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36 Years

Proposed High-Rise Residential Development 1200 Maritime Way

Serviceability & Stormwater Management Report

Proposed High-Rise Residential Development
1200 Maritime Way

Serviceability and Stormwater Management Report

Prepared for:

Claridge Homes

Prepared By:

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

January 25, 2021
Amended November 3, 2021

Novatech File: 120144
Ref No. R-2021-012

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November 3, 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: **Ms. Laurel McCreight, MCIP, RPP**

Dear Laurel:

Reference: **1200 Maritime Way - Claridge Development**
Serviceability and Stormwater Management Report

Enclosed is the Serviceability and Stormwater Management Report for the proposed 1200 Maritime Way development located along the Highway 417, Kanata Avenue and Maritime Way in the City of Ottawa. This report is submitted in support of the zoning amendment/site plan control applications 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

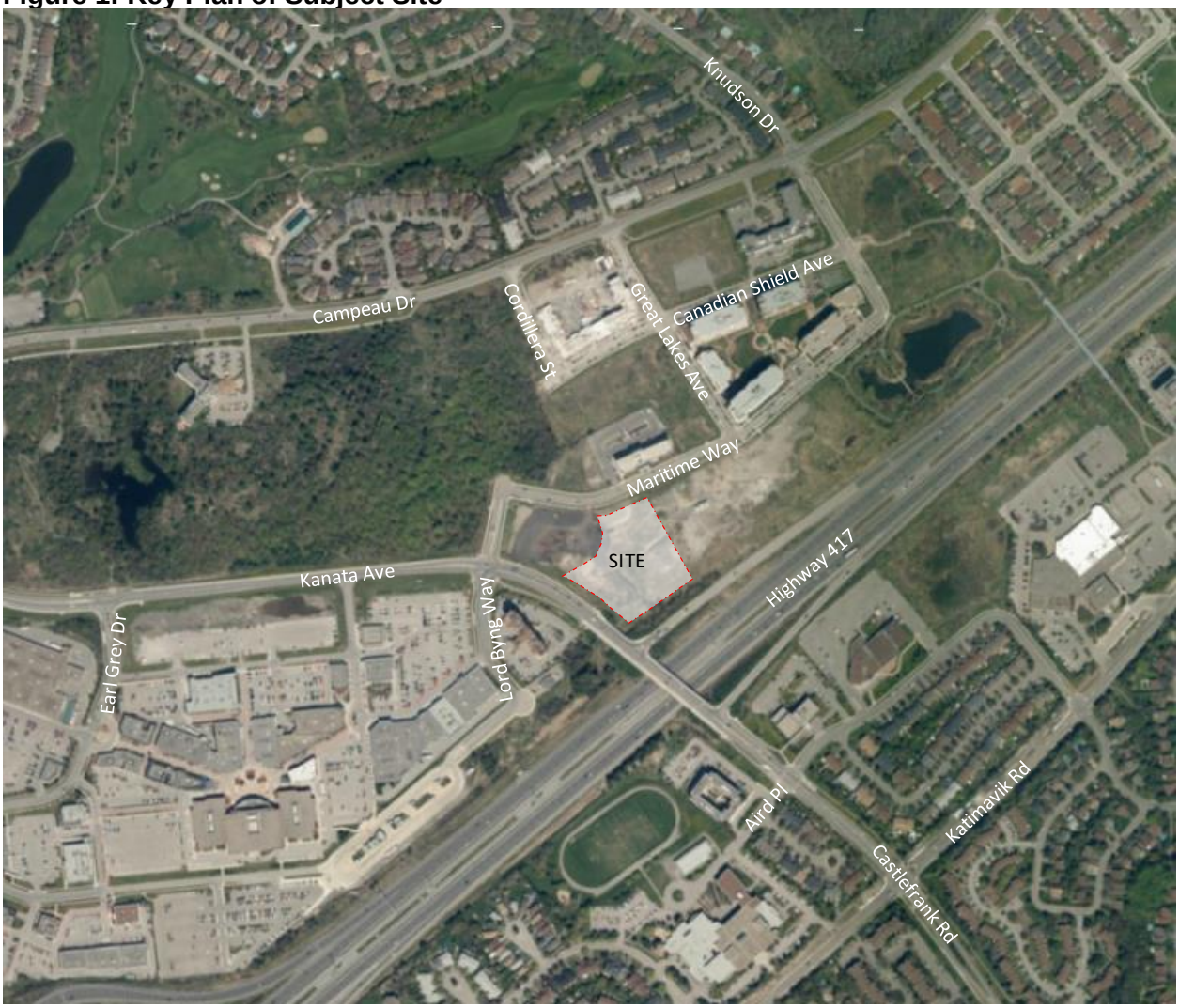
This Serviceability Study has been prepared in support of Zoning By-Law Amendment and Site Plan Control applications for the Claridge lands located at 1200 Maritime Way, as shown in **Figure 1 – Key Plan of Subject Site**. The subject site is currently occupied by a vacant land. The proposed redevelopment will include a total of 632 dwelling units and 662 parking spaces.

The subject site has an approximate area of 1.28 hectares, and is surrounded by the following:

- Maritime Way and Townplace Suites by Marriott hotel to the north;
- Highway 417 to the south;
- Vacant land to the east; and
- A retirement residence to the west.

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

Figure 1: Key Plan of Subject Site



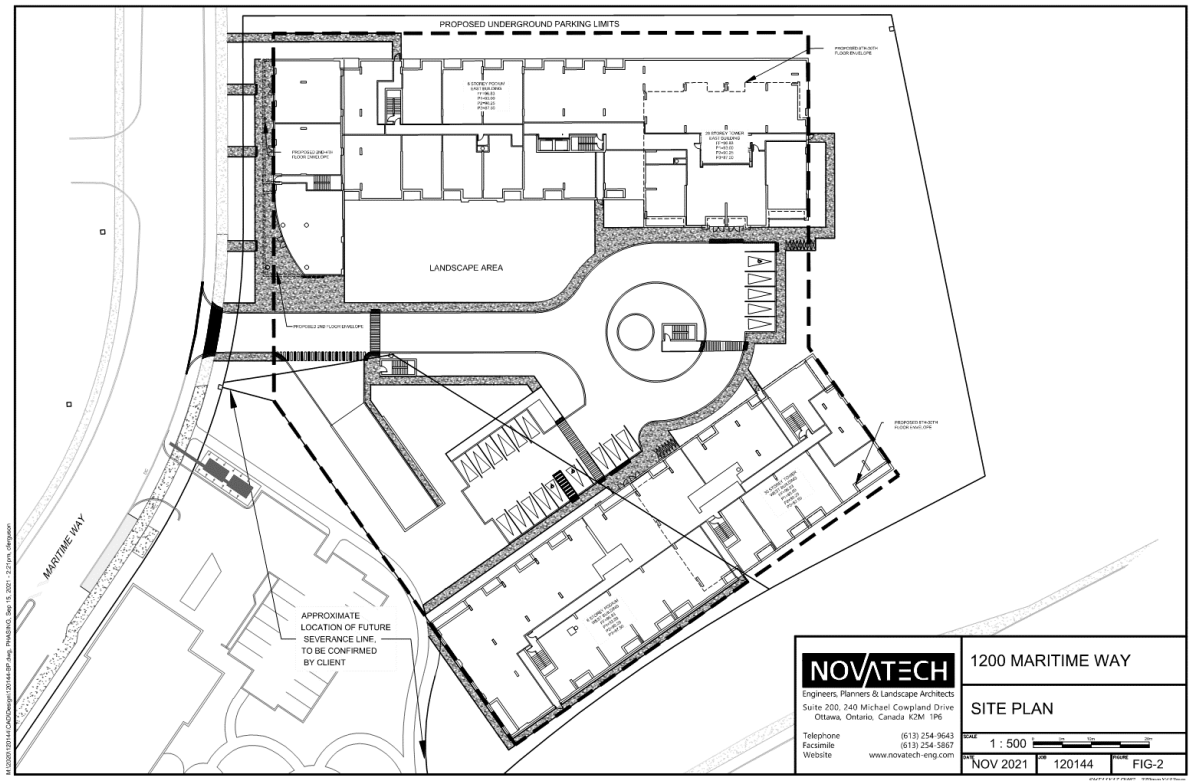
1.1 Proposed Development

The subject site is located within one of the Zone AM10 of the City of Ottawa. The implemented zoning for the property 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 and FSI (floor space index).

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

- East Tower: 28-storey high-rise including 7-storey podium with 300 dwellings;
- West Tower: 30-storey high-rise including 7-storey podium with 332 dwellings.

Figure 2 Site Plan



In total, the proposed development will consist of 632 apartment dwellings. The entire site will include 662 parking spaces for residents (632 inside) and visitors (30 outside) and will be accessed via full-movement driveway to Maritime Way. The development is anticipated to be built out by 2028.

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

2.0 SANITARY SEWER

The development will be serviced by the existing 825mm diameter sanitary sewer on Maritime Way, as shown on the general plan of services.

The service will be a 375mm diameter sanitary sewer to Maritime Way.

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**.

Table 2.1 Proposed Sanitary Flows

Phase	Peak Sanitary Flow (L/sec)
East Tower	5.52
West Tower	6.02
Total	**11.54**

Table 2.2 Development Statistics

Building Component	Area (ha)	1 Bdr	2 Bdr	Total
East Tower				
Tower (incl. Podium)	-	177	123	300
Total	**+/- 0.64**	**177**	**123**	**300**
West Tower				
Tower (incl. Podium)	-	204	128	332
Total	**+/- 0.64**	**204**	**128**	**332**
Grand Total	**1.28**	**381**	**251**	**632**

Sanitary Flows East Tower

Area = 0.64 ha

Tower (incl. Podium): (177 x 1.4) +(123 x 2.1) = 507 people

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

Population = 507 people
Peak Factor = $1 + 14/(4 + (P/1000)^{1/2}) \times 0.80 = 3.23$ (using entire population of 1,062)
Area = 0.64 ha

$$Q_{\text{Phases 1}} = \frac{(507)(280)}{86{,}400}(3.23) + (0.64)(0.33) = 5.52 \text{ L/sec}$$

Therefore, the total peak sanitary flow for **East Tower is 5.52 L/sec.**

Sanitary Flows West Tower

Area = 0.64 ha

Tower (incl. Podium): (204 x 1.4) + (128 x 2.1) = 555 people

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

Population = 555 people
Peak Factor = $1 + 14/(4 + (P/1000)^{1/2}) \times 0.80 = 3.23$ (using entire population of 1,062)
Area = 0.52 ha

$$Q_{\text{Phases 2}} = \frac{(555)(280)}{86{,}400}(3.23) + (0.64)(0.33) = 6.02 \text{ L/sec}$$

Therefore, the total peak sanitary flow for **West Tower is 6.02 L/sec.**
Furthermore, the total peak sanitary flow **is 11.54 L/sec.**

The existing 825 mm diameter sanitary trunk sewer on Maritime Way was designed by J.L. Richards in 1998 to accommodate the development of the KTC-CBD subdivision and upstream lands. At the time of the original design of the trunk sewer the land parcels were designated for commercial use and the sanitary flows were estimated using 50,000 L/ha/day per Ministry guidelines. Subsequently, the land uses have changed to include residential use. The original sanitary sewer design sheet for the 825mm diameter trunk sewer has been updated to reflect this change in land use and resulting sanitary flows. This analysis has been completed by the original designer, J.L. Richards and is included in Appendix C of this report. It included the change in land use for Block 122 (Claridge lands at 1250 Maritime Way) as well as Blocks 4 and 5 east of Maritime Way and north of the stormwater management facility. The results of this analysis show that adequate reserve capacity is available in the 825-mm diameter trunk sewer for the remaining vacant lands in the KTC-CBD subdivision, as well as the increase in sanitary flows from 1250 Maritime Way, Block 4 and Block 5. J.L. Richards noted an increase in the theoretical design flows at the junction of Teron Road and Campeau Drive from 475.94 L/sec to 480.24 L/sec, or a 0.90 % increase. The capacity of the sewer at that point is 838.6 L/s.

The Novatech spreadsheet adds the development flows of 11.54 L/sec to the spreadsheet completed by JLR above. The flow at the connection to the trunk sewer at Teron Road increases from 480.26 L/sec to 490.60 L/sec, or an increase of 10.34 L/sec (smaller than 11.54 L/sec due to decreasing peaking factor as population downstream increases). This increase in sewer flow is actually less due to the following:

- From MH 507-506 the spreadsheet includes the subject area as commercial of 2.79 L/sec for an area of 1.32 ha.
- The JLR spreadsheet also includes 3.86 L/sec for future development of 1250 Maritime Way

Therefore, the actual increase in sanitary flow is 10.34 l/s – (2.79 + 3.86) = 3.69 L/s. This increase is negligible compared to the total flow of 480 L/s, e.g. 0.80 %. Further, to be consistent with the original analysis completed for 1250 Maritime Way, the outdated City design guidelines were used for calculating sewer flows. Using current standards, e.g. 280 L/cap/day would further reduce the impact.

3.0 STORM SEWER AND STORMWATER MANAGEMENT

As part of this development, stormwater will be controlled on-site and discharged via a 375mm dia. service that will connect to the existing 1650mm dia. storm sewer on Maritime Way as shown on the General Plan of Services.

The site is fairly flat overall and the majority of storm runoff from the site is self-contained with some being conveyed overland towards the neighboring properties.

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); Kanata Town Centre, Central Business District, Stormwater Management Report (J.L. Richards, January 1999) and Servicing Brief (Revised) – Kanata Town Centre Central Business District Subdivision, Technical Memorandum (J.L. Richards, June 13, 2012). 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 0.8 (refer to Dwg 15712-STM in Appendix C)
    - A time of concentration of 20 minutes
    - A 5-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 1.28 ha site was determined to be 199.99 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 storage requirements for the site were determined for each tower of the development.

The post-development drainage areas were delineated based on the proposed development grading. Refer to **Drawing 120144-GR** for the proposed site grading and **Drawing 120144-SWM** 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 Maritime Way.

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 120144-SWM**. All the sub-catchments are assumed to be 100% impervious with exception to the grassed areas not over underground parking (A-1, part A-2, A-3, part A-4, part A-5 and part A-6) 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 199.99 L/s and will be achieved using internal stormwater tanks that will be pumped to the storm sewers on Maritime Way.

Runoff from the grassed areas (Sub-catchments A-1, A-2, A-3, A-4, A-5 and A-6) will be uncontrolled and will drain towards to Maritime Way. The total uncontrolled flows from the site in the 100-year event will be 87.81 L/s which requires the remaining areas of the site to be controlled to 112.18 L/s in order to meet the allowable release rate.

The remaining 112.18 L/s of allowable release rate was divided between the development phases using area-weighting as shown in **Table 3.1**.

Table 3.1 Controlled Release Rates

Phase	Drainage Area (ha)	Allowable Release Rate (L/s)
East Tower (incl. CB1/2)	0.54	70.44
West Tower (incl. CB3/4 & TD)	0.32	41.74
Total	*0.86*	*112.18*

The runoff from each tower and corresponding CBs or TD will be collected into at least one tank located within the development. The site was modeled so that the pump rate for each phase was equal to the allowable release rate for that phase. East and West towers will be pumped to the Maritime Way storm sewer. The tanks will have an emergency overflow that will connect to the ground surface. The required storage in the 100-year event for each phase is summarized in **Table 3.2**.

Table 3.2 Required Tank Storage for the 100-year Storm

Phase	Required Storage Volume (m^3)
East Tower	139.56
West Tower	93.97
Total	*233.53*

The storage provided allows for the proposed development to meet the allowable release rate of 199.99 L/s. The total release rates from the site during the 100-year storm event are 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)
East Tower (incl. CB1/2)	0.56	70.44
West Tower (incl. CB3/4 & TD)	0.36	41.74
Uncontrolled	0.36	87.81
Total	*1.28*	*199.99*

3.4 Water Quality Control

Runoff from the roofs, podiums, and uncontrolled grassed areas would be considered clean and will not require treatment. Additionally, the storage tanks 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.

Cisterns from the East Tower and West Tower will discharge to the existing storm sewer on Maritime Way.

Also, there will be water quality control provided by the downstream SWM facility which has been designed to provide quantity and quality control for the proposed development (as per the Stormwater Management Study prepared by JL Richards.

The site will be graded such that flows in excess of the 100-year storm event will be conveyed overland to Maritime Way.

4.0 WATERMAIN

4.1 Domestic Water Demand

The proposed development will be serviced by the 200mm dia. watermain on Maritime Way as shown on the General Plan of Services. Shutoff valves will be provided at property lines as per City of Ottawa Specifications. The water meters will be in the basement level mechanical rooms of the buildings. Similarly, remote receptacles will be located at the surface near the entrances to the buildings on the exterior.

The services will be two (2) 200mm diameter water services to Maritime Way, with a valve in between both of them.

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

Watermain Flows East Tower

Average Day Demand = 2.05 L/sec

Maximum Day Demand (x2.5) = 5.13 L/sec

Peak Hour Demand (x2.2) = 11.28 L/sec

Watermain Flows West Tower

Average Day Demand = 2.25 L/sec

Maximum Day Demand (x2.5) = 5.63 L/sec

Peak Hour Demand (x2.2) = 12.38 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)
East Tower	6000
West Tower	5000

5.0 CONCLUSIONS

Based on the foregoing, report conclusions are:

- Adequate sanitary sewer capacity is available on Maritime Way and in the downstream system to the trunk sewer.

- 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 0.80 and 5-year storm. This will be implemented through construction of cisterns in the underground parking structure as summarized below. Uncontrolled flow from grass areas will drain overland to Maritime Way.

Phase	Cistern Volume (m^3)	Discharge (L/s)	Street Sewer
East Tower	139.56	70.44	Maritime Way
West Tower	93.97	41.74	Maritime Way
1	Uncontrolled	87.81	Maritime Way
Total	**233.53**	**199.99**	

- Adequate water services are available on Maritime Way 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 to 6,000 L/min. The buildings will be equipped with fire pumps and sprinklers.

NOVATECH

Prepared by:

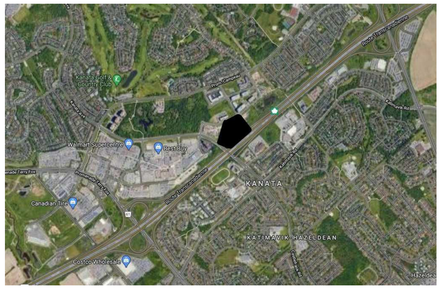
Jazmine Gauthier, B.A.Sc.
Project Manager | Land Development

Reviewed by:

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

APPENDIX A

Site Plan



KEY PLAN

ZONE AM10

PROVISION	REQUIRED	PROVIDED
Min Lot Width	no minimum	+/- 69.65 m
Min Lot Area	no minimum	+/- 12 808 m²
Max Building Height	67m	+/- 93.5 m
Min Front Yard Setback	no mininum	7.50 m / 3.09 m
Min Corner Side Yard Setback	no minimum	5.24 m
Min FSI	2	+/- 4.84
Min Interior Side Yard Setback	no minimum	15.40 m / 15.13 m

SITE AREA :		**+/- 12 808 m² (To be confirmed by surveyor)**
SITE COVERAGE :		+/- 2 471 m² (East Tower)
		+/- 1 968 m² (West Tower)
	Total =	+/- 4 439 m² = **34.7 %**
GROUND PARKING AREA :		+/- 1 785 m² = **13.9%**
LANDSCAPED AREA (EXCLUDING PARKING) :		+/- 6 584 m² = **51.4 %**

RENTAL - EAST TOWER

PROPOSED GROSS FLOOR AREA :	**+/- 21 913 m²**
BASEMENT G.F.A. :	**+/- 0m²**
GROUND FLOOR G.F.A. :	**+/- 1139 m²**
RENTAL FLOORS G.F.A. (2nd to 28th floor) :	**+/- 20 774 m²**
PRIVATE AMENITY AREA (G.F.A.) :	**+/- 1 953 m²**
COMMUNAL AMENITY AREA :	**+ /- 991 m²**
NUMBER OF FLOORS AND BUILDING HEIGHT :	**28 FLOORS + MECH. / +/- 87.50m**
DWELLING UNITS :	**301**
PARKING STALLS :	**308** (293 INSIDE / 5 VIS. OUTSIDE + 10 VIS. INSIDE)
PROVIDED BICYCLE STALLS :	**150** (142 INSIDE / 8 OUTSIDE)

NUMBER OF SUITES REQUIRED TO BE BARRIER-FREE :
301 UNITS = **45 UNITS** HAVE TO BE BARRIER-FREE
THEY WILL BE DISTRIBUTED BETWEEN THE 28 FLOORS

RENTAL - WEST TOWER

PROPOSED GROSS FLOOR AREA :	**+/- 27 723 m²**
BASEMENT G.F.A. :	**+/- 0m²**
GROUND FLOOR G.F.A. :	**+/- 391 m²**
RENTAL FLOORS G.F.A. (2nd to 30th floor) :	**+/- 27332 m²**
PRIVATE AMENITY AREA (G.F.A.) :	**+/- 2 247 m²**
COMMUNAL AMENITY AREA :	**+ /- 1 045 m²**
NUMBER OF FLOORS AND BUILDING HEIGHT :	**30 FLOORS + MECH. / +/- 93.50m**
DWELLING UNITS :	**332**
PARKING STALLS :	**338** (323 INSIDE / 12 VIS. OUTSIDE + 3 VIS. INSIDE)
PROVIDED BICYCLE STALLS :	**166** (159 INSIDE / 7 OUTSIDE)

NUMBER OF SUITES REQUIRED TO BE BARRIER-FREE :
332 UNITS = **50 UNITS** HAVE TO BE BARRIER-FREE
THEY WILL BE DISTRIBUTED BETWEEN THE 30 FLOORS

- FOR EXISTING SITE CONDITIONS, SEE SURVEY PLAN BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD., SUBMITTED SEPARATELY;
- FOR NEW GRADES AND SITE SERVICES, SEE CIVIL ENGINEERING PLAN BY NOVATECH ENGINEERING CONSULTANTS, SUBMITTED SEPARATELY;
- FOR PROPOSED VEGETATION AND LANDSCAPE INFORMATION, SEE LANDSCAPE PLAN BY JAMES B. LENNOX & ASSOCIATES, SUBMITTED SEPARATELY.

SNOW WILL BE HAULED OFF SITE

GARBAGE / RECYCLING PICK-UP BY PRIVATE COMPANY

NOTES GÉNÉRALES General Notes

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3. Veuillez aviser l'architecte de toute dimension erreur et/ou divergences entre ces documents et ceux des autres professionnels. / The architect must be notified of all errors, omissions and discrepancies between these documents and those of the others professionnals.
4. Les dimensions sur ces documents doivent être lues et non mesurées. / The dimensions on these documents must be read and not measured.

STRUCTURE Structural
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18-77, Auriga Drive, Ottawa ON K2E 7Z7
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ARCHITECTURE DE PAYSAGE Landscape Architect
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SCEAU / Seal

NEUF ARCHITECT(E)S
NEUF ARCHITECTES SENCRL

CLIENT Client

CLARIDGE HOMES

OUVRAGE Project

1200 MARITIME WAY (KANATA RENTAL)

EMPLACEMENT Location
OTTAWA

NO PROJET No.
12371.00

NO	RÉVISION	DATE (aa-mm-jj)
A	FOR COMMENTS	2020.05.28
B	FOR COMMENTS	2020.06.05
C	FOR COMMENTS	2020.07.23
D	IN PROGRESS	2020.09.16
E	SITE PLAN COORDINATION	2020.12.08
F	SITE PLAN COORDINATION	2020.12.16
G	SITE PLAN COORDINATION	2021.02.22
H	PER TRANSPORTATION COMMENTS	2021.05.18
I	PER CITY COMMENTS	2021.05.27

DESSINÉ PAR Drawn by
PV

VÉRIFIÉ PAR Checked
LH

DATE (aa.mm.jj)
05/28/20

ÉCHELLE Scale
1 : 300

TITRE DU DESSIN Drawing Title

SITE PLAN AT GROUND FLOOR LEVEL

RÉVISION Revision
I

NO. DESSIN Dwg Number
A203

#18348

D07-12-21-0017

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APPENDIX B

Sanitary Sewer Design Downstream Capacity

MEMORANDUM

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

To: Greg MacDonald, P.Eng.
Novatech Engineering Consultants Ltd.

Date: August 18, 2017

Job No.: 15712-015.1

CC: Lucie Dalrymple, P.Eng.
J.L. Richards & Associates Ltd.

From: Karla Ferrey, P.Eng.

Re: Kanata Town Centre Central Business District
Master Design Sheet Update - Sanitary Peak Flows
Block 4, Block 5 and Block west of Block 9 (Zone 122)

We understand that the City is requesting an update to the Master Sanitary Sewer Design Sheet for the Kanata Town Centre Central Business District (KTC-CBD) from JL Richards such to incorporate the proposed peak flow revision from Block 4, Block 5, and the parcel west of Block 9 (previously Robinson'96 - Zone 122). Refer to attached JLR Sanitary Drainage Plan and Robinson Consultants Figure 7.1 for locations of Block 4, Block 5 and Zone 122.

We understand that the City will ultimately decide (as the owner of the existing sewers within the KTC-CBD and downstream system) whether the proposed peak flow increase is acceptable and that if accepted, it will not require a reduction of the allowable peak flows for the remaining future development in the KTC-CBD.

As requested, we have incorporated the proposed sanitary peak flow increase associated with your following developments:

a) Proposed Block 4 - Residential development
The proposed development will result in a theoretical increase in peak flow from 3.88 L/s to 4.71 L/s at MH 513 where the Block 4 development outlets to Maritime Way. This represents a theoretical peak flow increase of 0.83 L/s from the anticipated 2012 land use (i.e., hotel use, based on 270 L/pers/day).

b) Proposed Block 5 - Residential development
The proposed development will result in a theoretical increase in peak flow from 3.52 L/s to 5.13 L/s at MH 511 where the Block 5 development outlets to Maritime Way. This represents a theoretical peak flow increase of 1.61 L/s from the anticipated 2012 land use (i.e., hotel use, based on 270 L/pers/day).

c) Proposed parcel west of Block 9 (previously identified in the 1996 Robinson KTC Sanitary Design as Zone 122) – Retirement Home – Claridge Homes
The proposed development will result in a theoretical increase in peak flow from 2.84 L/s to 7.19 L/s at MH 7A where Claridge Homes development outlets to Maritime Way. This represents a theoretical peak flow increase of 3.57 L/s from the anticipated 2012 land use (i.e., Commercial use based on 2787m2 office space and Infiltration based 1.5ha). Theoretical flows for Zone 122 were taken from Robinson Consultants Sanitary Trunk Information from Table 4.7 and Figure 7.1, see attached copies.

At the most downstream MH at the intersection of Teron Rd and Campeau Dr (MH Ex. 2) shown on the attached Sanitary Sewer Design Sheet for the Kanata Village Green subdivision (prepared in 1998 by JLR), the proposed 3 developments would result in a theoretical increase in peak flow from 475.94 L/s to 480.24 L/s which corresponds to a 4.3 L/s (0.9%) peak flow increase.

Based on the available theoretical residual capacities noted in the attached updated Master Sanitary Sewer Design Sheet, the existing sanitary sewer system from the intersection of Rock Mountain Gate and Maritime Way to the intersection of Campeau Dr and Teron Rd has the capacity to accommodate the additional theoretical peak flows of Block 4, Block 5 and Zone 122. Downstream of the Campeau Drive intersection, JLR does not have on record design sheets for the City's existing downstream sanitary sewer system.

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

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Karla Ferrey, P.Eng.

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA

KANATA TOWN CENTRE
CENTRAL BUSINESS DISTRICT
URBANDALE CORPORATION
JLR PROJECT NO.: 15712

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Manning's Coefficient (n) =	0.013	

MASTER SANITARY SEWER DESIGN SHEET
Designed: L.D.

2017 Update by: KF
2017 Check by: LD

Date: August 15, 2017

2017 Updates to Block 4,5, West of 9 Peak Flows

STREET	M.H. #		RESIDENTIAL														COMMERCIAL / INSTITUTIONAL			PLUGGED FLOW		R+C		SEWER DATA					CAPACITY	
			NUMBER OF UNITS									CUMMULATIVE		PEAKING	POPUL.		Actual	CUMM.	COMM.										
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	AREA	AREA	FLOW	FLOW	CUMM. FLOW	PEAK EXTR. FLOW	PEAK DES. FLOW	DIA. mm	SLOPE %	CAPAC. l/s	VEL. m/s	LENGTH m	Residual	% Full
	FROM	TO				No units	Act. pop	No units	Act. pop.	Equ. pop.	people	ha	people	ha		l/s	ha	ha	l/s	l/s	l/s	l/s	l/s						(L/s)	
Robinson - 1996	Upstream	7A									(1) 2588	(1) 28.38	2588	28.38	3.50	36.65	(1) **20.37**	20.37	**17.68**	(1) 162.69	162.69	**14.01**	**231.04**							
Claridge	Block 122 (per Robinson'96)	7A									**377**	**0.89**	**377**	**0.89**	**4.00**	**6.11**	**0.005**	**0.005**	**0.004**	(6) **0.83**	**0.83**	**0.25**	**7.19**							
MARITIME WAY	7A	507											2965	29.27	3.45	41.40		20.38	**17.69**		163.52	**14.26**	**236.87**	825	0.14	529.34	0.99	81.90	292.47	45%
MARITIME WAY	507	506						125	225	174	174	1.02	3139	30.29	3.43	43.56	4.91	25.29	21.95		163.52	15.92	244.95	825	0.12	500.32	0.94	119.30	255.37	49%
CORDILLERA ST.	534	533						125	207	207	207	0.58	207	0.58	4.00	3.35	0.55	0.55	0.48			0.32	4.15	200	1.65	42.13	1.34	66.60	37.98	10%
CANADIAN SHIELD AV.	533	532											207	0.58	4.00	3.35		0.55	0.48			0.32	4.15	200	1.20	35.93	1.14	69.60	31.78	12%
CANADIAN SHIELD AV.	532	531										0.33	207	0.91	4.00	3.35		0.55	0.48			0.41	4.24	200	1.20	35.93	1.14	69.60	31.69	12%
GREAT LAKES AV.	536	531						100	180	139	139	0.78	139	0.78	4.00	2.25	0.04	0.04	0.03	(5) 0.30	0.30	0.23	2.81	200	2.40	50.81	1.62	60.00	48.00	6%
GREAT LAKES AV.	531	530											346	1.69	4.00	5.61		0.59	0.51		0.30	0.64	7.05	200	3.75	63.51	2.02	80.80	56.46	11%
GREAT LAKES AV.	530	506A											346	1.69	4.00	5.61		0.59	0.51		0.30	0.64	7.05	200	1.40	38.80	1.24	85.20	31.75	18%
GREAT LAKES AV.	506A	506										0.38	346	2.07	4.00	5.61		0.59	0.51		0.30	0.74	7.16	200	1.40	38.80	1.24	4.90	31.65	18%
MARITIME WAY	506	505						176	316.8	269	269	0.57	3754	32.93	3.36	51.06		25.87	22.46		163.82	16.82	254.17	825	0.12	486.76	0.91	111.00	232.59	52%
MARITIME WAY	505	504						146	262.8	230	230	0.56	3984	33.49	3.33	53.82	1.75	27.62	23.98		163.82	17.47	259.09	825	0.11	484.63	0.91	114.40	225.55	53%
MARITIME WAY	504	501										0.27	3984	33.76	3.33	53.82		27.62	23.98		163.82	17.55	259.16	825	0.11	476.06	0.89	29.90	216.89	54%
CANADIAN SHIELD AV.	542	541						176	316.8	269	269	0.74	269	0.74	4.00	4.36						0.21	4.57	200	2.20	48.64	1.55	71.30	44.08	9%
CANADIAN SHIELD AV.	541	540						154	277.2	232	232	0.51	501	1.25	3.97	8.06	1.36	1.36	1.18			0.73	9.98	200	0.90	31.13	0.99	77.70	21.15	32%
	Block 3	540				208	333			428	428	1.02	428	1.02	4.00	6.93						0.29	7.22	200	0.60	25.40	0.81	12.00	18.18	28%
CANADIAN SHIELD AV.	540	512										0.30	929	2.57	3.82	14.38		1.36	1.18			1.10	16.66	200	0.71	27.65	0.88	82.60	11.00	60%
MARITIME WAY	514	513													4.00									200	2.14	47.96	1.53	51.20	47.96	
MARITIME WAY (Block 4)	513	512						**144**	**271**	**271**	**271**	**1.12**	**271**	**1.12**	**4.00**	**4.39**						**0.31**	**4.71**	200	2.28	49.52	1.58	51.90	44.81	10%
MARITIME WAY	512	511								58	58	(2) 0.73	1258	4.42	3.73	19.02		1.36	1.18			1.62	21.82	200	3.12	57.95	1.84	49.30	36.12	38%
	Block 5	511						**154**	**301**	**301**	**301**	**0.92**	**301**	**0.92**	**4.00**	**4.88**						**0.26**	**5.13**	200	2.00	46.38	1.48	12.20	41.25	11%
MARITIME WAY	511	510											1559	5.34	3.67	23.16		1.36	1.18			1.87	26.21	200	1.70	42.76	1.36	38.40	16.54	61%
MARITIME WAY	510	501											1559	5.34	3.67	23.16		1.36	1.18			1.87	26.21	200	2.28	49.52	1.58	11.30	23.30	53%
TRUNK EASEMENT	501	500											5543	39.09	3.20	71.92		28.98	25.16		163.82	19.42	280.32	825	0.10	462.89	0.87	129.00	182.57	61%
TRUNK EASEMENT	500	94											5543	39.09	3.20	71.92		28.98	25.16		163.82	19.42	280.32							
A	90	92			35						95	0.80	95	0.80	4.00	1.53						0.22	1.76	250	0.60	46.06	0.94	120.0	44.30	4%
	92	94			12						32	1.19	127	1.99	4.00	2.06						0.56	2.61	250	2.20	88.20	1.80	103.0	85.58	3%
	94	95											5670	41.08	3.19	73.36		28.98	25.16		163.82	19.98	282.31	825	0.12	497.22	0.93	17.5	214.91	57%
	95	89			10						27	0.52	5697	41.60	3.19	73.66		28.98	25.16		163.82	20.12	282.76	825	0.12	497.22	0.93	66.6	214.46	57%
B	85	87	19								65	1.19	65	1.19	4.00	1.05						0.33	1.38	250	0.40	37.61	0.77	116.9	36.23	4%
	87	89			24						65	0.82	129	2.01	4.00	2.10						0.56	2.66	250	1.41	70.70	1.44	116.7	68.04	4%
A	89	84			12						32	0.35	5859	43.96	3.18	75.48		28.98	25.16		163.82	20.78	285.24	825	0.12	497.22	0.93	79.0	211.98	57%
C	80	82	19								65	1.08	65	1.08	4.00	1.05						0.30	1.35	250	0.40	37.61	0.77	120.0	36.26	4%
	82	84			25						68	0.83	132	1.91	4.00	2.14						0.53	2.68	250	1.20	65.18	1.33	118.5	62.51	4%
A	84	79			14						38	0.54	6028	46.41	3.17	77.38		28.98	25.16		163.82	21.47	287.83	825	0.12	497.22	0.93	79.0	209.39	58%
D	75	76			17						46	0.37	46	0.37	4.00	0.74						0.10	0.85	250	0.40	37.61	0.77	57.0	36.76	2%
	76	77			20						54	0.29	100	0.66	4.00	1.62						0.18	1.80	250	0.40	37.61	0.77	78.4	35.80	5%
	77	79			13						35	0.63	135	1.29	4.00	2.19						0.36	2.55	250	0.81	53.66	1.09	117.7	51.12	5%
PARK EASEMENT	79	67										0.98	6163	48.68	3.16	78.89		28.98	25.16		163.82	22.11	289.97	825	0.12	497.22	0.93	55.0	207.25	58%
	67	66			6						16	0.33	6180	49.01	3.16	79.07		28.98	25.16		163.82	22.20	290.25	825	0.12	497.22	0.93	70.0	206.98	58%

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			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	AREA	AREA	FLOW	FLOW	CUMM. FLOW	FLOW	FLOW	DIA. mm	SLOPE %	CAPAC. l/s	VEL. m/s	LENGTH m	Residual	% Full
	FROM	TO				No units	Act. pop	No units	Act. pop.	Equ. pop.	people	ha	people	ha		l/s	ha	ha	l/s	l/s	l/s	l/s	l/s						(L/s)	
BELLROCK DRIVE	70	73		12	14						70	2.56	70	2.56	4.00	1.14						0.72	1.85	250	0.40	37.61	0.77	87.2	35.75	5%
	73	74			12						32	0.54	103	3.10	4.00	1.66						0.87	2.53	250	0.40	37.61	0.77	60.3	35.08	7%
EASEMENT	74	62										0.31	103	3.41	4.00	1.66						0.95	2.62	250	0.40	37.61	0.77	39.9	34.99	7%
CAMBRAY LANE	62	66			25						68	0.48	170	3.89	4.00	2.76						1.09	3.85	250	0.77	52.18	1.06	100.5	48.33	7%
BISHOPS MILLS WAY	66	65			9						24	0.53	6374	53.43	3.15	81.22		28.98	25.16		163.82	23.44	293.64	825	0.12	497.22	0.93	62.0	203.59	59%
SOUTH of HWY 417	EX.	65									(1) 7792	(1) 191.60	7792	191.60	3.06	96.63				(4) 37.72	37.72	53.65	188.00	900	0.11	600.38	0.94	50.2	412.38	31%
BISHOPS MILLS WAY	65	64			2						5		14171	245.03	2.80	160.92		28.98	25.16		201.54	77.08	464.70	900	0.11	600.38	0.94	17.0	135.69	77%
EDENVALE DRIVE	59	60			8						22	0.50	22	0.50	4.00	0.35						0.14	0.49	200	1.40	38.80	1.24	77.0	38.31	1%
KETTLEBY STREET	60	61			22						59	0.62	81	1.12	4.00	1.31						0.31	1.63	250	0.40	37.61	0.77	103.6	35.98	4%
CAMBRAY LANE	58	61			5						14	0.41	14	0.41	4.00	0.22						0.11	0.33	200	0.70	27.44	0.87	74.5	27.10	1%
KETTLEBY STREET	61	64			25						68	0.42	162	1.95	4.00	2.63						0.55	3.17	250	0.90	56.41	1.15	105.0	53.24	6%
BISHOPS MILLS WAY	64	63			3						8		14342	246.98	2.80	162.55		28.98	25.16		201.54	77.63	466.87	900	0.11	600.38	0.94	13.0	133.51	78%
	63	57			10						27	0.68	14369	247.66	2.80	162.80		28.98	25.16		201.54	77.82	467.32	900	0.11	600.38	0.94	64.9	133.06	78%
TER. BUNGALOW Ph.2	51	53		48							130	0.94	130	0.94	4.00	2.10						0.26	2.36	200	0.70	27.44	0.87	122.3	25.08	9%
	53	54		4							11		140	0.94	4.00	2.28						0.26	2.54	200	0.70	27.44	0.87	13.6	24.90	9%
	54	55										0.27	140	1.21	4.00	2.28						0.34	2.61	200	0.70	27.44	0.87	36.7	24.82	10%
BISHOPS MILLS WAY	55	56	11								37	0.81	178	2.02	4.00	2.88						0.57	3.45	250	0.40	37.61	0.77	107.1	34.16	9%
	56	57	7		12						56	0.65	234	2.67	4.00	3.79						0.75	4.54	250	0.60	46.06	0.94	101.5	41.52	10%
PARK	57	34			1						3	0.37	14605	250.70	2.79	165.06		28.98	25.16		201.54	78.67	470.43	900	0.11	600.38	0.94	53.5	129.95	78%
	34	33			3						8		14613	250.70	2.79	165.14		28.98	25.16		201.54	78.67	470.51	900	0.11	600.38	0.94	50.3	129.87	78%
HAWKSTONE	43	44		22							59	1.19	59	1.19	4.00	0.96						0.33	1.30	250	1.00	59.46	1.21	51.0	58.17	2%
	44	45		8							22	0.09	81	1.28	4.00	1.31						0.36	1.67	250	0.50	42.05	0.86	29.0	40.38	4%
ENDENVALE	45	35										0.08	81	1.36	4.00	1.31						0.38	1.69	250	0.50	42.05	0.86	39.8	40.35	4%
BIRKENDALE DRIVE	35	36	7								24	1.18	105	2.54	4.00	1.70						0.71	2.41	250	0.37	36.18	0.74	93.2	33.77	7%
	36	37	13								44	0.79	149	3.33	4.00	2.41						0.93	3.35	250	0.37	36.09	0.74	77.1	32.74	9%
	37	33	2		3						15		164	3.33	4.00	2.66						0.93	3.59	250	0.40	37.61	0.77	17.9	34.02	10%
BIRKENDALE DRIVE	33	32			10						27	0.56	14804	254.59	2.78	166.96		28.98	25.16		201.54	79.76	473.42	900	0.11	600.38	0.94	72.7	126.97	79%
TEESWATER STREET	30	31			16						43	0.66	43	0.66	4.00	0.70						0.18	0.88	250	0.40	37.61	0.77	75.1	36.72	2%
	31	32			19						51	0.41	95	1.07	4.00	1.53						0.30	1.83	250	0.40	37.61	0.77	77.9	35.78	5%
BIRKENDALE STREET	32	18			6						16	0.37	14915	256.03	2.78	168.01		28.98	25.16		201.54	80.16	474.87	900	0.11	600.38	0.94	44.4	125.51	79%
	18	16			4						11		14926	256.03	2.78	168.11		28.982	25.16		201.54	80.16	474.97	900	0.11	600.38	0.94	44.4	125.41	79%
COMMERCIAL PLAZA	19	17													4.00		0.52	0.52	0.45			0.15	0.60	150	0.90	14.45	0.82	26.5	13.85	4%
COLCHESTER SQUARE	17	16										0.10		0.10	4.00			0.52	0.45			0.17	0.62	250	0.40	37.61	0.77	33.2	36.98	2%
COLCHESTER SQUARE	16	15			10						27	0.56	14953	256.69	2.78	168.37		29.50	25.61		201.54	80.49	476.01	900	0.11	600.38	0.94	66.0	124.37	79%
	15	14 A			2						5		14958	256.69	2.78	168.42		29.50	25.61		201.54	80.49	476.06	900	0.11	600.38	0.94	25.8	124.32	79%
ELSINORE LANE	39	28		32							86	0.53	86	0.53	4.00	1.40						0.15	1.55	250	1.00	59.46	1.21	56.7	57.91	3%
	28	24		18							49	1.47	135	2.00	4.00	2.19						0.56	2.75	250	0.40	37.61	0.77	43.0	34.86	7%
	24	23		12							32	0.14	167	2.14	4.00	2.71						0.60	3.31	250	0.40	37.61	0.77	34.0	34.30	9%
ELSINORE LANE	23	306		8							22	0.24	189	2.38	4.00	3.06						0.67	3.73	250	0.44	39.41	0.80	48.8	35.68	9%
ENDENVALE DRIVE	306	14 A										0.45	189	2.83	4.00	3.06						0.79	3.85	250	0.49	41.68	0.85	46.4	37.83	9%
COLCHESTER SQUARE	14 A	14											15147	259.52	2.77	170.21		29.50	25.61		201.54	81.29	478.65	900	0.11	600.38	0.94	14.7	121.74	80%
	Church	14													4.00		0.52	0.52	0.45			0.15	0.60	150	1.00	15.23	0.86	35.0	14.63	4%

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2017 Updates to Block 4,5, West of 9 Peak Flows

STREET	M.H. #		RESIDENTIAL													COMMERCIAL / INSTITUTIONAL			PLUGGED FLOW		R+C		SEWER DATA					CAPACITY	
			NUMBER OF UNITS									CUMMULATIVE		PEAKING	POPUL.	Actual	CUMM.	COMM.											
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	AREA	AREA	FLOW	FLOW	CUMM. FLOW	PEAK EXTR. FLOW	PEAK DES. FLOW	DIA. mm	SLOPE %	CAPAC. l/s	VEL. m/s	LENGTH m	Residual (L/s)	% Full
	FROM	TO				No units	Act. pop	No units	Act. pop.	Equ. pop.	people	ha	people	ha		l/s	ha	ha	l/s	l/s	l/s	l/s	l/s							
COLCHESTER SQUARE	14	11		4							11	0.16	15158	259.68	2.77	170.31		30.02	26.06		201.54	81.48	479.39	900	0.11	600.38	0.94	72.6	120.99	80%
TERON	11	10											15158	259.68	2.77	170.31		30.02	26.06		201.54	81.48	479.39	900	0.11	600.38	0.94	29.6	120.99	80%
	10	EX.										0.25	15158	259.93	2.77	170.31		30.02	26.06		201.54	81.55	479.46	900	0.11	600.38	0.94	72.3	120.92	80%
TERON	O.P.P.	EX.													4.00					0.78	0.78		0.78	100	Forcemain					
TERON	EX.	EX. 2											15158	259.93	2.77	170.31		30.02	26.06		202.32	81.55	480.24	680	0.96	838.61	2.31	9.4	358.37	57%

(1) As per Kanata Town Centre Sanitary Trunk Sewer Study, revised March 27, 1996, by Robinson Consultants Inc.

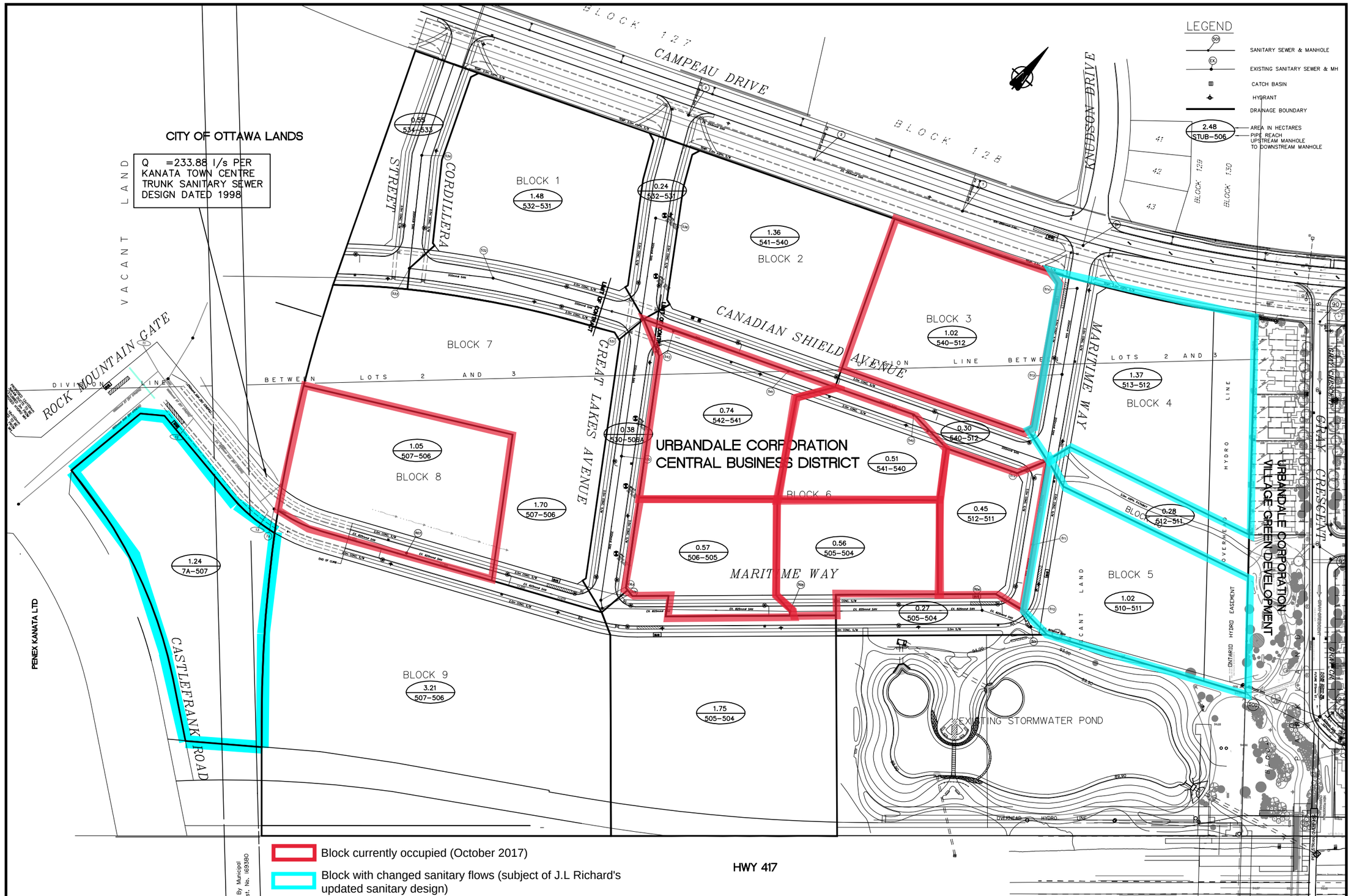
(2) Park or open space area.

(3) Equivalent population base on 208 rooms and 20 staff members.

(4) Allowance for an ultimate flow of 188 l/s to provide flexibility in future development as per Kanata Town Centre Sanitary Trunk Study.

(5) Additional flow associated with hotel ammenities including swimming pool with bathrooms and laundry as per design calculations for Block 1 provided by WSP (October 2016)

(6) Additional flow associated with overall ammenities including beauty salon, staff, dining and laundry as per design calculations for 1250 Maritime Way (Timberwalk Retirement Home) provided by Novatech (July 31,2017)



	DATE	REVISIONS	BY	NO.	DATE	REVISIONS	BY
				5	02/11/06	PER CITY COMMENTS	CSB
9	12/06/12	REVISED CBD DRAINAGE	JLP	4	13/09/06	ISSUED TO CITY FOR REVIEW	LND
8	24/07/07	REVISED AS PER CITY COMMENTS	CSB	3	21/07/06	ISSUED TO CITY FOR REVIEW (STREET 'A' NORTH-SOUTH LEG)	LND
7	25/05/07	PHASE 2 ISSUED FOR CITY REVIEW	CSB	2	05/11/98	REVISED PER RMOC	LND
6	08/03/07	ISSUED FOR TENDER	CSB	1	08/06/98	ISSUED FOR MOE APPROVAL (SAN)	LND

SCALE
0 10m 20m 30m 40m
HORIZONTAL 1:1000

V:\15712-NAD83\LD\15712 C SAN-NAD83.DWG

J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
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DESIGN	C.B.
CHECKED	L.N.D.
DRAWN	T.S.
CHECKED	
APPROVED	

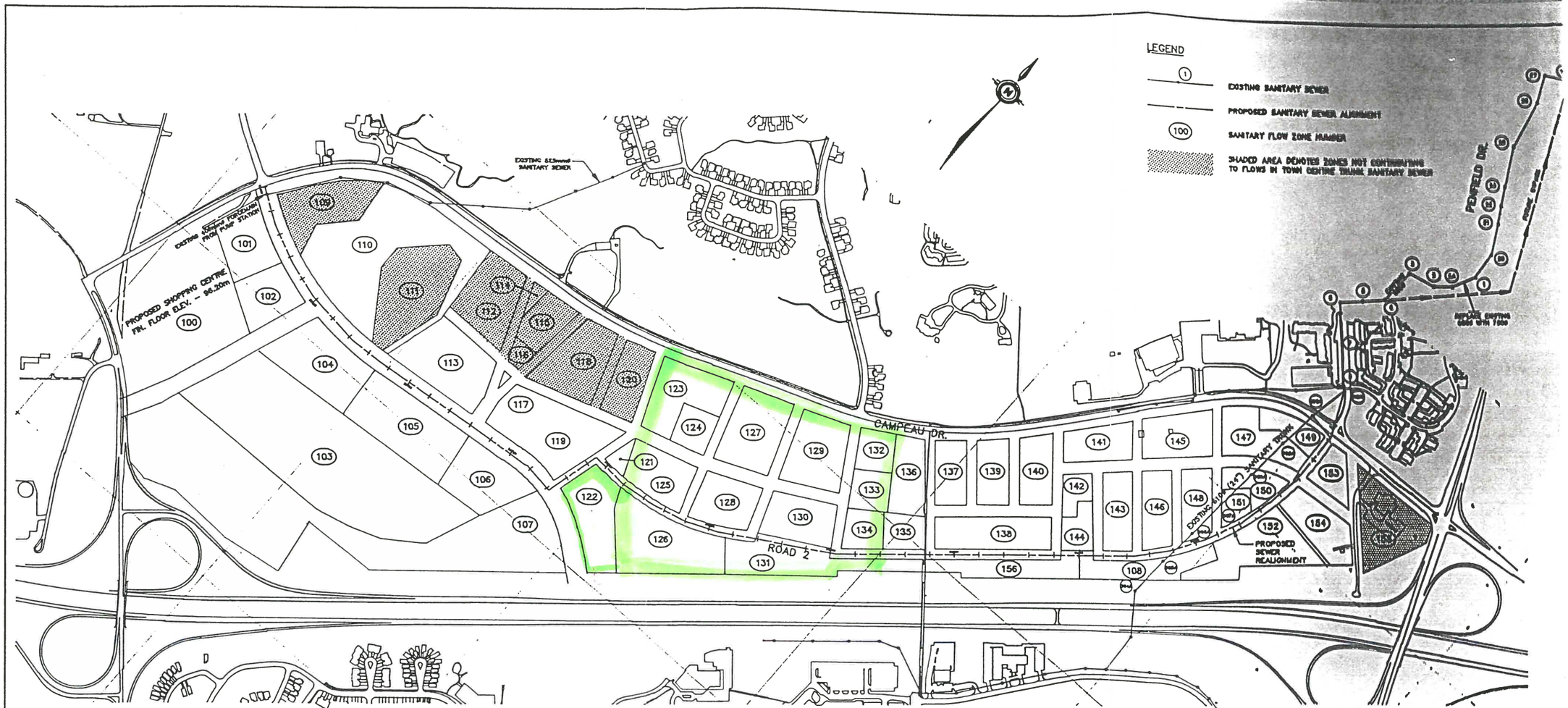
Ottawa

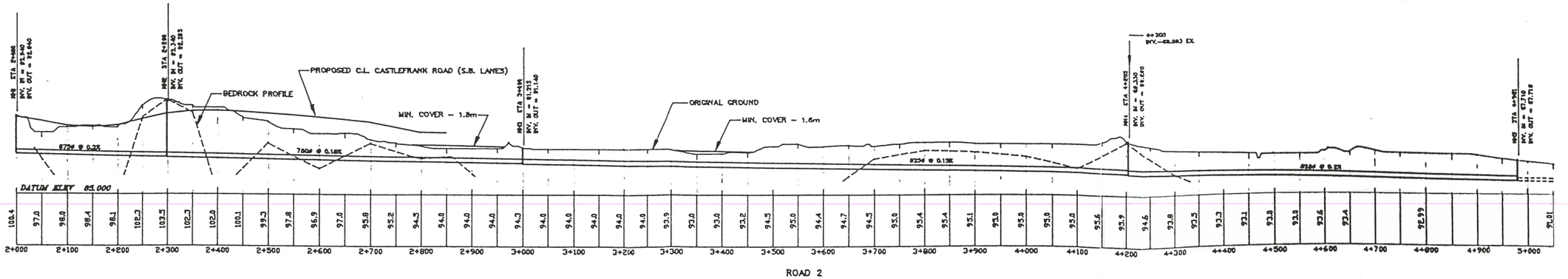
URBANDALE CORPORATION

KANATA TOWN CENTRE
CENTRAL BUSINESS DISTRICT
SANITARY DRAINAGE PLAN

PROJECT No.	15712-NAD 83
STARTED	JUNE 1998
DWG. No.	15712-SAN

By Municipal Inst. No. 69380





NOTE: THIS PLAN WAS PRODUCED ON AN AUTOCAD® DRAFTING SYSTEM							
No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	05.10.94	REVISED PROFILE	F.G.				
2	06.28.94	GENERAL REVISIONS AND ADDITIONS	F.G.				
3	07.11.94	GENERAL REVISIONS	F.G.				
4	07.28.95	PIPE SIZE PENFIELD DR. AND LOGO	A.J.R.				

SCALES
1:4000 HORIZONTAL
1:400 VERTICAL

Robinson Consultants
CONSULTING ENGINEERS
136, Michael Cowpland Dr.
Kanata, Ontario, K2M 2E9
Telephone (613) 592-6060

DESIGN P.G.
CHECKED A.J.R.
DRAWN I.D.M.
CHECKED
APPROVED A.J.R.

CITY OF KANATA
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

Figure 7.1
KANATA TOWN CENTRE
Trunk Sanitary Sewer Functional Design

PROJECT No. 93055
CONTRACT No. –
DATED OCT. 93
DWG. No. 93055-C

Table 4.7 - Revised as per RMOC Letter Dated March 27, 1996

KANATA TOWN CENTRE SANITARY TRUNK SEWER STUDY

Ultimate Development Flows Worksheet
Revised March, 1996
Project 93055

SR Pump Stn. Qp= 163 l/s

q (res)=	4.1E-03 l/cap x s	0.35	cu. m/capita/day
q (ret)=	5.8E-05 l/s x m2	5000	l/1000m2 x day
q (com)=	5.8E-05 l/s x m2	5000	l/1000m2 x day
q (hot)=	2.6E-03 l/s x bed	225	l/bed x day
Peaking factor for ret & off & hot=		1.5	

Flow Scenario - III

2 beds/room
I= 0.28 l/s/ha

3.8 persons/dwelling (low & med density)
2.2 persons/dwelling (high density)

Zone	Area	Residential Units			Retail		Office		Special Gen.		Peaking	Qp	Qi	Qtot	Cummul.
		Low	Med	High	GLA (m2)	Emp.	Area (m2)	Emp.	Hotel Rooms	Emp.	Factor	(l/s)	(l/s)	(l/s)	Qtot (l/s)
			0												
112	1.6		100		2230	47	5574	200							
111	2.2														
109	2.2	200	33						200	88					
115	0.8						1394	50							
116	0.20														
114	0.10														
118	1.7			50			9755	350							
120	1.1		87												
100	7.40				16908	386					4.00	1.47	2.07	3.54	166.62
101	1.30				4041	87					4.00	0.35	0.36	0.71	167.34
102	0.80				1579	34					4.00	0.14	0.22	0.36	167.70
104	1.50			168	10080	217					4.00	6.86	0.42	7.28	174.98
110	8.20		300								3.68	16.98	2.30	19.28	193.78
103	13.30				74459	1603					3.68	6.46	3.72	10.19	203.97
105	2.10			90	8826	190					3.64	3.68	0.59	4.27	208.00
106	1.50				3298	71					3.64	0.29	0.42	0.71	208.70
117	0.04										3.64	0.00	0.01	0.01	208.72
119	2.60			100	2230	47	34838	1250			3.60	6.42	0.73	7.15	215.59
107	9.10								100	88	3.60	0.78	2.55	3.33	218.53
113	2.10			300	2230	47	16722	600			3.50	10.99	0.59	11.58	229.31
121	0.10						19509	700			3.50	1.69	0.03	1.72	231.04
122	1.50						27870	1000			3.50	2.42	0.42	2.84	233.88
123	1.70		72	50			1394	50			3.45	5.48	0.48	5.95	239.30
124	0.60										3.45	0.00	0.17	0.17	239.47
125	1.40										3.45	0.00	0.39	0.39	239.86
126	2.80										3.45	0.00	0.78	0.78	240.64
127	1.80		80				4181	150			3.41	4.56	0.50	5.07	245.27
128	1.20		36				4181	150			3.39	2.24	0.34	2.58	247.65
129	1.70		70				6968	250			3.37	4.23	0.48	4.71	251.96
130	1.10						11148	400			3.37	0.97	0.31	1.28	253.24
131	2.00										3.37	0.00	0.56	0.56	253.80
132	0.60		40								3.35	2.06	0.17	2.23	255.80
133	0.60										3.35	0.00	0.17	0.17	255.97
134	0.70						4181	150			3.35	0.36	0.20	0.56	256.52
135	0.60		36								3.34	1.85	0.17	2.02	258.33
136	1.00		18								3.33	0.92	0.28	1.20	259.43
137	0.80	10	18								3.32	1.43	0.22	1.65	260.92
138	1.50		93								3.29	4.71	0.42	5.13	265.50
139	0.80	18	8								3.28	1.31	0.22	1.54	266.88
156	1.10		37								3.27	1.86	0.31	2.17	268.82
140	0.90	8	27								3.26	1.75	0.25	2.01	270.62
141	1.00		59								3.24	2.94	0.28	3.22	273.48
142	0.50										3.24	0.00	0.14	0.14	273.62
144	0.60		34								3.23	1.69	0.17	1.86	275.27
143	1.10	10	30								3.22	1.98	0.31	2.29	277.31
145	1.30		92								3.19	4.52	0.36	4.88	281.63
146	1.00	16	19								3.18	1.71	0.28	1.99	283.41
108	1.20		34								3.17	1.66	0.34	2.00	285.19
148	1.00	8	18								3.17	1.27	0.28	1.55	286.58
150	0.70		11								3.16	0.54	0.20	0.73	287.24
151	0.30										3.16	0.00	0.08	0.08	287.32
152	2.00										3.16	0.00	0.56	0.56	287.88
154	1.20		66								3.15	3.20	0.34	3.53	291.00
155	1.80						3177	114			3.15	0.28	0.50	0.78	291.78
147	1.30		49								3.13	2.36	0.36	2.73	294.20
153	0.80			100							3.12	2.78	0.22	3.00	296.84
149	0.60				1858	39					3.12	0.16	0.17	0.33	297.17
Totals	90.84	70	1247	808	125509	2768	134169	5414	100	176					
Total Town Centre Population					6782.2										
Average Persons per Dwelling Unit					3.19				Combined Down Stream Flow		425.64				

q (res) = 350 l/cap/day
q (com) = 50,000 l/ha/day
q (inst) = 50,000 l/ha/day

I = 0.280 l/s/ha

Singles, Townhouses, Ter. Bungalows = 3.8 pers / unit (low & medium density)

Stacked Townhouses / Apartments = 2.2 pers / unit (high density)
Stacked Townhouses / Apartments = 80 units / ha (high density)

CITY OF KANATA

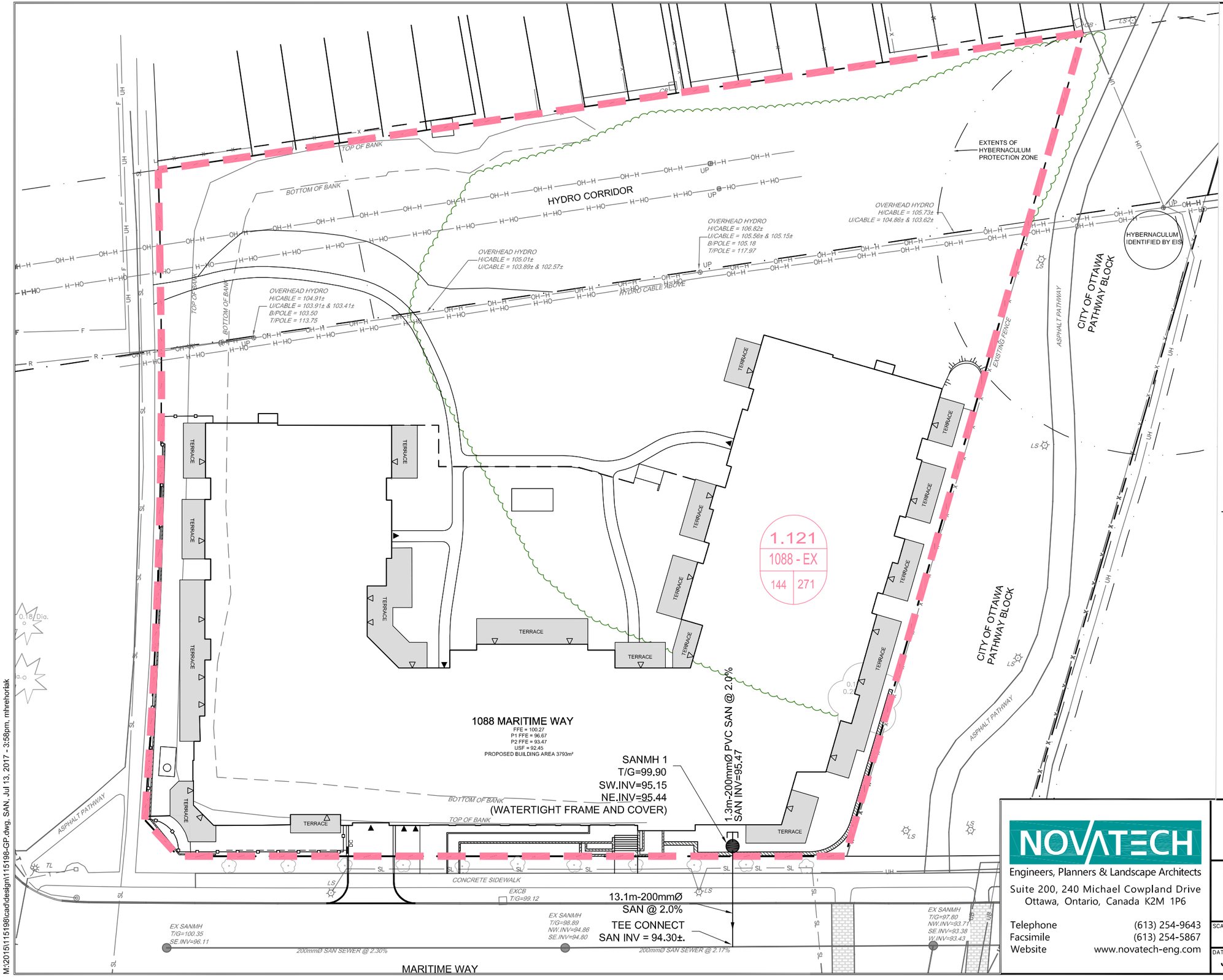
KANATA TOWN CENTRE
(RESIDENTIAL)
URBANDALE CORPORATION

SANITARY SEWER DESIGN SHEET

Designed by: L.N.D.

Checked by: M.F.S.

STREET	M.H. #		No. of UNITS		AREA	CUMMULATIVE		Peaking	POPUL.	INFIL.	PEAK	SEWER DATA				
			Singles &	Stacked		POPUL.	AREA	Factor	FLOW	FLOW	FLOW	DIA	Slope	CAPAC.	VEL.	LENGTH
	FROM	TO	Townhouses	Townhouses	ha	peop.	ha		l/s	l/s	l/s	mm	%	l/s	m/s	m
A	90	92	37		0.80	141	0.80	4.00	2.28	0.22	2.50	250	0.60	46.06	0.94	120.0
	92	94	13		1.19	190	1.99	4.00	3.08	0.56	3.64	250	2.20	88.20	1.80	103.0
	94	95			66.80	4831	68.79	3.26	63.77	19.26	270.61	825	0.12	497.22	0.93	17.5
	95	89	10		0.52	4869	69.31	3.26	64.21	19.41	271.20	825	0.12	497.22	0.93	66.6
B	85	87	19		1.19	72	1.19	4.00	1.17	0.33	1.50	250	0.40	37.61	0.77	116.9
	87	89	26		0.82	171	2.01	4.00	2.77	0.56	3.33	250	1.41	70.70	1.44	116.7
A	89	84	12		0.35	5085	71.67	3.24	66.71	20.07	274.35	825	0.12	497.22	0.93	79.0
C	80	82	20		1.08	76	1.08	4.00	1.23	0.30	1.53	250	0.40	37.61	0.77	120.0
	82	84	28		0.83	182	1.91	4.00	2.96	0.53	3.49	250	1.20	65.18	1.33	118.5
A	84	79	14		0.54	5321	74.12	3.22	69.40	20.75	277.74	825	0.12	497.22	0.93	79.0
D	75	76	19		0.37	72	0.37	4.00	1.17	0.10	1.27	250	0.40	37.61	0.77	57.0
	76	77	20		0.29	148	0.66	4.00	2.40	0.18	2.59	250	0.40	37.61	0.77	78.4
	77	79	14		0.63	201	1.29	4.00	3.26	0.36	3.62	250	0.81	53.66	1.09	117.7
PARK EASEMENT	79	67			0.98	5522	76.39	3.20	71.69	21.39	280.66	825	0.12	497.22	0.93	55.0
	67	66	6		0.33	5545	76.72	3.20	71.95	21.48	281.01	825	0.12	497.22	0.93	70.0
BELLROCK DRIVE	70	73	26		2.56	99	2.56	4.00	1.60	0.72	2.32	250	0.40	37.61	0.77	87.2
	73	74	10		0.54	137	3.10	4.00	2.22	0.87	3.08	250	0.40	37.61	0.77	60.3
EASEMENT	74	62			0.31	137	3.41	4.00	2.22	0.95	3.17	250	0.40	37.61	0.77	39.9
CAMBRAY LANE	62	66	25		0.48	232	3.89	4.00	3.76	1.09	4.85	250	0.77	52.18	1.06	100.5
BISHOPS MILLS WAY	66	65	9		0.53	5811	81.14	3.18	74.95	22.72	285.25	825	0.12	497.22	0.93	62.0
SOUTH of HWY 417	EX.	65			191.60	7792	191.60	3.06	96.63	53.65	188.16	900	0.11	600.38	0.94	50.2
BISHOPS MILLS WAY	65	64	2			13610	272.74	2.82	155.52	76.37	457.35	900	0.11	600.38	0.94	17.0
EDENVALE DRIVE	59	60	8		0.50	30	0.50	4.00	0.49	0.14	0.63	200	1.40	38.80	1.24	77.0
KETTLEBY STREET	60	61	24		0.62	122	1.12	4.00	1.97	0.31	2.28	250	0.40	37.61	0.77	103.6
CAMBRAY LANE	58	61	8		0.41	30	0.41	4.00	0.49	0.11	0.61	200	0.70	27.44	0.87	74.5
KETTLEBY STREET	61	64	25		0.42	247	1.95	4.00	4.00	0.55	4.55	250	0.90	56.41	1.15	105.0
BISHOPS MILLS WAY	64	63	3			13869	274.69	2.81	158.01	76.91	460.38	900	0.11	600.38	0.94	13.0
	63	57	10		0.68	13907	275.37	2.81	158.38	77.10	460.94	900	0.11	600.38	0.94	64.9
TER. BUNGALOW Ph.2	51	53	48		0.94	182	0.94	4.00	2.96	0.26	3.22	200	0.70	27.44	0.87	122.3
	53	54	4			198	0.94	4.00	3.20	0.26	3.47	200	0.70	27.44	0.87	13.6
	54	55			0.27	198	1.21	4.00	3.20	0.34	3.54	200	0.70	27.44	0.87	36.7
BISHOPS MILLS WAY	55	56	11		0.81	239	2.02	4.00	3.88	0.57	4.44	250	0.40	37.61	0.77	107.1
	56	57	19		0.65	312	2.67	4.00	5.05	0.75	5.80	250	0.60	46.06	0.94	101.5
PARK	57	34	1		0.37	14222	278.41	2.80	161.40	77.95	464.82	900	0.11	600.38	0.94	53.5
	34	33	3		0.00	14234	278.41	2.80	161.51	77.95	464.93	900	0.11	600.38	0.94	50.3
HAWKSTONE	43	44	16		1.19	61	1.19	4.00	0.99	0.33	1.32	250	1.00	59.46	1.21	51.0
	44	45	8		0.09	91	1.28	4.00	1.48	0.36	1.84	250	0.50	42.05	0.85	29.0
ENDENVALE	45	35			0.08	91	1.36	4.00	1.48	0.38	1.86	250	0.50	42.05	0.86	39.8
BIRKENDALE DRIVE	35	36	7		1.18	118	2.54	4.00	1.91	0.71	2.62	250	0.37	36.18	0.74	93.2
	36	37	13		0.79	167	3.33	4.00	2.71	0.93	3.64	250	0.37	36.09	0.74	77.1
	37	33	2		0.00	175	3.33	4.00	2.83	0.93	3.76	250	0.40	37.61	0.77	17.9
BIRKENDALE DRIVE	33	32	13		0.56	14458	282.30	2.79	163.66	79.04	468.16	900	0.11	600.38	0.94	72.7
TEESWATER STREET	30	31	18		0.66	68	0.66	4.00	1.11	0.18	1.29	250	0.40	37.61	0.77	75.1
	31	32	19		0.41	141	1.07	4.00	2.28	0.30	2.58	250	0.40	37.61	0.77	77.9
BIRKENDALE STREET	32	18	4		0.37	14614	283.74	2.79	165.14	79.45	470.05	900	0.11	600.38	0.94	44.4
	18	16	6			14636	283.74	2.79	165.36	79.45	470.27	900	0.11	600.38	0.94	44.4
COMMERCIAL PLAZA	19	17			0.52	0	0.52	1.50	0.45	0.15	0.60	150	0.90	14.45	0.82	26.5
COLCHESTER SQUARE	17	16			0.10	0	0.62	4.00	0.45	0.17	0.62	250	0.40	37.61	0.77	33.2
COLCHESTER SQUARE	16	15	10		0.56	14674	284.92	2.79	166.17	79.78	471.41	900	0.11	600.38	0.94	66.0
	15	14 A	2			14682	284.92	2.79	166.25	79.78	471.48	900	0.11	600.38	0.94	25.8
ELSINORE LANE	39	28	22		0.53	84	0.53	4.00	1.35	0.15	1.50	250	1.00	59.46	1.21	56.7
	28	24	14		1.47	137	2.00	4.00	2.22	0.56	2.78	250	0.40	37.61	0.77	43.0
	24	23	12		0.14	182	2.14	4.00	2.96	0.60	3.55	250	0.40	37.61	0.77	34.0
ELSINORE LANE	23	306	8		0.24	213	2.38	4.00	3.45	0.67	4.11	250	0.44	39.41	0.80	48.8
ENDENVALE DRIVE	306	14 A			0.45	213	2.83	4.00	3.45	0.79	4.24	250	0.49	41.68	0.85	46.4
COLCHESTER SQUARE	14 A	14				14895	287.75	2.78	167.82	80.57	473.85	900	0.11	600.38	0.91	14.7
	Church	14			0.52	0	0.52	1.50	0.45	0.15	0.60	150	1.00	15.23	0.86	35.0
COLCHESTER SQUARE	14	11	4		0.16	14910	288.43	2.78	168.87	80.76	475.09	900	0.11	600.38	0.94	72.6
TERON	11	10				14910	288.43	2.78	168.87	80.76	475.09	900	0.11	600.38	0.94	29.6
	10	EX.			0.25	14910	288.68	2.78	168.87	80.83	475.16	900	0.11	600.38	0.94	72.3
TERON	O P P.	EX.									0.78	100	Forcemain			
TERON	EX.	EX.									475.94	680	0.96	838.61	2.31	9.4



LEGEND

1.121 / 1088 - EX / 144 | 271	SANITARY DRAINAGE AREA (ha) / LOCATION / UNITS / POPULATION
SANMH	SANITARY MANHOLE
	SANITARY SERVICE WITH FLOW DIRECTION

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

1088 MARITIME WAY

SANITARY DRAINAGE AREA PLAN

SCALE 1 : 500 (0 5 10 15 20)
DATE JULY 2017
JOB 115198
FIGURE A3

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24m HYDRO CORRIDOR

EXTENTS OF HYBERNACULUM PROTECTION ZONE

HYBERNACULUM IDENTIFIED BY EIS

EX SANMH
T/G=95.14
W.INV=90.22
E.INV=90.19

OVERHEAD HYDRO
H/CABLE = 100.65±
U/CABLE = 100.14± & 99.22±

OVERHEAD HYDRO
H/CABLE = 101.61±
U/CABLE = 100.97± & 100.37±
B/POLE = 100.36
T/POLE = 113.68

OVERHEAD HYDRO
H/CABLE = 102.41±
U/CABLE = 101.78± & 100.93±

OVERHEAD HYDRO
H/CABLE = 106.19±
U/CABLE = 105.11± & 104.77±
B/POLE = 104.78
T/POLE = 118.25

HYDRO CABLE ABOVE

SWALE @ 4.5%

SWALE @ 1.5%

SWALE @ 3.4%

SWALE

CITY OF OTTAWA PATHWAY BLOCK

ASPHALT PATHWAY

EXISTING FENCE

EXTENT OF UG PARKING

TERRACE

SANITARY SEWER AND WATERMAIN EASEMENT

825mmØ SAN SEWER

Asphalt Path

0.915
1136 - EX
154 301

1136 MARITIME WAY
FFE = 98.32
P1 FFE = 94.72
P2 FFE = 91.52
USF = 90.52
PROPOSED BUILDING AREA: 2794M²

SANMH 1
T/G=96.00
SW.INV=91.80
NE.INV=91.83
(WATERTIGHT FRAME AND COVER)

1.5m-200mmØ PVC SAN @ 2.0%
SAN INV=91.86

12.2m-200mmØ
SAN @ 2.0%

TEE CONNECT
SAN INV = 91.56±.

EX HMH
T/G=97.84

HYDRO TRANS

EX HMH
T/G=97.60

ROGERS BOX

CONCRETE SIDEWALK

EX HMH
T/G=95.67

EX SANMH
T/G=94.91
NW.INV=90.91
W.INV=90.34
E.INV=90.32

EX SANMH
T/G=96.45
NW.INV=91.92
SE.INV=91.86

200mmØ SAN SEWER @ 3.06%

200mmØ SAN SEWER @ 1.57%

EX SANMH
T/G=95.28
NW.INV=91.25
E.INV=91.24

MARITIME WAY

LEGEND

0.915 / 1136 - EX / 154 301	SANITARY DRAINAGE AREA (ha) / LOCATION / UNITS / POPULATION
SANMH	SANITARY MANHOLE
	SANITARY SERVICE WITH FLOW DIRECTION

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1136 MARITIME WAY

SANITARY DRAINAGE AREA PLAN

SCALE 1 : 500 (0 5 10 15 20)

DATE JULY 2017 | JOB 115199 | FIGURE A3

SHT11X17.DWG - 279mmX432mm

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SANITARY SEWER DESIGN SHEET
1250 Maritime Way
Timberwalk Retirement Home
Developer: Claridge Homes

Date: 30-Nov-17

Designed: CMS
Revised: JDM
Checked: GJM

Location			RESIDENTIAL							INSTITUTIONAL				COMMECIAL			OTHER												INFILTRATION		Total Flow (L/s)	PIPE					
			1 Bedroom		2 Bedroom		Total (Residential)			Assisted Care				Convenience Store			Staff			Beauty Salon			Laundry			Dining											
ID	From	To	Units	Pop.	Units	Pop.	Pop.	Peak Factor	Flow (L/s)	Units / Bed	Pop.	Peak Factor	Flow (L/s)	Area (m2)	Peak Factor	Flow (L/s)	Pop.	Peak Factor	Flow (L/s)	Stations	Peak Factor	Flow (L/s)	Machines	Peak Factor	Flow (L/s)	Seats	Peak Factor	Flow (L/s)	Total Area (ha)	Infilt. Flow (L/s)		Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
Part A (current application)	BLD1	MH4	92	129.0	8	17.0	146.0	4.0	2.37	54	60.0	1.5	0.47	100	1.5	0.009	20	1.5	0.10	2	1.5	0.02	6	1.5	0.13	55	1.5	0.11	0.48	0.13	3.33	200	2.66	9.6	55.8	1.72	6.0%
Part A (current application)	MH4	MH2	0	0.0	0	0.0	146.0	4.0	2.37	0	0.0	1.5	0.47	0	1.5	0.009	0	1.5	0.10	0	1.5	0.02	0	1.5	0.13	0	1.5	0.11	0.00	0.13	3.33	200	2.70	27.8	56.2	1.73	5.9%
Part B (future application)	FUT-BLD2	MH2	0	0.0	110	231.0	231.0	4.0	3.74	0	0.0	1.5	0.00	0	1.5	0.000	0	1.5	0.00	0	1.5	0.00	0	1.5	0.00	0	1.5	0.00	0.41	0.11	3.86	200	2.00	2.5	48.4	1.49	8.0%
TOTAL (Parts A + B)	**MH2**	**EX MH**	**92**	**129.0**	**118**	**248.0**	**377.0**	**4.0**	**6.11**	**54**	**60.0**	**1.5**	**0.47**	**100**	**1.5**	**0.009**	**20**	**1.5**	**0.10**	**2**	**1.5**	**0.02**	**6**	**1.5**	**0.13**	**55**	**1.5**	**0.11**	**0.89**	**0.25**	**7.19**	**200**	**1.50**	**13.8**	**41.9**	**1.29**	**17.2%**

Design Parameters:

Residential	350	L/cap/day
Institutional	450	L/bed/day
Commercial	5	L/m^2 per day
Staff	275	L/cap/day
Beauty Salon	650	L/day per station
Laundy	1200	L/day per machine
Dining	115	L/seat/day
Infiltration	0.28	L/s/ha

Peaking Factor:

Residential	Harmon Equation (max 4, min 2)
Institutional	1.5
Commercial	1.5
Other	1.5

People/Unit:

1.10	Assisted Care
1.40	1 Bedroom
2.10	2 Bedroom
1.00	Studio

Notes:
1. The harmon peaking factor calculated for section 507 to 7A is 3.5 per JLR Design Sheet dated October 12th, 2016
2. Residential flows were used for senior apartments (350 L/cap/day, Harmon Peaking Factor)
3. Institutional flow used for assisted care units (450 L/bed/day, Peaking Factor = 1.5)
4. Future building assumed to be a 10 storey building comprised of 110 2 bedroom units

NOVATECH
Engineers, Planners & Landscape Architects

1200 Maritime Way
SANITARY SEWER DESIGN SHEET OF DOWNSTREAM SEWERS
JOB# 120144

NOVATECH ENGINEERING CONSULTANTS LTD.

LOCATION			RESIDENTIAL															COMMERCIAL/INSTITUTIONAL			PLUGGED FLOW		R + C		PROPOSED SEWER					
STREET	FROM MH	TO MH	NUMBER OF UNITS								INDIVIDUAL		CUMULATIVE		PEAK FACTOR (M)	POPUL. FLOW L/S		ACTUAL AREA ha	CUMM AREA ha	COMM FLOW l/s	FLOW l/s	COMM FLOW l/s	PEAK EXTR. FLOW	PEAK DESIGN FLOW	LENGTH (m)	PIPE SIZE (mm)	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)
			Houses			Extended Care		Hotel/Apt			POPUL. People	AREA ha	POPUL. People	AREA ha									l/s	L/S						
			Singles	Stacks	Towns	No. Units	Act Pop	No. Units	Act. Pop	Equ. Pop																				
Robinson - 1996	Upstream	7A									2588	28.38	2588	28.38	3.496	36.65		20.370	20.370	17.68	162.69	162.69	14.02	231.04						
1250 Maritime Way	Blk 122	7A									377	0.89	377	0.89	4.000	6.11		0.005	0.005	0.004	0.83	0.83	0.25	7.19						
1200 Maritime Way	**Blk 126**	**7A**																					**0.000**	**0.00**						
Maritime Way	7A	507											2965	29.27	3.447	41.40			20.375	17.687		163.520	14.266	236.87	81.9	825	0.14	534.563	1.00	44%
Maritime Way	507	506						125	225	174	174	1.02	3139	30.29	3.426	43.56		4.910	25.285	21.949		163.520	15.92	244.95	119.3	825	0.12	534.563	0.93	46%
Cordillera Street	534	533						125	207	207	207	0.58	207	0.58	4.000	3.35		0.550	0.550	0.477			0.32	4.16	66.6	200	1.65	43.952	1.36	9%
Can. Shield Avenue	533	532											207	0.58	4.000	3.35			0.550	0.477			0.32	4.16	69.9	200	1.20	37.482	1.16	11%
Can. Shield Avenue	532	531										0.33	207	0.91	4.000	3.35			0.550	0.477			0.41	4.24	69.9	200	1.20	37.482	1.16	11%
Great Lakes Avenue	536	531						100	180	139	139	0.78	139	0.78	4.000	2.25		0.040	0.040	0.035	0.300	0.300	0.23	2.82	60.0	200	2.40	53.008	1.63	5%
Great Lakes Avenue	531	530											346	1.69	4.000	5.61			0.590	0.512		0.300	0.644	7.06	80.8	200	3.75	66.260	2.04	11%
Great Lakes Avenue	530	506A											346	1.69	4.000	5.61			0.590	0.512		0.300	0.644	7.06	85.2	200	1.40	40.486	1.25	17%
Great Lakes Avenue	506A	506										0.38	346	2.07	4.000	5.61			0.590	0.512		0.300	0.740	7.16	4.9	200	1.40	40.486	1.25	18%
Maritime Way	506	505						176	316.8	269	269	0.57	3754	32.93	3.358	51.06			25.875	22.461		163.820	16.818	254.16	111.0	825	0.12	518.749	0.94	49%
Maritime Way	505	504						146	262.8	230	230	0.56	3984	33.49	3.335	53.82	1.750		27.625	23.980		163.820	17.479	259.10	114.4	825	0.11	496.665	0.90	52%
Maritime Way	504	501										0.27	3984	33.76	3.335	53.82			27.625	23.980		163.820	17.556	259.18	29.9	825	0.11	496.665	0.90	52%
Can. Shield Avenue	542	541						176	316.8	269	269	0.74	269	0.74	4.000	4.36							0.212	4.57	71.3	200	2.20	50.751	1.56	9%
Can. Shield Avenue	541	540						154	272.2	232	232	0.51	501	1.25	3.974	8.06	1.360	1.360	1.181				0.731	9.98	77.7	200	0.90	32.461	1.00	31%
	Block 3	540				208	333			428	428	1.02	428	1.02	4.000	6.94							0.286	7.22	12.0	200	0.60	26.504	0.82	27%
Can. Shield Avenue	540	512										0.3	929	2.57	3.820	14.38			1.360	1.181			1.100	16.66	82.6	200	0.71	28.831	0.89	58%
Maritime Way	514	513																							51.2	200	2.14	50.055	1.54	0%
Maritime Way (Blk 4)	513	512						144	271	271	271	1.12	271	1.12	4.000	4.39							0.314	4.70	51.9	200	2.28	51.666	1.59	9%
Maritime Way	512	511								58	58	0.73	1258	4.42	3.734	19.03			1.360	1.181			1.618	21.83	49.3	200	3.12	60.439	1.86	36%
	Block 5	511						154	301	301	301	0.92	301	0.92	4.000	4.88							0.258	5.13	12.2	200	2.00	48.390	1.49	11%
Maritime Way	511	510											1559	5.34	3.667	23.16			1.360	1.181			1.876	26.22	38.4	200	1.70	44.613	1.38	59%
Maritime Way	510	501											1559	5.34	3.667	23.16			1.360	1.181			1.876	26.22	11.3	200	2.28	51.666	1.59	51%
Trunk Easement	501	500											5543	39.1	3.203	71.93			28.985	25.161		163.820	19.425	280.33	129.0	825	0.10	473.551	0.86	59%
Trunk Easement	500	94											5543	39.1	3.203	71.93			28.985	25.161		163.820	19.425	280.33						
A	90	92			35						95	0.80	95	0.80	4.000	1.54							0.228	1.77	120.0	250	0.60	48.055	0.95	4%
	92	94			12						32	1.19	127	1.99	4.000	2.06							0.568	2.63	103.0	250	2.20	92.018	1.82	3%
	94	95											5670	41.09	3.194	73.36			28.985	25.161		163.820	19.992	282.33	17.5	825	0.12	518.749	0.94	54%
	95	89			10						27	0.52	5697	41.61	3.192	73.67			28.985	25.161		163.820	20.141	282.79	66.6	825	0.12	518.749	0.94	55%

1200 Maritime Way
SANITARY SEWER DESIGN SHEET OF DOWNSTREAM SEWERS
JOB# 120144

NOVATECH ENGINEERING CONSULTANTS LTD.

LOCATION			RESIDENTIAL														COMMERCIAL/INSTITUTIONAL			PLUGGED FLOW		R + C		PROPOSED SEWER					
STREET	FROM MH	TO MH	NUMBER OF UNITS								INDIVIDUAL		CUMULATIVE		PEAK FACTOR (M)	POPUL. FLOW L/S	ACTUAL AREA ha	CUMM AREA ha	COMM FLOW l/s	FLOW l/s	COMM FLOW l/s	PEAK EXTR. FLOW	PEAK DESIGN FLOW	LENGTH (m)	PIPE SIZE (mm)	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)
			Houses			Extended Care		Hotel/Apt			POPUL. People	AREA ha	POPUL. People	AREA ha								l/s	L/S						
			Singles	Stacks	Towns	No. Units	Act Pop	No. Units	Act. Pop	Equ. Pop																		
B	85	87	19								65	1.19	65	1.19	4.000	1.05						0.340	1.39	116.9	250	0.40	39.237	0.77	4%
	87	89			24						65	0.82	130	2.01	4.000	2.11						0.573	2.68	116.7	250	1.41	73.667	1.45	4%
A	89	84			12						32	0.35	5859	43.97	3.181	75.49		28.985	25.161		163.820	20.792	285.26	79.0	825	0.12	518.749	0.94	55%
C	80	82	19								65	1.08	65	1.08	4.000	1.05						0.308	1.36	120.0	250	0.40	39.237	0.77	3%
	82	84			25						67	0.83	132	1.91	4.000	2.14						0.544	2.68	118.5	250	1.20	67.960	1.34	4%
A	84	79			14						38	0.54	6029	46.42	3.169	77.39		28.985	25.161		163.820	21.490	287.86	79.0	825	0.12	518.749	0.94	55%
D	75	76			17						46	0.37	46	0.37	4.000	0.75						0.105	0.85	57.0	250	0.40	39.237	0.77	2%
	76	77			20						54	0.29	100	0.66	4.000	1.62						0.188	1.81	78.4	250	0.40	39.237	0.77	5%
	77	79			13						35	0.63	135	1.29	4.000	2.19						0.368	2.56	117.7	250	0.81	55.835	1.10	5%
Park Easement	79	67										0.98	6164	48.69	3.160	78.89		28.985	25.161		163.820	22.099	289.97	55.0	825	0.12	518.749	0.94	56%
	67	66			6						16	0.33	6180	49.02	3.159	79.07		28.985	25.161		163.820	22.192	290.25	70.0	825	0.12	518.749	0.94	56%
BELLROCK DRIVE	70	73		12	14						70	2.56	70	2.56	4.000	1.13						0.728	1.86	87.2	250	0.40	39.237	0.77	5%
	73	74			12						32	0.54	102	3.1	4.000	1.65						0.882	2.53	80.3	250	0.40	39.237	0.77	6%
EASEMENT	74	62										0.31	102	3.41	4.000	1.65						0.970	2.62	39.9	250	0.40	39.237	0.77	7%
CAMBRAY LANE	62	66			25						68	0.48	170	3.89	4.000	2.75						1.107	3.86	100.5	250	0.40	39.237	0.77	10%
BISHOPS MILLS WAY	66	65			9						24	0.53	6374	53.44	3.146	81.22		28.985	25.161		163.820	23.450	293.65	62.0	825	0.12	518.749	0.94	57%
SOUTH OF HWY 7	EX.	65									7792	191.6	7792	191.6	3.061	96.63				37.720	37.720	53.648	188.00	50.2	900	0.11	626.373	0.95	30%
BISHOPS MILLS WAY	65	64			2						5		14171	245.04	2.803	160.91		28.985	25.161		201.540	77.083	464.70	17.0	900	0.11	626.373	0.95	74%
EDENVALE DRIVE	59	60			8						22	0.50	22	0.50	4.000	0.36						0.141	0.50	77.0	200	1.40	40.486	1.25	1%
KETTLEBY STREET	60	61			22						59	0.62	81	1.12	4.000	1.31						0.315	1.63	103.6	250	0.40	39.237	0.77	4%
CAMBRAY LANE	58	61			5						14	0.41	14	0.41	4.000	0.23						0.115	0.34	74.5	200	0.70	28.628	0.88	1%
KETTLEBY STREET	61	64			25						68	0.42	163	1.95	4.000	2.64						0.549	3.19	105.0	250	0.90	58.855	1.16	5%
BISHOPS MILLS WAY	64	63			3						8		14342	246.99	2.798	162.55		28.985	25.161		201.540	77.632	466.88	13.0	900	0.11	626.373	0.95	75%
	63	57			10						27	0.68	14369	247.67	2.797	162.81		28.985	25.161		201.540	77.823	467.33	64.9	900	0.11	626.373	0.95	75%
TER. BUNGALOW Ph. 2	51	53		48							130	0.94	130	0.94	4.000	2.11						0.264	2.37	122.3	200	0.70	28.628	0.88	8%
	53	54		4							11		141	0.94	4.000	2.28						0.264	2.55	13.6	200	0.70	28.628	0.88	9%
	54	55										0.27	141	1.21	4.000	2.28						0.340	2.63	36.7	200	0.70	28.628	0.88	9%
BISHOPS MILLS WAY	55	56	11								37	0.81	178	2.02	4.000	2.88						0.568	3.45	107.1	250	0.40	39.237	0.77	9%
	56	57	7		12						56	0.65	234	2.67	4.000	3.79						0.751	4.54	101.5	250	0.60	48.055	0.95	9%
PARK	57	34			1						3	0.37	14606	250.71	2.790	165.07		28.985	25.161		201.540	78.678	470.45	53.5	900	0.11	626.373	0.95	75%
	34	33			3						8		14614	250.71	2.790	165.15		28.985	25.161		201.540	78.678	470.53	50.3	900	0.11	626.373	0.95	75%

1200 Maritime Way
SANITARY SEWER DESIGN SHEET OF DOWNSTREAM SEWERS
JOB# 120144

NOVATECH ENGINEERING CONSULTANTS LTD.

LOCATION			RESIDENTIAL														COMMERCIAL/INSTITUTIONAL			PLUGGED FLOW		R + C		PROPOSED SEWER					
STREET	FROM MH	TO MH	NUMBER OF UNITS								INDIVIDUAL		CUMULATIVE		PEAK FACTOR (M)	POPUL. FLOW L/S	ACTUAL AREA ha	CUMM AREA ha	COMM FLOW l/s	FLOW l/s	COMM FLOW l/s	PEAK EXTR. FLOW	PEAK DESIGN FLOW	LENGTH (m)	PIPE SIZE (mm)	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)
			Houses			Extended Care		Hotel/Apt			POPUL. People	AREA ha	POPUL. People	AREA ha								l/s	L/S						
			Singles	Stacks	Towns	No. Units	Act Pop	No. Units	Act. Pop	Equ. Pop																		
HAWSTONE	43	44		22							59	1.19	59	1.19	4.000	0.96						0.335	1.29	51.0	250	1.00	62.039	1.22	2%
	44	45		8							22	0.09	81	1.28	4.000	1.31						0.360	1.67	29.0	250	0.50	43.868	0.87	4%
EDENVALE	45	35										0.06	81	1.34	4.000	1.31						0.377	1.69	39.8	250	0.50	43.868	0.87	4%
BIRKENDALE DRIVE	35	36	7								24	1.18	105	2.52	4.000	1.70						0.709	2.41	93.2	250	0.37	37.737	0.74	6%
	36	37	13								44	0.79	149	3.31	4.000	2.41						0.931	3.35	77.1	250	0.37	37.737	0.74	9%
	37	33	2		3						15		164	3.31	4.000	2.66						0.931	3.59	17.9	250	0.40	39.237	0.77	9%
BIRKENDALE DRIVE	33	32			10						27	0.56	14805	254.58	2.784	166.96		28.985	25.161		201.540	79.767	473.43	72.7	900	0.11	626.373	0.95	76%
TEESWATER STREET	30	31			16						43	0.66	43	0.66	4.000	0.70						0.186	0.88	75.1	250	0.40	39.237	0.77	2%
	31	32			19						51	0.41	94	1.07	4.000	1.52						0.301	1.82	77.9	250	0.40	39.237	0.77	5%
BIRKENDALE STREET	32	18			6						16	0.37	14915	256.02	2.781	168.01		28.985	25.161		201.540	80.172	474.88	44.4	900	0.11	626.373	0.95	76%
	18	16			4						11		14926	256.02	2.780	168.11		28.985	25.161		201.540	80.172	474.99	44.4	900	0.11	626.373	0.95	76%
COMMERCIAL PLAZA	19	17													4.000	0.00	0.520	0.520	0.451			0.146	0.60	26.5	150	0.90	15.073	0.83	4%
COLCHESTER SQUARE	17	16										0.10		0.10	4.000	0.00		0.520	0.451			0.174	0.63	33.2	250	0.40	39.237	0.77	2%
COLCHESTER SQUARE	16	15			10						27	0.56	14953	256.68	2.780	168.37		29.505	25.612		201.540	80.504	476.03	66.0	900	0.11	626.373	0.95	76%
	15	14A			2						5		14958	256.68	2.779	168.42		29.505	25.612		201.540	80.504	476.07	25.8	900	0.11	626.373	0.95	76%
ELSINORE LANE	39	28		32							86	0.53	86	0.53	4.000	1.39						0.149	1.54	56.7	250	1.00	62.039	1.22	2%
	28	24		18							49	1.47	135	2.00	4.000	2.19						0.563	2.75	43.0	250	0.40	39.237	0.77	7%
	24	23		12							32	0.14	167	2.14	4.000	2.71						0.602	3.31	34.0	250	0.40	39.237	0.77	8%
ELSINORE LANE	23	306		8							22	0.24	189	2.38	4.000	3.06						0.669	3.73	48.8	250	0.44	41.152	0.81	9%
ENDENVALE DRIVE	306	14-A										0.45	189	2.83	4.000	3.06						0.796	3.86	46.4	250	0.49	43.427	0.86	9%
COLCHESTER SQUARE	14-A	14											15147	259.51	2.774	170.21		29.505	25.612		201.540	81.300	478.66	14.7	900	0.11	626.373	0.95	76%
	Church	14															0.520	0.520	0.451			0.146	0.60	35.0	150	1.00	15.888	0.87	4%
COLCHESTER SQUARE	14	11		4							11	0.16	15158	259.67	2.774	170.31		30.025	26.063		201.540	81.491	479.41	72.6	900	0.11	626.373	0.95	77%
TERON	11	10											15158	259.67	2.774	170.31		30.025	26.063		201.540	81.491	479.41	29.6	900	0.11	626.373	0.95	77%
	10	EX.										0.25	15158	259.92	2.774	170.31		30.025	26.063		201.540	81.562	479.48	72.3	900	0.11	626.373	0.95	77%
TERON	0.P.P.	EX.																		0.780	0.780		0.78	100 FORCEMAIN					
TERON	EX.	EX. 2											15158	259.92	2.774	170.31		30.025	26.063		202.320	81.562	480.26	9.400	680.000	0.960	876.293	2.34	55%

Notes:

1) As per Kanata Town Centre Sanitary Trunk Sewer Study revised March 27, 1996 by Robinson Consultants Inc.
2) Park or open space area.
3) Equivalent population base on 208 rooms and 20 staff members.
4) Allowance for an ultimate flow of 188 l/s to provide flexibility in future development as per Kanata Town Centre Sanitary Trunk Study.

1200 Maritime Way
SANITARY SEWER DESIGN SHEET OF DOWNSTREAM SEWERS
JOB# 120144

NOVATECH ENGINEERING CONSULTANTS LTD.

LOCATION			RESIDENTIAL											COMMERCIAL/INSTITUTIONAL			PLUGGED FLOW		R + C		PROPOSED SEWER					
			NUMBER OF UNITS							INDIVIDUAL		CUMULATIVE														
			Houses			Extended Care		Hotel/Apt																		
STREET	FROM MH	TO MH	Singles	Stacks	Towns	No. Units	Act Pop	No. Units	Act. Pop	Equ. Pop	POPUL. People	AREA ha	POPUL. People	AREA ha	PEAK FACTOR (M)	POPUL. FLOW L/S	ACTUAL AREA ha	CUMM AREA ha	COMM FLOW l/s	FLOW l/s	COMM FLOW l/s	PEAK EXTR. FLOW l/s	PEAK DESIGN FLOW L/S	LENGTH (m)	PIPE SIZE (mm)	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)

5) Additional flow associated with hotel amendities including swimming pool with bathrooms and laudry as per design calculations for Block 1 provided by WSP (October 2016).
6) Additional flow associated with overall amenities including beauty salon, staff, dining and laundry as per design calculations for 1250 Maritime Way (Timberwalk Retirement Home) provided by Novatech (July 31, 2017).

Design Parameters:

1) Q(e) = 0.28 L/sec/ha	**3.4**
2) Q(p) = (PxqxM/86,400)	**2.7**
3) Q(d) = Q(p) + Q(e)	**1.4 1BDR; 2.1 2 BDR.**
Definitions:	**2.3**

P = Population
q = Average per capita flow = 350 L/person/day
M = Residential Peaking Factor (Harmon Formula from section 4.4.1 of the City Sewer Design Guidelines):
M = 1+[14/(4+Pop/1000)]^1/2*1 - (Maximum of 4.0)
N = Commercial Peak Factor 1.5
Q(d) = Design Flow (L/sec)
Q(p) = Population Flow (L/sec)
Q(r) = Commercial Flow (L/sec)
Q(e) = Extraneous Flow (L/sec)

1200 Maritime Way
SANITARY SEWER DESIGN SHEET

Date	January 27, 2021					
Design	GMAC					
Job No.		Dwg. Referenc	Checked and Stamped:			
120144		120144-SAN	--			

1200 Maritime Way
SANITARY SEWER DESIGN SHEET OF DOWNSTREAM SEWERS
JOB# 120144

NOVATECH ENGINEERING CONSULTANTS LTD

LOCATION			RESIDENTIAL														COMMERCIAL/INSTITUTIONAL			PLUGGED FLOW		R + C		PROPOSED SEWER					
STREET	FROM MH	TO MH	NUMBER OF UNITS								INDIVIDUAL		CUMULATIVE		PEAK FACTOR (M)	POPUL. FLOW L/S	ACTUAL AREA ha	CUMM AREA ha	COMM FLOW l/s	FLOW l/s	COMM FLOW l/s	PEAK EXTR. FLOW	PEAK DESIGN FLOW	LENGTH (m)	PIPE SIZE (mm)	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)
			Houses			Extended Care		Hotel/Apt			POPUL. People	AREA ha	POPUL. People	AREA ha								l/s	L/S						
			Singles	Stacks	Towns	No. Units	Act Pop	No. Units	Act. Pop	Equ. Pop																		
Robinson - 1996	Upstream	7A									2588	28.38	2588	28.38	3.496	36.65	20.370	20.370	17.68	162.69	162.69	14.02	231.04						
1250 Maritime Way	Blk 122	7A									377	0.89	377	0.89	4.000	6.11	0.005	0.005	0.004	0.83	0.83	0.25	7.19						
1200 Maritime Way	**Blk 126**	**7A**						**632**		**1062**	**1062**	**1.28**	**1062**	**1.28**	**3.226**	**11.10**						**0.422**	**11.53**						
Maritime Way	7A	507											4027	30.55	3.331	54.33		20.375	17.687		163.520	14.26	249.80	81.9	825	0.14	534.563	1.00	47%
Maritime Way	507	506						125	225	174	174	1.02	4201	31.57	3.314	56.40	4.910	25.285	21.949		163.520	16.29	258.16	119.3	825	0.12	534.563	0.93	48%
Cordillera Street	534	533						125	207	207	207	0.58	207	0.58	4.000	3.35	0.550	0.550	0.477			0.32	4.16	66.6	200	1.65	43.952	1.36	9%
Can. Shield Avenue	533	532											207	0.58	4.000	3.35		0.550	0.477			0.32	4.16	69.9	200	1.20	37.482	1.16	11%
Can. Shield Avenue	532	531										0.33	207	0.91	4.000	3.35		0.550	0.477			0.41	4.24	69.9	200	1.20	37.482	1.16	11%
Great Lakes Avenue	536	531						100	180	139	139	0.78	139	0.78	4.000	2.25	0.040	0.040	0.035	0.300	0.300	0.23	2.82	60.0	200	2.40	53.008	1.63	5%
Great Lakes Avenue	531	530											346	1.69	4.000	5.61		0.590	0.512		0.300	0.644	7.06	80.8	200	3.75	66.260	2.04	11%
Great Lakes Avenue	530	506A											346	1.69	4.000	5.61		0.590	0.512		0.300	0.644	7.06	85.2	200	1.40	40.486	1.25	17%
Great Lakes Avenue	506A	506										0.38	346	2.07	4.000	5.61		0.590	0.512		0.300	0.740	7.16	4.9	200	1.40	40.486	1.25	18%
Maritime Way	506	505						176	316.8	269	269	0.57	4816	34.21	3.260	63.60		25.875	22.461		163.820	17.184	267.07	111.0	825	0.12	518.749	0.94	51%
Maritime Way	505	504						146	262.8	230	230	0.56	5046	34.77	3.241	66.26	1.750	27.625	23.980		163.820	17.845	271.90	114.4	825	0.11	496.665	0.90	55%
Maritime Way	504	501										0.27	5046	35.04	3.241	66.26		27.625	23.980		163.820	17.922	271.98	29.9	825	0.11	496.665	0.90	55%
Can. Shield Avenue	542	541						176	316.8	269	269	0.74	269	0.74	4.000	4.36						0.212	4.57	71.3	200	2.20	50.751	1.56	9%
Can. Shield Avenue	541	540						154	272.2	232	232	0.51	501	1.25	3.974	8.06	1.360	1.360	1.181			0.731	9.98	77.7	200	0.90	32.461	1.00	31%
	Block 3	540				208	333			428	428	1.02	428	1.02	4.000	6.94						0.286	7.22	12.0	200	0.60	26.504	0.82	27%
Can. Shield Avenue	540	512										0.3	929	2.57	3.820	14.38		1.360	1.181			1.100	16.66	82.6	200	0.71	28.831	0.89	58%
Maritime Way	514	513																						51.2	200	2.14	50.055	1.54	0%
Maritime Way (Blk 4)	513	512						144	271	271	271	1.12	271	1.12	4.000	4.39						0.314	4.70	51.9	200	2.28	51.666	1.59	9%
Maritime Way	512	511								58	58	0.73	1258	4.42	3.734	19.03		1.360	1.181			1.618	21.83	49.3	200	3.12	60.439	1.86	36%
	Block 5	511						154	301	301	301	0.92	301	0.92	4.000	4.88						0.258	5.13	12.2	200	2.00	48.390	1.49	11%
Maritime Way	511	510											1559	5.34	3.667	23.16		1.360	1.181			1.876	26.22	38.4	200	1.70	44.613	1.38	59%
Maritime Way	510	501											1559	5.34	3.667	23.16		1.360	1.181			1.876	26.22	11.3	200	2.28	51.666	1.59	51%
Trunk Easement	501	500											6605	40.38	3.131	83.77		28.985	25.161		163.820	19.790	292.54	129.0	825	0.10	473.551	0.86	62%
Trunk Easement	500	94											6605	40.38	3.131	83.77		28.985	25.161		163.820	19.790	292.54						
A	90	92			35						95	0.80	95	0.80	4.000	1.54						0.228	1.77	120.0	250	0.60	48.055	0.95	4%
	92	94			12						32	1.19	127	1.99	4.000	2.06						0.568	2.63	103.0	250	2.20	92.018	1.82	3%
	94	95											6732	42.37	3.123	85.17		28.985	25.161		163.820	20.358	294.50	17.5	825	0.12	518.749	0.94	57%
	95	89			10						27	0.52	6759	42.89	3.121	85.46		28.985	25.161		163.820	20.506	294.95	66.6	825	0.12	518.749	0.94	57%

1200 Maritime Way
SANITARY SEWER DESIGN SHEET OF DOWNSTREAM SEWERS
JOB# 120144

NOVATECH ENGINEERING CONSULTANTS LTD

B	85	87	19								65	1.19	65	1.19	4.000	1.05						0.340	1.39	116.9	250	0.40	39.237	0.77	4%
	87	89			24						65	0.82	130	2.01	4.000	2.11						0.573	2.68	116.7	250	1.41	73.667	1.45	4%
A	89	84			12						32	0.35	6921	45.25	3.111	87.23		28.985	25.161		163.820	21.157	297.37	79.0	825	0.12	518.749	0.94	57%
C	80	82	19								65	1.08	65	1.08	4.000	1.05						0.308	1.36	120.0	250	0.40	39.237	0.77	3%
	82	84			25						67	0.83	132	1.91	4.000	2.14						0.544	2.68	118.5	250	1.20	67.960	1.34	4%
A	84	79			14						38	0.54	7091	47.70	3.101	89.08		28.985	25.161		163.820	21.855	299.92	79.0	825	0.12	518.749	0.94	58%
D	75	76			17						46	0.37	46	0.37	4.000	0.75						0.105	0.85	57.0	250	0.40	39.237	0.77	2%
	76	77			20						54	0.29	100	0.66	4.000	1.62						0.188	1.81	78.4	250	0.40	39.237	0.77	5%
	77	79			13						35	0.63	135	1.29	4.000	2.19						0.368	2.56	117.7	250	0.81	55.835	1.10	5%
Park Easement	79	67										0.98	7226	49.97	3.093	90.55		28.985	25.161		163.820	22.463	301.99	55.0	825	0.12	518.749	0.94	58%
	67	66			6						16	0.33	7242	50.30	3.092	90.72		28.985	25.161		163.820	22.557	302.26	70.0	825	0.12	518.749	0.94	58%
BELLROCK DRIVE	70	73		12	14						70	2.56	70	2.56	4.000	1.13						0.728	1.86	87.2	250	0.40	39.237	0.77	5%
	73	74			12						32	0.54	102	3.1	4.000	1.65						0.882	2.53	80.3	250	0.40	39.237	0.77	6%
EASEMENT	74	62										0.31	102	3.41	4.000	1.65						0.970	2.62	39.9	250	0.40	39.237	0.77	7%
CAMBRAY LANE	62	66			25						68	0.48	170	3.89	4.000	2.75						1.107	3.86	100.5	250	0.40	39.237	0.77	10%
BISHOPS MILLS WAY	66	65			9						24	0.53	7436	54.72	3.081	92.81		28.985	25.161		163.820	23.814	305.61	62.0	825	0.12	518.749	0.94	59%
SOUTH OF HWY 7	EX.	65									7792	191.6	7792	191.6	3.061	96.63				37.720	37.720	53.648	188.00	50.2	900	0.11	626.373	0.95	30%
BISHOPS MILLS WAY	65	64			2						5		15233	246.32	2.771	171.02		28.985	25.161		201.540	77.443	475.17	17.0	900	0.11	626.373	0.95	76%
EDENVALE DRIVE	59	60			8						22	0.50	22	0.50	4.000	0.36						0.141	0.50	77.0	200	1.40	40.486	1.25	1%
KETTLEBY STREET	60	61			22						59	0.62	81	1.12	4.000	1.31						0.315	1.63	103.6	250	0.40	39.237	0.77	4%
CAMBRAY LANE	58	61			5						14	0.41	14	0.41	4.000	0.23						0.115	0.34	74.5	200	0.70	28.628	0.88	1%
KETTLEBY STREET	61	64			25						68	0.42	163	1.95	4.000	2.64						0.549	3.19	105.0	250	0.90	58.855	1.16	5%
BISHOPS MILLS WAY	64	63			3						8		15404	248.27	2.767	172.64		28.985	25.161		201.540	77.992	477.33	13.0	900	0.11	626.373	0.95	76%
	63	57			10						27	0.68	15431	248.95	2.766	172.89		28.985	25.161		201.540	78.183	477.78	64.9	900	0.11	626.373	0.95	76%
TER. BUNGALOW Ph. 2	51	53		48							130	0.94	130	0.94	4.000	2.11						0.264	2.37	122.3	200	0.70	28.628	0.88	8%
	53	54		4							11		141	0.94	4.000	2.28						0.264	2.55	13.6	200	0.70	28.628	0.88	9%
	54	55										0.27	141	1.21	4.000	2.28						0.340	2.63	36.7	200	0.70	28.628	0.88	9%
BISHOPS MILLS WAY	55	56	11								37	0.81	178	2.02	4.000	2.88						0.568	3.45	107.1	250	0.40	39.237	0.77	9%
	56	57	7		12						56	0.65	234	2.67	4.000	3.79						0.751	4.54	101.5	250	0.60	48.055	0.95	9%
PARK	57	34			1						3	0.37	15668	251.99	2.759	175.12		28.985	25.161		201.540	79.038	480.86	53.5	900	0.11	626.373	0.95	77%
	34	33			3						8		15676	251.99	2.759	175.20		28.985	25.161		201.540	79.038	480.94	50.3	900	0.11	626.373	0.95	77%
HAWSTONE	43	44		22							59	1.19	59	1.19	4.000	0.96						0.335	1.29	51.0	250	1.00	62.039	1.22	2%
	44	45		8							22	0.09	81	1.28	4.000	1.31						0.360	1.67	29.0	250	0.50	43.868	0.87	4%
EDENVALE	45	35										0.06	81	1.34	4.000	1.31						0.377	1.69	39.8	250	0.50	43.868	0.87	4%
BIRKENDALE DRIVE	35	36	7								24	1.18	105	2.52	4.000	1.70						0.709	2.41	93.2	250	0.37	37.737	0.74	6%
	36	37	13								44	0.79	149	3.31	4.000	2.41						0.931	3.35	77.1	250	0.37	37.737	0.74	9%
	37	33	2		3						15		164	3.31	4.000	2.66						0.931	3.59	17.9	250	0.40	39.237	0.77	9%
BIRKENDALE DRIVE	33	32			10						27	0.56	15867	255.86	2.754	176.99		28.985	25.161		201.540	80.127	483.82	72.7	900	0.11	626.373	0.95	77%
TEESWATER STREET	30	31			16						43	0.66	43	0.66	4.000	0.70						0.186	0.88	75.1	250	0.40	39.237	0.77	2%

1200 Maritime Way
SANITARY SEWER DESIGN SHEET OF DOWNSTREAM SEWERS
JOB# 120144

NOVATECH ENGINEERING CONSULTANTS LTD

	31	32			19						51	0.41	94	1.07	4.000	1.52						0.301	1.82	77.9	250	0.40	39.237	0.77	5%
BIRKENDALE STREET	32	18			6						16	0.37	15977	257.30	2.751	178.03		28.985	25.161		201.540	80.532	485.26	44.4	900	0.11	626.373	0.95	77%
	18	16			4						11		15988	257.30	2.750	178.13		28.985	25.161		201.540	80.532	485.36	44.4	900	0.11	626.373	0.95	77%
COMMERCIAL PLAZA	19	17													4.000	0.00	0.520	0.520	0.451			0.146	0.60	26.5	150	0.90	15.073	0.83	4%
COLCHESTER SQUARE	17	16										0.10		0.10	4.000	0.00		0.520	0.451			0.174	0.63	33.2	250	0.40	39.237	0.77	2%
COLCHESTER SQUARE	16	15			10						27	0.56	16015	257.96	2.750	178.38		29.505	25.612		201.540	80.864	486.40	66.0	900	0.11	626.373	0.95	78%
	15	14A			2						5		16020	257.96	2.749	178.43		29.505	25.612		201.540	80.864	486.44	25.8	900	0.11	626.373	0.95	78%
ELSINORE LANE	39	28		32							86	0.53	86	0.53	4.000	1.39						0.149	1.54	56.7	250	1.00	62.039	1.22	2%
	28	24		18							49	1.47	135	2.00	4.000	2.19						0.563	2.75	43.0	250	0.40	39.237	0.77	7%
	24	23		12							32	0.14	167	2.14	4.000	2.71						0.602	3.31	34.0	250	0.40	39.237	0.77	8%
ELSINORE LANE	23	306		8							22	0.24	189	2.38	4.000	3.06						0.669	3.73	48.8	250	0.44	41.152	0.81	9%
ENDENVALE DRIVE	306	14-A										0.45	189	2.83	4.000	3.06						0.796	3.86	46.4	250	0.49	43.427	0.86	9%
COLCHESTER SQUARE	14-A	14											16209	260.79	2.744	180.20		29.505	25.612		201.540	81.660	489.01	14.7	900	0.11	626.373	0.95	78%
	Church	14															0.520	0.520	0.451			0.146	0.60	35.0	150	1.00	15.888	0.87	4%
COLCHESTER SQUARE	14	11		4							11	0.16	16220	260.95	2.744	180.30		30.025	26.063		201.540	81.851	489.75	72.6	900	0.11	626.373	0.95	78%
TERON	11	10											16220	260.95	2.744	180.30		30.025	26.063		201.540	81.851	489.75	29.6	900	0.11	626.373	0.95	78%
	10	EX.										0.25	16220	261.20	2.744	180.30		30.025	26.063		201.540	81.922	489.82	72.3	900	0.11	626.373	0.95	78%
TERON	0.P.P.	EX.																		0.780	0.780		0.78	100 FORCEMAIN					
TERON	EX.	EX. 2											16220	261.20	2.744	180.30		30.025	26.063		202.320	81.922	490.60	9.400	680.000	0.960	876.293	2.34	56%

Notes:

1) As per Kanata Town Centre Sanitary Trunk Sewer Study revised March 27, 1996 by Robinson Consultants Inc.
2) Park or open space area.
3) Equivalent population base on 208 rooms and 20 staff members.
4) Allowance for an ultimate flow of 188 l/s to provide flexibility in future development as per Kanata Town Centre Sanitary Trunk Study.
5) Additional flow associated with hotel amendities including swimming pool with bathrooms and laudry as per design calculations for Block 1 provided by WSP (October 2016).
6) Additional flow associated with overall amenities including beauty salon, staff, dining and laundry as per design calculations for 1250 Maritime Way (Timberwalk Retirement Home) provided by Novatech (July 31, 2017).
7) JLR Spreadsheet up-dated to include development flows from 1200 Maritime Way. Reference Appendix A of Serviceability Report for 1250 Maritime Way attached in Appendix of 1200 Maritime Way Serviceability Report (Novatech January 28, 2021)..

Design Parameters:

1) Q(e) = 0.28 L/sec/ha **3.4**
2) Q(p) = (PxqxM/86,400) **2.7**
3) Q(d) = Q(p) + Q(e) **1.4 1BDR; 2.1 2 BDR.**

Definitions: **2.3**

P = Population
q = Average per capita flow = 350 L/person/day
M = Residential Peaking Factor (Harmon Formula from section 4.4.1 of the City Sewer Design Guidelines):
M = 1+[14/(4+Pop/1000)]^1/2*1 - (Maximum of 4.0)
N = Commercial Peak Factor 1.5
Q(d) = Design Flow (L/sec)
Q(p) = Population Flow (L/sec)
Q(r) = Commercial Flow (L/sec)
Q(e) = Extraneous Flow (L/sec)

1200 Maritime Way
SANITARY SEWER DESIGN SHEET

Date	January 27, 2021					
Design	GMAC					
Job No.		**wg. Referenc**	**Checked and Stamped:**			
120144		120144-SAN	--			

APPENDIX C

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	253.7	27.3	0.95	226.4	0.20	0.28	0.33
A-02	462.2	199.9	0.95	262.3	0.20	0.52	0.57
A-03	1578.1	41.3	0.95	1536.8	0.20	0.22	0.27
A-04	744.8	417.2	0.95	327.6	0.20	0.62	0.67
A-05	296.4	249.3	0.95	47.1	0.20	0.83	0.88
A-06	157.5	157.5	0.95	0.0	0.20	0.95	1.00
Total	**3492.68**	**1092.5**	**0.95**	**2400.2**	**0.20**	**0.43**	**0.48**

NOVATECH ENGINEERING CONSULTANTS LTD.

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	0.0254	0.28	20.00	70.25	1.39	no control	-	-	-	-	-	-	-
A-02	0.0462	0.52	20.00	70.25	4.73	no control	-	-	-	-	-	-	-
A-03	0.1578	0.22	20.00	70.25	6.77	no control	-	-	-	-	-	-	-
A-04	0.0745	0.62	20.00	70.25	9.02	no control	-	-	-	-	-	-	-
A-05	0.0296	0.83	20.00	70.25	4.81	no control	-	-	-	-	-	-	-
A-06	0.0158	0.95	20.00	70.25	2.92	no control	-	-	-	-	-	-	-
CB Storage	-	-	-	-	-	-	-	-	-	-	-	-	-
Total:	0.3493				29.64								

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	0.0254	0.33	10.00	178.56	4.16	no control	-	-	-	-	-	-	-
A-02	0.0462	0.57	10.00	178.56	13.18	no control	-	-	-	-	-	-	-
A-03	0.1578	0.27	10.00	178.56	21.12	no control	-	-	-	-	-	-	-
A-04	0.0745	0.67	10.00	178.56	24.77	no control	-	-	-	-	-	-	-
A-05	0.0296	0.88	10.00	178.56	12.96	no control	-	-	-	-	-	-	-
A-06	0.0158	1.00	20.00	119.95	5.25	no control	-	-	-	-	-	-	-
CB Storage	-	-	-	-	-	-	-	-	-	-	-	-	-
Total:	0.3493				81.45								

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.

Allowable release rate

Area	1.28	ha
C	0.8	
tc	20	min
i_5	70.25	

Q allowable = 2.78 x C x i x A

199.99 L/s

tank all = 118.54 tank A = 70.44 tank B = 41.74

Summary table

Area ID	Area (ha)	Runoff 5 year event L/s	Runoff 100 year event L/s	Storage available (m^3)	Storage used 5 year event (m^3)	Storage used 100 year event (m^3)
Controlled						
Roof	0.0425	2.01	2.58	18.83	7.38	15.35
Uncontrolled						
A-01	0.0254	1.39	4.16	-	-	-
A-02	0.0462	4.73	13.18	-	-	-
Total:	0.11	8.14	19.92	18.83	7.38	15.35

Vol. = 139.56

Vol. = 93.97

Tot. Vol. = 749.78

PREPARED BY: NOVATECH

DATE: November 3rd, 2021

REQUIRED STORAGE - 5-YEAR EVENT
AREA **East Tower (incl. CB1/2)** **: TANK**

OTTAWA IDF CURVE
Area = 0.5600 ha Qallow = 70.44
C = 0.95 Vol(max) = 50.19

Time (min)	Intensity (mm/hr)	Q Uncontrolled (L/s)	Q Controlled (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	208.80	0.00	138.36	41.51
10	104.19	154.10	0.00	83.66	50.19
15	83.56	123.58	0.00	53.14	47.82
20	70.25	103.90	0.00	33.46	40.15
25	60.90	90.06	0.00	19.62	29.43
30	53.93	79.76	0.00	9.32	16.77
35	48.52	71.76	0.00	1.32	2.76
40	44.18	65.35	0.00	-5.09	-12.22
45	40.63	60.09	0.00	-10.35	-27.95
50	37.65	55.69	0.00	-14.75	-44.26
55	35.12	51.95	0.00	-18.49	-61.03
60	32.94	48.72	0.00	-21.72	-78.18
65	31.04	45.91	0.00	-24.53	-95.66
70	29.37	43.44	0.00	-27.00	-113.40
75	27.89	41.25	0.00	-29.19	-131.37
80	26.56	39.28	0.00	-31.16	-149.55
85	25.37	37.52	0.00	-32.92	-167.90
90	24.29	35.92	0.00	-34.52	-186.40
95	23.31	34.47	0.00	-35.97	-205.04
100	22.41	33.14	0.00	-37.30	-223.80
105	21.58	31.92	0.00	-38.52	-242.68
110	20.82	30.80	0.00	-39.64	-261.65
115	20.12	29.76	0.00	-40.68	-280.72
120	19.47	28.79	0.00	-41.65	-299.87
125	18.86	27.89	0.00	-42.55	-319.09
130	18.29	27.06	0.00	-43.38	-338.39
135	17.76	26.27	0.00	-44.17	-357.75
140	17.27	25.54	0.00	-44.90	-377.17
145	16.80	24.85	0.00	-45.59	-396.64
150	16.36	24.20	0.00	-46.24	-416.17
155	15.95	23.59	0.00	-46.85	-435.75
160	15.56	23.01	0.00	-47.43	-455.37
165	15.18	22.46	0.00	-47.98	-475.03
170	14.83	21.94	0.00	-48.50	-494.74

East Tower

REQUIRED STORAGE - 100-YEAR EVENT
AREA **East Tower (incl. CB1/2)** **: TANK**

OTTAWA IDF CURVE
Area = 0.5600 ha Qallow = 70.44
C = 1.00 Vol(max) = 139.56

Time (min)	Intensity (mm/hr)	Q Uncontrolled (L/s)	Q Controlled (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	377.84	0.00	307.40	92.22
10	178.56	277.98	0.00	207.54	124.52
15	142.89	222.46	0.00	152.02	136.82
20	119.95	186.74	0.00	116.30	139.56
25	103.85	161.67	0.00	91.23	136.84
30	91.87	143.02	0.00	72.58	130.64
35	82.58	128.56	0.00	58.12	122.05
40	75.15	116.99	0.00	46.55	111.71
45	69.05	107.50	0.00	37.06	100.06
50	63.95	99.56	0.00	29.12	87.37
55	59.62	92.82	0.00	22.38	73.86
60	55.89	87.02	0.00	16.58	59.68
65	52.65	81.96	0.00	11.52	44.93
70	49.79	77.51	0.00	7.07	29.70
75	47.26	73.57	0.00	3.13	14.07
80	44.99	70.04	0.00	-0.40	-1.91
85	42.95	66.87	0.00	-3.57	-18.20
90	41.11	64.00	0.00	-6.44	-34.77
95	39.43	61.39	0.00	-9.05	-51.57
100	37.90	59.01	0.00	-11.43	-68.60
105	36.50	56.82	0.00	-13.62	-85.81
110	35.20	54.80	0.00	-15.64	-103.20
115	34.01	52.94	0.00	-17.50	-120.75
120	32.89	51.21	0.00	-19.23	-138.45
125	31.86	49.60	0.00	-20.84	-156.28
130	30.90	48.10	0.00	-22.34	-174.23
135	30.00	46.70	0.00	-23.74	-192.30
140	29.15	45.38	0.00	-25.06	-210.47
145	28.36	44.15	0.00	-26.29	-228.74
150	27.61	42.98	0.00	-27.46	-247.10
155	26.91	41.89	0.00	-28.55	-265.55
160	26.24	40.85	0.00	-29.59	-284.07
165	25.61	39.87	0.00	-30.57	-302.67
170	25.01	38.94	0.00	-31.50	-321.34

PREPARED BY: NOVATECH
DATE: November 3rd, 2021

REQUIRED STORAGE - 5-YEAR EVENT
AREA **West Tower (incl. CB3/4 & TD)** **: TANK**

OTTAWA IDF CURVE
Area = 0.3600 ha Qallow = 41.74
C = 0.95 Vol(max) = 34.39

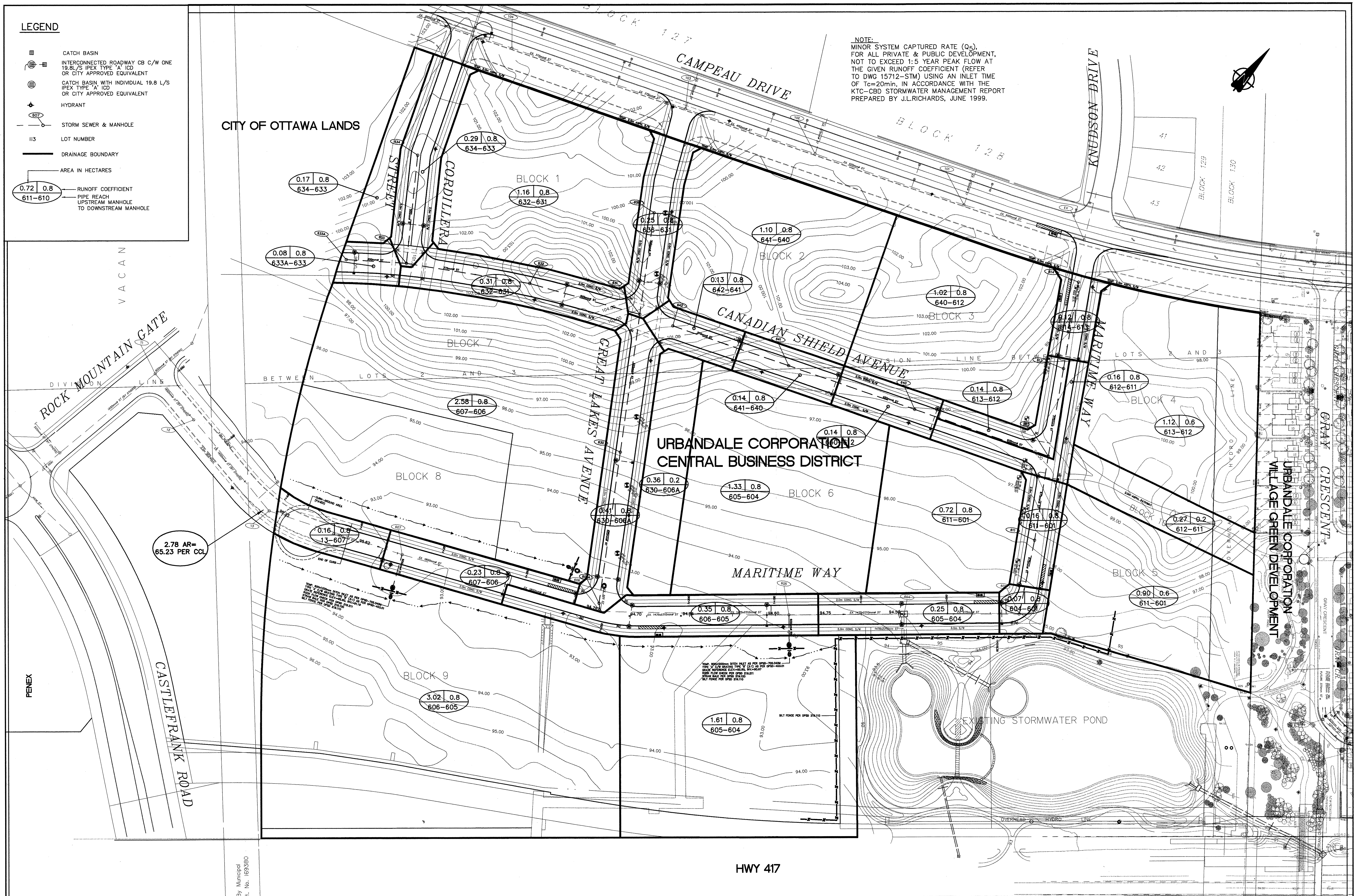
Time (min)	Intensity (mm/hr)	Q Uncontrolled (L/s)	Q Controlled (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	134.23	0.00	92.49	27.75
10	104.19	99.06	0.00	57.32	34.39
15	83.56	79.44	0.00	37.70	33.93
20	70.25	66.79	0.00	25.05	30.06
25	60.90	57.90	0.00	16.16	24.24
30	53.93	51.27	0.00	9.53	17.16
35	48.52	46.13	0.00	4.39	9.22
40	44.18	42.01	0.00	0.27	0.65
45	40.63	38.63	0.00	-3.11	-8.40
50	37.65	35.80	0.00	-5.94	-17.82
55	35.12	33.39	0.00	-8.35	-27.54
60	32.94	31.32	0.00	-10.42	-37.51
65	31.04	29.52	0.00	-12.22	-47.68
70	29.37	27.93	0.00	-13.81	-58.02
75	27.89	26.52	0.00	-15.22	-68.51
80	26.56	25.25	0.00	-16.49	-79.13
85	25.37	24.12	0.00	-17.62	-89.86
90	24.29	23.09	0.00	-18.65	-100.70
95	23.31	22.16	0.00	-19.58	-111.62
100	22.41	21.30	0.00	-20.44	-122.62
105	21.58	20.52	0.00	-21.22	-133.69
110	20.82	19.80	0.00	-21.94	-144.82
115	20.12	19.13	0.00	-22.61	-156.02
120	19.47	18.51	0.00	-23.23	-167.26
125	18.86	17.93	0.00	-23.81	-178.56
130	18.29	17.39	0.00	-24.35	-189.90
135	17.76	16.89	0.00	-24.85	-201.28
140	17.27	16.42	0.00	-25.32	-212.70
145	16.80	15.97	0.00	-25.77	-224.16
150	16.36	15.56	0.00	-26.18	-235.65
155	15.95	15.16	0.00	-26.58	-247.17
160	15.56	14.79	0.00	-26.95	-258.73
165	15.18	14.44	0.00	-27.30	-270.30
170	14.83	14.10	0.00	-27.64	-281.91

West Tower

REQUIRED STORAGE - 100-YEAR EVENT
AREA **West Tower (incl. CB3/4 & TD)** **: TANK**

OTTAWA IDF CURVE
Area = 0.3600 ha Qallow = 41.74
C = 1.00 Vol(max) = 93.97

Time (min)	Intensity (mm/hr)	Q Uncontrolled (L/s)	Q Controlled (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	242.90	0.00	201.16	60.35
10	178.56	178.70	0.00	136.96	82.18
15	142.89	143.01	0.00	101.27	91.14
20	119.95	120.05	0.00	78.31	93.97
25	103.85	103.93	0.00	62.19	93.29
30	91.87	91.94	0.00	50.20	90.36
35	82.58	82.64	0.00	40.90	85.90
40	75.15	75.21	0.00	33.47	80.32
45	69.05	69.11	0.00	27.37	73.89
50	63.95	64.01	0.00	22.27	66.80
55	59.62	59.67	0.00	17.93	59.17
60	55.89	55.94	0.00	14.20	51.12
65	52.65	52.69	0.00	10.95	42.70
70	49.79	49.83	0.00	8.09	33.98
75	47.26	47.29	0.00	5.55	24.99
80	44.99	45.03	0.00	3.29	15.78
85	42.95	42.99	0.00	1.25	6.37
90	41.11	41.14	0.00	-0.60	-3.22
95	39.43	39.47	0.00	-2.27	-12.96
100	37.90	37.93	0.00	-3.81	-22.84
105	36.50	36.53	0.00	-5.21	-32.84
110	35.20	35.23	0.00	-6.51	-42.96
115	34.01	34.03	0.00	-7.71	-53.18
120	32.89	32.92	0.00	-8.82	-63.50
125	31.86	31.89	0.00	-9.85	-73.89
130	30.90	30.92	0.00	-10.82	-84.37
135	30.00	30.02	0.00	-11.72	-94.92
140	29.15	29.18	0.00	-12.56	-105.54
145	28.36	28.38	0.00	-13.36	-116.22
150	27.61	27.63	0.00	-14.11	-126.96
155	26.91	26.93	0.00	-14.81	-137.76
160	26.24	26.26	0.00	-15.48	-148.60
165	25.61	25.63	0.00	-16.11	-159.50
170	25.01	25.03	0.00	-16.71	-170.44


LEGEND
CATCH BASIN
INTERCONNECTED ROADWAY CB C/W ONE 19.8L/S IPEX TYPE 'A' ICD OR CITY APPROVED EQUIVALENT
CATCH BASIN WITH INDIVIDUAL 19.8 L/S IPEX TYPE 'A' ICD OR CITY APPROVED EQUIVALENT
HYDRANT
STORM SEWER & MANHOLE
LOT NUMBER
DRAINAGE BOUNDARY
AREA IN HECTARES
RUNOFF COEFFICIENT
PIPE REACH UPSTREAM MANHOLE TO DOWNSTREAM MANHOLE
NOTE:
MINOR SYSTEM CAPTURED RATE (Q5), FOR ALL PRIVATE & PUBLIC DEVELOPMENT, NOT TO EXCEED 1:5 YEAR PEAK FLOW AT THE GIVEN RUNOFF COEFFICIENT (REFER TO DWG 15712-STM) USING AN INLET TIME OF Tc=20min, IN ACCORDANCE WITH THE KTC-CBD STORMWATER MANAGEMENT REPORT PREPARED BY J.L.RICHARDS, JUNE 1999.
CITY OF OTTAWA LANDS
CAMPEAU DRIVE
KNUDSON DRIVE
STREET
CORDILLERA
ROCK MOUNTAIN GATE
CASTLEFRANK ROAD
GREAT LAKES AVENUE
CANADIAN SHIELD AVENUE
MARITIME WAY
GRAY CRESCENT
BLOCK 1
BLOCK 2
BLOCK 3
BLOCK 4
BLOCK 5
BLOCK 6
BLOCK 7
BLOCK 8
BLOCK 9
URBANDALE CORPORATION CENTRAL BUSINESS DISTRICT
URBANDALE CORPORATION VILLAGE GREEN DEVELOPMENT
EXISTING STORMWATER POND
2.78 AR= 65.23 PER CCL
PENEX
HWY 417

	DATE	REVISIONS	BY	NO.	DATE	REVISIONS	BY
				5	02/11/06	PER CITY COMMENTS	CB
				4	13/09/06	ISSUED TO CITY FOR REVIEW	LND
8	24/07/07	REVISED AS PER CITY COMMENTS	CSB	3	21/07/06	ISSUED TO CITY FOR REVIEW (STREET 'A' NORTH-SOUTH LEG)	LND
7	25/05/07	PHASE 2 ISSUED TO CITY FOR REVIEW	CB	2	05/11/98	REVISED PER RMOC	MFS
6	08/03/07	ISSUED FOR TENDER	CB	1	09/10/98	ISSUED FOR MOE APPROVAL (ST&WM)	MFS

LICENSED PROFESSIONAL ENGINEER J.S.C. BOUGIE 100010090 July 25, 07 PROVINCE OF ONTARIO

SCALE
0 10m 20m 30m 40m
HORIZONTAL 1:1000

V:\15712-NAD83.LD\15712 C STM-NAD83.dwg

J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
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Fax: 613 728 6012

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DESIGN S.D.
CHECKED M.F.S.
DRAWN T.S.
CHECKED
APPROVED

Ottawa

URBANDALE CORPORATION

URBANDALE CORPORATION
KANATA TOWN CENTRE
CENTRAL BUSINESS DISTRICT
STORM DRAINAGE PLAN

PROJECT No. 15712-NAD 83
STARTED JUNE 1998
DWG. No. 15712-STM

13813

APPENDIX D

Fire Demand Calculations

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 120144
Project Name: 1200 Maritime Way - East Tower
Date: 1/22/2021
Input By: Jazmine Gauthier
Reviewed By: Greg MacDonald

Legend: Input by User; No Information or Input Required

Building Description: 28 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)	2204			
		Total Floors/Storeys (Podium)	7			
		Tower Footprint (m^2)	742			
		Total Floors/Storeys (Tower)	28			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			3,306	
	F	**Base fire flow without reductions**				8,000
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	6,800
		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%	-3,400
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	30.1- 45 m		5%	2,720
		East Side	0 - 3 m		25%	
		South Side	> 45.1m		0%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**40%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**6,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**100**
				or	USGPM	1,585
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	720

FUS - Fire Flow Calculations - User Guide - Fire Resistive

Novatech Project #: 120144
Project Name: 1200 Maritime Way - East
Date: 1/22/2021
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	3,306	m^2
Occupancy Reduction	-15%	
Sprinkler Reduction	-50%	
Exposure Surcharge	40%	
Total Fire Flow	6,000	L/min

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

Base Fire Flow

Construction Material

1
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)

Floor Area

2
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

Occupancy hazard reduction or surcharge

3
Residential - with no garage
Residential - with garage
General Commercial - Generally, no reduction
Check usage with FUS
Check usage with FUS

Sprinkler Reduction

4
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

Exposure Surcharge (cumulative %)

5
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

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 120144
Project Name: 1200 Maritime Way - West Tower
Date: 1/22/2021
Input By: Jazmine Gauthier
Reviewed By: Greg MacDonald

Legend: Input by User; No Information or Input Required

Building Description: 30 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)	1947			
		Total Floors/Storeys (Podium)	7			
		Tower Footprint (m^2)	906			
		Total Floors/Storeys (Tower)	30			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**2,921**	
	F	**Base fire flow without reductions**				**7,000**
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,950**
		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%	**-2,975**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	> 45.1m		0%	**2,380**
		East Side	20.1 - 30 m		10%	
		South Side	30.1- 45 m		5%	
		West Side	0 - 3 m		25%	
				Cumulative Total	**40%**	
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 #: 120144
Project Name: 1200 Maritime Way - Wes
Date: 1/22/2021
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	2,921	m^2
Occupancy Reduction	-15%	
Sprinkler Reduction	-50%	
Exposure Surcharge	40%	
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 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	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	

APPENDIX F

Pre-Consult Notes

Please refer to the below regarding the Pre-Application meeting held on August 6, 2020 for the property at 1200 Maritime Way for a Site Plan Control Application and Zoning By-law Amendment for a residential development. I have also attached the required Plans & Study List for application submission. Despite the amount of hard copies identified in the list, they may not be required- please confirm with the Planner prior to submission.

Below are staff's preliminary comments based on the information available at the time of the pre-consultation meeting:

Planning / Urban Design

General:

- You are encouraged to contact the Ward Councillor, Councillor Jenna Sudds, regarding the proposal.
- Urban Design Review Panel review is required for the proposed increase in height and site plan control application.
    - A pre-consult with the UDRP is also recommended.
- Cash-in-Lieu of Parkland will be required if proof of payment cannot be provided.

Zoning By-law Amendment:

- Staff do not have a concern with the proposed increase in height provided it meets Official Plan and Secondary Planning requirements and policies.
- Please ensure that adequate tower separation and associated setbacks on-site and from abutting property lines is achieved in accordance with the high-rise design guidelines.
- A zoning schedule and or FSI should be considered as part of the Zoning By-law amendment to increase the height on the subject property.

Site Plan Control:

- Current proposal does not adequately address Maritime Way.
- Please ensure that adequate setbacks (11.5 metres for a tower) are provided from the eastern property line, and the length of a podium is not designed to directly face this property line.
- Please utilize a 6-storey podium in lieu of a 9 storey podium.
- Please consider that if the towers are the same height, they have the same floor plate (pairing) vs. the current proposal.
- If different floor plates are desired for the two towers, they should be different heights.
- Three towers are possible on-site, one at the desired 30 storeys and two at a lower height (ex. 15).
- Need to study massing as it relates to other properties, buildings, shadowing, wind etc.

- Proposal needs to work with grades along Kanata Avenue.
- Connections to the MUP to the south need to be considered.
- Ensure that adequate outdoor amenity space is provided.
- Group “back” of house and functional requirements.
- Reduce surface parking to the greatest extent possible.
- Provide grade related units.
- Please see attached illustration.
- A Design Brief is required.
    - A terms of reference is provided. All applicable elements of the Design Brief have been highlighted.
- Please review the Building Code to make sure the proposed development will meet the accessibility requirements.

Engineering

General:

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates. The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.
- All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not encroach within the right-of-way.
- Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided and all easements shall be shown on the engineering plans.
- Please provide an **Existing Conditions/Removals Plan** as part of the engineering drawing set. Any existing services are to be removed or abandoned in accordance with City standards.
- Please note that the proposed servicing design and site works shall be in accordance with the following documents:
    - Ottawa Sewer Design Guidelines (October 2012)
    - Technical Bulletin PIEDTB-2016-01
    - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
    - Ottawa Design Guidelines - Water Distribution (2010)
    - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
    - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
    - City of Ottawa Environmental Noise Control Guidelines (January 2016)
    - City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
    - Ottawa Standard Tender Documents (latest version)
    - Ontario Provincial Standards for Roads & Public Works (2013)

- Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).

Stormwater Management Criteria and Information:

- It appears the subject site is located within **the KTC SWM Pond (Phase 2)** catchment (see attached). The consultant should review the attached report and confirm SWM criteria, flow allowance to the existing storm system, design assumptions, etc. Consult Operations staff to determine how the existing facility is currently performing (i.e. ability to achieve targets, condition of infrastructure within the SWM block, etc.
- **Water Quality Control:** Please consult with the local conservation authority regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report.
- Please note that foundation drain is to be independently connected to sewermain unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.
- Please note that as per *Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14)* **there shall be no surface ponding on private parking areas during the 2-year storm rainfall event**. Depending on the SWM strategy proposed underground or additional underground storage may be required to satisfy this requirement.
- **Underground Storage:** Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.
- When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**
- In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

- Note that the above will added to upcoming revised Sewer Design Guidelines to account for underground storage, which is now widely used.
- Provide sufficient details and information on any proposed underground storage system. A cross-section of any underground storage system is to be provided with sufficient details and information. In case of a pump failure or blockage an overflow should be provided. Backup power supply is required if using a pump.
- Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.
- Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.
- Please provide a **Pre-Development Drainage Area Plan** to define the pre-development drainage areas/patterns. **Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution**.
- If rooftop control and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system.

Storm Sewer:

- Storm sewer monitoring maintenance holes are required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.
- As-built drawings of the existing services within the vicinity of the site shall be obtained and reviewed in order to determine proper servicing and SWM plan for the subject site(s).
- Storm service connections are to have backwater valves.

Sanitary Sewer:

- **An analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater system is required to be provided**. **The City can provide flows for existing areas and direction on how to estimate future flows for vacant areas within the sewer shed.**
- Please apply the wastewater design flow parameters *in Technical Bulletin PIEDTB-2018-01.*

- Sanitary sewer monitoring maintenance holes are required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.
- Sanitary service connections are to have backwater valves.

Water:

- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m^3/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration.* The basic day demand for each site anticipated to exceed 50m^3/day therefore 2 water services will be required. There shall be primary water service and a secondary connection.
- Please review Technical Bulletin ISTB-2018-0, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A **hydrant coverage figure** shall be provided and **demonstrate there is adequate fire protection**.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
    - Type of Development and Units
    - Site Address
    - A plan showing the proposed water service connection locations.
    - **Average Daily Demand** (L/s)
    - **Maximum Daily Demand** (L/s)
    - **Peak Hour Demand** (L/s)
    - **Fire Flow** (L/min)
    - [*Fire flow demand requirements shall be based on Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection*
    - *1999*]
    - *Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).*
    - Hydrant capacity shall be assessed to demonstrate the RFF can be achieved. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.
- The subject site is located within the 1E Pressure Zone.

Snow Storage:

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

Permits and Approvals:

- The consultant shall determine if this project will be subject to an Environmental Compliance Approval (ECA) for Private Sewage Works. It shall be determined if the exemptions set out under Ontario Regulation 525/98: *Approval Exemptions* are satisfied. All regulatory approvals shall be documented and discussed in the report.

Geotechnical Investigation:

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long term damages associated with lowering the groundwater in this area.
- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.
- https://documents.ottawa.ca/sites/default/files/documents/cap137602.pdf

Exterior Site Lighting:

- Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light

spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a **Site Lighting Plan, Photometric Plan and Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

Please contact Infrastructure Project Manager Ahmed Elsayed for follow-up questions.

Transportation

- Follow Traffic Impact Assessment Guidelines
  - A TIA is required. Please proceed to submit Scoping report.
  - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
  - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
- TMP shows:
  - Future BRT along Hwy 417 (affordable network) and future LRT along Hwy 417 (ultimate network); and
  - Plans to widen Kanata Avenue from two to four lanes, between Highway 417 and Campeau Drive (Phase 2: 2020-2025).
- Drive aisle width should be 6.7m wide.
- Reduce number of conflict points as much as possible within internal roadways.
- Noise Impact Studies required for the following:
  - Road
  - Stationary (if there will be any exposed mechanical equipment due to the proximity to neighbouring noise sensitive land uses)
- On site plan:
  - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
  - Show clear throat length dimension on site plan.
  - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
  - Turning movement diagrams required for internal movements (loading areas, garbage).
  - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
  - Show lane/aisle widths.
  - Sidewalk is to be continuous across access as per City Specification 7.1.
  - Grey out any area that will not be impacted by this application.
- AODA legislation is in effect for all organizations, please ensure that the design conforms to these standards.

Please contact Transportation Project Manager, Josiane Gervais for follow-up questions.

Other

Please refer to the links to "Guide to preparing studies and plans" and fees for general information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-consultation comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

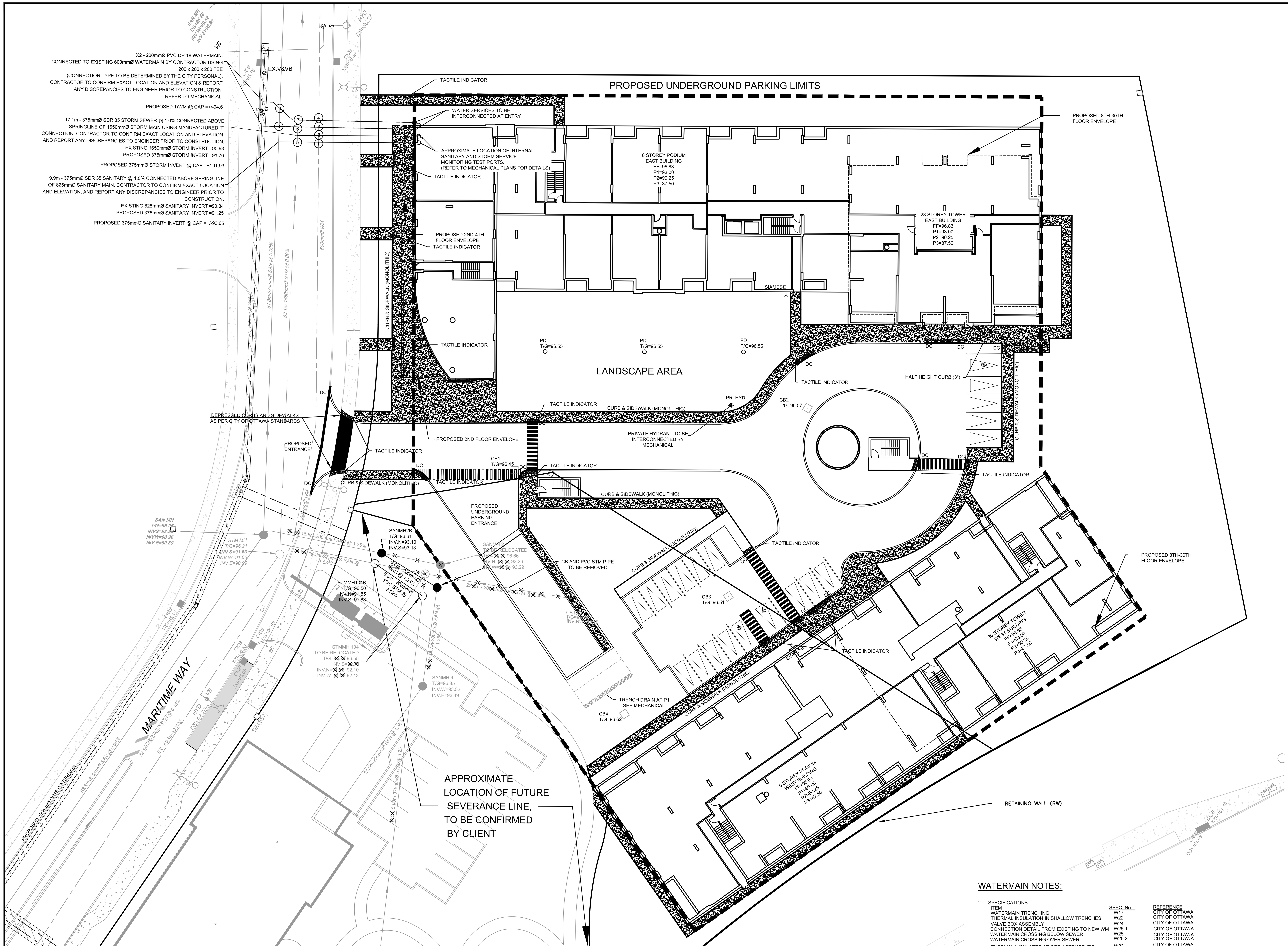
Please do not hesitate to contact me if you have any questions.

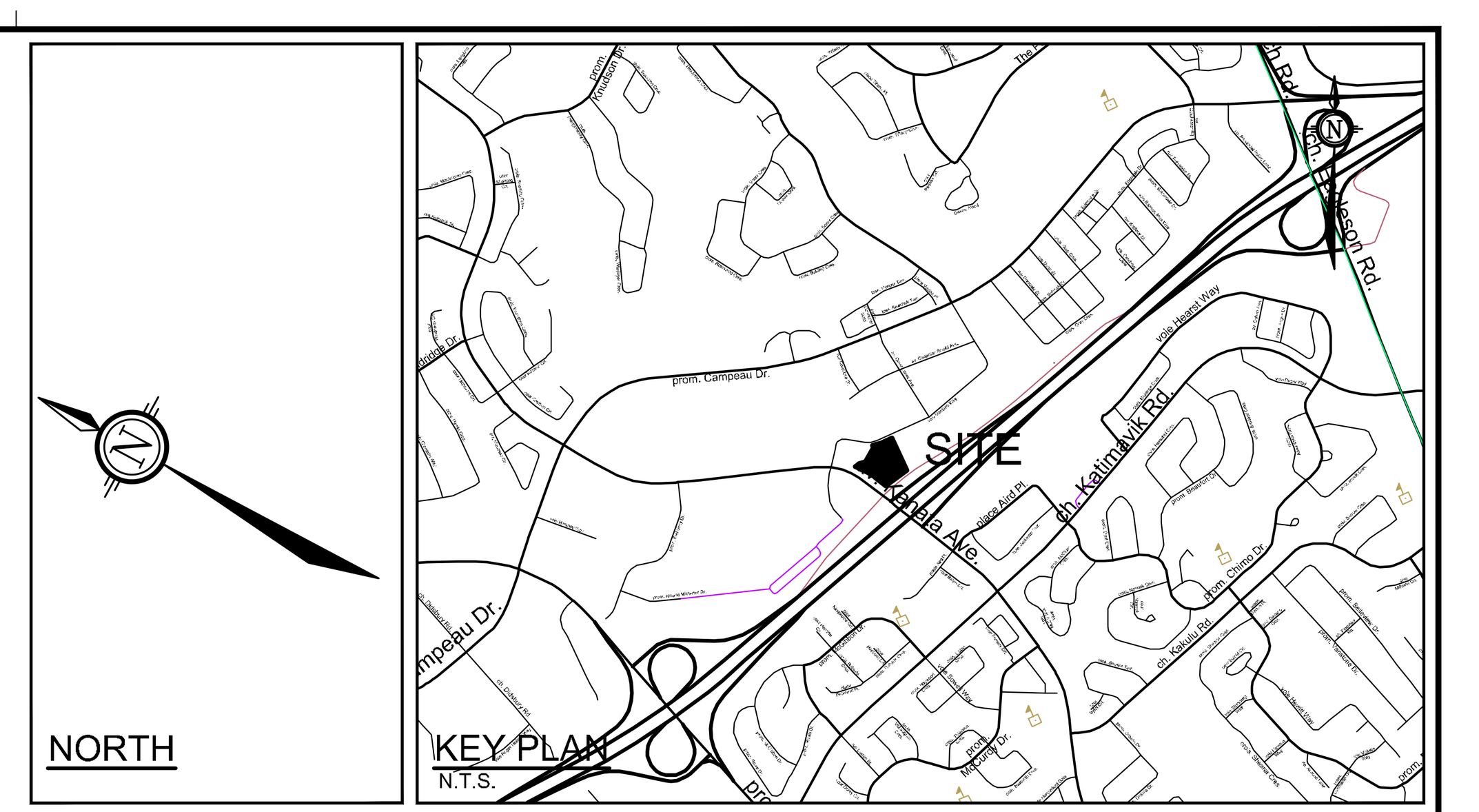
Regards,
Laurel

Laurel McCreight MCIP, RPP
Planner
Development Review West
Urbaniste
Examen des demandes d'aménagement ouest

City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 16587
ottawa.ca/planning / ottawa.ca/urbanisme

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
EXISTING FLOW DIRECTION OF SEWERS
EXISTING SANITARY MANHOLE & SEWER
EXISTING STORM MANHOLE & SEWER
EXISTING CATCH BASIN
EXISTING BUILDING ENVELOPE

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
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EXISTING JOINT USE STREET LIGHT
EXISTING STREET LIGHT
EXISTING TRAFFIC HAND HOLE
EXISTING TRAFFIC SIGN
EXISTING DITCH INLET CATCH BASIN
EXISTING HYDRANT
PROPOSED HYDRANT
PROPOSED SIAMESE CONNECTION

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.

PIPE CROSSING TABLE

CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE
1	EX. WATERMAIN 600mm DIA. T/WM.=93.41	PROP.SAN 375mm DIA. INV=93.91	0.50m
2	PROP.STM 375mm DIA. OBV.=92.16	EX. WATERMAIN 600mm DIA. B/WM.=92.81	0.65m
3	EX. WATERMAIN 600mm DIA. T/WM.=93.40	PROP. WATER SERV 200mm DIA. B/WM.=93.65	0.25m
4	EX. WATERMAIN 600mm DIA. T/WM.=93.40	PROP. WATER SERV 200mm DIA. B/WM.=93.65	0.25m
5	EX.STM 1650 mm DIA. OBV.=92.58	PROP.SAN 375mm DIA. INV=93.88	1.30m
6	EX.STM 1650mm DIA. OBV.=92.59	PROP. WATER SERV 200mm DIA. B/WM.=92.87	0.28m
7	EX.STM 1650mm DIA. OBV.=92.58	PROP. WATER SERV 200mm DIA. B/WM.=92.87	0.29m
8	EX.SAN 825mm DIA. OBV.=91.75	PROP. WATER SERV 200mm DIA. B/WM.=92.80	1.05m
9	EX.SAN 825mm DIA. OBV.=91.75	PROP. WATER SERV 200mm DIA. B/WM.=92.80	1.05m

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

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

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2.	RE-ISSUED FOR COORDINATION	JAN 22/21	JAG
1.	ISSUED FOR COORDINATION	JAN15/21	JAG

SCALE 1:250

DESIGN JAG
CHECKED GJM
DRAWN CJF
CHECKED JAG
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
G.J. MacDONALD
Sept. 23, 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
1200 MARITIME WAY

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 120144
REV REV # 6
DRAWING No. 120144 - GP

D07-12-17-0063

PLANB1.DWG - 1000mmx707mm
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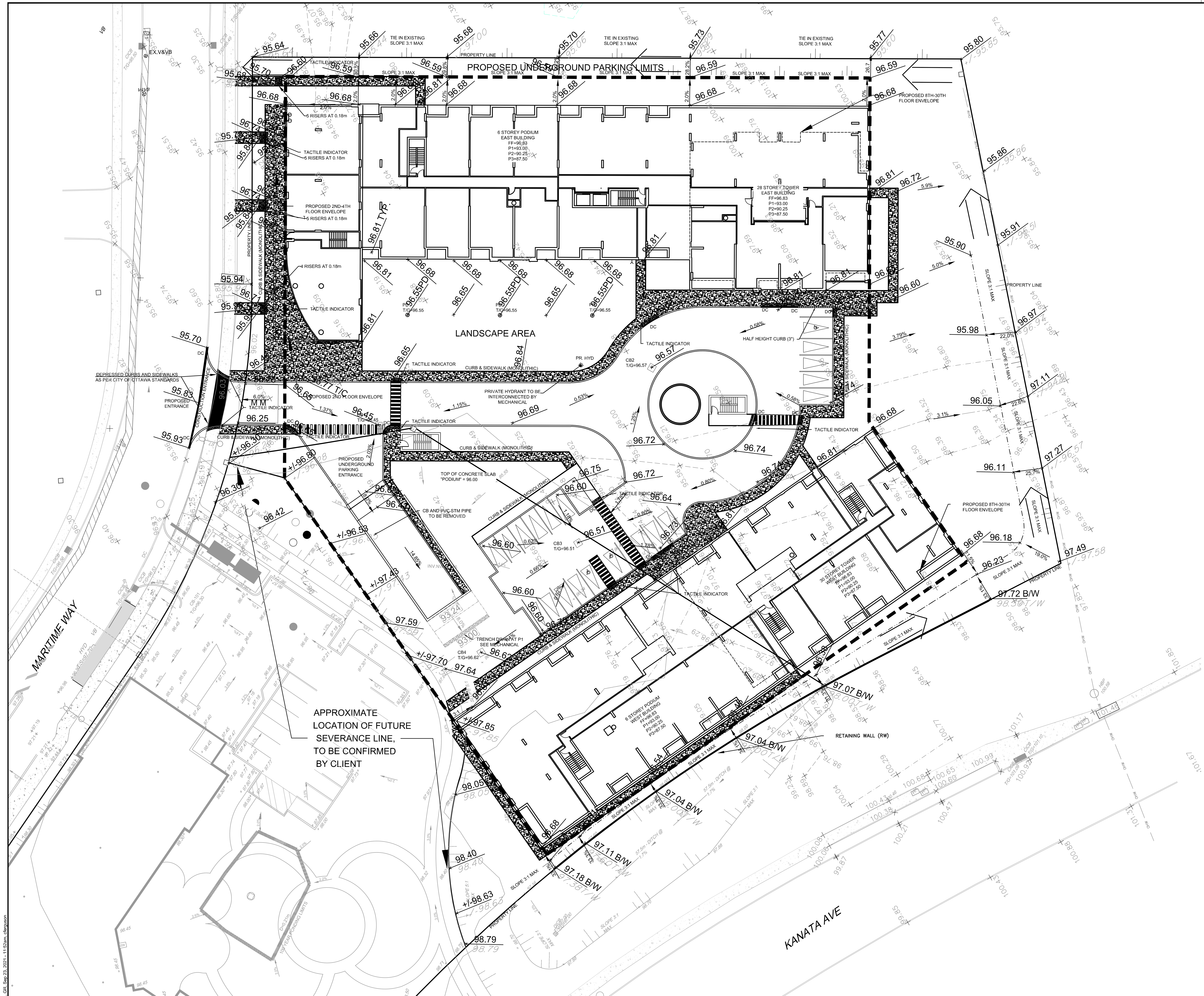

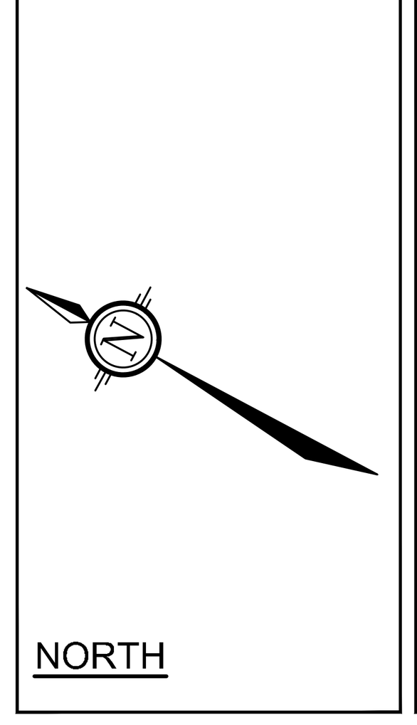

LEGEND

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
DC PROPOSED DEPRESSED CURB	EXISTING STREET LIGHT
TD TRENCH DRAIN	EXISTING TRAFFIC HAND HOLE
PROPOSED TERRACING SLOPE 3:1 MAX	EXISTING TRAFFIC SIGN
PROPOSED PONDING AREA	EXISTING STANDARD IRON BAR
EMERGENCY OVERLAND FLOW	EXISITING CATCHBASIN
PROPOSED SWALE	EXISITING DITCH INLET CATCHBASIN
	EXISTING BUILDING ENVELOPE
	PROPOSED FILTER CLOTH IN EXISTING CATCHBASIN
	PROPOSED SILT FENCE
	PROPOSED MUD MAT

GENERAL NOTES:

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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.
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:
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1.	SITE PLAN COORDINATION	JAN15/21	JAG

SCALE 1:250

DESIGN CJF
CHECKED JAG
DRAWN CJF
CHECKED JAG
APPROVED GJM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER G.J. MacDONALD Sept. 23, 2021 PROVINCE OF ONTARIO

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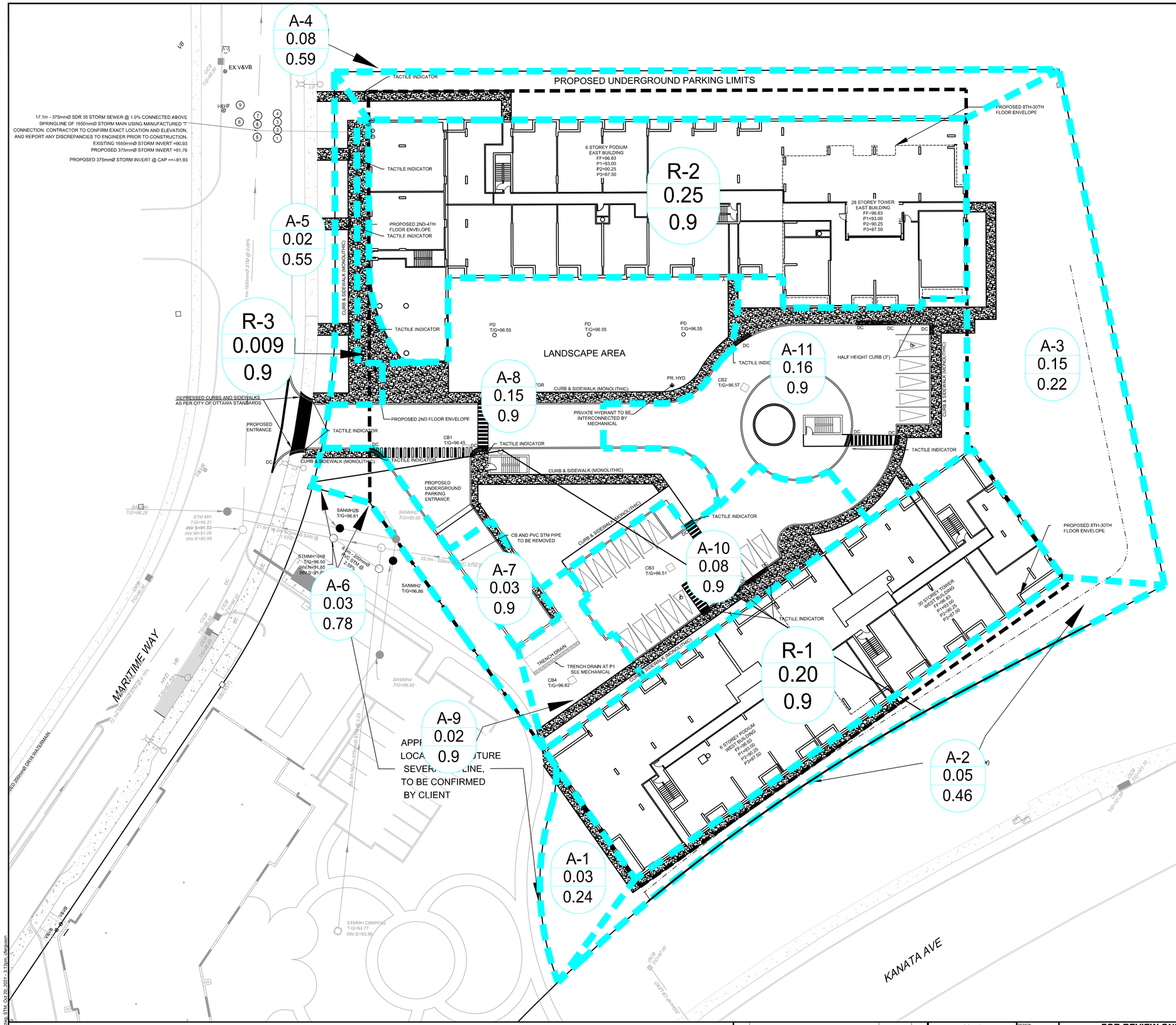
LOCATION
CITY OF OTTAWA
1200 MARITIME WAY

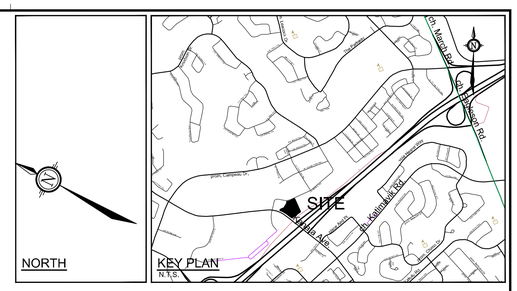
DRAWING NAME
GRADING, EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 120144
REV REV # 6
DRAWING No. 120144-GR

D07-12-17-0063

#17421





DRAINAGE AREA LIMITS

A-X | 0.039 | 0.46 — DRAINAGE AREA ID / AREA (ha) / RUNOFF COEFFICIENT (5-YEAR)

STORMWATER MANAGEMENT NOTES:

1. REFER TO 'SERVICEABILITY AND STORMWATER MANAGEMENT REPORT' PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
2. NO ROOF TOP CONTROL ALLOWED.
3. TOTAL AREA: 1.28 ha

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K2P 0Y6.

No.	REVISION	DATE	BY
3.	ISSUED FOR COORDINATION BASED ON URDP	OCT20/21	JAG
2.	ISSUED FOR CITY COMMENTS	JUL07/21	JAG
1.	SUBMITTED WITH ZONING/SITE PLAN APPLICATIONS	JAN25/21	JAG

SCALE 1:250 (1:250, 0 2 4 6 8 10)
DESIGN JAG
CHECKED GJM
DRAWN CJF
CHECKED JAG
APPROVED GJM

FOR REVIEW ONLY

LICENCED PROFESSIONAL ENGINEER G.J. MacDONALD PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
MARITIME WAY - KANATA RENTAL

DRAWING NAME
STORM WATER MANAGEMENT PLAN

PROJECT No. 120144
REV # 3
DRAWING No. 120144-SWM

D07-12-17-0063
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