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- Environmental Restoration

829 Carling Avenue – Claridge Icon 2

Serviceability and Stormwater Management Report

Proposed High-Rise Residential Development
829 Carling Avenue – Claridge Icon 2

Serviceability and Stormwater Management Report

Prepared for:

Claridge Homes

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

April 15, 2021
Revised: April 21st, 2023
Revised: January 19th, 2024
Revised: December 13th, 2024

Novatech File: 121008
Ref No. R-2021-055

NOVATECH
Engineers, Planners & Landscape Architects

December 13th, 2024

City of Ottawa
Planning, Infrastructure and Economic Development Department
Planning and Infrastructure Approvals Branch
110 Laurier Avenue West, 4th Floor
Ottawa ON, K1P 1J1

Attention: **Mr. Shawn Wessel, A.Sc.T.,rcji**

Dear Sir:

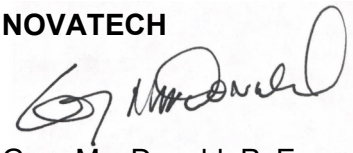
Reference: **829 Carling Avenue – Claridge Icon 2**
Serviceability and Stormwater Management Report

Please find enclosed the 'Serviceability and Stormwater Management Report' for the above-noted project. This report is submitted in support of the site plan application and outlines how the site will be serviced with public infrastructure.

Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

NOVATECH



Greg MacDonald, P. Eng.
Director, Land Development and Public Sector Infrastructure

cc: Vincent, Denomme, Claridge Homes

TABLE OF CONTENTS

List of Figures

List of Tables

List of Appendices

List of Drawings

Erosion and Sediment Control Plan	121008-ESC-Rev.3
General Plan of Services	121008-GP-Rev.5
Cistern Detail Plan	121008-CIS-Rev.3
Grading Plan	121008-GR-Rev.6

1.0 INTRODUCTION

Novatech has been retained by Claridge Homes to prepare a Serviceability and Stormwater Management Report for the proposed development located at 829 Carling Avenue within the City of Ottawa. The proposed site is denoted as Part of Lots 1554, 1555, 1556, and 1557, Registered Plan 38, City of Ottawa. This report is submitted in support of a site plan application, and a zoning by-law amendment. It will demonstrate how the site will be serviced with public infrastructure. **Figure 1** Key Plan shows the site location.

1.1 Existing Conditions

The subject site has an approximate area of 0.15 hectares (ha). Presently the site contains a brick collated CIBC Branch with a surrounding asphalt parking lot fronting Preston and Sidney Street.

The site is bound by an existing commercial building to the west, Sidney Street to the north, Preston Street to the east, and Carling Avenue to the south. The property north of Sidney Street is currently under development (SoHo Italia). **Figure 2** shows the existing site conditions.

1.2 Proposed Development

The subject site is designated as 'Mixed Use Centre' on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is 'Arterial Mainstreet' (AM1), and the site is within the Preston-Carling District Secondary Plan, which permits the proposed land uses. However, a Zoning By-Law Amendment is required to permit certain attributes of the proposed development (i.e., building height).

The proposed development will be constructed in one phase as described below:

- 50-storey high-rise tower including 505 dwelling units.
- 329 m^2 of retail space at ground level.

Residents and visitors will access the building via full-movement driveway to Sidney Street. The development is anticipated to be built out by 2028. **Figure 3** shows the site plan.

A pre-consultation meeting was held with the City of Ottawa on March 15th, 2021. Notes of the meeting minutes can be found in **Appendix A.**

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CITY OF OTTAWA

829 CARLING AVENUE

KEYPLAN

SCALE: N.T.S

DATE: DEC 2022 | JOB: 121008 | FIGURE: FIGURE-1

M:\2021\121008\CAD\Design\121008-KP.dwg, 8x11 landscape, Dec 06, 2022 - 2:30pm, cferguson

SHT8X11.DWG - 216mmx279mm

LEGEND

SITE BOUNDARY

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CITY OF OTTAWA
829 CARLING AVENUE

EXISTING CONDITIONS

SCALE 1 : 750 (0, 10, 20, 30)

DATE DEC 2022 | JOB 121008 | FIGURE FIGURE-2

SHT11X17.DWG - 279mmX432mm

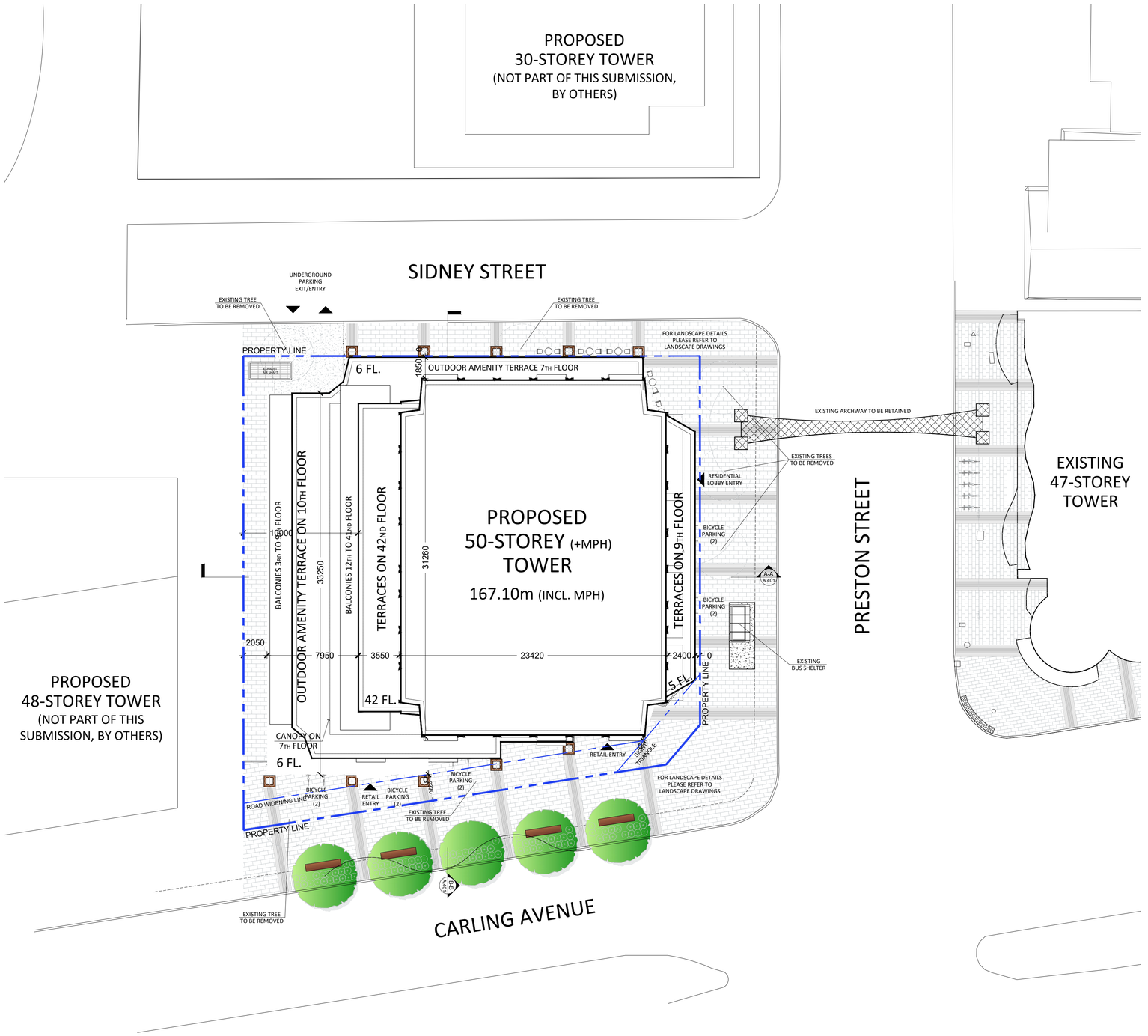
M:\2021\121008\CAD\Design\Figures\Design Brief\121008- Existing Conditions Figure.dwg, EXC, Dec 06, 2022 - 2:55pm, cferguson

DEVELOPMENT AREA SUMMARY		
SITE AREA (INCL. ROAD WIDENING)	1,519 m2	16,350 ft2
SITE AREA (EXCL. ROAD WIDENING)	1,417 m2	15,253 ft2
FSI (LOT AREA INCL. ROAD WIDENING)	19,26	

BUILDING GFA SUMMARY		
TOTAL RESID. GFA	29,056.0 m2	312,756 ft2
TOTAL RETAIL GFA	329.0 m2	3,541 ft2
TOTAL GFA	29,259.0 m2	314,941 ft2

RESIDENTIAL UNIT BREAKDOWN					
B./ST.	1BR	1BR+D	2BR	3BR	TOTAL
31	160	85	197	32	505
9.4%	30.6%	16.3%	37.6%	6.1%	–

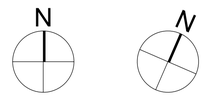
ZONING TABLE			
PROVISION	REQUIRED	PROVIDED	COMPLIANCE
MIN. LOT AREA	NO MINIMUM	1,519 m2	✓
MIN. LOT WIDTH	NO MINIMUM	32.16 m	✓
MIN. FRONT YARD SETBACK	MIXED-USE BLDG: 0m	0 m	✓
MIN. CORNER SIDE YARD SETBACK	MIXED-USE BLDG: 0m	0 m	✓
MIN. REAR YARD	MIXED-USE BLDG NOT ABUTTING A RESIDENTIAL ZONE: 0m	0 m	✓
BUILDING HEIGHT	MAX. 30m AND NO HIGHER THAN 9 STOREYS	136.80m (INCL. MPH); 40 ST.	✗
AMENITY AREA	MIN. 6m2/DU; 50% MUST BE COMMUNAL; 396x6=2,376m2 TOTAL AND 1,188m2 COMM.	COMMUNAL: 1,199 m2	✓
MINIMUM RESID. VEHICLE PARKING	AREA Z: NO PARKING REQ'D.	166 SPACES	✓
MAXIMUM RESID. VEHICLE PARKING	1.75 SPACES / DU 396 x 1.75 = 693	166 SPACES	✓
MINIMUM VISITOR PARKING	0.1 SPACES / DU AFTER FIRST 12 DU, MAX. 30 SPACES REQUIRED	30 SPACES	✓
MIN. COMMERCIAL VEHICLE PARKING	AREA Z: NO PARKING REQ'D.	0 SPACES	✓
MIN. RESIDENTIAL BICYCLE PARKING	MIN. RESID. BICYCLE PARK. 0.5 SPACES / DU 396 x 0.5 = 198 SPACES	198 SPACES	✓
MIN. COMMERCIAL BICYCLE PARKING	1 / 250m2 GFA 335m2 = 1.34 (2 ROUNDED)	2 SPACES	✓
DRIVEWAY WIDTH	TWO-WAY FOR RESID.: 6.0m	6.0 m	✓
AISLE WIDTH	90-DEGREE PARKING SPACES: 6.0m	6.0 m	✓
PARKING SPACE SIZE	MAX. 40% OF RESID. SPACES CAN BE SMALL SIZE (2.4m x 4.6m) 196 x 40% = 79 SPACES	SMALL SIZE PARK.: 25	✓



General Notes:

1. These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretations of these documents by the contractor. Upon written application the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents. The Architect will review Shop Drawings submitted by the Contractor for design conformance only.
2. Drawings are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the Work and report any discrepancies with the Contract Documents to the Architect before commencing work.
3. Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on the Architectural drawings. The locations shown on the Architectural drawings govern over the Mechanical and Electrical drawings. Those items not clearly located will be located as directed by the Architect.

North



Project North True North

CLARIDGE HOMES

PROJECT TEAM

CLIENT	CLARDIGE HOMES
ARCHITECT	HARIRI PONTARINI ARCHITECTS
LANDSCAPE	JAMES B. LENNOX + ASSOCIATES
PLANNING	FOTENN PLANNING + DESIGN
STRUCTURAL	GOODEVE STRUCTURAL INC.
CIVIL/TRAFFIC	NOVATECH GROUP
GEOTECH	PATERSON GROUP INC.
WIND	GRADIENT WIND ENGINEERING
SURVEYOR	ANNIS O'SULLIVAN, VOLLEBEKK LTD.

Rev.	Issue / Description	Date
3	RE-ISSUED FOR OPA, ZBA, AND SPA (DRAFT)	MAR 24, 2023
2	RE-ISSUED FOR OPA, ZBA, AND SPA (DRAFT)	NOV 08, 2022
1	ISSUED FOR OPA, ZBA, AND SPA	MAY 10, 2021

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ONTARIO ASSOCIATION OF ARCHITECTS
DAVID PONTARINI
LICENCE
4466

Project Title:

829 CARLING AVENUE

MIXED-USE DEVELOPMENT

OTTAWA, ON

SITE PLAN

Project number: 2030
Scale: 1 : 200
Date: MARCH 24, 2023
Drawn by: HPA

Drawing No.: A.102

Revision:

2.0 SITE GEOTECHNICAL

A geotechnical investigation was completed by Paterson Group Inc. and a report prepared entitled 'Geotechnical Investigation, Proposed High-Rise Building, 829 Carling Avenue, Ottawa, Ontario – prepared for Claridge Homes' dated May 12th, 2021 (Report: PG5744-1). Key findings of the report are as follows:

- Generally, the subsurface profile across the site consists of an approximate 0.9 to 1.5 m thickness of fill underlain by bedrock. Bedrock predominantly consists of grey limestone.

- The long-term groundwater table can be expected at approximate depths of 3.0 to 4.0 m below the existing ground surface. However, it should be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater level could vary at the time of construction.

- Existing foundation walls and other construction debris should be entirely removed from within the perimeters of the proposed buildings. Under paved areas, existing construction remnants, such as foundation walls, should be excavated to a minimum of 1 m below final grade.

- The excavation side slopes above the groundwater level extending to a maximum depth of 3m should be excavated at 1H:1V or shallower. The shallower slope is required for excavation below groundwater level. The subsurface soils are considered a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

- A temporary Ministry of Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required if more than 400,000 L/day of ground and/or surface water are to be pumped during the construction phase. At least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP.

- For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16. If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MECP review of the PTTW application.

3.0 SANITARY SEWER

There are existing sanitary and combined sewers within the surrounding Sidney Street, Preston Street, and Carling Avenue rights-of-way. There is an existing 450mm diameter combined sewer within Sidney Street right-of-way, a 1500mm diameter combined sewer within the Preston Street right-of-way, and a 300mm sanitary within the Carling Avenue right-of-way. Through correspondence with the City of Ottawa it is understood that there are no capacity issues within the surrounding sanitary systems that will affect the design of the development.

3.1 Design Criteria

Sanitary flows for the proposed development were calculated using criteria from Section 4 of the City of Ottawa Sewer Design Guidelines and the Ontario Building Code as follows:

- Residential Average Flow = 280 L/capita/day
- Studio Apartment = 1.4 Person/unit
- 1 Bed apartment = 1.4 Person/unit
- 2 Bed apartment = 2.1 Person/unit
- 3 Bed apartment = 3.1 Person/unit
- Commercial flow = 125 L/seat/day
- Residential Peaking Factor = Harmon Equation (max peaking factor = 4.0)
- Commercial Peaking Factor = 1.0
- Peak Extraneous Flows (Infiltration) = 0.33L/s/ha

3.2 Sidney Street Servicing

The tower is proposed to contain a 200mm sanitary service. The proposed service will connect to the existing 450mm diameter combined sewers within the Sidney Street right-of-way. Based on the available data the existing sanitary sewers were installed in 2009 and are composed of reinforced concrete. The sewer flows to the north-east down Sidney Street to Preston Street infrastructure. Additionally, it was confirmed through correspondence with the City, the combined sewer's 100-year HGL upstream of the site is 59.25m.

The total sanitary design flow including infiltration for the site development was calculated to be **10.26 L/s**. Through correspondence with the City of Ottawa Senior Water Resources Engineer it is understood that the system has capacity to take the proposed development.

Detailed sanitary flow calculations, and correspondence are provided in **Appendix B** for reference.

4.0 STORM SERVICING

There is a 450mm diameter combined sewer within the Sidney Street right-of-way, a 1500mm diameter combined sewer in the Preston Street right-of-way, and 450mm dia. storm sewer in the Carling Avenue right-of-way.

It is proposed to service the site with one (1) 250mm storm service connection. The service will convey the uncontrolled foundation drain, roof flows, and the controlled flows from the internal stormwater cistern within the parking garage. This will be achieved by the mechanical consultant connecting the foundation drain flows downstream of the controlled cistern connection to the service. The service will connect to existing 450mm diameter combined sewer within Sidney Street.

General Plan of Services drawing (**121008 - GP**) and Cistern Detail drawing (**121008-CIS**) for more details.

The design criteria used in sizing the storm sewers are summarized below in **Table 4.1.**

Table 4.1:Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	2 Year Return Period
Storm Sewer Design	Rational Method
IDF Rainfall Data	Ottawa Sewer Design Guidelines
Initial Time of Concentration (Tc)	10 min
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

Refer to **Appendix C** for detailed storm drainage area plans and storm sewer design sheets.

5.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

The stormwater management strategy for the site is based on the established criteria from the City of Ottawa.

5.1 Design Criteria

Through correspondence with the City of Ottawa and our knowledge of development requirements in the area, the following criteria have been adopted to control post-development stormwater discharge from the site:

- Control proposed development flows, up to and including the 100-year storm event, to a 2-year allowable release rate calculated using a runoff coefficient (C) equal to existing conditions but in no case greater than 0.40 and a time of concentration (T_c) no less than 10 minutes;

- Provide source controls which are in conformity with the City of Ottawa requirements, where possible;

- Limit ponding to 0.15 m for all rooftop storage areas and 0.30 m for all parking storage areas; and

- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

The approach to the stormwater management design is to determine the allowable release rate for the site, calculate the uncontrolled flow, and ensure that the remaining flow, in combination with the uncontrolled flow, does not exceed the allowable release rate. All proposed development runoff in excess of the allowable release rate, will be attenuated on-site prior to being released into the combined sewers within Sidney Street.

5.2 Existing Site Drainage

As mentioned previously the site is currently occupied by one existing commercial building. The site generally drains towards Sidney Street, with a small portion of the frontage draining towards Carling Avenue and Preston Street.

5.3 Quantity Control

The allowable release rate for the 0.15 ha site was calculated to be **13.0 L/s** based on the SWM criteria provided by the City of Ottawa.

Design Storms

The design storms are based on City of Ottawa design storms. Design storms were used for the 2, 5, 100, and 100+20%-year return periods (i.e. storm events).

Model Parameters

Post-development catchments were modelled based on the proposed site plan and grading as shown on **Drawing 121008-SWM** within **Appendix C**. All the sub-catchments over proposed underground parking areas are assumed to be 100% impervious. The building roofs were assumed to have no depression storage.

The site has been divided into eight (8) drainage areas for the post development condition. The drainage areas are as follows:

Area A-01, A-02, R-01

- Flows from the proposed garage access, side courtyard and uncontrolled building roof will be conveyed to the existing combined sewer in Sidney Street. These flows will be captured by an area drain, trench drain and roof drains which will be conveyed to the proposed cistern located near the intersection of Sidney Street and Preston Street. Flows from the cistern to the existing sewer in Sidney Street will be pumped and discharged above the 100-year HGL. The pump (to be designed by the mechanical consultant) is required to convey flow at 3.7 L/s. A “stand-by” pump will be provided for emergency and/or maintenance purposes. An emergency back-up power supply will also be provided. The storm service will be equipped with a backflow prevention device to protect the building from any potential sewer back-ups. Storage will be provided for storms up to and including the 100-year event within the cistern. A 150mm internal overflow is provided at the 100-yr water elevation, and a vented lid is proposed on the tank for maintenance access and emergencies which will convey flows directly to the Sidney Street right-of-way.

Area D-01:

- A small portion of drainage along the hardscape along the north frontage of the property will flow uncontrolled to the Preston Street Right of way.

Area D-02:

- A small portion of the hardscaped area at the south-east corner of the site will drain uncontrolled to the Preston Street Right of way.

Area D-03:

- South frontage flowing uncontrolled to Carling Avenue Right of way.

Area D-04:

- Small portion of hardscape in the sites north-west corner, area will drain uncontrolled to Sidney Street Right of way.

Area D-05:

- Very small portion of hardscape which is not covered by above upper floor limits drains uncontrolled to Sidney Street Right of way.

The total post development flows from the site are as follows;

- 2-Year; **7.3 L/s**
- 5-Year; **8.6 L/s**
- 100-Year: **13.0 L/s**
- Allowable; **13.0 L/s**

As depicted above the post development flows for the site either are below or equal to the allowable release rate for all design storm events. Refer to **Appendix C** for Rational Method calculations, STM-Post Development Drainage Area Plan, storage required, and storage provided for each of the site drainage areas.

5.4 Major Overland Flow Route

A major overland flow route will be provided for storms greater than the 100-year storm event. Stormwater will be directed to the surrounding rights-of-way. The major overland system is shown on the Grading Plan (drawing **121008-GR**).

6.0 WATERMAIN

There is an existing 150mm diameter PVC watermain within the Sidney Street right-of-way, a 300mm diameter PVC watermain within the Carling Avenue right-of-way, and a 400mm diameter ductile iron watermain in the Preston Street right-of-way. The proposed development will include a twin 150mm diameter PVC DR 18 water service to the public mains.

As per the City of Ottawa Technical Bulletin ISDTB-2014-02, proposed services will consist of twin 150mm watermains separated by an isolation valve. One (1) service will connect to Sidney Street and the second to Preston Street. The proposed building will be sprinklered and equipped with a siamese connection. The siamese connection will be placed to be within 45m of a fire hydrant. Refer to the General Plan of Services drawing (**121008-GP**), and the Coverage Plans included in **Appendix D** for details.

Water demands have been calculated using criteria from Section 4 of the City of Ottawa Water Distribution Guidelines and the Ontario Building Code as provided in **Table 6.1 – Watermain Design Parameters and Criteria**.

Table 6.1: Watermain Design Parameters and Criteria

Domestic Demand Design Parameters	**Design Parameters**
Unit Population: 1-Bedroom Apartment 2-Bedroom Apartment 3-Bedroom Apartment	1.4 people/unit 2.1 people/unit 3.1 people/unit
Commercial Demand	125L/day/seat
Basic Day Residential Demand (BSDY)	280 L/c/d
Maximum Day Demand (MXDY)	Residential: 2.5 x Basic Day Commercial: 1.5 x Basic Day
Peak Hour Demand (PKHR)	Residential: 2.2 x Maximum Day Commercial: 2.7 x Basic Day
Fire Demand (FF) Design	
Per FUS 2020	
System Pressure Criteria Design Parameters	**Criteria**
Maximum Pressure (BSDY) Condition	< 80 psi occupied areas < 100 psi unoccupied areas
Minimum Pressure (PKHR) Condition	> 40 psi
Minimum Pressure (MXDY+FF) Condition	> 20 psi

The required fire demands have been calculated using the Fire Underwriters Survey (FUS) Guidelines. The water demand and fire flow calculations are provided in **Appendix D** for reference. A summary of the water demand and fire flows are provided in **Table 6.1** below.

Table 6.2: Sidney Street Domestic Water Demand Summary

Phase	**Population**	**Ave. Daily Demand (L/s)**	**Max. Daily Demand (L/s)**	**Peak Hour Demand (L/s)**	**Fire Flow (L/s)**
Total	**959**	**3.23**	**7.95**	**17.42**	**83**

The above water demand information was submitted to the City for boundary conditions from the City's water model. These boundary conditions were used for analyzing the performance of the proposed and existing watermain systems for three theoretical conditions:

1) High Pressure check under Average Day conditions
2) Peak Hour demand
3) Maximum Day + Fire Flow demand.

Refer to **Table 6.3** for a summary of the proposed boundary conditions and hydraulic analysis.

Table 6.3: Water Boundary Conditions and Hydraulic Analysis Summary

Criteria	Head (m)	Pressure[1] (psi)	Pressure Requirements (psi)
Connection 1: Sidney Street			
Max HGL	115.2	73.9	< 80psi
Min HGL	106.9	62.1	> 40psi
Max Day + Fire Flow	105.4	60.0	> 20psi
Connection 2: Preston Street			
Max HGL	115.2	73.9	< 80psi
Min HGL	107.0	62.3	> 40psi
Max Day + Fire Flow	109.4	65.7	> 20psi

* Pressure based on finish floor elevation of 63.21m.

The above hydraulic analysis indicates that the system can provide adequate pressures and flow to meet the domestic and fire flow requirements for the site. Refer to **Appendix D** for detailed water demand calculations, and City of Ottawa boundary conditions.

7.0 EROSION AND SEDIMENT CONTROL

Temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter socks (catchbasin inserts) will be placed in existing and proposed catchbasins and catchbasin manholes, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- Mud mats will be installed at the site entrances;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair, or replacement requirements. Sediments that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Erosion and Sediment Control Plan (**121008-ESC**) for additional information.

8.0 CONCLUSIONS

Sanitary Servicing

The analysis of the existing and proposed sanitary system confirms the following:

- It is proposed to service the development utilizing a new 200mm sanitary service to Sidney Street.
- The total sanitary flow including infiltration for the site development was calculated to be 10.26 L/s.
- There is adequate capacity within city infrastructure downstream from the development for the project.

Stormwater Management

The following provides a summary of the storm sewer and stormwater management system:

- The proposed 250mm diameter storm sewers will connect to the 450mm diameter combined sewer in the Sidney Street right-of-way. The sewer systems will provide storm conveyance for the entire site.
- Stormwater control for the tower will be provided by a cistern within the P1 parking levels. Pump release rate 3.7 L/s. Total cistern volume = 81.11m^3.
- Flows to be pumped above Sydney Street combined sewer HGL.
- As per the proposed grading plans, major overland flow routes have been provided to the surrounding rights-of-way.

Watermain

The analysis of the existing and proposed watermain network confirms the following:

- The proposed watermain contains individual dual services (150mm diameter) separated by Isolation valves connections to the existing 150mm diameter watermain within Sidney Street and 400mm within the Preston Street right-of-ways.
- There are adequate pressures in the existing watermain infrastructure to meet the required domestic demands for the development.
- There is adequate flow and pressure to service the proposed fire protections system.

Erosion and Sediment Control

- Erosion and sediment control measures (i.e. filter fabric, catchbasin inserts, silt fences, etc.) will be implemented prior to construction and are to remain in place until vegetation is established.

9.0 CLOSURE

This report is submitted in support of a site plan application and zoning by-law amendment. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:

Curtis Ferguson, E.I.T.
Land Development Engineering

Reviewed by:

Greg MacDonald, P.Eng.
Director, Land Development and Public Sector Infrastructure

APPENDIX A

Pre-Consultation Meeting Minutes

Pre-Consul Meeting Notes to the File Lead - Andrew McCreight March 15, 2021
Re: 829 Carling Ave. (ICON II)
Ward 14 - Somerset, Councillor Catherine McKenney
Zoning By-law Amendment and SPC Application
60-Storey, Mixed-Use Residential Apt. Building with 459 units and 6 levels of UG parking as well as surface parking
Claridge Homes (Limited Partnership)

Infrastructure:

Preston St.:

A 405 mm dia. PVC Watermain (c. 2009) is available.

A 1500 mm dia. Conc. Combined Trunk Sewer – Preston St. Combined Trunk (c. 2009) is available, which drains to Booth St. Combined Trunk.

Sydney St.:

A 127 mm dia. UCI Watermain (c. 1909) is available.

A 450 mm dia. Conc. Combined Sewer (c. 2009) is available, which drains to the Preston St. Combined Trunk Sewer.

Carling Ave:

A 127 mm dia. UCI Watermain (c. 1911) is available (Westbound Lane).

A 1067 mm dia. COO Feeder Watermain (c. 1960) is available (Eastbound Lane).

A 300 mm dia. Conc. San Sewer (c. 1910) is available, which drains to the Preston St. Combined Trunk Sewer. If connection occurs on the separated sewer portion of this sewer, no MECP ECA would be required.

A 450 mm dia. Conc. Stm Sewer (c. 1910) is available, which drains to the Preston St. Combined Trunk Sewer.

The following apply to this site and any development within a combined sewer area:

- Total allowable release rate will be 2-year pre-development rate.
- Coefficient (C) of runoff will need to be determined **as per existing conditions** but in no case more than 0.4
- TC = 20 minutes or can be calculated
  TC should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.
- Any storm events greater than 2 year, up to 100 year, and including 100-year storm event must be detained on site.
- Two separate sewer laterals (one for sanitary and other for storm) will be required.

An MECP ECA will be required.

Please have applicant provide one copy of the following for our review:

MECP ECA Application Form - TOR or Direct Submission tied to SPC
~~Fees - Certified Cheque made out to "City of Ottawa" for TOR or for DS "Ministry of Finance"~~
Proof of Applicant's Identification (if no Certificate of Incorporation)
Certificate of Incorporation (if Applicable)
NAICS Code (If Applicable)
Plan & Profile
Grading and Servicing Plans
Survey Plan
Pipe Data Form
Draft ECA (City of Ottawa Expanded Works Form)
Source Protection Policy Screening & Significant Threat Report
Sewer Drainage Area Plan
SWM Report
Services Report
Geotechnical Report & any other supportive documentation
Correspondence: City of Ottawa including ROW, Water Resources Dept., ISD etc., MNR, Conservation Authority & MECP.

Please note that once the review has been completed and the Sr. Engineer is satisfied and ready to sign off on the application, after the PM recommendations ~~3 final bound copies including 3 CD Rom disks will be required to accompany the applications with MECP and for City of Ottawa records.~~

Please note a change in process, as per MECP, whereas payment will be arranged between Applicant and MECP for DS applications.
As previously done, applicant to supply all information for our review.

Submission to MECP will be in form of WeTransfer file, created by applicant and emailed to City - including all listed above as well as City provided Sr. Eng. sign-off document and Source Protection Screening. We will be happy to clarify any confusion generated from these instructions.
CD/USB drives with digital files will not be required at this time.

Applicant may request TOR application as the MECP has recently updated their procedures. PM with investigate internally and with MECP to see if this application qualifies.

Footer of ECA Application should have reference #: 8551E (2019/05)

As the MECP are entertaining TOR ECA applications, where the application meets the required tests, as per conditions 1 and 2 of the attached schedule A. The tests include that these works be considered public. Also, in the event that the only reason that the applicant is going as direct submission is because of private ownership then City should be able to process under ToR. Each proposal will need approval from the MECP supervisor.

UPDATED_City of Ottawa_TOR 2_0 Addi

Please also note:

Foundation drains are to be independently connected to sewermain (separated or combined) unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.

Roof drains are to be connected downstream of any incorporated ICD within the SWM system. Provide Roof plan showing roof drain and scupper locations, flow rates, drain type and weir opening if controlled. Provide Manufacturer Specifications on drains and also provide 5- and 100-year ponding limits on plan.

Boundary Conditions will be provided at request of consultant after providing Average Daily Demands, Peak Hour Demands & Max Day + Fire Flow Demands

Existing buildings require a CCTV inspection and report 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.

CCTV Scan Guideline.pdf

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.

Other:

Environmental Noise Study is required due to Preston Street and Carling Avenue.

Stationary Noise Study – consultant to speak to this in their report as per City NCG and NPC 300 Guidelines. May be required after Mechanical Design completed and prior to building permit issuance.

When greater than 9 metres in height Wind Study for all buildings/dwellings.
No Capital Projects listed in the area on GeoOttawa or Envista.

Water Supply Redundancy – Fire Flow:

Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)
FUS Fire Flow Criteria to be used unless a low-rise building, where OBC requirements may be applicable.

W12.pdf

Site Lighting:
Site lighting certificate and photometric plan required for this site. This will be a condition of agreement(s).

Site lighting certificate and photometric plan required for this site, particularly looking at light spillage and effects on nearby residential properties.

Capital Works:
Road and Sidewalk Renewal project planned for Preston Street, South of Carling, within the next 3-5 years.

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

General Bulletin_New Tree Protection Bylaw.

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.

Gas Pressure Regulating Station.pd

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):
SPPS will be provided to applicant by City Risk Mgmt. Officer within Asset Mgmt. Dept.

Applicant to contact Rideau Valley Conservation Authority (RVCA) for possible restrictions due to quality control. Provide correspondence in Report.

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).

Vibration monitoring will be required for all backbone watermains (1067 mm dia.in this case) within 15m of site and trunk sewers (1500 mm dia.in this case) in proximity of site. Conditions for Vibration will be applied to agreements.

Note: In addition to requirement of a vibration specialist engineer required to design and monitor vibration, a certificate of liability insurance shall be submitted to the City wherein the Owner is the named insured and the City of Ottawa is an additional insured. The limits of the policy shall be in the amount of $25,000,000 and shall be kept in full force and effect for the term of the construction work.

CCTV sewer inspection required for pre and post construction conditions to ensure no damage to City Assets surrounding site. See nearby Transit Way, Preston Street and Carling Avenue.

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.

Due to proximity of site to Transit Way and Dows Lake Station, applicant to contact City LRT Group in regard to required building offset from transitway. Noise study to review vibration conditions within 75m of Transitway. See Rail Guidelines and CPCS Report as well as OP Annex 17, Zones of Influence and Guidelines for Proximity Study.

2013_05_29_Guidelines_NewDevelopment_E

CPCS Report Appendix_F.pdf

annex_17_en.pdf

Trillium ZOI.pdf

Confederation East ZOI.pdf

Confederation West ZOI.pdf

Confed Railway Line Prox. Guidelines.pdf

Where underground storage (UG) and surface ponding are being considered:

Show all ponding for 5- and 100-year events

Above and below ground storage is permitted although uses ½ Peak Flow Rate or is modeled. Please confirm that this has been accounted for and/or revise.

Rationale:

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 be used 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.

Note that the above will added to upcoming revised Sewer Design Guidelines to account for underground storage, which is now widely used.

Further to above, what will be the actual underground storage provided during the major (100 year) and minor (2 year) storm events?

Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?

Note - 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.

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.

Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. 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.

For proposed depressed driveways or developments with private lanes, parking areas or with entrances etc. lower than roadway…


S18.pdf


S18.1.pdf

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.

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.

Note:
"Provided Info to applicant":
Please be advised that it is the responsibility of the applicant and their representatives/consultants to verify information provided by the City of Ottawa.
Please contact City View and Release Info Centre at Ext. 44455

Environmental Source Information:

Due to more sensitive use, a Record of Site Condition (RSC) is required. Ensure Phase I, and if applicable, Phase II ESA's speak to required RSC.

City of Ottawa - Historical Land Use Inventory (HLUI) - Required

Rationale:
The HLUI database is currently undergoing an update. The updated HLUI will include additional sources beyond those included in the current database, making the inclusion of this record search even more important.
Although a municipal historic land use database is not specifically listed as required environmental record in O. Reg 153/04, Schedule D, Part II states the following:

The following are the specific objectives of a records review:

1. To obtain and review records that relate to the Phase I (One) property and to the current and past uses of and activities at or affecting the Phase I (One) property in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

2. To obtain and review records that relate to properties in the Phase I (One) study area other than the Phase I (One) property, in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

It is therefore reasonable to request that the HLUI search be included in the Phase I ESA to meet the above objectives.
Please submit.

All existing reports and plans will need to be revised if older than 2 years and must reflect current City Standards, Guidelines, By-laws and Policies.

Please refer to City of Ottawa website portal **for "Guide to preparing Studies and Plans"** at https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans.

Please ensure you are using the current guidelines, bylaws and standards including materials of construction, disinfection and all relevant reference to OPSS/D and AWWA guidelines - all current and as amended, such as:

City of Ottawa Sewer Design Guidelines (**CoOSDG**) complete with ISTDB 2012-01, 2014-01, 2016-01, 2018-01 & 2019-02 technical bulletin updates as well as current Sewer, Landscape & Road Standard Detail Drawings as well as Material Specifications (MS Docs).
Sewer Connection (2003-513) & Sewer Use (2003-514) By-Laws.

City of Ottawa Water Distribution Design Guidelines (**CoOWDDG**) complete with ISTDB 2010-02, 2014-02 & 2018-02 technical bulletin updates as well as current Watermain/ Services Material Specifications (MS Docs) as well as Water and Road Standard Detail Drawings.
FUS Fire Flow standards
Water (2018-167) By-Law

Ensure to include version date and add **"(as amended)"** when referencing all standards, detail drwaings, by-Laws and guidelines.

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 (Britney.McGrath@ottawa.ca) early in the zoning & site plan process to determine the ability to construct site and copy **Andrew McCreight** on this request.

Contact me by e-mail shawn.wessel@ottawa.ca if you have any questions.

Sincerely,

Original signed

Shawn Wessel, A.Sc.T., rcji
Project Manager
Development Review, Central Branch

Pre-Application Consultation Meeting Minutes
829 Carling Avenue

PC2021-0082

March 15, 2021

Applicant: Claridge Homes (Vincent Denomme)

Attendees:

Applicant team

- **Hariri Pontarini Architects** - Ken Lee & Asem Alhadrab
- **Novatech** - Greg MacDonald & Brad Byvelds
- **Paterson** - Mark Darcy, Dave Gilbert and Scott Dennis
- **FoTenn** - Kersten Nitsche & Brian Casagrande
- **Claridge** - Neil Malhotra, Jim Burghout & Vincent Denomme

City of Ottawa

- Doug James, Manager, Development Review Central
- Andrew McCreight, File Lead, Planner
- Randolph Wang, Urban Design
- Shawn Wessel, Engineering
- Mike Giampa, Transportation

Dalhousie Community Association (DCA)

*subject to non-disclosure agreements

- Catherine Boucher
- Eric Darwin

Meeting Notes & Comments

Applicant Team – Project Overview

- Presentation of proposed development concept
- Parking design includes seven levels underground, and seven levels above ground – 387 spaces.
- Parking access from Sidney.

- Site is close to Carling O-Train station
- Surrounding approvals include zoning for 55-storey, and Icon is under construction at 45 storeys
- Proposed development is 60-storey mixed-use building with ground floor commercial units and residential above. Approximately 460 units.
- 7-storey podium design (with parking) will sculpt tower at bottom
- Above grade parking structure wil use mix of screens/glass to provide residential appearance to hide parking deck.
- 8th floor designed as an amenity level

Engineer – Shawn W

- Detailed comments will be attached as a separate document in the pre-con follow-up email, including plan and study requirements.
- ECA required if connecting on Preston.
- Servicing has several opportunities
- LRT proximity study required
- Noise Study re: Preston/Carling
- Wind analysis
- Greg – sewer on Sidney, is this an option? Shawn - Connection to combined requires ECA (direct submission). Applicant can make request for transfer of review to City. Greg – SAN on Carling is quite small, likely won't connect to it. Will go with Combined sewer connection. Can City issue foundation before ECA? No connection. SW – yes, this can be considered.

Transportation – Mike Giampa

- TIA, ROW protection, sight triangle etc. will be identified in pre-con follow up
- Be aware of new Ottawa hospital and TIA should include details from forecasting etc. plans and start dates etc.
- Brad – Step 1 sent. Looking at surrounding approvals etc. multiple developments have access from Sidney and may trigger street becoming a Right-in right-out. Was there Cost-sharing or anything to modify this area? TBD through TIA step process.
- Doug – 845 Carling had S. 37 and was supposed to convert Sidney into woonerf.

Planning – Andrew McCreight

- SP / Zoning / OP – Is this intent to submit applications concurrently?
    - Yes - Apply for all three at same time.
- The proposed parking, both in terms of the amount (387 spaces) and strategy that includes podium parking (7 levels above grade) is very concerning.
    - This development shall focus on being an active transit development and highlight implementing transit demand strategies.
    - If parking below grade is constrained (depth?) consider alternative arrangement like the auto-mated systems or stacked systems.
    - The above grade parking structure is not supported and requires further evaluation, starting with the amount of parking proposed and necessity to even consider parking within the podium.
- What is the strategy for bicycle parking? Ideally there would be room for a ground floor bike room and/or dedicated bicycle parking area that are a safe and convenient to use. The location warrants a 1:1 bicycle to unit ratio.
- As per the Preston-Carling Secondary all Cash-in-Lieu Parking stays in area.
- Thoroughly review the Secondary Plan for policies associated with the Station Area, and high-rise development (including policies for greater than 30 storeys)
    - Note the requirements for transition, exceptional architecture design, streetscape quality and skyline impacts.
    - Review the Public Realm improvement polices in Section 5.
    - Thorough view analysis required from multiple vantage points.
    - Special UDRP process and tall building panel.
- Ground Floor design – Retail should be oriented toward Preston – *"Continuous at grade retail and commercial frontages shall be provided along Preston Street."*
- Public realm plan -with enhanced pedestrian realm on all frontages and street trees. Opportunity for public plaza?
- S.37 applies. Planning Rationale should cover as-of-right GFA versus proposed as per the Guidelines.

Urban Design - Randolph

- Design Priority Area, and as per proposed height Tall Building Panel review required.
- Tower is about 12m from western property line? Alex - Its about 10m
- Floor plate changes 590-790
- This is a very tall building. Plans calls for 25m separation. Looking to achieve 12.5 on your side.
- Special Panel requirement. Similar process to ICON.
- Review public realm study requirement.
- More detailed comments will be provided in the follow-up email

OP Team - David

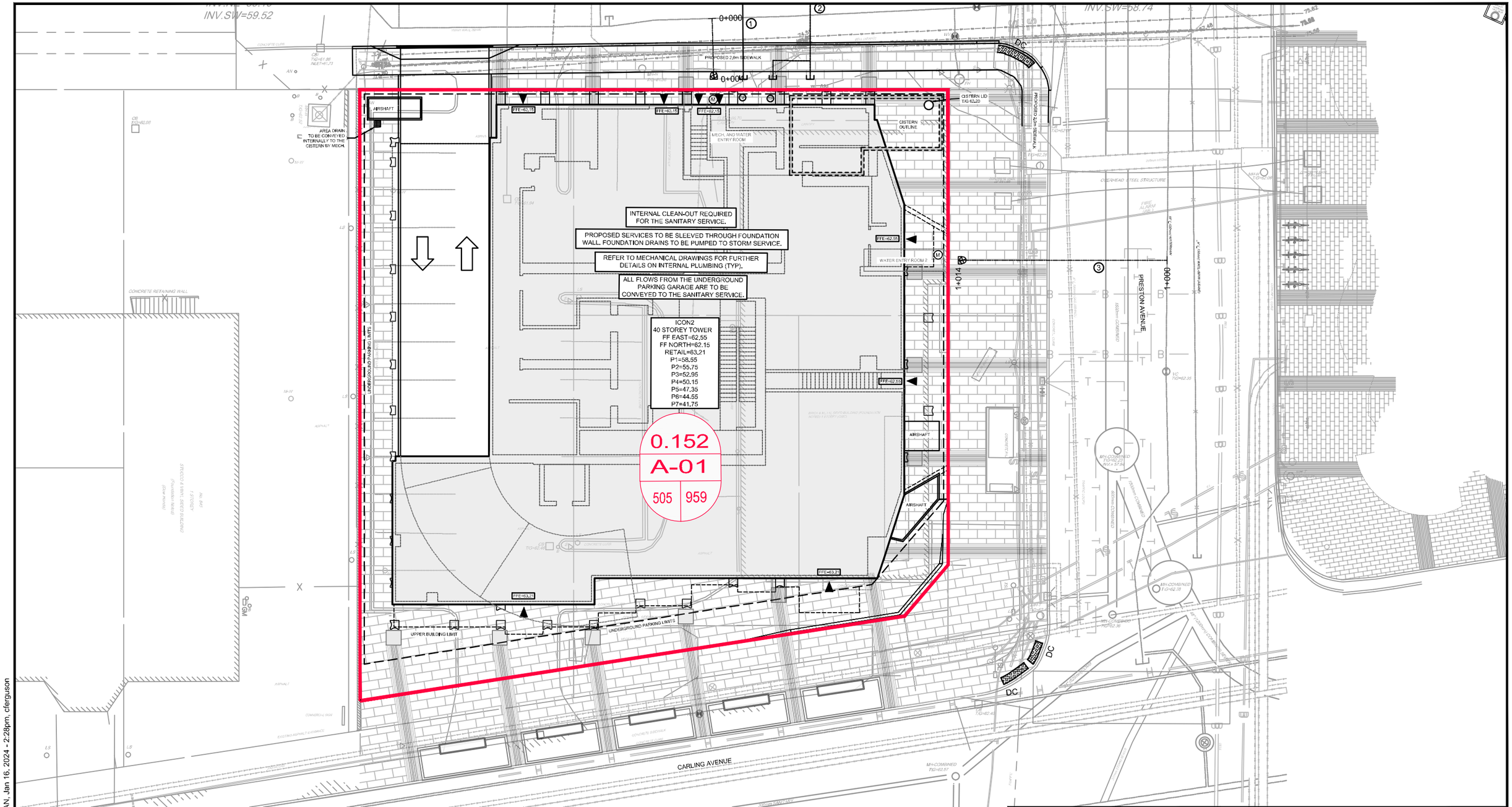
- Take into consider the emerging directions of new policy in draft OP.
- Rideau Canal Special District – provide background view of canal and renderings for view analysis.
- Cluster of skyscraper developing in this area. Want to see variation in height and use of colours and visual interest.
- Active frontages and street trees are important.
- Public realm improvement and pedestrian spaces at grade.
- Consider new skyscraper criteria such as providing interior public spaces, like observation decks, upper floor restaurants etc.

DCA – Catherine / Eric

- Echo concerns raised by City staff
- How does this proposal relate to rest of neighbourhood?
- The experience at grade needs to be iconic.
- Above grade parking is not something the community is interested in. The amount of parking proposed seems excessive.
- Where is the bicycle parking?
- Parking above grade takes away from “eyes on the street”
- SP does call for public plaza. More greening of site is required.
- Better mainsteet commercial uses along frontage.
- More trees.
- Major concerns re above ground parking
    - Precedent concern of other developments coming in.
    - Don’t want a neighbourhood of parking. Also, a huge waste of prime views to Dow’s Lake and commissioners park.
- Mixed views on location of commercial and residential lobby area.
- Concerned about greenspace along preston. If just grass, it will become a dog poop park…..
- Other City’s have better dog criteria, and this should be considered in the design of this site.
- Parking structure is a dead zone… no eyes on the street. What if it was greened or more innovative than fake screens and façade.
- Should be sidewalk on west side of property connecting Carling and Sidney.

APPENDIX B

Sanitary Servicing



LEGEND

- SANITARY SEWER DRAINAGE AREA BOUNDARY
- 0.47 / 20A-19A / 71 | 128 — DRAINAGE AREA (ha); SAN SEWER PIPE RUN; NO. UNITS/POPULATION
- PROPERTY LINE

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
829 CARLING AVENUE
(CLARIDGE ICON 2)

SANITARY DRAINAGE AREA PLAN

SCALE 1 : 500 (0, 5m, 10m, 20m)
DATE JAN 2024
JOB 121008
FIGURE SAN

SHT11X17.DWG - 279mmX432mm

M:\2021\121008\CADD\design\121008-SAN.dwg, SAN, Jan 16, 2024 - 2:28pm, cferguson

SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121008
Project Name: 829 Carling Avenue
Date Prepared: 12/6/2022
Date Revised: 4/20/2023
Date Revised: 1/16/2024
Input By: Curtis Ferguson, E.I.T.
Reviewed By: Greg MacDonald, P.Eng
Drawing Reference: 121008-SAN

Legend:
- PROJECT SPECIFIC INFO
- USER DESIGN INPUT
- CUMULATIVE CELL
- CALCULATED DESIGN CELL OUTPUT

LOCATION			DEMAND																	DESIGN CAPACITY							
			RESIDENTIAL FLOW									COMMERCIAL FLOW					EXTRANEOUS FLOW			PROPOSED SEWER PIPE SIZING / DESIGN							
AREA	FROM MH	TO MH	Studio	1 Bed Apartment	2 Bed Apartment	3 Bed Apartment	POPULATION (in 1000's)	CUMULATIVE POPULATION (in 1000's)	PEAK FACTOR M	AVG POPULATION FLOW (L/s)	PEAKED DESIGN POP FLOW (L/s)	AREA (m^2)	CUMULATIVE AREA (m^2)	DESIGN COMMERICAL FLOW (L/s)	COMMERICAL PEAK FACTOR	PEAKED COMMERCIAL FLOW	Total Area (ha.)	Accum. Area (ha.)	DESIGN EXTRAN. FLOW (L/s)	TOTAL DESIGN FLOW (L/s)	PIPE LENGTH (m)	PIPE SIZE (mm) AND MATERIAL	PIPE ID ACTUAL (m)	ROUGH. (n)	DESIGN GRADE (%)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak Design / Qcap
SAN-01	BLDG	SANMH 100	31	160	282	32	0.959	0.959	3.25	3.11	10.10	329.0	329.0	0.12	1.00	0.12	0.15	0.15	0.05	10.26	6.9	200 PVC	0.203	0.013	1.00	34.2	1.06	30.0%

Design Parameters:

1. Residential Flows					
-Studio	1.4	Person/ Unit			**As per City of Ottawa Sewer Design Guidelines, 2012**
-1 Bed Apartment	1.4	Person/ Unit			
-2 Bed Apartment	2.1	Person/ Unit			
-3 Bed Apartment	3.1	Person/ Unit			
2. Commercial Flow					
-Retail Area (329.0m^2)	125	L/seat/day			**As per OBC Section 8.2**
3. Q Avg capita flow	**280**	L/capita/day			**As per City of Ottawa - Technical Bulletin ISTB-2018-01**
4. M = Harmon Formula (maximum of 4.0)					
5. K =	**0.8**				
6. Commercial Peak Factor	**1.0**				**As per City of Ottawa - Technical Bulletin ISTB-2018-01**
7. Peak Extraneous Flow =	**0.33**	**L/sec/ha**			

(*assumed 1 seat/4m^2)

CAPACITY EQUATION

Q full= (1/n) A R^(2/3)S_o^(1/2)

Where : Q full = Capacity (L/s)

n = Manning coefficient of roughness (0.013)
A = Flow area (m^2)
R = Wetter perimenter (m)
So = Pipe Slope/gradient

Curtis Ferguson

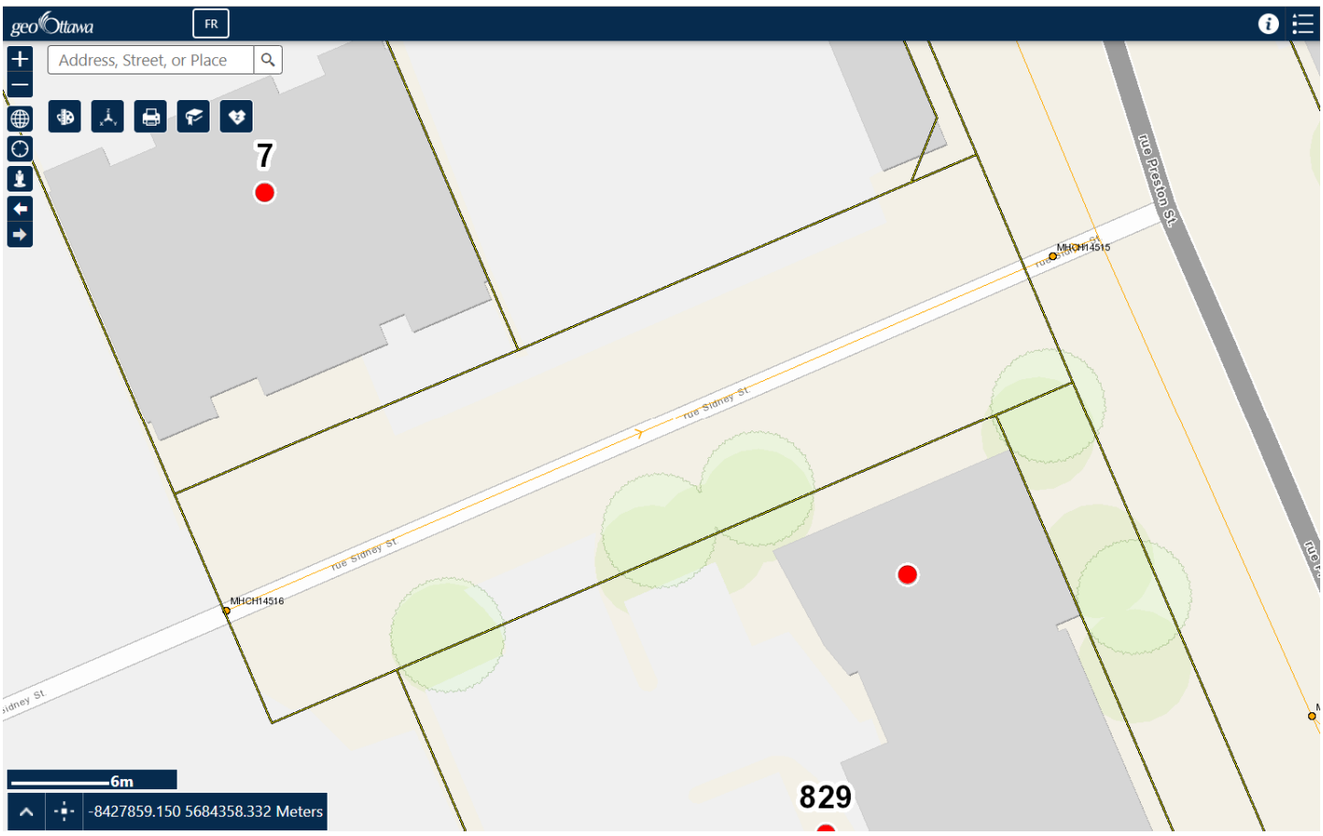
From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Tuesday, April 4, 2023 11:57 AM
To: Curtis Ferguson
Cc: Greg MacDonald
Subject: 829 Carling Avenue

Follow Up Flag: Follow up
Flag Status: Flagged

As requested, here are HGLs near 829 Carling Ave

At MHCH14493 -Carling/Preston
100 year – HGL EL. 59.25 Carling at Preston
5 year - HGL EL. 59.05 Carling at Preston

at MHCH14418 on Carling Ave
5 year – EL 59.39 but 100 year is not available.



If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Pronouns: he/him | Pronom: il
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Real Estate and Economic Development Department | Direction générale de la planification des biens immobiliers et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1

(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

Please consider the environment before printing this email

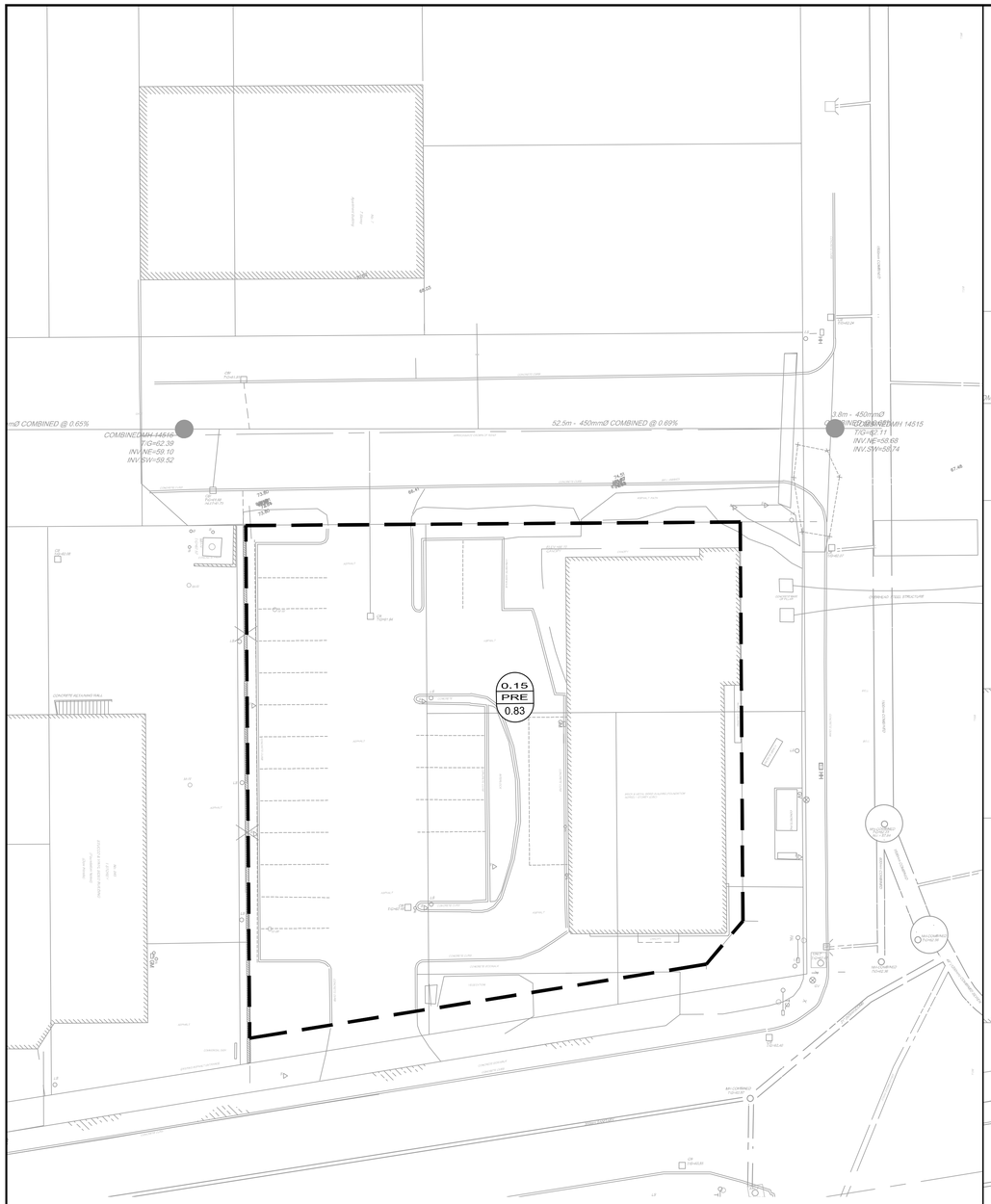
*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

'

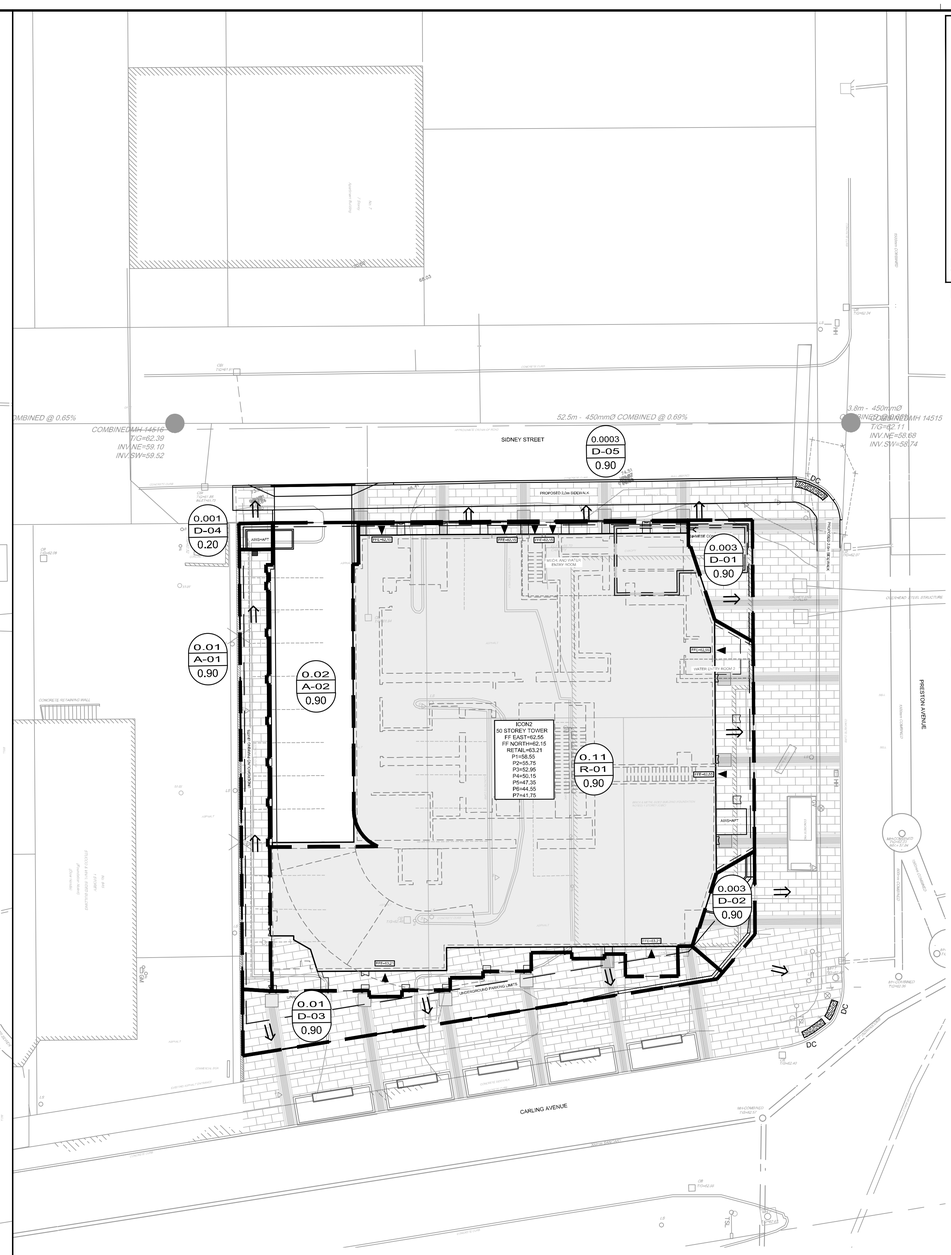
'

APPENDIX C

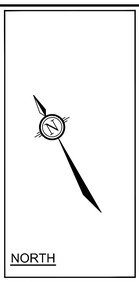
Storm Servicing

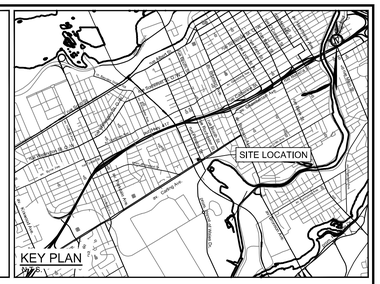


PRE-DEVELOPMENT STORMWATER PLAN



POST-DEVELOPMENT STORMWATER PLAN





LEGEND

- DRAINAGE AREA LIMITS
- AREA (ha)
- DRAINAGE AREA ID
- RUNOFF COEFFICIENT (5-YEAR)

NOTES

STORMWATER MANAGEMENT NOTES:

1. REFER TO 'SERVICEABILITY AND STORMWATER MANAGEMENT REPORT' PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD, R-2021-055 (DATED JANUARY, 19 2024)
2. NO ROOF TOP CONTROL ACCOUNTED FOR.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CLARIDGE HOMES

CLARIDGE HOMES
505 PRESTON STREET,
OTTAWA , ONTARIO
K1S 4N7.

No.	REVISION	DATE	BY
5.	RE-ISSUED FOR ZBA AND SPA	DEC13/24	GJM
4.	ISSUED FOR ZBA AND SPA	JAN19/24	GJM
3.	ISSUED FOR ZBA AND SPA	APRIL21/23	GJM
2.	ISSUED FOR COORDINATION	JUL13/22	CJF
1.	ISSUED WITH SITE PLAN APPLICATION	APR15/21	GJM

SCALE: 1:200 (1:200, 0 2 4 6 8)

DESIGN: CJF
CHECKED: GJM
DRAWN: CJF
CHECKED: GJM
APPROVED: GJM

FOR REVIEW ONLY

NOVATECH
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Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
ICON2 - 829 CARLING AVE.

DRAWING NAME
STORMWATER MANAGEMENT PLAN

PROJECT No. 121008
REV REV # 5
DRAWING No. 121008-STM

D07-12-21-0067

M:\2021\121008\CAD\Design\121008-STM.dwg, STM, Jan 17, 2024 - 4:48pm, dferguson

18581

Time to Peak Calculations - Existing Conditions

TABLE 1A: Time of Concentration (Uplands Overland Flow Method)

Area ID	Overland Flow						Channel Flow			Overall	
	Length (m)	Elevation U/S (m)	Elevation D/S (m)	Slope (%)	Velocity (Uplands (m/s)	Travel Time (min)	Length (m)	Velocity * (m/s)	Travel Time (min)	Time of Concentration (min)	Time to Peak (min)
PRE	41.423	63.13	62.07	2.6%	1	0.69	N/A	N/A	N/A	0.69	0.46

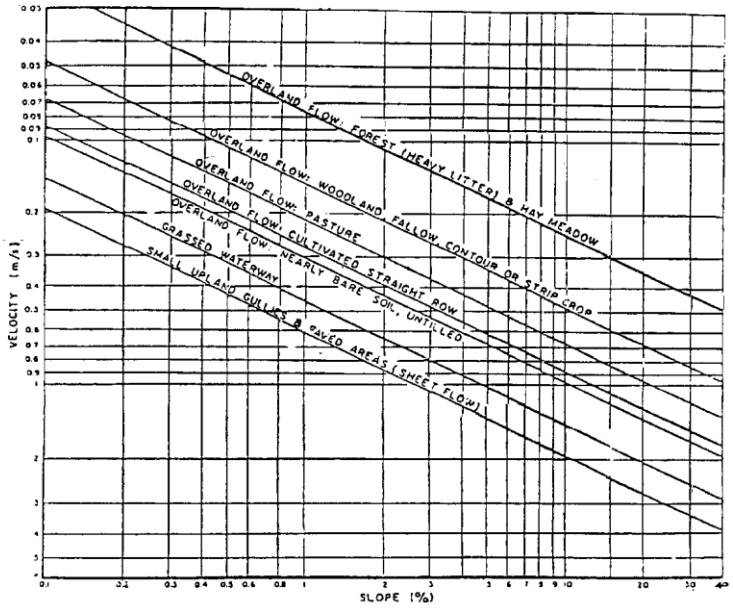

Figure A.5.2: Upland Method for Estimating Time of Concentration
(SCS National Engineering Handbook, 1971)

PROJECT #: 121008
PROJECT NAME: 829 Carling Avenue
LOCATION: City of Ottawa

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DATE PREPARED: December, 2022

TABLE 2A: Pre-Development Runoff Coefficient "C" - PRE

Area	Surface	Ha	"C"	C_{avg}	$*C_{100}$
Total	Hard	0.137	0.90	0.83	0.93
0.152	Soft	0.015	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

TABLE 2B: Pre-Development Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Sidney Street	0.152	0.83	10	**27.0**	**36.6**	**69.9**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

TABLE 3A: Allowable Runoff Coefficient "C"

Area	"C"
Total	0.40
0.152	

TABLE 3B: Allowable Flows

Outlet Options	Area (ha)	"C"	Tc (min)	$Q_{2\ Year}$ (L/s)	Q_{ALLOW} (L/s)
Sidney Street	0.152	0.40	10	**13.0**	**13.0**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$

Equations:
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 121008
PROJECT NAME: 829 Carling Avenue
LOCATION: City of Ottawa

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DATE PREPARED: DECEMBER, 2022

TABLE 4A: Post-Development Runoff Coefficient "C" - D-01

Area	Surface	Ha	"C"	C_{avg}	$*C_{100}$
Total	Hard	0.003	0.90	0.90	1.00
0.003	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 4B: Post-Development D-01 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Preston Street	0.003	0.90	10	**0.7**	**0.9**	**1.7**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 121008
PROJECT NAME: 829 Carling Avenue
LOCATION: City of Ottawa

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DATE PREPARED: December, 2022

TABLE 5A: Post-Development Runoff Coefficient "C" - D-02

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.003	0.90	0.90	1.00
0.003	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 5B: Post-Development D-02 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Preston Street	0.003	0.90	10	**0.5**	**0.7**	**1.4**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 121008
PROJECT NAME: 829 Carling Avenue
LOCATION: City of Ottawa

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DATE PREPARED: December, 2022

TABLE 6A: Post-Development Runoff Coefficient "C" - D-03

Area	Surface	Ha	"C"	C_{avg}	$*C_{100}$
Total	Hard	0.012	0.90	0.90	1.00
0.012	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 6B: Post-Development D-03 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Carling Avenue	0.012	0.90	10	**2.3**	**3.1**	**5.8**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 121008
PROJECT NAME: 829 Carling Avenue
LOCATION: City of Ottawa

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DATE PREPARED: December, 2022

TABLE 6A: Post-Development Runoff Coefficient "C" - D-03

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.001	0.90	0.90	1.00
0.001	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 6B: Post-Development D-03 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Sidney Street	0.001	0.90	10	**0.1**	**0.1**	**0.3**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 121008
PROJECT NAME: 829 Carling Avenue
LOCATION: City of Ottawa

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DATE PREPARED: December, 2022

TABLE 6A: Post-Development Runoff Coefficient "C" - D-03

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.000	0.90	0.90	1.00
0.0003	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

TABLE 6B: Post-Development D-03 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Sidney Street	0.0003	0.90	10	**0.0**	**0.1**	**0.1**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

PROJECT #: 121008
PROJECT NAME: 829 Carling Avenue
LOCATION: City of Ottawa

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DATE PREPARED: December, 2022

TABLE 12A: Post-Development Runoff Coefficient "C" - A-01,02,R-01

			5 Year Event		100 Year Event	
Area	0.4	Ha	"C"	C_{avg}	"C" + 25%	$*C_{avg}$
Total	Hard	0.024	0.90	0.90	1.00	1.00
0.133	Roof	0.109	0.90		1.00	
	Soft	0.000	0.20		0.25	

TABLE 12B: 2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-01,02,R06-9

0.133 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	25	45.17	15.04	3.7	11.34	17.01
	30	40.04	13.33	3.7	9.63	17.34
	35	36.06	**12.01**	**3.7**	**8.31**	**17.44**
	40	32.86	10.94	3.7	7.24	17.38
	45	30.24	10.07	3.7	6.37	17.20

TABLE 12C: 5 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-01,02,R-06-9

0.133 =Area (ha)
0.90 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	35	48.52	16.15	3.70	12.45	26.15
	40	44.18	14.71	3.70	11.01	26.43
	45	**40.63**	**13.53**	**3.70**	**9.83**	**26.54**
	50	37.65	12.54	3.70	8.84	26.51
	55	35.12	11.69	3.70	7.99	26.38

TABLE 12D: 100 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-01,02,R-06-9

0.133 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	75	47.26	17.48	3.7	13.78	62.02
	80	44.99	16.64	3.7	12.94	62.13
	85	**42.95**	**15.89**	**3.7**	**12.19**	**62.18**
	90	41.11	15.21	3.7	11.51	62.15
	95	39.43	14.59	3.7	10.89	62.07

TABLE 12E: 100+20 YEAR EVENT QUANTITY STORAGE REQUIREMENT - A-01,02,R-06-9

0.133 =Area (ha)
1.00 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR +20%	95	47.32	17.51	3.7	13.81	78.70
	100	45.48	16.83	3.7	13.13	78.76
	105	**43.80**	**16.20**	**3.7**	**12.50**	**78.77**
	110	42.24	15.63	3.7	11.93	78.73
	115	40.81	15.10	3.7	11.40	78.64

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation
$C_s = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$
$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

TABLE 12F: Structure information - A-01,02,R-01

Structures	Size Dia.(mm)	Area (m^2)	T/G
STORAGE TANK	N/A	26.97	62.20

TABLE 12G: Storage Provided - A-01,02,R-01

Area A-01,02,R-01: Storage Table				
Elevation (m)	System Depth (m)	TANK Volume (m^3)	Underground Volume (m^3)*	
58.550	0.00	0.00	0.00	
58.650	0.10	2.70	2.70	
58.750	0.20	5.39	5.39	
58.850	0.30	8.09	8.09	
58.950	0.40	10.79	10.79	
59.050	0.50	13.49	13.49	
59.150	0.60	16.18	16.18	
59.250	0.70	18.88	18.88	
59.350	0.80	21.58	21.58	
59.450	0.90	24.27	24.27	
59.550	1.00	26.97	26.97	
59.650	1.10	29.67	29.67	
59.750	1.20	32.36	32.36	
59.850	1.30	35.06	35.06	
59.950	1.40	37.76	37.76	
60.050	1.50	40.46	40.46	
60.150	1.60	43.15	43.15	
60.250	1.70	45.85	45.85	
60.350	1.80	48.55	48.55	
60.450	1.90	51.24	51.24	
60.550	2.00	53.94	53.94	
60.650	2.10	56.64	56.64	
60.750	2.20	59.33	59.33	
60.850	2.30	62.03	62.03	
60.950	2.40	64.73	64.73	
61.050	2.50	67.43	67.43	
61.150	2.60	70.12	70.12	
61.250	2.70	72.82	72.82	
61.350	2.80	75.52	75.52	
61.450	2.90	78.21	78.21	
61.550	3.00	80.91	80.91	**Top Of Tank**
61.650	3.10	80.94	80.94	
61.750	3.20	80.97	80.97	
61.850	3.30	80.99	80.99	
61.950	3.40	81.02	81.02	
62.050	3.50	81.05	81.05	
62.150	3.60	81.08	81.08	
62.200	3.65	81.11	81.11	**Top of Grate**

TABLE 5G: Orfice Sizing information Area - STM TANK

Control Device *PUMP*					
Design Event	**Flow (L/S)**	**Head (m)**	**Elev (m)**	**Outlet dia. (mm)**	**Required Volume (m^3)**
1:2 Year	3.7	0.65	59.20	300.00	17.44
1:5 Year	3.7	0.99	59.54	300.00	26.54
1:100 Year	3.7	2.32	60.87	300.00	62.18
1:100+20% Year	3.7	2.93	61.48	300.00	78.77

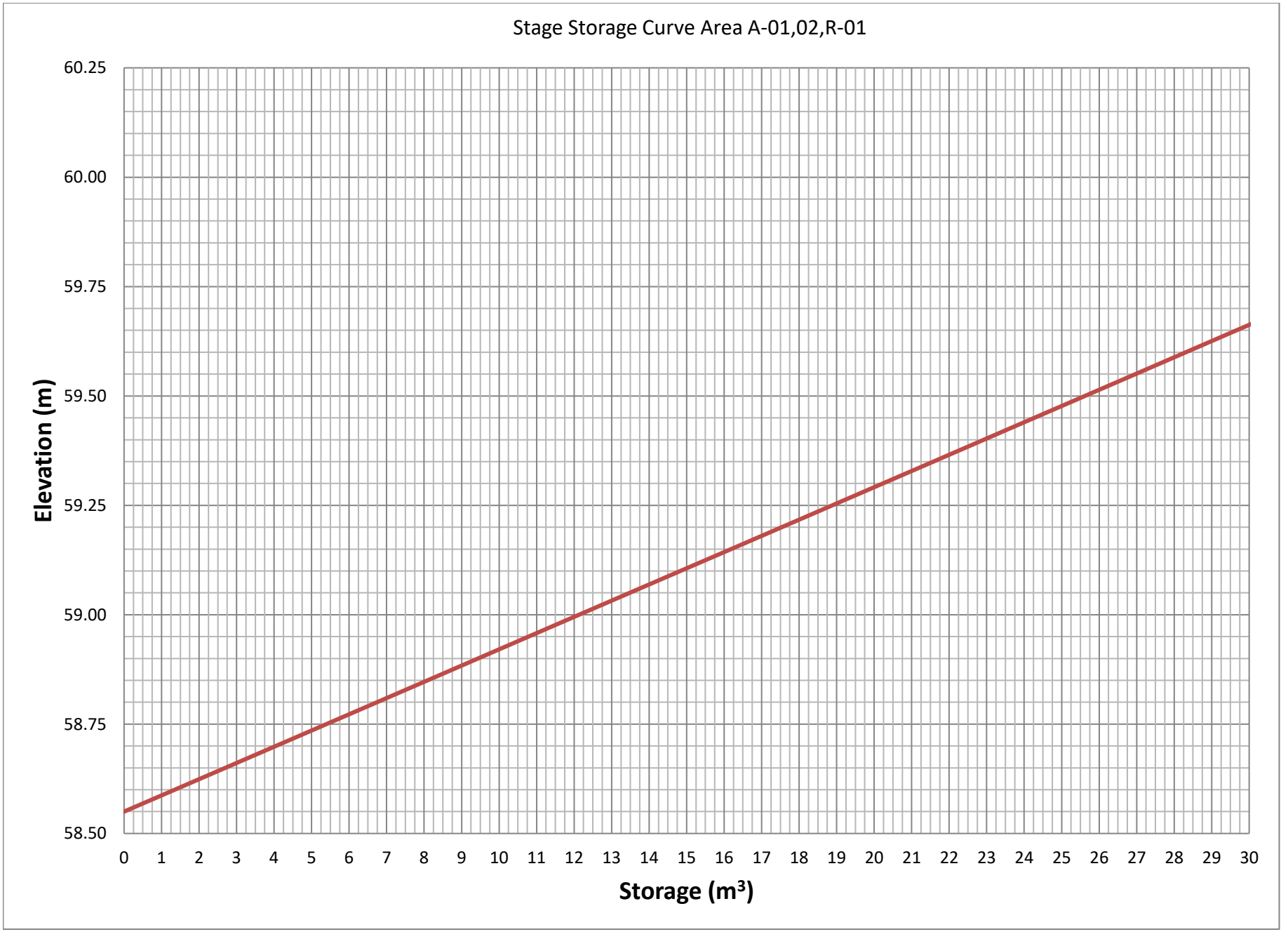

Stage Storage Curve Area A-01,02,R-01
Elevation (m)
60.25
60.00
59.75
59.50
59.25
59.00
58.75
58.50
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Storage (m³)

Table 7: Post-Development Stormwater Mangement Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	Oulet Location	Control	2 Year Storm Event			5 Year Storm Event			100 Year Storm Event			
					Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head (m)	Req'd Vol (cu.m)	Release (L/s)	Head	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)
D-01	0.003	0.90	Preston Street	N/A	0.70	N/A	N/A	0.90	N/A	N/A	1.70	N/A	N/A	N/A
D-02	0.003	0.90	Preston Street	N/A	0.50	N/A	N/A	0.70	N/A	N/A	1.40	N/A	N/A	N/A
D-03	0.012	0.90	Carling Avenue	N/A	2.30	N/A	N/A	3.10	N/A	N/A	5.80	N/A	N/A	N/A
D-04	0.001	0.90	Sidney Street	N/A	0.10	N/A	N/A	0.10	N/A	N/A	0.30	N/A	N/A	N/A
D-05	0.001	0.90	Sidney Street	N/A	0.00	N/A	N/A	0.10	N/A	N/A	0.10	N/A	N/A	N/A
A-01,02,R-01	0.133	0.90	Sidney Street	PUMP	3.70	0.70	17.44	3.70	1.00	26.54	3.70	2.40	62.18	81.11
Total					**7.3**			**8.6**			**13.0**			
Allowable					**13.0**			**13.0**			**13.0**			

APPENDIX D

Water Servicing

NOVATECH
Engineers, Planners & Landscape Architects

ICON2 - 829 CARLING AVENUE
HYDRAULIC ANALYSIS

JOB NO. 121008
DATE PREPARED: NOVEMBER 2022
REVISED: MARCH 2023
REVISED: DECEMBER 2023

Table 1
Water Demand

	Unit Type							Total Demand (L/s)		
Occuupancy	**Retail Area (Seats)**	**1 Bed Apartment**	**2 Bed Apartment & 1 Bed Apartment + Den**	**3 Bed Apartment**	**Bachelor**	**Total Units**	**Total Population**	**Avg Day**	**Max. Daily**	**Peak Hour**
Icon2										
Residential		160	282	32	31	505	959	3.11	7.77	17.09
Commercial	83							0.12	0.18	0.32
Total								3.23	7.95	17.42

Design Parameters:

- 1 Bed Apartment	**1.4**	**persons/unit**
- 2 Bed Apartment / 1 Bed + Den	**2.1**	**persons/unit**
- 3 Bed Apartment	**3.1**	**persons/unit**
- Bachelor	**1.4**	**persons/unit**

City of Ottawa Water Distribution Guidelines

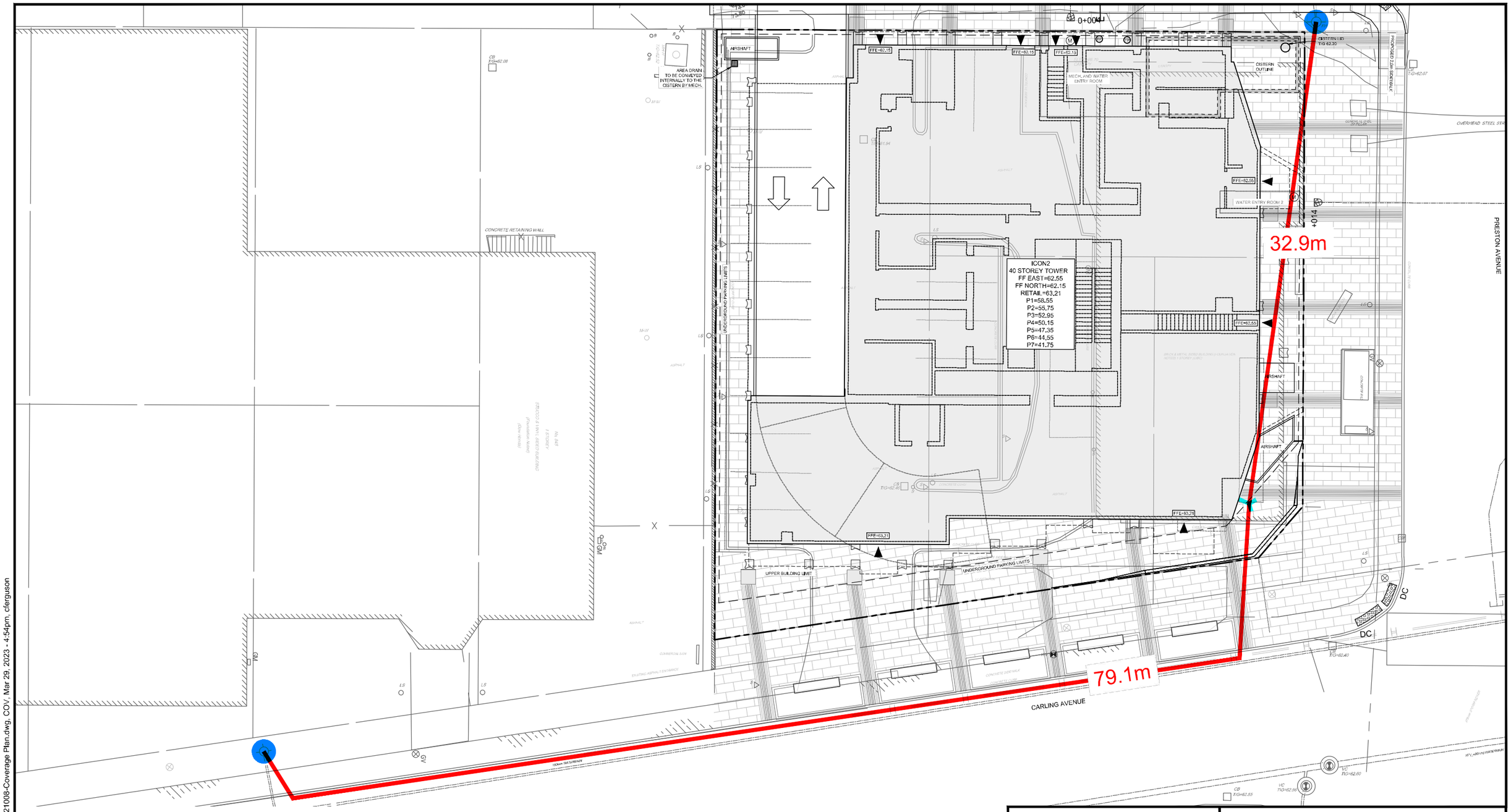
- Average Domestic Flow	280	L/c/day	L/person/day
- "Commerical Space A" Café	125	L/day/seat	(assume 1 seat/4m^2)
		Total:	329m2

Residential Peaking Factors City of Ottawa Water Distrubution Guidelines:

Conditions	Peaking Factor		Units
Maximum Day	2.5	x avg day	L/c/day
Peak Hour	2.2	x max day	L/c/day

Commercial Peaking Factors City of Ottawa Water Distribution Guidelines

Conditions	Peaking Factor		Units
Maximum Day	1.5	x avg day	L/c/day
Peak Hour	1.8	x max day	L/c/day



LEGEND

- PROPERTY LINE
- PROPOSED SIAMESE CONNECTION
- EXISTING CLASS AA HYDRANT
- DISTANCE FROM HYDRANT TO SIAMESE CONNECTION/ BUILDING ENTRANCE

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Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
829 CARLING AVENUE

COVERAGE PLAN

SCALE 1 : 250 (0 2 4 6 8 10)
DATE JAN 2024
JOB 121008
FIGURE COV

SHT11X17.DWG - 279mmX432mm

M:\2021\121008\CAD\Design\Figures\Hydraulic\121008-Coverage Plan.dwg, COV, Mar 29, 2023 - 4:54pm, cferguson

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

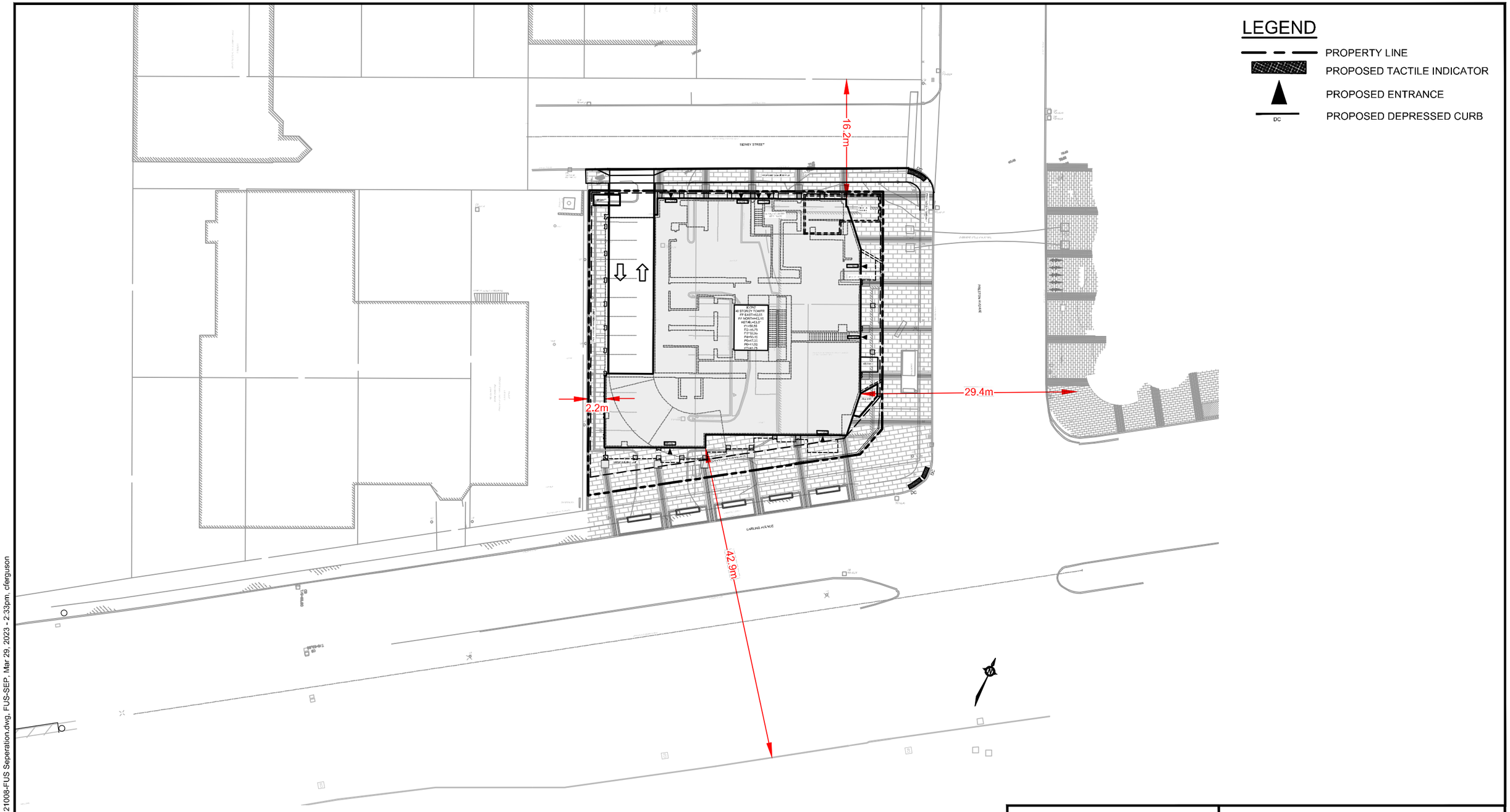
NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121008
Project Name: 829 Carling Ave - Icon2
Date: January 11th, 2024
Input By: Curtis Ferguson, E.I.T.
Reviewed By: Greg Maccdonald, P.Eng

Legend: Input by User; No Information or Input Required

Building Description: 50 Storey Mixed-Use Tower
Type I - Fire resistive construction (2 hrs)

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Type V - Wood frame		1.5	0.6	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)	Yes	0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	1134			
		Number of Floors/Storeys	50			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**1,701**	
	F	**Base fire flow without reductions**				**5,000**
		F = 220 C $(A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**4,250**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-1,700**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Sub-Total	**-50%**	
		Area of Sprinklered Coverage (m^2)	45360	80%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	10.1 - 20 m		15%	**2,125**
		East Side	20.1 - 30 m		10%	
		South Side	>30m		0%	
		West Side	0 - 3 m		25%	
				Cumulative Total	**50%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**5,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**83**
				or	USGPM	1,321



M:\2021\121008\CAD\Design\Figures\Hydraulic\121008-FUS Seperation.dwg, FUS-SEP, Mar 29, 2023 - 2:33pm, cferguson

NOVATECH
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Telephone (613) 254-9643
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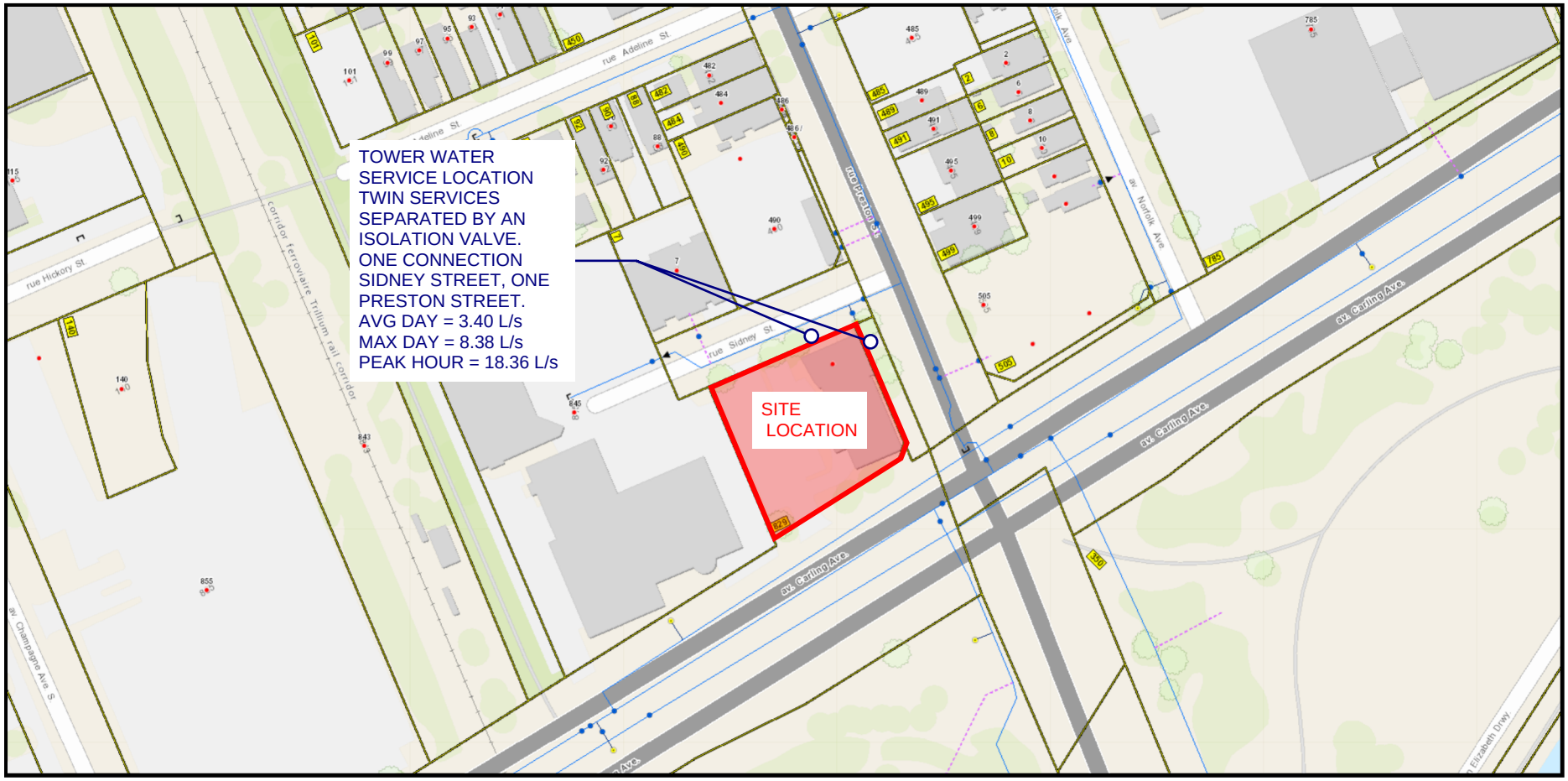
Website www.novatech-eng.com

CITY OF OTTAWA
829 CARLING AVENUE

FUS SEPARATION

SCALE	JOB	FIGURE
1 : 500 (0, 5m, 10m, 20m)	121008	FUS
DATE: JAN 2023		

SHT11X17.DWG - 279mmX432mm


TOWER WATER
SERVICE LOCATION
TWIN SERVICES
SEPARATED BY AN
ISOLATION VALVE.
ONE CONNECTION
SIDNEY STREET, ONE
PRESTON STREET.
AVG DAY = 3.40 L/s
MAX DAY = 8.38 L/s
PEAK HOUR = 18.36 L/s
SITE
LOCATION
rue Adeline St
rue Hickory St
corridor ferroviaire Trillium rail corridor
rue Sidney St
av. Norfolk Ave
av. Champagne Ave S
ave Elizabeth Drwy
av. Carling Ave.

Curtis Ferguson

From: Anish Jain <ajain@jainconsultants.com>
Sent: Thursday, June 29, 2023 12:17 PM
To: Curtis Ferguson; Ken Lee
Cc: Vincent Denomme; Anthony Mestwarp; Johannes Schneider; Dinesh Jain
Subject: RE: 829 Carling Ave - Icon 2 - Comment Response Round 2 (121008)

Follow Up Flag: Follow up
Flag Status: Flagged

The building will be fully sprinklered, with a standard water supply, and full supervised.

Regards,

Anish

From: Curtis Ferguson <c.ferguson@novatech-eng.com>
Sent: Tuesday, June 27, 2023 12:06 AM
To: Ken Lee <klee@hp-arch.com>; Anish Jain <ajain@jainconsultants.com>; Dinesh Jain <djain@jainconsultants.com>
Cc: Vincent Denomme <vincent.denomme@claridgehomes.com>; Anthony Mestwarp <a.mestwarp@novatech-eng.com>; Johannes Schneider <jschneider@hp-arch.com>
Subject: RE: 829 Carling Ave - Icon 2 - Comment Response Round 2 (121008)

Hi Ken,

Thanks, much appreciated.

Anish and Dinesh, please include Anthony Mestwarp (CC'd) on responses as I'm away on vacation starting tomorrow (until July, 4th).

Regards,
Curtis Ferguson, B.A.Sc., E.I.T. | Land Development
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 EXT: 331

From: Ken Lee <klee@hp-arch.com>
Sent: Monday, June 26, 2023 3:58 PM
To: Curtis Ferguson <c.ferguson@novatech-eng.com>; Johannes Schneider <jschneider@hp-arch.com>
Cc: Anish Jain <ajain@jainconsultants.com>; Dinesh Jain <djain@jainconsultants.com>; Vincent Denomme <vincent.denomme@claridgehomes.com>
Subject: RE: 829 Carling Ave - Icon 2 - Comment Response Round 2 (121008)

Hi Curtis,

This is the first time we are being asked these questions for a rezoning submission--
The building will be Type II, Non-Combustible Construction, however, the Sprinkler Reduction system is beyond our scope of work. I have cc'ed Jain Engineering to see if they are able to help.

Anish and Dinesh, please see below in yellow.

Thanks,
Ken

From: Curtis Ferguson <c.ferguson@novatech-eng.com>
Sent: Tuesday, June 20, 2023 3:26 PM
To: Johannes Schneider <jschneider@hp-arch.com>
Cc: Ken Lee <klee@hp-arch.com>
Subject: 829 Carling Ave - Icon 2 - Comment Response Round 2 (121008)

Good Afternoon Johannes,

Hope you're doing well.

Few questions and comments pertaining to Comment Response #2 for 829 Carling Ave.

Experts from letter which require your attention;

Please include email confirmation from the Architect within the Appendix regarding the building construction to confirm the building assumptions made in the FUS fire flow requirement calculations are accurate for type of construction, occupancy type and sprinkler protection/protected opening to justify the selections (**Please Answer Below**)

Construction Material;

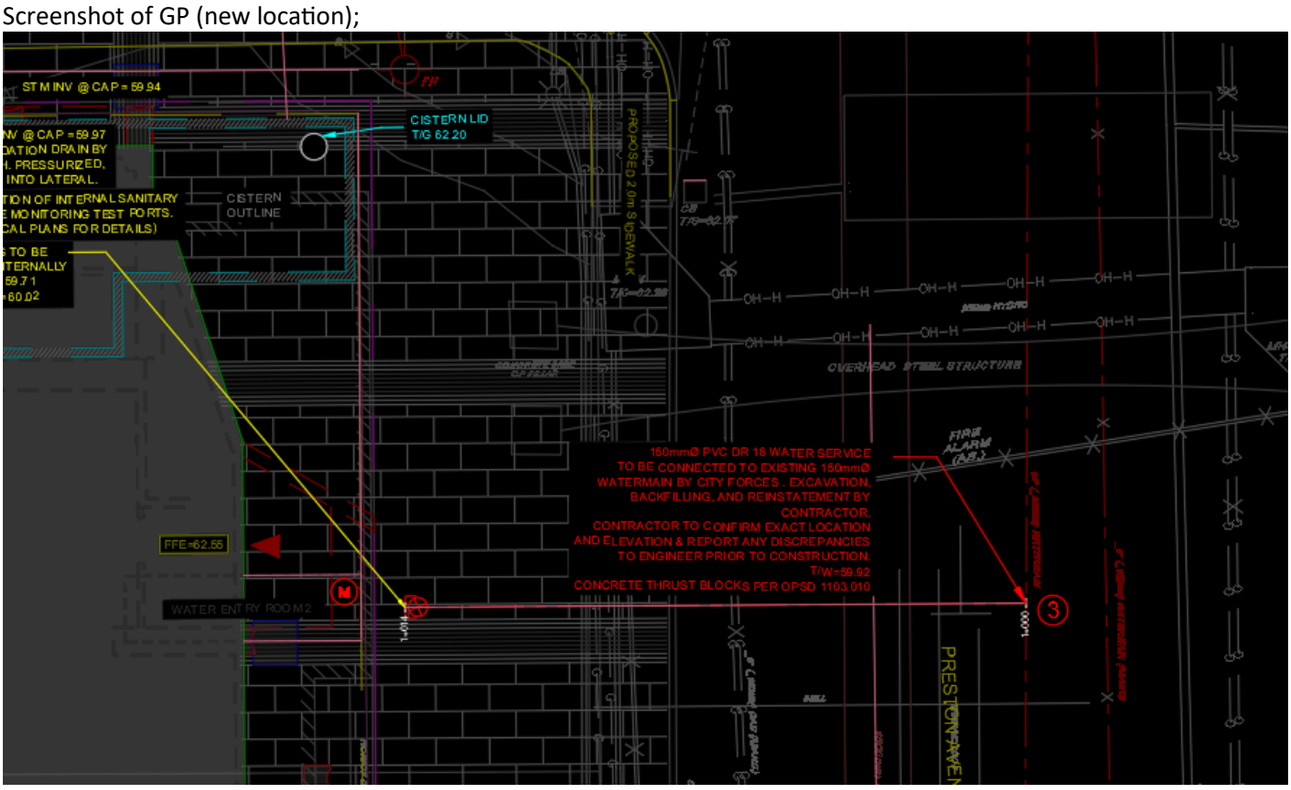
- Type II – Non-Combustible Construction
  OR
- Type I – Fire Resistive Construction (2hrs)

Sprinkler Reduction;

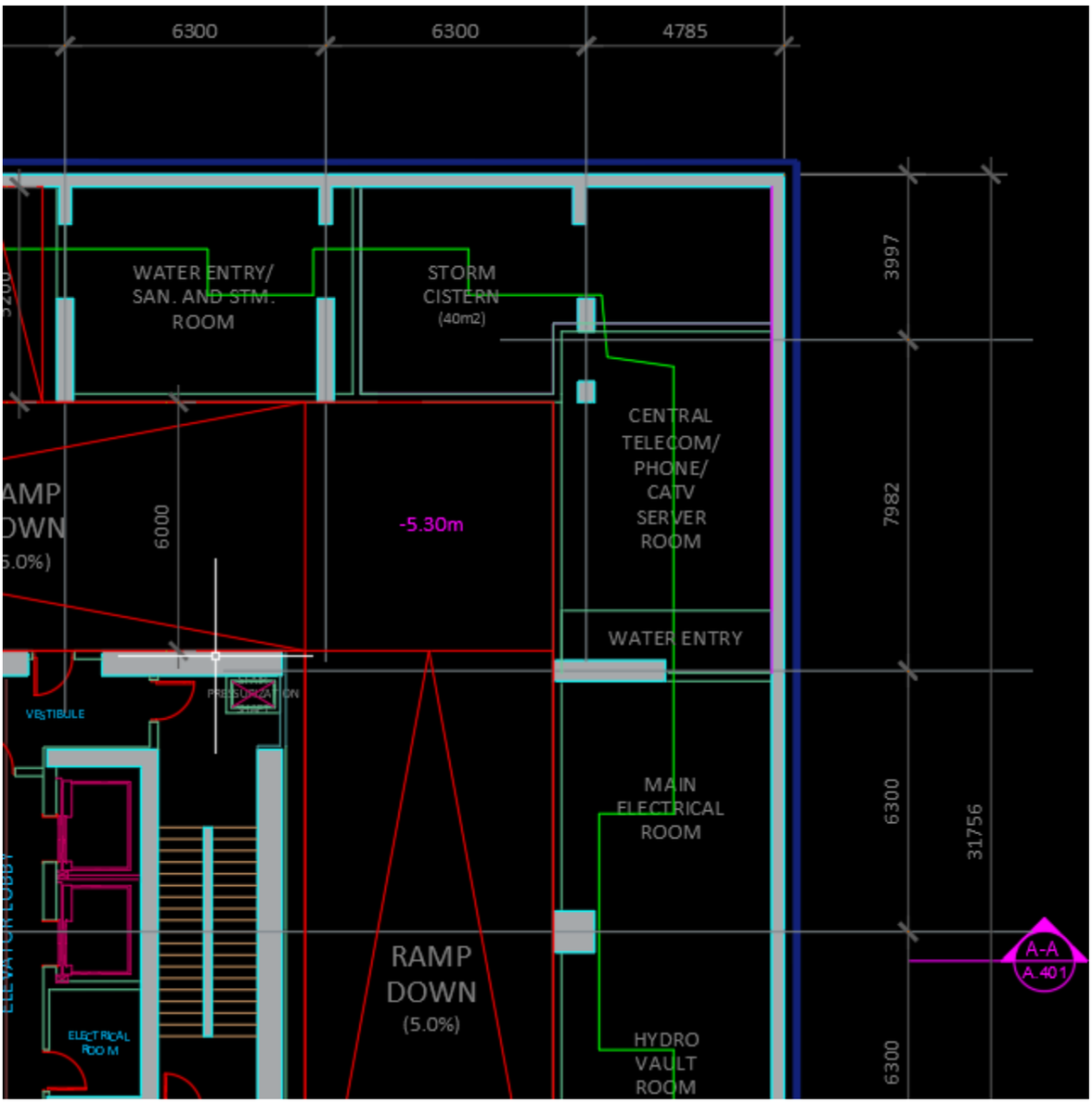
- Adequately Designed System (NFPA 13) – **Y OR N**
- Standard Water Supply – **Y OR N**
- Fully Supervised System – **Y OR N**

Additionally, we received a comment regarding the location of the watermain connection on Preston Street (previously it was in conflict with the "Preston Arch"). I have since adjusted the location to accommodate – see below screenshot of preferred location and rearrange of P1 - can send CAD files if required.

Screenshot of GP (new location);



Screenshot of altered P1 to accommodate (flipped water entry to bottom of Central Telecom Room). Figured this was the "easier" fix without altering multiple rooms and or parking spaces.



Let me know if you have any comments or would like me to set-up a Teams meeting to discuss.

Thanks,

Curtis Ferguson, B.A.Sc., E.I.T. | Land Development

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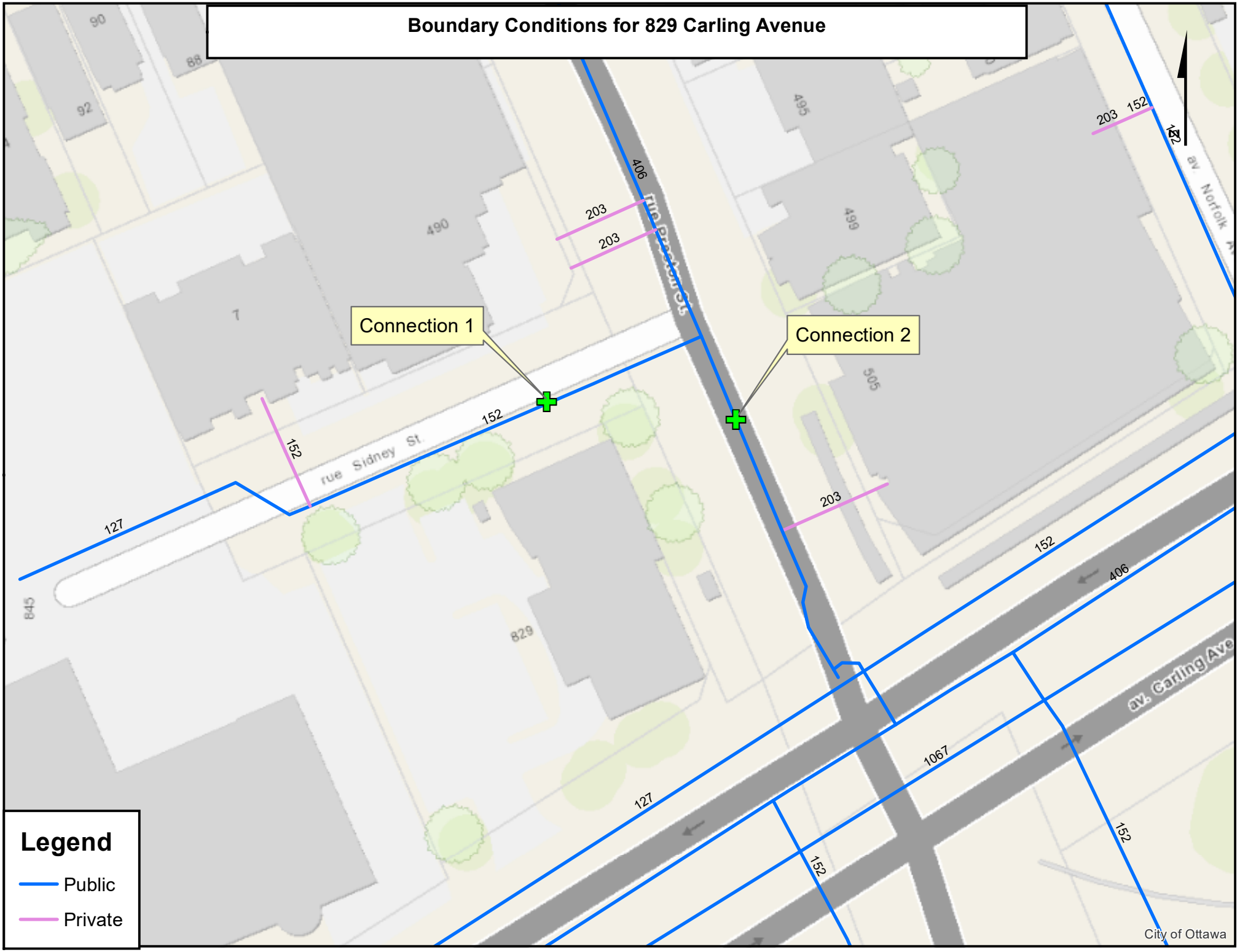
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 EXT: 331


Boundary Conditions for 829 Carling Avenue
Connection 1
Connection 2
rue Sidney St
rue Preston St
av. Carling Ave
av Norfolk
Legend
Public
Private
City of Ottawa

From: McCreight, Andrew <Andrew.McCreight@ottawa.ca>
Sent: Friday, May 3, 2024 9:07:45 AM
To: Greg MacDonald <g.Macdonald@novatech-eng.com>; Curtis Ferguson <c.ferguson@novatech-eng.com>
Cc: Wessel, Shawn <shawn.wessel@ottawa.ca>; Wu, John <John.Wu@ottawa.ca>
Subject: 829 Carling Avenue - Boundary Conditions

Hi Greg and Curtis,

We received the following Boundary Conditions from Water Dept provided below.. Shawn is away but is expected to return mid next week. If you have any questions please follow up with John and copy Shawn.

Thanks,

Andrew

--

The following are boundary conditions, HGL, for hydraulic analysis at 829 Carling Avenue (zone 1W) assumed to be connected via two connections to the 152 mm watermain on Sidney Street and the 406 mm watermain on Preston Street (see attached PDF for location).

Connection 1 (Sidney St):

Minimum HGL: 106.9 m

Maximum HGL: 115.2 m

Max Day + Fire Flow (83L/s): 105.4 m

Connection 2 (Preston St):

Minimum HGL: 107.0 m

Maximum HGL: 115.2 m

Max Day + Fire Flow (83L/s): 109.4 m

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

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

'

'

CALCULATED WATER DEMNADS:

Water Demands

Average Day (Maximum HGL)=	3.23 L/s
Maximum Day =	7.95 L/s
Peak Hour (Minimum HGL) =	17.42 L/s
Fire Flow (FUS) =	83.00 L/s

City of Ottawa Boundary Conditions:

Sidney Street (Connection 1)

Average Day (Maximum HGL)=	115.2 m
Peak Hour (Minimum HGL) =	106.9 m
Max Day + Fire =	105.4 m

Preston Street (Connection 2)

Average Day (Maximum HGL)=	115.2 m
Peak Hour (Minimum HGL) =	107 m
Max Day + Fire =	109.4 m

Watermain Analysis

Finished Floor Elevation = 63.21 m (worst case Retail FFE)

Sidney Street (Connection 1)

High Pressure Test = Max. HGL -Finished Floor Elevation x 1.42197 PSI/m < 80 PSI

High Pressure = 73.9 PSI

Low Pressure Test = Min. HGL - Finished Floor Elevation x 1.42197 PSI/m > 40 PSI

Low Pressure = 62.1 PSI

Max Day + Fire Test = Max Day + Fire Flow - Finished Floor Elevation x 1.42197 PSI/m > 20 PSI

Max Day + Fire (Connection #1) = 60.0 PSI

Preston Street (Connection 2)

High Pressure Test = Max. HGL -Finished Floor Elevation x 1.42197 PSI/m < 80 PSI

High Pressure = 73.9 PSI

Low Pressure Test = Min. HGL - Finished Floor Elevation x 1.42197 PSI/m > 40 PSI

Low Pressure = 62.3 PSI

Max Day + Fire Test = Max Day + Fire Flow - Finished Floor Elevation x 1.42197 PSI/m > 20 PSI

Max Day + Fire (Connection #2) = 65.7 PSI

APPENDIX E

Servicing Study Guidelines Checklist

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Executive Summary (for larger reports only).	NA		
Date and revision number of the report.	Y	COVER	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	DWGS	ALL DRAWINGS
Plan showing the site and location of all existing services.	Y	DWG	GP
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.	Y	INTRO	
Summary of Pre-consultation Meetings with City and other approval agencies.	Y	APP A	
Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Y	REPORT	THROUGHOUT
Statement of objectives and servicing criteria.	Y	REPORT	SECTION 3.1/4.1
Identification of existing and proposed infrastructure available in the immediate area.	Y	DWG	GP/REPORT 3.0/4.0
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).	NA		
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 neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y	REPORT/ GR	

Development Servicing Study Checklist

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
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.	NA		
Proposed phasing of the development, if applicable.	Y		
Reference to geotechnical studies and recommendations concerning servicing.	Y	REPORT	
All preliminary and formal site plan submissions should have the following information:			
Metric scale	Y		ALL DRAWINGS
North arrow (including construction North)	Y		ALL DRAWINGS
Key plan	Y		ALL DRAWINGS
Name and contact information of applicant and property owner	Y		DRAWINGS/REPORTS
Property limits including bearings and dimensions	Y		REPORT
Existing and proposed structures and parking areas	Y		ALL DRAWINGS
Easements, road widening and rights-of-way	Y		ALL DRAWINGS
Adjacent street names	Y		ALL DRAWINGS

Development Servicing Study Checklist

4.2 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available.	NA		
Availability of public infrastructure to service proposed development.	Y	3, 4, 5	GP AND REPORT
Identification of system constraints.	NA		
Identify boundary conditions.	Y	APP D	REQUESTED
Confirmation of adequate domestic supply and pressure.	NA		
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.	Y		APPENDIX D
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.	NA		
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	NA		
Address reliability requirements such as appropriate location of shut-off valves.	Y		DRAWINGS
Check on the necessity of a pressure zone boundary modification.	Y		N/A
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	NA		
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.	Y	4.0	REPORT
Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	NA		
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	APP D	REPORT AND SECTION 5
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	NA		

Development Servicing Study Checklist

4.3 Wastewater	Addressed (Y/N/NA)	Section	Comments
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).	Y	REPORT	
Confirm consistency with Master Servicing Study and/or justifications for deviations.	NA		
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.	NA		
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	REPORT	SECTION 3
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)	Y	REPORT	
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	NA		
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	REPORT	SECTION 3
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).	NA		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	NA		
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	NA		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	NA		
Special considerations such as contamination, corrosive environment etc.	NA		

Development Servicing Study Checklist

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	REPORT	
Analysis of the available capacity in existing public infrastructure.	NA		
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y		GR, STM
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.	Y	REPORT	SECTION 4, APP C
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	REPORT	SECTION 4
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	REPORT	SECTION 4
Set-back from private sewage disposal systems.	NA		
Watercourse and hazard lands setbacks.	Y		
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N		
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N		
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	Y	REPORT	APPENDIX C
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	NA		
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.	Y	REPORT	APPENDIX C
Any proposed diversion of drainage catchment areas from one outlet to another.	NA		
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM facilities.	Y	REPORT	APPENDIX C

Development Servicing Study Checklist

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.	Y	REPORT	APPENDIX C

Development Servicing Study Checklist

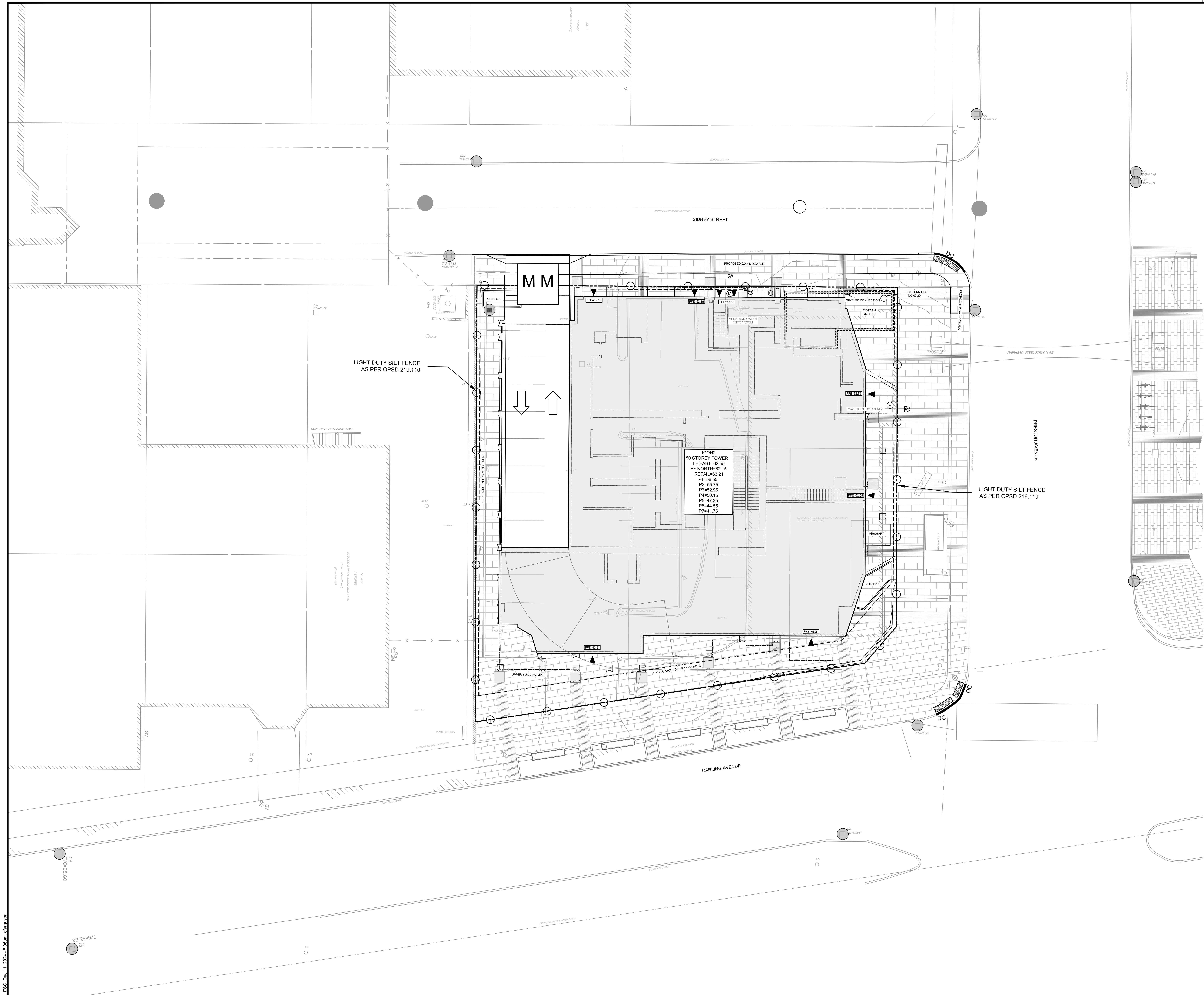
4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Identification of municipal drains and related approval requirements.	N/A		
Description of how the conveyance and storage capacity will be achieved for the development.	Y	REPORT	SECTION 4,APP C
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y	DWG	GR
Inclusion of hydraulic analysis including HGL elevations.	Y		APP C
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	REPORT	ESC DRAWING
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.	NA		
Identification of fill constrains related to floodplain and geotechnical investigation.	NA		

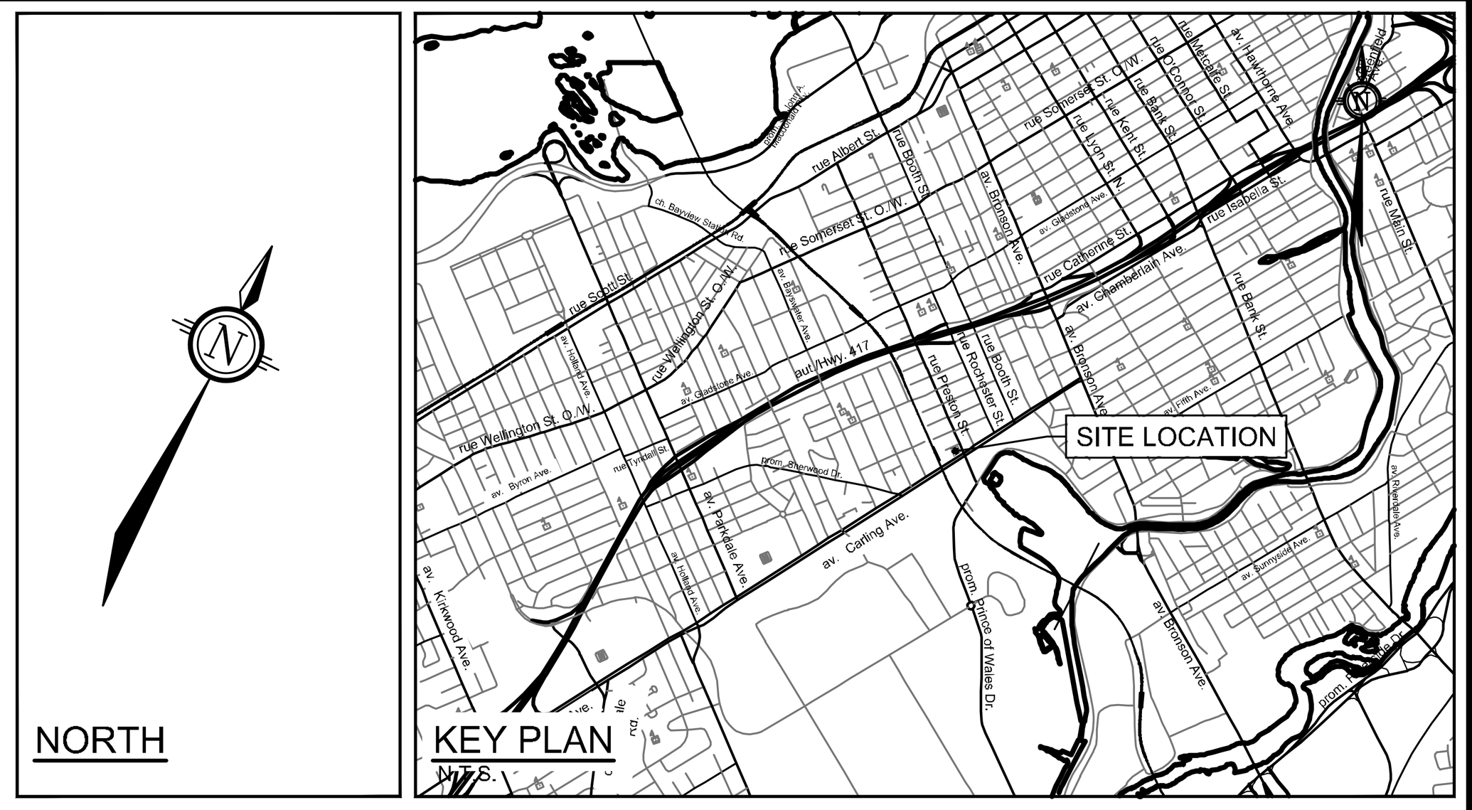
Development Servicing Study Checklist

4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
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.	NA		
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	NA		
Changes to Municipal Drains.	NA		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	NA		

4.6 Conclusion	Addressed (Y/N/NA)	Section	Comments
Clearly stated conclusions and recommendations.	Y	REPORT	SECTION 6
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.	Y	Letter	
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	ALL	

DRAWINGS





LEGEND

Symbol	Description
— - —	PROPERTY LINE
——	PROPOSED CURB
DC	PROPOSED DEPRESSED CURB
▬	TACTILE WALKING SURFACE INDICATOR (TWSI) PER CITY DETAIL SC7.3
M M	PROPOSED MUD MAT
—o—	LIGHT DUTY SILT FENCE (OPSD 219.110)
●	PROPOSED FILTER BAGS AT CATCHBASINS, CATCHBASIN MANHOLES AND TRENCHDRAINS
C	PROPOSED CAP
—O—	PROPOSED STORM SEWER AND MANHOLE
■	PROPOSED AREA DRAIN
▭	PROPOSED TRENCH DRAIN
▼	PROPOSED BUILDING ENTRANCE
STMMH ○	*EXISTING STORM MANHOLE*
CB 1 ▣	*EXISTING CATCHBASIN*
☼	*EXISTING LIGHT STANDARD*
LS	*EXISTING FENCE*

EROSION AND SEDIMENT CONTROL NOTES:

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

1) THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS BUT NOT LIMITED TO INSTALLING FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.

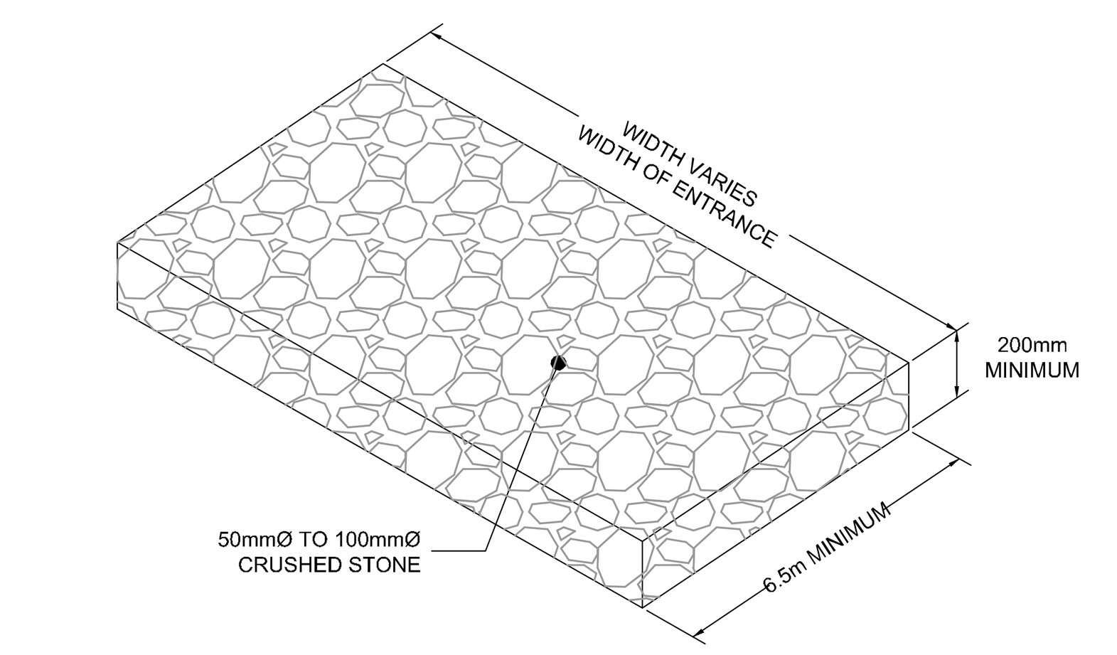
2) THE CONTRACTOR SHALL PLACE FILTER BAGS UNDER THE CATCHBASIN AND MANHOLE GRATES FOR THE DURATION OF CONSTRUCTION AND WILL REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION.

3) SILT FENCING FOR ENTIRE PERIMETER OF SITE, SHALL BE UTILIZED TO CONTROL EROSION FROM THE SITE DURING CONSTRUCTION.

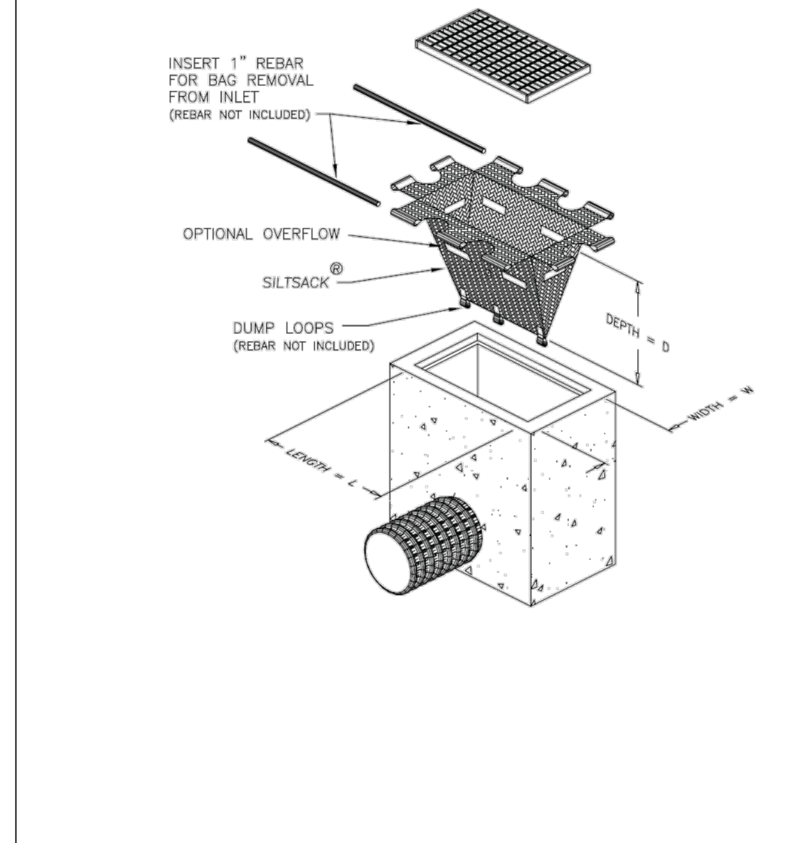
4) THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

5) PROVIDE MUD MATS AT ALL CONSTRUCTION ACCESS POINTS TO MINIMIZE SEDIMENT TRANSPORT OFFSITE.

6) EROSION AND SEDIMENT CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY.



MUD MAT DETAIL
NOT TO SCALE



TEMPORARY CATCHBASIN INSERT DETAIL - SILTSACK BY TERRAFIX (OR APPROVED EQUIVALENT)
N.T.S.

NOTE:
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OTTAWA , ONTARIO
K1S 4N7.

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2.	ISSUED FOR ZBA AND SPA	JAN19/24	GJM
1.	ISSUED FOR ZBA AND SPA	APRIL21/23	GJM

SCALE 1:150

DESIGN	CJF
CHECKED	GJM
DRAWN	CJF
CHECKED	GJM
APPROVED	GJM

FOR REVIEW ONLY

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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
ICON2 - 829 CARLING AVE.

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 121008
REV REV # 3
DRAWING No. 121008-ESC

D07-12-21-0067

PLANB1.DWG - 1000mmx707mm

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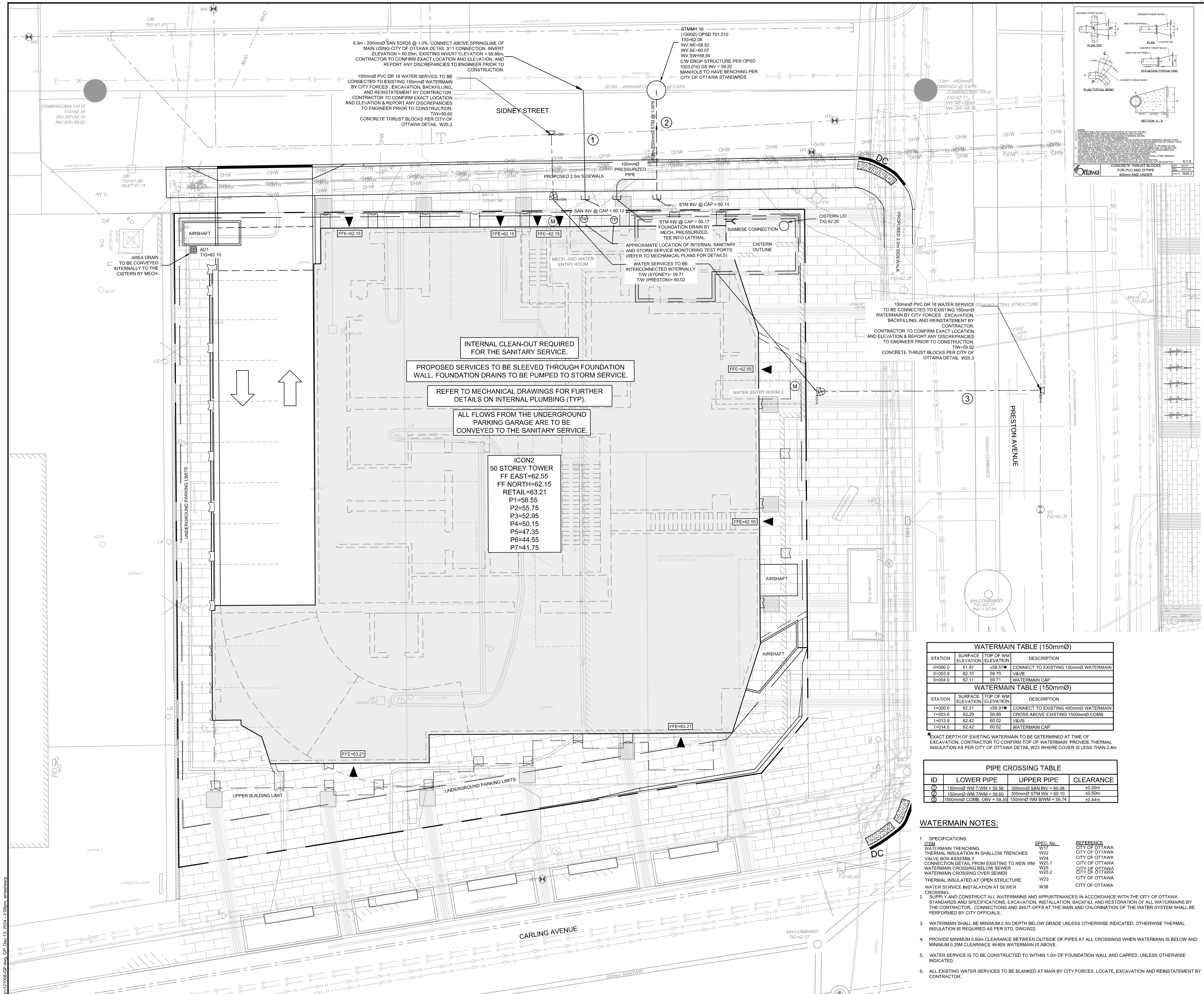
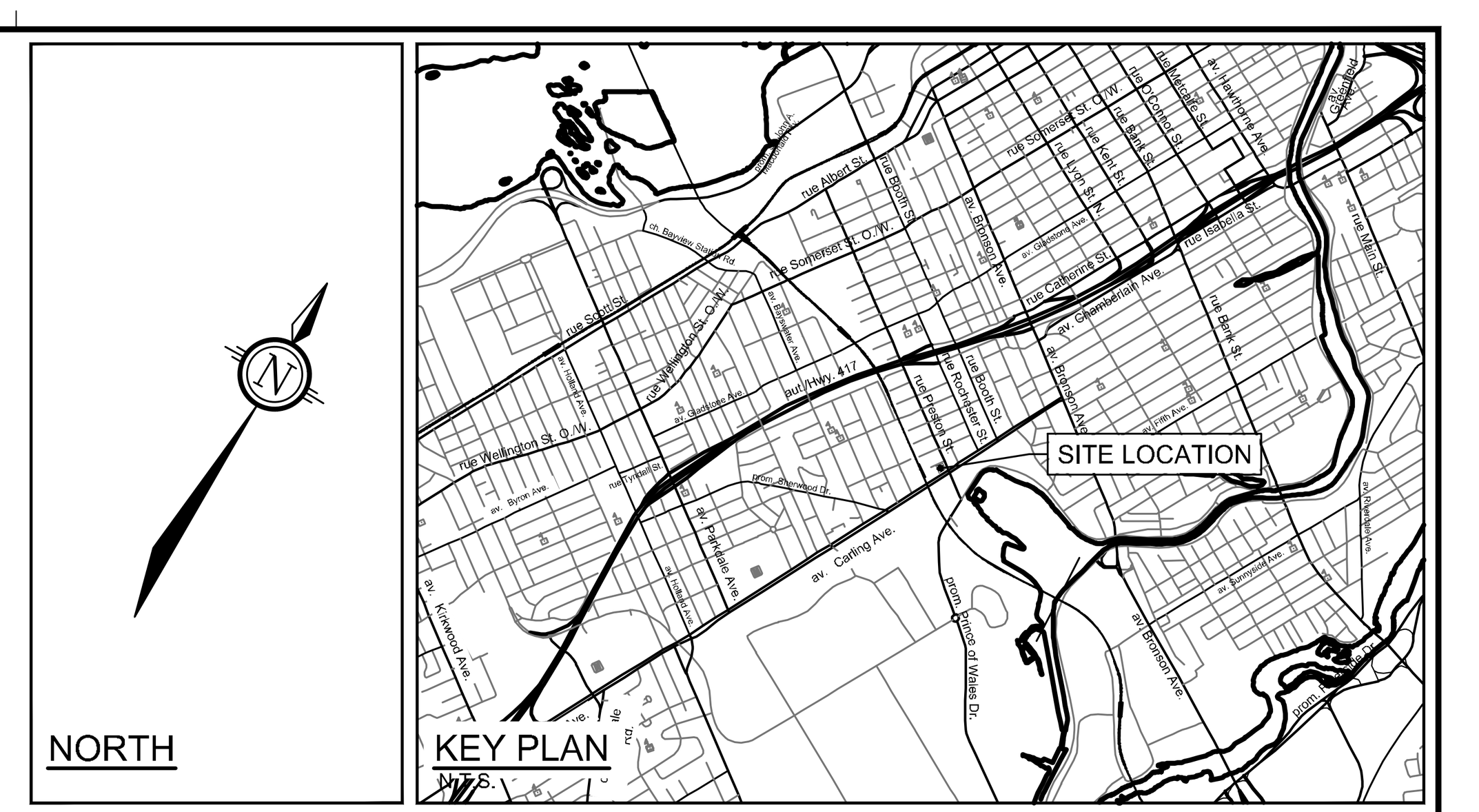




LEGEND

PROPERTY LINE	EXISITING WATERMAIN VALVE CHAMBER
PROPOSED WATERMAIN	EXISITING WATERMAIN SHUT-OFF VALVE BOX
PROPOSED VALVE BOX	EXISTING WATERMAIN
PROPOSED STORM MANHOLE	EXISTING HYDRANT C/W LEAD & SHUT OFF VALVE BOX
PROPOSED AREA DRAIN	EXISTING GAS VALVE
PROPOSED SANITARY SEWER	EXISTING GAS MAIN
UNDERGROUND PARKING LIMITS	EXISTING ABANDONED GAS MAIN
PROPOSED STORM SEWER	EXISTING BELL CONDUIT
PROPOSED CAP	EXISTING OVER HEAD WIRE
PROPOSED TACTILE WALKING SURFACE INDICATOR (TWSI)	EXISTING HYDRO/UTILITY POLE
PROPOSED SIAMESE CONNECTION	EXISTING GUY WIRE
PROPOSED BUILDING ENTRANCE	EXISTING TRAFFIC MANHOLE
PROPOSED WATER METER LOCATION	EXISTING JOINT USE STREET LIGHT
PROPOSED SAN/STM TEST PORT LOCATION	EXISTING STREET LIGHT
PROPOSED THRUST BLOCK PER W25_3	EXISTING TRAFFIC HAND HOLE
EXISTING LEGAL ADJACENT LINE	EXISTING TRAFFIC SIGN
EXISTING STANDARD IRON BAR / CONTROL POINT	EXISTING DITCH INLET CATCH BASIN
EXISITING FLOW DIRECTION OF SEWERS	EXISTING HYDRANT
EXISTING SANITARY MANHOLE & SEWER	
EXISTING STORM MANHOLE & SEWER	
EXISTING CATCH BASIN	
EXISTING BUILDING ENVELOPE	

WATERMAIN TABLE (150mmØ)

STATION	SURFACE ELEVATION	TOP OF WM ELEVATION	DESCRIPTION
0+000.0	61.97	±59.57*	CONNECT TO EXISTING 150mmØ WATERMAIN
0+003.9	62.10	59.70	V&VB
0+004.0	62.11	59.71	WATERMAIN CAP

WATERMAIN TABLE (150mmØ)

STATION	SURFACE ELEVATION	TOP OF WM ELEVATION	DESCRIPTION
1+000.0	62.31	±59.91*	CONNECT TO EXISTING 400mmØ WATERMAIN
1+003.6	62.29	59.89	CROSS ABOVE EXISTING 1500mmØ COMB.
1+013.9	62.42	60.02	V&VB
1+014.0	62.42	60.02	WATERMAIN CAP

*EXACT DEPTH OF EXISTING WATERMAIN TO BE DETERMINED AT TIME OF EXCAVATION, CONTRACTOR TO CONFIRM TOP OF WATERMAIN. PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W23 WHERE COVER IS LESS THAN 2.4m

PIPE CROSSING TABLE

ID	LOWER PIPE	UPPER PIPE	CLEARANCE
1	150mmØ WM T/WM = 59.58	300mmØ SAN INV = 60.08	±0.50m
2	150mmØ WM T/WM = 59.60	300mmØ STM INV = 60.10	±0.50m
3	1500mmØ COMB. OBV = 59.30	150mmØ WM B/WM = 59.74	±0.44m

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
CONNECTION DETAIL FROM EXISTING TO NEW WM	W25.1	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN CROSSING OVER SEWER	W25.2	CITY OF OTTAWA
THERMAL INSULATED AT OPEN STRUCTURE	W23	CITY OF OTTAWA
WATER SERVICE INSTALATION AT SEWER CROSSING.	W38	CITY OF OTTAWA

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED. OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD. DWGW22.
4. PROVIDE MINIMUM 0.50m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS WHEN WATERMIAN IS BELOW AND MINIMUM 0.25M CLEARANCE WHEN WATERMAIN IS ABOVE.
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.
6. ALL EXISTING WATER SERVICES TO BE BLANKED AT MAIN BY CITY FORCES. LOCATE, EXCAVATION AND REINSTATEMENT BY CONTRACTOR.

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC AND REFERRED TO THE CVGD28 DATUM. BEARINGS ARE REFERENCED TO THE MTM ZONE 9 NAD-83 (ORIGINAL) DATUM. REFER TO ANNIS O'SULLIVAN, VOLLEBEKK LTD. TOPOGRAPHICAL PLAN OF SURVEY PARTS OF LOTS 1554, 1555, 1556, AND 1557, REGISTERED PLAN 38, CITY OF OTTAWA, DATED JULY 30, 2020.
8. REFER TO GEOTECHNICAL REPORT (No. PG5744-1), DATED MAY 12, 2021 PREPARED BY PATERSON. FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO STORMWATER MANAGEMENT REPORT PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD. R-2021-055 - DATED DECEMBER 13TH, 2024.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

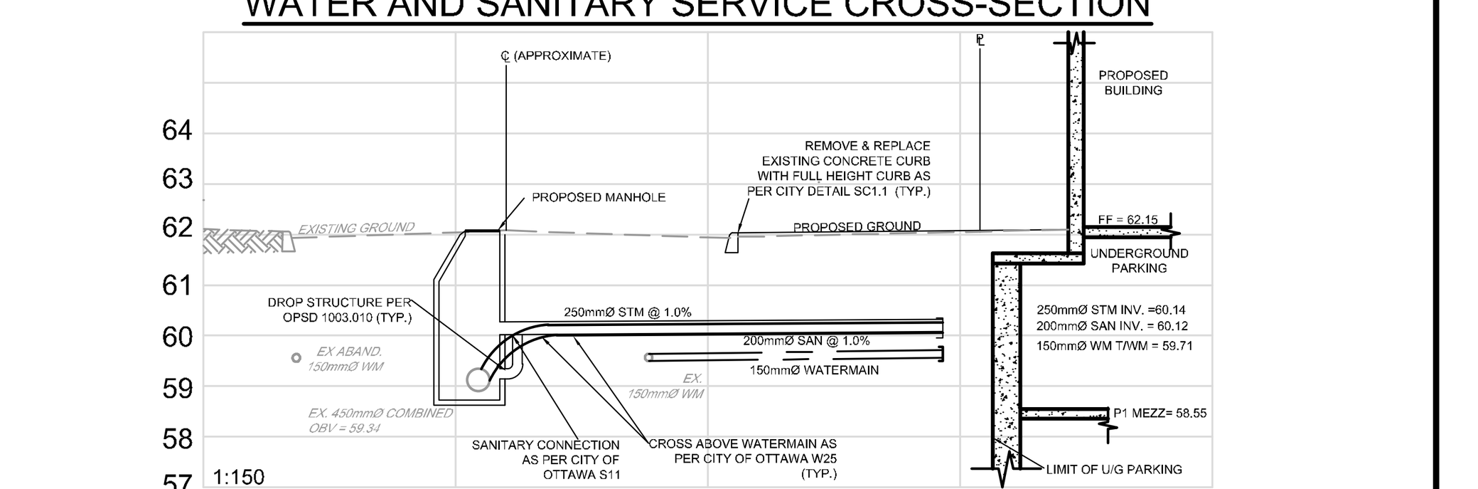
SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200Ø)	701.010	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
SEWER TRENCH - BEDDING (GRANULAR A) COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE=25mm)	S6, S7, W17	CITY OF OTTAWA / OPSD
STORM SEWER	PVC DR 35	
SANITARY SEWER	PVC DR 35	
CATCHBASIN LEAD	PVC DR 35	
SEWER SERVICE CONNECTION - RIGID PIPE	S11	CITY OF OTTAWA
SEWER SERVICE ABANDONMENT	S11,4	CITY OF OTTAWA

2. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 2.0m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
3. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
7. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
8. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.
9. FULL PORT BACKWATER VALUES ARE REQUIRED ON THE SANITARY SERVICES. INSTALLED AS PER THE MANUFACTURES RECOMMENDATIONS AND A BACKWATER VALVE IS REQUIRED ON THE STORM SERVICES / FOUNDATION DRAINS FOR EACH BUILDING; INSTALLED AS PER STD. DWGS14
10. REINSTATE ALL EXISTING PAVEMENT, CURB AND BOULEVARDS AS PER CITY OF OTTAWA R10.
11. ALL EXISTING SANITARY AND STORM SERVICES ARE TO BE CAPPED AT THE PROPERTY LINE TO THE SATISFACTION OF THE CITY OF OTTAWA'S SEWER OPERATION. ALL EXISTING WATER SERVICES TO BE BLANKED AT MAIN BY CITY FORCES. LOCATE, EXCAVATION AND REINSTATEMENT BY CONTRACTOR.
12. MONITORING TEST PORTS FOR BUILDING SERVICES TO BE INSTALLED IN PARKING GARAGE.

WATER AND SANITARY SERVICE CROSS-SECTION



REFER TO 121008-CIS FOR STORM SERVICING AND CISTERN DETAILS

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2.	ISSUED WITH SITE PLAN APPLICATION	APR15/21	JAG
1.	ISSUED FOR PRELIMINARY CONSTRUCTION	FEB22/21	JAG

SCALE 1:100

DESIGN CJF · CHECKED GJM · DRAWN CJF · CHECKED GJM · APPROVED GJM

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DRAWING NAME
GENERAL PLAN OF SERVICING

PROJECT No. 121008
REV # 5
DRAWING No. 121008-GP

D07-12-21-0067

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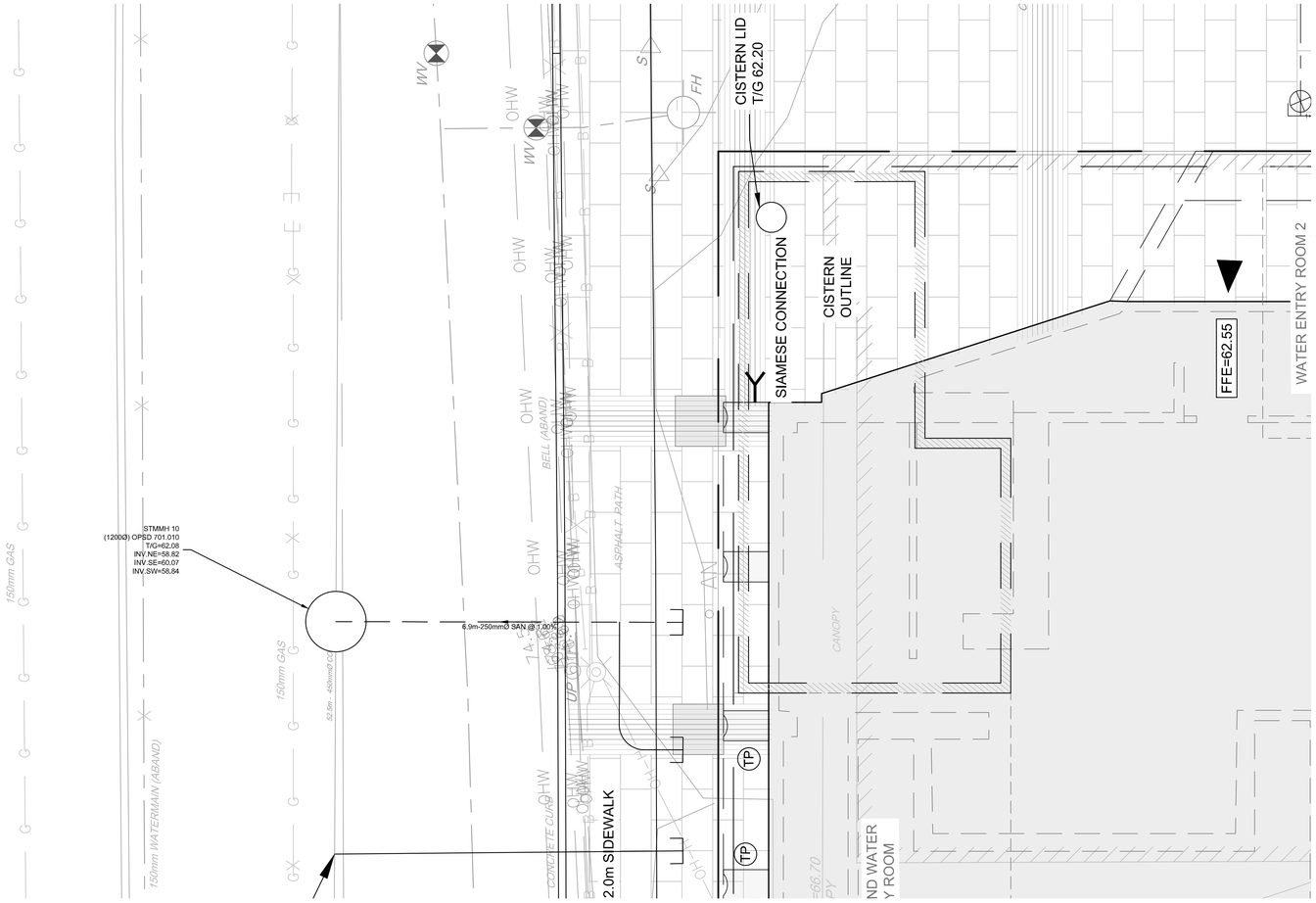

GP CISTERN PLAN

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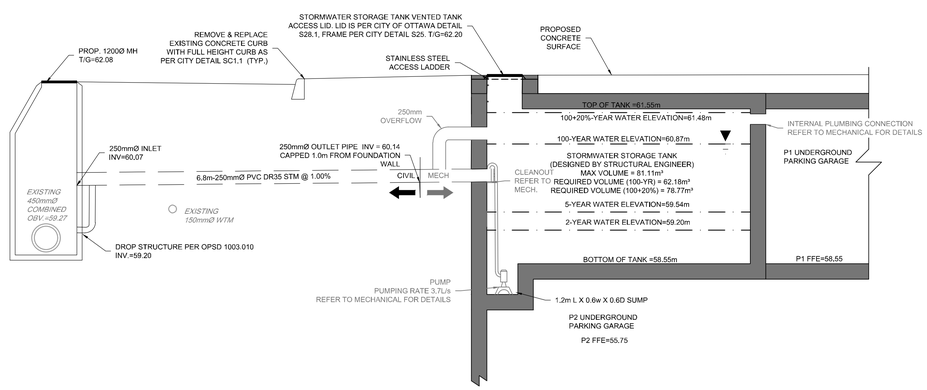

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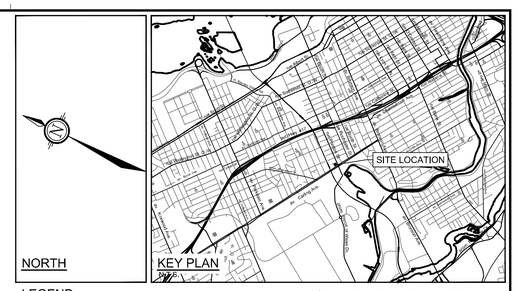

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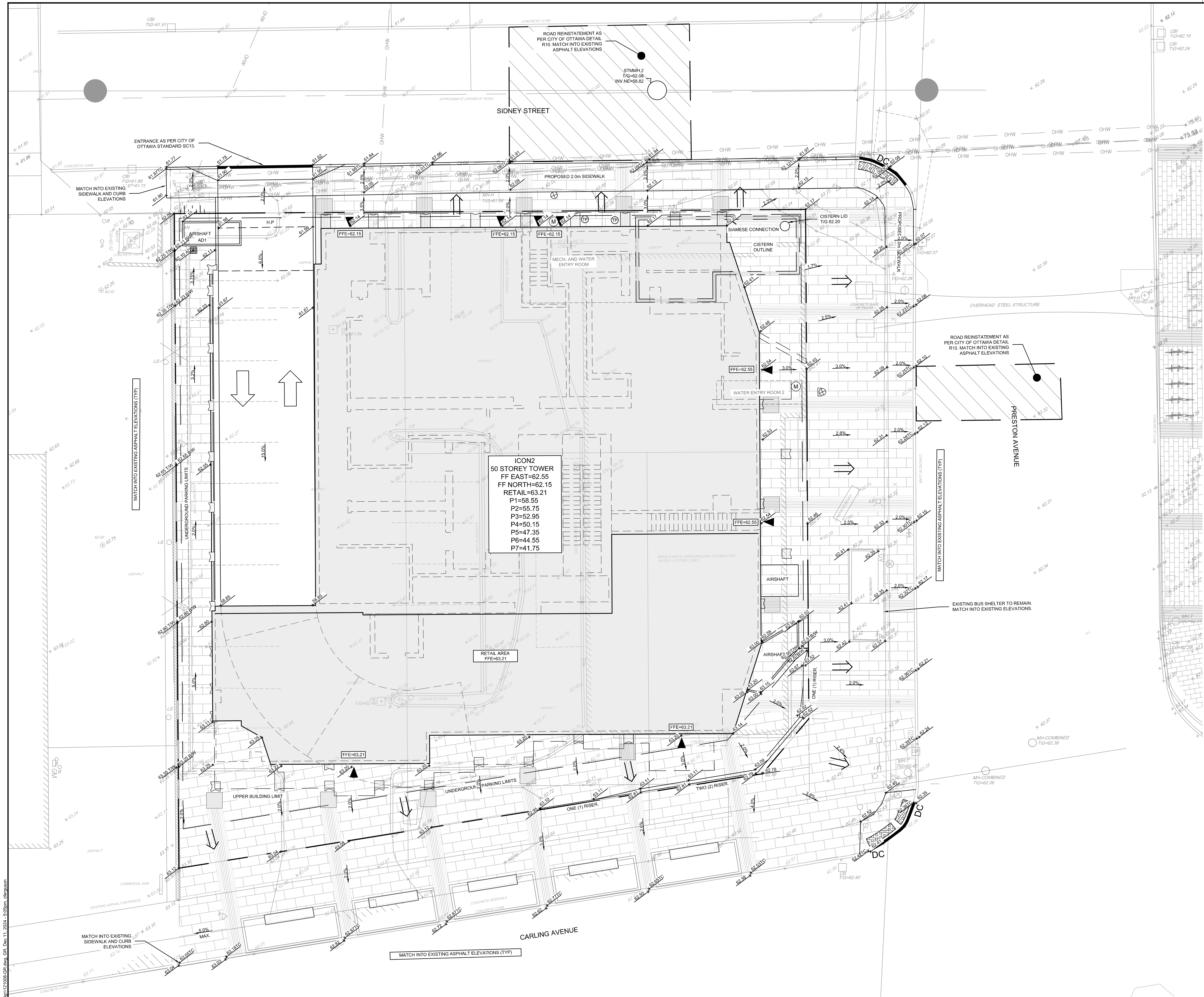

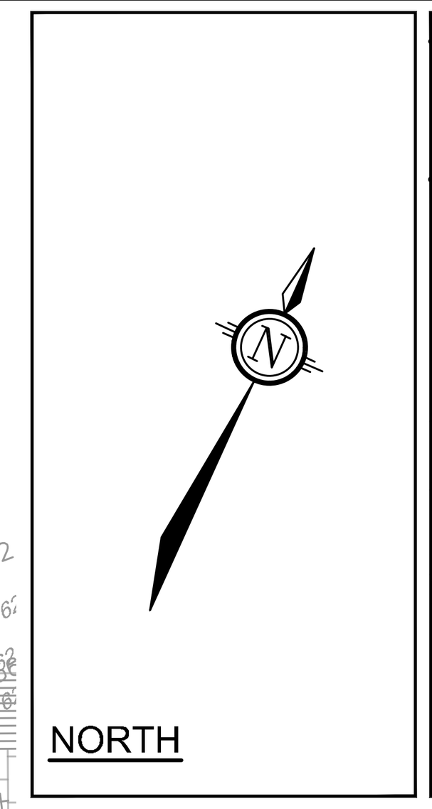

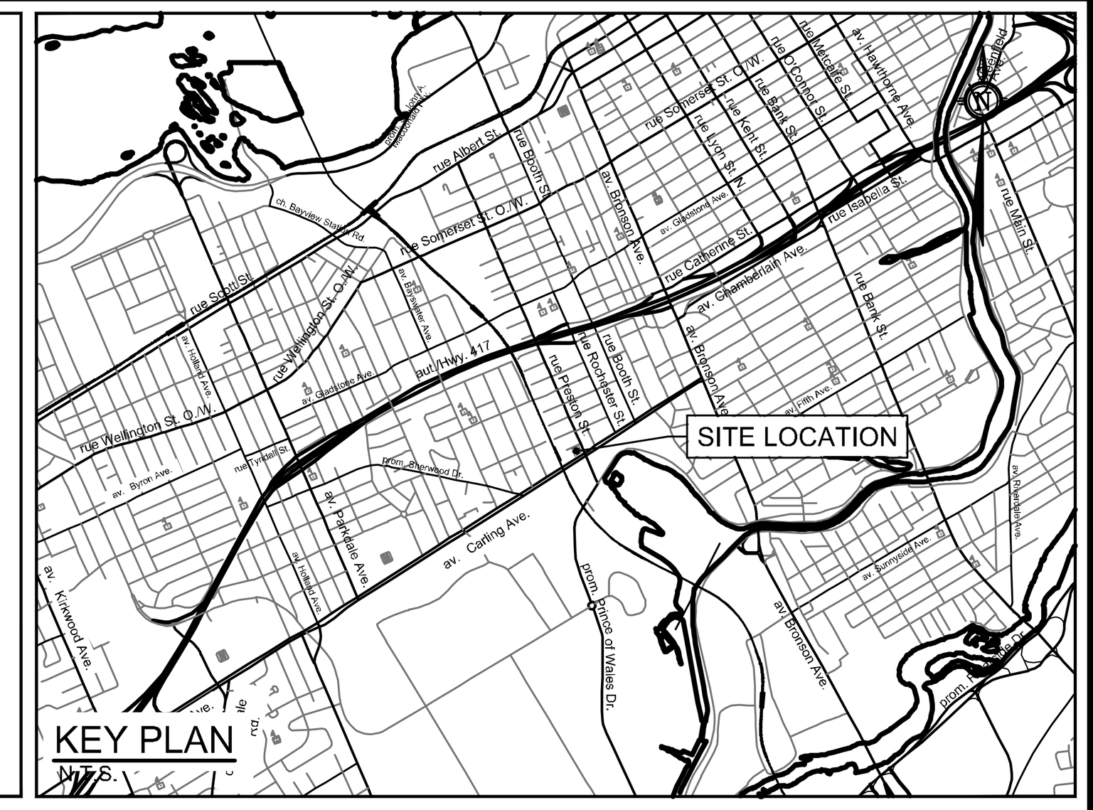

LEGEND

- PROPERTY LINE
- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- PROPOSED TACTILE WALKING SURFACE INDICATOR (TWSI)
- 98.40 — PROPOSED ELEVATION
- 98.40 — EXISTING ELEVATION
- 97.79AD — PROPOSED AREA DRAIN ELEVATION
- 97.79TW — PROPOSED TOP OF WALL ELEVATION
- 97.79BW — PROPOSED BOTTOM OF WALL ELEVATION
- 97.88TC — PROPOSED TOP OF CURB ELEVATION
- PROPOSED VALVE AND VALVE BOX
- FIRE DEPARTMENT SIAMESE CONNECTION
- PROPOSED BUILDING ENTRANCE
- H.P. — PROPOSED HIGH POINT
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
- 2.0% — SLOPE AND DIRECTION
- DIRECTION OF MAJOR OVERLAND FLOW
- PROPOSED AREA DRAIN
- STM MH — PROPOSED STORM MANHOLE
- PROPOSED VALVE AND VALVE BOX
- EXISTING VALVE & VALVE BOX
- EXISTING VALVE & LEAD
- SAN MH — EXISTING SANITARY MANHOLE
- STM MH — EXISTING STORM MANHOLE
- CB 1 — EXISTING CATCHBASIN
- EXISTING DITCH CENTERLINE
- EXISTING UTILITY POLE
- EXISTING UTILITY POLE ANCHORS
- EXISTING STREETLIGHT

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4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
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6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
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9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO SERVICEABILITY AND STORMWATER MANAGEMENT REPORT PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD. R-2021-055 DATED DECEMBER 13, 2024.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS WILL APPLY WHERE NO CITY STANDARDS ARE AVAILABLE.
14. ALL PRIVATE APPROACHES MUST BE CONSTRUCTED AS PER CITY SPECIFICATION SC13.
15. ALL EXISTING INFRASTRUCTURE (STORM AND SANITARY NETWORK & MANHOLES) ON-SITE TO BE REMOVED.

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

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2.	ISSUED WITH SITE PLAN APPLICATION	APR15/21	JAG
1.	ISSUED FOR PRELIMINARY COORDINATION	FEB 9/21	JAG

SCALE: 1:100

1:100 (0 1 2 3 4)

DESIGN: CJF
CHECKED: GJM
DRAWN: CJF
CHECKED: GJM
APPROVED: GJM

FOR REVIEW ONLY

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LOCATION
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ICON2 - 829 CARLING AVE.

DRAWING NAME
GRADING PLAN

PROJECT No. 121008
REV: REV # 6
DRAWING No. 121008-GR

D07-12-21-0067

PLANB1.DWG - 1000mmx707mm

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