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36 Years

CARRÉ SAINT LOUIS
1050 CANADIAN SHIELD AVENUE
OTTAWA, ONTARIO

SERVICING AND STORMWATER MANAGEMENT REPORT

SERVICING AND STORMWATER MANAGEMENT REPORT

CARRÉ SAINT LOUIS
1050 CANADIAN SHIELD AVENUE
OTTAWA, ONTARIO

Prepared by:

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

July 7, 2021
Revised January 14, 2022

Novatech File: 120191
Ref No. R-2021-097

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Engineers, Planners & Landscape Architects

January 14, 2022

Planning and Infrastructure Approvals
City of Ottawa
110 Laurier Avenue West
Ottawa, Ontario, K1P 1J1

Attention: **Lisa Stern, MCIP, RPP**

Dear Ms Stern:

Reference: **Carré Saint Louis**
1050 Canadian Shield Avenue, Ottawa
Servicing and Stormwater Management Report
Our File No. : 120191

Please find enclosed the 'Servicing and Stormwater Management Report' for the above noted project. This report is submitted in support of the Site Plan Application for the proposed development.

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

Yours truly,

NOVATECH

Cara Ruddle, P.Eng.
Senior Project Manager | Land Development Engineering

cc: Pascale Lépine, Lepine Corporation

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

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1.0 INTRODUCTION

Novatech has been retained to prepare a Servicing and Stormwater Management Report for the proposed development located at 1050 Canadian Shield Avenue, Ottawa (formerly Kanata), Ontario. The property at 1050 Canadian Shield Avenue is formally Block 2 of the Kanata Town Center Central Business District which is identified on Plan 4M-1325 provided in **Appendix A**. This report will support a Site Plan Application for the subject development. **Figure 1** Key Plan shows the site location.

2.0 EXISTING CONDITIONS

The site is currently mostly undeveloped consisting of grass with some shrub, trees, and a gravel parking area. The site is bounded by Campeau Drive to the north, the Red Oak Retirement Residence to the east, Canadian Shield Avenue to the south, and Great Lakes Avenue to the west. The property contains an existing berm on all sides with an opening in the south-east corner. The topography slopes in a south easterly direction towards Canadian Shield Avenue. There are existing municipal services in the Campeau Drive, Great Lakes Avenue and Canadian Shield Avenue Right-of Ways. **Figure 2** shows the existing site conditions.

3.0 PROPOSED DEVELOPMENT

The site is 1.10 hectares in size, and it is proposed to develop a six-storey, 244-unit apartment building with an underground parking structure and 274m^2 of commercial space with street access. There will be amenity areas provided in the building (such as a gym facility) but it is understood that these are for residents only. The building footprint is approximately 6205m^2 at the ground floor level. Access to the building and underground parking is proposed from Canadian Shield Avenue. A landscaped courtyard area is proposed within the center of the building over the proposed underground parking garage roof with external access from Campeau Drive. Refer to **Figure 3** for the proposed site layout.

4.0 SERVICING REPORT REFERENCES

- J.L. Richards & Associated Limited, Kanata Town Center Stormwater Management Report, Dated January 1999.
- J.L. Richards & Associated Limited, Kanata Town Center Servicing Brief (Revised), Dated June 13, 2012.
- J.L. Richards & Associated Limited, 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), Dated August 18, 2017.

5.0 WATER SERVICING

The proposed development is in the 3W pressure zone of the City of Ottawa water distribution network. There is an existing 200mm diameter watermain in the Canadian Shield Avenue right-of-way, a 200mm and a 900mm diameter watermain in the Great Lakes Avenue right-of-way, and a 300mm and 900mm diameter watermain within the Campeau Drive right-of-way. It is proposed to servcie the development by connecting to the existing 200mm diameter watermain within the Great Lakes Avenue right-of-way. As per the City of Ottawa Technical Bulletin ISDTB-2014-02, the proposed development will require two service connections since the average day demand for the proposed development is greater than 50 cubic meters of water.

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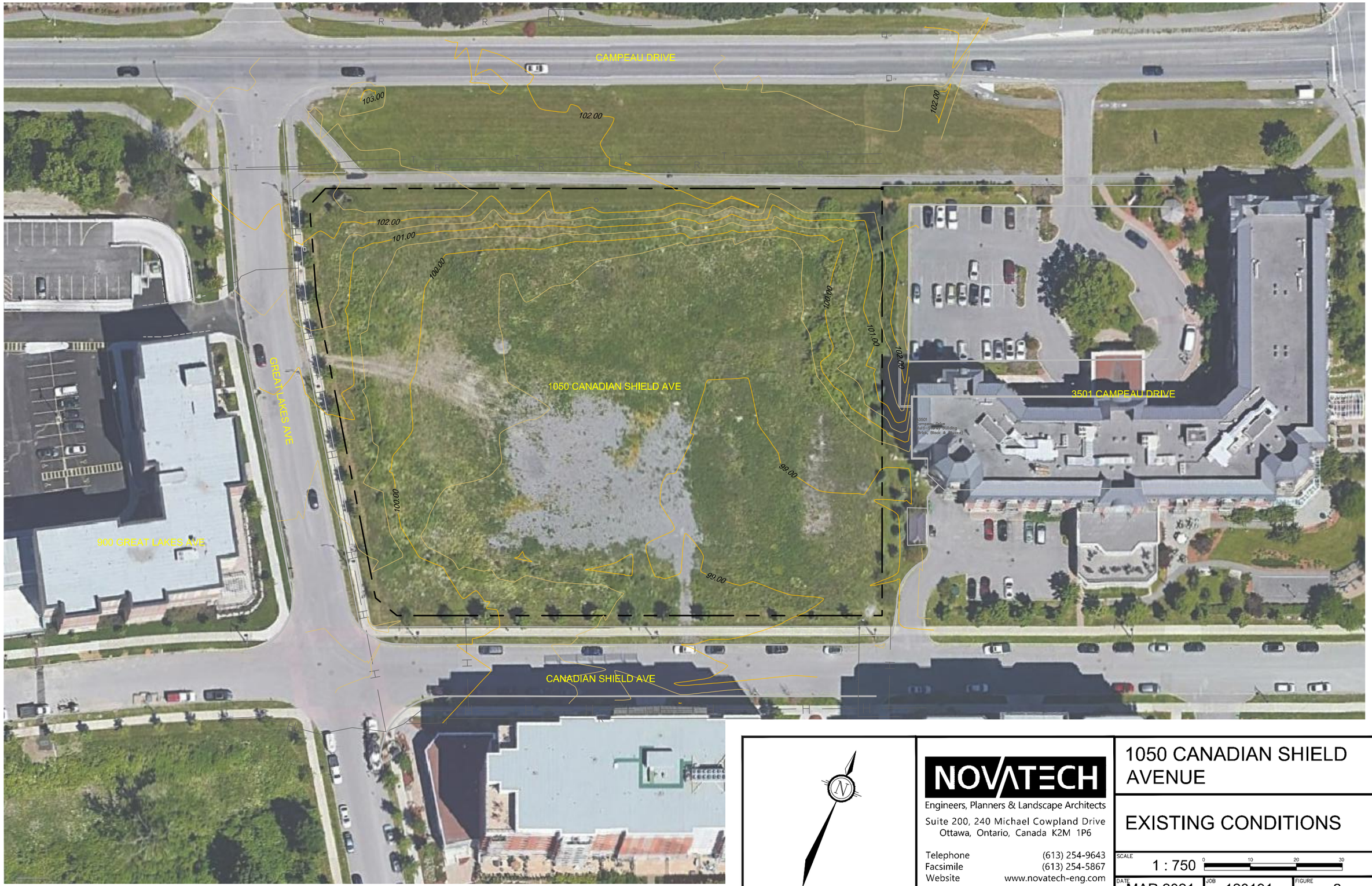
1050 CANADIAN SHIELD AVENUE

KEYPLAN

SCALE		
N.T.S.		
DATE	JOB	FIGURE
MAR 2021	120191	1

M:\2020\120191\CAD\Design\120191-KP.dwg, Keyplan, Mar 23, 2021 - 2:00pm, jkaloudas

SHT8X11.DWG - 216mmx279mm



M:\2020\120191\CAD\Design\Figures\120191 - XCON.dwg, X-CON, Mar 24, 2021 - 9:58am, jkaloudas

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1050 CANADIAN SHIELD AVENUE

EXISTING CONDITIONS

SCALE 1 : 750 (0, 10, 20, 30)
DATE MAR 2021
JOB 120191
FIGURE 2

SHT11X17.DWG - 279mmX432mm

GREAT LAKES AVENUE

6 STOREY APARTMENT BUILDING
FOOTPRINT=6333 SQM
FFE=102.80
P1 FFE=99.20
P2 FFE=96.00

CANADIAN SHIELD AVENUE

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1050 CANADIAN SHIELD AVENUE

PROPOSED SITE PLAN

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE JUN 2021 | JOB 120191 | FIGURE 3

The City of Ottawa design criteria for Water Distribution systems were used to calculate the theoretical water demand for the proposed six-storey apartment building. The water demand has been calculated for the building based on a population of 561 people and 274m^2 of commercial space, a summary of the flows is provided in **Table 6.1**.

Table 6.1 Water Demand Summary

	Proposed Development
Water Demand Rate	Residential: 350 (L/c/d) Commercial: 75 (L/9.3m^2/day)
Units/Area	25 – 1 Bed, 158 – 2 Bed, 45- 3-Bed, 16 – 4-Bed
Density	1.4 ppu - 1 Bed, 2.1 ppu - 2 Bed, 3.1 ppu - 3 Bed, 3.4
Factors	Residential : MD=2.5, PH=2.20 Commercial: MD=1.5, PH =1.8
Average Day Demand (L/s)	2.30
Maximum Daily Demand (L/s)	5.72
Peak Hour Demand (L/s)	12.57
FUS Fire Flow Requirement (L/s)	183.00
Max Day+Fire Flow (L/s)	188.72

The required fire demand was calculated using the Fire Underwriters Survey (FUS) Guidelines. The proposed building is to be sprinklered with the Siamese connection located by the water services along Great Lakes Avenue. Existing hydrants within the Canadian Shield, Great Lakes Avenue, and Campeau Drive Right-of-Ways will provide fire protection for the proposed development. The required fire demand was calculated to be 2,906 USGPM (or 11,000 L/min). Refer to **Appendix B** for a copy of the water calculations.

The above water demand info was submitted to the City and boundary conditions provided from the City's water model. The boundary conditions are provided in **Table 6.2**.

Table 6.2 Water Boundary Conditions

Criteria	**Head (m)**	**Pressure (psi)**
Connection 1 (Ground Elevation = 101.4m)		
Max HGL	161.3	85.2
Peak Hour	156.3	78.0
Max Day + Fire Flow	149.8	68.8
Connection 2 (Ground Elevation = 101.2)		
Max HGL	161.3	85.4
Peak Hour	156.3	78.2
Max Day + Fire Flow	149.8	69.1

These boundary conditions were used to analyze the performance of the proposed watermain for three theoretical conditions:

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

The following **Table 6.3** summarizes the results from the hydraulic water analysis.

Table 6.3 Water Analysis Results Summary

Condition	Demand (L/s)	Min/Max Allowable Operating Pressures (psi)	Limits of Design Operating Pressures (psi)[1]
Connection 1			
High Pressure	2.30	80psi (Max)	87.7
Peak Hour	12.57	40psi (Min)	80.6
Maximum Daily + *Fire Flow*	188.72	20psi (Min)	71.4
Connection 2			
High Pressure	2.30	80psi (Max)	87.7
Peak Hour	12.57	40psi (Min)	80.6
Maximum Daily + *Fire Flow*	188.72	20psi (Min)	71.4

[1]Pressures based on a P1 FEE of 99.60m

Based on the proceeding analysis it can be concluded that the watermain, as designed, will provide adequate system pressures for the fire flow + maximum day demand and peak hour demand. Refer to **Appendix B** for detailed hydraulic calculations and boundary conditions.

Since the average day demand for the development is greater than 50 cubic metres, two water services are required to service the building. Therefore, two 150mm diameter water services are proposed to service the building and will connect to the existing 200mm diameter watermain within the Great Lakes Avenue right-of-way. The two services will be separated by an isolation valve within the existing watermain system in the event maintenance on the City system is required. In the average day (high pressure), and the peak hour condition the system pressures are above the 80psi threshold, therefore pressure reducing valves will be required on both service connections. Refer to the General Plan of Services drawing (120191-GP) for the water servicing information.

6.0 SANITARY SERVICING

There are existing 200mm diameter sanitary sewers along Canadian Shield and Great Lakes Avenues and a 250mm diameter sanitary sewer along Campeau Drive. It is proposed to service the development by connecting a 200mm dia. sanitary service to the existing 200mm diameter sanitary sewer within the Canadian Shield Avenue right-of-way. This existing sanitary sewer flows east along Canadian Shield Avenue and connects to the existing 200mm sanitary sewer under Maritime Way where it flows south and connects to an existing 825mm sanitary trunk sewer. Refer to the General Plan of Services (120191-GP) for sanitary servicing information.

Flows for the proposed development have been calculated based on a total population of 561 people and 274m^2 of commercial space. The sanitary flows were calculated based on an average domestic demand of 280 L/day, and a commercial area flow of 75 L/9.3m^2/day. The total peak flow calculated for the apartment building is 6.22 L/s. Sanitary flow calculations are included in **Appendix C** for reference.

The subject site is included in the Kanata Town Centre – Central Business District (KTC-CBD) Subdivision. A Technical Memorandum prepared by J.L. Richards dated June 13, 2012 provides design criteria for the KTC-CBD Subdivision area based on estimated developments within the subdivision. The Memorandum assumed that the subject property, which was denoted as Block 2 would be a commercial development. Refer to **Table 7.1** for a comparison of the proposed development and the original allocated sanitary flows for the site from the J.L Richards design memorandum.

Table 7.1 Sanitary flow summary

	Proposed Development	J.L. Richards Allocated Flow
Flow Rate	280 L/c/d	50000L/ha/day
Units	25 – 1 Bed, 158 – 2 Bed, 45-3-Bed, 16 – 4-Bed	0
Commercial area (m^2)	274	13,600m^2
Density	1.4 ppu - 1 Bed 2.1 ppu - 2 Bed 3.1 ppu - 3 Bed 3.4 ppu - 4 Bed	n/a
Population	561	n/a
Peaking Factor	3.2	3.97
Peak Daily Flow (L/s)	5.77	1.18
Peak Extraneous	0.45	0.38
Total Peak Design	6.22	1.56

The total flow for the proposed development exceeds the allotted flow from the original J.L Richards design by 4.66 L/s. The J.L Richards Memorandum includes a drainage area plan and the updated August 2017 sanitary sewer design sheets for the KTC-CBD subdivision and the downstream sanitary sewer system to the intersection of Campeau and Teron Road. Flows for the proposed development have been provided to JL Richards and a Technical Memorandum with updated design sheets has been provided from JL Richards. This updated Memorandum confirms there is capacity in the downstream sanitary sewer system for the additional flows. A copy of the updated Technical Memorandum with design sheets are included in **Appendix C**.

7.0 STORM SERVICING

There is an existing 375mm and 450mm diameter storm sewer within the Canadian Shield Avenue right-of-way, an existing 300mm diameter storm sewer within the Great Lakes right-of-

way and a 525mm diameter storm sewer within the Campeau Drive right-of-way. The existing 450mm diameter storm sewer within Canadian Shield Avenue is the proposed storm sewer outlet for the subject site. This existing storm sewer outlets to the existing Stormwater Management Facility downstream of the site at the end of Maritime Way (adjacent to Highway 417).

The building frontage areas will sheet drain across the boulevard area and to the existing storm sewer systems within each of the Campeau Drive, Great Lakes Avenue and Canadian Shield Avenue right-of-ways. Stormwater from the remainder of the site will be collected in area drains and into a private storm sewer system which will outlet to the existing 450mm diameter storm sewer along Canadian Shield Avenue. The storm servicing information is shown on the General Plan of Services (120191-GP).

8.0 STORMWATER MANAGEMENT

8.1 Stormwater Management Criteria

As indicated previously, the subject site is part of the Kanata Town Centre – Central Business District Subdivision. This subdivision is serviced by a Stormwater Management Facility (wet pond) currently located to the south-east of the site along Maritime Way (adjacent to the highway). The facility provides both quantity and quality control of stormwater. The facility design is outlined in a report entitled 'Stormwater Management Report Kanata Town Centre Central Business District' prepared by J.L. Richards & Associates Ltd. dated January 1999. A subsequent Technical Memorandum was prepared by J.L. Richards dated June 13, 2012. This Technical Memorandum updates the servicing information based on an increase in number of units proposed. The following Stormwater Management criteria is proposed for the subject development based on criteria established in the above noted J.L. Richards Report/Memorandum:

- Post-development peak flows to the existing storm sewer are to be controlled to the 5-year pre-development levels for all storms up to and including the 100-year event with a run-off coefficient of 0.8.

8.2 Quantity Control

Stormwater from the proposed development for storms up to and including the 100-year storm event will be controlled to the 5-year pre-development level with a run-off coefficient of 0.8 and a time of concentration of 20 minutes. The allowable release to the existing Canadian Shield Avenue storm sewer was calculated to be 171.9L/s.

The site has been divided into two different drainage areas as follows:

Area A-1

- Most of the area surrounding the building will sheet drain to the surrounding right-of-ways and enter the storm system along Canadian Shield. A small mainly grassed portion of A-1 will sheet drain towards Campeau similar to existing conditions. Any additional flows conveyed to the Campeau storm sewer system are considered minimal and will not adverse impact the Campeau storm sewer.

Area A-2

- Flows from the building roof and central courtyard area will be directed to the existing storm sewer along Canadian Shield. These flows will be captured by roof drains and area deck drains and will be conveyed by internal building plumbing to an underground storage tank under the front of the building. Flows from the storage tank will be controlled by an inlet control device prior to release to the existing storm sewer along Canadian Shield Avenue. Storage will be provided for storms up to and including the 100-year event within the storage tank.

The performance of the proposed stormwater management system was evaluated using a dual-drainage model created in PCSWMM. The PCSWMM model simulates the storage and routing of flows through the proposed storm drainage network. The results of the analysis were used to:

- Calculate the storm sewer hydraulic grade line and storage volumes for the 5-year, and 100-year storm events.
- Determine the allowable release rates from each drainage area and size the required inlet control devices (ICD's).
- Calculate the modelled runoff from the controlled portions and uncontrolled portions of the site under post-development conditions.

The design storms used in the hydrologic analysis model include the 3-hour Chicago distribution for return periods of 1:5 years and 1:100 years. IDF data was taken from the *City of Ottawa Sewer Design Guidelines* (OSDG) (October 2012). The 3-hour Chicago storm distribution was found to generate the highest peak flows and the model results from this distribution are documented in the following tables. The model schematic, system parameters and output files are provided in **Appendix D**.

The stormwater storage tank will be concrete and cast in place with the building foundation walls. It is anticipated that the tank will be 14m x 8.2m and provide an excess of 312 m³ volume of storage. An inlet control device (196mm diameter) will control the release of stormwater from the storage tank to 126.0 L/s. A second pipe (250mm diameter) will be installed as an overflow pipe which bypasses the inlet control device in the event there is a blockage or for storms in excess of the 100-year storm event. The storage tank extends beyond the building foundation wall and a manhole access lid is provided outside the building area to access the storage tank. In the event the municipal storm sewer surcharges, stormwater will flow out the manhole lid. A backflow prevention valve will be placed in the storage tank inlet pipe to prevent stormwater backing up into the building sewer system. A cross section detail of the storage tank is provided on the Notes and Detail drawing (120191-ND).

Refer to the Stormwater Management Plan (120191-SWM) for the various drainage areas. **Table 8.1** below summarizes the flow, storage required, and storage provided for each of the site drainage areas.

Table 8.1 Stormwater Management Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	Orifice Size & Type	5 Year Storm Event			100 Year Storm Event		
				Flow (L/s)	Req Vol (cu.m)	Max. Vol. Prov (cu.m.)	Flow (L/s)	Req Vol (cu.m)	Max. Vol. Prov (cu.m.)
A-1	0.190	0.42	N/A	23.1	N/A	N/A	45.9	N/A	N/A
A-2	0.902	0.90	196mm	89.2	149	>312	126.0	278	>312
Total Flow				**110.2**			**171.9**		
Allowable				**171.9**			**171.9**		

Refer to **Appendix D** for Rational Method calculations and modeling results. Refer to the Grading Plans (120191-GR) and the Stormwater Management Plan (120191-SWM) for more details.

8.3 Quality Control

Quality control of stormwater is provided from the existing Stormwater Management Facility located downstream of the site at the end of Maritime Way (adjacent to the highway). Sections of the J.L Richards Kanata Town Center Stormwater Management Report dated January 1999 have been provided in Appendix A of the report which details the total treated drainage area and the design parameters used in the QUALHYMO model. The J.L Richards report identifies that the SWMF facility has been designed for a treatment level of 70% TSS removal. The proposed development of Block 2 of the Kanata Town Center was included in the sub-watershed area number 3 for the QUALHYMO model and has been accounted for in the design of stormwater management facility for quality control.

8.4 Major Overland Flow Route

A major overland flow route will be provided for storms greater than the 100-year storm event. Stormwater from the central courtyard, and the rear of the site will be directed to Campeau Drive. Stormwater from the storage tank in the building will overflow out of the access lid to Canadian Shield Avenue and will flow towards the existing SWM facility. The major overland system is shown on the Grading Plan (dwg 120191-GR).

9.0 EROSION AND SEDIMENT CONTROL

9.1 Temporary Measures

Temporary erosion and sediment control measures will be implemented during construction. Silt fence, mud mats and filter socks in catchbasins, and area drains will be used as erosion and sediment control measures.

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair or replacement requirements. Sediments or granulars that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Grading Plan and Notes and Details Plan (dwg 120191-GR, 120191-ND) for additional information.

10.0 CONCLUSIONS AND RECOMMENDATIONS

- Water servicing for the proposed development will be serviced by two connections. Two 150mm diameter water services will connect to the existing 200mm diameter watermain within the Great Lakes Avenue right-of-way. The two services will be separated by an isolation valve within the existing watermain system in the event maintenance on the City system is required. The existing watermain infrastructure can provide adequate domestic flows and pressure for fire protection. Pressure reducing valves will be required on both water service connections.
- The proposed building will be serviced by a 200mm diameter sanitary service. The proposed building service will connect to the existing 200mm sanitary sewer within the Canadian Shield Avenue right-of-way. The existing sanitary sewer has adequate excess capacity to service the development.
- Quantity control of stormwater will be provided through a stormwater storage tank to attenuate flows to the existing storm sewer along Canadian Shield Avenue to the 5-year pre-development level for storms up to and including the 100-year event. The allowable release rate is 171.9 L/s and the post-development stormwater release rates are 112.3 L/s and 171.9 L/s for the 5 and 100 year events respectively.
- Quality control of stormwater management will be provided in the existing end of pipe stormwater management facility located on Maritime Way.
- An overland flow route is provided.
- Erosion and sediment control measures will be implemented prior to and during construction.

NOVATECH

Prepared by:

Paul Newcombe, EIT
Land Development Engineering

Reviewed by:

Cara Ruddle, P. Eng.
Senior Project Manager

APPENDIX A

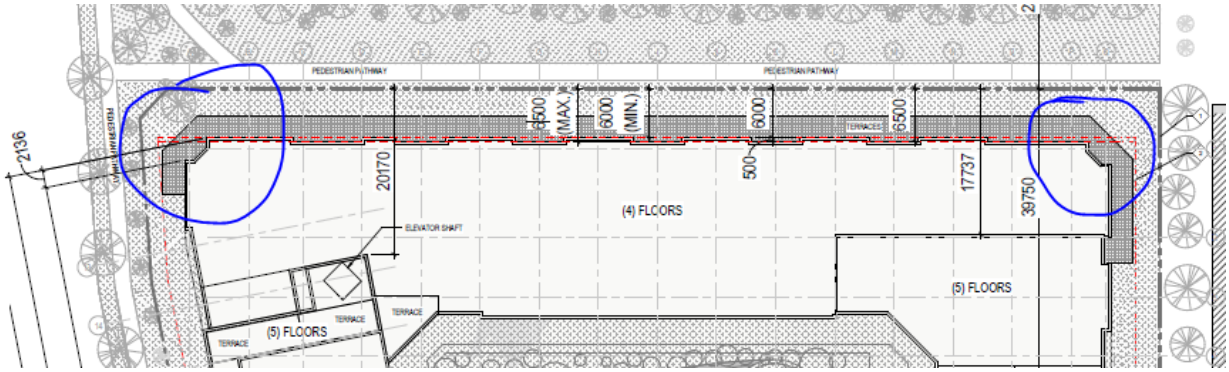
Correspondence

Planning Comments

1. The proposal is subject to a Minor Zoning By-law Amendment application and a subsequent Site Plan Control, Complex application. The application fee and timeline can be found here.
2. The site is zoned MC15 [2027].

Zoning Deficiencies

3. In the MC15 subzone, there is a requirement for office types uses (FSI of 1.5 or amount equal to residential) before residential is allowed. Similarly, retail and other commercial uses is only allowed when office/residential types use reaches FSI of 0.75 or greater. The goal is to promote office type uses first before allowing a mix of uses within the building.
4. All part of the building facing Campeau requires a maximum setback of 6.5m.



5. Maximum setback from a lot line abutting Great Lakes and Canadian Shield for at least 80% width of any building wall
   a. 0.5 m; or
   b. 2 m where a patio is located between the building wall and a lot line
6. Please confirm what the proposed building height is along Great Lakes and Canadian Shield. The cross section shows 7 storeys based on average grade which exceed the zoning and OP requirement of 6 storeys. If this design is kept, an Official Plan Amendment will also be required.
7. Please confirm if the minimum building separation to the adjacent retirement is met. The requirement is 12m for any portion greater than 15m in height. If the proposal changes based on the urban design comments (below) into two buildings, please make sure that proper separation distance is maintained.
8. Exceed maximum gfa of 2,500 sq m above for floors above 15m in height. This means that any floor even with a portion exceeding 15m need to adhere to the 2,500 sq m requirement.
9. Please confirm if minimum landscape area of 30% is met.
10. Please confirm if 50% of the length of any ground floor wall facing a public street must consist of windows and/or entrances.

11. Any proposed non-residential use on the ground floor must have direct access to the street.
12. Please confirm parking count at the time of submission.
13. Please confirm sufficient amenity space is provided as per section 137.

Official Plan

14. The site is designated as Town Centre within the City's Official Plan.
15. Employment target of at least 10,000 jobs in the Town Centre. Based on the 2016 Employment Survey, the current job number is 8,093. Please confirm that the remaining parcels can sufficient achieve the 10,000 jobs target if there is a request to reduce the amount of employment uses on-site.
16. Please confirm if the proposal meets the 120 people/jobs per gross hectare density target in Figure 2.3 of the OP.
17. The site is designated as Centre Business District with a maximum height of 6 storeys under the Kanata Town Centre Secondary Plan.
18. Under the secondary plan, the following is required. Any deviation will result in the need of an OPA application.

    Development facing Campeau Drive (between the City lands to the west and Gray Crescent) will be subject to the following provisions:

    a. A minimum building height of three storeys is required

    b. The maximum building height is three storeys for any development within 25 metres of the lot line abutting Campeau Drive Current design does not meet this.

    c. Mid-rise buildings up to a maximum of six storeys are permitted provided the building transitions from three storeys along Campeau Drive in accordance with the principles in Section 4.11 of the Official Plan. Current design does not meet this.

    d. To maintain a landscaped buffer and parkway character between the edge of the Town Centre and residential neighbourhoods to the north, yard setbacks from a lot line abutting Campeau Drive will generally be 6 metres.

19. A 100% residential building does not meet the intent of the Central Business District. It is the intent of this designation that these lands become an urban place that provides for employment uses, complemented by higher density residential uses. Given that this site has a zoning that requires a minimum of 1.5 FSI for non-residential uses before residential is permitted, an amendment to eliminate all non-residential uses may not be suitable. Please incorporate some non-residential uses into the building and preferably along the ground floor facing

Canadian Shield and Great Lakes. The frontage facing Campeau should remain residential in nature.

20. Cash-in-lieu of parkland will be required based on the Parkland Dedication By-law. If this has been previously paid through the subdivision process, please provide evidence of payment.
21. Please consult the Ward Councillor, Jenna Sudds, prior to application submission.

Urban Design Comments

1. A Design Brief is required. The requirements are attached.
2. Urban Design Review Panel will be required for the proposed increase in height and density beyond the current 2500 sq. m. threshold for all building gfa above 15 metres in height.
3. PRUD staff are concerned with a complete elimination of 100% of the requirement for non-residential uses, given the current requirement for 1.5 FSI of non-residential use. At a minimum the ground floor abutting Canadian Shield Avenue and Great Lakes Avenue should contain non-residential uses.
4. The provision of non-residential uses at grade is not conducive to the proposed 7+/- setback along Canadian Shield. Although some relief to the current 2 m maximum setback may be considered, a complete removal of this requirement is not supported.
5. More points of access and entry to the central courtyard should be provided.
6. Provide an additional main entrance in an additional location (Intersection of Campeau and Great Lakes shown)
7. The eastern yard functions as a rear yard for the site. The setback from this property line should be a minimum of 7.5 metres to provide adequate separation from the abutting second phase of the retirement home to the east. This area should be utilized to provide a north/south pedestrian connection on site.
8. All at grade residential units should have grade related terraces with direct access to the public realm – similar to Place St. Emillion abutting the storm water management pond.
9. Consider two buildings in lieu of one large building to allow for better light penetration into the courtyard and circulation.
10. Non-residential uses should be focused along the Canadian Shield and Great Lakes frontages where on-street parking is provided.

Engineering Comments

General:

- More comments from Infrastructure Planning Unit will follow, If any.

- 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.

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

Transportation Comments

Note that these are for re-zoning only. Additional information will be required at the time of SPA.

- Follow Traffic Impact Assessment Guidelines:
    - A TIA is required.
    - Note that because this application is for rezoning only at this time, the Design Review components (Module 4.1-4.4) are excluded.
    - It is noted that provided parking is identified as T.B.C. within the brochure. If a reduction in parking is sought, then Module 4.2 must also be included within the TIA.
    - 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)
- ROW protection on Campeau Dr between Didsbury and Teron is 40m even.
- The TMP includes the following planned infrastructure within the study area:
    - LRT along Hwy 417, Grade Separated Crossings (Ultimate Network, Map 3)
    - BRT along Hwy 417, Grade Separated Crossings (2031 Network Concept, Map 4)
    - Future BRT along Hwy 417 (2031 Affordable Network, Map 5)
    - Campeau Dr and Kanata Avenue are identified as Widened Arterials (2031 Network Concept, Map 10)
    - Kanata Avenue widening is identified as part of Phase 2 works (2031 Affordable Network, Map 11), note that the timing of Kanata Avenue widening is yet to be determined but is anticipated to be somewhere around 2031.
- Ensure the separation between the garage entrance and the moving aisle meets the Private Approach Bylaw.
- Sidewalk is to be continuous across access as per City Specification 7.1.
- Notes of items that will be evaluated at the time of SPA are provide for your information:
    - 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.
    - 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.

Forester Comments (Privately Owned Trees)

1. a Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City; an approved TCR is a requirement of Site Plan or Plan of Subdivision approval.
2. any removal of privately-owned trees 10cm or larger in diameter requires a tree permit issued under the Urban Tree Conservation Bylaw; the permit is based on the approved TCR
3. any removal of City-owned trees will require the permission of Forestry Services who will also review the submitted TCR
4. the TCR must list all trees on site by species, diameter and health condition
5. the TCR must list all trees on adjacent sites if they have a critical root zone that extends onto the development site
6. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
7. the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
8. Please ensure newly planted trees have an adequate soil volume for their size at maturity. Here are the recommended soil volumes:

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

9. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca

Forester Comment (City Owned Trees)

- The site plan must be developed such that there is no excavation or disturbance within the Critical Root Zones of these existing trees.
- Entrances and walkways must be limited in order to reduce the number of trees impacted. Any trees that must be removed from City property will require compensation.
- Metal tree protection fencing must be installed to separate the trees from the construction site prior to any works taking place.

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-con 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 contact me at stream.shen@ottawa.ca or at 613-580-2424 extension 24488 if you have any questions.

Sincerely,

Stream Shen MCIP RPP
Planner II
Development Review - West

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

TOPOGRAPHIC SURVEY OF BLOCK 2 REGISTERED PLAN 4M-1325 CITY OF OTTAWA

SCALE 1 : 250

0 5 10 20 25 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

ELEVATION NOTES

1. ELEVATIONS SHOWN HEREON ARE REFERRED TO GEODETIC DATUM.
2. ELEVATIONS FOR MANHOLE COVERS AND CATCH BASINS HAVE TO BE INDEPENDENTLY CONFIRMED BEFORE THEY CAN BE ACCEPTED FOR FINAL DESIGN OR CONSTRUCTION PURPOSES.
3. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT THEIR RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS DRAWING.

UTILITY NOTES

1. THIS DRAWING CANNOT BE ACCEPTED AS ACKNOWLEDGING ALL OF THE UNDERGROUND UTILITIES AND IT WILL BE THE RESPONSIBILITY OF THE USER TO CONTACT THE RESPECTIVE UTILITY AUTHORITIES FOR CONFIRMATION OR LOCATION.
2. UNDERGROUND UTILITIES, AS REPORTED ON THIS DRAWING, ARE NOT BASED ON AN ACTUAL "FIELD LOCATE" BY THE RESPECTIVE UTILITY AGENCIES BUT HAVE BEEN COMPILED FROM DATA OBTAINED FROM THE FOLLOWING SOURCE:
   a) CITY OF OTTAWA PUBLIC UTILITY REGISTRY.
3. BEFORE ANY WORK INVOLVING PROBING, EXCAVATING, ETC., A FIELD LOCATION OF UNDERGROUND PLANT BY THE PERTINENT UTILITY AUTHORITY IS MANDATORY.

NOTE

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM NCC CONTROL MONUMENTS 019781209 (N 5015107.459, E 349882.099) AND MTO 00919763383 (N 5013150.370, E 347729.674) AND ARE REFERRED TO THE CENTRAL MERIDIAN 76°30'W LONGITUDE, M.T.M. ZONE 9 (NAD83 ORIGINAL).

LEGEND

- ■ – SURVEY MONUMENT FOUND
- SIB – STANDARD IRON BAR
- SSIB – SHORT STANDARD IRON BAR
- CP – CONCRETE PIN
- (P) – REGISTERED PLAN 4M-1325
- (P1) – PLAN 4R-31231
- (M) – MEASURED
- (S) – SET
- (857) – FAIRHALL, MOFFATT & WOODLAND LIMITED, O.L.S. (REF. 1(a)-4M-1325, 21-4M-1325)
- DIA. – DIAMETER
- INV – INVERT
- PIN – PROPERTY IDENTIFIER NUMBER
- CB – CATCH BASIN
- MH – MANHOLE
- LS – LAMP STANDARD
- FH – FIRE HYDRANT
- WV – WATER VALVE
- HH – HAND HOLE
- – SIGN
- – DECIDUOUS TREE
- —W— – WATERMAIN
- —ST— – STORM SEWER
- —S— – SANITARY SEWER
- —G— – GAS LINE
- —SL— – STREET LIGHTING
- — B — – BELL
- —R— – ROGERS
- —T— – TELUS (2020)
- —HO— – HYDRO
- ═══ – CURB
- —x— – FENCE

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON AUGUST 05, 2020.

2020/08/17
DATE

JOHN H. GUTRI
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2316059

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

Fairhall Moffatt & Woodland LIMITED
ONTARIO LAND SURVEYORS
OTTAWA
Surveying and Land Information Services
100-600 TERRY FOX DRIVE, KANATA, ONTARIO K2L 4B6
TEL: (613) 591-2580 FAX: (613) 591-1465
www.fmw.on.ca

JOB No.	AA222000
	E 351675, N 5019712
REFERENCE No.	22-4M-1325
S:\JOBS\AA222000\DWG	11.08.2020
TP_AA222.dwg	(ss)

APPENDIX B
Water Servicing Information

1050 CANADIAN SHIELD

Floor areas + room distribution

FLOORS	GROSS AREA	COMMON SPACES	RENTAL AREA	ROOMS								TOTAL
		INCLUDING : CIRCULATION, PARKING AND SERVICES	(RESIDENTIAL)	1BD - TYPE A (800-850 sft)	1BD+O - TYPE B (851-900 sft)	1BD+O - TYPE C (901-950 sft)	1BD+O - TYPE D (951-1000 sft)	2BD type	2BD+O type	3BD type	3BD+O type	
	m²	m²	m²	qty	qty	qty	qty	qty	qty	qty	qty	qty
P2 PARKING LEVEL	8 824 m²	8 824	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
P1 PARKING LEVEL	8 786 m²	7 999	513	1	2	1	2	*0*	*0*	*0*	*0*	6
1ST FLOOR LEVEL	6 074 m²	1 368	4 706	8	17	1	10	4	8	*0*	1	49
2ND FLOOR LEVEL	6 216 m²	788	5 428	8	17	2	7	10	9	*0*	2	55
3RD FLOOR LEVEL	6 248 m²	743	5 505	4	17	2	7	14	6	*0*	4	54
4TH FLOOR LEVEL	4 083 m²	697	3 386	2	6	2	6	4	5	1	5	31
5TH FLOOR LEVEL	3 565 m²	415	3 149	2	5	2	6	5	7	2	1	30
6TH FLOOR LEVEL	2 762 m²	408	2 353	*0*	1	*0*	*0*	8	3	4	3	19
TOTAL	46 558 m²	21 243	25 041	25	65	10	38	45	38	7	16	244
TOTAL (sq. ft.)	*501 147*	*228 657*	*269 539*									
				18%	*49%*	*7%*	*26%* *100%*					
				10%	*27%*	*4%*	*14%*	*18%*	*16%*	*3%*	*7%*	*100%*
				55%				*45%*				*100%*

COMMERCIAL SPACES ON P1 LEVEL	
LOCAL #3520	76 m² (818 ft²)
LOCAL #3521	122 m² (1313 ft²)
LOCAL #356	76 m² (818 ft²)
TOTAL	274 m² (2 949 ft²)

GENERAL STATISTICS

LOT AREA 10 917 m²
117 509 sq.ft

BUILDING FOOTPRINT 6 261 m²
67 392 sq.ft

	REQUIRED	PROVIDED
LANDSCAPE AREA	30% MIN. / 3275 m² 35251 sq.ft	32.4% / 3 541 m² 38 115 sq.ft
TOTAL PRIVATE AMENITY SPACE	6 m² PER UNIT 1 464 m2	2622 m²
TOTAL COMMUNAL AMENITY AREA	50% OF PRIVATE AMENITY SPACES 735 m2	686 m2 (INDOOR) 373 m2 (OUTDOOR) **1059 m2 (TOTAL)**

WINDOWS / DOORS - GROUND FLOOR WALL FACING A PUBLIC STREET	50% OFTHE WALL LENGHT	• CAMPEAU DRIVE 52% • CANADA SHIELD AVE. 50% • GREAT LAKES AVE. 52%

PARKING REQUIRED

1.0 Residents (parking space / dwelling unit)		**244**
0.2 Visitors (parking space / dwelling unit)		**49**
Commercial parking		**10**
TOTAL PARKING REQUIRED		**303**
TOTAL PARKING PROVIDED INCLUDED BARRIER FREE PARKING		**351**
MINIMUM BARRIER FREE PARKING REQUIRED 10	PROVIDED 10	

Bicycle parking required - Residential → *123* (0,5 bicycle parking / dwelling unit) **Provided** → *124*

STATISTICS

NOVATECH
Engineers, Planners & Landscape Architects

1050 CANADIAN SHIELD AVENUE
Carré Saint Louis
HYDRAULIC ANALYSIS

JOB NO. 120191
DATE PREPARED: JUNE 2021
REVISED: NOVEMBER 2021

Table 1
Water Demand

	Unit Type						Total Demand (L/s)		
	1 Bed Apartment	2 Bed Apartment	3 Bed Apartment	3 Bed+ Office Apartment	Commercial	Total	Avg Day	Max. Daily	Peak Hour
Unit Count	25	158	45	16	n/a	244	2.27	5.68	12.50
Area (m^2)	-	-	-	-	274	274	0.03	0.04	0.07
Population	35	332	140	54	-	561	**2.30**	**5.72**	**12.57**

Design Parameters:

- 1 Bed Apartment	1.4	persons/unit
- 2 Bed/ 1 Bed + Office Apartment	2.1	persons/unit
- 3 Bed/ 2 Bed + Office Apartment	3.1	persons/unit
-3 Bed + Office Apartment	3.4	persons/unit
Section 4.0 Ottawa Sewer Design Guidelines		
- Average Domestic Flow	350	L/person/day
Ontario Building Code Table 8.2.1.3		
- Office Area Flows	75	l/9.3m² /day
Peaking Factors: Table 4.2 Ottawa Design Guidelines - Water Distribution		
Max. Daily Demand:		
- Residential	2.5	x Avg Day
- Commercial	1.5	x Avg Day
Peak Hourly Demand:		
- Residential	2.20	x Max Day
- Commercial	1.80	x Max Day

1050 CANADIAN SHIELD AVENUE
Carré Saint Louis
HYDRAULIC ANALYSIS

BOUNDAY CONDITIONS (Values provided by the City of Ottawa)

Connection 1 - Ground Elevation = 101.4m		
Demand Scenario	**Head (m)**	**Pressure (psi)**
Maximum HGL	161.3	85.2
Peak Hour	156.3	78
Max Day plus Fire 1	149.8	68.8
Connection 2 - Ground Elevation = 101.2m		
Maximum HGL	161.3	85.4
Peak Hour	156.3	78.2
Max Day plus Fire 1	149.8	69.1

PRESSURE TESTS

To convert Head(m) to PSI: multiply by 1.42

Potential Finished Floor Elevation 99.60 m

Connection 1

High Pressure Test = (Max HGL - Avg.Ground Elev.) x 1.42197 PSI/m < 80 PSI

High Pressure = **87.7** PSI

Low Pressure Test = (Min. HGL - Avg. Ground Elev.) x 1.42197 PSI/m > 40 PSI

Low Pressure = **80.6** PSI

Max Day + Fire Flow Test = (Max Day + Fire Flow - Avg. Ground Elev.) x 1.42197 PSI/m > 20 PSI

71.4 PSI

Connection 2

High Pressure Test = (Max HGL - Avg.Ground Elev.) x 1.42197 PSI/m < 80 PSI

High Pressure = **87.7** PSI

Low Pressure Test = (Min. HGL - Avg. Ground Elev.) x 1.42197 PSI/m > 40 PSI

Low Pressure = **80.6** PSI

Max Day + Fire Flow Test = (Max Day + Fire Flow - Avg. Ground Elev.) x 1.42197 PSI/m > 20 PSI

71.4 PSI

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 120191
Project Name: 1050 Canadian Shield
Date: 3/30/2021
Input By: Jesse Kaloudas
Reviewed By: Matt Hrehoriak

Legend: Input by User; No Information or Input Required

Building Description: 6-Storey Apartment Building
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	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	8877.75			
		Number of Floors/Storeys	1			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**8,878**	
	F	**Base fire flow without reductions**				**17,000**
		F = 220 C (A)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**14,450**
		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%	**-7,225**
		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%	**3,613**
		East Side	10.1 - 20 m		15%	
		South Side	30.1- 45 m		5%	
		West Side	30.1- 45 m		5%	
				Cumulative Total	**25%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**11,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**183**
				or	USGPM	2,906
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	1320

Boundary Conditions
1050 Canadian Shield Avenue

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	136	2.27
Maximum Daily Demand	339	5.65
Peak Hour	745	12.42
Fire Flow Demand #1	11,000	183.33

Location

Results

Connection 1 – Canadian Shield Ave.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.3	85.2
Peak Hour	156.3	78.0
Max Day plus Fire 1	149.8	68.8

Ground Elevation = 101.4 m

Connection 2 – Canadian Shield Ave.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.3	85.4
Peak Hour	156.3	78.2
Max Day plus Fire 1	149.8	69.1

Ground Elevation = 101.2 m

Notes

1. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

APPENDIX C
Sanitary Servicing Information

MEMORANDUM

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

To: Cara Ruddle, P.Eng.
Novatech Engineering Consultants Ltd.

Date: October 7, 2021

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 2 – 1050 Canadian Shield Avenue

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 2. Refer to attached JLR Sanitary Drainage Plan for location of Block 2.

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 development:

a) **Proposed Block 2 - Residential development**
The proposed development will result in a theoretical increase in peak flow from 1.56 L/s to 9.49 L/s at MH 541 where the Block 2 development outlets to Canadian Shield Avenue. This represents a theoretical peak flow increase of 7.93 L/s from the anticipated 2012 land use (i.e., Commercial Use).

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 development would result in a theoretical increase in peak flow from 475.94 L/s to 484.37 L/s which corresponds to a 8.43 L/s (1.02%) 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 on Canadian Shield Avenue, Maritime Way to the intersection of Campeau Dr and Teron Rd has the capacity to accommodate the additional theoretical peak flows of Block 2. 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

Commercial Flow =	50000	L/ha/d
q residential=	350	l/cap/d
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q retirement homes =	450	l/cap/d
I =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room

Manning's Coefficient (n) = 0.013

MASTER SANITARY SEWER DESIGN SHEET
Designed: L.D.

2021 Update by: KF
2021 Check by: LD

Date: October 6, 2021

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.		CUMM.	PEAK EXTR.	PEAK DES.						
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	AREA	AREA	FLOW	FLOW	FLOW	FLOW	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							
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.	Block 2	541						244	561	561	561	1.33	561	1.33	4.00	9.09	0.0274	0.0274	0.02			0.38	9.49	200	2.00	46.38	1.48	14.80	36.88	20%
CANADIAN SHIELD AV.	541	540						154	277.2	232	232	0.51	1062	2.58	3.78	16.27		0.03	0.02			0.73	17.03	200	0.90	31.13	0.99	77.70	14.10	55%
	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	1490	3.90	3.68	22.22		0.03	0.02			1.10	23.34	200	0.71	27.65	0.88	82.60	4.31	84%
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	1819	5.75	3.62	26.65		0.03	0.02			1.62	28.30	200	3.12	57.95	1.84	49.30	29.65	49%
	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											2120	6.67	3.57	30.62		0.03	0.02			1.87	32.52	200	1.70	42.76	1.36	38.40	10.24	76%
MARITIME WAY	510	501											2120	6.67	3.57	30.62		0.03	0.02			1.87	32.52	200	2.28	49.52	1.58	11.30	17.00	66%
TRUNK EASEMENT	501	500											6104	40.42	3.16	78.23		27.65	24.00		163.82	19.42	285.47	825	0.10	462.89	0.87	129.00	177.42	62%
TRUNK EASEMENT	500	94											6104	40.42	3.16	78.23		27.65	24.00		163.82	19.42	285.47							
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											6231	42.41	3.16	79.64		27.65	24.00		163.82	19.98	287.44	825	0.12	497.22	0.93	17.5	209.79	58%
	95	89			10						27	0.52	6258	42.93	3.15	79.94		27.65	24.00		163.82	20.12	287.88	825	0.12	497.22	0.93	66.6	209.34	58%
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	6420	45.29	3.14	81.73		27.65	24.00		163.82	20.78	290.33	825	0.12	497.22	0.93	79.0	206.89	58%
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	6589	47.74	3.13	83.60		27.65	24.00		163.82	21.47	292.89	825	0.12	497.22	0.93	79.0	204.33	59%
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	6724	50.01	3.12	85.08		27.65	24.00		163.82	22.11	295.01	825	0.12	497.22	0.93	55.0	202.21	59%
	67	66			6						16	0.33	6741	50.34	3.12	85.26		27.65	24.00		163.82	22.20	295.28	825	0.12	497.22	0.93	70.0	201.94	59%

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			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							
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	6935	54.76	3.11	87.39		27.65	24.00		163.82	23.44	298.64	825	0.12	497.22	0.93	62.0	198.58	60%
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		14732	246.36	2.79	166.28		27.65	24.00		201.54	77.08	468.90	900	0.11	600.38	0.94	17.0	131.48	78%
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		14903	248.31	2.78	167.89		27.65	24.00		201.54	77.63	471.06	900	0.11	600.38	0.94	13.0	129.32	78%
	63	57			10						27	0.68	14930	248.99	2.78	168.15		27.65	24.00		201.54	77.82	471.51	900	0.11	600.38	0.94	64.9	128.88	79%
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	15166	252.03	2.77	170.39		27.65	24.00		201.54	78.67	474.60	900	0.11	600.38	0.94	53.5	125.78	79%
	34	33			3						8		15174	252.03	2.77	170.47		27.65	24.00		201.54	78.67	474.68	900	0.11	600.38	0.94	50.3	125.70	79%
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	15365	255.92	2.77	172.27		27.65	24.00		201.54	79.76	477.57	900	0.11	600.38	0.94	72.7	122.81	80%
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	15476	257.36	2.76	173.32		27.65	24.00		201.54	80.16	479.02	900	0.11	600.38	0.94	44.4	121.36	80%
	18	16			4						11		15487	257.36	2.76	173.42		27.649	24.00		201.54	80.16	479.12	900	0.11	600.38	0.94	44.4	121.26	80%
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	15514	258.02	2.76	173.67		28.17	24.45		201.54	80.49	480.16	900	0.11	600.38	0.94	66.0	120.23	80%
	15	14 A			2						5		15519	258.02	2.76	173.72		28.17	24.45		201.54	80.49	480.21	900	0.11	600.38	0.94	25.8	120.17	80%
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											15708	260.85	2.76	175.50		28.17	24.45		201.54	81.29	482.78	900	0.11	600.38	0.94	14.7	117.60	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%
COLCHESTER SQUARE	14	11		4							11	0.16	15719	261.01	2.76	175.60		28.69	24.90		201.54	81.48	483.52	900	0.11	600.38	0.94	72.6	116.86	81%
TERON	11	10											15719	261.01	2.76	175.60		28.69	24.90		201.54	81.48	483.52	900	0.11	600.38	0.94	29.6	116.86	81%
	10	EX.										0.25	15719	261.26	2.76	175.60		28.69	24.90		201.54	81.55	483.59	900	0.11	600.38	0.94	72.3	116.79	81%
TERON	O.P.P.	EX.													4.00					0.78	0.78		0.78	100	Forcemain					

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q hotel =	270	l/cap/d
q retirement homes =	450	l/cap/d
I =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room

Manning's Coefficient (n) = 0.013

MASTER SANITARY SEWER DESIGN SHEET
Designed: L.D.

2021 Update by: KF
2021 Check by: LD

Date: October 6, 2021

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.														
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	Actual AREA	CUMM. AREA	COMM. 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							
TERON	EX.	EX. 2											15719	261.26	2.76	175.60		28.69	24.90		202.32	81.55	484.37	680	0.96	838.61	2.31	9.4	354.24	58%

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

(2) Park or open space area.

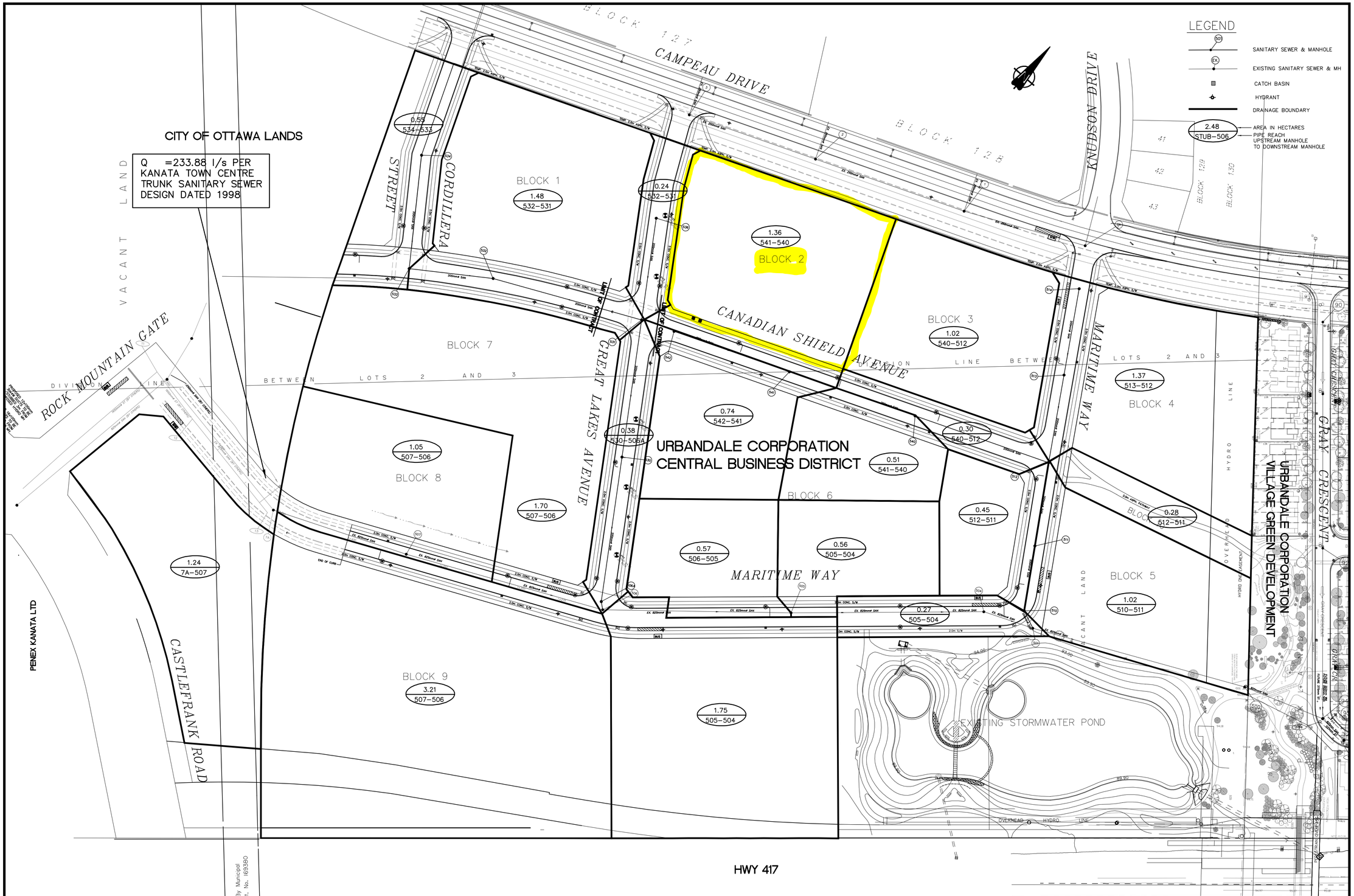
(3) Equivalent population base on 208 rooms and 20 staff members.

(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)

LICENSED PROFESSIONAL ENGINEER
K.R. FERREY MORENO
100122432
2021-10-07
PROVINCE OF ONTARIO



	DATE	REVISIONS	BY
9	12/06/12	REVISED CBD DRAINAGE	JLP
8	24/07/07	REVISED AS PER CITY COMMENTS	CSB
7	25/05/07	PHASE 2 ISSUED FOR CITY REVIEW	CSB
6	08/03/07	ISSUED FOR TENDER	CSB

NO.	DATE	REVISIONS	BY
5	02/11/06	PER CITY COMMENTS	CSB
4	13/09/06	ISSUED TO CITY FOR REVIEW	LND
3	21/07/06	ISSUED TO CITY FOR REVIEW (STREET 'A' NORTH-SOUTH LEG)	LND
2	05/11/98	REVISED PER RMOC	LND
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
Tel: 613 728 3571
Fax: 613 728 6012

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

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. # FROM	M.H. # TO	No. of UNITS Singles & Townhouses	No. of UNITS Stacked Townhouses	AREA ha	CUMMULATIVE POPUL. peop.	CUMMULATIVE AREA ha	Peaking Factor	POPUL. FLOW l/s	INFIL. FLOW l/s	PEAK FLOW l/s	SEWER DATA DIA. mm	Slope %	CAPAC. l/s	VEL. m/s	LENGTH 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	0.83	200	1.40	38.60	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	0.67	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	0.86	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	0.94	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

LICENSED PROFESSIONAL ENGINEER
M. N. I. DALRYMPLE
PROVINCE OF ONTARIO

PROJECT #: 120191
PROJECT NAME: 1050 CANADIAN SHIELD AVENUE
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: May 2021

1050 CANADIAN SHIELD SANITARY FLOWS

LOCATION			RESIDENTIAL									COMMERCIAL		INFILTRATION			Total Flow (l/s)	PIPE					
AREA	FROM	TO	Apartment Units					TOTAL															
			1 Bed Units	2 Bed Units	3 Bed Units	3 Bed + Office	Pop.	Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)	Area	Peak Flow (l/s)	Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)		Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
	1050	EX	25	158	45	16	561	561	561	3.2	5.74	274.00	0.03	1.36	1.36	0.45	6.22	200	2.00	14.8	46.3	1.48	13.4%

Design Parameters:

- 1 Bed Apartment	1.4	persons/unit
- 2 Bed/ 1 Bed + Office Apartment	2.1	persons/unit
- 3 Bed/ 2 Bed + Office Apartment	3.1	persons/unit
-3 Bed + Office Apartment	3.4	persons/unit

Ontario Building Code Table 8.2.1.3

- Office Area Flows	75	l/9.3m² /day

Section 4.0 Ottawa Sewer Design Guidelines

- Average Domestic Flow	280	L/person/day
- Extraneous Flows	0.33	l/s/ha
Residential Peaking Factor	Harmon Equation	
Commercial Peaking Factor	1	

APPENDIX D
Stormwater Management Calculations

PROJECT #: 120191
PROJECT NAME: Carré Saint Louis
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: June 2021
Revised: December 2021

TABLE 1A: Allowable Runoff Coefficient "C"

Area	"C"
Total	0.80
1.10	

TABLE 1B: Allowable Flows

Outlet Options	Area (ha)	"C"	Tc (min)	$Q_{5\ Year}$ (L/s)
Candian Shield	1.100	0.80	20	**171.9**

Time of Concentration Tc= 20 min
Intensity (5 Year Event) I_5= 70.25 mm/hr
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$

PROJECT #: 120191
PROJECT NAME: Carré Saint Louis
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: June 2021
Revised December 2021

TABLE 2A: Post-Development Runoff Coefficient "C" - A-1

Area	Surface	Ha	"C"	C_{avg}	$*C_{100}$
Total	Hard	0.060	0.90	0.42	0.49
0.190	Soft	0.130	0.20		

Runoff Coefficient Equation

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

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

TABLE 2B: Post-Development A-1 Flows

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Canadian Shield	0.190	0.42	10	**17.1**	**23.1**	**45.9**

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

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

TABLE 3A: Post-Development Runoff Coefficient "C" - A-2

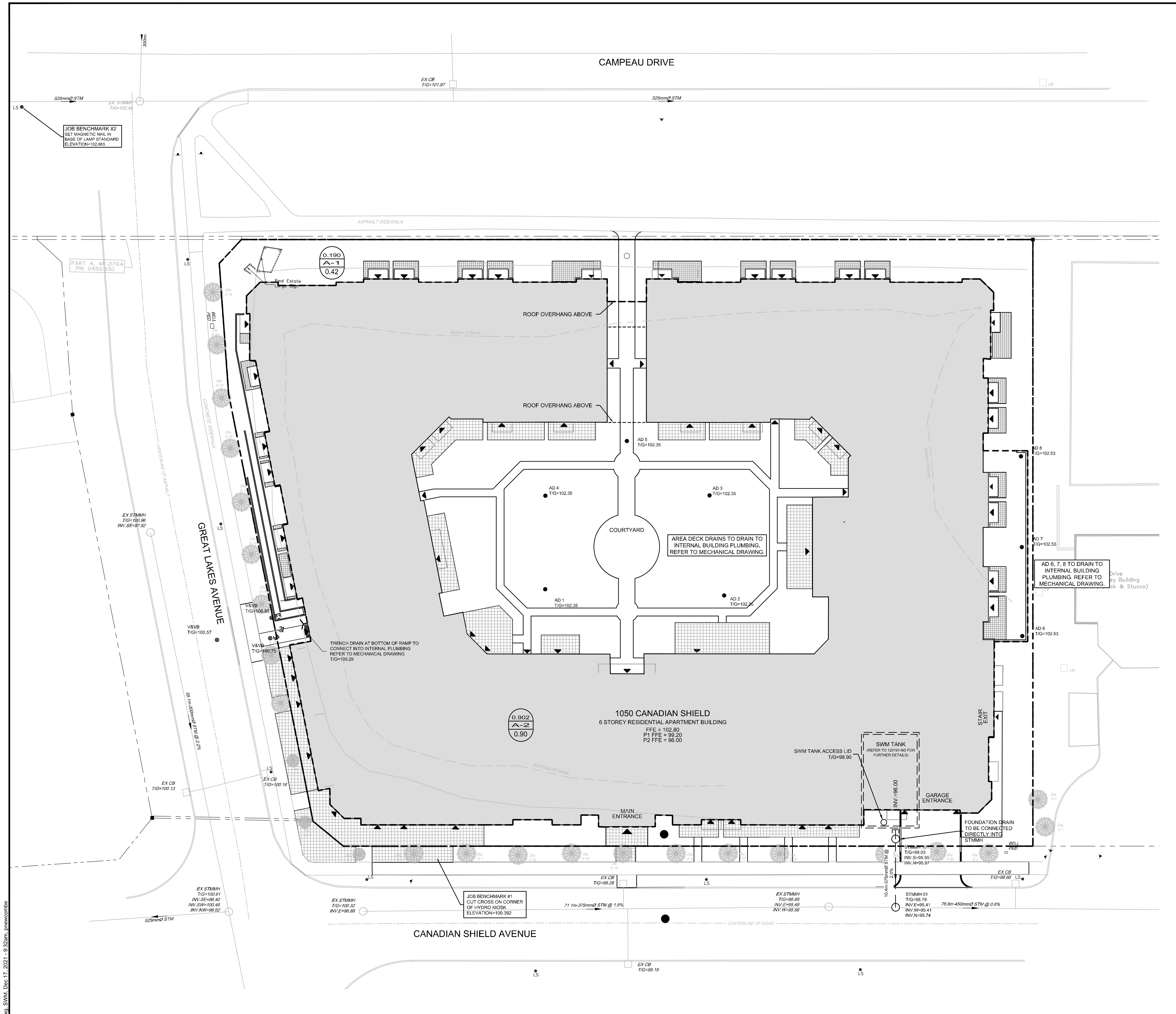
Area	Surface	Ha	"C"	C_{avg}	% IMP
Total	Hard	0.902	0.90	0.90	100%
0.902	Soft	0.000	0.20		

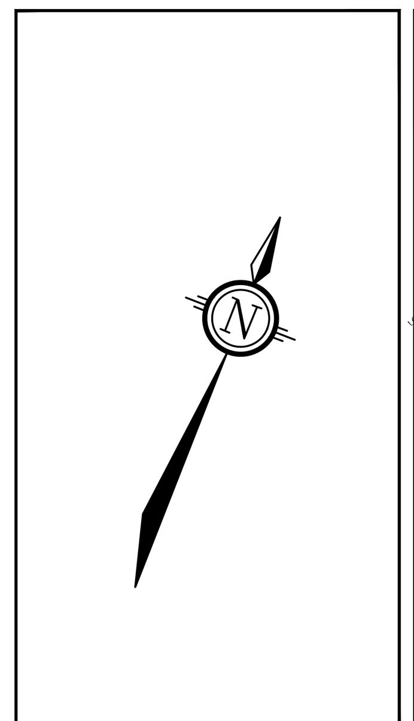
Note:
Stormwater from area A-2 is to drain to the stormwater tank, and has been modeled using PCSWMM. Refer to model results for details

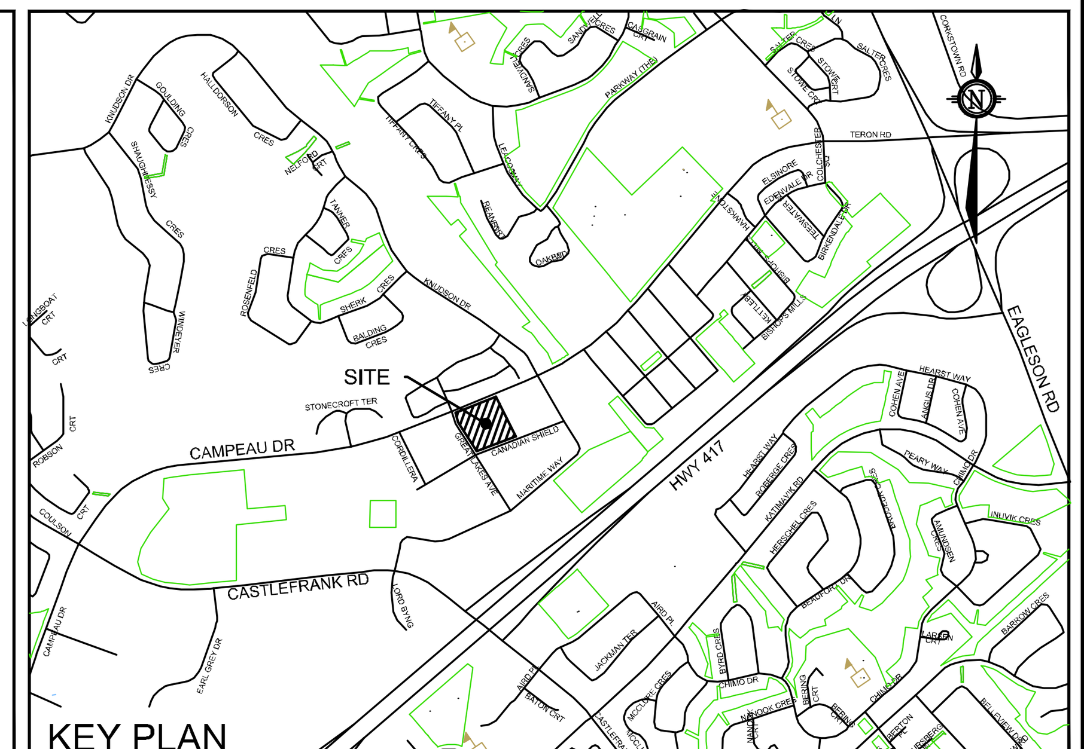
Table 4: Post-Development Stormwater Mangement Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	1:100 Year Weighted Cw	Outlet Location	Orifice	2 Year Storm Event			5 Year Storm Event			100 Year Storm Event		
						Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)	Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)	Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)
A-1	0.190	0.42	0.49	Canadian Shield	N/A	17.1	N/A	N/A	23.1	N/A	N/A	45.9	N/A	N/A
A-2	0.902	0.90	1.00	Canadian Shield	196mm	74.1	0.92	106.0	89.2	1.30	149.0	126.0	2.52	278.0
Total						**91.2**			**112.3**			**171.9**		
Allowable						**171.9**			**171.9**			**171.9**		

Notes: Information for drainage area A-2 from PCSWMM model







INLET CONTROL DEVICE FOR STORAGE TANK					
DESIGN EVENT	ICD TYPE AND SIZE	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	STORAGE REQUIRED (m^3)
1:2 YEAR	196mm	375	74.1	0.92	106
1:5 YEAR			89.2	1.30	149
1:100 YEAR			126.0	2.52	278

LEGEND

- PROPERTY LINE
- PROPOSED STORM SEWER AND MANHOLE
- DIRECTION OF FLOW
- AD — PROPOSED AREA DECK DRAIN BY OTHERS (REFER TO MECH DRAWINGS FOR MORE INFO)
- RD — PROPOSED ROOF DRAIN NY OTHERS (REFER TO MECH DRAWINGS FOR MORE INFO)
- STM MH — EXISTING STORM MANHOLE & SEWER
- CB 1 — EXISTING CATCHBASIN
- STORM SEWER DRAINAGE AREA BOUNDARY
- 0.085 / A-16 / 0.78 — DRAINAGE AREA (ha) / DRAINAGE AREA ID / RUNOFF COEFFICIENT

REFER TO 120191-ND FOR ADDITIONAL NOTES

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.

PRELIMINARY NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENTS	DEC 17/21	CJR
2.	ISSUED FOR SITE PLAN APPROVAL	JUL 7/21	CJR
1.	ISSUED FOR COORDINATION	MAR 30/21	CJR

SCALE 1:300

DESIGN MJH
CHECKED CJR
DRAWN MJH
CHECKED CJR
APPROVED JLS

FOR REVIEW ONLY

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
CARRÉ-SAINT-LOUIS

DRAWING NAME
STORMWATER MANAGEMENT PLAN

PROJECT No. 120191
REV # 3
DRAWING No. 120191-SWM

D07-16-15-0008
#18567

M:\2020\120191\CAD\Design\120191-SWM.dwg, SWM, Dec 17, 2021 - 9:32am, jnewcombe

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

****
Element Count
****
Number of rain gages 4
Number of subcatchments ... 1
Number of nodes 3
Number of links 3
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
Chicago3hr_100yr	ch3-100	INTENSITY	10 min.
Chicago3hr_2yr	ch3-2	INTENSITY	10 min.
Chicago3hr_5yr	ch3-5	INTENSITY	10 min.
Stress_Test(100yr+20%)	ch3-100+20	INTENSITY	10 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A-2	0.90	451.00	100.00	2.0000	Chicago3hr_100yr	TANK

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
STM101	JUNCTION	95.95	3.08	0.0	
MH01	OUTFALL	95.40	0.71	0.0	
TANK	STORAGE	96.00	2.90	0.0	

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	STM101	MH01	CONDUIT	10.4	2.0196	0.0130
C2	TANK	STM101	CONDUIT	5.0	2.6009	0.0130
OR1	TANK	STM101	ORIFICE			

```
  *********************
  Cross Section Summary
  *********************
                                      Full     Full     Hyd.     Max.   No. of
Full
  Conduit          Shape              Depth     Area     Rad.    Width  Barrels
Flow
  ---------------------------------------------------------------------------
---
  C1               CIRCULAR            0.38     0.11     0.09     0.38        1
249.18
  C2               CIRCULAR            0.25     0.05     0.06     0.25        1
95.91


  ***********************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  ***********************************************************

  ****************
  Analysis Options
  ****************
  Flow Units ............... LPS
  Process Models:
    Rainfall/Runoff ........ YES
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 03/29/2021 00:00:00
  Ending Date .............. 03/30/2021 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:01:00
  Wet Time Step ............ 00:05:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 1
  Head Tolerance ........... 0.001524 m


  *************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m            mm
  *************************     ---------       -------
  Total Precipitation ......         0.065        71.667
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.000         0.000
  Surface Runoff ...........         0.065        71.714
  Final Storage ............         0.000         0.157
  Continuity Error (%) .....        -0.286


  *************************        Volume        Volume
```

Flow Routing Continuity	hectare-m	10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.065	0.646
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.065	0.646
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.007	

Time-Step Critical Elements

Link C1 (15.40%)

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	2.25 sec
Average Time Step	:	4.67 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff 10^6 ltr	Total Runoff LPS	Runoff Coeff
A-2	71.67	0.00	0.00	0.00	71.71	0.00	71.71	0.65	447.39	1.001

Node Depth Summary

	Average	Maximum	Maximum	Time of Max	Reported

Node	Type	Depth Meters	Depth Meters	HGL Meters	Occurrence days hr:min	Max Depth Meters
STM101	JUNCTION	0.03	0.19	96.14	0 01:20	0.19
MH01	OUTFALL	0.50	0.53	95.93	0 01:20	0.53
TANK	STORAGE	0.20	2.52	98.52	0 01:20	2.52

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Flow Inflow Volume 10^6 ltr	Flow Balance Error Percent
STM101	JUNCTION	0.00	125.96	0 01:20	0	0.646	0.001
MH01	OUTFALL	0.00	125.96	0 01:20	0	0.646	0.000
TANK	STORAGE	447.39	447.39	0 01:10	0.646	0.646	0.000

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
TANK	0.023	7	0	0	0.278	89	0 01:20	125.96

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
MH01	35.52	36.41	125.96	0.646
System	35.52	36.41	125.96	0.646

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	125.96	0 01:20	2.26	0.51	0.50
C2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
OR1	ORIFICE	125.96	0 01:20			1.00

****
Flow Classification Summary
****

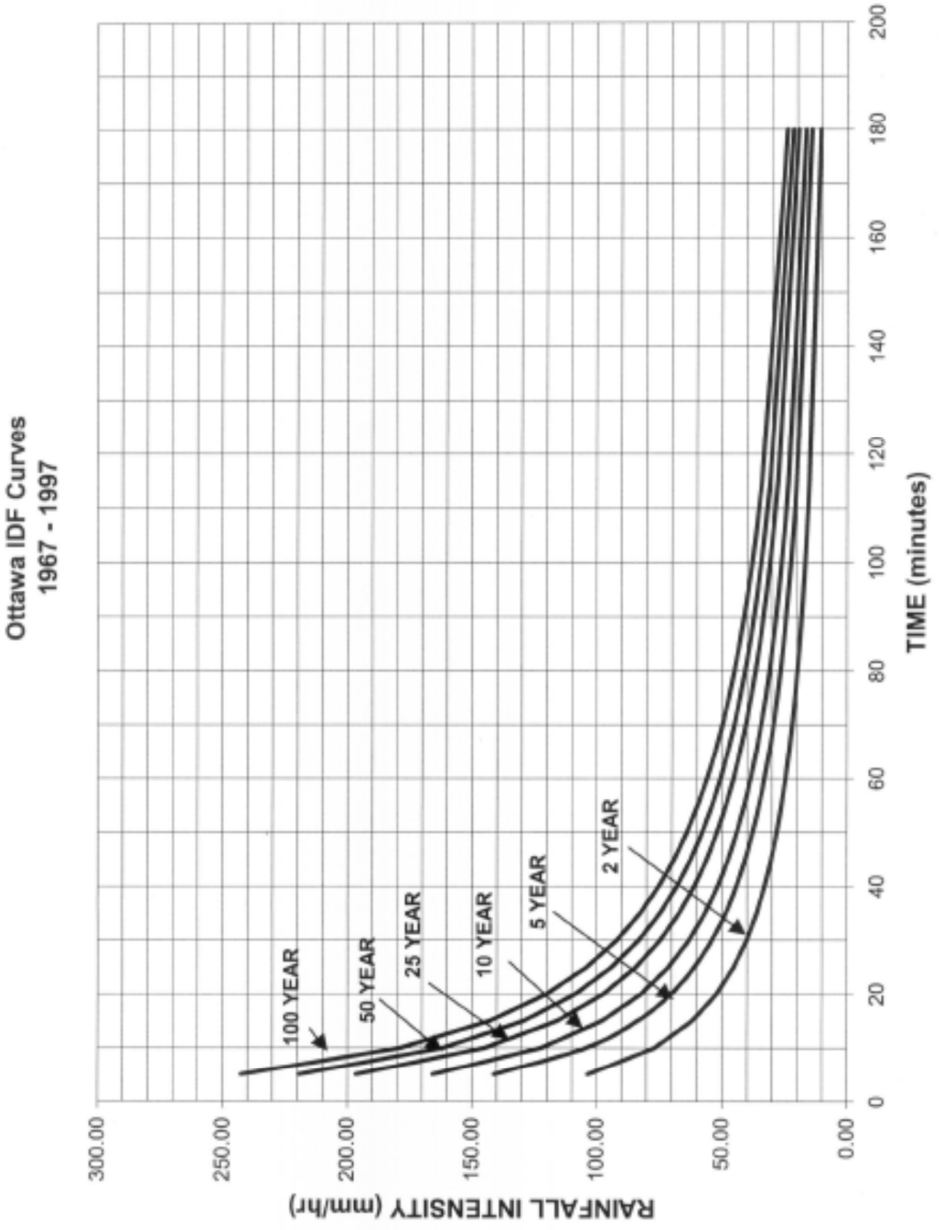
Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.00	0.01	0.00	0.85	0.14	0.00	0.00	0.96	0.00
C2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Dec 9 19:03:52 2021
Analysis ended on: Thu Dec 9 19:03:53 2021
Total elapsed time: 00:00:01

APPENDIX 5-A OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE



APPENDIX E
Referenced Reports

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

Commercial Flow =	50000	L/ha/d
q residential=	350	l/cap/d
q hotel =	270	l/cap/d
q retirement homes =	450	l/cap/d
i =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room
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.		CUMM.	PEAK EXTR.	PEAK DES.							
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	AREA	AREA	FLOW	FLOW	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)	
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%

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA

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

Commercial Flow =	50000	L/ha/d
q residential=	350	l/cap/d
q hotel =	270	l/cap/d
q retirement homes =	450	l/cap/d
i =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room
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.		CUMM.	PEAK EXTR.	PEAK DES.						
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	AREA	AREA	FLOW	FLOW	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%

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA

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

Commercial Flow =	50000	L/ha/d
q residential=	350	l/cap/d
q hotel =	270	l/cap/d
q retirement homes =	450	l/cap/d
i =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room
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 (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.

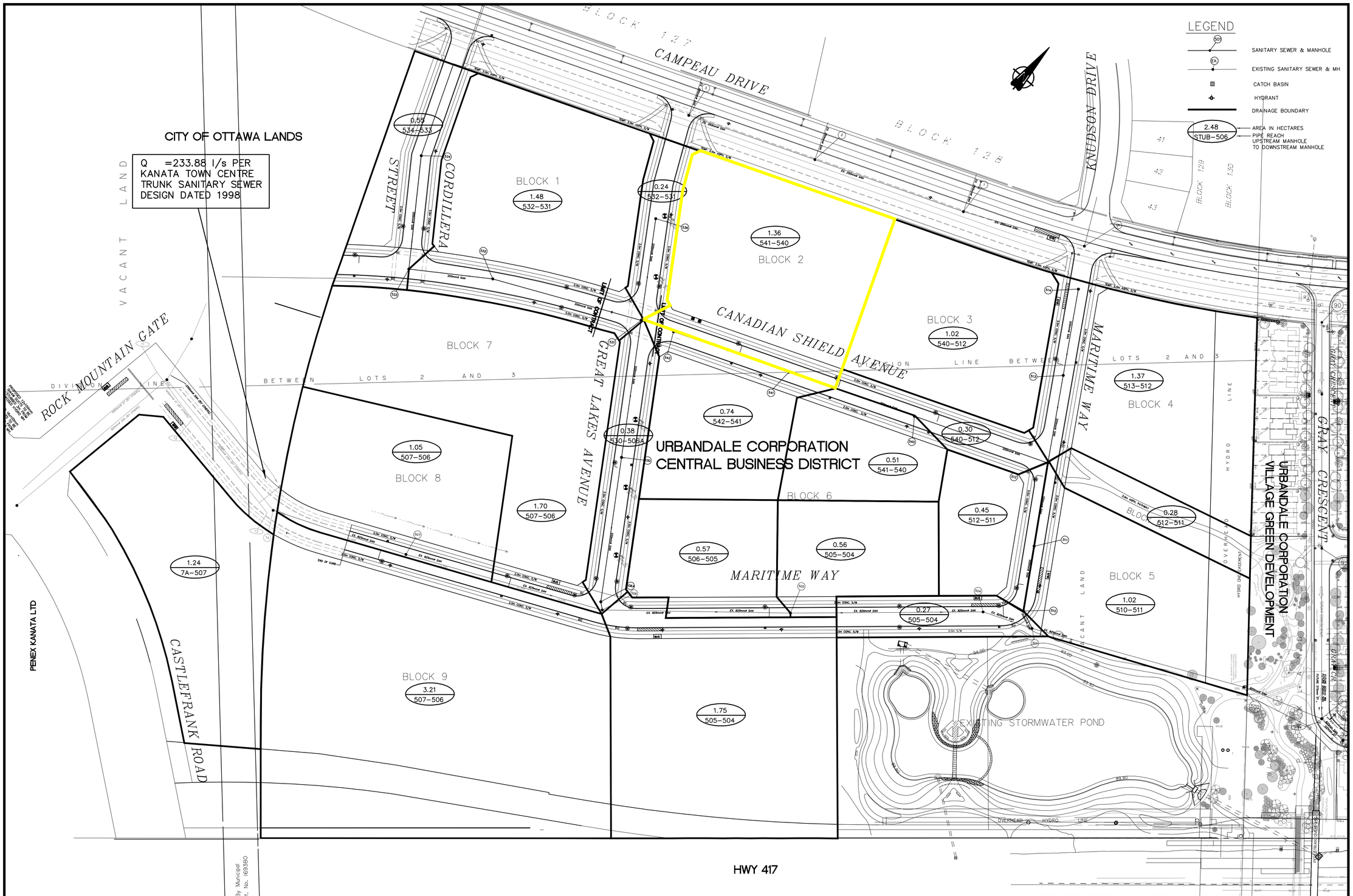
(2) Park or open space area.

(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
9	12/06/12	REVISED CBD DRAINAGE	JLP
8	24/07/07	REVISED AS PER CITY COMMENTS	CSB
7	25/05/07	PHASE 2 ISSUED FOR CITY REVIEW	CSB
6	08/03/07	ISSUED FOR TENDER	CSB

NO.	DATE	REVISIONS	BY
5	02/11/06	PER CITY COMMENTS	CSB
4	13/09/06	ISSUED TO CITY FOR REVIEW	LND
3	21/07/06	ISSUED TO CITY FOR REVIEW (STREET 'A' NORTH-SOUTH LEG)	LND
2	05/11/98	REVISED PER RMOC	LND
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
Tel: 613 728 3571
Fax: 613 728 6012

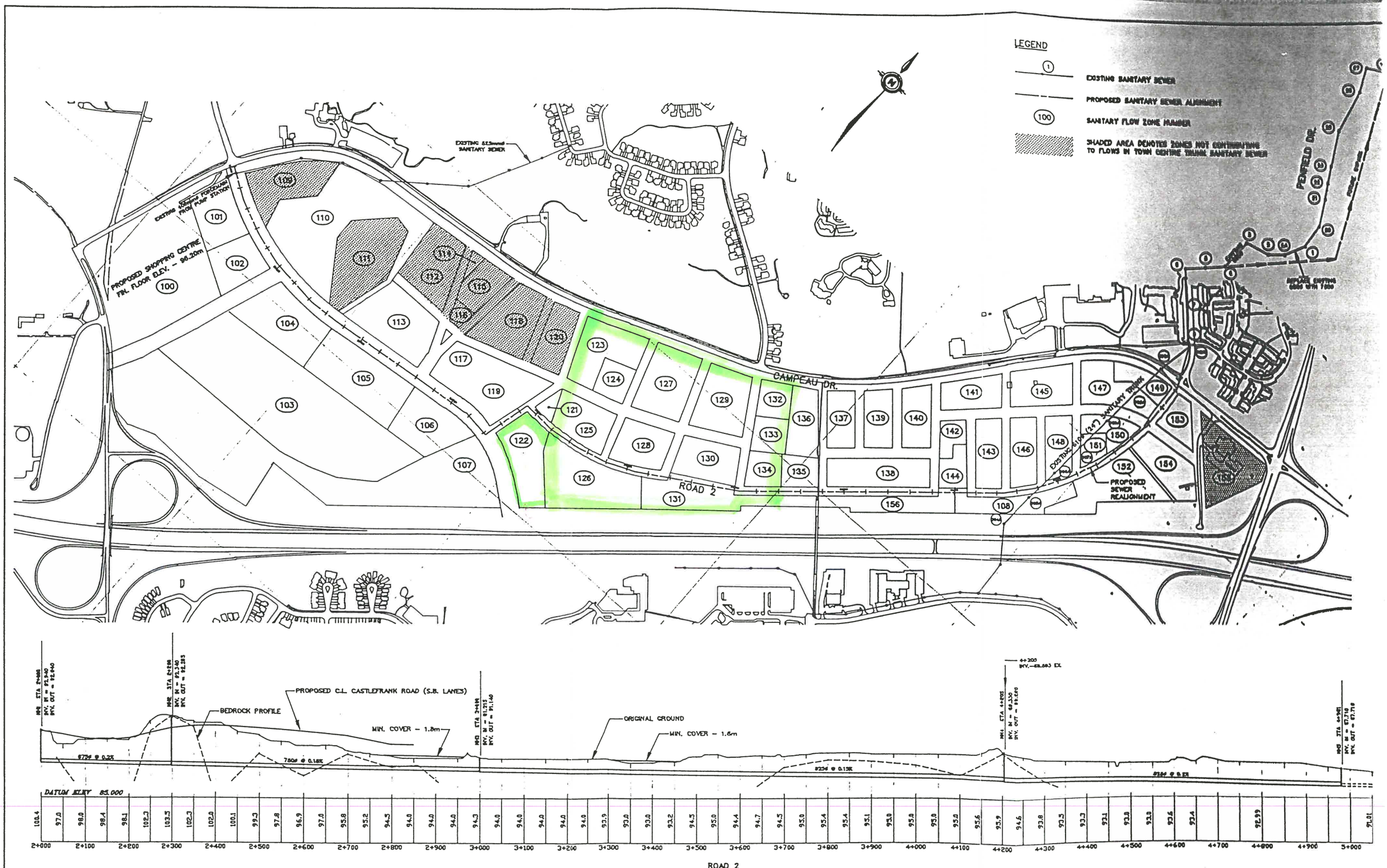
DESIGN	C.B.
CHECKED	L.N.D.
DRAWN	T.S.
CHECKED	
APPROVED	

Ottawa

URBANDALE CORPORATION

KANATA TOWN CENTRE
CENTRAL BUSINESS DISTRICT
SANITARY DRAINAGE PLAN

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



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

L.C. ENSE PROFESSIONAL ENGINEER
M. N. I. DALRYMPLE
PROVINCE OF ONTARIO

Karla Ferrey

From: Lucie Dalrymple
Sent: August 1, 2017 9:43 AM
To: Karla Ferrey
Subject: FW: Kanata Town Centre - Sanitary Flows
Attachments: 1088 San Drainage.pdf; 1136 San Drainage.pdf

…here it is

Lucie Dalrymple, P.Eng.
Associate
Senior Civil Engineer

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

From: Matthew Hrehoriak [mailto:m.hrehoriak@novatech-eng.com]
Sent: July 31, 2017 10:16 AM
To: Lucie Dalrymple
Subject: RE: Kanata Town Centre - Sanitary Flows

Hi Lucie,

The sanitary info for the block 4 and 5 developments are as follows:

1088 Maritime Way (Block 4)

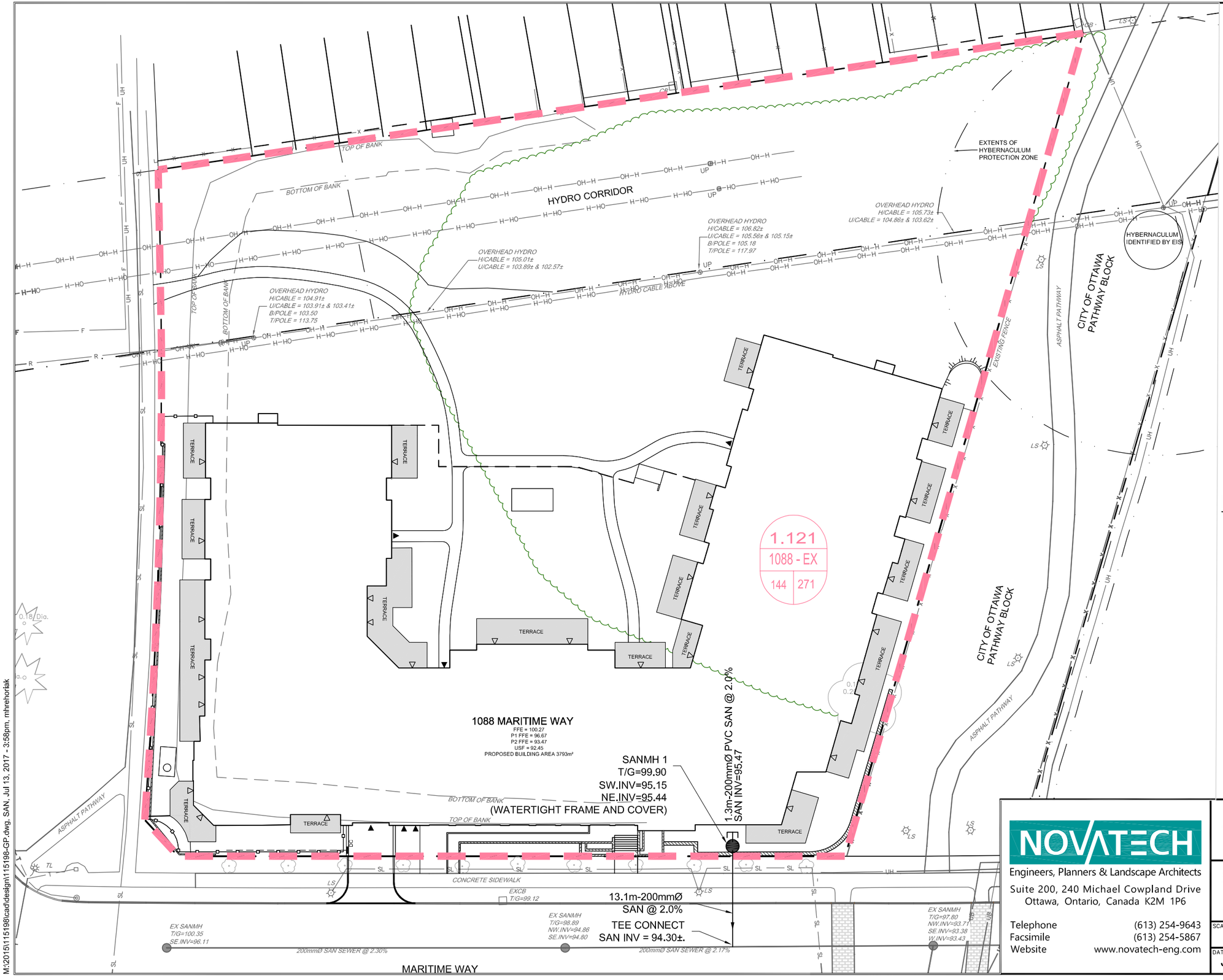
San service connection between SANMH 512-513
San Drainage Area = 1.121 ha
No. Units = 144
Population = 271

1136 Maritime Way (Block 5)

San service connection between SANMH 510-511
San Drainage Area = 0.915 ha
No. Units = 154
Population = 301

Regards,

Matthew Hrehoriak, B.Eng., EIT
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 273 | Fax: 613.254.5867



LEGEND

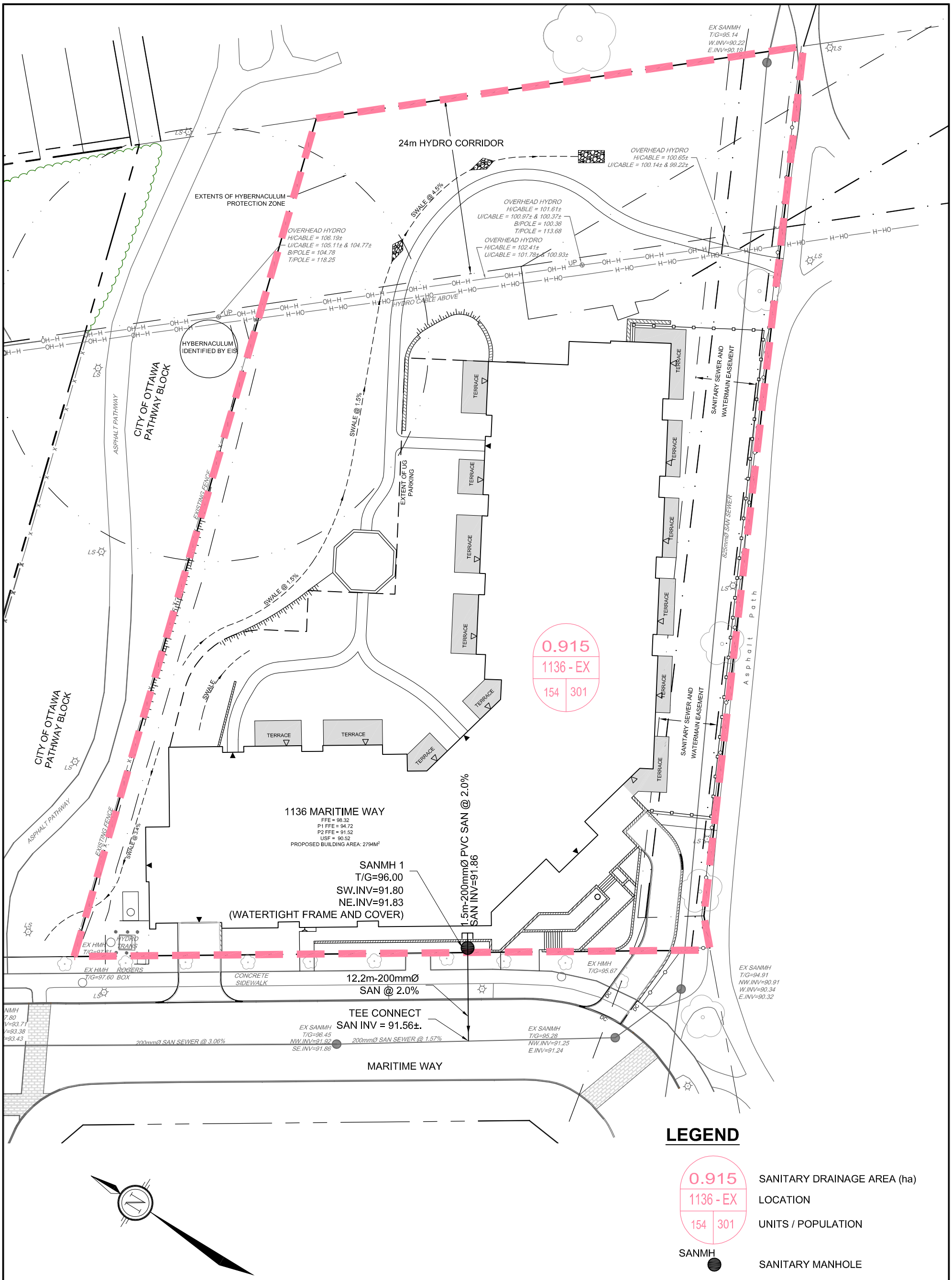
1.121 / 1088 - EX / 144 | 271	SANITARY DRAINAGE AREA (ha) / LOCATION / UNITS / POPULATION
SANMH	SANITARY MANHOLE
	SANITARY SERVICE WITH FLOW DIRECTION

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



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

Telephone (613) 254-9643
Facsimile (613) 254-5867
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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: 31-Jul-17

Designed: CMS
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			Total Area (ha)	Infilt. Flow (L/s)		Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
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)									
Part A (current application)	BLD-1	MH101	92	129.0	8	17.0	146.0	4.0	2.37	54	60.0	1.5	0.47	50	1.5	0.004	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	2.00	2.5	48.4	1.49	6.9%
Part A (current application)	MH101	TEE-1	0	0.0	0	0.0	146.0	4.0	2.37	0	0.0	1.5	0.47	0	1.5	0.004	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	2.00	13.4	48.4	1.49	6.9%
Part B (future application)	BLD-2	MH103	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%
Part B (future application)	MH103	TEE-2	0	0.0	0	0.0	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	0.00	0.11	3.86	200	2.00	13.4	48.4	1.49	8.0%
TOTAL (Parts A + B)	**-**	**-**	**92**	**129.0**	**118**	**248.0**	**377.0**	**4.0**	**6.11**	**54**	**60.0**	**1.5**	**0.47**	**50**	**1.5**	**0.004**	**20**	**1.5**	**0.10**	**2**	**1.5**	**0.02**	**6**	**1.5**	**0.13**	**55**	**1.5**	**0.11**	**0.89**	**0.25**	**7.18**	**200**	**2.00**	**2.5**	**48.4**	**1.49**	**14.8%**

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

T E C H N I C A L
M E M O R A N D U M

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

TO: Urbandale Corporation
c/o Mary Jarvis, MCIP, RPP
Director of Planning

DATE: June 13, 2012

JOB NO.: 15712-10

FROM: Jonathan Párraga, P.Eng.

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

RE: Servicing Brief (Revised)
Kanata Town Centre
Central Business District Subdivision

PURPOSE OF UNDERTAKING

This Servicing Brief was prepared, in support of Urbandale Corporation's re-zoning application for the Kanata Town Centre - Central Business District (KTC-CBD) Subdivision. The following confirms that water, sanitary and storm sewer services are readily available to accommodate this subdivision.

DESCRIPTION OF PROPERTY

The subject lands encompass an area of approximately 18.8 hectares within the KTC-CBD, in the City of Ottawa (former City of Kanata). The lands are bounded to the north by Campeau Drive, to the west by a partial of land fronting Castlefrank Drive, south by Hwy. 417 and to the east by the Hydro One corridor (refer to Figure 1 attached). This subdivision is comprised of residential and commercial developments. Civil infrastructure (i.e., local watermains, storm and sanitary sewers) within the ROWs are all existing and in service. The trunk storm sewer, sanitary sewer, and watermain along the south leg of Maritime Way were constructed by Urbandale Corporation in 1998 and the remaining local infrastructure in 2007-2008. The 900 mm dia. feedermain on Great Lakes Avenue was constructed for the City of Ottawa in 2008-2009.

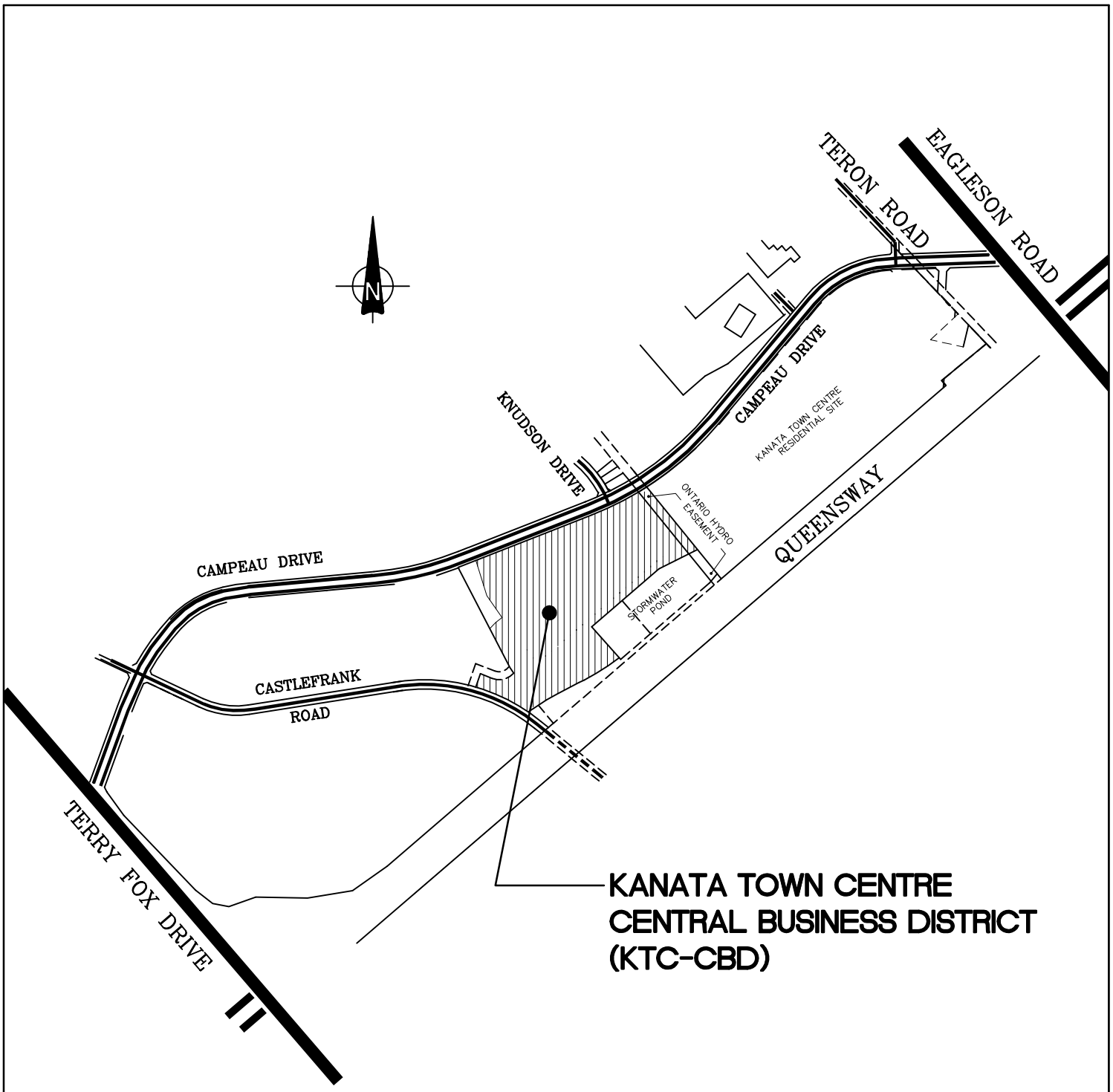
STORM SEWER SERVICING

Outlet:

The KTC-CBD lands are tributary to the KTC-CBD Stormwater Management Facility (SWMF) located in the southeast corner of the subdivision (refer to Figure 1 for Pond location), which subsequently drains to Watts Creek. This SWMF was designed, and subsequently constructed, to accommodate the development of the KTC-CBD subdivision and provides quantity as well as quality control for the stormwater flows. Details of the SWMF can be found in the Stormwater Management Report, Kanata Town Centre, Central Business District, dated January 1999 and prepared by J.L. Richards & Associates Limited.

Minor/Major System:

The KTC-CBD storm drainage system has been designed using the dual drainage concept, consisting of a minor and a major system. The minor system conveys storm runoff generated during frequent storm events (i.e., 1:5 year or less) via a local storm sewer collection system outletting to the KTC-CBD



URBANDALE CORPORATION

Ottawa

PROJECT: KTC–CBD URBANDALE CORPORATION CITY OF OTTAWA	DRAWING: KEY PLAN

J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS

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

DESIGN:	DRAWN: T.S.	DRAWING No.: FIG. 1
DATE: OCT. 2006		
SCALE: N.T.S.		JOB No.: 15712

SWMF where, as noted, water quality and quantity treatment is provided. In accordance with the noted SWMF Design Report, the following runoff coefficients were used at detailed design of the local storm sewers

Residential - Low Density	C=0.40
Residential - Medium Density	C=0.45
Residential - High Density	C=0.50 and 0.60
Commercial Area	C=0.80 and 0.90
Parkland	C=0.20

An excerpt from the noted 1999 Stormwater Management Report, indicating assigned runoff coefficients 'C', allowable capture rates, and required on-site storage volumes for the specific land parcels is included in Attachment 1. The servicing design for each Block in the KTC-CBD shall adhere to these SWM design requirements.

The major system was established at the detailed design stage to convey excess runoff generated during severe events which would not be captured in the minor system. The excess runoff will be conveyed via overland routes to the KTC-CBD SWMF. The grading plans of the KTC-CBD lands have been developed with roadway sags. Local Blocks of land are expected to incorporate parking lot, cistern and roof top storage (or a combination thereof) at Site Plan Control, to ensure that the minor / major drainage concept, as specified in the Attachment 1 Table, is properly implemented.

A Hydraulic Grade Line (HGL) Analysis was carried out during detailed design to verify the anticipated amount of freeboard provided between the maximum storm sewer HGL elevations and the building underside of footing elevations. At detailed design of each Block, and as required at Site Plan Control, the on-site HGL clearance will require confirmation. The analysis was based on the estimated maximum water elevations of the KTC-CBD SWMF.

WATER SERVICING

The local network of water servicing for the KTC-CBD Subdivision was originally developed based on the existing 610 mm and 406 mm diameter watermains on Maritime Way. Water servicing specifics for the subdivision were addressed in detail in the Hydraulic Network Analysis (HNA) Report, which was prepared and submitted to the City in conjunction with the detailed servicing design of this project. The HNA Report for KTC-CBD demonstrated that the proposed (now existing) watermain sizing satisfied the water demand during the maximum hourly and fire flow conditions, as per the City of Ottawa Design Guidelines. Furthermore, the analysis included an assessment of pressures during low demand conditions (i.e., high pressure check) ensuring that the system pressures do not exceed the maximum pressure requirements set by the Ontario Building Code (OBC).

Since then a 900 mm diameter feedermain was constructed in 2008-2009 on Great Lakes Avenue, linking the existing 610 mm diameter feedermain on Maritime Way to the existing 900 mm diameter feedermain on Campeau Drive. At detailed design of each Block, and as required at Site Plan Control, the designer will have to obtain boundary conditions from the City of Ottawa and carry out an HNA for their respective Block.

SANITARY SEWER SERVICING

There is an existing 825 mm diameter trunk sanitary sewer along the south leg of Maritime Way and extends easterly along a service easement to Gray Crescent in Village Green. This sanitary trunk sewer was designed by JLR (1998) to accommodate the development of the KTC-CBD subdivision and upstream lands. Local sanitary sewers were subsequently designed by JLR (2007) and constructed. 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/d (MOE guidelines for sanitary flow for commercial zones). Subsequently, the land use was revised to include residential use, as well as commercial use. As such, in 2007, JLR revised the original sanitary flow estimate according to the projected land use to design the local sewers. Currently, Blocks 3, 6 and 8 have been sold and either developed or partially developed. As such, the estimated sanitary flows generated by the local Blocks have currently been updated to reflect exiting conditions and projected development of local Blocks. Table 1 provides a summary of the existing and anticipated land uses.

Table 1 - Kanata Town Centre Existing and Anticipated Land Uses

Block No.	Land Use Description	Number of Units/Rooms	Population	Daily Sewage Flow	Area
1	Hotel Suites	167	301	270 L/pp/d*	1.48
2	Commercial			50,000 L/pp/d	1.36
3	Retirement Home	208	333		1.02
4	Apartments	120	216	350 L/pp/d	1.37
5	Apartments	120	216	350 L/pp/d	1.02
6	Apartments with Community Centre			350 L/pp/d**	2.83
7	Commercial	N/A		50,000 L/pp/d	1.70
8	Hotel	125	225	270 L/pp/d*	1.02
9	Commercial	N/A	N/A	50,000 L/pp/d	4.96
10	Walkway Easement	N/A	N/A	N/A	0.28

Note: * Additional flow of dining room and staff accounted for in design
** Additional flow from Community Centre pool 40 L/pp/d accounted for in design

The current peak flow estimate has been revised in accordance with the land uses presented in Table 1. A comparison of the original peak flow estimate (1998) and the current peak flow estimate is presented in Table 2. The revised peak flow estimate, based on the current land use projections and existing land uses, creates an increase of estimated flow of 4.05 L/s (274.66 L/s – 270.61 L/s) at the Trunk easement. This flow, however, with a reduction in the downstream peaking factor due to the increase in residential units in the CBD, normalizes close to the original (1998) estimated flow and actually estimates a small reduction of 0.15 L/s (475.94 L/s - 475.79L/s) at the end of the residential subdivision at the intersection of Campeau Drive and Teron Road. The original peak flow design estimate (1998) and the updated detailed design spreadsheet, as well as the sanitary drainage boundary plan, can be found in Attachment 2.

Table 2 - Kanata Town Centre Estimated Sanitary Peak Flow

Location	Tributary Area	Up MH	Down MH	Original Assigned Flow Estimate (1998)	Current Flow Estimate (2012)
Trunk Easement	Upstream + KTC-CBD	500	94	**270.61**	**274.66**
Total Flow at end of Residential	Upstream + KTC-CBD + Residential to Teron Road	Ex.	Ex. 2	**475.94**	**475.79**

SUMMARY

The existing trunk (1998) and local (2007-2008) infrastructure servicing the subject lands, which are referred to as KTC-CBD, have capacity to service the local Blocks, with regards to stormwater and wastewater; based on the SWM design parameters provided in Attachment 1 and wastewater based on the revised existing and proposed land uses as per Table 1 of this report.. Domestic water is available along the frontage of each Block with the understanding that a site specific HNA is to be carried out at Site Plan Control to demonstrate conformance with the City Guidelines

Revised by:

J.L. RICHARDS & ASSOCIATES LIMITED

Jonathan Párraga, P.Eng.

JP:jd
Attach.

ATTACHMENT 1

Kanata Town Centre - Central Business District

Stormwater Design Criteria - Tributary Areas to SWMF

DRAINAGE AREA No.	Description	Area (ha)	TIMP (%)	C factor	Allowable Capture Rate	On-Site Storage	Required on-site Storage Volume
1	AMC Site	7.85	85	0.80	1:5 year	Yes	up to 100 yr
2	Park & Ride	1.46	95	0.87	1:5 year	No	
3	Phase IV	3.03	95	0.87	1:5 year	Yes	up to 100 yr
4	Transitway	3.55	95	0.87	1:5 year	No	
5	Hotel Road	0.38	80	0.76	1:5 year	No	
6	Hotel Site	0.80	95	0.87	1:5 year	Yes	up to 100 yr
7	Castlefrank Road	2.84	80	0.76	1:10 year	No	
8	Adjacent Lands	2.77	57	0.60	1:10 year	No	
9	Exist Pond **	0.82	---	0.20	1:10 year	Yes	up to 100 yr
10	Kanata North	4.66	85	0.80	1:5 year	No	
11	Adj Lands (east)	2.16	85	0.80	1:5 year	No	
12	Adj Lands (south-east)	2.11	85	0.80	1:5 year	Yes	up to 100 yr
13	Street "A"	1.32	85	0.80	1:5 year	Limited	up to 10 yr
14	Urbandale North	10.41	85	0.80	1:5 year	Limited	up to 10 yr
15	Urbandale South	4.48	85	0.80	1:5 year	Yes	up to 100 yr
16	Urbandale East	1.82	57	0.60	1:5 year	Limited	up to 10 yr
17	Urbandale East (park)	0.54	---	0.20	1:5 year	No	
18	Queensway	7.87	30	0.41	1:100 year	No	
19	SWMF	0.95	52	0.56	1:100 year	No	

CASTLEFRANK ROAD

CAMPEAU DRIVE

KNUDSON DRIVE

TERRY FOX DRIVE

HIGHWAY NO. 417

SOUTH TRUNK SEWER

1	3.75	0.82	0.70
2	1.46	0.95	
3	3.03	0.95	
4	3.55	0.95	
5	0.38	0.80	
6	0.80	0.95	
7	2.86	0.80	
8	2.77	0.57	
9	0.82	0.70	
10	4.66	0.85	
11	2.16	0.85	
12	2.11	0.85	
13	1.32	0.85	
14	10.41	0.85	
15	4.55	0.85	
16	1.82	0.57	
17	0.54	70	
18	7.87	0.30	
19	2.30	0.55	

LEGEND:

SUB-BASIN I.D. NO. — 1
AREA IN HECTARES — 3.75
CURVE NUMBER (CN) — 12

SUB-BASIN I.D. NO. — 2
AREA IN HECTARES — 6.1
TOTAL IMPERVIOUSNESS — 0.8

NO.	DATE	REVISIONS	BY	NO.	DATE	REVISIONS	BY

SCALE 0 25 50 75 100m

J.L. Richards & Associates Limited
Consulting Engineers, Architects & Planners
OTTAWA, KINGSTON, SUDBURY, CANADA

DESIGN G.F.
CHECKED G.F.
DRAWN E.K.O'B.
CHECKED
APPROVED

CITY OF KANATA
DEPARTMENT OF ENGINEERING AND PUBLIC WORKS

URBANDALE CORPORATION

KANATA TOWN CENTRE FUTURE CONDITIONS

DATED JANUARY 1990
DWG. NO. FIGURE 3

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
- 0.72 | 0.8 | 611–610 — RUNOFF COEFFICIENT; PIPE REACH UPSTREAM MANHOLE TO DOWNSTREAM MANHOLE

NOTE:
MINOR SYSTEM CAPTURED RATE (Q_5), 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

URBANDALE CORPORATION
CENTRAL BUSINESS DISTRICT

BLOCK 1 · BLOCK 2 · BLOCK 3 · BLOCK 4 · BLOCK 5 · BLOCK 6 · BLOCK 7 · BLOCK 8 · BLOCK 9 · BLOCK 10

CAMPEAU DRIVE · KNUDSON DRIVE · CORDILLERA STREET · CANADIAN SHIELD AVENUE · GREAT LAKES AVENUE · MARITIME WAY · GRAY CRESCENT · ROCK MOUNTAIN GATE · CASTLEFRANK ROAD

DIVISION LINE BETWEEN LOTS 2 AND 3 · DIVISION LINE BETWEEN LOTS 2 AND 3

0.29 | 0.8 | 634–633 · 0.17 | 0.8 | 634–633 · 1.16 | 0.8 | 632–631 · 0.23 | 0.8 | 636–631 · 1.10 | 0.8 | 641–640 · 0.08 | 0.8 | 633A–633 · 0.31 | 0.8 | 632–631 · 0.13 | 0.8 | 642–641 · 1.02 | 0.8 | 640–612 · 0.12 | 0.8 | 613–612 · 0.16 | 0.8 | 612–611 · 1.12 | 0.6 | 613–612 · 2.58 | 0.8 | 607–606 · 0.14 | 0.8 | 641–640 · 0.14 | 0.8 | 641–642 · 0.14 | 0.8 | 613–612 · 0.36 | 0.2 | 630–606A · 1.33 | 0.8 | 605–604 · 0.41 | 0.8 | 630–606A · 0.16 | 0.8 | 13–607 · 0.72 | 0.8 | 611–601 · 0.16 | 0.8 | 611–601 · 0.27 | 0.2 | 612–611 · 0.23 | 0.8 | 607–606 · 0.35 | 0.8 | 606–605 · 0.25 | 0.8 | 605–604 · 0.07 | 0.8 | 604–601 · 0.90 | 0.6 | 611–601 · 3.02 | 0.8 | 606–605 · 1.61 | 0.8 | 605–604

2.78 AR= 65.23 PER CCL

EXISTING STORMWATER POND

OVERHEAD HYDRO LINE

HWY 417

PENEX

	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 & Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
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J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS

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

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA

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

STORM SEWER DESIGN SHEET
IDF CURVE 1: 5

Designed by: C.B.
Checked by: D.L.

Date: May 25, 2007

5 YEAR IDF CURVE
Manning's Coefficient (n) = 0.013

LEGEND
DENOTES EXISTING SEWERS

MANHOLE NUMBER		DRAINAGE AREAS										1:5 YR PEAK FLOW GENERATION					ACTUAL SEWER DATA							UPSTREAM							DOWNSTREAM						
From	To	0.20	0.30	0.40	0.50	0.60	0.80	0.80	0.90	area (ha)	cumm area (ha)	2.78AR	2.78AR CUMM	Time min	Intens. mm/hr	Peak Flow L/s	Dia (mm)	Dia (mm)	Slope %	Q full (l/s)	V full (m/s)	Length (m)	Flow Time (min)	Ex. Ground	Pr. Center Line	Obvert Drop	Obvert	Invert	Cover	Ex. Ground	Pr. Center Line	Obvert Drop	Forced Drop	Obvert	Invert	Cover	Dstream Bend
13	607	0.75				4.01		15.53	9.57	29.86	29.86	65.59	65.59	28.52	55.80	3659.80	1676.4	1650	0.19	4155.57	1.88	83.20	0.74		96.32		92.656	91.006	3.66		95.47		-0.15	92.497	90.847	2.97	
607	606						5.60	0.23		5.83	35.69	12.97	78.55	29.26	54.85	4308.72	1828.8	1800	0.21	5495.32	2.09	119.10	0.95		95.47		92.647	90.847	2.82		94.80		0.33	92.397	90.597	2.40	15.00
														30.21																						
635	634													20.00	70.25		304.8	300	2.90	171.80	2.35	51.50	0.36		103.38		97.681	97.381	5.70		102.56			96.187	95.887	6.37	13.00
634	633						0.17	0.29		0.46	0.46	1.02	1.02	20.36	69.46	71.06	304.8	300	1.60	127.61	1.75	64.00	0.61		102.56		96.187	95.887	6.37		101.67			95.163	94.863	6.51	90.00
														20.97																						
633A	633							0.08		0.08	0.08	0.18	0.18	20.00	70.25	12.50	304.8	300	0.87	94.10	1.29	35.10	0.45		101.49		95.122	94.822	6.37				0.30	94.816	94.516	-94.82	
														20.45																						
633	632										0.46		1.20	20.97	68.18	81.88	381	375	1.00	182.91	1.60	64.70	0.67		101.67		95.163	94.788	6.51		101.29			94.516	94.141	6.77	13.00
632	631						1.16	0.31		1.47	1.93	3.27	4.47	21.65	66.83	298.76	533.4	525	1.00	448.66	2.01	74.80	0.62		101.29		94.516	93.991	6.77		97.55			93.768	93.243	3.78	80.00
														22.27																						
636	631							0.25		0.25	0.25	0.56	0.56	20.00	70.25	39.06	304.8	300	2.23	150.65	2.06	93.30	0.75		102.26		95.849	95.549	6.41		97.55			93.768	93.468	3.78	
														20.75																						
631	630										2.18		5.03	22.27	65.64	329.91	533.4	525	3.85	880.33	3.94	81.10	0.34		100.65		96.921	96.396	3.73		97.55		0.03	93.798	93.273	3.75	
630	606A	0.36						0.41		0.77	0.77	1.11	6.14	22.61	65.00	398.97	533.4	525	1.35	521.29	2.33	88.90	0.64		97.55		93.768	93.243	3.78		94.64		0.03	92.568	92.043	2.07	18.00
606A	606										0.77		6.14	23.25	63.85	391.91	533.4	525	1.35	521.29	2.33	4.90	0.04		94.64		92.538	92.013	2.10		94.80		0.41	92.472	91.947	2.33	81.00
														23.28																						
606	605							0.35		0.35	36.81	0.78	85.47	30.21	53.68	4587.99	(1) 1828.8	(1) 1800	0.25	6049.60	2.30	110.40	0.80		94.80		92.065	90.590	2.74		94.69		0.02	91.784	90.309	2.91	
605	604						2.94	0.25		3.19	40.00	7.09	92.57	31.00	52.73	4881.44	(1) 1828.8	(1) 1800	0.24	5911.34	2.25	67.40	0.50		94.69		91.765	90.290	2.93		94.50	0.06	-0.02	91.601	90.126	2.90	90.00
														31.50																						
642	641							0.13		0.13	0.13	0.29	0.29	20.00	70.25	20.31	381	375	1.85	248.79	2.18	71.30	0.54		100.26		97.259	96.884	3.00		98.94			95.940	95.565	3.00	
641	640						1.10	0.14		1.24	1.37	2.76	3.05	20.54	69.08	210.47	457.2	450	0.80	266.03	1.62	77.70	0.80		98.94		95.940	95.490	3.00		98.33			95.318	94.868	3.01	
														21.34																						
640	612						1.02	0.14		1.16	2.53	2.58	5.63	21.34	67.43	379.43	609.6	600	0.66	520.98	1.79	82.30	0.77		98.33		95.318	94.718	3.01		97.86		-0.04	94.774	94.174	3.09	80.00
														22.11																						
614	613							0.12		0.12	0.12	0.27	0.27	20.00	70.25	18.75	304.8	300	2.16	148.20	2.03	51.20	0.42		100.07		96.938	96.638	3.13		98.96			95.833	95.533	3.13	
613	612					1.12		0.14		1.26	1.38	2.18	2.45	20.42	69.34	169.64	381	375	1.98	257.25	2.26	51.60	0.38		98.96		95.833	95.458	3.13		97.86			94.813	94.438	3.05	
														20.80																						
612	611	0.27						0.16		0.43	4.34	0.51	8.58	22.11	65.93	565.64	685.8	675	3.12	1548.97	4.19	49.60	0.20		97.86		94.813	94.138	3.05		96.45		0.03	93.265	92.590	3.18	
611	601					0.90	0.72	0.16		1.78	6.12	3.46	12.04	22.31	65.56	789.16	685.8	675	1.60	1109.24	3.00	44.10	0.24		96.45		93.235	92.560	3.21		94.93	0.06		92.530	91.855	2.40	80.00
601	604							0.07		0.07	6.19	0.16	12.19	22.55	65.10	793.79	685.8	675	1.42	1044.99	2.83	67.50	0.40		94.93		92.470	91.795	2.46		94.50		-0.05	91.511	90.836	2.99	90.00
														22.95																						
604	Chamber										46.19		104.76	31.50	52.16	5464.60	(1) 1828.8	(1) 1800	0.21	5495.32	2.09	14.40	0.11		94.50		91.556	90.081	2.94		94.00		-0.01	91.526	90.051	2.47	
														31.62																						
Chamber	Pond										46.19		104.76	31.62	52.03	5451.05	1524	2x1500	0.33	8472.67	2.32	11.50	0.08		94.50		91.539	90.039	2.96		94.00			91.501	90.001	2.50	
														31.70																						

(1) The equivalent size of a round pipe is shown to simplify spreadsheet calculations. The actual existing pipe is a horizontal elliptical 1475 x 2310 HE III.

LICENSED PROFESSIONAL ENGINEER
J.S.C. BOUGIE
100010090
May 29, 07
PROVINCE OF ONTARIO

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA

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

STORM SEWER DESIGN SHEET
IDF CURVE 1: 5

Designed by: C.B.
Checked by: D.L.

Date: May 25, 2007

5 YEAR IDF CURVE
Manning's Coefficient (n) = 0.013

LEGEND
DENOTES EXISTING SEWERS

MANHOLE NUMBER		DRAINAGE AREAS										1:5 YR PEAK FLOW GENERATION					ACTUAL SEWER DATA							UPSTREAM							DOWNSTREAM						
From	To	0.20	0.30	0.40	0.50	0.60	0.80	0.80	0.90	area (ha)	cumm area (ha)	2.78AR	2.78AR CUMM	Time min	Intens. mm/hr	Peak Flow L/s	Dia (mm)	Dia (mm)	Slope %	Q full (l/s)	V full (m/s)	Length (m)	Flow Time (min)	Ex. Ground	Pr. Center Line	Obvert Drop	Obvert	Invert	Cover	Ex. Ground	Pr. Center Line	Obvert Drop	Forced Drop	Obvert	Invert	Cover	Dstream Bend
13	607	0.75				4.01		15.53	9.57	29.86	29.86	65.59	65.59	28.52	55.80	3659.80	1676.4	1650	0.19	4155.57	1.88	83.20	0.74		96.32		92.656	91.006	3.66		95.47		-0.15	92.497	90.847	2.97	
607	606						5.60	0.23		5.83	35.69	12.97	78.55	29.26	54.85	4308.72	1828.8	1800	0.21	5495.32	2.09	119.10	0.95		95.47		92.647	90.847	2.82		94.80		0.33	92.397	90.597	2.40	15.00
														30.21																						
635	634													20.00	70.25		304.8	300	2.90	171.80	2.35	51.50	0.36		103.38		97.681	97.381	5.70		102.56			96.187	95.887	6.37	13.00
634	633						0.17	0.29		0.46	0.46	1.02	1.02	20.36	69.46	71.06	304.8	300	1.60	127.61	1.75	64.00	0.61		102.56		96.187	95.887	6.37		101.67			95.163	94.863	6.51	90.00
														20.97																						
633A	633							0.08		0.08	0.08	0.18	0.18	20.00	70.25	12.50	304.8	300	0.87	94.10	1.29	35.10	0.45		101.49		95.122	94.822	6.37				0.30	94.816	94.516	-94.82	
														20.45																						
633	632										0.46		1.20	20.97	68.18	81.88	381	375	1.00	182.91	1.60	64.70	0.67		101.67		95.163	94.788	6.51		101.29			94.516	94.141	6.77	13.00
632	631						1.16	0.31		1.47	1.93	3.27	4.47	21.65	66.83	298.76	533.4	525	1.00	448.66	2.01	74.80	0.62		101.29		94.516	93.991	6.77		97.55			93.768	93.243	3.78	80.00
														22.27																						
636	631							0.25		0.25	0.25	0.56	0.56	20.00	70.25	39.06	304.8	300	2.23	150.65	2.06	93.30	0.75		102.26		95.849	95.549	6.41		97.55			93.768	93.468	3.78	
														20.75																						
631	630										2.18		5.03	22.27	65.64	329.91	533.4	525	3.85	880.33	3.94	81.10	0.34		100.65		96.921	96.396	3.73		97.55		0.03	93.798	93.273	3.75	
630	606A	0.36						0.41		0.77	0.77	1.11	6.14	22.61	65.00	398.97	533.4	525	1.35	521.29	2.33	88.90	0.64		97.55		93.768	93.243	3.78		94.64		0.03	92.568	92.043	2.07	18.00
606A	606										0.77		6.14	23.25	63.85	391.91	533.4	525	1.35	521.29	2.33	4.90	0.04		94.64		92.538	92.013	2.10		94.80		0.41	92.472	91.947	2.33	81.00
														23.28																						
606	605							0.35		0.35	36.81	0.78	85.47	30.21	53.68	4587.99	(1) 1828.8	(1) 1800	0.25	6049.60	2.30	110.40	0.80		94.80		92.065	90.590	2.74		94.69		0.02	91.784	90.309	2.91	
605	604						2.94	0.25		3.19	40.00	7.09	92.57	31.00	52.73	4881.44	(1) 1828.8	(1) 1800	0.24	5911.34	2.25	67.40	0.50		94.69		91.765	90.290	2.93		94.50	0.06	-0.02	91.601	90.126	2.90	90.00
														31.50																						
642	641							0.13		0.13	0.13	0.29	0.29	20.00	70.25	20.31	381	375	1.85	248.79	2.18	71.30	0.54		100.26		97.259	96.884	3.00		98.94			95.940	95.565	3.00	
641	640						1.10	0.14		1.24	1.37	2.76	3.05	20.54	69.08	210.47	457.2	450	0.80	266.03	1.62	77.70	0.80		98.94		95.940	95.490	3.00		98.33			95.318	94.868	3.01	
														21.34																						
640	612						1.02	0.14		1.16	2.53	2.58	5.63	21.34	67.43	379.43	609.6	600	0.66	520.98	1.79	82.30	0.77		98.33		95.318	94.718	3.01		97.86		-0.04	94.774	94.174	3.09	80.00
														22.11																						
614	613							0.12		0.12	0.12	0.27	0.27	20.00	70.25	18.75	304.8	300	2.16	148.20	2.03	51.20	0.42		100.07		96.938	96.638	3.13		98.96			95.833	95.533	3.13	
613	612					1.12		0.14		1.26	1.38	2.18	2.45	20.42	69.34	169.64	381	375	1.98	257.25	2.26	51.60	0.38		98.96		95.833	95.458	3.13		97.86			94.813	94.438	3.05	
														20.80																						
612	611	0.27						0.16		0.43	4.34	0.51	8.58	22.11	65.93	565.64	685.8	675	3.12	1548.97	4.19	49.60	0.20		97.86		94.813	94.138	3.05		96.45		0.03	93.265	92.590	3.18	
611	601					0.90	0.72	0.16		1.78	6.12	3.46	12.04	22.31	65.56	789.16	685.8	675	1.60	1109.24	3.00	44.10	0.24		96.45		93.235	92.560	3.21		94.93	0.06		92.530	91.855	2.40	80.00
601	604							0.07		0.07	6.19	0.16	12.19	22.55	65.10	793.79	685.8	675	1.42	1044.99	2.83	67.50	0.40		94.93		92.470	91.795	2.46		94.50		-0.05	91.511	90.836	2.99	90.00
														22.95																						
604	Chamber										46.19		104.76	31.50	52.16	5464.60	(1) 1828.8	(1) 1800	0.21	5495.32	2.09	14.40	0.11		94.50		91.556	90.081	2.94		94.00		-0.01	91.526	90.051	2.47	
														31.62																						
Chamber	Pond										46.19		104.76	31.62	52.03	5451.05	1524	2x1500	0.33	8472.67	2.32	11.50	0.08		94.50		91.539	90.039	2.96		94.00			91.501	90.001	2.50	
														31.70																						

(1) The equivalent size of a round pipe is shown to simplify spreadsheet calculations. The actual existing pipe is a horizontal elliptical 1475 x 2310 HE III.

LICENSED PROFESSIONAL ENGINEER
J.S.C. BOUGIE
100010090
May 29,07
PROVINCE OF ONTARIO

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA

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

STORM SEWER DESIGN SHEET
IDF CURVE 1: 5

Designed by: C.B.
Checked by: D.L.

Date: May 25, 2007

5 YEAR IDF CURVE
Manning's Coefficient (n) = 0.013

LEGEND
DENOTES EXISTING SEWERS

MANHOLE NUMBER		DRAINAGE AREAS										1:5 YR PEAK FLOW GENERATION					ACTUAL SEWER DATA							UPSTREAM							DOWNSTREAM				
From	To	0.20	0.30	0.40	0.50	0.60	0.80	0.80	0.90	area (ha)	cumm area (ha)	2.78AR	2.78AR CUMM	Time min	Intens. mm/hr	Peak Flow L/s	Dia (mm)	Dia (mm)	Slope %	Q full (l/s)	V full (m/s)	Length (m)	Flow Time (min)	Ex. Ground	Pr. Center Line	Obvert Drop	Obvert	Invert	Cover	Ex. Ground	Pr. Center Line	Obvert Drop	Forced Drop	Obvert	Invert	Cover	Dstream Bend
13	607	0.75				4.01		15.53	9.57	29.86	29.86	65.59	65.59	28.52	55.80	3659.80	1676.4	1650	0.19	4155.57	1.88	83.20	0.74		96.32		92.656	91.006	3.66		95.47		-0.15	92.497	90.847	2.97	
607	606						5.60	0.23		5.83	35.69	12.97	78.55	29.26	54.85	4308.72	1828.8	1800	0.21	5495.32	2.09	119.10	0.95		95.47		92.647	90.847	2.82		94.80		0.33	92.397	90.597	2.40	15.00
														30.21																						
635	634													20.00	70.25		304.8	300	2.90	171.80	2.35	51.50	0.36		103.38		97.681	97.381	5.70		102.56			96.187	95.887	6.37	13.00
634	633						0.17	0.29		0.46	0.46	1.02	1.02	20.36	69.46	71.06	304.8	300	1.60	127.61	1.75	64.00	0.61		102.56		96.187	95.887	6.37		101.67			95.163	94.863	6.51	90.00
														20.97																						
633A	633							0.08		0.08	0.08	0.18	0.18	20.00	70.25	12.50	304.8	300	0.87	94.10	1.29	35.10	0.45		101.49		95.122	94.822	6.37				0.30	94.816	94.516	-94.82	
														20.45																						
633	632										0.46		1.20	20.97	68.18	81.88	381	375	1.00	182.91	1.60	64.70	0.67		101.67		95.163	94.788	6.51		101.29			94.516	94.141	6.77	13.00
632	631						1.16	0.31		1.47	1.93	3.27	4.47	21.65	66.83	298.76	533.4	525	1.00	448.66	2.01	74.80	0.62		101.29		94.516	93.991	6.77		97.55			93.768	93.243	3.78	80.00
														22.27																						
636	631							0.25		0.25	0.25	0.56	0.56	20.00	70.25	39.06	304.8	300	2.23	150.65	2.06	93.30	0.75		102.26		95.849	95.549	6.41		97.55			93.768	93.468	3.78	
														20.75																						
631	630										2.18		5.03	22.27	65.64	329.91	533.4	525	3.85	880.33	3.94	81.10	0.34		100.65		96.921	96.396	3.73		97.55		0.03	93.798	93.273	3.75	
630	606A	0.36						0.41		0.77	0.77	1.11	6.14	22.61	65.00	398.97	533.4	525	1.35	521.29	2.33	88.90	0.64		97.55		93.768	93.243	3.78		94.64		0.03	92.568	92.043	2.07	18.00
606A	606										0.77		6.14	23.25	63.85	391.91	533.4	525	1.35	521.29	2.33	4.90	0.04		94.64		92.538	92.013	2.10		94.80		0.41	92.472	91.947	2.33	81.00
														23.28																						
606	605							0.35		0.35	36.81	0.78	85.47	30.21	53.68	4587.99	(1) 1828.8	(1) 1800	0.25	6049.60	2.30	110.40	0.80		94.80		92.065	90.590	2.74		94.69		0.02	91.784	90.309	2.91	
605	604						2.94	0.25		3.19	40.00	7.09	92.57	31.00	52.73	4881.44	(1) 1828.8	(1) 1800	0.24	5911.34	2.25	67.40	0.50		94.69		91.765	90.290	2.93		94.50	0.06	-0.02	91.601	90.126	2.90	90.00
														31.50																						
642	641							0.13		0.13	0.13	0.29	0.29	20.00	70.25	20.31	381	375	1.85	248.79	2.18	71.30	0.54		100.26		97.259	96.884	3.00		98.94			95.940	95.565	3.00	
641	640						1.10	0.14		1.24	1.37	2.76	3.05	20.54	69.08	210.47	457.2	450	0.80	266.03	1.62	77.70	0.80		98.94		95.940	95.490	3.00		98.33			95.318	94.868	3.01	
														21.34																						
640	612						1.02	0.14		1.16	2.53	2.58	5.63	21.34	67.43	379.43	609.6	600	0.66	520.98	1.79	82.30	0.77		98.33		95.318	94.718	3.01		97.86		-0.04	94.774	94.174	3.09	80.00
														22.11																						
614	613							0.12		0.12	0.12	0.27	0.27	20.00	70.25	18.75	304.8	300	2.16	148.20	2.03	51.20	0.42		100.07		96.938	96.638	3.13		98.96			95.833	95.533	3.13	
613	612					1.12		0.14		1.26	1.38	2.18	2.45	20.42	69.34	169.64	381	375	1.98	257.25	2.26	51.60	0.38		98.96		95.833	95.458	3.13		97.86			94.813	94.438	3.05	
														20.80																						
612	611	0.27						0.16		0.43	4.34	0.51	8.58	22.11	65.93	565.64	685.8	675	3.12	1548.97	4.19	49.60	0.20		97.86		94.813	94.138	3.05		96.45		0.03	93.265	92.590	3.18	
611	601					0.90	0.72	0.16		1.78	6.12	3.46	12.04	22.31	65.56	789.16	685.8	675	1.60	1109.24	3.00	44.10	0.24		96.45		93.235	92.560	3.21		94.93	0.06		92.530	91.855	2.40	80.00
601	604							0.07		0.07	6.19	0.16	12.19	22.55	65.10	793.79	685.8	675	1.42	1044.99	2.83	67.50	0.40		94.93		92.470	91.795	2.46		94.50		-0.05	91.511	90.836	2.99	90.00
														22.95																						
604	Chamber										46.19		104.76	31.50	52.16	5464.60	(1) 1828.8	(1) 1800	0.21	5495.32	2.09	14.40	0.11		94.50		91.556	90.081	2.94		94.00		-0.01	91.526	90.051	2.47	
														31.62																						
Chamber	Pond										46.19		104.76	31.62	52.03	5451.05	1524	2x1500	0.33	8472.67	2.32	11.50	0.08		94.50		91.539	90.039	2.96		94.00			91.501	90.001	2.50	
														31.70																						

(1) The equivalent size of a round pipe is shown to simplify spreadsheet calculations. The actual existing pipe is a horizontal elliptical 1475 x 2310 HE III.

LICENSED PROFESSIONAL ENGINEER
J.S.C. BOUGIE
100010090
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JLR PROJECT NO.: 15712

STORM SEWER DESIGN SHEET
IDF CURVE 1: 5

Designed by: C.B.
Checked by: D.L.

Date: May 25, 2007

5 YEAR IDF CURVE
Manning's Coefficient (n) = 0.013

LEGEND
DENOTES EXISTING SEWERS

MANHOLE NUMBER		DRAINAGE AREAS										1:5 YR PEAK FLOW GENERATION					ACTUAL SEWER DATA							UPSTREAM						DOWNSTREAM					
From	To	0.20	0.30	0.40	0.50	0.60	0.80	0.80	0.90	area (ha)	cumm area (ha)	2.78AR	2.78AR CUMM	Time min	Intens. mm/hr	Peak Flow L/s	Dia (mm)	Dia (mm)	Slope %	Q full (l/s)	V full (m/s)	Length (m)	Flow Time (min)	Ex. Ground	Pr. Center Line	Obvert Drop	Obvert	Invert	Cover	Ex. Ground	Pr. Center Line	Obvert Drop	Forced Drop	Obvert	Invert	Cover	Dstream Bend
13	607	0.75				4.01		15.53	9.57	29.86	29.86	65.59	65.59	28.52	55.80	3659.80	1676.4	1650	0.19	4155.57	1.88	83.20	0.74		96.32		92.656	91.006	3.66		95.47		-0.15	92.497	90.847	2.97	
607	606						5.60	0.23		5.83	35.69	12.97	78.55	29.26	54.85	4308.72	1828.8	1800	0.21	5495.32	2.09	119.10	0.95		95.47		92.647	90.847	2.82		94.80		0.33	92.397	90.597	2.40	15.00
														30.21																						
635	634													20.00	70.25		304.8	300	2.90	171.80	2.35	51.50	0.36		103.38		97.681	97.381	5.70		102.56			96.187	95.887	6.37	13.00
634	633						0.17	0.29		0.46	0.46	1.02	1.02	20.36	69.46	71.06	304.8	300	1.60	127.61	1.75	64.00	0.61		102.56		96.187	95.887	6.37		101.67			95.163	94.863	6.51	90.00
														20.97																						
633A	633							0.08		0.08	0.08	0.18	0.18	20.00	70.25	12.50	304.8	300	0.87	94.10	1.29	35.10	0.45		101.49		95.122	94.822	6.37				0.30	94.816	94.516	-94.82	
														20.45																						
633	632										0.46		1.20	20.97	68.18	81.88	381	375	1.00	182.91	1.60	64.70	0.67		101.67		95.163	94.788	6.51		101.29			94.516	94.141	6.77	13.00
632	631						1.16	0.31		1.47	1.93	3.27	4.47	21.65	66.83	298.76	533.4	525	1.00	448.66	2.01	74.80	0.62		101.29		94.516	93.991	6.77		97.55			93.768	93.243	3.78	80.00
														22.27																						
636	631							0.25		0.25	0.25	0.56	0.56	20.00	70.25	39.06	304.8	300	2.23	150.65	2.06	93.30	0.75		102.26		95.849	95.549	6.41		97.55			93.768	93.468	3.78	
														20.75																						
631	630										2.18		5.03	22.27	65.64	329.91	533.4	525	3.85	880.33	3.94	81.10	0.34		100.65		96.921	96.396	3.73		97.55		0.03	93.798	93.273	3.75	
630	606A	0.36						0.41		0.77	0.77	1.11	6.14	22.61	65.00	398.97	533.4	525	1.35	521.29	2.33	88.90	0.64		97.55		93.768	93.243	3.78		94.64		0.03	92.568	92.043	2.07	18.00
606A	606										0.77		6.14	23.25	63.85	391.91	533.4	525	1.35	521.29	2.33	4.90	0.04		94.64		92.538	92.013	2.10		94.80		0.41	92.472	91.947	2.33	81.00
														23.28																						
606	605							0.35		0.35	36.81	0.78	85.47	30.21	53.68	4587.99	(1) 1828.8	(1) 1800	0.25	6049.60	2.30	110.40	0.80		94.80		92.065	90.590	2.74		94.69		0.02	91.784	90.309	2.91	
605	604						2.94	0.25		3.19	40.00	7.09	92.57	31.00	52.73	4881.44	(1) 1828.8	(1) 1800	0.24	5911.34	2.25	67.40	0.50		94.69		91.765	90.290	2.93		94.50	0.06	-0.02	91.601	90.126	2.90	90.00
														31.50																						
642	641							0.13		0.13	0.13	0.29	0.29	20.00	70.25	20.31	381	375	1.85	248.79	2.18	71.30	0.54		100.26		97.259	96.884	3.00		98.94			95.940	95.565	3.00	
641	640						1.10	0.14		1.24	1.37	2.76	3.05	20.54	69.08	210.47	457.2	450	0.80	266.03	1.62	77.70	0.80		98.94		95.940	95.490	3.00		98.33			95.318	94.868	3.01	
														21.34																						
640	612						1.02	0.14		1.16	2.53	2.58	5.63	21.34	67.43	379.43	609.6	600	0.66	520.98	1.79	82.30	0.77		98.33		95.318	94.718	3.01		97.86		-0.04	94.774	94.174	3.09	80.00
														22.11																						
614	613							0.12		0.12	0.12	0.27	0.27	20.00	70.25	18.75	304.8	300	2.16	148.20	2.03	51.20	0.42		100.07		96.938	96.638	3.13		98.96			95.833	95.533	3.13	
613	612					1.12		0.14		1.26	1.38	2.18	2.45	20.42	69.34	169.64	381	375	1.98	257.25	2.26	51.60	0.38		98.96		95.833	95.458	3.13		97.86			94.813	94.438	3.05	
														20.80																						
612	611	0.27						0.16		0.43	4.34	0.51	8.58	22.11	65.93	565.64	685.8	675	3.12	1548.97	4.19	49.60	0.20		97.86		94.813	94.138	3.05		96.45		0.03	93.265	92.590	3.18	
611	601					0.90	0.72	0.16		1.78	6.12	3.46	12.04	22.31	65.56	789.16	685.8	675	1.60	1109.24	3.00	44.10	0.24		96.45		93.235	92.560	3.21		94.93	0.06		92.530	91.855	2.40	80.00
601	604							0.07		0.07	6.19	0.16	12.19	22.55	65.10	793.79	685.8	675	1.42	1044.99	2.83	67.50	0.40		94.93		92.470	91.795	2.46		94.50		-0.05	91.511	90.836	2.99	90.00
														22.95																						
604	Chamber										46.19		104.76	31.50	52.16	5464.60	(1) 1828.8	(1) 1800	0.21	5495.32	2.09	14.40	0.11		94.50		91.556	90.081	2.94		94.00		-0.01	91.526	90.051	2.47	
														31.62																						
Chamber	Pond										46.19		104.76	31.62	52.03	5451.05	1524	2x1500	0.33	8472.67	2.32	11.50	0.08		94.50		91.539	90.039	2.96		94.00			91.501	90.001	2.50	
														31.70																						

(1) The equivalent size of a round pipe is shown to simplify spreadsheet calculations. The actual existing pipe is a horizontal elliptical 1475 x 2310 HE III.

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100010090
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ATTACHMENT 2

J.L.Richards
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CITY OF OTTAWA

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

Commercial Flow =	50000	L/ha/d
q residential=	350	l/cap/d
q hotel =	270	l/cap/d
q retirement homes =	450	l/cap/d
i =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room

Manning's Coefficient (n) = 0.013

SANITARY SEWER DESIGN SHEET
Designed: C.B.
Revised by: J.L.P.
Checked By: D.L.

2016 Update by: HM
2016 Check by: LD

Date: October 12, 2016

2016 Updates to Block 1 Peak Flows

STREET	M.H. #		RESIDENTIAL													COMMERCIAL / INSTITUTIONAL			PLUGGED FLOW		R+C		SEWER DATA					CAPACITY	
			NUMBER OF UNITS									CUMMULATIVE		PEAKING	POPUL.														
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA		FACTOR	FLOW	Actual AREA	CUMM. AREA	COMM. 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							
MARITIME WAY	7A	507									(1) 2588	(1) 28.38	2588	28.38	3.50	36.65	(1) 23.16	23.159	20.10	(1) 162.69	162.69	14.43	233.88	825	0.14	529.34	0.99	81.90	295.46	44%
MARITIME WAY	507	506						125	225	174	174	1.02	2762	29.40	3.47	38.85	4.91	28.07	24.37		162.69	16.09	242.00	825	0.12	500.32	0.94	119.30	258.32	48%
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	3377	32.04	3.40	46.49		28.65	24.87		162.99	16.99	251.34	825	0.12	486.76	0.91	111.00	235.41	52%
MARITIME WAY	505	504						146	262.8	230	230	0.56	3607	32.60	3.37	49.29	1.75	30.40	26.39		162.99	17.64	256.31	825	0.11	484.63	0.91	114.40	228.32	53%
MARITIME WAY	504	501										0.27	3607	32.87	3.37	49.29		30.40	26.39		162.99	17.72	256.39	825	0.11	476.06	0.89	29.90	219.67	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		
MARITIME WAY	513	512						120	216	216	216	1.37	216	1.37	4.00	3.50						0.38	3.88	200	2.28	49.52	1.58	51.90	45.64	8%
MARITIME WAY	512	511								58	58	(2) 0.73	1203	4.67	3.75	18.26		1.36	1.18			1.69	21.13	200	3.12	57.95	1.84	49.30	36.82	36%
MARITIME WAY	511	510						120	216	216	216	1.02	1419	5.69	3.70	21.25		1.36	1.18			1.97	24.40	200	1.70	42.76	1.36	38.40	18.36	57%
MARITIME WAY	510	501											1419	5.69	3.70	21.25		1.36	1.18			1.97	24.40	200	2.28	49.52	1.58	11.30	25.12	49%
TRUNK EASEMENT	501	500											5026	38.56	3.24	66.02		31.76	27.57		162.99	19.69	276.28	825	0.10	462.89	0.87	129.00	186.61	60%
TRUNK EASEMENT	500	94											5026	38.56	3.24	66.02		31.76	27.57		162.99	19.69	276.28							
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											5153	40.55	3.23	67.48		31.76	27.57		162.99	20.25	278.29	825	0.12	497.22	0.93	17.5	218.93	56%
	95	89			10						27	0.52	5180	41.07	3.23	67.79		31.76	27.57		162.99	20.39	278.75	825	0.12	497.22	0.93	66.6	218.48	56%
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	5342	43.43	3.22	69.64		31.76	27.57		162.99	21.05	281.25	825	0.12	497.22	0.93	79.0	215.97	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	5511	45.88	3.21	71.57		31.76	27.57		162.99	21.74	283.87	825	0.12	497.22	0.93	79.0	213.35	57%
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	5646	48.15	3.20	73.10		31.76	27.57		162.99	22.37	286.03	825	0.12	497.22	0.93	55.0	211.19	58%
	67	66			6						16	0.33	5663	48.48	3.19	73.28		31.76	27.57		162.99	22.47	286.31	825	0.12	497.22	0.93	70.0	210.92	58%

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

CITY OF OTTAWA

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

Commercial Flow =	50000	L/ha/d
q residential=	350	l/cap/d
q hotel =	270	l/cap/d
q retirement homes =	450	l/cap/d
i =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room

Manning's Coefficient (n) = 0.013

SANITARY SEWER DESIGN SHEET
Designed: C.B.
Revised by: J.L.P.
Checked By: D.L.

2016 Update by: HM
2016 Check by: LD

Date: October 12, 2016

STREET	M.H. #		RESIDENTIAL													COMMERCIAL / INSTITUTIONAL			PLUGGED FLOW		R+C		2016 Updates to Block 1 Peak Flows SEWER DATA					CAPACITY	
			NUMBER OF UNITS									CUMMULATIVE		PEAKING	POPUL.	Actual	CUMM.	COMM.		CUMM.	PEAK EXTR.	PEAK DES.							
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	AREA	AREA	FLOW	FLOW	FLOW	FLOW	DIA.	SLOPE %	CAPAC.	VEL.	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	mm		l/s	m/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	5857	52.90	3.18	75.47		31.76	27.57		162.99	23.70	289.73	825	0.12	497.22	0.93	62.0	207.49	58%
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		13654	244.50	2.82	155.95		31.76	27.57		200.71	77.35	461.58	900	0.11	600.38	0.94	17.0	138.80	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		13825	246.45	2.81	157.59		31.76	27.57		200.71	77.90	463.77	900	0.11	600.38	0.94	13.0	136.62	77%
	63	57			10						27	0.68	13852	247.13	2.81	157.85		31.76	27.57		200.71	78.09	464.22	900	0.11	600.38	0.94	64.9	136.17	77%
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	14088	250.17	2.81	160.12		31.76	27.57		200.71	78.94	467.34	900	0.11	600.38	0.94	53.5	133.04	78%
	34	33			3						8		14096	250.17	2.81	160.20		31.76	27.57		200.71	78.94	467.42	900	0.11	600.38	0.94	50.3	132.96	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	14287	254.06	2.80	162.03		31.76	27.57		200.71	80.03	470.34	900	0.11	600.38	0.94	72.7	130.05	78%
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	14398	255.50	2.80	163.09		31.76	27.57		200.71	80.43	471.80	900	0.11	600.38	0.94	44.4	128.58	79%
	18	16			4						11		14409	255.50	2.80	163.19		31.764	27.57		200.71	80.43	471.90	900	0.11	600.38	0.94	44.4	128.48	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	14436	256.16	2.79	163.45		32.28	28.02		200.71	80.76	472.94	900	0.11	600.38	0.94	66.0	127.44	79%
	15	14 A			2						5		14441	256.16	2.79	163.50		32.28	28.02		200.71	80.76	472.99	900	0.11	600.38	0.94	25.8	127.39	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%

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CITY OF OTTAWA

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

Commercial Flow =	50000	L/ha/d
q residential=	350	l/cap/d
q hotel =	270	l/cap/d
q retirement homes =	450	l/cap/d
i =	0.28	l/s/ha
SING. HOUSING	3.4	pers/hse
MULT. HOUSING	2.7	pers/hse
Hotel/Appartments	1.8	pers/room
Retirement Homes	1.6	pers/room

Manning's Coefficient (n) = 0.013

SANITARY SEWER DESIGN SHEET
Designed: C.B.
Revised by: J.L.P.
Checked By: D.L.

2016 Update by: HM
2016 Check by: LD

Date: October 12, 2016

STREET	M.H. #		RESIDENTIAL													COMMERCIAL / INSTITUTIONAL			PLUGGED FLOW		R+C		2016 Updates to Block 1 Peak Flows SEWER DATA					CAPACITY	
			NUMBER OF UNITS									CUMMULATIVE		PEAKING	POPUL.														
			SING.	Stacks	Towns	Ext. Care		Hotel/Apart.			POPUL.	AREA	POPUL.	AREA	FACTOR	FLOW	Actual AREA	CUMM. AREA	COMM. FLOW	FLOW	CUMM. FLOW	PEAK EXTR. FLOW	PEAK DES. FLOW	DIA.	SLOPE	CAPAC.	VEL.	LENGTH	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	mm	%	l/s	m/s	m	(L/s)	
COLCHESTER SQUARE	14 A	14											14630	258.99	2.79	165.30		32.28	28.02		200.71	81.56	475.59	900	0.11	600.38	0.94	14.7	124.79	79%
	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%
COLCHESTER SQUARE	14	11		4							11	0.16	14641	259.15	2.79	165.40		32.80	28.48		200.71	81.75	476.33	900	0.11	600.38	0.94	72.6	124.05	79%
TERON	11	10											14641	259.15	2.79	165.40		32.80	28.48		200.71	81.75	476.33	900	0.11	600.38	0.94	29.6	124.05	79%
	10	EX.										0.25	14641	259.40	2.79	165.40		32.80	28.48		200.71	81.82	476.40	900	0.11	600.38	0.94	72.3	123.98	79%
TERON	O.P.P.	EX.													4.00					0.78	0.78		0.78	100	Forcemain					
TERON	EX.	EX. 2											14641	259.40	2.79	165.40		32.80	28.48		201.49	81.82	477.18	680	0.96	838.61	2.31	9.4	361.43	

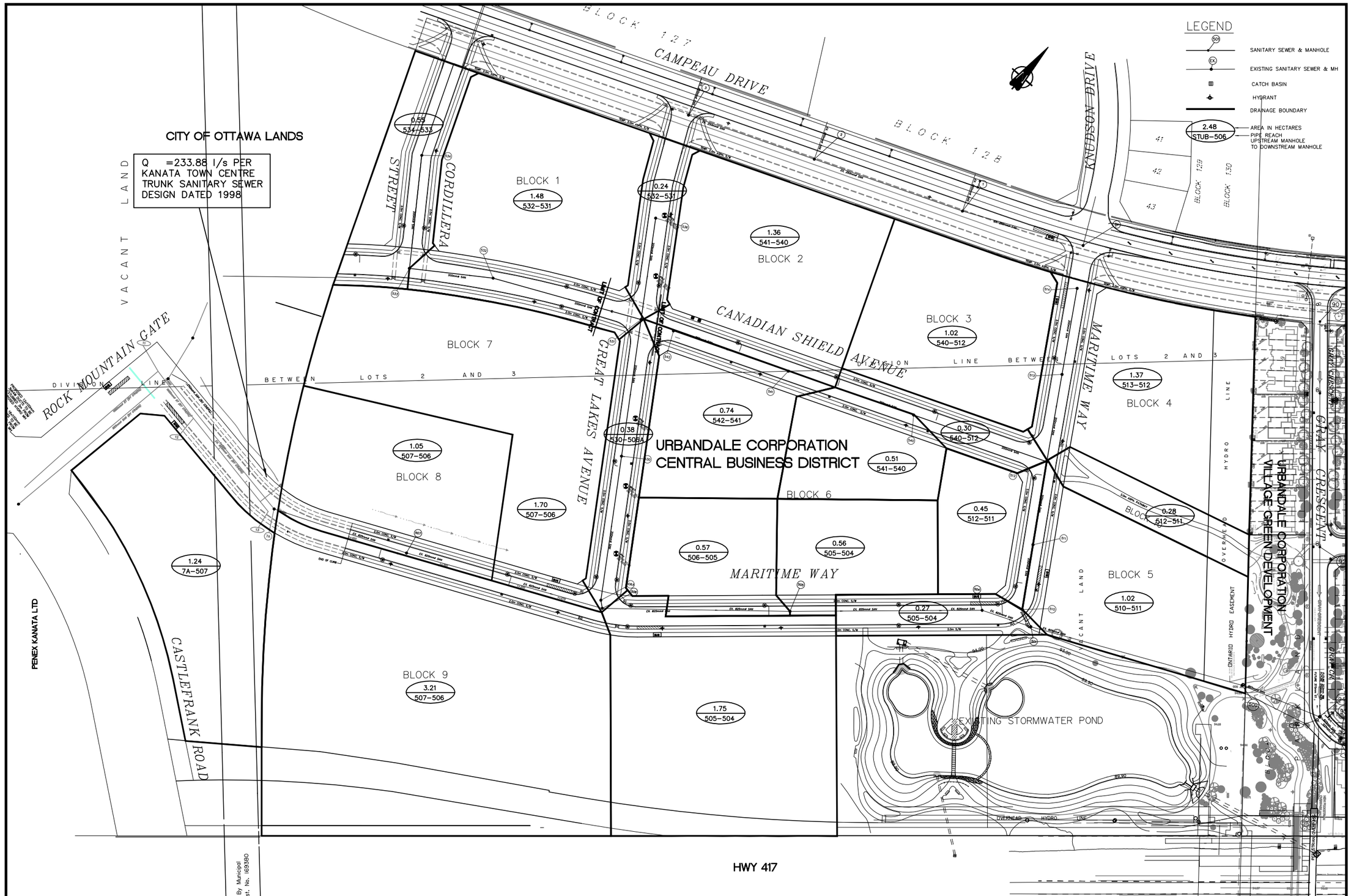
(1) As per Kanata Town Centre Sanitary Trunk Sewer Study, revised March 27, 1996, by Robinson Consultants Inc.

(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)



	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
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864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 8012

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

CITY OF KANATA

SANITARY SEWER DESIGN SHEET

KANATA TOWN CENTRE
(RESIDENTIAL)
URBANDALE CORPORATION

Designed by: L.N.D.

Checked by: M.F.S.

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)

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	0.94	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

	DATE	REVISIONS	BY	NO.	DATE	REVISIONS	BY
				2	12/06/12	REVISED CBD DRAINAGE	JP
				1	18/01/08	ISSUED TO CITY FOR REVIEW	CB

SCALE

0 10m 20m 30m 40m 50m 60m 70m 80m
HORIZONTAL 1:2000

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

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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

OVERALL SANITARY DRAINAGE PLAN

PROJECT No. 15712-NAD 83
STARTED DEC. 2007
DWG. No. 15712-OVSAN

APPENDIX F
Development Servicing Study Checklist

4. Development Servicing Study Checklist

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

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

4.1 General Content

N/A ☐ Executive Summary (for larger reports only).

☒ Date and revision number of the report.

☒ Location map and plan showing municipal address, boundary, and layout of proposed development.

☒ Plan showing the site and location of all existing services.

☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.

☒ Summary of Pre-consultation Meetings with City and other approval agencies.

☒ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.

☒ Statement of objectives and servicing criteria.

☒ Identification of existing and proposed infrastructure available in the immediate area.

☒ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).

☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.

N/A ☐ 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.

N/A ☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:

- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

N/A ☐ Confirm consistency with Master Servicing Study, if available

☒ Availability of public infrastructure to service proposed development

N/A ☐ Identification of system constraints

☒ Identify boundary conditions

☒ Confirmation of adequate domestic supply and pressure

☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.

☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.

N/A ☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design

☒ Address reliability requirements such as appropriate location of shut-off valves

N/A ☐ Check on the necessity of a pressure zone boundary modification.

☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.

N/A ☐ 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.

☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.

☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).

☒ Confirm consistency with Master Servicing Study and/or justifications for deviations.

N/A ☐ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.

☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.

☒ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)

☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.

☒ Description of proposed sewer network including sewers, pumping stations, and forcemains.

N/A ☐ 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).

N/A ☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.

N/A ☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.

N/A ☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.

☐ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)

N/A ☐ Analysis of available capacity in existing public infrastructure.

☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.

☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.

N/A ☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.

☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.

N/A ☐ Set-back from private sewage disposal systems.

☒ Watercourse and hazard lands setbacks.

N/A ☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.

☒ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.

- [X] Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- [X] Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- [X] 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.
- N/A [ ] Any proposed diversion of drainage catchment areas from one outlet to another.
- [X] Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- N/A [ ] 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.
- N/A [ ] Identification of potential impacts to receiving watercourses
- N/A [ ] Identification of municipal drains and related approval requirements.
- [X] Descriptions of how the conveyance and storage capacity will be achieved for the development.
- [X] 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.
- [X] Inclusion of hydraulic analysis including hydraulic grade line elevations.
- [X] Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- N/A [ ] 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.
- N/A [ ] Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

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

☒ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.

☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.

N/A ☐ Changes to Municipal Drains.

N/A ☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

☒ Clearly stated conclusions and recommendations

N/A ☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.

☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

APPENDIX G
Drawings

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 AND THE CITY OF OTTAWA AS THIRD PARTY.
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. PG5371-1, DATED MAY 19, 2021), PREPARED BY PATERSON GROUP 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 (R-2021-097) 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 AS REQUIRED FOR REINSTATEMENT.
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	S25	CITY OF OTTAWA
SANITARY COVER	S24	CITY OF OTTAWA
STORM COVER (CLOSED)	S24.1	CITY OF OTTAWA
STORM COVER (OPEN)	S28.1	CITY OF OTTAWA
SEWER TRENCH	S6 & S7	CITY OF OTTAWA
STORM SEWER	PVC DR 35	CITY OF OTTAWA
SANITARY SEWER	PVC DR 35	CITY OF OTTAWA
ELBOW CB	S31	CITY OF OTTAWA
TEE CB	S30	CITY OF OTTAWA

2. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
3. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
4. 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.
5. 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.
6. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
7. 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.
8. DYE TESTING IS TO BE COMPLETED ON SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN.
9. A SANITARY BACKWATER VALVE ON THE SANITARY SERVICE IS REQUIRED.
10. ALL DRAINAGE FOR THE UNDERGROUND PARKING LEVELS IS REQUIRED TO BE DIRECTED TO THE SANITARY SEWER.

EROSION AND SEDIMENT CONTROL NOTES:

1. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS BUT NOT LIMITED TO INSTALLING FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
2. THE CONTRACTOR SHALL PLACE FILTER CLOTH UNDER THE CATCHBASIN AND MANHOLE GRATES FOR THE DURATION OF CONSTRUCTION AND WILL REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION.
3. SILT FENCING FOR ENTIRE PERIMETER OF SITE, SHALL BE UTILIZED TO CONTROL EROSION FROM THE SITE DURING CONSTRUCTION.
4. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
5. EROSION AND SEDIMENT CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY.

GRADING NOTES:

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

WATERMAIN NOTES:

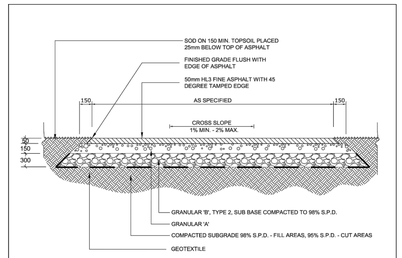
1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN	PVC DR 18	

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.
4. PROVIDE MINIMUM 0.25m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

SWM TANK NOTES:

1. THE MINIMUM INTERNAL SIZE OF THE STORMWATER MANAGEMENT TANK IS TO BE 312m^3. REFER TO THE CROSS SECTION DETAIL AND THE ARCHITECT'S DRAWINGS FOR TANK DIMENSIONS, CONFIGURATION, MATERIALS AND WATERPROOFING DETAILS.
2. THE ACCESS HATCHES ARE TO OPERATE AS THE EMERGENCY OVERFLOW FOR THE SWM TANK. PROVIDE THE FRAME AND COVERS PER S25 & S28.1 RESPECTIVELY.
3. PROVIDE CIRCULAR HOLLOW ALUMINIUM MAINTENANCE HOLE STEPS ALONG TANK WALLS AT THE ACCESS HATCHES PER OPSD 405.010.



NOTES:

ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

EXCAVATION:	EXCAVATE TO 500mm MIN. DEPTH OR DEEPER, AS REQUIRED. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ANY UNSUITABLE SUBGRADE MATERIAL SUCH AS TOPSOIL, ALL SOFT SPOTS AND/OR ORGANIC MATTER AND REPLACEMENT WITH CLEAN SUBSOIL FILL. SUBGRADE SHALL BE CONSOLIDATED TO A 98% S.P.D. REMOVE EXCAVATED MATERIAL OFF SITE UNLESS OTHERWISE DIRECTED
GRANULAR BASE:	GRANULAR 'A' - 100% STANDARD PROCTOR DENSITY MIN., GRANULAR B, TYPE 2, SUB BASE GRANULARS TO OPSS
ASPHALT:	50 TOP SURFACE LAYER (AFTER COMPACTION) OF HOT MIX HL3 FINE IN ACCORDANCE WITH O.P.S.S. STANDARDS
EDGE TREATMENT:	ASPHALT EDGE TO BE 45 DEGREES WELL TAMPED TO FORM UNIFORMLY SMOOTH, CLEAN EDGES WITHOUT LATERAL DEVIATIONS. SOD TO FEATHER IN WITH EXISTING SOD AND GRADES AT A MAXIMUM SLOPE OF 4:1. ALL SODDED AREAS SHALL BE 25mm BELOW THE ASPHALT SURFACE. REPLACE ALL TOPSOIL AND SOD AS DIRECTED IN CUT AND FILL SITUATIONS
DRAINAGE:	SLOPE TO BE A MINIMUM OF 2% ON CROWNED OR CROSS SLOPED PATHS AS DIRECTED ON SITE OR AS SHOWN IN DRAWINGS
SODDING:	ALL DISTURBED AREAS ALONG ASPHALT WALKWAYS SHALL BE SODDED OVER 150mm TOPSOIL FOR A MINIMUM DISTANCE OF 900mm
GEOTEXTILE:	GEOTEXTILE SHALL BE APPROVED NON-WOVEN CLASS 1 GEOTEXTILE AS PER MS-22.15 WHEN WARRANTED BY SOIL CONDITIONS, SUBJECT TO APPROVAL BY THE CONTRACT ADMINISTRATOR

**NOTE: TO BE CONFIRMED WITH SOIL INVESTIGATIONS AND MODIFIED ACCORDINGLY*

	TITLE: ASPHALT WALKWAY/ SERVICE ACCESS - HEAVY DUTY	DATE: FEB 2013
		REV: FEB 2016
		DWG No: SC21

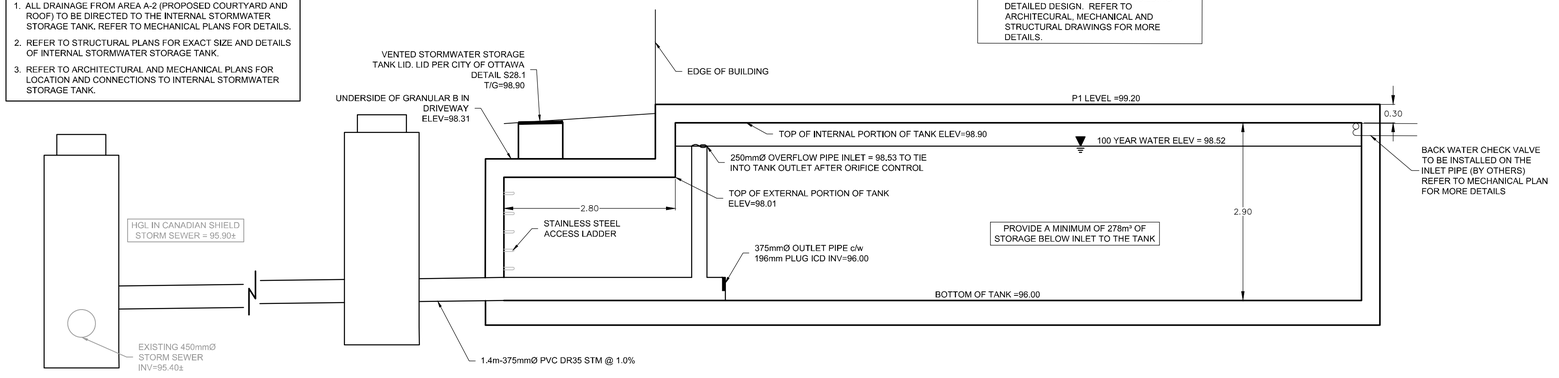
STORMWATER STORAGE TANK TABLE

DESIGN EVENT	CONTROLLED FLOW FROM STORAGE TANK	STORAGE TANK VOLUME	
		REQUIRED	PROVIDED
1:2 YR	74.1 L/s	106 m³	>312 m³
1:5 YR	89.2 L/s	149 m³	
1:100 YR	126.0 L/s	278 m³	

NOTES:

1. ALL DRAINAGE FROM AREA A-2 (PROPOSED COURTYARD AND ROOF) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE TANK. REFER TO MECHANICAL PLANS FOR DETAILS.
2. REFER TO STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE TANK.
3. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR LOCATION AND CONNECTIONS TO INTERNAL STORMWATER STORAGE TANK.

NOTE:
1. ELEVATIONS SHOWN ARE APPROXIMATE AND WILL BE CONFIRMED DURING BUILDING DETAILED DESIGN. REFER TO ARCHITECURAL, MECHANICAL AND STRUCTURAL DRAWINGS FOR MORE DETAILS.



SWM TANK DETAIL

1:50 SCALE

NOTE:
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PRELIMINARY NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
4.	REVISED PER CITY COMMENTS	JAN 14/22	CJR
3.	REVISED PER CITY COMMENTS	DEC 17/21	CJR
2.	ISSUED FOR SITE PLAN APPROVAL	JUL 07/21	CJR
1.	ISSUED FOR COORDINATION	MAR 30/21	CJR

SCALE: AS NOTED

DESIGN: MJH
CHECKED: CJR
DRAWN: MJH
CHECKED: CJR
APPROVED: JLS

FOR REVIEW ONLY

LICENCE PROFESSIONAL ENGINEER C.J. RUDDLE JAN 14/22 PROVINCE OF ONTARIO

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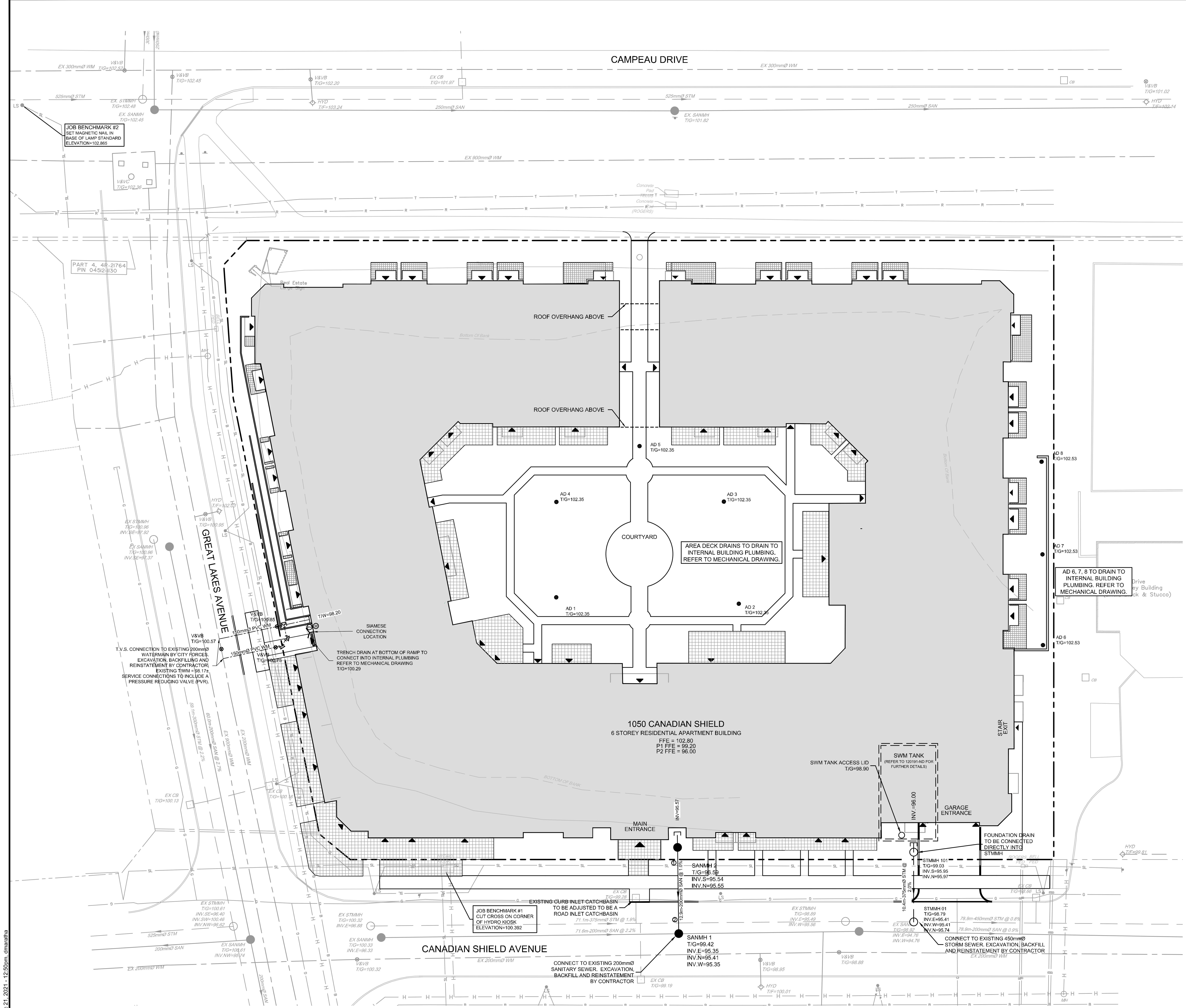
Facsimile (613) 254-5867
Website www.novatech-eng.com

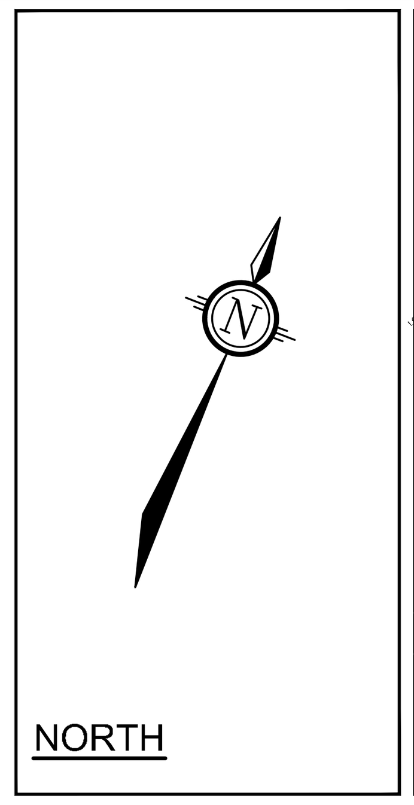
LOCATION
CITY OF OTTAWA
1050 CANADIAN SHIELD

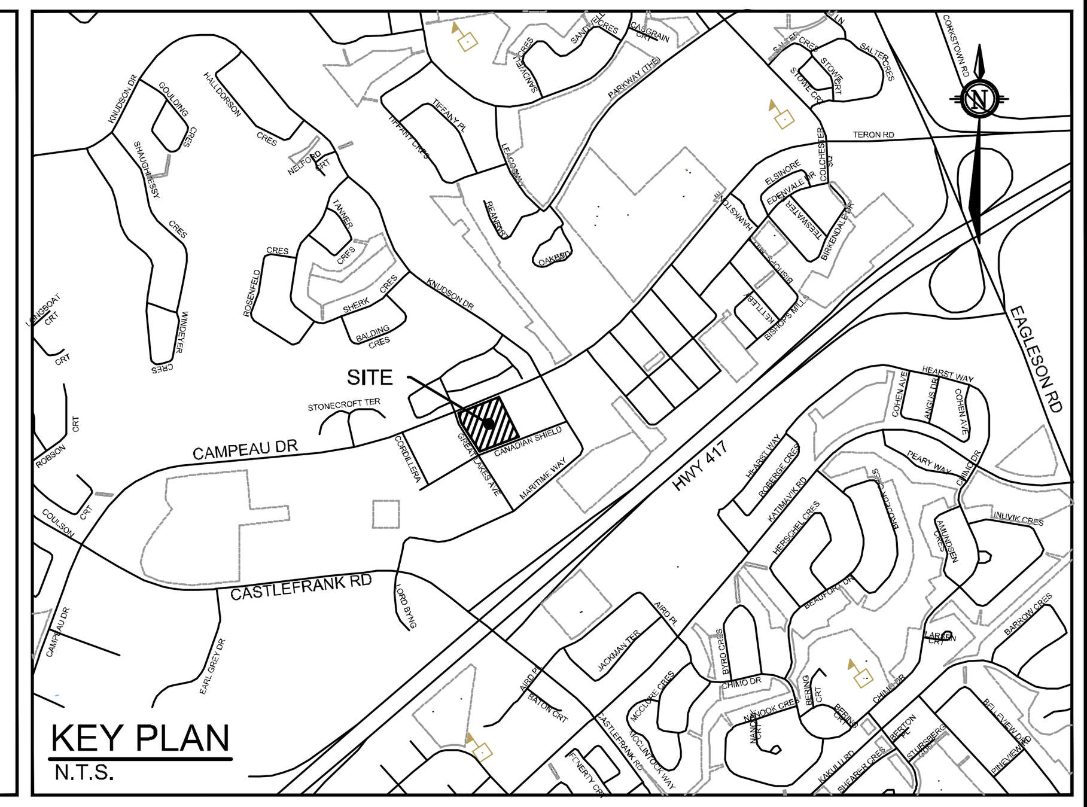
DRAWING NAME
NOTES AND DETAILS PLAN

PROJECT No. 120191
REV REV # 4
DRAWING No. 120191-ND

D07-16-15-0008







LEGEND

- PROPERTY LINE
- PROPOSED CURB
- DC — PROPOSED DEPRESSED CURB
- PROPOSED WATER SERVICE
- SP — PROPOSED STANDPOST
- V&VB — PROPOSED VALVE AND VALVE BOX
- PROPOSED CAP
- PROPOSED WATER METER
- PROPOSED REMOTE METER
- SANMH — PROPOSED SANITARY SERVICE C/W MANHOLE
- STMMH — PROPOSED STORM SEWER C/W MANHOLE
- PROPOSED BUILDING ENTRANCE
- DIRECTION OF FLOW
- AD — PROPOSED AREA DECK DRAIN BY OTHERS (REFER TO MECH DRAWINGS FOR MORE INFO)
- RD — PROPOSED ROOF DRAIN NY OTHERS (REFER TO MECH DRAWINGS FOR MORE INFO)
- GM — PROPOSED GAS METER
- PROPOSED TERRACE ENTRANCE
- EXISTING UTILITY POLE C/W GUY WIRES
- V&VC — EXISTING WATERMAIN C/W VALVE & VALVE CHAMBER
- EXISTING HYDRANT C/W VALVE & LEAD
- SAN MH — EXISTING SANITARY MANHOLE & SEWER
- STM MH — EXISTING STORM MANHOLE & SEWER
- CB 1 — EXISTING CATCHBASIN
- EXISTING GAS MAIN
- EXISTING UNDERGROUND BELL LINE
- EXISTING UNDERGROUND TELUS LINE
- EXISTING UNDERGROUND ROGERS LINE
- EXISTING UNDERGROUND STREETLIGHT LINE
- EXISTING UNDERGROUND HYDRO LINE
- EXISTING STREETLIGHT

REFER TO 120191-ND FOR ADDITIONAL NOTES

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2.	ISSUED FOR COORDINATION	MAY 14/21	CJR
1.	ISSUED FOR COORDINATION	MAR 30/21	CJR

SCALE 1:300

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DESIGN MJH
CHECKED CJR
DRAWN MJH
CHECKED CJR
APPROVED JLS

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LICENSED PROFESSIONAL ENGINEER C.J. RIDDLE JAN 14/22 PROVINCE OF ONTARIO

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Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
CARRÉ-SAINT-LOUIS

DRAWING NAME
GENERAL SERVICING PLAN

PROJECT No. 120191
REV # 5
DRAWING No. 120191-GP

D07-16-15-0008

#18567

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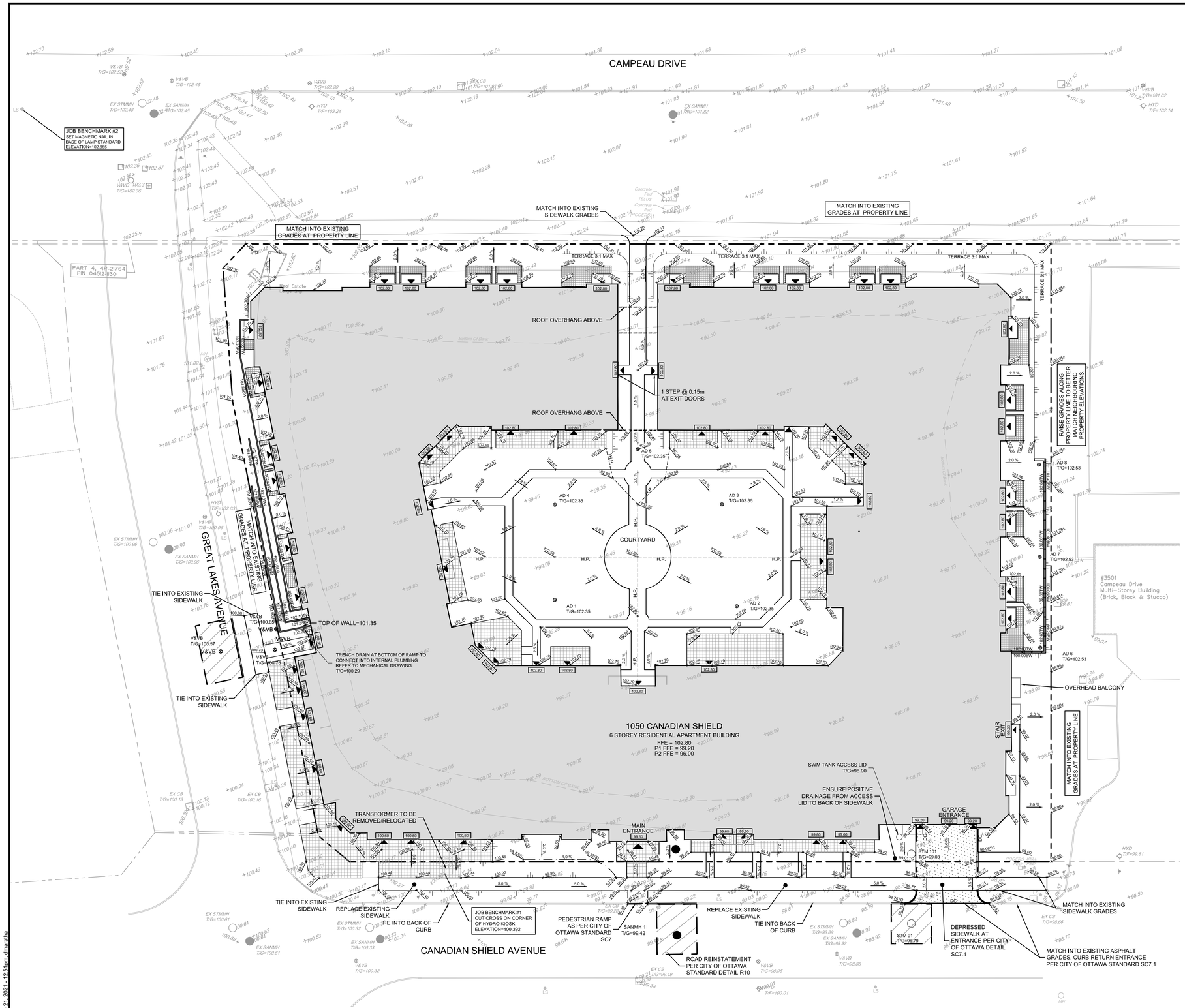

NORTH

KEY PLAN
N.T.S.

LEGEND

▬ ▬ ▬	PROPERTY LINE
98.40	PROPOSED ELEVATION
x 98.40	EXISTING ELEVATION
97.79TW	PROPOSED TOP OF WALL ELEVATION
97.79BW	PROPOSED BOTTOM OF WALL ELEVATION
97.88TC	PROPOSED TOP OF CURB ELEVATION
102.80	PROPOSED DOOR SILL ELEVATION
2.0 %	SLOPE AND DIRECTION
V&VB ⊗	PROPOSED VALVE AND VALVE BOX
▼	PROPOSED BUILDING ENTRANCE
⇐	DIRECTION OF MAJOR OVERLAND FLOW
AD	PROPOSED AREA DECK DRAIN BY OTHERS (REFER TO MECH DRAWINGS FOR MORE INFO)
●	PROPOSED FILTER BAGS AT CATCHBASINS, CATCHBASIN MANHOLES AND TRENCHDRAINS
M M	PROPOSED MUD MAT
—○—	LIGHT DUTY SILT FENCE (OPSD 219.110)
H.P.	PROPOSED HIGH POINT
═	PROPOSED CURB
DC	PROPOSED DEPRESSED CURB
	TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
▬	PROPOSED RETAINING WALL
	PROPOSED RAILING
▬ ▬ ▬	SAWCUT
▨	ROAD REINSTATEMENT
V&VC	*EXISTING VALVE & VALVE CHAMBER*
V&VB	*EXISTING VALVE & VALVE BOX*
	EXISTING HYDRANT
SAN MH ●	*EXISTING SANITARY MANHOLE*
STM MH ○	*EXISTING STORM MANHOLE*
CB 1	*EXISTING CATCHBASIN*
LS	*EXISTING LIGHT STANDARD*

PAVEMENT STRUCTURE:

⛆	HEAVY DUTY PAVEMENT 40mm HL3 OR SP 12.5 50mm HL8 PR SP 19.0 150mm OPSS GRANULAR "A" 450mm OPSS GRANULAR "B" TYPE II

REFER TO 120191-ND FOR ADDITIONAL NOTES

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5.	ISSUED FOR SITE PLAN APPROVAL	JUL 7/21	CJR
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3.	ISSUED FOR COORDINATION	MAY 04/21	CJR
2.	ISSUED FOR COORDINATION	APR 23/21	CJR
1.	ISSUED FOR COORDINATION	MAR 30/21	CJR

SCALE
1:300
1:300
0 3 6 9 12

DESIGN MJH
CHECKED CJR
DRAWN MJH
CHECKED CJR
APPROVED JLS

FOR REVIEW ONLY

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C.J. RUDDLE
JAN 14/22
PROVINCE OF ONTARIO
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LOCATION
CITY OF OTTAWA
CARRÉ-SAINT-LOUIS

DRAWING NAME
GRADING PLAN

PROJECT No. 120191
REV
REV # 7
DRAWING No.
120191-GR

D07-16-15-0008

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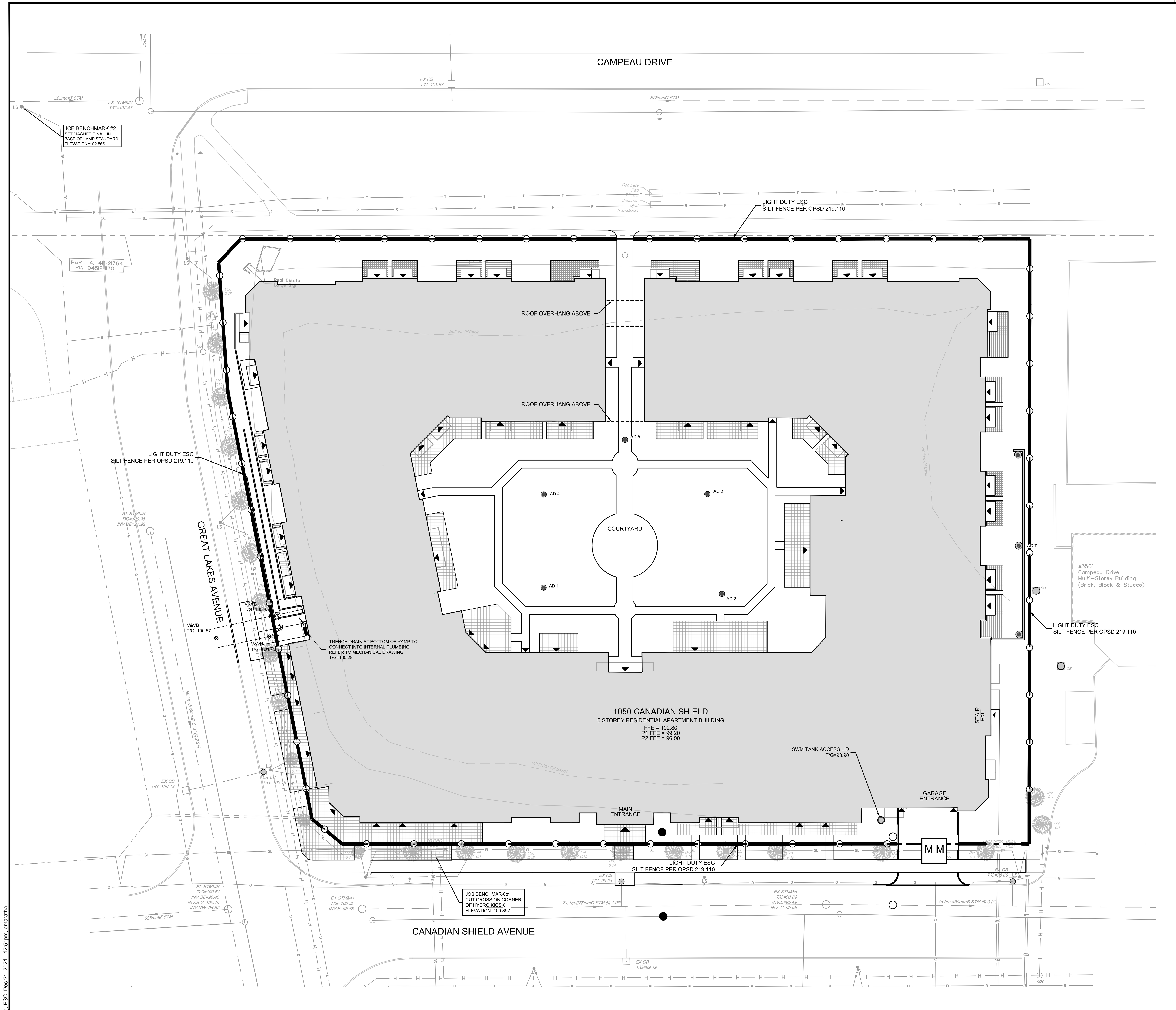
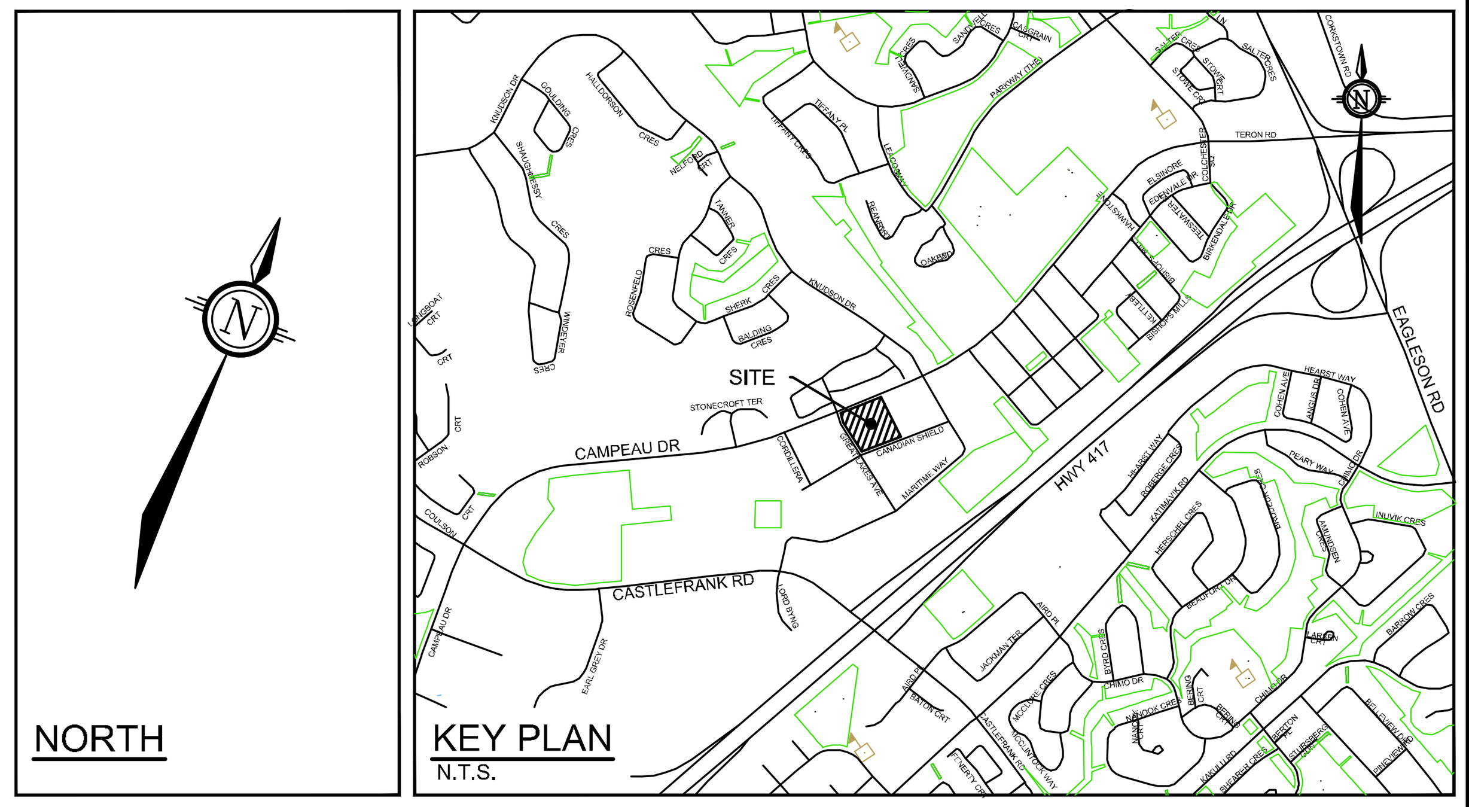
#18567





LEGEND

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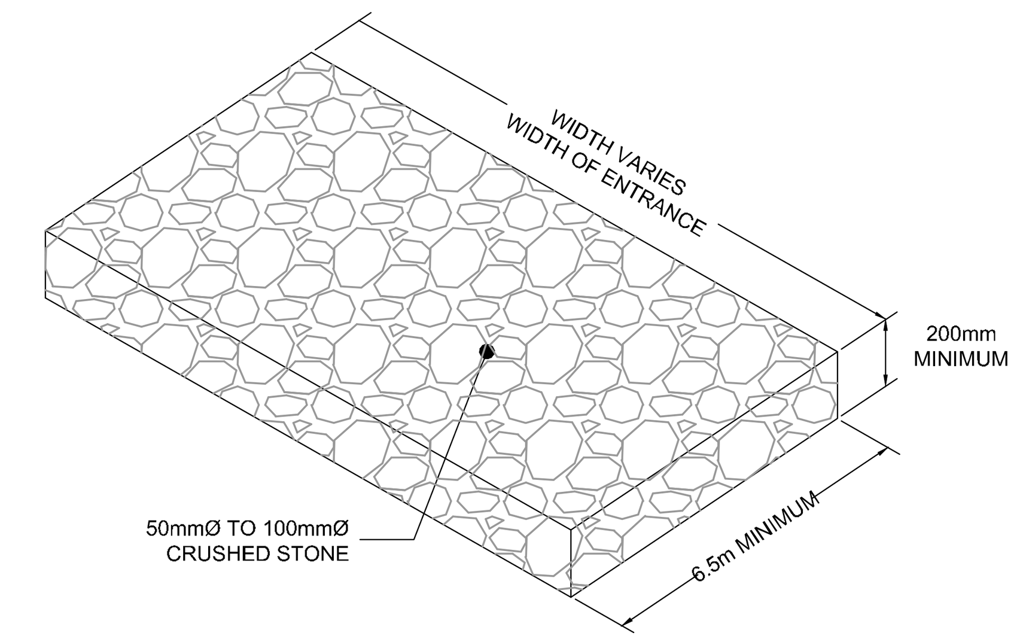
- PROPOSED DEPRESSED CURB
- PROPOSED STORM MANHOLE
- PROPOSED BUILDING ENTRANCE
- PROPOSED AREA DECK DRAIN BY OTHERS (REFER TO MECH DRAWINGS FOR MORE INFO)
- PROPOSED ROOF DRAIN NY OTHERS (REFER TO MECH DRAWINGS FOR MORE INFO)
- PROPOSED FILTER BAGS AT CATCHBASINS, CATCHBASIN MANHOLES AND TRENCHDRAINS
- PROPOSED MUD MAT
- LIGHT DUTY SILT FENCE (OPSD 219.110)
- *EXISTING STORM MANHOLE*
- *EXISTING CATCHBASIN*



MUD MAT DETAIL
NOT TO SCALE

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LOCATION
CITY OF OTTAWA
CARRÉ-SAINT-LOUIS

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 120191
REV # 2
DRAWING No. 120191-ESC

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