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Assessment of Adequacy of Public Services

1081 Carling Avenue, Ottawa ON



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1.0 INTRODUCTION

1.1 Background

In 2021, J.L. Richards & Associates Limited (JLR) was retained by 1081 Carling Avenue 2019 Co-tenancy, care of Taggart Realty Management (TRM), to prepare an Assessment of Adequacy of Public Services (AAPS) Report and functional-level drawings of municipal infrastructure in support of two high-rise residential towers sited at 1081 Carling Avenue in the City of Ottawa. An AAPS Report was prepared in August 2021 as supporting documentation to a Zoning By-Law Amendment (ZBLA) which was reviewed by the City and Urban Design review Panel (UDRP).

This AAPS Report (October 7, 2022) was prepared to address comments issued by the City of Ottawa (July 25, 2022). It has also been prepared to outline the design objectives and criteria, servicing constraints and strategies for developing the subject lands with water, wastewater, storm and stormwater management services in accordance with:

- i) the November 2009 Servicing Study Guidelines for Development Applications in the City of Ottawa (City)
- ii) the Ottawa Sewer Design Guidelines (2012) and associated Technical Bulletins (Section 1.4)
- iii) the discussions held during a pre-consultation meeting with City staff, and
- iv) subsequent Email correspondences with the City, and comments issued on July 25, 2022.

A copy of the latest Site Plan, Legal Plan and Topographical Survey is included in Appendix A while a copy of the pre-consultation meeting, follow-up Email correspondences and the Servicing Checklist have been included in Appendix B.

1.2 Site Description and Background

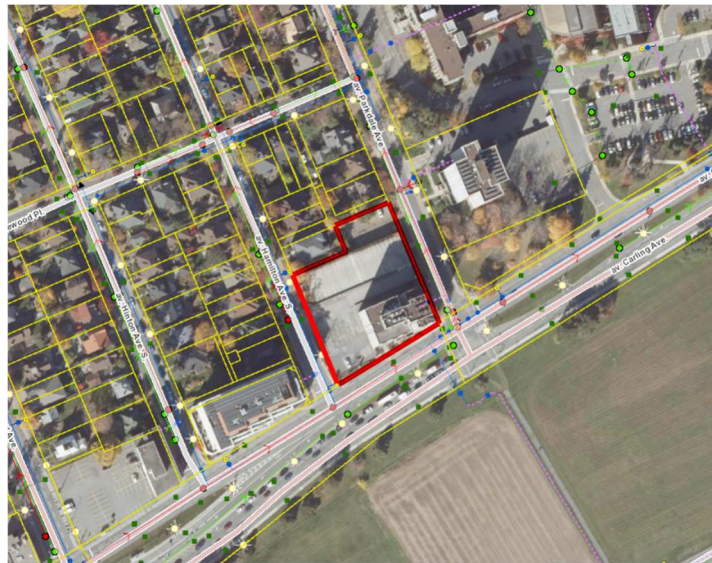
The subject property is located within the urban limits of the City of Ottawa, specifically in the Ottawa Civic Hospital neighborhood, an area bounded by the Bronson Avenue to the east, by Highway 417 to the north, and by the Central Experimental Farm to the south.

As illustrated on Figure 1 (below), the subject site currently consists of an existing commercial building and by adjacent surrounding parking within the 1081 Carling Avenue parcel. The site currently consists of a combination of asphalt and building which makes the subject site fully impervious.

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Figure 1: Site Plan Location



The subject parcels amount to $\pm 4293 \text{ m}^2$. Under the Zoning By-Law (ZBL), the subject properties are zoned AM2 H(11) and AM10[2196]. The façade of the existing building is fronting on Carling Avenue and access to a parking area off Hamilton Avenue and to another existing parking annex on Parkdale Avenue.

TRM proposes to redevelop the subject property with two high-rise residential condominium towers as follows:

- Step 1: The existing building would be demolished.
- Step 2: Construct the both mid-rise 16-storey and 25-storey residential condominium buildings (146 and 268 units respectively).

The Site Plan (Appendix A) provides a breakdown of the type of units for the residential towers.

1.3 Existing Infrastructure

A review of existing civil drawings was carried out in the vicinity of the site. Available information has been included in Appendix C. Based on the review of the available information, the following infrastructure has been identified to exist within the Hamilton Avenue south, Parkdale Avenue and Carling Avenue Right-Of-Way (R.O.W.):

Watermains:

- 152 mm diameter unlined cast iron watermain located within Hamilton Avenue ROW
- 305 mm diameter PVC located within Parkdale Avenue ROW
- 406 mm diameter unlined cast iron watermain located within Carling Avenue ROW

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Based on the review of “geoOttawa”, the following four (4) hydrants are located within the prescribed distances of ISTB-2018-02, in proximity of the subject property:

- One (1) hydrant is located on the southwest corner of the property at the intersection of Hamilton Avenue south and Carling Avenue intersection
- One (1) hydrant is located within 3 m of the northwest corner of the property along Hamilton Avenue
- One (1) hydrant is located within 37 m from the southwest corner of the property along Carling Avenue; and
- One (1) hydrant is located within 18 m from the northeast corner of the property, in front of civic address 751 Parkdale Avenue

Sanitary Sewers:

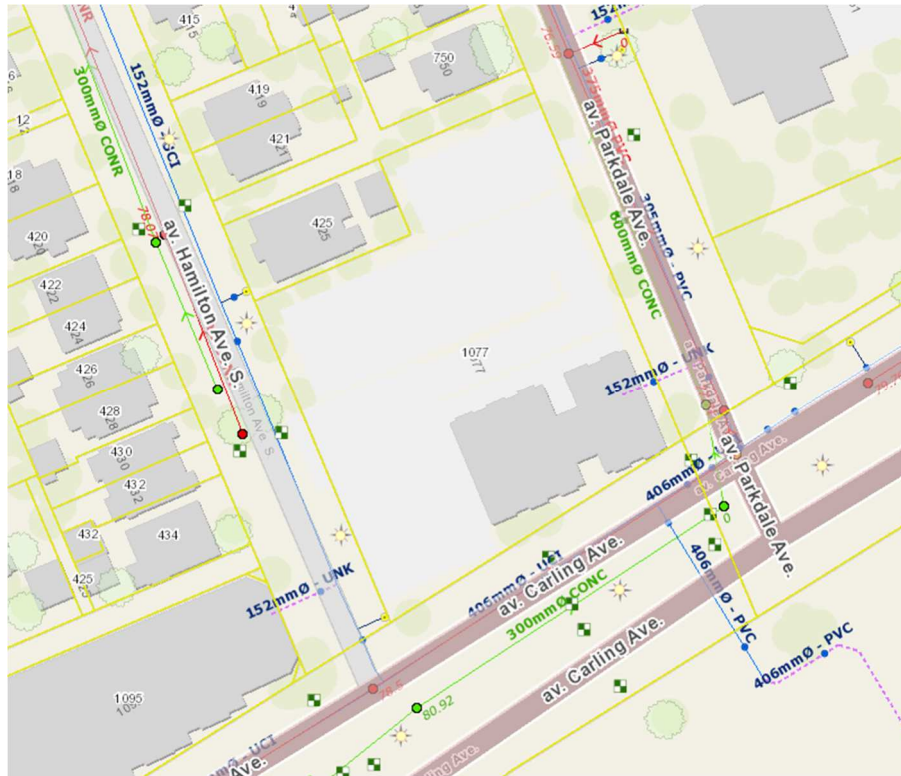
- 225 mm diameter sanitary sewer located within Carling Avenue ROW (flowing east). This sanitary sewer eventually discharges into to the 375 mm diameter Parkdale Avenue’s sanitary sewer, which in turn outlets into the Robert O. Pickard Environmental Centre (ROPEC) via a series of trunk sanitary sewers.
- 300 mm diameter sanitary sewer located within the Hamilton Avenue south ROW. This sanitary sewer also outlets to ROPEC via a series of trunk sanitary sewers.

Storm Sewers:

- There is an on-site catch basin (CB) in the parking area at the end of the parking ramp connected to the 300 mm diameter concrete storm sewer with Hamilton Avenue south ROW.
- 300 mm diameter concrete storm sewer located within Carling Avenue ROW. This sewer outlets to the 600 mm concrete storm sewer located within the Parkdale Avenue ROW.

Figure 2 below shows the existing infrastructure near the property parcel.

Figure 2: Existing Infrastructure



1.4 Functional Servicing

The existing servicing and connections to off-site linear infrastructure is summarized in Section 1.3 and 1.4. Based on the above-noted connections with existing infrastructure, the following proposed servicing is envisioned:

Water Servicing:

Proposed water service lateral for the East Tower to connect to the existing Parkdale Avenue 305 mm diameter watermain. Given the overall population for the project site and associated demands, a dual water service lateral is proposed with an isolation valve to provide a redundant supply to the East Tower. The connection is consistent with the existing condition. Existing water service lateral to be re-used if the condition is acceptable.

Proposed water service lateral for the West Tower was revised to connect to the existing 406 mm diameter Carling Avenue as per the latest City comment. The 150 mm service lateral connecting to the Carling Avenue will be the primary service lateral with the redundant lateral connecting to the Hamilton Avenue 150 mm diameter watermain. Refer to Section 2.4 for potential servicing details that will be reviewed at detailed design.

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Wastewater: Proposed sanitary lateral for the east tower to connect to the existing Parkdale Avenue 375 mm diameter sanitary sewer. Proposed sanitary lateral for the west tower to connect to the existing Hamilton Avenue 300 mm diameter sanitary sewer.

Storm: Runoff generated from site to be directed towards the existing 600 mm diameter sewer on Parkdale Ave and existing 300 mm diameter sewer on Hamilton Avenue. On-site storage and controls to be implemented to respect the storm discharge design criteria.

1.5 Municipal Design Guidelines

This AAPS and functional-level drawings were prepared in support of the ZBLA in accordance with the following:

Ottawa Sewer Design Guidelines (October 2012) complete with the following Technical Bulletins:

- ISTB-2012-01
- ISTDB-2014-01
- ISTDB-2016-01
- ISTDB-2018-01
- ISTDB-2019-01; and
- ISTDB-2019-02

City of Ottawa Water Distribution Guidelines complete with the following Technical Bulletins:

- ISTDB-2010-02
- ISTDB-2014-02
- ISTDB-2018-02; and
- ISTDB-2021-03

Detail Drawings as well as Sewer Material Specifications including:

- Sewer Connection (2003-513) and Sewer Use (2003-514) By-Laws
- Watermains/Services Material Specifications as well as Water and Road Standard Detail Drawings
- Water By-Law (2018-167)

1.6 Pre-Consultation, Permits and Approvals

A pre-consultation meeting was held between Taggart and the City of Ottawa via a Teams Meeting on June 30, 2021 (refer to Appendix B for a copy of the pre-consultation meeting notes).

Once the AAPS Report is approved under the joint ZBLA, the redevelopment of the above-referenced property will be subject to the municipal Site Plan control approval process with the City of Ottawa. As previously noted, the Servicing Study Checklist is included in Appendix B.

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2.0 WATER SERVICING

2.1 Water Supply and Design Criteria

A Hydraulic Network Analysis (HNA) was carried out for the proposed site to confirm that the existing watermain and water service can provide adequate supply while complying with both the Ottawa Design Guidelines for Water Distribution (July 2010) and Technical Bulletins ISDTB-2014-02 and ISTB-2018-02.

Section 4.2.2 of the Water Design Guidelines requires that all new development additions to the public water distribution system be designed such that the minimum and maximum water pressure, as well as the fire flow rates, conform to the following:

- Under maximum hourly demand conditions (peak hour), the pressures shall not be less than 276 kPa
- During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 140 kPa (20 psi)
- In accordance with the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi)
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi); and
- Feeder mains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand.

Table 2-1 summarizes the design criteria for water servicing, which will also serve as the basis of the detailed design for the site.

Table 2-1: Water Design Criteria

Design Criteria	Design Value
Population > 500	
Residential average demand	280 L/cap/day
Residential maximum demand	2.5 x Avg
Residential peak hour	2.2 x Max Day
Fire Flow Requirements	
Municipal ROW	F.U.S.
Within Private Property	OBC
Pressure/Flow	
Peak hour	>275 kPa (40 psi)
Maximum day plus fire flow	>140 kPa (20 psi)
Minimum hour (maximum HGL)	<552 kPa (80 psi)

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2.2 Domestic Water Demands

The water demands were calculated to reflect the proposed unit count shown of the latest Site Plan (Appendix A). The calculations presented in Appendix B are based on the East Tower having 146 units and the East Tower having 268 units fronting on Hamilton Avenue and Parkdale Avenue, respectively.

Residential consumption rate under average day demand was set to 280 L/c/d as recommended in Technical Bulletin ISTB-2018-01 while the peaking factors were based on the Design Guidelines for areas with a population exceeding 500. Since the initial submission of the AAPS Report (2021), the Site Plan has been revised with a lesser unit count when compared to the current Site Plan. Table 2-2 summarizes the water demands (Appendix D).

Table 2-2: Water Consumption Rates

Demand Scenario	Water Demand Eastern Tower (L/s)	Water Demand Western Tower (L/s)
Average Day	1.57	0.85
Maximum Day	3.91	2.13
Peak Hour	8.61	4.69

2.3 Proposed Water Servicing

Water servicing will be provided by extending the existing 150 mm water service connection from the 305 mm diameter watermain on Parkdale Avenue to the Eastern Tower. Given the overall population of the Towers combined, a second service lateral is proposed with an isolation valve as shown on Drawing F-SGE. Similarly, supply to the Western Tower will be provided by a proposed 150 mm diameter water service lateral that will connect to the existing Carling Avenue 406 mm diameter watermain as requested by the City of Ottawa. It is proposed to provide a redundant 150 mm diameter service lateral that will connect to the Hamilton Avenue 150 mm diameter watermain.

2.4 Required Fire Flow

Within the City of Ottawa, the required fire flow (RFF) within a municipal right-of-way (ROW) must be estimated per the guidance of the Fire Underwriters Survey (FUS) for the given type of development. As part of the initial submission of the AAPS Report (August 2021), the RFF was calculated based on the 1999 FUS Guidelines. The RFF calculation showed RFF of 267 L/s and 283 L/s for the East and West Towers, respectively. Boundary conditions (BC) were subsequently generated by the City for the above-noted RFFs (refer to Appendix D for E-Mail dated August 24, 2021).

Fire flow requirements were re-evaluated as part of this AAPS Report (October 2022) to reflect the revised Site Plan, the new unit breakdown while accounting for the latest guidance of the FUS Guidelines (2020) rather than the 1999 FUS Guideline. Based on the latest document and calculated exposures, the RFF was estimated at 150 L/s and 167 L/s for the East and West Towers, respectively (refer to Appendix D). Although the revised RFF for each Tower noted above

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is substantially less than what used by the City in 2021 to generate boundary conditions, they were maintained for this updated analysis given that it is more conservative. The boundary conditions received from the City via their 2021 E-Mail can be found in Appendix D while the BCs used in the analysis is summarized below (i.e., Carling BC set to the Parkdale BC).

Table 2-3: Hydraulic Boundary Conditions

Water Demand Scenario	Head on Parkdale Avenue (m)	Head on Carling Avenue (m)
Peak Hour	123.4	123.3
Maximum HGL	132.3	132.2
Max. Day + Fire Flow per FUS (Appendix D)	106.2 (283 L/s)	N/A (267 L/s)
Max Day + Fire Flow NFPA	125.2 L/s (69.2 L/s)	117.6 L/s (69.2 L/s)

The City of Ottawa indicated via their comments issued that a connection to the Hamilton Avenue watermain for the West Tower should not be pursued due to its low supply characteristics. The City also advised that the Western Tower should be fed from the Carling Avenue 406 mm diameter watermain. Due to timing with this resubmission, a request for an updated BC that would reflect the supply for the Carling Avenue 406 mm diameter feedermain was not sought. Given the scope of the AAPS, it is recommended that a BC update be requested at detailed design to obtain the supply characteristics of the Carling Avenue feedermain. At such time, revised domestic demands will be provided to the City of Ottawa as well as the lesser RFFs calculated based on the 2020 FUS Guidelines. Given that Carling Avenue was recently paved, the detailed design analysis will review the viability of a connection to the Hamilton Avenue 150 mm diameter watermain to prevent a road cut of an arterial recently paved and the management of traffic during lane closures.

Given that the supply characteristics of the Carling Avenue 406 mm diameter feedermain is greater than the Parkdale Avenue 305 mm diameter watermain, the BC obtained for the Parkdale Avenue 305 mm diameter watermain was used as a means to reflect the supply from the Carling Avenue 406 mm diameter feedermain (see bottom Table of Headloss Calculation – Appendix D).

2.5 Headloss Calculations

Headloss calculations was carried out using the Hazen-Williams equation to confirm sizing of service laterals. The proposed functional servicing as presented on the Functional Servicing, Grading, and Erosion and Sediment Control Plan (Drawing F-SGE) was evaluated under the demand scenarios listed in Section 2.2. The operating pressures at the East and West Towers (finished floor elevations) were calculated using the water demand scenarios listed in Table 2-2. The Headloss Calculation Spreadsheet summarizes the operating pressures estimated at both Towers (mechanical room) under peak hour, maximum pressure, and maximum day plus fire flow scenarios. Detailed calculations for each water demand scenario are included in Appendix D.

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2.5.1 Peak Hour

The peak hour demand shown in Table 2-2 for the East and West Towers was applied along each 150 mm diameter service laterals. Using the boundary conditions shown in Table 2-3, the anticipated pressure at the building was found to be 402 kPa (58.4 psi) and 400 kPa (58.0 psi) for the East and West Towers, respectively exceeding the minimum pressure criterion of 276 kPa (40 psi).

2.5.2 Maximum Day Plus Fire Flow

The headloss calculation was carried out to reflect the BC generated from the FUS calculation method. Given that the BC generated reflected a RFF of 283 L/s, a revised BC was interpolated to reflect the revised RFF of 150 L/s and 167 L/s per the 2020 FUS Guideline. By applying the interpolated BC, the pressure at the building is estimated to be 326 kPa (47.2 psi) and 313 kPa (45.4 psi) for the East and West Towers, respectively. These pressures at the finish floor exceed the minimum requirement of 140 kPa (20 psi).

2.5.3 Maximum HGL

The Water Design Guidelines require that a high-pressure check (maximum hydraulic grade elevation) be performed to ensure that the maximum pressure constraint of 552 kPa (80 psi) is not exceeded. Based on a zero demand (0 L/s) and the maximum HGL boundary condition at each of the buildings (refer to Table 2-3), maximum pressures of 490 kPa (71.1 psi) and 489 kPa (70.9 psi) are expected at each of the Towers. This pressure is below the maximum pressure constraint of 552 kPa (80 psi) and pressure reducing valves (PRV) is not required on either of the Towers.

Given the height of the Towers, domestic and fire pumps as well as a sprinkler system will be designed at detailed design by the Owner's mechanical engineer.

2.6 Summary and Conclusions

Based on the HNA presented above, it is expected that both 150 mm diameter water service laterals along with the reductant 150 mm diameter water service (with an isolation valve) can provide adequate domestic supply to each of the Towers. The RFF were revised based on the 2020 FUS Guideline and were found to be less than those generated in 2020. As a result, the BC reflecting the lesser RFFs were linearly interpolated. It is recommended that a BC update be requested at detailed design to generate the supply characteristics of the Carling 406 mm diameter watermain and that would also reflect the lesser domestic demands and RFFs. Given the height of both towers, a mechanical engineer will design domestic and fire pumps at detailed design.

3.0 WASTEWATER SERVICING

3.1 Existing Conditions

The existing building is currently being serviced by a 150 mm diameter sanitary lateral connected to the existing 375 mm diameter sanitary sewer on Parkdale Ave.

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3.2 Design Criteria

The sanitary service for the proposed towers will be designed based on the City of Ottawa Sewer Design Guidelines ((OSDG) - (October 2012)) and associated Technical Bulletins. Key design parameters have been summarized in Table 3-1

Table 3-1: Wastewater Servicing Design Criteria

Design Criteria	Design Value	Reference
Residential average flow	280 L per capita/day	ISTB-2018-01
Residential peaking factor	Harmon Formula x 0.8	City Section 4.4.1
Infiltration Allowance 0.05 L/s/ha (dry I/I) 0.28 L/s/ha (wet I/I)	0.33 L/s/ha	ISTB-2018-01
Minimum velocity	0.6 m/s	OSDG Section 6.1.2.2
Maximum velocity	3.0 m/s	OSDG Section 6.1.2.2
Manning Roughness Coefficient (for smooth wall pipes)	0.013	OSDG Section 6.1.8.2
Minimum allowable slopes	Varies	OSDG Table 6.2, Section 6.1.2.2

3.3 Theoretical Sanitary Peak Flow and Proposed Sanitary Servicing

Wastewater flows from the two high-rise buildings will be accommodated by its own sanitary lateral. The 16-storey west tower will be serviced via a sanitary connection to the existing 300 mm diameter sewer on Hamilton Ave and the 258-storey east tower will be serviced via a sanitary connection to the existing 375 mm diameter sanitary sewer on Parkdale Ave.

Based on a density of 1.8 person per unit for apartment buildings (as recommended by the OSDG), the peak wastewater flow was calculated based on the design value of 280 L per capita per day and an overall population of 263 for the west tower and 482 for the east tower. Based on the calculated populations, peak wastewater flows of 3.00 L/s and 5.33 L/s was calculated for the west tower and east tower, respectively (refer to Appendix E for Detailed Wastewater Flow Calculations). The peak wastewater flows were calculated based on a Harmon Formula, and total infiltration allowances of 0.03 L/s and 0.04 L/s for the west tower and east tower, respectively based on 0.05 L/s/ha (dry I/I) and (0.28 L/s/ha (wet I/I), in accordance with the OSDG and ISTB-2018-01. Appendix E includes the Sanitary Design Sheet. The City of Ottawa has confirmed that both the Parkdale Ave and Hamilton Ave existing sanitary sewers have sufficient residual capacity to accommodate the wastewater flows for this redevelopment. The City of Ottawa correspondence confirming the sanitary capacity is presented in Appendix E.

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3.4 Summary and Conclusions

Section 3.0 and the calculations presented in Appendix E demonstrate that the site can be serviced using the existing infrastructure within vicinity of the site.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Existing Conditions

The following stormwater infrastructure is located adjacent to the site:

- 300mm diameter storm sewer on Hamilton Avenue South
- 600m diameter storm sewer on Parkdale Avenue
- 300mm diameter storm sewer on Carling Avenue

The existing building, multi-storey parking, parking lot to the north of the existing building and a frontage on Parkdale Ave are all tributary to the Parkdale Avenue Storm Sewer. A portion of frontage of Carling Ave on the property parcel is tributary to the 300mm diameter sewer on Carling. The remainder of the site consisting of an at-grade parking lot is tributary to the 300mm Ave. sewer on Hamilton Ave. Existing condition drainage areas are provided in Appendix F.

4.2 Storm Criteria

This AAPS Report and functional drawings have been prepared based on the discussions held at the pre-consultation meeting and subsequent e-mail correspondences. The storm design criteria used in this design is based on the following:

- The allowable peak flow shall be estimated based on a 1:2-year intensity which is to be calculated based on a Runoff Coefficient (C-Factor) of the lesser of the existing conditions and shall not exceed 0.50.
- The allowable peak flow is to be calculated using the 1:2-year IDF statistics (per the Ottawa Sewer Design Guidelines – (OSDG)) based on the calculated time of concentration (T_c) reflecting existing condition. The calculated T_c shall not be less than a T_c of 15 mins.
- The post-development peak flows shall be controlled up to the 1:100-year storm to the allowable peak flow by means of on-site storage. On-site measures to consist of rooftop storage, at grade ponding, underground cistern or a combination of these measures.
- The subject property is tributary to existing storm sewers and consists of rooftops and at grade amenity areas. The Rideau Valley Conservation Authority (RVCA) has confirmed that no additional water quality protections are required for this site. Best management practices will be implemented. Correspondence is presented in Appendix B.

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4.3 Allowable Release Rate

Storm servicing and stormwater management for the subject property is to be developed to limit the 1:100-year post-development flow from the subject property to the aggregate sum of the allowable peak flows set by the storm criteria.

To evaluate the allowable peak flows, the various areas were delineated based on their type and outlet locations. Pre-development drainage areas, and peak flow calculations are presented in Appendix F and summarized in the table below.

Table 4-1: Allowable Stormwater Release Rates

Storm Sewer Outlet	Area (m ²)	Allowable Release Rate (L/s)
300mm dia. Hamilton Sewer	1448	12.15
600mm dia. Parkdale Sewer	2588	21.80
375mm dia. Carling Sewer	16	0.14

4.4 Storm Servicing Strategy

On site storage requirements were calculated based on the Modified Rational Method (MRM). To limit the post development peak flows to those presented in Table 4-1, flow restrictors combined with storage volume will be implemented within the limits of this project. Given that the goal of this AAPS is to demonstrate that the site is serviceable, the stormwater management solution presented herein is found to meet the storm discharge criteria. However, at the final design stage, the stormwater management solution might be revised based on the ultimate Site Plan and after further coordination with the architect and mechanical engineer with respect to rooftop storage and cistern sizing. Thus, storage calculations for functional design were undertaken and are provided in Appendix F. A summary of the results is presented in the table below.

Table 4-2: Post Development Release Rates & Storage

Outlet	Post Development Tributary area (m ²)	Controlled Release Rate (L/s)	Required Storage (m ³)	Storage Provided (m ³)
300mm dia. Hamilton Sewer	697	12.03	9.15	39.60
600mm dia. Parkdale Sewer	3292	21.78	100.79	128.82

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The results summarized in Table 4-2 are supported by stormwater management calculations presented in Appendix F. These calculations demonstrate that adequate storage can be provided to respect the storm discharge criteria described in Section 4.2.

The conceptual stormwater management servicing strategy shown on the Post-Development Drainage Plan (Drawing F-DST). It is proposed to utilize rooftop storage and supplement any further storage requirements with an on-site underground cistern of 77 m³ in size within the parking lot. The analysis presented above is meant to confirm that the site can be serviced and that the stormwater criteria can be met; however, they should not be interpreted as detailed design calculations. Surface ponding, detailed calculations for the proposed cistern and ponding volumes for the rooftop will be provided during detailed design once the site plan is finalized and more information is available. At such time, the optimum cistern size will be coordinated with the mechanical engineer in tandem with rooftop storage to minimize the loss of underground parking stalls.

4.5 Summary and Conclusions

The storm and stormwater management solutions presented in this AAPS Report were found to fulfill the water quantity and quality criteria presented in Section 4.2. The parameters adopted for the rooftop storage calculations (i.e., storage and capacity) will need to be reviewed by the Owner's mechanical engineer as the towers are designed. Similarly, the collection system and storage tank will be coordinated with the Owners mechanical engineer as the client moves forward with detailed design.

Desktop calculations (Appendix F) were carried out to assess the effectiveness of the proposed grading, servicing and stormwater management design under both the 1:100-year and CCE storms. This assessment has demonstrated that the rooftop controls along with a 77 m³ cistern can accommodate the 1:100-year and CCE storms while protecting the towers.

5.0 EROSION AND SEDIMENTATION CONTROL

At the onset of construction of the Condominium Towers, substantial excavation will be completed for the underground garage for both Towers. As a result, runoff from the site will mostly be contained in the excavation area. As such, appropriate erosion and sedimentation control measures, as outlined in the Ontario Ministry of Natural Resources (MNR) Guidelines on Erosion and Sediment Control for Urban Construction Sites, will be implemented to trap sediment on site. The following erosion and sedimentation control measures could be implemented during construction (refer to Drawing FSGE):

- Supply and installation of a silt fence barrier, as per OPSD 219.110, if required;
- Supply and installation of filter fabric between the frame and cover of catch basins and maintenance holes adjacent to the project area during construction, to prevent sediment from entering the sewer system. The filter fabric is to be inspected regularly and corrected as required;
- Stockpiling of material during construction is to be located offsite;
- Sandbags are to be placed blocking part of the sewer pipe in the connecting storm maintenance holes to eliminate construction debris from entering the existing storm sewer

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system. The sandbags are to be removed after the proposed storm sewers have been fully cleaned.

The proposed removal and reinstatement measure as well as the erosion control measures (refer to Drawing FSGE) shall conform to the following documents:

- “Guidelines on Erosion and Sediment Control for Urban Construction Sites” published by Ontario Ministries of Natural Resources, Environment, Municipal Affairs, and Transportation & Communication, Association of Construction Authorities of Ontario and Urban Development Institute, Ontario, May 1987.
- “MTO Drainage Manual”, Chapter F: “Erosion of Materials and Sediment Control”, Ministry of Transportation & Communications, 1985.
- “Erosion and Sediment Control” Training Manual by Ministry of Environment, Spring 1998.
- Applicable Regulations and Guidelines of the Ministry of Natural Resources.

This report has been prepared for the exclusive use of Taggart Realty Management (TRM) for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of TRM and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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K1Z 5M2
Tel: 613 728-3571

ottawa@jlrichards.ca

North Bay

200-175 Progress Road
North Bay ON Canada
P1A 0B8
Tel: 705 495-7597

northbay@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
Tel: 613 544-1424

kingston@jlrichards.ca

Hawkesbury

326 Bertha Street
Hawkesbury ON Canada
K6A 2A8
Tel: 613 632-0287

hawkesbury@jlrichards.ca

Sudbury

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
Tel: 705 522-8174

sudbury@jlrichards.ca

Guelph

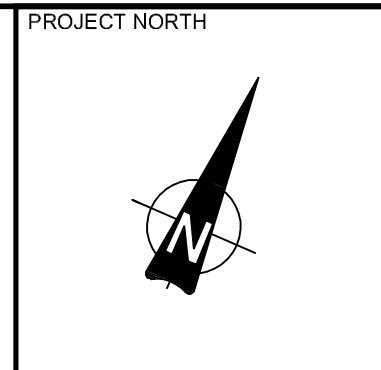
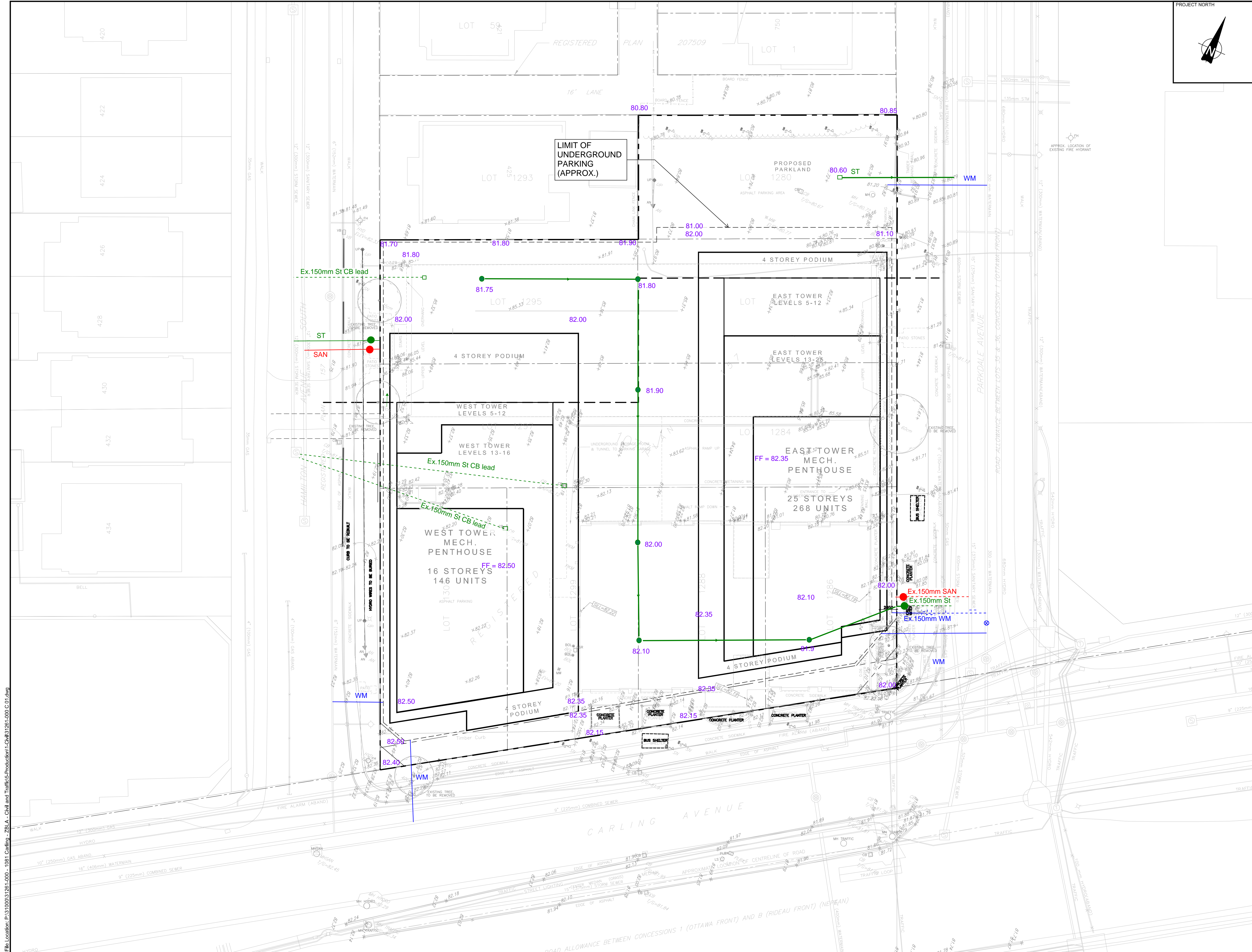
107-450 Speedvale Ave.
West Guelph ON Canada
N1H 7Y6
Tel: 519 763-0713

guelph@jlrichards.ca

Timmins

201-150 Algonquin Blvd.
East
Timmins ON Canada
P4N 1A7
Tel: 705 360-1899
timmins@jlrichards.ca





- Proposed storm sewer
- Proposed sanitary sewer
- Proposed watermain

2.	ISSUED TO CITY FOR REVIEW	26/08/21
1.	ISSUED FOR CLIENT REVIEW	5/08/21

No.	ISSUE / REVISION	DDMMYY

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VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING.



CLIENT:
TAGGART

CONSULTANT:
J.L. Richards
ENGINEERS - ARCHITECTS - PLANNERS

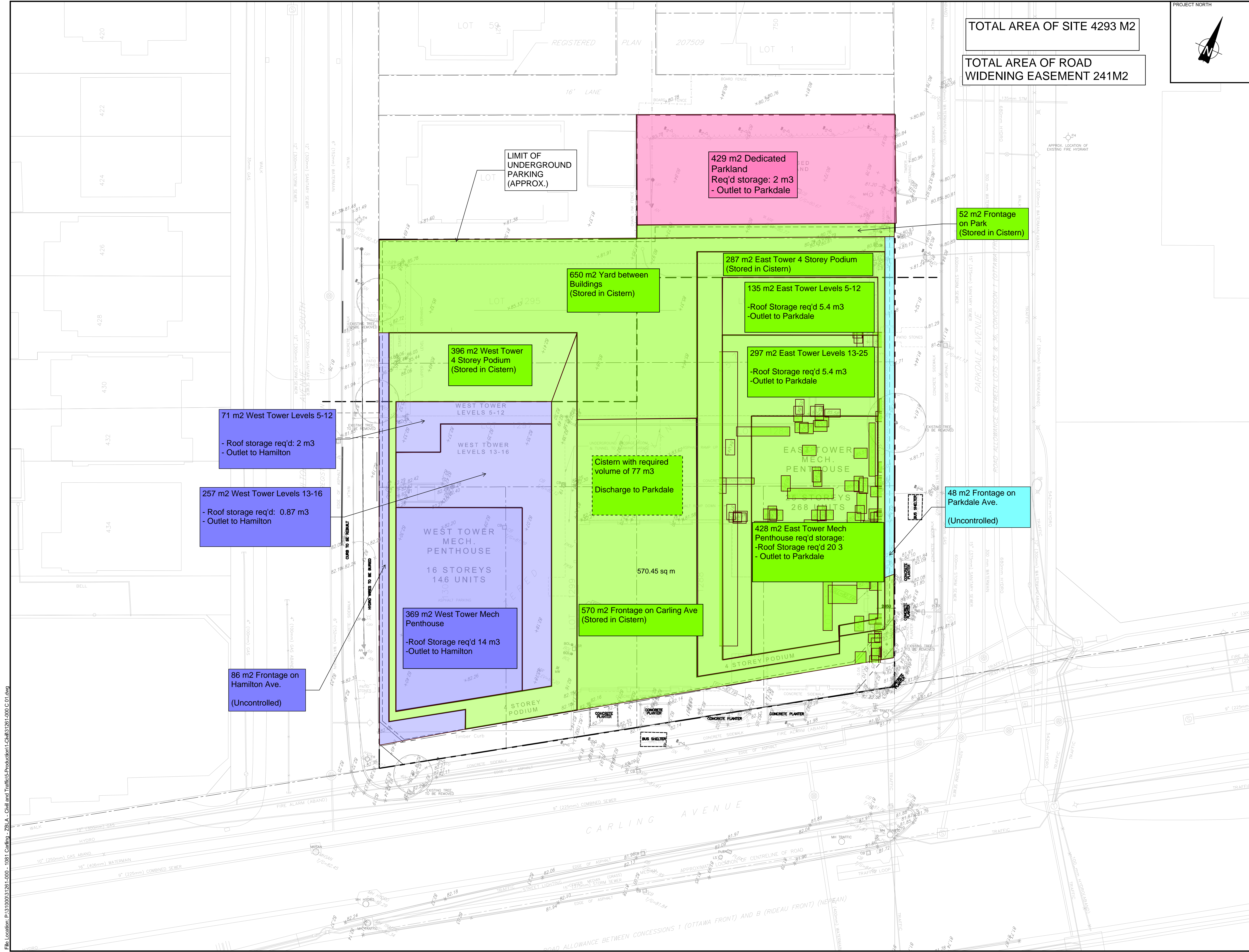
PROFESSIONAL STAMP

PROJECT:
FUNCTIONAL SERVICING, GRADING and EROSION AND SEDIMENT CONTROL PLAN

DESIGN:	AT	DRAWING #:	F-SGE
DRAWN:	AT	JLR #:	
CHECKED:	LD		

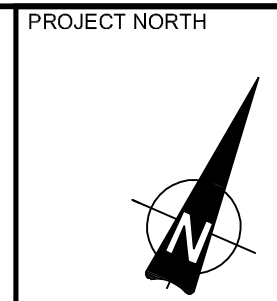
File Location: P:\13\1000\1261-1000 - 1081 Carling - ZBLA - Civil and Traffic\Production\1261-1000_C 01.dwg

PLOT DATE: Monday, October 3, 2022 9:23:30 AM



TOTAL AREA OF SITE 4293 M2

TOTAL AREA OF ROAD WIDENING EASEMENT 241M2



LIMIT OF UNDERGROUND PARKING (APPROX.)

429 m2 Dedicated Parkland
Req'd storage: 2 m3
- Outlet to Parkdale

52 m2 Frontage on Park
(Stored in Cistern)

650 m2 Yard between Buildings
(Stored in Cistern)

287 m2 East Tower 4 Storey Podium
(Stored in Cistern)

135 m2 East Tower Levels 5-12
-Roof Storage req'd 5.4 m3
-Outlet to Parkdale

297 m2 East Tower Levels 13-25
-Roof Storage req'd 5.4 m3
-Outlet to Parkdale

Cistern with required volume of 77 m3
Discharge to Parkdale

48 m2 Frontage on Parkdale Ave.
(Uncontrolled)

428 m2 East Tower Mech Penthouse req'd storage:
-Roof Storage req'd 20.3
- Outlet to Parkdale

396 m2 West Tower 4 Storey Podium
(Stored in Cistern)

71 m2 West Tower Levels 5-12
- Roof storage req'd: 2 m3
- Outlet to Hamilton

257 m2 West Tower Levels 13-16
- Roof storage req'd: 0.87 m3
- Outlet to Hamilton

WEST TOWER MECH. PENTHOUSE
16 STOREYS
146 UNITS

369 m2 West Tower Mech Penthouse
-Roof Storage req'd 14 m3
-Outlet to Hamilton

86 m2 Frontage on Hamilton Ave.
(Uncontrolled)

570 m2 Frontage on Carling Ave
(Stored in Cistern)

File Location: P:\13\1000\1261-1000 - 1081 Carling - ZBLA - Civil and Traffic\Production\1-261-1000-C-01.dwg

1. ISSUED FOR CLIENT REVIEW 5/08/21

No.	ISSUE / REVISION	DDMMYY

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CLIENT:
TAGGART

CONSULTANT: www.jrichards.ca



CONSULTANT:

PROFESSIONAL STAMP

PROJECT:

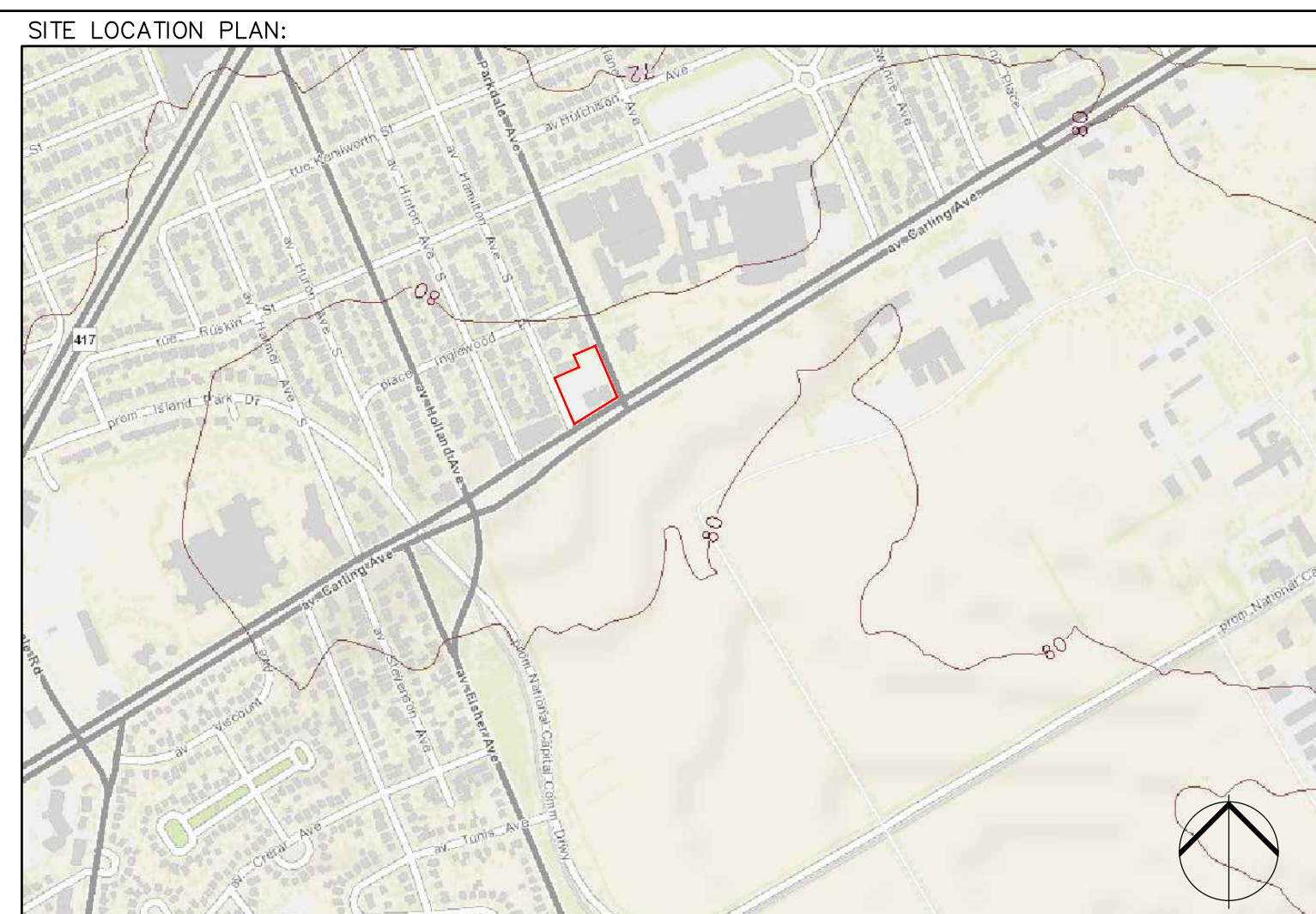
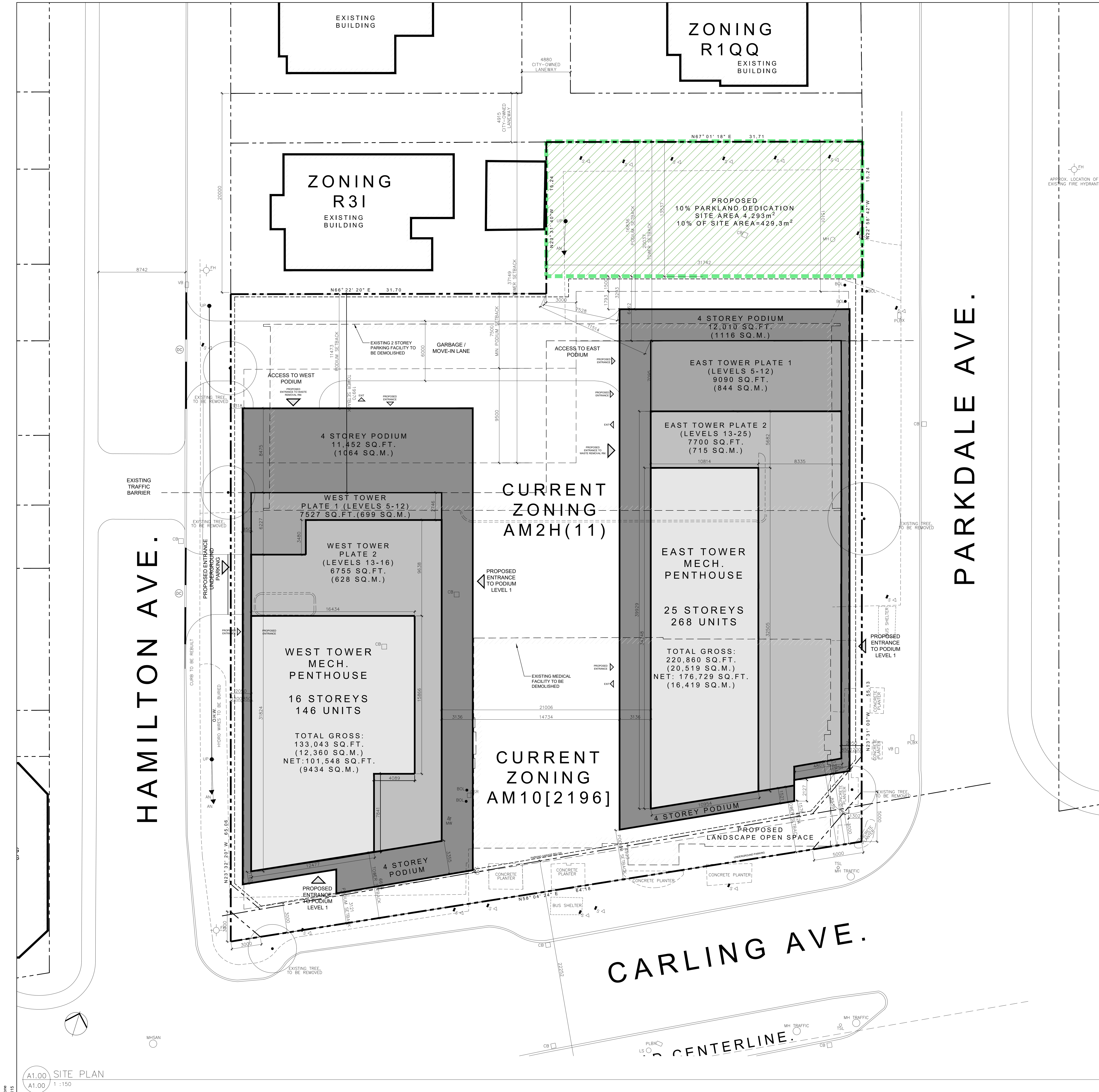
DRAWING:
POST DEVELOPMENT DRAINAGE PLAN & SWMM

DESIGN: AT	DRAWING #:
DRAWN: AT	F-DST
CHECKED: GF	
JLR #:	

PLOT DATE: Monday, October 3, 2023 2:30 AM

Appendix A

Site Plan and Legal Plans



ZONING NOTES:

CURRENT ZONING: NORTH PARCEL AM 2 H(11), SOUTH PARCEL AM10[2196]

LOT AREA : 4,293 m²

DEVELOPMENT STATS PHASE 1

	REQUIRED	PROPOSED
LOT WIDTH		63.44m
LOT DEPTH		70.3m IRREGULAR
UNITS		268
EAST TOWER UNITS		146
WEST TOWER UNITS		116
TOTAL UNITS		262
FRONT YARD SETBACK	CARLING AVENUE	3 m VARIES - 3.1m - 5m
REAR YARD SETBACK		7.5 m VARIES - 11.4m - 16.8m
CORNER SIDE YARD SETBACK	PARKDALE AVE.	1.3 m
CORNER SIDE YARD SETBACK	HAMILTON AVE.	1.3 m
MAXIMUM HEIGHT		30 m
EAST TOWER		77 m
WEST TOWER		50 m
NUMBER OF STOREYS		
EAST TOWER		25 STOREYS
WEST TOWER		16 STOREYS
BUILDING AREA (TOTAL GROSS)		
EAST TOWER		+/-21,072 m ²
WEST TOWER		+/-12,240 m ²

NOTE: ALL EXISTING SITE INFORMATION AS PER SITE SURVEY PLAN DATED JUNE 12, 2018 AND PREPARED BY STANTEC

AMENITY SPACE REQUIREMENTS

REQUIRED AMENITY SPACE 6 m² REQUIRED PER UNIT

414 UNITS X 6 SQ.M. = 2,484 SQ.M. TOTAL AMENITY REQUIRED

REQUIRED COMMON AMENITY SPACE - 1,242 SQ.M.

REQUIRED PRIVATE AMENITY SPACE - 1,242 SQ.M.

AMENITY SPACE PROVIDED

PROVIDED COMMON AMENITY SPACE - 1,900 SQ.M.

PROVIDED PRIVATE AMENITY SPACE - 2,328 SQ.M.

TOTAL AMENITY SPACE PROVIDED - 4,228 SQ.M.

WEST TOWER	PROPOSED	EAST TOWER	PROPOSED
TOTAL UNIT COUNT	146	TOTAL UNIT COUNT	268
STUDIOS	14 10%	STUDIOS	37 14%
1 BEDROOM	77 53%	1 BEDROOM	132 49%
1 BEDROOM + DEN	14 10%	1 BEDROOM + DEN	21 8%
2 BEDROOM	35 24%	2 BEDROOM	54 20%
2 BEDROOM + DEN	6 4%	2 BEDROOM + DEN	24 9%

PARKING SUMMARY

REQUIRED	PHASE 1	PHASE 2	TOTAL	PROVIDED
West Tower	146		146	
East Tower		268	268	
Units	146	268	414	
Hand count reduced by 12				402
Parking Req. (0.75 Units)	70	131	201	
Hand Count	14	27	41	
Proposed Req.	64	158	222	
TOTAL			222	394

no. date revision

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

Do not scale drawings.

This drawing may not be used for construction until signed.

Copyright reserved.

LEGEND:

- PROPOSED FIRE ROUTE
- PROPOSED BUILDING TO BE DEMOLISHED
- EXISTING TRAFFIC LIGHT
- EXISTING FIRE HYDRANT
- CONC. CURBS DETAIL TO CITY OF OTTAWA STANDARD SC-7
- BIKE PARKING SPACE
- BOLLARD
- ANCHOR
- VALVE BOX
- PULL BOX
- MONITORING WELL
- CONCRETE PLANTER
- EDGE OF SIDEWALK
- PROPERTY LINE
- SETBACK
- PROPOSED DEPRESSED CURB DETAIL TO CITY OF OTTAWA STANDARD SC-7
- EXTENT OF PARKLAND
- CURB TO BE REBUILT
- ROLL CURB
- DEMOLITION
- EXISTING UTILITY POLE
- GAS SERVICE REGULATOR
- MAINTENANCE HOLE SANITARY
- TRAFFIC SIGNAL LIGHT
- LIGHT STANDARD
- UNDERGROUND PARKING
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- SIGNAGE FOR ACCESSIBLE PARKING SPACE
- SIGNAGE FOR FIRE ROUTE ACCESS
- EXISTING SIGN
- EXISTING LIGHT POLE
- NEW LIGHT POLE
- PROPOSED WALL MOUNTED LIGHT
- EXISTING STREET LIGHTING BOX
- EXISTING TRAFFIC SIGNAL BOX
- MAINTENANCE HOLE HYDRO
- MAINTENANCE HOLE TRAFFIC
- EXISTING TREE

SCALE 1 : 150

TAGGART REALTY MANAGEMENT

PROJECT TEAM

ARCHITECT
HOBIN ARCHITECTURE
PATRICK BISSON
T 613-238-7200

PLANNING
POTERN CONSULTANTS INC.
STEPHANIE MORRIS
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CIVIL
J.L. RICHARDS
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CSW LANDSCAPE ARCHITECTS
SHERI EDWARDS
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ENVIRONMENTAL
GRADIENT WIND ENGINEERING
JOSHUA FOSTER
T 613-858-0834

SUBVEYOR
STANTEC
BRIAN WEBSTER
T 613-229-7444

PROJECT LOCATION:
TAGGART REALTY
1081 CARLING AVE.
OTTAWA ON.

DRAWING TITLE:
SITE PLAN

DRAWN BY: DATE: SCALE:
PB 22.10.19 1:150

PROJECT:
2117

DRAWING NO.:
A1.00

REVISION NO.:



ASSOCIATION OF ONTARIO
LAND SURVEYORS
PLAN SUBMISSION FORM
2169023

THIS PLAN IS NOT VALID
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ORIGINAL COPY
ISSUED BY THE SURVEYOR
In accordance with
Regulation 1026, Section 29(3)



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

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**TOPOGRAPHIC PLAN OF
LOTS 1280, 1282, 1284, 1286, 1295
1297 1299 AND 1301
REGISTERED PLAN 157
CITY OF OTTAWA**

Scale 1:200
0 5 10 METRES

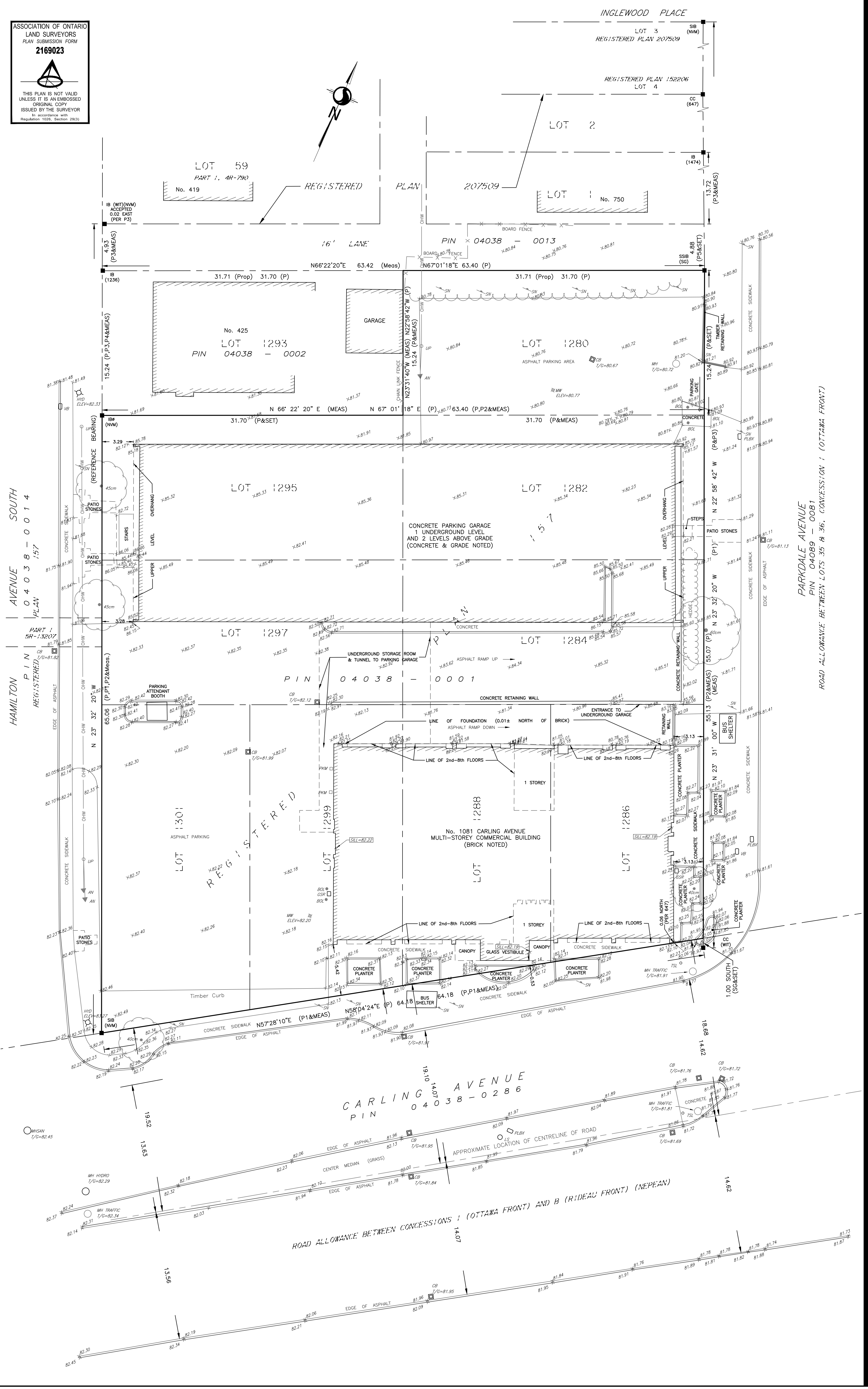
METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES
AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING NOTE
BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE DERIVED
FROM THE EASTERLY LIMIT OF HAMILTON AVENUE SOUTH SHOWN AS
N23°32'20"W ON PLAN D-50, BA1486.

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC VERTICAL DATUM
(CGVD-1928/1978) AND ARE DERIVED FROM CAN NET NETWORK MONUMENT:
OTTAWA ELEVATION 95.230.

LEGEND (IF APPLICABLE)

SYMBOL	DENOTES	FOUND MONUMENTS
IB	IRON BAR	FOUND MONUMENTS
IB@	ROUND IRON BAR	SET MONUMENTS
SIB	STANDARD IRON BAR	IRON BAR
SSIB	SHORT STANDARD IRON BAR	ROUND IRON BAR
CC	CUT CROSS	STANDARD IRON BAR
CP	CONCRETE PIN	SHORT STANDARD IRON BAR
WIT	WITNESS	CUT CROSS
PI#	PROPERTY IDENTIFICATION NUMBER	CONCRETE PIN
MEAS	MEASURED	WITNESS
PROP	PROPORTIONED	PROPERTY IDENTIFICATION NUMBER
OU	ORIGIN UNKNOWN	MEASURED
SG	STANTEC GEOMATICS LTD.	PROPORTIONED
647	H.R. FARLEY O.L.S.	ORIGIN UNKNOWN
1236	P.A. RIDDELL O.L.S.	STANTEC GEOMATICS LTD.
1474	M.E. RENAUD O.L.S.	H.R. FARLEY O.L.S.
P1	REGISTERED PLAN 157	P.A. RIDDELL O.L.S.
P2	PLAN D-50, BA1486	M.E. RENAUD O.L.S.
P3	PLAN BY 1474 DATED FEBRUARY 19, 1973	REGISTERED PLAN 157
P4	PLAN BY 1236 DATED SEPT. 4, 1973	PLAN D-50, BA1486
P5	REGISTERED PLAN 207509	PLAN BY 1474 DATED FEBRUARY 19, 1973
		PLAN BY 1236 DATED SEPT. 4, 1973
		REGISTERED PLAN 207509
ACU	AIR CONDITIONING UNIT	REGISTERED PLAN 157
AN	ANCHOR	PLAN D-50, BA1486
AP	AIR PUMP	PLAN BY 647 DATED FEBRUARY 19, 1973
ANT	ANTENNA	PLAN BY 1474 DATED FEBRUARY 19, 1973
BH	BOREHOLE	PLAN BY 1236 DATED SEPT. 4, 1973
BIB	BOREHOLE	REGISTERED PLAN 207509
BKR	BIKE RACK	AIR CONDITIONING UNIT
BENCH	BENCH	ANCHOR
BOUL	BOULDER	AIR PUMP
CB	CATCH BASIN	ANTENNA
DCB	DOUBLE CB	BOREHOLE
CBMH	CB MANHOLE	BOREHOLE
DCBMH	DOUBLE CB MANHOLE	BIKE RACK
SICB	SIDE INLET CB	BOREHOLE
CHM	CHIMNEY	BIKE RACK
CO	CURB STOP VALVE	BOREHOLE
CSV	CURB STOP VALVE	BIKE RACK
DRN	DRAIN	BOREHOLE
EPOST	ELECTRICAL OUTLET	BIKE RACK
FP	FLAG POLE	BOREHOLE
FLOOD	FLOOD LIGHT	BIKE RACK
FTL	FUEL TANK FILLER CAP	BOREHOLE
GC	GARBAGE CAN	BIKE RACK
GFL	PIPE FLANGE (GAS)	BOREHOLE
GFP	GAS FUEL PUMP	BIKE RACK
GP	POLE GUYS	BOREHOLE
CSR	GAS SERVICE REGULATOR	BIKE RACK
GV	GAS VALVE	BOREHOLE
HIC	HICKENBOTTOM	BIKE RACK
HDS	HEADSTONE	BOREHOLE
HLS	HYDRO LIGHT STANDARD	BIKE RACK
HM	HYDRO METER	BOREHOLE
HTN	HYDRO TRANSFORMER	BIKE RACK
HW	HAND WELL	BOREHOLE
HYD	FIRE HYDRANT	BIKE RACK
JBX	JUNCTION BOX	BOREHOLE
LS	LIGHT STANDARD	BIKE RACK
MB	MAILBOX	BOREHOLE
MP	MONITORING PIN	BIKE RACK
MH	MAINTENANCE HOLE UNIDENTIFIED	BOREHOLE
MHP	MAINTENANCE HOLE BELL	BIKE RACK
MHF	MAINTENANCE HOLE FIBRE OPTIC	BOREHOLE
MHH	MAINTENANCE HOLE HYDRO	BIKE RACK
MHSA	MAINTENANCE HOLE SANITARY	BOREHOLE
MHST	MAINTENANCE HOLE STORM	BIKE RACK
MHT	MAINTENANCE HOLE TRAFFIC	BOREHOLE
MW	MONITORING WELL	BIKE RACK
NPB	NEWS PAPER BOX	BOREHOLE
OLS	LIGHT STANDARD ORNAMENTAL	BIKE RACK
OW	OBSERVATION WELL	BOREHOLE
PKM	PARKING METER	BIKE RACK
PMB	PULL BOX	BOREHOLE
PLQ	PLAQUE	BIKE RACK
PLR	PILLAR	BOREHOLE
RHS	RAILWAY SWITCH STAND	BIKE RACK
SAT	SATELLITE DISH	BOREHOLE
SCLP	SCULPTURE	BIKE RACK
SCP	SUMP/CATCH PIT	BOREHOLE
SCV	SPRINKLER CONTROL VALVE	BIKE RACK
SH	SPRINKLER HEAD	BOREHOLE
SN	SIAMSE CONNECTION	BIKE RACK
SPAN	SOLAR PANEL	BOREHOLE
SPT	SEPTIC TANK LID	BIKE RACK
TBL	TABLE	BOREHOLE
TB BELL	TERMINAL BOX - BELL	BIKE RACK
TB CATV	TERMINAL BOX - CABLE	BOREHOLE
TCB	TRAFFIC CONTROL BOX	BIKE RACK
TFP	TEST PIT	BOREHOLE
TSL	TRAFFIC SIGNAL LIGHT	BIKE RACK
UMC	MARKER BELL UNDERGROUND	BOREHOLE
UMG	MARKER GAS UNDERGROUND	BIKE RACK
UMD	MARKER OIL UNDERGROUND	BOREHOLE
UP	UTILITY POLE	BIKE RACK
VB	VALVE BOX	BOREHOLE
VC	VALVE CHAMBER	BIKE RACK
WV	WATER VALVE	BOREHOLE
	TREE CONIFEROUS	BIKE RACK
	TREE DECIDUOUS	BOREHOLE
OHW	OVERHEAD WIRE	BIKE RACK



SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
1. THE SURVEY WAS COMPLETED ON THE 1st DAY OF JUNE, 2021.

DATE _____ BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

DRAWN: NJ CHECKED: BW PM: BW FIELD: AW/NB PROJECT No.: 161614366-111

This plan was signed with a scanned signature as a result of the Emergency Order related to the COVID-19 pandemic.

Appendix B

Pre-Consultation Notes and
Email Correspondences

Pre-Application Consultation Meeting Notes

Property Address: 1081 Carling Avenue

File No: PC2021-0219

Date: Wednesday, June 30, 2021

Via Microsoft Teams

Attendees:

City of Ottawa

- Kimberley Baldwin, File Lead
- Holly Newitt, Student Planner
- Christopher Moise, Urban Design
- Nishant Jhamb, Engineering
- Wally Dubyk, Transportation
- Mark Richardson, Forestry
- Mike Russett, Parks

Applicant Team

- Paul Black, Fotenn
- Tamara Nahal, Fotenn
- Braden Walker, Taggart
- Derek Howe, Taggart
- Julie Taggart, Taggart
- Jeff Parkes, Taggart
- Kyle Kazda, Taggart
- Patrick Bisson, Hobin Architecture
- Mark Baker, Parsons
- Matt Mantle, Parsons
- Lucie Darlymple, JL Richards
- Alexandre Tourigny, JL Richards
- Guy Forget, JL Richards

Subject: 1081 Carling Avenue

Opening & attendee introduction

- Introduction of meeting attendees

Overview of proposal

Site context

- Bounded by three streets, Carling Avenue, Parkdale and Hamilton. Low-rise residential neighbourhood abutting the north property lines.
- Immediately east is an existing apartment building and the civic hospital
- Existing on site is an office building with surface and built parking
- Currently a split zoning designation across the site (AM10 [2196]– along Carling Avenue and AM2 H(11) – back portion of site)

- Close to proposed O-train station at Parkdale and Carling

Proposal

- Proposed two high rise buildings – 22 storeys (west tower) and 28 storeys (east tower). Each tower proposes includes a 6-storey podium.
- City road widening along Carling is planned but would like to discuss reducing this corridor
- Size of the site would trigger parkland dedication
- Transition has been explored through the High-rise Building Design Guidelines
- The east building was shifted away from Carling Avenue to provide an open landscaped area at the corner of Carling and Parkdale
- Two proposed access points for underground parking - one off of Parkdale and one off of Hamilton but layout is not confirmed

Preliminary comments and questions from staff and agencies:

Planning (Kimberley Baldwin)

- Designated Arterial Mainstreet in the Official Plan. Policies found in 3.6.3 of Plan
 - Policy 12 in 3.6.3 - High-rise buildings may only be permitted subject to a zoning amendment and where the building is located at a specific node (as described in the OP) and *where the development provides a community amenity and adequate transition is provided to adjacent low-rise*. The site is located at a node (adjacent to a Major Urban Facility). See below for further direction on how planning and urban design staff will evaluate this policy.
- Transition
 - The proposal will need to demonstrate adequate transition is provided to adjacent low-rise residential (see also Urban Design guidance below)
 - Adequate transition to rise from the maximum permitted height of adjacent residential – adjacent R3 zone permits a maximum height of 11 metres.
 - Additional visual analysis is required to assess what may be considered adequate transition to the sensitive low-rise neighbourhood to the north – see policies in Section 4.11, particularly policies 12 and 13, of the OP for further direction.
 - Eg. adequate transition accomplished through incremental changes in building height (angular planes) and building setbacks and stepbacks.
- High-rise buildings
 - See Policies for High-Rise Buildings in Policies 14-18 in Section 4.11 of the OP
 - Proposal to demonstrate how the base of the high-rise building respects the scale of adjacent residential and will relate positively to the proposed park (ie. limit shadowing, animating park)
 - Direction on tower separation and floor plates
 - Urban Design Guidelines for High-Rise Buildings
 - 23 metre separation between towers
 - 20 metre tower setback from abutting low-rise residential property lines (proposed east tower currently shown approximately 10 metres from adjacent residential property, proposed west tower 17 metres from adjacent residential property.)

- Zoning performance standards (eg. setbacks) in the AM zone contemplates buildings up to 9 storeys in height. A high-rise building in this context will require a closer examination to determine appropriate setbacks for a high rise-built form (10+ storeys).
- Amenity Areas
 - A Shadow Analysis is required to evaluate the potential impacts of the development on the adjacent low-rise residential properties and the proposed park to the north.
 - Avoid shadow patterns on adjacent public and private spaces. (Policy 14 a) of 4.11)
 - Siting and design of buildings shall minimize undesirable impacts on the existing private amenity spaces of adjacent residential units (Policy 19 of 4.11)
- Public Art - Explore opportunities to provide public art on site. (Policy 21 of Section 4.11)

Urban Design (Christopher Moise)

- This proposal runs along one of the City's Design Priority Areas and must attend the City's UDRP for a formal visit once a full submission is made. However, we recommend the proposal attend an Informal visit (prior to a full submission and which is not a public meeting), with the City's UDRP to further discuss and evaluate various scenarios of development for the whole site;
- We have the following comments/questions relating to the proposed design:
 - In other locations where increased density are contemplated along Carling and where an established and sensitive residential community is adjacent we pay special attention to the potential impacts of height and how transition is being considered in addition to how the tall building guidelines are addressed;
 - **Transition:** Separation is one tool (minimum 20m which is not achieved for the west tower) but we also would like to see additional analysis using a 45 degree angular plane measured from the northern lot lines drawn from the allowable height of that zone;
 - **Tower separation:** Minimum 23m (not achieved);
 - **Floor plate maximums:** 750m²
 - **Podium scale:** The podium should investigate a transition of scale toward the north through stepping the massing;
 - We recommend that alternative massing be investigated and illustrated in the design brief to show some analysis of different approaches to the site. As there are already deficiencies in various high-rise guidelines we are not currently convinced that this site is large enough to accommodate two high-rise towers;
- A scoped Design Brief is a required submittal for all Site Plan/Re-zoning applications and can be combined with the Planning Rationale. Please see the Design Brief Terms of Reference provided and consult the City's website for details regarding the UDRP schedule.
- This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. We are happy to assist and answer any questions regarding the above. Good luck.

Parks Planning (Mike Russett)

- 10% development area dedication requirement.
- If Section 37 is applicable, please direct to park design/construction.
- note potential for OBC Limiting Distance Agreement, and Limiting Distance Compensation Agreement requirements

Forestry (Mark Richardson)

Tree Conservation Report requirements:

- A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
 - An approved TCR is a requirement of Site Plan approval.
- As of January 1 2021, any removal of privately-owned trees 10cm or larger in diameter, or publicly (City) owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
- The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
 - If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
 - Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
- The TCR must list all trees on site by species, diameter and health condition
- Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
- The TCR must list all trees on adjacent sites if they have a critical root zone that extends onto the development site
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
- All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
 - the location of tree protection fencing must be shown on a plan
 - show the critical root zone of the retained trees
 - if excavation will occur within the critical root zone, please show the limits of excavation
- The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
- For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

LP tree planting requirements:

- For additional information on the following please contact tracy.smith@Ottawa.ca
- Minimum Setbacks
 - Maintain 1.5m from sidewalk or MUP/cycle track.
 - Maintain 2.5m from curb
 - Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
 - Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
 - Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
- Tree specifications
 - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
 - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
- Hard surface planting
 - Curb style planter is highly recommended
 - No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
 - Trees are to be planted at grade
- Soil Volume
 - Please ensure adequate soil volumes are met:

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

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

Engineering

Important notes

- Please note that these comments are considered preliminary based on the information available to date and therefore maybe amended as additional details become available and presented to the City. It is the responsibility of the applicant to verify the above information. The applicant may contact me for follow-up questions related to engineering/infrastructure prior to submission of an application if necessary.
- Please control post-development runoff from the subject site, up to and including the **100-year storm event**, to a **2-year pre-development level**. The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than 0.5.
- Please provide the new and existing Sanitary sewer discharge and we will confirm if sanitary sewer main has the capacity.
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m³/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration*.
- Road Resurfacing and new transit construction is planned on Carling Ave. this season, please note that once the road is resurfaced, a road cut permit will not be issued on Carling Ave for three years. <https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/road-activity-law-no-2003-445#road-activity-law-no-2003-445>
Please let me know if more information is required on the proposed construction work on Carling Ave.

General:

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.
- Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided and all easements shall be shown on the engineering plans.
- A deep excavation and dewatering operations have the potential to cause damages to the neighboring adjacent buildings/ City infrastructure. Document that construction activities (excavation, dewatering, vibrations associated with construction, etc.) will not have an impact on any adjacent buildings and infrastructure.
- A **Record of Site Condition (RSC) in accordance with O.Reg. 153/04** will be required to be filed and acknowledged by the Ministry prior to issuance of a building permit due to a change to a more sensitive property use.
- A CCTV inspection and report is required to ensure existing services to be re-used are in good working order and meet current minimum size requirements. Located services to be placed on site servicing plans.
- All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not extend either above or below into the existing property lines and sight triangles.
- Reference documents for information purposes:
 - Ottawa Sewer Design Guidelines (October 2012)
 - Technical Bulletin PIEDTB-2016-01
 - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
 - Ottawa Design Guidelines - Water Distribution (2010)
 - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
 - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
 - City of Ottawa Environmental Noise Control Guidelines (January 2016)
 - City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
 - Ottawa Standard Tender Documents (latest version)
 - Ontario Provincial Standards for Roads & Public Works (2013)
 - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).
- Please note that this is the applicant responsibility to refer to the latest applicable guidelines while preparing reports and studies.

Disclaimer:

The City of Ottawa does not guarantee the accuracy or completeness of the data and information contained on the above image(s) and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the image(s) provided. This image is for schematic purposes only.

**Stormwater Management Criteria and Information:**

- **Water Quantity Control:** In the absence of area specific SWM criteria please control post-development runoff from the subject site, up to and including the **100-year storm event**, to a **2-year pre-development level**. The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than 0.5. [If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5]. The time of concentration (T_c) used to determine the pre-development condition should be calculated. T_c should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; T_c of 10 minutes shall be used for all post-development calculations].
- Any storm events greater than the established **2-year allowable** release rate, up to and including the **100-year storm event**, shall be detained on-site. The SWM measures required to avoid impact on downstream sewer system will be subject to review.
- Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. **It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.**

- **Water Quality Control:** Please consult with the local conservation authority (RVCA) regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report.
- Please note that as per *Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14)* **there shall be no surface ponding on private parking areas during the 5-year storm rainfall event.**
- **Underground Storage:** Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.
 - When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**
 - In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.
 - Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 2- and 100-year event storage requirements.
 - In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.
 - Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.
- Please note that the minimum orifice dia. for a plug style **ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s** in order to reduce the likelihood of plugging.
- Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.
- Please provide a **Pre-Development Drainage Area Plan** to define the pre-development drainage areas/patterns. **Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution.**
- **If rooftop control** and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a **Roof Drain Plan** as part of the submission.
- If **Window wells** are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.

- There must be at least **15cm of vertical clearance** between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.
- Rear yard on grade parking to be permeable pavement. Refer to City Standard Detail Drawings SC26 (maintenance/temp parking areas), SC27 or permeable asphalt materials. No gravel or stone dust parking areas permitted.
- Street catch basins are not to be located at any proposed entrances.

Storm Sewer:

- STM (2005) 600mm CONC on Parkdale, STM 300mm Conc on Carling and STM 300mm(1980) CONR on Hamilton is available
- A storm sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices.

Sanitary Sewer

- SAN (2005) 375mm PVC on Parkdale
- SAN 225mm (1936) Conc on Carling
- SAN 300mm (1980) CONR on Hamilton
- Please provide the new Sanitary sewer discharge and we will confirm if sanitary sewer main has the capacity.
- Please apply the wastewater design flow parameters *in Technical Bulletin PIEDTB-2018-01*.
- Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.
- A backwater valve is required on the sanitary service for protection.
- Include correspondence from the Architect within the Appendix of the report confirming the number of residential units per building **and a unit type breakdown for each of the buildings** to support the calculated building populations.

Water:

- A WTR(2006) 305mm PVC on Parkdale
- WTR 406mm (1913) UCI on Carling
- WTR 152mm (1935) UCI on Hamilton
- Existing residential service to be blanked at the main.
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m³/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration*.
- Please **review Technical Bulletin ISTB-2018-0**, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A **hydrant coverage figure** shall be provided and **demonstrate there is adequate fire protection for the proposal**. Two or more public hydrants are anticipated to be required to handle fire flow.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following

information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.

- Type of Development and Units
- Site Address
- A plan showing the proposed water service connection location.
- Average Daily Demand (L/s)
- Maximum Daily Demand (L/s)
- Peak Hour Demand (L/s)
- Fire Flow (L/min)
 - *[Fire flow demand requirements shall be based on **Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 1999**]*
 - *Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).*
- **Hydrant capacity shall be assessed to demonstrate the RFF can be achieved.**
Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

Other Construction projects:

New Transit	On Carling Ave. from Bayswater Ave to Sir John A Macdonald Pky	Start in 2021
Road Resurfacing	On Carling Ave. from Bayswater Ave to Marivale Road	Start in 2021

Snow Storage:

- Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patterns or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

Trees:

- Please note that a new Tree By-law is now in effect.

Sensitive marine clay:

- If Sensitive marine clay soils are present in this area that are susceptible to soil shrinkage that can lead to foundation and building damages. All six (6) conditions listed in the Tree Planting in Sensitive Marine Clay Soils-2017 Guidelines are required to be satisfied. Note that if the plasticity index of the soil is determined to be less than 40% a minimum separation between a street tree and the proposed building foundations of 4.5m will need to be achieved. A memorandum addressing the Tree in Clay Soil Guidelines prepared by a geotechnical engineer is required to be provided to the City. <https://ottawa.ca/en/city-hall/planning-and-development/community-plans-and-design-guidelines/design-and-planning/completed-guidelines/tree-planting-sensitive-marine-clay-soils-2017-guidelines>

Severance:

- If severance is planned, this needs to be addressed in servicing to satisfy severance requirements. Where a large parcel with multiple buildings is planned, City will require an ultimate servicing plan so as to appropriately understand how severance requirements are being met.

Gas pressure regulating station

- A gas pressure regulating station may be required depending on HVAC needs (typically for 12+ units). Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is to ensure that there are no barriers for overland flow routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.

Regarding Quantity Estimates:

- Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities. In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

Source Protection Policy Screening (SPPS):

- The address lies within the Mississippi-Rideau Source Protection Region and is subject to the policies of the Mississippi-Rideau Source Protection Plan.
- The area is not located within a Surface Water Intake Protection Zone (IPZ) where significant threat policies apply.
- The area is not located within a Wellhead Protection Area (WHPA).
- The area is not located within a Significant Groundwater Recharge Area (SGRA).
- The area is not located within a Highly Vulnerable Aquifer (HVA).
- In terms of the development application, please note that the address is not located in an area where activities could be considered a significant threat to drinking water sources and there are no legally binding source protection policies.

CCTV sewer inspection

- CCTV sewer inspection required for pre and post construction conditions to ensure no damage to City Assets surrounding site.

Pre-Construction Survey

- Pre-Construction (Piling/Hoe Ramming or close proximity to City Assets) and/or Pre-Blasting (if applicable) Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise to residents within 150 m of site. Conditions for Pre-Construction/Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.

Road Reinstatement

- Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By-Law 2003-445 and City Standard Detail Drawing R10. The amount of overlay will depend on condition of roadway and width of roadway(s).

Required Engineering Plans and Studies:

- **Plans:**
 - Existing Conditions and Removals Plan
 - Site Servicing Plan
 - Grade Control and Drainage Plan
 - Erosion and Sediment Control Plan
 - Roof Drainage Plan
 - Foundation Drainage System Detail (if applicable)
 - Topographical survey
- **Reports:**
 - Site Servicing and Stormwater Management Report
 - Geotechnical Study/Investigation
 - Noise Control Study
 - Phase I ESA
 - Phase II ESA (Depending on recommendations of Phase I ESA)
 - RSC (Record of the site Conditions)
 - Site lighting certificate
 - Wind analysis
- Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:**
- Specific information has been incorporated into both the [Guide to Preparing Studies and Plans](#) for a site plan. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.
- Added to the general information for servicing and grading plans is a note that an O.L.S. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an O.L.S. for development projects is emphasized.

Phase One Environmental Site Assessment:

- A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.
- The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.
- Official Plan Section 4.8.4: <https://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety>

RSC (Record of the site Conditions)

- A RSC is required when changing the land use (zoning) of a property to a more sensitive land use and **a memorandum prepared by an environmental consultant confirming that no potential contaminating activities have taken place within the RSC area since the filling of the RSC.** [Submitting a record of site condition | Ontario.ca](#)

Geotechnical Investigation:

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long-term damages associated with lowering the groundwater in this area.

- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.
<https://documents.ottawa.ca/sites/default/files/documents/cap137602.pdf>

Noise Study:

- A **Transportation Noise Assessment** is required as the subject development is located within 100m proximity of Carling Ave
- A **Stationary Noise Assessment** is required in order to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.

Wind analysis:

- When greater than 9 storey in height Wind Study for all buildings/dwellings.
- A wind analysis must be prepared, signed and stamped by an engineer who specializes in pedestrian level wind evaluation. Where a wind analysis is prepared by a company which do not have extensive experience in pedestrian level wind evaluation, an independent peer review may be required at the expense of the proponent.
- [Terms of Reference: Wind Analysis \(ottawa.ca\)](#)

Exterior Site Lighting:

- Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a **Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

Fourth (4th) Review Charge:

- Please be advised that additional charges for each review, after the 3rd review, will be applicable to each file. There will be no exceptions.

Construction approach:

- Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the Site Plan process to determine the ability to construct site and copy File Lead on this request.

Transportation (Wally Dubyk)

- Carling Avenue is targeted for resurfacing starting this season.
- The Screening Form has indicated that the TIA Triggers have been met. Please proceed with the TIA Step 2 – Forecasting Report.
- Update to the TIA Guideline Forecasting Report
 - We would like to inform all consultants making TIA Forecasting Report submissions to the City of Ottawa as part of a development application, that all new applications (pre-consultation meetings dated after March 3, 2021) must use the NEW TRANS Trip Generation Manual when forecasting site generated trips using this manual (see attached).
 - The TRANS committee (a joint transportation planning committee serving the National Capital region) finalized a new manual early in March 2021. The document will be available

in French and English on the TRANS website <http://www.ncr-trans-rcn.ca/surveys/2009-trip-generation>.

- The new manual has simplified the conversion from vehicle trips to person trips and then trips by modal share. The City has also developed a spreadsheet that will apply the factors of location and building type to quickly provide the existing trip numbers by mode share.
- Carling Avenue is designated as an Arterial road within the City's Official Plan with a ROW protection limit of 44.5 metres. The ROW protection limit and the offset distance (22.25 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City.
- ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.
- Parkdale Avenue is classified as an Arterial road. There are no additional protected ROW limits identified in the OP.
- A 5.0 metres x 5.0 metres sight triangle would be required at the intersection of Carling Avenue and Parkdale Avenue. The sight triangle area is to be conveyed to the City and is to be shown on all drawings. The sight triangle dimensions are to be measured from the ROW protected limits.
- A 5.0 metres x 5.0 metres sight triangle would be required at the intersection of Parkdale Avenue and Hamilton Avenue. The sight triangle area is to be conveyed to the City and is to be shown on all drawings. The sight triangle dimensions are to be measured from the ROW protected limits.
- The proponent shall comply with the Private Approach By-Law 2003-447
- No private approach shall be constructed within 0.3 metres of any adjacent property measured at the highway line, and at the curb line or roadway edge.
- The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.
- Ensure that the driveway grade does not exceed 2% within the private property for a distance of 9.0 metres from the ROW limit; see Section 25 (u) of the Private Approach By-Law #2003-447. Any grade exceeding 6% will require a subsurface melting device. For private property, the mechanism to vary the slope is a minor variance. The consultant would need to provide technical rationale.
- All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend either above or below into the existing property lines, sight triangles and/or future road widening protection limits.
- The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.
- Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.
- A construction Traffic Management Plan is to be provided for approval by the Senior Engineer, Traffic Management, Transportation Services Dept.

City Surveyor

- The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
- Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

Next steps

- We encourage the applicant to discuss the proposal with the local Councillor and the community association
- City staff to send follow-up email confirming submission requirements

Alexandre Tourigny

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Friday, July 30, 2021 10:49 AM
To: Alexandre Tourigny
Subject: RE: 1081 Carling Avenue Stormwater Quality

[CAUTION] This email originated from outside JLR. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt, please forward suspicious emails to Helpdesk.

Hi Alexandre,

Based on the proposed site plan, the RVCA will not require any additional water quality protections. Best management practices are encouraged to be implemented where possible.

Thanks,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: Emma Bennett <emma.bennett@rvca.ca>
Sent: Friday, July 30, 2021 9:55 AM
To: Eric Lalande <eric.lalande@rvca.ca>
Subject: FW: 1081 Carling Avenue Stormwater Quality

Hi Eric,

Here's an inquiry about stormwater quality.

Happy Friday!
Emma

From: LRC Info <info@lrconline.com>
Sent: Friday, July 30, 2021 9:03 AM
To: Emma Bennett <emma.bennett@rvca.ca>
Subject: FW: 1081 Carling Avenue Stormwater Quality

From: RVCA Info <info@rvca.ca>
Sent: Thursday, July 29, 2021 3:08 PM
To: LRC Info <info@lrconline.com>
Subject: Fw: 1081 Carling Avenue Stormwater Quality

From: Alexandre Tourigny <atourigny@jlrichards.ca>
Sent: July 29, 2021 2:13 PM

To: RVCA Info <info@rvca.ca>

Cc: Braden Walker <braden.walker@taggart.ca>; Derek Howe <derek.howe@taggart.ca>

Subject: 1081 Carling Avenue Stormwater Quality

Good afternoon,

J.L.Richards & Associates Ltd. has been retained by Ownership Group 1081 Carling Avenue Ltd. care of Taggart Realty Management (TRM) to prepare an Assessment of Adequacy of Public Services (AAPS) Report and functional-level drawings of municipal infrastructure in support of two high-rise residential towers of both 22-storeys and 28-storeys sited at 1081 Carling Avenue in the City of Ottawa. The subject site currently consists of an existing commercial building and by adjacent surrounding parking within the 1081 Carling Avenue parcel. The site currently consists of a combination of asphalt and building which makes the subject site fully impervious.

The preliminary site plan is attached for reference.

Based on the above description of the site and the accompanying site plan, and considering that we are replacing an asphalt parking area with a building rooftop and landscape features, we would like to confirm that the proposed project will not require any stormwater quality control measures.

Please let me know if you have any questions.

Thank you,
Alex

Alexandre Tourigny, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4522



**J.L. Richards
& Associates Limited**
ENGINEERS • ARCHITECTS • PLANNERS



Platinum
member

*J.L. Richards & Associates Limited is proactively doing our part to protect the wellbeing of our staff and communities while improving our communication technology. **We are pleased to announce that we have implemented direct phone lines for all of our staff, allowing you to connect with us regardless of whether we are working remotely or in the office.** We are dedicated to delivering quality services to you through value and commitment, as always. Please reach out to us if you have any questions about your project.*

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

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

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

4.1 General Content

- Executive Summary (for larger reports only).
- Date and revision number of the report.
- Location map and plan showing municipal address, boundary, and layout of proposed development.
- Plan showing the site and location of all existing services.
- Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- Summary of Pre-consultation Meetings with City and other approval agencies.
- Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.
- Statement of objectives and servicing criteria.
- Identification of existing and proposed infrastructure available in the immediate area.
- Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- Proposed phasing of the development, if applicable.

- Reference to geotechnical studies and recommendations concerning servicing.
- All preliminary and formal site plan submissions should have the following information:
 - Metric scale
 - North arrow (including construction North)
 - Key plan
 - Name and contact information of applicant and property owner
 - Property limits including bearings and dimensions
 - Existing and proposed structures and parking areas
 - Easements, road widening and rights-of-way
 - Adjacent street names

4.2 Development Servicing Report: Water

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

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

4.3 Development Servicing Report: Wastewater

- Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- Confirm consistency with Master Servicing Study and/or justifications for deviations.
- Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.
- Description of proposed sewer network including sewers, pumping stations, and forcemains.
- Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- Analysis of available capacity in existing public infrastructure.
- A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- Set-back from private sewage disposal systems.
- Watercourse and hazard lands setbacks.
- Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- Any proposed diversion of drainage catchment areas from one outlet to another.
- Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- Identification of potential impacts to receiving watercourses
- Identification of municipal drains and related approval requirements.
- Descriptions of how the conveyance and storage capacity will be achieved for the development.
- 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- Inclusion of hydraulic analysis including hydraulic grade line elevations.
- Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

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

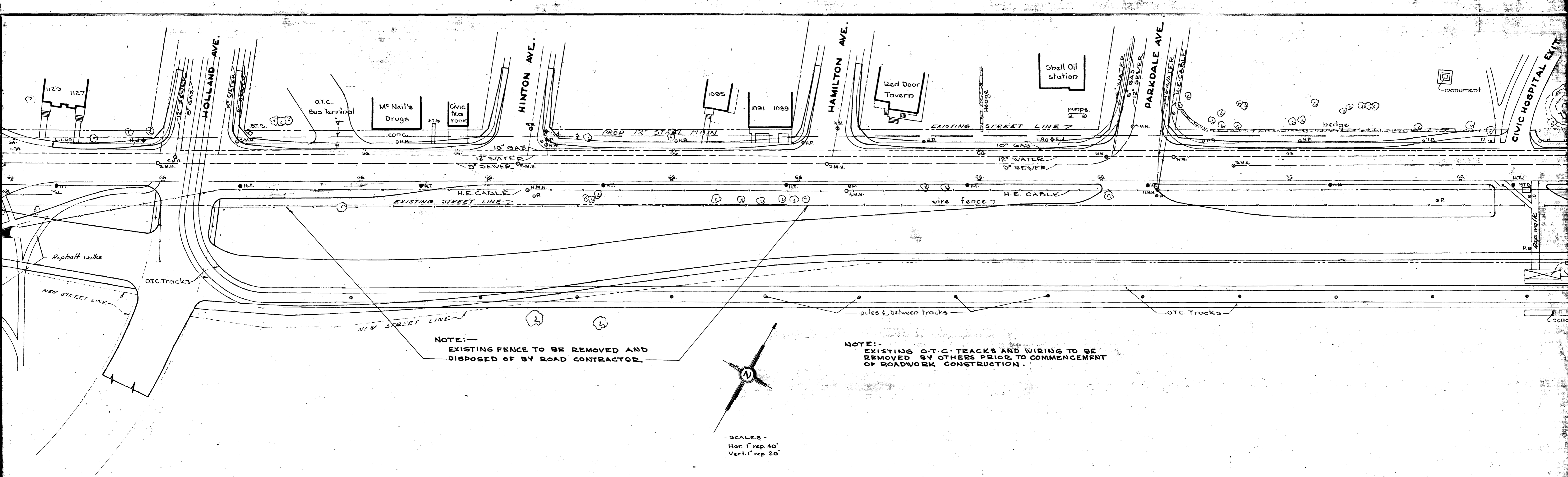
- Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for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

4.6 Conclusion Checklist

- Clearly stated conclusions and recommendations
- Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

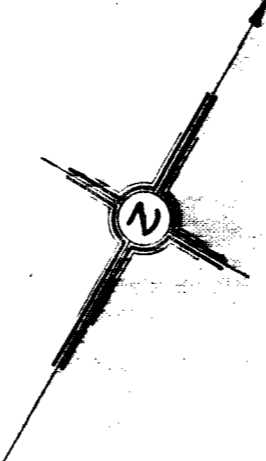
Appendix C

Background Drawings

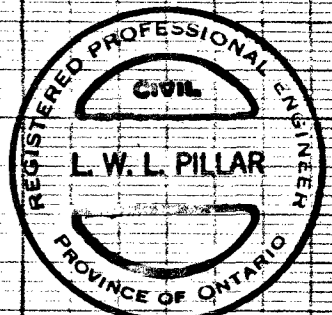
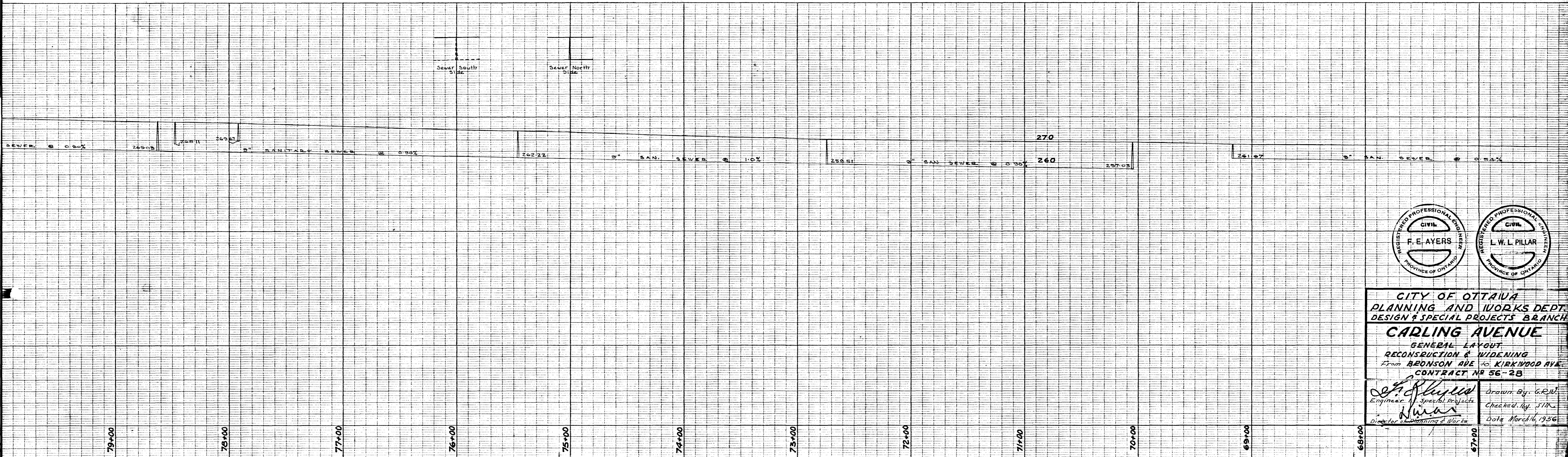


NOTE:—
EXISTING FENCE TO BE REMOVED AND
DISPOSED OF BY ROAD CONTRACTOR.

NOTE:—
EXISTING O.T.C. TRACKS AND WIRING TO BE
REMOVED BY OTHERS PRIOR TO COMMENCEMENT
OF ROADWORK CONSTRUCTION.

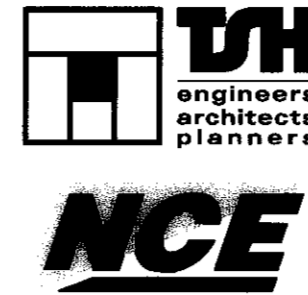


SCALES -
Hor. 1" rep. 40'
Vert. 1" rep. 20'



CITY OF OTTAWA
PLANNING AND WORKS DEPT.
DESIGN & SPECIAL PROJECTS BRANCH
CARLING AVENUE
GENERAL LAYOUT
RECONSTRUCTION & WIDENING
From BRONSON AVE TO KIRKWOOD AVE.
CONTRACT NO 56-28

Drawn By: G.R.W.
Checked By: JTK
Date: March 16, 1956



AS BUILT
APRIL 11, 2008

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal utilities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

NO.	REVISIONS	BY	DATE
1	ISSUED FOR TENDER	B.R.	07/05
2	ADDENDUM 2	B.R.	07/14/05
3	ISSUED FOR CONSTRUCTION	B.R.	08/15/05
4	AS BUILT	S.A.E.	05/11/08

PARKDALE AVENUE
ROAD RECONSTRUCTION

GRADING AND DRAINAGE
STA. 2+470 TO 2+629

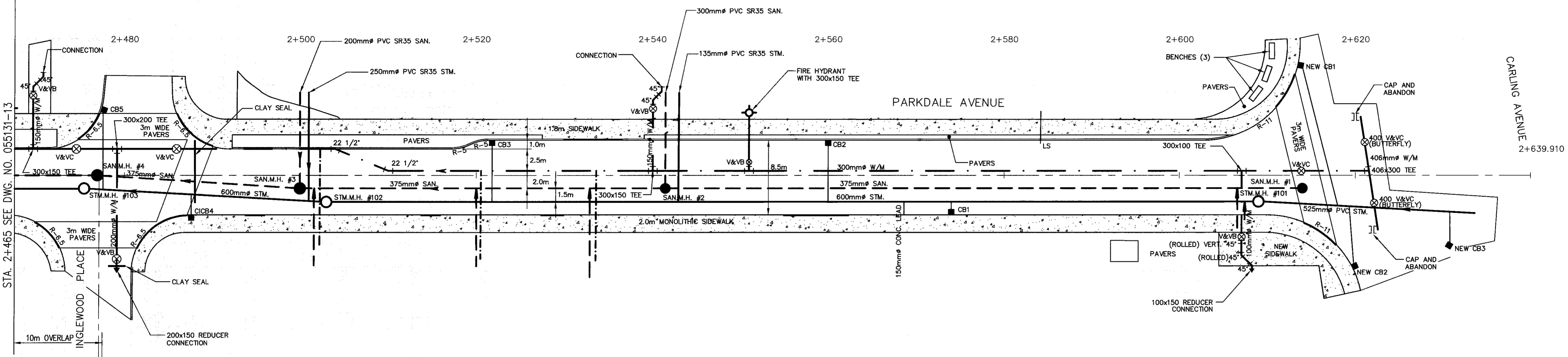


CONTRACT NO.
ISB05-5131
DWG. NO.
055131-14

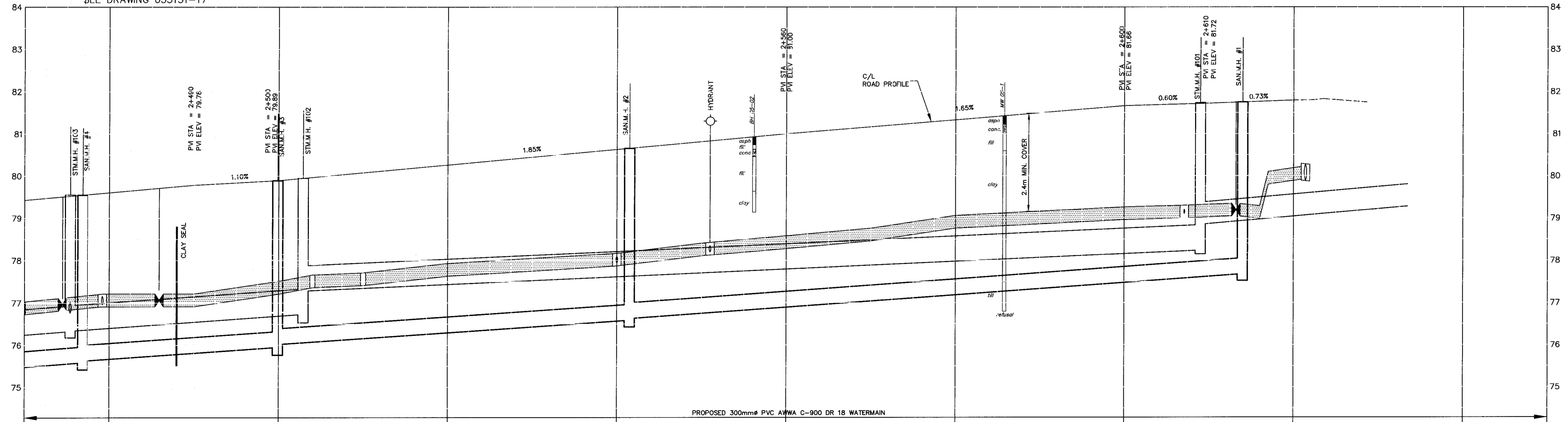
W. NEWELL, P. ENG.
Director Infrastructure Services
Dwn: L.H. Chkd: C.T.

B.M. MASON, P. ENG.
Manager Construction Services
Des: L.H. Chkd: C.T.

Date: JUNE 2005
Scale:
HORIZONTAL 1:250
VERTICAL 1:50



FOR PLAN & PROFILE
SEE DRAWING 055131-17



PROPOSED C/L ROAD ELEVATION	79.43	79.61	79.78	79.89	80.08	80.26	80.45	80.63	80.82	81.00	81.16	81.33	81.49	81.66	81.72	81.79
SANITARY SEWER INVERT	75.59	75.63	23.1m 375mm PVC SDR 35 SANITARY SEWER @ 1.39%	76.02	76.00	41.6m - 375mm PVC SDR 35 SANITARY SEWER @ 1.37%	76.63	76.62	72.5m - 375mm PVC SDR 35 SANITARY SEWER @ 1.45%	77.68	78.15	77.68	78.15	78.24	78.35	78.28
STORM SEWER INVERT	76.33	76.33	27.5m 600mm CONCRETE CL 1000 STORM SEWER @ 1.42%	76.33	76.33	106.1m 600mm CONCRETE CL 1000 STORM SEWER @ 0.90%	76.33	76.33	25.1m - 525mm PVC 1000 STORM SEWER @ 1.79%	76.33	76.33	76.33	76.33	76.33	76.33	76.33
PROPOSED TOP OF WATERMAIN	77.03	77.03	77.22	77.51	77.71	77.71	77.71	77.71	77.71	77.71	77.71	77.71	77.71	77.71	77.71	77.71
CHAINAGE	2+474.5	2+479.2	2+485.0	2+500.0	2+504.0	2+510.0	2+520.0	2+540.0	2+551.0	2+560.0	2+580.0	2+600.0	2+607.1	2+613.2	2+617.0	2+620.0

GENERAL

- FOR FURTHER INFORMATION REFER TO GEOTECHNICAL INFORMATION IN CARLING AVENUE WATERMAIN REHABILITATION REPORT FILE 06-1120-367 DATED MARCH 2007.
- CONTRACTOR TO PROTECT, AND WHERE REQUIRED, SUPPORT EXISTING UTILITIES AND TRAFFIC PLANT FROM CONSTRUCTION ACTIVITIES. BEFORE EXCAVATING CALL FOR UNDERGROUND LOCATES.
- REFER TO GL05 AND R-05 FOR REMOVALS AND REINSTATEMENT RELATED TO WATERMAIN CONSTRUCTION.

WATERMAIN NOTES

- ALL WATERMAIN MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY STANDARD SPECIFICATIONS AND STANDARD DRAWINGS.
- ALL CONNECTIONS OF NEW WATERMAIN TO EXISTING WATERMAIN AND VALVE INSTALLATIONS AND SERVICES SHALL BE PERFORMED BY CITY OF OTTAWA FORCES. THE CONTRACTOR SHALL PROVIDE EXCAVATION, BACKFILL AND REINSTATEMENT.
- A MINIMUM OF 2m SEPARATION IS REQUIRED BETWEEN ALL NEW HYDRANTS AND CATCH BASINS OR OPEN STRUCTURES AND SHALL BE INSULATED PER CITY STANDARD DETAIL W23 AS APPLICABLE.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE VIA EXCAVATION THE EXACT LOCATION AND ELEVATION OF THE EXISTING WATERMANS AS REQUIRED FOR ALL CONNECTIONS, RELOCATIONS AND BLANKINGS.

- HEAVY COMPACTION EQUIPMENT SHOULD NOT BE USED UNTIL A MINIMUM OF 800mm OF COMPACTED BACKFILL IS PLACED OVER THE PIPE. DURING BACKFILLING OPERATION, CARE SHOULD BE TAKEN TO ENSURE THAT THE BACKFILLING PROCEEDS IN EQUAL STAGES SIMULTANEOUSLY ON BOTH SIDES OF THE PIPE.
- PAVEMENT STRUCTURE**
 SURFACE COURSE - 40mm SUPERPAVE 12.5
 BASE COURSE - 80mm SUPERPAVE 19.0
 CUT REPAIR - 50mm SUPERPAVE 19.0
 OPSS GRANULAR A - 150mm
 OPSS GRANULAR B (TYPE II) - 600mm
- FINAL ASPHALT SURFACE SHOULD MATCH REMAINING PAVEMENT STRUCTURE AND EXISTING CURB AND GUTTER ELEVATIONS.
 - CONSTRUCTION TRAFFIC IS TO BE CONTROLLED TO MINIMIZE DAMAGE AND PROTECT THE INTEGRITY OF THE SUBGRADE, BASE AND SUBBASE LAYERS DURING CONSTRUCTION.
 - ALL GRANULAR MATERIALS SHOULD BE COMPACTED TO AT LEAST 98% OF STANDARD PROCTOR MAXIMUM DRY DENSITY.

SIDEWALK

- MONOLITHIC CURB AND CONCRETE SIDEWALK REINSTATEMENT AS PER CITY STANDARD SC2.
 - CONCRETE BARRIER CURB AS PER CITY STANDARD SC1.1.
 - SIDEWALKS TO BE REINSTATEMENT TO REQUIREMENTS OF OPSS 311 AND 351, AND APPLICABLE CITY OF OTTAWA STANDARD.
 - SIDEWALKS SHOULD BE PLACED ON A MINIMUM OF 150mm COMPACTED GRANULAR BASE COMPACTED TO AT LEAST 98% STANDARD PROCTOR MAXIMUM DRY DENSITY.
- UNDERGROUND UTILITIES**
 ALL UNDERGROUND LOCATES TO BE COMPLETED PRIOR TO EXCAVATION. HAND DIG ONLY WITHIN 1m OF BURIED PLANT.

HYDRO

- PRIOR TO UNDERTAKING ANY WORK CONTACT ONTARIO ONE CALL AT 1-800-400-2255 A MINIMUM OF 7 WORKING DAYS PRIOR TO THE PROPOSED DATE OF THE EXCAVATION. STEEL CURB AND SUPPORT RINGS ARE NOT TO BE USED IN THE VICINITY OF HYDRO OTTAWA UNDERGROUND PLANT.
- NO EXCAVATIONS WITHIN 5 FEET (1.5m) FROM BASE OF ALL POLES AND ANCHORS.
- ALL WORKERS AND EQUIPMENT MUST REMAIN AT ALL TIMES AT LEAST 10 FEET (3.0m) FROM OVERHEAD PRIMARY HYDRO LINES.

- CONTACT SCOTT EDEY AT (613)580-2424 EXT 23197 FOR POSSIBLE CONFLICTS WITH STREET LIGHTING SYSTEM A MINIMUM OF 48 HOURS IN ADVANCE OF CONSTRUCTION.
- ENBRIDGE CONSUMERS GAS**
- GAS MAINS MUST BE FIELD LOCATED. BEFORE DIGGING, PLEASE CALL ONTARIO ONE CALL 48 HOURS IN ADVANCE AT 1-800-400-2255 FOR FREE GAS LOCATE SERVICE. A MINIMUM OF 0.8m HORIZONTAL AND 0.3m VERTICAL CLEARANCE MUST BE MAINTAINED. VERTICAL CLEARANCE MUST BE INCREASED TO 0.8m FOR MAINS NPS 16 OR LARGER. IF INFORMATION ON COVER OF EXISTING PLANT IS NOT AVAILABLE EXPOSURE BY HAND IS REQUIRED. A MINIMUM OF 0.15m OF SAND BACKFILL PADDING IS TO BE PLACED AROUND GAS MAINS AND SERVICES BEFORE BACKFILLING WITH UNSHRINKABLE FILL.
- BELL CANADA**
- FOR ANY MODIFICATIONS TO MAINTENANCE HOLES / BELL STRUCTURE FACILITIES CONTACT COLIN LANDRIGAN AT (613)742-5786. A MINIMUM OF 48-HOURS IN ADVANCE OF THE REQUIRED WORKS.

MRC **MCCORMICK RANKIN CORPORATION**

NO.	REVISIONS	BY	DATE
	PRE-TENDER SUBMISSION	M.J.R.	MAR. 26 /07
	ISSUED FOR TENDER	M.J.R.	APR. 5 /07
	ISSUED FOR CONSTRUCTION	M.J.R.	MAY 16 /07
	AS-BUILT	M.J.R.	SEPT 10 /07

NOTE:
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CARLING AVENUE REHABILITATION
 MERIVALE ROAD TO MELROSE AVENUE
 KITCHISSIPPI AND RIVER WARDS

WATERMAIN
VALVE INSTALLATIONS

WAYNE NEWELL, P. ENG.
 Director Infrastructure Services

B. MASON, P. ENG.
 A. Manager Construction Services West

AS-BUILT

These As-Built Drawings have been prepared based on inspections and observations undertaken by MRC staff during any stages of construction and on information submitted in part by others. While this information is believed to be reliable, MRC is not responsible for its accuracy or for errors or omissions that may have been incorporated into this drawing as a result.

Ottawa

CONTRACT NO.
ISB07-5002

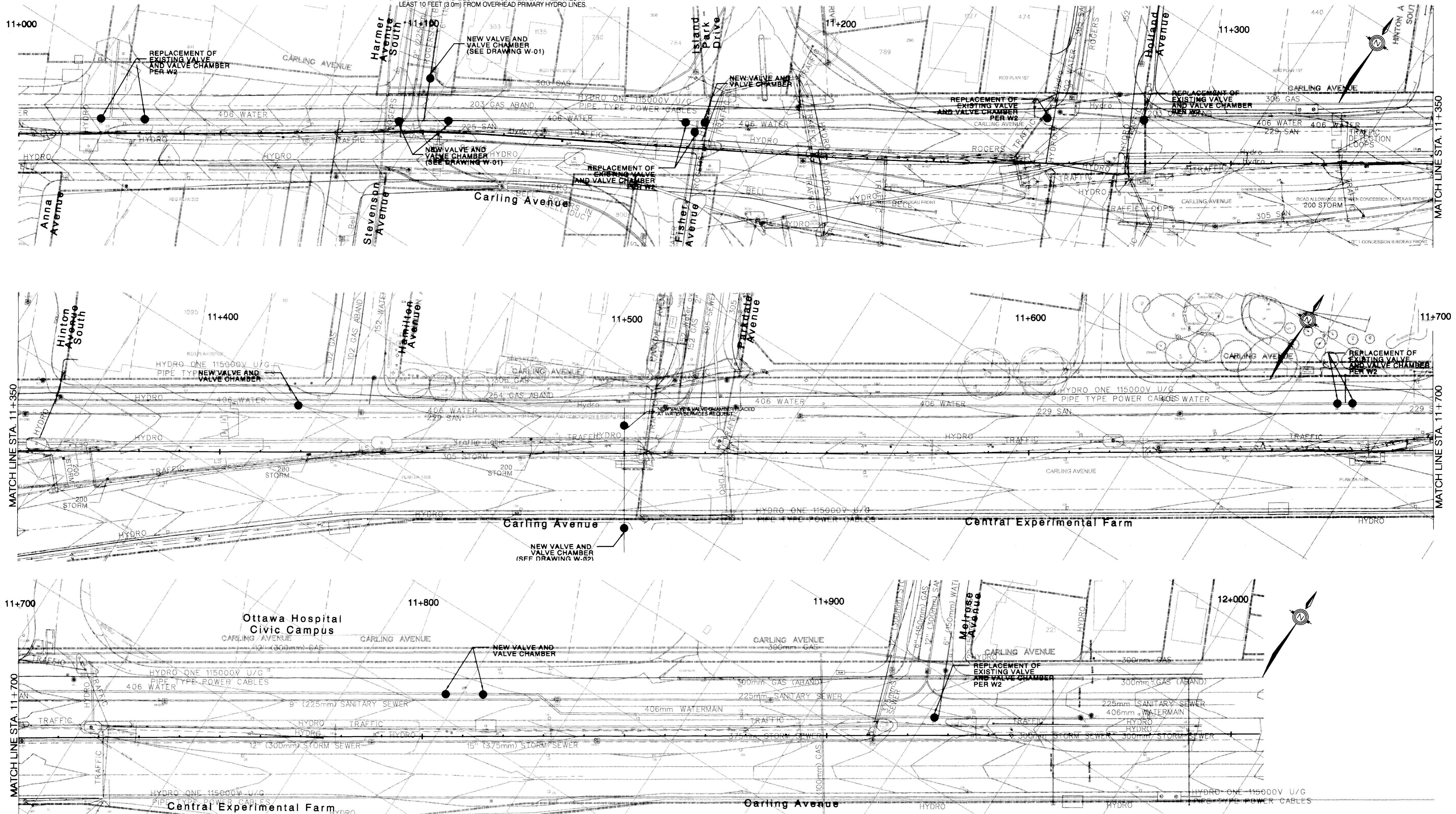
DWG. NO.
5002-012

SHEET 12 OF 34

Date: FEBRUARY 13, 2007

Scale: 0m HORIZ. 5.0
 0m VERT. 0.5

W-03



DATE: 10/9/2007
 TIME: 8:16:23 AM
 CONTRACT: SHEETS: 06703, W03, 09m
 DWG. FRAME: 790mm X 534mm, RUC: 56793-WG

GENERAL

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MRC **MCCORMICK RANKIN**
CORPORATION

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CARLING AVENUE REHABILITATION
 MERVALE ROAD TO MELROSE AVENUE
 KITCHISSIPPI AND RIVER WARDS



CONTRACT NO.
ISB07-5002
 DWG. NO.
5002-011

SHEET 11 OF 34

Date: FEBRUARY 13, 2007
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WAYNE NEWELL, P. ENG.
 Director Infrastructure Services

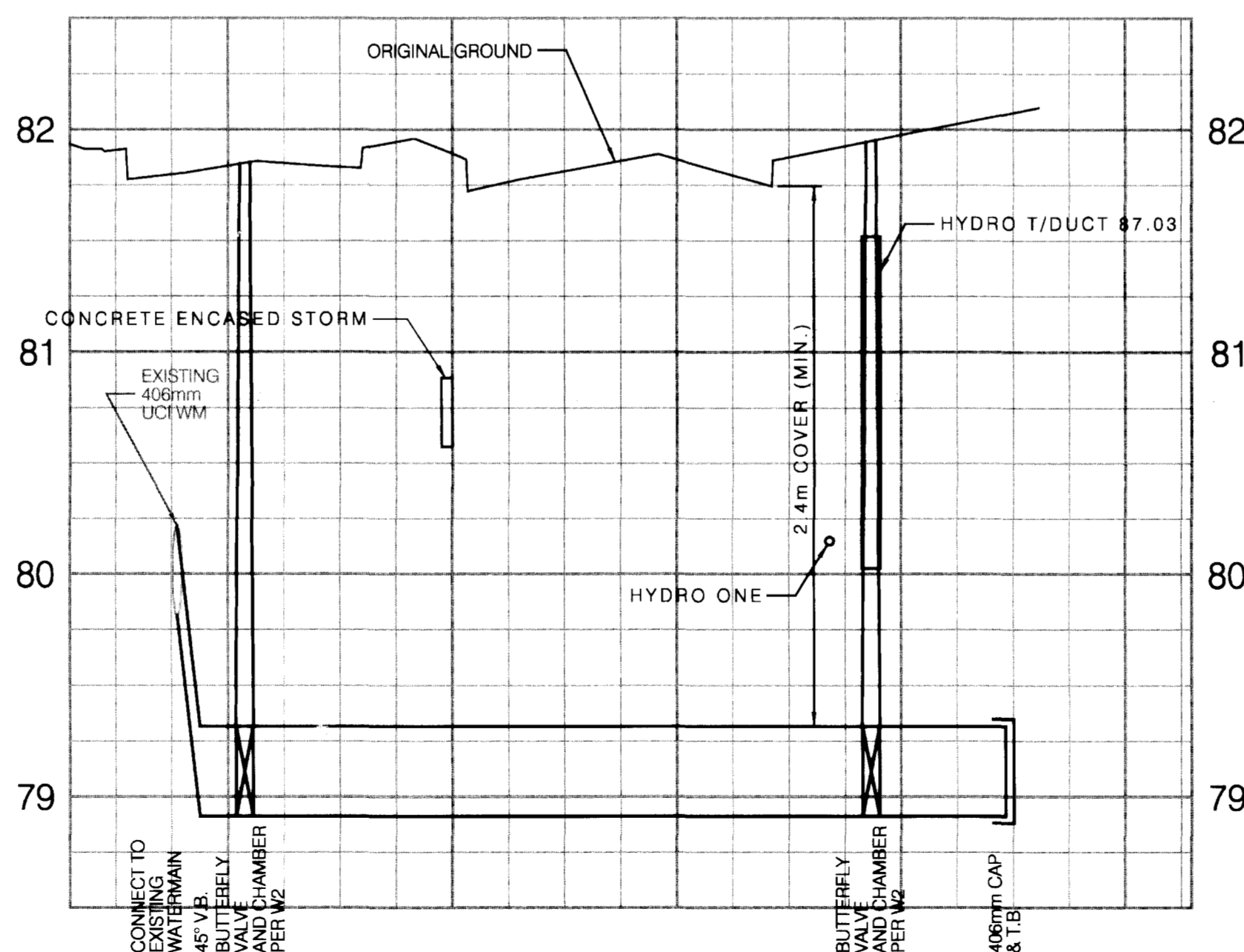
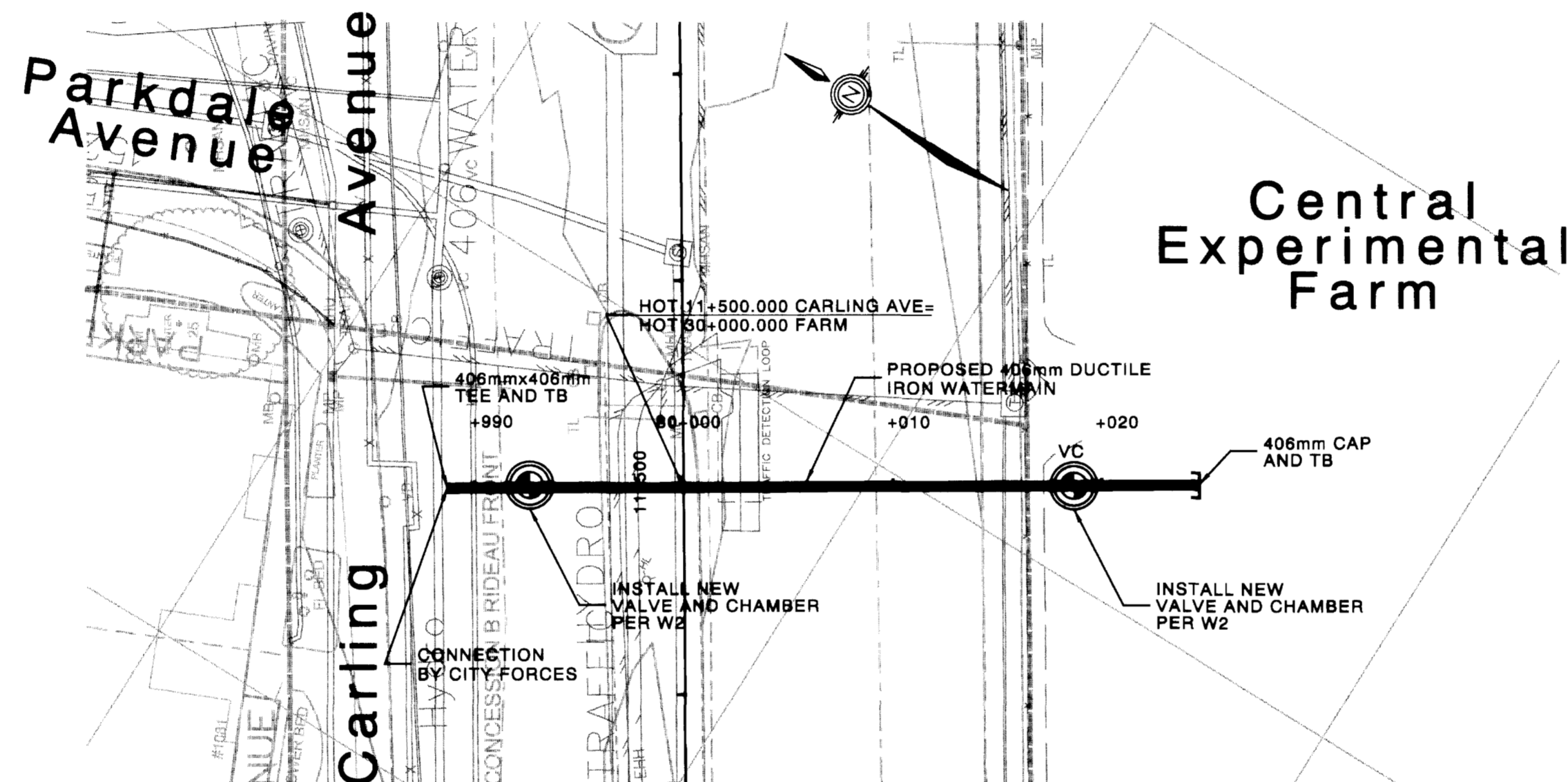
B. MASON, P. ENG.
 A. Manager Construction Services West

Dwn: MS Ckcd: MSB Des: MSB Ckcd: MJR

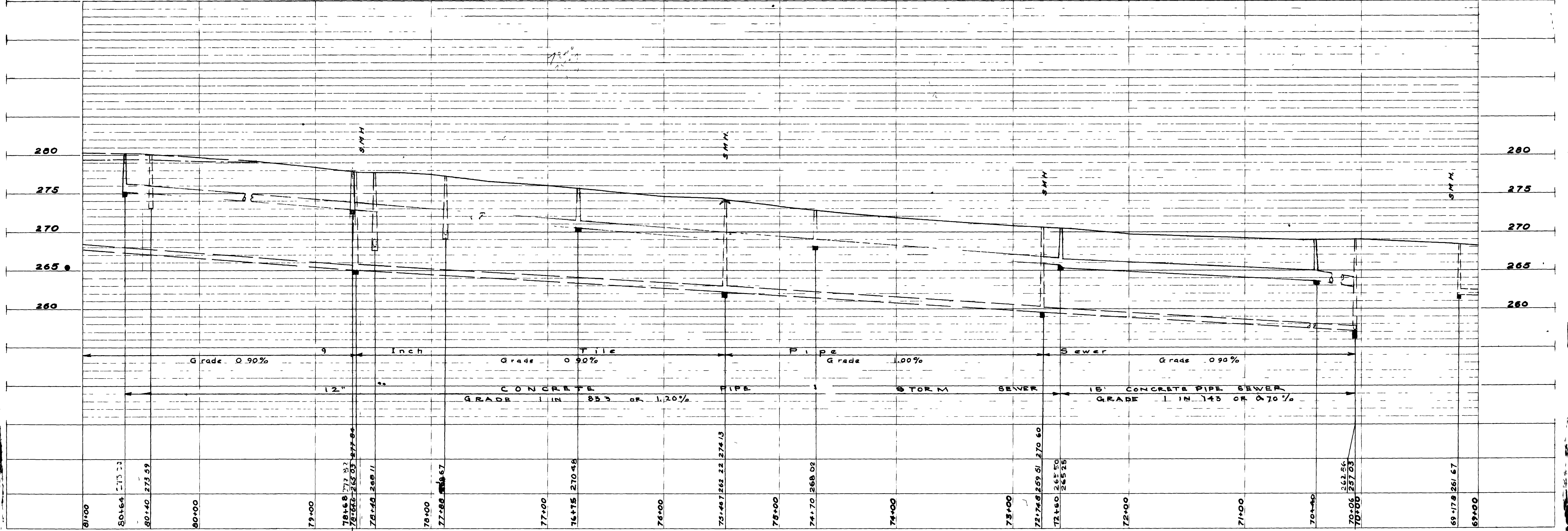
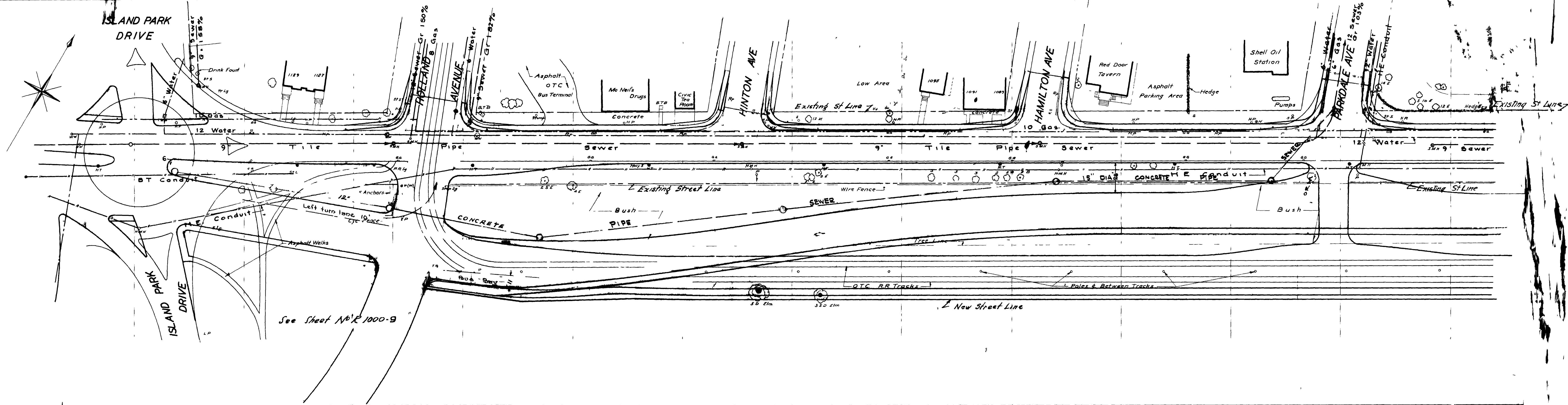
AS-BUILT

W-02

These As-Built Drawings have been prepared based on inspections and observations undertaken by MRC staff during key stages of construction and on information submitted, in part, by others. While this information is believed to be reliable, MRC is not responsible for its accuracy or for errors or omissions that may have been incorporated into this drawing as a result.



STATION	TOP OF WATERMAIN ELEVATION	DEPTH OF WATERMAIN
+987.75	82.16	2.4m
+990.75	82.16	2.4m
+993.57	82.14	2.4m
30+1.000	79.33	2.4m
30+1.010	79.33	2.4m
30+1.020	79.33	2.4m
30+1.024.75	79.3	2.4m



SEWER & DRAINAGE

J-29
8

CITY OF OTTAWA
DEPARTMENT OF PLANNING & WORKS

ENGINEER IN CHARGE OF DESIGN
ENGINEER IN CHARGE OF ROADWAYS
ENGINEER IN CHARGE OF SEWERS
DIRECTOR OF PLANNING & WORKS

Appendix D

Water Servicing Calculations

Guy Forget

From: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Sent: Tuesday, August 24, 2021 4:43 PM
To: Alexandre Tourigny
Cc: Guy Forget; Braden Walker
Subject: RE: 1081 Carling Boundary Condition Request
Attachments: 1081 Carling Avenue August 2021 - revised.pdf

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Hello Alexandre

The following are boundary conditions, HGL, for hydraulic analysis at 1081 Carling Avenue (zone 2W2C) with an assumed dual connection to both the 305 mm watermain on Parkdale Avenue and the 152 mm on Hamilton Avenue (see attached PDF for location).

Parkdale Connection

Minimum HGL: 123.4 m

Maximum HGL: 132.3 m

Max Day + FireFlow (283 L/s): 106.2 m

Max Day + Fireflow (69.2 L/s): 125.2 m

Hamilton Connection

Minimum HGL: 123.3 m

Maximum HGL: 132.2 m

Max Day + FireFlow (267 L/s): N/A

Max Day + FireFlow (69.2 L/s): 117.6 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.

Regards

Nishant Jhamb, P.Eng

Project Manager | Gestionnaire de projet

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review - Central Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 23112, nishant.jhamb@ottawa.ca

Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Alexandre Tourigny <atourigny@jlrichards.ca>

Sent: August 17, 2021 8:09 AM

To: Jhamb, Nishant <nishant.jhamb@ottawa.ca>

Cc: Guy Forget <gforget@jlrichards.ca>; Braden Walker <braden.walker@taggart.ca>

Subject: 1081 Carling Boundary Condition Request

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Hi, Nishant

Thanks for the quick meeting this afternoon to discuss the BC information recently provided to us and to go over fire protection in accordance to the Ontario Building Code (OBC).

The City provided to us boundary conditions on July 14, 2021 for this project. At the time, we had lumped the domestic demands of both building into one overall demand. We have revised the calculations so that the demand for each building is now separate as per the attached. As shown, we refer the Western Tower as the building adjacent to Hamilton and the Eastern Tower as the one adjacent to Parkdale.

As discussed, each building would be fed from a dual WM service lateral (with an isolation valve in between to provide redundancy). The Western Tower on Hamilton would be fed from the 152 mm diameter WM while the Eastern Tower from the Parkdale 305 mm diameter WM. Both of these mains are connected to the Carling Ave 406 mm diameter feedermain.

We understand that the City recommends the use of the FUS. However, within private property where a high-rise residential building equipped with a sprinkler system is proposed, the provincial regulation that applies is the Ontario Building Code. As such, there are hydrants located within the prescribed distance of 45 m (Hamilton & Parkdale) of the proposed Siamese.

Based on Section 6.2 of the attached OBC, sprinklered buildings need to be designed in accordance with NFPA 13. The required fire flow (RFF) based on NFPA 13 must account for: i) the sprinkler system allowance, and ii) a hose stream allowance.

I have attached excerpts extracted from NFPA 13; the chart associated with the sprinkler system allowance (Table [11.2.2.1](#)) and also the chart for the hose stream allowance (Table 11.2.3.1.2). As per NFPA 13 and for the propose building classification, the RFF should consist of the following:

Sprinkler system flow = 3,200 L/min (Table [11.2.2.1](#)) and a hose stream allowance 950 L/min (Table 11.2.3.1.2), which amounts to 4,150 L/min (69.2 L/s).

We, therefore, request hydraulic boundary conditions for the buildings at 1081 Carling Avenue along the Parkdale 305 mm diameter watermain as well as on the Hamilton 152 mm diameter.

Based on the City Design Guidelines, the following demands are anticipated:

Average Day = 1.51 L/s (Eastern Tower) and 1.19 Ls (Western Tower)
Maximum Day = 3.77 L/s (Eastern Tower) and 2.98 L/s (Western Tower)
Peak Hour = 8.29 L/s (Eastern Tower) and 6.58 L/s (Western Tower)

Required Fire Flow

Western Tower:

FUS = 17,000 L/min (283 L/s)

NFPA 13 = 69.2 L/s which is required by provincial legislation

Eastern Tower:

FUS = 16,000 L/min (267 L/s)

NFPA 13= 69.2 L/s which is required by provincial legislation

As discussed with you, we have coordinated the use of the OBC (NFPA 13) approach for the Brigil high-rise condominium tower at 99 Parkdale in 2020. I have attached an excerpt of the boundary condition from Shawn Wessel (page 72 of the Site Servicing Report). During the project, I had discussions with the Water Resources Group (Walid Khawan).

As discussed earlier, there are numerous high-rise condominium Towers in the downtown area that was approved using the OBC approach (NFPA 13), including:

151 Chapel Street (25 and 26 storey high rise Towers) – Trinity Development
505 Preston Street (45 storey high rise Tower) - Claridge Homes
201, 301 & 324 Lett Street (25 to 45 storey high rise Towers) Claridge (Lebreton Flats)
450 Lloyd Avenue (25 to 45 storey high-rise Towers) Claridge (Lebreton Flats)
133 Booth Street (25 to 45 storey high-rise Towers) Claridge (Lebreton Flats)
212 Slater (22 storey high-rise Tower) - 212 Slater
245 Rideau Street (19 storey high-rise Tower) - 245 Rideau
141 George Street, 325 Dalhousie and 110 York (15 storey, 22 storey 18 storey high rise Towers)
145 Loretta & 951 Gladstone (30, 35 and 40 high-rise towers) Trinity development

Should you have any questions or require anything further, please do not hesitate to call.

Regards,

Alexandre Tourigny, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4522



**J.L. Richards
& Associates Limited**
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Boundary Conditions for 1081 Carling Avenue



Parkdale Connection

Hamilton Connection

- Legend**
- PRIVATE
 - PUBLIC

Annie Williams

From: Alexandre Tourigny
Sent: Tuesday, July 6, 2021 12:48 PM
To: Annie Williams
Cc: Guy Forget; Lucie Dalrymple
Subject: FW: 2021-07-05 1081 Carling - Pre-Consult Summary - Civil Servicing Follow-up

Follow Up Flag: Follow up
Flag Status: Completed

Let me know if you need anything else for the boundary conditions.

Thanks,

From: Braden Walker <braden.walker@taggart.ca>
Sent: Tuesday, July 6, 2021 12:28 PM
To: Alexandre Tourigny <atourigny@jlrichards.ca>
Cc: Derek Howe <derek.howe@taggart.ca>; Lucie Dalrymple <ldalrymple@jlrichards.ca>
Subject: RE: 2021-07-05 1081 Carling - Pre-Consult Summary - Civil Servicing Follow-up

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Hello Alex,

Thank you for the questions. Our response is below.

Derek, would you be able to answer question #3 below?

Thank you,
Braden Walker | Development Manager
Taggart Realty Management
T | 613-234-7000 ext: 512 D | 613-604-0868 M | 613-223-1579
A | 225 Metcalfe Street, Suite 708, Ottawa, Ontario K2P 1P9
E | braden.walker@taggart.ca
W | <https://www.taggart.ca/>



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From: Alexandre Tourigny <atourigny@jlrichards.ca>
Sent: July 6, 2021 10:41 AM
To: Braden Walker <braden.walker@taggart.ca>

Cc: Derek Howe <derek.howe@taggart.ca>; Lucie Dalrymple <ldalrymple@jlrichards.ca>

Subject: 2021-07-05 1081 Carling - Pre-Consult Summary - Civil Servicing Follow-up

Hi Braden,

Following up on the pre-consult summary we received yesterday, we have the following questions:

1. We understand that the project will consist of twin towers; the western tower will be 22 storey while the eastern tower will be 28 storey. As part of our Servicing Brief, we will need to calculate the domestic demands as well as the required fire flow (RFF) in accordance with the Fire Underwriters Survey (FUS). Given that it takes 2 weeks to get the boundary condition back from the City, we would like to submit the information today. In order to carry out the RFF, we would like, when possible, that you clarify the following (we will make assumptions if item can not be answered):
 - Given the height and usage, we assumed that a sprinkler system will be incorporated in both towers. Would the material consist of non-combustible or fire resistive? If fire-resistive, are the vertical openings 'properly protected' (one hour rating)? – The building will be non-combustible and sprinklered. Protected openings will only be required where limiting distance calls for it.
 - Please confirm whether firewalls will be part of the building construction. – I don't believe firewalls are required in non-combustible construction.
 - Pending on the connection requirements with the existing watermains, where would the mechanical room be located. – There will be a mechanical penthouse for HVAC and the majority of the mechanical equipment. We can bring services into the first floor of the underground parking garage also.
 - Please confirm the unit statistics for both Towers (1-bedroom, 2-bedroom, etc.) Note that there is a discrepancy with the number of units on the Drawing (plan view vs table). Will there be commercial space in these buildings, if so, do you have an approximate area? – We will get Hobin to provide an updated unit mix list.

We would complete the RFF calculations based on the response, and would make assumptions for the information that cannot be confirmed.

2. As discussed last week, we strongly recommend having a CCTV inspection carried out for Parkdale, Hamilton and Carling Ave. This would allow us to determine where the existing service connections (Storm and Sanitary) are located. Given the timeline, this may not be feasible in time for the Servicing Brief submission. Are there any objections to JLR sending an inspector to confirm the size and directions of the storm laterals for the existing CBs? Are any permissions required? – I am not sure CCTV inspections are absolutely required for a rezoning. I think we keep things simple. We need to confirm the City infrastructure can support the development, that is all the City will want to know at this point. Exact connection designs are too detailed at this time. If the City asks for more I think we should push back – this is a rezoning, not site plan.
3. We suggest separate connections for sanitary and watermain for each building, on Hamilton and Parkdale Street respectively. Are there any objections to this approach? Are there any shared services between both buildings? – I would assume that it would be more cost effective to have shared water and sewer connections between the buildings. Unless we want the potential to sever these buildings in the future, I would think shared utilities would be more efficient (water, sewer, storm, gas, hydro).

Don't hesitate to give us a call if you would like to discuss any of the above.

Thanks,
Alex

Alexandre Tourigny, P.Eng.
Civil Engineer

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700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4522



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Water Demand Calculations
1081 Carling Avenue (JLR 31261-001)

West Tower

Unit Breakdown	No.	Person Per Unit (Table 4.1)
Studio	N/A	1.4
1 Bed	N/A	1.4
1 Bed +	N/A	1.4
2 Bed	N/A	2.1
2 Bed+	N/A	2.1
3 Bed	N/A	3.1
Average	146	1.8
Total Unit Count =	146	
Total Population	263	ppl
Average Day Consumption Rate	280	L/c/d
Average Day Demand	0.85	L/s
Maximum Day Peaking Factor	2.50	City of Ottawa
Maximum Day Demand	2.13	L/s
Peak Hour Peaking Factor	2.20	City of Ottawa
Peak Hour Demand	4.69	L/s
Minimum Hour Peaking Factor	0.40	x Avg Day (Table 3-1 MOE)
Minimum Hour Demand	0.34	L/s

Water Demand Calculations
1081 Carling Avenue (JLR 31261-001)

East Tower

Unit Breakdown	No.	Person Per Unit (Table 4.1)
Studio	N/A	1.4
1 Bed	N/A	1.4
1 Bed +	N/A	1.4
2 Bed	N/A	2.1
2 Bed+	N/A	2.1
3 Bed	N/A	3.1
Average	268	1.8
Total Unit Count =	268	
Total Population	483	ppl
Average Day Consumption Rate	280	L/c/d
Average Day Demand	1.57	L/s
Maximum Day Peaking Factor	2.50	City of Ottawa
Maximum Day Demand	3.91	L/s
Peak Hour Peaking Factor	2.20	City of Ottawa
Peak Hour Demand	8.61	L/s
Minimum Hour Peaking Factor	0.40	x Avg Day (Table 3-1 MOE)
Minimum Hour Demand	0.63	L/s

FUS Fire Flow Calculations

1081 Carling - High Rise Residential Development
(JLR 31261-000)

East Tower (Parkdale)				
Step	Parameter	Value		Note
A	Type of Construction	Non-combustible		
	Coefficient (C)	0.8		
B	Sum of All Floors	20516	m ²	Gross Area for 25 storeys
C	Height in storeys	25	storeys	Basements are excluded.
	Total Floor Area	5880	m ²	Total Effective Area as per FUS (2020): consider the two largest floor areas plus 50% of all floors immediately above them up to a maximum of 8
D	Fire Flow Formula	F=220C√A		
	Fire Flow	13496	L/min	
	Rounded Fire Flow	13000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Residential.
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-1950		
	Fire Flow	11050	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-5525	L/min	
G	<i>South Side Exposure</i>			No structure 50 m of East Tower
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	24.0	m	
	Height of Exposed Wall:	1	storeys	
	Length-Height Factor	24.0	m-storeys	
	Separation Distance	50	m	
	South Side Exposure Charge	0%		
	<i>West Side Exposure</i>			West Tower
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:	48.0	m	
	Height of Exposed Wall:	16	storeys	
	Length-Height Factor	768.0	m-storeys	
	Separation Distance	15	m	
	West Side Exposure Charge	15%		
	<i>North Side Exposure</i>			Existing building north of East Tower
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	12.6	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	25.2	m-storeys	
	Separation Distance	22	m	
	North Side Exposure Charge	8%		
	<i>East Side Exposure</i>			Existing building East of Parkdale Ave
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:	11.0	m	
	Height of Exposed Wall:	16	storeys	
	Length-Height Factor	176.0	m-storeys	
Separation Distance	35	m		
East Side Exposure Charge	5%			
Total Exposure Charge	28%		The total exposure charge is below the maximum value of 75%.	
Increase for Exposures	3094	L/min		
H	Fire Flow	8619	L/min	
	Rounded Fire Flow	9000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	Required Fire Flow (RFF)	9000	L/min	The City of Ottawa's cap does not apply since the building is a high rise building.
		150	L/s	

Fire Underwriters Survey (FUS) Fire Flow Calculations

In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018

FUS Fire Flow Calculations

1081 Carling - High Rise Residential Development
(JLR 31261-000)

West Tower (Hamilton)				
Step	Parameter	Value		Note
A	Type of Construction	Non-combustible		
	Coefficient (C)	0.8		
B	Sum of All Floors	12360	m ²	Gross Area for 16 storeys
C	Height in storeys	16	storeys	Basements are excluded.
	Total Floor Area	5289	m ²	Total Effective Area as per FUS (2020): consider the two largest floor areas plus 50% of all floors immediately above them up to a maximum of 8
D	Fire Flow Formula	F=220C√A		
	Fire Flow	12800	L/min	
	Rounded Fire Flow	13000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Residential.
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-1950		
	Fire Flow	11050	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-5525	L/min	
G	<i>South Side Exposure</i>			No structure within 50m south of West Tower
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	25.0	m	
	Height of Exposed Wall:	16	storeys	
	Length-Height Factor	400.0	m-storeys	
	Separation Distance	50	m	
	South Side Exposure Charge	0%		
	<i>West Side Exposure</i>			Buildings located West of Hamilton Ave.
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	48.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	96.0	m-storeys	
	Separation Distance	20	m	
	West Side Exposure Charge	15%		
	<i>North Side Exposure</i>			Existing building north of West Tower
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	15.0	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	30.0	m-storeys	
	Separation Distance	14	m	
	North Side Exposure Charge	12%		
	<i>East Side Exposure</i>			East Tower
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:	48.0	m	
Height of Exposed Wall:	16	storeys		
Length-Height Factor	768.0	m-storeys		
Separation Distance	15	m		
East Side Exposure Charge	15%			
Total Exposure Charge	42%		The total exposure charge is below the maximum value of 75%.	
Increase for Exposures	4641	L/min		
H	Fire Flow	10166	L/min	
	Rounded Fire Flow	10000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	Required Fire Flow (RFF)	10000	L/min	The City of Ottawa's cap does not apply since the building is a high rise building.
		167	L/s	

Fire Underwriters Survey (FUS) Fire Flow Calculations
In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018

J.L. Richards & Associates Limited

HEAD LOSS - HAZEN-WILLIAMS
1081 Carling - High Rise Residential Development
(JLR 31261-000)

Demand Scenario (Calculated for October 2022 Submission)	East Tower	West Tower
Average Day	1.57	0.85
Maximum Day	3.91	2.13
Required Fire Flow (FUS)	150.00	167.00
Required Fire Flow (NFPA)	69.17	69.17
Peak Hour	8.61	4.69

Boundary Conditions (Email from City, August 24, 2021):

Water Demand Scenario	Demand East Tower (L/s)	Demand West Tower (L/s)	Head (m) on Parkdale Ave. Connection	Head (m) on Hamilton Ave. Connection
Peak Hour (per Aug. 2021 Demand Calculations)	8.29	6.58	123.4	123.3
Maximum HGL	0.00	0.00	132.3	132.3
Max Day + Fire Flow (OBC)	69.20	69.20	125.2	117.6
Max Day + Fire Flow (FUS) (per Aug. 2021 Demand Calculations)	267.00	283.00	106.2	N/A

Headloss Calculations (Hazen Williams Equation)

Hazen Williams equation (Mays, 1999; Streeter et al., 1998; Viessman and Hammer, 1993) where k=0.85 for meter and seconds units or 1.318 for feet and seconds units:

$$H = L \left[\frac{V}{kC} \left(\frac{4}{D} \right)^{0.63} \right]^{1/0.54} \quad V = \frac{Q}{A} \quad A = \frac{\pi}{4} D^2$$

Where,
HL = Headloss (m)
Q - Flow (m³/s)
L - Length (m)
C - Hazen Williams "C"
D - Watermain Diameter (m)
V - Velocity (m/s)
A - Watermain Cross-Sectional Area (m²)

Demands (L/s) and Head (m) for October 2022 Submission

Water Demand Scenario	Demand East Tower (L/s)	Demand West Tower (L/s)	Head (m) on Parkdale Ave. Connection	Head (m) on Carling Ave. Connection*
Peak Hour (per Oct. 2022 Demand Calculations)	8.61	4.69	123.4	123.3
Maximum HGL	0.00	0.00	132.3	132.3
Max Day + Fire Flow (OBC)	69.20	69.20	125.2	117.6
Max Day + Fire Flow (FUS with Linearly Interpolated HGLs)**	150.00	167.00	117.4	115.8

*West Tower now proposed to connect to 400 mm feedermain on Carling Avenue. It is assumed that the Parkdale HGL will be applicable to Carling Avenue.

**HGLs for 150 L/s and 167 L/s RFF were linearly interpolated based on the HGLs provided by the City for Parkdale Avenue

1081 Carling Ave. Headloss Calculations

Water Demand Condition	Flow (Q) (L/s)	Flow (Q) (m ³ /s)	Length (m)	C	D (m)	V (m/s)	A (m ²)	Head Loss (m)	HGL (m)	Calculated HGL (m)	Elevation (m) of Tower	Pressure @ Node			ODG 4.2.2 Requirement	Criteria Achieved?
												(m)	(kPa)	(psi)		
Peak Hour (East Tower)	8.61	0.009	13.0	100	0.155	0.456	0.019	0.036	123.400	123.364	82.35	41.014	402	58.4	276 kPa	Yes
Peak Hour (West Tower)	4.69	0.005	10.0	100	0.155	0.249	0.019	0.009	123.300	123.291	82.50	40.791	400	58.0	276 kPa	Yes
Maximum HGL (East Tower)	0.00	0.000	13.0	100	0.155	0.000	0.019	0.000	132.300	132.300	82.35	49.950	490	71.1	552 kPa	Yes
Maximum HGL (West Tower)	0.00	0.000	10.0	100	0.155	0.000	0.019	0.000	132.300	132.300	82.50	49.800	489	70.9	552 kPa	Yes
Max Day + Fire Flow (East Tower: RFF = 69.2 L/s)	73.08	0.073	13.0	100	0.155	3.873	0.019	1.892	117.439	115.547	82.35	33.197	326	47.2	140 kPa	Yes
Max Day + Fire Flow (West Tower: RFF = 69.2 L/s)	71.30	0.071	10.0	100	0.155	3.778	0.019	1.390	115.806	114.415	82.50	31.915	313	45.4	140 kPa	Yes

11.2.2 Water Demand Requirements — Pipe Schedule Method.

11.2.2.1 Table 11.2.2.1 shall be used in determining the minimum water supply requirements for light and ordinary hazard occupancies protected by systems with pipe sized according to the pipe schedules of Section 23.7.

Table 11.2.2.1 Water Supply Requirements for Pipe Schedule Sprinkler Systems

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

11.2.2.2 Pressure and flow requirements for extra hazard occupancies shall be based on the hydraulic calculation methods of 11.2.3.

11.2.2.3 The pipe schedule method shall be permitted as follows:

- (1) Additions or modifications to existing pipe schedule systems sized according to the pipe schedules of Section 23.7
- (2) Additions or modifications to existing extra hazard pipe schedule systems
- (3) New systems of 5000 ft² (465 m²) or less
- (4) New systems exceeding 5000 ft² (465 m²) where the flows required in Table 11.2.2.1 are available at a minimum residual pressure of 50 psi (3.4 bar) at the highest elevation of sprinkler

11.2.2.4 Table 11.2.2.1 shall be used in determining the minimum water supply requirements.

11.2.2.5 The lower duration value of Table 11.2.2.1 shall be acceptable only where the sprinkler system waterflow alarm device(s) and supervisory device(s) are electrically supervised and such supervision is monitored at an approved, constantly attended location.

11.2.2.6* Residual Pressure.

11.2.2.6.1 The residual pressure requirement of Table 11.2.2.1 shall be met at the elevation of the highest sprinkler.

11.2.2.6.2 Friction Loss Due to Backflow Prevention Valves.

11.2.2.6.2.1 When backflow prevention valves are installed on pipe schedule systems, the friction losses of the device shall be accounted for when determining acceptable residual pressure at the top level of sprinklers.

11.2.2.6.2.2 The friction loss of this device [in psi (bar)] shall be added to the elevation loss and the residual pressure at the top row of sprinklers to determine the total pressure needed at the water supply.

11.2.2.7 The lower flow figure of Table 11.2.2.1 shall be permitted only where the building is of noncombustible construction or the potential areas of fire are limited by building size or compartmentation such that no open areas exceed 3000 ft² (280 m²) for light hazard or 4000 ft² (370 m²) for ordinary hazard.

11.2.3 Water Demand Requirements — Hydraulic Calculation Methods.

11.2.3.1 General.

11.2.3.1.1 The water demand for sprinklers shall be determined only from one of the following, at the discretion of the designer:

- (1) Density/area curves of Figure 11.2.3.1.1 in accordance with the density/area method of 11.2.3.2
- (2) The room that creates the greatest demand in accordance with the room design method of 11.2.3.3
- (3) Special design areas in accordance with 11.2.3.4

11.2.3.1.2 The minimum water supply shall be available for the minimum duration specified in Table 11.2.3.1.2.

11.2.3.1.3 The lower duration values in Table 11.2.3.1.2 shall be permitted where the sprinkler system waterflow alarm device(s) and supervisory device(s) are electrically supervised and such supervision is monitored at an approved, constantly attended location.

11.2.3.1.4 **Restrictions.** When either the density/area method or room design method is used, the following shall apply:

- (1)*For areas of sprinkler operation less than 1500 ft² (139 m²) used for light and ordinary hazard occupancies, the density for 1500 ft² (139 m²) shall be used.
- (2) For areas of sprinkler operation less than 2500 ft² (232 m²) for extra hazard occupancies, the density for 2500 ft² (232 m²) shall be used.

11.2.3.1.5 Unsprinklered Combustible Concealed Spaces.

11.2.3.1.5.1* When using the density/area or room design method, unless the requirements of 11.2.3.1.5.2 are met for buildings having unsprinklered combustible concealed spaces, as described in 8.15.1.2 and 8.15.6, the minimum area of sprinkler operation for that portion of the building shall be 3000 ft² (280 m²).

(A) The design area of 3000 ft² (280 m²) shall be applied only to the sprinkler system or portions of the sprinkler system that are adjacent to the qualifying combustible concealed space.

(B) The term *adjacent* shall apply to any sprinkler system protecting a space above, below, or next to the qualifying concealed space except where a barrier with a fire resistance rating at least equivalent to the water supply duration completely separates the concealed space from the sprinklered area.

11.2.3.1.5.2 The following unsprinklered concealed spaces shall not require a minimum area of sprinkler operation of 3000 ft² (280 m²):

- (1) Noncombustible and limited-combustible concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
- (2) Noncombustible and limited-combustible concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.
- (3) Combustible concealed spaces filled entirely with noncombustible insulation.
- (4)*Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are directly attached

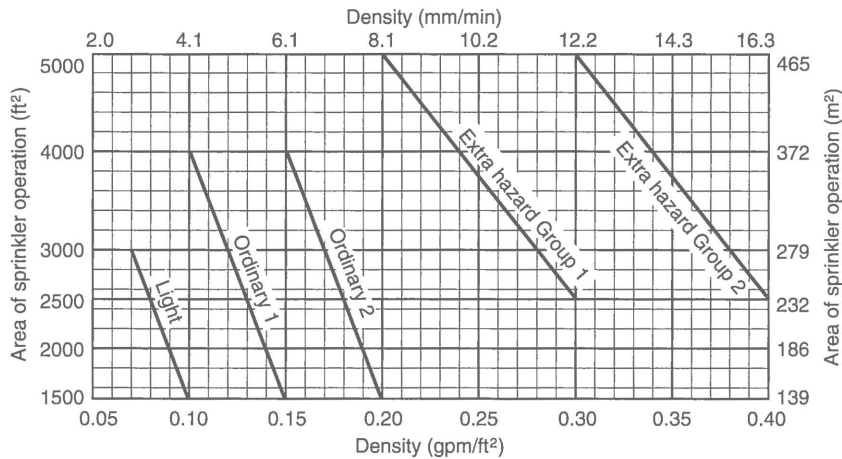


FIGURE 11.2.3.1.1 Density/Area Curves.

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

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

to the bottom of solid wood joists or solid limited-combustible construction or noncombustible construction so as to create enclosed joist spaces 160 ft³ (4.5 m³) or less in volume, including space below insulation that is laid directly on top or within the ceiling joists in an otherwise sprinklered concealed space.

- (5) Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less and the materials have been demonstrated to not propagate fire more than 10.5 ft (3.2 m) when tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test for Surface Burning Characteristics of Building Materials*, extended for an additional 20 minutes in the form in which they are installed in the space.
- (6) Concealed spaces in which the exposed materials are constructed entirely of fire-retardant-treated wood as defined by NFPA 703.
- (7) Concealed spaces over isolated small rooms not exceeding 55 ft² (5.1 m²) in area.
- (8) Vertical pipe chases under 10 ft² (0.9 m²), provided that in multifloor buildings the chases are firestopped at each floor using materials equivalent to the floor construction, and where such pipe chases contain no sources of ignition, piping shall be noncombustible, and pipe penetrations at each floor shall be properly sealed.

- (9) Exterior columns under 10 ft² (0.9 m²) in area formed by studs or wood joists, supporting exterior canopies that are fully protected with a sprinkler system.
- (10)*Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are attached to the bottom of composite wood joists either directly or on to metal channels not exceeding 1 in. (25 mm) in depth, provided the adjacent joist channels are firestopped into volumes not exceeding 160 ft³ (4.5 m³) using materials equivalent to ½ in. (13 mm) gypsum board, and at least 3½ in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.

11.2.3.2 Density/Area Method.

11.2.3.2.1 Water Supply.

11.2.3.2.1.1 The water supply requirement for sprinklers only shall be calculated from the density/area curves of Figure 11.2.3.1.1 or from Chapter 22 where density/area criteria are specified for special occupancy hazards.

11.2.3.2.1.2 When using Figure 11.2.3.1.1, the calculations shall satisfy any single point on the appropriate density/area curve.

11.2.3.2.1.3 When using Figure 11.2.3.1.1, it shall not be necessary to meet all points on the selected curves.

11.2.3.2.2 Sprinklers.

11.2.3.2.2.1 The densities and areas provided in Figure 11.2.3.1.1 shall be for use only with spray sprinklers.

11.2.3.2.2.2 Quick-response sprinklers shall not be permitted for use in extra hazard occupancies or other occupancies where there are substantial amounts of flammable liquids or combustible dusts.

11.2.3.2.2.3 For extended coverage sprinklers, the minimum design area shall be that corresponding to the hazard in Figure 11.2.3.1.1 or the area protected by five sprinklers, whichever is greater.

11.2.3.2.2.4 Extended coverage sprinklers shall be listed with and designed for the minimum flow corresponding to the density for the hazard as specified in Figure 11.2.3.1.1.

Appendix E

Wastewater Peak Flow
Calculations



**1081 Carling Avenue
SANITARY SEWER DESIGN SHEET
TAGGARD REALTY MANAGEMENT
JLR NO. 31261-000**

Single Family	3.4	pers/unit	q =	280	L/cap/day
Appartment Units	1.8	pers/unit	l =	0.330	L/s/ha
Manning's Coeff. N =	0.013		Inst. =	50000	L/ha/day

STREET	M.H. #		RESIDENTIAL				PEAKING FACTOR	POPUL. FLOW l/s	PEAK EXTR. FLOW l/s	PEAK DES. FLOW l/s
			NUMBER OF UNITS		CUMULATIVE					
	FROM	TO	Apt.	AREA ha	POPUL. peop.	AREA ha				
West Tower	MH1	MH2	146	0.1054	263	0.11	3.48	2.97	0.03	3.00
East Tower	MH 3	MH4	268	0.12	482	0.12	3.39	5.29	0.04	5.33

Alexandre Tourigny

From: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Sent: Tuesday, July 13, 2021 3:34 PM
To: Alexandre Tourigny
Cc: Lucie Dalrymple; Braden Walker
Subject: RE: 1081 Carling Ave Existing Sanitary peak flow

[CAUTION] This email originated from outside JLR. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt, please forward suspicious emails to Helpdesk.

Hello Alexandre,

Both Sanitary mains on Hamilton Ave and Parkdale Ave have the capacity to take required 10.55L/s discharge.

There is more capacity of Parkdale Ave so our first preference is to connect sanitary service to Parkdale Ave and recommends to use the existing service lateral (*as long as you can confirm that existing sanitary service lateral has the required capacity and is in good condition*).

Second preference is to divide the discharge between Parkdale Ave and Hamilton Ave.

Last preference is to connect sanitary service on Hamilton Ave only.

I will get back to you with Boundary conditions once I receive it.

Thanks
Nishant

From: Jhamb, Nishant
Sent: July 12, 2021 10:28 AM
To: Alexandre Tourigny <atourigny@jlrichards.ca>
Cc: Lucie Dalrymple <ldalrymple@jlrichards.ca>; Braden Walker <braden.walker@taggart.ca>
Subject: RE: 1081 Carling Ave Existing Sanitary peak flow

Hello Alexandre,

Thank you. I will get back to you as soon as I hear from concerned department.

Regards

Nishant Jhamb, P.Eng

Project Manager |Gestionnaire de projet

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review - Central Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 23112, nishant.jhamb@ottawa.ca

Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Alexandre Tourigny <atourigny@jrichards.ca>

Sent: July 12, 2021 10:21 AM

To: Jhamb, Nishant <nishant.jhamb@ottawa.ca>

Cc: Lucie Dalrymple <ldalrymple@jrichards.ca>; Braden Walker <braden.walker@taggart.ca>

Subject: 1081 Carling Ave Existing Sanitary peak flow

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ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Good morning Nishant,

The existing peak sanitary design flow for the existing building at 1081 Carling Avenue is estimated at 0.288 L/s. There is currently an 8 story commercial building on-site which we believe is being serviced by the existing sanitary sewer on Parkdale Ave.

- Commercial average flow: 28,000 L/gross ha/d
- Building Area: 0.0682 ha
- Number of stories: 8
- Commercial peak factor: 1.5
- Infiltration Allowance: 0.33 L/s/ha

$28,000 \text{ L/gross ha/d} \times (0.0682 \text{ ha} \times 8) \times 1.5 = 22,915.2 \text{ L/d} (0.265 \text{ L/s})$.

$I/I: 0.33 \text{ L/s/ha} \times 0.0682 \text{ ha} = 0.023 \text{ L/s}$

Average Flow (L/ha/d)	Gross Area (ha) [building footprint x 8]	Peaking Factor	Ave. Commercial Flow (L/s)	Peak Extra flow (L/s)	Peak Design Flow (L/s)
28000	0.546	1.5	0.265	0.023	0.288

Best Regards,

Alexandre Tourigny, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4522

*J.L. Richards & Associates Limited is proactively doing our part to protect the wellbeing of our staff and communities while improving our communication technology. **We are pleased to announce that we have implemented direct phone lines for all of our staff, allowing you to connect with us regardless of whether we are working remotely or in the office.** We are dedicated to delivering quality services to you through value and commitment, as always. Please reach out to us if you have any questions about your project.*

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Appendix F

Storm Servicing and
Stormwater Management
Calculations

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

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TOPOGRAPHIC PLAN OF
**LOTS 1280, 1282, 1284, 1286, 1295
1297 1299 AND 1301**
REGISTERED PLAN 157
CITY OF OTTAWA

Scale 1:200

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

BEARING NOTE
BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE DERIVED
FROM THE EASTERLY LIMIT OF HAMILTON AVENUE SOUTH SHOWN AS
N23°32'20"W ON PLAN D-50, BA1486.

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC VERTICAL DATUM
(CGVD-1928/1978) AND ARE DERIVED FROM CAN NET NETWORK MONUMENT:
OTTAWA ELEVATION 95.230.

LEGEND (IF APPLICABLE)

SYMBOL	DENOTES	FOUND MONUMENTS
IB	IRON BAR	FOUND MONUMENTS
IB2	ROUND IRON BAR	SET MONUMENTS
SIB	STANDARD IRON BAR	IRON BAR
SSIB	SHORT STANDARD IRON BAR	ROUND IRON BAR
CC	CUT CROSS	STANDARD IRON BAR
CP	CONCRETE PIN	SHORT STANDARD IRON BAR
WIT	WITNESS	CUT CROSS
PI	PROPERTY IDENTIFICATION NUMBER	CONCRETE PIN
MEAS	MEASURED	WITNESS
PROP	PROPORTIONED	PROPERTY IDENTIFICATION NUMBER
OG	ORIGIN UNKNOWN	MEASURED
SG	STANTEC GEOMATICS LTD.	PROPORTIONED
647	H.R. FARLEY, O.L.S.	ORIGIN UNKNOWN
1236	P.A. RIDDELL, O.L.S.	STANTEC GEOMATICS LTD.
1474	M.E. RENAUD, O.L.S.	H.R. FARLEY, O.L.S.
P2	REGISTERED PLAN 157	P.A. RIDDELL, O.L.S.
P1	PLAN D-50, BA1486	M.E. RENAUD, O.L.S.
P3	PLAN BY 647 DATED FEBRUARY 19, 1973	REGISTERED PLAN 157
P4	PLAN BY 1474 DATED FEBRUARY 22, 2001	PLAN D-50, BA1486
P5	PLAN BY 1236 DATED SEPT. 4, 1973	PLAN BY 647 DATED FEBRUARY 19, 1973
	REGISTERED PLAN 207509	PLAN BY 1474 DATED FEBRUARY 22, 2001
		PLAN BY 1236 DATED SEPT. 4, 1973
		REGISTERED PLAN 207509
		AIR CONDITIONING UNIT
ACU	AIR CONDITIONING UNIT	ANCHOR
AN	ANCHOR	AIR PUMP
AP	AIR PUMP	ANTENNA
ANT	ANTENNA	BOREHOLE
BH	BOREHOLE	BOISE BIB
BIB	BOISE BIB	BIKE RACK
BKR	BIKE RACK	BOLLARD
BENCH	BENCH	BOULDER
BOUL	BOULDER	CATCH BASIN
CB	CATCH BASIN	DOUBLE CB
DCB	DOUBLE CB	CB MANHOLE
CBMH	CB MANHOLE	DOUBLE CB MANHOLE
DCBMH	DOUBLE CB MANHOLE	SIDE INLET CB
SICB	SIDE INLET CB	CHIMNEY
CHM	CHIMNEY	CLEAN OUT
CO	CLEAN OUT	CURB STOP VALVE
CSV	CURB STOP VALVE	DRAIN
DRN	DRAIN	ELECTRICAL OUTLET
EPOST	ELECTRICAL OUTLET	FLAG POLE
FP	FLAG POLE	FLOOD LIGHT
FL	FLOOD LIGHT	FUEL TANK FILLER CAP
FLC	FUEL TANK FILLER CAP	GARBAGE CAN
GC	GARBAGE CAN	PIPE FLANGE (GAS)
GFL	PIPE FLANGE (GAS)	GAS FUEL PUMP
GFP	GAS FUEL PUMP	POLE GUYS
GP	POLE GUYS	GAS SERVICE REGULATOR
CSR	GAS SERVICE REGULATOR	GAS VALVE
GV	GAS VALVE	HICKENBOTTOM
HIC	HICKENBOTTOM	HEADSTONE
HDS	HEADSTONE	HYDRO LIGHT STANDARD
HLS	HYDRO LIGHT STANDARD	HYDRO METER
HM	HYDRO METER	HYDRO TRANSFORMER
HTN	HYDRO TRANSFORMER	HAND WELL
HW	HAND WELL	FIRE HYDRANT
HYD	FIRE HYDRANT	JUNCTION BOX
JBX	JUNCTION BOX	LIGHT STANDARD
LS	LIGHT STANDARD	MAILBOX
MB	MAILBOX	MONITORING PIN
MP	MONITORING PIN	MAINTENANCE HOLE UNIDENTIFIED
MH	MAINTENANCE HOLE UNIDENTIFIED	MAINTENANCE HOLE BELL
MHB	MAINTENANCE HOLE BELL	MAINTENANCE HOLE FIBRE OPTIC
MHF	MAINTENANCE HOLE FIBRE OPTIC	MAINTENANCE HOLE HYDRO
MHH	MAINTENANCE HOLE HYDRO	MAINTENANCE HOLE SANITARY
MHSA	MAINTENANCE HOLE SANITARY	MAINTENANCE HOLE STORM
MHST	MAINTENANCE HOLE STORM	MAINTENANCE HOLE TRAFFIC
MHT	MAINTENANCE HOLE TRAFFIC	MONITORING WELL
MW	MONITORING WELL	NEWS PAPER BOX
NPB	NEWS PAPER BOX	LIGHT STANDARD ORNAMENTAL
OLS	LIGHT STANDARD ORNAMENTAL	OBSERVATION WELL
OW	OBSERVATION WELL	PARKING METER
PKM	PARKING METER	PULL BOX
PLB	PULL BOX	PLAQUE
PLQ	PLAQUE	PILLAR
PLR	PILLAR	RAILWAY SWITCH STAND
RWSS	RAILWAY SWITCH STAND	SATELLITE DISH
SAT	SATELLITE DISH	SCULPTURE
SCLP	SCULPTURE	SUMP/CATCH PIT
SCP	SUMP/CATCH PIT	SPRINKLER CONTROL VALVE
SCV	SPRINKLER CONTROL VALVE	SPRINKLER HEAD
SH	SPRINKLER HEAD	SIAMSE CONNECTION
SIA	SIAMSE CONNECTION	SIGN
SN	SIGN	SOLAR PANEL
SPAN	SOLAR PANEL	SEPTIC TANK LID
SPF	SEPTIC TANK LID	TABLE
TBL	TABLE	TERMINAL BOX - BELL
TBL	TERMINAL BOX - BELL	TERMINAL BOX - CABLE
TBC	TERMINAL BOX - CABLE	TRAFFIC CONTROL BOX
TCP	TRAFFIC CONTROL BOX	TEST PIT
TPIT	TEST PIT	TRAFFIC SIGNAL LIGHT
TSL	TRAFFIC SIGNAL LIGHT	MARKER BELL UNDERGROUND
UMB	MARKER BELL UNDERGROUND	MARKER CABLE UNDERGROUND
UMC	MARKER CABLE UNDERGROUND	MARKER GAS UNDERGROUND
UMG	MARKER GAS UNDERGROUND	MARKER OIL UNDERGROUND
UMO	MARKER OIL UNDERGROUND	UTILITY POLE
UP	UTILITY POLE	VALVE BOX
VB	VALVE BOX	VALVE CHAMBER
VC	VALVE CHAMBER	WATER VALVE
WV	WATER VALVE	TREE CONIFEROUS
	TREE STUMP	TREE DECIDUOUS
	TREE CONIFEROUS	
	TREE DECIDUOUS	
OH	OVERHEAD WIRE	



SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THE SURVEY WAS COMPLETED ON THE 1st DAY OF JUNE, 2021.

DATE: _____ BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

DRAWN: NJ CHECKED: BW PM: BW FIELD: AW/NB PROJECT No.: 161614366-111

This plan was signed with a scanned signature as a result of the Emergency Order related to the COVID-19 pandemic.

1081 Carling
Pre-development (Existing) Peak Flow Calculations

Guidance on Approach to Estimate Allowable Peak Flow and SWM Calculations:

- 1 Allowable peak flow shall be estimated based on a 1:2 year IDF and based on a C-Factor = 0.1
- 2 Time of Concentration (Tc) to be calculated based on existing condition.
- 3 Rooftop flows and Amenity Area Flows to be controlled and conveyed to the Hamilton Avenue 300mm dia. Sewer and the 600m dia. Sewer on Parkdale Av
- 4 1:100 year post-development flows to be limited to the allowable peak flow (1:2 year flow) by means of on-site retention measures
- 5 SWM calculations to be compiled using the Modified Rational Method (MRM) for rooftop and at grade storage
- 6 MRM calculations to estimate cistern storage, to be estimated based on 50% of the peak flow rate per City requirement
- 7 All storm contributions to be released to storm sewers to be controlled by means of an inlet control device (ICD) or accounted as uncontrolled

Total Area of Site: 4293 m²
Total area of Road Widening Easement: 241 m²
Flow Allocation based on Total Site Area 4293m² - Area of Road Widening Easement 241 m² = 4052 m²

Pre-Development Area Breakdown:

To Parkdale Avenue 600mm dia. Storm Sewer

Type of Area	Area (m ²)	C-Factor	C-Factor (EI)
Parking Lot (P1)	317	0.5	
Parking Storage (P2)	1300	0.5	
Roof (R)	216	0.5	
Escape Ramp (R4)	127	0.5	
Boulevard (P5)	143	0.5	
Total	2588	0.50	12.90

Time of Concentration (existing):

Flow Path P1

Travel time from parking lot to CB 15min
Travel time from CB to Sewer on Parkdale
Assume pipe velocity = 1.0m/s; travel Length 23m; Travel Length = 23m/1.0 m/s = 0.4min
Tc (exist) = 15 mins + 0.4 mins

Flow Path P2:

Travel Time from Parking lot to parking leader drain 15min
Travel Time from Leader to Parkdale Sewer
Assume pipe velocity = 1.0m/s; travel Length 15m; Travel Length = 15m/1.0 m/s = 0.3min
Tc (exist) = 15 mins + 0.3 mins

Flow Path P3:

Travel time from Roof to roof drain 15min
Travel time from lead to Parkdale Sewer
Assume pipe velocity = 1.0m/s; travel Length 15m; Travel Length = 15m/1.0 m/s = 0.5min
Tc (exist) = 15 mins + 0.5 mins

Flow Path P4:

Travel Time from garage ramp to drain 15min
Travel time from drain to Parkdale Sewer
Assume pipe velocity = 1.0m/s; travel Length 23m; Travel Length = 23m/1.0 m/s = 0.4min
Tc (exist) = 15 mins + 0.4 mins

Flow Path P5:

Travel time from edge of building to CB 15min
Travel time from CB to Parkdale sewer
Assume pipe velocity = 1.0m/s; travel Length 3m; Travel Length = 3m/1.0 m/s = 0.05min
Tc (exist) = 15 mins + 0.05 mins

Tc = 15.50 mins
Intensity_{avg} = 60.61 mm/hr

Existing Peak Flow Calculations (1:2-year @ C-Factor = 0.50)

Q₂ = 2.78CAI
Q_{2p} = (2.78) x (0.50) x (0.2588 ha) x (60.61 mm/hr)
Q_{2p} = 21.8 L/s

To Hamilton Avenue 300mm dia. Storm Sewer

Type of Area	Area (m ²)	C-Factor	C-Factor (EI)
Escaped Parking Lot (R1)	1448	0.5	0.50
Total	1448	0.50	0.50

Time of Concentration (existing):

Flow Path H1

Travel time from parking lot to CB 15min
Travel time from CB to Sewer on Parkdale
Assume pipe velocity = 1.0m/s; travel Length 33m; Travel Length = 33m/1.0 m/s = 0.55min
Tc (exist) = 15 mins + 0.6 mins

Tc = 15.60 mins
Intensity_{avg} = 60.39 mm/hr

Existing Peak Flow Calculations (1:2-year @ C-Factor = 0.50)

Q₂ = 2.78CAI
Q_{2p} = (2.78) x (0.50) x (0.1448 ha) x (60.39 mm/hr)
Q_{2p} = 12.15 L/s

Summary Table

Area draining to the Parkdale 600mm dia. sewer:	2588 m ²
Area draining to Hamilton 300mm dia. sewer:	1448 m ²
Area draining to Carling 375mm dia. sewer (inc. Road Widening Easement)	16 m ²
Area of Road widening Easement draining to Carling 375mm dia. storm sewer:	241 m ²
Total Site Area	4293 m²

To Carling Avenue 375mm dia. Sewer

Type of Area	Area (m ²)	C-Factor	C-Factor (EI)
Escaped Interlock	16	0.5	0.50
Total	16	0.50	0.50

Time of Concentration (existing):

Flow Path C1

Travel time from edge of building to CB 15 mins
Travel time from CB to Carling sewer 3m
Assume pipe velocity = 1.0m/s; travel Length 3m; Travel Length = 3m/1.0 m/s = 0.05min
Tc (exist) = 15 mins + 0.05 mins

Tc = 15.05 mins
Intensity_{avg} = 61.65 mm/hr

Existing Peak Flow Calculations (1:2-year @ C-Factor = 0.50)

Q₂ = 2.78CAI
Q_{2p} = (2.78) x (0.50) x (0.0016 ha) x (61.65 mm/hr)
Q_{2p} = 0.14 L/s

1081 Carling
Allowable Peak Flow & SWM Calculations (Hamilton Ave Storm Sewer)

Allowable Peak Flow Calculation:

To Hamilton 300 mm diameter storm sewer:

Q _{allowable} (1.2-year) =	12.15 L/s
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Post-Development Drainage Areas

Controlled Flow To Hamilton Ave 300 mm diameter sewer:

Type of Area	Area (m ²)	C-Factor
West Tower Mech Penthouse	369	0.90
West Tower (Levels 5-12)	71	0.90
West Tower (Levels 13-16)	257	0.90
Total =	697	

Summary of Flows	Release Rate
West Tower Mech Penthouse Roof Storage	4.41 L/s
West Tower Rooftop Storage (Levels 5-12)	1.26 L/s
West Tower Rooftop Storage (Levels 13-16)	2.52 L/s
Uncontrolled to Hamilton	3.84 L/s
Total Flow	12.03 L/s

Un-controlled Flow To Hamilton Ave 300 mm diameter sewer:

Type of Area	Area (m ²)	C-Factor
Hamilton Ave. Frontage	86	0.90

Total Area tributary to Hamilton Ave. Storm Sewer 783 m²

Summary of Storage Requirements	
West Tower Mech Penthouse Roof Storage	8.00 m ³
West Tower Rooftop Storage (Levels 5-12)	1.15 m ³
West Tower Rooftop Storage (Levels 13-16)	0.39 m ³
Total	9.15 m³

1:100 Year Peak Uncontrolled Flow to Hamilton:

T _c	10 min.
Intensity _{100yr}	179 mm/hr.
Q=2.8CAI	3.84 L/s

Summary of Storage Provided	
West Tower Mech Penthouse Roof Storage	33.21 m ³
West Tower Rooftop Storage (Levels 5-12)	6.39 m ³
West Tower Rooftop Storage (Levels 13-16)	23.1 m ³
Total	39.60 m³

Remaining Allowable Release Rate to Hamilton Ave. 300mm dia. Sewer:
Q = 12.15L/s - 3.84 L/s = 8.31 L/s

SWM Calcs for Areas Tributary to Hamilton 300mm diameter Sewer :

West Tower Mech Penthouse Roof Storage	
Area (m ²)	369
C =	0.90
Sum of Roof Drains =	4.41
Storage Volume (m³)	8.00

Assuming Watts Adjustable Accutrol Weir (weir fully closed at 6" depth)	
No. of Drains	14
Flow/drain:	0.315 L/s

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Rooftop ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
10	178.56	16.49	4.41	12.08	7.25	20.61	16.20	9.72
15	142.89	13.19	4.41	8.78	7.90	16.49	12.08	10.87
20	119.95	11.07	4.41	6.66	8.00	13.84	9.43	11.32
25	103.85	9.59	4.41	5.18	7.77	11.98	7.57	11.36
30	91.87	8.48	4.41	4.07	7.33	10.60	6.19	11.15
35	82.58	7.62	4.41	3.21	6.75	9.53	5.12	10.75
40	75.15	6.94	4.41	2.53	6.07	8.67	4.26	10.23
45	69.05	6.37	4.41	1.96	5.31	7.97	3.56	9.61
50	63.95	5.90	4.41	1.49	4.48	7.38	2.97	8.91
55	59.62	5.50	4.41	1.09	3.61	6.88	2.47	8.15
60	55.89	5.16	4.41	0.75	2.70	6.45	2.04	7.35

The following assumptions were made in regard to rooftop configuration:

Rooftop flow (14 drains) =	4.41 L/s
Area of Roof	369 m ²
60% of roof for storage =	221 m ²
Vol. @ 6" ponding =	33.2 m ³

The SWM Calculations (above) shows rooftop storage volume requirements of 8.0 m³ and 11.36 m³ under the 1:100 year and climate change event (CCE)
Based on the above assumption (60% of rooftop used as storage), sufficient rooftop storage (33.2 m³) will be provided to detain both the 1:100 yr and CCE on the rooftop

1081 Carling

Allowable Peak Flow & SWM Calculations (Hamilton Ave Storm Sewer)

West Tower Roof Storage: (Levels 5-12)

Roof (m2)	71
C =	0.90
Sum of Roof Drains =	1.26
Storage Volume (m3)	1.15

Assuming Watts Adjustable Accutrol Weir (weir fully closed at 6" depth)	
No. of Drains	4
Flow/drain:	0.315 L/s

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Rooftop ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
10	178.56	3.17	1.26	1.91	1.15	3.96	2.70	1.62
15	142.89	2.54	1.26	1.28	1.15	3.17	1.91	1.72
20	119.95	2.13	1.26	0.87	1.04	2.66	1.40	1.68
25	103.85	1.84	1.26	0.58	0.88	2.31	1.05	1.57
30	91.87	1.63	1.26	0.37	0.67	2.04	0.78	1.40
35	82.58	1.47	1.26	0.21	0.43	1.83	0.57	1.20
40	75.15	1.33	1.26	0.07	0.18	1.67	0.41	0.98

The following assumptions were made in regard to rooftop configuration:

Rooftop flow (4 drains) =	1.26 L/s
Area of Roof	71 m2
60% of roof for storage =	43 m2
Vol. @ 6" ponding =	6.4 m3

The SWM Calculations (above) shows rooftop storage volume requirements of 1.15m3 and 1.72 m3 under the 1:100 year and climate change event (CCE)
Based on the above assumption (60% of rooftop used as storage), sufficient rooftop storage (6.4 m3) will be provided to detain both the 1:100 yr and CCE on the rooftop

West Tower Roof Storage: (Levels 13-16)

Roof (m2)	257
C =	0.90
Sum of Roof Drains =	2.52
Storage Volume (m3)	0.39

Assuming Watts Adjustable Accutrol Weir (weir fully closed at 6" depth)	
No. of Drains	8
Flow/drain:	0.315 L/s

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Rooftop ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
10	178.56	3.17	2.52	0.65	0.39	3.96	1.44	0.87
15	142.89	2.54	2.52	0.02	0.02	3.17	0.65	0.59
20	119.95	2.13	2.52	N/A	N/A	2.66	0.14	0.17
25	103.85	1.84	2.52	N/A	N/A	2.31	N/A	N/A
30	91.87	1.63	2.52	N/A	N/A	2.04	N/A	N/A
35	82.58	1.47	2.52	N/A	N/A	1.83	N/A	N/A
40	75.15	1.33	2.52	N/A	N/A	1.67	N/A	N/A

The following assumptions were made in regard to rooftop configuration:

Rooftop flow (8 drains) =	0.90 L/s
Area of Roof	257 m2
60% of roof for storage =	154 m2
Vol. @ 6" ponding =	23.1 m3

The SWM Calculations (above) shows rooftop storage volume requirements of 0.39m3 and 0.87 m3 under the 1:100 year and climate change event (CCE)
Based on the above assumption (60% of rooftop used as storage), sufficient rooftop storage (23.1 m3) will be provided to detain the 1:100 yr and CCE on the rooftop

1081 Carling
Allowable Peak Flow & SWM Calculations (Parkdale Storm Sewer)

Allowable Peak Flow Calculation:

To Parkdale 600 mm diameter storm sewer:

$Q_{allowable}$ (1:2-year) =	21.80 L/s
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Post-Development Drainage Areas

Controlled Flow To Parkdale Ave 600 mm diameter sewer:

Type of Area	Area (m ²)	C-Factor
East Tower Mech Penthouse	428	0.90
East Tower Roof (Levels 5-12)	135	0.90
East Tower Roof (Levels 13-25)	297	0.90
East Tower 4 Storey Podium	287	0.90
Frontage on Carling Ave. & West Tower 6 Storey	1616	0.90
Park Dedication	429	0.30
Park Frontage	52	0.90
Total =	3244	

Un-controlled Flow To Parkdale Ave 600 mm diameter sewer:

Type of Area	Area (m ²)	C-Factor
Frontage on Parkdale Ave	52	0.90

Total Area Tributary to Parkdale Ave. Storm Sewer: 3296 m²

1:100 Year Peak Uncontrolled Flow to Parkdale:

T_c	10 min.
Intensity _{100yr}	179 mm/hr.
$Q=2.8CAI$	2.32 L/s

1:5 Year Peak Flowrate from dedicated Parkland:

T_c	10 min.
Intensity _{5yr}	104 mm/hr.
$Q=2.8CAI$	3.73 L/s

Summary of Flows

	Release Rate
East Tower Mech Penthouse Roof Drains	1.89 L/s
East Tower Roof Drains (Levels 5-12)	0.95 L/s
East Tower Roof Drains (Levels 13-25)	0.95 L/s
Park Dedication - Release Rate	3.73 L/s
Cistern - Release Rate	11.95 L/s
Uncontrolled Peak Flow	2.32 L/s
Total	21.78 L/s

Summary of Storage Requirements

East Tower Mech Penthouse Roof Storage	14.88 m ³
East Tower Roof Drains (Levels 5-12)	3.88 m ³
East Tower Roof Drains (Levels 13-25)	3.88 m ³
Park Dedication	0.96 m ³
Cistern	77.19 m ³
Total	100.79 m³

Summary of Storage Provided

East Tower Mech Penthouse Roof Storage	38.52 m ³
East Tower 28 Story Roof Storage	12.15 m ³
Park Dedication	0.96 m ³
Cistern	77.19 m ³
Total	128.82 m³

Allowable Peak Flow & SWM Calculations (Parkdale Storm Sewer)

SWM Calcs for Areas Tributary to Parkdale 600mm diameter Sewer:

East Tower Mech Penthouse Roof Storage

Area (m2)	428
C =	0.90
Sum of Roof Drains =	1.89
Storage Volume (m3)	14.88

Assuming Watts Adjustable Accutrol Weir (weir fully closed at 6" depth)

No. of Drains	6
Flow/drain:	0.315 L/s

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Rooftop ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
10	178.56	19.12	1.89	17.23	10.34	23.90	22.01	13.21
15	142.89	15.30	1.89	13.41	12.07	19.13	17.24	15.51
20	119.95	12.84	1.89	10.95	13.15	16.06	14.17	17.00
25	103.85	11.12	1.89	9.23	13.85	13.90	12.01	18.02
30	91.87	9.84	1.89	7.95	14.31	12.30	10.41	18.73
35	82.58	8.84	1.89	6.95	14.60	11.05	9.16	19.24
40	75.15	8.05	1.89	6.16	14.78	10.06	8.17	19.60
45	69.05	7.39	1.89	5.50	14.86	9.24	7.35	19.85
50	63.95	6.85	1.89	4.96	14.88	8.56	6.67	20.01
55	59.62	6.38	1.89	4.49	14.83	7.98	6.09	20.10
60	55.89	5.99	1.89	4.10	14.74	7.48	5.59	20.13
65	52.65	5.64	1.89	3.75	14.62	7.05	5.16	20.11
70	49.79	5.33	1.89	3.44	14.46	6.66	4.77	20.05

The following assumptions were made in regard to rooftop configuration:

Rooftop flow (6 drains) =	1.89 L/s
Area of Roof	428 m2
60% of roof for storage =	257 m2
Vol. @ 6" ponding =	38.5 m3

The SWM Calculations (above) shows rooftop storage volume requirements of 14.88 m3 and 20.13 m3 under the 1:100 year and climate change event (CCE) Based on the above assumption (60% of rooftop used as storage), sufficient rooftop storage (38.5 m3) will be provided to detain the 1:100 yr and CCE on the rooftop

East Tower Roof Storage (Levels 5-12)

Roof (m2)	135
C =	0.90
Sum of Roof Drains =	0.95
Storage Volume (m3)	3.88

Assuming Watts Adjustable Accutrol Weir (weir fully closed at 6" depth)

No. of Drains	3
Flow/drain:	0.315 L/s

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Rooftop ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
10	178.56	6.03	0.95	5.09	3.05	7.54	6.59	3.96
15	142.89	4.83	0.95	3.88	3.49	6.03	5.09	4.58
20	119.95	4.05	0.95	3.11	3.73	5.06	4.12	4.94
25	103.85	3.51	0.95	2.56	3.84	4.38	3.44	5.16
30	91.87	3.10	0.95	2.16	3.88	3.88	2.93	5.28
35	82.58	2.79	0.95	1.84	3.87	3.49	2.54	5.34
40	75.15	2.54	0.95	1.59	3.82	3.17	2.23	5.35
45	69.05	2.33	0.95	1.39	3.75	2.92	1.97	5.32
50	63.95	2.16	0.95	1.22	3.65	2.70	1.76	5.27
55	59.62	2.01	0.95	1.07	3.53	2.52	1.57	5.19
60	55.89	1.89	0.95	0.94	3.39	2.36	1.41	5.09
65	52.65	1.78	0.95	0.83	3.25	2.22	1.28	4.98

The following assumptions were made in regard to rooftop configuration:

Rooftop flow (3 drains) =	0.95 L/s
Area of Roof	135 m2
60% of roof for storage =	81 m2
Vol. @ 6" ponding =	12.2 m3

The SWM Calculations (above) shows rooftop storage volume requirements of 3.88 m3 and 5.35 m3 under the 1:100 year and climate change event (CCE) Based on the above assumption (60% of rooftop used as storage), sufficient rooftop storage (12.2 m3) will be provided to detain the 1:100 yr and CCE on the rooftop

1081 Carling
Allowable Peak Flow & SWM Calculations (Parkdale Storm Sewer)

East Tower Roof Storage (Levels 13-25)	
Roof (m2)	297
C =	0.90
Sum of Roof Drains =	0.95
Storage Volume (m3)	3.88

Assuming Watts Adjustable Accutrol Weir (weir fully closed at 6" depth)	
No. of Drains	3
Flow/drain:	0.315 L/s

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Rooftop ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
10	178.56	6.03	0.95	5.09	3.05	7.54	6.59	3.96
15	142.89	4.63	0.95	3.68	3.49	6.03	5.09	4.58
20	119.95	4.05	0.95	3.11	3.73	5.06	4.12	4.94
25	103.85	3.51	0.95	2.56	3.84	4.38	3.44	5.16
30	91.87	3.10	0.95	2.16	3.88	3.88	2.93	5.28
35	82.58	2.79	0.95	1.84	3.87	3.49	2.54	5.34
40	75.15	2.54	0.95	1.59	3.82	3.17	2.23	5.35
45	69.05	2.33	0.95	1.39	3.75	2.92	1.97	5.32
50	63.95	2.16	0.95	1.22	3.65	2.70	1.76	5.27

The following assumptions were made in regard to rooftop configuration:

Rooftop flow (3 drains) =	0.95 L/s
Area of Roof	297 m ²
60% of roof for storage =	178 m ²
Vol. @ 6" ponding =	26.7 m ³

The SWM Calculations (above) shows rooftop storage volume requirements of 9.3 m³ and 13.0 m³ under the 1:100 year and climate change event (CCE). Based on the above assumption (60% of rooftop used as storage), sufficient rooftop storage (32.4 m³) will be provided to detain the 1:100 yr and CCE on the rooftop.

Park Storage	
Area of Park (Dedication)	429
C =	0.3
CB ICD	3.73
Storage Volume (m3)	0.96

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Park ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
10	178.56	5.32	3.73	1.60	0.96	6.65	2.93	1.76
15	83.56	2.49	3.73	N/A	N/A	3.11	N/A	N/A
20	70.25	2.09	3.73	N/A	N/A	2.62	N/A	N/A

The SWM Calculations (above) shows Park storage volume requirements of 0.96 m³ and 1.76 m³ under the 1:100 year and climate change event (CCE). The storage volume req can be accommodated by a depression or within the proposed infrastructure. A surface ponding area of 50 m² under ponding depth of 0.25 m can meet the requirement.

Underground Cistern - Storage Calculation	
Area Fronting Parkdale	52
Areas (3) Fronting Carling	1616
4th Storey Podium	287
C =	0.9
Cistern ICD (50% of 11.95 L/s)	5.98
Storage Volume (m3)	77.19

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Cistern ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m ³)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m ³)
50	63.95	31.28	5.98	25.31	75.92	39.10	33.13	99.38
55	59.62	29.16	5.98	23.19	76.53	36.46	30.48	100.59
60	55.89	27.34	5.98	21.37	76.92	34.18	28.20	101.52
65	52.65	25.75	5.98	19.78	77.13	32.19	26.21	102.24
70	49.79	24.35	5.98	18.38	77.19	30.44	24.47	102.76
75	47.26	23.11	5.98	17.14	77.13	28.89	22.92	103.13
80	44.99	22.01	5.98	16.03	76.95	27.51	21.53	103.36
85	42.95	21.01	5.98	15.04	76.68	26.26	20.29	103.47
90	41.11	20.11	5.98	14.13	76.32	25.14	19.16	103.47
95	39.43	19.29	5.98	13.31	75.89	24.11	18.14	103.38
100	37.90	18.54	5.98	12.56	75.39	23.17	17.20	103.20

The SWM Calculations (above) shows Cistern storage volume requirements of 77.19 m³ under the 1:100 year. The cistern to be equipped with an overflow pipe by the mechanical engineer sized to convey the difference between the 1:100-year peak flow and the CCE flow.