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39 Years

Proposed High-Rise Residential Development 829 Carling Avenue

Serviceability and Stormwater Management Report

Proposed High-Rise Residential Development
829 Carling Avenue

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

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

NOVATECH
Engineers, Planners & Landscape Architects

April 15, 2021

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 Development**
Serviceability and Stormwater Management Report

Enclosed is the Serviceability and Stormwater Management Report for the proposed 829 Carling Avenue development located along Sidney Street, Preston Street and Carling Avenue in the City of Ottawa. This report is submitted in support of the OPA, zoning amendment and site plan application and outlines how the site will be serviced with public infrastructure.

Trusting this report is adequate for your purposes. Should you have any questions, or require additional information, please contact me.

Yours truly,

NOVATECH

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

cc: Vincent, Denomme, Claridge Homes

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1.0 INTRODUCTION

This Serviceability Study has been prepared in support of Official Plan Amendment, Zoning By-Law Amendment and Site Plan Control applications for the Claridge lands located at 829 Carling Avenue, as shown in **Figure 1 – Key Plan of Subject Site**. The subject site is currently occupied by a CIBC banking centre. The subject site is currently served by one driveway to Carling Avenue, and one driveway to Sidney Street. The proposed redevelopment will include a total of 459 apartment dwellings, and 387 parking spaces.

The subject site has an approximate area of 0.15 hectares, and is surrounded by the following:

- Sidney Street and future high-rise residential development to the north;
- Carling Avenue and Dow's Lake Public Parking to the south;
- Preston Street and future high-rise residential development to the east; and
- An existing auto dealership to the west.

The most recent aerial view of the subject site is provided in **Figure 1**.

Figure 1: Key Plan of Subject Site

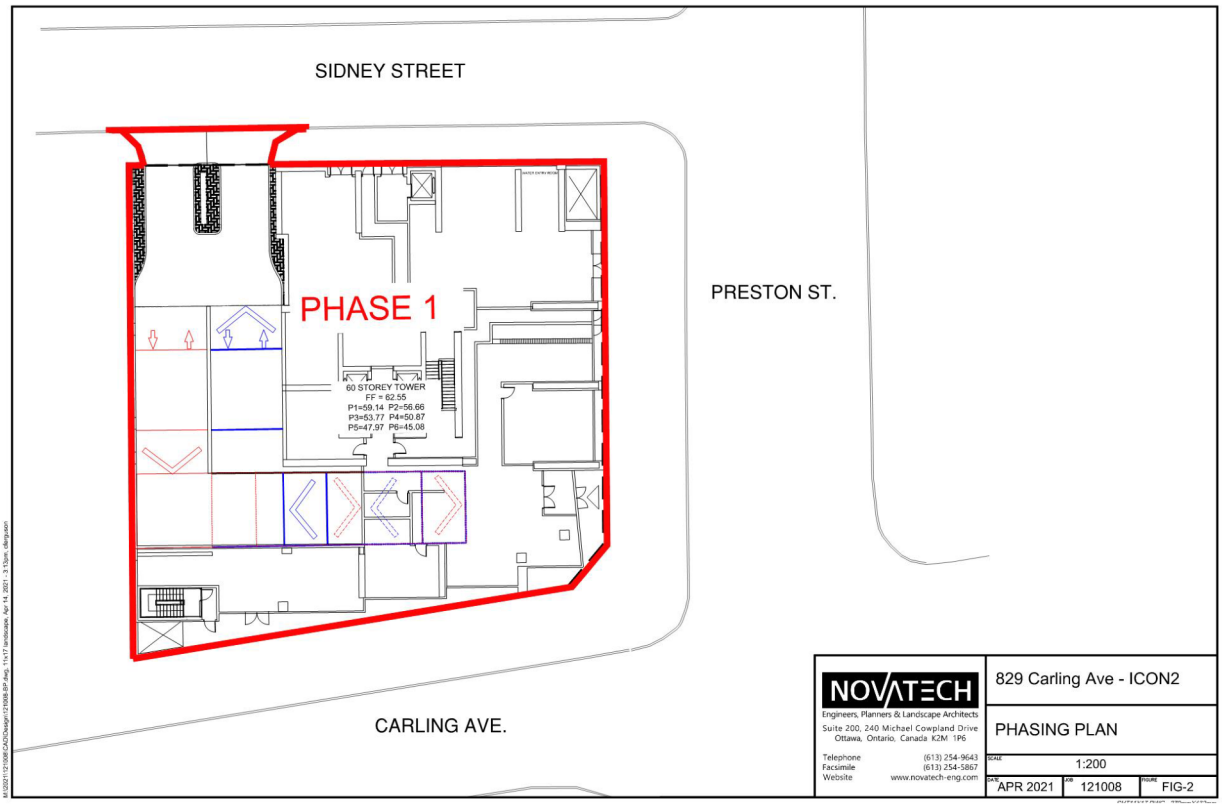
1.1 Proposed Development

The subject site is located within the '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, such as building height.

The proposed development will be constructed in one phase as shown in **Figure 2 – Phasing Plan** and as described below.

- Phase 1 (Tower):
  - 62-storey high-rise including 7-storey podium with 459 dwellings.

Figure 2 Phasing Plan



In total, the proposed development will consist of 459 apartment dwellings. The entire site will include 387 parking spaces for residents and visitors and will be accessed via full-movement driveway to Sidney Street. Phase 1 of the development is anticipated to be built out by 2028.

A copy of the Site Plan is included in **Appendix A – Site Plan.**

2.0 SANITARY SEWER

The development will be serviced by the existing 450mm diameter combined sewer on Sidney Street as shown on the general plan of services.

The service will be a 300mm diameter sanitary sewer to Sidney.

The proposed development flows are based on the City of Ottawa Sewer Design Guidelines and are provided below.

2.1 Proposed Sanitary Flows from Development Site

Proposed sanitary flows are summarized in **Table 2.1 – Proposed Sanitary Flows** with detailed calculations below. Development statistics are summarized in **Table 2.2 – Development Statistics**. A Phasing Plan is shown in **Figure 2 – Phasing Plan.**

Table 2.1 Proposed Sanitary Flows

Phase	Peak Sanitary Flow (L/sec)
Tower	8.78
Total	**8.78**

Table 2.2 Development Statistics

Building Component	Area (ha)	Bachelor (x1.4)	1 Bdr (x1.4)	2 Bdr (x2.1)	3 Bdr (x3.1)	Total
Tower						
Tower (incl. Podium)	-	50	193	189	27	459
Total	**0.15**	**50**	**193**	**189**	**27**	**459**
Grand Total	**0.15**	**50**	**193**	**189**	**27**	**459**

Sanitary Flows - Tower

Area = 0.15 ha

Tower (incl. Podium): 70.0 + 270.2 + 396.9 + 83.7 = 820.8 people

Total: 821 people

Sanitary flows are calculated below using the City's new Sewer Design Criteria.

Population = 821 people
Peak Factor = $1 + 14/(4 + (P/1000)^{1/2}) \times 0.80 = 3.28$
Area = 0.15 ha

$$Q_{Tower} = \frac{(821)(280)}{86{,}400}(3.28) + (0.15)(0.33) = 8.78 \text{ L/sec}$$

Therefore, the total peak sanitary flow for **Tower is 8.78 L/sec.**

Furthermore, the total peak sanitary flow for all **Phases is 8.78 L/sec.**

3.0 STORM SEWER AND STORMWATER MANAGEMENT

As part of this development, stormwater will be controlled on-site and discharged via a 300mm dia. service that will connect to the existing 450mm dia. combined sewer on Sidney Street as shown on the general plan of services.

The site has an overall slope towards Sidney Street. The majority of storm runoff from the site is self-contained with some being conveyed overland towards Sidney Street, Preston Street, Carling Avenue and neighboring property.

3.1 Storm Water Management Criteria

Stormwater management (SWM) design criteria for the proposed development were established by the City of Ottawa Sewer Design Guidelines (October 2012) and correspondence with the City of Ottawa. The SWM design criteria are as follows:

- Control post-development peak flows up-to and including the 100-year storm event to the allowable release rate. Provide on-site water quantity control for all flow in excess of the allowable release rate. The allowable release rate is to be determined by applying the following parameters to the site area:
    - A runoff coefficient of 0.4
    - A time of concentration of 20 minutes
    - A 2-year intensity using the City of Ottawa Intensity-Duration-Frequency (IDF) curves
- Minimize the impact on the downstream receiving watercourses by minimizing the potential erosion and volume of sediment entering the watercourses both on a temporary basis (during construction) and on a permanent basis.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

3.2 Hydrologic and Hydraulic Modelling

The allowable release rate for the 0.15 ha site was determined to be 8.68 L/s based on the SWM criteria provided by the City of Ottawa.

The rational method was used to estimate post-development peak flows (quantity control targets) and determine approximate storage requirements for the site.

The post-development drainage areas were delineated based on the proposed development grading. Refer to **Drawing 121008-GR** for the proposed site grading and **Drawing 121008-STM** for the drainage areas. The storage requirements are based on meeting the allowable release rate generated for the site.

The site will be graded such that flows in excess of the 100-year storm event will be conveyed overland to Sidney Street, Preston Street and Carling Avenue.

Design Storms

The design storms are based on City of Ottawa design storms. Design storms were used for the 5 and 100-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-STM**. All the sub-catchments are assumed to be 100% impervious with exception to the grassed areas which are 0% impervious. The building roofs were assumed to have no depression storage.

A summary of the allowable release rate, post-development parameters and output for the 5 and 100-year storm events are provided in **Appendix C – Stormwater Management Calculations**.

3.3 Water Quantity Control

On-site stormwater management will be implemented to control post-development stormwater discharge to the allowable release rate of 8.68 L/s and will be achieved using an internal stormwater tank that will be pumped to the combined sewer on Sidney Street.

Runoff from the surrounding areas (Sub-catchments A-1, A-2, A-3 and A-4) will be uncontrolled and will drain towards Sidney Street, Preston Street, Carling Avenue and neighboring property. The total uncontrolled flows from the site in the 100-year event will be 2.17 L/s which requires the remaining areas of the site to be controlled to 6.51 L/s, as shown in **Table 3.1**, in order to meet the allowable release rate.

Table 3.1 Controlled Release Rates

Phase	Drainage Area (ha)	Allowable Release Rate (L/s)
Tower	0.15	6.51
Total	*0.15*	*6.51*

The runoff will be collected into at least one tank located within the development. The site was modeled so that the pump rate was equal to the allowable release rate. The tank will be pumped to the combined sewer in Sidney Street at 6.51 L/sec and will have an emergency overflow that will connect to the ground surface. The required storage in the 100-year event is summarized in **Table 3.2**.

Table 3.2 Required Tank Storage for the 100-year Storm

Phase	Required Storage Volume (m^3)
Tower	60
Total	*60*

The storage provided allows for the proposed development to meet the allowable release rate of 8.68 L/s. The total release rate from the site during the 100-year storm event is provided in **Table 3.3**.

Table 3.3 Overall Site Release Rate for the 100-year Storm

Phase	Drainage Area (ha)	Allowable Release Rate (L/s)
Tower	0.15	6.51
Uncontrolled	0.00	2.17
Total	*0.15*	*8.68*

3.4 Water Quality Control

Runoff from the roofs, podiums, and uncontrolled areas would be considered clean and will not require treatment. Additionally, the storage tank will allow for some settling of particulates in the stored runoff from the remaining site areas. Additional water quality treatment will not be required. Erosion and sediment control measures will be implemented during all phases of construction and inspected regularly.

Cistern from Tower will discharge to the existing combined sewer on Sidney Street.

The site will be graded such that flows in excess of the 100-year storm event will be conveyed overland to Sidney Street, Preston Street and Carling Avenue.

4.0 WATERMAIN

4.1 Domestic Water Demand

The proposed development will be serviced by the 150mm dia. watermain on Sidney Street as shown on the General Plan of Services. Shutoff valves will be provided at property lines as per City of Ottawa Specifications. The water meter will be in the basement level mechanical room of the building. Similarly, remote receptacle will be located at the surface near the entrance to the building on the exterior.

The services will be two (2) 150mm diameter water services to Sidney.

Estimated domestic water demands for the development are provided below with a detailed breakdown per phase:

Watermain Flows - Tower

Average Day Demand = 3.33 L/sec

Maximum Day Demand (x2.5) = 8.33 L/sec

Peak Hour Demand (x2.2) = 18.32 L/sec

4.2 Fire Demand

An estimate of the water required to meet firefighting demands is described below.

Section 4.2.11 of the City of Ottawa Water Design Guidelines reads:

“When calculating the fire flow requirements and affected pipe sizing, designers shall use the method developed by the Fire Underwriters Survey”, and

“The requirements for levels of fire protection on private property are covered in Section 7.2.11 of the Ontario Building Code.”

The Fire Underwriters Survey is used to assess the performance of the water distribution system on a “City Block” basis rather than an individual building basis. The Ontario Building Code governs the assessment of fire demand for individual buildings.

Section 7.2.11.1 of the Ontario Building Code states that the design, construction, installation and testing of fire service mains and water service pipe combined with fire service mains shall be in conformance with NFPA 24.

NFPA 24 is the standard for the “Installation of Private Fire Service Mains and their Appurtenances”. Chapter 13 of NFPA 24 discusses sizing the private service fire mains for fire protection systems which shall be approved by the authority having jurisdiction, considering the following factors:

- Construction and Occupancy of the Building
- Fire Flow and Pressure of the Water Required
- Adequacy of the Water Supply

It is expected that any future building on the site will be sprinklered per Section 3.2.2.45 of the OBC. Section 3.2.5.7 of the OBC requires that an adequate water supply for fire fighting be provided to each building, and references Appendix A of the OBC. Sentence 3 of Section A 3.2.5.7 of the OBC (Appendix A) states that NFPA 13 be used for determining both sprinkler and hose stream demands for a sprinklered building.

The design of the sprinkler system is completed by a Fire Protection Engineer, or typically computed by the sprinkler contractor and approved by the Fire Protection Engineer. This process involves detailed hydraulic calculations based on building layout, pipe runs, head losses, fire pump requirements, etc. At this stage in the planning and site design process, these details are not available. Therefore, this report will confirm the maximum anticipated sprinkler and hose stream demands as per NFPA 13.

Section 11.2.3 of the NFPA 13, "Water Demand Requirements – Hydraulic Calculations Methods" was used to estimate the sprinkler and hose stream demands. Figure 11.2.3.1.1 – Area/Density Curves confirms the sprinkler demand, assuming Ordinary 1 construction. Table 11.2.3.1.2 confirms the hose stream allowance and water supply demand requirements, assuming ordinary hazard construction.

For Ordinary 1 type construction, design is based on a density of 0.15 gpm (US), and a maximum area of sprinkler operation limited to 1500 ft^2 (139 m^2). As per NFPA 13 Figure 11.2.3.1.1, the maximum anticipated sprinkler demand is 225 gpm (US). As per NFPA 13 Table 11.2.3.1.2, the maximum total combined inside and outside hose demand is 250 gpm (US) with a duration of 60-90 minutes.

Based on the calculations above, the total estimated sprinkler and hose demand for the development is 475 gpm (US). However, because the development has not been finalized to-date, it is recommended to add a 50% contingency. Therefore, a sprinkler demand of 713 gpm (US), 2700L/min, should be anticipated at this stage. Refer to **Appendix E – Fire Demand Calculations.**

Boundary conditions are requested from the City of Ottawa using a fire demand calculated using the **Fire Underwriters Insurance** procedure. This method is used by municipalities to assess their systems on a more global basis and results in a more conservative fire demand for individual sites, as compared to Building Code calculations. The estimated fire demand using FUS for each of the phases is provided in **Table 4.1 – Calculated Fire Demand.** Detailed calculations are included in **Appendix D – Fire Demand.**

Table 4.1 Calculated Fire Demand

Phase	Fire Demand (L/min)
Tower	5000

5.0 CONCLUSIONS

Based on the foregoing, report conclusions are:

- Adequate sanitary sewer capacity is available on Sidney Street.

- On site stormwater management will be implemented to control post-development flows to that value calculated using a tc of 20 minutes, run-off coefficient of 0.40 and 2-year storm. This will be implemented through construction of a cistern in underground parking structure as summarized below. Uncontrolled flow from surrounding areas will drain overland to Sidney Street, Preston Street and Carling Avenue.

Phase	**Cistern Volume (m^3)**	**Discharge (L/s)**	**Street Sewer**
Tower	60	6.51	Sidney Street
1-4	Uncontrolled	2.17	Uncontrolled to Sidney Street, Preston Street and Carling Avenue
Total	**60**	**8.68**	

- Adequate water services are available on Sidney Street for domestic demand. It is expected that adequate water supply is available for firefighting which will be confirmed once boundary conditions are received from the City. Calculated fire demand ranged from 5000 L/min. The buildings will be equipped with fire pumps and sprinklers.

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Prepared by:

Jazmine Gauthier, B.A.Sc.
Project Manager | Land Development

Reviewed by:

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

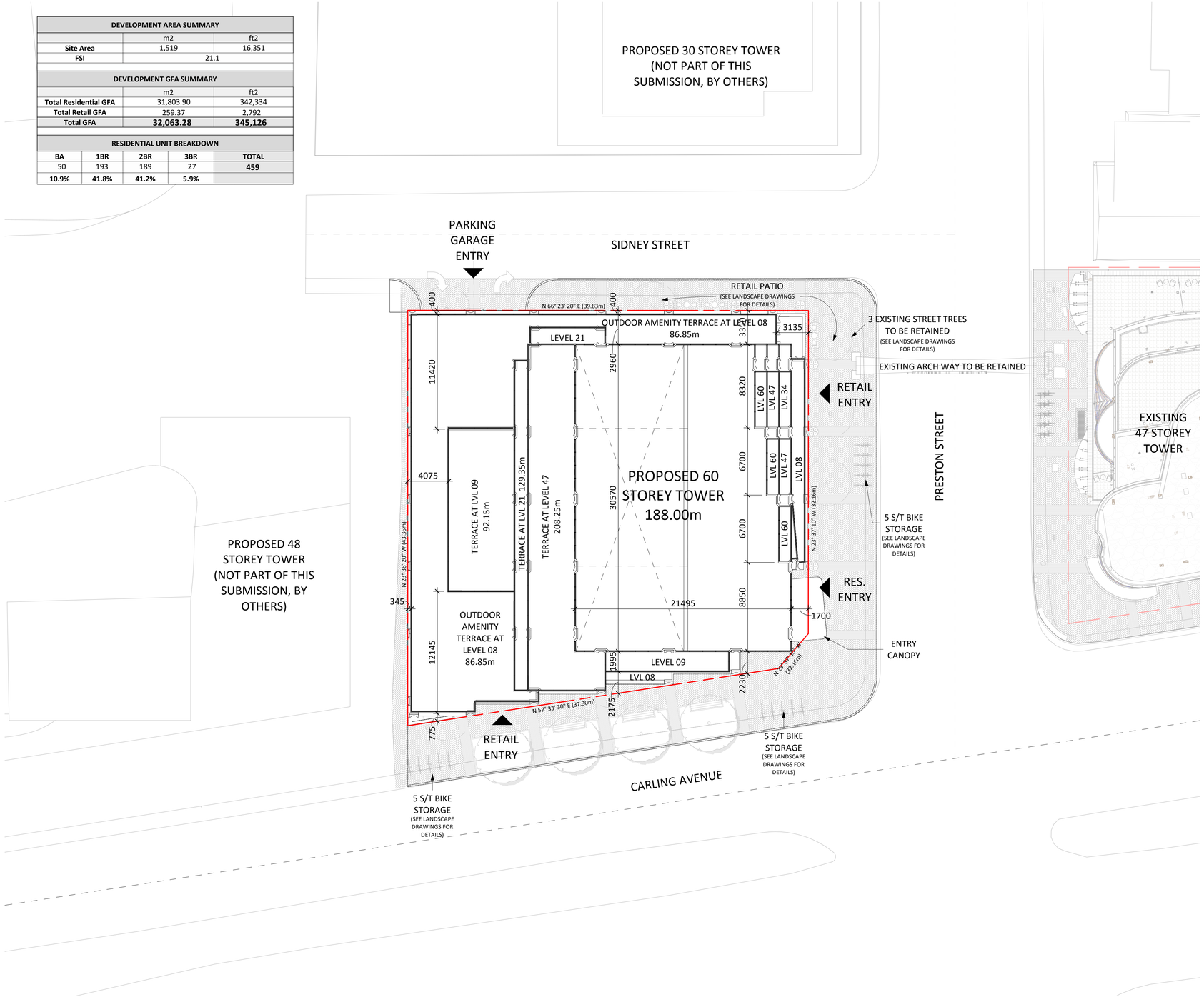
APPENDIX A

Site Plan

DEVELOPMENT AREA SUMMARY		
	m2	ft2
Site Area	1,519	16,351
FSI	21.1	

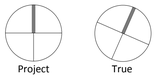
DEVELOPMENT GFA SUMMARY		
	m2	ft2
Total Residential GFA	31,803.90	342,334
Total Retail GFA	259.37	2,792
Total GFA	**32,063.28**	**345,126**

RESIDENTIAL UNIT BREAKDOWN				
BA	**1BR**	**2BR**	**3BR**	**TOTAL**
50	193	189	27	**459**
10.9%	**41.8%**	**41.2%**	**5.9%**	



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.



KEYPLAN

PROJECT TEAM	
CLIENT	CLARIDGE 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.

DRAWING STATUS

NOT FOR CONSTRUCTION

NO.	YYYY-MM-DD	DESCRIPTION
1	2021-04-15	ISSUED FOR OPA/ZBA/SPA

HARIRI PONTARINI ARCHITECTS
235 Carlaw Avenue
Suite 301
Toronto, Canada M4M 2S1
tel 416 929 4901
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hariripontarini.com

Project Title:

829 Carling Ave Mixed-Use Development

829 CARLING AVE. OTTAWA, ON

SITE PLAN

Project number:	2030
Scale:	1 : 200
Sheet Start Date:	11/23/20
Drawn / Checked by:	HPA HPA

Drawing No.: Revision:

A102

24" x 36" ARCH D SHEET SIZE PRINT DATE: 15/04/2021 1:01:28 PM

APPENDIX B

Stormwater Management Calculations

Runoff Coefficients

Drainage Area	Total Area (m^2)	Hard Surface Area		Grass Area		5-Year Runoff Coefficient	100-Year Runoff Coefficient
		Area (m^2)	C	Area (m^2)	C		
A-01	19.0	19.0	0.95	0.0	0.20	0.95	1.00
A-02	18.0	18.0	0.95	0.0	0.20	0.95	1.00
A-03	5.9	5.9	0.95	0.0	0.20	0.95	1.00
A-04	0.8	0.8	0.95	0.0	0.20	0.95	1.00
Total	**43.72**	**43.7**	**0.95**	**0.0**	**0.20**	**0.95**	**1.00**

Controlled Flow

5 YR

Area No.	Area (ha)	C_{5yr}	Time (min)	intensity mm/hr	Uncontrolled runoff L/s	Control System	Zurn Model Number	Release Rate (L/s/m of head)	Notches	Depth (m)	Controlled Flow (L/s)	Storage available (m^3)	Storage used (m^3)
A-01	0.0019	0.95	10.00	104.19	0.52	no control	-	-	-	-	-	-	-
A-02	0.0018	0.95	10.00	104.19	0.50	no control	-	-	-	-	-	-	-
A-03	0.0006	0.95	10.00	104.19	0.16	no control	-	-	-	-	-	-	-
A-04	0.0001	0.95	10.00	104.19	0.02	no control	-	-	-	-	-	-	-
CB Storage	-	-	-	-	-	-	-	-	-	-	-	-	-
Total:	0.3716				1.20						40.67	69.90	27.72

100 YR

Area ID	Area (ha)	C_{100yr}	Time (min)	intensity mm/hr	Uncontrolled runoff L/s	Control System	Zurn Model Number	Release Rate (L/s/m of head)	Notches	Depth (m)	Controlled Flow (L/s)	Storage available (m^3)	Storage used (m^3)
A-01	0.0019	1.00	10.00	178.56	0.94	no control	-	-	-	-	-	-	-
A-02	0.0018	1.00	10.00	178.56	0.89	no control	-	-	-	-	-	-	-
A-03	0.0006	1.00	10.00	178.56	0.29	no control	-	-	-	-	-	-	-
A-04	0.0001	1.00	10.00	178.56	0.04	no control	-	-	-	-	-	-	-
CB Storage	-	-	-	-	-	-	-	-	-	-	-	-	-
Total:	0.3716				2.17						69.90	69.90	57.41

Note: In all cases, there is only one notch in the Zurn roof drain and and flows through each drain is further reduced with and adjustable weir. See Zurn roof drains sheet and adjustable weir specification for more details on the reduction of flow.

2.17

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Allowable release rate

Area	0.15	ha
C	0.4	
tc	20	min
i_2	52.03	

Q allowable = 2.78 x C x i x A

8.68 L/s

REQUIRED STORAGE - 5-YEAR EVENT
AREA Tower : TANK

OTTAWA IDF CURVE
Area = 0.1475 ha Qallow = 6.51
C = 0.95 Vol(max) = 26.10

Time (min)	Intensity (mm/hr)	Q Uncontrolled (L/s)	Q Controlled (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	55.01	0.00	48.50	14.55
10	104.19	40.60	0.00	34.09	20.45
15	83.56	32.56	0.00	26.05	23.44
20	70.25	27.37	0.00	20.86	25.04
25	60.90	23.73	0.00	17.22	25.83
30	53.93	21.01	0.00	14.50	26.10
35	48.52	18.90	0.00	12.39	26.03
40	44.18	17.22	0.00	10.71	25.69
45	40.63	15.83	0.00	9.32	25.17
50	37.65	14.67	0.00	8.16	24.48
55	35.12	13.69	0.00	7.18	23.68
60	32.94	12.84	0.00	6.33	22.77
65	31.04	12.10	0.00	5.59	21.79
70	29.37	11.44	0.00	4.93	20.73
75	27.89	10.87	0.00	4.36	19.60
80	26.56	10.35	0.00	3.84	18.43
85	25.37	9.88	0.00	3.37	17.21
90	24.29	9.46	0.00	2.95	15.95
95	23.31	9.08	0.00	2.57	14.65
100	22.41	8.73	0.00	2.22	13.32
105	21.58	8.41	0.00	1.90	11.97
110	20.82	8.11	0.00	1.60	10.58
115	20.12	7.84	0.00	1.33	9.17
120	19.47	7.59	0.00	1.08	7.74
125	18.86	7.35	0.00	0.84	6.29
130	18.29	7.13	0.00	0.62	4.82
135	17.76	6.92	0.00	0.41	3.34
140	17.27	6.73	0.00	0.22	1.84
145	16.80	6.55	0.00	0.04	0.32
150	16.36	6.38	0.00	-0.13	-1.21
155	15.95	6.21	0.00	-0.30	-2.75
160	15.56	6.06	0.00	-0.45	-4.31
165	15.18	5.92	0.00	-0.59	-5.88
170	14.83	5.78	0.00	-0.73	-7.45

A

REQUIRED STORAGE - 100-YEAR EVENT
AREA Tower : TANK

OTTAWA IDF CURVE
Area = 0.1475 ha Qallow = 6.51
C = 1.00 Vol(max) = 59.22

Time (min)	Intensity (mm/hr)	Q Uncontrolled (L/s)	Q Controlled (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	99.55	0.00	93.04	27.91
10	178.56	73.24	0.00	66.73	40.04
15	142.89	58.61	0.00	52.10	46.89
20	119.95	49.20	0.00	42.69	51.23
25	103.85	42.59	0.00	36.08	54.12
30	91.87	37.68	0.00	31.17	56.11
35	82.58	33.87	0.00	27.36	57.46
40	75.15	30.82	0.00	24.31	58.35
45	69.05	28.32	0.00	21.81	58.89
50	63.95	26.23	0.00	19.72	59.16
55	59.62	24.45	0.00	17.94	59.22
60	55.89	22.93	0.00	16.42	59.09
65	52.65	21.59	0.00	15.08	58.82
70	49.79	20.42	0.00	13.91	58.43
75	47.26	19.38	0.00	12.87	57.92
80	44.99	18.45	0.00	11.94	57.33
85	42.95	17.62	0.00	11.11	56.65
90	41.11	16.86	0.00	10.35	55.90
95	39.43	16.17	0.00	9.66	55.09
100	37.90	15.55	0.00	9.04	54.22
105	36.50	14.97	0.00	8.46	53.29
110	35.20	14.44	0.00	7.93	52.33
115	34.01	13.95	0.00	7.44	51.32
120	32.89	13.49	0.00	6.98	50.27
125	31.86	13.07	0.00	6.56	49.19
130	30.90	12.67	0.00	6.16	48.07
135	30.00	12.30	0.00	5.79	46.93
140	29.15	11.96	0.00	5.45	45.75
145	28.36	11.63	0.00	5.12	44.55
150	27.61	11.32	0.00	4.81	43.33
155	26.91	11.04	0.00	4.53	42.09
160	26.24	10.76	0.00	4.25	40.82
165	25.61	10.50	0.00	3.99	39.53
170	25.01	10.26	0.00	3.75	38.23

APPENDIX C

Fire Demand Calculations

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121008
Project Name: 829 Carling Avenue
Date: 4/15/2021
Input By: Jazmine Gauthier
Reviewed By: Greg MacDonald

Legend: Input by User; No Information or Input Required

Building Description: 62 Storey Building with 7 Storey Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	1411			
		Total Floors/Storeys (Podium)	7			
		Tower Footprint (m^2)	1463			
		Total Floors/Storeys (Tower)	55			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**2,117**	
	F	**Base fire flow without reductions**				**6,000**
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,100**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,550**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	10.1 - 20 m		15%	**2,805**
		East Side	20.1 - 30 m		10%	
		South Side	30.1- 45 m		5%	
		West Side	0 - 3 m		25%	
				Cumulative Total	**55%**	
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
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	1.75
		Required Volume of Fire Flow (m^3)			m^3	525

FUS - Fire Flow Calculations - User Guide - Fire Resistive

Novatech Project #: 121008
Project Name: 829 Carling Avenue
Date: 4/15/2021
Input By: Jazmine Gauthier
Reviewed By: Greg MacDonald

- Please use the notes below as a guide when completing the FUS Fire Flow Calculations
- When in doubt, confirm construction material, firewalls, etc. with architect/owner
- When in doubt, err on conservative side

Note: This form only applies for Fire Resistive

Enter a description of the building or unit being considered, i.e. use/most stringent condition/address

Summary		
Construction Type	Fire Resistive Construction	
Floor Area Considered	2,117	m^2
Occupancy Reduction	-15%	
Sprinkler Reduction	-50%	
Exposure Surcharge	55%	
Total Fire Flow	5,000	L/min

Project Manager Review
Date: _____
Name: _____
Signature: _____

Base Fire Flow

1 Construction Material

Does not apply for this form
Does not apply for this form
Does not apply for this form
Only Use if can be confirmed with client/architect (ISO Cl 5)
Only Use if can be confirmed with client/architect (ISO Cl 6)

2 Floor Area

If considered gross floor area, then enter 1 floor/storey. If Fire wall, then reduce footprint accordingly.

Un-Protected **8** = number of floors above first 2, up to max of 10 floors total

Protected **2** = number of additional immediately adjoining floors to be considered, up to 2

Do vertical openings have minimum 1 hour rating between floors? Confirm this with the architect.

For unprotected openings scenario only, can be mix of podium and tower

Reductions or Surcharges

3 Occupancy hazard reduction or surcharge

Residential - with no garage
Residential - with garage
General Commercial - Generally, no reduction
Check usage with FUS
Check usage with FUS

4 Sprinkler Reduction

Only Use if can be confirmed with client/architect
Only Use if can be confirmed with client/architect
Only Use if can be confirmed with client/architect

5 Exposure Surcharge (cumulative %)

For Fire walls: FUS considers a Fire wall to have a minimum 2 hour rating per NBC.

Results

6

NOTE: Refer to City Technical Bulletin ISDTB-2014-02 for additional considerations to cap this value at 10,000L/min

If IGPM is needed, divide USGPM by 1.20095

7

For Rural areas, or where required

APPENDIX D

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	p.1	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Dwgs	GP, GR, STM
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.	N		
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	All sections
Statement of objectives and servicing criteria.	Y	Report	
Identification of existing and proposed infrastructure available in the immediate area.	Y	Dwg	GP
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	

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/Report
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		
Identification of system constraints.	NA		
Identify boundary conditions.	NA		
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
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.	NA		
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	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	Report	
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	Drawings
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	Appendix
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		
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	
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	Report	
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	Report	
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		Appendix
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		Appendix
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	And Appendix
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	And Appendix

Development Servicing Study Checklist

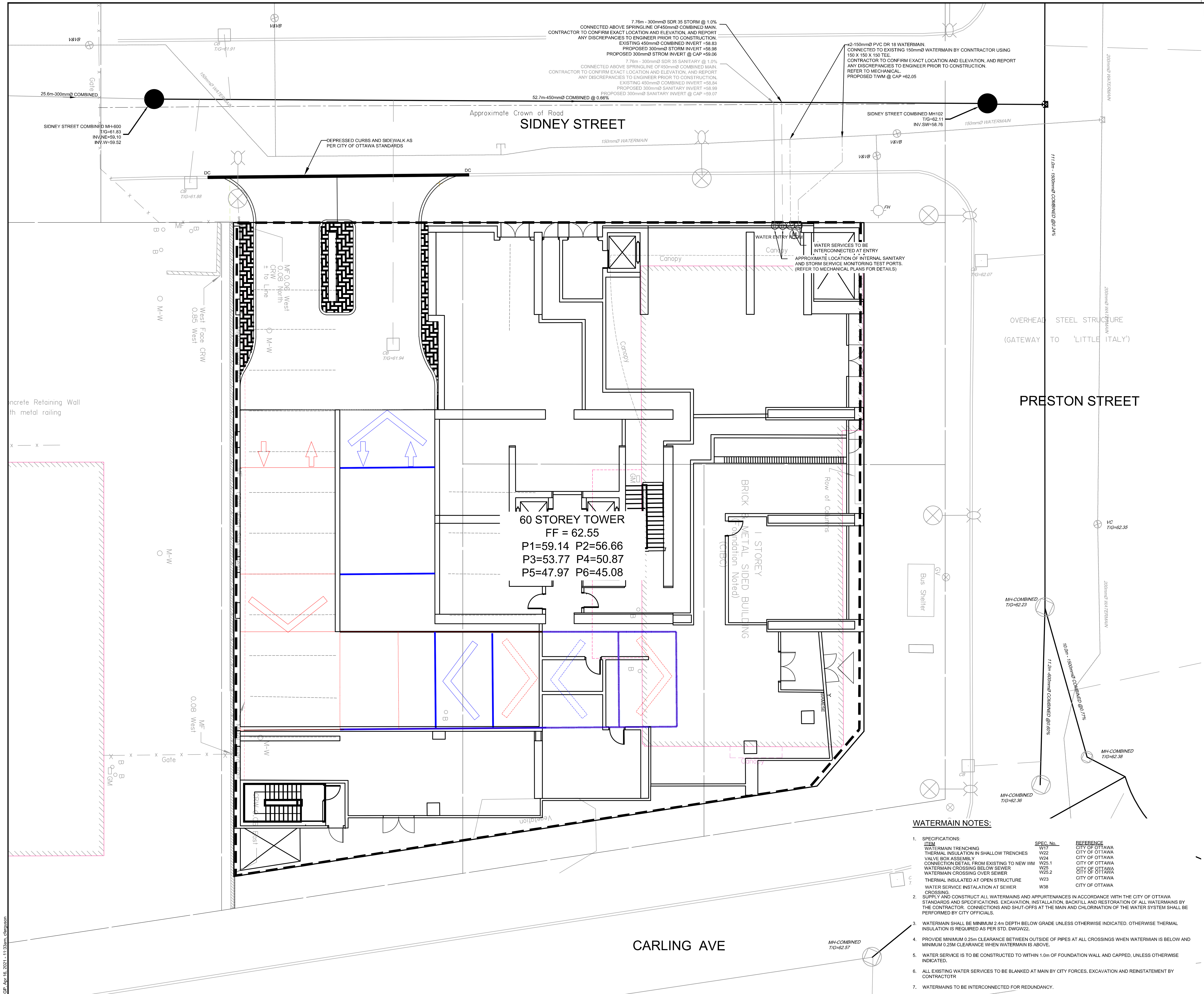
4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Identification of municipal drains and related approval requirements.	Y	Report	
Description of how the conveyance and storage capacity will be achieved for the development.	Y	Report	
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y		Appendix
Inclusion of hydraulic analysis including HGL elevations.	Y		Appendix
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	Report	Drawings
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		

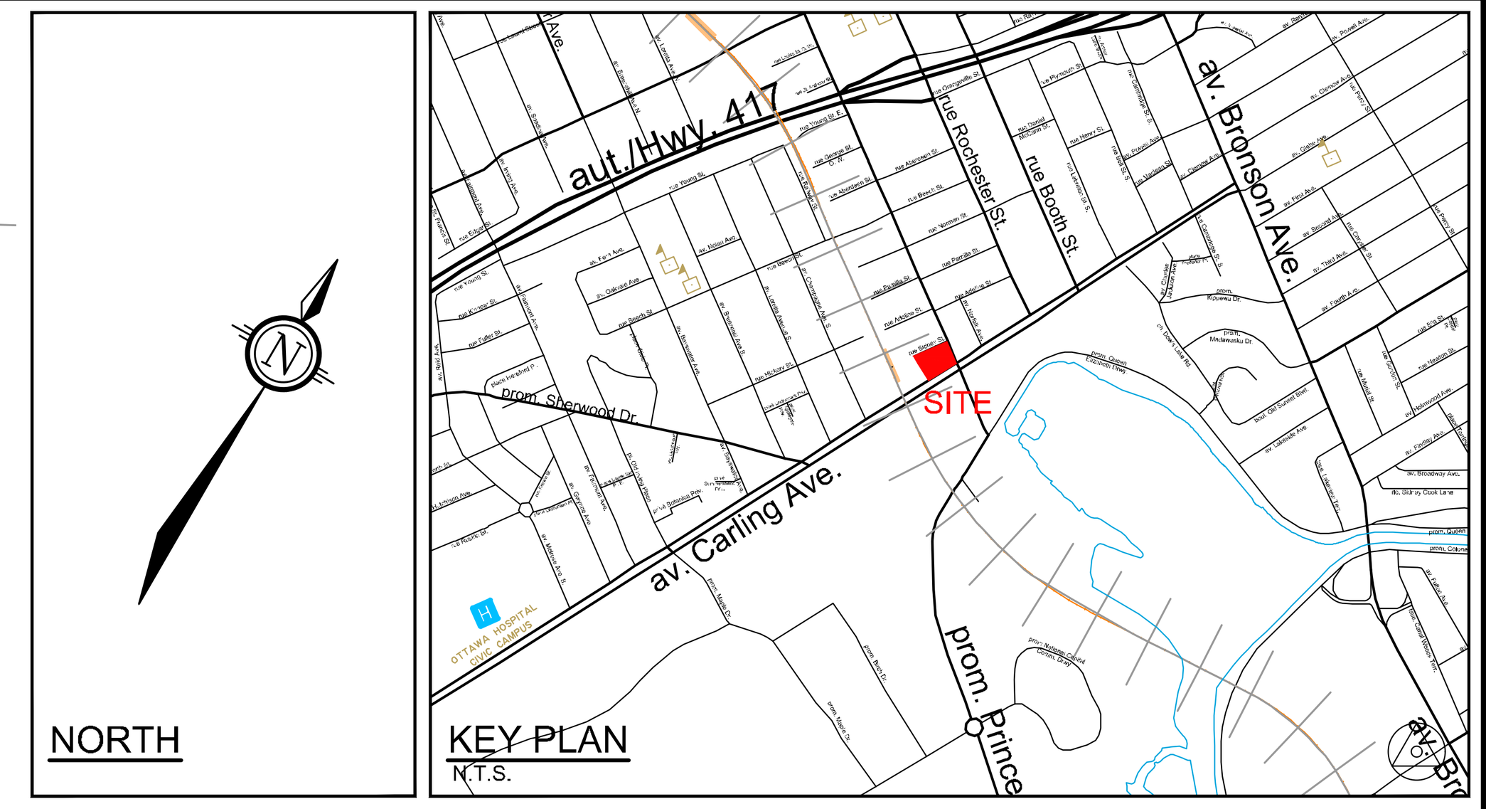
Development Servicing Study Checklist

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	
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.	NA		
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	Report	

DRAWINGS





PROPOSED PROPERTY LINE
PROPOSED WATERMAIN
PROPOSED VALVE BOX
PROPOSED STORM MANHOLE
PROPOSED SANITARY SEWER
PROPOSED FOUNDATION DRAIN
UNDERGROUND PARKING LIMITS
PROPOSED STORM SEWER
PROPOSED STORM TRENCH DRAIN
PROPOSED CAP
PROPOSED BACKWATER VALVE
EXISTING LEGAL ADJACENT LINE
EXISTING STANDARD IRON BAR / CONTROL POINT
EXISITING FLOW DIRECTION OF SEWERS
EXISTING SANITARY MANHOLE & SEWER
EXISTING STORM MANHOLE & SEWER
EXISTING CATCH BASIN
EXISTING BUILDING ENVELOPE
PROPOSED SIAMESE CONNECTION
EXISTING WATERMAIN VALVE CHAMBER
EXISTING WATERMAIN SHUT-OFF VALVE BOX
EXISTING WATERMAIN
EXISTING HYDRANT C/W LEAD & SHUT OFF VALVE BOX
EXISTING GAS VALVE
EXISTING GAS MAIN
EXISTING ABANDONED GAS MAIN
EXISTING BELL CONDUIT
EXISTING OVER HEAD WIRE
EXISTING HYDRO/UTILITY POLE
EXISTING GUY WIRE
EXISTING TRAFFIC MANHOLE
EXISTING JOINT USE STREET LIGHT
EXISTING STREET LIGHT
EXISTING TRAFFIC HAND HOLE
EXISTING TRAFFIC SIGN
EXISTING DITCH INLET CATCH BASIN
EXISTING HYDRANT
PROPOSED HYDRANT

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.
8. REFER TO GEOTECHNICAL REPORT (No. PB5281-1, DATED JUL 16TH, 2020), 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.
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. 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 1.5m 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.
12. MONITORING TEST PORTS FOR BUILDING SERVICES TO BE INSTALLED IN PARKING GARAGE.

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 0.25m 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. EXCAVATION AND REINSTATEMENT BY CONTRACTOTR
7. WATERMAINS TO BE INTERCONNECTED FOR REDUNDANCY.

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
SUITE 2001,
210 GLADSTONE AVENUE,
OTTAWA , ONTARIO
K2P 0Y6.

No.	REVISION	DATE	BY
2.	ISSUED WITH SITE PLAN APPLICATION	APR15/21	JAG
1.	ISSUED FOR PRELIMINARY CONSTRUCTION	FEB22/21	JAG

SCALE 1:100

DESIGN CJF
CHECKED JAG
DRAWN CJF
CHECKED JAG
APPROVED GJM

FOR REVIEW ONLY

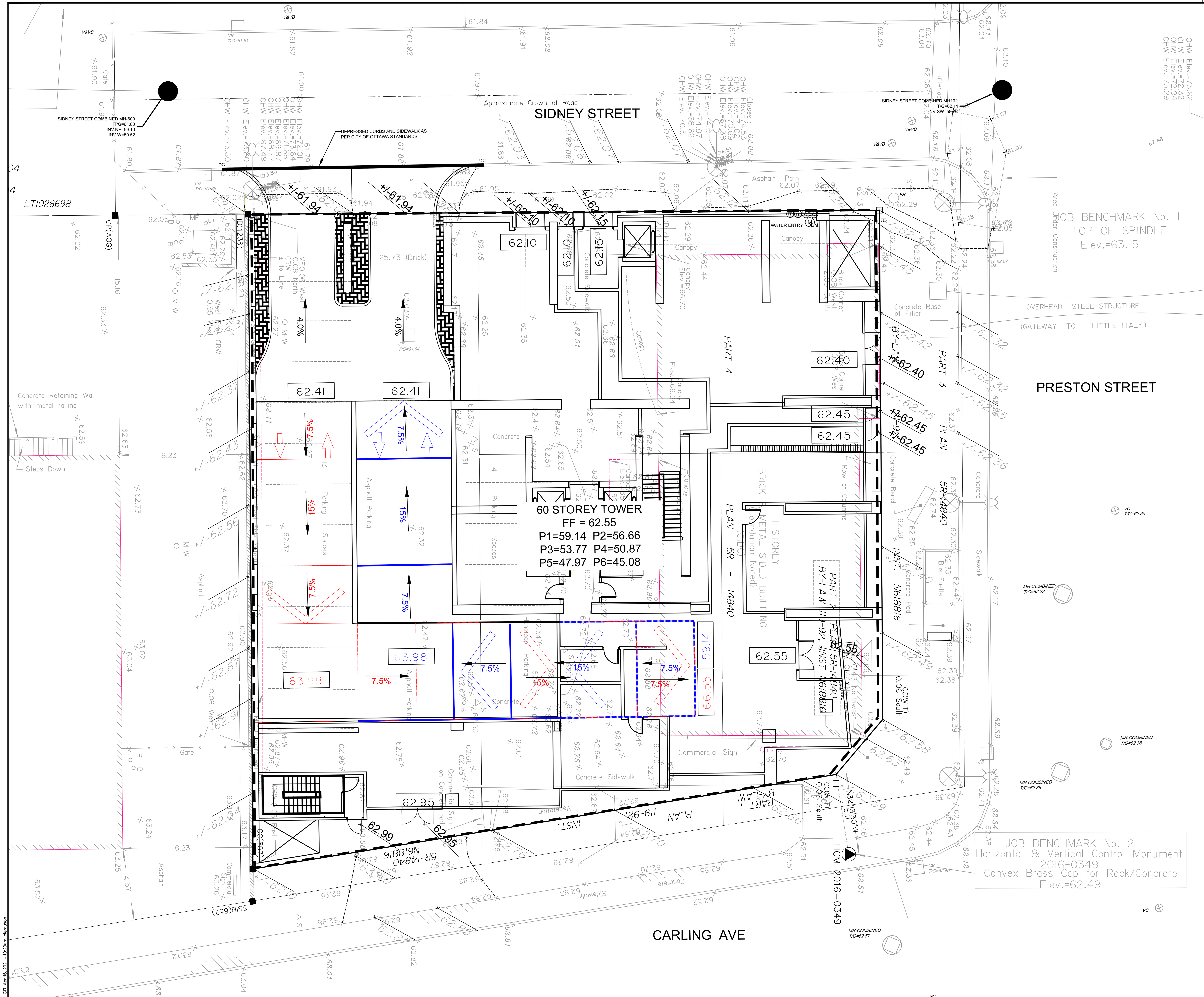
LICENSED PROFESSIONAL ENGINEER
G.J. MacDONALD
April 21, 2021
PROVINCE OF ONTARIO

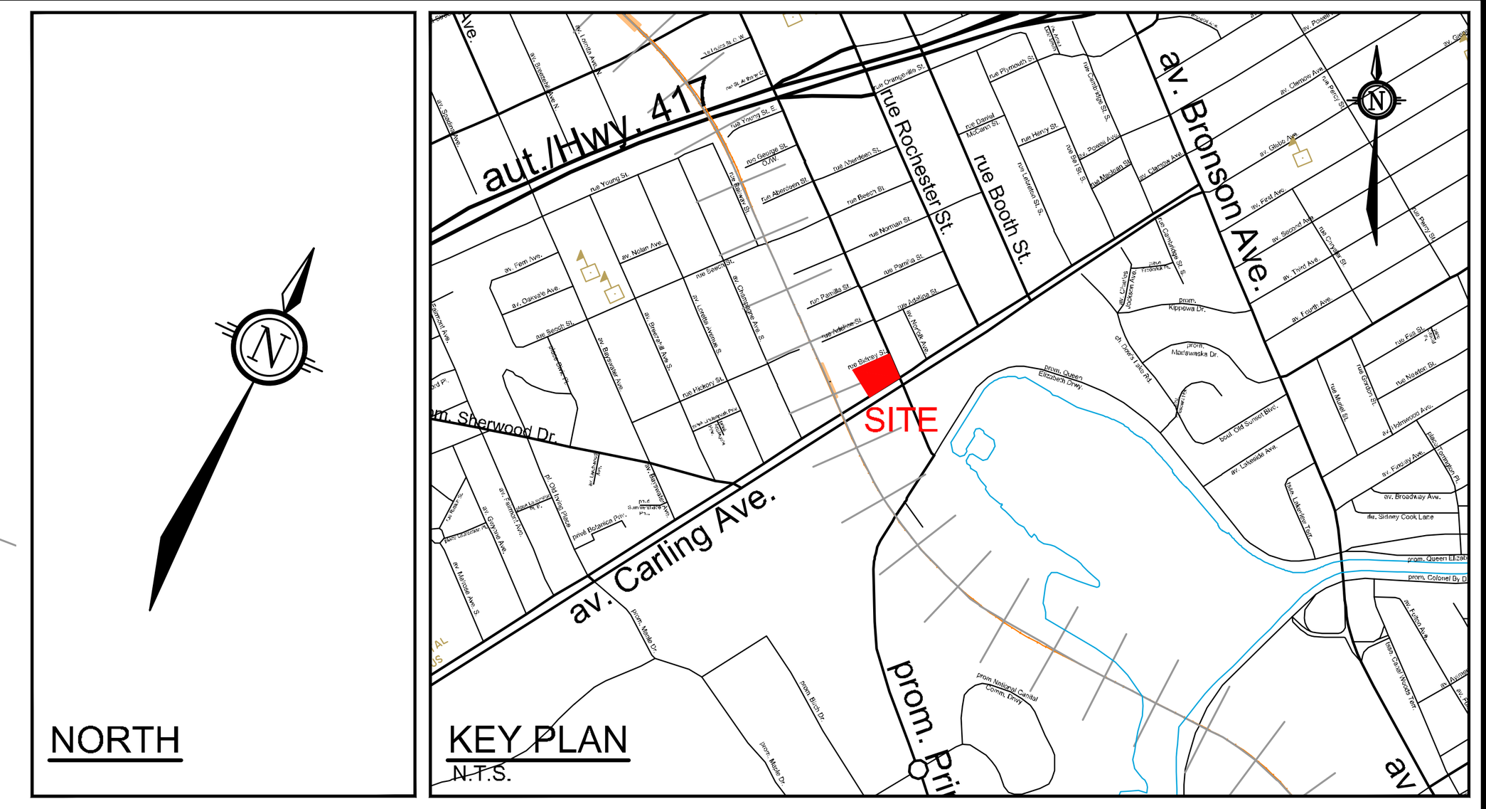
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
ICON2 - 829 CARLING AVE.

DRAWING NAME
GENERAL PLAN OF SERVICING

PROJECT No. 121008
REV REV # 2
DRAWING No. 121008-GP





PROPOSED PROPERTY LINE	EXISTING GAS VALVE
EXISTING LEGAL ADJACENT LINE	EXISTING GAS MAIN
EXISTING ELEVATION	EXISTING ABANDONED GAS MAIN
PROPOSED GRADES	EXISTING BELL CONDUIT
PROPOSED SWALE GRADES	EXISTING OVER HEAD WIRE
PROPOSED TOP OF RETAINING WALL	EXISTING TRAFFIC CONDUIT
PROPOSED BOTTOM OF RETAINING WALL	EXISTING HYDRO/UTILITY POLE
PROPOSED UNDERGROUND PARKING RAMP GRADES	EXISTING GUY WIRE
PROPOSED SLOPE AND FLOW DIRECTION	EXISTING TRAFFIC MANHOLE
FF=93.80 PROPOSED FINISHED FLOOR ELEVATION	EXISTING JOINT USE STREET LIGHT
PROPOSED DEPRESSED CURB	EXISTING STREET LIGHT
TRENCH DRAIN	EXISTING TRAFFIC HAND HOLE
PROPOSED TERRACING SLOPE 3:1 MAX	EXISTING TRAFFIC SIGN
PROPOSED PONDING AREA	EXISTING STANDARD IRON BAR
DIRECTION OF MAJOR OVERLAND FLOW	EXISITING CATCHBASIN
PROPOSED SWALE	EXISITING DITCH INLET CATCHBASIN
	EXISTING BUILDING ENVELOPE
	PROPOSED FILTER CLOTH IN EXISTING CATCHBASIN
	PROPOSED SILT FENCE
	PROPOSED RAMP UP
	PROPOSED RAMP DOWN

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.
8. REFER TO GEOTECHNICAL REPORT (No. PB5281-1, DATED JUL 16TH, 2020), 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 SERVICEABILITY AND STORMWATER MANAGEMENT REPORT PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
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 95% 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.

PAVEMENT STRUCTURE:

LIGHT DUTY
50mm HL3
150mm GRAN "A"
300mm GRAN "B" TYPE II

HEAVY DUTY
40mm HL3
50mm HL8
150mm GRAN "A"
450mm GRAN "B" TYPE II

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
SUITE 2001,
210 GLADSTONE AVENUE,
OTTAWA , ONTARIO
K2P 0Y6.

No.	REVISION	DATE	BY
2.	ISSUED WITH SITE PLAN APPLICATION	APR15/21	JAG
1.	ISSUED FOR PRELIMINARY COORDINATION	FEB 9/21	JAG

SCALE 1:100

DESIGN CJF
CHECKED JAG
DRAWN CJF
CHECKED JAG
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER G.J. MacDONALD April 21, 2021 PROVINCE OF ONTARIO

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

LOCATION
CITY OF OTTAWA
ICON2 - 829 CARLING AVE.

DRAWING NAME
GRADING AND EROSION SEDIMENT CONTROL PLAN

PROJECT No. 121008
REV REV # 2
DRAWING No. 121008-GR

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PLANB1.DWG - 1000mmx707mm

7.76m - 300mmØ SDR 35 STORM @ 1.0%
CONNECTED ABOVE SPRINGLINE OF450mmØ COMBINED MAIN.
CONTRACTOR TO CONFIRM EXACT LOCATION AND ELEVATION, AND REPORT
ANY DISCREPANCIES TO ENGINEER PRIOR TO CONSTRUCTION.
EXISTING 450mmØ COMBINED INVERT =58.83
PROPOSED 300mmØ STORM INVERT =58.98
PROPOSED 300mmØ STROM INVERT @ CAP =59.06

25.6m-300mmØ COMBINED

52.7m-450mmØ COMBINED @ 0.6

SIDNEY STREET COMBINED MH-600
T/G=61.83
INV.NE=59.10
INV.W=59.52

SIDNEY STREET COMBINED MH102
T/G=62.11
INV.SW=58.76

DEPRESSED CURBS AND SIDEWALK AS PER CITY OF OTTAWA STANDARDS

DC

CB T/G=61.88

V&VB

FH

WATER ENTRY ROOM

WATER SERVICES TO BE INTERCONNECTED AT ENTRY

APPROXIMATE LOCATION OF INTERNAL SANITARY AND STORM SERVICE MONITORING TEST PORTS, (REFER TO MECHANICAL PLANS FOR DETAILS)

CB T/G=62.07

111.0m - 1500mmØ COMBINED @0.24%

A-3
0.001
0.9

T-3
0.006
0.9

T-4
0.001
0.9

T-2
0.02
0.9

T-5
0.01
0.9

T-6
0.003
0.9

A-4
0.0001
0.9

A-2
0.002
0.9

R-1
0.06
0.9

T-1
0.04
0.9

A-1
0.002
0.9

TERRACE LEVEL 8

TERRACE LEVEL 21

TERRACE LEVEL 9

TERRACE LEVEL 47

TERRACE LEVEL 60

TERRACE LEVEL 34

60 STOREY TOWER
FF = 62.55
P1=59.14 P2=56.66
P3=53.77 P4=50.87
P5=47.97 P6=45.08

SHARDE

UNDERGROUND PARKING LIMITS

PRESTON STREET

CARLING AVE

VC T/G=62.35

MH-COMBINED T/G=62.23

10.0m - 1500mmØ COMBINED @0.77%

11.2m -600mmØ COMBINED @0.60%

MH-COMBINED T/G=62.38

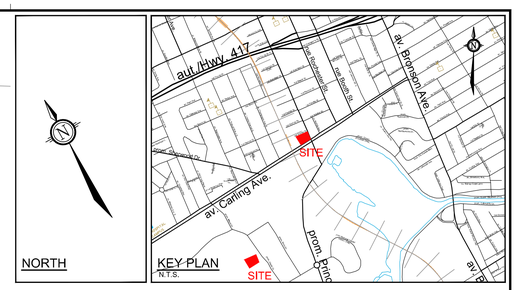
MH-COMBINED T/G=62.36

CB

CB T/G=62.40

MH-COMBINED T/G=62.57

VC



DRAINAGE AREA LIMITS

A-X
0.039
0.46

DRAINAGE AREA ID (MULTIPLE AREAS)
AREA (ha)
RUNOFF COEFFICIENT (5-YEAR)

- UNCONTROLLED, GROUND (A1-A4)
- TERRACE, LEVEL 8 (T1)
- TERRACE, LEVEL 9 (T2)
- TERRACE, LEVEL 21 (T3)
- TERRACE, LEVEL 34 (T4)
- TERRACE, LEVEL 47 (T5)
- TERRACE, LEVEL 60 (T6)
- ROOF, LEVEL 60 (R1)

STORMWATER MANAGEMENT NOTES:

1. REFER TO 'SERVICEABILITY AND STORMWATER MANAGEMENT REPORT' PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
2. NO ROOF TOP CONTROL ACCOUNTED FOR.
3. TOTAL AREA: *** ha

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SCALE 1:100

1:100
0 1 2 3 4

DESIGN CJF
CHECKED JAG
DRAWN CJF
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APPROVED GJM

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April 21, 2021
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DRAWING NAME
STORMWATER MANAGEMENT PLAN

PROJECT No. 121008
REV REV # 1
DRAWING No. 121008-STM

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