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FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

MATTAMY HOMES
WATERIDGE VILLAGE – BLOCK 19

CITY OF OTTAWA

PROJECT NO.: 17-947

OCTOBER 2019 – REV 2

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT
FOR
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MATTAMY HOMES
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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained to prepare a Functional Servicing and Stormwater Management report in support of the Site Plan Application for Block 19 of the former CFB Rockcliffe lands, which are currently under re-development by the Canada Lands Company.

The subject property is located within the City of Ottawa urban boundary, in the Rideau-Rockcliffe Ward. As illustrated in ***Figure 1***, the subject property is encompassed by Hemlock Road to the north, Mikinak Road to the south, Codd's Road to the west and Bareille-Snow Street to the east, all of which are currently under construction. Comprised of a single parcel, the subject property measures approximately ***1.63 ha*** and is zoned General Mixed Use Zone 31 H(30).

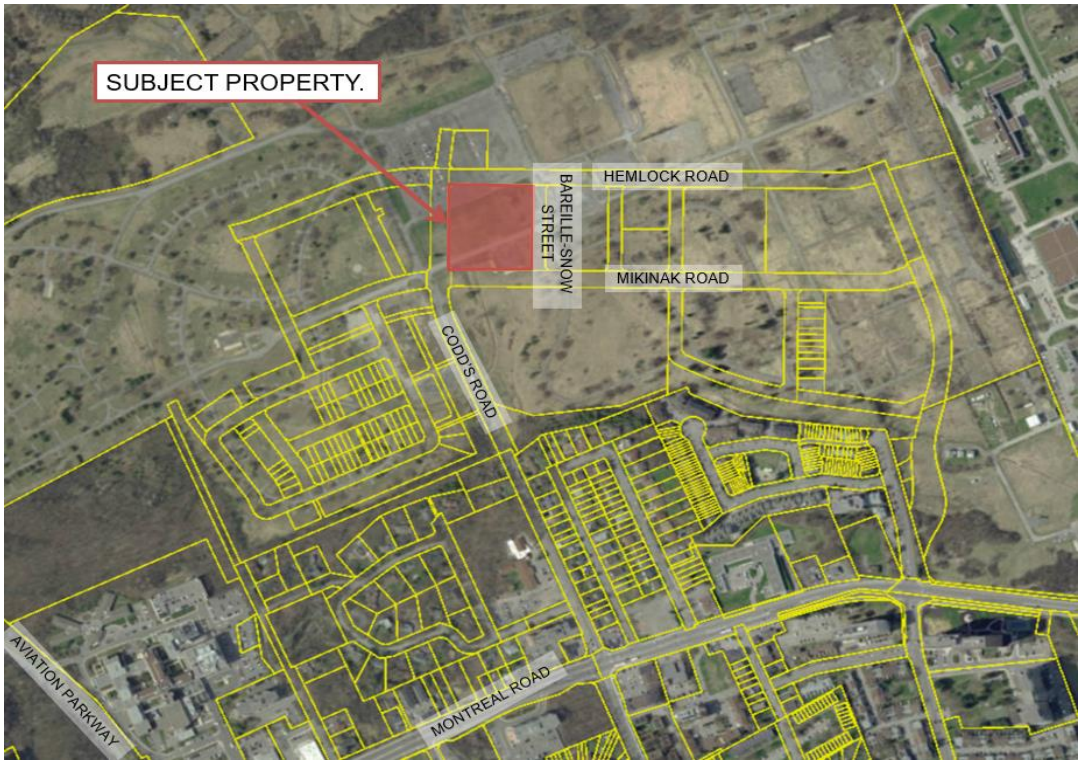

Figure 1: Site Location

The proposed development by Mattamy Homes involves the construction of four (4), 7-floor mixed use buildings, and an underground parking garage.

The objective of this report is to demonstrate the availability of site services in support the application for site plan control (SPC).

1.1 Existing Conditions

The existing lands are vacant, but it should be noted that construction of the surrounding road network and underground services are currently underway at the time of this publication. Historically, the lands were part of the Canadian Forces Base Rockcliffe (CFB Rockcliffe).

A geotechnical investigation was completed by Paterson Group Inc. in August 2017. Per the geotechnical report, the subject site consists of a layer of existing fill from the previous land use, underlain by stiff to very stiff brown silty clay.

Supplemental information from Paterson Group Inc. was also received regarding the anticipated infiltration rates. An infiltration rate of 50 mm/day was estimated for Block 19; collaborating correspondence is found in ***Appendix A***.

The Canada Lands Company will be delivering the site to a pre-grade condition in accordance with Mattamy Homes requirements.

The infrastructure described below is based on design drawings, not as-built drawings. The design drawings are as per the ***Wateridge Village at Rockcliffe Phase 1B*** drawing set, by ***IBI Group***, ***December 6, 2017*** and ***Wateridge Village at Rockcliffe Phase 1A*** drawing set, by ***IBI Group, April 2016,*** received by DSEL on July 21, 2017.

Hemlock Road

- 300mm diameter watermain
- 1200mm diameter storm sewer
- 300mm diameter sanitary sewer

Mikinak Road

- 300mm diameter watermain
- 2700mm diameter storm sewer
- 375mm diameter sanitary sewer

Codd's Road

- 400mm diameter watermain
- 3000mm diameter storm sewer

- 375mm diameter sanitary sewer

Bareille-Snow Street

- 675mm diameter storm sewer
- 250mm diameter sanitary sewer
- 200mm watermain

1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, 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)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (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)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE Design Guidelines)

  - **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)

- **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)

- **Water Supply for Public Fire Protection**
  Fire Underwriters Survey, 1999.
  (FUS)

- **Low Impact Development Stormwater Management Planning and Design Guide**
  Credit Valley Conservation & Toronto and Region Conservation, 2010.
  (LID Guide)

- **Former CFB Rockcliffe Master Servicing Study**
  IBI Group, August 2015.
  (MSS)

- **Low Impact Development (LID) Demonstration Project**
  Aquafor Beech Ltd., August 2015.
  (LID Demonstration Project)

- **Design Brief Wateridge Village at Rockcliffe Phase 1A**
  IBI Group., April 2016.
  (Design Brief Phase 1A)

- **Design Brief Wateridge Village at Rockcliffe Phase 1B**
  IBI Group., June 2017.
  (Design Brief Phase 1B)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa MONT pressure zone, as shown by the Pressure Zone map in ***Appendix B***. A local 200 mm diameter watermain currently exists within Bareille Snow Street, and a local 400mm watermain currently exists within Codd's Road, which are available to service the subject site.

The water servicing for the subject site was accounted for in the design of the water distribution system outlined in the ***Design Brief Phase 1B*** with a population of ***514***. Contemplated water demand according to the design brief for the subject property is summarized below:

Table 1
Summary of Water Demand per *Design Brief Phase 1B*

Design Parameter	Total Demand (L/min)
Average Day	99.9
Peak Hour	549.7
Max Day	249.9

Table 2 summarizes the available fire flow for the hydrants adjacent to the subject site according to ***Design Brief Phase 1B.***

Table 2
Available Fire Flow at Hydrants per *Design Brief Phase 1B*

Street Name	Available Fire Flow (L/min)
Codd's Road	53,759
Mikinak Road	49,504
Hemlock Road	48,265
Bareille-Snow Street	30,173

Refer to ***Appendix B*** for relevant extracted pages from the ***Design Brief Phase 1B.***

3.2 Water Supply Servicing Design

It is proposed to provide one connection to the 200mm watermain within Bareille-Snow Street and one connection to the 400mm watermain within Codd's Road. The site is serviced by surrounding fire hydrants on Squadron Hemlock Road, Mikinak Road, Codd's Road and Bareille-Snow Street.

Table 3 summarizes the ***Water Supply Guidelines*** employed in the preparation of the water demand estimate for the proposed development.

Table 3
Water Supply Design Criteria

Design Parameter	Value
Townhouse	2.7 P/unit
Residential Average Daily Demand	280 L/d/P***
Residential Maximum Daily Demand	2.5 x avg. day *
Residential Maximum Hourly	5.5 x avg. day *
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 must not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa

Daily average based on Appendix 4-A from **Water Supply Guidelines*
*** 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-2014-02*
Daily consumption rate to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ISTB-2018-03. As a result, DSEL is submitting for a deviation from the ***Water Supply Guidelines

Table 4 summarizes the anticipated water supply demand and proposed boundary conditions. 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***.

Table 4
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Anticipated Demand[1] (L/min)	Boundary Condition[2] Connection 1 (m H_2O / kPa)		Boundary Condition[2] Connection 2 (m H_2O / kPa)	
Average Daily Demand	157.1	59.1	579.8	58.4	572.9
Peak Hour	391.4	57.1	560.2	52.4	514.0
Max Day + Fire Flow	11,000 + 860.3	58.8	576.8	58.1	570.0

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 87.9m at Connection 1 (Codd's Road) and 88.6m at Connection 2 (Barielle-Snow Street). See ***Appendix B.***

The City provided both the anticipated minimum and maximum water pressures, as well as the estimated water pressure during fire flow demand for the demands as indicated by the correspondence in ***Appendix B***. The maximum pressures exceed the required range identified in ***Table 3***. A pressure check is recommended during installation to determine if pressure reducing valves are required.

Fire flow requirements are to be determined in accordance with Local Guidelines (**ISDTB-2018-02**), City of Ottawa ***Water Supply Guidelines***, and the Ontario Building Code.

Using the Technical Bulletin **ISDTB-2018-02** method, a conservative estimation of fire flow had been established. As coordinated with the building architect, the following assumptions were made:

- Type of construction – Fire-Resistant Construction;
- Occupancy type – Non-Combustible; and
- Sprinkler Protection – Sprinklered - Supervised.

The above assumptions result in an estimated fire flow of approximately ***11,000 L/min***, noting that actual building materials selected will affect the estimated flow; see ***Appendix B*** for detailed FUS calculations. The estimated fire flow for the proposed development can be accommodated by any of the hydrants adjacent to the subject property as the available fire flows as per ***Table 2***, exceeds the estimated fire flow for the proposed development***.***

3.3 Water Supply Conclusion

Anticipated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions.

The anticipated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions. As demonstrated by ***Table 4***, the maximum pressures exceed the required range identified in the ***Water Supply Guidelines***. A pressure check is recommended during installation to determine if pressure reducing valves are required.

As indicated in ***Table 3***, DSEL employed a daily consumption rate of 280 L/person/day to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ***ISTB-2018-01***. As a result, DSEL is submitting for a deviation from the ***Water Supply Guidelines***.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The sanitary flow from the subject property was considered in the wastewater design for the Wateridge Subdivision. A portion of Block 19 was contemplated to drain to the 375mm sanitary sewer within Codd's Road. The total wastewater flow from the ***Design Brief Phase 1A*** is summarized in ***Table 5*** below.

Table 5
Wastewater Flow per Design Brief Phase 1A – Directed to Codd's Road

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	0.88
Estimated Peak Dry Weather Flow	3.51
Estimated Peak Wet Weather Flow	4.22

The total flow summarized in ***Table 5*** is from the drainage areas from Block 19 directed to Codd's road per ***Design Brief Phase 1A***. Please refer to ***Appendix C*** for reduced copies of the IBI sanitary design calculations and drainage area map.

4.2 Wastewater Design

It is proposed that the development will connect to the 375mm diameter sanitary sewer within the Codd's Road right-of-way, as contemplated in the ***Design Brief Phase 1A***.

Table 6 summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 6
Wastewater Design Criteria

Design Parameter	Value
Townhouse	2.7 P/unit
Average Daily Demand - Residential	280 L/d/per
Peaking Factor	Harmon's Peaking Factor. 3.8
Infiltration and Inflow Allowance	0.28L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200mm 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 7 demonstrates the anticipated peak flow from the proposed development. See ***Appendix C*** for associated calculations.

Table 7
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	2.69
Estimated Peak Dry Weather Flow	10.16
Estimated Peak Wet Weather Flow	10.61

The estimated sanitary flow, based on the site plan provided in ***Drawings/Figures,*** anticipates a peak wet weather flow of ***10.61 L/s***.

The anticipated peak wastewater flow generated from the proposed site is ***5.94 L/s*** greater than the flow that was considered to enter the external system between MH176A and MH141A per ***Design Brief Phase 1A.***

Based on the analysis completed in ***Design Brief Phase 1A*** there is available capacity in the local sanitary sewer up to the discharge to the Codd's Road Shaft. The most restrictive leg of local sewer, located between MH141A and MH124A, has ***16.76 L/s*** of available capacity, which is sufficient to convey the ***5.94 L/s*** proposed increase in flow. Refer to Appendix C for drainage area map and sanitary design sheets prepared in ***Design Brief Phase 1A***.

4.3 Wastewater Servicing Conclusions

The sanitary flow from the subject property has been considered with respect to the wastewater design for the Wateridge Subdivision, outlined in the ***Design Brief Phase 1A***.

The proposed development results in a total wastewater flow of ***10.61 L/s***, which is ***5.94 L/s*** greater than the contemplated wastewater flow in the ***Design Brief Phase 1A***. As per ***Design Brief Phase 1A***, there is sufficient capacity within the designed sanitary system to accommodate the proposed increased sanitary flow.

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

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

The flow from the subject site was accounted for in ***Design Brief Phase 1A*** to be conveyed via 3000 m storm mains to the Eastern SWM Facility. For the development the subject site, major flow is proposed to be directed to a dry pond to the south of Mikinak Road for quantity control. Eventually discharging through the minor system to the Easter SWM Facility.

The ***Design Brief Phase 1A*** contemplated that the drainage from the subject site would flow partially into the storm sewer within Codd's Road, Mikinak Road and Bareille-Snow Street. Refer to ***Appendix D*** for reduced copy of the storm design sheet and drainage area figures prepared by IBI.

Flows that influence the watershed in which the subject property is located are further reviewed by the principal authority. The subject property is located within the Ottawa River watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA).

5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were reviewed with the City of Ottawa and CLC, where the proposed development is required to:

- Follow quantity and quality controls outlined in the ***Design Brief Phase 1A;***
- Incorporate Low Impact Development measures in accordance with the ***Design Brief Phase 1A*** and ***LID Demonstration Project.***

5.3 Proposed Stormwater Management System

It is proposed that the stormwater from the proposed development will be directed to the 3000 mm storm sewer within Codd's Road.

The following analysis was completed to confirm that adequate capacity is available to convey the minor storm event from the subject property:

Table 8
Summary of Release Rates for Anticipated and Proposed Scenarios – Flow directed to Codd's Road

Storm Event	5-Year Release Rate per Design Brief Phase 1A* (L/s)	5-Year Release Rate Proposed (L/s)
5-Year Storm	194	358.5
Minor System Capture in 100-Year Storm	283	475
* Captured Flow to Codd's Road Sewer per ***Design Brief Phase 1A***		

The stormwater management plan proposes to direct an additional ***75.5 L/s*** of flow to the Codd's Road storm sewer in the 5-year storm event compared to the 5-year storm event release rate from ***Design Brief Phase 1A***. A connection from the subject site to the sewer within Codd's Road is proposed between MH142 and MH141, which has an available capacity of ***2617 L/s,*** sufficient capacity to convey the minor system flow from the subject site.

As per correspondence with IBI Group, found in ***Appendix A***, the minor system flow in the 100-year storm event for the site cannot exceed ***475 L/s.*** Restrictions include an inlet control device installed at the proposed rainwater harvesting cistern, roof controls and area drains to restrict flow to a maximum of ***475 L/s*** directed to the minor system on Codd's Road in the major system event. Refer to detailed calculation sheet included in ***Appendix D*** for further details.

Major flow was contemplated to be directed overland to Mikinak Road from the subject site to the Dry Pond south of the subject site. It is proposed to re-directed the major flow to Codd's Road where it will travel 60m south before discharging to the Dry Pond.

A major overland flow route is located between Building C and Building D with a conveyance capacity of ***823 L/s*** adequate to convey the 100-year storm event less the ***475 L/s*** minor storm capture equal to ***293.1 L/s***. Refer to ***Appendix D*** for overland flow route capacity calculation.

5.4 Low Impact Development (LID) Practices

LID measures are proposed in accordance with the ***Design Brief Phase 1A*** and ***LID Demonstration Project***. It is proposed to direct all roof, landscaped and hardscaping flow to pre-treatment LIDs and an internal rainwater harvesting cistern to be used for irrigation purposes.

Table 9, below, summarizes post-development flow rates based on the proposed Site Plan.

Table 9
Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Storage Required
	(L/s)	(m^3)	(L/s)	(m^3)
Unattenuated Areas	47.31	0.0	101.36	0.0
Attenuated Areas	169.69	98.7	355.64	206.9
Total	**217.0**	**98.73**	**457.00**	**206.9**

It is calculated that ***206.9 m^3*** of storage will be required on site to attenuate flow to the established release rate of ***355.6 L/s*** and will be provided via a rainwater harvesting cistern.

The rainwater harvesting tank has been sized to store the minimum of the 15 mm event directed from a total of ***1.41 ha*** collected by roof drains and surface drains above the parking garage, refer to **SWM-1** for drainage directed to the building. A rainwater harvesting tank in combination with pre-treatment LIDs with ***244.5 m3*** of storage is required to provide the adequate storage per the ***LID Demonstration Project***.

5.5 Stormwater Servicing Conclusions

The proposed flow entering the sewers within Codd's Road is increased in the proposed development compared to that in ***Design Brief Phase 1A,*** there is sufficient capacity within the sewers to accommodate this increased flow in the 5-year event.

A rainwater harvesting system is proposed to collect runoff from roof drains and surface drains above the parking garage to be used for irrigation. The rainwater harvesting system is proposed to be ***244.5 m³*** per the ***LID Demonstration Project.***

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

6.0 UTILITIES

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. During construction the extent of erosion losses is exaggerated due to the removal of vegetation and the top layer of soil becoming 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 or an approved equivalent 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 for the proposed development for Block 19 of the former CFB Rockcliffe lands, which are currently under re-development. The preceding report outlines the following:

- Based on boundary conditions provided by the City the existing municipal water infrastructure is capable of providing the contemplated development, however pressures exceed the City's required pressure range. A pressure check is recommended during installation to determine if pressure reducing valves are required;
- Based on estimated fire flow per the ***FUS***, there is sufficient pressure within the local system to provide the required fire flow;
- The proposed development is anticipated to have a peak wet weather flow of ***10.61 L/s***; the adjacent sanitary sewer has capacity to convey the flow;
- The quantity and quality controls are provided for the site through a dry pond to the south of the site and the Eastern SWM Facility, as outlined in the ***Design Brief Phase 1A;***
- Minor system flow is restricted to a maximum of ***475 L/s*** through inlet control device within the rainwater harvesting tank, roof controls and restrictions on area drains overtop of the parking garage.
- Collection of rainwater for the purpose of irrigation is proposed by the use of a rainwater harvesting tank in accordance with the ***LID Demonstration Project.***

Prepared by,
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Reviewed by,
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Per: Steven J. Pichette, P.Eng.

APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

18-947 16/10/2019

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).	N/A
☒	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/A
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☐	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 1.1
☒	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.	N/A
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	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 5.2
☒	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.	Appendix 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.	N/A
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	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 7.0
☐	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

Steve Merrick

From: David Gilbert <DGilbert@Patersongroup.ca>
Sent: Friday, September 22, 2017 2:30 PM
To: Steve Merrick
Subject: RE: Wateridge Village Phase 1B - Geotech Report

Hi Steve,

As discussed, the upper portion of the soils profile within Block 19 consists mainly of a silty clay. If this material were re-compacted across the other blocks, we estimate that the infiltration rate would be approximately 50 mm/day. To provide an accurate infiltration rate assessment, we could complete a series of pask permeameter tests once the material has been placed and re-compacted or in its presence state within Block 19.

Best regards,

David Gilbert, P.Eng.
Senior Geotechnical Engineer

patersongroup
Solution Oriented Engineering
60 years serving our clients

154 Colonnade Road South
Ottawa, Ontario
K2E 7J5
Tel: 613.226-7381 ext. 205

From: Steve Merrick [mailto:SMerrick@dsel.ca]
Sent: Thursday, September 21, 2017 9:21 AM
To: David Gilbert <DGilbert@Patersongroup.ca>
Subject: RE: Wateridge Village Phase 1B - Geotech Report

Hi Dave, same project but a different question. Can Paterson please provide an average infiltration rate for the Block 19? We are looking for this to size our LID systems understanding that the LID measures for Blocks 15, 22 and 24 will be within fill taken from Block 19.

I'll follow up with a phone call this morning to discuss.

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: Wednesday, September 20, 2017 4:03 PM
To: 'David Gilbert' <DGilbert@Patersongroup.ca>
Cc: 'Adam Fobert' <afobert@dsel.ca>
Subject: RE: Wateridge Village Phase 1B - Geotech Report

Thanks Dave, we are trying to get the feasibility of this option back to Mattamy quickly and your input would really help.

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: Wednesday, September 20, 2017 3:29 PM
To: David Gilbert <DGilbert@Patersongroup.ca>
Cc: 'Adam Fobert' <afobert@dsel.ca>
Subject: RE: Wateridge Village Phase 1B - Geotech Report

Hi Dave,

We are looking at some servicing options for Mattamy' blocks at Wateridge and wanted to input from Paterson on zone of influence and sewers in close proximity to the units. I have attached 3 sketches (very rough) showing some restrictive areas. Can you advise on the zone of influence from the footings and provide any other geotechnical recommendations or issues with the proposed sections?

Please refer to the servicing plans for locations of the 3 sections.

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: Jillian Normand [mailto:Jillian.Normand@mattamycorp.com]
Sent: Wednesday, August 9, 2017 5:21 PM
To: Adam Fobert <AFobert@dsel.ca>; Steve Merrick <SMerrick@dsel.ca>; Anne-Claude Schellenberg <ACSchellenberg@nak-design.com>; Sean Leogreen <sleogreen@nak-design.com>; Anita Bennell <abennell@nak-design.com>; Kevin Murphy <Kevin.Murphy@mattamycorp.com>; Jessica McLellan <Jessica.Mclellan@mattamycorp.com>; Marco VanderMaas <MVanderMaas@q4architects.com>; Daniel Potechin <Daniel.Potechin@mattamycorp.com>
Subject: Wateridge Village Phase 1B - Geotech Report

Hi team,

Please see attached for the updated Geotech Report, for your reference.

Jillian

Jillian Normand
Land Development Manager
T (613) 831-5144 (direct). **C** (613) 415-7786. **F** (613) 831-9060
Jillian.Normand@mattamycorp.com
Ottawa Office: 50 Hines Road, Suite 100, Ottawa, ON Canada K2K 2M5

Steve Merrick

From: Winston Yang <Winston.Yang@ibigroup.com>
Sent: Wednesday, August 16, 2017 11:50 AM
To: Adam Fobert; Jean Lachance
Cc: Jillian Normand; Jim Moffatt
Subject: RE: 918 Mattamy - Wateridge: IBI Servicing Review

Hi Adam and Jean,

I have reviewed the impact as per DSEL design for Block 15, 22 and 24.

Upon review of the proposed grading plans for Blocks 15, 22, and 24, we found the leave grades provided by DSEL to be reasonable.
We do not have a conceptual plan for Block 19 yet. The leave grades for that block seem low for a typical basement development. However they might be fine if underground parking is planned.

For the Servicing side, the storm and sanitary outlets location for each block were changed compared to the MSS and Design Brief.
Then we have implemented the changes DSEL made into our sewer design and have examined the capacity for each downstream sewers.
The result shows that the downstream sewers for storm and sanitary have the capacity to convey the flow for all new outlets for blocks, 15, 22 and 24.

In order to minimize the impact and cost, we are going to shift some manholes to accommodate the new outlets base on DSEL design.
For Block 22, MH210 and MH210A can be shifted to the south to replace the STM101 and SAN1 along Michael Stoqua Street.
For Block 24, MH213 and MH213A can be shifted to the south to replace the STM101 and SAN1 along Moses Tenisco Street. At the same time, MH212 and MH212A will be shifted to the south in order to reduce the length of the sewers.
For Block 15, there is no choice, the manhole STM101 and SAN1 are required for Squadron Crescent.
Since the typical 1200mm Dia. Manholes have been already ordered by the contractor.
We will contact the contractor to find out any further impacts will be caused by shifting the manholes.

For the storm section below. DSEL met the IBI criteria for the proposed lots.
In regards to Block 19, the drainage areas should be corresponded to IBI Lot141, Lot 167 in Phase 1A and Lot208B, Lot209 in Phase 1B.
And the IBI 100 year capture rate is 475l/s (283l/s+63l/s+46l/s+83l/s). Please considered in your design later on.

Should you have any questions please do not hesitate to contact either Jim or me.

Yours truly,

Winston Yang P.Eng.

email Winston.Yang@ibigroup.com web www.ibigroup.com

IBI GROUP
Suite 400, 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel +1 613 225 1311 fax +1 613 225 9868

From: Adam Fobert [mailto:AFobert@dsel.ca]
Sent: Tuesday, August 15, 2017 5:27 PM
To: Winston Yang <Winston.Yang@ibigroup.com>; Jim Moffatt <jmoffatt@IBIGroup.com>
Cc: Jean Lachance <JLachance@clc.ca>; Jillian Normand <Jillian.Normand@mattamycorp.com>
Subject: 918 Mattamy - Wateridge: IBI Servicing Review

Hello Jim and Winston,

How is your review of our site servicing is coming along? I have reviewed your Design Brief's for Phase 1A and 1B and have compared the analysis contained within to our proposed design.

I offer the following considerations based on my review:

General:
DSEL proposed one storm and one sanitary connection to each block. The City indicated that this was their expectation during our pre-consultation as it is their standard practice for multi-block parcels.

Block 15: The servicing brief shows three connections to Squadron Crescent. DSEL are proposing one connection downstream of the contemplated connections.

Block 22: The surrounding grades slope from east to west. The servicing brief shows a drainage divide mid-block, where half the site drains to Moses Tenisco and the other to Michael Stoqua . Moses Tenisco is 1.14m higher than Michael Stoqua at the proposed road connection points. As such, to avoid fighting grades DSEL proposed storm and sanitary connections to Michael Stoqua only.

Block 24: Moses Tenisco slopes from north to south 1.1m from Hemlock to Mikinak. The servicing brief shows a drainage divide mid-block with connections to Moses Tenisco and Mikinak. DSEL proposed a storm and sanitary outlet at the southern road connection on Moses Tenisco based on Mattamy's proposed site. This avoids fighting grades internally.

Wastewater:
Block 15:

IBI Servicing Brief = 487.3p
Mattamy Proposal = 335p

Proposed connections are downstream of IBI contemplated connections. Population is less than included in servicing brief. Therefore, we do not expect servicing issues with Block 15.

Block 22:

IBI Servicing Brief ~ 105p (note that I am interpolating since half of Block 22 is included in northern half of Block 24.)

Mattamy Proposal = 52p

IBI servicing brief assumed 52.5p tributary to Moses Tenisco. Therefore, we do not expect capacity issues.

Block 24:

IBI Servicing Brief ~284.4p (note that I am interpolating based on the population shown on phase 1A southern half of block 24).

Mattamy Proposal = 364p

DSEL reviewed the available capacity in the receiving sewers and did not see any capacity issues.

Note: Mattamy's proposed servicing eliminates the need for 63.8m of sanitary sewer on Moses Tennisco from MH213A to MH212A. Savings to CLC.

Stormwater:

I have reviewed Appendix E of the servicing briefs to compare our calculations to the assumptions used in the model.

Review of the Summary of DDSWMM Parameters

Block 15:

IBI Servicing brief: No storage assumed. 5 and 100 year capture 396L/s

Mattamy's proposal: 275m3 of storage provided. DSEL's estimated 5-year peak 357.4L/s

Block 19:

IBI Servicing brief: No storage assumed. 194 + 57 (note that Lot 209 and 208B are missing from chart).

Mattamy's proposal: TBD.

Block 22:

IBI Servicing brief: No storage assumed. 5 and 100 year (46 + 46) 92L/s

Mattamy's proposal: 46.5m3 of storage provided. DSEL's estimated 5-year peak 87L/s.

Block 24:

IBI Servicing brief: No Storage. 5 and 100 year capture (162 +162) 324L/s.

Mattamy's proposal: 27.3m3 of storage provided. DSEL's estimated 5-year peak 325.7L/s.

Let me know if you have any comments or questions. Thank you for your time.

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

DSEL
david schaeffer engineering ltd.

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

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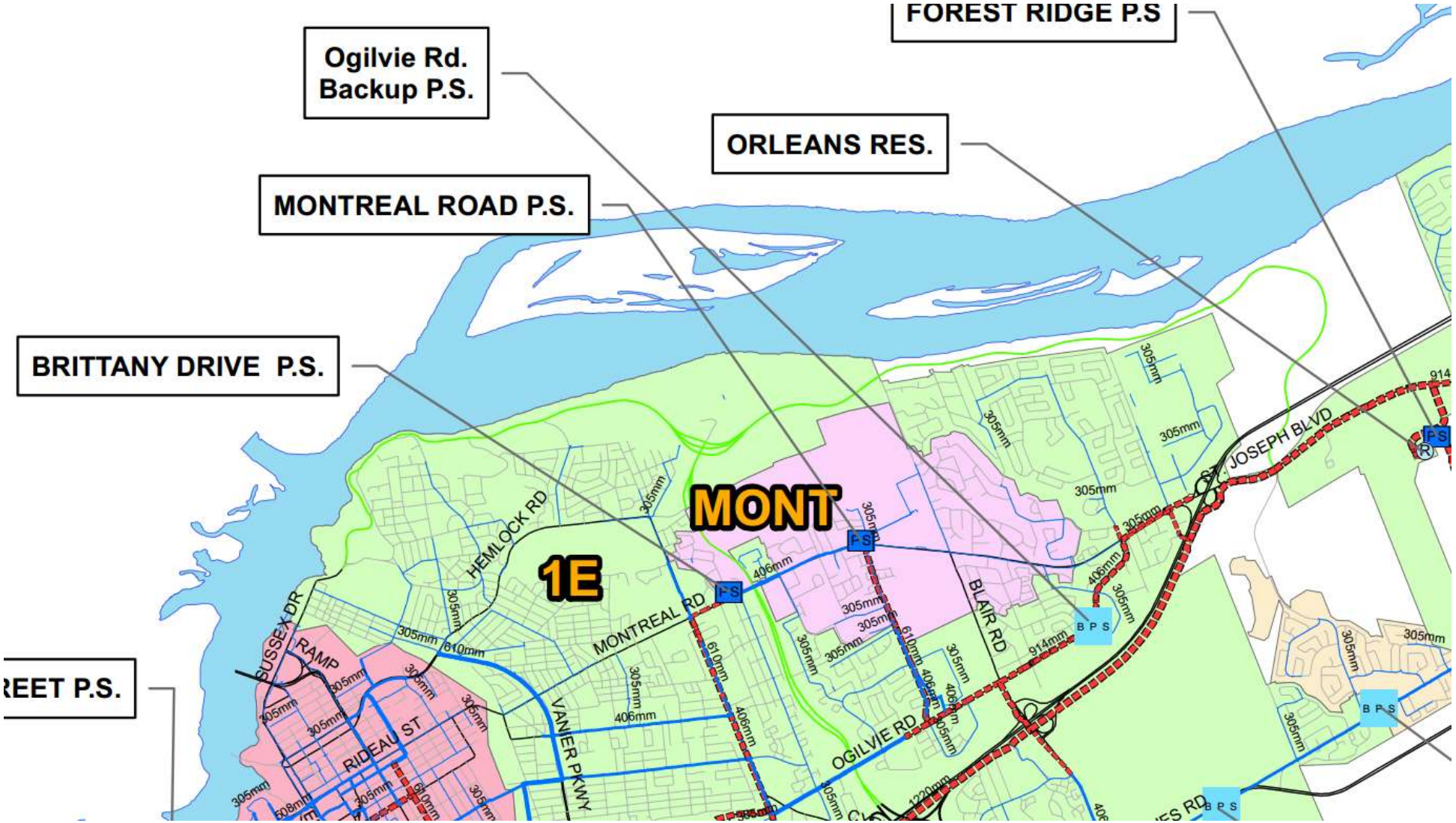
direct: (613) 836-0626
cell: (613) 222-9493
email: afobert@DSEL.ca

APPENDIX B

Water Supply


FOREST RIDGE P.S
Ogilvie Rd.
Backup P.S.
ORLEANS RES.
MONTREAL ROAD P.S.
BRITTANY DRIVE P.S.
REET P.S.
MONT
1E
HEMLOCK RD
MONTREAL RD
SUSSEX DR
RAMP
RIDEAU ST
VANIER PKWY
OGILVIE RD
BLAIR RD
ST. JOSEPH BLVD
305mm
406mm
610mm
914mm
1220mm
508mm
P S
B P S

Alison Gosling

From: Fraser, Mark <Mark.Fraser@ottawa.ca>
Sent: October 2, 2019 2:01 PM
To: Alison Gosling
Cc: Charlotte Kelly
Subject: RE: 17-947 Wateridge Block 19 - Boundary Condition Request
Attachments: wtr-2019-09-23_947.pdf; Wateridge Village (rockcliffe) Block 19 Sept 2019.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hi Alison,

Please find below boundary conditions, HGL, for hydraulic analysis at 681 Mikinak Road (Wateridge Village-Block 19) assumed to be connected to the existing 406mm dia. watermain within Codd's Road and the existing 203mm dia. watermain within Barielle-Snow Street (see attached for connection locations):

Block 19-Wateridge Village Subdivision
Type of Development: Residential and Commercial
Site Address: 681 Mikinak Road
Average Day Demand: 2.62 L/s
Maximum Daily Demand: 6.52 L/s
Maximum Hourly Demand: 14.34 L/s
Fire Flow: 11,000 L/min.

Existing Conditions based on current pump operations:

CONNECTION 1 (406mm dia. - Codds Road)
MAX HGL = 147.0m, *the maximum pressure is estimated to be more than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required*.
MIN HGL = 146.7m
MXDY+Fire (183 L/s) = 145.0m

CONNECTION 2 (203mm dia. - Barielle-Snow Street)
MAX HGL = 147.0m, *the maximum pressure is estimated to be more than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required*.
MIN HGL = 146.7m
MXDY+Fire (183 L/s) = 141.0m

Please note the following:

- *Boundary conditions provided above are for existing conditions. Upgrades to the Montreal and Brittany pump stations are currently being planned to support the CFB Rockcliffe development. The City plans to control the discharge HGL to 143.0m. Furthermore, the current plan is to use a different pumping strategy that will try to maintain a constant HGL of 143.0m even during peak hour and/or fire flow conditions.*

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

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties

of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Regards,

Mark Fraser
Project Manager, Planning Services
Development Review Central Branch
City of Ottawa | Ville d'Ottawa
Planning, Infrastructure and Economic Development Department
110 Laurier Avenue West. 4th Floor, Ottawa ON, K1P 1J1
Tel:613.580.2424 ext. 27791
Fax: 613-580-2576
Mail: Code 01-14
Email: Mark.Fraser@ottawa.ca

From: Alison Gosling <AGosling@dsel.ca>
Sent: September 24, 2019 5:55 PM
To: Fraser, Mark <Mark.Fraser@ottawa.ca>
Cc: Charlotte Kelly <CKelly@dsel.ca>
Subject: 17-947 Wateridge Block 19 - Boundary Condition Request

Good afternoon Mark,

We would like to request water boundary conditions for 681 Mikinak Road, located within the Wateridge development, using the following proposed development demands:

1. Location of Service / Street Number: Codd's Road / Barielle-Snow Street

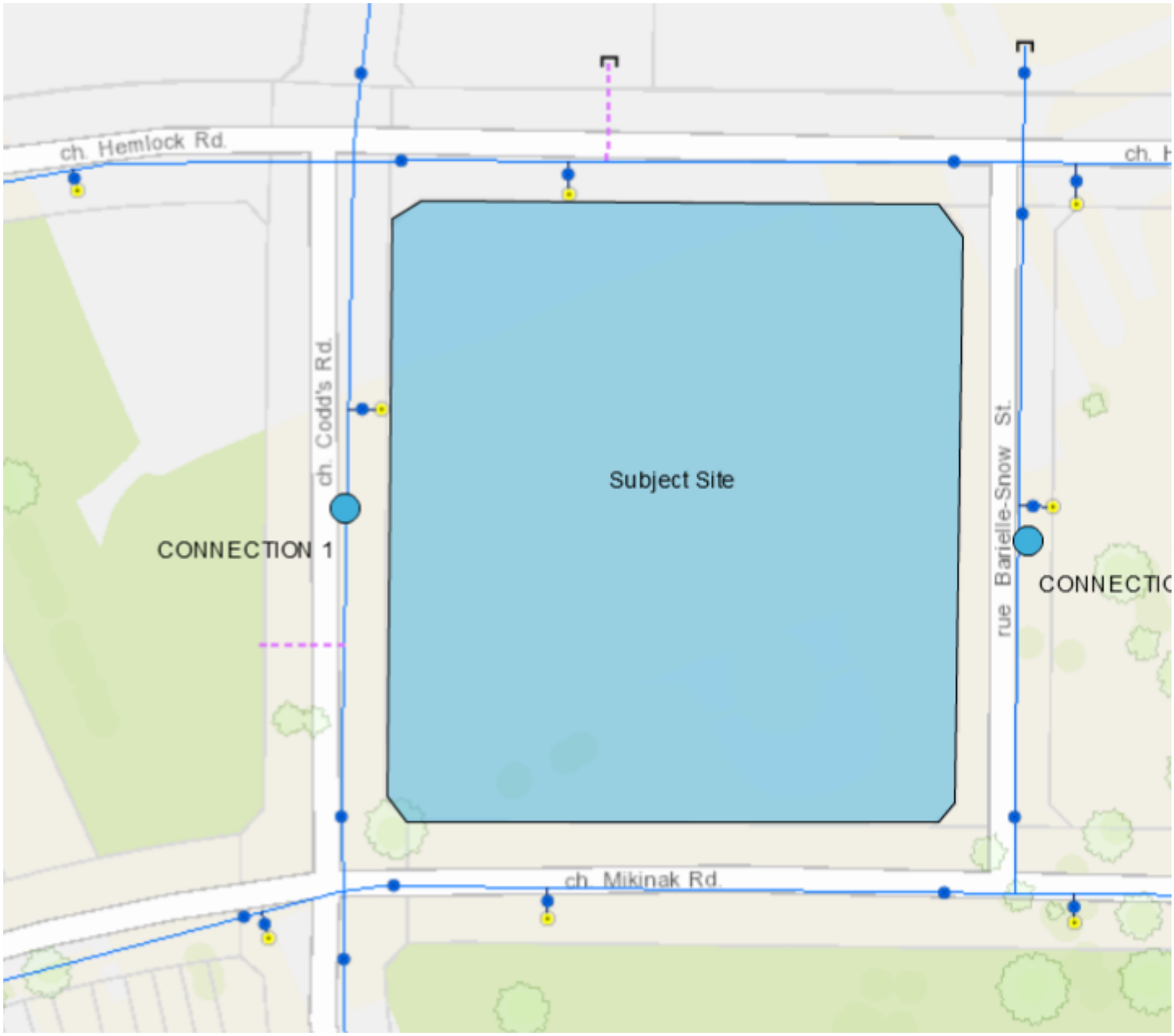
2. Type of development and the amount of fire flow required for the proposed development:

- The development would include approximately ***791 m²*** of commercial space ***445 units*** divided between ***four*** 6-storey condominium buildings.
- It is anticipated that the development will have a dual connection to be serviced from the existing 406mm diameter watermain within Codd's Road and the existing 203mm diameter watermain within Barielle-Snow Street, as shown by the map below.
- Fire demand based on Technical Bulletin ISTB-2018-02 has been used to estimate a maximum fire demand of ***11,000 L/min***. Refer to the attached for detailed calculations.

Additional Demand	L/min	L/s
Avg. Daily	157.1	2.62
Max Day	391.4	6.52

Peak Hour	860.3	14.34

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



Thank you,

Alison Gosling, E.I.T.
Junior Project Manager

DSEL
david schaeffer engineering ltd.

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

phone: (613) 836-0856 ext.542

email: agosling@dsel.ca

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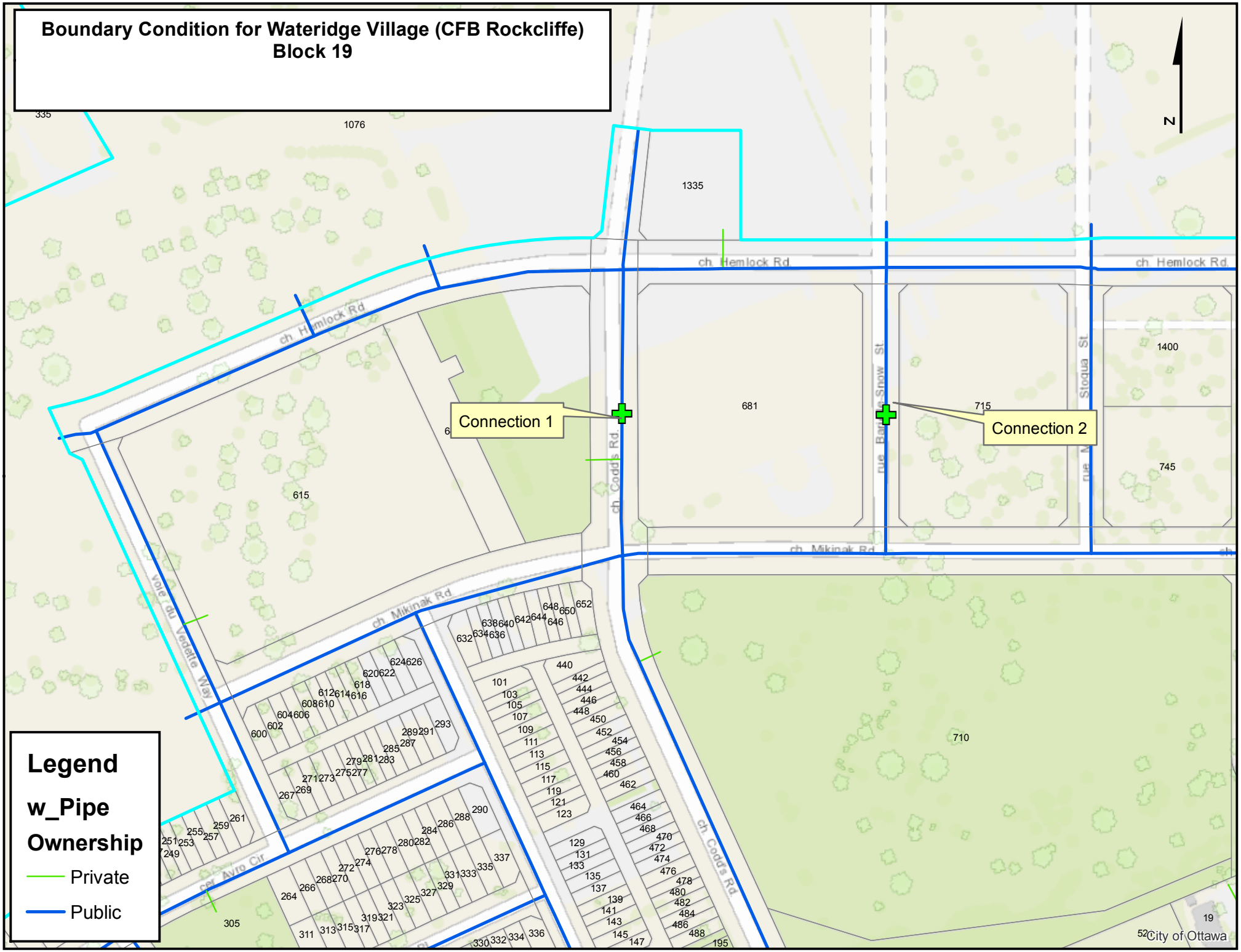
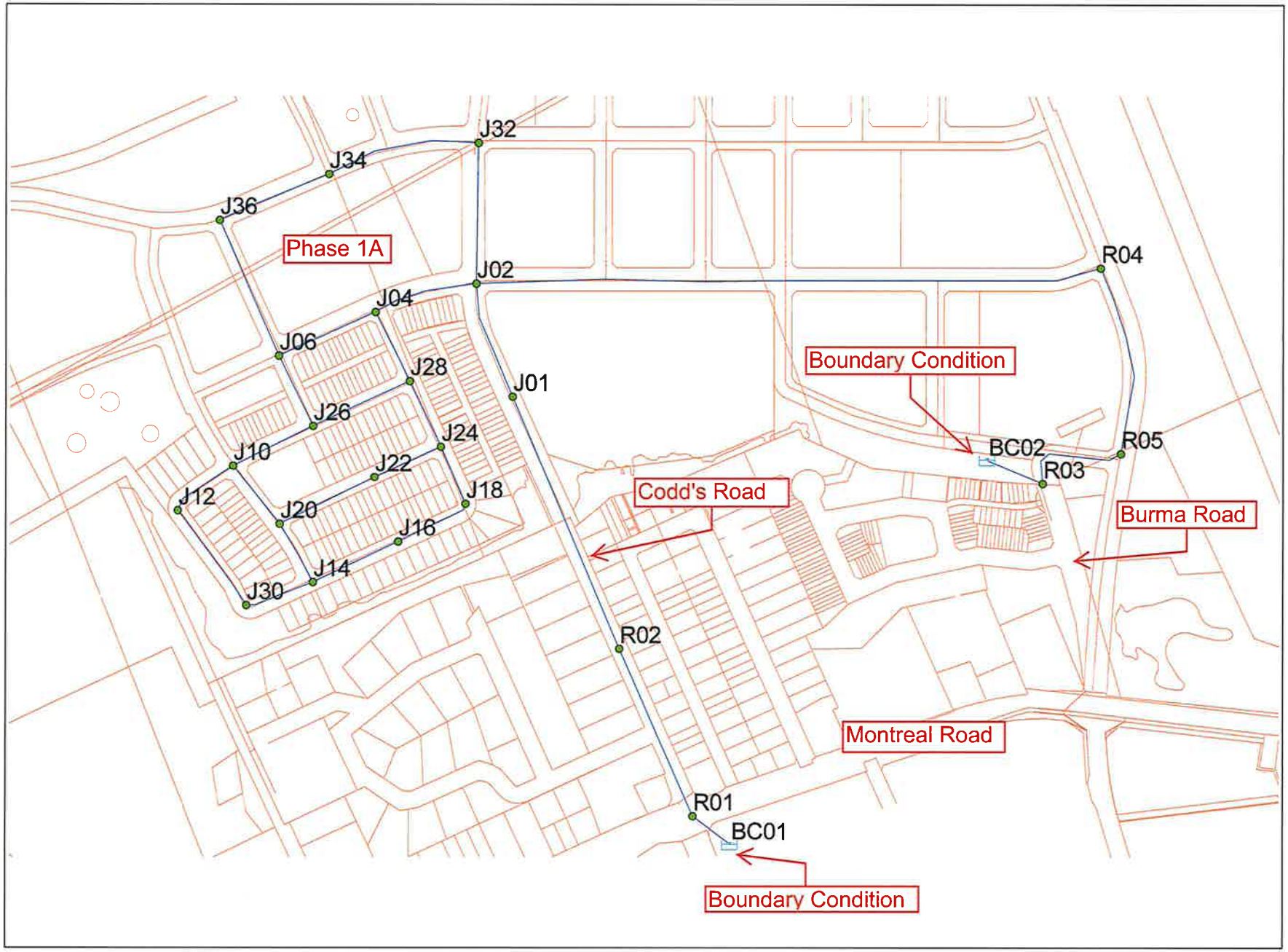

Boundary Condition for Wateridge Village (CFB Rockcliffe)
Block 19
N
Connection 1
Connection 2
ch Hemlock Rd
ch Mikinak Rd
ch Coddis Rd
Stoqua St
Legend
w_Pipe
Ownership
Private
Public
City of Ottawa

Phase 1A - Node ID's



Date: Tuesday, January 26, 2016

Basic Day Future HGL 143.0m - Junction Report

	ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	J01	0.20	88.50	143.00	534.04
2	J02	0.12	87.60	143.00	542.86
3	J04	0.14	87.00	143.00	548.73
4	J06	0.08	85.35	143.00	564.90
5	J10	0.18	85.60	143.00	562.44
6	J12	0.11	85.50	143.00	563.42
7	J14	0.16	88.10	143.00	537.94
8	J16	0.26	88.50	143.00	534.02
9	J18	0.15	89.00	143.00	529.12
10	J20	0.13	86.60	143.00	552.64
11	J22	0.22	87.45	143.00	544.31
12	J24	0.26	88.30	143.00	535.98
13	J26	0.22	86.10	143.00	557.54
14	J28	0.26	87.50	143.00	543.82
15	J30	0.08	88.90	143.00	530.10
16	J32	0.00	88.10	143.00	537.96
17	J34	1.01	88.30	143.00	535.99
18	J36	0.00	85.65	143.00	561.96
19	R01	0.00	103.00	143.00	391.97
20	R02	0.36	105.00	143.00	372.36
21	R03	0.00	92.00	143.00	499.76
22	R04	0.00	92.60	143.00	493.88
23	R05	0.00	92.20	143.00	497.80

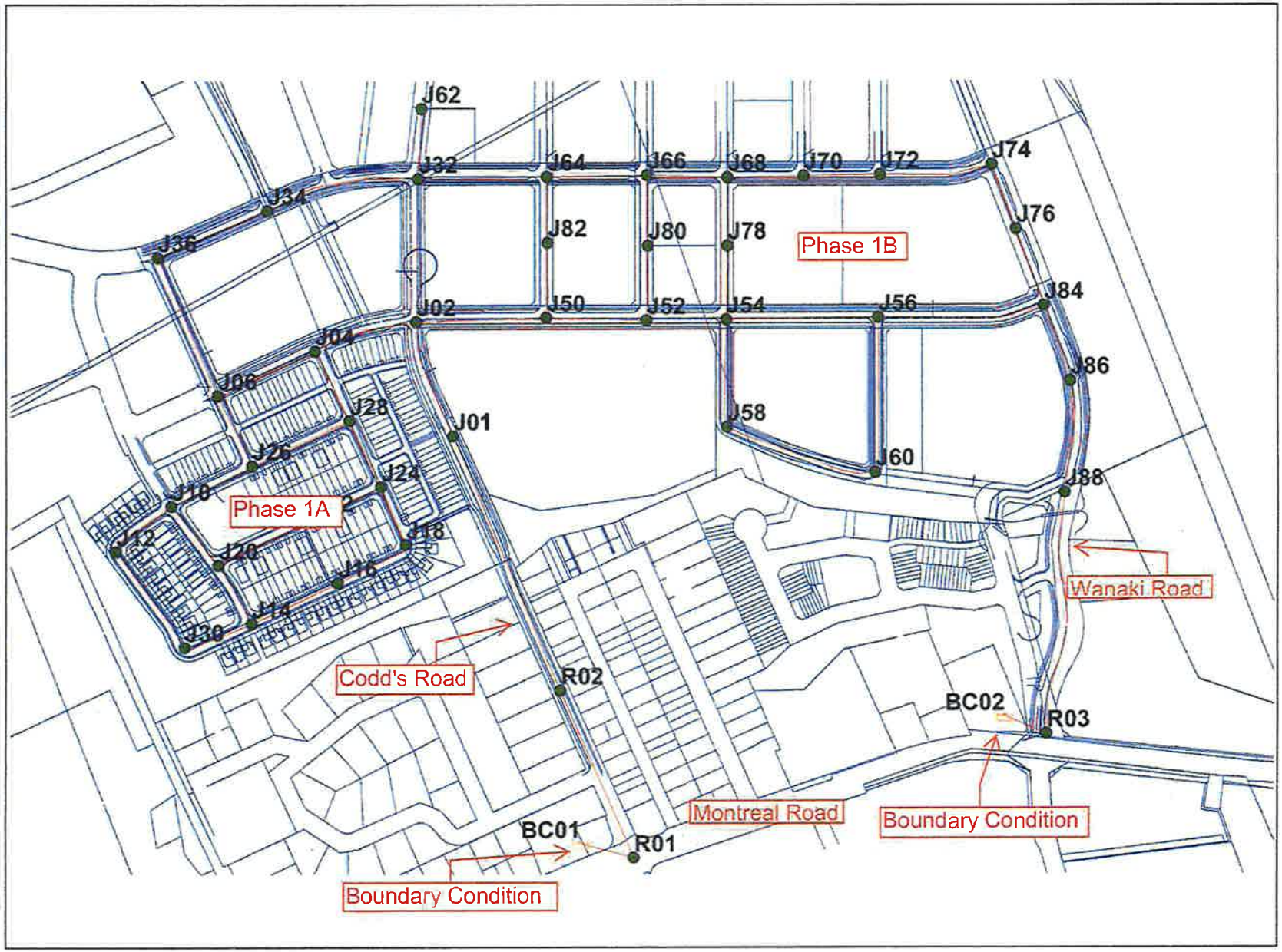
Peak Hour Future HGL 142.0m - Junction Report

	ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	J01	1.08	88.50	141.98	524.04
2	J02	0.66	87.60	141.97	532.82
3	J04	0.78	87.00	141.96	538.57
4	J06	0.42	85.35	141.96	554.72
5	J10	0.96	85.60	141.92	551.91
6	J12	0.61	85.50	141.92	552.86
7	J14	0.88	88.10	141.92	527.35
8	J16	1.45	88.50	141.92	523.43
9	J18	0.80	89.00	141.92	518.55
10	J20	0.74	86.60	141.92	542.06
11	J22	1.19	87.45	141.92	533.72
12	J24	1.45	88.30	141.92	525.44
13	J26	1.21	86.10	141.94	547.15
14	J28	1.45	87.50	141.94	533.43
15	J30	0.45	88.90	141.92	519.52
16	J32	0.00	88.10	141.97	527.86
17	J34	2.73	88.30	141.96	525.84
18	J36	0.00	85.65	141.96	551.80
19	R01	0.00	103.00	142.00	382.17
20	R02	1.97	105.00	141.99	362.47
21	R03	0.00	92.00	142.00	489.96
22	R04	0.00	92.60	141.99	484.03
23	R05	0.00	92.20	142.00	487.96

Max Day + Fire HGL 139.5 - 140.2m - Fireflow Report

	ID	Total Demand (L/s)	Critical Node 1 ID	Critical Node 1 Pressure (kPa)	Critical Node 1 Head (m)	Adjusted Fire-Flow (L/s)	Available Flow @Hydrant (L/s)	Critical Node 2 ID	Critical Node 2 Pressure (kPa)	Critcal Node 2 Head (m)	Adjusted Available Flow (L/s)	Design Flow (L/s)
1	J01	167.16	R02	332.18	122.40	1,098.43	926.94	J01	139.97	102.78	926.95	926.95
2	J02	166.97	R02	332.55	121.54	1,142.62	861.82	J18	126.12	100.47	844.12	844.12
3	J04	167.03	R02	332.55	120.94	1,142.68	642.80	J18	126.46	99.91	629.88	629.88
4	J06	166.86	R02	332.55	119.29	1,142.51	605.19	J06	139.97	99.63	605.19	605.19
5	J10	167.11	R02	332.55	119.54	1,142.76	297.57	J10	139.96	99.88	297.57	297.57
6	J12	166.95	R02	332.55	119.44	1,142.60	257.59	J12	139.96	99.78	257.59	257.59
7	J14	167.07	R02	332.55	122.04	1,142.72	253.71	J14	139.96	102.38	253.71	253.71
8	J16	167.33	J16	319.53	121.11	243.72	243.72	J16	139.96	102.78	243.72	243.72
9	J18	167.03	J18	331.60	122.84	255.01	255.01	J18	139.96	103.28	255.01	255.01
10	J20	167.01	J20	315.09	118.75	234.17	234.17	J20	139.96	100.88	234.17	234.17
11	J22	167.21	J22	206.65	108.54	186.24	186.24	J22	139.96	101.73	186.24	186.24
12	J24	167.33	R02	332.55	122.24	1,142.99	294.22	J24	139.96	102.58	294.22	294.22
13	J26	167.22	R02	332.55	120.04	1,142.88	378.63	J26	139.96	100.38	378.63	378.63
14	J28	167.33	R02	332.55	121.44	1,142.99	373.90	J28	139.96	101.78	373.90	373.90
15	J30	166.88	J30	308.66	120.40	236.80	236.80	J30	139.96	103.18	236.80	236.80
16	J32	216.67	R02	328.96	121.67	1,142.31	606.25	J32	139.97	102.38	606.25	606.25
17	J34	218.19	R02	328.96	121.87	1,143.85	549.00	J34	139.97	102.58	549.01	549.01
18	J36	216.67	R02	328.96	119.22	1,142.31	564.62	J36	139.97	99.93	564.62	564.62
19	R02	167.57	R02	331.05	138.78	981.61	981.52	R02	139.97	119.28	981.55	981.55
20	R04	166.67	R02	336.96	126.99	2,727.42	789.43	R04	139.97	106.88	789.44	789.44

Phase 1B - Node ID's



Date: Wednesday, June 29, 2016

Basic Day Future HGL 142.0m - Junction Report

	ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	J01	0.20	88.50	142.98	533.88
2	J02	0.12	88.10	142.98	537.76
3	J04	0.14	87.00	142.98	548.53
4	J06	0.08	85.35	142.98	564.70
5	J10	0.18	85.60	142.98	562.23
6	J12	0.11	85.50	142.98	563.21
7	J14	0.16	88.10	142.98	537.73
8	J16	0.26	88.50	142.98	533.81
9	J18	0.15	89.00	142.98	528.91
10	J20	0.13	86.60	142.98	552.43
11	J22	0.22	87.45	142.98	544.10
12	J24	0.26	88.30	142.98	535.77
13	J26	0.22	86.10	142.98	557.34
14	J28	0.26	87.50	142.98	543.62
15	J30	0.08	88.90	142.98	529.89
16	J32	0.85	88.10	142.98	537.75
17	J34	1.45	88.30	142.98	535.79
18	J36	0.00	85.65	142.98	561.76
19	J50	0.31	88.40	142.98	534.81
20	J52	0.59	88.90	142.98	529.90
21	J54	0.81	89.40	142.98	525.00
22	J56	1.44	91.00	142.98	509.33
23	J58	1.29	90.60	142.97	513.23
24	J60	0.86	90.00	142.97	519.11
25	J62	0.52	89.85	142.98	520.60
26	J64	1.49	89.10	142.98	527.94
27	J66	0.98	89.40	142.98	525.00
28	J68	0.62	90.50	142.98	514.22
29	J70	0.65	92.50	142.98	494.63
30	J72	1.45	94.05	142.98	479.45
31	J74	0.52	94.80	142.98	472.12
32	J76	0.38	94.00	142.98	479.97
33	J78	1.23	89.90	142.98	520.10
34	J80	0.43	89.25	142.98	526.47
35	J82	1.05	88.75	142.98	531.37
36	J84	0.51	92.60	142.98	493.69
37	J86	1.78	92.60	142.98	493.72
38	J88	0.55	92.20	142.99	497.68
39	R01	0.00	103.00	143.00	391.95
40	R02	0.36	105.00	142.99	372.29
41	R03	0.00	104.00	143.00	382.15

Phase 1B - Peak Hour Future HGL 142.0m - Junction Report

	ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	J01	1.08	88.50	141.67	521.02
2	J02	0.66	88.10	141.60	524.24
3	J04	0.78	87.00	141.58	534.83
4	J06	0.42	85.35	141.57	550.95
5	J10	0.96	85.60	141.54	548.15
6	J12	0.61	85.50	141.54	549.10
7	J14	0.88	88.10	141.53	523.59
8	J16	1.45	88.50	141.53	519.67
9	J18	0.80	89.00	141.53	514.79
10	J20	0.74	86.60	141.53	538.30
11	J22	1.19	87.45	141.53	529.97
12	J24	1.45	88.30	141.54	521.68
13	J26	1.21	86.10	141.55	543.39
14	J28	1.45	87.50	141.55	529.67
15	J30	0.45	88.90	141.53	515.76
16	J32	4.70	88.10	141.58	524.04
17	J34	3.91	88.30	141.57	522.04
18	J36	0.00	85.65	141.57	548.01
19	J50	1.69	88.40	141.57	521.02
20	J52	3.26	88.90	141.56	516.05
21	J54	4.44	89.40	141.56	511.15
22	J56	3.89	91.00	141.59	495.71
23	J58	7.11	90.60	141.53	499.05
24	J60	4.73	90.00	141.53	504.97
25	J62	2.87	89.85	141.58	506.89
26	J64	8.18	89.10	141.56	514.05
27	J66	5.38	89.40	141.56	511.11
28	J68	3.42	90.50	141.56	500.35
29	J70	3.58	92.50	141.57	480.85
30	J72	7.99	94.05	141.59	465.84
31	J74	1.41	94.80	141.65	459.09
32	J76	1.02	94.00	141.66	467.03
33	J78	6.78	89.90	141.55	506.15
34	J80	2.34	89.25	141.56	512.58
35	J82	5.79	88.75	141.56	517.46
36	J84	1.38	92.60	141.67	480.88
37	J86	4.80	92.60	141.72	481.33
38	J88	1.48	92.20	141.80	485.99
39	R01	0.00	103.00	141.96	381.81
40	R02	1.97	105.00	141.84	361.01
41	R03	0.00	104.00	141.97	372.06

Phase 1B - Max Day + Fire HGL 139.5 - 140.2m - Fireflow Design Report

	ID	Total Demand (L/s)	Critical Node 1 ID	Critical Node 1 Pressure (kPa)	Critical Node 1 Head (m)	Adjusted Fire-Flow (L/s)	Available Flow @Hydrant (L/s)	Critical Node 2 ID	Critical Node 2 Pressure (kPa)	Critcal Node 2 Head (m)	Adjusted Available Flow (L/s)	Design Flow (L/s)
1	J01	167.16	R02	331.32	122.31	1,121.92	1,021.46	J01	139.97	102.78	1,021.48	1,021.48
2	J02	166.97	R02	331.94	121.97	1,198.01	976.69	J62	129.72	101.34	960.99	960.99
3	J04	167.03	R02	331.97	120.88	1,201.90	700.87	J18	129.19	100.18	689.35	689.35
4	J06	166.86	R02	331.98	119.23	1,203.78	660.69	J06	139.97	99.63	660.69	660.69
5	J10	167.11	R02	331.97	119.48	1,202.62	302.21	J10	139.96	99.88	302.21	302.21
6	J12	166.95	R02	331.97	119.38	1,202.42	260.38	J12	139.96	99.78	260.38	260.38
7	J14	167.07	R02	331.97	121.98	1,202.50	256.53	J14	139.96	102.38	256.53	256.53
8	J16	167.33	J16	321.74	121.33	246.17	246.17	J16	139.96	102.78	246.17	246.17
9	J18	167.03	R02	331.97	122.88	1,202.42	257.94	J18	139.96	103.28	257.94	257.94
10	J20	167.01	J20	317.31	118.98	236.20	236.20	J20	139.96	100.88	236.20	236.20
11	J22	167.21	J22	208.86	108.76	187.09	187.09	J22	139.96	101.73	187.09	187.09
12	J24	167.33	R02	331.97	122.18	1,202.69	298.92	J24	139.96	102.58	298.92	298.92
13	J26	167.22	R02	331.97	119.98	1,202.95	389.43	J26	139.96	100.38	389.43	389.43
14	J28	167.33	R02	331.97	121.38	1,202.60	384.11	J28	139.96	101.78	384.11	384.11
15	J30	166.88	J30	310.88	120.63	239.06	239.06	J30	139.96	103.18	239.06	239.06
16	J32	218.80	R02	328.76	121.65	1,230.08	895.98	J62	122.82	100.63	872.30	872.30
17	J34	218.84	R02	328.59	121.83	1,215.80	642.28	J34	139.97	102.58	642.29	642.29
18	J36	216.67	R02	328.53	119.18	1,208.48	630.89	J36	139.97	99.93	630.90	630.90
19	J50	217.44	R02	329.56	122.03	1,306.50	825.07	J50	139.97	102.68	825.07	825.07
20	J52	218.15	R02	330.35	122.61	1,395.62	807.70	J52	139.97	103.18	807.70	807.70
21	J54	218.69	R02	331.05	123.18	1,484.86	790.43	J54	139.97	103.68	790.44	790.44
22	J56	218.83	R02	331.90	124.87	1,607.21	734.61	J56	139.97	105.28	734.61	734.61
23	J58	219.90	J58	320.28	123.28	332.38	332.38	J58	139.96	104.88	332.39	332.38
24	J60	218.82	J60	305.43	121.17	312.36	312.37	J60	139.96	104.28	312.37	312.36
25	J62	217.98	R02	328.76	123.40	1,229.26	773.19	J62	139.97	104.13	773.20	773.20
26	J64	220.39	R02	329.62	122.74	1,315.85	804.42	J64	139.97	103.38	804.43	804.43
27	J66	219.12	R02	330.35	123.11	1,397.22	794.11	J66	139.97	103.68	794.12	794.12
28	J68	218.22	R02	331.00	124.28	1,479.87	767.72	J68	139.97	104.78	767.73	767.73
29	J70	218.30	R02	331.59	126.34	1,563.02	702.65	J70	139.97	106.78	702.65	702.65
30	J72	220.30	R02	332.08	127.94	1,632.26	691.52	J72	139.97	108.33	691.53	691.53
31	J74	217.45	R02	332.67	128.75	1,753.48	804.04	J74	139.97	109.08	804.04	804.04
32	J76	217.23	R02	332.82	127.96	1,794.90	864.82	J74	137.21	108.00	860.44	860.44
33	J78	219.75	R02	330.85	123.66	1,467.48	492.19	J78	139.96	104.18	492.19	492.19
34	J80	217.73	R02	330.27	122.95	1,388.98	491.89	J80	139.96	103.53	491.90	491.90
35	J82	219.30	R02	329.53	122.38	1,306.06	502.89	J82	139.96	103.03	502.89	502.89
36	J84	217.43	R02	333.09	126.59	1,865.81	977.08	J74	126.62	105.52	953.70	953.70
37	J86	219.33	R02	333.73	126.66	2,029.46	1,034.26	J86	139.97	106.88	1,034.28	1,034.28
38	J88	217.49	R02	334.75	126.36	2,359.29	1,166.02	J88	139.98	106.48	1,166.05	1,166.05
39	R02	167.57	R02	329.43	138.62	951.03	951.01	R02	139.97	119.28	951.03	951.03

Wateridge Block 19
Proposed Site Conditions

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		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8	445	801

	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	801	224.3	155.8	560.7	389.4	1233.5	856.6

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 $L/m^2/d$	791	1.98	1.4	3.0	2.1	5.3	3.7
Office	75 $L/9.3m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand			2.0	1.4	3.0	2.1	5.3	3.7
Total Demand			**226.3**	**157.1**	**563.7**	**391.4**	**1238.9**	**860.3**

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	8569.2	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	16292.3	L/min	
	16000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Non-Combustible	-25%
Fire Flow	**12000.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%
Reduction	**-6000 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Wood Frame	20.1m-30m	79.57	2	160	10%
S	Non-Combustible	20.1m-30m	18.65	6	112	10%
E	Wood Frame	20.1m-30m	18.68	2	38	8%
W	Non-Combustible	10.1m-20m	18.68	6	113	15%
		% Increase				**43%** *value not to exceed 75%*

Increase	**5160.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	11160.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	11000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by RLA Architecture
-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	9211.2	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	16891.6	L/min	
	17000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Non-Combustible	-25%	
Fire Flow	**12750.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-6375**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	20.1m-30m	18.65	6	112	10%	
S	Wood Frame	>45m	18.65	2	38	0%	
E	Wood Frame	20.1m-30m	86.1	2	173	10%	
W	Non-Combustible	10.1m-20m	18.7	6	113	15%	
		% Increase				**35%**	*value not to exceed 75%*

Increase	**4462.5**	**L/min**	

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	10837.5	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	11000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by RLA Architecture
-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	8506.8	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	16232.9	L/min	
	16000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Non-Combustible	-25%	
Fire Flow	**12000.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-6000**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	20.1m-30m	18.65	6	112	10%	
S	Wood Frame	>45m	79.55	2	160	0%	
E	Non-Combustible	10.1m-20m	18.7	6	113	15%	
W	Wood Frame	30.1m-45m	18.7	2	38	5%	
		% Increase				**30%**	*value not to exceed 75%*

Increase	**3600.0**	**L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	9600.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	10000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by RLA Architecture
-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	9330.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	17000.2	L/min	
	17000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Non-Combustible	-25%	
Fire Flow	**12750.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-6375**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Wood Frame	20.1m-30m	18.65	2	38	8%	
S	Non-Combustible	20.1m-30m	18.65	6	112	10%	
E	Wood Frame	10.1m-20m	86.1	2	173	15%	
W	Non-Combustible	30.1m-45m	18.68	6	113	5%	
		% Increase				**38%**	*value not to exceed 75%*

Increase	**4845.0**	**L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	11220.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	11000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Wateridge Block 19
Boundary Condition Conversion

Boundary Conditions Unit Conversion

Connection 1 - Codd's Road

	Height (m)	Elevation (m	m H_2O	PSI	kPa
Avg. DD	147.0	87.9	59.1	84.1	579.8
Max Day	146.7	87.9	58.8	83.7	576.8
FF	145.0	87.9	57.1	81.2	560.2

Connection 2 - Barielle-Snow Street

	Height (m)	Elevation (m	m H_2O	PSI	kPa
Avg. DD	147.0	88.6	58.4	83.1	572.9
Max Day	146.7	88.6	58.1	82.7	570.0
FF	141.0	88.6	52.4	74.6	514.0

APPENDIX C

Wastewater Collection

LEGEND

256A (aw00200) — NODE IDENTIFICATION (CITY SEWER NODE)

200mmØ — PROPOSED SANITARY SEWER SIZE AND DIRECTION

300mmØ FORCEMAIN — EXISTING FORCEMAIN AND SIZE

200mmØ CO — EXISTING SITE SEWER SIZE AND DIRECTION

N

RCAF SANITARY PUMP STATION

INLET SEWER FROM AVIATION MUSEUM

TO OTTAWA RIVER 900mmØ CO OVERFLOW

300mmØ FORCEMAIN

RCAF PULL-BACK SEWER

(rc00900)

300mmØ CO

NRC SHAFT

675mmØ CO

EXISTING AIR BASE PULLBACK SEWER 300mmØ @ 0.69% CAPACITY ±84.l/s

(aw00100)

(aw00200)

ALVIN HEIGHTS PULL-BACK SEWER (300mmØ CO)

AIR BASE SEWER (750mmØ CO)

FUTURE MUSEUM

CODD'S ROAD SHAFT

CONNECT TO EXISTING CODD'S ROAD SHAFT INVERT 76.85m

OTTAWA INTERCEPTOR OUTFALL (2400mmØ CO)

INTERCEPT EXISTING SANITARY INVERT ±86.40m

EXISTING THORNCLIFFE VILLAGE SANITARY SEWER

CAP SEWER AND CONSTRUCT TEMPORARY OVER FLOW TO SWM FACILITY

PEACH TREE LANE SHAFT

EXISTING MONTFORT HOSPITAL SANITARY SEWER

Scale 0 100 200

Project Title

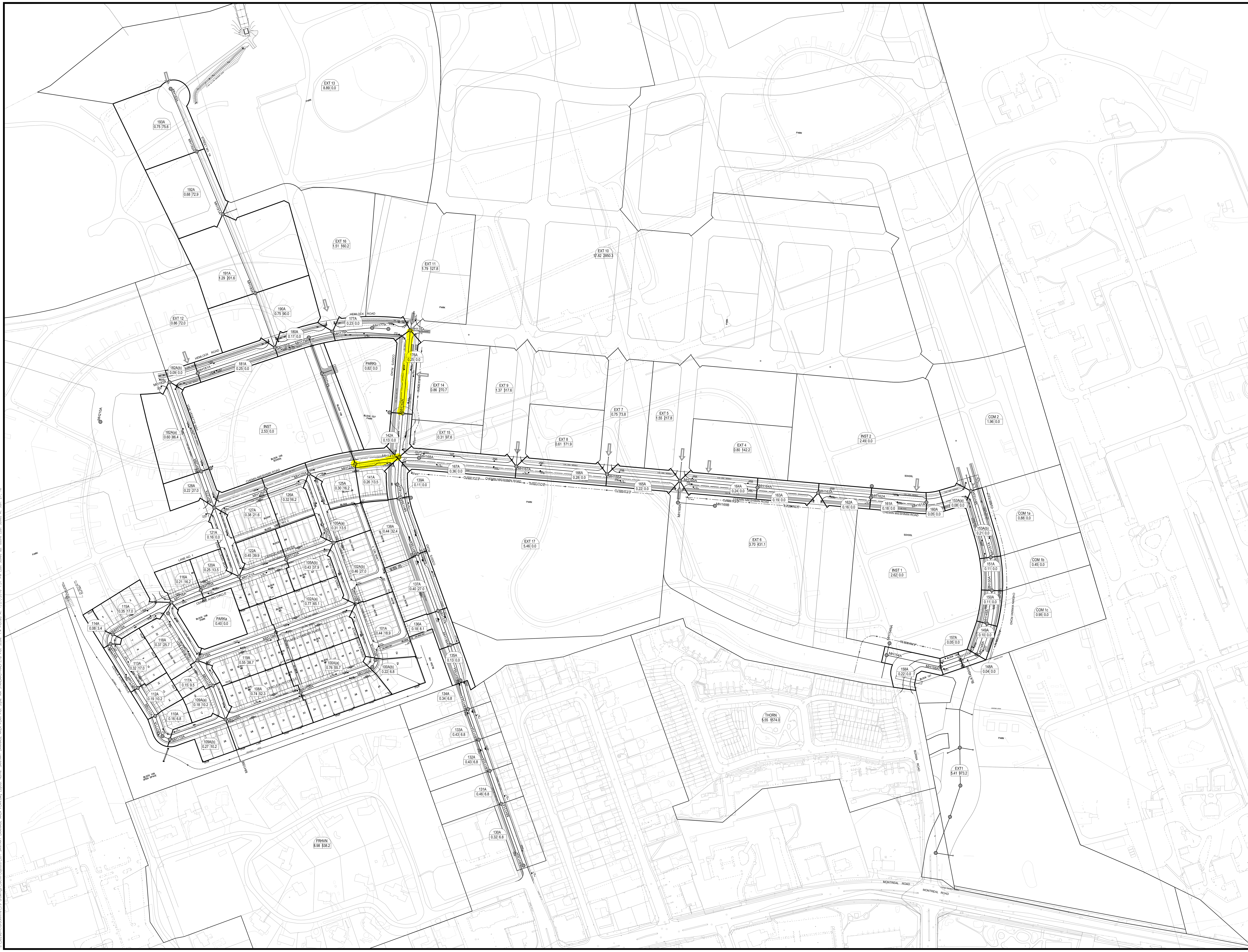
DESIGN BRIEF
WATERIDGE VILLAGE
AT ROCKCKIFFE
PHASE 1A

Drawing Title

RECOMMENDED
WASTEWATER PLAN

Sheet No.

FIGURE 3.1



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

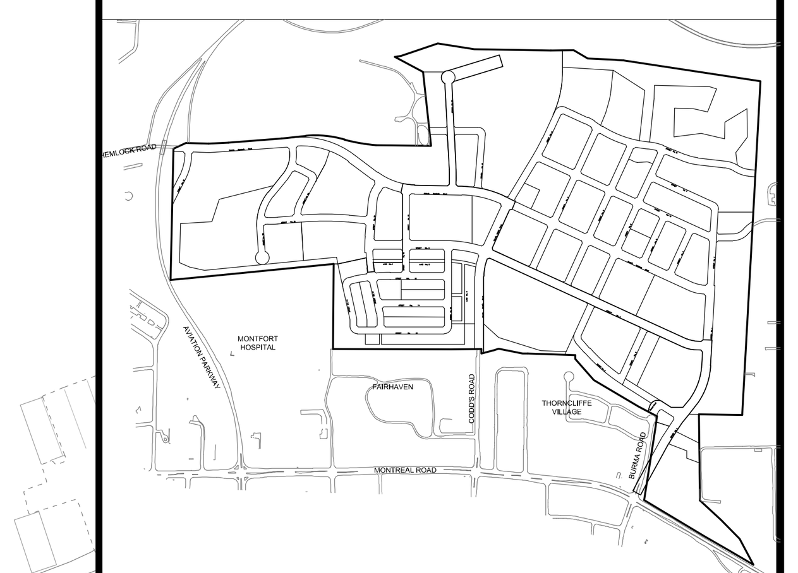
Signed ______________________

Date ______________________ 2016

Plan Number ______________________

LEGEND :

S168 2.01 0.80 — AREA NUMBER / RUNOFF COEFFICIENT / AREA IN HECTARES



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6	REVISED PER CITY COMMENTS	J.I.M.	2016:01:27
5	REVISED PER CITY COMMENTS	J.I.M.	2015:11:30
4	REVISED PER CITY COMMENTS	J.I.M.	2015:11:20
3	REVISED PER CITY COMMENTS	J.I.M.	2015:11:13
2	ISSUED FOR CITY INTERNAL CIRCULATION	J.I.M.	2015:09:22
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2015:06:30

CANADA LANDS COMPANY
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30 Metcalfe Street Suite 601
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IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
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ibigroup.com

Project Title

WATERIDGE VILLAGE AT ROCKCLIFFE

PHASE 1A

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
16/01/27
PROVINCE OF ONTARIO

N

Drawing Title

SANITARY DRAINAGE AREA PLAN

Scale: 1 : 2000

Design	Date
J.I.M./M.B.	JUNE 2015
Drawn	**Checked**
D.D. / M.M.	J.I.M.
Project No.	**Drawing No.**
38298	501

D07-16-15-0003

#17063

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Ottawa, Ontario K1S 5N4 Canada
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ibigroup.com

SANITARY SEWER DESIGN SHEET

Former CFB Rockcliffe
City of Ottawa
Canada Lands Company

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			FIXED	TOTAL	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION			AREA (Ha)							AREA (Ha)		FLOW	FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	Ph1 (Ha)	SF	SD	TH	APT	External (Ha)	IND	CUM	PEAK FACTOR	PEAK FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	PEAK FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
cercle AVRO CIRCLE	100A(a)	MH100A	MH108A	0.76	14	3				55.7	55.7	4.00	0.90		0.00		0.00		0.00	0.00	0.76	0.76	0.21		1.12	39.24	93.65	250	0.40	0.774	38.12	97.16%
cercle AVRO CIRCLE	108A	MH108A	MH109A	0.74	13	3				52.3	108.0	4.00	1.75		0.00		0.00		0.00	0.00	0.74	1.50	0.42		2.17	39.24	98.01	250	0.40	0.774	37.07	94.47%
---	FRHVN	SAN EXT	MH109A						8.98	538.2	538.2	3.96	8.63		0.00		0.00		0.00	0.00	8.98	8.98	2.51		11.14	94.09	53.04	250	2.30	1.857	82.94	88.16%
voie CHENE WAY	109A	MH109A	MH117A	0.18	3					10.2	656.4	3.91	10.40		0.00		0.00		0.00	0.00	0.18	10.66	2.98		13.38	62.04	44.52	250	1.00	1.224	48.66	78.43%
	117A	MH117A	MH118A	0.15	2	1				9.5	665.9	3.91	10.54		0.00		0.00		0.00	0.00	0.15	10.81	3.03		13.57	62.04	36.30	250	1.00	1.224	48.47	78.13%
PLACE LYSANDER	102A(a)	MH102A	MH119A	0.77	12	9				65.1	65.1	4.00	1.05		0.00		0.00		0.00	0.00	0.77	0.77	0.22		1.27	48.45	103.71	250	0.61	0.956	47.18	97.38%
PLACE LYSANDER	119A	MH119A	MH118A	0.55	9	3				38.7	103.8	4.00	1.68		0.00		0.00		0.00	0.00	0.55	1.32	0.37		2.05	55.49	102.75	250	0.80	1.095	53.44	96.30%
voie CHENE WAY	118A	MH118A	MH118C	0.37	2	7				25.7	795.4	3.86	12.44		0.00		0.00		0.00	0.00	0.37	12.50	3.50		15.94	48.06	65.25	250	0.60	0.948	32.11	66.82%
voie CHENE WAY		MH118C	MH116A							0.0	795.4	3.86	12.44		0.00		0.00		0.00	0.00	0.00	12.50	3.50		15.94	48.06	14.10	250	0.60	0.948	32.11	66.82%
cercle AVRO CIRCLE	109A(b)	MH109A	Mh110A	0.27	3					10.2	10.2	4.00	0.17		0.00		0.00		0.00	0.00	0.27	0.27	0.08		0.24	80.89	72.73	250	1.70	1.596	80.65	99.70%
PLACE LYSANDER	---	Mh110A	Mh111A							0.0	10.2	4.00	0.17		0.00		0.00		0.00	0.00	0.00	0.27	0.08		0.24	67.96	9.98	250	1.20	1.341	67.72	99.65%
cercle AVRO CIRCLE	110A	MH111A	MH112A	0.16	2					6.8	17.0	4.00	0.28		0.00		0.00		0.00	0.00	0.16	0.43	0.12		0.40	67.96	26.44	250	1.20	1.341	67.56	99.42%
voie VEDETTE WAY	112A	MH112A	MH113A	0.19	3					10.2	27.2	4.00	0.44		0.00		0.00		0.00	0.00	0.19	0.62	0.17		0.61	50.02	40.55	250	0.65	0.987	49.40	98.77%
voie CHENE WAY	113A	MH113A	MH114A	0.32	5					17.0	44.2	4.00	0.72		0.00		0.00		0.00	0.00	0.32	0.94	0.26		0.98	57.20	63.75	250	0.85	1.129	56.22	98.29%
Street No. 18	114A	MH114A	MH115A	0.08	1					3.4	47.6	4.00	0.77		0.00		0.00		0.00	0.00	0.08	1.02	0.29		1.06	36.70	12.10	250	0.35	0.724	35.65	97.12%
Street No. 19	115A	MH115A	MH116A	0.35	5					17.0	64.6	4.00	1.05		0.00		0.00		0.00	0.00	0.35	1.37	0.38		1.43	36.70	82.09	250	0.35	0.724	35.27	96.10%
cercle AVRO CIRCLE	116A	MH116A	MH120A	0.21		2	4			16.2	876.2	3.84	13.62		0.00		0.00		0.00	0.00	0.21	14.08	3.94		17.56	31.02	39.22	250	0.25	0.612	13.46	43.39%
cercle AVRO CIRCLE	PARKa	BULK120AS	MH120A	0.40						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.40	0.40	0.11		0.11	43.87	12.01	250	0.50	0.866	43.76	99.74%
cercle AVRO CIRCLE	120A	MH120A	MH121A	0.25		4	1			13.5	889.7	3.83	13.81		0.00		0.00		0.00	0.00	0.25	14.73	4.12		17.94	31.02	49.86	250	0.25	0.612	13.08	42.18%
cercle AVRO CIRCLE	105A(b)	MH105A	MH122A	0.43	4	6	3			37.9	37.9	4.00	0.61		0.00		0.00		0.00	0.00	0.43	0.43	0.12		0.73	62.04	61.74	250	1.00	1.224	61.30	98.82%
cercle AVRO CIRCLE	122A	MH122A	MH121A	0.45	3	8	3			39.9	77.8	4.00	1.26		0.00		0.00		0.00	0.00	0.45	0.88	0.25		1.51	55.14	61.74	250	0.79	1.088	53.63	97.27%
voie VEDETTE WAY	121A	MH121A	MH127A	0.16						0.0	967.5	3.81	14.93		0.00		0.00		0.00	0.00	0.16	15.77	4.42		19.34	31.02	90.10	250	0.25	0.612	11.67	37.64%
voie VEDETTE WAY	182A(a)	MH182A	MH128A	0.60			32			86.4	86.4	4.00	1.40		0.00		0.00		0.00	0.00	0.60	0.60	0.17		1.57	50.40	117.51	250	0.66	0.995	48.83	96.89%
voie VEDETTE WAY	INST	BULK128AE	MH128A							0.0	0.0	4.00	0.00	2.53	2.53		0.00		0.00	2.20	2.53	2.53	0.71		2.90	39.24	13.48	250	0.40	0.774	36.33	92.60%
voie VEDETTE WAY	128A	MH128A	MH127A	0.22			10			27.0	113.4	4.00	1.84		0.00		0.00		0.00	0.00	0.22	3.35	0.94		2.78	39.24	47.30	250	0.40	0.774	36.46	92.93%
hemin MIESHIMIN ROA	127A	MH127A	MH126A	0.38		4	4			21.6	1102.5	3.77	16.85		0.00		0.00		0.00	0.00	0.38	19.50	5.46		22.31	47.32	67.16	300	0.22	0.648	25.01	52.86%
hemin MIESHIMIN ROA	126A	MH126A	MH125A	0.32		4	2			16.2	1118.7	3.77	17.08		0.00		0.00		0.00	0.00	0.32	19.82	5.55		22.63	47.32	56.33	300	0.22	0.648	24.69	52.18%
cercle AVRO CIRCLE	100A(b)	MH100A	MH101A	0.22	2					6.8	6.8	4.00	0.11		0.00		0.00		0.00	0.00	0.22	0.22	0.06		0.17	43.87	9.43	250	0.50	0.866	43.70	99.61%
PLACE LYSANDER	101A	MH101A	MH102A	0.44		2	5			18.9	25.7	4.00	0.42		0.00		0.00		0.00	0.00	0.44	0.66	0.18		0.60	69.36	73.24	250	1.25	1.369	68.76	99.13%
cercle AVRO CIRCLE	102A(b)	MH102A	MH105A	0.46		3	7			27.0	52.7	4.00	0.85		0.00		0.00		0.00	0.00	0.46	1.12	0.31		1.17	51.91	80.00	250	0.70	1.024	50.74	97.75%
voie VEDETTE WAY	MH105A(a)	MH105A	MH125A	0.31		1	4			13.5	66.2	4.00	1.07		0.00		0.00		0.00	0.00	0.31	1.43	0.40		1.47	43.87	90.01	250	0.50	0.866	42.39	96.64%
hemin MIESHIMIN ROA	125A	MH125A	MH124A	0.30			6			16.2	1201.1	3.75	18.23		0.00		0.00		0.00	0.00	0.30	21.55	6.03		24.27	48.38	58.42	300	0.23	0.663	24.11	49.84%
Street No. 11	EXT 11	BULK176AN	MH176A						1.79	127.8	127.8	4.00	2.07		0.00		0.00		0.00	0.00	1.79	1.79	0.50		2.57	55.49	23.23	250	0.80	1.095	52.92	95.36%
Hemlock Road	EXT 10	BULK176AE	MH176A						17.82	2850.3	2850.3	3.46	39.96		0.00		0.00		0.00	0.00	17.82	17.82	4.99		44.95	65.38	21.97	300	0.42	0.896	20.43	31.24%
Codd's Road	176A(a), EXT 14	MH176A	MH142A	0.25					0.86	270.7	3248.8	3.41	44.91		0.00		0.00		0.00	0.00	1.11	20.72	5.80		50.72	81.80	102.64	375	0.20	0.717	31.08	38.00%
Codd's Road	PARKb	BULK142AW	MH142A	0.82						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.82	0.82	0.23		0.23	43.87	16.40	250	0.50	0.866	43.64	99.48%
Codd's Road	142A	MH142A	MH141A	0.13						0.0	3248.8	3.41	44.91		0.00		0.00		0.00	0.00	0.13	21.67	6.07		50.98	100.18	55.36	375	0.30	0.879	49.20	49.11%
hemin MIESHIMIN ROA	153A(a)	MH153A	MH160A	0.08						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.08	0.08	0.02		0.02	75.22	37.14	250	1.47	1.484	75.20	99.97%
hemin MIESHIMIN ROA	160A	MH160A	MH161A	0.05						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.05	0.13	0.04		0.04	75.22	19.37	250	1.47	1.484	75.18	99.95%
hemin MIESHIMIN ROA	161A	MH161A	MH162A	0.18						0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	0.18	0.31	0.09		0.09	57.53	68.62	250	0.86	1.135	57.45	99.85%
hemin MIESHIMIN ROA	INST 2	BULK162AN	MH162A							0.0	0.0	4.00	0.00	2.49	2.49		0.00		0.00	2.16	2.49	2.49	0.70		2.86	39.24	14.00	250	0.40	0.774	36.38	92.71%
hemin MIESHIMIN ROA	162A	MH162A	MH163A	0.16						0.0	0.0	4.00	0.00		2.49		0.00		0.00	2.16	0.16	2.96	0.83		2.99	57.53	65.05	250	0.86	1.135	54.54	94.80%
hemin MIESHIMIN ROA	163A	MH163A	MH164A	0.19						0.0	0.0	4.00	0.00		2.49		0.00		0.00	2.16	0.19	3.15	0.88		3.04	63.57	74.89	250	1.05	1.255	60.53	95.21%
hemin MIESHIMIN ROA	EXT 4	BULK164AN	MH164A						0.80	142.2	142.2	4.00	2.30		0.00		0.00		0.00	0.00	0.80	0.80	0.22		2.53	50.78	14.99	250	0.67	1.002	48.25	95.02%
hemin MIESHIMIN ROA	164A	MH164A	MH165A	0.24						0.0	142.2	4.00	2.30		2.49		0.00		0.00	2.16	0.24	4.19	1.17		5.64	56.52	95.88	250	0.83	1.115	50.88	90.02%
Street No. 2	EXT 5	BULK165AN	MH165A						1.55	217.8	217.8	4.00	3.53		0.00		0.00		0.00	0.00	1.55	1.55	0.43		3.96	39.24	22.50	250	0.40	0.774	35.27	89.90%

Design Parameters:

Residential

SF	3.4	p/p/u
TH/SD	2.7	p/p/u
APT	1.8	p/p/u
Other	60	p/p/Ha

ICI Areas

			Peak Factor
INST	50,000	L/Ha/day	1.5
COM	50,000	L/Ha/day	1.5
IND	35,000	L/Ha/day	MOE Chart
	17000	L/Ha/day	

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha 0.4 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5))
   where P = population in thousands

Designed: MB, WY

Checked: JIM

Dwg. Reference: 38298-501

No.	Revision	Date
1.	Submission No. 1 for City Review	2015-06-30
2.	Submission No. 2 for City Review	2015-11-30
3.	Submission No. 3 for City Review	2016-01-27

File Reference: 38298.5.7.1

Date: 2015-06-30

Sheet No: 1 of 2

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SANITARY SEWER DESIGN SHEET

Former CFB Rockcliffe
City of Ottawa
Canada Lands Company

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FIXED FLOW	TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW			CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	Ph1 (Ha)	SF	SD	TH	APT	External (Ha)	IND	CUM	FACTOR	FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
chemin WANAKI ROAD	COM 2	BULK153AN	MH153A							0.0	0.0	4.00	0.00		0.00	1.96	1.96		0.00	1.70	1.96	1.96	0.55		2.25	51.91	20.13	250	0.70	1.024	49.66	95.66%
chemin WANAKI ROAD	153A(b), COM 1a	MH153A	MH151A	0.21						0.0	0.0	4.00	0.00		0.00	0.88	2.84		0.00	2.47	1.09	3.05	0.85		3.32	36.70	85.04	250	0.35	0.724	33.38	90.96%
chemin WANAKI ROAD	151A, COM 1b	MH151A	MH150A	0.11						0.0	0.0	4.00	0.00		0.00	0.45	3.29		0.00	2.86	0.56	3.61	1.01		3.87	36.70	40.97	250	0.35	0.724	32.84	89.46%
chemin WANAKI ROAD	150A, COM 1c	MH150A	MH149A	0.11						0.0	0.0	4.00	0.00		0.00	0.95	4.24		0.00	3.68	1.06	4.67	1.31		4.99	36.70	41.34	250	0.35	0.724	31.71	86.41%
chemin WANAKI ROAD	149A	MH149A	MH148A	0.10						0.0	0.0	4.00	0.00		0.00		4.24		0.00	3.68	0.10	4.77	1.34		5.02	36.70	40.04	250	0.35	0.724	31.69	86.33%
chemin WANAKI ROAD	148A	MH148A	MH157A	0.04						0.0	0.0	4.00	0.00		0.00		4.24		0.00	3.68	0.04	4.81	1.35		5.03	36.70	20.58	250	0.35	0.724	31.68	86.30%
chemin WANAKI ROAD	EXT1	BULK148AW	MH157A						5.41	973.2	973.2	3.81	15.01		0.00		0.00		0.00	0.00	5.41	5.41	1.51		16.53	62.04	8.00	250	1.00	1.224	45.51	73.36%
chemin WANAKI ROAD	157A	MH157A	MH158A	0.05						0.0	973.2	3.81	15.01		0.00		4.24		0.00	3.68	0.05	10.27	2.88		21.57	31.02	26.39	250	0.25	0.612	9.45	30.47%
chemin WANAKI ROAD	158A	MH158A	MH154A	0.22						0.0	973.2	3.81	15.01		0.00		4.24		0.00	3.68	0.22	10.49	2.94		21.63	31.02	67.81	250	0.25	0.612	9.39	30.27%
Pond	INST 1	BULK154AN	MH154A							0.0	0.0	4.00	0.00	2.62	2.62		0.00		0.00	2.27	2.62	2.62	0.73		3.01	39.24	15.10	250	0.40	0.774	36.23	92.33%
hemin MIESHIMIN ROA	THORN	MH169B	MH169A						5.55	1574.0	1574.0	3.66	23.36		0.00		0.00		0.00	0.00	5.55	5.55	1.55		24.92	43.87	45.68	250	0.50	0.866	18.95	43.20%
Street No. 2	EXT 6	MH169A	MH165A						3.70	431.1	2978.3	3.45	41.56		2.62		0.00		0.00	2.27	3.70	17.28	4.84		48.68	63.80	27.00	300	0.40	0.874	15.13	23.71%
hemin MIESHIMIN ROA	165A	MH165A	MH166A	0.22						0.0	3338.3	3.40	46.01		5.11		0.00		0.00	4.44	0.22	23.24	6.51		56.96	100.18	90.00	375	0.30	0.879	43.23	43.15%
Street No. 8	EXT 7	BULK166AN	MH166A						0.75	73.8	73.8	4.00	1.20		0.00		0.00		0.00	0.00	0.75	0.75	0.21		1.41	39.24	21.10	250	0.40	0.774	37.83	96.42%
hemin MIESHIMIN ROA	166A, EXT 8	MH166A	MH167A	0.28					0.61	171.9	3584.0	3.38	49.01		5.11		0.00		0.00	4.44	0.89	24.88	6.97		60.41	98.50	112.00	375	0.29	0.864	38.09	38.67%
Street No. 9	EXT 9	BULK167AN	MH167A						1.37	317.6	317.6	4.00	5.15		0.00		0.00		0.00	0.00	1.37	1.37	0.38		5.53	39.24	20.43	250	0.40	0.774	33.71	85.91%
hemin MIESHIMIN ROA	167A, EXT 15	MH167A	MH168A	0.36					0.31	97.6	3999.2	3.33	54.00		5.11		0.00		0.00	4.44	0.67	26.92	7.54		65.98	115.68	120.00	375	0.40	1.015	49.71	42.97%
hemin MIESHIMIN ROA	---	MH168A	MH141A							0.0	3999.2	3.33	54.00		5.11		0.00		0.00	4.44	0.00	26.92	7.54		65.98	155.21	24.54	375	0.72	1.361	89.23	57.49%
Codd's Road	130A	MH130A	MH131A						0.32	6.8	6.8	4.00	0.11		0.00		0.00		0.00	0.00	0.32	0.32	0.09		0.20	33.98	80.74	250	0.30	0.671	33.78	99.41%
Codd's Road	131A	MH131A	MH132A						0.46	6.8	13.6	4.00	0.22		0.00		0.00		0.00	0.00	0.46	0.78	0.22		0.44	33.98	42.98	250	0.30	0.671	33.54	98.71%
Codd's Road	132A	MH132A	MH133A						0.43	6.8	20.4	4.00	0.33		0.00		0.00		0.00	0.00	0.43	1.21	0.34		0.67	113.38	40.68	250	3.34	2.238	112.71	99.41%
Codd's Road	133A	MH133A	MH134A						0.43	6.8	27.2	4.00	0.44		0.00		0.00		0.00	0.00	0.43	1.64	0.46		0.90	114.39	39.75	250	3.40	2.258	113.49	99.21%
Codd's Road	134A	MH134A	MH135A						0.34	6.8	34.0	4.00	0.55		0.00		0.00		0.00	0.00	0.34	1.98	0.55		1.11	114.39	36.55	250	3.40	2.258	113.29	99.03%
Codd's Road	135A	MH135A	MH136A	0.13						0.0	34.0	4.00	0.55		0.00		0.00		0.00	0.00	0.13	2.11	0.59		1.14	114.39	45.41	250	3.40	2.258	113.25	99.00%
Codd's Road	136A	MH136A	MH137A	0.18			3			8.1	42.1	4.00	0.68		0.00		0.00		0.00	0.00	0.18	2.29	0.64		1.32	114.39	44.68	250	3.40	2.258	113.07	98.84%
Codd's Road	137A	MH137A	MH138A	0.40			10			27.0	69.1	4.00	1.12		0.00		0.00		0.00	0.00	0.40	2.69	0.75		1.87	65.07	74.12	250	1.10	1.284	63.19	97.12%
Codd's Road	138A	MH138A	MH139A	0.44			12			32.4	101.5	4.00	1.64		0.00		0.00		0.00	0.00	0.44	3.13	0.88		2.52	43.87	72.60	250	0.50	0.866	41.35	94.25%
Codd's Road	EXT 17	BULK139AE	MH139A						5.46	0.0	0.0	4.00	0.00		0.00		0.00		0.00	0.00	5.46	5.46	1.53		1.53	48.06	14.60	250	0.60	0.948	46.53	96.82%
Codd's Road	139A	MH139A	MH140A	0.11						0.0	101.5	4.00	1.64		0.00		0.00		0.00	0.00	0.11	8.70	2.44		4.08	36.17	17.46	250	0.34	0.714	32.09	88.72%
Codd's Road	---	MH140A	MH141A							0.0	101.5	4.00	1.64		0.00		0.00		0.00	0.00	0.00	8.70	2.44		4.08	36.70	33.66	250	0.35	0.724	32.62	88.88%
hemin MIESHIMIN ROA	141A	MH141A	MH124A	0.26			5			13.5	7363.0	3.09	92.03		5.11		0.00		0.00	4.44	0.26	57.55	16.11		112.58	129.34	54.50	375	0.50	1.134	16.76	12.96%
EX Shaft	---	MH124A	MH200A							0.0	8564.1	3.02	104.81		5.11		0.00		0.00	4.44	0.00	79.10	22.15		131.40	173.52	118.42	375	0.90	1.522	42.13	24.28%
Hemlock Road	182A(b)	MH182A	MH181A	0.09						0.0	0.0	4.00	0.00		0.0		0.0		0.0	0.00	0.09	0.09	0.03		0.03	50.02	36.63	250	0.65	0.987	49.99	99.95%
	181A, EXT 12	MH181A	MH180A	0.25					0.86	72.0	72.0	4.00	1.17		0.0		0.0		0.0	0.00	1.11	1.20	0.34		1.50	47.32	100.00	300	0.22	0.648	45.82	96.82%
Street No. 19	EXT 13, 193A	MH193A	MH192A						9.64	75.6	75.6	4.00	1.23		0.0		0.0		0.0	0.00	9.64	9.64	2.70		3.92	52.27	83.57	250	0.71	1.032	48.35	92.49%
Street No. 19	192A	MH192A	MH191A						0.68	72.9	148.5	4.00	2.41		0.0		0.0		0.0	0.00	0.68	10.32	2.89		5.30	45.12	83.57	300	0.20	0.618	39.82	88.26%
Street No. 18	EXT 16	BULK191AE	MH191A						1.51	160.2	160.2	4.00	2.60		0.0		0.0		0.0	0.00	1.51	1.51	0.42		3.02	55.26	18.00	300	0.30	0.757	52.24	94.54%
Street No. 19	191A	MH191A	MH190A						1.29	201.6	510.3	3.97	8.21		0.0		0.0		0.0	0.00	1.29	13.12	3.67		11.88	45.12	105.00	300	0.20	0.618	33.24	73.67%
Street No. 19	190A	MH190A	MH180A						0.75	90.0	600.3	3.93	9.56		0.0		0.0		0.0	0.00	0.75	13.87	3.88		13.45	135.35	71.19	300	1.80	1.855	121.90	90.07%
chemin Hemlock Road	180A	MH180A	MH179A	0.17						0.0	672.3	3.90	10.63		0.0		0.0		0.0	0.00	0.17	15.24	4.27		14.90	55.26	43.49	300	0.30	0.757	40.35	73.03%
Hemlock Road	177A	MH177B	MH177A	0.23						0.0	0.0	4.00	0.00		0.0		0.0		0.0	0.00	0.23	0.23	0.06		0.06	33.98	20.00	250	0.30	0.671	33.92	99.81%
Hemlock Road	---	MH177A	MH178A							0.0	0.0	4.00	0.00		0.0		0.0		0.0	0.00	0.00	0.23	0.06		0.06	33.98	49.20	250	0.30	0.671	33.92	99.81%
Hemlock Road	---	MH178A	MH179A							0.0	0.0	4.00	0.00		0.0		0.0		0.0	0.00	0.00	0.23	0.06		0.06	33.98	29.83	250	0.30	0.671	33.92	99.81%
EX Shaft	---	MH179A	MH200A							0.0	672.3	3.90	10.63		0.0		0.0		0.0	0.00	0.00	15.47	4.33		14.97	50.44	47.29	300	0.25	0.691	35.48	70.33%
EX Shaft	---	MH200A	EX. Shaft							0.0	9236.4	2.99	111.83		5.1		0.0		0.0	4.44	0.00	94.57	26.48		142.75	200.37	12.90	375	1.2	1.757	57.62	28.76%

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	INST	50,000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	50,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart
				17000	L/Ha/day	

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha 0.4 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5))
   where P = population in thousands

Designed: MB, WY

Checked: JIM

Dwg. Reference: 38298-501

No.	Revision	Date
1.	Submission No. 1 for City Review	2015-06-30
2.	Submission No. 2 for City Review	2015-11-30
3.	Submission No. 3 for City Review	2016-01-27

File Reference: 38298.5.7.1

Date: 2015-06-30

Sheet No: 2 of 2

Wateridge Block 19
Contemplated Site Conditions
(Design Brief Phase 1A)

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2012

Site Area 2.540 **ha**

Extraneous Flow Allowances

Infiltration / Inflow **0.71 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
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop **271**

Average Domestic Flow **0.88 L/s**

Peaking Factor **4.00**

Peak Domestic Flow **3.51 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate		No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5	$L/m^2/d$		0.00
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross 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	**0.88 L/s**
Total Estimated Peak Dry Weather Flow Rate	**3.51 L/s**
Total Estimated Peak Wet Weather Flow Rate	**4.22 L/s**

Mattamy Homes
Wateridge Block 19
Proposed Site Conditions

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2012

Site Area 1.632 **ha**

Extraneous Flow Allowances

Infiltration / Inflow	**0.46**	**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
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8	445	801

Total Pop	**801**	
Average Domestic Flow	**2.60**	**L/s**
Peaking Factor	**3.86**	
Peak Domestic Flow	**10.02**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space*	5	$L/m^2/d$	791	0.09
Hospitals	900	L/bed/d		0.00
School	70	L/student/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00

Average I/C/I Flow	**0.09**
Peak Institutional / Commercial Flow	0.14
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.14**

** 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	**2.69**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**10.16**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**10.61**	**L/s**

APPENDIX D

Stormwater Management

LEGEND

108 NODE IDENTIFICATION

2700mmØ PROPOSED STORM SEWER SIZE AND DIRECTION

1050Ø STM EXISTING SITE STORM SEWER SIZE AND DIRECTION

N

Scale 0 100 200

EASTERN STORM FACILITY

POTENTIAL WATERFALL

FUTURE MUSEUM

TEMPORARY SWALE OUTLET PIPE

TEMPORARY DRAINAGE SWALE

INTERCEPT EXISTING STORM INVERT ±87.00m

CAP SEWER AND CONSTRUCT TEMPORARY DRAINAGE PIPE TO SWM FACILITY

1050Ø STM

2700mmØ

1800mmØ

1650mmØ

1500mmØ

1350mmØ

1200mmØ

1050mmØ

900mmØ

825mmØ

750mmØ

675mmØ

600mmØ

525mmØ

450mmØ

375mmØ

300mmØ

MH101 MH102 MH103 MH104 MH105 MH106 MH107 MH108 MH109 MH110 MH111 MH112 MH113 MH114 MH115 MH116 MH117 MH118 MH119 MH120 MH121 MH122 MH123 MH124 MH125 MH126 MH127 MH128 MH129 MH130 MH131 MH132 MH133 MH134 MH135 MH136 MH137 MH138 MH139 MH140 MH141 MH142 MH143 MH144 MH145 MH146 MH147 MH148 MH149 MH150 MH151 MH152 MH153 MH154 MH155 MH156 MH157 MH158 MH159 MH160 MH161 MH162 MH163 MH164 MH165 MH166 MH167 MH168

Project Title
DESIGN BRIEF
WATERIDGE VILLAGE
AT ROCKCLIFFE
PHASE 1A

Drawing Title
RECOMMENDED MINOR
STORM PLAN

Sheet No.
FIGURE 4.2

J:\182398-CFRRockcliffe\5.0 Drawings\5dwg\Current\DESIGN BRIEF FIGURE4.2 Plot Style: AIA STANDARD COLOR-HALF.CTB Plot Scale: 1:0.969 Plotted At: 1/28/2016 10:26 AM Last Saved By: mmilne Last Saved At: Jan. 26, 16

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

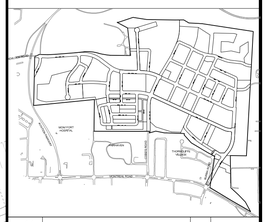
Signed _____

Date _____ 2016

Plan Number _____

LEGEND :

S168 2.01|0.80 — AREA NUMBER / RUNOFF COEFFICIENT / AREA IN HECTARES



No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6	REVISED PER CITY COMMENTS	J.I.M.	2016:01:27
5	REVISED PER CITY COMMENTS	J.I.M.	2015:11:30
4	REVISED PER CITY COMMENTS	J.I.M.	2015:11:20
3	REVISED PER CITY COMMENTS	J.I.M.	2015:11:13
2	ISSUED FOR CITY INTERNAL CIRCULATION	J.I.M.	2015:09:22
1	SUBMISSION No.1 FOR CITY REVIEW	J.I.M.	2015:06:30

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Project Title

WATERIDGE VILLAGE AT ROCKCLIFFE

PHASE 1A

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
16/01/27
PROVINCE OF ONTARIO

N

Drawing Title

STORM DRAINAGE AREA PLAN

Scale: 1 : 2000

Design	Date
J.I.M./M.B.	JUNE 2015
Drawn: D.D. / M.M.	Checked: J.I.M.
Project No.: 38298	Drawing No.: 500

D07-16-15-0003

#17063

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STORM SEWER DESIGN SHEET

Former CFB Rockcliffe
City of Ottawa
Canada Lands Company

LOCATION				RATIONAL DESIGN FLOW																SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.30	C= 0.50	C= 0.45	C= 0.56	C= 0.67	C= 0.73	C= 0.80	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
Temp Ditch	---	DICB 2	PIPE141																				3,270.00	3,270.00	3,402.95	18.95	1200			0.70	2.915	132.95	3.91%
Codd's Road	S141A,B, EX141	MH141	MH142							0.31	0.96	2.76	46.08	19.33	0.63	19.96	71.75	83.97	122.53	3,306.18			8,884.00	12,190.18	14,807.43	76.59	3000			0.10	2.029	2617.25	17.68%
Park Block 141	P141	CBMH142W	MH142		0.86							0.72	0.72	10.00	0.22	10.22	104.19	122.14	178.56	74.73				74.73	129.34	15.00	375			0.50	1.134	54.61	42.22%
Codd's Road	S142	MH142	MH176							0.18		0.37	47.16	19.96	0.65	20.61	70.34	82.31	120.10	3,317.10			8,884.00	12,201.10	14,807.43	79.32	3000			0.10	2.029	2606.33	17.60%
Future Hemlock Rd E	S176C, EX176A	BULK176E	MH176							0.05	8.78	19.63	19.63	16.59	0.27	16.86	78.75	92.20	134.60	1,545.70				1,545.70	2,156.55	24.06	1350			0.15	1.460	610.85	28.33%
Future Codd's Road N	EX176B	BULK176N	MH176								1.78	3.96	3.96	10.78	0.15	10.93	100.25	117.49	171.73	396.84				396.84	572.93	18.21	600			0.80	1.963	176.09	30.73%
Hemlock Road	S176D,E	MH176	BEND177							0.22		0.45	71.19	20.61	0.31	20.92	68.93	80.66	117.68	4,907.69			8,884.00	13,791.69	18,135.33	46.25	3000			0.15	2.485	4343.64	23.95%
Hemlock Road	---	BEND177	MH178									0.00	71.19	20.92	0.31	21.23	68.29	79.90	116.57	4,861.72			8,884.00	13,745.72	18,135.33	45.59	3000			0.15	2.485	4389.61	24.20%
Hemlock Road	---	MH178	BEND179									0.00	71.19	21.23	0.28	21.51	67.66	79.17	115.49	4,817.33			8,884.00	13,701.33	18,135.33	42.27	3000			0.15	2.485	4434.00	24.45%
Hemlock Road	---	BEND179	MH180									0.00	71.19	21.51	0.21	21.72	67.10	78.51	114.52	4,776.97			8,884.00	13,660.97	18,135.33	30.68	3000			0.15	2.485	4474.36	24.67%
Future Street No. 19	S180, EX180	MH180	MH190							0.16	0.54	1.53	99.46	21.72	0.43	22.14	66.69	78.03	113.82	6,633.26			8,884.00	15,517.26	18,135.33	63.40	3000			0.15	2.485	2618.06	14.44%
	EX190B	MH190	MH191								1.08	2.40	101.86	22.14	0.76	22.90	65.87	77.07	112.41	6,709.96			8,884.00	15,593.96	18,135.33	112.71	3000			0.15	2.485	2541.37	14.01%
Future Street No. 18	EX190A	BULK191E	MH191								2.01	4.47	4.47	12.26	0.10	12.36	93.60	109.67	160.24	418.41				418.41	640.56	13.71	600			1.00	2.195	222.15	34.68%
	EX191B-C	MH191	MH192		0.82						0.90	2.69	109.02	22.90	0.77	23.67	64.47	75.42	110.00	7,028.34			8,884.00	15,912.34	18,135.33	115.55	3000			0.15	2.485	2222.98	12.26%
	EX192	MH192	MH193								0.47	1.05	110.06	23.67	0.27	23.94	63.10	73.81	107.64	6,944.82			8,884.00	15,828.82	18,730.09	41.34	3000			0.16	2.567	2901.27	15.49%
Future Park Block 36	P193	MH193	MH 194		1.94							1.62	111.68	23.94	0.64	24.59	62.64	73.27	106.84	6,995.54			8,884.00	15,879.54	20,940.87	110.85	3000			0.20	2.870	5061.33	24.17%
Temp Ditch	---	DICB 3	PIPE193																				1,560.00	1,560.00	1,956.07	2.67	975			0.70	2.538	396.07	20.25%
	---	MH 194	OUTLET									0.00	111.68	24.59	0.02	24.60	61.56	72.01	105.00	6,875.66			8,884.00	15,759.66	20,940.87	3.00	3000			0.20	2.870	5181.21	24.74%
From MSS Document	---	BULK195E	OUTLET									34.91	34.91	22.83	0.08	22.91	64.59	75.57	110.21	2,255.01				2,255.01	4,754.27	10.00	1650			0.25	2.154	2499.26	52.57%
chemin WANAKI ROAD	S152, EX152A-B	MH152	MH151							0.23	0.92	2.51	2.51	10.00	1.10	11.10	104.19	122.14	178.56	261.82				261.82	438.47	78.40	675			0.25	1.187	176.65	40.29%
chemin WANAKI ROAD	S151, EX151	MH151	MH150							0.02	0.41	0.95	3.47	11.10	0.58	11.68	98.72	115.69	169.09	342.08				342.08	438.47	41.34	675			0.25	1.187	96.39	21.98%
chemin WANAKI ROAD	S150, EX150	MH150	MH149							0.18	0.96	2.50	5.97	11.68	0.44	12.12	96.08	112.59	164.52	573.17				573.17	748.75	35.95	825			0.25	1.357	175.58	23.45%
chemin WANAKI ROAD	S149	MH149	MH148							0.15		0.30	6.27	12.12	0.55	12.68	94.17	110.34	161.23	590.47				590.47	748.75	45.17	825			0.25	1.357	158.28	21.14%
Burma Road	S148	MH148	MH157							0.12		0.24	6.21	12.12	0.63	12.76	94.17	110.34	161.23	584.74				584.74	865.46	50.00	900			0.21	1.318	280.72	32.44%
Burma Road	---	MH157	MH154									0.00	6.27	12.68	0.85	13.53	91.90	107.66	157.30	576.20				576.20	844.60	65.50	900			0.20	1.286	268.41	31.78%
Block 71	EXSC154	BULK154N	MH154								2.62	5.83	5.83	12.00	0.20	12.20	94.70	110.96	162.13	551.78				551.78	687.10	17.90	750			0.35	1.507	135.32	19.69%
SW Swale	---	BULK SWL	EX MH																				1704.00	1,704.00	1,707.41	80.70	825			1.30	3.094	3.41	0.20%
																													1.25			

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: MB, WY
Checked: JIM
Dwg. Reference: 38298-500

No.	Revision	Date
1.	Submission No. 1 for City Review	2015-06-30
2.	Submission No. 2 for City Review	2015-11-30
3.	Submission No. 3 for City Review	2016-01-27

File Reference: 38298.5.7.1
Date: 2015-06-30
Sheet No: 3 of 3

Mattamy Homes
Wateridge Village - Block 19
Existing Site Conditions

Stormwater - Existing Conditions
City of Ottawa Sewer Design Guidelines, 2004

Existing Drainage Area Charateristics

Area	1.63	ha
L	188.3	m, longest flow path
H1	87.5	m, elevation of hydraulically most remote location
H2	86.2	m, elevation at outlet
S	0.69	%
C	0.2	Rational Method runoff coefficient

Existing Time of Concentration (per Federal Aviation Administration)

t_c	45.6	min

Estimated Existing Peak Flow

	5-year	100-year	
i	40.3	68.4	mm/hr
Q	36.5	62.0	L/s

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

Proposed Post Development Minor System Flow to Codd's Road

Total Area	1.63	ha
C	0.76	Rational Method runoff coefficient
t_c	10	min, tc at outlet without restriction

	5-year	**100-year**		
i	104.2	178.6	mm/hr	mm/hr
Q	358.5	768.1	L/s	L/s

Note: Reference target requirements

									Ditch Data												
Up	Down	Area	C	Indiv AxC	Acc AxC	T_C	I	Q*	depth	Side Slope	Bot. Width	Mannings	Slope	Length	A_{flow}	Wet. Per.	R	Velocity	Qcap	Time Flow	Q / Q full
		(ha)	(-)			(min)	(mm/hr)	(L/s)	(mm)	(X:1)	(m)	n	(%)	(m)	(m^2)	(m)	(m)	(m/s)	(L/s)	(min)	(-)
		1.630	0.76	1.24	1.24	10.0	178.6	293.1	180	33.3	0	0.03	1.30	20	1.079	11.993	0.09	0.76	823.3	0.4	0.36
	*100-year Flow - 475 L/s minor storm capture																				

STORAGE SUMMARY
BLOCK 19
STORAGE VOLUME AVAILABLE BELOW OVERFLOW

Total Site		
Rainfall (mm)	**Drainage Area (sq.m)**	**Volume Required (cu.m)**
15	16300	244.5

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

Post Development Drainage Area Charateristics

Total Area 1.63 ha
C 0.76 Rational Method runoff coefficient
t_c 10 min, tc at outlet without restriction

5-year		**100-year**		
Q	358.8 L/s	**Q**	457 L/s	**Based on consultation with IBI dated August 16, 2017*

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area 0.218 ha
C 0.75 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	47.3	47.3	0.0	0.0	178.6	101.4	101.4	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

Total Area 1.41 ha
C 0.82 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)**
5	141.2	452.9	169.2	283.7	85.1	242.7	952.2	355.6	596.5	179.0
10	104.2	334.2	169.7	164.6	98.7	178.6	700.5	355.6	344.9	206.9
15	83.6	268.0	170.1	98.0	88.2	142.9	560.6	355.6	205.0	184.5
20	70.3	225.4	170.3	55.0	66.1	120.0	470.6	355.6	114.9	137.9
25	60.9	195.4	170.5	24.8	37.2	103.8	407.4	355.6	51.8	77.6
30	53.9	173.0	170.7	2.3	4.1	91.9	360.4	355.6	4.8	8.6
35	48.5	155.6	170.9	0.0	0.0	82.6	324.0	355.6	0.0	0.0
40	44.2	141.7	171.0	0.0	0.0	75.1	294.8	355.6	0.0	0.0
45	40.6	130.3	171.1	0.0	0.0	69.1	270.9	355.6	0.0	0.0
50	37.7	120.8	171.2	0.0	0.0	64.0	250.9	355.6	0.0	0.0
55	35.1	112.7	171.3	0.0	0.0	59.6	233.9	355.6	0.0	0.0
60	32.9	105.7	171.4	0.0	0.0	55.9	219.3	355.6	0.0	0.0
65	31.0	99.6	171.5	0.0	0.0	52.6	206.5	355.6	0.0	0.0
70	29.4	94.2	171.6	0.0	0.0	49.8	195.3	355.6	0.0	0.0
75	27.9	89.5	171.6	0.0	0.0	47.3	185.4	355.6	0.0	0.0
80	26.6	85.2	171.7	0.0	0.0	45.0	176.5	355.6	0.0	0.0
85	25.4	81.4	171.8	0.0	0.0	43.0	168.5	355.6	0.0	0.0
90	24.3	77.9	171.8	0.0	0.0	41.1	161.3	355.6	0.0	0.0
95	23.3	74.8	171.9	0.0	0.0	39.4	154.7	355.6	0.0	0.0
100	22.4	71.9	171.9	0.0	0.0	37.9	148.7	355.6	0.0	0.0
105	21.6	69.2	172.0	0.0	0.0	36.5	143.2	355.6	0.0	0.0

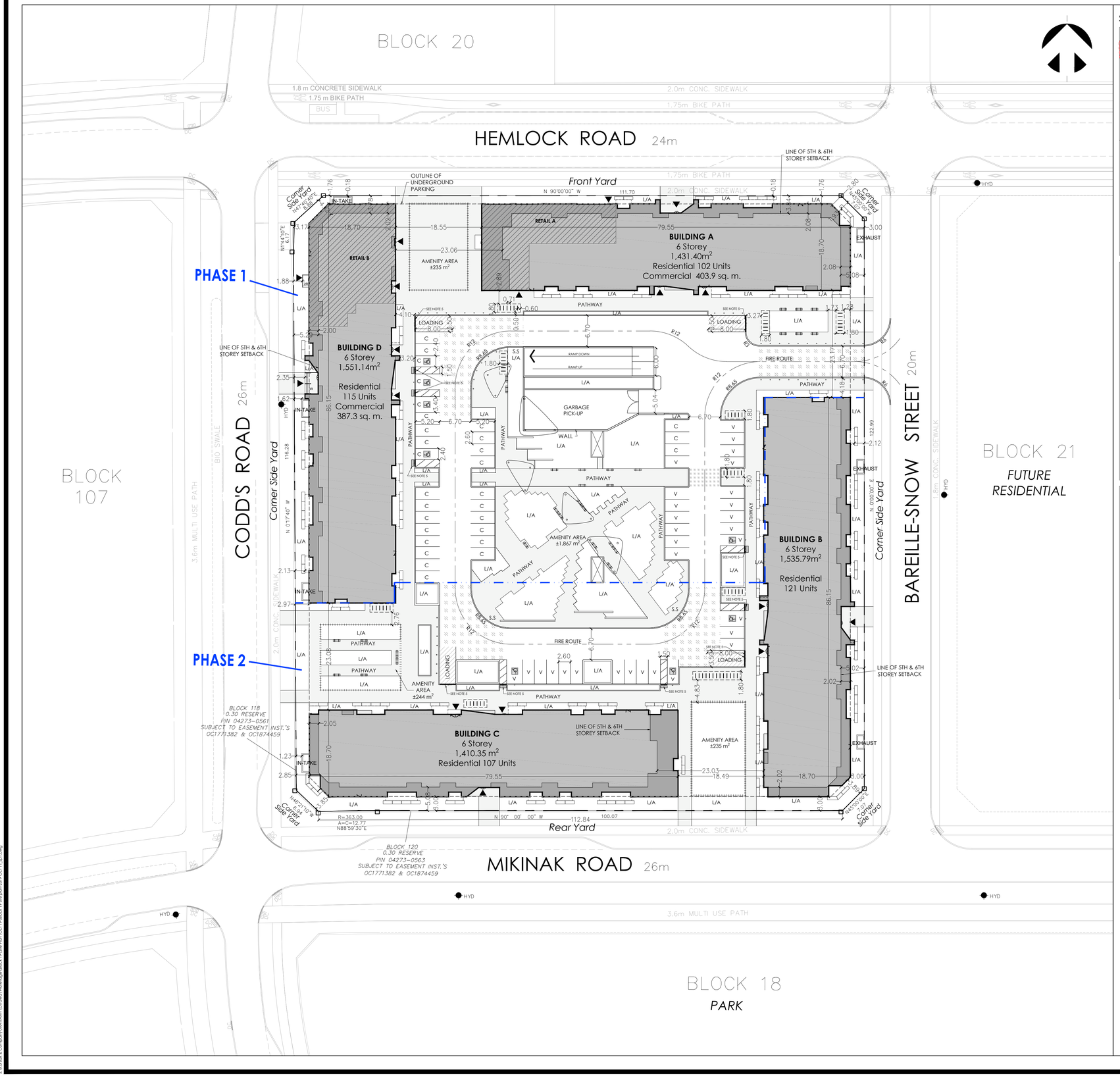
Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

5-year $Q_{attenuated}$	**169.69 L/s**	**100-year $Q_{attenuated}$**	**355.64 L/s**
5-year Max. Storage Required	**98.7 m^3**	**100-year Max. Storage Required**	**206.9 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	47.31	0.0	101.36	0.0
Attenutated Areas	169.69	98.7	355.64	206.9
Total	**217.0**	**98.73**	**457.00**	**206.9**

DRAWINGS / FIGURES



SITE STATISTICS AND DEVELOPMENT DATA

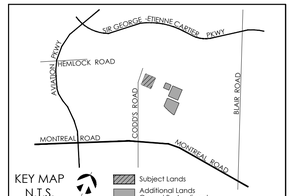
SITE AREA	16,250.85m² (1.62 ha)
PAVED AREA	3,653.52m² (22.5%)
LANDSCAPED AREA	6,668.65m² (41.0%)
TOTAL BUILDING COVERAGE	5,928.68m² (36.5%)
TOTAL GROSS FLOOR AREA	33,700.50m²
BUILDING A (102 units)	8,004.60m²
BUILDING B (121 Units)	8,839.80m²
BUILDING C (107 units)	7,994.40m²
BUILDING D (115 units)	8,861.70m²
DENSITY (UPH)	275 UPH
ZONE CATEGORY	GM 31H(30)

BUILDING	BUILDING TYPE	GROUND FLOOR AREA (m2)	UNITS
BUILDING A	RESIDENTIAL/ COMMERCIAL	1,431.40	102
BUILDING B	RESIDENTIAL	1,535.79	121
BUILDING C	RESIDENTIAL	1,410.35	107
BUILDING D	RESIDENTIAL/ COMMERCIAL	1,551.14	115
	TOTAL	5,928.68	445

SECTION	ZONE PROVISION	REQUIRED	PROPOSED
187 (Table)	MIN. LOT WIDTH (m)	No minimum	N/A
187 (Table)	MIN. LOT AREA (m²)	No minimum	N/A
187 (Table)(6)(A)	MAX. BUILDING HEIGHT (m)	30m	20.0m (6 storey)
188H-GM31(Table)	MIN. FRONT YARD AND CORNER SIDE YARD SETBACK (m): 1. FOR A BUILDING WITH RESIDENTIAL LAND USE AT GRADE	5.0m	2.85m*(Building C)
	2. ALL OTHER CASES (m)	0.0m	1.76m on Hemlock
188H-GM31(Table)	DESPITE ROW 1, ABOVE MAX. FRONT AND CORNER SIDE YARD SETBACK FOR LOTS EAST OF CODD'S ROAD WHERE THEY ABUT HEMLOCK ROAD (m)	2.0m (Max)	1.76m
188H-GM31(Table)	MIN. INTERIOR SIDE YARD (m)	N/A	N/A
188H-GM31(Table)	MIN. REAR YARD SETBACK ABUTS A STREET (m)	3.0m	3.0m
188H-GM31(Table)	MAX FLOOR SPACE INDEX (0.5/unit)	No max	N/A
101(3)(A),101(Table) AREA X	RESIDENT PARKING: WITH THE FIRST 12 UNITS NOT REQUIRED (0.5/unit)	217	422 (underground)
102(2),102 (Table)	VISITOR PARKING: WITH THE FIRST 12 UNITS NOT REQUIRED (0.1/unit)	44	44 (30 surface, 14 underground)
111A (Table)	BICYCLE PARKING (0.5/unit)	223	224 (79 surface, 145 underground)
111A (Table)(E)	COMMERCIAL BICYCLE PARKING (1/250m² of GFA)	3	3
101 (Table) N79)	COMMERCIAL PARKING (5/100m² over 200m²)	30	30
107(1), 107 (Table)	MIN. WIDTH OF AISLE (m)	6.7m	6.7m
137 (Table)	MIN. TOTAL AMENITY AREA (6m²/unit)	2,670m²	2,870m²
137 (Table)	MIN. COMMUNAL AMENITY AREA (Min. 50% area)	1,335m²	2,581m²

SECTION	ADDITIONAL PROVISIONS	REQUIRED	PROPOSED
65	MAX. PERMITTED PROJECTIONS INTO YARDS:		
65(5)	FIRE ESCAPES, OPEN STAIRWAYS, STOOP (m)	>0.6m to lot line	1.8m
65(6)	COVERED OR UNCOVERED BALCONY, PORCH, DECK	2m (Max) but >1.0m to lot line	1.9m
106(1)	MIN. PERPENDICULAR PARKING SPACE SIZE (m)	2.6m x 5.2m	2.6m x 5.2m
106(2)	BARRIER FREE PARKING: TYPE A PARKING SPACE SIZE (m)	3.4m x 5.2m	3.4m x 5.2m
	TYPE B PARKING SPACE SIZE (m)	2.4m x 5.2m	2.4m x 5.2m
	ACCESS AISLE (m)	1.5m	1.5m
111B (Table)	MIN. BICYCLE PARKING SPACE DIMENSIONS, HORIZONTAL	Width: 0.6m Length: 1.8m	0.6m 1.8m
111(9)	MIN. BICYCLE PARKING SPACE ACCESS AISLE WIDTH (m)	1.5m	1.5m
187 (Table)(H)	MIN. WIDTH OF LANDSCAPED AREA ABUTTING A STREET (m)	3.0m	2.85m *
GM31(31)(T)	DESPITE ITEM (H) IN TABLE 187, NO LANDSCAPED AREA IS REQUIRED ABUTTING A STREET FOR BUILDINGS WITH NO REQUIRED FRONT OR CORNER SIDE YARD SETBACK (m)	N/A	N/A
GM31(31)(M)	MIN. DRIVEWAY WIDTH FOR PARKING LOTS OR GARAGES (m)	3.0m	6.0m
GM31(31)(O)	MAX. DRIVEWAY WIDTH TO PARKING LOTS OR GARAGES (m)	6.0m	6.0m
GM31(31)(C)	WHERE THE BUILDING CONTAINS MORE THAN FOUR STOREYS BUT LESS THAN 13 STOREYS, AT AND ABOVE THE FOURTH STOREY A BUILDING MUST BE FURTHER SETBACK (m)	2.0m	2.0m *
GM31(31)(F)	MIN. SEPARATION DISTANCE BETWEEN PORTIONS OF A BUILDING ABOVE FOUR STOREYS (m)	23.0m	23.03m
????	MIN. CEILING HEIGHT FOR COMMERCIAL	4.5m	?

*** SUBJECT TO MINOR VARIANCE**



SCALE 1:400 (0 4 8 12 16 20 24)

LEGEND

- APARTMENT BUILDING
- CURB (0.2m)
- S.S SNOW STORAGE AREA
- L/A LANDSCAPED AREA
- ENTRANCE
- V VISITOR PARKING
- C COMMERCIAL PARKING
- HYD FIRE HYDRANT
- BLOCK BOUNDARY
- UNDERGROUND PARKING
- PHASE LINE
- PATHWAY (PAVERS)
- DRIVEWAY (PAVERS)
- NO PARKING
- BENCH
- SHADE STRUCTURE
- BIKE RACKS
- CUSTOM PLANTER (L/A)
- PRIVATE PATIO
- BOLLARD
- STAIRS TO UNDERGROUND
- R RISERS
- TACTILE WALKING SURFACE INDICATOR

DATE (D.M.Y)	REVISION	BY
11/10/19	Draft Site Plan	SP

GENERAL NOTES

1. DO NOT SCALE DRAWINGS FOR PRINT.
2. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF KORSIAK URBAN PLANNING AND MATTAMY HOMES. COPYRIGHT RESERVED.
3. SITE PLAN PREPARED IN ACCORDANCE WITH PLAN 4M-1559, PREPARED BY ANNIS O'SULLIVAN, VOLLEBEKK LTD.
4. WALKWAYS AND CURBS TO BE TIED INTO PUBLIC ROW WHERE APPLICABLE.
5. REFERENCES CITY OF OTTAWA T.W.S.I. DETAIL SC7.3

PROJECT TEAM

SITE PLAN DESIGN: KORSIAK Urban Planning
PLANNING/STRUCTURAL: Stantec
ARCHITECTURE: Q4A
CIVIL ENGINEER: DSEL
LANDSCAPE ARCHITECTURE: NAK design strategies
TRANSPORTATION: NOVATECH
NOISE: VALCOUSTICS Canada Ltd.
GEOTECHNICAL & STRUCTURAL: paterson group
MECHANICAL/ ELECTRICAL: STRIK BALDINELLI MONIZ
ENVIRONMENTAL: KILGOUR & Associates

mattamyHOMES

WATERIDGE VILLAGE: PHASE 1B

BLOCK 19, REGISTERED PLAN 4M-1559
PART OF LOTS 21, 22 AND 23
CONCESSION 1 (OTTAWA FRONT)
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

TITLE: BLOCK 19 SITE PLAN

DATE: October 11, 2019	DRAWN BY: SP CHECKED BY: CR	DRAWING NO. A1
FILE NO.:		
JOB NO.: Mattamy - Wateridge		

S:\Korsiak & Company\MATTAMY Ottawa\Wateridge\Block 1 PI\Site Plan\Oct 19\Block 19 plot plan 2019 OCT 11.dgn.dwg