D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

SITE SERVICING & STORMWATER MANAGEMENT REPORT

TONY GRAHAM PREP SHOP
2500 PALLADIUM DRIVE,
UNIT 4
OTTAWA, ONTARIO

REPORT NO. 25023

JUNE 26, 2025

CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

This report has been prepared in support of the Site Plan Control application for a proposed 'Tony Graham Prep Shop' located in Ottawa at 2500 Palladium Drive, 'Unit 4'of the Palladium Auto-Park condominium in Ottawa. This report describes the servicing for the proposed building and stormwater management for the 1.90 hectare property, of which 0.72 hectares is proposed to be developed at this time. The property is currently vacant. Refer to Pre-Application Consultation meeting notes in Appendix D.

This report forms part of the site servicing and stormwater management design for the proposed development. Also refer to drawings C-1 to C-7 prepared by D.B. Gray Engineering Inc.

2.0 WATER SERVICING

2.1 WATER SUPPLY FOR FIREFIGHTING

The closest existing fire hydrant is a private Class AA fire hydrant located in front of the subject property on the far side of the street, ±73 m unobstructed distance to the far end of the façade of the proposed building that faces the fire route. Since this is less than the maximum 90 m required by the Ontario Building Code (OBC); therefore, an additional private fire hydrant is not required.

In accordance with City of Ottawa Technical Bulletin IWSTB-2024-05, when calculating the required fire flow on private property in urban areas, the Ontario Building Code (OBC) method is to be used. Using the OBC method, the required fire flow is calculated to be 5,400 L/min (90 L/s). Refer to calculations in Appendix A.

Palladium Auto-Park is served by a 300 mm private looped watermain system that connects to municipal watermains at two points (at a 300 mm watermain in Palladium Drive and at 300 mm watermain in Huntmar Drive). Boundary conditions at the Huntmar Drive connection provided by the City of Ottawa for the 90 L/s fire flow at the subject property indicate a hydraulic grade line (HGL) of 155.6 m and a pressure of 76.0 psi (assuming a ground elevation of 102.1 m). A hydrant flow tests was performed on the nearest existing fire hydrant. Refer to Appendix A. Using the Hazen-Williams Formula, it is calculated that 90 L/s is available from a single 2.5" nozzle at 601 kPa (87 psi) (and 510 L/s is available at 138 (20 psi)). Since the required fire flow is available above the Ontario Building Code's minimum required pressure of 140 kPa (20 psi), there is an adequate water supply for firefighting from the existing private water distribution system.

In accordance with City of Ottawa Technical Bulletin ISTB-2018-02, the aggregate flow of all contributing fire hydrants within 150 m of the building shall not be less than the required fire flow; and as per ISTB-2018-02 Appendix I, Class AA fire hydrants within 75 m can contribute 5,700 L/min (95 L/s). Therefore, the existing private fire hydrant discussed above can contribute 5,700 L/min (95 L/s); greater than the required fire flow of 5,400 L/min (90 L/s).

2.2 DOMESTIC WATER SUPPLY

In accordance with the City of Ottawa Water Design Guidelines for the consumption rate and peaking factors for a light industrial property, the average daily demand is calculated to be 0.3 L/s, the maximum

daily demand is calculated to be 0.4 L/s and the maximum hourly demand is calculated to be 0.8 L/s. Refer to calculations in Appendix A.

The boundary conditions at the connection to 300 mm Huntmar Drive municipal watermain provided by the City of Ottawa indicate a maximum HGL of 162.6 m and a minimum HGL of 155.6 m. Refer to Appendix A. Based on these boundary conditions, the pressure at the proposed water meter is calculated to vary between 569 kPa (82 psi) and 500 kPa (73 psi). Since water pressure can be above 80 psi at times the installation of a pressure reducing valve (PRV) immediately downstream of the water meter will be required.

Based on the AWWA water flow demand curve, and a water pressure at the meter at 80 psi, the peak demand is expected to be 3.2 l/s (195 L/min / 51 USgpm). Refer to Appendix A. The AWWA method calculates the instantaneous demand and is used to size the water service. This peak demand will produce an acceptable velocity of 1.7m/s in the proposed 50 mm water service connection.

3.0 SANITARY SERVICING

In accordance with

i. the City of Ottawa Sewer Design Guidelines for the peaking factor, and
ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the average daily flow and infiltration allowance,

the post-development sanitary flow rate is calculated to be 0.24 L/s. A 150 mm sanitary sewer system is proposed, and the last segment, at 0.65% slope, has a capacity of 11.63 L/s. At the design flow rate the sanitary sewer will only be at 5% of its capacity. The proposed 150 mm sanitary sewer will connect to an existing 150 mm sanitary sewer stub located near the northwest corner of the proposed development. Refer to calculations in Appendix B. The proposed redevelopment is expected to have an acceptable impact on the existing sanitary sewers.

4.0 STORMWATER MANAGEMENT

4.1 QUALITY CONTROL

An oil grit separator (OGS) manhole is proposed to be located downstream of the inlet control device (ICD). Calculations by the manufacturer indicate that the proposed CDS PMSU2015-4 OGS will remove 86.0% of total suspended solids. Refer to calculations in Appendix C.

An Erosion & Sediment Control Plan has been developed to be implemented during construction. Refer to drawing C-4 and notes 2.1 to 2.6 on drawing C-6:

i. Sediment capture filter sock inserts are to be installed in all existing and proposed catch basins and catch basin manholes adjacent to and within the site,
ii. A silt fence barrier is to be installed along the perimeter of the site, and
iii. Any material deposited on the public road is to be removed.

4.2 QUANTITY CONTROL

As per Pre-Consultation Meeting Feedback: *"The site must reference to the existing stormwater management design report for the auto park for the stormwater management criteria for this specific site."* As per the Stormwater Management Report for the Palladium Auto-Park, dated April, 2003, prepared by J.L. Richards & Associates Limited, there is a maximum release rate of 84 L/s per lot for the 100-year storm event. However, since only 38% (0.72 ha) of 1.90 ha property is being developed at this time, the maximum allowable release rate for the proposed development is 31.90 L/s (38% of 84 L/s). Also as per J.L. Richards' report, there is a minimum on-site storage volume requirement based on post-development areas, which, for the subject site, is calculated to be 241.71 m^3. Refer to Appendix C.

The Rational and Modified Rational Methods are used to calculate the post-development flow rates and corresponding storage volumes. The runoff coefficients for the 100-year event are increased by 25% to maximum 1.00. Refer to calculations in Appendix C.

It is calculated that the pre-development conditions reflect a 5-year runoff coefficient of 0.30 (woodland or pasture - flat - clay and silt loam as per Table 5.7 Ottawa Sewer Design Guidelines); and 0.375 for the 100-year runoff coefficient. Using the Airport Formula, the pre-development time of concentration is calculated to be 42 minutes for the 100-year event and 47 minutes for the 5-year event. Using the Rational Method and the calculated time of concentrations, the pre-development flow rates are calculated to be 54.49 L/s during the 100-year event and 40.60 L/s during the 5-year event.

Drainage Area I (Uncontrolled Flow Off Site – 173 m^2)
Areas around the perimeter of the property will drain uncontrolled off site. The flow rates are calculated at a time of concentration of 10 minutes.

	100-Year Event	5-Year Event
Maximum Flow Rate	9.00 L/s	4.20 L/s

Drainage Area II (6,498 m^2)
An inlet control device (ICD) located in the outlet pipe of catch basin / manhole CB/MH-15 will restrict the flow of stormwater and cause it to backup into the upstream infrastructure (including underground chambers) and pond in the pavement above catch basins. The ICD will be a plug style with trash basket and a round orifice located at the bottom of the plug manufactured by Pedro Plastics or approved equivalent, and sized by the manufacturer for a release rate of 22.91 L/s at 2.58 m. It is calculated that an orifice area of 5,281 mm^2 ($\pm$82 mm dia.) with a discharge coefficient of 0.61 will restrict the outflow rate to 22.91 L/s at a head of 2.58 m. Based on this orifice the maximum outflow rate for the 5-year storm event is calculated to be 22.58 L/s at 2.50 m. Since underground storage infrastructure is proposed, an average release rate equal to 50% of the maximum release rate is used to calculate the required storage volumes. The underground storage infrastructure will consist of 7 – Soleno HydroStor HS180 open bottom chambers surrounded by clear stone wrapped in geotextile fabric.

	100-Year Event	5-Year Event
Maximum Release Rate	22.91 L/s	22.58 L/s
Maximum Water Elevation	103.40 m	103.32 m
Maximum Volume Stored	309.69 m^3	135.79 m^3

Summary

	100-Year Event	5-Year Event
Pre Development Flow Rate	54.49 L/s	40.60 L/s
Maximum Allowable Release Rate	31.90 L/s	31.90 L/s
Maximum Release Rate	31.90 L/s	26.78 L/s
Maximum Volume Required & Stored	309.69 m^3	135.79 m^3
Maximum Volume Available	309.69 m^3	309.69 m^3
Volume Required as per J.L. Richards' Report	241.71 m^3	241.71 m^3

The maximum post-development release rate during the 100-year event is calculated to be 31.90 L/s, which is 34% less than the pre-development flow rate and equal to the maximum allowable release rate. The maximum release rate during the 5-year event is calculated to be 26.78 L/s, which is 34% less than the pre-development flow rate and 16% less than the maximum allowable release rate. To achieve the maximum allowable release rate, a maximum storage volume of 309.69 m^3 is required and provided, which is 28% more than the minimum required by the J.L. Richards report. The reduction in flow is expected to have a positive impact on the existing downstream storm sewers.

4.3 STORM SERVICING

An on-site storm sewer system is proposed to connect to an existing 375 mm storm sewer stub located near the northwest corner of the proposed development. The peak unrestricted flow rate in the last segment of the proposed storm sewer system during the 2-year event is calculated to be 101.3 L/s; which would be at 97% of its capacity. However, the restricted flow rate through the ICD is 21.44 L/s; which is only 21% of the capacity of the 375 mm sewer. Refer to calculations in Appendix C.

The Ministry of Environment, Conservation and Parks (MECP) is expected to consider the property 'industrial lands'; therefore, an Environmental Compliance Approval (ECA) is expected to be required for the proposed stormwater management facility.

5.0 CONCLUSIONS

1. An additional private fire hydrant is not required.

2. There is an adequate water supply for firefighting from the existing water distribution system.

3. The existing fire hydrants can contribute a flow which is greater than the required fire flow.

4. The water pressure can be above 80 psi at times; therefore, a pressure reducing valve (PRV) immediately downstream of the water meter will be required.

5. The post-development sanitary flow rate will be adequately handled by the proposed sanitary sewer system.

6. The proposed redevelopment is expected to have an acceptable impact on the existing sanitary sewers.

7. A proposed oil grit separator (OGS) manhole will achieve an enhanced (80% TSS removal) level of protection.

8. An Erosion & Sediment Control Plan has been developed to be implemented during construction.

9. The proposed stormwater management facility will restrict post-development release rate to 34% less than the pre-development flow rate during the 100-year event and equal to the maximum allowable release rate; and during the 5-year event, 34% less than the pre-development flow rate and 16% less than the maximum allowable release rate.

10. To achieve the maximum allowable release rate, a maximum storage volume of 309.69 m^3 is required and provided, which is 28% more than the minimum required by the J.L. Richards report.

11. The reduction in flow is expected to have a positive impact on the existing downstream storm sewers.

12. The peak unrestricted flow rates during the 2-year event will be adequately handled by the proposed private site storm sewer system.

13. The MECP is expected to consider the property 'industrial lands'; therefore, an ECA is expected to be required for the proposed stormwater management facility.

Prepared by D.B. Gray Engineering Inc.

APPENDIX A

WATER SERVICING

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

May 15, 2025

2500 Palladium Dr

Ottawa, Ontario

FIRE FLOW CALCULATIONS
OBC Method

Q = Required water supply in litres
= KVS_{Total}

K = Water supply coefficient as per OBC A-3.2.5.7. Table 1
= 27 F-2 Building of noncombustible construction with fire separations, but with no fire resistance ratings.

V = Building volume in cubic meters

	Floor Area (sq.m)	Height (m)	Volume (cu.m)
Ground floor:	139	3.44	478
Ground floor(high ceilings):	714	7.66	5,469
Mezzanine	139	4.22	587
			6,534

S_{Total} = Total of spatial coefficients from exposure distances
= $1.0 + S_{Side\ 1} + S_{Side\ 2} + S_{Side\ 3} + S_{Side\ 4}$

	Spatial Coefficient	Exposure Distance (m)	
$S_{Side\ 1}$	0.0	24.7	(to centerline of Autopark Dr)
$S_{Side\ 2}$	0.0	24.3	(to end of development area)
$S_{Side\ 3}$	0.0	29.8	(to South property line)
$S_{Side\ 4}$	0.0	16.4	(to East property line)
S_{Total}	1.0		

Q = 176,417 L
= 5,400 L/min as per OBC A-3.2.5.7. Table 2
= 90 L/s

DATE	16-Jun-25

CLIENT	Pri-Tec Construction Ltd.	INSPECTOR NAME	Ilyas Omari
BUILDING NAME	2500 Palladium Drive	COMPANY	Avangard Fire & Life Safety
STREET	2500 Palladium Drive	STREET	2979 Merivale Road
CITY	Kanata, Ontario	CITY	Ottawa, Ontario
SITE CONTACT		PHONE #	(613) 223-2223
PHONE #		LICENSE #	13866906

FIRE HYDRANT FLOW TEST RESULTS

HYDRANT #1 FLOW TEST

FLOW HYDRANT LOCATION: 2500 PALLADIUM UNIT #9

PRESSURE GAUGE HYDRANT LOCATION: 2500 PALLADIUM UNIT #10

DEVICES USED TO MEASURE FLOW/PRESSURE: HOSE MONSTER 25FT x 2.5" HOSE x 1

STATIC PRESSURE (PSI)	NOZZLE SIZE (INCH)	PITOT READING (PSI)	GPM	RESIDUAL PRESSURE (PSI)
90	2.5	50	1186	88

HYDRANT #2 FLOW TEST

FLOW HYDRANT LOCATION:

PRESSURE GAUGE HYDRANT LOCATION:

DEVICES USED TO MEASURE FLOW/PRESSURE:

STATIC PRESSURE (PSI)	NOZZLE SIZE (INCH)	PITOT READING (PSI)	GPM	RESIDUAL PRESSURE (PSI)

HYDRANT #3 FLOW TEST

FLOW HYDRANT LOCATION:

PRESSURE GAUGE HYDRANT LOCATION:

DEVICES USED TO MEASURE FLOW/PRESSURE:

STATIC PRESSURE (PSI)	NOZZLE SIZE (INCH)	PITOT READING (PSI)	GPM	RESIDUAL PRESSURE (PSI)

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

18-Jun-25

2500 Palladium Dr
Ottawa, Ontario

Fire Hydrant Flow Test Calculations

RESIDUAL HYDRANT
2500 PALLADIUM UNIT #9
FLOW HYDRANT
2500 PALLADIUM UNIT #10

Measured Static	90	psi	
Measured Residual	88	psi	
Measured Flowrate	1186	USgpm	
Calculated Flowrate at:	138	kPa	
	20.0	psi	
	8088	USgpm	Hazen-Williams
	30612	l/min	
	510	L/s	
Calculated Flowrate at:	601	kPa	
	87	psi	
	1427	USgpm	Hazen-Williams
	5400	l/min	
	90	L/s	

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

15-May-25
REVISED 29-May-25

2500 Palladium Dr

Ottawa, Ontario

Water Demand

LIGHT INDUSTRIAL DAILY AVERAGE:	35,000	L /gross ha / day (as per Ottawa Design Guidelines)				
	0.72	ha (land area)				
	25200	L/day				
	24	hour day				
	17.5	L/min	0.3	L/s	4.6	USgpm
MAXIMUM DAILY DEMAND:	1.5	(Peaking Factor as per Ottawa Design Guidelines)				
	26.3	L/min	0.4	L/s	6.9	USgpm
MAXIMUM HOURLY DEMAND:	1.8	(Peaking Factor as per Ottawa Design Guidelines)				
	47.3	L/min	0.8	L/s	12.5	USgpm

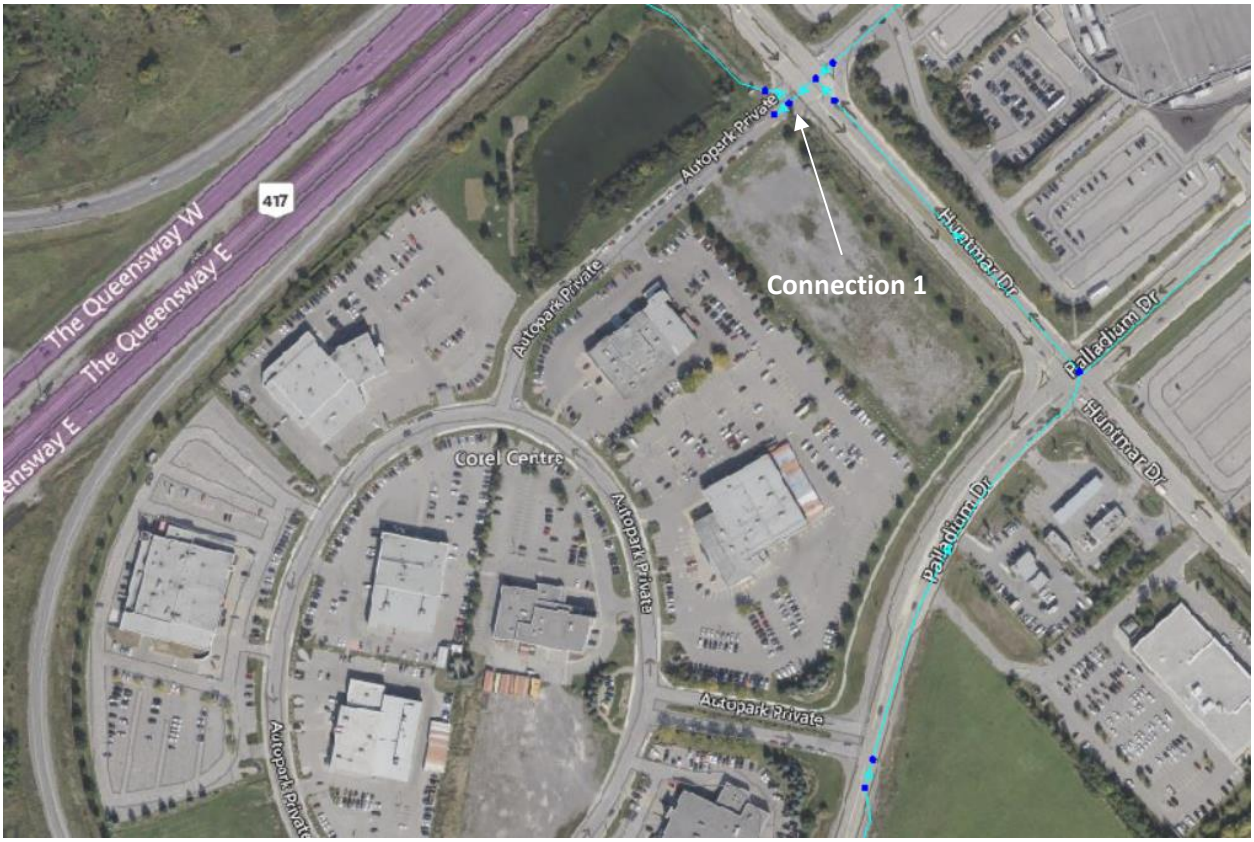
			Static Pressure at Water Meter			
Elevation of Water Meter:	104.60	m ASL				
Finish Floor Elevation:	103.70	m ASL				
MAXIMUM HGL:	162.6	m ASL	82	psi	569	kPa
MINIMUM HGL:	155.6	m ASL	73	psi	500	kPa

Boundary Conditions
2500 Palladium Drive

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	18	0.30
Maximum Daily Demand	24	0.40
Peak Hour	48	0.80
Fire Flow Demand #1	5,400	90.00

Location



Results

Connection 1 – Autopark Priv. & Huntmar Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	162.6	86.0
Peak Hour	155.6	76.0
Max Day plus Fire Flow #1	155.6	76.0

[1] Ground Elevation = 102.1 m

Note:

1. The Infrastructure and Waster Services Department (IWSD) has recently updated their water modelling software. Any perceived significant difference between previously received boundary condition (BC) results and newly received BC results can be attributed to this change.
2. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
   a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
   b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

25-Jun-25

2500 Palladium Dr
Ottawa, Ontario
Peak Water Demand

WATER FIXTURE VALUE
(AWWA Manual M22 - Sizing Water Service Lines and Meters)

	No.	F.V.	Total
Bathtub		8	0
Toilet - tank	4	6	24
Toilet - flush valve		24	0
Lavs.	4	1.5	6
Bidet		2	0
Urinal - wall flush valve		10	0
Shower		2.5	0
K. Sink	1	1.8	1.8
Dishwasher		1.3	0
Clothes Washer		3	0
Commercial Sink		4	0
J. Sink	1	4	4
Commercial Dishwasher		4	0
Commercial Washer		4	0
Hose 1/2 in	5	5	25
Hose 3/4 in		12	0
			60.8

Peak Demand (fig 4-2 or 4-3 AWWA M22)			44	USgpm
Pressure @ Meter	552	kPa	80	psi (assumed)
Pressure Factor (table 4-1 AWWA M22)			1.17	
Peak Demand			51	USgpm
Irrigation - hose 1/2 in	0		0	USgpm (includes pressure factor)

(assumes hose bibs operating in non peak hours)

TOTAL PEAK DEMAND	195	l/min	51	USgpm	3.2	l/s
Nominal Size			2.0	in	50	mm
			5.4	ft/s	1.7	m/s

APPENDIX B

SANITARY SERVICING

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

SANITARY SEWER CALCULATIONS

2500 Palladium Dr
Prep Shop
Ottawa, Ontario

June 16, 2025

Residential Average Daily Flow:	280	L/capita/day	Residential Peaking Factor:	Harmon Formula
Commercial Average Daily Flow:	28,000	L/ha/day	Harmon Formula Correction Factor:	0.8
Institutional Average Daily Flow:	28,000	L/ha/day	Commercial Peaking Factor:	1.5
Light Industrial Average Daily Flow:	35,000	L/ha/day	Institutional Peaking Factor:	1.5
Heavy Industrial Average Daily Flow:	55,000	L/ha/day	Industrial Peaking Factor:	Ministry of the Environment
Infiltration Allowance:	0.33	L/s/ha	Manning's Roughness Coefficient:	0.013

		Residential													Non-Residential				Infiltration			Q	Sewer Data						
		Individual									Cumulative				Individual			Cumulative	Individual	Cumulative		Total							
Location		Single	Semi		Apartment				Area	Population	Area	Population	Peaking	Flow Rate	Area	Daily Flow	Peaking	Flow Rate	Area	Area	Flow Rate	Flow Rate	Length	Nominal Diameter	Actual Diameter	Slope	Velocity	Q_{Full} Capacity	
From	To	Family	Detached	Duplex	(1 Bed)	(2 Bed)	(3 Bed)	(Average)	(ha)		(ha)		Factor	(L/s)	(ha)	L/ha/day	Factor	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(m)	(mm)	(mm)	(%)	(m/s)	(L/s)	Q / Q_{Full}
		ppu = 3.4	ppu = 2.7	ppu = 2.3	ppu = 1.4	ppu = 2.1	ppu = 3.1	ppu = 1.8																					
Building	MH SA.1									0	0.0000	0	3.2	0.00	0.7223	28,000	1.5	0.35	0.7223	0.7223	0.24	0.59	5	150	147	1	0.85	14.43	0.04
MH SA.1	MH SA.2									0	0.0000	0	3.2	0.00	0.0000	28,000	1.5	0.35	0.0000	0.7223	0.24	0.59	64.2	150	147	0.65	0.69	11.63	0.05
																				Existing 150mm Sanitary Service:			150	147	1.00	0.85	14.43	

APPENDIX C

STORMWATER MANAGEMENT

CDS ESTIMATED NET ANNUAL TSS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
AND A FINE PARTICLE SIZE DISTRIBUTION

Echelon Environmental
55 Albert Street, Suite #200 | Markham, ON, L3P 2T4
www.echelonenvironmental.ca info@echelonenvironmental.ca 905-948-0000

Project Name:	2500 Palladium Dr.	**Engineer:**	**D.B. Gray Engineering Inc.**
Location:	Ottawa, ON	**Contact:**	Laurent Brosseau
OGS ID:	1	**Report Date:**	11-Jun-25

Area:	0.6498	ha	**Rainfall Station #**	215	
C Value:	0.82		**Particle Size Distribution**	FINE	
CDS Model:	PMSU2015-4		**CDS Treatment Capacity:**	20	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.5	9.2%	9.2%	0.7	0.7	3.7	97.8	9.0
1.0	10.6%	19.8%	1.5	1.5	7.3	96.8	10.3
1.5	9.9%	29.7%	2.2	2.2	11.0	95.7	9.5
2.0	8.4%	38.1%	2.9	2.9	14.6	94.7	7.9
2.5	7.7%	45.8%	3.7	3.7	18.3	93.6	7.2
3.0	5.9%	51.7%	4.4	4.4	22.0	92.6	5.5
3.5	4.4%	56.1%	5.2	5.2	25.6	91.5	4.0
4.0	4.7%	60.7%	5.9	5.9	29.3	90.5	4.2
4.5	3.3%	64.0%	6.6	6.6	32.9	89.4	3.0
5.0	3.0%	67.1%	7.4	7.4	36.6	88.4	2.7
6.0	5.4%	72.4%	8.8	8.8	43.9	86.3	4.6
7.0	4.4%	76.8%	10.3	10.3	51.3	84.2	3.7
8.0	3.5%	80.3%	11.8	11.8	58.6	82.1	2.9
9.0	2.8%	83.2%	13.3	13.3	65.9	80.0	2.3
10.0	2.2%	85.3%	14.7	14.7	73.2	77.9	1.7
15.0	7.0%	92.3%	22.1	20.1	100.0	63.9	4.5
20.0	4.5%	96.9%	29.4	20.1	100.0	47.9	2.2
25.0	1.4%	98.3%	36.8	20.1	100.0	38.3	0.6
30.0	0.7%	99.0%	44.2	20.1	100.0	32.0	0.2
35.0	0.5%	99.5%	51.5	20.1	100.0	27.4	0.1
40.0	0.5%	100.0%	58.9	20.1	100.0	24.0	0.1
45.0	0.0%	100.0%	66.3	20.1	100.0	21.3	0.0
50.0	0.0%	100.0%	73.6	20.1	100.0	19.2	0.0
							86.0

Removal Efficiency Adjustment[2] = 6.5%
Predicted Net Annual TSS Removal Efficiency = 80%
Predicted Annual Rainfall Treated = 96%

1 - Based on 42 years of hourly rainfall data from Canadian Station 6105976, Ottawa ON
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.
3 - CDS Efficiency based on testing conducted at the University of Central Florida
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

CDS PMSU 2015-4-C DESIGN NOTES

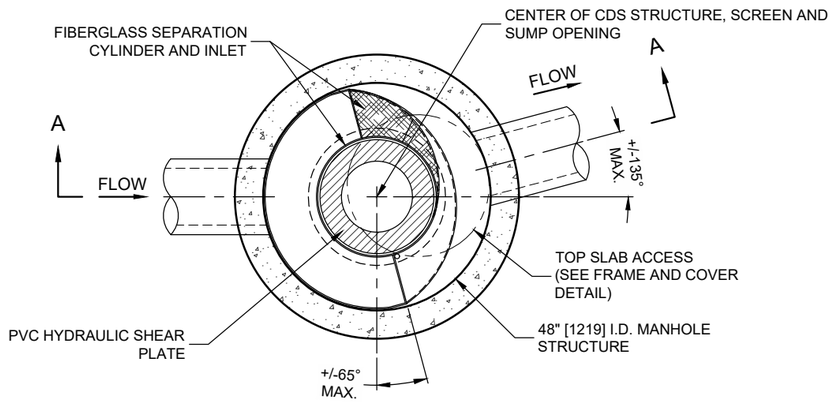
THE STANDARD CDS PMSU 2015-4-C CONFIGURATION IS SHOWN.

ANTI-BUOYANCY SLAB MAY BE INCLUDED (NOT SHOWN).

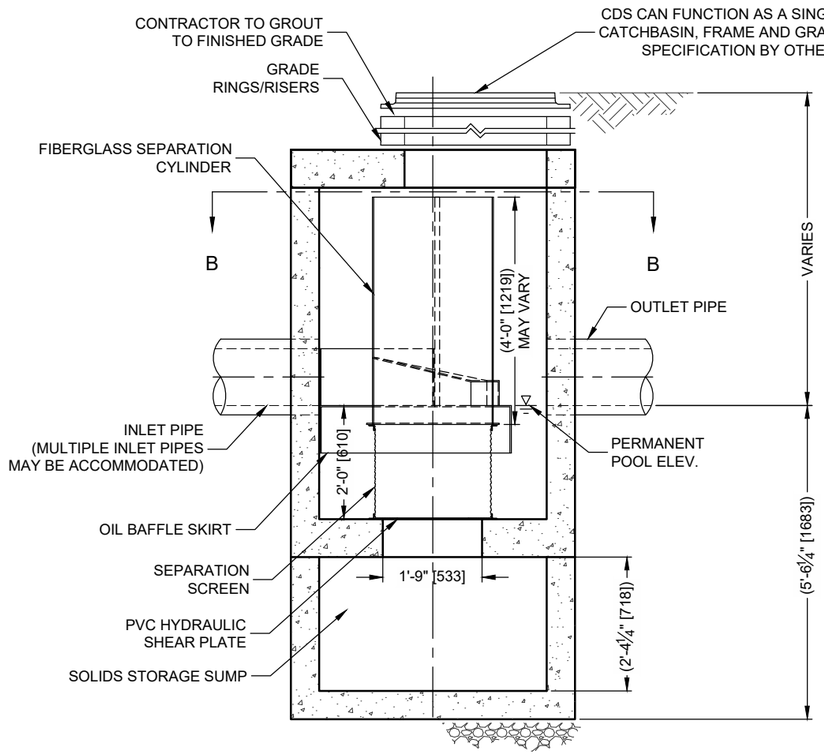
SUMP DEPTH SHOWN IS TYPICAL, CAN BE EXTENDED AS REQUIRED.

HYDRAULIC CHARACTERISTICS VARY BASED ON PIPE SIZE, MATERIAL, AND CDS UNIT SELECTION. FOR CUSTOM HYDRAULIC ANALYSIS PLEASE CONTACT ECHELON ENVIRONMENTAL.

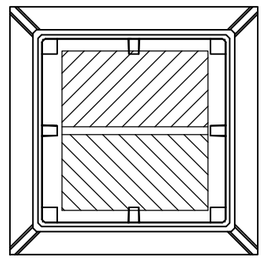
FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT ECHELON ENVIRONMENTAL.



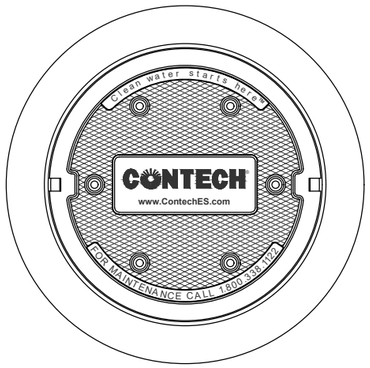
PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND GRATE
(DIMENSIONS VARIES)
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET HS20 (AASHTO M 306) AND BE CAST WITH THE CONTECH LOGO.
6. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

ECHELON ENVIRONMENTAL
55 ALBERT STREET, MARKHAM ON L3P2T4
CONTACT: INFO@ECHELONENVIRONMENTAL.CA
905-948-0000

CONTECH ENGINEERED SOLUTIONS LLC

CDS PMSU 2015-4-C
ONLINE CDS
STANDARD DETAIL

DATE: 13-FEB-25
REVISION:1
DRAWN BY: PG

SUMMARY TABLES

100-YEAR EVENT

Drainage Area	Pre-Development Flow Rate (L/s)	Maximum Allowable Release Rate (L/s)	Minimum Storage Volume Required (cu.m)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	-	-	9.00	-	-
AREA II	-	-	-	22.91	309.69	309.69
TOTAL	54.49	31.90	241.71	31.90	309.69	309.69

5-YEAR EVENT

Drainage Area	Pre-Development Flow Rate (L/s)	Maximum Allowable Release Rate (L/s)	Minimum Storage Volume Required (cu.m)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	-	-	4.20	-	-
AREA II	-	-	-	22.58	135.79	135.79
TOTAL	40.60	31.90	241.71	26.78	135.79	135.79

June 26, 2025

2500 Palladium Dr

Ottawa, Ontario

STORMWATER MANAGEMENT CALCULATIONS
Modified Rational Method

100-YEAR EVENT

PRE-DEVELOPMENT CONDITIONS

Total Catchment Area:	7,223	sq.m

C	
0.375	1.25 x Woodland or Pasture - Flat - Clay and Silt Loam as per Table 5.7 Ottawa Sewer Design Guidelines

Airport Formula

$$Tc = \frac{3.26 \cdot (1.1 - C) \cdot L^{1/2}}{Sw^{0.33}} \text{ min}$$

Runoff Coefficient (C):	0.375	
Sheet Flow Distance (L):	110	m
Slope of Land (Sw):	0.2	%
Time of Concentration (Sheet Flow):	42	min
Rainfall Intensity (i):	72	mm/hr
100-Year Pre-Development Flow Rate (2.78AiC):	54.49	L/s

MAXIMUM ALLOWABLE RELEASE RATE

As per SWM report prepared by J.L. Richards & Associates Limited,
there is a maximum release rate of 84L/s per lot for the 100yr storm

Lot 4 area:	19022	sq.m
Development area:	7223	sq.m
Percentage of Lot 4 being developed:	38%	
Maximum allowable release rate for developed area:	31.90	L/s

STORAGE VOLUME REQUIREMENT

As per SWM report prepared by J.L. Richards & Associates Limited,
there is an on-site storage volume requirement based on post-development areas

			C	A x C
Roof Area:	0.0853	ha	1.00	0.085
Hard Area:	0.4922	ha	0.90	0.443
Soft Area:	0.1448	ha	0.20	0.029
Total Catchment Area:	0.7223	ha	0.77	0.557

Volume if A x C <1.6 = (632.094 x "A x C") - 110.52

Volume if A x C >1.6 = $10^{(("A \times C" \times 0.3437)+2.4051)}$

Storage volume Required= 241.71 cu.m

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(100-YEAR EVENT)

			C
Roof Area:	0	sq.m	1.00
Hard Area:	0	sq.m	1.00
Gravel Area:	0	sq.m	1.00
Soft Area:	725	sq.m	0.25
Total Catchment Area:	725	sq.m	0.25
Area (A):	725	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coeficient (C):	0.25		
Flow Rate (2.78AiC):	9.00	L/s	

DRAINAGE AREA II

(100-YEAR EVENT)

			C
Roof Area:	853	sq.m	1.00
Hard Area:	4,922	sq.m	1.00
Gravel Area:	0	sq.m	1.00
Soft Area:	723	sq.m	0.25
Total Catchment Area:	6,498	sq.m	0.92

Water Elevation:	103.40	m
Head:	2.58	m
Centroid of ICD Orifice: (ICD in Outlet Pipe of CB/MH-15)	100.82	m
Invert of Outlet Pipe of CB/MH-15:	100.78	m
Orifice Diameter:	82	mm
Orifice Area:	5,281	sq.mm
Discharge Coefficient:	0.61	
Maximum Release Rate:	22.91	L/s

CB/MH	Top Area (sq.m)	Depth (m)	Volume	
CB-1	275	0.20	18.19	cu.m
CB-2	248	0.20	16.37	cu.m
CB-3	252	0.20	16.63	cu.m
CB-4	166	0.16	8.78	cu.m
CB-5	689	0.20	45.54	cu.m
CB/MH-6	235	0.20	15.53	cu.m
CB-8	381	0.20	25.20	cu.m
CB/MH-9	143	0.15	7.05	cu.m
CB-10	215	0.20	14.23	cu.m
CB-11	132	0.20	8.70	cu.m
CB/MH-12	176	0.17	9.89	cu.m
CB-13	169	0.20	11.17	cu.m
CB/MH-14	82	0.14	3.78	cu.m
CB/MH-15	375	0.20	24.82	cu.m

Chamber Storage

No. of Chambers	Volume Per Chamber	No. of Rows	No. of End Caps	Volume Per End Cap	Volume	
7	3.22	1	2	0.43	23.40	cu.m

Clear Stone Storage

Length	Width	Depth	Volume	40% Voids	
16.891	2.576	1.46	40.13	16.05	cu.m

DRAINAGE AREA II (Continued)

(100-YEAR EVENT)

CB/MH Storage

CB/MH	Invert	Size	Volume	
CB-1	101.12	0.61	0.85	cu.m
CB-2	101.10	0.61	0.86	cu.m
CB-3	101.13	0.61	0.84	cu.m
CB-4	101.04	0.61	0.88	cu.m
CB-5	101.02	0.61	0.88	cu.m
CB/MH-6	101.03	1.219	2.76	cu.m
CB/MH-7	101.24	1.219	2.52	cu.m
CB-8	100.97	0.61	0.90	cu.m
CB/MH-9	100.89	1.219	2.93	cu.m
CB-10	101.21	0.61	0.81	cu.m
CB-11	101.06	0.61	0.87	cu.m
CB/MH-12	101.24	1.219	2.52	cu.m
CB-13	100.90	0.61	0.93	cu.m
CB/MH-14	100.93	1.219	2.88	cu.m
CB/MH-15	100.78	1.219	3.06	cu.m

Pipe Storage

From	Invert	To	Invert	Length	Diameter	Volume	
CB-1	101.12	CB/MH-6	101.03	19.1	250	0.94	cu.m
CB-2	101.10	pipe	101.20	15.6	250	0.77	cu.m
CB-3	101.13	pipe	100.98	31.4	250	1.54	cu.m
CB-4	101.04	pipe	101.01	4.3	250	0.21	cu.m
CB-5	101.02	pipe	100.95	14.4	250	0.71	cu.m
CB/MH-6	101.03	CB/MH-9	100.89	39.0	300	2.76	cu.m
CB-8	100.97	pipe	100.92	9.2	250	0.45	cu.m
CB/MH-9	100.89	CB/MH-15	100.78	39.3	375	4.34	cu.m
CB-10	101.21	pipe	101.16	9.5	250	0.47	cu.m
CB-11	101.06	pipe	101.00	9.4	250	0.46	cu.m
CB/MH-12	101.24	CB/MH-14	100.93	70.3	250	3.45	cu.m
CB-13	100.90	pipe	100.87	4.6	250	0.23	cu.m
CB/MH-14	100.93	CB/MH-15	100.78	34.0	250	1.67	cu.m
CB/MH-7	101.24	CB/MH-9	101.20	17.1	375	1.89	cu.m

Maximum Volume Stored: 309.69 cu.m

Maximum Volume Required: 309.69 cu.m

DRAINAGE AREA II (Continued)

(100-YEAR EVENT)

Time (min)	i (mm/hr)	2.78AiC (L/s)	50% of ICD Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	179	295.64	11.45	284.19	170.51
15	143	236.59	11.45	225.14	202.62
20	120	198.60	11.45	187.15	224.58
25	104	171.94	11.45	160.49	240.73
30	92	152.11	11.45	140.65	253.17
35	83	136.73	11.45	125.27	263.07
40	75	124.42	11.45	112.96	271.11
45	69	114.33	11.45	102.87	277.76
50	64	105.89	11.45	94.43	283.30
55	60	98.72	11.45	87.27	287.98
60	56	92.54	11.45	81.09	291.93
65	53	87.17	11.45	75.71	295.28
70	50	82.44	11.45	70.98	298.13
100	38	62.76	11.45	51.30	307.81
130	31	51.16	11.45	39.70	309.69
160	26	43.44	11.45	31.99	307.11
190	23	37.91	11.45	26.46	301.62
220	20	33.73	11.45	22.28	294.09
250	18	30.46	11.45	19.00	285.04
280	17	27.81	11.45	16.36	274.80
310	15	25.63	11.45	14.17	263.62
340	14	23.79	11.45	12.34	251.66
370	13	22.22	11.45	10.77	239.06
400	13	20.87	11.45	9.41	225.91
460	11	18.64	11.45	7.18	198.25
520	10	16.87	11.45	5.42	169.13
580	9	15.44	11.45	3.99	138.87
640	9	14.26	11.45	2.80	107.68
700	8	13.26	11.45	1.80	75.71
760	7	12.40	11.45	0.95	43.09
820	7	11.66	11.45	0.20	9.92
880	7	11.00	11.00	0.00	0.00
940	6	10.43	10.43	0.00	0.00
1000	6	9.92	9.92	0.00	0.00

5-YEAR EVENT

PRE-DEVELOPMENT CONDITIONS

Total Catchment Area:	7,223	sq.m

C	
0.30	Woodland or Pasture - Flat - Clay and Silt Loam as per Table 5.7 Ottawa Sewer Design Guidelines

Airport Formula

$$Tc = \frac{3.26 \cdot (1.1 - C) \cdot L^{1/2}}{Sw^{0.33}} \text{ min}$$

Runoff Coefficient (C):	0.30	
Sheet Flow Distance (L):	110	m
Slope of Land (Sw):	0.2	%
Time of Concentration (Sheet Flow):	47	min
Rainfall Intensity (i):	67	mm/hr
5-Year Pre-Development Flow Rate (2.78AiC):	40.60	L/s

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(5-YEAR EVENT)

			C
Roof Area:	0	sq.m	0.90
Hard Area:	0	sq.m	0.90
Gravel Area:	0	sq.m	0.80
Soft Area:	725	sq.m	0.20
Total Catchment Area:	725	sq.m	0.20
Area (A):	725	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	104	mm/hr	
Runoff Coeficient (C):	0.20		
Flow Rate (2.78AiC):	4.20	L/s	

DRAINAGE AREA II

(5-YEAR EVENT)

			C
Roof Area:	853	sq.m	0.90
Hard Area:	4,922	sq.m	0.90
Gravel Area:	0	sq.m	0.80
Soft Area:	723	sq.m	0.20
Total Catchment Area:	6,498	sq.m	0.82

Water Elevation:	103.32	m
Head:	2.50	m
Centroid of ICD Orifice: (ICD in Outlet Pipe of CB/MH-15)	100.82	m
Invert of Outlet Pipe of CB/MH-15:	100.78	m
Orifice Diameter:	82	mm
Orifice Area:	5,281	sq.mm
Discharge Coefficient:	0.61	
Maximum Release Rate:	22.58	L/s

CB/MH	Top Area (sq.m)	Depth (m)	Volume	
CB-1	125	0.12	5.21	cu.m
CB-2	102	0.12	4.26	cu.m
CB-3	100	0.12	4.14	cu.m
CB-4	48	0.08	1.35	cu.m
CB-5	273	0.12	11.33	cu.m
CB/MH-6	89	0.12	3.70	cu.m
CB-8	151	0.12	6.27	cu.m
CB/MH-9	36	0.07	0.90	cu.m
CB-10	102	0.12	4.22	cu.m
CB-11	190	0.12	7.91	cu.m
CB/MH-12	25	0.09	0.79	cu.m
CB-13	14	0.12	0.57	cu.m
CB/MH-14	18	0.06	0.39	cu.m
CB/MH-15	41	0.12	1.69	cu.m

Chamber Storage

No. of Chambers	Volume Per Chamber	No. of Rows	No. of End Caps	Volume Per End Cap	Volume	
7	3.22	1	2	0.43	23.40	cu.m

Clear Stone Storage

Length	Width	Depth	Volume	40% Voids	
16.891	2.576	1.46	40.13	16.05	cu.m

DRAINAGE AREA II (Continued)

(5-YEAR EVENT)

CB/MH Storage

CB/MH	Invert	Size	Volume	
CB-1	101.12	0.61	0.82	cu.m
CB-2	101.10	0.61	0.83	cu.m
CB-3	101.13	0.61	0.82	cu.m
CB-4	101.04	0.61	0.85	cu.m
CB-5	101.02	0.61	0.86	cu.m
CB/MH-6	101.03	1.22	2.68	cu.m
CB/MH-7	101.24	1.22	2.43	cu.m
CB-8	100.97	0.61	0.88	cu.m
CB/MH-9	100.89	1.22	2.84	cu.m
CB-10	101.21	0.61	0.79	cu.m
CB-11	101.06	0.61	0.84	cu.m
CB/MH-12	101.24	1.22	2.43	cu.m
CB-13	100.90	0.61	0.90	cu.m
CB/MH-14	100.93	1.22	2.79	cu.m
CB/MH-15	100.78	1.22	2.97	cu.m

Pipe Storage

From	Invert	To	Invert	Length	Diameter	Volume	
CB-1	101.12	CB/MH-6	101.03	19.1	250	0.94	cu.m
CB-2	101.10	pipe	101.20	15.6	250	0.77	cu.m
CB-3	101.13	pipe	100.98	31.4	250	1.54	cu.m
CB-4	101.04	pipe	101.01	4.3	250	0.21	cu.m
CB-5	101.02	pipe	100.95	14.4	250	0.71	cu.m
CB/MH-6	101.03	CB/MH-9	100.89	39.0	300	2.76	cu.m
CB-8	100.97	pipe	100.92	9.2	250	0.45	cu.m
CB/MH-9	100.89	CB/MH-15	100.78	39.3	375	4.34	cu.m
CB-10	101.21	pipe	101.16	9.5	250	0.47	cu.m
CB-11	101.06	pipe	101.00	9.4	250	0.46	cu.m
CB/MH-12	101.24	CB/MH-14	100.93	70.3	250	3.45	cu.m
CB-13	100.90	pipe	100.87	4.6	250	0.23	cu.m
CB/MH-14	100.93	CB/MH-15	100.78	34.0	250	1.67	cu.m
CB/MH-7	101.24	CB/MH-9	101.20	17.1	375	1.89	cu.m

Maximum Volume Stored: 135.79 cu.m

Maximum Volume Required: 135.79 cu.m

DRAINAGE AREA II (Continued)

(5-YEAR EVENT)

Time (min)	i (mm/hr)	2.78AiC (L/s)	50% of ICD Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	104	154.74	11.29	143.45	86.07
15	84	124.09	11.29	112.80	101.52
20	70	104.33	11.29	93.04	111.65
25	61	90.44	11.29	79.15	118.72
30	54	80.09	11.29	68.80	123.84
35	49	72.05	11.29	60.76	127.61
40	44	65.62	11.29	54.33	130.39
45	41	60.34	11.29	49.05	132.43
50	38	55.92	11.29	44.63	133.89
55	35	52.16	11.29	40.87	134.88
60	33	48.92	11.29	37.64	135.49
65	31	46.10	11.29	34.81	135.77
70	29	43.62	11.29	32.33	135.79
100	22	33.28	11.29	21.99	131.93
130	18	27.17	11.29	15.88	123.87
160	16	23.10	11.29	11.81	113.40
190	14	20.18	11.29	8.89	101.36
220	12	17.97	11.29	6.68	88.21
250	11	16.24	11.29	4.95	74.24
280	10	14.84	11.29	3.55	59.62
310	9	13.68	11.29	2.39	44.49
340	9	12.71	11.29	1.42	28.93
370	8	11.88	11.29	0.59	13.03
400	8	11.16	11.16	0.00	0.00
460	7	9.97	9.97	0.00	0.00
520	6	9.04	9.04	0.00	0.00
580	6	8.28	8.28	0.00	0.00
640	5	7.64	7.64	0.00	0.00
700	5	7.11	7.11	0.00	0.00
760	4	6.65	6.65	0.00	0.00
820	4	6.26	6.26	0.00	0.00
880	4	5.91	5.91	0.00	0.00
940	4	5.60	5.60	0.00	0.00
1000	4	5.33	5.33	0.00	0.00

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

STORM SEWER CALCULATIONS

nal Method

2-YEAR EVENT

: 2500 Palladium Dr
Ottawa, Ontario

June 26, 2025

Manning's Roughness Coefficient: 0.013

Location		Individual					Cumulative				Sewer Data							
From	To	Roof C = 0.90 (ha)	Hard C = 0.90 (ha)	Gravel C = 0.80 (ha)	Soft C = 0.20 (ha)	2.78AC	2.78AC	Time (min)	Rainfall Intensity (mm/hr)	Q Flow Rate (L/s)	Length (m)	Nominal Diameter (mm)	Actual Diameter (mm)	Slope (%)	Velocity (m/s)	Q_{Full} Capacity (L/s)	Time (min)	Q / Q_{Full}
CB-1	CB/MH-6		0.0480			0.1201	0.1201	10.00	77	9.2	19.1	250	251	0.43	0.80	39.4	0.4	0.23
CB-2	CB/MH-6		0.0257		0.0018	0.0653	0.0653	10.00	77	5.0	15.6	250	251	0.43	0.80	39.4	0.3	0.13
CB-3	CB/MH-6		0.0261		0.0098	0.0708	0.0708	10.00	77	5.4	31.4	250	251	0.43	0.80	39.4	0.7	0.14
CB-4	CB/MH-6	0.0105	0.0287			0.0981	0.0981	10.00	77	7.5	4.3	250	251	0.43	0.80	39.4	0.1	0.19
CB-5	CB/MH-6	0.0111	0.0814		0.0054	0.2344	0.2344	10.00	77	18.0	14.4	250	251	0.43	0.80	39.4	0.3	0.46
CB/MH-6	CB/MH-9		0.0242			0.0605	0.6492	10.66	74	48.3	39	300	299	0.34	0.80	55.9	0.8	0.86
CB-8	CB/MH-9	0.0345	0.0535		0.0155	0.2288	0.2288	10.00	77	17.6	9.2	250	251	0.43	0.80	39.4	0.2	0.45
CB/MH-7	CB/MH-9					0.0000	0.0000	10.00	77	0.0	17.1	375	366	0.26	0.80	83.8	0.4	0.00
CB/MH-9	CB/MH-15	0.0292	0.0272			0.1411	1.0191	11.47	72	72.9	39.3	375	366	0.26	0.80	83.8	0.8	0.87
CB-10	CB/MH-12		0.0477		0.0029	0.1210	0.1210	10.00	77	9.3	9.5	250	251	0.43	0.80	39.4	0.2	0.24
CB-11	CB/MH-12		0.0368		0.0073	0.0961	0.0961	10.00	77	7.4	9.4	250	251	0.43	0.80	39.4	0.2	0.19
CB/MH-12	CB/MH-14		0.0203		0.0019	0.0518	0.2689	10.20	76	20.5	70.3	250	251	0.43	0.80	39.4	1.5	0.52
CB-13	CB/MH-14		0.0201		0.0104	0.0561	0.0561	10.00	77	4.3	4.6	250	251	0.43	0.80	39.4	0.1	0.11
CB/MH-14	CB/MH-15		0.0101		0.0019	0.0263	0.3513	11.67	71	24.9	34	250	251	0.43	0.80	39.4	0.7	0.63
CB/MH-15	MH-16		0.0423		0.0155	0.1145	1.4849	12.38	69	102.1	10.7	375	366	0.4	0.99	103.9	0.2	0.98
							FLOW THROUGH ICD:			21.44	10.7	375	366	0.40	0.99	103.9	0.2	0.21
MH-16	MH-17					0.0000	1.4849	12.56	68	101.3	9.8	375	366	0.4	0.99	103.9	0.2	0.97
							RESTRICTED FLOW:			21.44	9.8	375	366	0.40	0.99	103.9	0.2	0.21
									Existing 375 mm Storm Service:			375	366	0.31	0.87	91.5		

APPENDIX D

PRE-CONSULTATION MEETING NOTES

File No.: PC2025-0052

March 25, 2025

Sheldon Creek Developments
Via email: josh@sheldoncreek.com

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Application – 2500 Palladium Drive

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on March 6, 2025.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Should you choose, proceed to complete a Phase 2 / Phase 3 Pre-consultation Application Form. Please submit this information together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed is requested with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

3. Please note, if your development proposal changes significantly in scope, design, or density it is recommended that a subsequent pre-consultation application be submitted.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline

the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

Phasing

1. If the intention is for site plan to apply to the entire property (including Phase 2) then we will need interim measures that prevent the parking of vehicles on Phase 2 lands. Armourstone, which is already being used around the perimeter of the site, is a preferred measure over concrete barriers.

2. Consider the future conditions of both Phase 1 and 2 acting as one site in your planning of the first phase.

Landscaping

3. Per Table 188E (j) Only 25% of the frontage may be used for the display of vehicles, balance must be landscaped.

    a. I interpret the policy applying to the 'storage' of any vehicles as well. Unless the parking spaces are designated for employee parking, the 25% must be provided.

4. Where a yard is provided and not used for required driveways, aisles, parking or loading spaces, the whole yard must be landscaped.

5. Please include landscaped islands within the parking area and interspersed along the edges of the site, painted lines are not an acceptable alternative.

Misc.

6. Show snow storage areas on the site plan, ensuring that no required drive aisles, parking, or drainage areas are covered.

Urban Design

Comments:

Submission Requirements

7. An Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation of the submission.

    a. The Urban Design Brief should be structured by generally following the headings highlighted under **Section 3 – Contents of these Terms of Reference**.
8. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of reference (Planning application submission information and materials | City of Ottawa) to prepare these drawings and studies. These include:

    b. Landscape Plan.

Comments on Preliminary Design

9. The following element of the preliminary design are of concern:

    a. Volume of asphalt.

Recommendations

10. We recommend there be soil volume and a tree planted at the end of each line of stacked parking spaces on the site.

11. We recommend additional trees be planted in support of the screening along the ring road surrounding the site.

12. In reference to the future phase of the site which will be more public focused, we recommending finding additional ways to provide a fulsome landscaping scheme, especially around the pedestrian paths of travel, facing the public right of way, and around the main entrance of the future building.

13. We recommend additional landscaping be provided facing the street.

Engineering

Comments:

14. Stormwater Management:

    a. The site must reference to the existing stormwater management design report for the auto park for the stormwater management criteria for this specific site.

15. Sanitary Sewer:

a. There are known sanitary constraints within the local sanitary sewer. The auto park may be near capacity and should reference to the background studies along with recent developments within the auto park to demonstrate that there is adequate capacity. Further discussions with the City are strongly recommended if there are sanitary sewer upgrades that are required.

16. Water

    a. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:
        i. Location of service
        ii. Type of development
        iii. The amount of fire flow required (per OBC or FUS).
        iv. Average daily demand: ___ l/s.
        v. Maximum daily demand: ___l/s.
        vi. Maximum hourly daily demand: ___ l/s.
    b. Water boundary conditions will be provided at the City main and the consultant must anaylsis the private watermain system to ensure there is adequate pressure.

17. The grading and drainage should follow the approved grading plan of the business park, if applicable.

18. The geotechnical report should provide be completed as per the City of Ottawa Geotechnical Design Guidelines.

19. An MECP Environmental Compliance Approval Industrial Sewage Works may be required for the proposed development. A Ministry contact has been provided below but please work with City staff on the need of an application.

    a. Shannon Hamilton-Browne at (613) 521-3450 or Shannon.Hamilton-Browne@ontario.ca

Feel free to contact Rubina Rasool, Project Manager, for follow-up questions.

Noise

Comments:

20. As per the City's Noise Control Guidelines, it is best practice to address noise for the following types of spaces: general offices, reception areas, individual or semi-private office, and retail stores. It is therefore recommended to review the roadway noise for the site due to the proximity to Highway 417 and Palladium Dr

and to ensure mitigation is provided (as required) so that workers and visitors are not adversely affected.

Feel free to contact Josiane Gervais, TPM, for follow-up questions.

Transportation

Comments:

21. A Transportation Impact Assessment (TIA) is not required.

22. You are strongly encouraged to complete and submit the Transportation Demand Management Measures Checklist and the Transportation Demand Management Supportive Development Design and Infrastructure Checklist in support of the application.

23. ROW Protection:

    a. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.

    b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

24. Nearby planned construction and infrastructure projects include road resurfacing is planned with a target start of 1-2 years along Palladium Dr between Convergence St and Huntmar.

25. As the proposed site is commercial, AODA legislation applies.

    a. Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.

    b. Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).

    c. Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements.

26. On site plan:

    a. Show all details of the roads abutting the site; include such items as pavement markings, signage, accesses, on-street parking, and/or sidewalks.

b. Turning movement diagrams recommended for internal movements (loading areas, garbage).

c. Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)

Feel free to contact Josiane Gervais, Transportation Project Manager, for follow-up questions.

Environment

Comments:

27. There are no triggers for an Environmental Impact Study.

28. Bird-Safe Design Guidelines - Please review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf

29. Please consider if there are features that can be added reduce the urban heat island effect (see OP 10.3.3). For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or incorporating building with low heat absorbing materials.Significant environmental features

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

Forestry

Comments:

30. **Tree Conservation Report (TCR)** requirements - The following have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact mark.richardson@ottawa.ca

    a. A Tree Conservation Report (TCR) must be supplied for review

        i. An approved TCR is a requirement of Site Plan approval.

    b. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

        i. The removal of boundary trees will require the permission of the adjoining landowner

ii. The planning forester will accept the site-wide removal of unhealthy, dead, or hazardous trees

c. The TCR must contain 2 separate plans:
   i. Plan/Map 1 - show existing conditions with tree cover information
   ii. Plan/Map 2 - show proposed development with tree cover information.

d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter and health condition.
   i. For ease of review, the Planning Forester suggests that all trees be numbered and referenced in an inventory table.

e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
   i. Compensation may be required for the removal of city owned trees.

g. The removal of trees on a property line will require the permission of both property owners.

h. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
   i. The location of tree protection fencing must be shown on the plan.
   ii. Show the critical root zone of the retained trees.

i. The city encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

31. **Landscape Plan** tree planting requirements - for more information on these requirements please contact mark.richardson@ottawa.ca
   a. Please ensure all retained trees are shown on the LP
   b. Minimum Setbacks
      i. Maintain 1.5m from sidewalk, MUP/cycle track, water service laterals.
      ii. Maintain 2.5m from curb.
      iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.

b. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

c. Tree specifications

    i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

    ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

d. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; if possible, include watering and warranty as described in the specification.

e. No root barriers, dead-man anchor systems, or planters are permitted.

f. No tree stakes unless necessary

g. Hard surface planting

    i. If there are hard surface plantings, a planting detail must be provided.

    ii. Curb style planter is highly recommended.

    iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

    iv. Trees are to be planted at grade.

i. Soil Volume - Please demonstrate as per the **Landscape Plan Terms of Reference** that the available soil volumes for new plantings will meet or exceed the following:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

j. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.

k. The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

l. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years.

m. Page 7 of the Landscape Plan Terms of Reference requires applicants to submit a digital, georeferenced CAD or GIS file of the final approved LP. Please follow this link to review the submission requirements: Feel free to contact Insert Name, Forester, for follow-up questions.

Parkland

Comments:

Parkland Dedication:

32. The amount of required parkland conveyance is to be calculated as per the City of Ottawa Parkland Dedication By-law No.2022-280 (or as amended):

    For conveyance of parkland, cash-in-lieu of conveyance parkland, or combination thereof 2% of the gross land area (commercial & industrial uses).

33. Therefore, Parkland Dedication requirements applies.

Form of Parkland Dedication:

34. PFP will be requesting **cash-in-lieu of conveyance of parkland** for parkland dedication in accordance with the Parkland Dedication By-law.

1st Pre-consultation Preliminary Parkland Dedication Calculation:

35. Parkland conveyance calculations based on information provided/identified in the pre-application consultation, is calculated to be **square meters** as per the table below. The information provided indicated the site area is 4.8 acres (1.942 hectares).

Proposed Use	**Gross Land Area (m^2)**	**Limit of construction Area (m^2)**	**Parkland Dedication Rate**	**Parkland Dedication (m^2)**
Commercial	1.942 hectares	NA	2% of gross land area.	388.4 meters sq

	19,420 meters sq.			
Total				**388.4**

	Total requirement:	388.4 meters square
	Conveyance of Parkland in land:	0.00
	Cash-in-lieu of Conveyance of Parkland:	388.4 meters sq.

- Site Area = 19420 sq.m (as per information provided in pre consult)

36. Please note, if the total area of the site is different than information provided at preconsult, the parkland dedication will be adjusted.

37. Cash-in-lieu of conveyance of parkland will be required prior to registration of the Site Plan Agreement. The Owner shall also pay the parkland appraisal fee as referenced in Schedule "B" of the site plan agreement.

38. CREO will provide an appraisal and PFP will calculate the fee for Schedule "B".

39. Full suite of park conditions will be included when a formal site plan application is submitted.

Reference Documents:

40. Please review the following City of Ottawa reference documents which outline the requirements for parkland conveyance and/or cash-in-lieu of parkland.

    - Official Plan (2021)
    - Parks and Recreation Facilities Master Plan (2021)
    - Park Development Manual, 2nd edition
    - Parkland Dedication By-Law (2022-280) and Planning Act amendments
    - City of Ottawa Standard Parks Conditions

Please note that the park comments are preliminary and will be finalized (and subject to change) upon receipt of accurate information on the area of the site, the development application and the requested supporting documentation.

Feel free to contact Diane Emmerson, Parks Planner, for follow-up questions.

Other

41. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.

    a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. The timing of an updated report to Committee is unknown at this time, and updates will be shared when they are available.

    b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

42. Under the Affordable Housing Community Improvement Plan, a Tax Increment Equivalent Grant (TIEG) program was created to incentivize the development of affordable rental units. It provides a yearly fixed grant for 20 years. The grant helps offset the revenue loss housing providers experience when incorporating affordable units in their developments.

    a. To be eligible for the TIEG program you must meet the following criteria:

        i. the greater of five units OR 15 per cent of the total number of units within the development must be made affordable

        ii. provide a minimum of 15 per cent of each unit type in the development as affordable

        iii. enter into an agreement with the city to ensure the units maintain affordable for a minimum period of 20 years at or below the city-wide average market rent for the entire housing stock based on building form and unit type, as defined by the Canada Mortgage and Housing Corporation

        iv. must apply after a formal Site Plan Control submission, or Building Permit submission for projects not requiring Site Plan Control, and prior to Occupancy Permit issuance

    b. Please refer to the TIEG information *at* *Affordable housing community improvement plan* / *Plan d'améliorations communautaires pour le*

logement abordable for more details or contact the TIEG coordinator via email at affordablehousingcip@ottawa.ca.

Submission Requirements and Fees

1. Site Plan Control – Complex Application
    a. Additional information regarding fees related to planning applications can be found here.
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
John Bernier, MCIP, RPP
Planner II