david schaeffer engineering ltd

120 Iber Road, Suite 103
Ottawa, Ontario K2S 1E9
Tel. (613) 836-0856
Fax (613) 836-7183
www.DSEL.ca

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES

FOR

100 NEW ORCHARD AVENUE NORTH
NEW ORCHARD INVESTMENT INC.

CITY OF OTTAWA

PROJECT NO.: 18-1031

JUNE 2018 – REV 1

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
FOR
100 NEW ORCHARD AVENUE NORTH
NEW ORCHARD INVESTMENT INC.

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
FOR
100 NEW ORCHARD AVENUE NORTH
NEW ORCHARD INVESTMENT INC.
JUNE 2018 – REV 1

CITY OF OTTAWA
PROJECT NO.: 18-1031

1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by New Orchard Investment Inc. to prepare an Assessment of Adequacy of Public Services report in support of the application for a Zoning By-law Amendment (ZBLA) at 100 New Orchard Avenue North.

The subject property is located within the City of Ottawa urban boundary, in the Bay ward. As illustrated in ***Figure 1***, the subject property is located North of the Richmond Road and New Orchard Avenue intersection. Comprised of a single parcel of land, the subject property measures approximately ***0.07 ha*** and is zoned Residential Fifth Density Zone (R5C).

Figure 1: Site Location

The proposed ZBLA would allow for the development of a 14-storey residential building fronting New Orchard Avenue North. The contemplated development would include approximately ***358 m²*** of amenity space, as well as underground parking with access from New Orchard Avenue North. The residential component is comprised of ***84 single units***. A copy of the conceptual site plan is included in ***Drawings/Figures***.

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

1.1 Existing Conditions

The existing site includes a residential property consisting of a detached home with vegetated areas. The elevations range between 62.7m and 61.5m with a grade change of approximately 1.2m from the Northeast to the Southwest corner of the property.

To the north of the site there is a 1220mm dia. Feedermain, as well as, the 1350mm dia. sanitary West Nepean Collector Trunk.

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:

New Orchard Avenue:

- 152mm diameter cast iron watermain
- 300mm diameter concrete sanitary sewer tributary to the West Nepean Collector
- 675mm diameter concrete storm sewer tributary to the Ottawa River which is located approximately 160m downstream

North of 100 New Orchard Avenue:

- 1220 mm diameter concrete feedermain watermain
- 1350 mm diameter concrete sanitary West Nepean Collector sewer

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.

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)

- **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*)

- **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)

- **Water Supply for Public Fire Protection**
  Fire Underwriters Survey, 1999.
  (FUS)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 1W pressure zone, as shown by the Pressure Zone map in ***Appendix B***. A local 152mm diameter watermain exists within the New Orchard Avenue right-of-way. In addition to the local service, a 1220mm diameter feedermain exists within the City of Ottawa right-of-way north of the site.

3.2 Water Supply Servicing Design

It is anticipated that the contemplated development would be serviced from the existing 152mm watermain within the New Orchard Avenue right-of-way.

Table 1 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 1 Bedroom Apartment	1.4 P/unit
Residential Average Daily Demand	280 L/d/P
Residential Maximum Daily Demand	3.6 x Average Daily *
Residential Maximum Hourly	5.4 x Average Daily *
Amenity Space	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 summarizes the anticipated water supply demand for the contemplated development based on the ***Water Supply Guidelines***.

Table 2
Summary of Anticipated Water Demand

Design Parameter	Anticipated Demand[1] (L/min)
Average Daily Demand	23.6
Max Day + Fire Flow	113.4 + 13,000 = 13,114.2
Peak Hour	171.5

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

Fire flow requirements are to be determined in accordance with Local Guidelines (***FUS***), City of Ottawa ***Water Supply Guidelines*** and the Ontario Building Code.

Using the ***FUS*** method a conservative estimation of fire flow had been established. The following assumptions were assumed:

- Type of construction - Ordinary Construction;
- Occupancy type – Limited Combustibility;
- Sprinkler Protection – Supervised Sprinkler System.

The above assumptions result in an estimated fire flow of approximately ***13,000 L/min***, noting that actual building materials selected will affect the estimated flow. A certified fire protection system specialist would need to be employed to design the building fire suppression system and confirm the actual fire flow demand.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand as indicated in ***Table 2***. No response was received at the time of publication. Correspondence with the City has been included in ***Appendix A***.

3.3 Water Supply Conclusion

The anticipated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions. No response was received at the time of publication.

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 West Nepean Collector Sewer catchment area, as shown by the City sewer mapping included in ***Appendix C***. An existing 300mm diameter sanitary sewer within New Orchard Avenue North is available to service the contemplated development.

The existing site consists of a single detached residential home which is contributing wastewater to the local New Orchard sewer system. The New Orchard Avenue sanitary sewer is tributary to the West Nepean Trunk Collector sewer, which is located approximately 10m downstream of the site. ***Table 3*** below summarizes the estimated existing wastewater flow from the site.

Table 3
Summary of Existing Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	0.01
Estimated Peak Dry Weather Flow	0.05
Estimated Peak Wet Weather Flow	0.07

4.2 Wastewater Design

It is anticipated that the contemplated development will connect to the existing 300mm sanitary sewer within New Orchard Avenue North.

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

Table 4
Wastewater Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0
Amenity 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	135mm 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 demonstrates the anticipated peak flow from the contemplated development. See ***Appendix C*** for associated calculations.

Table 5
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	0.42
Estimated Peak Dry Weather Flow	1.59
Estimated Peak Wet Weather Flow	1.61

The estimated sanitary flow, based on the concept plan provide in ***Drawings/Figures,*** is ***1.67 L/s***. As demonstrated by ***Table 3*** and ***Table 5***, the development results in an increase in peak wet weather sanitary flow of approximately ***1.54 L/s***. As discussed with City staff, due to the distance to the West Nepean Trunk Collector sewer and the complexity of the drainage area, the anticipated flow from the site was provided to confirm capacity and resulting HGL due to the proposed development.

4.3 Wastewater Servicing Conclusions

The site is tributary to the West Nepean Trunk Collector sewer. Based on the distance to the Collector sewer and complexity of the drainage area, the anticipated flow of ***1.61 L/s*** peak wet weather flow from the site was provided to confirm capacity and resulting HGL due to the proposed development.

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 and is 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. The subject property is located within the Ottawa River watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). Consultation with the RVCA is located in ***Appendix A***.

It was determined that the existing development contained no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized in ***Table 6***:

Table 6
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	11.0
5-year	14.9
100-year	32.1

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 is required to:

- Meet an allowable release rate based on the lesser of either the existing calculated Rational Method Coefficient or 0.50, employing the City of Ottawa IDF parameters for a 2-year storm with a time of concentration equal to or greater than 10 minutes;
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site;
- Quality controls are anticipated to be required for the proposed development due to the site's distance from the outlet; correspondence with the RVCA is included in ***Appendix A,*** however no response was received at the time of publication.

Based on the above the allowable release rate for the proposed development is ***7.7 L/s***.

5.3 Proposed Stormwater Management System

It is contemplated that the stormwater outlet from the proposed development will be to the existing 675mm diameter storm sewer within New Orchard Avenue North.

To meet the stormwater objectives the proposed development will likely require an internal cistern.

Table 7 summarizes post-development flow rates. 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 7
Stormwater Flow Rate Summary

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	1.8	0.0	3.7	0.0
Attenuated Areas	2.0	12.1	3.9	24.2
Total	**3.8**	**12.1**	**7.7**	**24.2**

It is anticipated that approximately ***24.2 m^3*** of storage provided via an internal cistern will be required on site to attenuate flow to the established release rate of ***7.7 L/s***; storage calculations are contained within ***Appendix D***.

Actual storage volumes will need to be confirmed at the detailed design stage based on a number of factors including, but not limited to grading constraints.

5.4 Stormwater Servicing Conclusions

In accordance with City of Ottawa ***City Standards***. 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. The post-development allowable release rate was calculated as ***7.7 L/s***; it is estimated that ***24.2 m^3*** of storage provided via an internal cistern will be required to meet the established release rate.

Quality controls are anticipated to be required for the proposed development due to the site's distance from the outlet; correspondence with the RVCA is included in ***Appendix A,*** however no response was received at the time of publication.

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

6.0 UTILITIES

Utility servicing will be coordinated with the individual utility companies prior to site development.

7.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by New Orchard Investment Inc. to prepare an Assessment of Adequacy of Public Services report in support of the application for a Zoning By-law Amendment (ZBLA) at 100 New Orchard Avenue North. The preceding report outlines the following:

- The watermain boundary conditions have been requested from the City of Ottawa, however they were unavailable at the time of this publication;
- The FUS method for estimating fire flow indicated ***13,000 L/min*** of flow is required for the contemplated development,
- The contemplated development is anticipated to have a peak wet weather flow of ***1.61 L/s***. Based on the distance to the Collector sewer and complexity of the drainage area, the anticipated flow from the site was provided to confirm capacity and resulting HGL due to the proposed development.
- Based on consultation with the City of Ottawa, the contemplated development will be required to attenuate post development flows to an equivalent release rate of ***7.7 L/s*** for all storms up to and including the 100-year storm event;
- It is contemplated that stormwater objectives may be met through storm water retention via an internal cistern, it is estimated that ***24.2 m^3*** of onsite storage will be required to attenuate flow to the established release rate;
- Based on the distance from the Ottawa River Outlet stormwater quality controls are anticipated;

Prepared by,
David Schaeffer Engineering Ltd.

Per: Alison J. Gosling, EIT.

Reviewed by,
David Schaeffer Engineering Ltd.

Per: Robert D. Freel, P.Eng.

z:\projects\18-1031_fotenn-100-new-orchard\b_design\b3_reports\b3-2_servicing (dsel)\2018-06_aes-sub1\aes-2018-06-15_1031_cmk.dotx.docx

APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

18-1031 15/06/2018

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.	N/A
☐	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	N/A

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 8.0
☐	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: Alison Gosling
Sent: Wednesday, June 13, 2018 1:47 PM
To: 'Schaeffer, Gabrielle'
Cc: Robert Freel
Subject: 18-1031 100 New Orchard Avenue

Good afternoon Gabrielle,

We would like to confirm Stormwater Management criteria and connection locations to municipal infrastructure for the site based on the pre-consultation meeting with the Bobby on May 31st, 2018.

Based on the information we were able to obtain, the surrounding municipal infrastructure exists:

Water:

- There is an existing 152mm diameter watermain within the New Orchard Avenue right-of-way and a 1220mm diameter watermain located North of the subject site.
- It is contemplated that the development will connect to the existing 152mm diameter watermain within New Orchard Avenue.

Sanitary:

- There is an existing 300mm diameter sanitary sewer within the New Orchard Avenue right-of-way and a 1350mm diameter sanitary sewer North of the subject site.
- It is contemplated that the development will connect to the existing 300mm diameter sanitary sewer within New Orchard Avenue.
- Based on preliminary calculations, there is a net increase in peak wet weather sanitary flow of approximately 1.9 L/s. Due to the site's proximity to the West Nepean Trunk Collector, the increase is not anticipated to create a capacity issue to the existing sanitary sewer. Can you please confirm capacity and HGL with the wastewater modelling group?

Storm:

- There is an existing 675mm diameter storm sewer within the New Orchard Avenue right-of-way, which is contemplated to service the development.
- It is contemplated that the site would need to meet an allowable release rate based on either a Rational Method Coefficient of 0.50 or the calculated existing Rational Method Coefficient (the lesser), employing the City of Ottawa IDF parameters for a 2-year storm with a calculated time of concentration.

Can you please confirm the background information and assumptions above?

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: Alison Gosling
Sent: Wednesday, June 13, 2018 1:56 PM
To: 'Eric Lalande'
Cc: Charlotte Kelly
Subject: 18-1031 100 New Orchard Avenue - Quality Requirement
Attachments: N_ORCH Preliminary Plans 2018_06_09.pdf

Good afternoon Eric,

We wanted to touch base with you regarding a development we are working on located at 100 New Orchard Avenue.

The stormwater collected from the site travels approximately 200m to a direct outlet into the Ottawa River.

The development proposes to construct a 13-storey residential building with associated underground parking. The development will discharge stormwater to the existing 675 mm diameter storm sewer within New Orchard Avenue. As shown by the attached, runoff will be mainly rooftop and landscaped areas.

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.

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

Charlotte Kelly

From: Alison Gosling
Sent: June 13, 2018 2:47 PM
To: Charlotte Kelly
Subject: FW: Job:18-1031 - 100 New Orchard Ave.
Attachments: wtr-2018-05-31_1031_FUS.PDF

From: Alison Gosling <AGosling@dsel.ca>
Sent: Thursday, May 31, 2018 5:28 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Robert Freel <RFreel@dsel.ca>
Subject: Job:18-1031 - 100 New Orchard Ave.

Good afternoon Gabrielle,

We would like to request water boundary conditions for New Orchard Avenue using the following proposed development demands:

1. Location of Service / Street Number: 100 New Orchard Avenue

2. Type of development and the amount of fire flow required for the proposed development:

- The proposed development is a condominium building consisting of **75** residential units and **243 m^2** of amenity space.
- It is anticipated that the development will have a single connection to be serviced from the existing 152 mm diameter watermain within New Orchard Avenue, as shown by the attached map.
- It is anticipated that a fire flow of 13,000 L/min will be required for the development.

3.

	L/min	L/s
Avg. Daily	26.7	0.44
Max Day	129.3	2.15
Peak Hour	195.4	3.26

If you have any questions please feel free to contact me.

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

APPENDIX B

Water Supply

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
Bachelor	1.4		0
1 Bedroom	1.4	84	118
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	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	118	33.0	22.9	161.9	112.4	244.5	169.8

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
Amenity space	2.5	$L/m^2/d$	358	0.90	0.6	1.3	0.9	2.4	1.7
Office	75	$L/9.3m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Restaurant*	125	L/seat/d		0.00	0.0	0.0	0.0	0.0	0.0
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				0.9	0.6	1.3	0.9	2.4	1.7
Total Demand				**33.9**	**23.6**	**163.2**	**113.4**	**246.9**	**171.5**

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	7865.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	19510.7	L/min	
	20000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**17000.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-8500**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Ordinary - Unprotected Openings	>45m		0	0	0%	
S	Ordinary - Unprotected Openings	3.1m-10m	30.2	13	393	19%	
E	Ordinary - Unprotected Openings	20.1m-30m	19.4	1	20	6%	
W	Ordinary - Unprotected Openings	>45m		0	0	0%	
		% Increase				**25%**	*value not to exceed 75%*

Increase	**4250.0**	**L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	12750.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section*
	13000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.
-Calculations based on Fire Underwriters Survey - Part II

CITY OF OTTAWA- WATER DISTRIBUTION SYSTEM

APPENDIX C

Wastewater Collection

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

Site Area 0.074 **ha**

Extraneous Flow Allowances

Infiltration / Inflow	**0.02**	**L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4	1	4
Semi-detached and 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		0

Total Pop	**4**	
Average Domestic Flow	**0.01**	**L/s**
Peaking Factor	**4.00**	
Peak Domestic Flow	**0.05**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5 $L/m^2/d$		0.00
Ex. Industrial - Light**	35,000 L/gross ha/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	**0.00**
Peak Institutional / Commercial Flow	0.00
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.00**

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

Total Estimated Average Dry Weather Flow Rate	**0.01 L/s**
Total Estimated Peak Dry Weather Flow Rate	**0.05 L/s**
Total Estimated Peak Wet Weather Flow Rate	**0.07 L/s**

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

Site Area 0.074 **ha**

Extraneous Flow Allowances

Infiltration / Inflow	**0.02**	**L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	84	118
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**118**	
Average Domestic Flow	**0.38**	**L/s**
Peaking Factor	**4.00**	
Peak Domestic Flow	**1.53**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Amenity Space	5 $L/m^2/d$	358	0.04
Ex. Industrial - Light**	35,000 L/gross ha/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	**0.04**
Peak Institutional / Commercial Flow	0.06
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.06**

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

Total Estimated Average Dry Weather Flow Rate	**0.42 L/s**
Total Estimated Peak Dry Weather Flow Rate	**1.59 L/s**
Total Estimated Peak Wet Weather Flow Rate	**1.61 L/s**


CITY OF OTTAWA-
SANITARY TRUNK AND
COLLECTION AREAS
WEST NEPEAN COLLECTOR
SUBJECT
SITE
BRITANNIA
PURIFICATION PLANT
Cassels St.
POOLER
87 Pooler Ave.
MCEWEN
31 McEwen Ave.
LINCOLN HGTS.
5 Lincoln Hgts. Rd.
WOODROFFE AVE.
COLLECTOR
RITANNIA RD.
@Howe
OTTAWA-RIVER 1500 CONC-1953 6562
1500 CONC-1961 6559
CHURCHILL
WOODROFFE
900 CONC-1955 6669
900 CONR-1956 6624
FAIRLAWN
MAITLAND
900 CONR-1975 6614
CAVE CREEK
COLLECTOR
WOODROFFE DIVERSION
1085 Woodroffe Ave.
PINECREST
COLLECTOR

APPENDIX D

Stormwater Management

New Orchard Investment Inc.
100 New Orchard Avenue
Existing Site Conditions

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

Existing Drainage Charateristics From Internal Site

Area	0.074	ha
C	0.48	Rational Method runoff coefficient
L	25.13	m
Up Elev	62.75	m
Dn Elev	59.25	m
Slope	13.9	%
Tc	4.2	min

	Imp.	Perv.	Total
Area	0.030	0.044	0.074
C	0.9	0.2	0.48

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	110.0	150.1	258.3	mm/hr
Q	11.0	14.9	32.1	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, 2004

Target Flow Rate

Area 0.075 ha
C 0.48 Rational Method runoff coefficient
t_c 10.0 min

2-year
i 76.8 mm/hr
Q 7.7 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area 0.007 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	1.8	1.8	0.0	0.0	178.6	3.7	3.7	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 0.067 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	16.6	2.0	14.6	8.8	178.6	33.4	3.9	29.4	17.7
15	83.6	13.3	2.0	11.3	10.2	142.9	26.7	3.9	22.8	20.5
20	70.3	11.2	2.0	9.2	11.0	120.0	22.4	3.9	18.5	22.2
25	60.9	9.7	2.0	7.7	11.6	103.8	19.4	3.9	15.5	23.2
30	53.9	8.6	2.0	6.6	11.9	91.9	17.2	3.9	13.2	23.8
35	48.5	7.7	2.0	5.7	12.1	82.6	15.4	3.9	11.5	24.1
40	44.2	7.0	2.0	5.0	12.1	75.1	14.1	3.9	10.1	24.2
45	40.6	6.5	2.0	4.5	12.1	69.1	12.9	3.9	9.0	24.2
50	37.7	6.0	2.0	4.0	12.0	64.0	12.0	3.9	8.0	24.0
55	35.1	5.6	2.0	3.6	11.9	59.6	11.1	3.9	7.2	23.8
60	32.9	5.2	2.0	3.3	11.7	55.9	10.5	3.9	6.5	23.4
65	31.0	4.9	2.0	3.0	11.5	52.6	9.8	3.9	5.9	23.0
70	29.4	4.7	2.0	2.7	11.3	49.8	9.3	3.9	5.4	22.5
75	27.9	4.4	2.0	2.5	11.0	47.3	8.8	3.9	4.9	22.0
80	26.6	4.2	2.0	2.2	10.8	45.0	8.4	3.9	4.5	21.4
85	25.4	4.0	2.0	2.0	10.5	43.0	8.0	3.9	4.1	20.8
90	24.3	3.9	2.0	1.9	10.1	41.1	7.7	3.9	3.7	20.2
95	23.3	3.7	2.0	1.7	9.8	39.4	7.4	3.9	3.4	19.5
100	22.4	3.6	2.0	1.6	9.5	37.9	7.1	3.9	3.1	18.8
105	21.6	3.4	2.0	1.4	9.1	36.5	6.8	3.9	2.9	18.1
110	20.8	3.3	2.0	1.3	8.7	35.2	6.6	3.9	2.6	17.4

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)

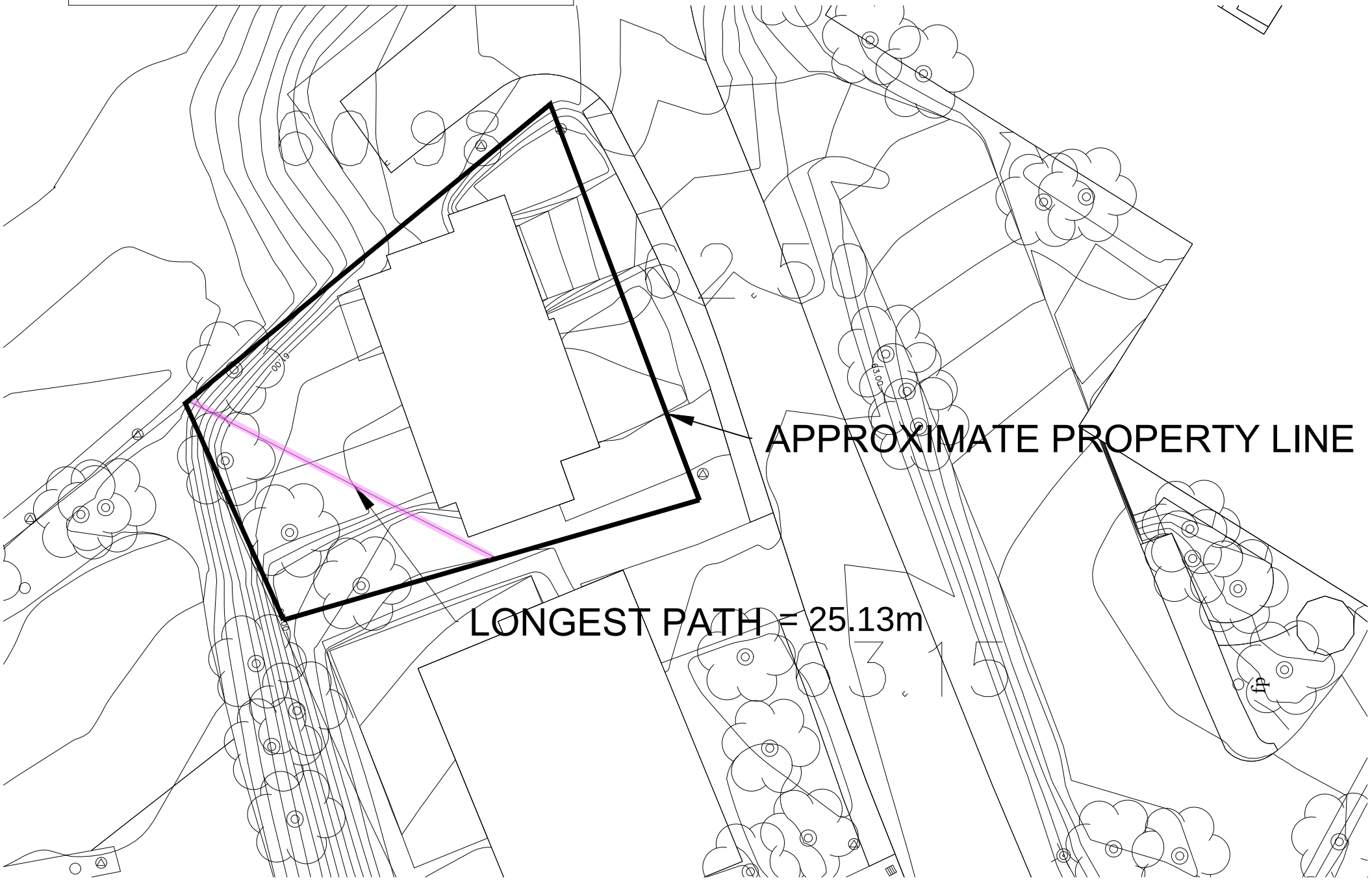
5-year $Q_{attenuated}$ 1.97 L/s **100-year $Q_{attenuated}$ 3.95 L/s**
5-year Max. Storage Required 12.1 m^3 **100-year Max. Storage Required 24.2 m^3**

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	1.8	0.0	3.7	0.0
Attenutated Areas	2.0	12.1	3.9	24.2
Total	**3.8**	**12.1**	**7.7**	**24.2**


IMPERVIOUS AREA ESTIMATION
IMPERVIOUS AREA
SUBJECT SITE
17 m
3 m
5 m
5.2 m
Area: 0.03 ha
Perimeter: 89 m
12 m
2 m
6 m
3 m
3 m
3 m
4 m
18 m
100
99
108
ave. New Orchard Ave. N.
City of Ottawa

ESTIMATION OF Tc



DRAWINGS / FIGURES

PROJECT INFORMATION

SITE AREA =..... .... 742.3m2
(7990sq.ft.)
BUILDING AREA
(max. footprint) =..... 605m2
(6510 sq.ft.)
LANDSCAPED AREA =.....88m2 (11.9%)
No. of STORIES = ... 14
No. of Dwelling Units = ... 84 (includes 9 third floor units designated as affordable housing)

PARKING REQUIRED
SCHEDULE 1A AREA X
1st 12 UNITS = ... 0
63 UNITS @ 0.5 SPACES/ UNIT =..... 31.5
LESS 10% U/G =..... .... 3.15
TOTAL SPACES REQUIRED = ... 28
VISITOR PARKING REQUIRED
1st 12 UNITS = ... 0
63 UNITS @ 0.1 = ... 6

TOTAL PARKING REQUIRED = 34 SPACES

PARKING PROVIDED
U/G LEVEL = 16 SPACES (INCL. 1 BARRIER FREE SPACE)
GROUND = 8 SPACES
SECOND =11 SPACES

PARKING PROVIDED = 35 SPACES

BICYCLE PARKING REQUIRED

75 D.U. X 0.5 = 38 SPACES REQUIRED

BICYCLE PARKING PROVIDED
25 HORIZONTAL SPACES
14 VERTICAL SPACES
TOTAL PROVIDED = 39 SPACES

APARTMENT UNITS

FLOOR 3 @ 9 D.U./ FLR = 9 UNITS (AFFORDABLE HOUSING)
FLOORS 3-7 @ 8 D.U./FLR = 40 UNITS
FLOORS 8-12 @ 7 D.U./FLR = 35 UNITS
> 75 UNITS
14TH FLOOR - AMENITY AREA 358m2 (3855 sq.ft.)

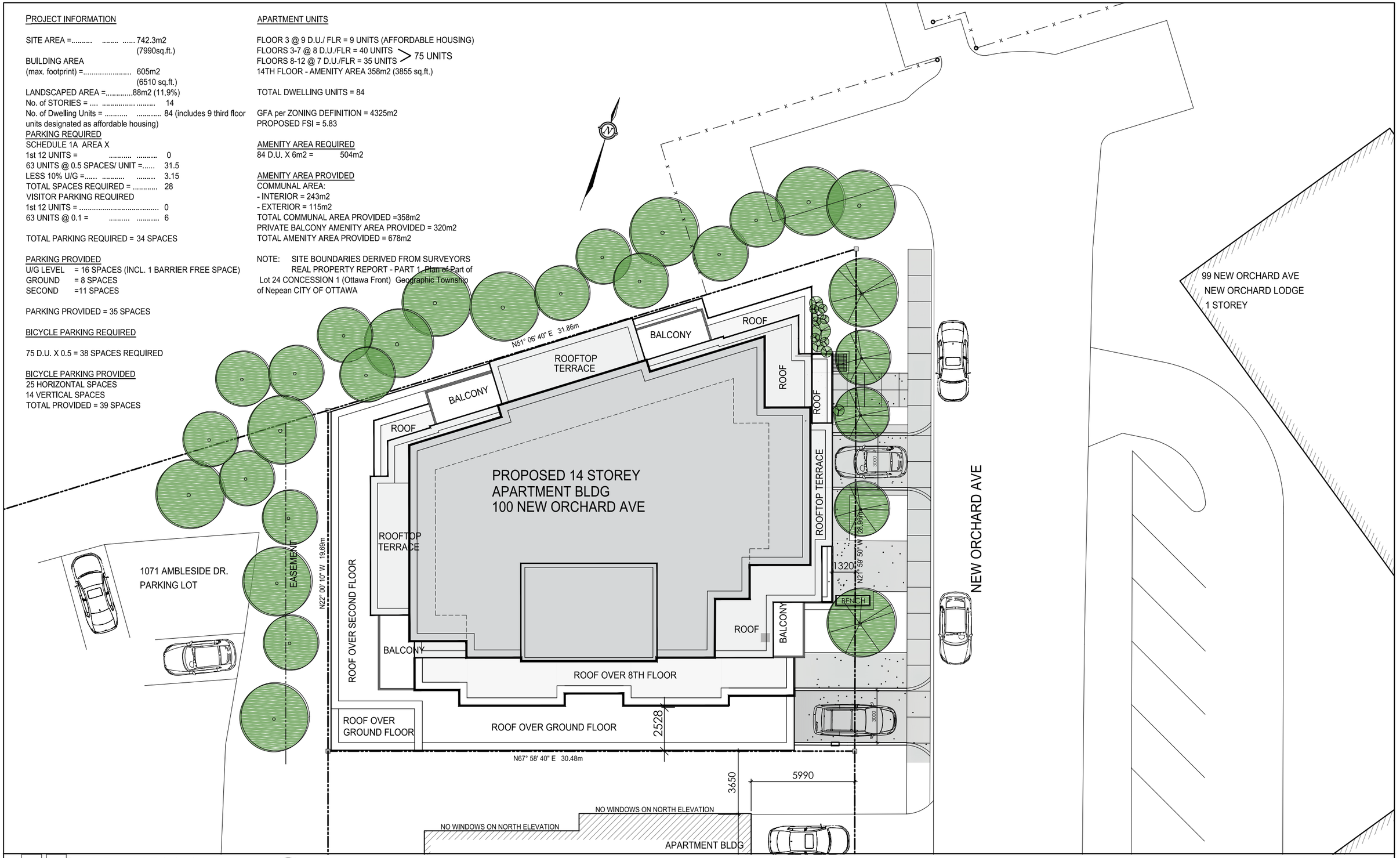
TOTAL DWELLING UNITS = 84

GFA per ZONING DEFINITION = 4325m2
PROPOSED FSI = 5.83

AMENITY AREA REQUIRED
84 D.U. X 6m2 = 504m2

AMENITY AREA PROVIDED
COMMUNAL AREA:
- INTERIOR = 243m2
- EXTERIOR = 115m2
TOTAL COMMUNAL AREA PROVIDED =358m2
PRIVATE BALCONY AMENITY AREA PROVIDED = 320m2
TOTAL AMENITY AREA PROVIDED = 678m2

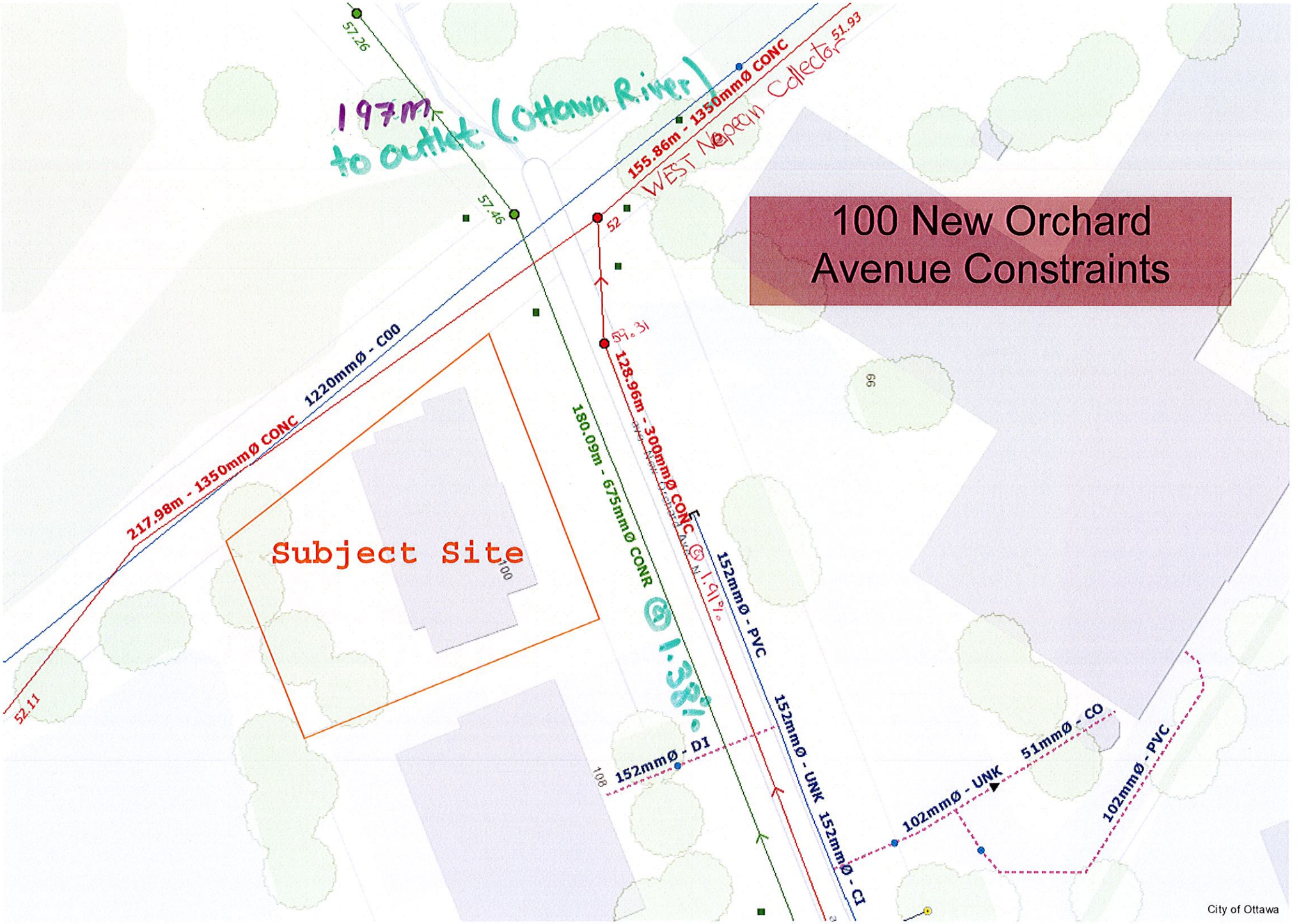
NOTE: SITE BOUNDARIES DERIVED FROM SURVEYORS REAL PROPERTY REPORT - PART 1, Plan of Part of Lot 24 CONCESSION 1 (Ottawa Front) Geographic Township of Nepean CITY OF OTTAWA



M. David Blakely
Architect Inc.
2200 Prince of Wales Dr. Suite 101 Ottawa, Ontario
Phone (613) 226-8811 Fax (613) 226-7942 K2E 6Z9

SP1 PRELIMINARY SITE PLAN - 14 STOREY APARTMENT BLDG
SCALE: 1:200

100 NEW ORCHARD
OTTAWA ONTARIO
JUNE 09, 2018


100 New Orchard Avenue Constraints
Subject Site
197m to outlet (Ottawa River)
155.86m - 1350mmØ CONC
WEST Nepean Collector
217.98m - 1350mmØ CONC
1220mmØ - C00
180.09m - 675mmØ CONR @ 1.38%
128.96m - 300mmØ CONC @ 1.91%
152mmØ - PVC
152mmØ - UNK
152mmØ - CI
152mmØ - DI
102mmØ - UNK
51mmØ - CO
102mmØ - PVC
57.26
57.46
52
54.31
52.11
51.93
City of Ottawa