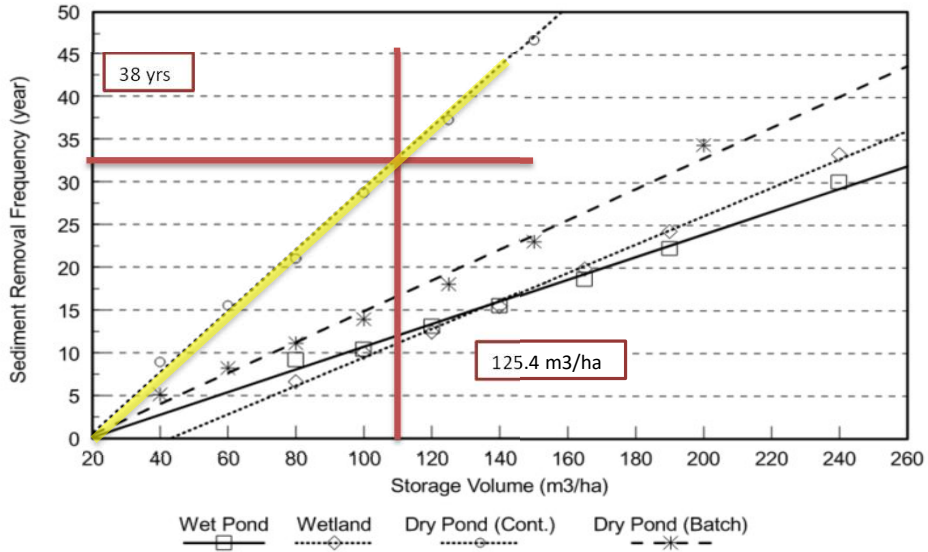
where:

- t = Drawdown time (seconds)
- C2 = Slope coefficient from the area-depth linear regression
- C3 = Intercept from the area-depth linear regression
- Ao = Cross-sectional area of the orifice (m2)
- h = Maximum water Elevation above the orifice

**TABLE C14**  
**SEDIMENT REMOVAL FREQUENCY**

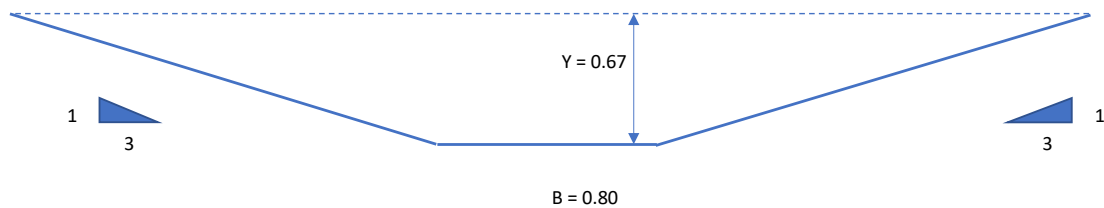
SWM Facility Type	<u><u>Extended Detention Dry Pond</u></u>
Upstream Drainage Area (ha)	<u><u>3.251796</u></u>
Imperviousness (%)	<u><u>51.7</u></u>
Required Water Quality Vol (m3/ha)	<u><u>110.8</u></u>
Sediment Removal Frequency (years)	<u><u>33</u></u> (from Figure 6.1 Below based on WQV)

**Figure 6.3: Storage Volume vs. Removal Frequency – for 70% Impervious Catchments**



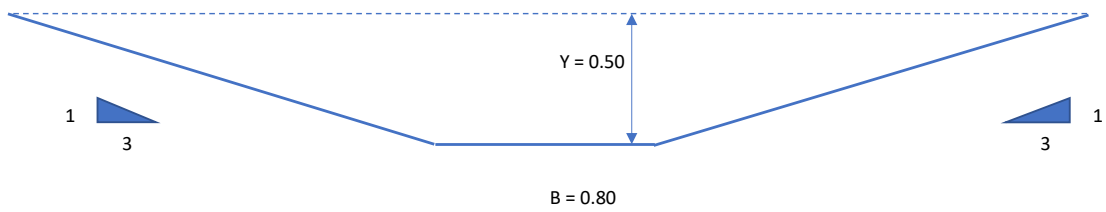
**Table C15 - Full Flow Capacity of Channel-1**

Channel Name:	Channel East			
Channel Type:	Trapezoidal			
Bottom Width, B =	0.8	m		
Side Slope (left) Z:1	3.0			
Side Slope (right) Z:1	3.0			
Max Depth, y	0.67	m	Flow Depth During WQF	0.16 m
$T = B + Y*(Z_1 + Z_2)$	4.820	m		1.772 m
$A = Y/2*(B + T)$	1.8827	m <sup>2</sup>		0.208332 m <sup>2</sup>
$P = B + 2*Y*\sqrt{1+Z^2}$	5.0375	m		1.8246 m
$R = A/P$	0.37374	m		0.11418 m
Manning N,	0.050	dimensionless		(kentucky bluegrass, mowed 0.10 to 0.15m high)
	low			(depth of flow > 0.2m)
Longitudinal Slope	0.0050	m/m		
Full Flow Capacity	1381.5	L/sec	Water Quality Flow (WQF)	69.3 L/sec
Full Flow Velocity	0.7	m/sec	WQF Velocity	0.33 m/sec



**Table C16 - Full Flow Capacity of Channel-2**

Channel Name:	Channel West			
Channel Type:	Trapezoidal			
Bottom Width, B =	0.8	m		
Side Slope (left) Z:1	3.0			
Side Slope (right) Z:1	3.0			
Max Depth, y	0.50	m	Flow Depth During WQF	0.17 m
$T = B + Y*(Z_1 + Z_2)$	3.800	m		1.802 m
$A = Y/2*(B + T)$	1.15	m <sup>2</sup>		0.217267 m <sup>2</sup>
$P = B + 2*Y*\sqrt{1+Z^2}$	3.9623	m		1.8562 m
$R = A/P$	0.29024	m		0.11705 m
Manning N,	0.050	dimensionless		(kentucky bluegrass, mowed 0.10 to 0.15m high)
	low			(depth of flow > 0.2m)
Longitudinal Slope	0.0050	m/m		
Full Flow Capacity	712.9	L/sec	Water Quality Flow (WQF)	73.5 L/sec
Full Flow Velocity	0.6	m/sec	WQF Velocity	0.34 m/sec



## **Appendix D – Additional Information**

**Pre-Consultation Meeting Notes from the City from Phase 1 Site Plan Application**

## Requirements

The following is to be brought to a Client Service Centre:

- 1) Application form for Site Plan Control: Application for New Development, Manager Approval, Public Consultation which can be found at:  
[http://app06.ottawa.ca/online\\_services/forms/ds/site\\_plan\\_control\\_en.pdf](http://app06.ottawa.ca/online_services/forms/ds/site_plan_control_en.pdf)
- 2) Application Fee Of \$23,483.66
  - \$21,508.66 for Site Plan Application Type
  - \$ 1,000 for Engineering Design Review and Inspection Fee (unless you think should be more)
  - \$975 Conservation Authority Fee
- 3) Plans
  - Street level visualization of the proposed development (.jpg or .pdf format) - optional
  - Survey Plan (2 copies)
  - Site Plan (10 copies)
  - Landscape Plan (10 copies) – prepared by a Landscape Architect
  - Architectural Elevation Drawings – including dimensions & materials (3 copies)
  - Grade Control and Drainage Plan (5 copies)
  - Site Servicing Plan (5 copies)
  - Stormwater Management Plan (5 copies)
  - Erosion and Sediment Control Plan (5 copies)

All plans and drawings must be produced on A1-sized paper and folded to 21.6 cm x 27.9 cm (8½" x 11"). A scale of 1:200 is recommended for the Site and Landscape Plans.

## Studies

- Planning Rationale including Design Statement and Integrated Environmental Review Statement (3 copies)
  - Minimum Distance Separation (MDS) (3 copies) – for institutional uses a review of a 2km radius is required.
  - Geotechnical Study (3 copies)
  - Hydrogeological and Terrain Analysis (3 copies)
  - Reasonable Use Assessment (if flows will exceed 10,000 L/d (3 copies)
  - Stormwater Management Brief (3 copies)
  - Environmental Impact Statement (3 copies)
  - Tree Conservation Report (3 copies)
  - Transportation Impact Brief (3 copies)
- 4) Electronic copies of all required studies and plans must be supplied on a Compact Disk on memory stick in Adobe .pdf format. These documents will be made publicly available on the City's Development Application Search Tool.

## Comments

- 1) For more details on Development Applications can refer to links [Development application review process](#), [Guide to Preparing studies and Plans](#).
- 2) Recommend that you contact the Ward Councillor, who is Scott Moffatt ([scott.moffatt@ottawa.ca](mailto:scott.moffatt@ottawa.ca) or 613-580-2491), neighbours who may be impacted by the

development and the following Community groups, before submitting an application (as they will be circulated when the application is provided):

Country Club Village Community Association

Attn: Denyse MacKenzie

Phone Day: 613-253-0026

[denysemackenzie@xplornet.ca](mailto:denysemackenzie@xplornet.ca)

6 Links Drive South

Ashton, Ontario

K0A 1B0

Richmond Village Association

Attn: John Shearer

Phone Day: 613-838-4830

[johnshearer@richmondvillage.ca](mailto:johnshearer@richmondvillage.ca); [davidproulx@richmondvillage.ca](mailto:davidproulx@richmondvillage.ca)

208 Cedarstone Street

Richmond, Ontario

K0A 2Z0

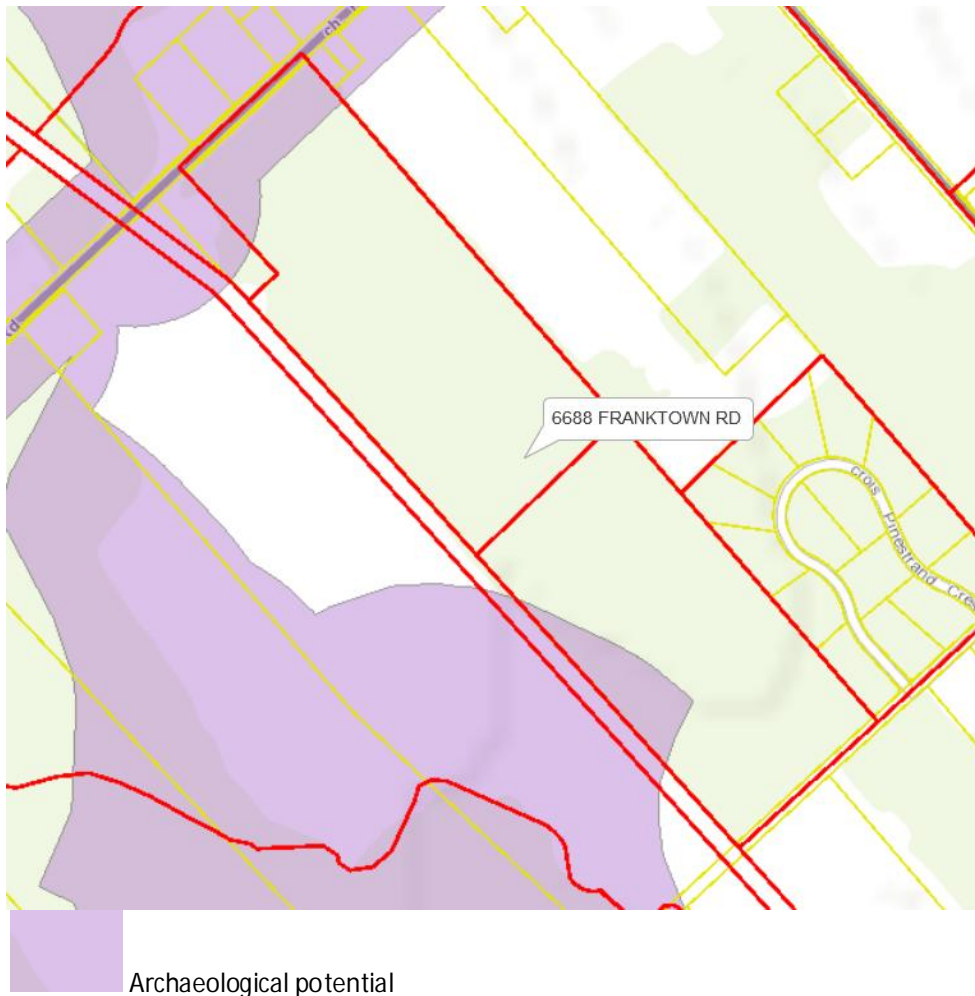
- 3) Comments from Rideau Valley Conservation Authority (RVCA):
  - There is a ditch running along the front of the property, identified as a watercourse, tributary to the Jock River. Development is to be setback 30 metres from the watercourse. Any new crossings/relocation of culverts will be subject to a permit from the RVCA.
  - Additionally, Stormwater Management will need to demonstrate that water quality protection is maintain 80% TSS removal.
  - If the site is to be on Private Services, it may be subject to review and permitting through the Ottawa Septic Office (or MOE based on sizing)
  - Stormwater will need to be controlled post to pre for the 5 year and 100 year events.
  - the proponent will need to provide 80% TSS removal for the proposal.
  - For private on-site wastewater systems, the flows for this type of development often exceed 10,000 L/day and therefore may require approval from Ministry of the Environment and Climate Change (MOECC). If flows are less than 10,000 L per day, the Ottawa Septic System Office (OSSO) would be involved with the review through the RVCA. A permit from the OSSO or an Environmental Compliance Approval (ECA) from MOECC is normally a requirement before completion granting Site Plan Approval, to show that the proposed on-site system is consistent with the site plan.
- 4) Franktown Road is an arterial road. Per the City's OP a right-of-way protection of 30m is required; i.e. 15m from the existing centreline of the road to the property line.
- 5) The site access should be designed and implemented in accordance to the City's Private Approach By-law.
- 6) Depending on the interface be between the Entrance Landscape Courtyard and Franktown Road Right of Way, may want to consider a landscaped buffer between the courtyard and the front property line. The design will need to take into consideration that there is a ditch.
- 7) If you have any questions regarding the Transportation Impact Brief, please feel free to contact Amira directly @ [amira.shehata@ottawa.ca](mailto:amira.shehata@ottawa.ca), 613-580-2424 x 27737.
- 8) Planning Rationale:



- Reference to policies of the Official Plan, particularly policies 3.7.2 – General Rural Area, 3.2 – Natural Environment, 4.6.4 - Scenic Entry Route, and 4.7.5 Protection of Groundwater Resources
  - References to Zoning By-law, particularly Rural Exceptions (Section 240) for RI[643r] and RI[644r], Rural Institutional Zone (Sec 223-224), Rural Countryside Zone (Section 227-228), Accessory uses, Buildings and Structures (Section 55), Place of Worship (Section 96), parking, Queuing and Loading Provisions (Section 100-114)
- 9) Hydrogeological:
- Must address the fact that the subject site is within a Wellhead Protection Area
  - Will need to drill well and test it as per MOECC guidelines as a minimum (more testing may be required depending on the scope of the project—this should be discussed with the City prior to starting the hydrogeological investigation).
  - Will need to determine how MOECC defines what the City calls an accessory rooming house and what criteria to apply for the Drinking Water System.
  - Will need to include a reasonable use assessment if flows exceed 10,000 L/d.
  - Will want to start discussions with MOECC as soon as possible because it can take up to a year for their approval.
- 10) Require Permit To Take Water if any water taking exceeds 50,000 litres per day.
- 11) Not sure if MOECC will need to approve stormwater but most likely will need to approve the sewage system (if the flows >10,000 L/d). Registration with either the MOECC or the City's Health Dept. will be required depending on the category of the Drinking Water System.
- 12) Site Plan:
- To show fire route
- 13) Environmental Impact Statement (EIS)
- The property is indicated in Schedule L2 as part of our Natural Heritage System due to the significant woodlands which triggers an EIS along with the potential for Endangered and Threatened Species Habitat.
  - The EIS is to conform with the Council-approved guidelines which are available here: [http://documents.ottawa.ca/sites/documents.ottawa.ca/files/documents/eis\\_guidelines2015\\_en.pdf](http://documents.ottawa.ca/sites/documents.ottawa.ca/files/documents/eis_guidelines2015_en.pdf)
  - Consultation with the Ministry of Natural Resources and Forestry very important to ensure all endangered and threatened species are considered and some of these have very particular survey requirements, for example the Whip-poor-will.
  - Should start before the end of June due to seasonal studies being required.
  - The EIS will need to demonstrate that their project will not have a significant negative impact on the significant woodlands and that any endangered and/or threatened species habitat present is protected as per MNRF requirements.
- 14) Tree Conservation Report (TCR) is required to demonstrate how trees will be retained and incorporated into the landscaping.
- could be combined with the EIS to simplify the coordination between the EIS and TCR reports.
- 15) The error in the zoning by-law for exception 643r has been corrected with the removal of the 'h'.
- 16) It appears that no development buildings are in the area of Archaeological Potential so an Archaeological Resource Assessment will not be required.
- 17) Will there be a connection between this property and the residential property in the northeast corner from the 6688 Franktown?

18) Design has changed significantly from the Concept Plan provided with the rezoning application, from the pre-consult in June 2005, and the downscaling noted in May of 2016..

- Appears to be more hardscape and less features protected.
- More parking (200 spaces)
- Slightly larger building
- Less uses? (previously proposed classroom, gift shop, office, main hall, conference room, storage, rooming house, pagoda)
- Private Approach - will it conform to the Private Approach By-law?
- sculptures



## 渥太华佛光山年度行事历

### Annual Calendar for Full Build out Occupancy of Fo Guang Shan Temple of Ottawa

一月/January

周 Week	天 Day	特别法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 <sup>st</sup>	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	200	150	10AM-12PM	100	2 H	10 P/ 1 DAY
2 <sup>nd</sup>	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   FRI		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	三好儿童冬令营 3 Acts of Goodness Children Winter Camp		130	100	8AM-5 PM	10	8 H	80 P / 4 DAYS
	Sun	光明燈圓燈法會 Completion of Light Offering Dharma Service Ceremony	童軍活動 /佛學班 Scouts activites/Dharma classes	330	300	10AM-12PM	200	2 H	30 P / 3 DAYS
3 <sup>rd</sup>	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	宗教聯合祈福法會 Multi faith prayer for world peace		300	300	10AM-12PM	200	2 H	50 P / 3 DYS

	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	80	60-80	2PM-4PM	40-60	2 H	5 P/ 1 DAY
4 th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	留学生围炉 Dinner for International students		100	100	5:30PM-8:30PM	50	3 H	5 P/ 1 DAY
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	360	200	2PM-4PM	200	2 H	N/A
二月/February									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activties	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 st	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		日常参访 Temple Visit	20-30	10-15	2 PM-3:30 PM	10	1 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	200	200	10AM-12PM	160	2 H	N/A
2 nd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		日常参访 Temple Visit	20-30	10-15	2 PM-3:30 PM	10	1 H	80 P / 4 DAYS
	Sat	農曆新年 Chinese New Year Celebrations		500	80	2 PM-3:30 PM	200	1.5 H	80 P / 1 DAYS

	Sun	農曆新年 Chinese New Year Celebrations		5000	500	11:30PM-12AM	260	1 H	40 P / 2 DAYS
3 rd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		日常参访 Temple Visit	20-30	10-15	2 PM-3:30 PM	10	1 H	N/A
	Sun	上灯法会 Annual Lamp Offering Inauguration Dharma Service	童軍活動 /佛學班 Scouts activites/Dharma classes	350	300	2PM-4PM	220	2 H	20 P / 3 DAYS
4 th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	N/A
三月/March									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 st	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	開學典禮 Buddhist Class Opening Ceremony		150	150	10AM-12PM	10	2 H	5 P / 1 DAYS
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	N/A
	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

2 nd	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	八關齋戒修道會 8 Precepts Retreat		150	150	8 AM-8 PM	100	12 H	50 P / 3 DAYS
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
3 rd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		日常参访 Temple Visit	20-30	10-15	2 PM-3:30 PM	10	1 H	N/A
	Sat	禪修修道會 Meditation Retreat		100	100	10 AM-5 PM	80	7 H	80 P / 5 DAYS
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
4 th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
四月/April									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activties	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1 st	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun	清明孝親報恩法會 Filial Piety Memorial Dharma Service	童軍活動 Scouts activites (2AM-3:30PM)	360	300	10AM-4PM	200	6 H	30 P / 3 DAYS
2 nd   3 rd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
4 th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
五月/May									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 st	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	佛光素宴 Buddha Light Vegetarian Gala		260	200	2PM-4PM	200	2 H	30 P / 1 DAYS

	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	350	300	6 PM-10 PM	260	4 H	30 P / 2 DAYS
2 nd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun	浴佛法會/ 慶祝佛陀聖誕暨母親 節 Celebration of Buddha's Birthday and Mothers Day Celebration	童軍活動 /佛學班 Scouts activites/Dharma classes	1000	500	10AM-12PM	260	2 H	20 P / 3 DAYS
3 rd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
4 th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS



六月/June

周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 st	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun	三好園遊會 Food Fair	童軍活動 /佛學班 Scouts activites/Dharma classes	1000	500	10AM-3PM	260	5 H	30 P / 3 DAYS
2 nd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	禪修修道會 Meditation Retreat		100	100	10 AM-5 PM	80	7 H	80 P / 5 DAYS
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
3 rd   4 th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS

七月/July

周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1 <sup>st</sup>	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	短期出家修道會 Short Term Monastic Retreat		300	300	6 AM-10 PM	200	16 H	80 P / 1 DAYS
	Sun	短期出家修道會 Short Term Monastic Retreat	共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	560	560	6 AM-10 PM	200	16 H	80 P / 1 DAYS
2 <sup>rd</sup>	Mon   Thu	短期出家修道會 Short Term Monastic Retreat	才藝班 community/interest classes	335	335	2 PM-3:30 PM	260	16 H	80 P / 4 DAYS
	Fri   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
3 <sup>rd</sup>	Mon   Fri	三好兒童夏令營 3 Acts of Goodness Children Summer Camp	才藝班 community/interest classes	185	185	2 PM-3:30 PM	60	7 H	80 P / 5 DAYS
	sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun	童軍大露營 Scouts Jamboree	共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	360	360	2PM-4PM	200	16 H	80 P / 1 DAYS
	Mon   Fri	童軍大露營 Scouts Jamboree		100	100	9 PM-4PM	200	7 H	80 P / 4 DAYS

4 th	Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
八月/August									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 st	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	加東聯合講習會 Training/Workshop for members from Eastern Canada	才藝班 community/interest classes	235	200	11:30 AM-2 PM	200	2 H	80 P / 1 DAYS
	Sun	加東聯合講習會 Training/Workshop for members from Eastern Canada	共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	460	260	2PM-4PM	200	2 H	80 P / 1 DAYS
2nd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	加東青年寺院生活體 驗營 Spiritual Life in the Monastery Camp for Youths from Eastern Canada	才藝班 community/interest classes	235	200	9 AM - 6 PM	200	9 H	80 P / 1 DAYS

	Sun	加東青年寺院生活體驗營 Spiritual Life in the Monastery Camp for Youths from Eastern Canada	共修法會/童軍活動/佛學班 Sunday dharma services/ Scouts activities/Dharma classes	460	260	11:30 AM-2 PM	200	9 H	80 P / 1 DAYS
3rd	Mon   Fri	加東青年寺院生活體驗營 Spiritual Life in the Monastery Camp for Youths from Eastern Canada	才藝班 community/interest classes	235	200	9 AM - 6 PM	200	9 H	80 P / 4 DAYS
	Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動/佛學班 Sunday dharma services/ Scouts activities/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
4th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動/佛學班 Sunday dharma services/ Scouts activities/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
九月/September									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A

1 <sup>st</sup>	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activities/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
2 <sup>nd</sup>	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	禪修修道會 Meditation Retreat		100	100	10 AM-5 PM	80	7 H	80 P / 5 DAYS
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activities/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
3 <sup>rd</sup>   4 <sup>th</sup>	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activities/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
十月/October									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 <sup>st</sup>	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A

4th	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activities/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
	十一月/November								
周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 st	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	八關齋戒修道會 8 Precepts Retreat	才藝班 community/interest classes	185	185	2 PM-3:30 PM	150	12 H	80 P / 2 DAYS
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activities/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
2 nd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun	药师法會 Medicine Buddha's Birthday Celebration	童軍活動 /佛學班 Scouts activities/Dharma classes	185	185	2 PM-3:30 PM	150	2 H	20 P / 1 DAYS
3rd 	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A

4th	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
十二月/December									
周 Week	天 Day	特別法會活動 Special Dharma Service/Activities	每週法會活動 Weekly Dharma service/activities	总出席人数 /天(8小时) Total Number of participants	平常周每天高峰出席量			持续时间 (小时) Typical visit duration	挂单 (人/天数) No. of people requiring
					出席人数 Number of participants	时间 Time of day	停车数量 Number of vehicles		
1 st	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Fri		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sat	禪修修道會 Meditation Retreat		100	100	10 AM-5 PM	80	7 H	80 P / 5 DAYS
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
2nd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS
3 rd	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun	彌陀佛七法會 Amitabha Chanting Retreat	童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	10AM-4PM	150	6 H	30 P / 3 DAYS

4 th	Mon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tue   Sat		才藝班 community/interest classes	35	30	2 PM-3:30 PM	30	1.5 H	N/A
	Sun		共修法會/童軍活動 /佛學班 Sunday dharma services/ Scouts activites/Dharma classes	260	200	2PM-4PM	200	2 H	5 P / 1 DAYS



## **Appendix E – Drawings**



**TOPOGRAPHIC PLAN OF SURVEY**  
 OF PART OF  
**LOT 19,**  
**CONCESSION 3**  
**GEOGRAPHIC TOWNSHIP OF**  
**GOULBOURN**  
**CITY OF OTTAWA**

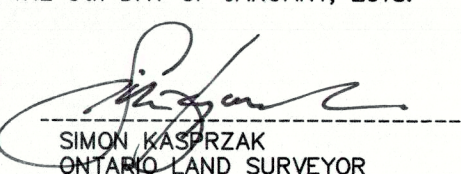
SCALE 1 : 500  
 0 10 20 30 40 50 Metres

McINTOSH PERRY SURVEYING INC.

**METRIC :**  
 DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES  
 AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

**SURVEYOR'S CERTIFICATE**

I CERTIFY THAT:  
 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH  
 THE SURVEY ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE  
 UNDER THEM.  
 2. THE SURVEY WAS COMPLETED ON THE 9th DAY OF JANUARY, 2018.

FEBRUARY 21, 2018  
 DATE   
 SIMON HARRIS  
 ONTARIO-LAND SURVEYOR

**LEGEND AND NOTES**

- DENOTES MONUMENT PLANTED
- DENOTES MONUMENT FOUND
- SB - STANDARD IRON BAR
- SSB - SHORT STANDARD IRON BAR
- IB - IRON BAR
- RPL - ROCK PLUG
- RIB - ROUND IRON BAR
- BM - BENCHMARK
- WT - WITNESS
- (M) - MEASURED
- (P1) - PLAN 4R-7040
- (P2) - PLAN 5R-6743
- (P3) - PLAN 5R-14318
- (P4) - PLAN 4R-8424
- (D1) - INSTRUMENT N733204
- (726) - WILLIAM D. RATZ, O.L.S.
- (1116) - WILLIAM J. JOHNSTON, O.L.S.
- (1442) - JOHN H. KENNEDY, O.L.S.
- BP - BELL POLE
- BHP - BELL & HYDRO POLE
- HP - HYDRO POLE
- N.T.S. - NOT TO SCALE
- TBM - TEMPORARY BENCHMARK
- PWF - POST & WIRE FENCE
- M.B. - MIXED BUSH
- OVER HEAD WIRES
- x - FENCE (TYPE NOTED ON PLAN)

TEMPORARY SITE BENCHMARK - NAIL & WASHER IN FACE OF BELL & HYDRO POLE, HAVING A GEODETIC ELEVATION OF 100.38

THE LOCATION AND CONFIGURATION OF UNDERGROUND SERVICES AND UTILITIES HAVE BEEN DERIVED FROM LIMITED FIELD INFO AND CANNOT BE GUARANTEED TO BE COMPLETE OR ACCURATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE CONFIGURATION AND LOCATION OF UNDERGROUND SERVICES AT THE SITE PRIOR TO CONSTRUCTION.

ELEVATIONS ARE CANADA GEODETIC VERTICAL DATUM 1928:1978 DERIVED FROM REAL TIME NETWORK GPS OBSERVATIONS WITH GEODIC CORRECTION APPLIED.

BEARINGS ARE UTM GRID BEARINGS, DERIVED BY REAL TIME NETWORK GPS OBSERVATIONS ON OBSERVED REFERENCE POINTS A AND B, SHOWN HEREON, AND ARE REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 9, (75°30' WEST LONGITUDE) NAD83 (ORIGINAL) 2011.

DISTANCES SHOWN ON THIS PLAN ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.99992.

OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM GPS OBSERVATIONS USING REAL TIME NETWORK (RTN) SERVICE - UTM ZONE 9, NAD83 (ORIGINAL) (2011)		
POINT ID	NORTHING	EASTING
ORP A	5004507.4	354848.4
ORP B	5004485.2	354848.4

COORDINATES TO RURAL ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

© COPYRIGHT IN THIS PLAN REMAINS THE PROPERTY OF  
 McINTOSH PERRY SURVEYING INC. REPRODUCTION OF  
 THIS PLAN BY ANY MEANS IS PROHIBITED.

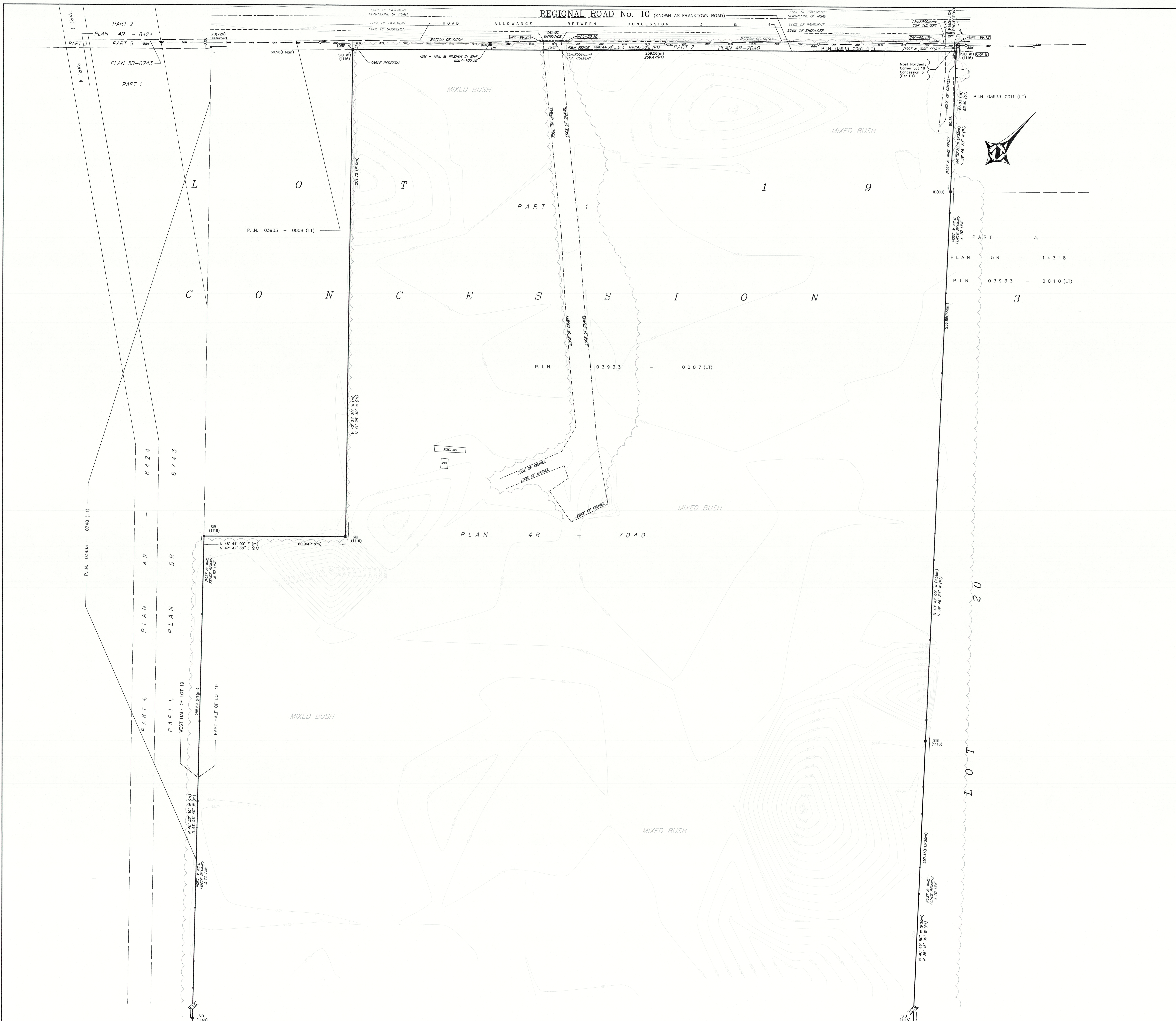
JOB No. 17-4410 DRAWING #17-4410-01

PREPARED FOR: MPCE (BEN CLARE)

**McINTOSH PERRY**  
 SURVEYING INC.  
 3360 Drummond Court, 5A, R.R. #2, Perth, ON K7H 3C9  
 Tel: 613-207-6524 Fax: 613-207-7992  
 www.mcintoshperry.com

EXAMINED: \_\_\_\_\_ CHECK: \_\_\_\_\_

McINTOSH PERRY SURVEYING INC. 17-4410 CLARE TPOV1-440 - TPO (P)DWG  
 February 21, 2018 2:17:37 PM





I REQUIRE THIS PLAN TO BE DEPOSITED UNDER "THE LAND TITLES ACT."  
 RECEIVED AND DEPOSITED  
 6 October 1987  
 6388/87  
 LAND REGISTRAR FOR THE  
 LAND TITLES DIVISION OF  
 OTTAWA - CARLETON N 2 4

AUGUST 24, 1987  
 W. J. JOHNSTON  
 ONTARIO LAND SURVEYOR  
 WINCHESTER, ONTARIO

APPROVED  
 SUPPL. 27, 1985  
 ASSISTANT EXAMINER OF SURVEYS

SCHEDULE OF PARTS	
PART	AREA
1	39.89 Ha.
2	0.096 Ha.

CONTR. N 2 304  
 APP. N 2 319-4-457

PLAN OF SURVEY OF  
**PART E1/2 LOT 19**  
**CONCESSION 3**  
 TOWNSHIP OF GOULBOURN  
 REGIONAL MUNICIPALITY OF OTTAWA - CARLETON  
 SCALE: 1:2000  
 1987  
 W. J. JOHNSTON, O.L.S.

METRIC: DISTANCES SHOWN ON THIS PLAN ARE IN METRES  
 AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.



- NOTES:**
- STANDARD IRON BARS SHOWN THUS  $\diamond$  SIB
  - IRON BARS SHOWN THUS  $\square$  IB
  - $\blacklozenge$  DENOTES EVIDENCE FOUND
  - $\circ$  DENOTES PLANTED
  - WIT. DENOTES WITNESS
  - O.H. DENOTES ONTARIO HYDRO
  - FENCES SHOWN THUS  $\text{---}$  T.C.P.L. DENOTES TRANS CANADA PIPELINES
  - DISTANCES PER SR-6743 SHOWN THUS (258.01)

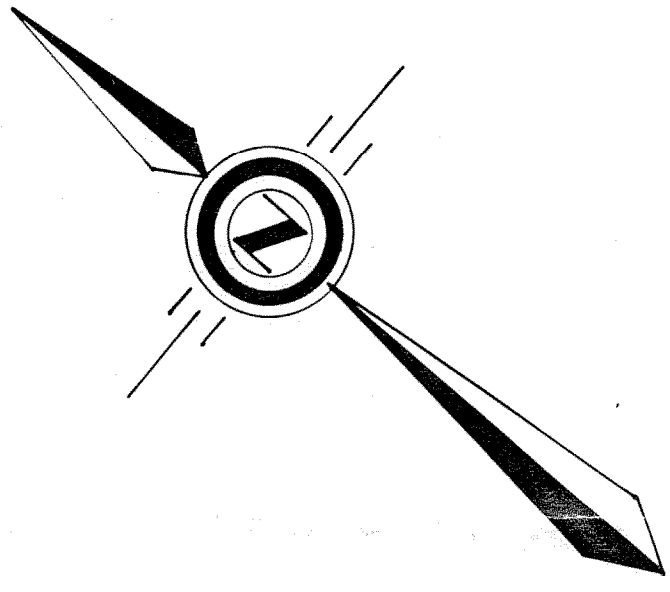
**BEARING REFERENCE:**  
 BEARINGS ARE ASTROMOMIC, AND ARE REFERRED TO THE WESTERLY LIMIT OF PART 1, PLAN SR-6743, BETWEEN MONUMENTS FOUND, THE BEARING BEING N 40° 51' 20" W.

**CAUTION:**  
 THIS PLAN IS NOT A PLAN OF SUBDIVISION WITHIN THE MEANING OF "THE PLANNING ACT."

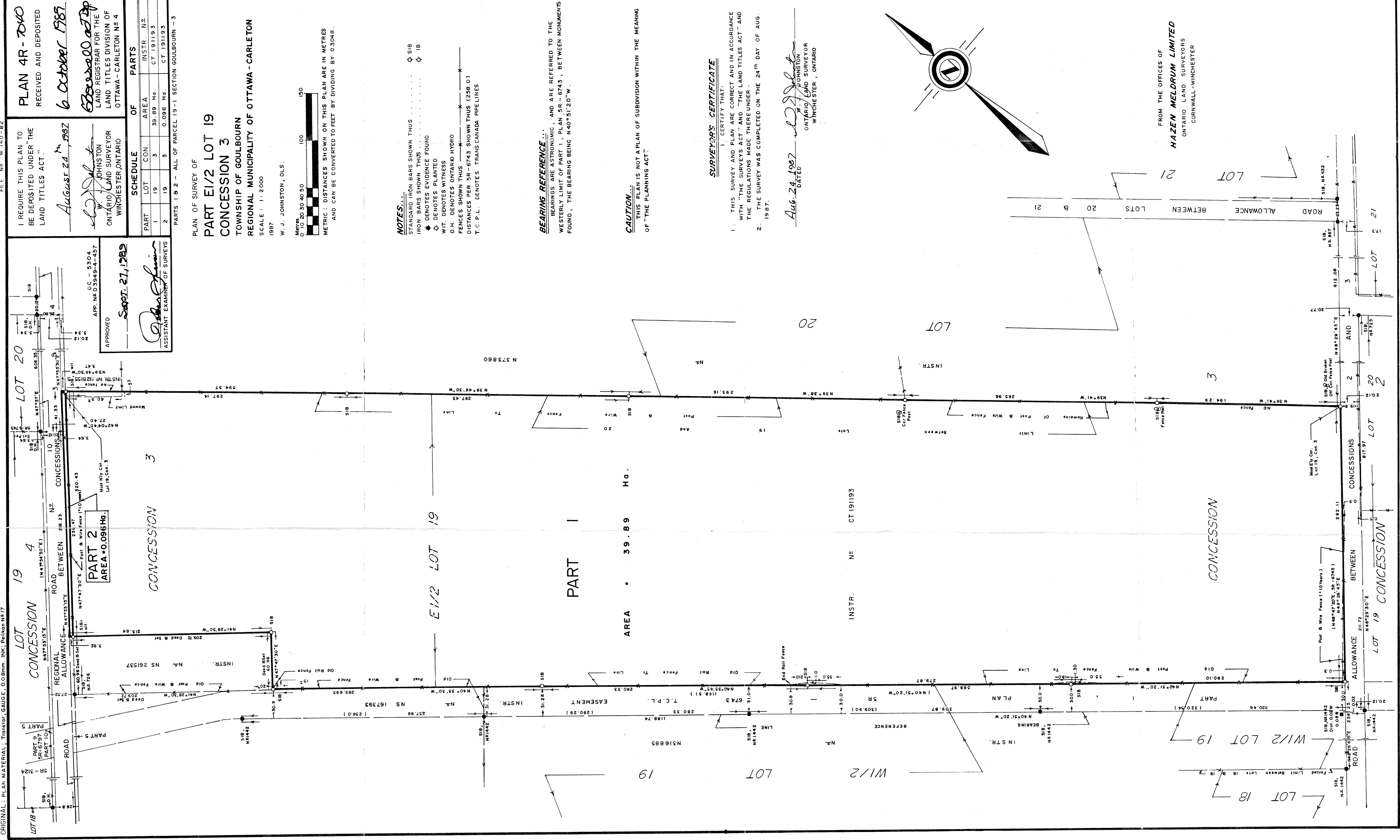
**SURVEYOR'S CERTIFICATE**

I CERTIFY THAT:  
 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH "THE SURVEYS ACT" AND "THE LAND TITLES ACT" AND THE REGULATIONS MADE THERE UNDER.  
 2. THE SURVEY WAS COMPLETED ON THE 24<sup>th</sup> DAY OF AUG. 1987.

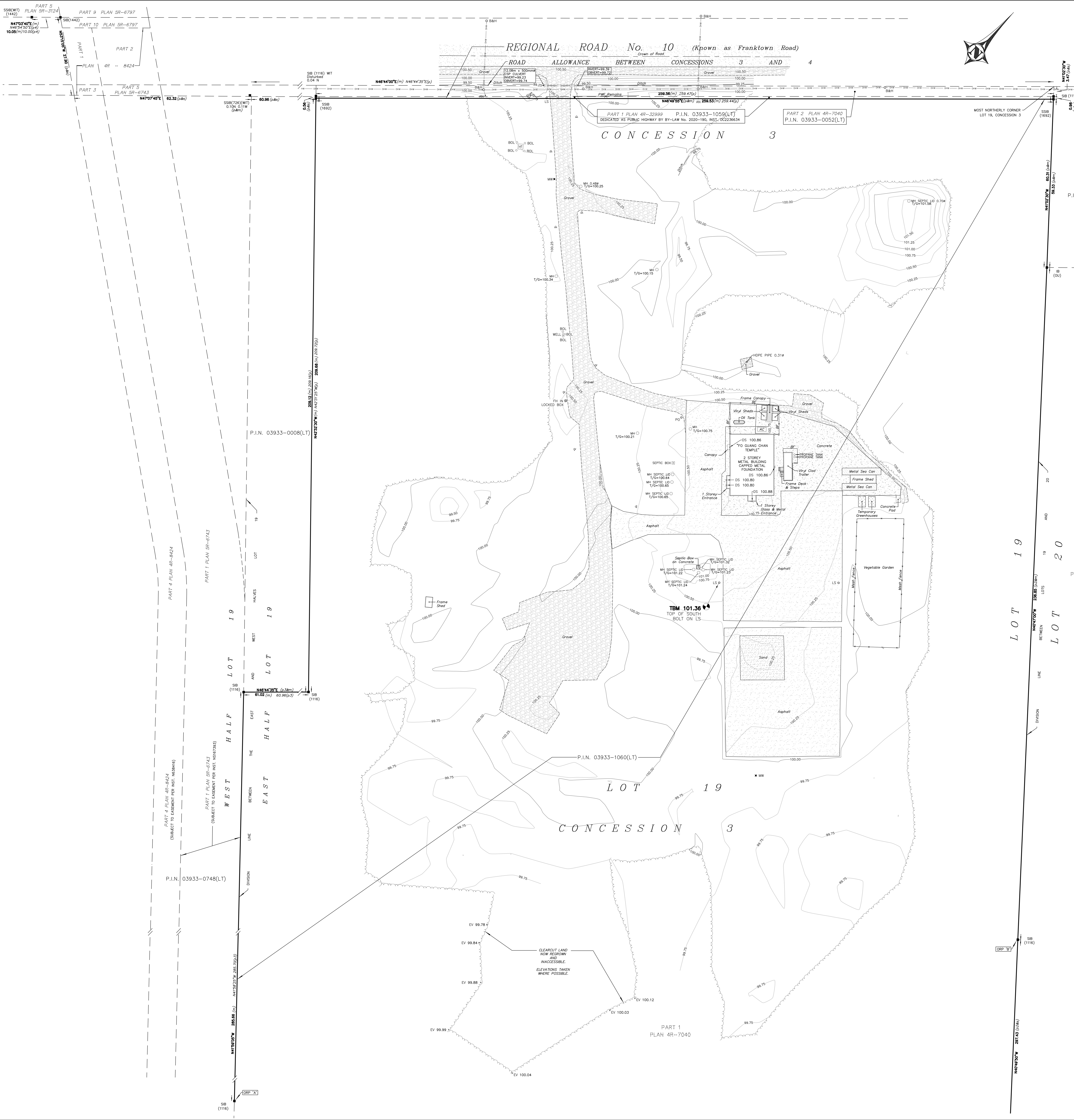
AUG. 24, 1987  
 W. J. JOHNSTON  
 ONTARIO LAND SURVEYOR  
 WINCHESTER, ONTARIO



FROM THE OFFICES OF  
**Hazen Melderum Limited**  
 ONTARIO LAND SURVEYORS  
 CORNWALL-WINCHESTER







**PLAN OF SURVEY WITH TOPOGRAPHY OF PART OF LOT 19 CONCESSION 3 GEOGRAPHIC TOWNSHIP OF GOULBOURN CITY OF OTTAWA**

McINTOSH PERRY SURVEYING INC

SCALE 1 : 400  
 0 10 20 30 40 Metres

THE INTENDED PLOT SIZE OF THIS PLAN IS 118mm IN WIDTH BY 1016mm IN HEIGHT WHEN PLOTTED AT A SCALE OF 1 : 400.

P.I.N. 03933-0011(LT)

**METRIC :**  
 DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

**SURVEYOR'S CERTIFICATE**  
 I CERTIFY THAT:  
 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT AND THE REGULATIONS MADE UNDER THEM.  
 2. THE SURVEY WAS COMPLETED ON THE 25TH DAY OF AUGUST, 2023.  
 AUGUST 28, 2023  
 DATE  
 JOHN LAUTNER  
 OTTAWA LAND SURVEYOR

**LEGEND :**

- DENOTES MONUMENT PLANTED
- DENOTES MONUMENT FOUND
- DENOTES IRON BAR
- DENOTES STANDARD IRON BAR
- DENOTES SHORT STANDARD IRON BAR
- (M) DENOTES MEASURED
- (A) DENOTES SET
- (P1) DENOTES PLAN 48-32299
- (P2) DENOTES PLAN SR-14318
- (P3) DENOTES PLAN 48-7040
- (P4) DENOTES PLAN SR-6743
- (116) DENOTES W.J. JOHNSTON, OLS
- (1442) DENOTES JOHN H. KENNEDY LTD., OLS
- (1692) DENOTES FARMLEY, SMITH & DENNIS SURVEYING LTD., OLS
- (U) DENOTES ORIGIN UNKNOWN
- WT DENOTES WITNESS
- N,S,E,W DENOTES NORTH, SOUTH, EAST, WEST
- BP DENOTES OBSERVED BENCHMARK POINT
- RF DENOTES BOARD FENCE
- PF DENOTES POST & RING FENCE
- BM DENOTES TELEPHONE & HYDRO POLE
- DENOTES OVERHEAD WIRES
- AN DENOTES ANCHOR
- LS DENOTES LAMP STANDARD
- AC DENOTES AIR CONDITIONING UNIT
- HT DENOTES HYDRO TRANSFORMER
- MH DENOTES MAINTENANCE HOLE
- CB DENOTES CATCH BASIN
- 1/2 DENOTES TOP OF GRATE
- FF DENOTES FIRE HYDRANT
- MW DENOTES MONITORING WELL
- WP DENOTES CORRUGATED STEEL PIPE
- HPPE DENOTES HIGH DENSITY POLYETHYLENE
- TM DENOTES TEMPORARY BENCHMARK
- DS DENOTES DOOR SILL ELEVATION
- EV DENOTES ELEVATION
- BOL DENOTES BOLLARD
- SD DENOTES SIGN
- DI DENOTES DIAMETER
- GT DENOTES GATE
- BUSH DENOTES BUSH

PART 3 PLAN SR-14318  
 P.I.N. 03933-0010(LT)

**NOTES :**

**MONUMENTATION:**  
 SSB'S HAVE BEEN SET IN LIEU OF SSB'S DUE TO SHALLOW OVERBURDEN AND THE PRESENCE OF SUBSURFACE UTILITIES.

**DISTANCES:**  
 DISTANCES SHOWN ON THIS PLAN ARE GROUND DISTANCES AND CAN BE USED TO COMPUTE GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.99998.

**BEARINGS:**  
 BEARINGS ARE WITH GRID BEARINGS, DERIVED BY REAL TIME NETWORK GNSS OBSERVATIONS ON OBSERVED REFERENCE POINTS 'A' AND 'B' SHOWN HEREON, AND ARE REFERRED TO THE NAD83 CSRS (ORIGINAL) MTM ZONE 9 COORDINATE SYSTEM.

**BEARING ROTATION:**  
 FOR THE PURPOSE OF COMPARISON, ASTROMERIC BEARINGS HAVE BEEN ROTATED AS FOLLOWS:

PLAN	ROTATION	DIRECTION
(G3) & (P4)	1° 02' 55"	COUNTER CLOCKWISE

**INTEGRATION DATA:**  
 OBSERVED REFERENCE POINTS (ORP) DERIVED FROM GNSS OBSERVATIONS USING THE CANMET REAL TIME NETWORK (RTN) SERVICE. COORDINATES ARE CONFIRMED BY THE NRCAN RTK COMPLIANCE AGREEMENT.  
 COORDINATE SYSTEM : NAD83 CSRS (ORIGINAL), MTM ZONE 9  
 COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP 'A'	5503898.73	354947.82
ORP 'B'	5504263.41	355042.99

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

**ELEVATIONS:**  
 ELEVATIONS ARE CANADA GEODETIC VERTICAL DATUM 28/78 DERIVED BY REAL TIME NETWORK GNSS OBSERVATIONS REFERENCED TO THE CANADA HT.2 GEOID MODEL.  
 THE CONTOUR INTERVAL IS 0.25 METRES.

**BENCHMARKS:**  
 TEMPORARY SITE BENCHMARK - TOP OF SOUTH BOLT ON LAMP STANDARD, HAVING AN ELEVATION OF 101.36m.

**CAUTION:**  
 THE LOCATION AND CONFIGURATION OF UNDERGROUND SERVICES AND UTILITIES IS NOT WITHIN THE SCOPE OF THIS SURVEY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE CONFIGURATION AND LOCATION OF UNDERGROUND SERVICES AT THE SITE PRIOR TO CONSTRUCTION.