david schaeffer engineering ltd

120 Iber Road, Suite 103
Ottawa, Ontario K2S 1E9
Tel. (613)836-0856
Fax (613) 836-7183
www.DSEL.ca

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

10731854 CANADA INC
788 MARCH ROAD

CITY OF OTTAWA

PROJECT NO.: 18-1039

AUGUST 2018 – REV 1

120 Iber Road, Suite 103
Ottawa, Ontario K2S 1E9
Tel. (613)836-0856
Fax (613) 836-7183
www.DSEL.ca

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT FOR 10731854 CANADA INC 788 MARCH ROAD

AUGUST 2018 – REV 1

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT FOR 10731854 CANADA INC 788 MARCH ROAD

CITY OF OTTAWA

AUGUST 2018 – REV 1

PROJECT NO.: 18-1039

1.0 INTRODUCTION

David Schaeffer Engineering Ltd. (DSEL) has been retained by 10731854 Canada Inc to prepare a Functional Servicing and Stormwater Management Report in support of Site Plan Application for the proposed development at 788 March Road.

The subject property is located within the City of Ottawa urban boundary, in the Kanata North ward. As illustrated in ***Figure 1***, below, the subject property is bounded by Klondike Road to the north-west, March Road to the south-west, an existing church to the north-east and an existing residential lot to the south-east. Shirley's Brook lies within the site area; hence the subject property lies within the floodplain overlay. The subject property measures approximately ***1.22 ha*** and is designated General Mixed-Use Zone (GM) under the current City of Ottawa zoning by-law. The development is restricted to outside of the 30m setback from the Shirley's Brook Creek and the MVCA floodplain of ***74.00m***, the total development area is equal to ***0.62 ha***.

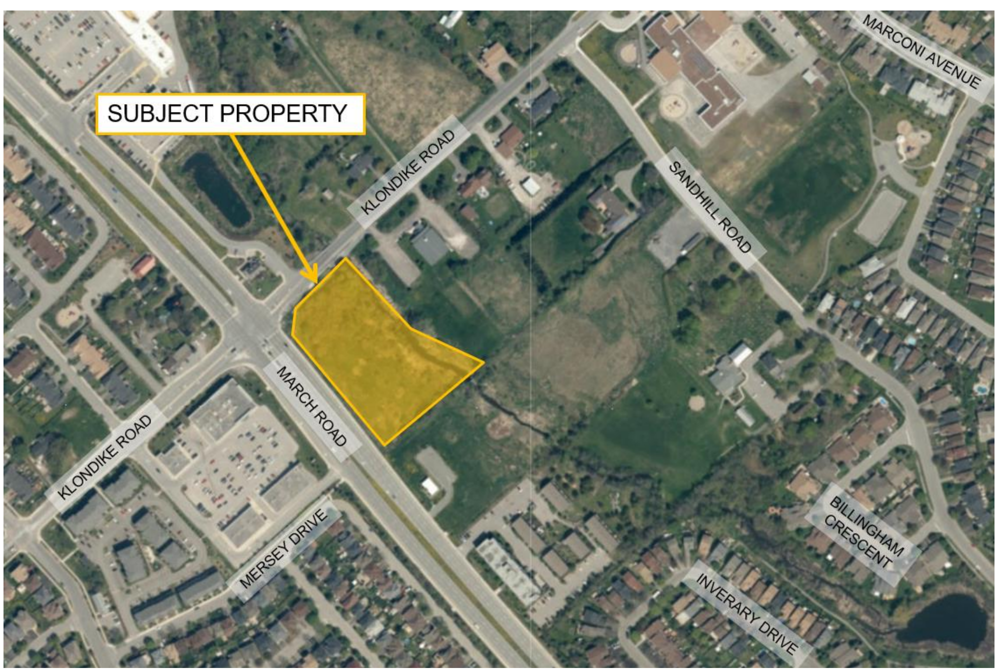


Figure 1: Site Location

The proposed development involves the construction of two, 6-storey apartment buildings consisting of a total of ***196 units***, a shared underground parking garage and a shared visitor parking lot. The development is proposed to be constructed in two phases, with phase 1 consisting of one 6-storey building with an average building area of ***1,584 m²*** and ***95 units***. Phase 2 is to follow with a second 6-storey apartment building with an average building area of ***1,640 m²*** and ***101 units***.

The objective of this report is to support the application for Site Plan Control by providing sufficient detail to demonstrate that phases 1 and 2 of the proposed development is supported by existing and proposed municipal servicing infrastructure and that the site design conforms to current City of Ottawa design standards.

1.1 Existing Conditions

The subject site is currently a vacant parcel consisting of grassy areas and a few trees. Shirley's Brook Creek, a tributary to the Ottawa River, also lies within the subject site.

Sewer system and watermain distribution mapping collected from the City of Ottawa indicate that the following services exist across the property frontages, within the adjacent municipal right-of-ways:

Klondike Road:

- 406 mm diameter watermain; and
- 750 mm diameter storm sewer, west of March Road.

March Road:

- 406 mm diameter watermain;
- 675 and 825 mm diameter storm sewer, east of Klondike Road; and
- 1800 mm diameter storm sewer, west of Klondike Road.

Mersey Drive:

- 203 mm diameter watermain;
- 200 mm diameter sanitary sewer; and
- 525 mm diameter storm sewer.

1.2 Required Permits / Approvals

Development of the site is subject to the City of Ottawa Planning and Development Approvals process. The City of Ottawa must approve detailed engineering designs, drawings and reports prepared to support the proposed development plan.

The subject property contains existing trees. Development, which may require removal of existing trees, maybe subject to the City of Ottawa Urban Tree Conservation By-law No. 2009-200.

1.3 Pre-consultation

Pre-consultation meeting notes are located in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES AND REPORTS

2.1 Existing Studies, Guidelines and Reports

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002**,*** October 2012.
  (City Standards)

  - **Technical Bulletin ISDTB-2014-01**
    City of Ottawa, February 5, 2014.
    (ITSB-2014-01)

  - **Technical Bulletin PIEDTB-2016-01**
    City of Ottawa, September 6, 2016.
    (PIEDTB-2016-01)

  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018.
    (ISTB-2018-01)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, October 2012.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

  - **Technical Bulletin ISDTB-2018-02**
    City of Ottawa, March 21, 2018.
    (ISDTB-2018-02)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch, January 1, 2010 Update.
  (OBC)

- **Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems**
  National Fire Protection Association
  2014 Edition.
  (NFPA 25)

- **Drainage Management Manual**
  Ministry of Transportation of Ontario (MTO), 1997.
  (MTO Drainage Manual)

- **Shirley's Brook Stormwater Management Facility 1 – West Design Brief**
  David McManus Engineering Ltd., April 15, 2009.
  (Shirley's Brook SWM Design Brief)

- **Due Diligence Servicing Brief, 788 March Road, Ottawa, Ontario**
  J.L.Richards, January 25, 2018.
  (Due Diligence Servicing Brief)

- **Kanata North Community Design Plan – Master Servicing Study**
  Novatech, June 28 2016.
  (KNCDP-MSS)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 2W2C pressure zone, as shown by the Pressure Zone map located in ***Appendix B.*** Watermains exist within Klondike Road and March Road rights-of-way.

3.2 Water Supply Servicing Design

The subject property is proposed to be serviced through two connections to the existing 406 mm municipal watermains located within March and Klondike Road. In accordance with City of Ottawa technical bulletin **ISDTB-2014-02**, redundant service connections will be required due to an anticipated average daily demand greater than 50 m^3/day. The two water services will be looped inside the building to satisfy redundancy. The looped water servicing is proposed to service Phase 1 in the interim condition and the ultimate condition when Phase 2 is constructed.

Table 1, below, summarizes the ***Water Supply Guidelines*** employed in the preparation of the water demand estimate.

Table 1
Water Supply Design Criteria

Design Parameter	Value
Residential Demand	350 L/p/d
Residential Maximum Daily Demand	3.0 x Average Daily *
Residential Maximum Hourly	4.5 x Average Daily *
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350kPa and 480kPa
During normal operating conditions pressure must not drop below	275kPa
During normal operating conditions pressure shall not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa
** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.* *** Table updated to reflect ISD-2018-2*	

Table 2, below, summarizes the anticipated water demand and boundary conditions for the proposed development and was calculated using the ***Water Supply Guidelines.***

Table 2
Proposed Water Demand

Design Parameter	Anticipated Demand[1] (L/min)	Boundary Conditions[2] (m H_2O / kPa)		Boundary Conditions[3] (m H_2O / kPa)	
Average Daily Demand	87.0	131.6	526.6	131.6	526.3
Max Day + Fire Flow (per OBC)	261.0 + 6,650	123.8	450.1	124.2	449.8
Max Day + Fire Flow (per ISDTB-2018-02)	261.0 + 13,000	120.2	414.8	123.8	414.5
Peak Hour	391.8	124.2	454.0	120.2	453.7

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions above for connection 1 to March Road assumed ground elevation equal to 77.92m
3) Boundary condition for connection 2 to Klondike Road assumed ground elevation equal to 77.95m

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in ***Appendix B***.

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow, as indicated by the correspondence in ***Appendix A***.

A hydrant has been added to provide adequate fire protection for the proposed development per the ***OBC*** fire flow above, refer to drawing ***SSP-1*** in ***Drawings/Figures***.

The required fire flow was estimated using two methods. The ***OBC*** method resulted in a fire flow of ***6,650 L/min***. Fire flow calculated using the ***ISTDB-2018-02*** method used the following assumptions from the Architect:

- Type of construction – Fire-Resistive Construction;
- Occupancy type – Limited Combustibility;
- Sprinkler Protection – Sprinklered; and
- Phase 1 and Phase 2 are considered separate fire areas.

The above assumptions result in a maximum estimated fire flow of approximately ***12,000 L/min*** and ***13,000L/min*** for ***Phase 1*** and ***Phase 2,*** respectively. See ***Appendix B*** for detailed calculations using the ***ISDTB-2018-02*** method.

The minimum and maximum pressures fall within the required range identified in ***Table 1.***

3.3 Water Supply Conclusion

It is proposed to service the private development from two connections to the existing 400 mm watermains located within March Road and Klondike Road.

The anticipated water demand was submitted to the City of Ottawa for establishing boundary conditions. The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow. As demonstrated by ***Table 2***, based on the City's model, the municipal system is capable of delivering water within the pressure range prescribed in the ***Water Supply Guidelines***. The available pressure during the fire flow scenario as per the ***OBC*** and ***ISDTB-2018-02*** calculations exceeds 140 kPa.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject property lies within the East March Trunk sewer catchment area, as shown by the ***Trunk Sanitary Sewers and Collection Areas Map*** included in ***Appendix C***. There are existing sanitary sewers within Mersey Drive and Klondike Road (west of March Road). An existing 200 mm sanitary sewer stub that is capped at both ends also exists across March Road, at the southwest corner of the site.

4.2 Wastewater Design

It is anticipated that the proposed development will be serviced by the future 600 mm sanitary trunk sewer to be constructed along March Road from Shirley's Brook Drive to Maxwell Bridge per the **Kanata North Community Design Plan – Master Servicing Study *(KNCDP-MSS)***. The development is proposed to connect to the future sanitary sewer via a proposed 200 mm sanitary service. Refer to, ***SSP-1,*** in ***Drawings/Figures*** for sanitary servicing layout.

The site area, as well as, the neighbouring parcel at 760 March Road were included in the ***KNCDP-MSS*** sanitary design sheet provided in ***Appendix C*** and are identified as Drainage Area X-5. The ***KNCDP-MSS*** assumes both sites were to be developed as high density residential, with a combined total area of ***1.76 ha*** and a total contributing peak flow of ***5.1 L/s***.

Table 3, below, summarizes the ***City Standards*** employed in the calculation of wastewater flow rates for the proposed development.

Table 3
Wastewater Design Criteria

Design Parameter	Value
Residential Demand	280 L/p/d
Peaking Factor	Harmon's Peaking Factor. Max 3.8, Min 2.0
Infiltration and Inflow Allowance	0.33L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sanitary Sewer Lateral	135mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 4, below, demonstrates the anticipated peak flow from the proposed development to the sanitary connection within March Road. See ***Appendix C*** for associated calculations.

Table 4
Summary of Proposed Wastewater Flows

Design Parameter	Anticipated Sanitary Flow[1] (L/s)
Average Dry Weather Flow Rate	1.16
Peak Dry Weather Flow Rate	3.99
Peak Wet Weather Flow Rate	4.20
1) Based on criteria shown in ***Table 3***	

The estimated peak wet weather sanitary flow, based on the ***Site Plan,*** provided in ***Drawings/Figures,*** is ***4.20 L/s*** to the March Road sanitary connection.

The subject site was contemplated in the ***KNCDP-MSS***, identified as a ***1.78 Ha*** parcel with a peak flow of ***5.1 L/s***. The contemplated parcel includes ***0.83 Ha*** of the subject lands and ***0.93 Ha*** from the adjacent 760 March Road. Pro-rated the allocation for the subject site is ***2.41 L/s***. The proposed development results in an increase of ***1.79 L/s*** to the future sanitary sewer within March Road.

As per the ***KNCDP-MSS*** sanitary design sheet provided in ***Appendix C***, the most restrictive leg of pipe up to the Briar Ridge Pump Station has a contemplate capacity of ***18 L/s*** (202.4 L/s Capacity – 184.4 L/s Flow), which is sufficient to convey the proposed increase in flow.

4.3 Wastewater Servicing Conclusions

The site is tributary to the East March Trunk sewer. The development is anticipated to generate a peak wet weather flow of ***4.20 L/s*** to be directed to the future 600 mm sanitary sewer within March Road. The future 600 mm sanitary has sufficient capacity to accommodate the flow increase of ***1.79 L/s*** from the proposed development.

The proposed wastewater design conforms to all relevant ***City Standards***.

5.0 STORMWATER MANAGEMENT

A stormwater management strategy has been developed to ensure there is no increased risk of flooding to the surrounding residential neighbourhood due to the development of the subject property.

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system and is located within the Ottawa West sub-watershed. As such, approvals for the proposed development within this area are under the approval authority of the City of Ottawa. The subject property is located within the Ottawa River watershed and is also subject to review by the Mississippi Valley Conservation Authority (MVCA).

The existing stormwater runoff from the site area generally drains northeast into Shirley's Brook Creek. Existing storm sewers lie within March and Klondike Road.

The site area is serviced by Shirley's Brook Stormwater Management (SWM) Facility, referred to as Pond No 1 – West, per the ***Shirley's Brook SWM Design Brief***. The site area lies within area ID *Klondike A-500,* per the Service Area Drainage Plan provided in ***Appendix D***. The pond is designed to accommodate minor flow from the site area and provide both water quantity control in the minor event and quality control to "Normal" level of treatment (70% total suspended solids removal). The pond was designed to accept minor flow at a rate of ***70 L/s/ha*** from the subject site and adjacent site.

The local 675 mm and 825 mm storm sewers fronting the site within March Road were sized to accommodate the 5-year flow from the subject site assuming a runoff coefficient of 0.80 for a total of ***352 L/s,*** refer to existing design sheet in ***Appendix D***.

A hydraulic grade line (HGL) analysis completed by Stantec resulted in an HGL of ***77.06 m*** and ***77.52 m*** at ***MH155*** and **MH158***,* respectively. Refer to ***Appendix D*** for existing HGL and drawing ***EX-1,*** accompanying this report, for location of the above noted manholes.

An estimate of the pre-development peak flow directed to Shirley's Brook Creek has been completed. The time of concentration using the Federal Aviation Administration method has been calculated with the following parameters 0.62 Ha; 0.20 RC; 62 m flow length; slope equal to 6.0%; and resulting in a time of concentration of ***12.7 minutes***. The south portion of the property within the 30 m buffer from Shirley's Brook Creek is not proposed to be altered from the pre- to post-condition and was therefore not analyzed in the calculations.

The estimated pre-development peak flows for the 2, 5, and 100-year storm events are summarized in ***Table 5,*** below:

Table 5
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	23.4
5-year	31.6
100-year	67.7

5.2 Post-development Stormwater Management Targets

Stormwater management requirements for the proposed development were reviewed with the City of Ottawa and are summarized below:

- Attenuate to a target release rate of ***70 L/s/ha*** based on ***Shirleys' Brook SWMF Design Brief***; and
- Flow attenuation is required up to and including the 100-year storm event.

5.3 Proposed Stormwater Management System

The proposed development consists of mostly rooftop, surface parking area and outdoor amenity space. It is proposed that flow from the roof area be directed to drain to an internal stormwater cistern. The on-site surface area parking is located above the parking garage and will direct stormwater flow to area drains, the internal mechanical plumbing system and to the stormwater cistern described forthwith. The cistern is sized to accommodate flow in the ultimate condition from Phase 1 and Phase 2 and will be constructed within the footprint of Phase 1. Both the roof and area drains are to be designed to capture up to the 100-year storm event, capture rate of surface drainage summarized in ***Appendix D***.

The stormwater cistern is proposed to be controlled to a maximum release rate of ***27.3 L/s*** and proposed to discharge to a 300 mm lateral via a submersible pump. The pump will be required to pump up to a minimum elevation of ***77.36 m***, 0.30 m above the 100-Year HGL at ***MH158,*** to ensure drainage from the cistern to the adjacent minor system. The 300 mm service is proposed to connect to ***MH155*** storm manhole within March Road. Refer to the drawing ***SSP-1*** in ***Drawings/Figures*** for storm servicing layout.

A portion around the boundary of the site will drain uncontrolled to March Road, Klondike Road and to Shirley's Brook via overland flow. Refer to drawing ***SWM-1,*** included with this report, for post-development stormwater management plan and drainage areas described above.

The existing ditch within the Klondike Road right-of-way is proposed to be retained. This ditch currently collects major system drainage in excess of the 10-year storm event from the east side of March Road between Morgan's Grant Way/Shirley Brook Drive and Klondike Road. The 100-year major system flow is summarized in the SWMHYMO results extracted from the ***Shirley's Brook SWMF Design Brief*** in ***Appendix D*** as ***357 L/s.*** The ***357 L/s*** includes flow from a ***1.21 Ha*** area that would not enter the ditch, therefore, the estimated flow to the ditch from the ***1.37 Ha*** area is actually estimated to be ***189.6 L/s*** (357 L/s x (1.37 Ha / (1.21 Ha + 1.37 Ha))). Proposed culverts within the ditch have been sized to accommodate the major flow described above, refer to ***Appendix D*** for culvert sizing.

To meet the stormwater objectives the proposed development will use cistern storage within the proposed building. ***Table 6,*** below***,*** estimates post-development flow rates.

Table 6
Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Storage
	(L/s)	(m^3)	(L/s)	(m^3)
Unattenuated Areas	27.1	0.0	58.1	0.0
Attenuated Areas	14.5	88.0	27.3	166.4
Total	**41.6**	**88.0**	**85.4**	**166.4**

Summarized in the table above, the internal cistern will require approximately ***166.4 m^3*** of storage to ensure a total release rate of ***85.4 L/s.***

5.4 Stormwater Servicing Conclusions

Existing conditions result in flow from the subject property to Shirley's Brook Creek. A target release rate of ***85.4 L/s*** was established per ***Shirley's Brook SWMF Design Brief***.

The development is proposed to be serviced by the existing 825 mm storm sewer within March road via a 300 mm lateral storm service. ***166.4 m^3*** of cistern storage within the building is proposed to meet requirements to attenuate flow to the allowable release rate.

The proposed stormwater design conforms to all relevant ***City Standards*** and Policies for approval.

6.0 UTILITIES

Gas, Hydro, Streetlighting, Bell and Rogers services exist within the March Road and Klondike Road rights-of-way.

Utility servicing will be coordinated with the individual utility companies prior to site development.

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. The extent of erosion losses is exaggerated during construction where vegetation has been removed and the top layer of soil becomes agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fence will be installed around the perimeter of the site and will be cleaned and maintained throughout construction. Silt fence will remain in place until the working areas have been stabilized and re-vegetated.

Catch basins will have SILTSACKs installed under the grate during construction to protect from silt entering the storm sewer system.

A mud mat will be installed at the construction access, in order to prevent mud tracking onto adjacent roads.

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents:

- Limit extent of exposed soils at any given time;
- Re-vegetate exposed areas as soon as possible;
- Minimize the area to be cleared and grubbed;
- Protect exposed slopes with plastic or synthetic mulches;
- Install silt fence to prevent sediment from entering existing ditches;
- No refueling or cleaning of equipment near existing watercourses;
- Provide sediment traps and basins during dewatering;
- Install filter cloth between catch basins and frames;
- Plan construction at proper time to avoid flooding; and
- Establish material stockpiles away from watercourses, so that barriers and filters may be installed.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers; and
- Clean and change filter cloth at catch basins.

8.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained to prepare a Functional Servicing and Stormwater Management Report in support of the Site Plan Application at 788 March Road. The preceding report outlines the following:

- Based on boundary conditions provided by the City, the existing municipal water infrastructure is capable of providing the proposed development with water within the City's required pressure range;
- The proposed development is anticipated to have a peak wet weather flow of ***4.20 L/s*** directed to the future 600 mm March Road sanitary sewer. Based on the ***KNCDP-MSS*** sanitary design sheets, the 600 mm sanitary sewer will have sufficient capacity to accommodate the flow increase of ***1.79 L/s*** from the proposed development;
- Based on ***Shirley's Brook Stormwater Management Facility Design Brief***, the proposed development will attenuate flow to a release rate of ***85.4 L/s***;
- It is proposed to attenuate flow through an internal cistern. It is anticipated that ***166.4m³*** of onsite cistern storage will be required to attenuate flow to the established release rate above; and
- Water quality and quantity control to be provided by the Pond No 1 – West per *Shirley's Brook SWMF Design Brief*, hence no additional quality control measures are proposed on-site.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Steven L. Merrick, P.Eng.

Reviewed by,
David Schaeffer Engineering Ltd.

LICENSED PROFESSIONAL ENGINEER
A. D. FOBERT
100090626
2018-08-23
PROVINCE OF ONTARIO
Job#18-1039

Per: Adam D. Fobert, P.Eng.

\\dse-fso1\2011$\projects\18-1039_omnipex_788 march road\b_design\b3_reports\b3-2_servicing (dsel)\fsr_subm1\fsr-2018-08-17_1039_aas_final.docx

APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

18-1039 14/08/2018

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Figure 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	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.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☒	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).	Section 1.0
☒	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.	Drawings/Figures
☐	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.	Section 1.0
☐	Reference to geotechnical studies and recommendations concerning servicing.	N/A
☒	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	N/A

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	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.	Section 3.2
☐	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	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.3
☐	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.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

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).	Section 4.2
☒	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 4.2
☐	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.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	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)	Section 4.2
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	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

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	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.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

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)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	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.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.3
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	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.	N/A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	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.	Section 5.1, 5.3
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	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.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0
☐	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.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	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 ct. 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.	Section 1.2
☐	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.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	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	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

File No. PC2017-0295

Subject: **788 March Road – Pre-Consultation Notes**
November 21, 2017 – 1:30PM, Room 4102E

Attendees

Name	Position	Organization
Kathy Rygus	Planner	City of Ottawa
Victoria Bissonnette	Planner	
Gabi Schaeffer	Project Manager (Infrastructure)	
Eric Surprenant	Project Manager (Infrastructure)	
Rosanna Baggs	Project Manager (Transportation)	
Matthew Hayley	Planner (Environmental)	
Mark Young	Planner (Urban Design)	
Ben Crooks	Planning Assistant	
Paul Black	Planner	Fotenn Planning & Design
Nico Church	Planner	
Edward Hayes	Owner	Omnipex Capital Corporation
Ralph Esposito	Owner	

Development Proposal

- The development of a six-storey structure, with retail uses on the ground floor and residential units above
- Proposed height of 21 m, versus the 18.5 m permitted in the Zoning By-law
- A 30 m setback from the Shirley's Brook creek centreline is proposed
- Proposing a right-in, right-out (RIRO) access from March Road and a full-movement access from Klondike Road
- Parking off of Klondike to be used for residents, parking off of March to be provided for the retail tenants
- Due to the proximity to future Bus Rapid Transit (BRT) stations along March Road, may want to investigate lowering the provision of parking
- No architect has been retained, still in the preliminary stage of identifying constraints and considerations.

Meeting Notes

<u>Environmental</u>

- Two primary environmental constraints affect the subject property: slope stability of Shirley's Brook & possible presence of Blanding's Turtles, an endangered species.

(a) Slope stability of Shirley's Brook
- The environmental management plan for the area discussed a 20 m setback from the top of bank due to the erosiveness of Shirley's Brook;
- The creek widens; so there is a need to determine the actual top of bank for this segment to establish more accurate setbacks;
- Will require that a civil engineer review the slope stability;
- Applicant has shown 30 m from the creek centreline on the concept plan as a conservative approach.

(b) Blanding's Turtles
- The area is regulated under the Endangered Species Act through the Ministry of Natural Resources (MNR);
- MNR approval or advice will be required on how to treat the 30 m setback area (e.g. with fencing, plantings, etc.);
- With regard to Category II and III turtle habitats, the applicant must make the case that the subject lands do not qualify as habitat based on the fact that they do not provide a corridor to other habitat;
  - Scenario 1: A permit will be required which will take 1-2 years
  - Scenario 2: A letter of advice will be provided which states that the MNR has no concerns.

- The proposed pathway within the creek setback area will be dealt with through the site plan approval process. Fencing and gates may be required to prevent turtles from escaping the protected corridor.

- The environmental issues are multi-jurisdictional, involving the City of Ottawa, Mississippi Valley Conservation Authority (MVCA), and the Ministry of Natural Resources:
  - The City will not become involved with review of the Environmental Impact Statement (EIS) until the application has been submitted;
  - It is recommended that the applicant contact MVCA soon;
  - The MNR process may started before application is submitted, provided that the development will not change substantially. They require EIS for their review. MNR will define limit of the turtle habitat; this limit is not made final until the application is received.

<u>Tree Conservation</u>
- A Tree Conservation Report (TCR) must be provided in support of the application; an approved TCR is a requirement of Site Plan Approval;
- Any removal of privately-owned trees 10 cm or larger in diameter requires a tree permit issued under the Urban Tree Conservation Bylaw; the permit is based on the approved TCR;
- The TCR can be combined with the EIS;

- The TCR must list all trees on site by species, diameter and health condition. Note that TCR must address all trees with a critical root zone that extends into the developable area;
- If trees are to be removed, the TCR must clearly show where they are and document the reason they can not be retained;
- All retained trees must also be shown and all retained trees within the area impacted by the development process must be protected as per the City guidelines listed on Ottawa.ca;
- The City encourages the retention of healthy trees wherever possible;
- The removal of City-owned trees will require the permission of Forestry Services who will also review the submitted TCR.

For more information on the process or for help with tree retention options, please contact Mark Richardson, Planning Forester (mark.richardson@ottawa.ca).

Transportation

- A full Transportation Impact Study (TIS) will be required due to the proximity of the site to the intersection of Klondike Road and March Road;
- The primary concern with access to Klondike Road is the recently completed improvements: new guard-rail, cycle track, bus pad and shelter;
- OC Transpo buses at the new stop may cause visibility problems with the northern site access;
- Need to ensure that vehicles utilizing the site access do not negatively impact the Klondike Road cycle track; raised bike lane may be recommended;
- The required clear throat lengths may affect the configuration of the surface parking lots;
- The Transportation Association of Canada (TAC) manual must be consulted to ensure that adequate distances are provided from proposed site accesses to the intersection;
- Surveyor must confirm that the Right of Way (ROW) protection has been taken for March Road;
- Please show all curb radii, turning templates, and all dimensions to speed up the plan circulation and review process;
- Ensure that sufficient space is provided so that cars can actually pass each other and move freely in the parking garage;
- The fire route may have to be adjusted due to concerns regarding fire vehicles operating on top of underground parking garages. Bringing the building closer to March Road would eliminate this issue.

Noise

- If building tenants are determined to be a noise sensitive use, a Noise Impact Assessment (NIA) will be required;

- If mechanical elements are proposed on the roof or exterior of the building, a stationary NIA will be required.

Engineering

- There is a watermain along the entire March Road frontage and along part of the Klondike Road frontage;
- Water frontage fees will apply;
- A stormwater sewer does exist along the March Road frontage, but certain items need to be addressed:
  - Consulting engineer must determine if this sewer has been designed to serve the property, or if stormwater flows will need to be directed to Shirley's Brook
  - Releasing stormwater flows into Shirley's Brook triggers the need for a Ministry of Environment Environmental Compliance Approval (ECA)
- There is no sanitary sewer fronting the site on either March Road or Klondike Road;
  - A sanitary sewer reaches 760 March Road; staff are unsure if this is owned by the City or Minto Communities. The applicant should consider reaching out to Minto to determine if capacity exists to add this development;
    - The Kanata North Community Design Plan (CDP) calls for a sanitary sewer to be built in front of the property, with construction scheduled to begin in 2019 & completion anticipated in 2020;
    - Consider coordinating with Kanata North Landowners Group to explore possible connections to the future sewer;
- The Kanata North CDP originally intended for this property to be commercial, therefore servicing constraints may exist due to the different use proposed;
  - A geotechnical investigation will be required: it should consider slope stability and the meanderbelt setback, as well as the hydraulic grade lines due to the two levels of underground parking proposed;
- Need to consider the Shirley's Brook floodplain:
  - Consult with the MVCA to determine the water level and the extent of the floodplain;
  - The proposed recreational pathway will need to be beyond a certain water level.

Planning & Urban Design

- The retail uses proposed on the ground floor are a very positive element of the project, considering that there is no requirement for mixed-use;
- The development is not within a Design Priority Area and therefore does not require consideration by Urban Design Review Panel;
- The future BRT corridor on March Road should be considered, including pedestrian connectivity being prioritized along with vehicular connections;

- The proposed height of 21m, above the 18 m permitted in the Zoning By-law, would require a minor variance from the Committee of Adjustment;
- Consider flanking the Klondike/March corner with the building, rather than a surface parking lot. It will be more attractive and prevent spillover parking from the March House day spa, which is experiencing parking challenges;
- If the C-shaped design is used, emphasize the front entrance and establish a direct pedestrian connection to March Road;
- If the building is residential use only, moving the parking lot to the rear of the site is preferred
- The access to the parking garage needs to be redesigned to improve the aesthetics from March and Klondike;
- Consider providing a direct link from the building amenity area to the creek pathway;
- A pedestrian easement along the southern side of the site may be requested to connect the creek pathway to March Road, instead of a walkway block;
- The site is in an area of archaeological potential, therefore an archaeological investigation will be required
- A Phase I Environmental Site Assessment (ESA) will be required

Brandon Chow

From: Brandon Chow
Sent: August 10, 2018 12:40 PM
To: 'Emily.Diamond@ontario.ca'
Cc: Steve Merrick
Subject: 788 March Rd - ECA requirement

Good afternoon Emily,

We would like to confirm our obligation under section 53 of the Ontario Water Resources Act (OWRA) for the development located at 788 March Road.

The subject lands are zoned as general mixed use and is wholly contained within one Property Identification Number (PIN).
The proposed development involves the construction of two 6-storey apartment buildings consisting of a total of 196 units, an underground parking garage and a visitor parking lot.

Stormwater run-off from the proposed development will be collected in the proposed building mechanical system. A cistern within the proposed building will be used for stormwater storage to attenuate the release rate to the City of Ottawa requirements. Stormwater is proposed to outlet to the existing 675mm storm sewer within March Road.

Proposed sanitary flows for the site will outlet to an existing 200mm service pipe which will outlet to the future 600mm sanitary within March Road.

As the stormwater and sanitary design will be servicing a single parcel of land and no connections are being proposed to an existing watercourse, it is assumed this falls within the exemption requirements of O.Reg 525/98.
Please confirm that the above rationale is satisfactory and let us know if you need any more information.

Thanks,

Brandon Chow
Project Coordinator / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.532
fax: (613) 836-7183
email: bchow@DSEL.ca

Brandon Chow

From: Nader Nakhaei <NNakhaei@mvc.on.ca>
Sent: August 16, 2018 10:14 AM
To: Brandon Chow
Cc: Matt Craig; Steve Merrick; Niall Oddie
Subject: RE: 788 March Rd - MVCA
Attachments: 788MARCH.PDF

Hello Brandon,

I've attached a map which contains the floodplain and meander belt hazard lines for Shirley's brook. In general, we do not have any objection toward the proposed SWM approach but the adequacy of the sewer system sizing and the pond for the corresponded flows from the site should be shown in the submitted report. Also, it should be noted that the required quality control for Shirley's Brook is "Enhanced" (80% TSS removal).

Please be advised that MVCA been contacted before about this development and the following was our planner's comments at the time:

"As shown on the attached mapping, the subject lands contain floodplain and meander belt hazards in relation to Shirley's Brook. The flood plain is based on the 1:100 year return event and the meander belt hazard is determined by 20x the bankfull width of the watercourse.
The drawings within the brochure package that you provided indicate that a portion of the building would be constructed within the floodplain – which appears to be the ramp providing access for two (2) stories of underground parking. The meander belt hazard extends farther onto the property than the floodplain and further impacts the proposed building. MVCA does not permit new development within either the floodplain or the meander belt hazards.
The applicant has the option of preparing a geomorphic assessment to assess the meander belt hazard for this reach of Shirley's Brook, which may refine the meander belt hazard. The development will then need to respect the greater hazard of the floodplain or the setback established by the geomorphic assessment.
As our regulation limit extends 15m beyond the greatest hazard, the development will remain within our regulated area and will required written authorization under O.Reg 153/06 "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses". The applicant will need to demonstrate that the building has been designed for drypassive
flood proofing for a floodplain elevation of 74.3m (0.3m above the 74m 1:100 year flood elevation) and designed to withstand hydrostatic pressures that may be encountered.
Upon discussion, MVCA will permit the inclusion of underground parking below the floodplain elevation provided the building has been designed for dry-passive flood proofing and hydrostatic pressures, as noted above. All mechanical rooms, storage areas and lounge will need to be above the 74.3m elevation; only parking will be permitted below this elevation. As part of dry-passive flood proofing, no openings in the structure are permitted below 74.3m (ventilation, windows, doors, etc.).
As noted in our previous correspondence, Shirley's Brook requires enhanced water quality treatment (80% TSS removal). Predevelopment flow rates are to be respected. Our policies do not allow SWM facilities within the floodplain or within the meander belt hazard. I understand that onsite stormwater storage and treatment is being proposed. The proposed site layout appears to maximize all lands outside of the floodplain. It may be beneficial to send along a conceptual SWM plan for review against our regulation policies.
MVCA notes that the subwatershed study for the area identified this reach of Shirley's Brook for restoration. The minutes from the pre-consultation meeting do not seem to mention any restoration plans, so I am not sure if this topic has previously been discussed. However, MVCA would be recommending restoration along the watercourse as part of the proposed development."

Please inform us if anything has been changed regarding the development and also please do not hesitate to contact me if you have any further question or concern.

Regards,

Nader Nakhaei, Ph.D. | Postdoctoral Felllow / Water Resources Engineer (EIT) | Mississippi Valley Conservation Authority
www.mvc.on.ca | t. 613 253 0006 ext. 259 | f. 613 253 0122 | NNakhaei@mvc.on.ca

---

From: Brandon Chow [mailto:BChow@dsel.ca]
Sent: Friday, August 10, 2018 12:41 PM
To: Nader Nakhaei <NNakhaei@mvc.on.ca>
Cc: Matt Craig <MCraig@mvc.on.ca>; Steve Merrick <SMerrick@dsel.ca>
Subject: 788 March Rd - MVCA

Good afternoon Nader,

DSEL is in the process of preparing a Stormwater Management Report for a proposed development located at 788 March Road.

The proposed development involves the construction of two 6-storey apartment buildings consisting of a total of 196 units, an underground parking garage and a visitor parking lot. A section of the existing Shirley's Brook Tributary is located along the north-eastern limit within the subject property. No development/alterations are proposed within a 30m setback from Shirley's Brook.

Areas within the 30m setback will remain in their existing condition and drain to Shirley's Brook. Stormwater run-off from the proposed development will be collected in the proposed building mechanical system. A cistern within the proposed building will be used for stormwater storage to attenuate the release rate to the City of Ottawa requirements. Stormwater from the site is proposed to outlet to the existing storm sewer within March Road which ultimately outlets to the existing March Road SWM Pond approximately 125m north-west of the subject property.

According to the SWM report prepared by DME (see link below), 70% TSS removal is provided within the SWM pond. The pond design as outlined in the report accommodates the minor stormwater flows contemplated from the subject property at 788 March Road.

https://spaces.hightail.com/receive/WnBv4EliB3

Please confirm if the SWM controls as outlined above are sufficient or if any additional quality/quantity controls are required for the subject site development.

Thanks,

Brandon Chow
Project Coordinator / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.532
fax: (613) 836-7183
email: bchow@DSEL.ca

APPENDIX B

Water Supply

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop						
Single Family	3.4		0						
Semi-detached	2.7		0						
Townhouse	2.7		0						
Apartment			0						
Bachelor	1.4		0						
1 Bedroom	1.4	96	135						
2 Bedroom	2.1	88	185						
3 Bedroom	3.1	12	38						
4 Bedroom	3.1		0						
Average	1.8		0						
			Pop	**Avg. Daily**		**Max Day**		**Peak Hour**	
				m^3/d	**L/min**	**m^3/d**	**L/min**	**m^3/d**	**L/min**
Total Domestic Demand			358	125.3	87.0	375.9	261.0	563.9	391.6

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate		Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5	$L/m^2/d$	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75	$L/9.3m^2/d$	-	0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand				0.0	0.0	0.0	0.0	0.0	0.0
Total Demand				**125.3**	**87.0**	**375.9**	**261.0**	**563.9**	**391.6**

Fire Flow Estimation per Fire Underwriters Survey
Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	9506.3	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	17160.1	L/min	
	17000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**14450.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered	-30%
Reduction	**-4335 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Non-Combustible	>45m	40	2	80	0%
S	Non-Combustible	10.1m-20m	20	6	120	15%
E	Non-Combustible	>45m	80	2	160	0%
W	Non-Combustible	>45m	52	1	52	0%
		% Increase				**15%** *value not to exceed 75%*

Increase	**2167.5 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	12282.5	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	12000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by NEUF ARCHITECTS.
-Calculations based on Fire Underwriters Survey - Part II

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	9841.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	17459.5 L/min	
	17000.0 L/min	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**14450.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered	-30%
Reduction	**-4335 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Non-Combustible	10.1m-20m	51	6	306	15%
S	Non-Combustible	30.1m-45m	54	1	54	5%
E	Non-Combustible	>45m	50	2	100	0%
W	Non-Combustible	>45m	46	1	46	0%
		% Increase				**20%** *value not to exceed 75%*

Increase	**2890.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	13005.0 L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	13000.0 L/min	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by NEUF ARCHITECTS.
-Calculations based on Fire Underwriters Survey - Part II

BOUNDARY CONDITIONS

Boundary Conditions For: 788 March Rd

Date of Boundary Conditions: 2018-Aug-01

Provided Information:

Scenario	Demand	
	L/min	L/s
Average Daily Demand	87	1.5
Maximum Daily Demand	261	4.4
Peak Hour	391.8	6.5
Fire Flow #1 Demand	6,000	116.7
Fire Flow #2 Demand	13,000	216.7

Number Of Connections: 2

Location:

BOUNDARY CONDITIONS

Results:

Connection #: 1

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.6	76.3
Peak Hour	124.2	65.8
Max Day Plus Fire (6,000) L/min	123.8	65.2
Max Day Plus Fire (13,000) L/min	120.2	60.1

[1]Elevation: **77.92 m**

Connection #: 2

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.6	76.3
Peak Hour	124.2	65.8
Max Day Plus Fire (6,000) L/min	123.8	65.2
Max Day Plus Fire (13,000) L/min	120.2	60.1

[1]Elevation: **77.95 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.

2) Two connections are required with an isolation valve in between in order to preserve continuous water service to proposed residential developments

3) Current hydrants within required distance allocation to development site as per City of Ottawa Water Distribution Guidelines (and FUS method) do not meet the required FUS fire flow of 13,000 L/min. Ensure that an additional hydrant is installed such that FUS flow requirements can be met.

BOUNDARY CONDITIONS

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.

Amr Salem

From: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Sent: August 3, 2018 12:28 PM
To: Steve Merrick; Adam Fobert; Amr Salem
Subject: RE: 788 March Road - Boundary Request
Attachments: 788 March Rd. BC_01Aug2018.docx

Hi Steve,

It was a typo, however all of the information is correct including HGL and PSI. See the revised document attached.

With regard to the notes:

2)I agree.
3) Hydrants will need to be in accordance with the FUS fire flow and Appendix I of Technical Bulletin ISTB-2018-02. Infrastructure Planning has indicated that it is reasonable for Development Review (DR) staff to question hydrant capacity wherever there are particularly high design fire flows. Table 1 in the TB provides hydrant capacities as a function of distance to the building, and if DR identifies that there is insufficient hydrant capacity for a specific building based on this table, then we may ask that another hydrant be added to the network, even if it is not on a dead-end. Although the comment for this site came directly from Infrastructure Planning, I agree with the requirement.

Regards,
Gabrielle

From: Steve Merrick <SMerrick@dsel.ca>
Sent: Thursday, August 02, 2018 11:07 AM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>; Adam Fobert <AFobert@dsel.ca>; Amr Salem <ASalem@dsel.ca>
Subject: RE: 788 March Road - Boundary Request

Thanks Gabrielle,

Not a huge impact on us but Is there a reason fire flow was provided at 15,000 L/min and not closer to 13,000 L/min listed below?

As for the notes in the attached:

2) The proposed connection points have an existing valve to provide adequate redundancy
3) We will ensure that hydrants are located in accordance with the OBC to the siamese connection/entrances. Is the comment referring to hydrant spacing and methodology per Appendix I of the technical bulletin ISTB-2018-02? I believe this only applies to dead end watermains, we will confirm adequate fire protection as we move to detail design.

Steve Merrick, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

From: Schaeffer, Gabrielle [mailto:gabrielle.schaeffer@Ottawa.ca]
Sent: Thursday, August 2, 2018 9:21 AM
To: Steve Merrick <SMerrick@dsel.ca>; Adam Fobert <AFobert@dsel.ca>; Amr Salem <ASalem@dsel.ca>
Subject: RE: 788 March Road - Boundary Request

Hi Steve,

Please find the attached boundary conditions for 788 March Road. Make sure to address notes 2 and 3.

Regards,
Gabrielle

From: Steve Merrick <SMerrick@dsel.ca>
Sent: Friday, July 27, 2018 9:20 AM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>; Adam Fobert <AFobert@dsel.ca>; Amr Salem <ASalem@dsel.ca>
Cc: Rogers, Christopher <Christopher.Rogers@ottawa.ca>; Bougadis, John <John.Bougadis@ottawa.ca>
Subject: RE: 788 March Road - Boundary Request

Hi Gabrielle,

Please find attached FUS calculation and the latest site plan. Please note, the site plan can still change from now until submission or in subsequent submissions and the FUS will be updated accordingly. The latest site plan also had some minor changes to unit counts reflected in the water demand calculations below:

	L/min	L/s
Avg. Daily	87.0	1.45
Max Day	261.0	4.35
Peak Hour	391.6	6.53

Provide pressures at the following fire flows:
OBC= 6,650 LPM + 261 LPM = **6,911 LPM**
FUS=13,000 LPM + 261 LPM = **13,261 LPM**

Steve Merrick, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

From: Schaeffer, Gabrielle [mailto:gabrielle.schaeffer@Ottawa.ca]
Sent: Monday, July 23, 2018 1:30 PM
To: Adam Fobert <AFobert@dsel.ca>; Steve Merrick <SMerrick@dsel.ca>; Amr Salem <ASalem@dsel.ca>
Cc: Rogers, Christopher <Christopher.Rogers@ottawa.ca>; Bougadis, John <John.Bougadis@ottawa.ca>
Subject: RE: 788 March Road - Boundary Request

Hi Adam,

Excellent, I will wait for the FUS calculations prior to requesting boundary conditions for this site plan.

Regards,
Gabrielle

From: Adam Fobert <AFobert@dsel.ca>
Sent: Monday, July 23, 2018 1:09 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>; Steve Merrick <SMerrick@dsel.ca>; Amr Salem <ASalem@dsel.ca>
Cc: Rogers, Christopher <Christopher.Rogers@ottawa.ca>; Bougadis, John <John.Bougadis@ottawa.ca>
Subject: RE: 788 March Road - Boundary Request

Hello Gabrielle,

I received an out of office for Chris, so I connected with John who evidently made the request for the FUS calculation. We agreed that I will forward along the FUS calculation and John will provide results for both calculations.

John will discuss with Chris once he gets back to confirm calculation methodology.

We will present the appropriate results / calculations per Chris' direction in our final report.

Adam Fobert, P.Eng.
Manager of Site Plan Design

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

office: (613) 836-0856
direct: (613) 836-0626
cell: (613) 222-9493
email: afobert@DSEL.ca

From: Adam Fobert
Sent: Monday, July 23, 2018 12:46 PM
To: 'Schaeffer, Gabrielle' <gabrielle.schaeffer@Ottawa.ca>; Steve Merrick <SMerrick@dsel.ca>; Amr Salem <ASalem@dsel.ca>
Cc: 'Rogers, Christopher' <Christopher.Rogers@ottawa.ca>
Subject: RE: 788 March Road - Boundary Request

Hello Gabrielle,

I worked with Chris Rogers' group on the development of the revised City of Ottawa FUS protocol. One of the things we had discussed was precisely was is expected under 4.2.11 of the City's Water Distribution Guidelines. What I understood from my conversation with Chris was that when sizing municipal mains, the FUS is required, however on-site services would be covered through NFPA 13 for buildings equipped with sprinklers. Note that this site is entirely covered by a building and there the service main size is determined by the mechanical engineer through the OBC requirements.

I would like ensure that we are consistently applying the City's guidelines.

Can you please confirm?

Adam Fobert, P.Eng.
Manager of Site Plan Design

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

office: (613) 836-0856
direct: (613) 836-0626
cell: (613) 222-9493
email: afobert@DSEL.ca

From: Schaeffer, Gabrielle [mailto:gabrielle.schaeffer@Ottawa.ca]
Sent: Monday, July 23, 2018 12:20 PM
To: Steve Merrick <SMerrick@dsel.ca>; Amr Salem <ASalem@dsel.ca>
Subject: RE: 788 March Road - Boundary Request

Hi Steve,

I spoke with our water group for suburban areas and they indicated that FUS is to be used for all developments, which is also the directive from Fire Services. They did however mention that exceptions to use the OBC method do occur within the downtown core when the FUS level of service cannot be met by the municipal infrastructure and no other measures can be taken.

Therefore, for this suburban site, the FUS method is to be used in calculating the required fire flow for this nearly 400 person condominium building. In addition to your FUS calculations please provide a draft site plan so I can complete a thorough review now instead of finding new information in the 1st submittal and having to re-issue the boundary conditions request.

Gabrielle

From: Steve Merrick <SMerrick@dsel.ca>
Sent: Friday, July 13, 2018 7:45 AM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>; Amr Salem <ASalem@dsel.ca>
Subject: RE: 788 March Road - Boundary Request

Hi Gabrielle,

I updated the summary table below to match the fire flow.

Again, we hope you can forward this onto the water resources group for their input.

Thanks,

Steve Merrick, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

From: Steve Merrick
Sent: Thursday, July 12, 2018 1:43 PM
To: 'Schaeffer, Gabrielle' <gabrielle.schaeffer@Ottawa.ca>; Amr Salem <ASalem@dsel.ca>
Subject: RE: 788 March Road - Boundary Request

Hi Gabrielle,

Please find attached our detailed water demand calculations for your review.

We are utilizing National Fire Protection Association 13 – Standard for the installation of Sprinkler Systems (**NFPA**) standards for the purpose of estimating fire flow per direction we have received from the water resources group on other similar projects not requiring the sizing of watermains or requiring internal hydrants. The proposed development contemplates a parking garage extending the footprint of the site, only water services will extend to the site.

As indicated by Section 11.2.2 from the ***NFPA***, fire flow requirements are to be determined by combining the required flow rate for the sprinkler system along with the anticipated hose stream. As indicated by Table 11.2.2.1 and Table 11.2.3.1.2 extracted from the ***NFPA***, the anticipated fire flow requirements for the sprinkler system is ***5,700 L/min.*** We have made a conservative estimate at this preliminary stage that the sprinkler system is not "constantly attended" per section 11.2.2.5 of the ***NFPA*** resulting in a flow of 5,700 L/min from Table 11.2.2.1. The anticipated internal and external total combined inside and outside hose stream demand is ***950 L/min***. As a result, the total fire flow is anticipated to be ***6,650 L/min*** .

Table 11.2.2.1 Water Supply Requirements for Pipe Schedule Sprinkler Systems

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

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

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

Summary of water demands for the proposed development at 788 March Road:

Design Parameter	Proposed Demand[1] (L/min)
Average Daily Demand	84.8
Max Day + Fire Flow	254.5 + 6,650= 6904.5
Peak Hour	381.7

Thank you,

Steve Merrick, P.Eng.
Project Manager / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

From: Schaeffer, Gabrielle [mailto:gabrielle.schaeffer@Ottawa.ca]
Sent: Wednesday, June 27, 2018 2:23 PM
To: Amr Salem <ASalem@dsel.ca>
Cc: Steve Merrick <SMerrick@dsel.ca>
Subject: RE: 788 March Road - Boundary Request

Hi Amr,

Please also provide me with your detailed FUS and domestic demand calculations. We are trying to streamline the number of boundary request iterations, so we are completing demand calculation review ahead of time.

Thank you,

Gabrielle Schaeffer, P.Eng
Project Manager - Infrastructure Approvals

City of Ottawa
Development Review - West Branch
Planning, Infrastructure and Economic Development Department
110 Laurier Ave., 4th Floor East;
Ottawa ON K1P 1J1
Mail Code 01-14
Tel: 613-580-2424 x 22517
Fax: 613-560-6006

From: Amr Salem <ASalem@dsel.ca>
Sent: Wednesday, June 27, 2018 1:04 PM
To: Schaeffer, Gabrielle <gabrielle.schaeffer@Ottawa.ca>
Cc: Steve Merrick <SMerrick@dsel.ca>
Subject: 788 March Road - Boundary Request

Good afternoon Gabrielle,

We would like to kindly request boundary conditions for the proposed development at **788 March Road** using the following proposed development demands:

1. Location of Service / Street Number: **788 March Road**

2. Type of development: **The proposed development involves 2 six-storey residential apartment buildings, consisting of a total of 190 residential units.**

3. Proposed Connection points:
   - **Connection 1 to existing 406 mm diameter watermain along Klondike Road east of March Road.**
   - **Connection 2 to existing 406 mm diameter watermain along March Road south of Klondike Road.**
     Please see the diagram below for reference.

4. Fire flow required for the proposed development: **The maximum fire flow at 20 PSI.**

5.

	L/min	L/s
Avg. Daily	84.8	1.41
Max Day	254.5	4.24
Peak Hour	381.7	6.36

If you have any questions please feel free to contact me.

Thank you,

Amr Salem
Project Coordinator/Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103

Stittsville, ON K2S 1E9

phone: (613) 836-0626 ext. 512
email: asalem@DSEL.ca

Amr Salem
Project Coordinator/Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0626 ext. 512
email: asalem@DSEL.ca

'

'
'

'
'

'

'

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

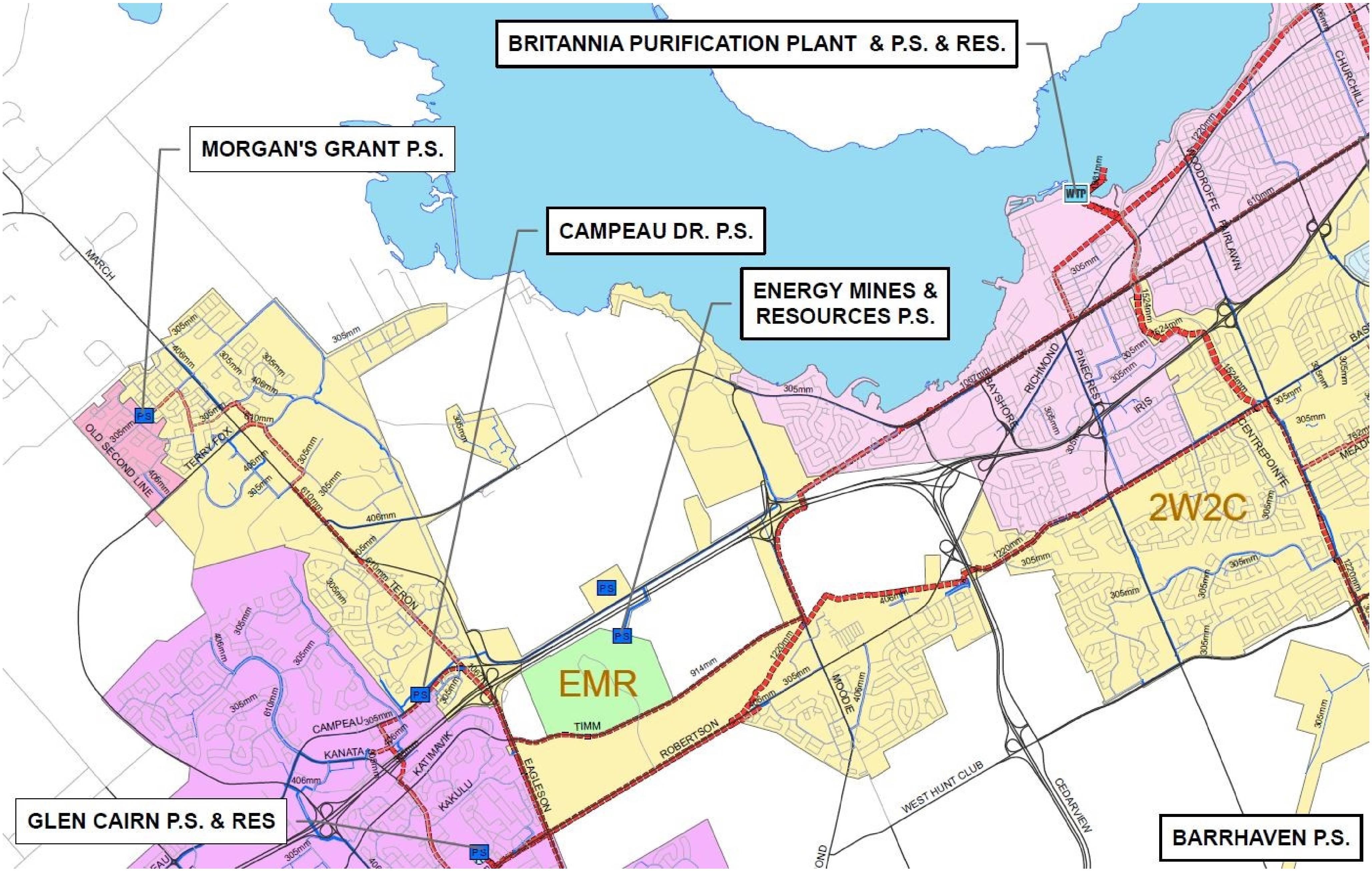
'

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'



BRITANNIA PURIFICATION PLANT & P.S. & RES.
MORGAN'S GRANT P.S.
CAMPEAU DR. P.S.
ENERGY MINES & RESOURCES P.S.
GLEN CAIRN P.S. & RES
BARRHAVEN P.S.
EMR
2W2C
MARCH
TERRY FOX
OLD SECOND LINE
TERON
CAMPEAU
KANATA
KATIMAVIK
KAKULU
EAGLESON
TIMM
ROBERTSON
MOODIE
WEST HUNT CLUB
CEDARVIEW
BAYSHORE
RICHMOND
PINECREST
IRIS
WOODROFFE
FAIRLAWN
CHURCHILL
CENTREPOINTE
WTP
P.S
305mm
406mm
610mm
914mm
1067mm
1220mm
1524mm
762mm

2017 Water Distribution System

Department of Planning, Infrastructure and Economic Development

This map was compiled from existing & collected engineering information from the City of Ottawa Geographic Information System and is protected by copyright. The location of Infrastructure is approximate and should not be used for construction purposes.

Scale 1:2500

Ottawa

Legend

- Public Hydrant
- Private Hydrant
- Summer only Flusher Hydrant
- Flusher Hydrant
- Acoustic Fibre Optic
- Gate Valve
- Tapping Valve
- Butterfly Valve
- Buried Valve
- Drain Pipe
- Check Valve
- Closed Valve
- Drain-Out Valve
- Left Hand Valve
- Spot Elevation
- Pressure Reducing Valve
- Air Relief Valve
- Bypass Valve
- Large Chamber Valve
- Inspection Plate
- Cap
- Reducer
- Jump
- Water Meter
- Water Service
- Backbone Pipe
- Watermain with Pipe Diameter, Material and Install Year (203 PVC-1981)
- Pipe in Casing
- Pressure Zone Delineation and Identifier (2W)
- Well
- Elevated Tank
- Water Pumping Station
- Water Reservoir
- Water Treatment Plant

Pipe Equivalents

nominal (mm)	actual (inches)	nominal (mm)	actual (inches)	nominal (mm)	actual (inches)
100	4	675	27	1800	72
150	6	750	30	1950	78
200	8	825	33	2025	80
250	10	900	36	2100	84
300	12	975	39	2250	90
375	15	1050	42	2400	96
400	16	1200	48	2550	102
450	18	1350	54	2700	108
525	21	1500	60	2850	114
600	24	1650	66	3000	120

Pipe Materials

A - ASBESTOS
CI - CAST IRON
CO - COPPER
CO0 - AWWA C300
CO1 - AWWA C301
CO2 - AWWA C302
CO3 - AWWA C303
DI - DUCTILE IRON
PE - POLYETHYLENE (DR11 TO DR21)
PVC - POLYVINYL CHLORIDE
STC - CONCRETE LINED STEEL PIPE
UCI - UNLINED CAST IRON
UNK - UNKNOWN MATERIAL

346-024	348-024	350-024
346-023	348-023	350-023
346-022	348-022	350-022

APPENDIX C

Wastewater Collection

Omnipex
788 March Road
ProposedSanitary Flow

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area		0.66	**ha**
Extraneous Flow Allowances			
	Infiltration / Inflow	**0.22**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse (Duplex)	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	96	135
2 Bedroom	2.1	88	185
3 Bedroom	3.1	12	38
Average	1.8		0
		Total Pop	**358**
		Average Domestic Flow	**1.16 L/s**
		Peaking Factor	**3.44**
		Peak Domestic Flow	**3.99 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**	**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	50,000 L/ha/d		0.00
		Average I/C/I Flow	**0.00**
		Peak Institutional / Commercial Flow	0.00
		Peak Industrial Flow**	0.00
		Peak I/C/I Flow	**0.00**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**1.16**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**3.99**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**4.20**	**L/s**

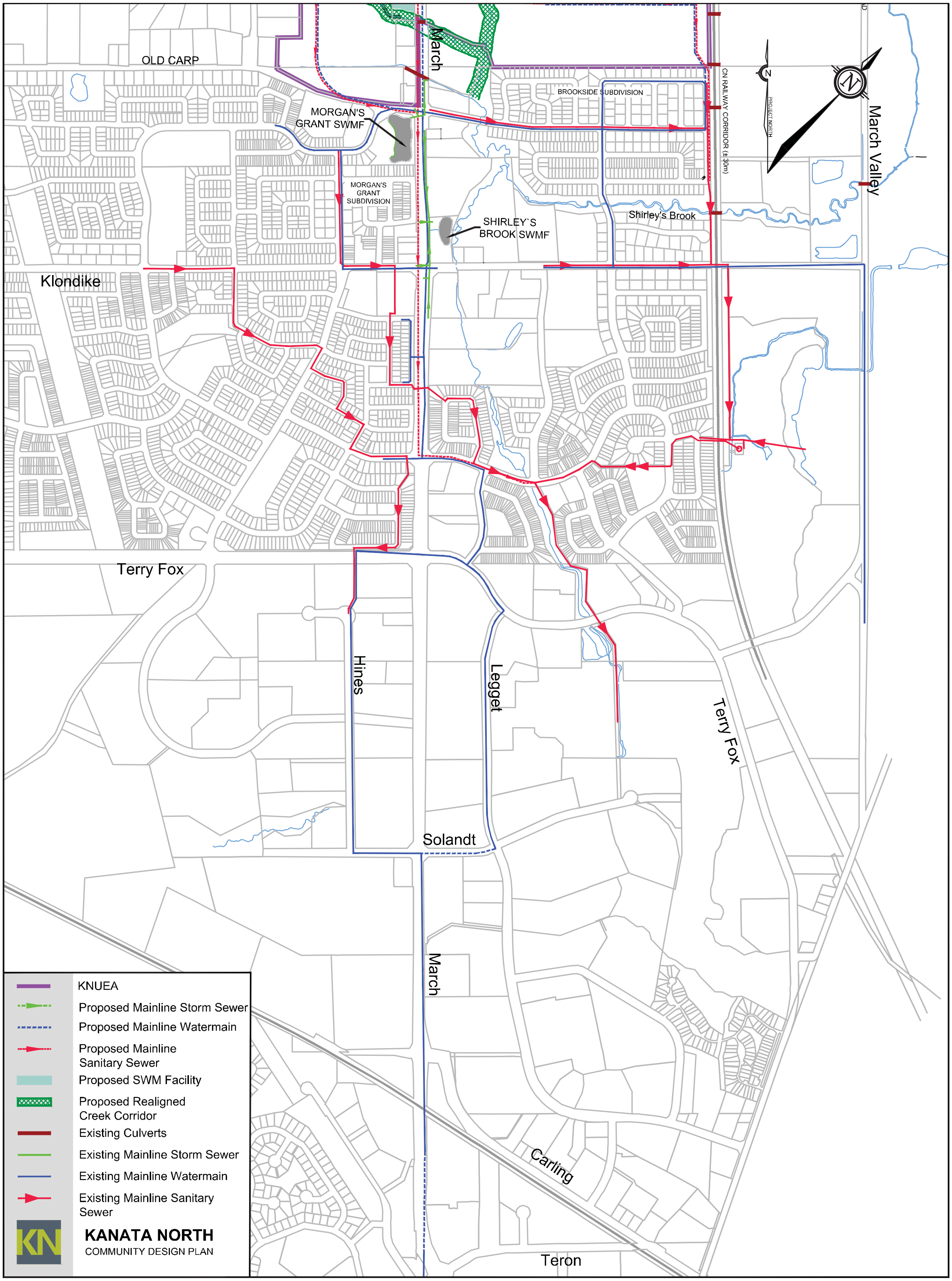


FIGURE 23 | Proposed Combined Infrastructure Offsite

KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DESIGN PLAN

TABLE C-6b:
SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION				RESIDENTIAL AREA AND POPULATION										ICI								INFILTRATION				FLOW	PIPE					
									Cumulative					IND			COMM		INST													
Street	From Node	To Node	Total Area (ha)	Dwellings SFH 3.4	Dwellings SD/TH 2.7	Density (Net ha) Low[3] 101	Density (Net ha) High[4] 161	Pop.	Residential Area (ha)	Residential Pop. New	Residential Pop. Exist	Peak Factor	Peak Flow (l/s)	Area (ha)	Accu. Area (ha)	Peak Factor	Area (ha)	Accu. Area (ha)	Area (ha)	Accu. Area (ha)	Peak Flow (l/s)	Total Area (ha)	Accu. Area New (ha)	Accu. Area Exist	Infiltration Flow (l/s)	Total Flow (l/s)	Dia Act (mm)	Dia Nom (mm)	Slope (%)	Velocity (Full) (m/s)	Capacity (Full) (l/s)	Ratio Q/Qfull (%)
W-16	W-16	W-17	6.55			3.17	1.76	606.8	4.95	607		3.93	9.7								0.0	6.55	6.55		1.8	11.5	203	200	0.35	0.62	20.2	57%
W-17	W-17	MR-1	3.43					0.0	7.51	865		3.84	13.5				3.05	3.05		8.04	9.6	6.48	19.99		5.6	28.7	254	250	0.30	0.67	33.9	84%
MR-1 (MARCH ROAD)	MR-1	MR-2	1.36					0.0	30.73	3373		3.40	46.4					3.40		8.04	9.9	1.36	47.42		13.3	69.6	610	600	0.10	0.69	202.4	34%
W-9	W-9	MR-2	7.17				1.13	181.9	1.13	182		4.00	2.9				1.38	1.38	3.77	3.77	4.5	7.17	25.90		7.3	14.7	203	200	1.20	1.15	37.4	39%
MR-2 (MARCH ROAD)	MR-2	MR-3	1.37					0.0	33.23	3555		3.38	48.7					4.78		11.81	14.4	1.37	74.69		20.9	84.0	610	600	0.10	0.69	202.4	41%
W-10	W-10	W-11	1.53				0.78	125.6	0.78	126		4.00	2.0								0.0	1.53	1.53		0.4	2.5	203	200	0.70	0.88	28.6	9%
W-11	W-11	MR-3	3.55				1.64	264.0	2.42	390		4.00	6.3				1.08	1.08			0.8	3.55	5.08		1.4	8.7	203	200	0.70	0.88	28.6	30%
W-18	W-18	W-19	3.90			1.21	1.82	415.2	3.03	415		4.00	6.7								0.0	3.90	3.90		1.1	7.0	203	200	0.35	0.62	20.2	39%
W-19	W-19	MR-3	9.23					0.0	3.03	415		4.00	6.7				8.83	8.83			7.7	9.23	13.13		3.7	18.1	254	250	0.25	0.61	31.0	58%
MR-3 (MARCH ROAD)	MR-3	MR-4	4.74					0.0	38.68	4360		3.30	58.3				2.06	16.75		11.81	24.8	4.74	97.64		27.3	110.4	610	600	0.10	0.69	202.4	55%
W-12	W-12	X-12	11.62			2.24	6.96	1350.0	9.22	1350		3.71	20.3						2.01	2.01	1.7	11.62	11.62		3.3	25.3	254	250	0.30	0.67	33.9	75%
X-12 (BIDGOOD / HALTON TERRACE)	X-12	MR-4	3.54				0.79	127.2	10.01	1477		3.66	22.0								0.0	3.54	15.16		4.2	26.3	254	250	1.00	1.22	62.0	42%
X-5 (760 & 788 March Road)	X-5	MR-4	1.76				1.76	283.4	1.76	283		4.00	4.6								0.0	1.76	1.76		0.5	5.1						
MR-4 (MARCH ROAD)	MR-4	MH 186	4.71					0.0	50.45	6120		3.16	78.4					16.75		13.82	26.5	4.71	119.27		33.4	138.3	610	600	0.10	0.69	202.4	68%
X-6 (750 March Road, Blue Heron Co-op Homes)****	X-6	X-8	1.29		83			224.1	1.29		224	4.00	2.1								0.0	1.29		1.29	0.5	2.5						
			**** 83 units obtained from Co-op website (http://www.chaseo.ca/member/blue-heron-co-op/)																													
X-7 (Morgans Grant) *****	X-7	X-8	48.45					3188.0	49.74		3189	3.42	25.2								0.0	48.45		49.74	17.4	42.6						
			***** Information obtained from JL Richards #24566, Sanitary Design Sheet, July 2012																													
X-8 (Inverary Drive)	X-8	MH 186	4.31	39	49			264.9	54.05		3677	3.37	28.6								0.0	4.31		54.05	18.9	47.6						
Shirley's Brooke Drive	MH 186	MH 184	0.00					0.0	104.50	6120	3677	2.96	98.7					16.75		13.82	26.5	0.00	119.27	54.05	52.3	177.5	610	600	0.10	0.69	202.4	88%
X-9 (Mckinley Drive)	X-9	MH 184	7.84		117			315.9			316	4.00	2.9				2.73	2.73			2.4	7.84		7.84	2.7	8.0						
Shirleys Brooke Drive	MH 184	MH 182	0.00					0.0	104.50	6120	3993	2.95	100.4					19.48		13.82	28.9	0.00	119.27	61.89	55.1	184.4	610	600	0.10	0.69	202.4	91%
Shirleys Brooke Drive	MH 182	MH 1	0.00					0.0	104.50	6120	3993	2.95	100.4					19.48		13.82	28.9	0.00	119.27	61.89	55.1	184.4	610	600	0.10	0.69	202.4	91%
X-10 (Sandhill Road)		MH 1	11.62	9	69		5.32	1049.1	11.62		1049	3.79	9.2						2.11	2.11	1.8	11.62		11.62	4.1	15.1						
X-11		MH 1	0.87				0.87	140.1	0.87		140	4.00	1.3								0.0	0.87		0.87	0.3	1.6						
Briar Ridge Pump Station	PS	MH 1							72.88	3644	6094	2.97	85.623	0	35.08	3.1	0.00	6.76	0.00	5.25	35.8	0.00	92.98	88.15	56.9	178.1						
EAST MARCH TRUNK	MH 1	EMT	0.00					0.0	189.87	9764	11276	2.63	172.7		35.08	3.1		26.24		21.18	66.3	0.00	212.23	162.53	116.3	355.3	762	750	0.10	0.80	367.1	97%

DESIGN PARAMETERS

Average Daily Flow (Future)=	350	L/cap/day
Average Daily Flow (Existing)=	200	L/cap/day
Indust/Comm/Inst Flow (Future)=	50000	L/ha/day
Indust/Comm/Inst Flow (Existing)=	20000	L/ha/day
Max Res Peak Factor=	4.00	
Comm/Inst Peak Factor=	1.50	

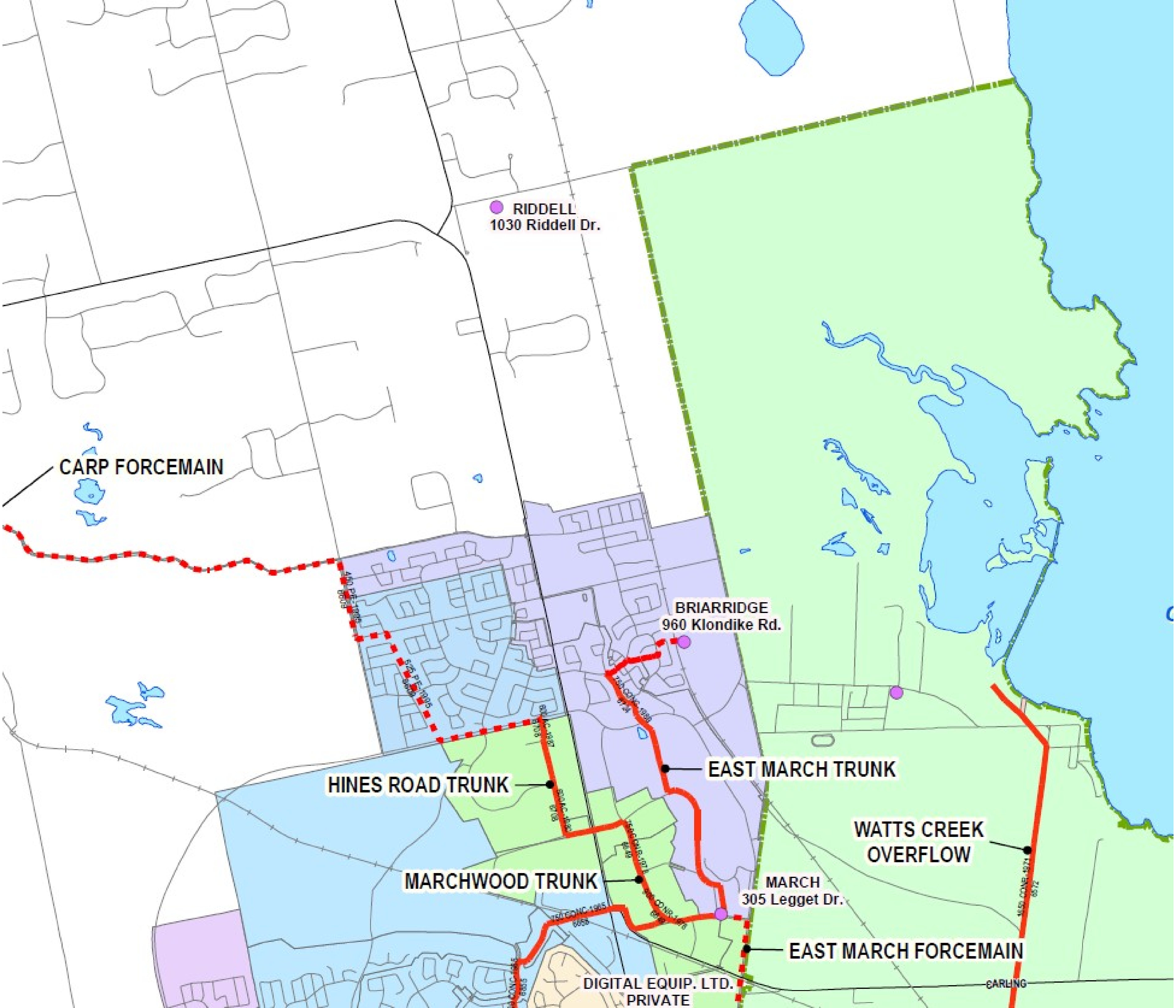
Industrial Peak Factor= per MOE graph	
Extraneous Flow (Future)=	0.28 L/s/ha
Extraneous Flow (Existing)=	0.35 L/s/ha (Jan 2008 monitored event)
Minimum Velocity=	0.60 m/s
Manning's n=	0.013

Designed:	Alex McAuley
Checked:	CJR
Dwg. Reference:	112117-SAN1 112117-SAN2

PROJECT: Kanata North Community Design Plan
CLIENT: Kanata North Land Owners
Date: May, 2016

Notes:
1. Existing sanitary sewers tributary to, and not receiving flow from the KNUEA Trunk sewer have not been analysed for capacity
2. Existing unit counts obtained from City of Ottawa geoOttawa (2014) parcel counts, unless otherwise indicated
3. Low Density based on (16.6 Singles/net ha * 3.4pers/unit) + (18.5 Towns/net ha * 2.7pers/unit)
4. High Density based on (35.8 Towns/net ha * 2.7pers/unit) + (35.8 Apartments/net ha * 1.8pers/unit)
5. Overall unit counts for the KNCDP are based on Demonstration Plan "A-24", plus 10% to allow for flexibility in unit type distribution

Upgraded Existing Sanitary Sewers


RIDDELL
1030 Riddell Dr.
CARP FORCEMAIN
BRIARRIDGE
960 Klondike Rd.
EAST MARCH TRUNK
HINES ROAD TRUNK
WATTS CREEK
OVERFLOW
MARCHWOOD TRUNK
MARCH
305 Legget Dr.
EAST MARCH FORCEMAIN
DIGITAL EQUIP. LTD.
PRIVATE
CARLING

2017 Sewer Collection System

Department of Planning, Infrastructure and Economic Development

This map was compiled from existing & collected engineering Information from the City of Ottawa Geographic Information System and is protected by copyright. The location of Infrastructure is approximate and should not be used for construction purposes.

Scale 1:2500

Legend

- Storm Inlet
- Storm Outlet
- Storm Manhole
- Sanitary Manhole
- Combined Manhole
- Combined Pipe
- Sanitary Pipe
- Storm Pipe
- Pipe Cap
- Combined Trunk Sewer
- Sanitary Trunk Sewer
- Storm Trunk Sewer
- Regulator
- Storm Pumping Station
- Storm Water Management Pond
- Sanitary Pumping Station
- Treatment Plant

Pipe Equivalents

nominal (mm)	actual (inches)	nominal (mm)	actual (inches)	nominal (mm)	actual (inches)
100	4	675	27	1800	72
150	6	750	30	1950	78
200	8	825	33	2025	80
250	10	900	36	2100	84
300	12	975	39	2250	90
375	15	1050	42	2400	96
400	16	1200	48	2550	102
450	18	1350	54	2700	108
525	21	1500	60	2850	114
600	24	1650	66	3000	120

Pipe Materials

A - ASBESTOS
CI - CAST IRON
CO - COPPER
CO0 - AWWA C300
CO1 - AWWA C301
CO2 - AWWA C302
CO3 - AWWA C303
DI - DUCTILE IRON
PE - POLYETHYLENE (DR11 TO DR21)
PVC - POLYVINYL CHLORIDE
STC - CONCRETE LINED STEEL PIPE
UCI - UNLINED CAST IRON
UNK - UNKNOWN MATERIAL

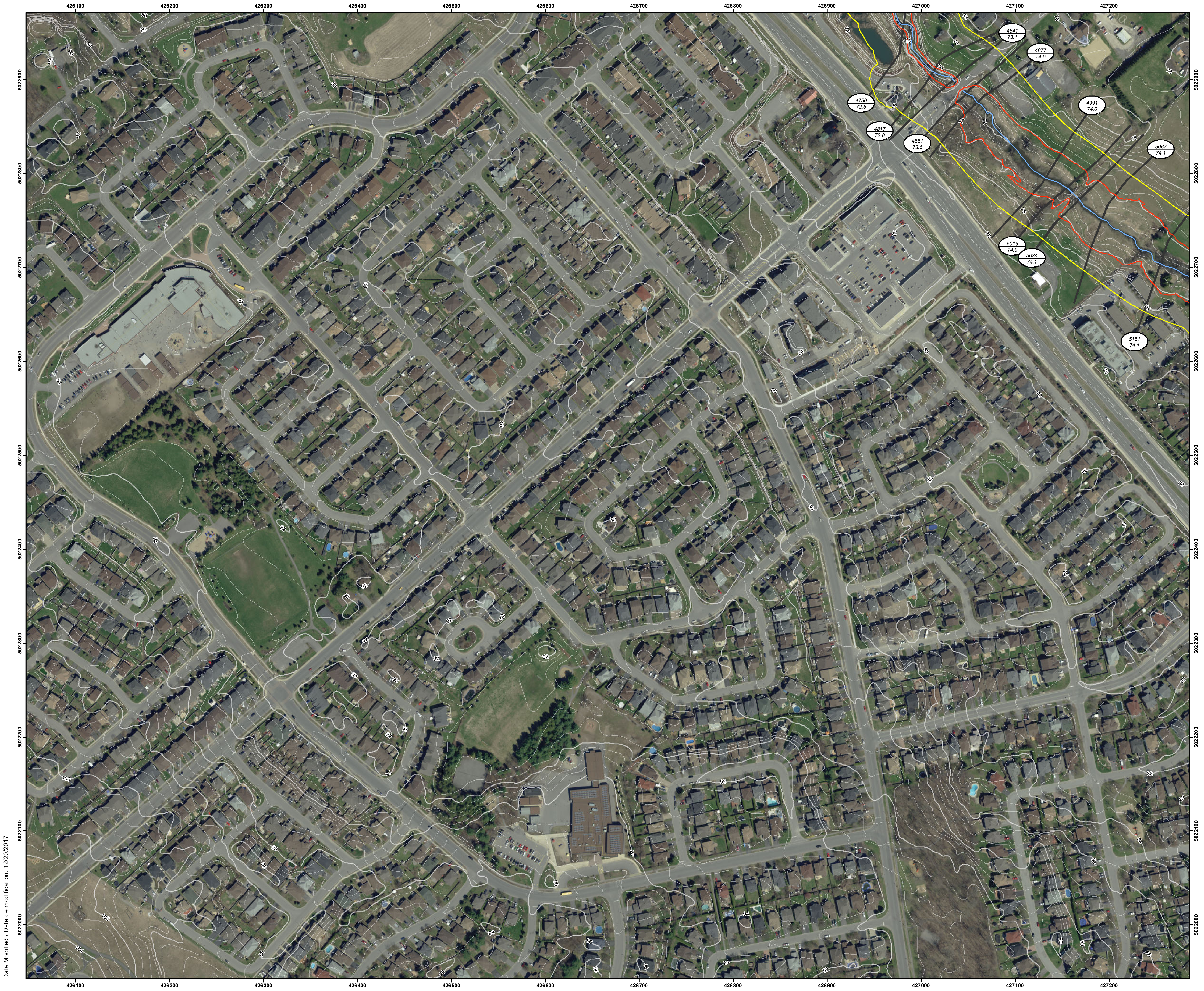
348-023

APPENDIX D

Stormwater Management

MAP No.
CARTE No. 4

FLOOD RISK MAP
SHIRLEY'S BROOK
CARTE DU RISQUE D'INONDATION



Date Modified / Date de modification: 12/20/2017

LEGEND / LÉGENDE

- Regulatory Floodplain / La Crue Régulatrice
- Regulatory Limit / Limite Réglementaire
- Contours / Courbes
- Stream / Ruisseau
- Cross Sections / La coupe traversale

Station Number — 6446 — Numéro de la station
Regulatory Flood Elevation (m) — 75.7 — Niveau de la crue regulatrice (m)

INDEX CONTOUR INTERVAL 2 METRES
WITH 0.5 METRE INTERMEDIATE CONTOUR
NORTH AMERICAN DATUM 1983

COURBES DE NIVEAU PRINCIPALES DE 2.0 MÈTRE
AVEC COURBES DE NIVEAU INTERMÉDIAIRES DE 0.5 MÈTRES
SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRIQUE 1983

GENERAL INFORMATION

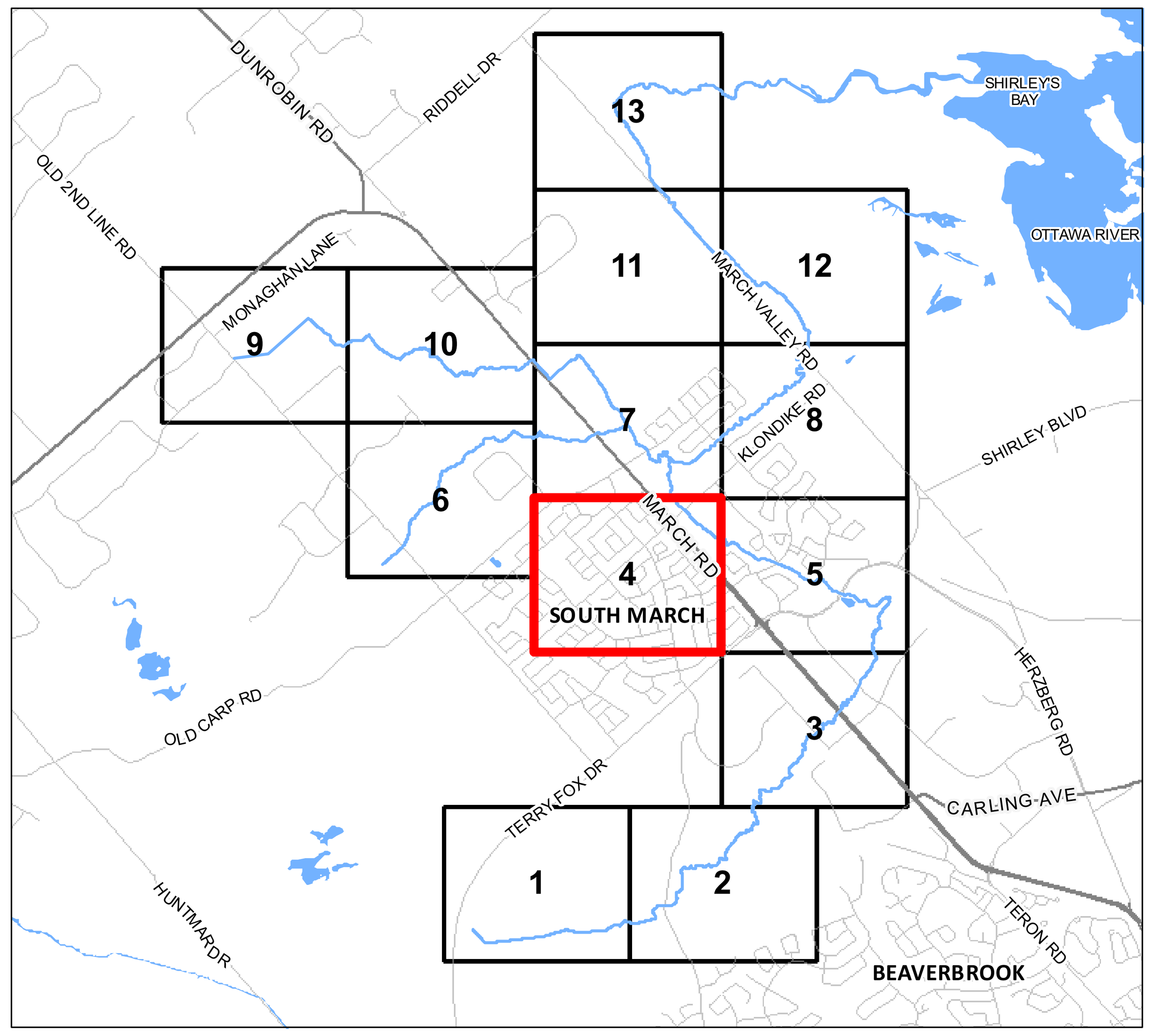
Vertical Datum: CGVD28
Horizontal Datum: North American 1983
Map Projection: Ottawa Transverse Mercator Projection

RENSEIGNMENTS GÉNÉRAUX

Niveau de référence vertical: CGVD28
Niveau de référence horizontal: Nord-americain 1983
Projection cartographique: Projection Mercator Transverse d'Ottawa

Mississippi Valley Conservation Authority
Ottawa

SHEET INDEX / TABLEAU D'ASSEMBLAGE



Revision #	Issue
1 - Oct. 25, 2017	Public Review
2 - Dec. 6, 2017	Board approval

LICENSED PROFESSIONAL ENGINEER
J. S. A. PRICE
Nov. 10/17
PROVINCE OF ONTARIO

This map and the associated information displayed are to be used for general illustrative purposes only. Although best efforts have been made to create accuracy; due to the complex and extensive nature of the data, all representations and/or information provided herein are approximate and to be verified by user. User hereby acknowledges that this map is not intended for true and accurate navigational purposes and hereby accepts and assumes all inherent risks associated with the use of this map.

This map is produced in part with data provided by the Ontario Geographic Data Exchange under Licence with the Ontario Ministry of Natural Resources and the Queen's Printer for Ontario, 2017

Imagery © Fugro Geospatial, May 2014
Digital Elevation Information © City of Ottawa

N
W E
S

SCALE 1:2,000 ÉCHELLE
0 25 50 100 150 200
Meters / Mètres

Cette carte et les renseignements connexes qui sont affichés sont fournis à titre d'exemple général seulement. En dépit de tous les efforts consentis pour en garantir l'exactitude, les représentations ou renseignements que l'on trouvera ici demeurent approximatifs du fait de la nature complexe et de l'étendue des données, et doivent donc être vérifiés par l'utilisateur. L'utilisateur reconnait par la présente que cette carte n'est pas conçue pour une navigation exacte et véridique, accepte et endosse les risques connexes associés à son utilisation.

Cette carte a été en partie réalisée à l'aide de données fournies par le Groupe d'échange de données géospatiales en Ontario, en vertu d'un contrat de licence passé avec le ministère des Richesses naturelles et l'Imprimeur de la Reine pour l'Ontario en 2017

Images aériennes © Fugro Geospatial, Mai 2014
Données altimétriques numériques © Ville d'Ottawa

788 March Road
Existing Conditions

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2012

Existing Drainage Charateristics From Internal Site

Area	0.62	ha
C	0.20	Rational Method runoff coefficient
L	62	m
Up Elev	77.67	m
Dn Elev	73.92	m
Slope	6.0	%
Tc	12.7	min

.

1) Time of Concentration per Federal Aviation Administration

$$\boxed{t_c = \frac{1.8(1.1-C)L^{0.5}}{S^{0.333}}}$$

tc, in minutes
C, rational method coefficient, (-)
L, length in ft
S, average watershed slope in %

Estimated Peak Flow

	2-year	5-year	100-year	
i	67.8	91.9	157.2	mm/hr
Q	23.4	31.6	67.7	L/s

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

DSEL

Target Flow Rate

Q* 85.4 L/s **70L/s/Ha per the Shirley's Brook SWM Facility Design Brief prepared by DME, dated April 2009.*

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID U1, U2
Total Area 0.16 ha
C 0.60 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}^* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	27.1	27.1	0.0	0.0	178.6	58.1	58.1	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Area ID A1
Total Area 0.46 ha
C 0.90 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	120.6	14.4	106.2	63.7	178.6	229.6	27.3	202.3	121.4
15	83.6	96.7	14.4	82.3	74.1	142.9	183.8	27.3	156.4	140.8
20	70.3	81.3	14.4	66.9	80.3	120.0	154.3	27.3	126.9	152.3
25	60.9	70.5	14.4	56.1	84.1	103.8	133.6	27.3	106.2	159.3
30	53.9	62.4	14.4	48.0	86.4	91.9	118.2	27.3	90.8	163.5
35	48.5	56.2	14.5	41.7	87.6	82.6	106.2	27.3	78.9	165.6
40	44.2	51.1	14.5	36.7	88.0	75.1	96.6	27.3	69.3	166.4
45	40.6	47.0	14.5	32.6	87.9	69.1	88.8	27.3	61.5	166.0
50	37.7	43.6	14.5	29.1	87.3	64.0	82.3	27.3	54.9	164.8
55	35.1	40.7	14.5	26.2	86.3	59.6	76.7	27.3	49.4	162.9
60	32.9	38.1	14.5	23.6	85.1	55.9	71.9	27.3	44.6	160.4
65	31.0	35.9	14.5	21.4	83.6	52.6	67.7	27.3	40.4	157.5
70	29.4	34.0	14.5	19.5	81.8	49.8	64.0	27.3	36.7	154.2
75	27.9	32.3	14.5	17.8	79.9	47.3	60.8	27.3	33.4	150.5
80	26.6	30.7	14.5	16.2	77.9	45.0	57.9	27.3	30.5	146.6
85	25.4	29.4	14.5	14.8	75.7	43.0	55.2	27.3	27.9	142.4
90	24.3	28.1	14.5	13.6	73.3	41.1	52.9	27.3	25.5	137.9
95	23.3	27.0	14.5	12.4	70.9	39.4	50.7	27.3	23.4	133.3
100	22.4	25.9	14.5	11.4	68.4	37.9	48.7	27.3	21.4	128.5
105	21.6	25.0	14.5	10.4	65.7	36.5	46.9	27.3	19.6	123.5
110	20.8	24.1	14.5	9.6	63.0	35.2	45.3	27.3	17.9	118.4

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

5-year $Q_{attenuated}$ **14.46** **L/s** **100-year $Q_{attenuated}$** **27.33** **L/s**
5-year Max. Storage Required **88.0** m^3 **100-year Max. Storage Required** **166.4** m^3

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage Storage (m^3)	100-Year Release Rate Release Rate (L/s)	100-Year Storage Storage (m^3)
Unattenuated Areas	27.1	0.0	58.1	0.0
Attenutated Areas	14.5	88.0	27.3	166.4
Total	**41.6**	**88.0**	**85.4**	**166.4**

Drawing name: W:\Projects\2600\2654 - Trinity - Kanata Plaza\C - Design Information\Z1 - SWM\ Date of plot: Mar 03 , 2009-4:56 pm

NOTES:

1. DRAINAGE AREAS AND PERCENT IMPERVIOUSNESS DERIVED FROM MARCH ROAD RECONSTRUCTION MINOR SYSTEM DRAINAGE PLAN, NOVEMBER 2008 RECEIVED FROM STANTEC.

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.

TRINITY

No.	REVISION	DATE	BY

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

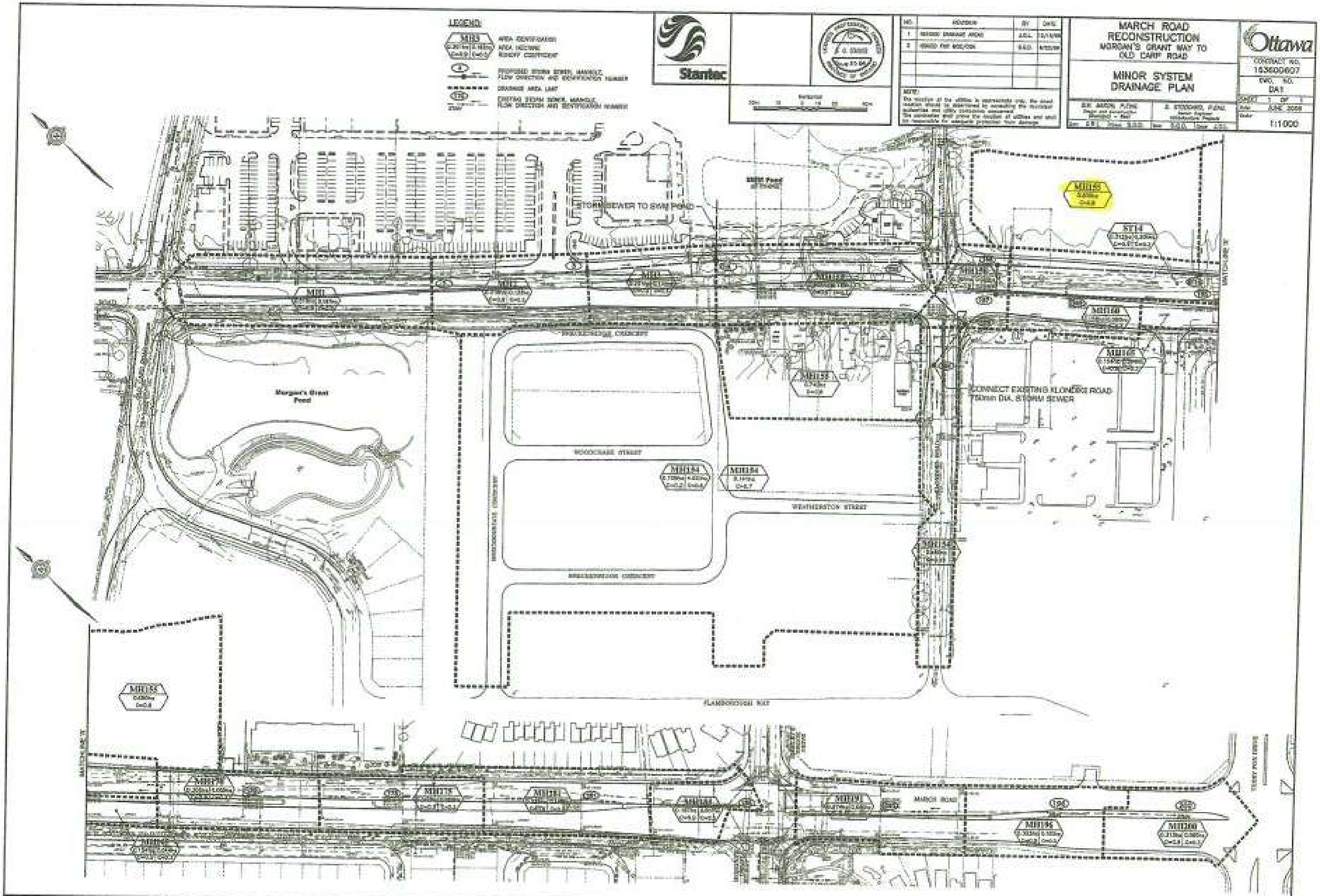
DME Ltd.
David McManus Engineering Ltd.
400 - 30 Camelot Drive
Ottawa Ontario, K2G 5X8
E-mail: mcmanus@dmeltd.ca
Ph. 225-1929 Fax 225-7330

BASEPLAN	DME	SCALE	
DESIGN		NOT TO SCALE	
CHECKED			
CAD	ACF		
PROJ. MGR.	MJG		
APPROVED	HGS		

TRINITY DEVELOPMENT GROUP
MARCH ROAD
CITY OF OTTAWA

SERVICE AREA DRAINAGE PLAN

PROJECT No. 2654
SURVEY BY STANTEC
DATE MARCH 2009
DRAWING No. STM-AREAS


LEGEND:
AREA IDENTIFICATION
AREA HECTARE
RUNOFF COEFFICIENT
PROPOSED STORM SEWER, MANHOLE, FLOW DIRECTION AND IDENTIFICATION NUMBER
DRAINAGE AREA LIMIT
EXISTING STORM SEWER, MANHOLE, FLOW DIRECTION AND IDENTIFICATION NUMBER
Stantec
MARCH ROAD
RECONSTRUCTION
MORGAN'S GRANT WAY TO
OLD CARP ROAD
MINOR SYSTEM
DRAINAGE PLAN
Ottawa
CONTRACT NO.
163600607
DWG. NO.
DA1
1:1000
STORM SEWER TO SWM POND
SWM Pond
Morgan's Grant Pond
CONNECT EXISTING KLONDIKE ROAD
750mm DIA. STORM SEWER
WOODCHASE STREET
WEATHERSTON STREET
BRECKENRIDGE CRESCENT
FLAMBOROUGH WAY
MARCH ROAD
MH165
ST14
MH160
MH155
MH184
MH196
MH200
MH191
MH175
MH181

STORM SEWER DESIGN WORKSHEET - MINOR FLOW ANALYSIS

LOCATION			AREAS (ha)				INDIV.	ACCUM.	TIME	RAIN-FALL	PEAK FLOW	SEWER DATA							
STREET	FROM	TO	R=0.60	R=0.30	R=0.80	R=0.90	2.78 AR	2.78 AR	OF CONC.	INT. I	Q (L/s)	TYPE OF PIPE	NOM. DIA. (mm)	SLOPE (%)	LENGTH (m)	FULL CAP. (L/s)	CAP. VEL. (m/s)	TIME OF FLOW (min)	Q/Qcap
MARCH ROAD																			
Existing Storm Sewer - Area 9A	200	196		0.060		0.313	0.83	0.83	10.0	122.1	102	Conc.	375	1.00	80	183	1.60	0.8	0.56
Existing Storm Sewer - Area 9	196	191		0.100		0.303	0.84	1.67	10.8	117.2	198	Conc.	450	1.10	105	312	1.90	0.9	0.63
Existing Storm Sewer - Area 8	191	185		0.060		0.374	0.99	2.66	11.8	112.2	299	Conc.	450	1.10	78	312	1.90	0.7	0.96
Existing Storm Sewer - Area 7	185	181		0.007		0.197	0.50	3.16	12.4	108.8	344	Conc.	675	0.16	107	351	0.95	1.9	0.98
Existing Storm Sewer - Area 6	181	175		0.186		0.325	0.87	4.13	14.3	100.5	415	Conc.	675	0.25	110	438	1.19	1.5	0.95
Existing Storm Sewer - Area 5	175	170		0.050		0.310	0.82	4.95	15.9	94.7	468	Conc.	750	0.16	100	465	1.02	1.6	1.01
Existing Storm Sewer - Area 4	170	165		0.059		0.305	0.81	5.76	17.5	89.3	514	Conc.	750	0.18	100	493	1.08	1.5	1.04
Existing Storm Sewer - Area 3	165	160		0.044		0.154	0.42	6.18	19.0	84.8	524	Conc.	750	0.21	90	532	1.17	1.3	0.98
Existing Storm Sewer - Area 2	160	157		0.060		0.158	0.44	6.62	20.3	81.4	539	Conc.	750	0.95	45	1132	2.48	0.3	0.46
	157	158					0.00	6.62	20.6	80.6	534	Conc.	750	0.50	20	821	1.80	0.2	0.65
Properties east of Klondike-March intersection (5-year)	ST14	158			1.520		3.38	3.38	10.0	104.2	352								
NE half of March Rd (10-yr)	ST14	158		0.104		0.312	0.87	0.87	10.0	122.1	106								
Total to ST14	ST14	158								Total	458	Conc.	675	0.30	125	480	1.30	1.6	0.95
	158	155		0.040		0.195	0.52	8.01	20.8	80.2	995	Conc.	825	0.85	60	1381	2.50	0.4	0.72
KLONDIKE ROAD (minor contribution from 750mm from MG)	1314	154					Controlled discharge from JLR design (w/ ICDs)				367		750	0.20	71	519	1.14	1.0	0.71
	154	156									367		750	1.30	45	1324	2.90	0.3	0.28
KLONDIKE ROAD (Major contribution from DICB at Intersection)	2 DICB	156a		Flow split between 4 leads determined using solvermatching U/S HGLs								2 Leads	610	1.25	6	748	2.48	0.0	0.00
	2 DICB	156a										2 Leads	525	4.50	6	952	4.26	0.0	0.00
										Total	0								
	156a	156									0	Conc.	1500	0.70	23	6170	3.38	0.1	0.00
	156	155									367	Conc.	1650	0.70	42	7955	3.60	0.2	0.05
	155	4	0.74	0.189		0.446	2.61	10.53	21.2	79.2	1,553	Conc.	1800	0.15	136	4644	1.77	1.3	0.33
MARCH ROAD (North of Klondike)	1	2		0.197		0.519	1.46	1.46	10.0	122.1	179	Conc.	450	0.46	110	202	1.23	1.5	0.89
	2	3		0.133		0.318	0.91	2.37	11.5	113.6	269	Conc.	525	0.40	97	284	1.27	1.3	0.95
	3	4		0.142		0.231	0.70	3.07	12.8	107.3	329	Conc.	600	0.75	78	555	1.90	0.7	0.59
MARCH Rd SAG Station 8+050 - (Major from March southbound)		DICB																	
MARCH Rd SAG Station 8+050 - (Major from 0.8 ha property on corner)		DICB																	
MARCH Rd SAG Station 8+050 - (carry over from intersection)		DICB																	
Sum of Above (to DICB)	2 DICB	4									0	twin leads	525	1.75	33	594	2.66	0.2	0.00
Storm Sewer to Diversion Chamber	4	STMH211					0.00	13.59	22.5	76.3	1,756	Conc.	1950	0.15	22	5749	1.87	0.2	0.31
To Pond (neglecting 900mm normal flow pipe to forebay)	STMH211	Pond									1,756	Conc.	1800	0.44	16	7954	3.03	0.1	0.22

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity in millimeters per hour (mm/h)
R = Runoff Coefficient

Notes:
1) 10 yr storm design
2) Accommodates future road widening
3) Mannings n=0.013
n=0.011 PVC
4) 100yr CB Capture = 100% of 10-yr

Designed: MT
Checked: SGD
Dwg. Reference:

PROJECT: MARCH ROAD RECONSTRUCTION
Solandt Road to Old Carp Road

LOCATION: TERRY FOX DRIVE to OLD CARP ROAD

File Ref.: 1636-00607/300 | Date: 09-Jul-09 | Sheet No.:

...Revised HGL Analysis to SB Option 4 Pond AP_UPDATE_REV11.xls

STORM SEWER DESIGN WORKSHEET - MINOR FLOW ANALYSIS

LOCATION			AREAS (ha)				INDIV.	ACCUM.	TIME OF	RAIN-FALL	PEAK FLOW	SEWER DATA									SEWER DATA						
STREET	FROM	TO	R=0.60	R=0.30	R=0.80	R=0.90	2.78 AR	2.78 AR	CONC.	INT. I	Q (L/s)	TYPE OF PIPE	NOM. DIA. (mm)	ACT. DIA. (m)	SLOPE (%)	LENGTH (m)	FULL CAP. (L/s)	CAP. VEL. (m/s)	TIME OF FLOW (min)	Q/Qcap	MH ELEVATION U/S (m)	MH ELEVATION D/S (m)	INVERT U/S (m)	INVERT D/S (m)	OBVERT U/S (m)	OBVERT D/S (m)	COV U/S (m)
MARCH ROAD																											
Existing Storm Sewer - Area 9A	200	196		0.060		0.313	0.83	0.83	10.0	122.1	122	Conc.	375	0.381	1.00	80	183	1.60	0.8	0.87	83.4	82.541	81.000	80.200	81.381	80.581	2.019
Existing Storm Sewer - Area 9	196	191		0.100		0.303	0.84	1.67	10.8	117.2	238	Conc.	450	0.457	1.10	105	312	1.90	0.9	0.78	82.541	81.2	80.130	78.970	80.587	79.427	1.954
Existing Storm Sewer - Area 8	191	185		0.060		0.374	0.99	2.66	11.6	112.2	358	Conc.	450	0.457	1.10	78	312	1.90	0.7	1.15	81.2	80.7	78.600	77.640	79.147	78.287	2.053
Existing Storm Sewer - Area 7	185	181		0.007		0.197	0.50	3.16	12.4	106.8	413	Conc.	675	0.686	0.16	107	351	0.95	1.9	1.18	80.700	80.100	77.000	76.830	77.686	77.516	3.014
Existing Storm Sewer - Area 6	181	175		0.188		0.323	0.97	4.13	14.3	100.5	498	Conc.	675	0.686	0.25	110	438	1.19	1.5	1.14	80.100	79.616	76.830	76.550	77.516	77.236	2.584
Existing Storm Sewer - Area 5	175	170		0.060		0.310	0.82	4.95	15.8	94.7	562	Conc.	750	0.762	0.16	100	465	1.02	1.6	1.21	79.616	79.141	76.480	76.320	77.242	77.082	2.374
Existing Storm Sewer - Area 4	170	165		0.058		0.305	0.81	5.76	17.5	89.3	617	Conc.	750	0.762	0.18	100	493	1.08	1.5	1.25	79.141	78.688	76.320	76.140	77.082	76.902	2.059
Existing Storm Sewer - Area 3	165	160		0.044		0.154	0.42	6.18	19.0	84.8	629	Conc.	750	0.762	0.21	90	532	1.17	1.3	1.18	78.688	78.420	76.140	75.950	76.902	76.712	1.786
Existing Storm Sewer - Area 2	160	157		0.060		0.158	0.44	6.62	20.3	81.4	647	Conc.	750	0.762	0.95	45	1132	2.45	0.3	0.57	78.420	78.360	75.350	74.923	76.112	75.685	2.308
	157	158					0.00	6.62	20.6	80.6	641	Conc.	750	0.762	0.50	20	821	1.80	0.2	0.78	78.420	78.360	74.850	74.750	75.612	75.512	2.808
Properties east of Klondike-March intersection (5-year)	ST14	158			1.520		3.38	3.38	10.0	104.2	352																
NE half of March Rd (10-yr)	ST14	158		0.104		0.212	0.87	0.87	10.0	122.1	127																
Total to ST14	ST14	158								Total	479	Conc.	675	0.686	0.30	125	460	1.30	1.6	1.00	78.254	77.825	75.168	74.793	75.854	75.479	2.400
	158	155		0.040		0.195	0.52	8.01	20.8	80.2	1,123	Conc.	825	0.838	0.85	60	1381	2.50	0.4	0.81	78.200	78.400	74.641	74.131	75.479	74.969	2.721
KLONDIKE ROAD (minor contribution from 750mm from MG)	1314	154		1:100-yr discharge from JLR design (w/ ICDs)							367		750	0.762	0.20	71	519	1.14	1.0	0.71	80.350	78.600	78.893	76.551	77.458	77.313	2.895
	154	156									387		750	0.762	1.30	45	1324	2.90	0.3	0.28	78.600	78.200	76.000	75.415	76.762	76.177	1.838
KLONDIKE ROAD (Major contribution from DICB at Intersection)	2 DICB	156a		Flow split between 4 leads determined using solvermatching U/S HGLs							2,095	2 Leads	610	0.620	1.25	3	748	2.48	0.0	0.89	77.500	78.200	75.950	75.913	76.570	76.532	0.930
											0																
	2 DICB	156a									1,375	2 Leads	525	0.533	4.00	4	952	4.26	0.0	0.72	77.600	78.200	76.000	75.820	76.533	76.353	0.967
										Total	3,380																
	156a	156									3,380	Conc.	1500	1.524	0.70	23	6170	3.38	0.1	0.55	78.200	78.400	74.231	74.070	75.755	75.594	2.445
	156	155									3,747	Conc.	1650	1.676	0.70	42	7955	3.60	0.2	0.47	78.200	78.400	73.857	73.563	75.534	75.240	2.666
	155	4	0.74	0.189		0.448	2.51	10.53	21.2	79.2	5,160	Conc.	1800	1.829	0.15	136	4844	1.77	1.3	1.10	78.360	78.633	73.411	73.207	75.240	75.036	3.120
MARCH ROAD (North of Klondike)	1	2		0.197		0.518	1.46	1.46	10.0	122.1	214	Conc.	450	0.457	0.46	110	202	1.23	1.5	1.06	78.530	78.060	75.870	75.364	76.327	75.821	2.203
	2	3		0.133		0.318	0.91	2.37	11.5	113.6	329	Conc.	525	0.533	0.40	97	284	1.27	1.3	1.14	78.060	77.430	75.288	74.900	75.821	75.433	2.239
	3	4		0.142		0.231	0.70	3.07	12.8	107.3	395	Conc.	600	0.610	0.75	78	555	1.90	0.7	0.71	77.430	77.230	74.385	73.800	74.995	74.410	2.435
MARCH Rd SAG Station 8+050 - (Major from March southbound)		DICB									267																
MARCH Rd SAG Station 8+050 - (Major from 8.8 ha property on corner)		DICB									181																
MARCH Rd SAG Station 8+050 - (carry over from intersection)		DICB									720																
Sum of Above (to DICB)	2 DICB	4									1,168	twin leads	525	0.533	1.75	33	594	2.66	0.2	0.98	77.000	78.633	75.503	74.988	76.036	75.519	0.904
Storm Sewer to Diversion Chamber	4	STMH211					0.00	13.59	22.5	78.3	6,512	Conc.	1950	1.981	0.15	22	5749	1.87	0.2	1.13	78.633		73.133	73.100	75.114	75.081	3.519
To Pond (neglecting 900mm normal flow pipe to forebay)	STMH211	Pond									6,512	Conc.	1800	1.829	0.44	16	7954	3.03	0.1	0.82	78.633		73.070	73.000	74.899	74.829	3.734

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity in millimeters per hour (mm/h)
R = Runoff Coefficient

Notes:
1) 10 yr storm design
2) Accommodates future road widening
3) Mannings n=0.013
n=0.011 PVC
4) 100yr CB Capture = 120% of 10-yr

Designed: MT	PROJECT:	MARCH ROAD RECONSTRUCTION Solandt Road to Old Carp Road
Checked: SGD	LOCATION:	TERRY FOX DRIVE to OLD CARP ROAD
Dwg. Reference:	File Ref.: 1636-00607/300	Date: [illegible] Sheet No.:

STORM SEWER DESIGN WORKSHEET - MINOR FLOW ANALYSIS

LOCATION			ER	HYDRAULIC GRADE LINE ANALYSIS												
STREET	FROM	TO	D/S (m)	R_h	A (m^2)	V (m/s)	$V^2/2g$ (m)	f	H_f (m)	K Exit	K Entrance	Kbend Benched	K Losses (m)	Total HL (m)	U/S HGL (m)	U/S HGL FREEBOARD (HGL-T/G)(m)
MARCH ROAD																
Existing Storm Sewer - Area 8A	200	196	1.960	0.086	0.114	1.07	0.058	0.0290	0.357				0.000	0.357	80.88	2.72
Existing Storm Sewer - Area 8	196	191	1.773	0.114	0.164	1.43	0.105	0.0273	0.658				0.000	0.658	80.02	2.52
Existing Storm Sewer - Area 8	191	185	2.403	0.114	0.164	2.18	0.243	0.0273	1.132				0.000	1.132	78.89	2.31
Existing Storm Sewer - Area 7	185	181	2.564	0.171	0.369	1.12	0.064	0.0239	0.237				0.000	0.237	78.65	2.05
Existing Storm Sewer - Area 6	181	175	2.380	0.171	0.369	1.35	0.093	0.0239	0.355				0.000	0.355	78.41	1.69
Existing Storm Sewer - Area 5	175	170	2.058	0.191	0.456	1.23	0.077	0.0231	0.234				0.000	0.234	78.08	1.56
Existing Storm Sewer - Area 4	170	165	1.788	0.191	0.456	1.35	0.093	0.0231	0.282				0.000	0.282	77.82	1.32
Existing Storm Sewer - Area 3	165	160	1.708	0.191	0.456	1.38	0.097	0.0231	0.264				0.000	0.264	77.54	1.15
Existing Storm Sewer - Area 2	160	157	2.676	0.191	0.456	1.42	0.103	0.0231	0.140				0.000	0.140	77.28	1.14
	157	158	2.846	0.191	0.456	1.41	0.101	0.0231	0.061				0.000	0.061	77.14	1.28
Properties east of Klondike-March intersection (5-year)	ST14	158														
NE half of March Rd (10-yr)	ST14	158														
Total to ST14	ST14	158	2.346	0.171	0.369	1.30	0.086	0.0239	0.373	0.5		0.3	0.069	0.442	77.52	0.73
	158	155	3.431	0.210	0.552	2.04	0.211	0.0223	0.338	0.5			0.106	0.443	77.08	1.12
KLONDIKE ROAD (minor contribution from 750mm from MG)	1314	154	1.287	0.191	0.456	0.80	0.033	0.0231	0.071				0.000	0.071	76.95	3.40
	154	156	2.023	0.191	0.456	0.80	0.033	0.0231	0.045	0.5			0.017	0.061	76.88	1.72
KLONDIKE ROAD (Major contribution from DICB at intersection)	2 DICB	156a	1.888	0.155	0.302	3.32	0.563	0.0177	0.048	1.0	0.5		0.644	0.892	77.90	-0.40
								check 77.80 + 0.111 grate losses <= to 78.05 m which is elevation to keep 1 lane of March Rd. free - OK								
	2 DICB	156a	1.847	0.133	0.223	3.08	0.483	0.0188	0.067	1.0	0.5		0.724	0.791	77.80	-0.30
								check 77.80 + 0.212 grate losses <= to 78.05 m which is elevation to keep 1 lane of March Rd. free - OK								
	156a	156	2.806	0.381	1.824	1.85	0.175	0.0183	0.048	0.5		0.3	0.140	0.188	77.01	1.19
	156	155	3.160	0.419	2.207	1.70	0.147	0.0177	0.035	0.5		0.3	0.118	0.153	76.82	1.36
	155	4	3.597	0.457	2.827	1.94	0.192	0.0172	0.246	0.5		0.3	0.154	0.400	76.63	1.73
MARCH ROAD (North of Klondike)	1	2	2.239	0.114	0.164	1.31	0.087	0.0273	0.572				0.000	0.572	77.68	0.85
	2	3	1.997	0.133	0.223	1.45	0.106	0.0260	0.503				0.000	0.503	77.11	0.95
	3	4	2.620	0.152	0.292	1.35	0.093	0.0248	0.298	0.5		0.3	0.075	0.371	76.81	0.82
MARCH Rd SAG Station 8+050 - (Major from March southbound)		DICB														
MARCH Rd SAG Station 8+050 - (Major from 0.8 ha property on corner)		DICB														
MARCH Rd SAG Station 8+050 - (carry over from intersection)		DICB														
Sum of Above (to DICB)	2 DICB	4	3.114	0.133	0.223	2.61	0.348	0.0260	0.559	0.5	0.5		0.348	0.907	77.14	-0.14
								check 77.14 + 0.036 grate losses <= to 77.50 m which is elevation to keep 1 lane of March Rd free - OK								
Storm Sewer to Diversion Chamber	4	STMH211		0.498	3.063	2.11	0.227	0.0166	0.042	0.3			0.068	0.111	76.23	2.40
To Pond (neglecting 900mm normal flow pipe to forebay)	STMH211	Pond		0.457	2.827	2.48	0.313	0.0172	0.047	1.0	0.3		0.407	0.454	76.12	2.51
									100 year water level in proposed Shirley's Brook pond (Option 4)						75.67	DME April 15, 2009

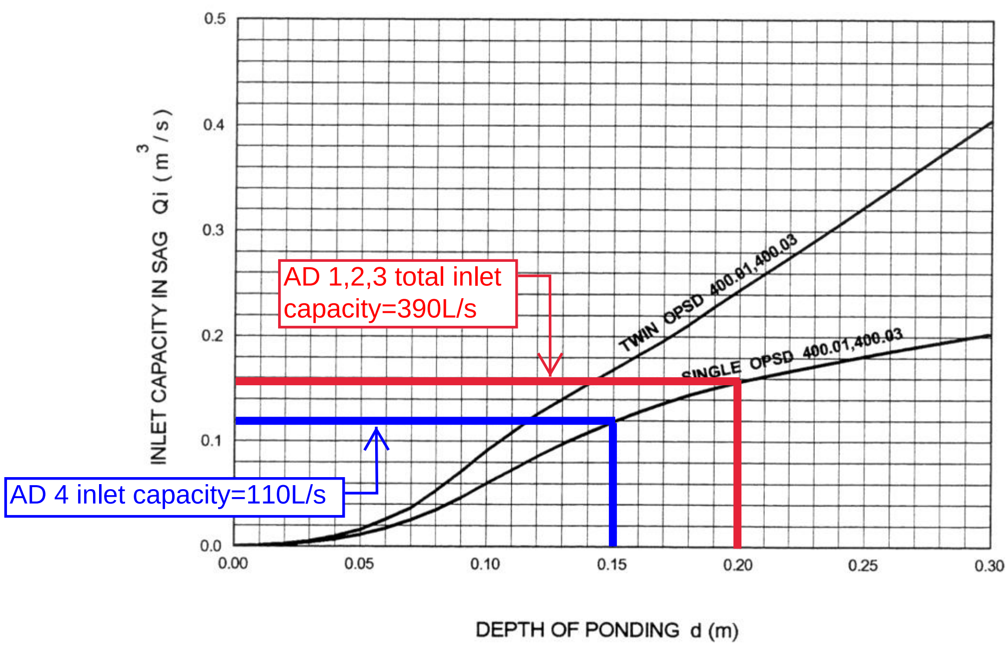
Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall intensity in millimeters per hour (mm/h)
R = Runoff Coefficient

$$h_L = f\frac{L}{d}\frac{V^2}{2g} \qquad f = \frac{8g}{c^2} \qquad c = \frac{1}{n}R_h^{1/6}$$

```
 ----------------------
 | CALIB STANDHYD      |   Area    (ha)=    5.90
 | 01:A-MR1  DT= 2.00 |   Total Imp(%)=   76.00   Dir. Conn.(%)=   64.00
 ----------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.48          1.42
     Dep. Storage     (mm)=       1.57          4.67
     Average Slope     (%)=        .30          2.00
     Length            (m)=    1000.00          5.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=      80.39        101.95
                over (min)       16.00         18.00
     Storage Coeff.  (min)=      15.93 (ii)    17.94 (ii)
     Unit Hyd. Tpeak (min)=      16.00         18.00
     Unit Hyd. peak  (cms)=        .07           .06
                                                             *TOTALS*
     PEAK FLOW       (cms)=        .67           .29            .960 (iii)
     TIME TO PEAK    (hrs)=       6.07          6.13           6.100
     RUNOFF VOLUME    (mm)=      92.34         68.31          83.691
     TOTAL RAINFALL   (mm)=      93.91         93.91          93.910
     RUNOFF COEFFICIENT   =        .98           .73            .891

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 001:0009-----------------------------------------------------------------------
 ----------------------
 | COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =    .603  (cms)
 | TotalHyd 01:A-MR1  |   Number of inlets in system [NINLET] =       1
 ----------------------   Total minor system capacity          =    .603  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK      TPEAK      R.V.      DWF
                                 (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   01:A-MR1        5.90       .960      6.100    83.691     .000
     ==========================================================================
     MAJOR SYST   03:MR1maj        .56       .357      6.100    83.691     .000
     MINOR SYST   04:MR1min       5.34       .603      5.833    83.691     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 -------------------------------------------------------------------------------
 001:0010-----------------------------------------------------------------------
 *
 * March Road between Terry Fox Drive and Old Carp Road
 * MAJOR SYSTEM ONLY. MINOR SYSTEM IN PREVIOUS HYDROGRAPH
 * (40-43m ROW, 28m paved width, 2m sidewalk each side)
 * Minor system capture = 0.336 m3/s (10yr SWMHYMO peak flow)
 * Major system storage = 0 m3/ha
 * TIMP/XIMP based on typical 4-lane arterial cross-section
 * -------------------------------------------------------
 *
 ----------------------
 | CALIB STANDHYD      |   Area    (ha)=    3.32
 | 01:A-MR2  DT= 2.00 |   Total Imp(%)=   74.00   Dir. Conn.(%)=   62.00
 ----------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.46           .86
```

Surface Inlet Capacity At Road Sags[8]

Design Chart 4.19: Inlet Capacity at Road Sag



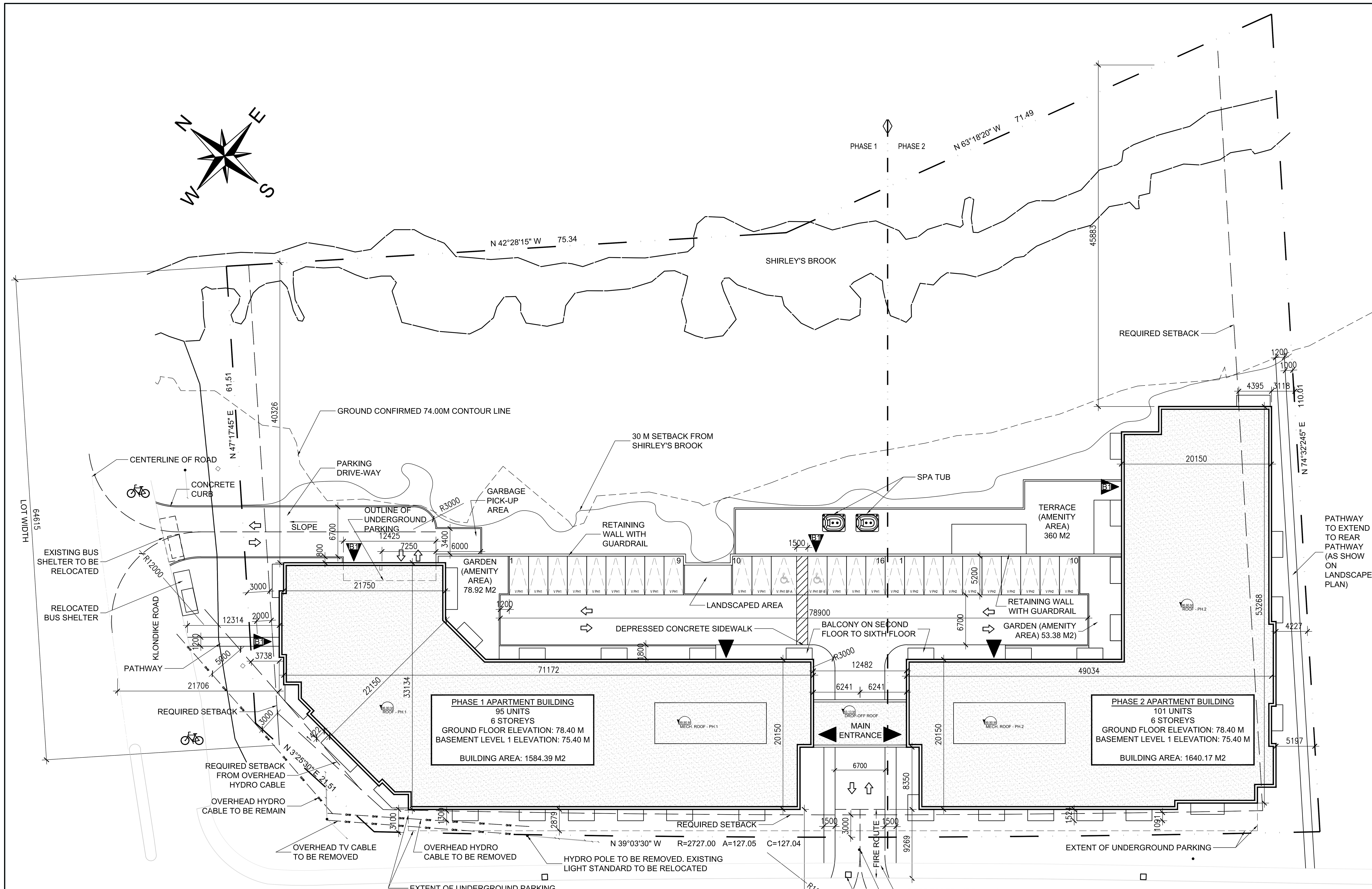
Drainage area to area drains = 0.14Ha , RC = 0.90
Rational method calculation of 100-year flow to AD 1,2,3,4 = 69.4 L/s
Total inlet capacity of AD 1,2,3,4 = 500 L/s

[8] From the *MTO Drainage Management Manual*

788 March Road
Culvert Sizing
Design Sheet

			Sewer Data								
		Q*	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Qcap	Time Flow	Q / Q full
		(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(min)	(-)
TO KLONDIKE OUTLET											
Culvert 1		208.1	400	5.00	6.50	0.126	0.100	3.71	465.7	0.0	0.45
Culvert 2		208.1	400	5.00	14.50	0.126	0.100	3.71	465.7	0.1	0.45
208.1 L/s is the total 100 yr flow from March Road (189.6 L/s) and Uncontrolled Area **U2 from the site (18.5L/s)*											

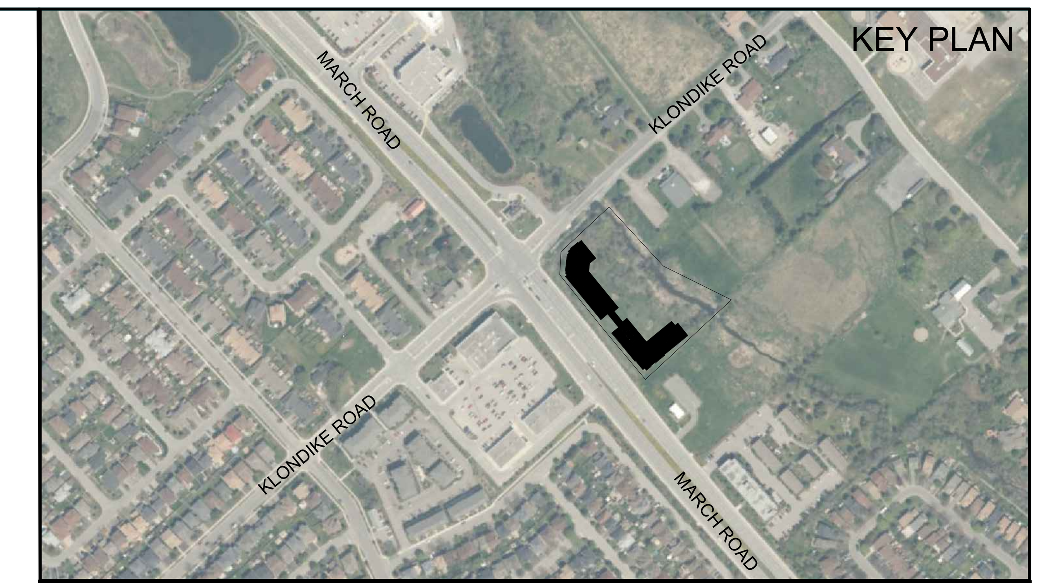
DRAWINGS / FIGURES



LEGAL DESCRIPTION:
This property is legally described as Part of Lot 10, Concession 4, Geographic Township of March, City of Ottawa

TOPOGRAPHICAL INFORMATION:
Property boundary has been derived from plan prepared by J.D. Barnes Limited. Topographical information has been prepared by DSEL Engineering Ltd.

KEY PLAN



PROJECT INFORMATION

2018-08-09

Zoning	City of Ottawa zoning By-law No. 2008-250	
Property Area	12210.01 sq. m	131,429 sq. ft

PROJECT STATISTICS	APARTMENT BUILDING PHASE 1 & PHASE 2
BUILDING HEIGHT (m)	20.81m
GROSS FLOOR AREA	16175,56m²

UNIT STATISTICS	APARTMENT BUILDING PHASE 1
1 Bedroom	24
1 Bedroom + Den	12
2 Bedroom	36
2 Bedroom + Den	17
3 Bedroom	6
TOTAL	95
	PHASE 2
1 Bedroom	24
1 Bedroom + Den	36
2 Bedroom	30
2 Bedroom + Den	5
3 Bedroom	6
TOTAL	101
GRAND TOTAL	196

PARKING PHASE 1 & 2	REQUIRED		PROVIDED
PHASE 1 - APARTMENT BUILDING - 95 UNITS	1.20	114	124
PHASE 1 - VISITORS	0.20	19	19
PHASE 2 - APARTMENT BUILDING - 101 UNITS	1.20	121	111
PHASE 2 - VISITORS	0.20	20	16
TOTAL	274		270
Phase 1 - Reduced parking stalls (Sec.106 up to 40%)	46		2
Phase 2 - Reduced parking stalls (Sec.106 up to 40%)	48		3
Phase 1 & Phase 2 - Accessible parking	7 (3 Type A + 4 Type B)		7
Visitor - Accessible parking	2 (1 Type A + 1 Type B)		2

BICYCLE PARKING PHASE 1 & 2	REQUIRED		PROVIDED
PHASE 1- APARTMENT BUILDING - 95 UNITS	0.50	48	48
PHASE 2 - APARTMENT BUILDING - 101 UNITS	0.50	51	51
TOTAL	99		99

GENERAL MIXED USE ZONE - GM ZONE PROVISION	REQUIRED	PROVIDED
MINIMUM LOT AREA	NO MINIMUM.	12210.01m²
MINIMUM LOT WIDTH	NO MINIMUM.	64.62m
MIN. FRONT YARD SETBACK	3m	3.74m
MIN. CORNER YARD SETBACK	3m	3.10m
MINIMUM INTERIOR SIDE YARD SETBACK	3m	40.33m
MINIMUM REAR YARD SETBACK	7.5m	3.12m
MAXIMUM BUILDING HEIGHT	18m	20.81m
MAXIMUM FLOOR SPACE INDEX	2	1.33
MINIMUM WIDTH OF LANSCAPE AREA	3m	3.10m
MINIMUM WIDTH OF DRIVE AISLE FOR PARKING LOT	6.7m	6.7m
MIN. WIDTH OF DRIVE AISLE FOR PARKING GARAGE	6.0m	6.0m
MAXIMUM PERMITED PROJECTIONS	2.0m	1.3m

AMENITY AREA ZONING BY-LAW SECTION 137	REQUIRED	PROVIDED
MIN. FOR APARTMMENT DWELLING: 6m²/ UNIT	1176m²	1788.49m²
MINIMUM 50% COMMUNAL	588m²	658,85m²
AT LEAST ONE AREA > 54m²	54m²	166,55m²
Basement 1: Resident lounge	-	166,55m²
Basement 1: Exterior terrace	-	360m²
Ground floor: Balconies	-	179.39m²
Ground floor: Resident gardens	-	132.3m²
Second to sixth floor: Balconies	-	950.25m²
TOTAL	1176m²	1788.49m²

WASTE MANAGEMENT PHASE 1 - 95 UNITS	REQUIRED		PROVIDED
GARBAGE - LOOSE	0.11/ UNIT	10.45y³	2- 6y³ CONT.
RECYCLING - FEL GLASS METAL PLASTIC	0.018/ UNIT	1.71y³	1- 2y³ CONT.
RECYCLING - FEL FIBER	0.038/ UNIT	3.61y³	1- 4y³ CONT.
ORGANICS	240/ 50 UNIT	1.9L	2- 240 L
PHASE 2 - 101 UNITS	REQUIRED		PROVIDED
GARBAGE - LOOSE	0.11/ UNIT	11.11y³	2- 6y³ CONT.
RECYCLING - FEL GLASS METAL PLASTIC	0.018/ UNIT	1.819y³	1- 2y³ CONT.
RECYCLING - FEL FIBER	0.038/ UNIT	3,838y³	1- 4y³ CONT.
ORGANICS	240/ 50 UNIT	2.02L	3- 240L

SIGNS

SIGNS SHALL BE PROVIDED FOR ALL VISITOR PARKINGS, BARRIER FREE PARKINGS & FIRE ROUTES
ALL THE SIGNS SHALL FOLLOW THE SPECIFICATIONS OF THE CITY OF OTTAWA

THE PARKING SIGNS WILL BE LABELED AS:
"VISITOR ONLY"
"RESIDENT ONLY"
"ACCESIBLE PARKING"
AND REINFORCED: " UNATHORIZED VEHICLES TOWED AWAY"

GENERAL NOTE:
WHEN RETAINING WALLS ARE GREATER THAN 1 METER IN HEIGHT THE DESIGN WILL BE DONE BY A STRUCTURAL ENGINEER
SNOW STORAGE NOT PROVIDED ON SITE.
SNOW WILL BE REMOVED FROM SITE

LEGEND

PROPERTY LINE
EXISTING OVERHEAD CABLES
BUILDING AREA
BUILDING ENTRANCE / EXIT (GROUND FLOOR)
BUILDING EXIT (BASEMENT LEVEL 1)
TRAFFIC DIRECTION
EXISTING CYCLE PATH
BICYCLE PARKING
5200 2600 CAR PARKING
R: RESIDENTIAL (WITH PHASES)
V: VISITOR
5200 2600 BARRIER FREE PARKING (TYPE B)
R: RESIDENTIAL (WITH PHASES)
V: VISITOR
5200 3400 BARRIER FREE PARKING (TYPE A)
R: RESIDENTIAL (WITH PHASES)
V: VISITOR

NOTES GÉNÉRALES General Notes

1. Ces documents d'architecture sont la propriété exclusive de NEUF architect(e)s et ne pourront être utilisés, reproduits ou copiés sans autorisation écrite au préalable. / These architectural documents are the exclusive property of NEUF architect(e)s and cannot be used, copied or reproduced without written pre-authorisation.
2. Les dimensions apparaissant aux documents devront êtres vérifiées par l'entrepreneur avant le début des travaux. / All dimensions which appear on the documents must be verify by the contractor before starting the work.
3. Veuillez aviser l'architecte de toute dimension erreur et/ou divergences entre ces documents et ceux des autres professionnels. / The architect must be notified of all errors, omissions and discrepancies between these documents and those of other professionnals.
4. Les dimensions sur ces documents doivent être lues et non mesurées. / The dimensions on these documents must be read and not measured.

PLANIFICATEUR Planner
FOTENN Planning and Urban design
223, McLeod Street, Ottawa, ON K2P 0Z8
T 613 730 5709 fotenn.com

ARCHITECTURE DE PAYSAGE Landscape architect
FOTENN Planning and Urban design
223, McLeod Street, Ottawa, ON K2P 0Z8
T 613 730 5709 fotenn.com

INGÉNIERIE TRANSPORT Engineering, Transportation
PARSONS
1223, Michael Street Suite 100, Ottawa, ON K1J 7T2
T 613 738 4160 parsons.com

CIVIL Civil
DSEL
120, Iber Road Suite 103, Ottawa, ON K2S 1E9
T 613 836 0856 www.dsel.ca

ARCHITECTES Architect
NEUF architect(e)s
630, boul. René-Lévesque O. 32e étage, Montréal QC H3B 1S6
T 514 847 1117 NEUFarchitectes.com

MÉCHANIQUE Mechanic

STRUCTURE Structure

SCEAU Seal

NEUF ARCHITECT(E)S

CLIENT Client
10731854 CANADA INC.
47 Clarence Street Suite 406, Ottawa , ON K1N 9K1

OUVRAGE Project
788 MARCH ROAD

EMPLACEMENT Location: OTTAWA
NO PROJET No.: 11 802

NO	RÉVISION	DATE (aa.mm.jj)
1	ISSUED FOR PRELIMINARY	2018-06-18
2	ISSUED FOR COORDINATION	2018-06-22
3	ISSUED FOR COORDINATION	2018-07-06
4	ISSUED FOR COORDINATION	2018-07-19
5	ISSUED FOR COORDINATION	2018-07-30
6	ISSUED FOR COORDINATION	2018-08-09

Preliminary
DO NOT USE FOR CONSTRUCTION

DESSINÉ PAR Drawn by: M.S. / E.C.
VÉRIFIÉ PAR Checked by: A.C.
DATE (aa.mm.jj): 18.08.09
ÉCHELLE Scale: AS SHOWN

TITRE DU DESSIN Drawing Title
SITE PLAN

RÉVISION Revision
NO. DESSIN Dwg Number: A100

I:\P_11800\11802\CAD\11802-A100 SITE PLAN.dwg