

SERVICING & STORMWATER MANAGEMENT REPORT

254 LAKE AVENUE WEST



Project No.: CCO-22-1448

City File No.:

Escape Homes Consulting
115 Blackberry Way
Dunrobin, ON
K0A 1T0

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road
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February 8th, 2023

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Escape Homes to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed residential development, located at 254 Lake Avenue West in the Town of Carleton Place.

The main purpose of this report is to present a servicing and stormwater management design for the development in accordance with the recommendations and guidelines provided by the City of Ottawa (City), the Mississippi Valley Conservation Authority (MVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- CCO-22-1448, C101 – Lot Grading and Drainage Plan
- CCO-22-1448, C102 – Servicing Plan
- CCO-22-1448, C103 – Sediment and Erosion Control Plan
- CCO-22-1448, PRE – Pre-Development Drainage Area Plan (**Appendix 'E'**)
- CCO-22-1448, POST – Post-Development Drainage Area Plan (**Appendix 'F'**)

1.2 Site Description

The property is located at 254 Lake Avenue West within the Town of Carleton Place. It is described as Part of Lots 12 and 13, Concession 11, Geographic Township of Beckwith, and in the County of Lanark. The land in question covers approximately **0.49 ha** and is located south-west of the Mississippi Road and Lake Avenue West intersection. Development is proposed over the full **0.49 ha** of the site. See Site Location Plan in **Appendix A** and topographic survey in **Appendix B** for more details.

1.3 Proposed Development and Statistics

The proposed development consists of four **197.8 m²** residential quadplex units, two **135.4 m²** two-storey detached residences, and a **282.5 m²** two storey semi-detached residence. New parking and drive aisles will be provided with access from Lake Avenue West. The existing site access from Lake Avenue West will remain for the existing building. Refer to **Site Plan** prepared by Stantec Consulting Ltd and included in **Appendix B** for further details.

1.4 Existing Conditions and Infrastructures

The existing site is currently developed as a two-storey detached dwelling and includes an asphalt driveway. The existing building is proposed to be retained within a subdivided plot of land, with the remaining **0.35 ha** being subdivided into 5 parcels of land.

Sewer and watermain mapping collected from the Town of Carleton Place indicate that the following services exist across the property frontages within the adjacent municipal rights-of-way(s):

❖ Water Servicing

- Based on Town of Carleton Place as-builts prepared by Stantec Consulting (Project No. 160401129), a 300 mm diameter watermain was installed along Lake Avenue West to support the Bodnar Lands subdivision.
- In addition, two municipal fire hydrants have been installed along Lake Avenue West to support the Bodnar Lands subdivision.

❖ Wastewater Servicing

- Based on coordination with Town staff, a 200 mm diameter sanitary stub is proposed to be installed within Lyndhurst Street and will be available to service the development. Refer to Town drawing LYNDHURST -2022 drawing PW2-2022-8 for further details.

❖ Stormwater Servicing

- A catchbasin system exists within Lake Avenue West. Based on coordination with Town staff, this storm sewer system often surcharges and overflows into the park.
- The site currently directs stormwater overland towards the shallow roadside ditch along the south side of Lake Avenue.

2.0 BACKGROUND STUDIES

2.1 Background Reports / Reference Information

As-built drawings of existing services, provided by the Town of Carleton Place, within the vicinity of the proposed site were reviewed in order to identify infrastructure available to service the proposed development.

A topographic survey (17446-21) of the site was completed by Annis, O’Sullivan, Vollebekk Ltd and dated June 30th, 2021.

The Site Plan (L100) was prepared by Stantec Consulting Ltd and dated January 27th, 2023 (*Site Plan*).

2.2 Applicable Guidelines and Standards

City of Ottawa:

- ◆ Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. (*Ottawa Sewer Guidelines*)
 - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. (*ISTB-2014-01*)
 - Technical Bulletin PIEDTB-2016-01 City of Ottawa, September 2016. (*PIEDTB-2016-01*)
 - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. (*ISTB-2018-01*)
 - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. (*ISTB-2018-03*)
 - Technical Bulletin ISTB-2019-01 City of Ottawa, January 2019. (*ISTB-2019-01*)
 - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (*ISTB-2019-02*)
- ◆ Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (*Ottawa Water Guidelines*)
 - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (*ISD-2010-2*)
 - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (*ISDTB-2014-02*)
 - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. (*ISTB-2018-02*)

Ministry of Environment, Conservation and Parks:

- ◆ Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. (*MECP Stormwater Design Manual*)
- ◆ Design Guidelines for Sewage Works, Ministry of the Environment, 2008. (*MECP Sewer Design Guidelines*)

3.0 WATERMAIN

3.1 Existing Watermain

There is an existing 300 mm diameter watermain within Lake Avenue West available to service the proposed development. As noted in Section 1.4, there are two fire hydrants fronting the site and installed to service the Bodnar Lands subdivision.

3.2 Proposed Watermain

A new 38 mm diameter water service is proposed to be serviced by a connection to the existing 300 mm watermain within Lake Avenue West for each of the proposed quadplex buildings. A 19 mm diameter water service is proposed to service the detached home from the Lake Avenue West watermain. Each water service contains a water valve located at the property line. The water services have been designed to have a minimum of 2.4 m of cover. Refer to drawing **C102** for a detailed servicing layout.

The Fire Underwriters Survey 1999 (FUS) method was utilized to estimate the required fire flow for the site. Fire flow requirements were calculated per City of Ottawa Technical Bulletin **ISTB-2018-02**. The following parameters were assumed.

- ❖ Type of construction – Wood Frame Construction
- ❖ Occupancy Type – Limited Combustibility
- ❖ Sprinkler Protection – No Sprinkler System

Table 1, below, summarizes the proposed fire flow demands based on the FUS method.

Table 1: Fire Flow Demands

Building	Fire Flow Demand (L/min)	Fire Flow Demand (L/s)
Detached Home (Lot 1 - western)	6,000	100
Quadplex (Lot 2)	8,000	133.33
Quadplex (Lot 3)	8,000	133.33
Quadplex (Lot 4)	8,000	133.33
Quadplex (Lot 5)	8,000	133.33
Semi-Detached Home (Lot 6/7)	7,000	116.66
Detached Home (Lot 8 – eastern)	5,000	83.33

The water demands for the proposed buildings have been calculated to adhere to the *Ottawa Design Guidelines – Water Distribution* manual and can be found in **Appendix ‘C’**. The criteria and corresponding results have been summarized in **Table 2**, below:

Table 2: Water Demands

Design Parameter	Value
Site Area	0.49 ha
Detached Homes	3.4 persons/unit
Average Apartment (Quadplex)	1.8 persons/unit
Residential Peaking Factor (Day)	9.5 x avg. day
Residential Peaking Factor (Hour)	14.3 x avg. day
Average Day Demand	0.14 L/s
Maximum Daily Demand	1.32 L/s
Peak Hourly Demand	1.99 L/s

To confirm the adequacy of fire flow to protect the proposed development, public fire hydrants within 150 m of the site were accounted for per City of Ottawa Technical Bulletin *ISTB 2018-03 Appendix I*. Results can be seen in **Table 3**, below.

Table 3: Fire Protection Confirmation

Buildings	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m (5,700 L/min)	Fire Hydrant(s) within 150m (3,800 L/min)	Combined Fire Flow (L/min.)
Lot 1-3	8,000 L/min (max)	1 public	2 public	12,900
Lot 4-5	8,000 L/min (max)	2 public	-	11,400
Lot 6-8	7,000 L/min (max)	1 public	1 public	9,500

Based on **Table 3**, above, there is enough hydrant coverage to support the calculated fire flow demand of 8,000 L/min. Therefore, additional private hydrants are not anticipated to be required.

The Town provided the static HGL and pressures for the municipal watermain within Lake Avenue West. The results have been summarized in **Table 4**, below. Based on the modelling results, the municipal watermain has sufficient pressures during normal operating scenarios to support development. Refer to **Appendix C** for pressure results provided by Stantec.

Table 4: Watermain Pressures

Scenario	Static HGL at Nearest Junction (m)	Pressure (psi)	Pressure (kPa)
Average Day Demand	184.5	66	437
Peak Hour Demand	182.4	63	458

4.0 SANITARY DESIGN

4.1 Existing Sanitary Sewers

There is an existing 200 mm diameter sanitary sewer located within Lyndhurst Street available to service the development. As noted in Section 1.4, a 200 mm diameter sanitary sewer replacement and extension is proposed. A 200 mm diameter sanitary stub will be available in the boulevard north of Lyndhurst Street to accommodate sanitary servicing from the proposed development.

4.2 Proposed Sanitary Sewer

135 mm diameter sanitary services are proposed to provide servicing to each building. The sanitary services will connect to a new 200 mm diameter gravity sanitary sewer located within the site along the north property line and east side of the existing building lot. The proposed sanitary sewer will lead to a E/One W-series pump station (or equivalent product) at the southeast corner of the site. From the pump station, a sanitary forcemain will then discharge to the 200 mm diameter sanitary stub located in the boulevard north of Lyndhurst Street (forcemain and pump station design by others). Refer to drawing C102 for a detailed sanitary sewer layout.

Table 5, below, summarizes the wastewater design criteria identified by the *Ottawa Sewer Guidelines*.

Table 5: Sanitary Design Criteria

Design Parameter	Value
Average Apartment	1.8 persons/unit
Single Family Home	3.4 persons/unit
Average Daily Demand	280 L/day/person
Residential Peaking Factor	3.68
Extraneous Flow Allowances	0.33 L/s/ha

Table 6, below, summarizes the estimated wastewater flow from the proposed development. Refer to **Appendix D** for detailed calculations.

Table 6: Summary of Estimated Sanitary Flow

Design Parameter	Total Flow (L/S)
Total Estimated Average Dry Weather Flow	0.16
Total Estimated Peak Dry Weather Flow	0.53
Total Estimated Peak Wet Weather Flow	0.67

The full flowing capacity of a 200 mm sanitary service at a 0.32% slope is estimated to be **19.36 L/s**. Per **Table 4**, above, a peak wet weather flow of **0.67 L/s** will be conveyed within the 200 mm diameter service, therefore the proposed system is sufficient sized for the development. See *Sanitary Sewer Design Sheet* in **Appendix D** of this report for more details.

5.0 STORM SEWER DESIGN

5.1 Existing Storm Sewers

There is an existing catchbasin system along Lake Avenue. Based on coordination with Town staff, this storm sewer system often surcharges and overflows into the park. In addition, a shallow roadside ditch exists north of the site and south of Lake Avenue. Site drainage currently infiltrates and flows overland towards the roadside ditch at the north-west corner of the site.

5.2 Proposed Storm Sewers

The roadside ditch along the south side of Lake Avenue is proposed to be deepened to allow for development, starting approximately 40.8 m west of the site and ending at the Mississippi Road intersection. Deepening the roadside ditch allows for a perimeter drainage system, which will direct site drainage towards the roadside ditch per existing conditions. The perimeter system will contain a layer of riverstone at the surface and a subdrain beneath surrounded in a clear stone trench. The subdrain system will promote. In a large storm event, water will back up through the downstream catchbasin, directing stormwater towards the roadside ditch.

In order to control stormwater to pre-development conditions, two depressed stormwater areas are required. Stormwater will be controlled by the culvert outlets sending stormwater towards the Lake Ave roadside ditch.

Buildings are proposed to be slab on grade. Foundation drainage will need a sump pumped towards landscaped areas of the respective lots and will ultimately discharge to the roadside ditch system. Sump pump system to be designed by others.

Runoff collected on the rooves of the proposed quadplexes will be stored and controlled internally using one roof drain per rooftop. The roof drain(s) will be used to limit the flow from the roof to the specified allowable release rate. For calculation purposes a Watts Accutrol roof drain was used estimate a reasonable roof flow. Other products maybe specified at detailed building design so long as release rates and storage volumes are respected.

See CCO-22-1448 - *POST* and *Storm Sewer Design Sheet* in **Appendix 'F'** of this report for more details. The Stormwater Management design for the subject property will be outlined in Section 6.0.

6.0 PROPOSED STORMWATER MANAGEMENT

6.1 Design Criteria and Methodology

Stormwater management for the proposed site will be maintained through positive drainage away from the proposed buildings and into the re-defined roadside ditch along the south side of Lake Avenue West. On-site swales will capture runoff from the roof (Lot 1, 6-8), parking lot, and landscaped areas. Depressed stormwater areas are proposed to restrict stormwater and provide the necessary storage to meet pre-development flow rates. The site has been designed such that the site will overtop the top of slope of the depressed stormwater area an emergency situation prior to backing up towards the building. Stormwater collected on the rooftops of the quadplexes will be controlled before discharging to the roadside ditch. The quantitative and qualitative properties of the storm runoff for both the pre & post development flows are further detailed below.

In summary, the following design criteria have been employed in developing the stormwater management design for the site as directed by the Town:

Quantity Control

- Post-development flow 5/100-year flow is be restricted to match the 5 and 100-year pre-development flow.

6.2 Runoff Calculations

Runoff calculations presented in this report are derived using the Rational Method, given as:

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

Where

C	=	Runoff coefficient
I	=	Rainfall intensity in mm/hr (City of Ottawa IDF curves)
A	=	Drainage area in hectares

It is recognized that the Rational Method tends to overestimate runoff rates. As a result, the conservative calculation of runoff ensures that any SWM facility sized using this method is expected to function as intended.

The following coefficients were used to develop an average C for each area:

Roofs/Concrete/Asphalt	0.90
Gravel	0.60
Undeveloped and Grass	0.20

As per the *City of Ottawa - Sewer Design Guidelines*, the 5-year balanced 'C' value must be increased by 25% for a 100-year storm event to a maximum of 1.0.

6.3 Pre-Development Drainage

The existing site drainage limits are demonstrated on the Pre-Development Drainage Area Plan. A summary of the Pre-Development Runoff Calculations can be found below.

Table 7: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Runoff Coefficient (5-Year)	Runoff Coefficient (100-Year)	5-year Peak Flow (L/s)	100-year Peak Flow (L/s)
A1	0.49	0.34	0.40	48.24	97.31
Total	0.49			48.24	97.31

See CCO-22-1448 - PRE in **Appendix E** and **Appendix G** for calculations.

6.4 Post-Development Drainage

To meet the stormwater objectives the development will contain rooftop and surface storage controls.

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CCO-22-1448 - POST in **Appendix F** of this report for more details. A summary of the Post-Development Runoff Calculations can be found below. See **Appendix G** for detailed calculations.

Table 8: Post-Development Runoff Summary

Drainage Area	Area (ha)	Runoff Coefficient (5-Year)	Runoff Coefficient (100-Year)	Unrestricted 5-year Peak Flow (L/s)	Unrestricted 100-year Peak Flow (L/s)
B1	0.02	0.90	1.00	5.16	9.82
B2	0.02	0.90	1.00	5.16	9.82
B3	0.02	0.90	1.00	5.16	9.82
B4	0.02	0.90	1.00	5.16	9.82
B5	0.15	0.41	0.47	17.14	34.06
B6	0.08	0.55	0.62	12.54	24.43
B7	0.04	0.53	0.61	6.80	13.26
B8	0.08	0.48	0.55	11.46	22.49
B9	0.06	0.39	0.45	6.55	13.05
Total	0.49			75.11	146.56

6.5 Quantity Control

After discussing the stormwater management criteria for the site with Town staff, the total post-development runoff for this site has been restricted to match the 5 and 100 year pre-development flow rates. These values result in the following allowable release rates for the development, not including the existing building lot.

Table 9: Allowable Release Rate Summary

Drainage Area	Area (ha)	Runoff Coefficient 5-Year	Runoff Coefficient 100-Year	Required Restricted Flow *5-Year* (L/s)	Required Restricted Flow 100-Year (L/s)
A1	0.49	0.34	0.40	48.24	97.31

Reducing site flows will be achieved using a flow restriction on rooftops and within the depressed stormwater area, creating the need for onsite storage.

Table 10: Post-Development Restricted Runoff Summary

Drainage Area	Post Development Restricted Flow (L/s)		Post Development Storage Requirement (m ³)	
	5-Year	100-Year	5-Year	100-Year
B1	0.42	0.72	4.3	8.5
B2	0.42	0.72	4.3	8.5
B3	0.42	0.72	4.3	8.5
B4	0.42	0.72	4.3	8.5
B5	17.14	34.06	-	-
B6	4.67	7.53	4.7	10.7
B7	2.95	5.11	2.3	4.9
B8	11.46	22.49	-	-
B9	6.55	13.05	-	-
Total	44.45	85.12	24.4	49.5

Runoff for area B1-B4 will be stored on the rooves of the proposed quadplex buildings and restricted using one Watts Accutrol roof drain (or equivalent product) per building to a maximum release rate of **0.72 L/s** and will provide up to **8.5 m³** of storage.

Runoff from area B5 is proposed to be unrestricted and will be compensated for by areas with flow attenuation.

Runoff for area B6 will be controlled by a depressed storage area with 100 mm outlet culvert. The storage area proposed to contain up to **10.7 m³** of surface storage up to a maximum release rate of **7.53 L/s**. Stormwater will be collected by the perimeter swale system and conveyed to the redefined roadside ditch.

Runoff for area B7 will be controlled by a depressed storage area with 100 mm outlet culvert. The storage area proposed to contain up to **4.9 m³** of surface storage up to a maximum release rate of **5.11 L/s**. Stormwater will be collected by the perimeter swale system and conveyed to the redefined roadside ditch.

Buildings are proposed to be slab on grade. Foundation drainage will need a sump pumped towards the roadside ditch system. Sump pump system to be designed by others.

7.0 EROSION AND SEDIMENT CONTROL

7.1 Temporary Measures

Before construction begins, temporary silt fence, straw bale or rock flow check dams will be installed at all natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

Silt fences will be installed where shown on the final engineering plans, specifically along the downstream property limits. The Contractor, at their discretion or at the instruction of the City, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way off site. The rock flow, straw bale & silt fence check dams and barriers shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required. Fibre roll barriers are to be installed at all existing curb inlet catchbasins and filter fabric is to be placed under the grates of all existing catchbasins and manholes along the frontage of the site and any new structures immediately upon installation. The measures for the existing/proposed structures is to be removed only after all areas have been paved. Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences without prior removal of the sediments shall not be permitted.

Although not anticipated, work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the City and/or Conservation Authority to review the site conditions and determine the appropriate course of action. As the ground begins to thaw, the Contractor shall place silt fencing at all required locations as soon as ground conditions warrant. Please see the *Site Grading, Drainage and Sediment & Erosion Control Plan* for additional details regarding the temporary measures to be installed and their appropriate OPSD references.

7.2 Permanent Measures

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon

as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

8.0 SUMMARY

- A new detached home and four quadplexes are proposed to be constructed at 254 Lake Avenue West.
- A new water service is proposed to service each building from the existing 300 mm diameter watermain within Lake Avenue West.
- A new 200 mm internal sanitary sewer and pump station is proposed to service the buildings. Each new building will be serviced by a 135 mm sanitary service.
- The Lake Avenue West roadside ditch is proposed to be deepened to support a stormwater management system at 254 Lake Avenue West. Stormwater management controls are proposed to be provided via surface storage and rooftop storage.

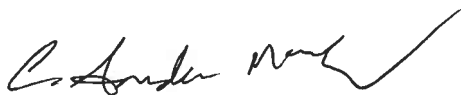
9.0 RECOMMENDATION

Based on the information presented in this report, we recommend that Town of Carleton Place approve this Servicing and Stormwater Management Report in support of the proposed development at 254 Lake Avenue West.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.



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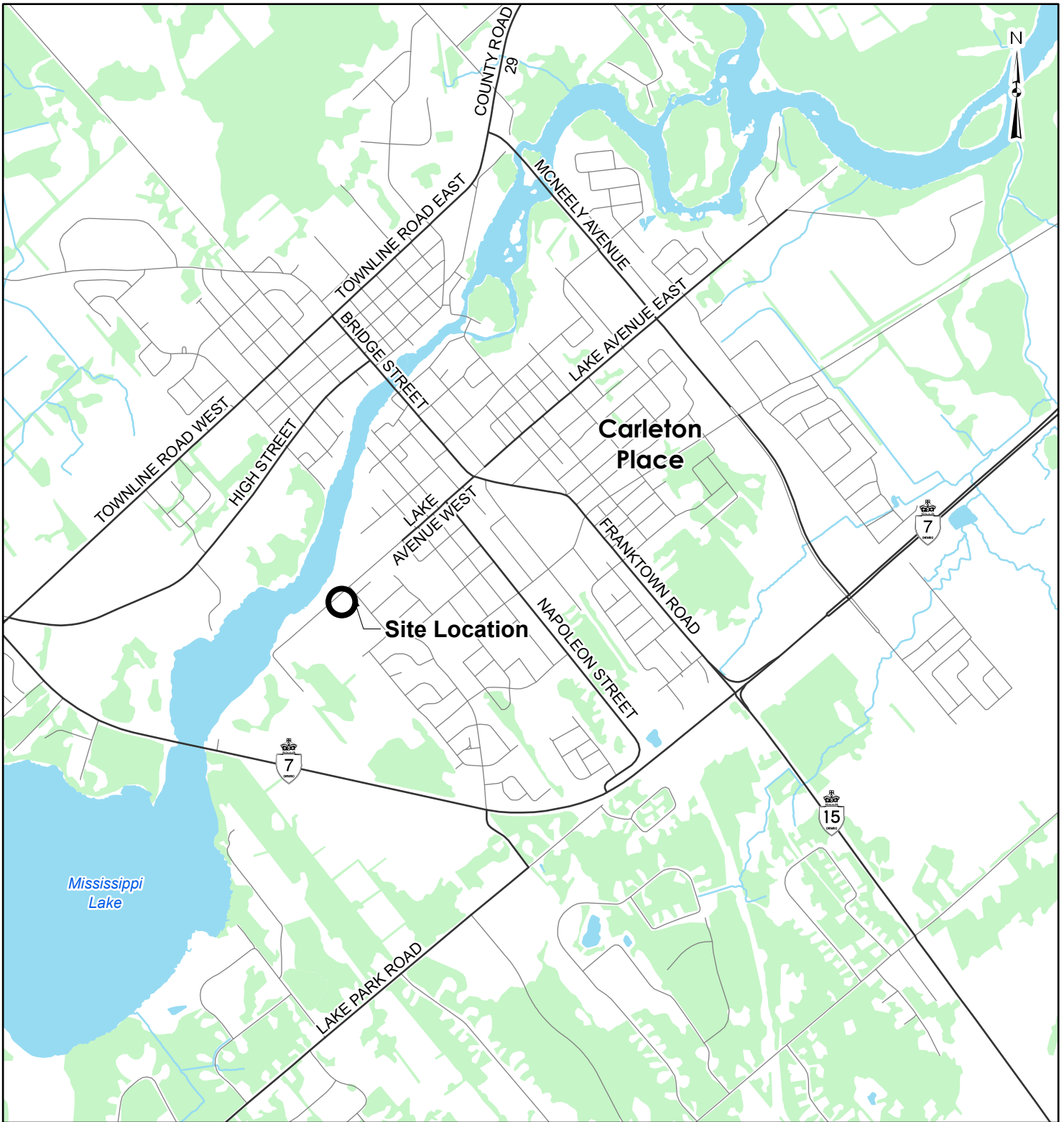
10.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of Escape Homes. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, City of Ottawa and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

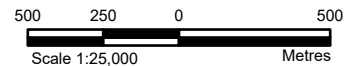
The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

**APPENDIX A
KEY PLAN**



LEGEND

-  Site Location
-  Local Road
-  Major Road
-  Watercourse
-  Waterbody
-  Wooded Area



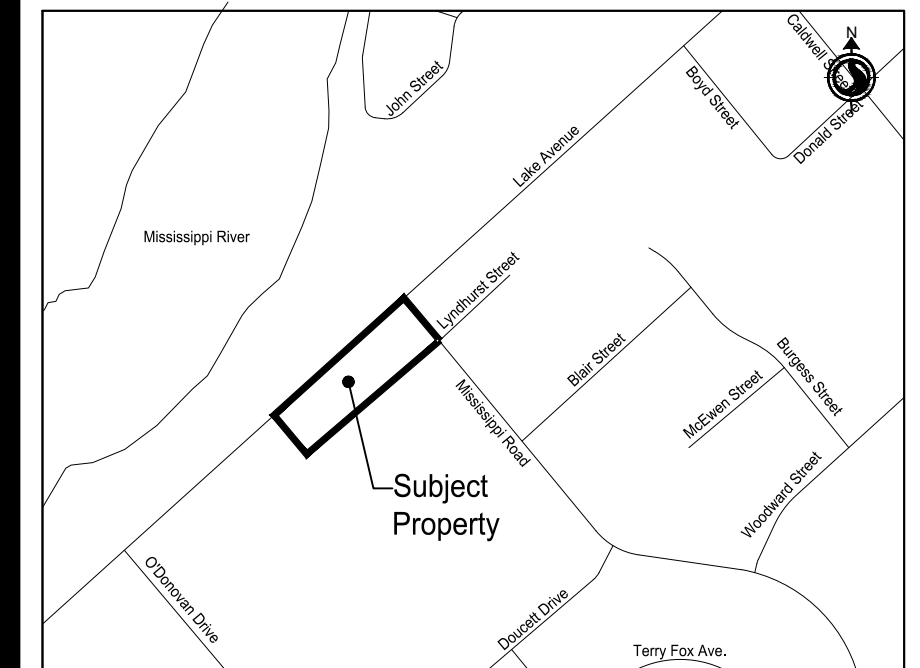
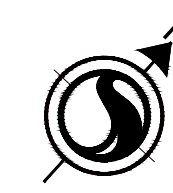
REFERENCE

GIS data provided by the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry, 2022.

CLIENT:		ESCAPE HOMES	
PROJECT:		254 LAKE AVE, CARLETON PLACE	
TITLE:		SITE LOCATION PLAN	
PROJECT NO: CCO-22-1448		FIGURE:	
Date	Mar., 24, 2022	1	
GIS	SK		
Checked By	AG		

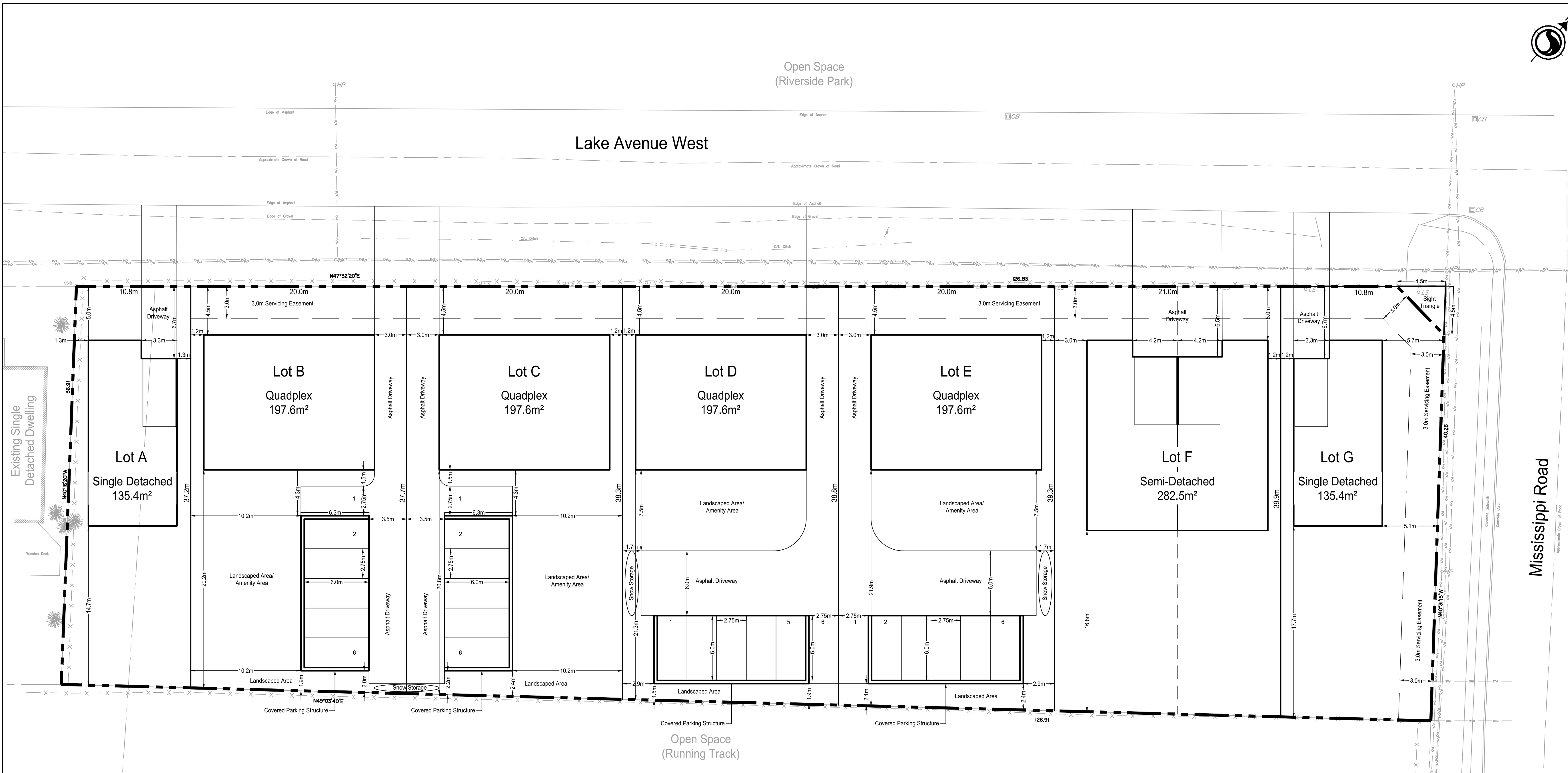
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**APPENDIX B
BACKGROUND DOCUMENTS**



Legal Description

Part of Lots 12 and 13,
Concession 11,
Town of Carleton Place,
County of Lanark



Details of Development

SITE DETAILS	REQUIRED	LOT A - PROVIDED	LOT G - PROVIDED
ZONING	RESIDENTIAL DISTRICT - SINGLE DETACHED DWELLING		
MINIMUM LOT AREA	NIL	418.6m²	574.2m²
MAXIMUM LOT COVERAGE	60.0%	32.3%	23.5%
MINIMUM LOT FRONTAGE	10.6m	10.8m	15.1m
FRONT YARD BUILD WITHIN AREA	MINIMUM = 4.5m MAXIMUM = 7.5m	5.0m	5.0m
EXTERIOR SIDE YARD BUILD WITHIN AREA	MINIMUM = 4.5m MAXIMUM = 7.5m	N/A	5.1m
MINIMUM INTERIOR SIDE YARD	1.2m	1.3m & 1.3m	1.2m
MINIMUM REAR YARD DEPTH	7.5m	14.7m	17.7m
MINIMUM USABLE LANDSCAPED OPEN SPACE IN THE REAR YARD	50.0m²	173.9m²	253.8m²
MAXIMUM BUILDING HEIGHT	11.0m	<11.0m	<11.0m
MINIMUM DWELLING UNIT AREA	92.9m²	135.4m²	135.4m²
NO ENCROACHMENT AREA FROM FRONT OR EXTERIOR SIDE LOT LINE	2.5m	2.5m	2.5m
PARKING SPACE	2 SPACES	2 SPACES	2 SPACES
MAXIMUM GARAGE WIDTH	50.0% OF LOT FRONTAGE	27.8%	21.8%
MINIMUM MAIN GARAGE FOUNDATION SETBACK	6.0m	6.7m	6.7m

Parking Calculation

SINGLE DETACHED DWELLING:
2 SPACES PER UNIT
1 UNIT x 2 SPACES = 2 SPACES

Details of Development

SITE DETAILS	REQUIRED	LOT B - PROVIDED	LOT C - PROVIDED	LOT D - PROVIDED	LOT E - PROVIDED
ZONING	RESIDENTIAL DISTRICT - QUADPLEX				
MINIMUM LOT AREA	NIL	749.2m²	759.8m²	770.5m²	781.1m²
MAXIMUM LOT COVERAGE	60.0%	26.4%	26.0%	25.6%	25.3%
MINIMUM LOT FRONTAGE	15.0m	20.0m	20.0m	20.0m	20.0m
FRONT YARD BUILD WITHIN AREA	MINIMUM = 4.5m MAXIMUM = 7.5m	4.5m	4.5m	4.5m	4.5m
EXTERIOR SIDE YARD BUILD WITHIN AREA	MINIMUM = 4.5m MAXIMUM = 7.5m	N/A	N/A	N/A	N/A
MINIMUM INTERIOR SIDE YARD	1.2m	1.2m & 3.0m	1.2m & 3.0m	1.2m & 3.0m	1.2m & 3.0m
MINIMUM REAR YARD DEPTH	9.0m	20.2m	20.8m	21.3m	21.9m
MINIMUM USABLE LANDSCAPED OPEN SPACE IN THE REAR YARD	30.0m²	107.9m²	107.9m²	125.5m²	125.5m²
MAXIMUM BUILDING HEIGHT	14.0m	<14.0m	<14.0m	<14.0m	<14.0m
NO ENCROACHMENT AREA FROM FRONT OR EXTERIOR SIDE LOT LINE	2.5m	2.5m	2.5m	2.5m	2.5m
PARKING SPACE	6 SPACES	6 SPACES	6 SPACES	6 SPACES	6 SPACES
VISITOR PARKING SPACE	1 SPACES	1 SPACES	1 SPACES	1 SPACES	1 SPACES

Parking Calculation

QUADPLEX:
1.25 SPACES PER UNIT
4 UNITS x 1.25 SPACES = 5 SPACES
VISITOR PARKING:
0.25 SPACE PER UNIT
4 UNITS x 0.25 SPACES = 1 SPACE

Details of Development

SITE DETAILS	REQUIRED	LOT F - PROVIDED
ZONING	RESIDENTIAL DISTRICT - SEMI-DETACHED	
MINIMUM LOT AREA	NIL	829.7m²
MAXIMUM LOT COVERAGE	60.0%	34.0%
MINIMUM LOT FRONTAGE	15.0m (7.5m/UNIT)	21.0m
FRONT YARD BUILD WITHIN AREA	MINIMUM = 4.5m MAXIMUM = 7.5m	5.0m
EXTERIOR SIDE YARD BUILD WITHIN AREA	MINIMUM = 4.5m MAXIMUM = 7.5m	N/A
MINIMUM INTERIOR SIDE YARD	1.2m	3.0m & 1.2m
MINIMUM REAR YARD DEPTH	7.5m	16.8m
MINIMUM USABLE LANDSCAPED OPEN SPACE IN THE REAR YARD	40.0m²	355.6m²
MAXIMUM BUILDING HEIGHT	11.0m	<11.0m
MINIMUM DWELLING UNIT AREA	92.9m²	282.5m²
NO ENCROACHMENT AREA FROM FRONT OR EXTERIOR SIDE LOT LINE	2.5m	2.5m
PARKING SPACE	2 SPACES	2 SPACES
MAXIMUM GARAGE WIDTH		40.0%
MINIMUM MAIN GARAGE FOUNDATION SETBACK		6.5m

Parking Calculation

SINGLE DETACHED DWELLING:
2 SPACES PER UNIT
1 UNIT x 2 SPACES = 2 SPACES

2. REVISED AS PER CLIENT COMMENTS	JJ	EB	2023.01.27
1. REVISED AS PER CLIENT COMMENTS	JJ	EB	2022.09.19
ISSUED FOR CLIENT REVIEW	JJ	EB	2022.08.30
Revision	By	Appd	YYYY.MM.DD
File Name: 160410347_R-SP	JJ	JJ	EB
	Dwn.	Dsgn.	Chkd.
			YYYY.MM.DD

Permit-Seal

Client/Project
ESCAPE HOMES

254 LAKE AVENUE WEST

CARLETON PLACE, ON

Title

SITE PLAN

Project No. 160410347 Scale 1:200

Revision 2 Sheet 1 of 1 Drawing No. SP-1

SURVEYORS REAL PROPERTY REPORT
PART 1 PARTIAL PLANNED CONVEYANCE
PART OF LOTS 12 and 13
CONCESSION 11
Geographic Township of Beckwith
TOWN OF CARLETON PLACE
COUNTY OF LANARK

Surveyed by Annis, O'Sullivan, Vollebæk Ltd.

Scale: 1:150
 0 1 1.5 2 3 Metres

METRIC
 ALL DIMENSIONS ARE IN METRES AND DECIMAL METRES
 CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Surveyor's Certificate
 I, the undersigned, being a duly qualified and licensed Surveyor, have surveyed the above described lands and have caused to be prepared and deposited in the Office of the Registrar of Titles a plan of the same, which plan is herewith submitted to you, together with this certificate.

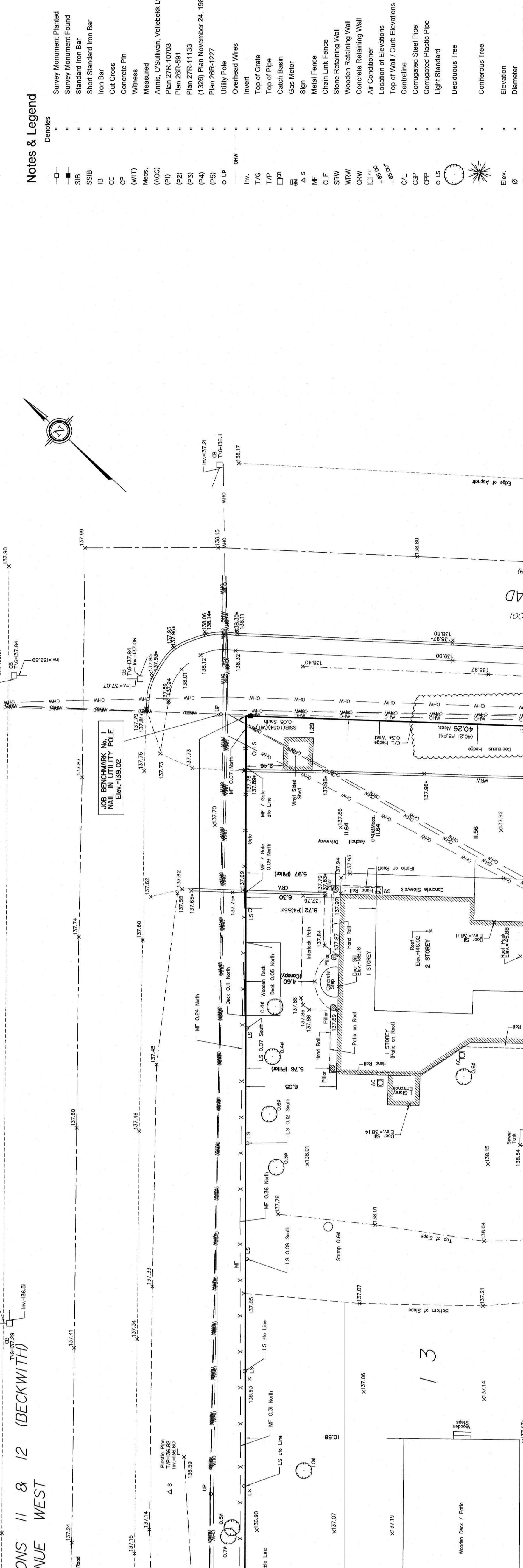
1. This survey and plan are correct and in accordance with the Surveys Act and the regulations thereunder.
 2. The survey was completed on the 28th day of June, 2021.

June 30, 2021
 Date
A. S. Beckwith
 Chartered Land Surveyor
 Ottawa, Ontario

PART 2
 THIS PLAN MUST BE READ IN CONJUNCTION WITH
 PARTS 1 AND 3 OF THIS REPORT.

ANNIS, O'SULLIVAN, VOLLEBÆK LTD.
 1415 BRANTFORD RD., SUITE 100
 OTTAWA, ONTARIO K2M 1R2
 TEL: (613) 727-8200 FAX: (613) 727-8201

Bearings are given, drawn from the bearing station of Lake Avenue West
 in front of 218 Lynchburg Street shown to have an elevation of 84.18 metres
 for bearing comparison, a station of 11.11 metres is shown on plan P2.
 For bearing comparison, a station of 11.11 metres is shown on plan P3.
 For bearing comparison, a station of 11.11 metres is shown on plan P4, P5,
 P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22,
 P23, P24, P25, P26, P27, P28, P29, P30, P31, P32, P33, P34, P35, P36, P37,
 P38, P39, P40, P41, P42, P43, P44, P45, P46, P47, P48, P49, P50, P51, P52,
 P53, P54, P55, P56, P57, P58, P59, P60, P61, P62, P63, P64, P65, P66,
 P67, P68, P69, P70, P71, P72, P73, P74, P75, P76, P77, P78, P79, P80,
 P81, P82, P83, P84, P85, P86, P87, P88, P89, P90, P91, P92, P93, P94,
 P95, P96, P97, P98, P99, P100, P101, P102, P103, P104, P105, P106,
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 P155, P156, P157, P158, P159, P160, P161, P162, P163, P164, P165, P166,
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 P503, P504, P505, P506, P507, P508, P509, P510, P511, P512, P513, P514,
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 P539, P540, P541, P542, P543, P544, P545, P546, P547, P548, P549, P550,
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 P971, P972, P973, P974, P975, P976, P977, P978, P979, P980, P981, P982,
 P983, P984, P985, P986, P987, P988, P989, P990, P991, P992, P993, P994,
 P995, P996, P997, P998, P999, P1000.



Notes & Legend

Symbol	Description
Symbol	Survey Monument Platina
Symbol	Survey Monument Found
Symbol	Short Standard Iron Bar
Symbol	Iron Bar
Symbol	Cut Cross
Symbol	Wholesaler's Mark
Symbol	Wholesaler
Symbol	Marked
Symbol	Annis, O'Sullivan, Vollebæk Ltd.
Symbol	Plan 278-11133
Symbol	Plan 298-5201
Symbol	Plan 269-1227
Symbol	Utility Pole
Symbol	Overhead Wires
Symbol	Top of Gate
Symbol	Top of Pipe
Symbol	Curtain Bath
Symbol	Cast Iron Manhole
Symbol	Spot
Symbol	MF
Symbol	Clear Link in Road
Symbol	Top of Concrete Retaining Wall
Symbol	Wooden Retaining Wall
Symbol	Concrete Retaining Wall
Symbol	Air Conditioner
Symbol	Top of VMH / Cup Extrusion
Symbol	Centreline
Symbol	Compressed Gas Pipe
Symbol	Light Standard
Symbol	Deciduous Tree
Symbol	Coniferous Tree
Symbol	Elevation
Symbol	Diameter
Symbol	Maintenance Hole (Summary)

ELEVATION NOTES
 1. The elevations shown on this plan are based on the datum of 84.18 metres
 in front of 218 Lynchburg Street shown to have an elevation of 84.18 metres.
 2. The elevations shown on this plan are based on the datum of 84.18 metres
 in front of 218 Lynchburg Street shown to have an elevation of 84.18 metres.
 This has not been determined and that its relative elevation and description
 agrees with the information shown on this plan.

UTILITY NOTES
 1. The user is responsible for determining the location of all utility lines and for
 being the responsibility of the user to contact the respective utility authorities for
 information and to obtain any necessary permits.
 2. The location of underground utilities were located.
 3. A field location of underground utility is shown by the reference to utility name
 in the description of the lot. The utility name shown is for information only.
 4. The location of underground utility is shown by the reference to utility name
 in the description of the lot. The utility name shown is for information only.

ANNIS, O'SULLIVAN, VOLLEBÆK LTD.
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PART 1
 PLAN 278-1073

APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Water Demands

Project:	254 Lake Avenue West
Project No.:	CO-22-1448
Designed By:	FV
Checked By:	AG
Date:	February 8, 2023
Site Area:	0.49 gross ha

Residential	NUMBER OF UNITS	UNIT RATE	
Single Family	4 homes	3.4	persons/unit
Average Apartment	16 units	1.8	persons/unit
Total Population	43 persons		

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	
Residential	280	L/c/d	
Industrial - Light	35,000	L/gross ha/d	
Industrial - Heavy	55,000	L/gross ha/d	
Shopping Centres	2,500	L/(1000m ² /d	
Hospital	900	L/(bed/day)	
Schools	70	L/(Student/d)	
Trailer Park with no Hook-Ups	340	L/(space/d)	
Trailer Park with Hook-Ups	800	L/(space/d)	
Campgrounds	225	L/(campsite/d)	
Mobile Home Parks	1,000	L/(Space/d)	
Motels	150	L/(bed-space/d)	
Hotels	225	L/(bed-space/d)	
Tourist Commercial	28,000	L/gross ha/d	
Other Commercial	28,000	L/gross ha/d	
AVERAGE DAILY DEMAND	Residential	0.14	L/s
	Commerical/Industrial/Institutional	0.00	L/s

McINTOSH PERRY

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	9.5	x avg. day	L/c/d
Industrial	1.5	x avg. day	L/gross ha/d
Commercial	1.5	x avg. day	L/gross ha/d
Institutional	1.5	x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	Residential	1.32	L/s
	Commerical/Industrial/ Institutional	0.00	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	14.3	x avg. day	L/c/d
Industrial	1.8	x max. day	L/gross ha/d
Commercial	1.8	x max. day	L/gross ha/d
Institutional	1.8	x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	Residential	1.99	L/s
	Commerical/Industrial/ Institutional	0.00	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT
CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

AVERAGE DAILY DEMAND	0.14	L/s
MAXIMUM DAILY DEMAND	1.32	L/s
MAXIMUM HOUR DEMAND	1.99	L/s

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Detached Lot 1 - Fire Underwriters Survey

Project: 254 Lake Avenue West - Detached Lot 1
 Project No.: CO-22-1448
 Designed By: FV
 Checked By: AG
 Date: February 8, 2023

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Wood Frame**

C 1.5 A 270.8 m²

Calculated Fire Flow 5,430.5 L/min
 5,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 4,250.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction 0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 2	0 to 3	Wood frame	12.5	2	25.0	22%
Exposure 3	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 4	3.1 to 10	Wood frame	14.49	2	29.0	17%
% Increase*						39%

Increase* 1,657.5 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 5,907.5 L/min
 Fire Flow Required** 6,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Quadplex Lot 2 - Fire Underwriters Survey

Project: 254 Lake Avenue West - Quadplex Lot 2
 Project No.: CO-22-1448
 Designed By: FV
 Checked By: AG
 Date: February 8, 2023

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Wood Frame**

C 1.5 A 395.6 m²

Calculated Fire Flow 6,563.6 L/min
 7,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 5,950.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction 0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 2	3.1 to 10	Wood frame	12.5	2	25.0	17%
Exposure 3	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 4	0 to 3	Wood frame	15.5	2	31.0	23%
% Increase*						40%

Increase* 2,380.0 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 8,330.0 L/min
 Fire Flow Required** 8,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Quadplex Lot 3 - Fire Underwriters Survey

Project: 254 Lake Avenue West - Quadplex Lot 3
 Project No.: CO-22-1448
 Designed By: FV
 Checked By: AG
 Date: February 8, 2023

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Wood Frame**

C 1.5 A 395.6 m²

Calculated Fire Flow 6,563.6 L/min
 7,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 5,950.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction 0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 2	0 to 3	Wood frame	12.5	2	25.0	22%
Exposure 3	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 4	3.1 to 10	Wood frame	12.5	2	25.0	17%
% Increase*						39%

Increase* 2,320.5 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 8,270.5 L/min
 Fire Flow Required** 8,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Quadplex Lot 4 - Fire Underwriters Survey

Project: 254 Lake Avenue West - Quadplex Lot 4
 Project No.: CO-22-1448
 Designed By: FV
 Checked By: AG
 Date: February 8, 2023

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Wood Frame**

C 1.5 A 395.6 m²

Calculated Fire Flow 6,563.6 L/min
 7,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 5,950.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction 0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 2	3.1 to 10	Wood frame	12.5	2	25.0	17%
Exposure 3	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 4	0 to 3	Wood frame	12.5	2	25.0	22%
% Increase*						39%

Increase* 2,320.5 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 8,270.5 L/min
 Fire Flow Required** 8,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Quadplex Lot 5 - Fire Underwriters Survey

Project: 254 Lake Avenue West - Quadplex Lot 5
 Project No.: CO-22-1448
 Designed By: FV
 Checked By: AG
 Date: February 8, 2023

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Wood Frame**

C 1.5 A 395.6 m²

Calculated Fire Flow 6,563.6 L/min
 7,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 5,950.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction 0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 2	3.1 to 10	Wood frame	17.5	2	35.0	18%
Exposure 3	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 4	3.1 to 10	Wood frame	12.5	2	25.0	17%
% Increase*						35%

Increase* 2,082.5 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 8,032.5 L/min
 Fire Flow Required** 8,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Semi-Detached Lot 6/7 - Fire Underwriters Survey

Project: 254 Lake Avenue West - Semi-Detached Lot 6/7
 Project No.: CO-22-1448
 Designed By: FV
 Checked By: AG
 Date: February 8, 2023

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Wood Frame**

C 1.5 A 282.5 m²

Calculated Fire Flow 5,546.6 L/min
 6,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 5,100.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction 0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 2	0 to 3	Wood frame	15.5	2	31.0	23%
Exposure 3	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 4	0 to 3	Wood frame	15.5	2	31.0	23%
% Increase*						46%

Increase* 2,346.0 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 7,446.0 L/min
 Fire Flow Required** 7,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Single Detached Lot 8 - Fire Underwriters Survey

Project: 254 Lake Avenue West - Single Detached Lot 8
 Project No.: CO-22-1448
 Designed By: FV
 Checked By: AG
 Date: February 8, 2023

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Wood Frame**

C 1.5 A 270.8 m²

Calculated Fire Flow 5,430.5 L/min
 5,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 4,250.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction 0.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 2	>45	Wood frame	N/A	N/A	-	0%
Exposure 3	>45	Non-Combustible	N/A	N/A	-	0%
Exposure 4	0 to 3	Wood frame	17.5	2	35.0	23%
% Increase*						23%

Increase* 977.5 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 5,227.5 L/min
 Fire Flow Required** 5,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

Alison Gosling

From: Guy Bourgon <gbourgon@carletonplace.ca>
Sent: November 18, 2021 4:02 PM
To: Alison Gosling
Cc: Niki Dwyer
Subject: FW: 22-1488 - 254 Lake Avenue

Follow Up Flag: Follow up
Flag Status: Completed

Hi Alison,

Please see below requested information relating to 254 Lake Avenue West.

Regards,

Guy

From: Razafimaharo, Christene <Christene.Razafimaharo@stantec.com>
Sent: November 18, 2021 3:59 PM
To: Guy Bourgon <gbourgon@carletonplace.ca>
Cc: Alemany, Kevin <kevin.alemany@stantec.com>; Niki Dwyer <ndwyer@carletonplace.ca>
Subject: RE: 22-1488 - 254 Lake Avenue

Good afternoon Guy,

We have reviewed the model & pressures as requested.

The pressures at 254 Lake Ave W range from 63 psi to 66 psi. The static hydraulic grade lines (HGLs) were obtained from the Town's model for peak hour demand (PHD) conditions (minimum HGL) and average day demand (ADD) conditions (maximum HGL). The ground elevation at the site is approximately 137.8 m, based on the Town's LIDAR digital elevation model.

Property:		254 Lake Ave			
Demand Condition	Static HGL @ nearest Model Junction (m)	Ground Elevation at site (m)	Pressure (m)	Pressure (kPa)	Pressure (psi)
PHD (Min HGL)	182.4	137.8	44.6	437	63
ADD (Max HGL)	184.5		46.7	458	66
HGL extracted from model on:		11/18/2021			
Ground obtained from Town LIDAR on:		11/18/2021			

Please let us know if you have any questions,

Best regards,

Christène

Christène Razafimaharo M.Sc., EIT
Water Resources Engineering Intern

Mobile: 343 996-7086
Christene.Razafimaharo@stantec.com

From: Alison Gosling <a.gosling@mcintoshperry.com>
Sent: November 17, 2021 1:48 PM
To: Niki Dwyer <ndwyer@carletonplace.ca>
Subject: 22-1488 - 254 Lake Avenue

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

Good afternoon,

Touching base with you regarding the development at 254 Lake Avenue.

One of our inquiries is in relation to the water pressure near the site. Can this be provided via a model or provided by a report?

Please let me know if you have any questions.

Thank you,

Alison Gosling, P.Eng.

Project Engineer, Land Development
115 Walgreen Road, Carp, ON, K0A 1L0

T. 613.714.4629

a.gosling@mcintoshperry.com | www.mcintoshperry.com

McINTOSH PERRY

Turning Possibilities Into Reality

Confidentiality Notice – If this email wasn't intended for you, please return or delete it. Click [here](#) to read all of the legal language around this concept.



Platinum
member



APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

CO-22-1448 - 254 Lake Avenue West - Sanitary Demands

Project:	254 Lake Avenue West		
Project No.:	CO-22-1448		
Designed By:	FV		
Checked By:	AG		
Date:	Feb-23		

Site Area	0.49	Gross ha	
Single Family	4	3.40	Persons per unit
Average Apartment	16	1.80	Persons per unit
Total Population	43	Persons	

DESIGN PARAMETERS

Institutional/Commercial Peaking Factor	1.5	
Residential Peaking Factor	3.66	* Using Harmon Formula = $1 + (14 / (4 + P^{0.5})) * 0.8$ where P = population in thousands, Harmon's Correction Factor = 0.8
Mannings coefficient (n)	0.013	
Demand (per capita)	280	L/day
Infiltration allowance	0.33	L/s/Ha

EXTRANEOUS FLOW ALLOWANCES

Infiltration / Inflow	Flow (L/s)
Dry	0.02
Wet	0.14
Total	0.16

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	43	0.14
Industrial - Light**	35,000	L/gross ha/d		0
Industrial - Heavy**	55,000	L/gross ha/d		0
Commercial / Amenity	2,800	L/(1000m ² /d)		0.00
Hospital	900	L/(bed/day)		0
Schools	70	L/(Student/d)		0
Trailer Parks no Hook-Ups	340	L/(space/d)		0
Trailer Park with Hook-Ups	800	L/(space/d)		0
Campgrounds	225	L/(campsite/d)		0
Mobile Home Parks	1,000	L/(Space/d)		0
Motels	150	L/(bed-space/d)		0
Hotels	225	L/(bed-space/d)		0
Office	75	L/7.0m ² /d		0
Tourist Commercial	28,000	L/gross ha/d		0
Other Commercial	28,000	L/gross ha/d		0

McINTOSH PERRY

AVERAGE RESIDENTIAL FLOW	0.14	L/s
PEAK RESIDENTIAL FLOW	0.51	L/s
AVERAGE ICI FLOW	0.00	L/s
PEAK INSTITUTIONAL/COMMERCIAL FLOW	0.00	L/s
PEAK INDUSTRIAL FLOW	0.00	L/s
TOTAL PEAK ICI FLOW	0.00	L/s

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.16	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	0.53	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	0.67	L/s

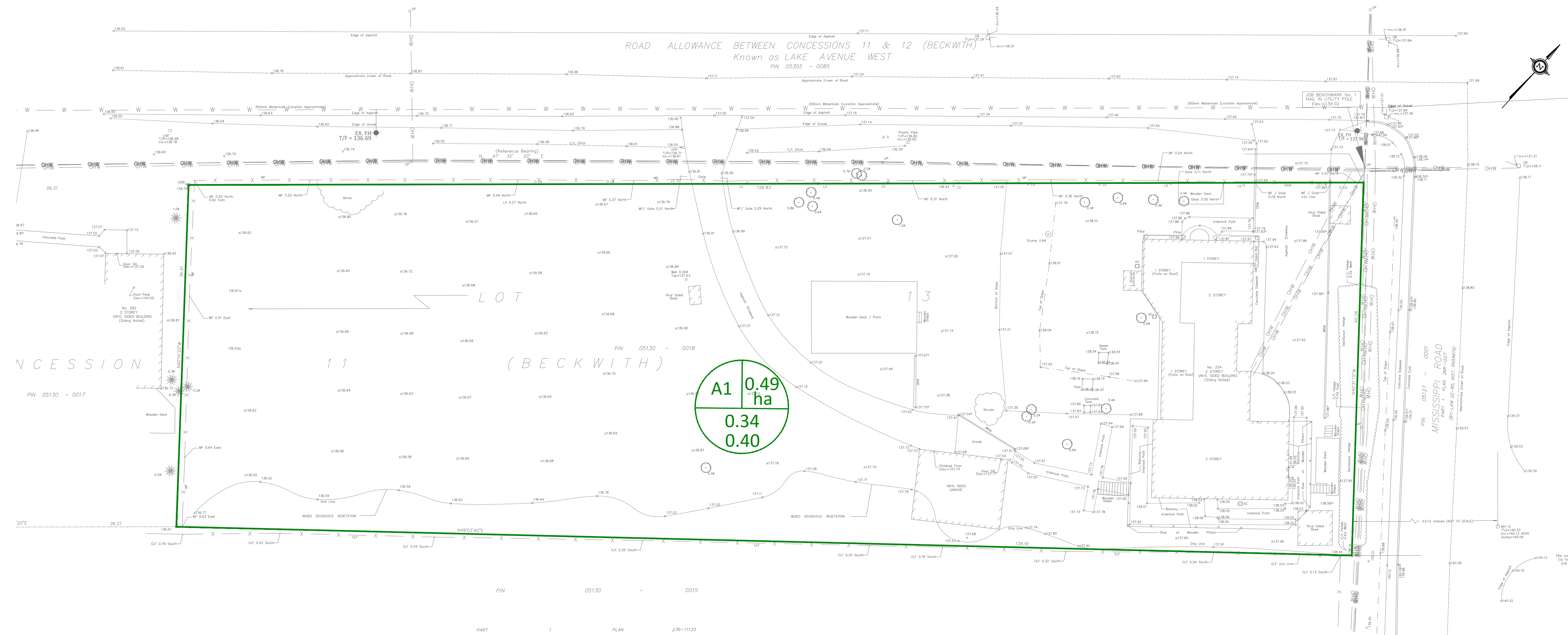
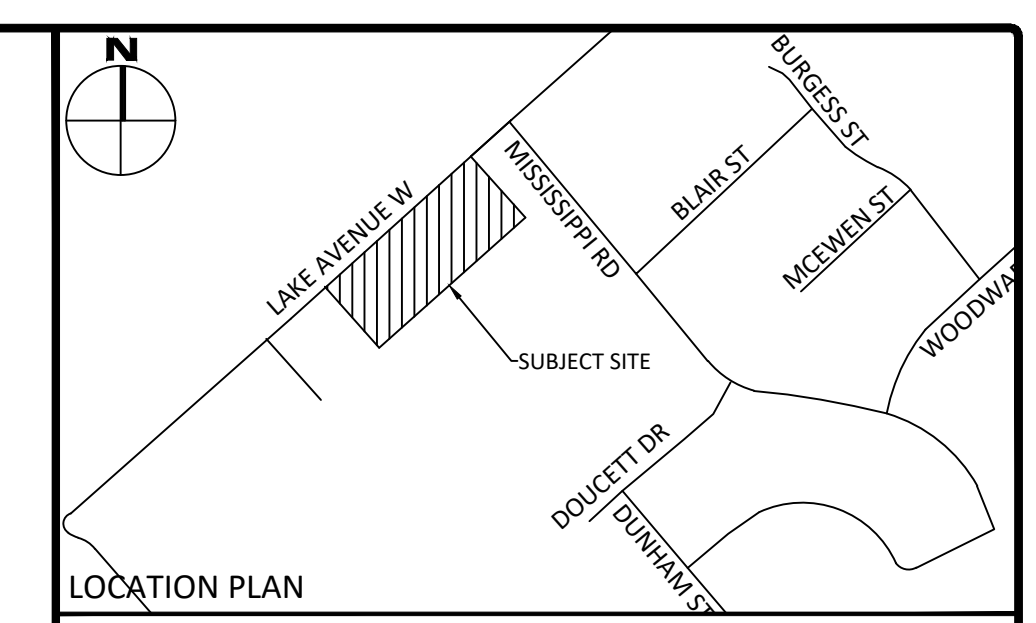
SANITARY SEWER DESIGN SHEET

PROJECT: CCO-22-1448
 LOCATION: 254 Lake Avenue West
 CLIENT: Escape Homes



LOCATION				RESIDENTIAL								ICI AREAS						INFILTRATION ALLOWANCE			FLOW		SEWER DATA											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES				AREA (ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (L/s)	AREA (ha)		FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY					
				SF	SD	TH	APT		IND	CUM			INSTITUTIONAL	COMMERCIAL	INDUSTRIAL	IND	CUM	IND		CUM	IND								CUM	IND	CUM	L/s	(%)	L/s
Lake Avenue West		MH1	MH2	1			8	0.25	17.8	17.8	3.71	0.21							0.00	0.00	0.00	0.00	0.25	0.25	0.08	0.29	19.36	52.20	200	0.32	0.597	19.06	98.48	
Lake Avenue West		MH2	MH3	3			8	0.24	24.6	42.4	3.66	0.50							0.00	0.00	0.00	0.00	0.24	0.49	0.16	0.66	19.36	56.59	200	0.32	0.597	18.69	96.56	
		MH3	MH4	0			0	0.00	0.0	42.4	3.66	0.50							0.00	0.00	0.00	0.00	0.00	0.49	0.16	0.66	19.36	6.25	200	0.32	0.597	18.69	96.56	
		MH4	Pump STN					0.00	0.0	42.4	3.66	0.50							0.00	0.00	0.00	0.00	0.00	0.49	0.16	0.66	19.66	32.97	200	0.33	0.606	18.99	96.62	
Design Parameters:				Notes:								Designed: FV						No.			Revision			Date										
Residential				ICI Areas								Checked: AM						1.			Issued for Review			2023-02-08										
SF	3.4	p/p/u																																
TH/SD	2.7	p/p/u		INST	28,000	L/Ha/day						1.5																						
APT	1.8	p/p/u		COM	28,000	L/Ha/day						1.5																						
Other	60	p/p/Ha		IND	35,000	L/Ha/day						MOE Chart																						
				1. Mannings coefficient (n) = 0.013								Project No.: CCO-22-1448												Sheet No:										
				2. Demand (per capita): 280 L/day																	1 of 1													
				3. Infiltration allowance: 0.33 L/s/Ha																														
				4. Residential Peaking Factor: Harmon Formula = 1+(14/(4+P^0.5))*0.8 where P = population in thousands																														

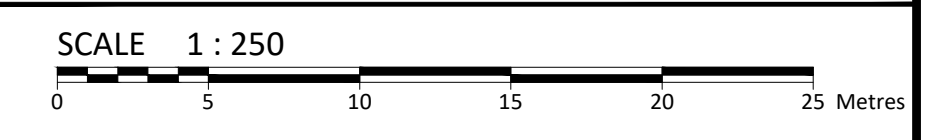
APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN



FOR REVIEW ONLY
NOT FOR CONSTRUCTION

1	ISSUED FOR REVIEW	FEB. 08, 2023
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Check and verify all dimensions before proceeding with the work. Do not scale drawings.



McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

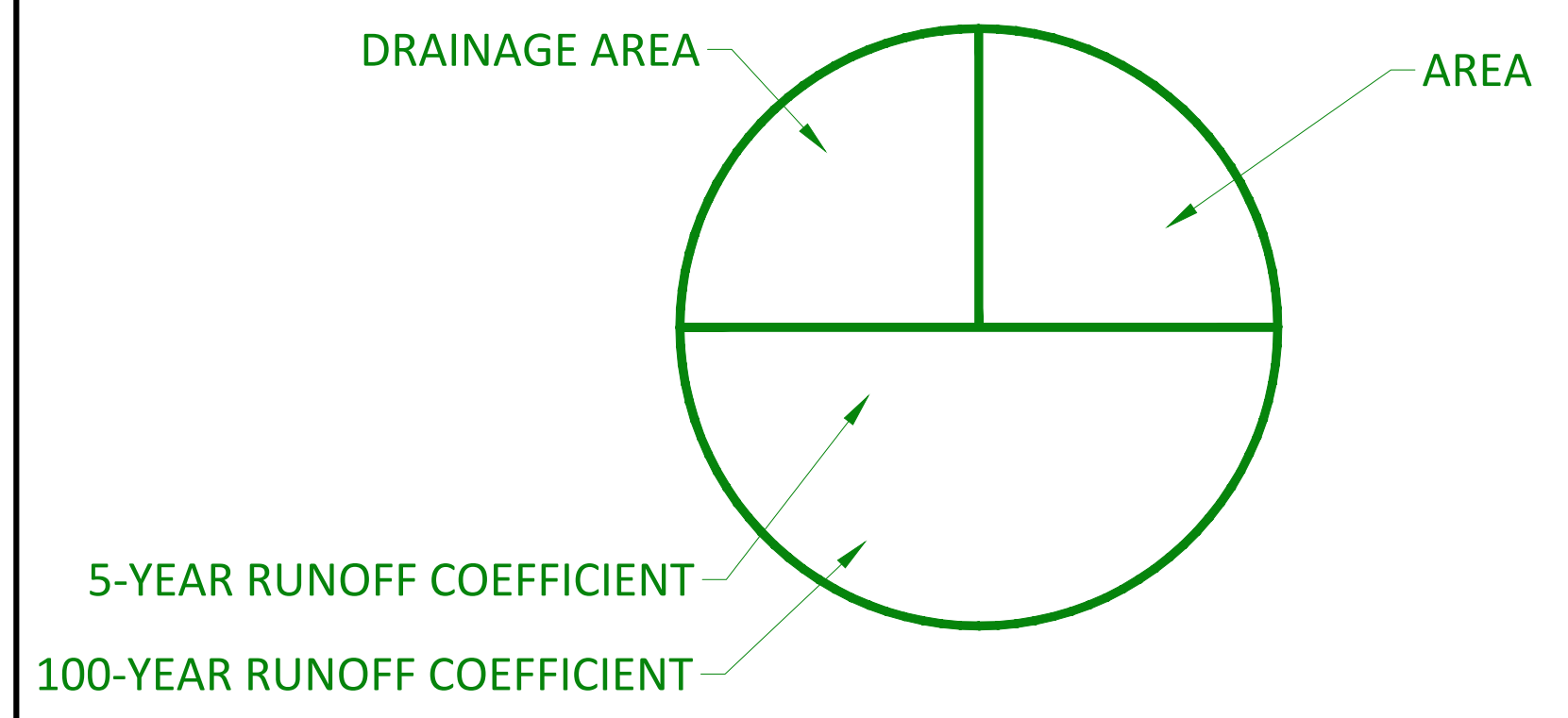
Client: ESCAPE HOMES
254 LAKE AVENUE WEST
CARLETON PLACE, ON K7C 1M4

Project: 254 LAKE AVENUE WEST

Drawing Title: PRE-DEVELOPMENT DRAINAGE PLAN

Scale:	1:250	Project Number:	CO-22-1448
Drawn By:	FV	Checked By:	AM
Designed By:	AG	Drawing Number:	PRE

LEGEND:



GENERAL NOTES

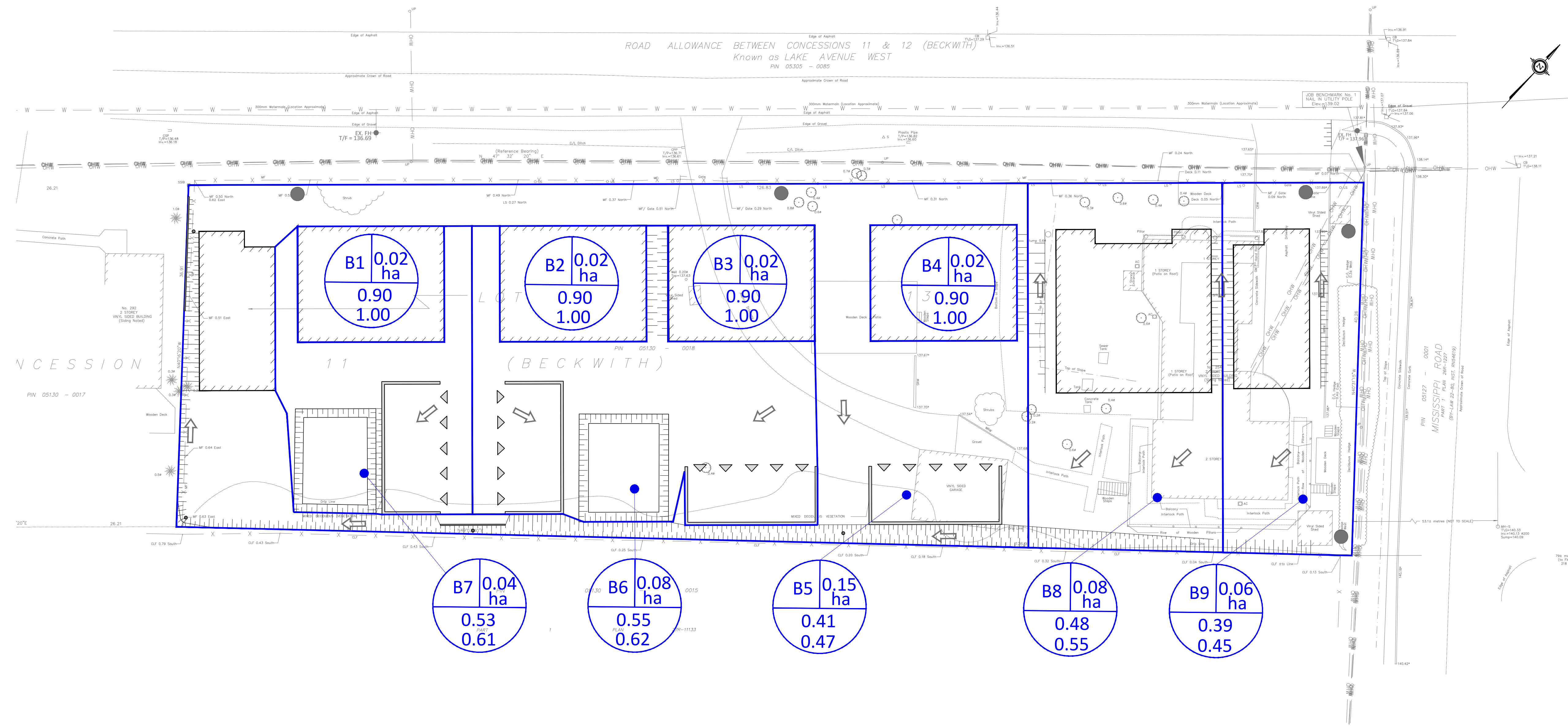
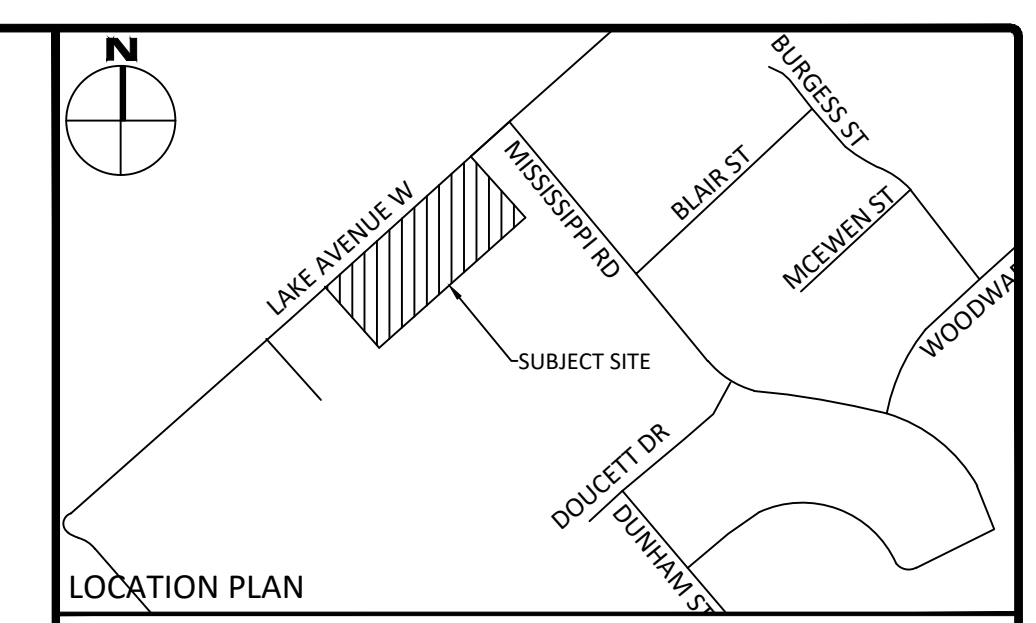
- THE ORIGINAL TOPOGRAPHY, GROUND ELEVATION AND SURVEY DATA SHOWN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY AND IMPLY NO GUARANTEE OF ACCURACY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
- THIS PLAN IS NOT A CADASTRAL SURVEY SHOWING LEGAL PROPERTY BOUNDARIES AND EASEMENTS. THE PROPERTY BOUNDARIES SHOWN HEREON HAVE BEEN DERIVED FROM INFORMATION SUPPLIED BY (OR SHOWN ON) ANNIS, OSULLIVAN, VOLLEBEK LTD. DRAWING 17446-21 AND CANNOT BE RELIED UPON TO BE ACCURATE OR COMPLETE. THE PRECISE LOCATION OF THE CURRENT PROPERTY BOUNDARIES AND EASEMENTS CAN ONLY BE DETERMINED BY AN UP-TO-DATE LAND TITLES SEARCH AND A SUBSEQUENT CADASTRAL SURVEY PERFORMED AND CERTIFIED BY AN ONTARIO LAND SURVEYOR.
- THE CONTRACTOR IS TO OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY BEFORE COMMENCING CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT.
- THE CONTRACTOR IS TO DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME ALL RESPONSIBILITY FOR EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
- RESTORE ALL TRENCHES AND SURFACES OF PUBLIC ROAD ALLOWANCES TO CONDITION EQUAL OR BETTER THAN ORIGINAL CONDITION AND TO THE SATISFACTION OF THE CITY AUTHORITIES.
- EXCAVATE AND DISPOSE OF ALL EXCESS EXCAVATED MATERIAL, SUCH AS ASPHALT, CURBING AND DEBRIS, OFF SITE AS DIRECTED BY THE ENGINEER AND THE CITY.
- TOPSOIL TO BE STRIPPED AND STOCKPILED FOR REHABILITATION. CLEAN FILL TO BE PLACED IN FILL AREAS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION, AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS.
- DO NOT ALTER GRADING OF THE SITE WITHOUT PRIOR APPROVAL OF THE ENGINEER/CITY.
- ALL ROADWAY, PARKING LOT, AND GRADING WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS. THE CONTRACTOR IS TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING.
- CONTACT THE CITY FOR INSPECTION OF ROUGH GRADING OF PARKING LOTS, ROADWAYS AND LANDSCAPED AREAS PRIOR TO PLACEMENT OF ASPHALT AND TOPSOIL. ALL DEFICIENCIES NOTED SHALL BE RECTIFIED TO THE CITY'S SATISFACTION PRIOR TO PLACEMENT OF ANY ASPHALT, TOPSOIL, SEED & MULCH AND/OR SOD.
- ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
- ELECTRICAL, GAS, TELEPHONE AND TELEVISION SERVICE LOCATIONS ARE SUBJECT TO THE INDIVIDUAL AGENCY:
 - ELECTRICAL SERVICE - HYDRO ONE,
 - GAS SERVICE - ENBRIDGE,
 - TELEPHONE SERVICE - BELL CANADA,
 - TELEVISION SERVICE - ROGERS.
- INSTALLATION TO BE IN ACCORDANCE WITH CURRENT CODES AND STANDARDS OF APPROVAL AGENCIES HYDRO ONE, BELL AND THE CITY.
- CONTRACTOR TO ENSURE ALL APPLICABLE OPS SPECIFICATIONS ARE FOLLOWED DURING CONSTRUCTION.
- ALL PROPOSED CURB TO BE CONCRETE BARRIER CURB UNLESS OTHERWISE SPECIFIED.

FILENAME: U:\Other\01\Project - Proposed\2022\06\16\CO-22-1448\ESCAPE_HOMES_SPC_254_Lake_Ave_Carleton_Place_13 - Drawing\CO-22-1448_Presentation.dwg
 DATE PLOTTED: Wednesday, February 08, 2023 1:51:45 PM
 PLOTTED BY: F. Valeri
 PLOTTER: HP DesignJet T1100

D07-12-XX-XXXX

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APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN



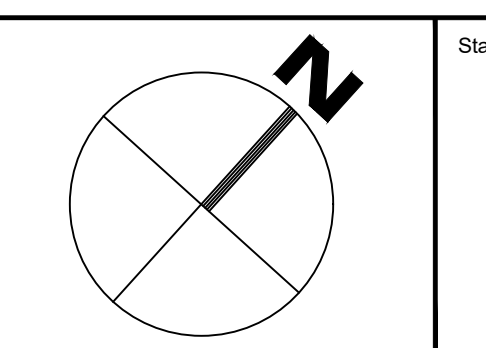
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1	ISSUED FOR REVIEW	FEB. 08, 2023
No.	Revisions	Date

Check and verify all dimensions before proceeding with the work. Do not scale drawings.

SCALE 1:250

McINTOSH PERRY
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Client: **ESCAPE HOMES**
254 LAKE AVENUE WEST
CARLETON PLACE, ON K7C 1M4

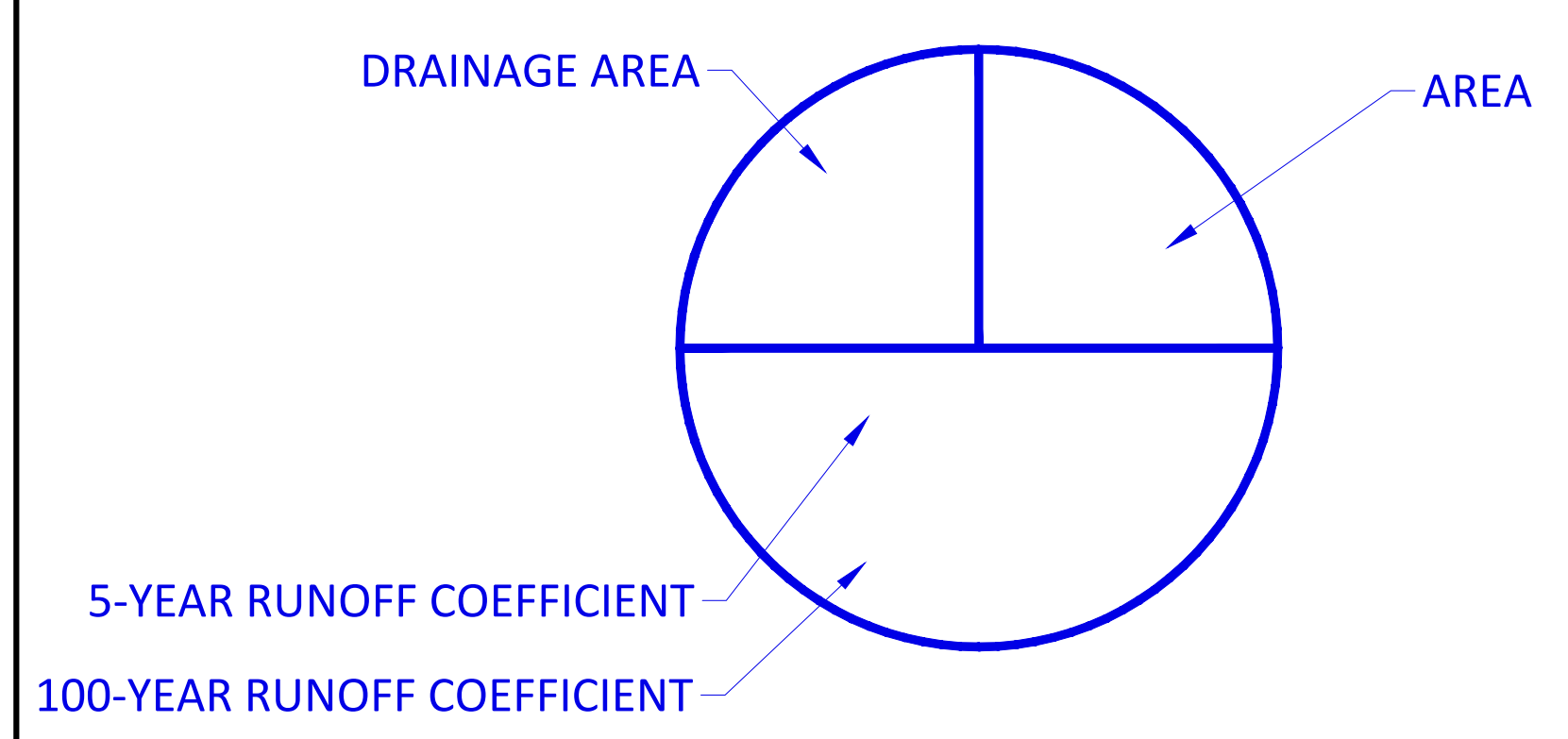
Project: **254 LAKE AVENUE WEST**

Drawing Title: POST-DEVELOPMENT DRAINAGE PLAN	
Scale: 1:250	Project Number: CO-22-1448
Drawn By: FV	Checked By: AM
Designed By: AG	Drawing Number: POST

GENERAL NOTES

- THE ORIGINAL TOPOGRAPHY, GROUND ELEVATION AND SURVEY DATA SHOWN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY AND IMPLY NO GUARANTEE OF ACCURACY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
- THIS PLAN IS NOT A CADASTRAL SURVEY SHOWING LEGAL PROPERTY BOUNDARIES AND EASEMENTS. THE PROPERTY BOUNDARIES SHOWN HEREON HAVE BEEN DERIVED FROM INFORMATION SUPPLIED BY (OR SHOWN ON) ANNIS, OSULLIVAN, VOLLEBEK LTD. DRAWING 17446-21 AND CANNOT BE RELIED UPON TO BE ACCURATE OR COMPLETE. THE PRECISE LOCATION OF THE CURRENT PROPERTY BOUNDARIES AND EASEMENTS CAN ONLY BE DETERMINED BY AN UP-TO-DATE LAND TITLES SEARCH AND A SUBSEQUENT CADASTRAL SURVEY PERFORMED AND CERTIFIED BY AN ONTARIO LAND SURVEYOR.
- THE CONTRACTOR IS TO OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY BEFORE COMMENCING CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT.
- THE CONTRACTOR IS TO DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME ALL RESPONSIBILITY FOR EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
- RESTORE ALL TRENCHES AND SURFACES OF PUBLIC ROAD ALLOWANCES TO CONDITION EQUAL OR BETTER THAN ORIGINAL CONDITION AND TO THE SATISFACTION OF THE CITY AUTHORITIES.
- EXCAVATE AND DISPOSE OF ALL EXCESS EXCAVATED MATERIAL, SUCH AS ASPHALT, CURBING AND DEBRIS, OFF SITE AS DIRECTED BY THE ENGINEER AND THE CITY.
- TOPSOIL TO BE STRIPPED AND STOCKPILED FOR REHABILITATION. CLEAN FILL TO BE PLACED IN FILL AREAS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION, AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS.
- DO NOT ALTER GRADING OF THE SITE WITHOUT PRIOR APPROVAL OF THE ENGINEER/CITY.
- ALL ROADWAY, PARKING LOT, AND GRADING WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS. THE CONTRACTOR IS TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING.
- CONTACT THE CITY FOR INSPECTION OF ROUGH GRADING OF PARKING LOTS, ROADWAYS AND LANDSCAPED AREAS PRIOR TO PLACEMENT OF ASPHALT AND TOPSOIL. ALL DEFICIENCIES NOTED SHALL BE RECTIFIED TO THE CITY'S SATISFACTION PRIOR TO PLACEMENT OF ANY ASPHALT, TOPSOIL, SEED & MULCH AND/OR SOD.
- ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
- ELECTRICAL, GAS, TELEPHONE AND TELEVISION SERVICE LOCATIONS ARE SUBJECT TO THE INDIVIDUAL AGENCY:
 - ELECTRICAL SERVICE - HYDRO ONE,
 - GAS SERVICE - ENBRIDGE,
 - TELEPHONE SERVICE - BELL CANADA,
 - TELEVISION SERVICE - ROGERS.
- INSTALLATION TO BE IN ACCORDANCE WITH CURRENT CODES AND STANDARDS OF APPROVAL AGENCIES HYDRO ONE, BELL AND THE CITY.
- CONTRACTOR TO ENSURE ALL APPLICABLE OPS SPECIFICATIONS ARE FOLLOWED DURING CONSTRUCTION.
- ALL PROPOSED CURB TO BE CONCRETE BARRIER CURB UNLESS OTHERWISE SPECIFIED.

LEGEND:



FILENAME: U:\Other\01\Project - Proposed\2022\06\16\CO-22-1448\Escape Homes_SPC_254 Lake Ave. Carleton Place\13 - Drawing\CO-22-1448 Presentation.dwg
 LAST SAVED: Wednesday, February 08, 2023 1:51:45 PM
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APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

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CO-22-1448 - 254 Lake Avenue West

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Tc (min)	Intensity (mm/hr)	
	5-Year	100-Year
20	70.3	120.0
10	104.2	178.6

C-Values	
Impervious	0.90
Gravel	0.60
Pervious	0.20

Pre-Development Runoff Coefficient

Drainage Area	Impervious Area (m ²)	Gravel (m ²)	Pervious Area (m ²)	Average C (5-year)	Average C (100-year)
A1	972	17	3,904	0.34	0.40

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
A1	0.49	0.34	0.40	10	48.24	97.31
Total	0.49				48.24	97.31

Post-Development Runoff Coefficient

Drainage Area	Impervious Area (m ²)	Gravel (m ²)	Pervious Area (m ²)	Average C (5-year)	Average C (100-year)	
B1	197.80	0	0	0.90	1.00	Roof 1
B2	197.80	0	0	0.90	1.00	Roof 2
B3	197.80	0	0	0.90	1.00	Roof 3
B4	197.80	0	0	0.90	1.00	Roof 4
B5	429.22	0	1,028	0.41	0.47	Unrestricted
B6	393.18	0	396	0.55	0.62	Surface Restricted
B7	209.48	0	230	0.53	0.61	Surface Restricted
B8	331.66	0	485	0.48	0.55	Unrestricted
B9	156.14	0	427	0.39	0.45	Unrestricted

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)		
					5-Year	100-Year	
B1	0.02	0.90	1.00	10	5.16	9.82	Restricted - Roof 1
B2	0.02	0.90	1.00	10	5.16	9.82	Restricted - Roof 2
B3	0.02	0.90	1.00	10	5.16	9.82	Restricted - Roof 3
B4	0.02	0.90	1.00	10	5.16	9.82	Restricted - Roof 4
B5	0.15	0.41	0.47	10	17.14	34.06	Unrestricted
B6	0.08	0.55	0.62	10	12.54	24.43	Surface Restricted
B7	0.04	0.53	0.61	10	6.80	13.26	Surface Restricted
B8	0.08	0.48	0.55	10	11.46	22.49	Unrestricted
B9	0.06	0.39	0.45	10	6.55	13.05	Unrestricted
Total	0.49				75.11	146.56	

Required Restricted Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	Q (L/s)	
				5-Year	100-Year
A1	0.49	0.34	10	48.24	97.31

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Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/S)		Restricted Flow (L/S)		Storage Required (m ³)		Storage Provided (m ³)	
	5-year	100-Year	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year
B1	5.16	9.82	0.42	0.72	4.3	8.5	5.2	8.9
B2	5.16	9.82	0.42	0.72	4.3	8.5	5.2	8.9
B3	5.16	9.82	0.42	0.72	4.3	8.5	5.2	8.9
B4	5.16	9.82	0.42	0.72	4.3	8.5	5.2	8.9
B5	17.14	34.06	17.14	34.06				
B6	12.54	24.43	4.67	7.53	4.7	10.7	4.9	11.9
B7	6.80	13.26	2.95	5.11	2.3	4.9	2.6	5.5
B8	11.46	22.49	11.46	22.49				
B9	6.55	13.05	6.55	13.05				
Total	75.11	146.56	44.45	85.12	24.4	49.5	28.3	53.0

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CO-22-1448 - 254 Lake Avenue West

Storage Requirements for Area B1

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5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	5.16	0.42	4.74	2.84
20	70.3	3.48	0.42	3.06	3.67
30	53.9	2.67	0.42	2.25	4.05
40	44.2	2.19	0.42	1.77	4.24
50	37.7	1.87	0.42	1.45	4.34
60	32.9	1.63	0.42	1.21	4.35
70	29.4	1.45	0.42	1.03	4.35
80	26.6	1.32	0.42	0.90	4.30

Maximum Storage Required 5-year =	4.35 m³
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100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	9.82	0.72	9.10	5.46
20	120.0	6.60	0.72	5.88	7.05
30	91.9	5.05	0.72	4.33	7.80
40	75.1	4.13	0.72	3.41	8.18
50	64.0	3.52	0.72	2.80	8.40
60	55.9	3.07	0.72	2.35	8.47
70	49.8	2.74	0.72	2.02	8.48
80	45.0	2.47	0.72	1.75	8.42
90	41.1	2.26	0.72	1.54	8.32
100	37.9	2.08	0.72	1.36	8.18

Maximum Storage Required 100-year =	8.48 m³
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5-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.035	5.19

Storage Available (m³) =	5.19
Storage Required (m³) =	4.35

100-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.060	8.90

Storage Available (m³) =	8.90
Storage Required (m³) =	8.48

*Area is 75% of the total roof area

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CO-22-1448 - 254 Lake Avenue West

Storage Requirements for Area B2

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5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B2	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	5.16	0.42	4.74	2.84
20	70.3	3.48	0.42	3.06	3.67
30	53.9	2.67	0.42	2.25	4.05
40	44.2	2.19	0.42	1.77	4.24
50	37.7	1.87	0.42	1.45	4.34
60	32.9	1.63	0.42	1.21	4.35
70	29.4	1.45	0.42	1.03	4.35
80	26.6	1.32	0.42	0.90	4.30

Maximum Storage Required 5-year =	4.35 m³
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100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B2	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	9.82	0.72	9.10	5.46
20	120.0	6.60	0.72	5.88	7.05
30	91.9	5.05	0.72	4.33	7.80
40	75.1	4.13	0.72	3.41	8.18
50	64.0	3.52	0.72	2.80	8.40
60	55.9	3.07	0.72	2.35	8.47
70	49.8	2.74	0.72	2.02	8.48
80	45.0	2.47	0.72	1.75	8.42
90	41.1	2.26	0.72	1.54	8.32
100	37.9	2.08	0.72	1.36	8.18

Maximum Storage Required 100-year =	8.48 m³
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5-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.035	5.19

Storage Available (m³) =	5.19
Storage Required (m³) =	4.35

100-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.060	8.90

Storage Available (m³) =	8.90
Storage Required (m³) =	8.48

*Area is 75% of the total roof area

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CO-22-1448 - 254 Lake Avenue West

Storage Requirements for Area B3

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5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B3	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	5.16	0.42	4.74	2.84
20	70.3	3.48	0.42	3.06	3.67
30	53.9	2.67	0.42	2.25	4.05
40	44.2	2.19	0.42	1.77	4.24
50	37.7	1.87	0.42	1.45	4.34
60	32.9	1.63	0.42	1.21	4.35
70	29.4	1.45	0.42	1.03	4.35
80	26.6	1.32	0.42	0.90	4.30

Maximum Storage Required 5-year =	4.35 m³
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100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B3	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	9.82	0.72	9.10	5.46
20	120.0	6.60	0.72	5.88	7.05
30	91.9	5.05	0.72	4.33	7.80
40	75.1	4.13	0.72	3.41	8.18
50	64.0	3.52	0.72	2.80	8.40
60	55.9	3.07	0.72	2.35	8.47
70	49.8	2.74	0.72	2.02	8.48
80	45.0	2.47	0.72	1.75	8.42
90	41.1	2.26	0.72	1.54	8.32
100	37.9	2.08	0.72	1.36	8.18

Maximum Storage Required 100-year =	8.48 m³
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5-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.035	5.19

Storage Available (m³) =	5.19
Storage Required (m³) =	4.35

100-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.060	8.90

Storage Available (m³) =	8.90
Storage Required (m³) =	8.48

*Area is 75% of the total roof area

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CO-22-1448 - 254 Lake Avenue West

Storage Requirements for Area B4

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B4	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	5.16	0.42	4.74	2.84
20	70.3	3.48	0.42	3.06	3.67
30	53.9	2.67	0.42	2.25	4.05
40	44.2	2.19	0.42	1.77	4.24
50	37.7	1.87	0.42	1.45	4.34
60	32.9	1.63	0.42	1.21	4.35
70	29.4	1.45	0.42	1.03	4.35
80	26.6	1.32	0.42	0.90	4.30

Maximum Storage Required 5-year =	4.35 m³
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100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B4	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	9.82	0.72	9.10	5.46
20	120.0	6.60	0.72	5.88	7.05
30	91.9	5.05	0.72	4.33	7.80
40	75.1	4.13	0.72	3.41	8.18
50	64.0	3.52	0.72	2.80	8.40
60	55.9	3.07	0.72	2.35	8.47
70	49.8	2.74	0.72	2.02	8.48
80	45.0	2.47	0.72	1.75	8.42
90	41.1	2.26	0.72	1.54	8.32
100	37.9	2.08	0.72	1.36	8.18

Maximum Storage Required 100-year =	8.48 m³
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5-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.035	5.19

Storage Available (m³) =	5.19
Storage Required (m³) =	4.35

100-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	148.35	0.060	8.90

Storage Available (m³) =	8.90
Storage Required (m³) =	8.48

*Area is 75% of the total roof area

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Roof Drain Flow (B1-B4)

Roof Drains Summary		
Type of Control Device	Watts Drainage - Accutrol Weir	
Number of Roof Drains	1	
	5-Year	100-Year
Rooftop Storage (m ³)	5.19	8.90
Storage Depth (mm)	0.035	0.060
Flow (Per Roof Drain) (L/s)	0.42	0.72
Total Flow (L/s)	0.42	0.72

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.18
20	0.24
25	0.30
30	0.36
35	0.42
40	0.48
45	0.54
50	0.60
55	0.66

*Roof Drain model to be Accutrol Weirs, See attached sheets
 *Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

1 roof drain during a 5 year storm

elevation of water = 25mm
 Flow leaving 1 roof drain = (1 x 0.30 L/s) = 0.30 L/s

1 roof drain during a 100 year storm

elevation of water = 50mm
 Flow leaving 1 roof drain = (1 x 0.60 L/s) = 0.60 L/s

4 roof drains during a 5 year storm

elevation of water = 25mm
 Flow leaving 4 roof drains = (4 x 0.30 L/s) = 1.20 L/s

4 roof drains during a 100 year storm

elevation of water = 50mm
 Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

Roof Drain Flow			
	Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
	0.18	15	0.18
	0.24	20	0.24
	0.30	25	0.30
	0.36	30	0.36
5-Year	0.42	35	0.42
	0.48	40	0.48
	0.54	45	0.54
	0.60	50	0.60
100-Year	0.66	55	0.66
	0.72	60	0.72
	0.78	65	0.78
	0.84	70	0.84
	0.90	75	0.90
	0.96	80	0.96
	1.02	85	1.02
	1.08	90	1.08
	1.14	95	1.14
	1.20	100	1.20
	1.26	105	1.26
	1.32	110	1.32
	1.38	115	1.38
	1.44	120	1.44
	1.50	125	1.50
	1.56	130	1.56
	1.62	135	1.62
	1.68	140	1.68
	1.74	145	1.74
	1.80	150	1.80

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

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CO-22-1448 - 254 Lake Avenue West

Storage Requirements for Area B6

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5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B6	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	12.55	4.67	7.88	4.73
20	70.3	8.46	4.67	3.79	4.55
30	53.9	6.49	4.67	1.82	3.28
40	44.2	5.32	4.67	0.65	1.56

Maximum Storage Required 5-year = 4.73 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B6	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	24.44	7.53	16.91	10.15
20	120.0	16.42	7.53	8.89	10.67
30	91.9	12.58	7.53	5.05	9.08
40	75.1	10.28	7.53	2.75	6.59

Maximum Storage Required 100-year = 10.67 m³

5-Year Storm Event Storage Summary

		Water Elev. (m) = 136.57			
Location	Btm Storage Area	INV. (out)	Depth (m)	Head (m)	Volume (m ³)
Storage Area 1	136.47	136.47	0.10	0.05	4.9

Storage Available (m³) = 4.9
Storage Required (m³) = 4.7

100-Year Storm Event Storage Summary

		Water Elev. (m) = 136.65			
Location	Btm Storage Area	INV. (out)	Depth (m)	Head (m)	Volume (m ³)
Storage Area 1	136.47	136.46	0.18	0.14	11.9

Storage Available (m³) = 11.9
Storage Required (m³) = 10.7

*Available Storage calculated from AutoCAD

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CO-22-1448 - 254 Lake Avenue West

For Orifice Flow, C= 0.60
 For Weir Flow, C= 1.84

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	Orifice 1
invert elevation	136.47
center of crest elevation	136.52
orifice width / weir length	100 mm
weir height	
orifice area (m ²)	0.008

Elevation Discharge Table - Storm Routing

Elevation	Orifice 1		Orifice 2		Weir 1		Weir 2		Total Q [L/s]
	H [m]	Q [m ³ /s]	H [m]	Q [m ³ /s]	H [m]	Q [m ³ /s]	H [m]	Q [m ³ /s]	
136.47	x	x							0.00
136.48	x	x							0.00
136.49	x	x							0.00
136.50	x	x							0.00
136.51	x	x							0.00
136.52	x	x							0.00
136.53	0.01	0.00							2.09
136.54	0.02	0.00							2.95
136.55	0.03	0.00							3.62
136.56	0.04	0.00							4.17
136.57	0.05	0.00							4.67
136.58	0.06	0.01							5.11
136.59	0.07	0.01							5.52
136.60	0.08	0.01							5.90
136.61	0.09	0.01							6.26
136.62	0.10	0.01							6.60
136.63	0.11	0.01							6.92
136.64	0.12	0.01							7.23
136.65	0.13	0.01							7.53
136.66	0.14	0.01							7.81
136.67	0.15	0.01							8.08
136.68	0.16	0.01							8.35
136.69	0.17	0.01							8.61
136.70	0.18	0.01							8.86
136.71	0.19	0.01							9.10
136.72	0.20	0.01							9.33
136.73	0.21	0.01							9.57
136.74	0.22	0.01							9.79
136.75	0.23	0.01							10.01
136.76	0.24	0.01							10.23
136.77	0.25	0.01							10.44
136.78	0.26	0.01							10.64
136.79	0.27	0.01							10.85
136.80	0.28	0.01							11.05
136.81	0.29	0.01							11.24
136.82	0.30	0.01							11.43
136.83	0.31	0.01							11.62
136.84	0.32	0.01							11.81

5-Year

100-Year

- Notes:
1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.
 2. Orifice Equation: $Q = cA(2gh)^{1/2}$
 3. Weir Equation: $Q = CLH^{3/2}$
 4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.
 5. H for orifice equations is depth of water above the centroid of the orifice.
 6. H for weir equations is depth of water above the weir crest.

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Storage Requirements for Area B7

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5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B7	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	6.80	2.95	3.85	2.31
20	70.3	4.58	2.95	1.63	1.96
30	53.9	3.52	2.95	0.57	1.02
40	44.2	2.88	2.95	0.00	0.00
50	37.7	2.46	2.95	0.00	0.00
60	32.9	2.15	2.95	0.00	0.00
70	29.4	1.92	2.95	0.00	0.00
80	26.6	1.73	2.95	0.00	0.00
90	24.3	1.58	2.95	0.00	0.00

Maximum Storage Required 5-year = 2.31 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B7	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	13.26	5.11	8.15	4.89
20	120.0	8.91	5.11	3.80	4.56
30	91.9	6.82	5.11	1.71	3.08
40	75.1	5.58	5.11	0.47	1.12
50	64.0	4.75	5.11	0.00	0.00
60	55.9	4.15	5.11	0.00	0.00
70	49.8	3.70	5.11	0.00	0.00
80	45.0	3.34	5.11	0.00	0.00
90	41.1	3.05	5.11	0.00	0.00
100	37.9	2.81	5.11	0.00	0.00
110	35.2	2.61	5.11	0.00	0.00
120	32.9	2.44	5.11	0.00	0.00

Maximum Storage Required 100-year = 4.89 m³

5-Year Storm Event Storage Summary

		Water Elev. (m) = 136.38			
Location	Btm Storage Area	INV. (out)	Depth (m)	Head (m)	Volume (m ³)
Storage Area 2	136.31	136.31	0.07	0.02	9.4

Storage Available (m³) = 2.6 *
Storage Required (m³) = 2.3

100-Year Storm Event Storage Summary

		Water Elev. (m) = 136.42			
Location	Btm Storage Area	INV. (out)	Depth (m)	Head (m)	Volume (m ³)
Storage Area 2	136.31	136.31	0.11	0.06	5.5

Storage Available (m³) = 5.5 *
Storage Required (m³) = 4.9

*Available Storage calculated from AutoCAD

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For Orifice Flow, C= 0.60
 For Weir Flow, C= 1.84

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	Orifice 1
invert elevation	136.31
center of crest elevation	136.36
orifice width / weir length	100 mm
weir height	
orifice area (m ²)	0.008

Tempest LMF 80 ICD is proposed based on Stormwater Analysis

Elevation Discharge Table - Storm Routing

Elevation	Orifice 1		Orifice 2		Weir 1		Weir 2		Total Q [L/s]
	H [m]	Q [m ³ /s]	H [m]	Q [m ³ /s]	H [m]	Q [m ³ /s]	H [m]	Q [m ³ /s]	
136.31	x	x							0.00
136.32	x	x							0.00
136.33	x	x							0.00
136.34	x	x							0.00
136.35	x	x							0.00
136.36	x	x							0.00
136.37	0.01	0.00							2.09
136.38	0.02	0.00							2.95
136.39	0.03	0.00							3.62
136.40	0.04	0.00							4.17
136.41	0.05	0.00							4.67
136.42	0.06	0.01							5.11
136.43	0.07	0.01							5.52
136.44	0.08	0.01							5.90
136.45	0.09	0.01							6.26
136.46	0.10	0.01							6.60
136.47	0.11	0.01							6.92
136.48	0.12	0.01							7.23
136.49	0.13	0.01							7.53
136.50	0.14	0.01							7.81
136.51	0.15	0.01							8.08
136.52	0.16	0.01							8.35
136.53	0.17	0.01							8.61
136.54	0.18	0.01							8.86
136.55	0.19	0.01							9.10
136.56	0.20	0.01							9.33
136.57	0.21	0.01							9.57
136.58	0.22	0.01							9.79
136.59	0.23	0.01							10.01
136.60	0.24	0.01							10.23
136.61	0.25	0.01							10.44
136.62	0.26	0.01							10.64
136.63	0.27	0.01							10.85
136.64	0.28	0.01							11.05
136.65	0.29	0.01							11.24
136.66	0.30	0.01							11.43
136.67	0.31	0.01							11.62
136.68	0.32	0.01							11.81

5-Year

100-Year

- Notes:
1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.
 2. Orifice Equation: $Q = cA(2gh)^{1/2}$
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Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	99	1.38	10	7

Therefore, a Tc of 10 can be used

$$T_c = (3.26(1.1-c)L^{0.5}/S^{0.33})$$

c = Balanced Runoff Coefficient

L = Length of drainage area

S = Average slope of watershed

**APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST**

City of Ottawa

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

Criteria	Location (if applicable)
<input type="checkbox"/> Executive Summary (for larger reports only).	N/A
<input type="checkbox"/> Date and revision number of the report.	On Cover
<input type="checkbox"/> Location map and plan showing municipal address, boundary, and layout of proposed development.	Appendix A
<input type="checkbox"/> Plan showing the site and location of all existing services.	Site Servicing Plan (C102)
<input type="checkbox"/> Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	1.1 Purpose 1.2 Site Description 7.0 Stormwater Management
<input type="checkbox"/> Summary of pre-consultation meetings with City and other approval agencies.	Appendix B
<input type="checkbox"/> Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.	1.1 Purpose 1.2 Site Description 7.0 Stormwater Management
<input type="checkbox"/> Statement of objectives and servicing criteria.	1.1 Purpose

<input type="checkbox"/> Identification of existing and proposed infrastructure available in the immediate area.	N/A
<input type="checkbox"/> Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Site Grading Plan (C101)
<input type="checkbox"/> Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Site Grading Plan (C101)
<input type="checkbox"/> Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
<input type="checkbox"/> Proposed phasing of the development, if applicable.	N/A
<input type="checkbox"/> Reference to geotechnical studies and recommendations concerning servicing.	Section 2.0 Background Studies, Standards and References
<input type="checkbox"/> All preliminary and formal site plan submissions should have the following information: <ul style="list-style-type: none"> ○ Metric scale ○ North arrow (including construction North) ○ Key plan ○ Name and contact information of applicant and property owner ○ Property limits including bearings and dimensions ○ Existing and proposed structures and parking areas ○ Easements, road widening and rights-of-way ○ Adjacent street names 	Site Grading Plan (C101)

4.2 Development Servicing Report: Water

Criteria	Location (if applicable)
<input type="checkbox"/> Confirm consistency with Master Servicing Study, if available	N/A
<input type="checkbox"/> Availability of public infrastructure to service proposed development	N/A
<input type="checkbox"/> Identification of system constraints	N/A
<input type="checkbox"/> Identify boundary conditions	Appendix C
<input type="checkbox"/> Confirmation of adequate domestic supply and pressure	N/A
<input type="checkbox"/> Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Appendix C
<input type="checkbox"/> Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
<input type="checkbox"/> Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
<input type="checkbox"/> Address reliability requirements such as appropriate location of shut-off valves	N/A
<input type="checkbox"/> Check on the necessity of a pressure zone boundary modification.	N/A
<input type="checkbox"/> Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Appendix C, Section 3.2

<input type="checkbox"/> Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Site Servicing Plan (C101)
<input type="checkbox"/> Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
<input type="checkbox"/> Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Appendix C
<input type="checkbox"/> Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Criteria	Location (if applicable)
<input type="checkbox"/> Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	N/A
<input type="checkbox"/> Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
<input type="checkbox"/> Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
<input type="checkbox"/> Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 5.2 Proposed Sanitary Sewer

<input type="checkbox"/> Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2 Proposed Sanitary Design
<input type="checkbox"/> Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N/A
<input type="checkbox"/> Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2 Proposed Sanitary Sewer
<input type="checkbox"/> Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
<input type="checkbox"/> Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
<input type="checkbox"/> Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
<input type="checkbox"/> Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
<input type="checkbox"/> Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

Criteria	Location (if applicable)
<input type="checkbox"/> Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.0 Stormwater Sewer Design & Section 6.0 Proposed Stormwater Management
<input type="checkbox"/> Analysis of available capacity in existing public infrastructure.	N/A
<input type="checkbox"/> A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Pre & Post-Development Plans
<input type="checkbox"/> Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5-year event (dependent on the receiving sewer design) to 100-year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.0 Stormwater Sewer Design & Section 6.0 Proposed Stormwater Management
<input type="checkbox"/> Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.0 Stormwater Sewer Design & Section 6.0 Proposed Stormwater Management
<input type="checkbox"/> Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 5.0 Stormwater Sewer Design & Section 6.0 Proposed Stormwater Management
<input type="checkbox"/> Set-back from private sewage disposal systems.	N/A
<input type="checkbox"/> Watercourse and hazard lands setbacks.	N/A
<input type="checkbox"/> Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
<input type="checkbox"/> Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
<input type="checkbox"/> Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).	Appendix G

<input type="checkbox"/> Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Site Grading Plan
<input type="checkbox"/> Calculate pre-and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 6.0 Proposed Stormwater Management Appendix G
<input type="checkbox"/> Any proposed diversion of drainage catchment areas from one outlet to another.	Section 5.0 Stormwater Sewer Design & Section 6.0 Proposed Stormwater Management
<input type="checkbox"/> Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 5.0 Stormwater Sewer Design & Section 6.0 Proposed Stormwater Management
<input type="checkbox"/> If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
<input type="checkbox"/> Identification of potential impacts to receiving watercourses	N/A
<input type="checkbox"/> Identification of municipal drains and related approval requirements.	N/A
<input type="checkbox"/> Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.0 Stormwater Sewer Design & Section 6.0 Proposed Stormwater Management
<input type="checkbox"/> 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Site Grading Plan (C101)
<input type="checkbox"/> Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A

<input type="checkbox"/> Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0 Sediment & Erosion Control
<input type="checkbox"/> Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
<input type="checkbox"/> Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

Criteria	Location (if applicable)
<input type="checkbox"/> Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	N/A
<input type="checkbox"/> Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
<input type="checkbox"/> Changes to Municipal Drains.	N/A
<input type="checkbox"/> Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

Criteria	Location (if applicable)
<input type="checkbox"/> Clearly stated conclusions and recommendations	Section 8.0 Summary Section 9.0 Recommendations
<input type="checkbox"/> Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	All are stamped
<input type="checkbox"/> All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	All are stamped