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FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

HOLLOWAY LODGING CORPORATION 1354 & 1376 CARLING AVENUE – PHASE I

CITY OF OTTAWA

PROJECT NO.: 16-908

DECEMBER 2018 – REV 3

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT
FOR
1354 & 1376 CARLING AVENUE
HOLLOWAY LODGING CORPORATION

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- Site Plan prepared by GeigerHuot Architects dated September 25th, 2018
- Concept Plan prepared by GeigerHuot Architects dated April 18th, 2018
- Topographic Survey prepared by Annis, O'Sullivan, Vollebekk Ltd. dated April 16th, 2018
- City of Ottawa, 2016 Sewer Collection System
- City of Ottawa, 2016 Water Distribution System

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FOR
1354 & 1376 CARLING AVENUE
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CITY OF OTTAWA
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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Holloway Lodging Corporation to prepare a Functional Servicing and Stormwater Management report in support of the application for a Zoning By-law Amendment (ZBLA) and Site Plan Control (SPC) in support of the development at 1354 and 1376 Carling Avenue.

The subject property is located within the City of Ottawa urban boundary, in the River ward. As illustrated in ***Figure 1***, the subject property is bounded by Carling Avenue to the north, Meath Street to the west and Archibald Street to the east. The subject property, which consists of three parcels of land, measures approximately ***1.9 ha*** and is zoned Arterial Main Street Use (AM) and Residential Fourth Density Zone (R4). The Phase I development will occupy 1354 Carling Avenue, which measures approximately ***0.85 ha***.

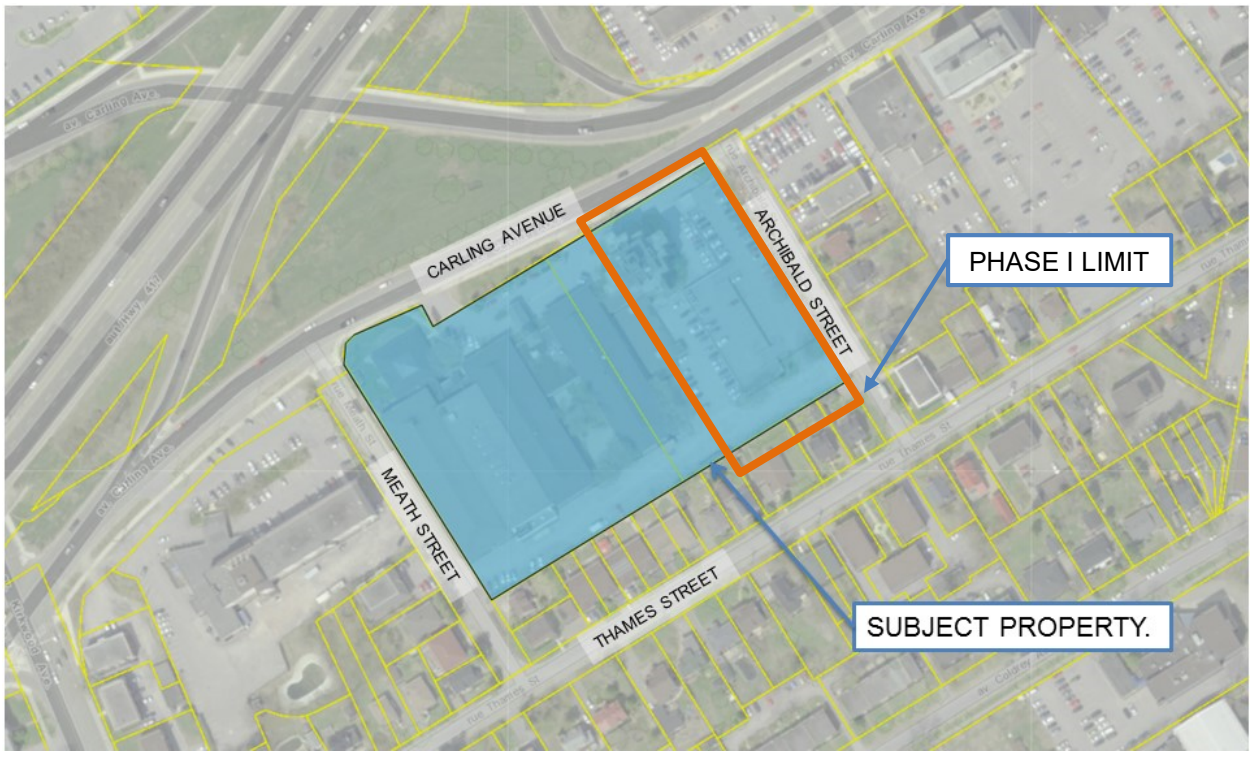

Figure 1: Site Location

The proposed ZBLA and SPC would allow for the development of four residential /commercial buildings; the proposed development is contemplated to be completed in phases with incremental demolition of the existing lodging buildings and the outdoor parking structure to allow for development as required.

The proposed development would include a full build-out of approximately ***2,165 m²*** of ground level retail and approximately ***921*** residential units, split between each phase. Phase I, containing proposed Building C and E, will include approximately ***1745 m²*** of ground level retail/amenity space and approximately ***403*** residential units with associated above and underground parking. In the interim, additional parking spaces will be added within 1376 Carling Avenue. Copies of the proposed Phase I and Ultimate site plans are included in ***Drawings/Figures***.

The objective of this report is to provide sufficient detail to demonstrate that the proposed re-zoning and proposed development is supported by existing municipal services and to support the SPC for the Phase I development.

1.1 Existing Conditions

The existing site contains two lodging buildings with associated asphalt parking lots.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

- **Meath Street**
- 152 mm diameter unlined cast iron watermain
- 300 mm diameter concrete sanitary sewer tributary to the Cave Creek Collector
- 375 mm diameter concrete storm sewer tributary to the Cave Creek Storm sewer
- 525 mm diameter concrete storm sewer tributary to the Cave Creek Storm sewer
- 300 mm diameter concrete storm sewer tributary to the Cave Creek Storm sewer
- **Archibald Street**
- 152 mm diameter unlined cast iron watermain
- 225 mm diameter concrete sanitary sewer tributary to the Cave Creek Collector
- 900 mm diameter concrete storm sewer tributary to the Cave Creek Storm sewer
- 675 mm diameter concrete storm sewer tributary to the Cave Creek Storm sewer
- **Carling Avenue**
- 1220 mm diameter concrete lined steel watermain
- 406 mm diameter PVC watermain
- 900 mm diameter concrete Cave Creek Collector sanitary sewer

- 1800 mm concrete Cave Creek Collector storm tunnel tributary to Ottawa River ~3.8 km downstream
- 2100 mm concrete West Hintonburg storm tunnel tributary to Ottawa River ~3.5 km downstream

1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

The proposed development is a single parcel of land that is not industrial and would outlet to a storm sewer. As a result, the stormwater management system is exempt from sections 53(1) and (3) of the Ontario Water Resources Act under Ontario Regulation 525/98. Correspondence with the MOE has been included in ***Appendix A***.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, is located in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002,* October 2012.
  (City Standards)

  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-01*)

  - **Technical Bulletin ISTB-2018-03**
    City of Ottawa, June 27, 2018.
    (*ISTB-2018-03*)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

  - **Technical Bulletin ISDTB-2018-02**
    City of Ottawa, March 21, 2018.
    (*ISDTB-2018-02*)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE* Design Guidelines*)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch, January 1, 2010 Update.
  (OBC)

- **NFPA 13 – Standard for the Installation of Sprinkler Systems**
  National Fire Protection Association, 2016.
  (NFPA Standards)

- **Geotechnical Investigation**
  Paterson Group Inc., PG3736-1, January 9, 2017.
  (Geotechnical Report)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 2W pressure zone, as shown by the Pressure Zone map in ***Appendix B***. The development at 1376 Carling Avenue is currently serviced by a 152 mm diameter watermain within the Meath Street right-of-way and the development at 1354 Carling Avenue is currently serviced by the 152 mm diameter watermain within the Archibald Street right-of-way.

Based on the information provided by Holloway Lodging Corporation, the existing average water demand is 0.76 L/s and maximum water demand is 1.0 L/s.

3.2 Water Supply Servicing Design

The phased redevelopment of the site means that portions of the existing commercial buildings will remain and are contemplated to retain their current connections to the watermain within the adjacent right-of-way.

It is anticipated that the proposed development will have connections to the 152 mm diameter watermain within Meath Street and the 152 mm diameter watermain within Archibald Street. During Phase I, the watermain network will connect to the 150 mm diameter watermain within Archibald Street via a 150mm diameter watermain for both Building C and Building E. Detailed servicing layout is identified by drawing ***SSP-1.***

In accordance with City of Ottawa technical bulletin ISDTB-2014-02, redundant service connections will be required due to an anticipated design flow of greater than 50 m^3/day, for each phase. In Phase I, a valve box is proposed within the Archibald Street right-of-way to ensure adequate water supply if either the watermain within Carling Avenue or the watermain on Archibald Street need to be closed.

Based on As-built drawings provided by the City of Ottawa, it appears that there are two fire hydrants fronting the property along Meath Street, one fire hydrant fronting the property along Carling Avenue, and two fire hydrant fronting the property along Archibald Street.

Table 1, below, summarizes the ***Water Supply Guidelines*** employed in the preparation of the preliminary water demand estimate.

Table 1
Water Supply Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Residential Average Daily Demand	350 L/d/P
Residential Maximum Daily Demand	2.5 x Average Daily *
Residential Maximum Hourly	5.5 x Average Daily *
Commercial Retail	2.5 $L/m^2/d$
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350kPa and 480kPa
During normal operating conditions pressure must not drop below	275kPa
During normal operating conditions pressure must not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa

Daily average based on Appendix 4-A from **Water Supply Guidelines*
*** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.*
-Table updated to reflect ISD-2010-2

Table 2 and ***Table 3*** summarize the estimated water supply demand and boundary conditions for the proposed ultimate development and Phase I development based on the ***Water Supply Guidelines***.

Table 2
Water Demand - Proposed Conditions

	Phase I	Ultimate (Phase I & Phase II)
Design Parameter	**Estimated Demand[1] (L/min)**	**Anticipated Demand[1] (L/min)**
Average Daily Demand	178.9	390.2
Max Day + Fire Flow	444.8 + 6,650 = 7,094.8	969.9 + 6,650 = 7,619.9
Peak Hour	977.1	2130.3

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.

Table 3
Boundary Conditions - Proposed Conditions (Phase 1)

Design Parameter	Archibald Street (BLDG C)	Archibald Street (BLDG E)
	Boundary Condition[1] (m H_2O / kPa)	Boundary Condition[1] (m H_2O / kPa)
Average Daily Demand	60.3 / 591.1	60.2 / 590.2
Max Day + Fire Flow	40.2 / 393.9	16.2 / 158.5
Peak Hour	51.6 / 505.7	51.4 / 503.8

2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation of 73.95m for Archibald Street (BLDG C), and 74.04m for Archibald Street (BLDG E). See ***Appendix B.***

Table 4
Boundary Conditions - Proposed Conditions (Phase 2)

Design Parameter	Meath Street	Archibald Street (BLDG C)	Archibald Street (BLDG E)
	Boundary Condition[2] (m H_2O / kPa)	Boundary Condition[2] (m H_2O / kPa)	Boundary Condition[2] (m H_2O / kPa)
Average Daily Demand	60.5 / 593.5	60.7 / 595.0	60.4 / 592.1
Max Day + Fire Flow	43.5 / 426.7	39.8 / 389.9	15.5 / 151.7
Peak Hour	50.7 / 497.4	50.9 / 498.8	50.7 / 497.0

1) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation of 74.0m for Meath Street, 73.95m for Archibald Street (BLDG C), and 74.04m for Archibald Street (BLDG E). See ***Appendix B.***

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in ***Appendix B***. Based on the updated Site Plan, dated December 4th, 2018. Correspondence with the City is included in ***Appendix B***.

The City provided the available fire flow at 140 kPa along with the estimated minimum and maximum water pressures for the demands, as indicated by the correspondence include in ***Appendix B***. The minimum and maximum pressures exceed the required range identified in ***Table 1***. As a result, pressure reducing valves at each building are required. Based on the City of Ottawa boundary conditions, the existing municipal infrastructure is capable of providing ***10,080 L/min*** at 140 kPa during fire flow demands.

The Nation Fire Protection Association (NFPA) is appropriate based on previous correspondence with City staff as it was determined that as no fire hydrants or internal watermain are proposed. As indicated by Section 11.2.2 from the ***NFPA Standards***, fire flow requirements are to be determined by combining the required flow rate for the sprinkler system, along with the anticipated hose stream. As indicated by Table 11.2.2.1 and Table 11.2.3.1.2 extracted from the ***NFPA Standards*** and included in ***Appendix B***, the anticipated fire flow requirements for the sprinkler system is ***5,700 L/min*** (1500 gpm) and the anticipated internal and external total combined inside and outside hose stream demand is ***950 L/min*** (250 gpm).

As a result, the total fire flow is anticipated to be ***6,650 L/min*** (2,450 gpm). Based on the boundary conditions provided by the City of Ottawa, sufficient supply is available for fire flow. A certified fire protection system specialist will need to be employed to design the building fire suppression system and confirm the actual fire flow demand.

3.3 Water Supply Conclusion

The estimated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions. Sufficient fire flow in accordance with ***NFPA Standards of 6,650 L/min*** is available. As demonstrated by ***Table 2***, based on the City's model, pressures during average day demands exceed the ***Water Supply Guidelines*** required pressure range. As a result, pressure reducing valves are required at Building C and Building E.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site lies within the Cave Creek Collector Sewer catchment area, as shown by the trunk sewer mapping included in ***Appendix C***. Based on the pre-consultation meeting with the City of Ottawa, 1354 and 1376 Carling Avenue are currently serviced by an existing 300 mm diameter sanitary sewer within Meath Street.

Based on the information provided by Holloway Lodging Corporation, the existing average wastewater demand is 0.76 L/s and maximum wastewater demand is 1.0 L/s.

4.2 Wastewater Design

The phased redevelopment of the site means that potions of the existing commercial building will remain and it is contemplated to retain this building's current connections to the existing onsite sanitary sewer.

For the ultimate development, it is anticipated that Buildings A, B and D will have a connection to the existing 300 mm diameter sanitary sewer within Meath Street and Buildings C and E will have a connection to the existing 225mm sanitary sewer within Archibald Street.

During Phase I, the existing lodging building within 1376 Carling Avenue will maintain the connections to the existing 300 mm diameter sanitary sewer within Meath Street. Proposed Buildings C and E are to be serviced via two 200 mm diameter sanitary lateral to the existing 225 mm diameter sanitary sewer within Archibald Street.

Table 4, below, summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 5
Wastewater Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Average Daily Demand	350 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0
Commercial Floor Space	5 L/m^2/d
Infiltration and Inflow Allowance	0.28L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 5 and ***Table 6*** demonstrate the estimated peak flow from the ultimate and the Phase I developments. See ***Appendix C*** for associated calculations.

Table 6
Summary of Estimated Peak Wastewater Flow - Ultimate

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	7.1
Estimated Peak Dry Weather Flow	25.1
Estimated Peak Wet Weather Flow	25.6

Table 7
Summary of Estimated Peak Wastewater Flow – Phase I

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	3.1
Estimated Peak Dry Weather Flow	11.7
Estimated Peak Wet Weather Flow	12.0

The estimated sanitary flow based on the proposed Site Plan, provide in ***Drawings/Figures,*** estimates a total peak wet weather flow for the ultimate development and Phase I development of ***25.6 L/s*** and ***12.0 L/s***, respectively.

In order to access the available capacity a sanitary analysis was conducted for the local municipal sanitary sewers located across the frontage of the subject property. The catchment area serviced by the Meath Street sanitary sewer and the Archibald Street sanitary sewer was identified and evaluated by reviewing existing development and zoning within the area. The analysis was conducted from the site to the upstream extents of the drainage area, as shown by the sanitary drainage plans within ***Appendix C***.

City of Ottawa Sewer Design Guidelines (2004) Figure 4.3 'Peak Flow Design Parameters' were employed to generate a conservative estimate of the existing wastewater flow conditions within the sewer.

Based on the sanitary analysis, the controlling section of the Meath Street sanitary sewer is located between Node 1B and 1D with an available residual capacity of ***57.1 L/s***; detailed calculations are included in ***Appendix C***.

Based on the sanitary analysis, the controlling section of the Archibald Street sanitary sewer is located between Node 2A and 2B with an available residual capacity of ***17.3 L/s***; detailed calculations are included in ***Appendix C***.

The analysis above indicates that sufficient capacity is available in the local sewers to accommodate the proposed development. Due to the proximity of the Cave Creek Collector, the existing collector capacity will need to be confirmed with the City of Ottawa water resources group.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Cave Creek Trunk Collector sewer. Based on the sanitary analysis of the local sewers, sufficient capacity is available to accommodate the anticipated ***25.6 L/s*** and ***12.0 L/s*** peak wet weather flow from the proposed ultimate development and Phase I development, respectively.

Due to the proximity of the Cave Creek Collector, the existing collector capacity will need to be confirmed with the City of Ottawa water resources group.

The proposed wastewater design conforms to all relevant ***City Standards***.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system located within the Ottawa Central sub-watershed. As such, approvals for proposed development within this area are under the approval authority of the City of Ottawa.

Flows that influence the watershed in which the subject property is located are further reviewed by the principal authority having jurisdiction. The subject property is located within the Ottawa River watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). Correspondence with the RVCA is located in ***Appendix A***.

Storm runoff from the existing site flows towards the existing catchbasin system which outlets to the existing 1800mm diameter storm sewer within Carling Avenue and the existing 300mm diameter storm sewer within Meath Street.

The estimated pre-development peak flows for the 2, 5, and 100-year for the entire site are summarized in ***Table 7***:

Table 8
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	397.3
5-year	540.0
100-year	1089.7

5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were reviewed with the City of Ottawa, where the proposed development has the following requirements:

- Meet an allowable release rate based on a Rational Method Coefficient of 0.68, employing the City of Ottawa IDF parameters for a 2-year storm with a calculated time of concentration no less than 10 minutes.
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site.
- Quality controls are not required for the proposed development due to the site's distance from the outlet; correspondence is included in ***Appendix A***.

As part of the Phase I development, existing area within 1376 Carling Avenue has been modified to incorporate additional parking spaces. To compensate for the increase in impervious area, additional storage (outlined in Section 5.4) will be added within the Phase 1 development.

Table 8, below, summarizes the allowable release rates for the 5-year and 100-year storm events.

Table 9
Allowable Release Rates

	5-Year Release Rate	100-Year Release Rate
	(L/s)	(L/s)
Ultimate	279.4	279.4
Phase 1	121.3	121.3

Based on ***Table 8***, the allowable release rate for the ultimate development is ***279.4 L/s*** and the allowable release rate for the Phase I development is ***121.3 L/s***.

5.3 Proposed Stormwater Management System - Ultimate

To meet the stormwater objectives the proposed development will utilize flow attenuation via cistern storage.

For the ultimate development, it is anticipated that Buildings A, B and D will have a connection to the existing 300 mm diameter storm sewer within Meath Street and Buildings C and E will have a connection to the existing 900 mm storm sewer within Archibald Street.

Table 9, below, summarizes the post-development flow rates for the ultimate development. The following storage requirement estimate assumes that approximately 10% of the development area will be directed to the outlet without flow attenuation. These areas will be compensated for in areas with flow attenuation controls.

Table 10
Stormwater Flow Rate Summary - Ultimate

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Storage
	(L/s)	(m^3)	(L/s)	(m^3)
Unattenuated Areas	47.5	0.0	95.7	0.0
Attenuated Areas	91.6	237.4	183.7	476.2
Total	**139.0**	**237.4**	**279.4**	**476.2**

It is anticipated that approximately ***476.2 m^3*** of storage will be required on site to attenuate flow to the established release rates indicated in ***Table 8***. As a result, there is a net reduction of approximately 74% from existing conditions. Detailed storage calculations are included in ***Appendix D***.

5.4 Proposed Stormwater Management System – Phase I

To meet the stormwater objectives the development proposes to utilize internal cistern storage.

The phased redevelopment of the site means that potions of the existing lodging building will remain and is contemplated to retain its current connections to the existing onsite storm sewer.

During Phase I, the existing lodging building within 1376 Carling Avenue will maintain the connections to the existing 300mm diameter storm sewer within Meath Street and to the existing 1800mm diameter storm sewer within Carling Avenue. Proposed buildings C and E are to be serviced via an internal mechanical network located in the underground parking garage. A 250mm diameter storm lateral to the existing 900mm diameter storm sewer within Archibald Street is proposed for both Building C and Building E. Detailed servicing layout is indicated on drawing ***SSP-1***.

Additional parking spaces are proposed to be added within 1376 Carling Avenue. To compensate for the change in the rational method coefficient within areas U2 and U3, additional storage will be added within the Phase 1 development to compensate.

Runoff from the parking and the hardscape surrounding Building C will be collected via area drains above the Building C parking garage. Stormwater is proposed to be attenuated within the ***141.0 m^3*** internal cistern. Detailed calculations are located in ***Appendix D***. Cistern details prepared by Desjardins Expert Conseil, will be submitted under a separate address.

Runoff along the South side of Building E will be collected via area drains above the Building E parking garage. Stormwater is proposed to be attenuated within the ***110.0m^3*** internal cistern. Detailed calculations are located in ***Appendix D***. Cistern details prepared by Desjardins Expert Conseil, will be submitted under a separate address.

Unattenuated flow will flow overland to the existing catchbasins located along Archibald Street and Carling Avenue. Unattenuated areas have be compensated for in areas with controls.

Table 10, below, summarizes post-development release rates and corresponding storage volume based on the existing and target release rates.

Table 11
Stormwater Flow Rate Summary – Phase I

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Storage Required	100-Year Storage Available
	(L/s)	(m^3)	(L/s)	(m^3)	(m^3)
EX	249.4	0.0	521.3	0.0	0.0
Unattenuated Areas (U2 & U3)	11.1	0.0	23.8	0.0	0.0
Total (Existing to Remain)	**260.5**	**0.0**	**545.1**	**0.0**	**0.0**
Unattenuated Areas (U1)	47.7	0.0	97.8	0.0	0.0
Attenuated Areas (A102 & A201)	28.8	112.5	45.4	250.5	251.0
Total (Phase I)	**76.5**	**112.5**	**143.2**	**250.5**	**251.0**
Total	**337.1**	**112.5**	**688.3**	**250.5**	**251.0**

Table 10, above, demonstrates the existing flow from the existing hotel area to remain which anticipates to have a release rate of ***260.5 L/s*** and ***545.1 L/s*** in the 5 and 100-year storm events, respectively.

The proposed release rates from the Phase I development is calculated to be ***337.1 L/s*** and ***688.3 L/s*** during the 5 and 100-year storm events, respectively. As a result, there is a net reduction of 38% in the Phase I condition from the existing conditions. It is estimated that approximately ***251 m^3*** of storage will be required on site to attenuate flow to the established release rates indicated in ***Table 8***. Detailed storage calculations are contained within ***Appendix D***.

5.5 Stormwater Servicing Conclusions

Post development stormwater runoff will be required to be restricted to the allowable target release rate for storm events up to and including the 100-year storm based on coordination with the City of Ottawa.

The post-development allowable release rate for the ultimate development was calculated as ***279.4 L/s***. It is estimated that ***476.2 m^3*** of storage will be required on site to attenuate flow to the established release rates. As a result, there is a net reduction of approximately 74% from existing conditions.

The post-development allowable release rate for the Phase I development was calculated as ***121.3 L/s***. It is estimated that ***250.5 m^3*** of storage will be required on site to attenuate flow to the established release rates.

Based on consultation with the RVCA, specific stormwater quality controls will not be required.

The proposed stormwater design conforms to all relevant ***City Standards*** and Policies for approval.

6.0 UTILITIES

Gas and Hydro services currently exist within the Carling Avenue, Meath Street and Archibald Street right-of-ways. Utility servicing will be coordinated with the individual utility companies prior to site development.

The proposed development will be coordinated and approved by the utility company having jurisdiction.

7.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Holloway Lodging Corporation to prepare a Functional Servicing and Stormwater Management report in support of the application for a Zoning By-law Amendment (ZBLA) and Site Plan Control (SPC) at 1354 and 1376 Carling Avenue. The preceding report outlines the following:

- Based on boundary conditions provided by the City, demands during average day exceed the required pressure range. As a result, pressure reducing valves are required at Building C and Building E;
- Fire flow requirements were estimated to be ***6,650 L/min*** in accordance with ***NFPA Standards*** and the boundary conditions provided by the City of Ottawa, sufficient flow is available to service the development;
- The proposed development is anticipated to have a total peak wet weather flow of ***25.6 L/s*** and ***12.0 L/s***, for the ultimate development and Phase I development, respectively;
- Due to the proximity of the Cave Creek Collector, the existing capacity will need to be confirmed with the City of Ottawa water resources group;
- Based on consultation with the City the proposed ultimate development will be required to attenuate post development flows to ***279.4 L/s*** for all storms up to and including the 100-year storm event. It is estimated that ***476.2 m^3*** of storage will be required to meet the established release rate;
- Based on consultation with the City the Phase I development will be required to attenuate post development flows to ***121.3 L/s*** for all storms up to and including the 100-year storm event. It is estimated that ***250.5 m^3*** of storage provided via internal cisterns will be required to meet the established release rate;
- Based on consultation with the RVCA, specific stormwater quality controls will not be required.

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Reviewed by,
David Schaeffer Engineering Ltd.

Per: Robert D. Freel, P.Eng

Reviewed by,
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Per: Adam D. Fobert, P.Eng

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APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

16-908 05/12/2018

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Figure 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	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 defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☐	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).	N/A
☐	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.	N/A
☐	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
☐	Proposed phasing of the development, if applicable.	N/A
☐	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.4
☒	All preliminary and formal site plan submissions should have the following information: -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	SSP-1

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	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.	Section 3.2
☐	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
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	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	Section 3.2, 3.3
☐	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.	N/A
☐	Description of off-site required feedermains, 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
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☐	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

☒	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).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐	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
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	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
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	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

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	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
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	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 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	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 5.1, 5.3
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
☐	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
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 6.0
☐	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
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	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 ct. 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.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 7.0
☐	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 draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

Alison Gosling

From: Diamond, Emily (MOECC) <Emily.Diamond@ontario.ca>
Sent: Tuesday, March 28, 2017 5:53 PM
To: Alison Gosling
Subject: RE: 1354-1376 Carling Avenue - ECA Requirement

Hi Alison,

Yes, I agree with your assumption that this project will meet the exemption set out under Ontario Regulation 525/98 section 3 once the parcels are amalgamated into one.

Regards,

Emily Diamond
Environmental Officer
Ministry of the Environment and Climate Change

Ottawa District Office
2430 Don Reid Drive
Ottawa, Ontario, K1H 1E1
Tel: 613-521-3450 ext 238
Fax: 613-521-5437
e-mail: emily.diamond@ontario.ca

From: Alison Gosling [mailto:AGosling@dsel.ca]
Sent: March-24-17 10:41 AM
To: Diamond, Emily (MOECC)
Cc: Robert Freel
Subject: 1354-1376 Carling Avenue - ECA Requirement

Good morning Emily,

We just wanted to touch base with you regarding a proposed development we are working on located at 1354-1376 Carling Avenue.

Currently comprised of two parcels of land, the existing 1.9ha site currently consists of two lodging buildings and is zoned Arterial Main Street and Residential Fourth Density. Please note that the parcels will be amalgamated into one parcel of land prior to construction.

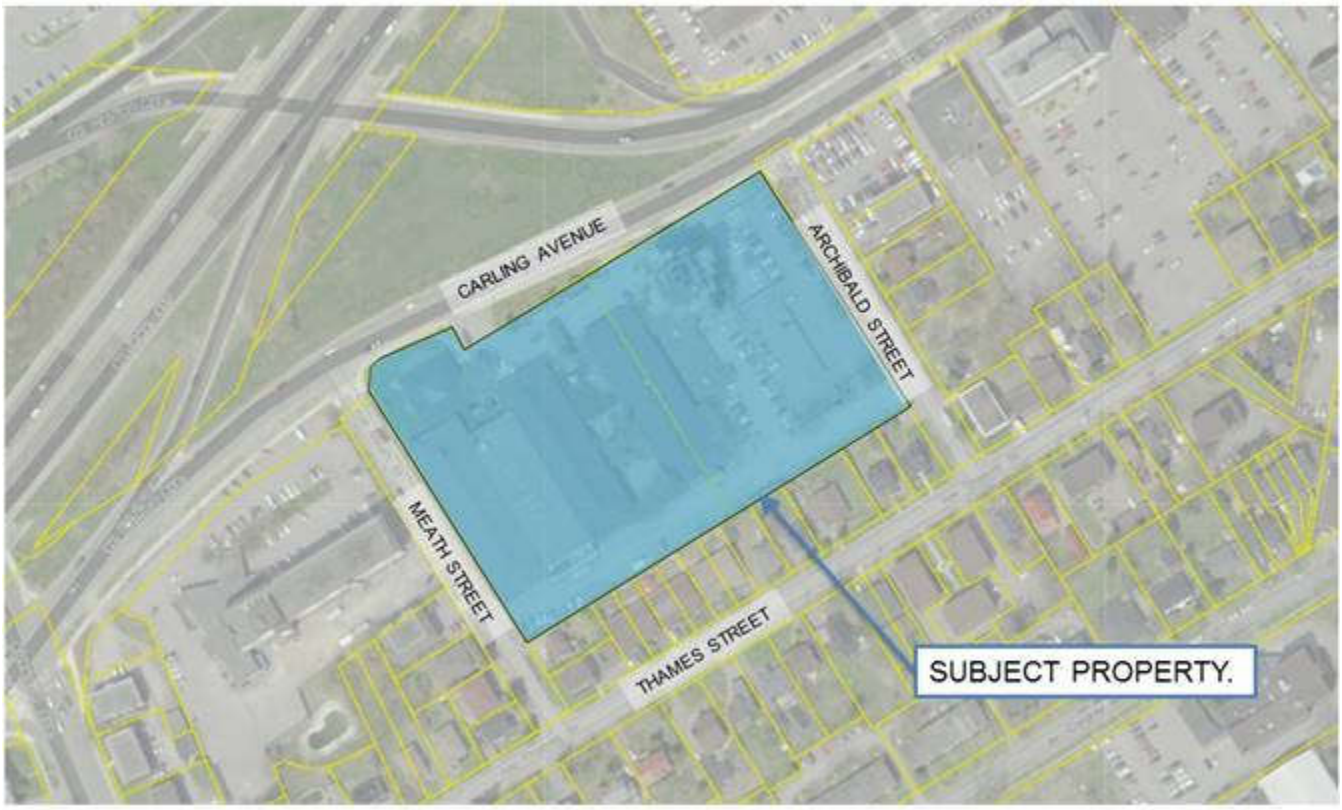
The phased development proposes to construct four residential/commercial buildings with incremental demolition of the existing buildings. The full build-out will consist of approximately 2,437 m² of commercial space and 914 residential units.

It appears that the existing stormwater management system currently directs flow towards the municipal infrastructure within Meath Street and Archibald Street.

Proposed stormwater controls will use subsurface storage, and surface ponding to attenuated the release rate to City of Ottawa requirements.

As the proposed sewage works and stormwater management facility will be servicing a single parcel of land which will be owned and operated by a single entity, does not discharge to a combined sewer system, and is not proposed to be used for industrial purposes, it is assumed this falls within the exemption requirements for an Environmental Compliance Approval as per O.Reg 525/98, Section 3 (a) & Ontario Water Resources Act Section 53. 6 (c).

I hope you could comment on my assumption that this property would be exempt from requiring an ECA. Please feel free to call to discuss this further.



Thank you,

Alison Gosling, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.542
fax: (613) 836-7183
email: agosling@DSEL.ca

Alison Gosling

From: Jocelyn Chandler <jocelyn.chandler@rvca.ca>
Sent: Thursday, October 27, 2016 3:49 PM
To: Alison Gosling
Subject: RE: 1376 Carling Ave - RVCA

Follow Up Flag: Follow up
Flag Status: Completed

Hello Alison,
Our records concur with the information you have provided. Given that the stormwater from this site will travel greater than 2 km before outletting to the receiver (the Ottawa River), the RVCA advises that we will not be requiring water quality controls on the stormwater management design for the redevelopment of this site.
Jocelyn

Jocelyn Chandler M.Pl. MCIP, RPP
Planner, RVCA
t) 613-692-3571 x1137
f) 613-692-0831
jocelyn.chandler@rvca.ca
www.rvca.ca
mail: Box 599 3889 Rideau Valley Dr., Manotick, ON K4M 1A5
courier: 3889 Rideau Valley Dr., Nepean, ON K2C 3H1

From: Alison Gosling [mailto:AGosling@dsel.ca]
Sent: Thursday, October 27, 2016 3:26 PM
To: Jocelyn Chandler <jocelyn.chandler@rvca.ca>
Cc: Robert Freel <RFreel@dsel.ca>
Subject: 1376 Carling Ave - RVCA

Good afternoon Jocelyn,

We wanted to touch base with you regarding a mixed-use development at 1376 Carling Avenue. The development proposes residential towers and at grade commercial units.

The existing stormwater on site discharges to the Carling Avenue storm sewer. Based on the information available, the existing storm sewers servicing the site travels 3.5-3.8 km to an outlet into the Ottawa River, as shown by the figure below.

Can you provide a comment regarding quality controls that maybe required for the site?

Please feel free to call if you have any questions or you would like to discuss.

Thanks in advance,

Alison Gosling, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.542
fax: (613) 836-7183
email: agosling@DSEL.ca

MEMO

Date: Feb 21, 2017

To / Destinataire	Sean Moore, Planner	
From / Expéditeur	Cody Oram, Senior Engineer, Infrastructure Approvals	
Subject / Objet	**Pre-Application Consultation** **1354 & 1376 Carling Ave. and Ward No. 16,** *Re-development of hotel, a mid-rise apartment building and commercial buildings proposed*	File No. PC2017-0025

Please note the following information regarding the engineering design submission for the above noted site:

1. The Servicing Study Guidelines for Development Applications are available at the following address: http://ottawa.ca/en/development-application-review-process-0/servicing-study-guidelines-development-applications

2. Servicing and site works shall be in accordance with the following documents:

   - ⇨ Ottawa Sewer Design Guidelines (October 2012)
   - ⇨ Ottawa Design Guidelines – Water Distribution (2010)
   - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
   - ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
   - ⇨ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
   - ⇨ City of Ottawa Park and Pathway Development Manual (2012)
   - ⇨ City of Ottawa Accessibility Design Standards (2012)
   - ⇨ Ottawa Standard Tender Documents (latest version)
   - ⇨ Ontario Provincial Standards for Roads & Public Works (2013)

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).

4. The Stormwater Management Criteria, for the subject site, is to be based on the following:

   i. The 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

   ii. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).

   iii. A calculated time of concentration (Cannot be less than 10 minutes).

   iv. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.

5. Services (Storm, Sanitary & Water Supply)

   i. Attachments at the end of this memo provide information on sewer size and location in respect to the proposed site. Disclaimer: Please be aware that the attached information is for reference only and that all information shown on the attachments is to be verified in the field prior to design and construction. This information does not show all underground and above ground utilities for this area and these utilities should be located and protected prior to and during construction.

   ii. Site services should connect to the existing public mains within Archibald St. and Meath St. Services should be grouped in a common trench to minimize the number of road cuts.

   iii. Connections to trunk sewers and easement sewers are typically not permitted.

   iv. Monitoring manholes are to be located in an accessible location on private property near the property line (ie. Not in a parking area).

Sewer connections to be made above the springline of the sewermain as per:

a. Std Dwg S11.1 for flexible main sewers – *connections made using approved tee or wye fittings.*

b. Std Dwg S11 (For rigid main sewers) – *lateral must be less that 50% the diameter of the sewermain,*

c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – *for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,*

d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

e. No submerged outlet connections.

6. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

   i. Location of service

   ii. Type of development and the amount of fire flow required (as per FUS, 1999).

   iii. Average daily demand: ___ l/s.

   iv. Maximum daily demand: ___l/s.

   v. Maximum hourly daily demand: ___ l/s.

7. MOECC ECA Requirements

   An MOECC Environmental Compliance Approval (Private Sewage Works) may be required for the proposed development due to the potential for stormwater management across multiple properties. Please contact Ontario Ministry of the Environment and Climate Change, Ottawa District Office to arrange a pre-submission consultation:

For I/C/I applications: Emily Diamond

(613) 521-3450, ext. 238

Emily.Diamond@ontario.ca

8. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

Should you have any questions or require additional information, please contact me directly at (613) 580-2424, x 13422 or by email at cody.oram@ottawa.ca

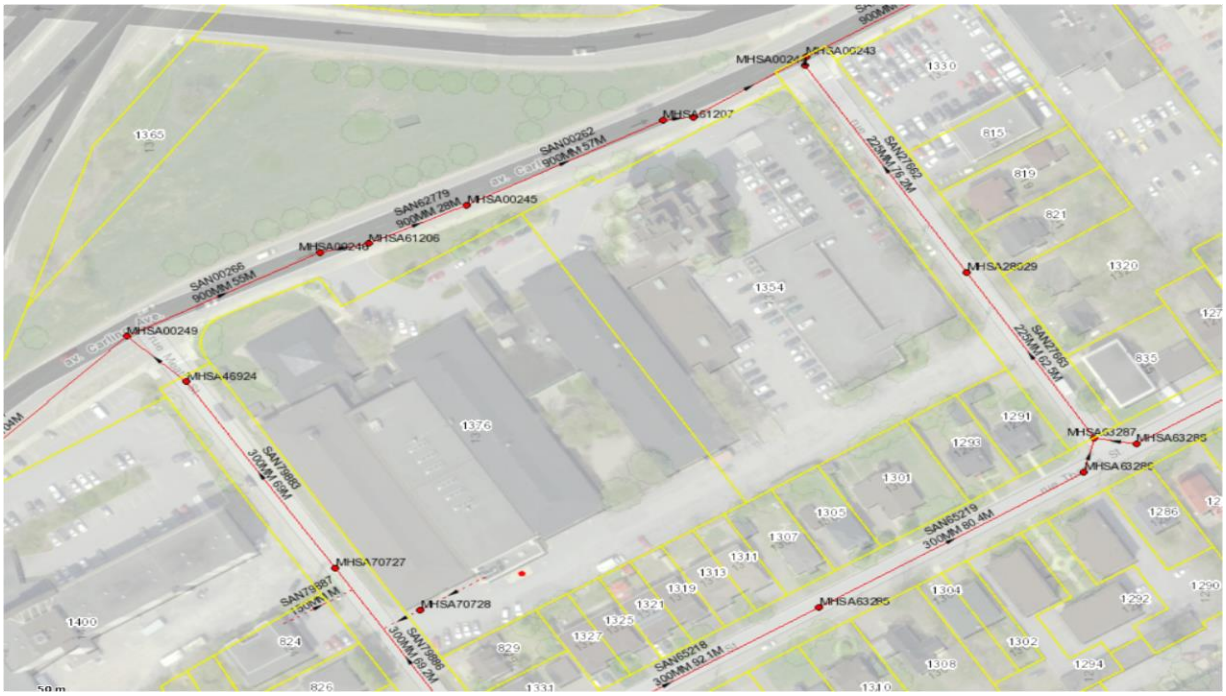


Fig 1: Sanitary

Fig 2: Storm


av. Carling Ave.
rue Thames St
rue Main St
WAT43565
406mm
WAT43564
406mm
WAT43524
152mm
WAT43566
152mm
WAT22798
152mm
WAT44470
152mm
WAT41057
152mm
WAT51168
152mm
WAT51167
203mm
WAT51166
203mm
WAT43998
200mm
WAT43518
200mm
1365
1376
1354
1330
815
819
821
1320
1273
835
1291
1293
1301
1305
1307
1311
1313
1319
1321
1325
1327
829
1331
1400
824
826
1286
1282
1304
1290
1292
1302
1294
1308
1310
50 m

Fig 3: Water

Alison Gosling

To: Robert Freel
Subject: RE: 1354/1376 Carling Ave - Job 908 - Sanitary Flows

From: Robert Freel
Sent: April 25, 2018 9:03 AM
To: 'Oram, Cody' <Cody.Oram@ottawa.ca>
Subject: RE: 1354/1376 Carling Ave - Job 908 - Sanitary Flows

Good morning Cody,

We were able to get the water bill for the Travelodge. Based on the attached we see an average existing demand of 66 m^3/d (0.76 L/s) and the max demand is 89.7 m^3/d (1.0 L/s). Based on this information it would appear that the ultimate condition will far exceed the flow of the Phase I condition.

Please let me know if you would like to discuss.

Thank you,

Bobby Freel, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.558
cell: (613) 314-7675
email: rfreel@DSEL.ca

From: Oram, Cody <Cody.Oram@ottawa.ca>
Sent: April 24, 2018 2:20 PM
To: Robert Freel <RFreel@dsel.ca>
Subject: RE: 1354/1376 Carling Ave - Job 908 - Sanitary Flows

We need to know how much extra flow to put in the model (when compared to existing).
Cody

From: Robert Freel <RFreel@dsel.ca>
Sent: Tuesday, April 24, 2018 12:55 PM
To: Oram, Cody <Cody.Oram@ottawa.ca>
Cc: Baker, Adam <adam.baker@ottawa.ca>
Subject: RE: 1354/1376 Carling Ave - Job 908 - Sanitary Flows

Hi Cody,

Would the model not already take into account the existing flows as it is the current condition?

Thank you,

Bobby Freel, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.558
cell: (613) 314-7675
email: rfreel@DSEL.ca

From: Oram, Cody <Cody.Oram@ottawa.ca>
Sent: April 24, 2018 10:26 AM
To: Robert Freel <RFreel@dsel.ca>
Cc: Baker, Adam <adam.baker@ottawa.ca>
Subject: RE: 1354/1376 Carling Ave - Job 908 - Sanitary Flows

Hi Bobby,

We need the existing flows to proceed. Below is the comment from our modelling group identifying what they need.

- The report only provides the ultimate wastewater flows. We will need to know the existing flows (so we can compare future to existing) and the interim flow in addition to the ultimate. We can then input these figures into our Cave creek model to determine the downstream impacts.

Regards,

Cody Oram, P.Eng. Senior Engineer
Development Review, South Services
Planning, Infrastructure and Economic Development Department | Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste **13422**, fax/téléc:613-580-2576, cody.oram@ottawa.ca

From: Robert Freel <RFreel@dsel.ca>
Sent: Monday, April 23, 2018 4:44 PM
To: Oram, Cody <Cody.Oram@ottawa.ca>; Baker, Adam <adam.baker@ottawa.ca>
Subject: 1354/1376 Carling Ave - Job 908 - Sanitary Flows

Hi Cody,

Below are the updated sanitary flows by phase. I would anticipate the current City model would account for the existing condition present on the site. We would anticipate the most conservative approach would be to use the Ultimate flow with the existing flows in the City model.

For the proposed ultimate design, flows are as follows:

Total Estimated Average Dry Weather Flow Rate	**6.8**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**24.3**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**24.9**	**L/s**

The flows for phase 1 of the proposed design are as follows:

Total Estimated Average Dry Weather Flow Rate	**2.9**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**10.9**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**11.2**	**L/s**

The flows for phase 2 of the proposed design are as follows:

Total Estimated Average Dry Weather Flow Rate	**4.0**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**14.7**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**14.9**	**L/s**

Please let me know if you have any questions.

Thank you,

Bobby Freel, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.558
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APPENDIX B

Water Supply

Holloway Lodging Corporation
1354-1376 Carling
Proposed Site Conditions - Phase I
Building C, E

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Building A	1.8		0
Building B	1.8		0
Building C	1.8	273	492
Building D	1.8		0
Building E	1.8	130	234

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Building C	492	172.2	119.6	430.5	299.0	947.1	657.7
Total Building E	234	81.9	56.9	204.8	142.2	450.5	312.8
Total Domestic Demand	726	254.1	176.5	635.3	441.1	1397.6	970.5

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial/Ammenity floor space								
Building C	2.5 $L/m^2/d$	1,355	3.39	2.4	5.1	3.5	9.1	6.4
Ammenity floor space Building E	2.5 $L/m^2/d$	390	0.10	0.1	0.2	0.1	0.3	0.2
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
		Total I/CI Demand	3.5	2.4	5.2	3.6	9.4	6.5
		Total Demand	**257.6**	**178.9**	**640.5**	**444.8**	**1407.0**	**977.1**

Max Day Peaking Factor (Residential) † =	2.5	**Peak Hour Peaking Factor (Residential)†† =**	5.5
Max Day Peaking Factor (Commercial) † =	1.5	**Peak Hour Peaking Factor (Commercial)†† =**	1.8

Holloway Lodging Corporation
1354-1376 Carling
Proposed Site Conditions - Phase II
Building A,B,D

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Building A	1.8	175	315
Building B	1.8	196	353
Building C	1.8		0
Building D	1.8	104	188
Building E	1.8		0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	856	299.6	208.1	749.0	520.1	1647.8	1144.3

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial floor space	2.5 $L/m^2/d$	1,546	3.87	2.7	5.8	4.0	10.4	7.2
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand			3.9	2.7	5.8	4.0	10.4	7.2
Total Demand			**303.5**	**210.7**	**754.8**	**524.2**	**1658.2**	**1151.6**

Max Day Peaking Factor (Residential) ŧ =	2.5	**Peak Hour Peaking Factor (Residential)ŧŧ =**	5.5
Max Day Peaking Factor (Commercial) ŧ =	1.5	**Peak Hour Peaking Factor (Commercial)ŧŧ =**	1.8

1354-1376 Carling
Proposed Site Conditions - Ultimate

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Building A	1.8	175	315
Building B	1.8	196	353
Building C	1.8	273	492
Building D	1.8	104	188
Building E	1.8	130	234

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	1582	553.7	384.5	1384.3	961.3	3045.4	2114.8

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial floor space	2.5 $L/m^2/d$	3,291	8.23	5.7	12.3	8.6	22.2	15.4
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand			8.2	5.7	12.3	8.6	22.2	15.4
Total Demand			**561.9**	**390.2**	**1396.6**	**969.9**	**3067.6**	**2130.3**

Max Day Peaking Factor (Residential) ǂ = 2.5
Max Day Peaking Factor (Commercial) ǂ = 1.5
Peak Hour Peaking Factor (Residential)ǂǂ = 5.5
Peak Hour Peaking Factor (Commercial)ǂǂ = 1.8

Boundary Conditions Unit Conversion

PHASE 1

ARCHIBALD (BLDG C)

	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	134.2	73.95	60.3	85.7	591.1
Peak Hour	125.5	73.95	51.6	73.3	505.7
Max Day + FF	114.1	73.95	40.2	57.1	393.9

ARCHIBALD (BLDG E)

	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	134.2	74.04	60.2	85.6	590.2
Peak Hour	125.4	74.04	51.4	73.1	503.8
Max Day + FF	90.2	74.04	16.2	23.0	158.5

PHASE 2

ARCHIBALD (BLDG C)

	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	134.6	73.95	60.7	86.3	595.0
Peak Hour	124.8	73.95	50.9	72.3	498.8
Max Day + FF	113.7	73.95	39.8	56.6	389.9

ARCHIBALD (BLDG E)

	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	134.4	74.04	60.4	85.9	592.1
Peak Hour	124.7	74.04	50.7	72.1	497.0
Max Day + FF	89.5	74.04	15.5	22.0	151.7

MEATH

	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	134.5	74	60.5	86.1	593.5
Peak Hour	124.7	74	50.7	72.1	497.4
Max Day + FF	117.5	74	43.5	61.9	426.7

Charlotte Kelly

From: Baker, Adam <adam.baker@ottawa.ca>
Sent: October 16, 2018 10:37 AM
To: Charlotte Kelly
Cc: Robert Freel; Oram, Cody
Subject: RE: 1354/1376 Carling Avenue - Boundary Condition Request - Job 908
Attachments: 1376 Carling (Updated) Oct 2018.pdf

Hi Charlotte,

Please see attached your water boundary conditions and some additional comments from our water resources group:

The following are boundary conditions, HGL, for hydraulic analysis at 1376 Carling (zone 2W) assumed to be connected to the 203 mm on Meath and the 152 mm on Archibald (see attached PDF for location).

Phase 1

Minimum HGL = 125.5 m (Building C)

Minimum HGL = 125.4 m (Building E)

Maximum HGL = 134.2 m (Both locations)

Max Day (5.04 L/s) + Fire Flow (111 L/s) = 114.1 m (Building C)

Max Day (2.37 L/s) + Fire Flow (111 L/s) = 90.2 m (Building E)

Phase 2

Minimum HGL = 124.8 m (Building C)

Minimum HGL = 124.7 m (Building E, Meath St)

Maximum HGL = 134.6 m (Building C)

Maximum HGL = 134.4 m (Building E)

Maximum HGL = 134.5 m (Meath St)

Max Day (5.04 L/s) + Fire Flow (111 L/s) = 113.7 m (Building C)

Max Day (2.37 L/s) + Fire Flow (111 L/s) = 89.5 m (Building E)

Max Day (8.74 L/s) + Fire Flow (111 L/s) = 117.5 m (Meath St)

The maximum pressure is estimated to be above 80 psi at all locations. A pressure check at completion of construction is recommended to determine if pressure control is required.

Additonally:

- The FUS method should be used if they will be designing a new water main or installing hydrants on their site
- They need to provide redundancy for the Phase 2 connection since the demands are greater than 50 m^3/day

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Thanks,

Adam Baker, EIT
Engineering Intern
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 26552, Adam.Baker@ottawa.ca

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: Wednesday, October 10, 2018 12:07 PM
To: Baker, Adam <adam.baker@ottawa.ca>
Cc: Robert Freel <RFreel@dsel.ca>
Subject: 1354/1376 Carling Avenue - Boundary Condition Request - Job 908

Hi Adam,

Just to follow up with the questions from the water resources group and your conversation with Bobby:

1) Phase 2 demands do not included Phase 1 demands.
2) Building C and E are proposing individual connections to Archibald. An additional valve is being proposed in Archibald to provide redundancy.
3) We are not contemplating any looped connections.

Please follow up myself or Bobby if any further information is required.

Thank-you,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca

From: Baker, Adam <adam.baker@ottawa.ca>
Sent: October 9, 2018 3:56 PM
To: Charlotte Kelly <CKelly@dsel.ca>; Oram, Cody <Cody.Oram@ottawa.ca>
Cc: Robert Freel <RFreel@dsel.ca>
Subject: RE: 1354/1376 Carling Avenue - Boundary Condition Request - Job 908

Hi Charlotte,

Our water resources group has some questions regarding this water boundary request:

1) Does the Phase 2 demand also include Phase 1 demands?
2) Will Building C and E each have their own connection to Archibald?
3) Will their be a looped watermain on their site between Archibald and Meath?

Could you please provide clarification for each of these points.

Thank you,

Adam Baker, EIT
Engineering Intern
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 26552, Adam.Baker@ottawa.ca

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: Thursday, September 27, 2018 3:15 PM
To: Baker, Adam <adam.baker@ottawa.ca>; Oram, Cody <Cody.Oram@ottawa.ca>
Cc: Robert Freel <RFreel@dsel.ca>
Subject: 1354/1376 Carling Avenue - Boundary Condition Request - Job 908

Good afternoon Adam and Cody,

We would like to resubmit a request for water boundary conditions for 1354 and 1376 Carling Avenue based on changes to the site plan using the following proposed
development demands:

1. Location of Service / Street Number: 1354/1376 Carling Avenue
2. Type of development and the amount of fire flow required for the proposed development:
    - The proposed Phased development is mixed use residential/commercial. The full build-out proposes 878 residential units and 3291 m^2 of commercial space.

- It is proposed that Phase I of the development will have two connections from the existing 150 mm diameter watermain within Archibald Street, and the Phase II development will have connections from Meath Street as shown by the map below.
- Fire demand based City of Ottawa's Technical Bulletin ISTB-2018-02 has been used to calculate an estimated fire demand of 23,000 L/min, it is anticipated that this will exceed the fire flow available from the City network based on previous results.
- For the purpose of estimating fire flow an alternative method has been evaluated, the National Fire Protection Association (NFPA) standards were utilized. As indicated by Section 11.2.2 from the NFPA Standards, fire flow requirements are to be determined by combining the required flow rate for the sprinkler system, along with the anticipated hose stream. As indicated by Table 11.2.2.1 and Table 11.2.3.1.2 extracted from the NFPA Standards, the max fire flow requirements for ordinary hazard sprinkler systems is 5,700 L/min (1500 gpm) and the anticipated internal and external total combined inside and outside hose stream demand for ordinary hazard is 950 L/min (250 gpm). As a result, the max total fire flow is anticipated to be 6,650 L/min (2,450 gpm).

3.

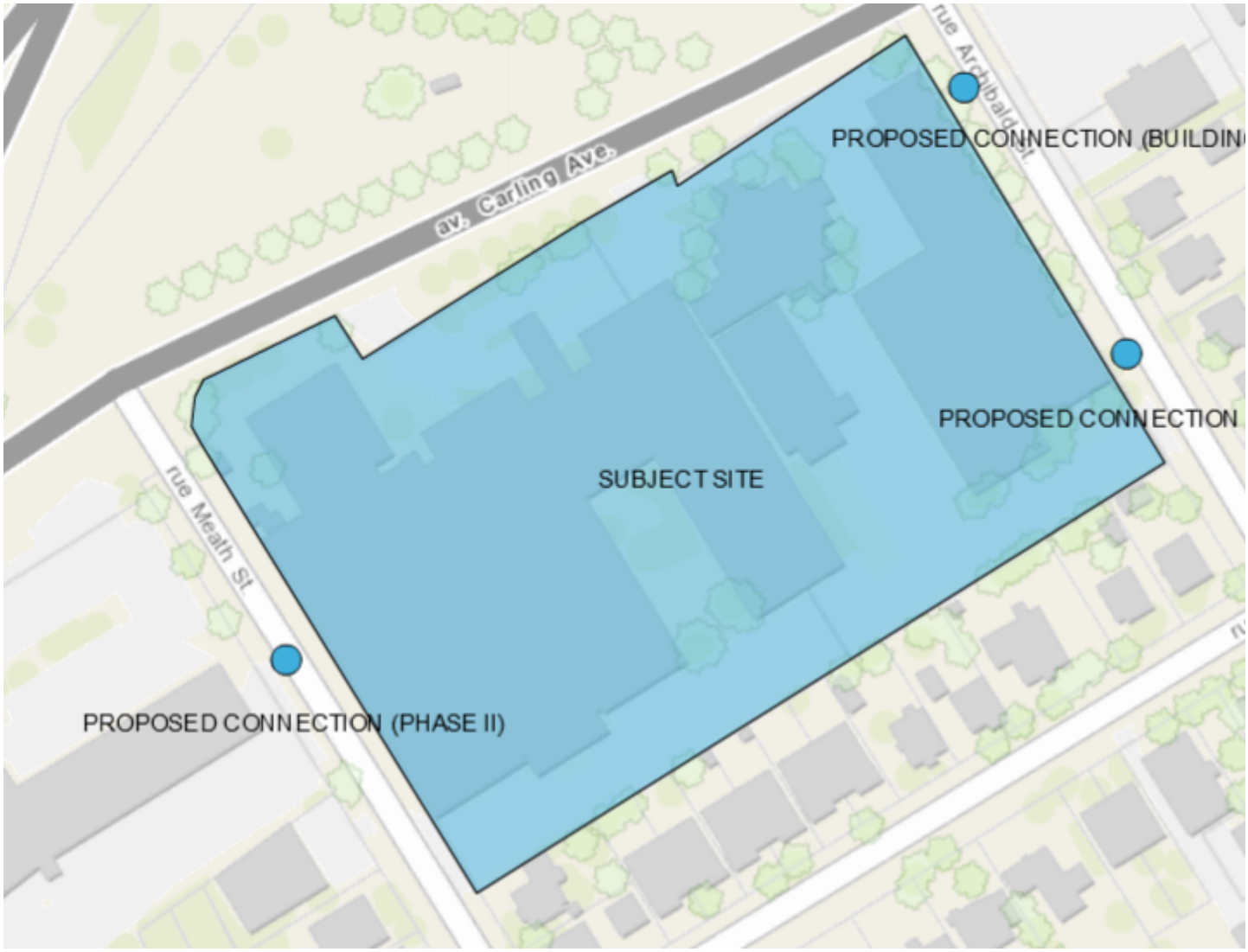
Phase I

Building C	L/min	L/s
Avg. Daily	121.9	2.03
Max Day	302.5	5.04
Peak Hour	664.1	11.07

Building E	L/min	L/s
Avg. Daily	56.9	0.95
Max Day	142.3	2.37
Peak Hour	313.0	5.22

Phase II

	L/min	L/s
Avg. Daily	210.7	3.51
Max Day	524.2	8.74
Peak Hour	1151.6	19.19



Please find the previous boundary request dated April 23rd 2018 and updated calculation sheets attached. Please let me know if you have any questions.

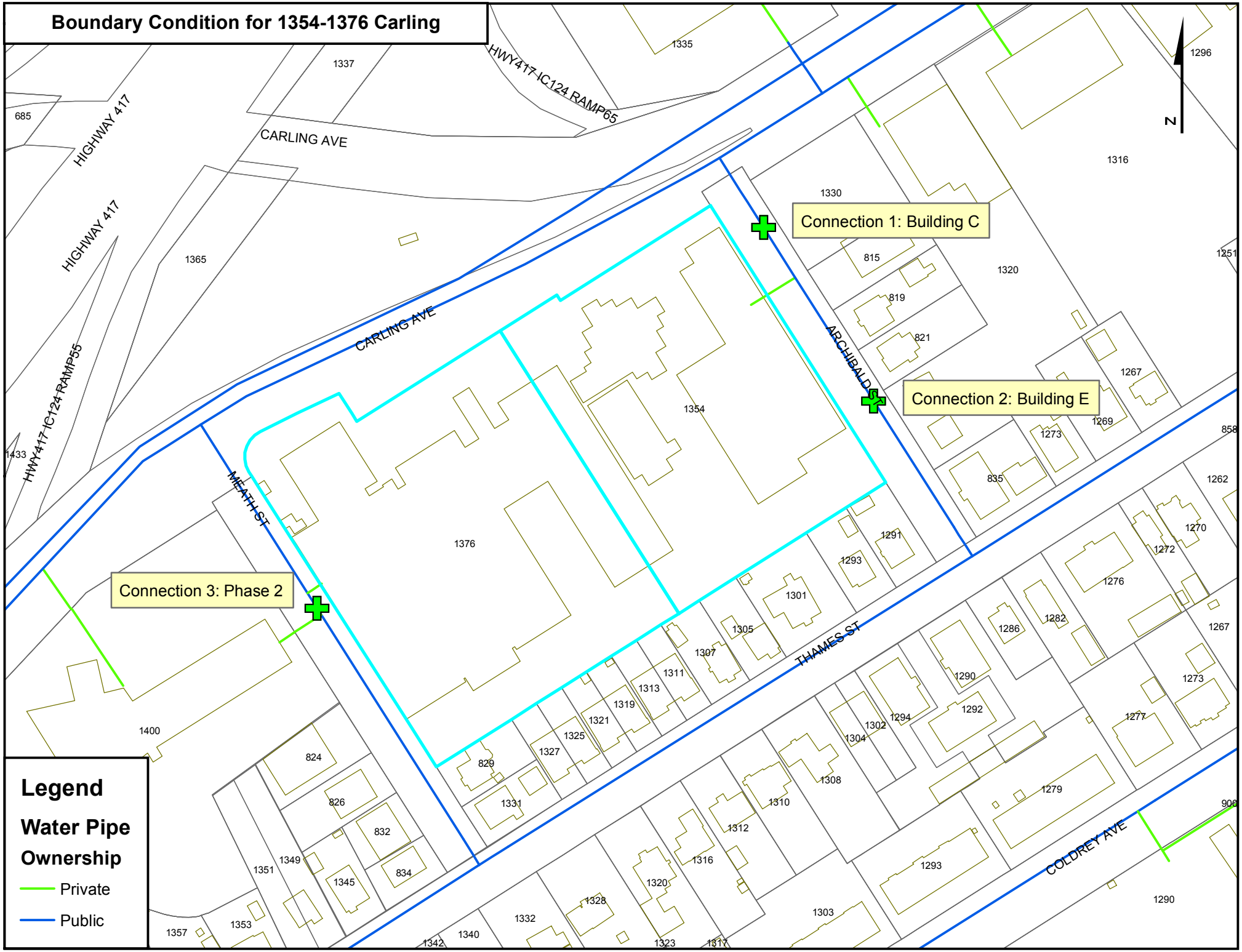
Kind Regards,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca



Legend

Water Pipe

Ownership

- Private
- Public

National Fire Protection Association (NFPA) 13 – Standard for the Installation of Sprinkler Systems

Table 11.2.2.1, Table 11.2.3.1.2

Table 11.2.2.1 Water Supply Requirements for Pipe Schedule Sprinkler Systems

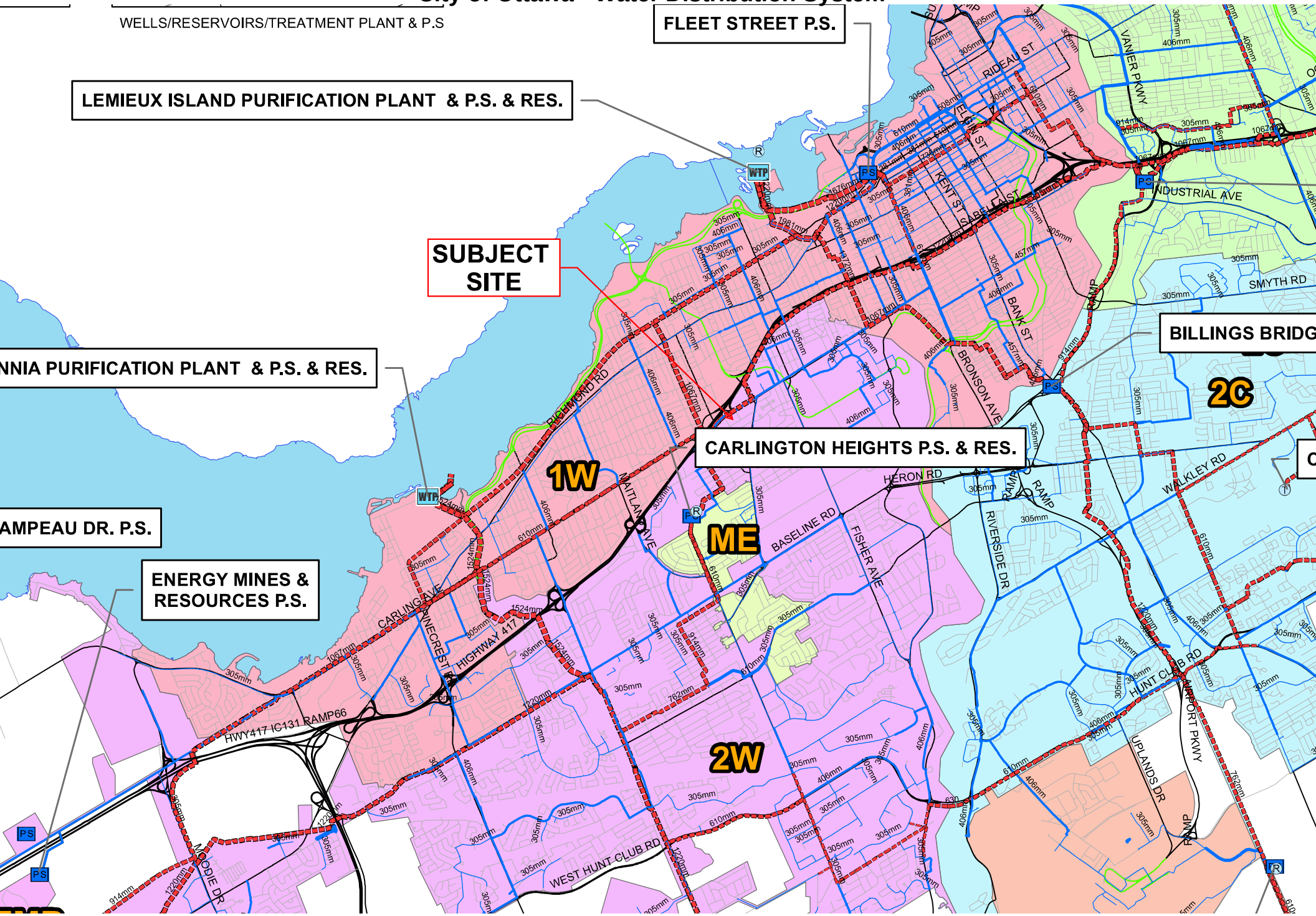
Occupancy Classification	Minimum Residual Pressure Required		Acceptable Flow at Base of Riser (Including Hose Stream Allowance)		Duration (minutes)
	psi	bar	gpm	L/min	
Light hazard	15	1	500–750	1900-2850	30–60
Ordinary hazard	20	1.4	850–1500	3200-5700	60–90

Table 11.2.3.1.2 Hose Stream Allowance and Water Supply Duration Requirements for Hydraulically Calculated Systems

Occupancy	Inside Hose		Total Combined Inside and Outside Hose		Duration (minutes)
	gpm	L/min	gpm	L/min	
Light hazard	0, 50, or 100	0, 190, or 380	100	380	30
Ordinary hazard	0, 50, or 100	0, 190, or 380	250	950	60–90
Extra hazard	0, 50, or 100	0, 190, or 380	500	1900	90–120

City of Ottawa - Water Distribution System

WELLS/RESERVOIRS/TREATMENT PLANT & P.S



2017-03-23_908_ajg

APPENDIX C

Wastewater Collection

1354-1376 Carling Avenue
Proposed SIte Conditions - Phase I

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 0.845 **ha**

Extraneous Flow Allowances

Infiltration / Inflow	**0.24**	**L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8	403	726

Total Pop	**726**	
Average Domestic Flow	**2.94**	**L/s**
Peaking Factor	**3.89**	
Peak Domestic Flow	**11.43**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate		No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5	$L/m^2/d$	1,745	0.20
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow	**0.20**
Peak Institutional / Commercial Flow	0.30
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.30**

** assuming a 12 hour commercial operation*

*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**3.1 L/s**
Total Estimated Peak Dry Weather Flow Rate	**11.7 L/s**
Total Estimated Peak Wet Weather Flow Rate	**12.0 L/s**

1354-1376 Carling Avenue
Proposed SIte Conditions - Phase II

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 0.845 **ha**

Extraneous Flow Allowances

Infiltration / Inflow **0.24 L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8	518	933

Total Pop **933**

Average Domestic Flow **3.78 L/s**

Peaking Factor **3.82**

Peak Domestic Flow **14.43 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate		No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5	$L/m^2/d$	1,546	0.18
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow **0.18**

Peak Institutional / Commercial Flow 0.27
Peak Industrial Flow** 0.00
Peak I/C/I Flow **0.27**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**4.0 L/s**
Total Estimated Peak Dry Weather Flow Rate	**14.7 L/s**
Total Estimated Peak Wet Weather Flow Rate	**14.9 L/s**

1354-1376 Carling Avenue
Proposed SIte Conditions - Ultimate

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 1.930 **ha**

Extraneous Flow Allowances

Infiltration / Inflow **0.54 L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8	921	1658

Total Pop **1658**

Average Domestic Flow **6.72 L/s**

Peaking Factor **3.65**

Peak Domestic Flow **24.50 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5 $L/m^2/d$	3,291	0.38
Hospitals	900 L/bed/d		0.00
School	70 L/student/d		0.00
Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Heavy**	55,000 L/gross ha/d		0.00

Average I/C/I Flow **0.38**

Peak Institutional / Commercial Flow 0.57
Peak Industrial Flow** 0.00
Peak I/C/I Flow **0.57**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**7.1 L/s**
Total Estimated Peak Dry Weather Flow Rate	**25.1 L/s**
Total Estimated Peak Wet Weather Flow Rate	**25.6 L/s**

SANITARY SEWER CALCULATION SHEET

CLIENT: **Holloway Lodging Corporation**
LOCATION: **1354-1376 Carling Avenue**
FILE REF: **16-908**
DATE: **09-May-18**

DESIGN PARAMETERS

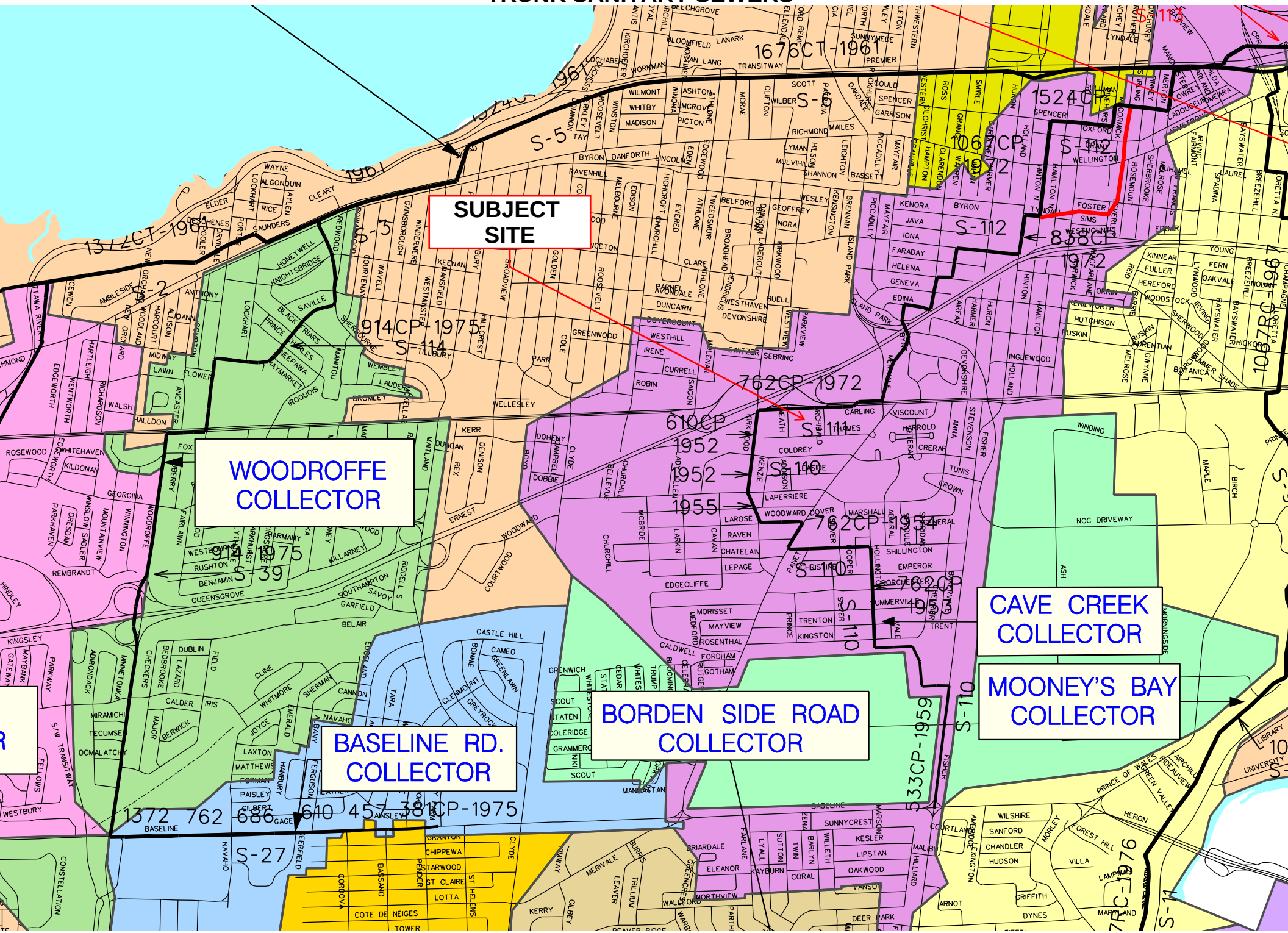
Avg. Daily Flow Res.	350	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.28	L/s/ha
Avg. Daily Flow Comr	50,000	L/ha/d	Peak Fact. Comm.	1.5	Min. Pipe Velocity	0.60	m/s full flowing
Avg. Daily Flow Instit.	50,000	L/ha/d	Peak Fact. Instit.	1.5	Max. Pipe Velocity	3.00	m/s full flowing
Avg. Daily Flow Indus	35,000	L/ha/d	Peak Fact. Indust. per MOE graph		Mannings N	0.013	

Location			Residential Area and Population									Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Area ID	Up	Down	Area	Number of Units by type				Pop.	Cumulative Area	Cumulative Pop.	Peak. Fact.	Q_{res}	Area	Accu. Area	Area	Accu. Area	Area	Accu. Area	Q_{C+I+I}	Total Area	Accu. Area	Infiltration Flow	Total Flow	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
			(ha)	Singles	Semi's	Town's	Apt's		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
MEATH/THAMES ST	1A	1B	2.060	13	4		6	66.0	2.060	66.0	4.00	1.07		0.00		0.00		0.00	0.0	2.060	2.060	0.577	1.65	300	0.40	54	0.071	0.075	0.87	61.2	0.03
	1B	1C	0.000					0.0	2.060	66.0	4.00	1.07	2.14	2.14		0.00		0.00	1.9	2.140	4.200	1.176	4.10	300	0.40	83	0.071	0.075	0.87	61.2	0.07
OUTLET TO CAVE CREEK	1C	1D	0.000					0.0	2.060	66.0	4.00	1.07		2.14		0.00		0.00	1.9	0.000	4.200	1.176	4.10	300	0.40	21	0.071	0.075	0.87	61.2	0.07
ARCHIBALD/THAMES ST	2A	2B	2.900	24	2		58	191.0	2.900	191.0	4.00	3.09	0.66	0.66		0.00		0.00	0.6	3.560	3.560	0.997	4.66	225	0.24	62	0.040	0.056	0.55	22.0	0.21
OUTLET TO CAVE CREEK	2B	2C	0.230	1			2	7.0	3.130	198.0	4.00	3.21	0.95	1.61		0.00		0.00	1.4	1.180	4.740	1.327	5.93	225	0.32	108	0.040	0.056	0.64	25.4	0.23


OUTLET TO THE CAVE CREEK COLLECTOR
2C
SUBJECT SITE
2B
2A
av. Carling Ave.
av. Merivale Rd
av. Crerar Ave
av. Coldrey Ave
rue Thames St
Meath St


OUTLET TO THE CAVE CREEK COLLECTOR
1D
1C
1B
1A
SUBJECT SITE
417
av. Carling Ave.
Kirkwood Ave.
av. Kirkwood
rue Thames St
av. Coldrey Ave
av. Leaside Ave

TRUNK SANITARY SEWERS



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APPENDIX D

Stormwater Management

1354-1376 Carling Avenue
Existing Site Conditions

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2012

Existing Drainage Charateristics From Internal Site

Area	1.930	ha
C	0.85	Rational Method runoff coefficient
L	93	m
Up Elev	74.75	m
Dn Elev	73.75	m
Slope	1.1	%
Tc	7.7	min

1) Time of Concentration per Federal Aviation Administration

$$t_c = \frac{1.8(1.1-C)L^{0.5}}{S^{0.333}}$$

tc, in minutes
C, rational method coefficient, (-)
L, length in ft
S, average watershed slope in %

Estimated Peak Flow

	2-year	5-year	100-year	
i	87.1	118.4	203.2	mm/hr
Q	397.3	540.0	1089.7	L/s

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Area 1.93 ha
C 0.68 Rational Method runoff coefficient
t_c 10.0 min

2-year
i 76.8 mm/hr
Q 279.4 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area 0.193 ha
C 0.85 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	47.5	47.5	0.0	0.0	178.6	95.7	95.7	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Total Area 1.737 ha
C 0.85 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	427.4	91.1	336.3	201.8	178.6	861.7	183.7	678.0	406.8
15	83.6	342.8	91.3	251.5	226.3	142.9	689.6	183.7	505.9	455.3
20	70.3	288.2	91.4	196.7	236.1	120.0	578.9	183.7	395.2	474.2
25	60.9	249.8	91.6	158.2	237.4	103.8	501.2	183.7	317.5	476.2
30	53.9	221.2	91.7	129.6	233.2	91.9	443.4	183.7	259.7	467.4
35	48.5	199.0	91.7	107.3	225.3	82.6	398.5	183.7	214.8	451.2
40	44.2	181.2	91.8	89.4	214.7	75.1	362.7	183.7	179.0	429.5
45	40.6	166.7	91.9	74.8	201.9	69.1	333.2	183.7	149.5	403.8
50	37.7	154.5	91.9	62.5	187.6	64.0	308.6	183.7	125.0	374.9
55	35.1	144.1	92.0	52.1	171.9	59.6	287.7	183.7	104.1	343.4
60	32.9	135.1	92.0	43.1	155.2	55.9	269.7	183.7	86.1	309.8
65	31.0	127.3	92.1	35.3	137.6	52.6	254.1	183.7	70.4	274.5
70	29.4	120.5	92.1	28.4	119.2	49.8	240.3	183.7	56.6	237.7
75	27.9	114.4	92.1	22.3	100.1	47.3	228.1	183.7	44.4	199.6
80	26.6	109.0	92.2	16.8	80.5	45.0	217.1	183.7	33.4	160.5
85	25.4	104.1	92.2	11.9	60.4	43.0	207.3	183.7	23.6	120.4
90	24.3	99.6	92.2	7.4	39.9	41.1	198.4	183.7	14.7	79.4
95	23.3	95.6	92.3	3.3	19.0	39.4	190.3	183.7	6.6	37.7
100	22.4	91.9	92.3	0.0	0.0	37.9	182.9	183.7	0.0	0.0
105	21.6	88.5	92.3	0.0	0.0	36.5	176.1	183.7	0.0	0.0
110	20.8	85.4	92.4	0.0	0.0	35.2	169.9	183.7	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

5-year $Q_{attenuated}$ 91.56 L/s **100-year $Q_{attenuated}$ 183.69 L/s**
5-year Max. Storage Required 237.4 m^3 **100-year Max. Storage Required 476.2 m^3**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m^3)	100-Year Release Rate (L/s)	100-Year Storage (m^3)
Unattenuated Areas	47.5	0.0	95.7	0.0
Attenutated Areas	91.6	237.4	183.7	476.2
Total	**139.0**	**237.4**	**279.4**	**476.2**

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Area 0.838 ha
C 0.68 Rational Method runoff coefficient
t_c 10.0 min

2-year
i 76.8 mm/hr
Q 121.3 L/s

EXISTING (EX+U2+U3)

Area 1.191 ha
C 0.78 Rational Method runoff coefficient
t_c 10.0 min

5-year		**100-year**	
i	104.2 mm/hr	**i**	178.6 mm/hr
Q	268.8 L/s	**Q**	575.8 L/s

TOTAL

5-year		**100-year**	
Q	390.1 L/s	**Q**	697.1 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID **U1**
Total Area 0.110 ha
C 0.80 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}^* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	25.3	25.3	0.0	0.0	178.6	54.2	54.2	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Area ID **U2**
Total Area 0.052 ha
C 0.74 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}^* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	11.1	11.1	0.0	0.0	178.6	23.8	23.8	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Area ID **U3**
Total Area 0.088 ha
C 0.88 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}^* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	22.4	22.4	0.0	0.0	178.6	43.6	43.6	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Area ID **EX**
Total Area 1.051 ha
C 0.82 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}^* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	249.4	249.4	0.0	0.0	178.6	521.3	521.3	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Area ID **A101**

Total Internal Cistern Storage (m^3) 141.0

Stage Attenuated Areas Storage Summary

	Surface Storage				Surface and Subsurface Storage			
	Stage	**Ponding**	**h_o**	**delta d**	**V***	**V_{acc}****	**$Q_{release}$†**	**$V_{drawdown}$**
	(m)	**(m^2)**	**(m)**	**(m)**	**(m^3)**	**(m^3)**	**(L/s)**	**(hr)**
Cistern INV	72.54		0.00			0.0	0.0	0.00
Cistern SL	73.04		0.50	0.50	70.5	70.5	16.5	1.18
Cistern OBV	73.54		1.00	0.50	70.5	141.0	23.4	1.67

* V=Incremental storage volume

**V_{acc}=Total surface and sub-surface

† $Q_{release}$ = Release rate calculated from orifice equation

Orifice Location **BLDG C** **Dia** 105

Total Area 0.393 ha

C 0.85 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

	5-year					100-year				
t_c	**i**	**Q_{actual}‡**	**$Q_{release}$**	**Q_{stored}**	**V_{stored}**	**i**	**Q_{actual}‡**	**$Q_{release}$**	**Q_{stored}**	**V_{stored}**
(min)	**(mm/hr)**	**(L/s)**	**(L/s)**	**(L/s)**	**(m^3)**	**(mm/hr)**	**(L/s)**	**(L/s)**	**(L/s)**	**(m^3)**
10	104.2	96.7	14.9	81.8	49.1	178.6	194.9	23.4	171.6	102.9
15	83.6	77.5	14.9	62.7	56.4	142.9	156.0	23.4	132.6	119.4
20	70.3	65.2	14.9	50.3	60.4	120.0	130.9	23.4	107.6	129.1
25	60.9	56.5	14.9	41.6	62.5	103.8	113.4	23.4	90.0	135.0
30	53.9	50.0	14.9	35.2	63.3	91.9	100.3	23.4	76.9	138.4
35	48.5	45.0	14.9	30.2	63.3	82.6	90.1	23.4	66.8	140.2
40	44.2	41.0	14.9	26.1	62.7	75.1	82.0	23.4	58.7	140.8
45	40.6	37.7	14.9	22.8	61.7	69.1	75.4	23.4	52.0	140.4
50	37.7	34.9	14.9	20.1	60.2	64.0	69.8	23.4	46.4	139.3
55	35.1	32.6	14.9	17.7	58.5	59.6	65.1	23.4	41.7	137.7
60	32.9	30.6	14.9	15.7	56.5	55.9	61.0	23.4	37.6	135.5
65	31.0	28.8	14.9	13.9	54.4	52.6	57.5	23.4	34.1	133.0
70	29.4	27.3	14.9	12.4	52.0	49.8	54.4	23.4	31.0	130.1
75	27.9	25.9	14.9	11.0	49.6	47.3	51.6	23.4	28.2	127.0
80	26.6	24.6	14.9	9.8	47.0	45.0	49.1	23.4	25.7	123.6
85	25.4	23.5	14.9	8.7	44.3	43.0	46.9	23.4	23.5	119.9
90	24.3	22.5	14.9	7.7	41.4	41.1	44.9	23.4	21.5	116.1
95	23.3	21.6	14.9	6.8	38.6	39.4	43.0	23.4	19.7	112.1
100	22.4	20.8	14.9	5.9	35.6	37.9	41.4	23.4	18.0	108.0
105	21.6	20.0	14.9	5.2	32.5	36.5	39.8	23.4	16.5	103.7
110	20.8	19.3	14.9	4.5	29.4	35.2	38.4	23.4	15.1	99.4

5-year $Q_{attenuated}$ **14.86 L/s** **100-year $Q_{attenuated}$** **23.38 L/s**

5-year Max. Storage Required **63.3 m^3** **100-year Max. Storage Required** **140.8 m^3**

Est. 5-year Storage Elevation **72.99 m** **Est. 100-year Storage Elevation** **73.54 m**

Estimated Post Development Peak Flow from Attenuated Areas

Area ID **A201**

Total Internal Cistern Storage (m^3) 110.0

Stage Attenuated Areas Storage Summary

		Surface Storage			Surface and Subsurface Storage			
	Stage	Ponding	h_o	delta d	V*	V_{acc}**	$Q_{release}$†	$V_{drawdown}$
	(m)	(m^2)	(m)	(m)	(m^3)	(m^3)	(L/s)	(hr)
Cistern INV	72.84		0.00			0.0	0.0	0.00
Cistern SL	73.34		0.50	0.50	55.0	55.0	15.6	0.98
Cistern OBV	73.84		1.00	0.50	55.0	110.0	22.1	1.38

* V=Incremental storage volume

**V_{acc}=Total surface and sub-surface

† $Q_{release}$ = Release rate calculated from orifice equation

Orifice Location **BLDG E** **Dia** 102

Total Area 0.324 ha

C 0.85 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

	5-year					100-year				
t_c	i	Q_{actual}‡	$Q_{release}$	Q_{stored}	V_{stored}	i	Q_{actual}‡	$Q_{release}$	Q_{stored}	V_{stored}
(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)
10	104.2	79.7	14.0	65.8	39.5	178.6	160.7	22.1	138.7	83.2
15	83.6	63.9	14.0	50.0	45.0	142.9	128.6	22.1	106.6	95.9
20	70.3	53.7	14.0	39.8	47.7	120.0	108.0	22.1	85.9	103.1
25	60.9	46.6	14.0	32.6	49.0	103.8	93.5	22.1	71.4	107.1
30	53.9	41.3	14.0	27.3	49.1	91.9	82.7	22.1	60.6	109.1
35	48.5	37.1	14.0	23.2	48.6	82.6	74.3	22.1	52.3	109.8
40	44.2	33.8	14.0	19.9	47.6	75.1	67.6	22.1	45.6	109.4
45	40.6	31.1	14.0	17.1	46.3	69.1	62.1	22.1	40.1	108.3
50	37.7	28.8	14.0	14.9	44.6	64.0	57.6	22.1	35.5	106.5
55	35.1	26.9	14.0	12.9	42.6	59.6	53.7	22.1	31.6	104.3
60	32.9	25.2	14.0	11.3	40.5	55.9	50.3	22.1	28.3	101.7
65	31.0	23.7	14.0	9.8	38.2	52.6	47.4	22.1	25.3	98.8
70	29.4	22.5	14.0	8.5	35.8	49.8	44.8	22.1	22.8	95.6
75	27.9	21.3	14.0	7.4	33.2	47.3	42.5	22.1	20.5	92.2
80	26.6	20.3	14.0	6.4	30.6	45.0	40.5	22.1	18.4	88.5
85	25.4	19.4	14.0	5.5	27.8	43.0	38.7	22.1	16.6	84.7
90	24.3	18.6	14.0	4.6	25.0	41.1	37.0	22.1	14.9	80.7
95	23.3	17.8	14.0	3.9	22.1	39.4	35.5	22.1	13.4	76.6
100	22.4	17.1	14.0	3.2	19.1	37.9	34.1	22.1	12.1	72.4
105	21.6	16.5	14.0	2.6	16.1	36.5	32.8	22.1	10.8	68.0
110	20.8	15.9	14.0	2.0	13.1	35.2	31.7	22.1	9.6	63.6

5-year $Q_{attenuated}$ **13.95 L/s** **100-year $Q_{attenuated}$** **22.05 L/s**

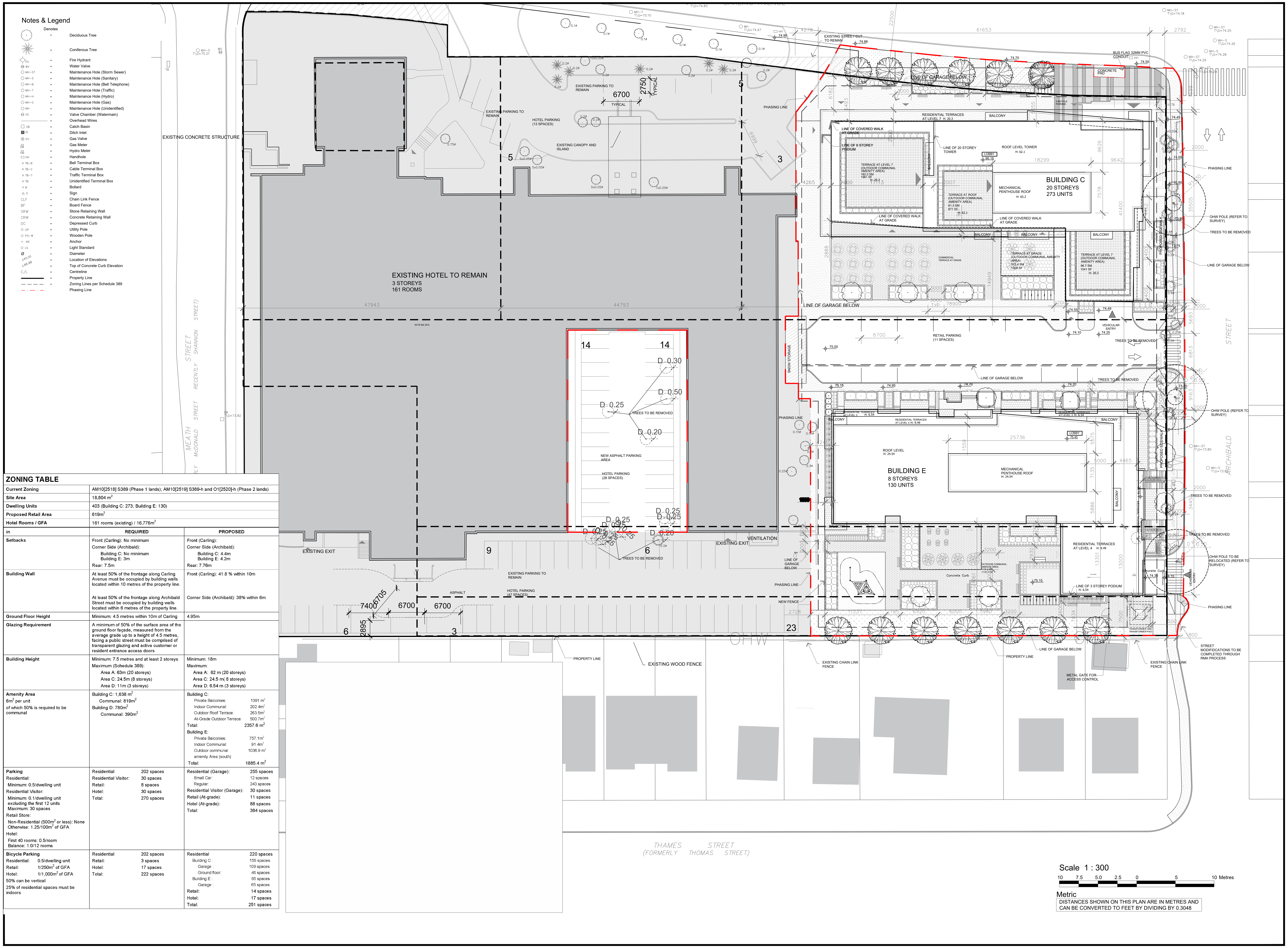
5-year Max. Storage Required **49.1 m^3** **100-year Max. Storage Required** **109.8 m^3**

Est. 5-year Storage Elevation **73.29 m** **Est. 100-year Storage Elevation** **73.84 m**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m^3)	100-Year Release Rate (L/s)	100-Year Required Storage (m^3)	100-Year Available Storage (m^3)
EX	249.4	0.0	521.3	0.0	0.0
Unattenuated Areas (U2 & U3)	11.1	0.0	23.8	0.0	0.0
Unattenuated Areas (U1)	47.7	0.0	97.8	0.0	0.0
Attenutated Areas (A102 & A201)	28.8	112.5	45.4	250.5	251.0
Total	**337.1**	**112.5**	**688.3**	**250.5**	**251.0**

DRAWINGS / FIGURES


Notes & Legend
Denotes
Deciduous Tree
Coniferous Tree
Fire Hydrant
Water Valve
Maintenance Hole (Storm Sewer)
Maintenance Hole (Sanitary)
Maintenance Hole (Bell Telephone)
Maintenance Hole (Traffic)
Maintenance Hole (Hydro)
Maintenance Hole (Gas)
Maintenance Hole (Unidentified)
Valve Chamber (Watermain)
Overhead Wires
Catch Basin
Ditch Inlet
Gas Valve
Gas Meter
Hydro Meter
Handhole
Bell Terminal Box
Cable Terminal Box
Traffic Terminal Box
Unidentified Terminal Box
Bollard
Sign
Chain Link Fence
Board Fence
Stone Retaining Wall
Concrete Retaining Wall
Depressed Curb
Utility Pole
Wooden Pole
Anchor
Light Standard
Diameter
Location of Elevations
Top of Concrete Curb Elevation
Centreline
Property Line
Zoning Lines per Schedule 389
Phasing Line
EXISTING CONCRETE STRUCTURE
EXISTING HOTEL TO REMAIN
3 STOREYS
161 ROOMS
EXISTING PARKING TO REMAIN
HOTEL PARKING
(13 SPACES)
EXISTING CANOPY AND ISLAND
NEW ASPHALT PARKING AREA
HOTEL PARKING
(28 SPACES)
TREES TO BE REMOVED
EXISTING EXIT
VENTILATION
HOTEL PARKING
(47 SPACES)
ASPHALT
BUILDING C
20 STOREYS
273 UNITS
MECHANICAL PENTHOUSE ROOF
ROOF LEVEL TOWER
LINE OF 20 STOREY TOWER
LINE OF 8 STOREY PODIUM
LINE OF COVERED WALK AT GRADE
RESIDENTIAL TERRACES AT LEVEL 7
BALCONY
LINE OF GARAGE BELOW
RETAIL PARKING
(11 SPACES)
VEHICULAR ENTRY
SNOW STORAGE
BUILDING E
8 STOREYS
130 UNITS
ROOF LEVEL
RESIDENTIAL TERRACES AT LEVEL 4
LINE OF 3 STOREY PODIUM
PHASING LINE
NEW FENCE
PROPERTY LINE
EXISTING WOOD FENCE
EXISTING CHAIN LINK FENCE
METAL GATE FOR ACCESS CONTROL
STREET MODIFICATIONS TO BE COMPLETED THROUGH RMA PROCESS
OHW POLE (REFER TO SURVEY)
OHW POLE TO BE RELOCATED (REFER TO SURVEY)
BUS FLAG 32MM PVC CONDUIT
EXISTING STREET CUT TO REMAIN
MEATH STREET
McDONALD STREET
SHANNON STREET
ARCHIBALD STREET
THAMES STREET
Scale 1 : 300
10 7.5 5.0 2.5 0 5 10 Metres
Metric
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

ZONING TABLE

Current Zoning	AM10[2518] S389 (Phase 1 lands); AM10[2519] S389-h and O1[2520]-h (Phase 2 lands)	
Site Area	18,804 m^2	
Dwelling Units	403 (Building C: 273; Building E: 130)	
Proposed Retail Area	619m^2	
Hotel Rooms / GFA	161 rooms (existing) / 16,776m^2	
in	**REQUIRED**	**PROPOSED**
Setbacks	Front (Carling): No minimum Corner Side (Archibald): Building C: No minimum Building E: 3m Rear: 7.5m	Front (Carling): Corner Side (Archibald): Building C: 4.4m Building E: 4.2m Rear: 7.76m
Building Wall	At least 50% of the frontage along Carling Avenue must be occupied by building walls located within 10 metres of the property line. At least 50% of the frontage along Archibald Street must be occupied by building walls located within 6 metres of the property line.	Front (Carling): 41.8 % within 10m Corner Side (Archibald): 38% within 6m
Ground Floor Height	Minimum: 4.5 metres within 10m of Carling	4.95m
Glazing Requirement	A minimum of 50% of the surface area of the ground floor façade, measured from the average grade up to a height of 4.5 metres, facing a public street must be comprised of transparent glazing and active customer or resident entrance access doors	
Building Height	Minimum: 7.5 metres and at least 2 storeys Maximum (Schedule 389): Area A: 63m (20 storeys) Area C: 24.5m (8 storeys) Area D: 11m (3 storeys)	Minimum: 18m Maximum: Area A: 62 m (20 storeys) Area C: 24.5 m(8 storeys) Area D: 6.54 m (3 storeys)
Amenity Area 6m^2 per unit of which 50% is required to be communal	Building C: 1,638 m^2 Communal: 819m^2 Building D: 780m^2 Communal: 390m^2	Building C: Private Balconies: 1391 m^2 Indoor Communal: 202.4m^2 Outdoor Roof Terrace: 263.5m^2 At-Grade Outdoor Terrace: 500.7m^2 Total: 2357.6 m^2 Building E: Private Balconies: 757.1m^2 Indoor Communal: 91.4m^2 Outdoor communal amenity Area (south) 1036.9 m^2 Total: 1885.4 m^2
Parking Residential: Minimum: 0.5/dwelling unit Residential Visitor: Minimum: 0.1/dwelling unit excluding the first 12 units Maximum: 30 spaces Retail Store: Non-Residential (500m^2 or less): None Otherwise: 1.25/100m^2 of GFA Hotel: First 40 rooms: 0.5/room Balance: 1.0/12 rooms	Residential 202 spaces Residential Visitor: 30 spaces Retail: 8 spaces Hotel: 30 spaces Total: 270 spaces	Residential (Garage): 255 spaces Small Car: 12 spaces Regular: 243 spaces Residential Visitor (Garage): 30 spaces Retail (At-grade): 11 spaces Hotel (At-grade): 88 spaces Total: 384 spaces
Bicycle Parking Residential: 0.5/dwelling unit Retail: 1/250m^2 of GFA Hotel: 1/1,000m^2 of GFA 50% can be vertical 25% of residential spaces must be indoors	Residential 202 spaces Retail: 3 spaces Hotel: 17 spaces Total: 222 spaces	Residential 220 spaces Building C : 155 spaces Garage : 109 spaces Ground floor: 46 spaces Building E : 65 spaces Garage : 65 spaces Retail: 14 spaces Hotel: 17 spaces Total: 251 spaces

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General Notes

Do not scale directly off drawings all dimensions and site contitions are to be verified on site prior to begining any work. Never proceed in uncertainty.

ONTARIO ASSOCIATION OF ARCHITECTS
ERIC HUOT
LICENCE
5307

Seal

TOPOGRAPHICAL PLAN OF

PART BLOCKS 6 AND 7
REGISTERED PLAN 221
AND
PART OF ROAD ALLOWANCE BETWEEN CONCESSION 1 (OTTAWA FRONT) AND CONCESSION A (RIDEAU FRONT)
CLOSED BY BY-LAW 231-66, INST 511589
GEOGRAPHIC TOWNSHOP OF NEPEAN
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.

date:	revision	par:
Se-25-2018	revised for SPA	op
Al-20-2018	issued for SPA	op

Révision

FOTENN Planning + Design

Landscape

Méchanical - Électrical

Project

1354 - 1376
Carling Avenue
Ottawa, On.

Phase 1

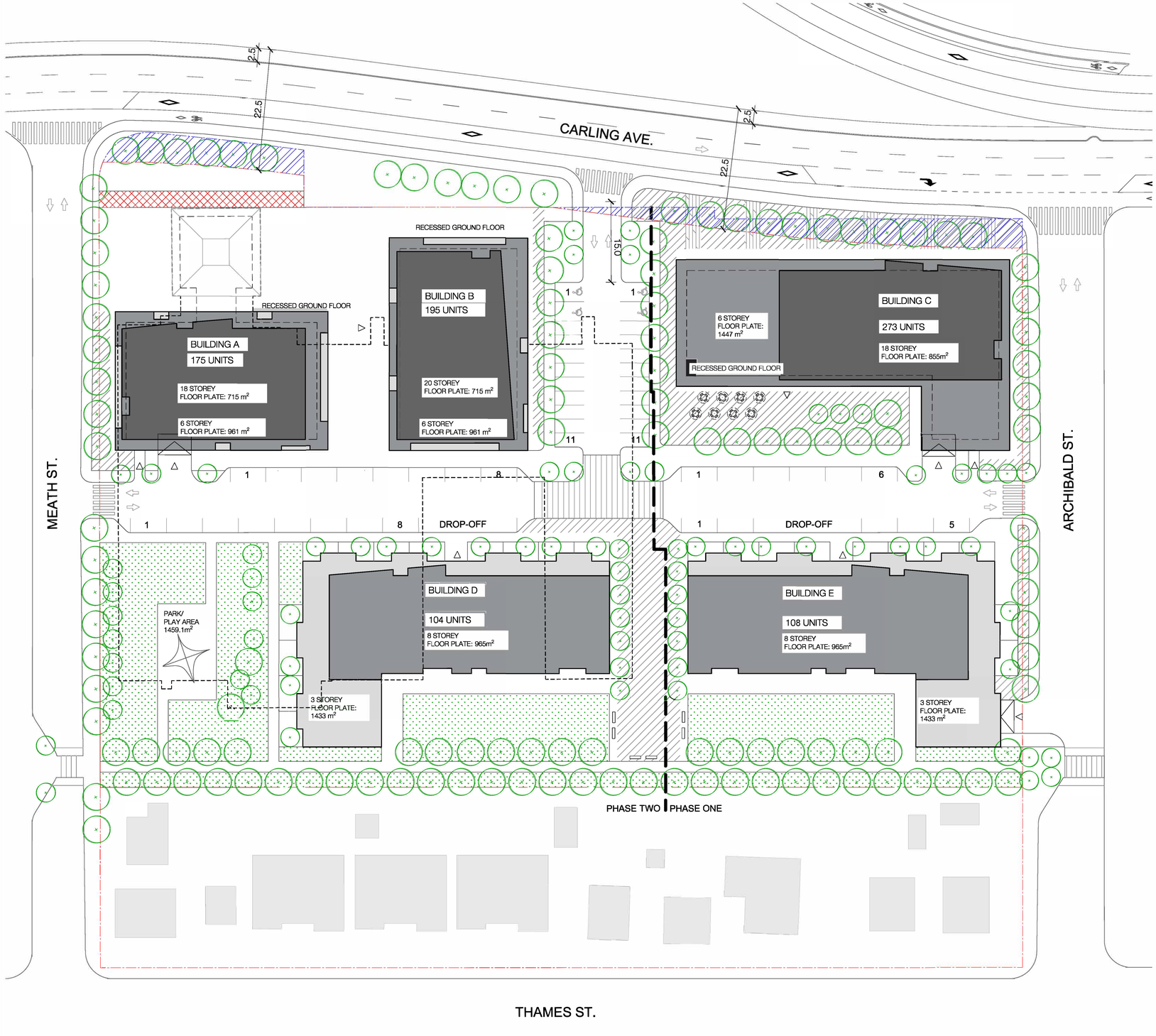
Drawing Title:

Site Plan

Scale: 1:300	**Drawn by:** a.b.
date: 03.06.2018	**approuve par:** E.H.

Drawing File:
Job Number: 16-080

A-0.1



DEVELOPMENT STATISTICS

CURRENT ZONING	AM10 & R4N

SITE AREA	
Total Site Area:	18,559m²

SETBACKS	REQUIRED	PROVIDED
F.Y.	0m	Road widening
C.Y. (A/B)	0m	3,5m
C.Y. (C/D)	3m	5m
R.Y.	7.5m	11.5m/26m

HEIGHT	Storeys
Commercial Ground Floor:	1(6m)
A/B/C	18/20/18
D/C	8
Total:	20

RESIDENTIAL UNITS	
Building A	175
Building B	195
Building C	273
Building D	104
Building E	108
TOTAL:	855

Assumes an 85% efficiency and 75m² units

PARKING	Above Ground
	49

NOTES

1. Assumes a typical residential floor height of 3m. Assumes a minimum commercial ground floor height of 6m.

2. For the purposes of this concept, an average unit size of 75m² (800sf) is used to calculate the approximate number of units.

3. GFA: Assumes 85% efficiency for apartment buildings. Areas are approximate.
   * Building includes interior amenity areas for the residents;

1354-1376 CARLING AVE

CONCEPT SITE PLAN

LEGEND

- PROPERTY LINE
- PHASING LINE
- EXISTING HOTEL
- ORIGINAL PROPERTY LINE
- ROAD WIDENING
- SEWER EASEMENT

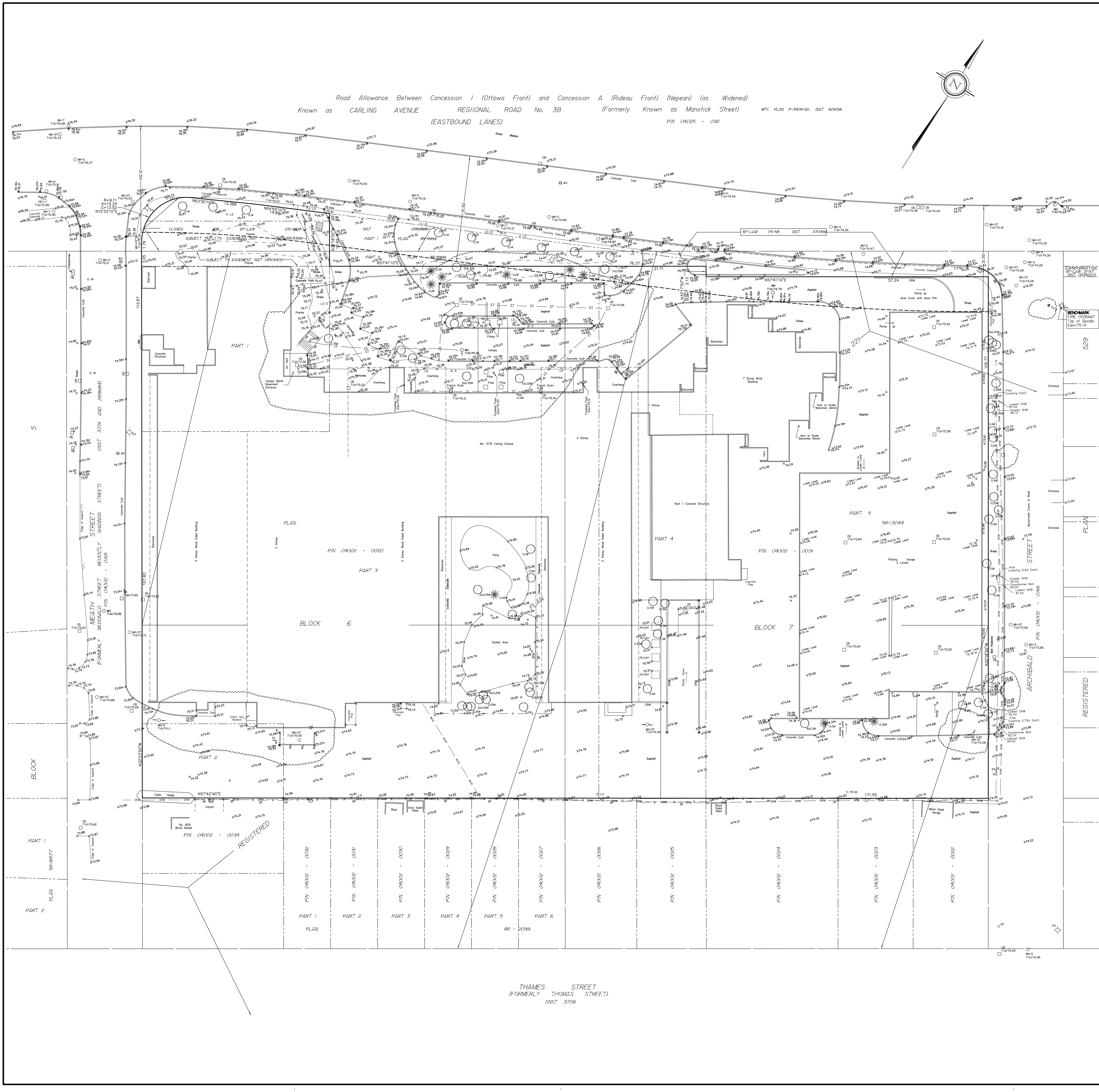
6	ACCESS ROAD THROAT	2018.04.18	RP
5	FOR CLIENT REVIEW	2018.01.30	EL
4	FOR CLIENT REVIEW	2017.11.10	RP
3	FOR CLIENT REVIEW	2017.09.13	RP
2	REVIEW	2017.09.12	RP
1	DRAWING	2017.09.07	RP

CREATED BY: RP
REVIEWED BY: PB
DATE: 2017.11.10

CLIENT
HOLLOWAY LODGING CORPORATION

FOTENN
Planning + Design
OTTAWA
223 McLeod Street
Ottawa, ON K2P 0Z8
T 613 730 5709

01



TOPOGRAPHICAL PLAN OF

PART BLOCKS 6 AND 7
REGISTERED PLAN 221
AND
PART OF ROAD ALLOWANCE
CONCESSION 1 (OTTAWA FR
CONCESSION A (RIDEAU FRO
CLOSED BY BY-LAW 231-66, I
GEOGRAPHIC TOWNSHIP OF
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 250

10 7.5 5.0 2.5 0 5 10 Me

Metric

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

Date

E.H. Herweyer O.L.S

Notes & Legend

Denotes

- Deciduous Tree
- Coniferous Tree
- FH - Fire Hydrant
- WV - Water Valve
- MH-ST - Maintenance Hole (Storm Sewer)
- MH-S - Maintenance Hole (Sanitary)
- MH-B - Maintenance Hole (Bell Telephon
- MH-T - Maintenance Hole (Traffic)
- MH-H - Maintenance Hole (Hydro)
- MH-G - Maintenance Hole (Gas)
- MH - Maintenance Hole (Unidentified)
- VC - Valve Chamber (Watermain)
- OHW - Overhead Wires
- CB - Catch Basin
- DI - Ditch Inlet
- GV - Gas Valve
- GM - Gas Meter
- HM - Hydro Meter
- HH - Handhole
- TB-B - Bell Terminal Box
- TB-C - Cable Terminal Box
- TB-T - Traffic Terminal Box
- TB - Unidentified Terminal Box
- B - Bollard
- S - Sign
- CLF - Chain Link Fence
- BF - Board Fence
- SRW - Stone Retaining Wall
- CRW - Concrete Retaining Wall
- DC - Depressed Curb
- UP - Utility Pole
- PO-W - Wooden Pole
- AN - Anchor
- LS - Light Standard
- Ø - Diameter
- 65.00 - Location of Elevations
- 65.00 - Top of Concrete Curb Elevation
- C/L - Centreline
- Property Line

Bearings are grid bearings and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

SITE AREA = 18861 m²

BOUNDARY INFORMATION COMPILED FROM PLAN

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD
2. It is the responsibility of the user of this information to verify has not been altered or disturbed and that it's relative elevati agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the be the responsibility of the user to contact the respective util confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility a mandatory before any work involving breaking ground, probi

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Ontario Land Surveyors

Job No. 16427-15 RLAHEY PTBLK6-7

2016 Sewer Collection System

Department of Infrastructure Services

This map was compiled from existing & collected engineering Information from the City of Ottawa Geographic Information System and is protected by copyright. The location of Infrastructure is approximate and should not be used for construction purposes.

Scale 1:2500

Ottawa

364-027

Legend

- Storm Inlet
- Storm Outlet
- Storm Manhole
- Sanitary Manhole
- Combined Manhole
- Combined Pipe
- Sanitary Pipe
- Storm Pipe
- Pipe Cap
- Combined Trunk Sewer
- Sanitary Trunk Sewer
- Storm Trunk Sewer
- Regulator
- Storm Pumping Station
- Storm Water Management Pond
- Sanitary Pumping Station
- Treatment Plant

Pipe Equivalents

nominal (mm)	actual (inches)	nominal (mm)	actual (inches)	nominal (mm)	actual (inches)
100	4	675	27	1800	72
150	6	750	30	1950	78
200	8	825	33	2025	80
250	10	900	36	2100	84
300	12	975	39	2250	90
375	15	1050	42	2400	96
400	16	1200	48	2550	102
450	18	1350	54	2700	108
525	21	1500	60	2850	114
600	24	1650	66	3000	120

Pipe Materials

A - ASBESTOS
CI - CAST IRON
CO - COPPER
CO0 - AWWA C300
CO1 - AWWA C301
CO2 - AWWA C302
CO3 - AWWA C303
DI - DUCTILE IRON
PE - POLYETHYLENE (DR11 TO DR21)
PVC - POLYVINYL CHLORIDE
STC - CONCRETE LINED STEEL PIPE
UCI - UNLINED CAST IRON
UNK - UNKNOWN MATERIAL

364-027

2016 Water Distribution System

Department of Infrastructure Services

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Scale 1:2500

Ottawa

364-027

Legend

- Public Hydrant
- Private Hydrant
- Summer only Flusher Hydrant
- Flusher Hydrant
- Acoustic Fibre Optic
- Gate Valve
- Tapping Valve
- Butterfly Valve
- Buried Valve
- Drain Pipe
- Check Valve
- Closed Valve
- Drain-Out Valve
- Left Hand Valve
- Spot Elevation
- Pressure Reducing Valve
- Air Relief Valve
- Bypass Valve
- Feedermain Valve
- Inspection Plate
- Cap
- Reducer
- Jump
- Water Meter
- Water Service
- Backbone Pipe
- Watermain with Pipe Diameter, Material and Install Year
- Pipe Casing
- Pressure Zone Delineation and Identifier
- Well
- Elevated Tank
- Water Pumping Station
- Water Reservoir
- Water Treatment Plant

Pipe Equivalents

nominal (mm)	actual (inches)	nominal (mm)	actual (inches)	nominal (mm)	actual (inches)
100	4	675	27	1800	72
150	6	750	30	1950	78
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Pipe Materials

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UCI - UNLINED CAST IRON
UNK - UNKNOWN MATERIAL

362-028	364-028	366-028
362-027	364-027	366-027
362-026	364-026	366-026