1746 Carling Avenue

Functional Servicing Report

Stantec

Prepared for:
Kerr Broadview Properties Ltd.

Prepared by:
Stantec Consulting Ltd.

Date:
October 20, 2025

Project/File:
160401895

Stantec Consulting Ltd.

Revision Schedule

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
0	ZBLA	Michael W.	2025-10-08	Alyssa G.	2025-10-10	Dustin T.	2025-10-17

Disclaimer

The conclusions in the Report titled 1746 Carling Avenue are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Kerr Broadview Properties Ltd. (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Prepared by: 

Signature

Michael Wu, E.I.T.

Reviewed by: 

Signature

Alyssa Gladish, E.I.T.

Approved by: 

Signature

Dustin Thiffault, P.Eng.

Table of Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

Stantec Consulting Ltd. (Stantec) is commissioned by Kerr Broadview Properties Ltd. (Kerr Broadview) to prepare the following Functional Servicing and Stormwater Management Report in support of a Zoning By-law Amendment (ZBLA) application to permit the proposed redevelopment at 1746 Carling Avenue in the City of Ottawa.

The 0.91 ha site is currently zoned AM10 and IG3 H (10.7) and consists of two existing commercial buildings and paved parking areas. The site is bounded by Carling Avenue to the north, existing commercial development to the northwest, existing residential developments to the southwest, Kerr Avenue to the south, and Boyd Avenue and an existing commercial building to the east, as shown in **Figure 1.1** below.

Figure 1.1: Key Plan of Site

RLA Architecture has provided a site plan dated September 15, 2025 (see **Appendix A.1**), which defines the proposed development and consists of two residential high-rise buildings, a mid-rise retirement residence, two levels of underground parking surface parking, and an allocation of parkland. The retirement residence will consist of Phase 1 (Building C) and the two residential high-rise buildings will consist of Phases 2 and 3 (Buildings A and B). The Phase 1 north boundary follows the limits of the Phase 1 underground parking structure. Phase 2 and Phase 3 have a shared underground parking structure and a shared access ramp. Phase 1 is to be independently serviced to allow for future severance. Due to the shared services and infrastructure, it is intended that Phases 2 and 3 will remain part of the same land parcel.

The preliminary mixed-use attributes for each building are listed in **Table 1.1** below. The two levels of underground parking are shared between Buildings A and B while Building C has its own underground parking, also with two levels.

Table 1.1: Preliminary Attributes of Proposed Buildings

Use/Attribute	Total	Building A	Building B	Building C
Number of Above Ground Storeys				
Podium	-	6	4	-
Tower	-	26	24	9
Total	**-**	**32**	**28**	**9**
Underground Parking Levels	2	-	-	-
Gross Parcel Area for Commercial (m^2)	5341	3489	1852	-
Residential Apartment Rental Units	741	332	287	122
Residential Apartment Unit Types				
Studio		26	22	0
One-bedroom		176	149	34
One-bedroom with Den		4	13	61
Two-bedroom		107	90	21
Two-bedroom with Den		19	13	0
Three-bedroom		0	0	6

Buildings A and B (Phase 2 and 3) are proposed to be accessed via a private driveway from Boyd Avenue to the east, while Building C (Phase 3) will be accessed via a layby along the north side of Kerr Avenue. Additional pedestrian access is available through a proposed network of sidewalks and walkways on the site. Within the site, the internal driveway provides access to the surface parking areas, and the underground parking ramp for Phases 2 and 3. The Phase 1 underground parking and loading bay are directly accessed from Kerr Avenue.

1.1 Objective

This functional report presents a preliminary servicing scheme and stormwater management (SWM) concept that is free of conflicts, provides onsite servicing concepts in accordance with the City of Ottawa

Design Guidelines, and uses the existing municipal infrastructure in compliance with any limitations communicated during consultation with the City of Ottawa staff. A copy of the July 18, 2024, pre-application consultation meeting minutes and preliminary comments is included in **Appendix A**.

Details of the existing infrastructure located within the Carling Avenue, Boyd Avenue, and the Kerr Avenue right of way (ROW) are obtained from available as-built drawings from the City of Ottawa and site topographic survey by Stantec Geomatics Ltd. (completed September 23, 2025).

Criteria and constraints provided by the City of Ottawa are used as a basis for the preliminary servicing design supporting the proposed development.

General and site-specific conditions considered are as follows:

- **Potable Water Servicing**
  - Estimate water demands to characterize the proposed feed(s) for the proposed development serviced from the municipal watermains within the Carling, Boyd, and/or Kerr Avenues ROWs.
  - No water service connection to the 600 mm watermain in Carling Avenue is permitted.
  - Watermain servicing for the development is to provide average daily and maximum daily (including peak hour) demands (i.e., non-emergency conditions) at pressures within the acceptable range of 345 to 552 kPa (50 to 80 psi) under the condition of maximum daily demand and no less than 276 kPa (40psi) under the condition of peak hourly demand.
  - the maximum pressure at any point in the water distribution system should not exceed 689 kPa (100 psi) as per the Ontario Building/Plumbing Code. Pressure reducing measures are required to service occupied areas where pressures greater than 552 kPa (80 psi) are anticipated.
  - Under fire flow (emergency) conditions, the water distribution system is to maintain a minimum pressure greater than 140 kPa (20 psi).
  - Demonstrate that fire hydrant coverage provides adequate fire protection for the proposed development.
  - Potable water servicing requires two connections separated by an isolation valve to avoid the creation of a vulnerable service area.
- **Wastewater (Sanitary) Servicing**
  - Identify the wastewater design flow from the proposed development.
  - Confirm the downstream sewer capacity to receive the peak wastewater flows through correspondence with the City of Ottawa.
  - Define and provide preliminary sizing of the proposed sanitary building services that will be connected to the existing municipal sanitary sewers within the Carling, Kerr, and/or Boyd Avenue ROWs.
- **Stormwater Servicing**
  - Delineate the functional major and minor system conveyance patterns and drainage boundaries in conjunction with the proposed grading plan.
  - Determine the preliminary stormwater management (SWM) storage requirements for water quantity control to meet the allowable release rates for the site.
  - Identify the water quality control measures to be applied to the site through correspondence with the City of Ottawa.

  - Define and provide preliminary size of the proposed storm sewers and building services that will be connected to the existing municipal storm sewers within the Carling, Kerr, and/or Boyd Avenue ROWs.
- **Site Grading Plan**
  - Prepare a preliminary grading plan to support the proposed site plan and interface with existing conditions along the site boundary.

To demonstrate the feasibility of servicing and stormwater management at a functional level, the accompanying Drawings illustrate the preliminary internal and municipal servicing scheme for the site.

Additional supporting information associated with utility service, approval process information, erosion and sediment control, and the project geotechnical investigation is also included herein.

2 Background Resources

Documents referenced in preparing this report include:

- *City of Ottawa Sewer Design Guidelines* (SDG), City of Ottawa, October 2012, including all subsequent technical bulletins
- *City of Ottawa Design Guidelines – Water Distribution*, City of Ottawa, July 2010, including all subsequent technical bulletins
- *Design Guidelines for Drinking Water Systems*, Ministry of the Environment, Conservation, and Parks (MECP), 2008
- *Fire Protection Water Supply Guideline* for Part 3 in the Ontario Building Code, Office of the Fire Marshal (OFM), October 2020
- *Water Supply for Public Fire Protection*, Fire Underwriters Survey (FUS), 2020
- *Geotechnical Desktop Review - Proposed Multi-Use Development 1740, 1746 & 1754 Carling Avenue, 828 Boyd Avenue, and 1755 Kerr Avenue,* Paterson Group, December 4, 2024
- Site Survey Plan, Annis, O'Sullivan, Vollebekk Ltd., September 23, 2025
- Pre-Consultation Meeting Minutes & Preliminary Comments, City of Ottawa, July 14, 2024

3 Water Servicing

3.1 Background

The existing municipal watermains along the boundaries of the site includes the 150 mm diameter UCI watermains in Carling Avenue, Boyd Avenue, and Kerr Avenue. The site is located within Pressure Zone 1W of the City of Ottawa's water distribution system. Each of the watermains connect to existing fire hydrants that will be used to service the site. Prior to installation of the water servicing infrastructure, the existing water service laterals are to be blanked at the main by City of Ottawa forces.

3.2 Water Demands

3.2.1 Domestic Water Demand

Preliminary domestic water demands are calculated using the City of Ottawa Water Distribution Guidelines (2010) as amended, and ISTB 2021-03 Technical Bulletin (see detailed calculations in **Appendix B.1**).

The population is estimated using an occupancy of 1.4 persons per unit for studio and one-bedroom apartments, 2.1 persons per unit for one-bedroom with study and two-bedroom units, and 3.1 persons per unit for three-bedroom apartments. Based on the site statistics and unit distribution listed in **Table 1.1**, the proposed site is estimated to have a total population of 1,309 residents.

A daily rate of 280 L/cap/day is used to estimate average daily (AVDY) potable water demand for the residential units, and 28,000 L/gross ha/day for the commercial demand. As the projected population exceeds 500 persons, the City of Ottawa peaking factors are used. The maximum day (MXDY) demand is determined by multiplying the AVDY demands by a peaking factor of 2.5 for residential areas and 1.5 for commercial and amenity areas. Peak hourly (PKHR) demand is determined by multiplying the MXDY by a peaking factor of 2.2 for residential areas and 1.8 for commercial areas. The estimated demand for the site is summarized in **Table 3.1** below and detailed in **Appendix B.1**.

Table 3.1: Estimated Water Demands

Demand Type	Population	Commercial Area (ha)	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Phase 1 (Building C)	238	-	0.7	1.8	3.9
Phase 2-3 (Building A and B)	1,071	0.53	3.6	8.9	19.6
Total Site	**1,309**	**0.53**	**4.3**	**10.7**	**23.5**

3.2.2 Fire Flow Demand

Preliminary fire flow requirements are estimated using the methodology described in the document *Fire Underwriters Survey's Water Supply for Public Fire Protection* (2020). The building complex is considered to be constructed with non-combustible materials, have a two-hour fire resistance rating of all structural elements, be fully sprinklered with a supervised sprinkler system to the NFPA 13 standard, and to have full protection of all vertical openings (one hour fire rating).

The total effective building area is determined by adding the gross floor area of the largest floor plus 25% of the floor area of each of the two immediately adjoining floors (Page 22 of FUS document).

All three buildings were determined to have a required fire flow (RFF) of approximately 4,000 L/min (66.7 L/s) each. Detailed fire flow calculations per the FUS methodology are provided for Building C in **Appendix B.2.**

3.2.3 Boundary Conditions

The existing municipal watermains in the adjacent ROWs were found to have insufficient flows and pressures for the RFF under the existing conditions. Through consultation with the City of Ottawa, it was determined that by upsizing the watermain in Boyd Avenue from a 150 mm diameter pipe to a 200 mm diameter pipe, adequate hydraulics can be achieved for this site. Consequently, this project requires upsizing the Boyd Avenue watermain from Carling Avenue to Kerr Avenue intersections, as shown in the Plan and Profile Drawing (PP-1) and the Site Servicing Plans (SSP-1 and SSP-2)

The estimated domestic water and fire flow demands are used to confirm the level of servicing available for the proposed development from the adjacent municipal watermain and hydrants. **Table 3.2** outlines the boundary conditions for the proposed connections servicing the site in consideration of upsizing the watermain on Boyd Avenue and from Kerr Avenue, provided by the City of Ottawa on November 6, 2024, and April 14, 2025, respectively.

Table 3.2: Boundary Conditions (200 mm Boyd Upsize)

Connection	Boyd Avenue	Kerr Avenue
Min. HGL (m)	108.6	
Max. HGL (m)	114.4	
Max. Day + FF (67 L/s) (m)	107.4	

3.2.4 Servicing Pressures

The proposed finished floor elevation (FFE) for the first floor of the apartment buildings serves as the reference elevations for the calculation of residual pressures at ground level. The FFEs of the buildings and the onsite pressures at ground level are summarized in **Table 3.3**.

Table 3.3: FFE and Normal Operating Pressures

Building	FFE (m)	Min. Pressure (psi)	Max. Pressure (psi)
A	78.65	42.6	50.8
B	78.74	42.4	50.7
C	79.76	41.0	49.2

3.2.5 Fire Flow Pressures

The boundary condition HGL elevations show that the water distribution system can provide the required fire flows for the site (67 L/s) while maintaining a residual pressure greater than 138 kPa (20 psi).

Booster pump(s) requirements are to be confirmed by the mechanical engineering consultant to ensure adequate water pressure above the ground floor elevations.

3.2.6 Fire Hydrant Coverage

There are two existing hydrants in the proximity of the proposed development site, as shown on **Figure 2.1**. The buildings will be sprinklered and a fire department connection (FDC) is provided on each building. As per Section 3.2.5.16 of the Ontario Building Code, the distance between one hydrant and the building FDC cannot exceed 45 m.

Two new fire hydrants are proposed onsite that would provide adequate coverage for all Buildings and meet the OBC requirements. A hydrant in the Kerr Avenue Right of Way is proposed to provide coverage for Building C and a second hydrant in the on-site surface parking area is proposed to ensure Building BFDC are no further than 45 m away from hydrants, as indicated on **Drawing SSP-2** and **Appendix B.4**.

To determine the number of fire hydrants required to meet the RFF of a building, the aggregate fire flow capacity of the nearby hydrants must be considered. According to the NFPA 1 Table 18.5.4.3 in Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02, the distance of a fire hydrant to a building (measured in accordance with NFPA 18.5.1.4 and 18.5.1.5) is related to the maximum fire flow capacity that can be credited to each hydrant. The RFF for each building of this site (4,000 L/min) can be achieved with the existing hydrants and the proposed new hydrants. See **Appendix B.4** for fire hydrant coverage table calculations and NFPA Table 18.5.4.3.

3.3 Proposed Water Servicing

The water servicing concept for Buildings A and B will be by two connections to the upsized 200 mm diameter watermain on Boyd Avenue and Building C will be by two connections the existing 152 mm watermain on Kerr Avenue. Each of the two connections will be separated by a new isolation valve installed on the municipal watermain. Once the existing watermain on Boyd Avenue is upsized to 200 mm diameter watermain, the connections to Boyd Avenue and Kerr Avenue will provide adequate fire flows, domestic flows, and pressures for the subject site.

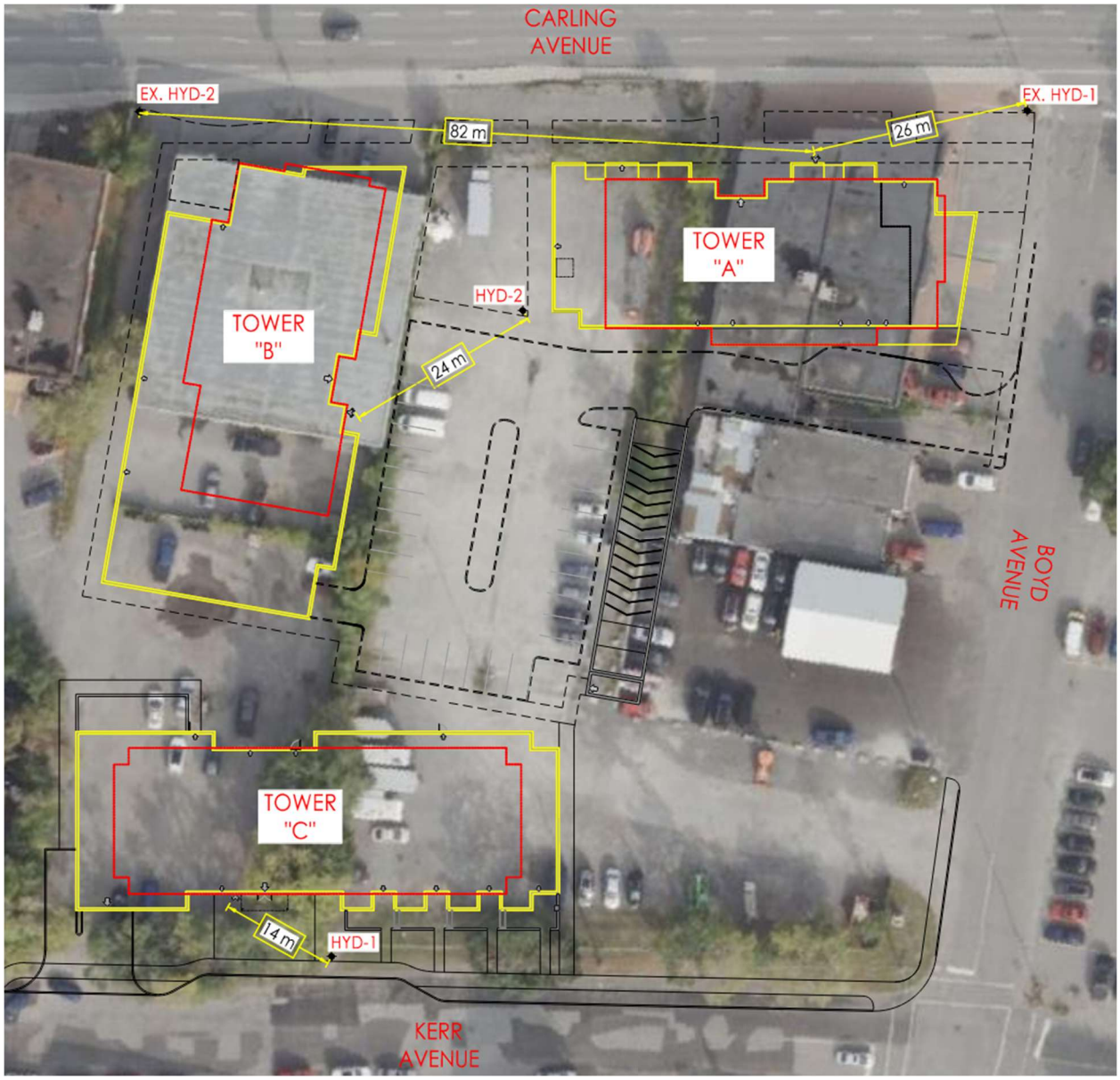


Figure 2.1 : Fire Hydrant Coverage

The mechanical engineering consultant will be responsible for confirming the service lateral sizes and booster pump requirements at the detailed design and building permit phases. The functional water servicing for the Site is shown on **Drawing SSP-2**.

4 Wastewater Servicing

4.1 Background

The existing municipal sanitary sewers adjacent to the site includes the 225 mm diameter concrete sanitary sewers within the Carling Avenue, Kerr Avenue, and Boyd Avenue ROWs.

4.2 Design Criteria

As outlined in the City of Ottawa Sewer Design Guidelines and the MECP Design Guidelines for Sewage Works, the following criteria are used to calculate the estimated wastewater flow rates and to determine the size and location of the sanitary service lateral:

- Minimum velocity = 0.6 m/s (0.8 m/s for upstream sections)
- Maximum velocity = 3.0 m/s
- Manning roughness coefficient for all smooth wall pipes = 0.013
- Minimum size of sanitary sewer service = 135 mm
- Minimum grade of sanitary sewer service = 1.0 % (2.0 % preferred)
- Average wastewater generation = 280 L/person/day (per City Design Guidelines)
- Peak Factor = based on Harmon Equation; maximum of 4.0 (residential)
- Harmon correction factor = 0.8
- Infiltration allowance = 0.33 L/s/ha (per City Design Guidelines)
- Minimum cover for sewer service connections – 2.0 m
- Population density for studio and one-bedroom apartments – 1.4 persons/apartment
- Population density for one-bedroom with den and two-bedroom apartments – 2.1 persons/apartment
- Population density for two-bedroom with den apartments – 3.1 persons/apartment
- Average commercial wastewater generation – 28,000 L/gross ha/day (per City Design Guidelines)

4.3 Wastewater Generation and Servicing Design

The estimated wastewater flows to be generated are based on the current site plan and unit breakdown as shown in **Table 1.1**. The anticipated wastewater peak flow generated from the proposed development is summarized in **Table 4.1**: Estimated Total Wastewater Peak Flow:

Table 4.1: Estimated Total Wastewater Peak Flow

Peak Residential Wastewater Flow				Commercial Wastewater Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
Building	**Population**	**Peak Factor**	**Peak Flow (L/s)**			
Building A and B	1071	3.22	11.2	0.3	0.2	11.6
Building C	238	3.50	2.7		0.1	2.8

Preliminary sanitary sewage generation calculations were prepared and are included in **Appendix C.1**. The anticipated peak wastewater flows for the proposed development were provided to the City of Ottawa staff to evaluate the adequacy of the receiving municipal sanitary sewer system in the vicinity of the site and downstream network.

For the Phase 1, Building C, peak wastewater flows contributing to the existing Kerr Avenue 225 mm diameter concrete sanitary sewer, the City has no capacity concerns for the receiving or downstream sewers (see correspondence in **Appendix C.2**).

Three connection options were considered for the Phase 2-3 (Buildings A and B) sanitary servicing:

(1) Connection to the existing 225mm diameter concrete sanitary sewer flowing west in the Carling Avenue ROW.

(2) Connection to the existing 225mm diameter concrete sanitary sewer flowing south in the Boyd Avenue ROW.

(3) Extension and connection to the existing 225mm diameter concrete sanitary sewer flowing east in the Carling Avenue ROW.

In an email correspondence dated June 4, 2024, City staff confirmed that Option 1 was the only acceptable connection for the proposed peak flow rate (see correspondence in **Appendix C.2**). The city staff confirmed that the downstream sanitary sewers (Carling Avenue west) can receive the proposed peak flows from the development, however, in correspondence on November 7, 2024, it is noted that the capacity available is limited and that there may not be additional capacity available by the time of building permit stage, depending on the status of other developments in the catchment area.

4.4 Proposed Sanitary Servicing

The Phase 1 sanitary service is proposed to connect to the 225 mm diameter sanitary sewer in Kerr Avenue to service Building C and the Phase 2-3 sanitary service is proposed to connect to the 225 mm diameter sanitary sewer in Carling Avenue (west) to service Buildings A and B. According to the City of Ottawa, the downstream sanitary sewers along Carling Avenue are nearing capacity.

The preliminary sanitary servicing is shown on **Drawing SSP2** and **SA-1**. Each proposed service connection will include an onsite sanitary monitoring manhole. The mechanical engineering consultant will be responsible for confirming the service lateral sizes and that the appropriate backwater valve requirements are satisfied at the detailed design and building permit phases.

5 Stormwater Management and Servicing

5.1 Background

The existing storm servicing system along the north and east boundaries of the site consists of curb and catch basins (urban roadway section), the 300 mm diameter storm sewers along Carling Avenue and the 450 mm diameter storm sewers along Boyd Avenue. Kerr Avenue, south of the site, is currently a rural roadway section with poorly defined swales, and no storm sewer. This section of Kerr Avenue drains toward the Boyd Avenue intersection where catch basins to the north and south on Boyd Avenue appear to collect the stormwater and inlet to the storm system.

The intent of Phase 1 of this development is to be independently serviced, for potential future severance. Consequently, it will be necessary for Phase 1 (Building C) to be serviced entirely from the municipal infrastructure in Kerr Avenue. Through discussion with the City of Ottawa, a storm sewer extension is proposed in Kerr Avenue from Boyd to the Building C services. The north side of Kerr Avenue and the segment of Boyd Avenue fronting the Parkland area will also be upgraded to an urban section, complete with a barrier curb. A new roadway catchbasin will be provided on Kerr Avenue to tie into the sewer extension, and an existing ditch inlet catch basin on Boyd Avenue will be removed and relocated to new curb, where the frame and cover will be replaced with a curb inlet type, with the lead tying into the existing 450 mm diameter storm sewer in Boyd Avenue.

5.2 Stormwater Management (SWM) Criteria

The Stormwater Management (SWM) criteria were established by combining current design practices outlined by the City of Ottawa Sewer Design Guidelines (SDG) (October 2012), review of project pre-consultation notes with the City of Ottawa, and through consultation with City of Ottawa staff. The following summarizes the criteria, with the source of each criterion indicated in brackets:

General

- Use of the dual drainage principle (City of Ottawa SDG)
- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff (City of Ottawa SDG)
- Assess impact of 100-year event outlined in the City of Ottawa Sewer Design Guidelines on the major and minor drainage systems (City of Ottawa SDG)

Storm Sewer & Inlet Controls

- Discharge for each storm event to be restricted to a 2-year storm event pre-development rate with a maximum pre-development C coefficient of 0.5 (City of Ottawa pre-consultation, **Appendix A.2)**
- Peak flows generated from events greater than the 2-year and including the 100-year storm must be detained onsite (City of Ottawa pre-consultation, **Appendix A.2**)

- The preferred stormwater system outlet for this site is the 300 mm diameter storm sewer within Carling Avenue. (City of Ottawa pre-consultation, **Appendix A.2**)
- The foundation drainage system is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump, and backflow prevention. (City of Ottawa pre-consultation, **Appendix A.2**)
- Tc should be not less than 10 minutes since IDF curves become unrealistic at less than 10 min (City of Ottawa SDG).

Surface Storage & Overland Flow

- Building openings to be a minimum of 0.30 m above the 100-year water level (City of Ottawa SDG)
- Maximum depth of flow under either static or dynamic conditions shall be less than 0.30 m (City of Ottawa SDG)
- Provide adequate emergency overflow conveyance off-site with a minimum vertical clearance of 0.15 m between the spill elevation and the ground elevation at the building envelope in the proximity of the flow route or ponding area (City of Ottawa SDG)

5.3 Existing Conditions

The pre-development imperviousness of the proposed development area is calculated at 94% (C = 0.86). Under existing conditions there are no controls in place to manage stormwater runoff and all runoff the from site boundary drains uncontrolled to the existing public drainage systems.

5.4 Stormwater Management Design

The Modified Rational Method is employed to assess the rate and volume of runoff anticipated during post-development rainfall runoff events. Based on the proposed Site Plan (**SSP-2**) and preliminary Grading Plan (**GP-2**), drainage area boundaries are defined, and runoff coefficient values are then assigned to each drainage area based on the anticipated finished surface condition (e.g. asphalt, concrete, gravel, grass, etc.). Runoff coefficients for each surface type are assigned based on City of Ottawa SDG and accepted practices. A summary of drainage areas and runoff coefficients are provided in **Table 5.1**, below. Further details can be found in **Appendix D.1**, while **Drawing SD-1** illustrates the proposed post-development storm drainage conditions.

Table 5.1: Summary of Post-Development Drainage Areas

Catchment Areas	Runoff Coefficient, C	Area (ha)	Catchment Type [1]	Outlet
TANK 1 – TANK 4, EXT-1 – EXT-2, R103A – R103F	0.74	0.19	Tributary	New 375 mm Storm Sewer (Kerr Avenue ROW)
PHASE 2	0.82	0.36	Tributary	450 mm Storm Sewer (Boyd Avenue ROW)

PHASE 3	0.84	0.19	Tributary	450 mm Storm Sewer (Boyd Avenue ROW)
C104A (Parkland)	0.40	0.10	Tributary	New 375 mm Storm Sewer (Kerr Avenue ROW)
UNC-1	0.64	0.04	Non-Tributary	Kerr Avenue ROW
UNC-2	0.90	0.01	Non-Tributary	Parkland Area then to Kerr and Boyd Avenue ROWs
UNC-3	0.61	0.04	Non-Tributary	Phase 2 Area then to Boyd Avenue ROW

1. Catchment Type refers to the nature of the catchment's outlet. Tributary catchments contribute to the onsite stormwater management systems.

The dedicated Parkland area, which is ultimately to be conveyed to the City, will be excluded from the SWM design. Only the total *developable* site area (0.81 ha, C=0.79) will be considered for the storage and release rate calculations.

5.4.1 Allowable Release Rate

Based on pre-consultation with City of Ottawa staff, the peak post-development discharge from the subject site is to be limited to the discharge resulting from the 2-year pre-development event using a site runoff coefficient of C= 0.5 or the pre-development C, whichever is less. Based on the calculated C value of 0.86 for the existing site condition, a runoff coefficient of 0.5 is used to establish the allowable release rate.

Given the limitations of site grading based on the existing topography, it is proposed that the post-development drainage pattern for the uncontrolled areas (UNC-1 and UNC-2) at the site perimeter be allowed to continue to drain uncontrolled to the adjacent public roads. Uncontrolled area UNC-3 is uncontrolled in the interim conditions, following construction of Phase 1. In the ultimate conditions (full site development of Phases 1-3), UNC-3 will enter the Phase 2 drainage system and will be controlled. For the purposes of the functional SWM analysis, we have accounted for the UNC-3 area as a tributary area to Phase 2 that impacts the storage volume and release rates of the overall site. Controlled areas of the site will need to be over-controlled to compensate for the uncontrolled areas. Drainage Areas in Phase 2 and 3 will be further discretized at the time of Site Plan Control (SPC) applications for those phases.

The allowable release rate for the site is determined using the modified rational method based on the criteria above. A time of concentration of 10 minutes is used based on the small site size, its proximity to the existing drainage outlet, and recommendations provided during pre-consultation with the City.

$$Q = 2.78\,(C)(I)(A)$$

Where:

$Q = peak\ flow\ rate, L/s$

$C = site\ runoff\ coefficient$

$I = rainfall\ intensity, mm/hr\ (per\ City\ of\ Ottawa\ IDF\ curves)$

$A = drainage\ area, ha$

$$\text{Intensity (mm/hr)} = \frac{732.951}{(10 + 6.199)^{0.810}} = 76.81 \text{ mm/hr}$$

$$\text{Q} = 2.78(0.50)(76.81\text{mm/hr})(0.81 \text{ ha}) = \mathbf{86.4\ L/s}$$

Table 5.2: Allowable Target Release Rate

Design Storm	**Pre-Development Flow Rate (L/s)** for C=0.50, A=0.81 ha, Tc = 10 min
2-Year	86.4

5.4.1.1 Uncontrolled Areas

As specified above, considering the existing conditions of the site, the portion of parkland dedication to be assumed by the City of Ottawa, and the grading restrictions along the site's perimeter, it is proposed to control the interior of the site and the high-rise apartment buildings roof areas only while allowing select perimeter areas of the site to drain uncontrolled. The drainage area UNC-1 will direct uncontrolled surface runoff south to the adjacent Kerr Avenue ROW, while UNC-2 will direct uncontrolled surface runoff east to the dedicated Parkland area. Peak discharges from the uncontrolled areas are calculated using the Rational Method (RM) approach and are summarized in the table below.

Table 5.3: Peak Post-Development Discharge of Uncontrolled Areas (UNC-1, UNC-2)

Design Storm	**UNC-1**	**UNC-2**	**Total**
2-Year	5.8	0.9	**6.7**
100-Year	17.0	2.3	**19.3**

The proposed uncontrolled runoff condition from 0.04 ha is considered an improvement over the existing condition with the developable site area of 0.81 ha contributing uncontrolled runoff to the existing public drainage system. For reference, the uncontrolled runoff rates for the existing 0.81 ha developable site area (applying the 0.86 runoff coefficient) are 148.6 L/s for the 2-year return period, and 345.5 L/s for the 100-year return period design storms.

The third uncontrolled area (UNC-3) is graded towards the Phase 2 area, as such its drainage is expected in future be collected and controlled by the Phase 2 area's stormwater management and storage system. If severance of the Phase 1 area proceeds, an easement will be required for the drainage of the UNC-3 area into Phase 2. Similarly, EXT-1 and EXT-2 drain from the Phase 3 area into the Phase 1 area. At the time of SPC for Phase 3 these areas will likely be regraded to drain to an area drain and into the Phase 3 stormwater management system. Under the current conditions, the drainage remains within the same land ownership parcel (overall Site) and complies with the intent of the SDG and site design criteria.

5.4.2 Quantity Control

Based on the change in overall imperviousness of the site, determined by the calculated runoff coefficients, quantity control measures are needed to manage stormwater runoff. It is proposed that a combination of rooftop capture, surface storage, and underground storage be used to reduce the site's peak outflow. A MRM spreadsheet approach is used to determine the storage volume required. The associated calculations consider the allowable release rate of 86.4 L/s, and the runoff coefficients associated with the proposed post-development catchments. The MRM calculations used to establish the storage volume requirement is provided in **Appendix D.1** and the storm sewer design sheet is provided in **Appendix D.2**. A total storage volume of 290 m^3 is required to reduce the peak flows from these areas for release from the site to meet the target discharge rate of 86.4 L/s.

The proposed stormwater management plan provides adequate attenuation to meet the target release rate for the 2 and 100-year storm events as shown in **Table 5.4**.

Table 5.4: Estimated Post-Development Discharge

Area Type	2-Year (L/s)	100-Year (L/s)	Required Volume Storage (m^3)	Target (L/s)
Uncontrolled	6.7	19.3	-	86.4
Phase 1 Controlled	15.7		110	
Phase 2 Controlled	34.2		120	
Phase 3 Controlled	17.2		60	
Total Controlled	*67.1*		**290**	
Total Flow to Sewer	**73.8**	**86.4**		

5.4.3 Quality Control

Phase 1 is not subject to quality control measures since there are no proposed sources of contamination, such as surface parking. The Phase 2 area of the site will include surface parking and is subject to enhanced level quality control (80 % TSS removal). Quality control measures for Phases 2 and 3 will be determined at detailed design.

5.5 Results

Through the MRM analysis, the controlled 2-year post-development release rate of 67 L/s plus the uncontrolled release rate of 6.7 L/s meets the 2-year pre-development target release rate of 86.4 L/s. In addition, the 100-year post-development storm event-controlled release rate will be maintained at the 67 L/s allowable rate, plus the uncontrolled release rate of 19.2 L/s still meets the 86.4 L/s target rate.

Relative to the existing site condition with 100 % uncontrolled runoff, the proposed post-development 2-year flow control for 0.81 ha of the site is anticipated to reduce the total stormwater discharge from the site. The data summarized in **Table 5.5** indicates that the proposed SWM plan reduces the overall site

storm runoff release rate by approximately 75 % compared to the existing C=0.86, 100-year design storm event.

Table 5.5: Comparison of Pre- and Post-Development Release Rates

Drainage Area	2-Year Discharge (L/s)	100-Year Discharge (L/s)
Pre-Development Release Rates		
Pre-Development Total (0.81 ha)	148.6	345.5
Post-Development Release Rates		
Uncontrolled (0.04 ha)	6.7	19.3
Controlled (0.77 ha)	67.1	67.1
Post-Development Total (0.81 ha)	73.8	86.4
Difference (Post minus Pre)	**-74.8 (-50 %)**	**-259.1 (-75 %)**

5.6 Proposed Stormwater Servicing

Buildings A and B are to be serviced by a 300 mm diameter storm sewer connection to the existing 450 mm diameter storm sewer in Boyd Avenue. A storm sewer extension is proposed on Kerr Avenue to accommodate Building C. Building C will be serviced by a 300 mm diameter storm sewer connection to the new 375 mm storm extension in Kerr Avenue. Stormwater servicing is also proposed for the dedicated Parkland Area, including a 300mm park storm sewer service. All three proposed stormwater services will include a stormwater monitoring manhole. A design sheet confirming the adequacy of the preliminary storm sewer infrastructure sizing is included in **Appendix D.2**.

Stormwater storage infrastructure (e.g., cistern, rooftop storage, etc.) with a minimum storage volume capacity of **290 m^3** will be provided onsite and discharge from the proposed development at a controlled flow rate of **67 L/s**. The final sizing and layout of the infrastructure, including the method(s) of flow attenuation, shall be confirmed at detailed design. See **Drawings SSP-2** and **SD-2** for the proposed preliminary locations of the stormwater infrastructure.

Foundation drains will be provided for buildings A and B and will combine prior to connection to the Phase 2-3 storm service lateral. Building C will have its own foundation drain connected to the Phase 1 Kerr Avenue storm service lateral. Sump pits and pumps will be required for all foundation drain systems. Storm area drains, catch basins, and catch basin lead locations and alignments will be determined at the detailed design phase.

The mechanical engineering consultant will be responsible to confirm service sizes to each building and ensure that the appropriate backwater valve requirements are satisfied. The mechanical engineering consultant will also design any roof drainage systems (including roof drains scuppers, and plumbing) to accommodate the 100-year design storm conditions per OBC requirements. The mechanical engineering consultant will also be responsible for the design of any sump pits/pumps, cistern pumps, and cistern

emergency overflow drains required. The structural engineering consultant will be responsible for the design of any stormwater management cisterns required within the building. The structural and mechanical engineering designs will be required at a later phase such as detailed design and building permit.

6 Site Grading

The topography across the existing site generally slopes from the southwest towards the Carling Avenue ROW at the north, as shown in the topographic data from the site survey plan and functional grading plan **Drawing GP-2.**

A functional grading plan (see **Drawing GP-2**) has been provided to satisfy the stormwater management requirements, as detailed in **Section 5.0**. The functional grading scheme considers emergency overland flow routes required for stormwater management and anticipated cover requirements over sanitary and storm laterals. It provides preliminary high and low point elevations in critical areas to demonstrate the overall drainage patterns. The functional grading plan has been aligned with the Site Plan and preliminary SWM concept. The plan ties-in to existing elevations at the property lines and no drainage is directed to the adjacent properties.

Since the underground parking covers most of the developable site area, it is anticipated that the foundation excavation and shoring will remove most of the silty clay from the site. Consequently, a grade raise restriction will not be applicable for the proposed development. There is a significant grade difference between the subject site and the adjacent properties to the west. An OPSD 3120.100 Type II retaining wall is required at the northwest corner of Phase 1 to accommodate the difference. This wall is an interim requirement for the construction of Phase 1. Once Phase 3 is under construction, this interim wall will be removed, and the exposed foundation wall of the Phase 3 underground parking structure will act as the retaining wall along the west side of Phase 3. The functional grading plan does not identify any other retaining wall or terracing requirements on this site. However, additional grading features may be required at the detailed design phase.

The pre-consultation has identified a minimum requirement of 150 mm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity to the flow route. The geotechnical report identifies grading requirements to protect footings against frost action as follows:

- a minimum of 1.5 m soil cover (or 0.6m soil cover combined with foundation insulation) should be provided for perimeter foundations of heated structures, and
- 2.1 m soil cover (or an equivalent combination of soil cover and foundation insulation) should be provided for exterior unheated foundation.

Detailed site grading to accommodate flow routes and frost protection will be provided at the detailed design phase. Detailed erosion control measures and construction best management practices will be provided at detailed design.

Underside of footing (USF) elevations and finished floor elevations (FFEs) are to be provided or confirmed at detailed design. The proposed USFs and FFEs will be coordinated with the architect to align with building elevation plans, accommodate accessibility standards, and respect the proposed storm sewer's hydraulic grade lines. The USFs and FFEs shown on Drawing GP-2 are preliminary for functional assessment of the development only.

7 Utilities

Hydro Ottawa, Bell, Rogers, and Enbridge all have existing utility plants in the area, which are anticipated to be used to service the site. The exact size, location, and routing of utilities are to be finalized by others during detailed design.

Overhead (OH) hydro-wires run parallel to the site along the west side of Boyd Avenue and the north side of Kerr Avenue. All utilities within the work area will require relocation during construction. The existing utility poles within the public right of way are to be protected during construction.

The existing utility poles, overhead wires, and utility plants within the public right of way and easement instruments are to be protected during construction. Some may need to be temporarily moved/reconfigured to allow sufficient clearance for the movement of heavy machinery required for construction. All utilities within the work area will require relocation during construction. The relocation of existing utilities is to be coordinated with the individual utility providers as needed following detailed design. Utility easement instruments will require registration on the Registered Plan (R-Plan) of the property. Requirements for gas regulating station(s) are to be coordinated with the architect, and the location(s) will be established at detailed design.

8 Approvals

The City of Ottawa will review and approve development applications as they relate to provision of water supply, wastewater collection and disposal, and stormwater management, conveyance, and treatment. While the site will be under single ownership and discharge to municipal storm sewers, no Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) is anticipated for the proposed onsite works. The storm sewer extension proposed in Kerr Avenue will require a municipal Consolidated Linear Infrastructure (CLI) ECA approval. The requirements and responsibility for the CLI-ECA are to be determined at the detailed design phase.

For ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). It is possible that groundwater may be encountered during the foundation excavation on this site. A minimum of two to four weeks should be allotted for completion of the EASR registration and the preparation of the Water Taking and Discharge Plan by a Qualified Person as stipulated under O.Reg. 63/16. An MECP Permit to Take Water (PTTW), which is required for dewatering volumes exceeding 400,000L/day, may also be required for this site. The PTTW requirements will be confirmed by the geotechnical engineer at detailed design.

9 Geotechnical Investigation

A Geotechnical Desktop Review report was prepared by Paterson Group on December 4, 2024. Field programs carried out between October 2013 and October 2018 for the site ESA included 17 boreholes advanced to a maximum depth of 10.3 metres below the existing ground surface (BGS). The subsoil information obtained from those previous field programs formed the basis for the geotechnical desktop review, and informed the geotechnical recommendations, construction considerations, and development constraints.

The subsurface profile encountered at the borehole locations is characterized primarily by fill, compact to dense silty sand to sandy silt, silty clay to clayey silt or glacial till, which is generally observed to consist of loose brown silty sand with gravel, all underlain by bedrock.

Based on observations from all the boreholes, the bedrock consists of grey limestone interbedded with dolostone or shale. The top of bedrock surface was found to be typically at a depth of 2.3 m BGS on the site. The first 0.5-1.0 m of bedrock profile is of poor-quality fractured bedrock and will need to be removed. The long-term groundwater table is expected to be at 2.0 to 3.0 m BGS, though as groundwater levels are subject to seasonal fluctuations, they could vary at the time of construction. Given the time gap between the field programs and the proposed development, a supplemental geotechnical investigation is recommended to confirm the groundwater levels provided.

Based on Paterson’s recommendations, the site is suitable for the proposed development. It is expected that the buildings will be founded on conventional shallow footings placed on the high-quality bedrock bearing surface. Bedrock removal is expected to be required to complete the excavation for the proposed buildings. While it is anticipated that the silty clay will be completely removed during the excavation operations, if a change in the proposed development is introduced where the silty clay will remain in place, additional recommendations must be provided by Paterson to accommodate the presence of the compressible silty clay layer below the proposed structures.

The report also presents Paterson's recommended pavement structure, trench bedding, and site-specific construction considerations that will be incorporated into the civil plans at detailed design. For further details, refer to the full geotechnical report provided in the submission package.

10 Conclusions

The potable water, wastewater, and storm water servicing conditions assessed in this report indicate that several key updates are required to the existing public services immediately adjacent to the project site:

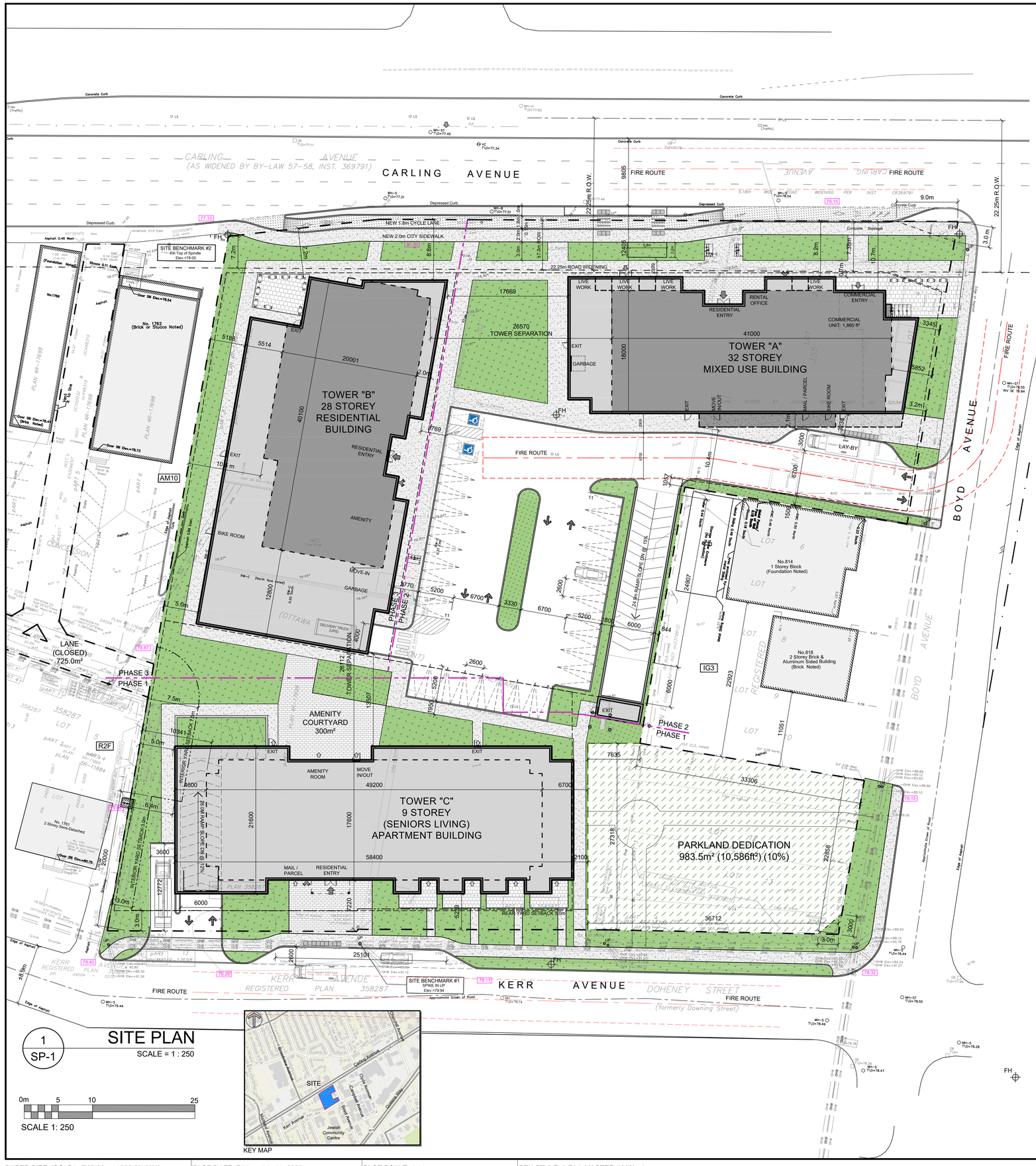
1. Upsize the existing 150 mm diameter watermain on Boyd Avenue from Carling to Kerr Avenue to a 200mm diameter watermain.
2. Extend the storm sewer along Kerr Avenue from the intersection of Kerr Avenue and Boyd Avenue to the location of the proposed storm service for Building C.
3. Install barrier curb along the north side of Kerr Avenue and along the Parkland fronting Boyd Avenue. Install a new curb inlet catch basin tying into the new storm sewer extension on Kerr Avenue and relocate an existing ditch inlet catch basin on Boyd Avenue to the new curb, replacing the frame and grate with a curb inlet type.
4. Install a new municipal fire hydrant within the municipal ROW on the north side of Kerr Avenue, to feed the Building C FDC.

Once these improvements are completed, the municipal infrastructure adjacent to the development site will be adequate to support the functional site servicing and stormwater management strategy that has been presented in this report. At a functional level, this report has also identified existing and available utilities; existing geotechnical conditions and requirements; and civil approval and permit requirements for this development to proceed. This report has effectively demonstrated that the proposed development is able to meet all the servicing requirements for Zoning Bylaw Amendment Approval.

Appendices

Appendix A Background

A.1 Site Plan



1 SP-1 SITE PLAN

SCALE = 1 : 250

0m 5 10 25

SCALE 1: 250

KEY MAP

PROJECT INFORMATION

Zoning By-law 2008-250 Consolidation	AM10	SITE AREA	1.056 ha.	10,560.0 sq. m. 113,667 sq. ft.

ZONING		REQUIRED	PROVIDED
BUILDING HEIGHT	BUILDING 'A'	15.0m & 30.0m	32 STOREY'S / 102.0m
	BUILDING 'B'	15.0m & 30.0m	28 STOREY'S / 90.0m
	BUILDING 'C'	15.0m & 30.0m	9 STOREY'S / 30.0m
ALLOWABLE PROJECTION - AMENITY LEVEL		0.0m	250m² / 4.5m
MAIN STREET FRONTAGE GROUND FLOOR HEIGHT		4.5m	4.5m
CARLING AVENUE GROUND FLOOR TRANSPARENT GLAZING FOR 4.5m HT.		50.0%	4.0m
DENSITY - MAXIMUM FLOOR SPACE INDEX (BASED ON 77% CONSTRUCTION AREA)		n.a.	4.35 = 42,747 m²
DENSITY - UNITS PER HECTARE		n.a.	761
TOWER SEPARATION		25.0m	29.4m
TOWER FOOTPRINT - GFA (GUIDELINE ONLY) NOT INCLUDES BALCONIES		750m²	760.0m² / 760.0m²
FRONT YARD SETBACK (MIXED USE BUILDING)		0.0m	7.2m
CORNER YARD SETBACK (MIXED USE BUILDING)		0.0m	3.4m
INTERIOR SIDE YARD SETBACK (0 to 20m FROM STREET)		3.0m	6.4m
INTERIOR SIDE YARD SETBACK (OVER 20m FROM STREET)		7.5m	5.0m
REAR YARD SETBACK (WITHIN 20m ABUTTING A STREET)		3.0m	5.2m
MINIMUM WIDTH OF LANDSCAPE BUFFER @ PARKING LOT		1.5m	1.9m
TOTAL RESIDENTIAL UNIT COUNT:		.	749
PARKING - RESIDENTIAL (AFTER 12 UNITS PER BLDG.) - 0.5 PER UNIT	ZONING AREA Y	357	449
PARKING - VISITOR ONLY (AFTER 12 UNITS PER BLDG.) - 0.1 PER UNIT		68	68
PARKING - COMMERCIAL RESTAURANT - 5.0 PER 100m² GFA	(UNITS OVER 350m² GFA)	0	0
PARKING - COMMERCIAL RETAIL / P.S.B. - 1.25 PER 100m² GFA	(UNITS OVER 500m² GFA)	0	0
BICYCLE PARKING - RESIDENTIAL - 0.5 PER UNIT		375	375
BICYCLE PARKING - COMMERCIAL - 1 PER 250m² GFA		4	12
AISLE & DRIVEWAY MINIMUM / MAXIMUM WIDTH		6.0m / 6.7m	6.0m / 6.7m
AMENITY AREA - TOTAL PER UNIT - 6.0m²		4,494.0m²	4,500m²
AMENITY AREA - 50% COMMUNAL PER UNIT - 3.0m²		2,247.0m²	2,250m²
PARKLAND DEDICATION AREA - 10%	(SITE AREA EXCLUDES LANE LANDS 9,834.7m²)	10% / 983.47m²	10% / 983.8m²

CAR & BICYCLE PARKING

REQUIRED - TOWER 'A' (336 Units)

RESIDENCE	- 0.5 PER DWELLING UNIT	162
VISITOR	- 0.1 PER DWELLING UNIT	30
COMMERCIAL USE	- NOT REQUIRED	0
RESIDENCE: BICYCLE	- 0.5 PER DWELLING UNIT	168
TOTAL VEHICLE		198

PROVIDED - TOWER 'A'

RESIDENCE	- 0.65 PER DWELLING UNIT	220
VISITOR	- 0.09 PER DWELLING UNIT	30
COMMERCIAL USE	-	0
RESIDENCE: BICYCLE	- 0.5 PER DWELLING UNIT	168
TOTAL VEHICLE		250

REQUIRED - TOWER 'B' (291 Units)

RESIDENCE	- 0.5 PER DWELLING UNIT	140
VISITOR	- 0.1 PER DWELLING UNIT	28
COMMERCIAL USE	- NOT REQUIRED	0
RESIDENCE: BICYCLE	- 0.5 PER DWELLING UNIT	146
TOTAL VEHICLE		168

PROVIDED - TOWER 'B'

RESIDENCE	- 0.51 PER DWELLING UNIT	149
VISITOR	- 0.1 PER DWELLING UNIT	28
COMMERCIAL USE	-	0
RESIDENCE: BICYCLE	- 0.5 PER DWELLING UNIT	146
TOTAL VEHICLE		177

REQUIRED - TOWER 'C' (122 Units)

RESIDENCE	- 0.5 PER DWELLING UNIT	55
VISITOR	- 0.1 PER DWELLING UNIT	11
COMMERCIAL USE	- NOT REQUIRED	0
RESIDENCE: BICYCLE	- 0.5 PER DWELLING UNIT	61
TOTAL VEHICLE		66

PROVIDED - TOWER 'C'

RESIDENCE	- 0.78 PER DWELLING UNIT	95
VISITOR	- 0.1 PER DWELLING UNIT	13
COMMERCIAL USE	-	0
RESIDENCE: BICYCLE	- 0.5 PER DWELLING UNIT	61
TOTAL VEHICLE		108

LOCATION

PARKING GARAGE - P1 LEVEL	176
PARKING GARAGE - P2 LEVEL	194
PARKING GARAGE - P2 LEVEL	135
EXTERIOR	30
TOTAL	535

AMENITY SPACE

AT GRADE EXTERIOR - COMMUNAL =	0.0 sq. m.
INTERIOR 1st fl. AMENITY - COMMUNAL =	0.0 sq. m.
EXTERIOR TERRACES - PRIVATE =	0.0 sq. m.
INTERIOR 5th fl. AMENITY - COMMUNAL =	0.0 sq. m.
EXTERIOR 5th fl. TERRACES - COMMUNAL =	0.0 sq. m.
EXTERIOR ROOF TOP - COMMUNAL =	0.0 sq. m.
INTERIOR ROOF TOP - COMMUNAL =	0.0 sq. m.
PRIVATE BALCONIES =	0.0 sq. m.
TOTAL =	4,500 sq. m.
TOTAL COMMUNAL =	2,250 sq. m.
REQUIRED - 6.0M² PER UNIT (749) =	4,494 sq. m.
REQUIRED COMMUNAL @ 50% =	2,247 sq. m.

BUILDING STATISTICS

GROSS BUILDING - AREAS

(CITY OF OTTAWA ZONING AREA)

BUILDING 'A' - 32 Storey's

TOTAL AREA BASED ON 76% OF CONSTRUCTION AREA		18,672.2 sq. m. 200,986 sq. ft.
TOWER FOOTPRINT		760.0 sq. m. 8,180 sq. ft.
UNIT COUNT		336
VEHICLE PARKING	235 (interior) + 15 (surface)	250
BICYCLE PARKING		168
COMMERCIAL AREA		189.3 sq. m. 2,038 sq. ft.

BUILDING 'B' - 28 Storey's

TOTAL BUILDING AREA BASED ON 76% OF CONSTRUCTION AREA		16,856.0 sq. m. 181,436 sq. ft.
TOWER FOOTPRINT		760.0 sq. m. 8,180 sq. ft.
UNIT COUNT		291
VEHICLE PARKING - RESIDENTIAL ONLY	162 (interior) + 15(surface)	177
BICYCLE PARKING		146
COMMERCIAL AREA		176.7 sq. m. 1,902 sq. ft.

BUILDING 'C' - 9 Storey's

TOTAL AREA BASED ON 76% OF CONSTRUCTION AREA		7,219.4 sq. m. 77,709 sq. ft.
UNIT COUNT		122
VEHICLE PARKING - RESIDENTIAL ONLY	108 (interior) + 0(surface)	108
BICYCLE PARKING		68

BUILDING AREA

BASED ON 76% OF CONSTRUCTION AREA

TOWER "A"	18,672.2 sq. m. 200,986 sq. ft.
TOWER "B"	16,856.0 sq. m. 181,436 sq. ft.
TOWER "C"	7,219.4 sq. m. 77,709 sq. ft.
TOTAL AREA ABOVE GRADE	42,747.6 sq. m. 460,131 sq. ft.

UNIT MIX - 749 UNITS

		BLDG - A	BLDG - B	BLDG - C	TOTAL
STUDIO UNIT	6.4%	26	22	0	48
ONE BED UNIT	47.9%	176	149	34	359
ONE BED + DEN UNIT	10.4%	4	13	61	78
TWO BED UNIT	29.1%	107	90	21	218
TWO BED + DEN UNIT	4.3%	19	13	0	32
THREE BED UNIT	0.8%	0	0	6	6
LIVE / WORK UNIT	1.1%	4	4	0	8
TOTAL UNITS	100%	336	291	122	749

LOT COVERAGE

SITE AREA EXCLUDES CLOSED LANES: 725m²

BUILDING FOOTPRINT - "A" =	926.2 m²	9.42%
BUILDING FOOTPRINT - "B" =	1,375.3 m²	13.98%
BUILDING FOOTPRINT - "C" =	1,173.5 m²	11.93%
PARKING GARAGE EXIT STAIR =	19.3 m²	0.20%
DRIVING SURFACE =	1,640.0 m²	16.67%
LANDSCAPE SURFACE =	3,716.9 m²	37.80%
PARKLAND DEDICATION =	983.5 m²	10.00%
TOTAL =	9,834.7 m²	100.00%

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.

DO NOT SCALE DRAWINGS.

NOTATION SYMBOLS:

00	INDICATES DRAWING NOTES, LISTED ON EACH SHEET.
00	INDICATES ASSEMBLIE TYPE; REFER TO TYPICAL ASSEMBLIES SCHEDUAL.
00	INDICATES WINDOW TYPE; REFER TO WINDOW ELEVATIONS AND DETAILS ON A900 SERIES.
000	INDICATES DOOR TYPE; REFER TO DOOR SCHEDULE AND DETAILS ON A900 SERIES.

DETAIL NUMBER

00 TITLE SCALE

A000 A000

DETAIL REFERENCE PAGE

DETAIL CROSS REFERENCE PAGE

No.	DESCRIPTION	DATE
7		
6	ISSUED FOR OWNER / CONSULTANT REVIEW	2025 07 10
5	ISSUED FOR OWNER / CONSULTANT REVIEW	2025 06 19
4	ISSUED FOR OWNER / CONSULTANT REVIEW	2025 05 23
3	ISSUED FOR UDRP	2024 12 16
2	ISSUED FOR DISCUSSION	2024 11 15
1	ISSUED FOR PRE-CONSULTATION	2024 06 04

REVISIONS:

ARCHITECT SEAL:

RODERICK I. LAHEY
LICENCE
4375

SEAL DATE: STAMP DATE

NORTH ARROW:

CLIENT:

THE PROPERTIES GROUP

ARCHITECT:

rla/architecture
roderick lahey architect inc.
56 beech street, ottawa, ontario K1S 3J6
t. 613.724.9932 f. 613.724.1209 rlaarchitecture.ca

PROJECT TITLE:

1746 CARLING AVENUE

OTTAWA ONTARIO

SHEET TITLE:

SITE PLAN

DRAWN: R.V.	CHECKED: R.V.
SCALE: 1:250	SHEET No. SP-1
PROJECT No. 2210	

PAPER SIZE: ISO_B1_(707.00_x_1000.00_MM) | PLOT DATE: Friday, July 11, 2025 | PLOT SCALE: 1:1 | PEN STYLE: 0-RLA-MASTER-100%.ctb | F:\2022\2210 – 1746 Carling_cont1825\01 Design Development\01 Site Plan\2210 SP-1 Site Plan 2025 07 11.dwg

City Plan # ______

D

A.2 Pre-Consultation

File No.: PC2024-0240

July 18, 2024

Thomas Freeman
Fotenn
Via email: freeman@fotenn.com

Subject: **Pre-Consultation: Meeting Feedback**
Proposed Zoning By-law Amendment Application – 1740, 1746, 1754 Carling Avenue, 1755 Kerr Avenue and 828 Boyd Avenue

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on July 2, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	2 ☐	3 ☒	4 ☐	5 ☐

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

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken.

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

3. Please note, if your development proposal changes significantly in scope, design, or density before the next submission, you may be requested to repeat the pre-consultation process before filing an Official application.

Supporting Information and Material Requirements

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

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

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

Consultation with Technical Agencies

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

Proposed Development

- Two high-rise mixed-use buildings fronting onto Carling, with tower heights of 32 and 28 storeys and a 9-storey mid-rise apartment building fronting onto Kerr Avenue. The proposal includes 736 dwelling units across the three buildings, approximately 5% 2 bedroom + den units.
- A 774 square metre park is proposed to be conveyed to the city at the corner of Kerr Avenue and Boyd Avenue

Planning

Comments:

1. Thank you for introducing commercial and active uses along Carling Avenue.

2. The additional land acquired since the previous pre-consultation has provided more space on the site for tower separation and better site layout options.

3. Official Plan Policies

    a. The site is situated in the Inner Urban Transect and designated Mainstreet Corridor (Carling Avenue) and Neighbourhood/Evolving Neighbourhood Overlay (Kerr/Boyd Avenue)

        i. Note that Policy 6.2.1 outlines that the Corridor designation applies to any lot abutting the Corridor to a maximum depth of 220 metres from the centreline of the mainstreet.

            (i) 1755 Kerr Avenue is currently abutting the Corridor via the lane.

            (ii) 828 Boyd Avenue does not currently have frontage on the Corridor. This site is therefore designated Neighbourhood with an Evolving Neighbourhood Overlay.

4. The site is adjacent to industrial uses. Review Ministry of Environment's D-6 Compatibility between Industrial Facilities for direction.

5. Zoning By-law

    a. 1740, 1746, 1754 Carling Avenue and 1755 Kerr Avenue are currently zoned AM10.

    b. 828 Boyd Avenue is currently zoned IG3 H(10.7).

6. Transition to adjacent low-rise neighbourhood designation

    a. Demonstrate appropriate transition to adjacent low-rise built forms to the west and south. See Urban Design Policies in the Official Plan and the *Design Guidelines for High-rise Buildings* for direction.

7. Transition to the park

    a. Please increase the building setback adjacent to the park. Currently, there is no space for tree plantings and pedestrian circulation adjacent to the park. See Urban Design Comments for further direction.

    b. If the building along Kerr remains as a mid-rise built form, please consider introducing a low-rise stepback adjacent to the park.

8. Please provide a safe and continuous pedestrian route through the site. Replace some surface parking with an accessible pathway. Consider adding trees between the pedestrian route and the parking area. See markup drawing.

9. Please show the extent of the underground parking on the site plan.

10. Reduce the amount of surface parking. Please consider removing the parking spaces nearest to Carling Avenue and explore using the space for a POPs, patio space or amenity spaces for residents and visitors.

11. Where possible, reduce the number of loading spaces, and accesses to the underground parking garage.

12. Westerly interior side yard setback/stepbacks

    a. Please show the setback dimension on the plan.

    b. Please show the tower setback dimension on the plan.

13. Design Guidelines

    a. Review Urban Design Guidelines for High-rise Buildings

    b. Review Urban Design Guidelines for Development along Arterial Mainstreets

14. Section 37 requirements / Community Benefits Charge

    a. The former Section 37 regime has been replaced with a “Community Benefits Charge”, By-law No. 2022-307, of 4% of the land value. This charge will be required for ALL buildings that are 5 or more storeys and 10 or more units and will be required at the time of building permit unless the development is subject to an existing registered Section 37 agreement. Questions regarding this change can be directed to Ranbir.Singh@ottawa.ca.

15. Planning submission requirements:

    a. Planning Rationale

    b. Building elevations

    c. Plan of Survey

    d. Wind Analysis

    e. Shadow Analysis

    f. Zoning Confirmation Report

    g. Public Consultation Stategy

Urban Design

Comments:

16. An Urban Design Brief is required for this application. Further details can be found here Urban Design Brief (ottawa.ca)

17. The concept plan is moving in the right direction and happy to see that additional lots have been consolidated, this gives more breathing room throughout the site.

18. Please consider moving the access on Carling to the far west side of the site. Between Tower A and B, consolidate ramps to one and locate within the building. You could then consider wrapping your commercial patio on the left side of Tower B with a possible POPs in the space between Tower A and B, while also still having some surface parking in the centre in addition to possible parallel stalls down the drive to the left. See image below.

19. Consider having Tower B in a more 'L' shape form to better address Carling and give more circulation room within the site.

20. Tower A should be sculpted more so that the building isn't coming straight down to the ground plane without additional stepbacks. Please consider shifting the angle of the building at the corner so that it is more open for movement at the ground plane for pedestrians and give the building a better presence.

21. Please examine both tower A and B articulation with Carling to build a better relationship with the street. The proposed commercial uses at grade are

supported but consider if the two buildings will have different building articulation and materiality to provide variety within the site/block.

22. The interior side yard setback on the west side is not labeled, please have a minimum of 11.5m. Please ensure all towers have 11.5m from any lot line. Guidelines for tower separation are 23m at minimum and 25m for towers over 30 storeys.

23. If there is an opportunity to, please pull the underground parking garage back so that there is capacity for tree planting within the site. There appears to be opportunities on the west side.

24. Please provide more details on the interface between the 9-storey building and the park. A 3m setback is recommended.

25. Pedestrian circulation through the site should have clearly delineated routes connecting Kerr to Carling, near the park would be one suggestion. Or a mid-block connection running along the west property line.

Phase 1 Comments:

26. The site is within a Design Priority Area and the proposal is subject to review by the City's Urban Design Review Panel prior to the application being deemed complete. Please contact udrp@ottawa.ca for details on submission requirements and scheduling. A report outlining the responses to the Panel's comments (Urban Design Review Panel Report) is required for a complete application.

27. While the Official Plan does support taller buildings along Carling, the proposal does need to conform to policies requiring transition and setbacks. Policies in Section 4.6 Urban Design mention specific design criteria to permit high-rise development.

28. A floorplate size of no larger than 750 m2 is encouraged.

29. Please spend some additional time working on the articulation and massing of the podium and tower so that it's not an overwhelming scale for the site. The corner at Carling should be better addressed.

30. When preparing the landscape plan, review the sun shadow study when deciding where landscape and trees will be planted. For trees and landscaping to be successful, they shouldn't be fully shadowed. As many large tree plantings as possible are always strongly encouraged and sufficient soil volume will need to be demonstrated.

Feel free to contact Molly Smith, Urban Design, for follow-up questions.

Engineering

Comments:

31. Water Service

    a. The water boundary conditions should be requested to confirm the available pressure. The surrounding infrastrcture may have a low pressure.

    Water Boundary Conditions:

        i. Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:

        ii. Location of service(s)

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

        iv. Average daily demand: ___ L/s

        v. Maximum daily demand: ___ L/s

        vi. Maximum hourly daily demand: ___ L/sFire protection (Fire demand, Hydrant Locations)

    b. A Form 1 is required if the the muncipal owned watermain will be upsized

    c. Ensure adequate hydrant coverage for the all buildings and identify fire lanes. Fire routes located above the underground structure should be coordinated with fire services and building code services.

    d. Service areas with a basic demand greater than 50 m3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid creation of vulnerable service area.

    e. A District Metering Area Chamber (DMA) is required for services 150mm or greater in diameter.

    f. The existing water services must be blanked at the main.

32. Sanitary Service

    a. The fronting sanitary sewer systems are near maximum capacity. The applicant should confirm the sanitary sewer demands with the City to ensure adequate capacity.

b. A monitoring miantenace hole is required at the property line.

33. Storm Service

    a. Ensure that the proposed drive ramp entrance to the underground parking garage is protected from the major overland flow route.

        i. A minimum freeboard elevation of 350mm from highpoint of the ramp to the street spill elevation.

        ii. A minimum freeboard elevation of 300mm from the invert of the ramp drain to the 100 year HGL of the storm sewer.

        iii. In general conformity of City of Ottawa Standard S17.

34. Stormwater Management

    a. Quality Control:

        i. Enhanced 80% TSS removal

    b. Quantity Control:

        i. Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min

        ii. Maximum allowable run-off coefficient C = 0.5

        iii. Maximum allowable flowrate: Control the 100-year storm events to the 2-year storm event.

35. Neighborhood Construction

    a. Road Resurfacing on Kerr Ave with a target start 2-3 years.

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

Noise

Comments:

36. Noise study required.

Feel free to contact Mike Giampa, TPM, for follow-up questions.

Transportation

Comments:

37. Right-of-way protection (Carling Avenue).

    a. See Schedule C16 of the Official Plan.

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

38. Corner Triangles (new):

    The new required corner triangle dimensions will be embedded within Schedule C16 of the OP in 2024. Here are the current requirements at all intersection types:

    Arterial/Arterial: overlapping 5m x 15m triangles
    Arterial/Collector: overlapping 5m x 15m triangles
    Collector/Collector: overlapping 5m x 15m triangles
    Arterial/Local: 3m x 9m with the longer dimension along the arterial road
    Collector/Local: 3m x 9m with the longer dimension along the collector road
    Local/Local: 3m x 3m
    Lane/Local: 3m x 3m

    Any exceptions to the above must be approved by Transportation Planning – specifically Max Walker from Transportation Policy & Networks.

39. A TIA is warranted- proceed to scoping (step 2). Required modules can be adjusted as required. The application will not be deemed complete until the submission of the draft step 2-3. Although a full review of the TIA Strategy report (Step 3) is not required prior to application, it is strongly recommended. Synchro files are required at Step 3.

40. Ensure that the clear throat requirements meet TAC guidelines (applies to arterial and collectors only).

41. A right-turn lane into the Carling Avenue access may be required and should be reviewed in the TIA.

Feel free to contact Mike Giampa, Transportation Project Manager, for follow-up questions.

Environment

Comments:

42. No natural features present to trigger an environmental impact study.

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

44. Urban Heat Island - Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building with low heat absorbing materials.

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

Forestry

Comments:

45. The arrangement of the site with the new design appears to increase the setbacks between the buildings and shared property lines except for the proposed underground parking, which is proposed up to all property lines. It is a strong priority to reduce the amount of parking and pull the underground parking away from the shared property lines to allow for tree retention and planting.

46. Please include in the TCR for the site, consideration of tree impacts if the access road from Carling is shifted to the west of 1754 Carling.

    Comments from the previous phase 2 review still apply:

47. Section 4.8.2 of the New Official Plan provides strong direction to maintain the urban forest canopy and its ecosystem services during intensification noting when considering the impacts on individual trees, planning and development decisions, including Committee of Adjustment decisions, shall give priority to the retention and protection of large, healthy trees over replacement plantings and compensation. Applications must address the cumulative impacts on the urban forest, over time and space, with the goal of 40% urban forest canopy cover in mind. Further, that the City and the Committee of Adjustment may refuse a development application where it deems the loss of a tree(s) avoidable.

48. A Tree Conservation Report is required with this application in accordance with Schedule E of the Tree Protection By-law.

    a. The extent of proposed underground parking and construction shoring must be included in the TCR, with the setbacks from property lines sufficient to retain adjacent and jointly-owned trees, including City trees and to plant new trees which will survive long-term without disturbance from maintenance of underground parking. These setbacks must be set through zoning.

    b. Please note that a permit cannot be issued for removal of trees on shared or adjacent properties without permission of all owners.

    c. The proposed parkland at the corner of Kerr and Boyd is an ideal location to plant large-growing trees toward the goal of 40% canopy cover.

    d. Please confirm whether the overhead hydro along Boyd and Kerr will be buried through this development.

49. A Landscape Plan is required with this application, in accordance with the Landscape Plan Terms of Reference, to show available softscape areas for tree planting, meeting the soil volume recommendations listed in the Tree Planting Requirements list provided with the PC1 comments.

50. The Official Plan requires that "On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect;"

    a. Soft-scaped areas need to be created on site and within the Right of Way to provide adequate space to plant large-growing trees. See image below.

    b. Please confirm that the proposed lot layout and setbacks account for the future road widening, to ensure that any trees planted along the Carling frontage will remain long-term.

    c. Planting in the ROWs must not be impeded by the proximity of underground parking, allowing for long-term survival of new trees.

    d. The Carling ROW does not have overhead wires, and is a high priority for planting large-growing trees to improve the canopy cover and streetscape of the site. Frontages with hydro above will be limited to small-growing trees unless opportunities are explored to bury the hydro.

    e. Trees are shown throughout the site on the concept plan, but most would be above the underground parking. The Landscape Plan must include

confirmation of sufficient soil volumes in all proposed planting locations, particularly those above the parking structure.

f. The Landscape Plan must include street trees along Kerr frontage to improve the streetscape and canopy cover in this location.

51. A permit is required prior to any tree removal on site. The tree permit will be released upon site plan approval. Please contact the planner associated with the file or the Planning Forester, Nancy Young (Nancy.young@ottawa.ca) for information on obtaining the tree permit.

52. To ensure that no harm is caused to breeding birds, tree removal and vegetation clearing should be avoided during the migratory bird season (April 15 – August 15) as specified by The City of Ottawa's Environmental Impact Study Guidelines.

Feel free to contact Nancy Young, Forester, for follow-up questions.

Parkland

Comments:

53. **Parkland Dedication Calculation:**

a. Parkland Dedication will apply to this application, at the rate specified in the Parkland Dedication By-law No. 2022-280 (as amended):

i. For residential uses > 18 units per net hectare, the requirement is an area equal to the lesser of:

one hectare per 600 net residential units; or 10% of the gross land area.

ii. For commercial and industrial uses, the requirement is: 2% of the gross land area.

iii. Where land is developed for a mix of uses within a building, the conveyance requirement shall be as calculated using the applicable rates above, prorated according to the proportion of gross floor area allocated to each use.

b. The property is identified as being 10,560m2 in area, and therefore the preliminary parkland conveyance calculation indicates a requirement of approximately **1,041 m2** (prorated for commercial/residential split).

c. PFP requests a surveyor's note (or equivalent) specifying the gross land area of the property with your application, to confirm land area for the purpose of finalizing the parkland dedication calculation.

d. Please note that the parkland dedication calculation provided is preliminary and is subject to change upon receipt of the development application and supporting documentation. The parkland dedication requirement will also be re-evaluated should any of the details of the proposal be modified.

54. **Type of Dedication:**

a. In accordance with the City's Land First Policies under Section 4.4.1 of the Official Plan, PFP will be requesting land conveyance for the entirety (1,041m2) of the required parkland dedication for this project. The proposed park block is to provide the full required parkland conveyance.

b. The park must be free of servicing lines, easements and other encumbrances.

c. A sidewalk and tree planting is to be provided along all park street frontages.

d. A 1.5m high chain link fence is to be provided where abutting private property lines.

e. The park block conveyance will be required in a 'clean and green' state. Further details will be provided at time of SPC application, and will include for example:

i. Removal of all debris, contaminated soils, vegetation;

ii. Providing a level grade to the surrounding area, ensuring positive surface drainage throughout the park block;

iii. Providing services to at least 2m inside the park block property line;

iv. Supplying and installing 150mm of topsoil and seed or sod to City standards;

55. Shape & Location of Required Park Block:

a. The park block, as proposed, is in a good location with about 50% street frontage, and is a useable shape, however staff note that the size of the park block will need to be increased to meet the requirement based on the calculations above.

b. The proposed park block is too close to the adjacent parking garage. PFP requests a minimum 3m setback from the neighbouring building and parking garage.

Feel free to contact Marika Atfield, Parks Planner, for follow-up questions.

Other

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

    a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. Please be advised that this is expected to occur in Q3 2024.

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

Submission Requirements and Fees

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

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

Yours Truly,

Kimberley Baldwin

Encl. Study and Plan Identification List

c.c. Kieran Watson, File Support
Rubina Rasool, Project Manager (lead)
Ryan Brault, Project Manager (support)
Mike Giampa, Transportation Project Manager

Molly Smith, Urban Design
Parks and Facilities Planning, Marika Atfield
Parks and Facilities Planning, Louise Cerveny
Nancy Young, Forester

List of Technical Agencies to Consult

Proposed Zoning By-law Amendment and Site Plan Control Applications – 1740, 1746 and 1754 Carling Avenue and 828 Boyd Avenue – PC2024-0240

☒	Zayo	Utility.Circulations@Zayo.com
☒	Bell Canada	circulations@wsp.com
☒	Telus Communications	Engineering.Requests@telus.com / jovica.stojanovski@telus.com
☒	Rogers Communications	OPE.Ottawa@rci.rogers.com
☒	Enbridge Gas Distribution	municipalplanning@enbridge.com
☒	O.C. District School Board	planningcirculations@ocdsb.ca
☒	O.C. Catholic School Board	planningcirculations@ocsb.ca
☒	Conseil des écoles publiques	planification@cepeo.on.ca
☒	Conseil des écoles catholiques du Centre-Est	planification@ecolecatholique.ca
☐	Hydro Ottawa (Local Distribution)	Choose an item
☐	Hydro One Networks (Transmission)	landuseplanning@hydroone.com
☐	Ontario Power Generation	Executivevp.lawanddevelopment@opg.com
☐	Trans Canada Pipeline c/o Lehman & Associates	dpresley@mhbcplan.com
☐	Trans Northern Pipeline Inc.	wwatt@tnpi.com
☐	Railways	Choose an item
☐	National Capital Commission	Ted.Horton@ncc-ccn.ca
☐	Parks Canada	Tom.Green@pc.gc.ca
☐	Airport Authority	Choose an item
☐	Transport Canada	aviation.ont@tc.gc.ca
☐	Ministry of Transportation	Via MTO's online portal. Note that MTO approval will be required ahead of applying for a building permit.
☐	Infrastructure Ontario	NoticeReview@infrastructureontario.ca
☐	Propane Operator	Mailing Addresses Only
☐	NAV Canada	landuse@navcanada.ca
☐	Conservation Authority	Choose an item

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Proposed Zoning By-law Amendment Application – 1740, 1746 and 1754 Carling Avenue and 828 Boyd Avenue – PC2024-0240

Legend: **R** = Required, the study or plan is required with application submission
A = Advised, the study or plan is advised to evaluate the application or satisfy a condition of approval/draft approval
1 - OPA, **2** - ZBA, **3** - Plan of Subdivision, **4** - Plan of Condominium, **5** - SPC

Core studies required for certain applications all the time (Remaining studies are site specific)

For information and guidance on preparing required studies and plans refer here:

ENGINEERING										
R	**A**	**Study/ Plan Name**	**Description**	**When Required**					**Applicable Study Components & Other Comments**
				1	**2**	**3**	**4**	**5**	
☒	☐	1. Environmental Site Assessment (Phase 1 & Phase 2)	Ensures development only takes place on sites where the environmental conditions are suitable for the proposed use	☒	☒	☒	☒	☒	Record of Site Condition Yes ☐ No ☐
				Study Trigger Details: All cases					
☒	☐	2. Geotechnical Study	Geotechnical design requirements for the subsurface conditions	☒	☒	☒	☒	☒	
				Study Trigger Details: All cases					
☒	☐	3. Grading and Drainage Plan	Grading relationships between connecting (or abutting) properties and surface runoff control	☐	☐	☒	☐	☒	
				Study Trigger Details: All cases					
☐	☐	4. Hydrogeological and Terrain Analysis	A scientific study or evaluation that includes a description of the ground and surface hydrology, geology, terrain, affected landform and its susceptibility	☐	☐	☒	☒	☒	Reasonable Use Study Yes ☐ No ☐ Groundwater Impact Study Yes ☐ No ☐
				Study Trigger Details: When developing on private services or when urban development is in close proximity to existing private serviced development					
☒	☐	5. Noise Control Study	Potential impacts of noise on a development	☒	☒	☒	☒	☒	Vibration Study Yes ☐ No ☐
				Study Trigger Details: See Terms of Reference for full details.					

☐	☐	6. Rail Proximity Study	Development on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan, to follow rail safety and risk mitigation best practices	☐	☒	☒	☒	☒ Study Trigger Details: Within the Development Zone of Influence for existing and future rapid transit stations and corridors, as shown on Annex 2 of the OP OR on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan	Rail Safety Report Yes ☐ No ☐ O-Train Network Proximity Study Yes ☐ No ☐
☒	☐	7. Site Servicing Study	Provides servicing details based on proposed scale of development with an engineering overview taking into consideration surrounding developments and connections.	☐	☒	☒	☒	☒ Study Trigger Details: All cases	Fluvial Geomorphological Report Yes ☐ No ☐ Assessment of Adequacy of Public Services Yes ☒ No ☐ Servicing Options Report Yes ☒ No ☐ Erosion and Sediment Control Plan / Brief Yes ☒ No ☐ Hydraulic Water Main Analysis Yes ☒ No ☐ Stormwater Management Report and Detailed Design Brief Yes ☒ No ☐
☐	☐	8. Slope Stability Study	Assessment of slope stability and measures to provide safe set-back.	☐	☒	☒	☒	☒ Study Trigger Details: Where the potential for Hazard Lands exists on a site.	Retrogressive Landslide Analysis Yes ☐ No ☐
☒	☐	9. Transportation Impact Assessment	Identify on and off-site measures to align a development with City transportation objectives.	☐	☒	☒	☒	☒ Study Trigger Details: If the development generates 60 person-trips or more; or if the development is located in a Location Trigger; or if the development has a Safety Trigger.	Roadway Modification Functional Design Yes ☐ No ☐

☐	☐	10. Water Budget Assessment	Identify impact of land use changes on the hydrologic cycle and post-development mitigation targets.	☐	☒	☒	☒	☒	
				Study Trigger Details: May be required for site plan control applications for sites with private servicing and / or proximity to hydrogeologically-sensitive areas. Draft plans of subdivision are required to integrate water budget assessments into supporting stormwater management plans and analysis for the study area.					
☐	☐	11. Wellhead Protection Study	Delineate a Wellhead Protection Area (WHPA) and characterize vulnerability for new communal residential drinking water well systems, in accordance with Technical Rules under *Clean Water Act*.	☐	☒	☒	☒	☒	
				Study Trigger Details: Required for all new communal residential drinking water well systems; including new municipal wells, new private communal wells (small water works) that require a Municipal Responsibility Agreement (MRA), expansions or increased water takings from an existing municipal well or existing private communal well and new private communal wells.					

PLANNING									
R	**A**	**Study/Plan Name**	**Description**	**When Required**					**Applicable Study Components & Other Comments**
				1	**2**	**3**	**4**	**5**	
☐	☐	12. Agrology and Soil Capability Study	Confirm or recommend alterations to mapping of agricultural lands in the City.	☒	☐	☐	☐	☐	
				Study Trigger Details: For the expansion of a settlement area or identification of a new settlement area through a comprehensive review; or where it is demonstrated that the land does not meet the requirements for an Agricultural Resource Area.					
☐	☐	13. Archaeological Assessment	Discover any archaeological resources on site, evaluate cultural heritage value and conservation strategies	☒	☒	☒	☒	☒	
				Study Trigger Details: When the land has either: a known archaeological site; or the potential to have archaeological sites; or where the City's Archaeological Resource Potential Mapping Study indicates archaeological potential, outside of the historic core; or upon discovery of any archaeological resource during construction in the City's historic core area.					
☒	☐	14. Building Elevations	Visual of proposed development to understand facing of building including direction of sunlight, height, doors, and windows.	☒	☒	☐	☐	☒	
				Study Trigger Details: Site Plan: for residential buildings with 25 or more residential units; or for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area. Official Plan or Zoning By-law: if staff deem it necessary to determine compliance with OP policies, the Zoning By-law or City of Ottawa Urban Design Guidelines.					

☐	☐	15. Heritage Impact Assessment	Determine impacts of proposed development on cultural heritage resources.	☒	☒	☒	☒	☒	Study Trigger Details: Where development or an application under the Ontario Heritage Act is proposed on, adjacent to, across the street from or within 30 metres of a protected heritage property; or for any development adjacent to the Rideau Canal UNESCO World Heritage Site and its landscaped buffer.	Conservation Plan Yes ☐ No ☐
☐	☐	16. Heritage Act Acknowledgement Report	A submission requirement to demonstrate that the *Ontario Heritage Act* requirements have been satisfied, to ensure that multiple applications are considered currently.	☐	☒	☒	☒	☒	Study Trigger Details: Where the subject property is listed on the Heritage Register and the applicant must submit a Heritage Permit Application (designated heritage property listed on the Heritage Register) or provide notice of intent to demolish or remove a building (non-designated property listed on the Heritage Register).	Heritage Permit Application Yes ☐ No ☐ Notice of Intent to Demolish Yes ☐ No ☐
☐	☐	17. Impact Assessment Study – Mineral Aggregate	Mineral aggregate extraction activities; and to protect known high quality mineral aggregate resources from development and activities that would preclude or hinder their existence (ability to be extracted) or expansion.	☒	☒	☒	☒	☒	Study Trigger Details: New Development within 500 metres of lands within the Bedrock Overlay , or within 300 metres of lands within the Sand and Gravel Resource Area Overlay.	
☐	☐	18. Impact Assessment Study – Mining Hazards	To identify or confirm known mineral deposits or petroleum resources and significant areas of mineral potential. To protect mineral and petroleum resources from development and activities which would preclude or hinder the establishment of new operations or access to the resources.	☒	☒	☒	☒	☒	Study Trigger Details: For all applications in proximity to mining operations.	

☐	☐	19. Impact Assessment Study – Waste Disposal Sites / Former Landfill Sites	To identify or confirm known proximity of existing or former waste disposal sites. To ensure issues of public health, public safety and environmental impact are addressed.	☒	☒	☒	☒	☒	
				Study Trigger Details: For the establishment of any new Solid Waste Disposal Site or for a footprint expansion of an operating Solid Waste Disposal Site; or development within three kilometers of an operating or non-operating Waste Disposal Site.					
☒	☐	20. Landscape Plan	A plan to demonstrate how the canopy cover, urban design, health, and climate change objectives of Official Plan will be met through tree planting and other site design elements.	☒	☒	☒	☒	☒	
				Study Trigger Details: Site Plan, Plan of Subdivision, and Plan of Condominium: always required, except where it is demonstrated that the landscape component of a project is not relevant to the review of the application. A high-level conceptual Landscape Plan may be required to support Zoning By-law and Official Plan Amendment applications.					
☐	☐	21. Mature Neighbourhood Streetscape Character Analysis	In the Mature Neighbourhoods a Streetscape Character Analysis is required to determine the applicable zoning requirements.	☐	☒	☐	☐	☐	
				Study Trigger Details: Zoning By-law amendment application in areas covered by the Mature Neighbourhoods zoning overlay for applications of residential development of four storeys or less located in a R1, R2, R3, or R4 zone.					
☐	☐	22. Minimum Distance Separation	Provincial land use planning tool that determines setback distances between livestock barns, manure storages or anaerobic digesters and surrounding land uses, with the objective of minimizing land use conflicts and nuisance complaints related to odour.	☒	☒	☒	☒	☒	
				Study Trigger Details: Applications in the Rural Area, outside of a village.					

☐	☐	23. Parking Plan	A tool to assess the sufficiency of on-street parking in plans of subdivision.	☐	☐	☒	☒	☐	
				Study Trigger Details: For new or revised plans of subdivision with public streets.					
☒	☐	24. Plan of Survey	A Plan of Survey depicts legal boundaries and is a specialized map of a parcel of land and it delineates boundary locations, building locations, physical features and other items of spatial importance.	☒	☒	☒	☒	☒	
				Study Trigger Details: Required for all *Planning Act* applications.					
☐	☐	25. Plan of Subdivision	Proposed subdivision layout to be used for application approval	☐	☒	☒	☐	☐	
				Study Trigger Details: Always required with the submission of plan of subdivision application. Only required with a Zoning By-law Amendment application, where such ZBLA is in response to enable a subdivision.					
☐	☐	26. Plan of Condominium	Proposed condominium layout to be used for application approval	☐	☐	☐	☒	☐	
				Study Trigger Details: With the submission of plan of condominium application.					
☒	☐	27. Planning Rationale	Provides the planning justification in support of the *Planning Act* application and to assist staff and the public in the review of the proposal.	☒	☒	☒	☐	☐	Integrated Environmental Review Summary Yes ☐ No ☐
				Study Trigger Details: For all Official Plan amendment, Zoning By-law amendment, or plan of subdivision applications.					
☒	☐	28. Preliminary Construction Management Plan	A checklist that shows a development proposal's anticipated impacts to all modes of transportation and all elements in the right of way during construction.	☐	☐	☒	☐	☒	
				Study Trigger Details: For all Site Plan and plan of subdivision applications.					

☒	☐	29. Public Consultation Strategy	Proposal to reach and collect public input as part of development application.	☒	☒	☒	☒	☒	Study Trigger Details: Official Plan Amendment, Zoning By-law Amendment and Subdivision: Always required. Condominium: Vacant Land only Site Plan: At the discretion of the City's file lead in consultation with the Business and Technical Support Services Manager.	
☒	☐	30. Shadow Analysis	A visual model of how the proposed development will cast its shadow.	☐	☒	☐	☐	☐	Study Trigger Details: When there is an increase in height or massing proposed for a residential, commercial or office use. Two triggers: 1. Inside the Greenbelt: proposed development is over 5 storeys in height (≤15 meters). If a development proposal is 5 storeys or less, but is proposing an increase in height and/or massing and is in close proximity to a shadow sensitive area, a shadow analysis may be requested. 2. Outside the Greenbelt: proposed development is over 3 storeys in height (≤9 meters) and is in close proximity to a shadow sensitive area. Where a proposed development is not in close proximity to a shadow sensitive area (e.g. industrial development) the trigger for a shadow analysis is over 5 storeys in height (≤15 meters).	
☒	☐	31. Site Plan	A Site Plan is a visual drawing that illustrates the proposed development of a site in two dimensions.	☒	☒	☒	☒	☒	Study Trigger Details: Site Plan: All Other applications: where a layout of the	Site Plan Yes ☐ No ☐ Concept Plan Yes ☐ No ☐

				public realm, building massing, heights, densities or massing of the proposal provides changes to the planned context; sites proposing multiple land uses; sites with multiple landowners; sites with two or more buildings, on-site park dedication, and/or a new public or private street(s); sites with proposed changes to connectivity (such as active transportation networks, vehicular circulation or access to transit); sites where the development potential on adjacent properties may be impacted by or could be integrated into the proposed site.	Facility Fit Plan Yes ☐ No ☐
☒	☐	32. Urban Design Brief	Illustrate how a development proposal represents high-quality and context sensitive design that implements policies of the Official Plan, relevant secondary plans, and Council approved plans and guidelines.	☒ ☒ ☒ ☐ ☒ Study Trigger Details: For all Official Plan amendment, Zoning By-law amendment, and plan of subdivision applications. For SPC applications: proposals for residential buildings with 25 or more residential units, or for proposals for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area where OP Policy 11.3 (3) is relevant; for non-residential and mixed-use proposals.	
☒	☐	33. Urban Design Review Panel Report	Demonstrates that a development proposal has attended an Urban Design Review Panel formal review meeting, received, and responded to the associated recommendations, if applicable	☒ ☒ ☒ ☒ ☒ Study Trigger Details: Required for all planning act applications subject to UDRP review, in accordance with the UDRP Panel Terms of Reference.	
☒	☐	34. Wind Analysis	A visual model and a written evaluation of how a proposed development will impact pedestrian-level wind conditions.	☐ ☒ ☐ ☐ ☒ Study Trigger Details: Applications seeking an increase in height and/or massing which is either: a tall building(s), 10 storeys or more or a proposed building that is more than twice the height of	

				adjacent existing buildings and is greater than five storeys in height and is adjacent to existing or planned low rise development, open spaces, water bodies and large public amenity areas.						
☒	☐	35. Zoning Confirmation Report	The purpose of the Zoning Confirmation Report (ZCR) is to identify all zoning compliance issues, if any, at the outset of a planning application.	☐	☒	☐	☐	☒	Study Trigger Details: Required for all SPC and ZBLA applications.	

ENVIRONMENTAL										
R	**A**	**Study / Plan Name**	**Description**	**When Required**					**Applicable Study Components & Other Comments**
				1	**2**	**3**	**4**	**5**	
☐	☐	36. Community Energy Plan	Includes a community energy analysis, alongside mitigation measures, and other associated information. The community energy analysis refers to the overall assessment process to identify on and off-site measures to align the design of the development with City climate objectives.	☐	☐	☐	☐	☐		
				NOT IMPLEMENTED & NOT REQUIRED						
☐	☐	37. Energy Modelling Report	The Energy Modeling Report is a Site Plan Control application submission requirement to show how climate change mitigation, and energy objectives will be met through exterior building design elements.	☐	☐	☐	☐	☐		
				NOT IMPLEMENTED & NOT REQUIRED						
☐	☐	38. Environmental Impact Study	Assessment of environmental impacts of a project and documents the existing natural features, identifies the potential environmental impacts,	☒	☒	☒	☐	☒	Assessment of Landform Features Yes ☐ No ☐ Integrated Environmental Review Yes ☐ No ☐	
				Study Trigger Details: Is required when development or site alteration is proposed in or within a						

			recommends ways to avoid and reduce the negative impacts, and proposes ways to enhance natural features and functions.	specified distance of environmentally designated lands, natural heritage features, the City's Natural Heritage System, or hazardous forest types for wildland fire. The EIS Decision Tool (Appendix 2 of the Environmental Impact Study Guidelines) provides a checklist of the natural heritage features and adjacent areas within which an EIS is required to support development applications under the *Planning Act.*	Protocol for Wildlife Protection during Construction Yes ☐ No ☐ Significant Woodlands Guidelines for Identification, Evaluation, and Impact Assessment Yes ☐ No ☐
☐	☐	39. Environmental Management Plan	A comprehensive environmental planning document that identifies, evaluates, and mitigates the potential impacts of proposed development on the natural environment and its ecological functions at local planning stage.	☒ ☐ ☐ ☐ ☐ Study Trigger Details: Official Plan amendments for local plans (area-specific policy or secondary plan, where: there is significant change in the conditions upon which the original study was based; there are proposed changes to planned infrastructure needed to service a subdivision that would have a significant impact on the infrastructure needs of another subdivision within the EMP study area, or the applicable Class Environmental Assessment approval has expired.	
☐	☐	40. High-performance Development Standard	A collection of voluntary and required standards that raise performance of new building projects to achieve sustainable and resilient design	☐ ☐ ☐ ☐ ☐ NOT IMPLEMENTED & NOT REQUIRED	
☒	☐	41. Tree Conservation Report	Demonstrates how tree cover will be retained and protected on the site, including mature trees, stands of trees, and hedgerows.	☐ ☐ ☒ ☒ ☒ Study Trigger Details: Where there is a tree of 10 centimeters in diameter or greater on the site and/or if there is a tree on an adjacent site that has a Critical Root Zone (CRZ) extending onto the development site.	

Appendix B Water Servicing

B.1 Domestic Water Demands

1746 Carling Avenue, Ottawa, ON - Domestic Water Demand Estimates

Site Plan provided by RLA Architecture. (2025-07-07)

Project No. 160401895 Designed by: AR

Revision: 02 Revised by:

Date: 7-Jul-2025 Checked by: MW

Date Checked: 15-Jul-2025

City File No. PC2024-0240

Population densities per Table 4.1 City of Ottawa Water Distribution Guidelines:		
Studio/1 Bedroom	1.4	ppu
2 Bedroom	2.1	ppu
3 Bedroom	3.1	ppu
Demand conversion factors per Table 4.2 of the City of Ottawa Water Design Guidelines and Technical Bulletin ISTB-2021-03:		
Residential	280	L/cap/day
Commercial	28000	L/gross ha/day

Unit Type	Gross Commercial Area (m²)	No. of Units	Population	Avg Day Demand		Max Day Demand [1,2]		Peak Hour Demand [1,2]	
				(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Residential									
Building A									
Studio		26	36	7.1	0.1	17.7	0.3	38.9	0.6
1 Bedroom		176	246	47.9	0.8	119.8	2.0	263.5	4.4
1 Bedroom + Den[3]		4	8	1.6	0.0	4.1	0.1	9.0	0.1
2 Bedroom		107	225	43.7	0.7	109.2	1.8	240.3	4.0
2 Bedroom + Den[4]		19	59	11.5	0.2	28.6	0.5	63.0	1.0
3 Bedroom		0	0	0.0	0.0	0.0	0.0	0.0	0.0
Commercial	3488.7		575	6.8	0.11	10.2	0.17	18.3	0.31
Building B									
Studio		22	31	6.0	0.1	15.0	0.2	32.9	0.5
1 Bedroom		149	209	40.6	0.7	101.4	1.7	223.1	3.7
1 Bedroom + Den[3]		13	27	5.3	0.1	13.3	0.2	29.2	0.5
2 Bedroom		90	189	36.8	0.6	91.9	1.5	202.1	3.4
2 Bedroom + Den[4]		13	40	7.8	0.1	19.6	0.3	43.1	0.7
3 Bedroom		0	0	0.0	0.0	0.0	0.0	0.0	0.0
Commercial	1852.0		496	3.6	0.06	5.4	0.09	9.7	0.16
Total Phases 2-3 (Buildings A and B)	**5341**	**619**	**1071**	**218.6**	**3.6**	**536.1**	**8.9**	**1173.2**	**19.6**

Notes:

1 The City of Ottawa water demand criteria used to estimate peak demand rates for residential areas are as follows:
maximum day demand rate = 2.5 x average day demand rate
peak hour demand rate = 2.2 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

2 Water demand criteria used to estimate peak demand rates for gross commercial area are as follows:
maximum daily demand rate = 1.5 x average day demand rate
peak hour demand rate = 1.8 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

3 Assumption that "1 bedroom with den" has density of 2.1 ppu.

4 Assumption that "2 bedroom with den" has density of 3.1 ppu.

1746 Carling Avenue, Ottawa, ON - Domestic Water Demand Estimates

Site Plan provided by RLA Architecture. (2025-07-07)

Project No. 160401895 Designed by: AR

Revision: 02 Revised by:

Date: 7-Jul-2025 Checked by: MW

Date Checked: 15-Jul-2025

City File No. PC2024-0240

Population densities per Table 4.1 City of Ottawa Water Distribution Guidelines:		
Studio/1 Bedroom	1.4	ppu
2 Bedroom	2.1	ppu
3 Bedroom	3.1	ppu
Demand conversion factors per Table 4.2 of the City of Ottawa Water Design Guidelines and Technical Bulletin ISTB-2021-03:		
Residential	280	L/cap/day
Commercial	28000	L/gross ha/day

Unit Type	Commercial (m^2)	No. of Units	Population	Avg Day Demand		Max Day Demand [1 2]		Peak Hour Demand [1 2]	
				(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Residential									
Building C									
1 Bedroom		34	48	9.3	0.2	23.1	0.4	50.9	0.8
1 Bedroom + Den[3]		61	128	24.9	0.4	62.3	1.0	137.0	2.3
2 Bedroom		21	44	8.6	0.1	21.4	0.4	47.2	0.8
3 Bedroom		6	19	3.6	0.1	9.0	0.2	19.9	0.3
Total Phase 1 (Building C)		**116**	**238**	**42.7**	**0.7**	**106.8**	**1.8**	**235.1**	**3.9**

Notes:

1 The City of Ottawa water demand criteria used to estimate peak demand rates for residential areas are as follows:
maximum day demand rate = 2.5 x average day demand rate
peak hour demand rate = 2.2 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

2 Water demand criteria used to estimate peak demand rates for gross commercial area are as follows:
maximum daily demand rate = 1.5 x average day demand rate
peak hour demand rate = 1.8 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

3 Assumption that "1 bedroom with den" has density of 2.1 ppu.

B.2 Fire Flow Demands

Stantec

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160401895
Project Name: 1746 Carling Avenue
Date: 3/17/2025
Fire Flow Calculation #: 3
Description: Building C - 9-Storey Mid-Rise Building.
Buidling Footprint: 944 m² for first floor, 1234 m² for 2nd to 6th floor, 1073 m² for 7th floor and 864 m² for 8th to 9th floor.

Notes: Footprint areas as per RLA Architecture Site Plan provided March 12, 2025.

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?					YES	-
		944	1234	1234	1234	1234	1234	1004	864	864		1561	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	7000
4	Determine Occupancy Charge	Limited Combustible										-15%	5950
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-2975
		Standard Water Supply										-10%	
		Fully Supervised										-10%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?				-	-
		North	10.1 to 20	24	9	> 100	Type I-II - Protected Openings	YES				0%	952
		East	> 30	0	0	0-20	Type V	NO				0%	
		South	> 30	40	2	61-80	Type V	NO				0%	
		West	3.1 to 10	12	2	21-49	Type V	NO				16%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											4000
		Total Required Fire Flow in L/s											66.7
		Required Duration of Fire Flow (hrs)											1.50
		Required Volume of Fire Flow (m^3)											360

B.3 Boundary Conditions

Wu, Michael

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: July 17, 2024 09:48
To: Gladish, Alyssa
Cc: Wu, Michael
Subject: RE: 1746 Carling Avenue Boundary Conditions Request
Attachments: 1746 Carling Avenue REVISED July 2024.pdf

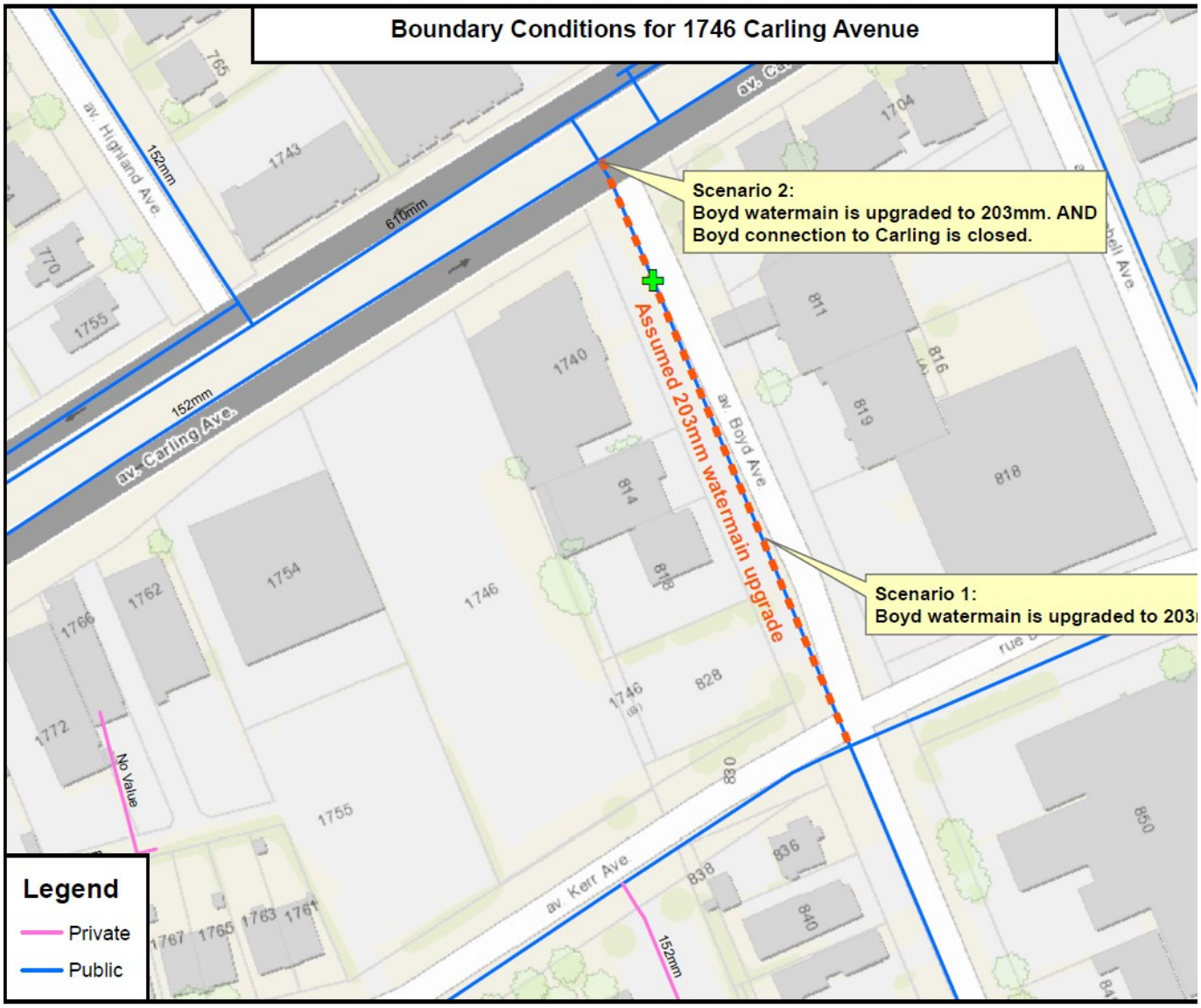
Hello,

Please see below the response for the water boundary conditions.

Please note that WM upgrade should be for the full length of the road i.e. from Carling to Kerr on Boyd. Upgrades can not be for only partial section on Boyd as the applicant had suggested. Also note that scenario 2 i.e. reliability scenario does not meet required fire flow.

The following are boundary conditions, HGL, for hydraulic analysis at 1746 Carling Avenue (zone 1W) assumed a dual connection connected to the 203mm upgraded watermain at Boyd Avenue **(Scenario 1) OR** to the 203mm upgraded watermain at Boyd Avenue and closed from Carling watermain **(Scenario 2)** (see attached PDF for location and also appended in this email).

The 203mm WM upgrade considered for this boundary condition on Boyd Ave is from Carling Ave to Kerr Ave shown below in red dotted line.



Scenario 1: upgraded 203mm Watermain on Boyd Avenue

Minimum HGL: 108.6 m

Maximum HGL: 114.4 m

Max Day+ Fire Flow (66.7 L/s): 107.4 m

Scenario 2 (RELIABILITY): upgraded 203mm Watermain on Boyd Avenue and closed from Carling watermain.

Minimum HGL: 103.7 m

Maximum HGL: 114.3 m

Available Fire Flow at 20 (psi): 43.0 L/s, assuming ground elevation of 78.6 m

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.

Rubina

Rubina Rasool
Project Manager
Planning, Infrastructure and Economic Development Department
Development Review – West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON K1P 1J1
613-580-2424 Ext. 24221
rubina.rasool@ottawa.ca

From: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Sent: June 25, 2024 5:56 PM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Wu, Michael <Michael.Wu@stantec.com>
Subject: RE: 1746 Carling Avenue Boundary Conditions Request

Hello Rubina,

Please find attached the requested analysis.

(1) FUS Calculations for each of the three buildings.
(2) The buildings are interconnected only in the underground parking levels. See attached for Parking P1 Plan
(3) Hydrant coverage:
    a. Map Attached
    b. Table Attached

Please let me know if you require any additional information.

Thank you,
Alyssa

Alyssa Gladish E.I.T.
Project Manager, Community Development

Direct: 780 917-8567
Mobile: 587 721-1241
Alyssa.Gladish@stantec.com

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

** Please note that I have a modified work schedule. I am available at my virtual office from 10:30 am to 6:00 pm EST daily.**

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: Tuesday, June 25, 2024 4:04 PM

To: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Subject: FW: 1746 Carling Avenue Boundary Conditions Request

Hi Gladish,

Could you please provide the following.

Thank you,

Rubina

Rubina Rasool
Project Manager
Planning, Infrastructure and Economic Development Department
Development Review – West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON K1P 1J1
613-580-2424 Ext. 24221
rubina.rasool@ottawa.ca

From: Ahmad, Shohan <Shohan.Ahmad@ottawa.ca>
Sent: June 25, 2024 3:37 PM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Afzalan, Bahar <bahar.afzalan@ottawa.ca>; Watson, Kieran <kieran.watson@ottawa.ca>; Nitsche, Kersten <Kersten.Nitsche@ottawa.ca>
Subject: RE: 1746 Carling Avenue Boundary Conditions Request

Hi Rubina,

Kindly provide the following:

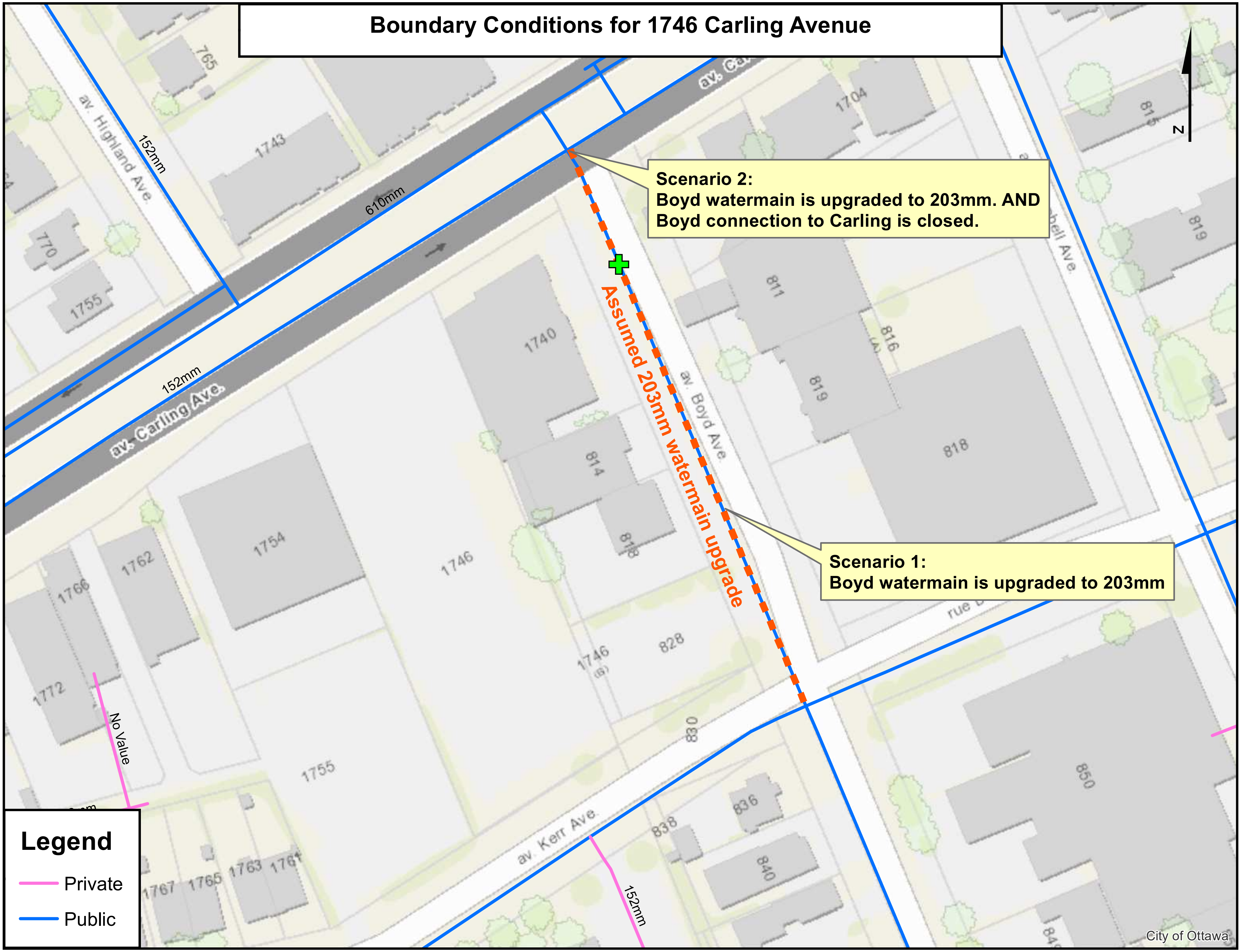
- FUS calculation for all 3 buildings
- Building interconnectivity
- Applicant to identify hydrants and hydrant coverage for all 3 buildings

Thanks
Shohan

'

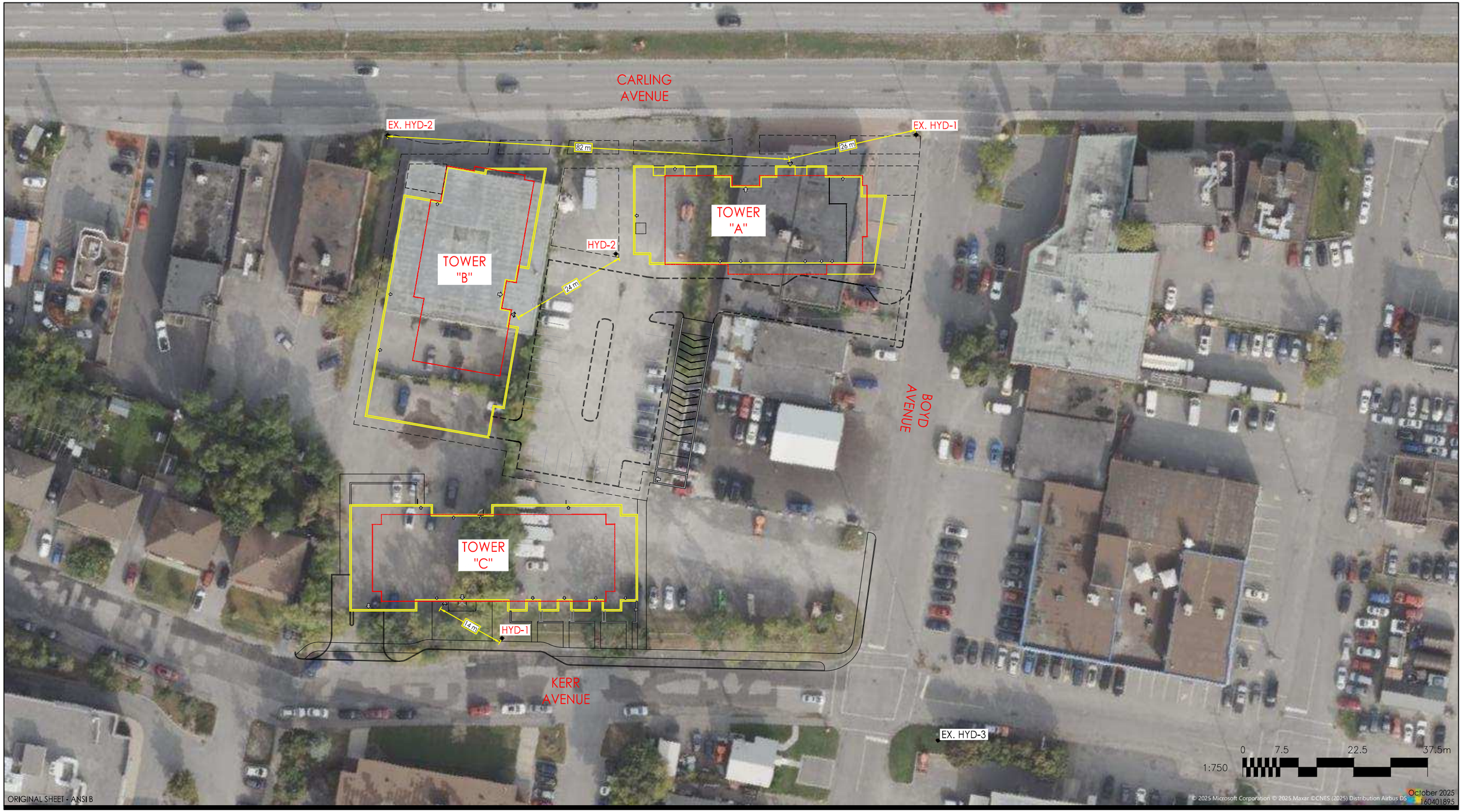
'

'



Boundary Conditions for 1746 Carling Avenue
Scenario 2:
Boyd watermain is upgraded to 203mm. AND
Boyd connection to Carling is closed.
Scenario 1:
Boyd watermain is upgraded to 203mm
Assumed 203mm watermain upgrade
av. Carling Ave.
av. Highland Ave.
av. Boyd Ave.
av. Kerr Ave.
610mm
152mm
152mm
152mm
No Value
1746
1740
1754
1755
1762
1766
1772
1743
1704
811
814
816
818
819
828
830
836
838
840
850
1763
1765
1767
N
Legend
Private
Public
City of Ottawa

B.4 Fire Hydrant Coverage



W:\active\160401895\design\drawing\Detailed Design Drawings\160401895 FH.dwg
2025/10/23 10:26 AM By: Gladish, Alyssa

ORIGINAL SHEET - ANSI B

Stantec
Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

Notes

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Client/Project
THE PROPERTIES GROUP
1746 CARLING AVENUE
Ottawa, ON

Figure No.
1.0

Title
FIRE HYDRANT COVERAGE

Project:	1746 Carling Avenue		160401895
TABLE 1: FIRE HYDRANT COVERAGE TABLE			
Revision:	1	Prepared By:	AR
Revision Date:	14-Oct-2025	Checked By:	AG

Description	Hydrants[1]				Total Available Fire Flow (L/min)	Total Required Fire Flow[2] (L/min)
	EX HYD (Carling & Boyd)	**EX HYD (Carling)**	**NEW HYD (On-site)**	**NEW HYD (Kerr)**		
Hydrant Class[4]	Class AA (light blue bonnet)	Class AA (light blue bonnet)	Class AA (as designed)	Class AA (as designed)	-	-
Building A						
Unobstructed distance from main entrance (m)	26	82.0	-	-	-	-
Maximum fire flow capacity[3] (L/min)	5,678	3,785	-	-	**9,463**	4,000
Building B						
Unobstructed distance from main entrance (m)	-	-	24.0	-	-	-
Maximum fire flow capacity[3] (L/min)	-	-	5,678	-	**5,678**	4,000
Building C						
Unobstructed distance from main entrance (m)	-	-	-	14.0	-	-
Maximum fire flow capacity[3] (L/min)	-	-	-	5,678	**5,678**	4,000

NFPA 1 Table 18.5.4.3	
Distance to Building (m)	Maximum Capacity (L/min)
≤ 76	**5,678**
> 76 and ≤ 152	**3,785**
> 152 and ≤ 305	**2,839**

Notes:

1. Existing hydrant locations as per topographic survey (15-Nov-2021).
2. See FUS Calculations.
3. See NFPA 1 Table 18.5.4.3 for maxiumim fire flow capacity of hydrants by distance to building.
4. Class of existing hydrants from NFPA 291 bonnet paint colour, observed from Google Street View (imagery Jun-2023). New hydrant, class as designed.

Appendix C Wastewater Servicing

C.1 Sanitary Sewer Design Sheet

Stantec

SUBDIVISION: **1746 Carling Avenue**

DATE: 2025-10-07
REVISION: 1
DESIGNED BY: AR
CHECKED BY: MW

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401895

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / 1 BED	1.4	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / 2 BED	2.1	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / 3 BED	3.1				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	1 BED	UNITS 2 BED	3 BED	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	**FLOW**	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)
R2A, G2A	C	1	0.12	34	82	6	238	0.00	238	3.50	2.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.0	0.28	0.28	0.1	2.8	1.9	200	PVC	SDR 35	2.00	47.3	**5.90%**	1.49
	1	EX SAN	0.00	0	0	0	0	0.00	238	3.50	2.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.0	0.00	0.28	0.1	2.8	11.0	200	PVC	SDR 35	0.50	23.6	**11.81%**	0.74
A, B	A & B	2	0.53	373	214	32	1071	0.53	1071	3.22	11.2	0.53	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.3	0.53	0.53	0.2	11.6	12.4	200	PVC	SDR 35	1.00	33.4	**34.77%**	1.05
G3A	3	16	0.00	0	0	0	0	0.00	0	3.80	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.0	0.10	0.10	0.0	0.0	12.1	150	PVC	DR 28	1.00	15.3	**0.21%**	0.86

C.2 Sanitary Sewer Capacity

From: Rasool, Rubina
To: Gladish, Alyssa
Cc: Wu, Michael; Renon, Ava
Subject: RE: 1746 Carling Avenue Boundary Conditions Request
Date: Tuesday, June 4, 2024 11:06:01 AM

Hi Alyssa,

The City looked at the options. Option 1 is the only acceptable connection for this flow rate.

Thank you,

Rubina

Rubina Rasool
Project Manager
Planning, Infrastructure and Economic Development Department
Development Review – West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON K1P 1J1
613-580-2424 Ext. 24221
rubina.rasool@ottawa.ca

From: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Sent: May 24, 2024 5:29 PM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Wu, Michael <Michael.Wu@stantec.com>; Renon, Ava <Ava.Renon@stantec.com>
Subject: RE: 1746 Carling Avenue Boundary Conditions Request

Hello Rubina,

We are currently evaluating Servicing Options for this site.

Please confirm which sanitary sewer was evaluated for downstream capacity. Was it the Carling Avenue 225 mm concrete sewer located in the eastbound lane (SAN Option 1, in the attached)?

Is there downstream sanitary sewer capacity available to receive the 14.8 L/s sanitary peak flow in the:

SAN Option 2 → 225 mm Ø concrete sanitary sewer in Boyd Avenue (connection to MH SA27916)?
SAN Option 3 → 225 mm Ø concrete sanitary sewer in Kerr Avenue (connection to MH SA26767)?

Thank you,
Alyssa

Alyssa Gladish E.I.T.

Project Manager, Community Development

Direct: 780 917-8567
Mobile: 587 721-1241
Alyssa.Gladish@stantec.com

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

** Please note that I have a modified work schedule. I am available at my virtual office from 10:30 am to 6:00 pm EST daily.**

Wu, Michael

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: April 16, 2025 14:51
To: Gladish, Alyssa
Cc: Wang, Ziyi; Wu, Michael
Subject: RE: 1746 Carling Avenue (PC2024-0240) - Building C Servicing
Attachments: a.png

Good afternoon,

There are no concerns with connecting Building 3 (2.8 L/s) on Kerr Avenue. The south portion of the existing site also drains to Boyd and the City does not see any concerns with connecting to Boyd after the 2-year control.

Thank you,

Rubina

Rubina Rasool
Project Manager
Planning, Infrastructure and Economic Development Department
Development Review – West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON K1P 1J1
613-580-2424 Ext. 24221
rubina.rasool@ottawa.ca

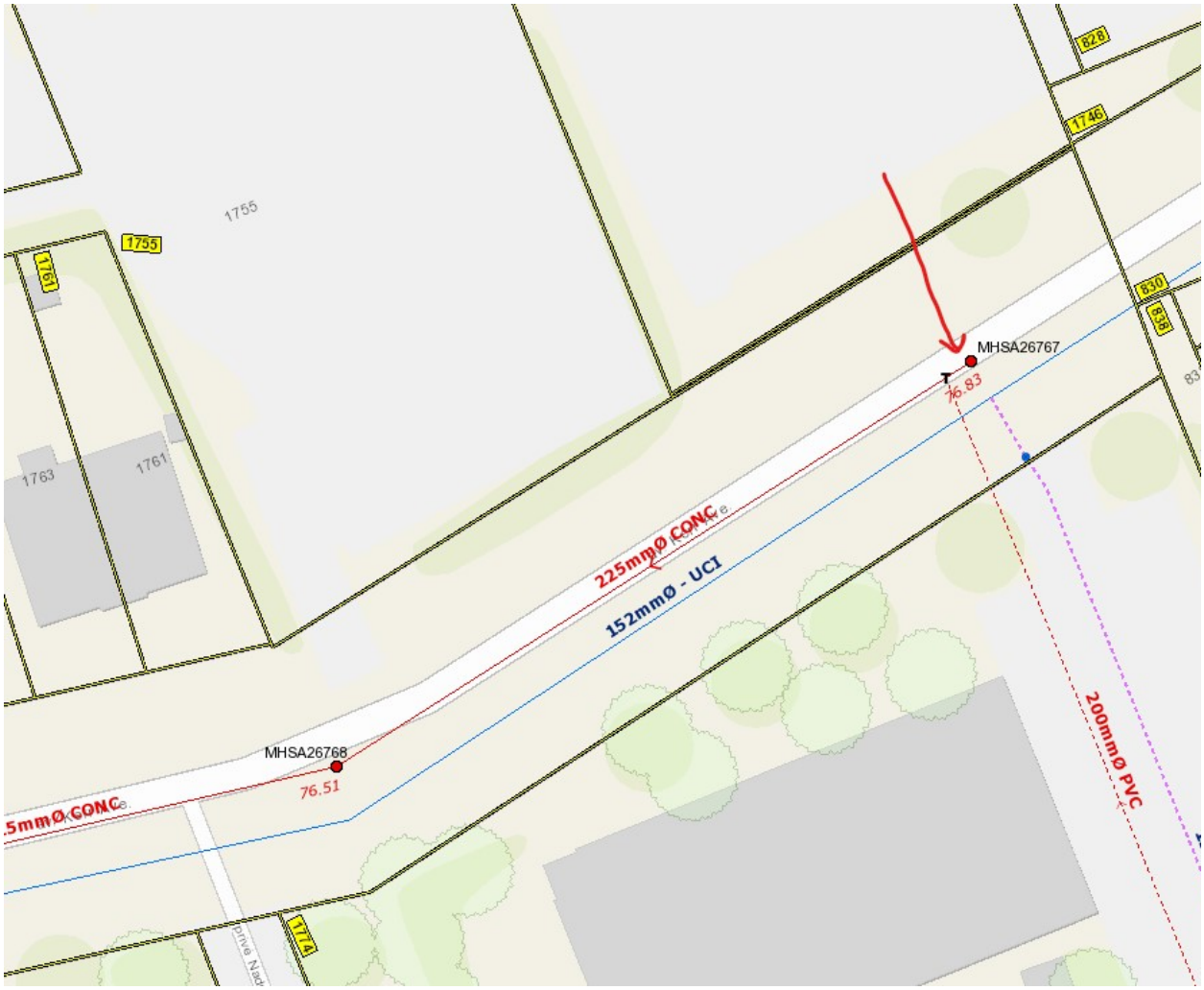
From: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Sent: March 25, 2025 11:11 AM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Wang, Ziyi <Ziyi.Wang@stantec.com>; Wu, Michael <Michael.Wu@stantec.com>
Subject: 1746 Carling Avenue (PC2024-0240) - Building C Servicing

Hello Rubina,

The owner of 1746 Carling Avenue (City Project No. PC2024-0240) is considering an Option where Building C (9-storey building fronting Boyd Avenue) is constructed separately from the other two buildings.

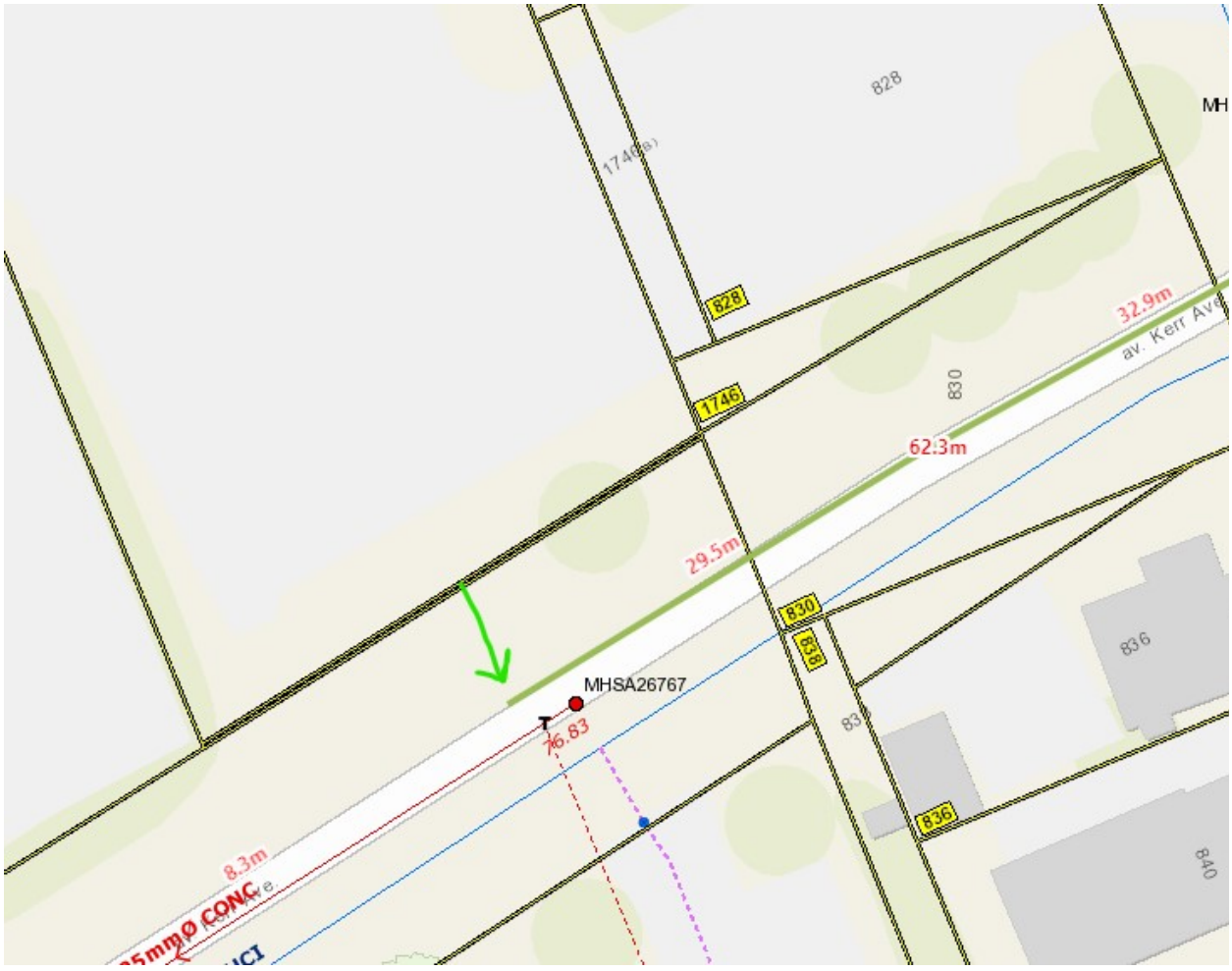
In this scenario, Building C would have 128 Dwelling Units and unique service connections for Water, Sanitary, and Storm. Please confirm the following:

1. The peak **sanitary flow rate** is calculated to be **2.8 L/s.**
    a. Would this service be permitted to connect to the upstream sanitary manhole MHSA26767 on Kerr Avenue?



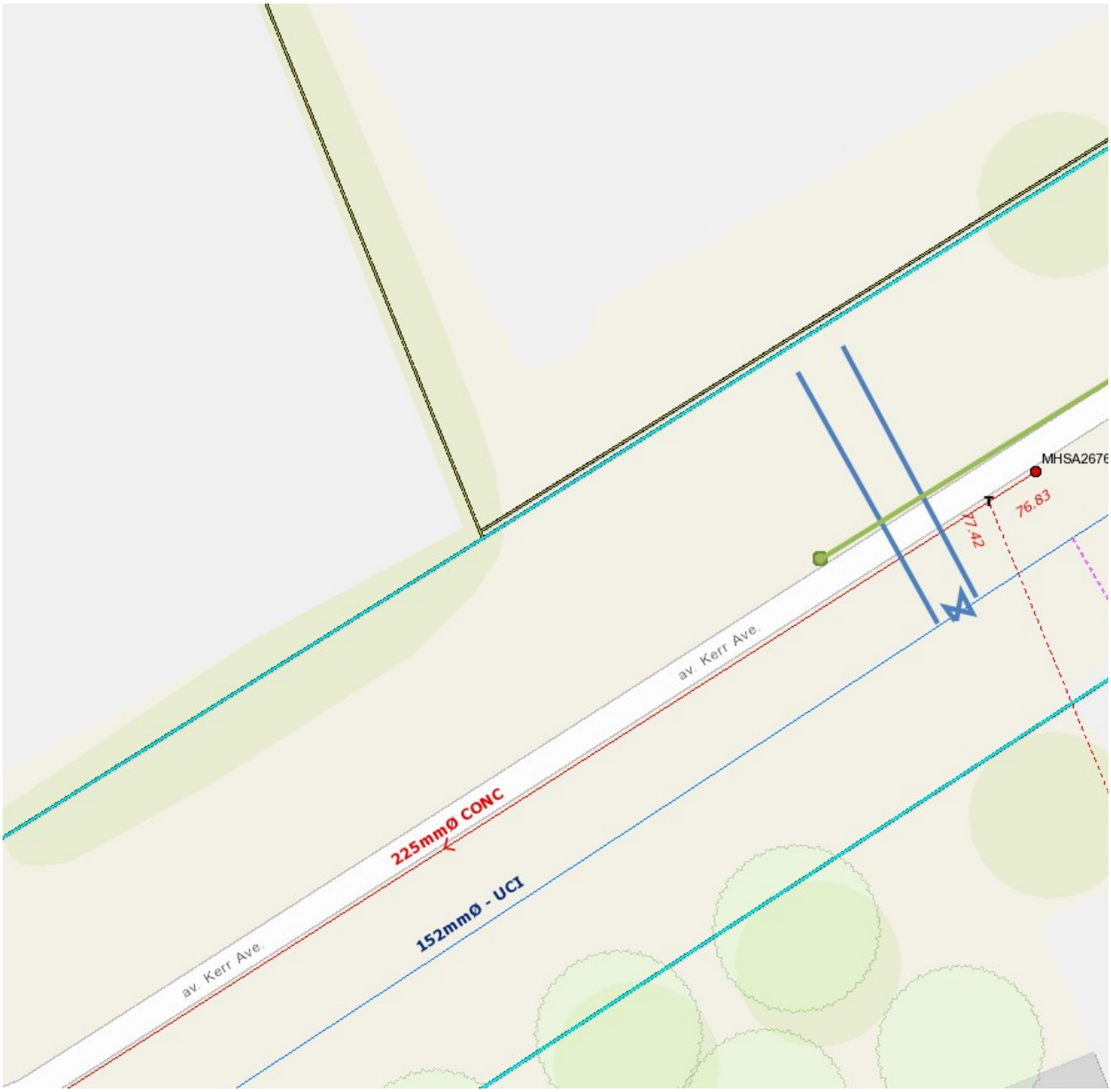
b. Does the downstream sanitary sewer system have the capacity to receive the proposed peak wastewater flow rate of 2.8 L/s?

2. The stormwater for Building C (Phase 3 area – 0.26 ha) will be controlled onsite to the pre-development 2-year storm event release rate. Assuming a pre-development C=0.5, City of Ottawa IDF Curves, and a Time of Concentration of 10 minutes, the post-development release rate for the phase three area will be restricted to **27.5 L/s**.
    a. A 300 mm diameter storm sewer extension will be required on Kerr Avenue from the storm sewer manhole on Boyd Avenue (MHST27733) to the Building C services (approximately 62 m west of the existing manhole). We understand that this extension would require Utilities Circulation for approvals. Would the City be open to this servicing approach?



b. Does the downstream storm sewer system on Boyd Avenue have the capacity to receive the proposed 2-year peak stormwater release rate of 27.5 L/s?

3. The potable water and fire servicing for Building 3 is proposed to have a connection to the municipal watermain on Kerr Avenue.
    a. Building C will include more than 50 dwelling units – consequently two water service connections (separated by an isolation valve) will be required.



b. A new municipal fire hydrant is to be installed on Kerr Avenue within 45m of the building's Siamese connection.
c. To provide sufficient fire flows and pressures to the 1746 Carling Avenue Site, the watermain is to be upsized to a 200mm diameter watermain on Boyd Avenue from Carling to Kerr, as per previous discussions with the City of Ottawa.
d. Please provide new Boundary Conditions for the Building C water service. A separate email with this request will follow.
e. Based on the new boundary conditions, will watermain upsizing also be required on Boyd Avenue? To what extent?

Thank you,

Alyssa

Alyssa Gladish E.I.T.
Project Manager, Community Development

Direct: 780 917-8567
Mobile: 587 721-1241
Alyssa.Gladish@stantec.com

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

'

'

Wu, Michael

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: May 16, 2024 14:29
To: Wu, Michael
Cc: Gladish, Alyssa
Subject: RE: 1746 Carling Avenue Boundary Conditions Request
Attachments: 1746 Carling Avenue May 2024.pdf

Hello Michael,

The sanitary capacity for this proposed development is okay; however, note that this is maximum available capacity and future developments in this area would not have capacity.

Please see the response below for the WBC.

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 1746 Carling Avenue (zone 1W) assumed connected via three connections to the 152mm watermain on Carling Avenue and the 152mm watermain on Kerr Avenue (see attached PDF for location).

Connection 1 (Carling)

Minimum HGL: 108.1 m

Maximum HGL: 114.5 m

Available Fire Flow at 20 (psi): 53.0 L/s, assuming ground elevation of 77.4 m

Connection 2 (Carling)

Minimum HGL: 108.4 m

Maximum HGL: 114.4 m

Available Fire Flow at 20 (psi): 79.0 L/s, assuming ground elevation of 78.5 m

Connection 3 (Kerr)

Minimum HGL: 108.4 m

Maximum HGL: 114.4 m

Available Fire Flow at 20 (psi): 49.0 L/s, assuming ground elevation of 79.4 m

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.

Rubina

Rubina Rasool
Project Manager
Planning, Infrastructure and Economic Development Department
Development Review – West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON K1P 1J1
613-580-2424 Ext. 24221
rubina.rasool@ottawa.ca

From: Wu, Michael <Michael.Wu@stantec.com>
Sent: May 15, 2024 11:26 AM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Subject: RE: 1746 Carling Avenue Boundary Conditions Request

Good morning, Rubina, as a quick follow-up, do you have a timeline on when we can expect the boundary conditions and the sanitary sewer capacity?

Thanks,

Michael Wu EIT
Civil Engineering Intern, Community Development

Direct: 1 (613) 738-6033
Michael.Wu@stantec.com

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: Friday, April 26, 2024 2:11 PM
To: Wu, Michael <Michael.Wu@stantec.com>
Cc: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Subject: RE: 1746 Carling Avenue Boundary Conditions Request

Hi Michael,

I have forwarded both of the requests. Please allow for 5-10 business days for the water boundary condition request.

Also, please note that a sign-off memo from the mechanical consultant is required to confirm that the proposed buildings will all have fully-supervised sprinkler systems.

Thank you,

Rubina

Rubina Rasool
Project Manager
Planning, Infrastructure and Economic Development Department
Development Review – West Branch
City of Ottawa
110 Laurier Avenue West Ottawa, ON K1P 1J1
613-580-2424 Ext. 24221
rubina.rasool@ottawa.ca

From: Wu, Michael <Michael.Wu@stantec.com>
Sent: April 26, 2024 12:01 PM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Subject: 1746 Carling Avenue Boundary Conditions Request

Good morning, Rubina:

We are requesting boundary conditions for the proposed development at 1746 Carling Avenue. The proposed development comprises of three apartment buildings and is projected to service a total population of 1370 persons with around 9083 m^2 of commercial space.

The boundary conditions requested are for the watermains on Carling Avenue and Kerr Avenue, and the water demands for the proposed development are as follows:

- Average Day Demand: 4.7 L/s (284.1 L/min)
- Maximum Day Demand: 11.5 L/s (692.6 L/min)
- Peak Hour Demand: 25.2 L/s (1,513.1 L/min)
- Fire Flow Demand: 83.3 L/s (5,000 L/min)

Attached are the calculation sheets, FUS exposure sketches, and the draft site plan for your reference.

We appreciate your time looking into this for us, and please feel free to reach out if you have any questions or comments.

Thanks,

Michael Wu EIT
Civil Engineering Intern, Community Development

Direct: 1 (613) 738-6033
Michael.Wu@stantec.com

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

'

'

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'

Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Appendix D Stormwater Servicing

D.1 Modified Rational Method

Stormwater Management Calculations

File No: **160401895**
Project: **1746 Carling Avenue**
Date: **04-Sep-25**

SWM Approach:
Post-development to Pre-development flows

Post-Development Site Conditions:

Overall Runoff Coefficient for Site and Sub-Catchment Areas

Runoff Coefficient Table

Catchment Type	Sub-catchment Area ID / Description		Area (ha) "A"		Runoff Coefficient "C"	"A x C"		Overall Runoff Coefficient
Phase 1 Controlled	PHASE 1	Hard	0.147		0.9	0.132		
		Soft	0.043		0.2	0.009		
		Subtotal		0.190			0.141	0.74
Phase 2 Overall	PHASE 2	Hard	0.318		0.9	0.286		
		Soft	0.041		0.2	0.008		
		Subtotal		0.359			0.295	0.82
Phase 3 Overall	PHASE 3	Hard	0.170		0.9	0.153		
		Soft	0.016		0.2	0.003		
		Subtotal		0.186			0.156	0.84
Uncontrolled - Non-Tributary	UNC-1	Hard	0.027		0.9	0.024		
		Soft	0.016		0.2	0.003		
		Subtotal		0.043			0.027	0.64
Tributary to Parkland	UNC-2	Hard	0.005		0.9	0.004		
		Soft	0.000		0.2	0.000		
		Subtotal		0.005			0.004	0.90
Tributary to Phase 2	UNC-3	Hard	0.016		0.9	0.014		
		Soft	0.011		0.2	0.002		
		Subtotal		0.027			0.016	0.61

Total	**0.809**	**0.639**	
Overall Runoff Coefficient= C:			**0.79**

Total Roof Areas	**0.09 ha**
Total Tributary Surface Areas (Controlled and Uncontrolled)	**0.65 ha**
Total Tributary Area to Outlets	**0.74 ha**
Total Uncontrolled Areas (Non-Tributary)	**0.07 ha**
Total Developable Site Area	**0.81 ha**

Stormwater Management Calculations

Project #160401895, 1746 Carling Avenue
Modified Rational Method Calculations for Storage

2 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	732.951
b =	6.199
c =	0.81

t (min)	I (mm/hr)
10	76.81
20	52.03
30	40.04
40	32.86
50	28.04
60	24.56
70	21.91
80	19.83
90	18.14
100	16.75
110	15.57
120	14.56

2 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 0.8093
C: 0.50

Typical Time of Concentration

tc (min)	I (2 yr) (mm/hr)	Qtarget (L/s)
10	76.81	**86.40**

2 YEAR Modified Rational Method for Entire Site

Subdrainage Area: PHASE 1 — Phase 1 Controlled
Area (ha): 0.19
C: 0.74

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	34.82	15.56	19.26	**11.56**
20	52.03	25.12	15.56	9.56	11.47
30	40.04	20.42	15.56	4.86	8.75
40	32.86	17.61	15.56	2.05	4.91
50	28.04	15.72	15.56	0.16	0.47
60	24.56	14.35	14.35	0.00	0.00
70	21.91	13.22	13.22	0.00	0.00
80	19.83	11.96	11.96	0.00	0.00
90	18.14	10.95	10.95	0.00	0.00
100	16.75	10.11	10.11	0.00	0.00
110	15.57	9.40	9.40	0.00	0.00
120	14.56	8.79	8.79	0.00	0.00

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	-	-	15.56	11.56	110.00	OK

Subdrainage Area: PHASE 2 — Phase 2 Overall
Area (ha): 0.36
C: 0.82

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	66.38	34.32	32.06	**19.23**
20	52.03	44.97	34.32	10.64	12.77
30	40.04	34.61	34.32	0.28	0.51
40	32.86	28.40	28.40	0.00	0.00
50	28.04	24.23	24.23	0.00	0.00
60	24.56	21.22	21.22	0.00	0.00
70	21.91	18.94	18.94	0.00	0.00
80	19.83	17.14	17.14	0.00	0.00
90	18.14	15.68	15.68	0.00	0.00
100	16.75	14.47	14.47	0.00	0.00
110	15.57	13.46	13.46	0.00	0.00
120	14.56	12.59	12.59	0.00	0.00

Includes drainage from UNC-3 in Phase 1

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	-	-	34.32	19.23	120.00	OK

Subdrainage Area: PHASE 3 — Phase 3 Overall
Area (ha): 0.19
C: 0.84

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	33.30	17.22	16.08	**9.65**
20	52.03	22.56	17.22	5.34	6.41
30	40.04	17.36	17.22	0.14	0.26
40	32.86	14.25	14.25	0.00	0.00
50	28.04	12.16	12.16	0.00	0.00
60	24.56	10.65	10.65	0.00	0.00
70	21.91	9.50	9.50	0.00	0.00
80	19.83	8.60	8.60	0.00	0.00
90	18.14	7.87	7.87	0.00	0.00
100	16.75	7.26	7.26	0.00	0.00
110	15.57	6.75	6.75	0.00	0.00
120	14.56	6.31	6.31	0.00	0.00

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	-	-	17.22	9.65	60.00	OK

Subdrainage Area: UNC-1 — Uncontrolled - Non-Tributary
Area (ha): 0.04
C: 0.64

tc	I (2 yr)	Qactual	Qrelease	Qstored	Vstored

Project #160401895, 1746 Carling Avenue
Modified Rational Method Calculations for Storage

100 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	1735.688
b =	6.014
c =	0.820

t (min)	I (mm/hr)
10	178.56
20	119.95
30	91.87
40	75.15
50	63.95
60	55.89
70	49.79
80	44.99
90	41.11
100	37.90
110	35.20
120	32.89

100 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 0.8093
C: 0.50

Estimated Time of Concentration after Development

tc (min)	I (100 yr) (mm/hr)	Q100yr (L/s)
10	178.56	**200.86**

100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: PHASE 1 — Phase 1 Controlled
Area (ha): 0.28
C: 0.93

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	131.32	15.56	115.77	69.46
20	119.95	89.77	15.56	74.21	89.06
30	91.87	69.86	15.56	54.30	97.75
40	75.15	58.01	15.56	42.45	101.87
50	63.95	50.07	15.56	34.51	103.54
60	55.89	44.36	15.56	28.80	**103.68**
70	49.79	40.03	15.56	24.47	102.78
80	44.99	36.63	15.56	21.07	101.13
90	41.11	33.88	15.56	18.32	98.92
100	37.90	31.60	15.56	16.04	96.26
110	35.20	29.69	15.56	14.13	93.25
120	32.89	28.05	15.56	12.49	89.95

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	-	-	15.56	103.68	110.00	OK
					6.32	

Subdrainage Area: PHASE 2 — Phase 2 Overall
Area (ha): 0.36
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	188.44	34.32	154.12	92.47
20	119.95	126.59	34.32	92.27	110.72
30	91.87	96.95	34.32	62.63	**112.73**
40	75.15	79.31	34.32	44.98	107.96
50	63.95	67.49	34.32	33.17	99.51
60	55.89	58.99	34.32	24.67	88.80
70	49.79	52.55	34.32	18.22	76.53
80	44.99	47.48	34.32	13.16	63.16
90	41.11	43.39	34.32	9.06	48.94
100	37.90	40.00	34.32	5.68	34.07
110	35.20	37.15	34.32	2.83	18.66
120	32.89	34.72	34.32	0.39	2.82

Includes drainage from UNC-3 in Phase 1

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	-	-	34.32	112.73	120.00	OK
					7.27	

Subdrainage Area: PHASE 3 — Phase 3 Overall
Area (ha): 0.19
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	92.17	17.22	74.95	44.97
20	119.95	61.91	17.22	44.70	53.63
30	91.87	47.42	17.22	30.20	**54.36**
40	75.15	38.79	17.22	21.57	51.76
50	63.95	33.01	17.22	15.79	47.37
60	55.89	28.85	17.22	11.63	41.87
70	49.79	25.70	17.22	8.48	35.62
80	44.99	23.22	17.22	6.00	28.82
90	41.11	21.22	17.22	4.00	21.60
100	37.90	19.56	17.22	2.34	14.07
110	35.20	18.17	17.22	0.95	6.28
120	32.89	16.98	17.22	0.00	0.00

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	-	-	17.22	54.36	60.00	OK
					5.64	

Subdrainage Area: UNC-1 — Uncontrolled - Non-Tributary
Area (ha): 0.04
C: 0.80

tc	I (100 yr)	Qactual	Qrelease	Qstored	Vstored

Stormwater Management Calculations

Project #160401895, 1746 Carling Avenue
Modified Rational Method Calculations for Storage

(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)
10	76.81	5.83	5.83		
20	52.03	3.95	3.95		
30	40.04	3.04	3.04		
40	32.86	2.50	2.50		
50	28.04	2.13	2.13		
60	24.56	1.87	1.87		
70	21.91	1.66	1.66		
80	19.83	1.51	1.51		
90	18.14	1.38	1.38		
100	16.75	1.27	1.27		
110	15.57	1.18	1.18		
120	14.56	1.11	1.11		

Subdrainage Area: UNC-2 Tributary to Parkland
Area (ha): 0.00
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	0.91	0.91		
20	52.03	0.61	0.61		
30	40.04	0.47	0.47		
40	32.86	0.39	0.39		
50	28.04	0.33	0.33		
60	24.56	0.29	0.29		
70	21.91	0.26	0.26		
80	19.83	0.23	0.23		
90	18.14	0.21	0.21		
100	16.75	0.20	0.20		
110	15.57	0.18	0.18		
120	14.56	0.17	0.17		

Subdrainage Area: UNC-3 Tributary to Phase 2
Area (ha): 0.03
C: 0.61

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	3.49	3.49		
20	52.03	2.36	2.36		
30	40.04	1.82	1.82		
40	32.86	1.49	1.49		
50	28.04	1.27	1.27		
60	24.56	1.12	1.12		
70	21.91	1.00	1.00		
80	19.83	0.90	0.90		
90	18.14	0.82	0.82		
100	16.75	0.76	0.76		
110	15.57	0.71	0.71		
120	14.56	0.66	0.66		

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	0.847	ha			
Total 2yr Flow to Sewer	67.1	L/s	0	0 m^3	Ok
Non-Tributary Area	0.146	ha			
Total 2yr Flow Uncontrolled	6.7	L/s			
Total Area	0.993	ha			
Total 2yr Flow	73.8	L/s			
Target	86.4	L/s			

Project #160401895, 1746 Carling Avenue
Modified Rational Method Calculations for Storage

(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)
10	178.56	16.95	16.95		
20	119.95	11.39	11.39		
30	91.87	8.72	8.72		
40	75.15	7.13	7.13		
50	63.95	6.07	6.07		
60	55.89	5.31	5.31		
70	49.79	4.73	4.73		
80	44.99	4.27	4.27		
90	41.11	3.90	3.90		
100	37.90	3.60	3.60		
110	35.20	3.34	3.34		
120	32.89	3.12	3.12		

Subdrainage Area: UNC-2 Tributary to Parkland
Area (ha): 0.00
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	2.34	2.34		
20	119.95	1.57	1.57		
30	91.87	1.20	1.20		
40	75.15	0.99	0.99		
50	63.95	0.84	0.84		
60	55.89	0.73	0.73		
70	49.79	0.65	0.65		
80	44.99	0.59	0.59		
90	41.11	0.54	0.54		
100	37.90	0.50	0.50		
110	35.20	0.46	0.46		
120	32.89	0.43	0.43		

Subdrainage Area: UNC-3 Tributary to Phase 2
Area (ha): 0.03
C: 0.76

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	10.14	10.14		
20	119.95	6.81	6.81		
30	91.87	5.22	5.22		
40	75.15	4.27	4.27		
50	63.95	3.63	3.63		
60	55.89	3.17	3.17		
70	49.79	2.83	2.83		
80	44.99	2.55	2.55		
90	41.11	2.33	2.33		
100	37.90	2.15	2.15		
110	35.20	2.00	2.00		
120	32.89	1.87	1.87		

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	0.847	ha			
Total 100yr Flow to Sewer	67.1	L/s	0	0 m^3	Ok
Non-Tributary Area	0.146	ha			
Total 100yr Flow Uncontrolled	19.3	L/s			
Total Area	0.993	ha			
Total 100yr Flow	86.4	L/s			
Target	86.4	L/s			

D.2 Storm Sewer Design Sheet

Stantec

1746 Carling Avenue	
DATE:	2025-09-19
REVISION:	1
DESIGNED BY:	MW
CHECKED BY:	-

STORM SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: **160401895**

DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:2 yr	1:5 yr	1:10 yr	1:100 yr
a =	732.951	998.071	1174.184	1735.688
b =	6.199	6.053	6.014	6.014
c =	0.810	0.814	0.816	0.820

MANNING'S n = 0.013 BEDDING CLASS = B
MINIMUM COVER: 2.00 m
TIME OF ENTRY 10 min

LOCATION			DRAINAGE AREA																						PIPE SELECTION									
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (5-YEAR) (-)	C (10-YEAR) (-)	C (100-YEAR) (-)	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	$I_{2\text{-YEAR}}$ (mm/h)	$I_{5\text{-YEAR}}$ (mm/h)	$I_{10\text{-YEAR}}$ (mm/h)	$I_{100\text{-YEAR}}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETE (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)
R103A-R103F, TANK 1-TANK 4, EXT-1-EXT-2	103	102	0.07	0.00	0.00	0.00	0.12	0.49	0.00	0.00	0.00	0.036	0.036	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	6.1	6.1	13.7	1.9	300	300	CIRCULAR	PVC	-	2.00	136.0	**10.11%**	1.93
	102	101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	10.03	76.69	104.03	121.95	178.28	0.0	6.1	13.7	9.0	300	300	CIRCULAR	PVC	-	0.50	68.0	**20.20%**	0.97
UNC-1	101	100	0.04	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.027	0.063	0.000	0.000	0.000	0.000	0.000	0.000	10.27	75.79	102.79	120.49	176.13	0.0	6.1	19.4	47.8	375	375	CIRCULAR	PVC	-	0.50	116.6	**16.64%**	1.11
																				11.44																	
C104A	104	100	0.10	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.040	0.040	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	8.4	9.7	300	300	CIRCULAR	PVC	-	1.00	96.2	**8.78%**	1.37
																				10.23																	
	100	27733	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.103	0.000	0.000	0.000	0.000	0.000	0.000	11.44	71.68	97.15	113.85	166.38	0.0	6.1	26.6	12.9	375	375	CIRCULAR	PVC	-	0.50	116.6	**22.78%**	1.11
																				11.73									375	375							
PHASE 2 & PHASE 3	A & B	EX. STM	0.53	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.442	0.442	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	94.2	12.4	375	375	CIRCULAR	PVC	-	1.00	164.8	**57.16%**	1.56
																				10.15									375	375							

Appendix E External Reports

PATERSON GROUP

Geotechnical Desktop Review

Proposed Mixed-Use Development

1740, 1746 & 1754 Carling Avenue, 828 Boyd Avenue, and 1755 Kerr Avenue
Ottawa, Ontario

Prepared for Kerr Broadview Properties Ltd.

Report PG7336-1 dated December 4, 2024

1.0 Introduction

Paterson Group (Paterson) was commissioned by Kerr Broadview Properties Ltd. to provide a geotechnical desktop review based on available subsoil information for the proposed mixed-use development to be located at 1740, 1746 & 1754 Carling Avenue, 828 Boyd Avenue, and 1755 Kerr Avenue in the City of Ottawa, Ontario (refer to Figure 1 – Key Plan in Appendix 2).

The objectives of the geotechnical desktop review were to:

- Determine the subsurface soil and groundwater conditions by means of existing boreholes completed by this firm.
- Provide geotechnical recommendations for the design of the proposed development including construction considerations which may affect the design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. This report contains our findings and includes geotechnical recommendations pertaining to the design and construction of the subject development as understood at the time of writing this report.

2.0 Proposed Development

Based on available plans and information, it is understood that the proposed development consists of three high-rise mixed-use buildings with multiple levels of underground parking.

A parkland and amenity courtyard are also proposed as part of the subject development. Associated access lanes, loading zones, at-grade parking areas, and landscaped areas are also anticipated. The buildings are expected to be serviced by municipal services.

4.0 Observations

4.1 Surface Conditions

The subject site is currently occupied by two commercial buildings, asphalt-surfaced parking lots, loading zone areas, graveled surfaced areas, and mature trees. It is understood that the existing buildings will be demolished prior to the start of construction for the proposed development.

The site is bordered by Carling Avenue and further by residential or commercial areas to the north, by Boyd Avenue and commercial buildings to the east, and by Kerr Avenue further by residential or commercial properties to the south and by residential and commercial properties and Broadview Avenue to the west.

The ground surface at the subject site is relatively flat and at grade or slightly above grade with the surrounding properties. Reference should be made to Drawing PG7336-1 – Test Hole Location Plan in Appendix 2.

4.2 Subsurface Profile

Overburden

Generally, the subsurface soil profile encountered at the test hole locations consists of fill, compact to dense silty sand to sandy silt, silty clay to clayey silt or glacial till extending to a maximum depth of 2.3 m below the existing grade, underlain by bedrock.

The fill was generally observed to consist of crushed stone or brown silty sand with gravel and clay with the exception of a think layer of asphalt, concrete or interlock brick encountered at the ground surface. The glacial till deposit was generally observed to consist of loose brown silty sand with gravel.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile encountered at each test hole location.

Bedrock

Bedrock consisting of grey limestone interbedded with dolostone or shale was encountered at all boreholes. The RDQ values indicate that the bedrock consists of very poor quality within the upper 0.5 to 1.0 m of the bedrock profile, followed by excellent quality, which is consistent of observations of fractured bedrock within the upper 0.5 to 1.0 m of the bedrock profile.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile encountered at each test hole location. Based on available geological mapping, the bedrock consists of interbedded limestone and dolomite of the Gull River Formation and is expected to be encountered at depths ranging from 1 to 5 m.

4.3 Groundwater

The stabilized groundwater levels measured in the piezometers and monitoring wells during the subsoil and groundwater investigations completed by this firm are presented in Table 1.

Table 1 – Summary of Groundwater Level Readings

Borehole Number	Ground Surface Elevation (m)	Measured Groundwater Level		Date Recorded
		Depth (m)	Elevation (m)	
BH 8	99.17	5.87	93.3	October 31, 2018
BH 9	99.20	5.00	94.2	
BH 1	98.40	4.01	94.39	May 15, 2015
BH 3	99.03	1.97	97.06	July 20, 2015
BH 5	97.64	3.81	93.83	
BH 6	99.05	2.82	96.23	
BH 7	99.25	2.31	96.94	
BH 1	98.66	1.95	96.71	May 12, 2015
BH 2	99.16	1.93	97.23	
BH 3	99.25	1.86	97.39	
BH 1-14	99.27	2.38	96.89	June 5, 2014
BH 2-14	99.27	2.06	97.21	
BH 1	98.94	2.23	96.71	November 4, 2013
BH 2	99.04	2.43	96.61	

Note: The ground surface elevation at each test hole location is based on the information provided by others in the previous geotechnical investigation report.

It should be noted that surface water can become trapped within a backfilled borehole that can lead to higher than typical groundwater level observations.

The long-term groundwater levels can also be estimated based on the observed colour, consistency, and moisture content of the recovered soil samples. Based on these observations, the long-term groundwater table can be expected at approximately **2.0 to 3.0 m** below ground surface. Groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.

It is important to note that groundwater levels may also be impacted by nearby developments and changes in natural terrains. Therefore, due to the time gap between the completion of the existing boreholes and the proposed development, it is important to complete a supplemental geotechnical investigation to confirm the groundwater levels provided herein.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is suitable for the proposed mix-use development. Based on the available information, it is understood that the proposed buildings will have multiple levels of underground parking. Therefore, it is expected that the proposed buildings will be founded on conventional footings placed on the bedrock bearing surface.

Bedrock removal is expected to be required to complete the excavation for the proposed buildings. Line drilling and controlled blasting where large quantities of bedrock need to be removed is recommended. All contractors should be prepared for bedrock and oversized boulder removal. The blasting operations should be planned and completed under the guidance of a professional engineer with experience in blasting operations. A vibration monitoring program is recommended to be implemented and monitored by the geotechnical consultant to confirm that the controlled blasting program does not negatively impact the existing adjacent structures in the vicinity of the site.

It is anticipated that the silty clay will be completely removed during the excavation operations. Therefore, a permissible grade raise restriction will not be applicable for the proposed development. However, if a change in the proposed development is introduced where silty clay will remain in place, additional recommendations must be provided by Paterson to accommodate the presence of a compressible silty clay layer below the proposed structures.

The above and other considerations are further discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

It is expected that all overburden materials will be excavated to the bedrock surface for the majority of the subject site to accommodate the underground parking structure.

Asphalt, topsoil, and any deleterious fill, such as those containing organic materials, should be removed from within the perimeter of the proposed building and other settlement sensitive structures.

Existing foundation walls and other construction debris should be entirely removed from within the perimeter of the proposed buildings.

The earth force component (P_o) under seismic conditions can be calculated using $P_o = 0.5\ K_o\ \gamma\ H^2$, where $K_o = 0.5$ for the soil conditions noted above.

The total earth force (P_{AE}) is considered to act at a height, h (m), from the base of the wall, where:

$$h = \{P_o \cdot (H/3) + \Delta P_{AE} \cdot (0.6 \cdot H)\} / P_{AE}$$

The earth forces calculated are unfactored. For the ULS case, the earth loads should be factored as live loads, as per OBC 2024.

Bedrock

Below the bedrock surface, it is expected that the basement walls are to be poured against a composite drainage blanket, which will be placed against the exposed bedrock face. Below the bedrock surface, a nominal coefficient for at-rest earth pressure of 0.05 is recommended in conjunction with a bulk unit weight of 24.5 kN/m^3 (effective 15.5 kN/m^3).

A seismic earth pressure component will not be applicable for the foundation wall, which is to be poured against the bedrock face. It is expected that the seismic earth pressure will be transferred to the underground floor slab, which should be designed to accommodate these pressures. A hydrostatic pressure should be added for the portion below groundwater level.

5.7 Pavement Structure

Pavement Structure Over Overburden

The following pavement structures may be considered for rigid pavement, car-only parking, and access lanes, heavy traffic parking/loading areas and fire truck lanes. The proposed pavement structures are shown in Tables 2, 3, and 4.

Table 2 – Recommended Rigid Pavement Structure – Lower Level

Thickness (mm)	Material Description
125	**Rigid Concrete Pavement** – 32 MPa concrete with air entrainment
300	**BASE** – OPSS Granular A Crushed Stone
SUBGRADE – Either fill, OPSS Granular B Type II material placed over fill or bedrock.	

Table 3 – Recommended Pavement Structure – Car-Only Parking Areas	
Thickness (mm)	**Material Description**
50	**Wear Course** – HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE** – OPSS Granular A Crushed Stone
300	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either in situ soil, fill, or OPSS Granular B Type I or II material placed over in situ soil or bedrock.	

Table 4 – Recommended Pavement Structure – Access Lanes, Heavy Truck Parking/Loading Areas and Fire Truck Lanes	
Thickness (mm)	**Material Description**
40	**Wear Course** – HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course** – HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** – OPSS Granular A Crushed Stone
450	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either in situ soil, fill, or OPSS Granular B Type I or II material placed over in situ soil or bedrock.	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project.

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material.

The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable compaction equipment. This may require the use of a geotextile, thicker subbase, or other measures that can be recommended at the time of construction as part of the field observation program.

Pavement Structure Over Podium Deck Area

If a podium deck is proposed for the proposed buildings, additional recommendations will be provided for pavement structures above the podium deck upon completing a geotechnical investigation for the proposed buildings.

7.0 Recommendations

It is recommended that the following be carried out by Paterson once preliminary and/or detailed design of the proposed development have been prepared:

- ❑ Completion of a supplemental geotechnical field investigation specific to the proposed development, including bedrock coring.
- ❑ Review detailed grading, servicing, landscaping and structural plan(s) from a geotechnical perspective.
- ❑ Review of the geotechnical aspects of the excavation contractor's shoring design, if not design by Paterson, prior to construction.
- ❑ Review of architectural, civil, mechanical and structural plans pertaining to foundation drainage and waterproofing systems, if not designed by Paterson.

It is a requirement for the foundation design data provided herein to be applicable that a material testing and observation program be performed by the geotechnical consultant. The following aspects of the program should be performed by Paterson:

- ❑ Review and inspection of the installation of the foundation drainage and waterproofing systems.
- ❑ Observation of the bedrock surface at the time of excavation to identify areas of highly weathered bedrock.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ Observation of all subgrades prior to backfilling and follow-up field density tests to determine the level of compaction achieved.
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued upon the completion of a satisfactory inspection program by the geotechnical consultant.

All excess soil must be handled as per *Ontario Regulation 406/19: On-Site and Excess Soil Management.*

8.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. Paterson requests permission to review the recommendations when the drawings and specifications are completed.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes.

A soils investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, we request that we be notified immediately in order to permit reassessment of our recommendations.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Kerr Broadview Properties Ltd. or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

Owen R. Canton, B.Eng. Faisal I. Abou-Seido, P.Eng.

Report Distribution:

- ❑ Kerr Broadview Properties Ltd. (1 copy)
- ❑ Paterson Group (1 copy)

With every community, we redefine what's possible.

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

Stantec Consulting Ltd.
300 - 1331 Clyde Avenue
Ottawa ON K2C 3G4
stantec.com