Lithos

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Functional Servicing and Stormwater Management Report

Project: 29 Selkirk Street, Ottawa
Selkirk & Main Developments Inc.

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Executive Summary

Lithos Group Inc. (Lithos) was retained by Selkirk & Main Developments Inc. (the "Owner") to prepare a Functional Servicing and Stormwater Management Report in support of a Rezoning Application, for a proposed mixed-use development located on the north west corner of the intersection between Selkirk Street and Montgomery Street, at 29 Selkirk Street (K1L 6N1), in the City of Ottawa (the "City"). The following summarizes our conclusions:

Storm Drainage

A more detailed Stormwater Management report will be prepared at the Site Plan Application. The property's existing drainage pattern is separated into two drainage areas (one flowing east towards Montgomery Street and one flowing south towards Selkirk Street).

The site stormwater discharge will be controlled to the 5-year pre-development flows according to the City of Ottawa IDF curves and one (1) proposed storm lateral will be connected to the existing 450 mm storm sewer on Montgomery Street . In order to attain the target flows and meet the City's guidelines, quantity controls will be utilized and up to 504.1 m^3 of storage will be required in total to meet the allowable flows towards Montgomery Street.

The stormwater management (SWM) system will be designed to provide enhanced level (Level 1) protection as specified by the Ministry of the Environment, Conservation and Parks (MECP). During Site Plan Application, a detailed analysis will be provided to assess the water quality on site and determine additional measures in order to achieve a minimum total suspended solids (TSS) removal of 80%.

Sanitary Sewers

Three (3) separate connections will be provided for the proposed mixed-use development: one for Tower A; one for Tower B; and one for Tower C. The sanitary connections for Towers A and C will be to the existing 250 mm diameter sanitary sewer on Montgomery Street. The sanitary connection for Tower B will be to the existing 200 mm diameter sanitary sewer on Selkirk Street. The expected total peak sanitary discharge flow from the proposed development towards Montgomery Street, is anticipated at approximately 8.41 L/s for Tower A and 9.24 L/s for Tower C. In addition, the expected total peak sanitary discharge flow from the proposed development towards Selkirk Street, is anticipated at approximately 6.42 L/s for Tower B. According to the information provided by the City, the existing infrastructure has the capacity to support the additional sanitary flow, from the proposed development.

Water Supply

The proposed building will exceed 84.0m in height, therefore, two (2) water sources will be required according to the Ontario Building Code (OBC) to support the proposed development's sprinkler system. One proposed water service will be connected to the existing 150 mm diameter watermain on the east side of Montgomery Street and one to the existing 152 mm diameter watermain along the centerline of Selkirk Street. It is anticipated that a total design flow of 153.1 L/s will be required to support the proposed development. Based on the boundary conditions received from the City, it is revealed that additional measures should be implemented, during the Site Plan Application stage, in order to provide the required design flow to support the proposed development, so that the existing water infrastructure can support the proposed development

Site Grading

The proposed grades will improve the existing drainage conditions to meet the City's/Regional requirements. Grades will be maintained along the property line wherever feasible and emergency overland flow will be gravity driven to the adjacent right-of-way's (ROW).

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1.0 Introduction

Lithos Group Inc. (Lithos) was retained by Selkirk & Main Developments Inc. (the "Owner") to prepare a Functional Servicing and Stormwater Management Report in support of a Zoning Application for a proposed mixed-use development located at 29 Selkirk Street in the City of Ottawa (the "City").

The purpose of this report is to provide site-specific information for the City's review with respect to infrastructure required to support the proposed development. More specifically, the report will present details on sanitary discharge, water supply and an outline of the storm drainage pattern.

We contacted the City's engineering department to obtain existing information in preparation of this report. The following documents were available for our review:

- Servicing maps of:
  - North River Road, Montreal Road and Montgomery Street, drawing No. D-16-22, dated August, 2016;
  - Montgomery Street, drawing No. D-16-23, dated July, 2014;
  - Montgomery and Selkirk Street, drawing No. D-16-29, dated November, 2012;
- Plan and Profiles of:
  - Selkirk Street, drawing No. 980605-P3, dated July, 1998;
  - Montreal Road, No. E.2209, dated August 08, 1973;
  - Montreal Road, drawing No. S-3, dated May, 1991;
  - Montgomery Street, drawing No. 931208-9, dated April, 1994;
  - North River Road, drawing No. 05-2050-003, dated January, 2006;
- Site Plan prepared by HOK, dated April 17, 2020;
- Site Statistics prepared by HOK, dated April 17, 2020;
- Topographical Survey prepared by Annis, O'Sullivan, Vollebekk Ltd., dated March 06, 2020;

2.0 Site Description

The existing site is approximately 1.693 hectares and is comprised of one (1) single-storey commercial building with outdoor parking area. The site is located on the north west corner of the intersection between Selkirk Street and Montgomery Street, at 29 Selkirk Street (K1L 6N1), in the City of Ottawa. Refer to **Figures 1** and **2** following this report and site photographs in **Appendix A**.

3.0 Site Proposal

The proposed development will consist of three (3) high-rise towers facilitated by two levels of underground parking and one at grade . More specifically, it is proposed to develop one 29-storey, one 33-storey and one 23-storey mixed use tower. The proposed development will be comprised of 1,003 residential units as well as 3,030 m^2 of retail space. Please refer to **Appendix B** for site plan and building statistics.

4.0 Terms of Reference and Methodology

4.1. Terms of Reference

The following references and technical guidelines were consulted in the present study:

- **City of Ottawa Servicing Study Guidelines**, online edition,
- **City of Ottawa Sewer Design Guidelines**, (2012),
- **City of Ottawa Design Guidelines – Water Distribution**, (2010),
- **Ministry of Environment, Conservation and Park (MECP) Guidelines for the Design of Water Systems** (2008)
- **MECP Guidelines for the Design of Sanitary** Sewage Systems (2008)
- **MECP Stormwater Planning and Design Manual** (2003)
- **Ontario Building Code** (2010)

4.2. Methodology: Stormwater Drainage and Management

This report provides a brief Stormwater Management (SWM) review of the pre-development and post-development conditions and comments on opportunities to reduce peak flows, as per the City of Ottawa guidelines. A detailed Stormwater Management (SWM) report will be prepared at the Site Plan Application stage.

The stormwater management criteria for this development are based on the City of Ottawa Sewer Design Guidelines, as well as the Ministry of Environment, Conservation and Parks (MECP) 2003 Stormwater Management Planning and Design Manual (SWMPD). The following design criteria will be reviewed:

- Post-development peak flow for the 100-year storm event from the site should be controlled to the 5-year target flow. A 20-minute time of concentration and a 10 min inlet time derived from City of Ottawa IDF curves, were considered for connection to a dedicated storm sewer;
- For connection to a dedicated storm sewer, when the imperviousness of the existing property is greater than 50%, the maximum value of the runoff coefficient, “c”, used in calculating the pre-development peak runoff rate is limited to 0.50;
- A safe overland flow will be provided for all flows in excess of the 100-year storm event.

4.3. Methodology: Sanitary Discharge

The sanitary sewage discharge from the site will be determined using sanitary sewer design sheets that incorporate the land use and building statistics as supplied by the design team. The calculated values provide peak sanitary flow discharge that considers infiltration.

The estimated sanitary discharge flows from the proposed site will be calculated based on the criteria shown **Table 4-1** below. (Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines)

Table 4-1 – Sanitary Design Criteria

Design Parameter	Value
Residential Units (1-Bedroom)	1.4 people/unit
Residential Units (2-Bedroom)	2.1 people/unit
Residential Units (3-Bedroom)	3.1 people/unit
Average Daily Residential Flow	280 L/person/day
Residential Peak Factor	$PF = 1 + (14/(4+(P/1000)^{1/2})$
Commercial Floor Space	50000 L/ha/day
Commercial Peaking Factor	1.5 if commercial contribution >20%, otherwise 1.0
Infiltration and Inflow Allowance	0.28 L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	1.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s

4.4. Methodology: Water Usage

The fire flow requirements were estimated using the method prescribed by the Fire Underwriters Survey (FUS). This method is based on the floor area of the building to be protected, the type and combustibility of the structural frame and the separation distances with adjoining building units.

Section 4.3.22 of the City Design guidelines for water distribution provides guidance for determining the method for estimating Fire Demand. As indicated, the requirements for levels of fire protection on private property are covered in the Ontario Building Code. Section 7.2.11 of the OBC addresses the installation of water service pipes and fire service mains. Part 3 of the OBC outlines the requirement for Fire Protection, Occupant Safety, and Accessibility; and subsection A-3.2.5.7 provides the provisions for firefighting. Based on trained personnel responding to the emergency, and water supply being delivered through a municipal, the required minimum provision for water supply flow rates shall not be less than 2,700L/min or greater than 9,000L/min (OBC Section A.3.2.5.7, Table 2). The City of Ottawa was contacted in November 2019 to obtain boundary conditions based on an estimated water demand.

The domestic water usage was calculated based on the City of Ottawa Guidelines – Water Distribution outlined in **Table 4-2** that follows.

Table 4-2 – Water Usage

Design Parameter	Value
Average Residential Day Demand	350 L/person/day
Maximum Residential Day Demand	2.5 x Average Day Demand
Maximum Residential Hour Demand	2.2 x Max Day Demand
Average Commercial Day Demand	2.5 L/m^2/d
Maximum Commercial Day Demand	1.5 x Average Day Demand
Maximum Commercial Hour Demand	1.8 x Max Day Demand
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During Peak Hour Demand desired operating pressure is within	350kPa and 480KPa
Minimum pressure during normal operating conditions (average day to maximum hour demand)	275kPa
During normal operating conditions, pressure must not exceed	552kPa
Minimum pressure during fire flow plus maximum day demand	140kPa

5.0 Stormwater Management and Drainage

5.1. Existing Conditions

The existing site contains one (1) single-storey commercial development with outdoor parking area. The site drains towards Montgomery Street and towards Selkirk Street. Moreover, no external areas drain towards the subject property.

According to available records, there are six (6) storm sewers abutting the subject property. More specifically:

- A 375mm diameter storm sewer on Montreal Road flowing north-east;
- A 300mm diameter storm sewer on North River Street flowing north;
- A 450mm diameter storm sewer on Montgomery Street flowing north-east;
- A 300mm diameter storm sewer on Montgomery Street flowing south-east; and
- A 375mm and a 525mm diameter storm sewer on Selkirk Street flowing south-east.

Two (2) internal drainage areas were identified in the existing site:

1. A1 Pre – Storm runoff from the north-east portion of the site, which incorporates the runoff from the north outdoor parking area and the existing single-storey building, being discharged into the City's storm network along Montgomery Street;
2. A2 Pre – Storm runoff from the south and south-east area of the site facing Selkirk Street, draining overland towards Selkirk Street.

For details, please refer to **DAP-1** in **Appendix C.**

Moreover, the existing site is primarily covered by impermeable areas, thus there is no significant infiltration onsite. Although the existing run-off composite coefficient is estimated at 0.9, the City of Ottawa Guidelines require target flow calculations based on a run-off coefficient of 0.5. **Table 5-1** shows the input parameters which are illustrated on the pre-development drainage area plan in **Figure DAP-1** in **Appendix C**.

Table 5-1 – Target Input Parameters

Catchment	Drainage Area (ha)	Actual "C"	Design "C"	Tc (min.)
A1 Pre (Parking Area and Building-north-east)	1.561	0.90	0.50	20
A2 Pre (Parking Area – south-east)	0.132	0.90	0.50	20

Peak flows calculated for the existing conditions are shown in **Table 5-2** below. Detailed calculations are in **Appendix C**.

Table 5-2 – Target Peak Flows

Catchment	Peak Flow Rational Method (L/s)		
	2-year	5-year	100-year
A1 Pre (Parking Area and Building-north-east)	112.8	152.3	260.1
A2 Pre (Parking Area – south-east)	9.5	12.9	22.0

As shown in **Table 5-2,** post-development flows towards Montgomery and Selkirk Street will need to be controlled to the target flows of 152.3 L/s and 12.9 L/s, respectively.

5.2. Proposed Conditions

In order to meet the City's Stormwater Management criteria, the development flow rate is to be controlled to the five (5)-year target flow established in **Section 5.1**. Overland flow from the site will be directed towards the adjacent right-of-ways.

The site consists of one (1) internal drainage area:

1. A1 Post – Storm runoff from the rooftops of Tower A, B & C and from the Podium's terraces and driveway area, is controlled in the underground storage tank located in the north side of the property;

The post-development drainage areas and runoff coefficients are indicated in **Figure DAP-2**, located in **Appendix C** and summarized in **Table 5-3** below.

Table 5-3 – Post-development Input Parameters

Drainage Area	Drainage Area (ha)	"C"	Tc (min.)
A1 Post (Towers A-B-C, Podium and Driveway Area)	1.693	0.90*	10

* "C" value for the 100 year storm event is increased by 25%, with a maximum of 1.0 per City's Sewer Design Guidelines.

5.2.1. Quantity Controls

As mentioned in **Section 5.1** storm runoff from the existing property drains towards two (2) storm sewer networks, therefore, quantity control analysis has been prepared for each storm network adjacent to the site in order to assess the pre to post development impacts on each network.

5.2.1.1 Post-development flows towards Montgomery Street

Using the City's intensity-duration-frequency (IDF) data, modified rational method calculations were undertaken to determine the maximum storage required during each storm event. Results for the 2, 5, and 100-year storm events are provided in **Table 5-4**. The detailed post-development quantity control calculations are provided in **Appendix C.**

Table 5-4 – Post-development Quantity Control as Per City Requirements

Storm Event	Storm Event	Target Flow (L/s)	Required Storage Tank Volume (m^3)
A1 Post- Towards Montgomery Street (Controlled)	2-year	152.3	103.7
	5-year		181.2
	100-year		504.1

As shown in **Table 5-4**, in order to control post-development flows to the 5-year pre-development conditions, a target flow of 152,3 L/s towards Montgomery is to be satisfied. The on site storage required in order to meet the allowable release rate for Montgomery Street is calculated at 504,1 m^3 for the 100-year storm event. This can be achieved through the design and installation of stormwater holding tanks, flow control devices and/or roof storage. In an effort to provide preliminary dimensions for the proposed stormwater tank, we have reviewed invert elevations of the existing storm network along Montgomery Street.

Further to our review and given that P1 level is three (3) meters high, in order for the proposed tank to work through gravity it will have to be suspended. Due to the fact that there isn't so much space available to accommodate 504.1m^3 and have the system work through gravity, a main storm tank will work through gravity, capable to retain up to a 2-year storm event. For storm events above the 2 and up to 100 years the main tank will overflow towards an emergency storm tank, which will pump storm water towards the control manhole, prior discharging into the City's storm network. Details through will be provided in the detailed design stage of Site Plan Application.

5.2.2. Quality Controls

Stormwater treatment must meet Enhanced Protection criteria as defined by the MECP 2003 SWMPD Manual, including the removal of at least 80% total suspended solids (TSS). Quality control and the need of additional measures is required, details of which will be discussed during Site Plan Application.

5.3. Proposed Storm Connection

Storm discharge the site will be connected to the existing 450 mm diameter storm sewer along Montgomery Street, via a 200 mm storm sewer service connection, with a minimum grade of 2.00% (or equivalent pipe design).

Orifice controls, as required, will be designed to meet the allowable release rates to the municipal system and will be defined at the detailed design stage, of Site Plan Application. Therefore, since the post-development discharge rate will meet the 5-year pre-development rate, it is anticipated that this development will not adversely affect flow conditions downstream. Flows above the 100-year event will be conveyed both overland and within pipes to the adjacent municipal right-of-ways (ROW).

The **'Proposed Servicing Plan' Figure-3** in **Appendix F** indicates the stormwater service connection.

6.0 Sanitary Drainage System

6.1. Existing Sanitary Drainage System

The existing site is comprised of one (1) single-storey commercial building with parking area. According to available records, there are five (5) sanitary sewers abutting the subject property. More specifically:

- A 200mm diameter sanitary sewer on Selkirk Street flowing east;
- A 1950mm diameter trunk sanitary sewer on North River Street flowing north;
- A 2100mm diameter trunk sanitary sewer on North River Street flowing south;
- A 600mm diameter sanitary sewer on Montreal Road flowing west;
- A 250mm diameter sanitary sewer on Montgomery Street flowing north west;

6.2. Existing and Proposed Sanitary Flows

The sanitary flow generated by the proposed development at 29 Selkirk Street was compared to the existing flow in order to quantify the net increase in the sanitary sewer.

Using the design criteria outlined in **Section 4.3** and existing site information, the sanitary discharge flow from the existing commercial building is estimated at 0.48 L/s, towards Montgomery Street.

Similarly, using the design criteria and the proposed development statistics, Towers A and C will discharge 17.65 L/s into the City's infrastructure along Montgomery Street and Tower B will discharge 6.42 L/s into the City's infrastructure along Selkirk Street.

The additional flow will be considered within the sanitary discharge rate, therefore, there is an increase in sanitary flow of approximately 17.65 L/s and 6.42 L/s within the City's sewer infrastructure along Montgomery Street and Selkirk Street, respectively.

After taking into consideration all the above, we provided the required calculations to the City, in order to review how the additional flows from the proposed development will affect the municipal networks downstream. According to the information provided, the sanitary sewer infrastructure along Montgomery Street and Selkirk Street have adequate capacity to accommodate the additional flows from the proposed development and, thus, they can support it. Refer to appendix B fo email correspondence with the City.

For detailed calculations refer to the sanitary sewer design sheet in **Appendix D.**

6.3. Proposed Sanitary Connection

Three (3) separate connections will be provided for the proposed development: one for Tower A; one for Tower B; and one for Tower C. The connections will be as follows:

Tower A

- *Mixed-Use of the high-rise building:* a 300 mm diameter sanitary lateral will connect on the 250 mm sanitary sewer on Montgomery Street;

Tower B

- *Mixed-Use of the high-rise building:* a 200 mm diameter sanitary lateral will connect on the 200 mm sanitary sewer on Selkirk Street;

Tower C

- *Residential-Use of the high-rise building:* a 300 mm diameter sanitary lateral will connect on the 250 sanitary sewer on Montgomery Street;

Refer to **'Proposed Servicing Plan' Figure-3** in **Appendix F**, for the proposed sanitary connections.

7.0 Water Supply System

7.1. Existing System

The subject property lies within the City of Ottawa 1E pressure zone. The existing watermain system consists of a 300 mm diameter watermain on the north side of Montreal Road, a 150 mm diameter watermain on the east side of Montgomery Street, a 203 mm diameter watermain on the east side of North River Road and a 152 mm diameter watermain on the centerline of Selkirk Street.

7.2. Proposed Water Supply Requirements

The estimated water consumption was calculated based on the occupancy rates shown on **Table 4-2**, according to the City's watermain design criteria. Water supply for the site will be provided by two (2) separate water connections for the proposed development. More specifically, the first water connection, be to the existing 152 mm diameter watermain on the east side of Montgomery Street, while the second water connection be to the existing 152 mm diameter watermain on the centerline of Selkirk Street.

It is anticipated that an average consumption of approximately 7.19 L/s (621,216 L/day), a maximum daily consumption of 19.77 L/s (1708,128 L/day) and a peak hourly demand of 29.69 L/s (106,884 L/hr) will be required to service the proposed development with domestic water.

The fire flow requirements we estimated using the method prescribed by the Fire Underwriters Survey (FUS) be undertaken to assess the minimum requirement for fire suppression. The fire flow calculations is normally conducted for the largest storey, by area, and for the two immediately adjacent storeys.

Tower A

Table 7-1 illustrates the input parameters used for the FUS calculations for proposed Tower A. According to our calculations, a minimum fire suppression flow of approximately 116.67 L/s (1,849 USGPM) will be required. Detailed calculations can be found in **Appendix E**.

Table 7-1 – Fire Flow Input Parameters

Parameter	Frame used for Building	Combustibility of Contents	Presence of Sprinklers	Separation Distance			
				North	East	South	West
Value according to FUS options	Fire-Resistive Construction	Non-Combustible	Yes	Road	0 m to 3.0 m	Road	Road
Surcharge/reduction from base flow	0.6	25%	30%	0%	25%	0%	0%

Tower B

Table 7-2 illustrates the input parameters used for the FUS calculations for proposed Tower B. According to our calculations, a minimum fire suppression flow of approximately 133.33 L/s (2,113 USGPM) will be required. Detailed calculations can be found in **Appendix E**.

Table 7-2 – Fire Flow Input Parameters

Parameter	Frame used for Building	Combustibility of Contents	Presence of Sprinklers	Separation Distance			
				North	East	South	West
Value according to FUS options	Fire-Resistive Construction	Non-Combustible	Yes	Road	Road	Road	0 m to 3.0 m
Surcharge/reduction from base flow	0.6	25%	30%	0%	0%	0%	25%

Tower C

Table 7-3 illustrates the input parameters used for the FUS calculations for proposed Tower C. According to our calculations, a minimum fire suppression flow of approximately 83.33 L/s (1,321 USGPM) will be required. Detailed calculations can be found in **Appendix E**.

Table 7-3 – Fire Flow Input Parameters

Parameter	Frame used for Building	Combustibility of Contents	Presence of Sprinklers	Separation Distance			
				North	East	South	West
Value according to FUS options	Fire-Resistive Construction	Non-Combustible	Yes	0 m to 3.0 m	0 m to 3.0 m	Road	Road
Surcharge/reduction from base flow	0.6	25%	30%	25%	25%	0%	0%

In summary, the required design flow is the sum of 'the minimum fire suppression flow' and 'maximum daily demand' (133.33 + 19.77 = 153.10 L/s, 2,427 USGPM).

Table 7-4 summarizes the anticipated water demand for the proposed development based on the City of Ottawa Guidelines – Water Distribution.

Table 7-4 – Water Demand

Design Parameter	Anticipated Demand[1] (L/min)
Average Day Demand	431.4
Max Day + Fire Flow	1,186.2 + 7,999.8= 9186
Max Hour Demand	1781.4

7.3. Watermain Analysis Results

Upon completion of the detailed calculations in order to determine the anticipated domestic water consumption and the required minimum fire flow for the proposed development, the calculation results were provided to the City of Ottawa. As a result, the above noted values were used to generate the municipal watermain network boundary conditions.

Table 7-5 below summarizes the boundary conditions provided by the City of Ottawa for the existing municipal watermain network along Montgomery and Selkirk Street.

Table 7-5– Boundary Conditions Provided by the City

Municipal Watermain Boundary Condition	Montgomery Street Connection	Selkirk Street Connection
Minimum HGL	107.2	107.2
Maximum HGL	118.2	118.2
Available Flow @ 20 psi	90 L/s	90 L/s

Table 7-6 below summarizes the calculated water demands for the proposed development under the various operating conditions and compares the anticipated operating pressures at the watermains to the normal operating pressures outlined in the City of Ottawa Design Guidelines.

Table 7-6- Watermain Analysis Results

Watermain Connection	Design Parameter	Anticipated Demand (L/s)	Approximate Design Operating Pressures (psi) / Relative Head (m)	Normal Municipal Operating Pressures (psi)
Montgomery Street	Average Demand	7.19	88 psi (61.7m)	50-70 psi
	Peak Hour Demand	29.69	72 psi (50.7m)	40-70 psi
Selkirk Street	Average Demand	7.19	88 psi (61.7m)	50-70 psi
	Peak Hour Demand	29.69	72 psi (50.7m)	40-70 psi

As indicated in the **Table 7-6** above, the results of the watermain analysis based on boundary conditions provided by the City, along Montgomery and Selkirk Street, reveal that the existing water infrastructure will not have enough pressure to support support the proposed development. During the site plan application stage, when the configuration of the proposed development is finalized, additional measures such as a) Fire separation Walls, b) Proposed water tank will be reviewed in order to support the proposed development with the required water pressure. The boundary conditions received by the City of Ottawa can be found in **Appendix E**.

According to **Table 7-6** and the information provided by the City of Ottawa, the water pressure for the average demand and the peak hour demand, result in greater values than the maximum allowed by the City's Guidelines. Hence, pressure reducing valves will be required for the proposed development at 29 Selkirk Street.

7.4. Proposed Watermain Connection

Two (2) separate connections will be provided to the proposed development. The connections will be as follows:

Montgomery Street

The proposed development will be serviced by a 200 mm diameter waterline that will distribute the entire site with domestic water and fire service. The proposed water lateral will connect on the 150mm existing watermain on Montgomery Street.

Selkirk Street

The proposed development will be serviced by a 200 mm diameter waterline that will distribute the entire site with domestic water and fire service. The proposed water lateral will connect on the 152mm existing watermain on Selkirk Street.

According to City standards the watermains will be constructed with a minimum depth of cover of 2.4m. Refer to **'Proposed Servicing Plan' Figure-3** in **Appendix F**, for the proposed water connection.

8.0 Erosion and Sediment Control

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

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

Silt fence will be installed around the perimeter of the site and will be cleaned and maintained throughout construction.

Catch basins will have filter fabric 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 extend 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.

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 following under silt barriers.
- Clean and change filter cloth at catch basins.

9.0 Site Grading

9.1. Existing Grades

The existing site is approximately 1.693 hectares and is currently occupied by one (1) single-storey commercial building and by outdoor parking area. Moreover, it is located between North River Road, Selkirk Street, Montgomery Street and Montreal Road, in the City of Ottawa. The site drains into the existing stormwater system inside the property and overland towards the adjacent right of ways (ROW).

9.2. Proposed Grades

The proposed grades will improve the existing drainage conditions to meet the City's/Regional requirements. Grades will be maintained along the property line wherever feasible and emergency overland flow will be directed towards the intersection between Montreal Road and Montgomery Street. Existing drainage patterns on adjacent properties will not be altered and stormwater runoff from the subject development will not affect the adjacent properties.

10.0 Conclusions and Recommendations

Based on our investigation, we conclude the following:

Storm Drainage

A more detailed Stormwater Management report will be prepared at the Site Plan Application. The property's existing drainage pattern is separated into two drainage areas (one flowing east towards Montgomery Street and one flowing south towards Selkirk Street).

The site stormwater discharge will be controlled to the 5-year pre-development flows according to the City of Ottawa IDF curves and one (1) proposed storm lateral will be connected to the existing 450 mm storm sewer on Montgomery Street . In order to attain the target flows and meet the City's guidelines, quantity controls will be utilized and up to 504.1 m^3 of storage will be required in total to meet the allowable flows towards Montgomery Street.

The stormwater management (SWM) system will be designed to provide enhanced level (Level 1) protection as specified by the Ministry of the Environment, Conservation and Parks (MECP). During Site Plan Application, a detailed analysis will be provided to assess the water quality on site and determine additional measures in order to achieve a minimum total suspended solids (TSS) removal of 80%.

Sanitary Sewers

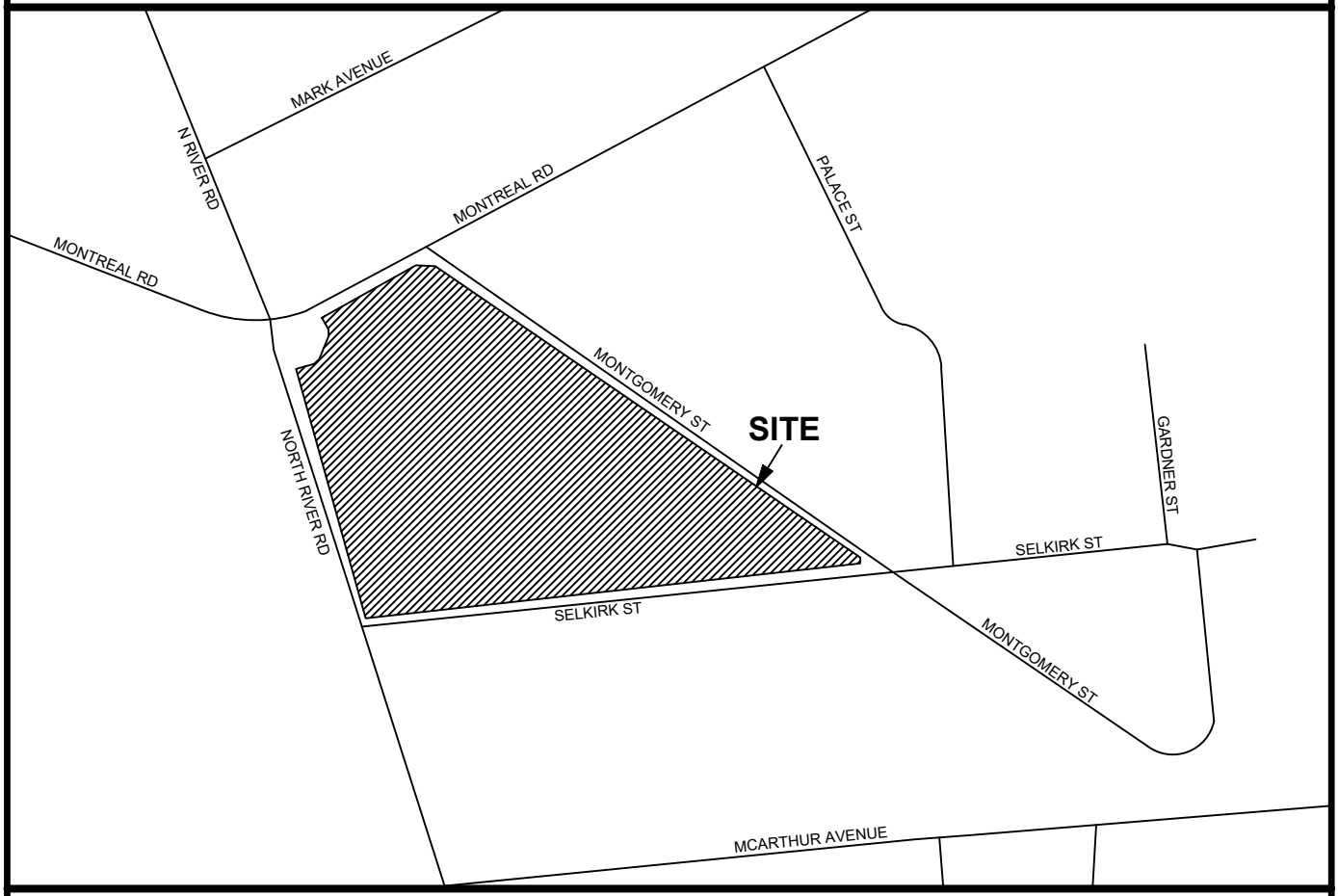
Three (3) separate connections will be provided for the proposed mixed-use development: one for Tower A; one for Tower B; and one for Tower C. The sanitary connections for Towers A and C will be to the existing 250 mm diameter sanitary sewer on Montgomery Street. The sanitary connection for Tower B will be to the existing 250 mm diameter sanitary sewer on Selkirk Street. The expected total peak sanitary discharge flow from the proposed development towards Montgomery Street, is anticipated at approximately 8.41 L/s for Tower A and 9.24 L/s for Tower C. In addition, the expected total peak sanitary discharge flow from the proposed development towards Selkirk Street, is anticipated at approximately 6.42 L/s for Tower B. According to the information provided by the City, the existing infrastructure has the capacity to support the additional sanitary flow, from the proposed development.

Water Supply

The proposed building will exceed 84.0m in height, therefore, two (2) water sources will be required according to the Ontario Building Code (OBC) to support the proposed development's sprinkler system. One proposed water service will be connected to the existing 150 mm diameter watermain on the east side of Montgomery Street and one to the existing 152 mm diameter watermain along the centerline of Selkirk Street. It is anticipated that a total design flow of 153.1 L/s will be required to support the proposed development. Based on the boundary conditions received from the City, it is revealed that additional measures should be implemented, during the Site Plan Application stage, in order to provide the required design flow to support the proposed development.

Site Grading

The proposed grades will improve the existing drainage conditions to meet the City's/Regional requirements. Grades will be maintained along the property line wherever feasible and emergency overland flow will be gravity driven to the adjacent right-of-way's (ROW).



Lithos

150 Bermondsey Road, Toronto, Ontario, M4A-1Y1

LOCATION PLAN
MIXED USE DEVELOPMENT
29 SELKIRK STREET
OTTAWA, ONTARIO

DATE:	JUNE 2020	PROJECT No:	UD19-079
SCALE:	N.T.S.	FIGURE No:	FIG 1

Lithos

150 Bermondsey Road, Toronto, Ontario, M4A-1Y1

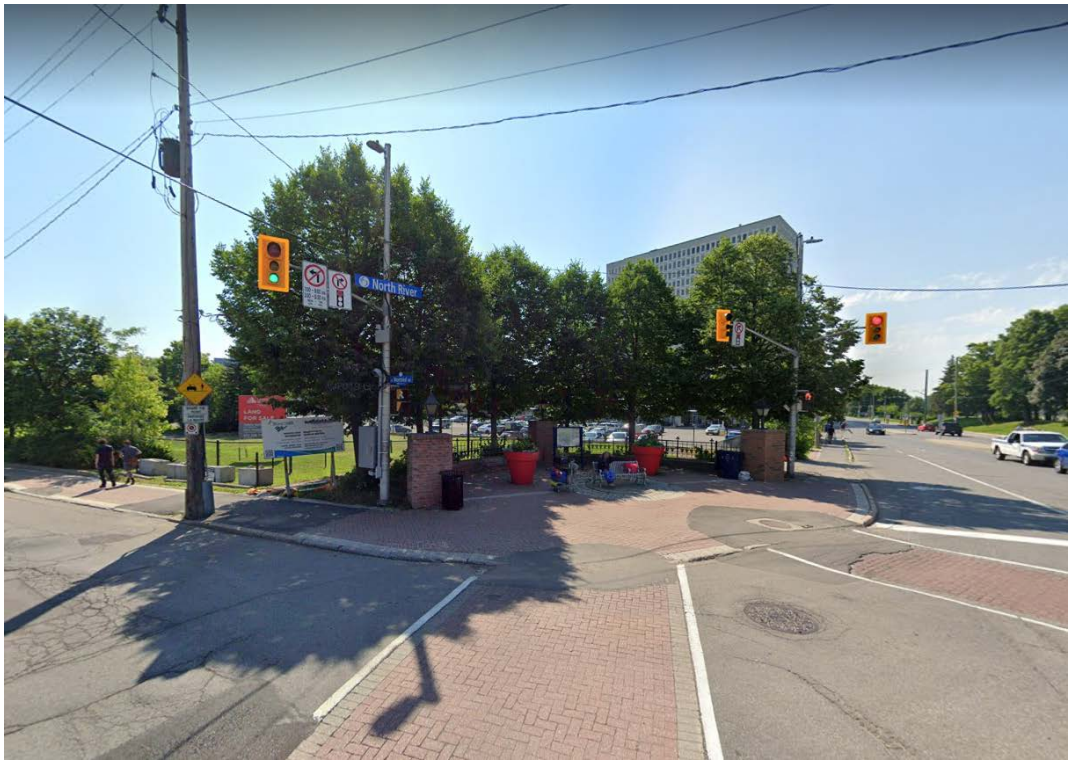
AERIAL PLAN

MIXED USE DEVELOPMENT
29 SELKIRK STREET
OTTAWA, ONTARIO

DATE:	JUNE 2020	PROJECT No:	UD19-079
SCALE:	N.T.S.	FIGURE No:	FIG 2

Appendix A

Site Photographs



North-West Corner of Property – Facing South-East

North-East Corner of Property – Facing South-West

South-East Corner of Property – Facing North-West

South-West Corner of Property – Facing North-East

Appendix B

Background Information

Notes & Legend

Denotes		
—□—	-	Survey Monument Planted
—■—	-	Survey Monument Found
SIB	-	Standard Iron Bar
SSIB	-	Short Standard Iron Bar
IB	-	Iron Bar
CC	-	Cut Cross
CP	-	Concrete Pin
IB#	-	Round Iron Bar
S&W	-	Spike & Washer
SSIB*	-	Short Standard Iron Bar
IB*	-	Iron Bar
(WIT)	-	Witness
Meas.	-	Measured
(AOG)	-	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	-	Plan 5R-12696
(P2)	-	(857) Plan, dated July 14, 2000 (Ref. 16a-49GR)
	-	Deciduous Tree
	-	Coniferous Tree
	-	Shrub
FH	-	Fire Hydrant
MH-S	-	Maintenance Hole (Sanitary)
MH-T	-	Maintenance Hole (Traffic)
MH-H	-	Maintenance Hole (Hydro)
MH	-	Maintenance Hole (Unidentified)
VC	-	Valve Chamber (Watermain)
WV	-	Water Valve
OHW	-	Overhead Wires
CB	-	Catch Basin
M-W	-	Monitoring Well
GM	-	Gas Meter
B	-	Bollard
S	-	Sign
PM	-	Parking Meter
HR	-	Handrail
MF	-	Metal Fence
CLF	-	Chain Link Fence
BF	-	Board Fence
TW	-	Top Wire
MW	-	Middle Wire
BW	-	Bottom Wire
BP	-	Brick Pillar with Light
Elev	-	Elevation
T/G	-	Top of Grate
EOA	-	Edge of Asphalt
CRW	-	Concrete Retaining Wall
SRW	-	Stone Retaining Wall
	-	Gate
UP	-	Utility Pole
AN	-	Anchor
LS	-	Light Standard
FP	-	Flag Pole
Ø	-	Diameter
65.00	-	Location of Elevations
65.00	-	Top of Concrete Curb Elevation
C/L	-	Centreline
tow	-	Top of Wall
	-	Property Line

TOPOGRAPHICAL PLAN OF SURVEY OF

LOTS 2, 4, 6, 8, 10, 12, 14, 16, 32, 33, 34, 35 AND PART OF LOT 1 REGISTERED PLAN 49 AND LOTS 14, 15, 16 AND PART OF LOTS 1, 2, 3, 4, AND 5 REGISTERED PLAN 51 AND PART OF LOT 7 JUNCTION GORE GEOGRAPHIC TOWNSHIP OF GLOUCESTER CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.
Field Work Completed March 6, 2020.

Scale 1 : 300

12 9 6 3 0 6 9 12 Metres

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 6th day of March, 2020.

Date — V. Andrew Shelp, Ontario Land Surveyor

Bearing Note

Bearings are grid, derived from the northerly limit of Selkirk Street having a bearing of N83°27'50"E as shown on a Plan by (857) dated July 14, 2000 and are referenced to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

SITE AREA = 16931,9 m²

Topographic data was collected under Winter Conditions. Snow cover and ice preclude determining location and elevation of some topographical data that is otherwise visible.

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2121743

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

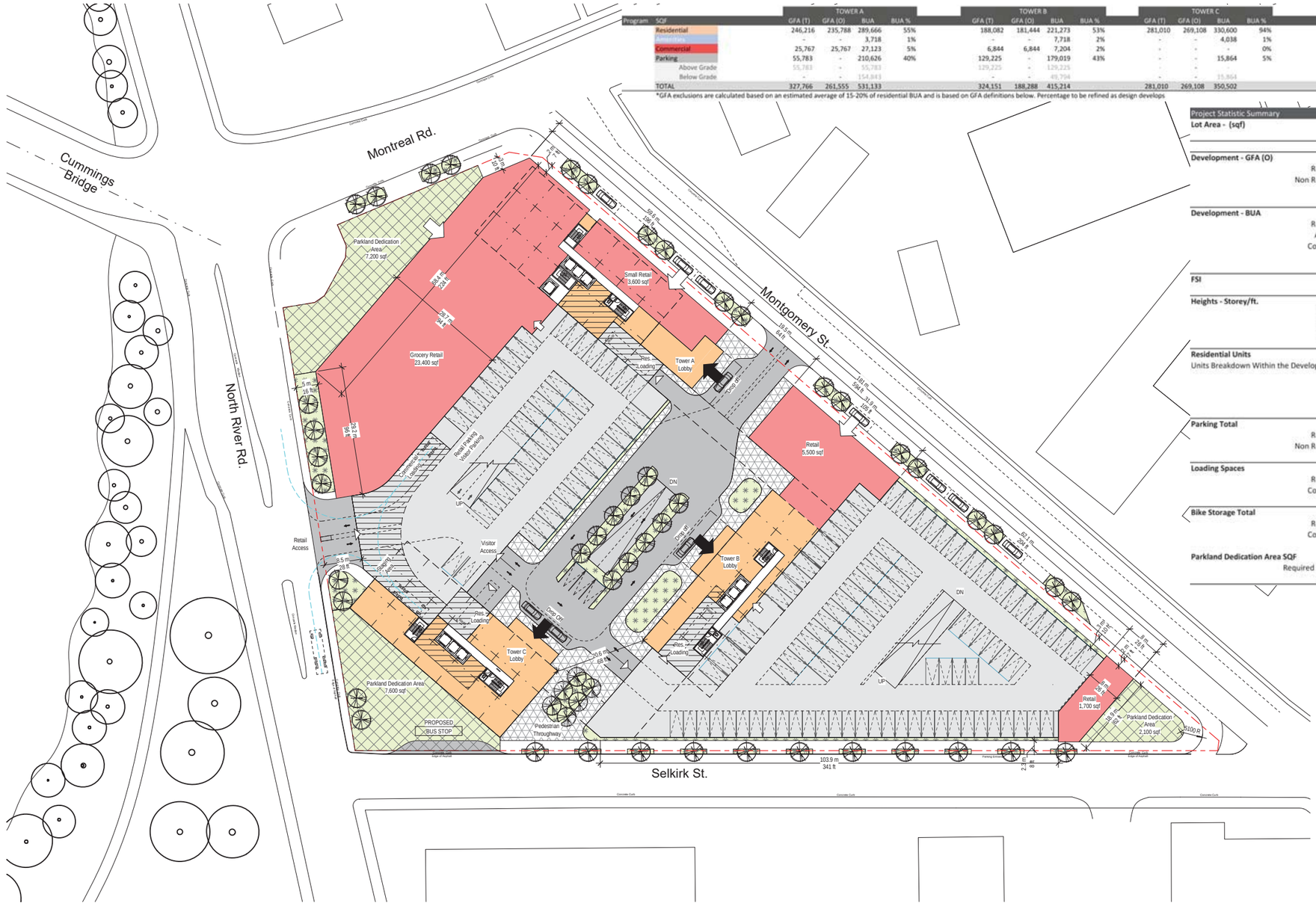
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@avsltd.com
Ontario Land Surveyors

Job No.Topo Property Survey – CAD DG

Program - SQF	TOWER A GFA (T)	TOWER A GFA (O)	TOWER A BUA	TOWER A BUA %	TOWER B GFA (T)	TOWER B GFA (O)	TOWER B BUA	TOWER B BUA %	TOWER C GFA (T)	TOWER C GFA (O)	TOWER C BUA	TOWER C BUA %	OVERALL DEVELOPMENT (A+B+C) GFA (T)	OVERALL DEVELOPMENT (A+B+C) GFA (O)	OVERALL DEVELOPMENT (A+B+C) BUA	OVERALL DEVELOPMENT (A+B+C) BUA %
Residential	246,216	235,788	289,666	55%	188,082	181,444	221,273	53%	281,010	269,108	330,600	94%	715,308	686,340	841,539	65%
Amenities	-	-	3,718	1%	-	-	7,718	2%	-	-	4,038	1%	-	-	15,474	1%
Commercial	25,767	25,767	27,123	5%	6,844	6,844	7,204	2%	-	-	-	0%	32,611	32,611	34,327	3%
Parking	55,783	-	210,626	40%	129,225	-	179,019	43%	-	-	15,864	5%	185,008	-	405,509	31%
Above Grade	55,783	-	55,783		129,225	-	129,225		-	-	-		185,008	-	185,008	
Below Grade	-	-	154,843		-	-	49,794		-	-	15,864		-	-	220,501	
TOTAL	327,766	261,555	531,133		324,151	188,288	415,214		281,010	269,108	350,502		932,927	718,951	1,296,849	

*GFA exclusions are calculated based on an estimated average of 15-20% of residential BUA and is based on GFA definitions below. Percentage to be refined as design develops

Project Statistic Summary			
Lot Area - (sqf)		**178,000**	16,537
		SQF	SQM
Development - GFA (O)		**718,951**	66,792
	Residential	686,340	63,763
	Non Residential	32,611	3,030
Development - BUA		**1,296,849**	120,480
	Residential	841,539	78,181
	Amenities	15,474	1,438
	Commercial	34,327	3,189
	Parking	405,509	37,673
FSI		**4.0**	
Heights - Storey/ft.			
	Tower A	28 Storeys/285'	(87 m)
	Tower B	22 Storeys/226'	(69 m)
	Tower C	32 Storeys/325'	(99 m)
Residential Units		**1,003**	
Units Breakdown Within the Development			
	1bdr	617	62%
	2bdr	308	31%
	3bdr	78	8%
Parking Total		**978**	
	Residential	898	
	Non Residential	80	
Loading Spaces		**5**	
	Residential	3	
	Commercial	2	
Bike Storage Total		**502**	
	Residential	502	
	Commercial	0	
Parkland Dedication Area SQF			
	Required (10% Lot)	17,800	1,654
	Provided	16,900	1,570



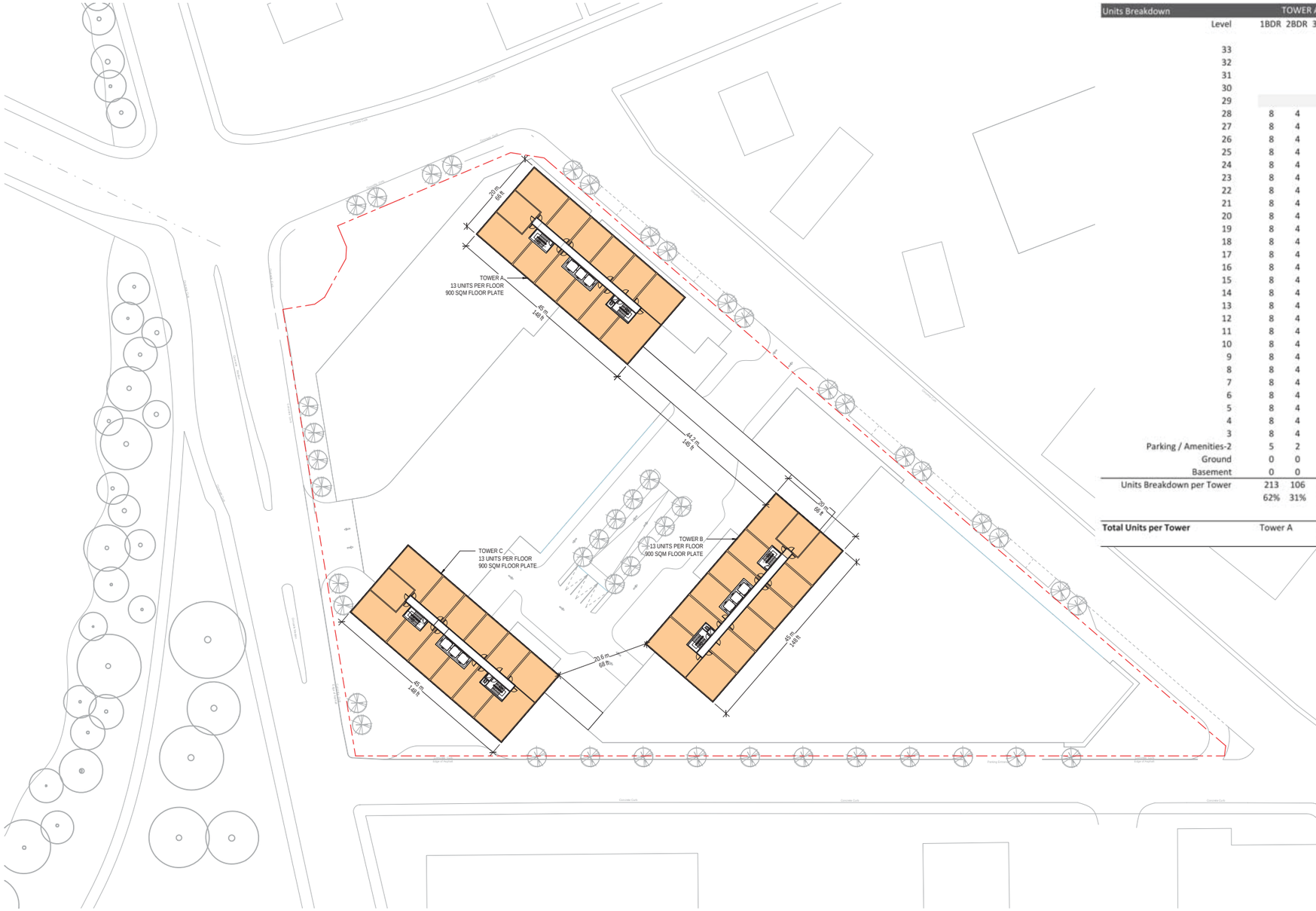
April 17, 2020

A101

3-33 Selkirk St.

Ground Level

As indicated



Units Breakdown	TOWER A			TOWER B			TOWER C		
Level	1BDR	2BDR	3BDR	1BDR	2BDR	3BDR	1BDR	2BDR	3BDR
33									
32							8	4	1
31							8	4	1
30							8	4	1
29							8	4	1
28	8	4	1				8	4	1
27	8	4	1				8	4	1
26	8	4	1				8	4	1
25	8	4	1				8	4	1
24	8	4	1				8	4	1
23	8	4	1				8	4	1
22	8	4	1	8	4	1	8	4	1
21	8	4	1	8	4	1	8	4	1
20	8	4	1	8	4	1	8	4	1
19	8	4	1	8	4	1	8	4	1
18	8	4	1	8	4	1	8	4	1
17	8	4	1	8	4	1	8	4	1
16	8	4	1	8	4	1	8	4	1
15	8	4	1	8	4	1	8	4	1
14	8	4	1	8	4	1	8	4	1
13	8	4	1	8	4	1	8	4	1
12	8	4	1	8	4	1	8	4	1
11	8	4	1	8	4	1	8	4	1
10	8	4	1	8	4	1	8	4	1
9	8	4	1	8	4	1	8	4	1
8	8	4	1	8	4	1	8	4	1
7	8	4	1	8	4	1	8	4	1
6	8	4	1	8	4	1	8	4	1
5	8	4	1	8	4	1	8	4	1
4	8	4	1	8	4	1	8	4	1
3	8	4	1	8	4	1	8	4	1
Parking / Amenities-2	5	2	1	0	0	0	4	2	1
Ground	0	0	0	0	0	0	0	0	0
Basement	0	0	0	0	0	0	0	0	0
Units Breakdown per Tower	213	106	27	160	80	20	244	122	31
	62%	31%	8%	62%	31%	8%	61%	31%	8%

Total Units per Tower	Tower A	346	Tower B	260	Tower C	397
		34%		26%		40%

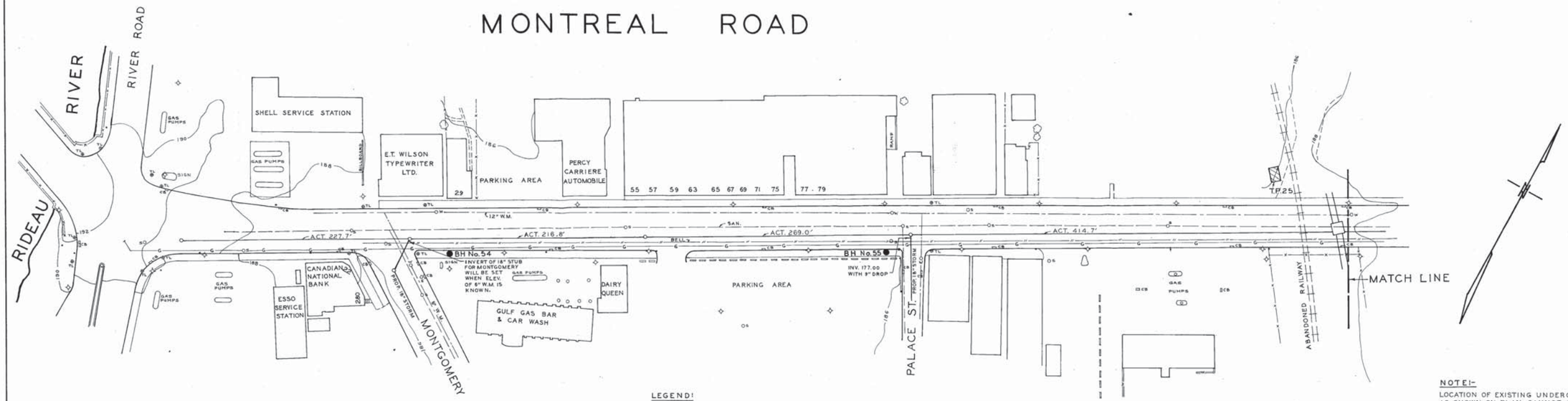
LEGEND

- PROPERTY LINE
- SETBACK
- TOWER ABOVE
- MAIN BUILDING ENTRANCE
- SECONDARY ENTRANCE
- VEHICLE ENTRANCE/EXIT
- PROPOSED TREE
- PARKLAND DEDICATION AREA

N

0 1 5 10 20 M

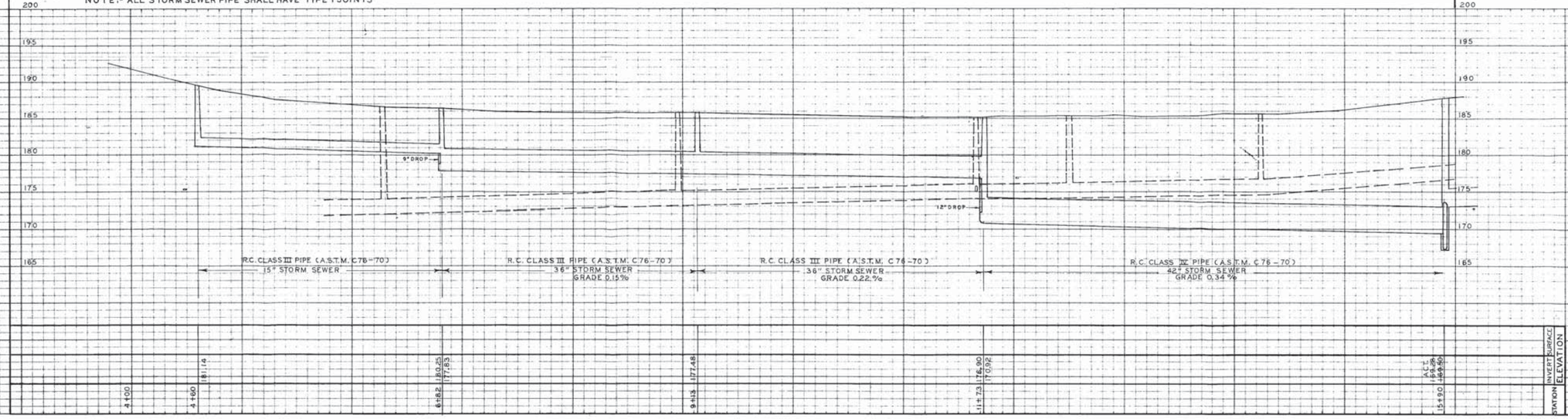
MONTREAL ROAD



LEGEND!
- SANITARY SEWER
- B.T.CO.
- GAS
- WATERMAIN

NOTE!-
LOCATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON PLAN CANNOT BE GUARANTEED BY THE ENGINEER.
THE CONTRACTOR MUST VERIFY LOCATION OF UTILITES WITH REPRESENTATIVES OF COMPANIES.

NOTE!- ALL STORM SEWER PIPE SHALL HAVE TYPE I JOINTS



DATE	SUBJECT	DRWN. BY	APPD. BY
MAR.11,'75	AS BUILT	JNT	NIM

REVISIONS

CORPORATION OF THE CITY OF VANIER

MONTREAL ROAD

RIVER ROAD TO ABANDONED RAILWAY

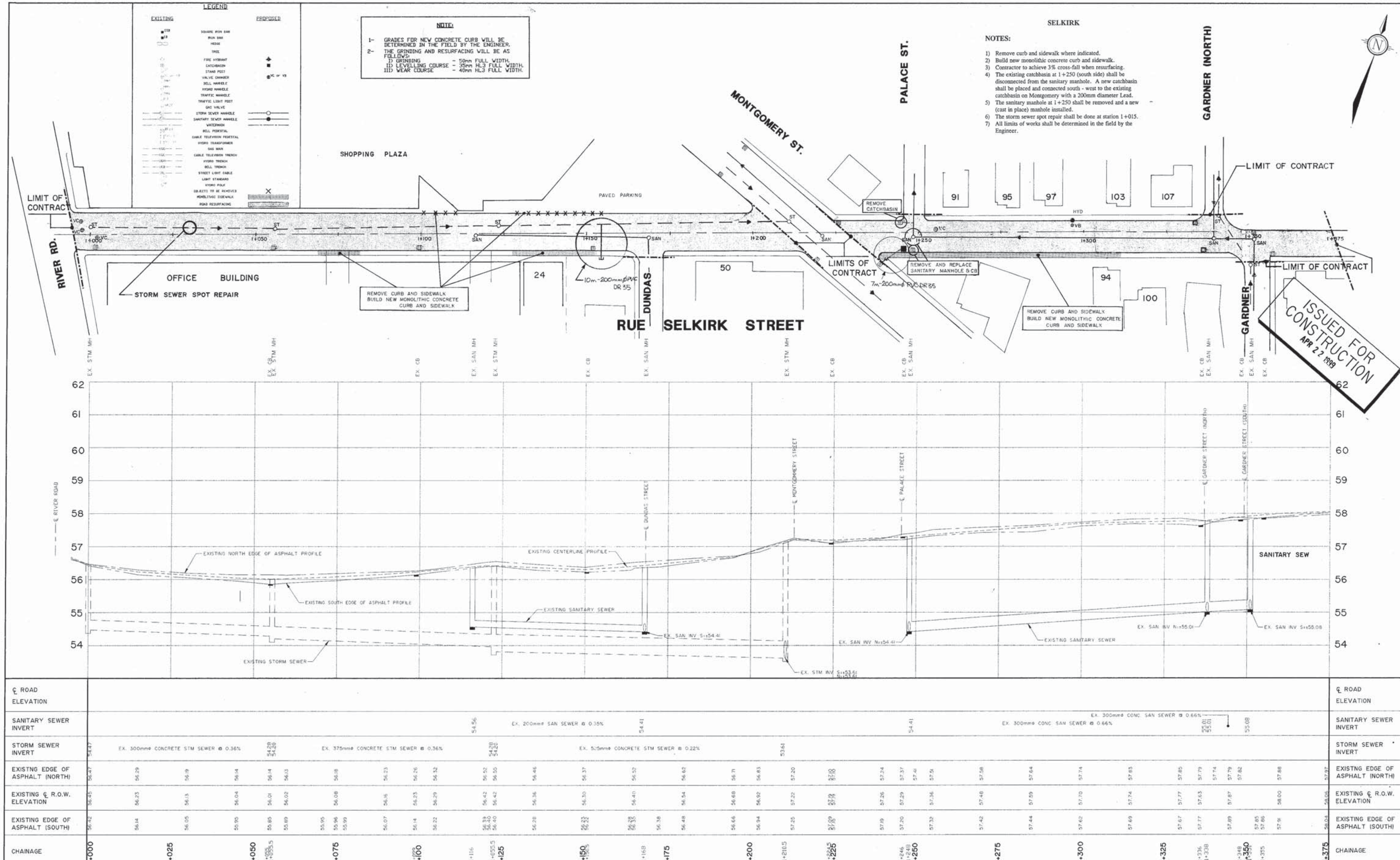
McROSTIE GENEST MIDDLEMISS & ASSOCIATES LTD. CONSULTING ENGINEERS
& ASSOCIÉS LTÉE INGÉNIEURS CONSEILS

J. Lemoan
CITY ENGINEER OF VANIER

DESIGNED BY: V. Sim & Mitchell
DRAWN BY: V.S./J.T.
CHECKED BY
DATE: 08 AUG 73

SCALES:- HORIZ. 1"=40' VERT. 1"=6'
JOB No. E.2209
2209/73/1

VA-254



THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY

SCALE — HORIZONTAL 1:500 (5m 0 15m) — VERTICAL 1:50 (0.5m 0 1.5m)

DESIGN YTS | CHECKED | DRAWN RRC | CHECKED | APPROVED

LICENSED PROFESSIONAL ENGINEER — Y.T.SIMONEAU — PROVINCE OF ONTARIO

Ville de / City of VANIER

ATREL Engineering Ltd Ltée
Engineers - Ingénieurs
380 LAURIER ST., ROCKLAND, ONTARIO K4K 1G2
TEL.: (613) 446-7423 FAX: (613) 446-7425

ROAD GRINDING AND RESURFACING

RUE SELKIRK STREET

PLAN AND PROFILE
RIVER RD. TO DEAD END
STATION 1+000 TO STATION 1+375

CLIENT No. 185
PROJECT No. 980605
DATE JULY, 1998
DRAWING No. 980605-P3

Record Drawing

These drawings have been prepared using information from third parties. Any changes made outside the contract, or after contract completion or the date of issue (whichever is earlier) may not be reflected in the drawings. Users are advised to take sufficient steps to field verify equipment, layout, locations, dimensions and elevations. R.V. Anderson Associates Limited / Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions based on, this information.

LOCAL SERVICING — Stantec

TRUNK SEWER — R.V. Anderson Associates Limited, engineering · environment · infrastructure

NO.		BY	DATE
04	99% U.C. & M.O.E. C of A	BG/TK	19/04/06
05	TENDER	BG/TK	06/01/06
06	FINAL TENDER	BG/TK	19/06/06
07	ISSUED FOR CONSTRUCTION	BG/TK	18/00/06
08	AS-BUILT	MZ/JK	30/11/09
09	REVISED AS-BUILT	JK	29/04/10

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

RIDEAU RIVER COLLECTOR SEWER TWINNING

NORTH RIVER ROAD from WRIGHT STREET to MONTREAL ROAD, VANIER

PLAN & PROFILE STATION 0+000 TO 0+175

W. NEWELL, P.ENG. — Director Infrastructure Services (Acting)

W. BENNETT, P.ENG. — Manager Construction Services

Dwn: TK/BJG | Chkd: JCK/MJL | Des: JCK/FW | Chkd: GAB/BB

Ottawa

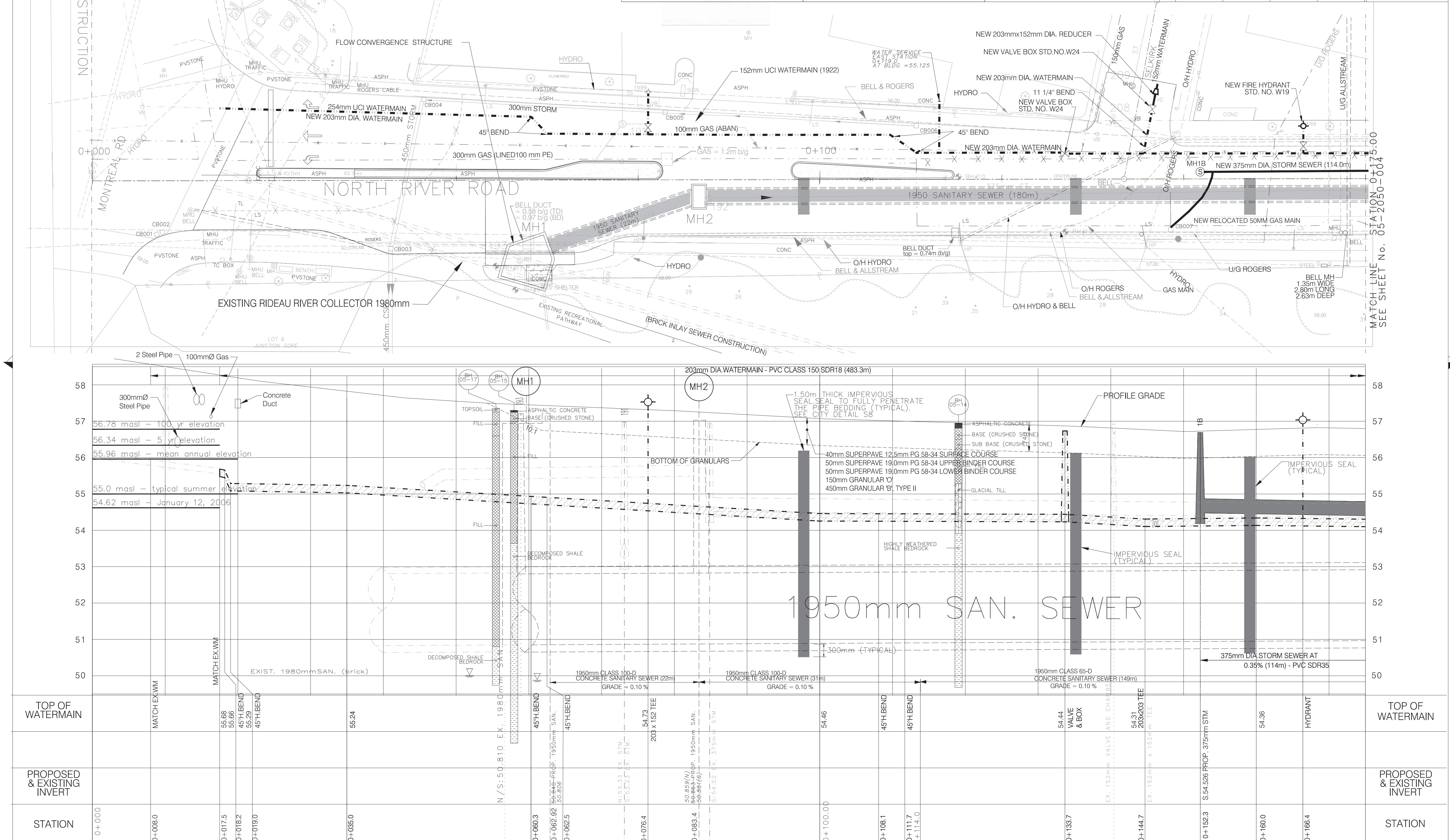
CONTRACT NO. ISB05-2050

DWG. NO. 05-2050-003

SHEET 3 OF 12

Date: JANUARY 2006

Scale: HORIZONTAL 1:250, VERTICAL 1:50



LIMIT OF CONSTRUCTION
305mm WATERMAIN
FLOW CONVERGENCE STRUCTURE
254mm UCI WATERMAIN
NEW 203mm DIA. WATERMAIN
300mm STORM
45° BEND
300mm GAS (LINED100 mm PE)
152mm UCI WATERMAIN (1922)
100mm GAS (ABAN)
BELL & ROGERS
NORTH RIVER ROAD
MONTREAL RD
1950 SANITARY SEWER (180m)
1950 SANITARY SEWER (22m)
MH1
MH2
MH1B
NEW 203mmx152mm DIA. REDUCER
NEW VALVE BOX STD.NO.W24
NEW 203mm DIA. WATERMAIN
11 1/4° BEND
NEW VALVE BOX STD. NO. W24
NEW FIRE HYDRANT STD. NO. W19
NEW 375mm DIA. STORM SEWER (114.0m)
NEW RELOCATED 50MM GAS MAIN
EXISTING RIDEAU RIVER COLLECTOR 1980mm
(BRICK INLAY SEWER CONSTRUCTION)
EXISTING RECREATIONAL PATHWAY
BELL MH 1.35m WIDE 2.80m LONG 2.63m DEEP
MATCH LINE SEE SHEET No. 05-2050-004 STATION 0+175.00
203mm DIA.WATERMAIN - PVC CLASS 150 SDR18 (483.3m)
56.78 masl - 100 yr elevation
56.34 masl - 5 yr elevation
55.96 masl - mean annual elevation
55.0 masl - typical summer elevation
54.62 masl - January 12, 2006
1.50m THICK IMPERVIOUS SEAL SEAL TO FULLY PENETRATE THE PIPE BEDDING (TYPICAL). SEE CITY DETAIL S8
PROFILE GRADE
BOTTOM OF GRANULARS
40mm SUPERPAVE 12.5mm PG 58-34 SURFACE COURSE
50mm SUPERPAVE 19.0mm PG 58-34 UPPER BINDER COURSE
50mm SUPERPAVE 19.0mm PG 58-34 LOWER BINDER COURSE
150mm GRANULAR 'A'
450mm GRANULAR 'B', TYPE II
IMPERVIOUS SEAL (TYPICAL)
1950mm SAN. SEWER
EXIST. 1980mmSAN. (brick)
1950mm CLASS 100-D CONCRETE SANITARY SEWER (22m) GRADE = 0.10 %
1950mm CLASS 100-D CONCRETE SANITARY SEWER (31m) GRADE = 0.10 %
1950mm CLASS 65-D CONCRETE SANITARY SEWER (149m) GRADE = 0.10 %
375mm DIA STORM SEWER AT 0.35% (114m) - PVC SDR35
TOP OF WATERMAIN
PROPOSED & EXISTING INVERT
STATION

NOTES AND SPECIFICATIONS

1) THE PLAN & PROFILE DATA IS TAKEN, IN WHOLE OR IN PART, FROM ORIGINAL MANUSCRIPTS SUPPLIED BY THE CITY OF VANIER.

2) EXACT LIMITS OF WORK SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

3) ALL WORK SHALL BE PERFORMED AS APPLICABLE IN ACCORDANCE WITH CITY OF VANIER STANDARD SPECIFICATIONS AND PREVAILENT OPSS STANDARDS.

4) CO-ORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.

5) FOR FRAMES & COVERS, SEE SPECIAL PROVISIONS SP-4

6) THE LONGITUDINAL ROAD PROFILE IS TO MATCH EXISTING CURB OR BIBEWALK.

7) EXACT LOCATIONS AND LIMITS OF AREAS TO BE GRINDED SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

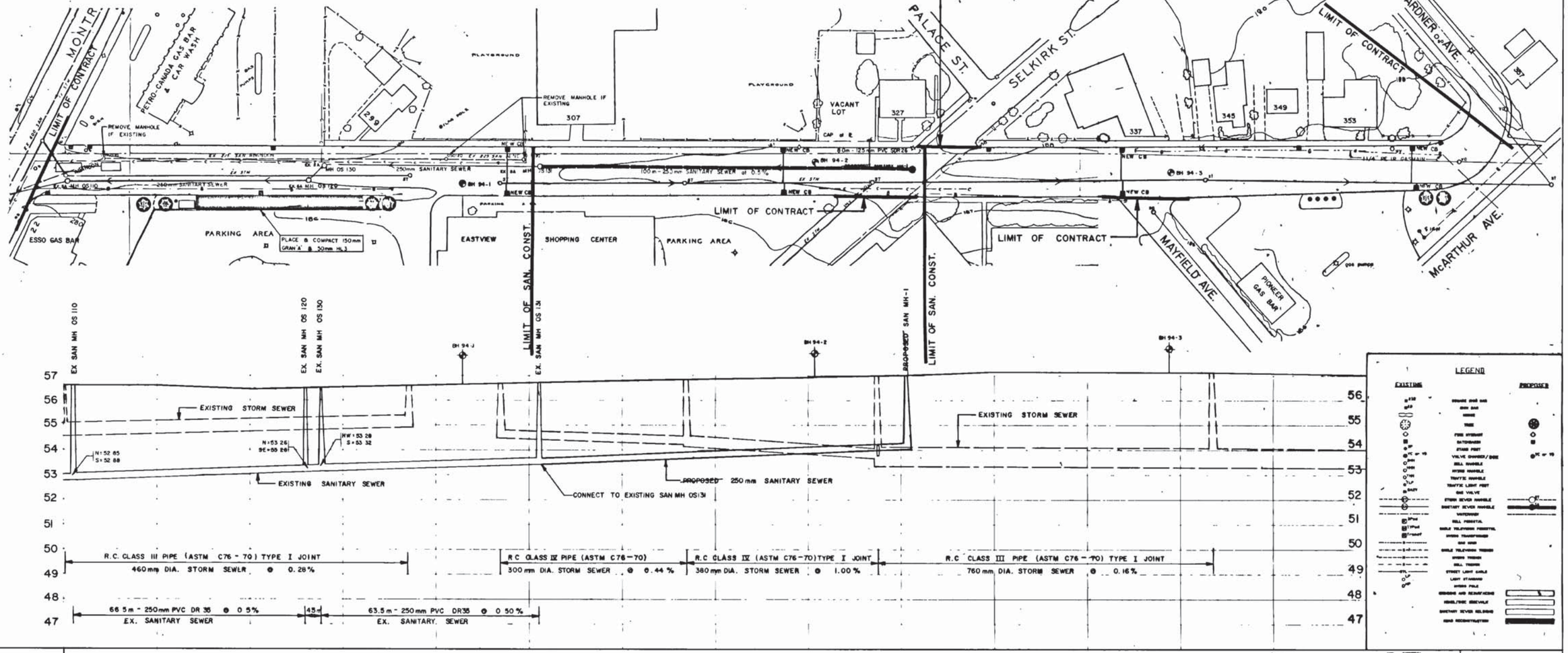
8) THE GRINDING AND RESURFACING WILL BE AS FOLLOW:
i) GRINDING 50mm PARTIAL WIDTH
ii) TAPER PADDING 50mm AT CENTRE TO 0 mm
iii) WEAR COURSE 50mm FULL WIDTH

9) STRUCTURES SHALL BE ADJUSTED TO MATCH THE NEW GRADING AND DRAINAGE PROFILE.

10) REFER TO SOILS REPORT PREPARED BY CONSULTING ENGINEERS FOR SUBSURFACE CONDITIONS.

11) PIPE SIZE AND MATERIAL USED SHALL BE AS PER MANUFACTURERS STANDARDS AND SPECIFICATIONS.

RUE MONTGOMERY STREET



LEGEND

EXISTING | PROPOSED

STONE END SUB
CATCH BASIN
MANHOLE
TREE
FIRE HYDRANT
CATCHBASIN
STONE POST
VALVE CHAMBER / GATE
BELL MANHOLE
HYDRO MANHOLE
TRAFFIC MANHOLE
TRAFFIC LIGHT POST
GAS VALVE
STORM SEWER MANHOLE
SANITARY SEWER MANHOLE
WATERMAIN
BELL PEDESTAL
CABLE TELEVISION PEDESTAL
HYDRO TRANSFORMER
GAS MAIN
CABLE TELEVISION TRENCH
HYDRO TRENCH
BELL TRENCH
STREET LIGHT CABLE
LIGHT STANDARD
HYDRO POLE
GUARDRAIL AND SEMAPHORE
HEADWALL END SECTION
SANITARY SEWER RELINING
ROAD RECONSTRUCTION

AS-BUILT

℄ ROAD ELEVATION	
TOP OF WATERMAIN ELEVATION	
STORM SEWER INVERT	54.69 54.74 — 55.00 — 54.90 — 54.28 54.23 — 53.69 53.39 — 53.24
SANITARY SEWER INVERT	53.57 53.97 — ~~95 @ 100m~~ 250mm SAN at ~~0.5%~~ 0.67% PVC SDR 35 ~~PROPOSED~~ — 54.07
EXISTING ℄ R.O.W. ELEVATION	
CHAINAGE	0+982.5 — 1+000 — 1+015 — 1+049 — 1+025 — 1+042 — 1+050 — 1+067 — 1+075 — 1+077.5 — 1+100 — 1+117 — 1+125 — 1+150 — 1+168 — 1+176 — 1+200 — 1+225 — 1+250 — 1+258 — 1+275 — 1+300

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No	REVISION	DATE	BY
1	AS-BUILT	OCT 26 94	AMB

SCALE
HORIZONTAL 1:500 (0m 0 10m)
VERTICAL 1:75 (1m 0 2m)

DESIGN YTS
CHECKED MDS
DRAWN ESL
CHECKED
APPROVED

LICENSED PROFESSIONAL ENGINEER M. DESJARDINS PROVINCE OF ONTARIO

CITY OF VANIER VILLE DE

ATREL Engineering Ltd. Engineers - Ingénieurs
SUITE 105, 2303 LAURIER ST., ROCKLAND, ONTARIO
TEL (613) 446-7423

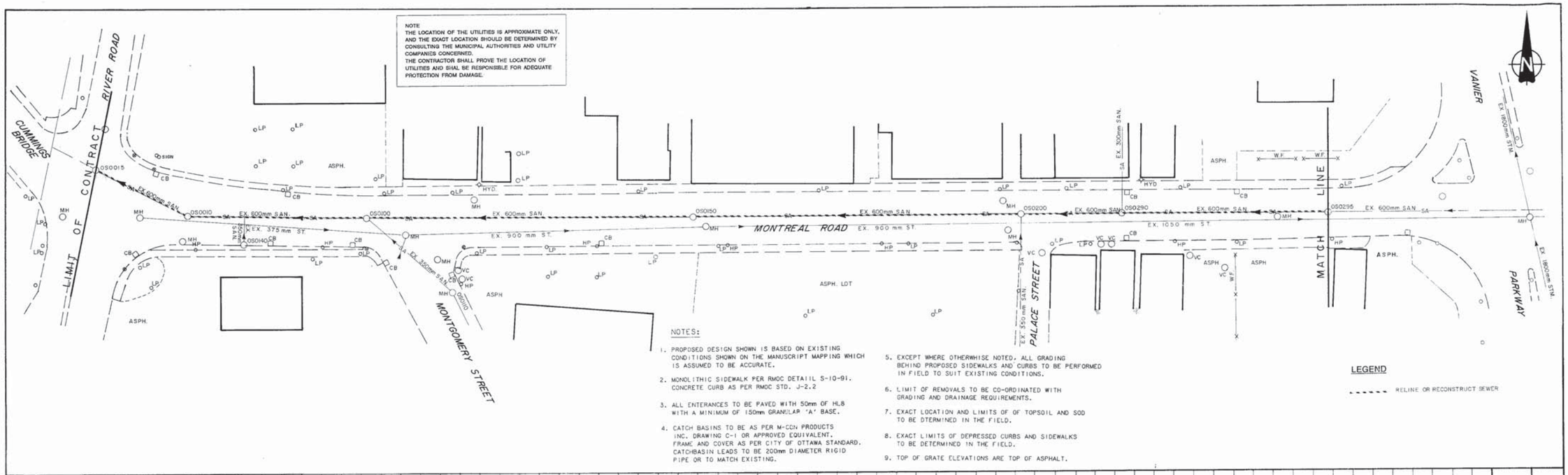
STORM SEWER AND ROAD RESURFACING

RUE MONTGOMERY STREET

PLAN AND PROFILE
MONTREAL RD. TO SELKIRK ST.
STA 1+000 TO STA 1+275

CLIENT No. 185
PROJECT No 931208
DATE APRIL 1994
DRAWING No 931208-9

NOTE
THE LOCATION OF THE UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED.
THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHAL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE.



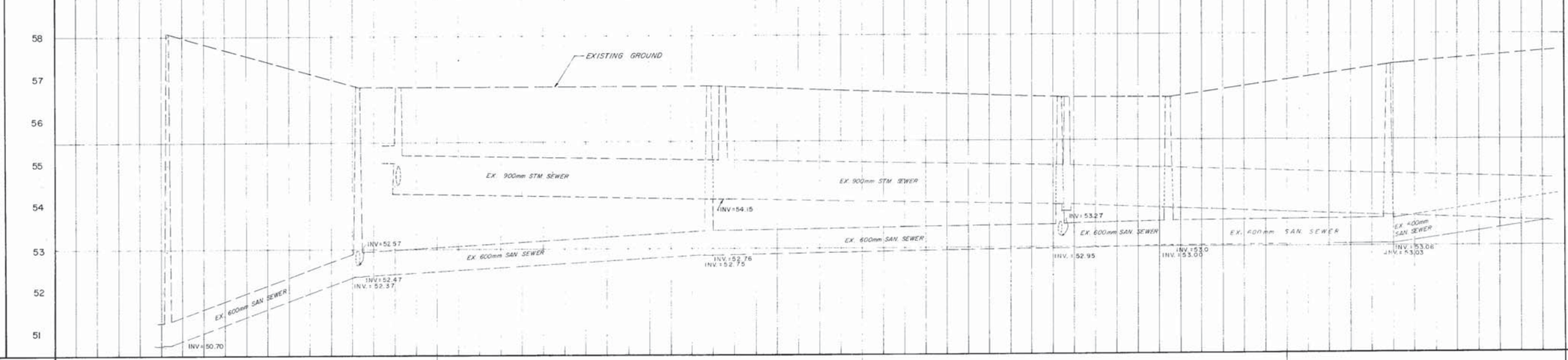
NOTES:

1. PROPOSED DESIGN SHOWN IS BASED ON EXISTING CONDITIONS SHOWN ON THE MANUSCRIPT MAPPING WHICH IS ASSUMED TO BE ACCURATE.
2. MONOLITHIC SIDEWALK PER RMOC DETAIIL S-10-91. CONCRETE CURB AS PER RMOC STD. J-2.2
3. ALL ENTERANCES TO BE PAVED WITH 50mm OF HL8 WITH A MINIMUM OF 150mm GRANULAR 'A' BASE.
4. CATCH BASINS TO BE AS PER M-CON PRODUCTS INC. DRAWING C-1 OR APPROVED EQUIVALENT. FRAME AND COVER AS PER CITY OF OTTAWA STANDARD. CATCHBASIN LEADS TO BE 200mm DIAMETER RIGID PIPE OR TO MATCH EXISTING.
5. EXCEPT WHERE OTHERWHISE NOTED, ALL GRADING BEHIND PROPOSED SIDEWALKS AND CURBS TO BE PERFORMED IN FIELD TO SUIT EXISTING CONDITIONS.
6. LIMIT OF REMOVALS TO BE CO-ORDINATED WITH GRADING AND DRAINAGE REQUIREMENTS.
7. EXACT LOCATION AND LIMITS OF OF TOPSOIL AND SOD TO BE DTERMINED IN THE FIELD.
8. EXACT LIMITS OF DEPRESSED CURBS AND SIDEWALKS TO BE DETERMINED IN THE FIELD.
9. TOP OF GRATE ELEVATIONS ARE TOP OF ASPHALT.

LEGEND

------ RELINE OR RECONSTRUCT SEWER

ELEVATIONS



ELEVATIONS

608.2

No.	DATE	REVISIONS	BY
1	21/06/91	ISSUED FOR TENDER	RB

SCALES
HORIZONTAL 0 5 10 20
VERTICAL 0 0.5 1.0 2.0

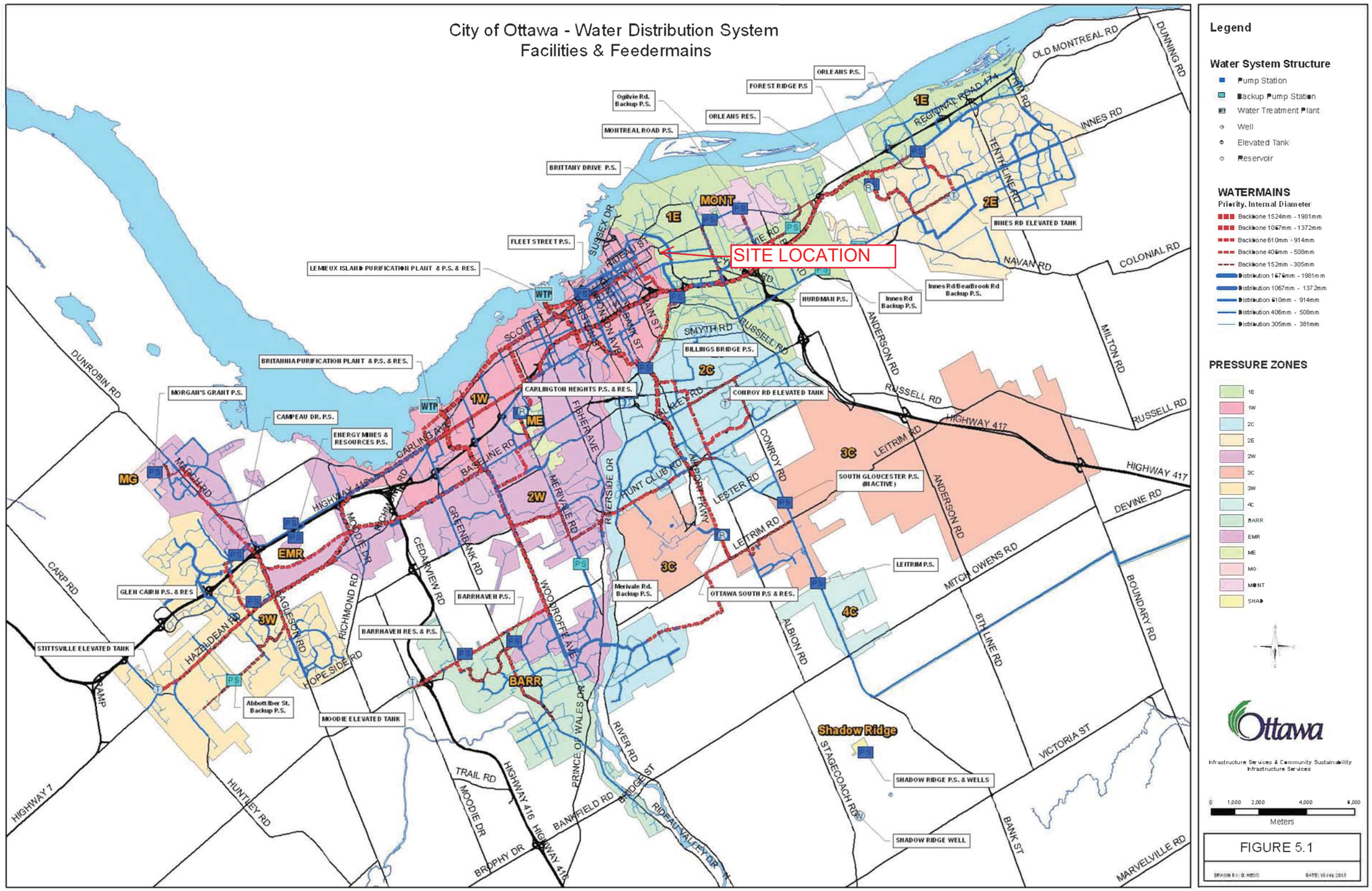
UMA Engineering Ltd.
Engineers & Planners
Ottawa, Ontario

DESIGN
CHECKED
DRAWN
CHECKED
APPROVED

THE CORPORATION OF THE CITY OF VANIER
LA CORPORATION DE LA VILLE DE VANIER

MONTREAL ROAD
SANITARY SEWER REHABILITATION
RIVER ROAD TO VANIER PARKWAY

PROJ No.
CONT No.
DATED MAY 1991
DWG No. S-3



Source: City of Ottawa GIS infrastructure database

Figure 5.1: City of Ottawa Water Distribution System, Facilities and Feedermains

4.1 General Content

☒ Executive Summary (for larger reports only).

Comments: *Page iii*

☒ Date and revision number of the report.

Comments: *Page i*

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

Comments: *Figure 1 and Figure 3 in Appendix F*

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

Comments: *Figure 3 in Appendix F*

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

Comments: *Appendix B*

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

Comments: *N/A*

☒ 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.

Comments: *N/A. Reference to the City's guidelines are included in Section 4.0 pg. 2*

☒ Statement of objectives and servicing criteria.

Comments: *Section 4.2 (Stormwater Criteria), Section 4.3 (Sanitary Sewer Criteria), Section 4.4 (Water Usage Criteria)*

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

Comments: *Section 5.1 (ex. storm sewers), Section 6.1 (ex. sanitary sewers), Section 7.1 (ex. water system)*

☐ 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).

Comments: *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.

Comments: *N/A during Zoning Application*

☐ 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.

Comments: *N/A*

☐ Proposed phasing of the development, if applicable.

Comments: *N/A*

☐ Reference to geotechnical studies and recommendations concerning servicing.

Comments: *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

Comments: *Existing and proposed structures and parking areas are included in topo survey and architectural dwgs. Name and owner info. can be found in zba cover letter.*

4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available

Comments: *Not available*

☒ Availability of public infrastructure to service proposed development

Comments: *Section 5.2.1.1, Section 6.3*

☒ Identification of system constraints

Comments: *N/A*

☒ Identify boundary conditions

Comments: *Upon receipt of the City of Ottawa boundary conditions.*

☒ Confirmation of adequate domestic supply and pressure

Comments: *Upon receipt of the City of Ottawa boundary conditions.*

☒ 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.

Comments: *Section 7.2 and Appendix E*

☒ 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.

Comments: *N/A*

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

Comments: *N/A*

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

Comments: *N/A*

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

Comments: *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

Comments: *Appendix E*

☒ 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.

Comments: *Appendix E and Figure-3 at Appendix F*

☐ 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.

Comments: *N/A*

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

Comments: *Section 4.4*

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

Comments: *Appendix B*

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).

Comments: *Section 4.3*

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

Comments: *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.

Comments: *N/A*

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

Comments: *Section 6.1*

☒ 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)

Comments: *Section 6.2*

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

Comments: *N/A*

☐ Special considerations such as contamination, corrosive environment etc.

Comments: *N/A*

4.4 Development Servicing Report: Stormwater

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

Comments: N/A

☒ Analysis of available capacity in existing public infrastructure.

Comments: Section 5.3

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

Comments: DAP1 and 2 in Appendix C

☒ 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.

Comments: Section 5.2.2

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

Comments: N/A during Zoning Application Stage

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

Comments: Section 5.3

☐ Set-back from private sewage disposal systems.

Comments: N/A

☐ Watercourse and hazard lands setbacks.

Comments: N/A

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

Comments: N/A

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

Comments: *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).

Comments: *Appendix C*

☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.

Comments: *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.

Comments: *Section 5.2 and Appendix C*

☐ Any proposed diversion of drainage catchment areas from one outlet to another.

Comments: *N/A*

☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.

Comments: *Section 5.3 and Figure 3 in Appendix F*

☒ 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.

Comments: *Section 5.3 and Figure 3 in Appendix F*

☒ Identification of potential impacts to receiving watercourses

Comments: *Section 5.3 and Figure 3 in Appendix F*

☒ Identification of municipal drains and related approval requirements.

Comments: *Section 5.3 and Figure 3 in Appendix F*

☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.

Comments: *Section 5.3 and Figure 3 in Appendix F*

☐ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

Comments: *N/A*

☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.

Comments: *N/A*

☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.

Comments: *Section 8.0*

☐ Identification of floodplains - proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.

Comments: *N/A*

☐ Identification of fill constraints related to floodplain and geotechnical investigation.

Comments: *N/A*

4.5 Approval and Permit Requirements: Checklist

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

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

Comments: *N/A*

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

Comments: *N/A*

☐ Changes to Municipal Drains.

Comments: *N/A*

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

Comments: *N/A*

4.6 Conclusion Checklist

☒ Clearly stated conclusions and recommendations

Comments: *Section 9.0*

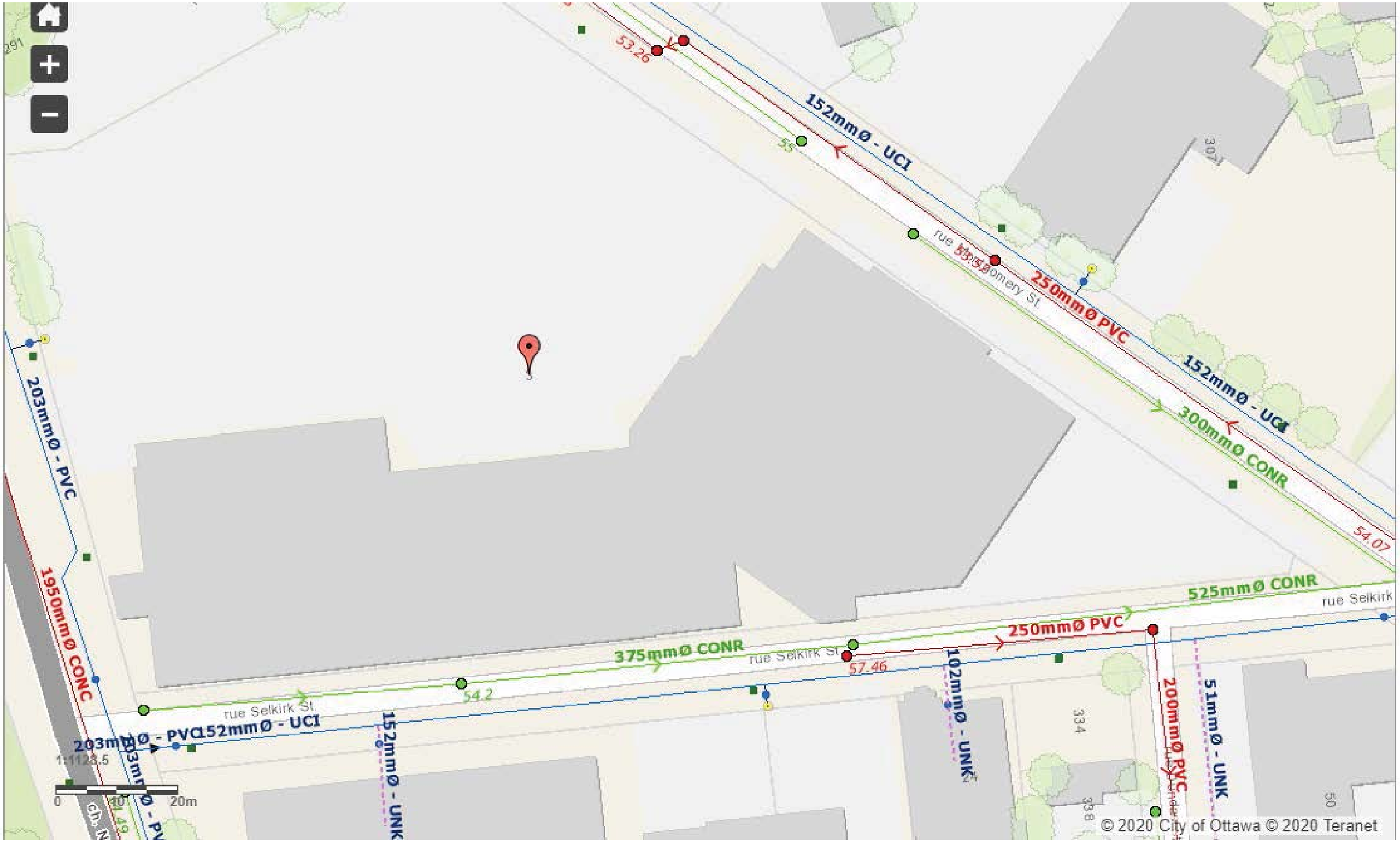
☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.

Comments: *N/A*

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

Comments: *Signed and stamped by Ontario engineer*


305mmØ - UC1
203mmØ - PVC
305mmØ - PVC
250mmØ PVC
102mmØ - UNK
152mmØ - UC1
ch. de Montreal Rd.
rue Montgomery St.
ch. North River Rd.
2100mmØ BRICK
1950mmØ CONC
2100mmØ BRICK
203mmØ - PVC
54.2
55.21
53.26
54.5
52.74
1:1128.5
0
10
20m
© 2020 City of Ottawa © 2020 Teranet


53.26
152mmØ - UCI
250mmØ PVC
152mmØ - UCI
300mmØ CONR
54.07
rue Montgomery St
203mmØ - PVC
1950mmØ CONC
375mmØ CONR
54.2
rue Selkirk St
152mmØ - UCI
152mmØ - UNK
57.46
102mmØ - UNK
250mmØ PVC
525mmØ CONR
rue Selkirk
200mmØ PVC
51mmØ - UNK
334
338
50
0
10
20m
© 2020 City of Ottawa © 2020 Teranet

From: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Sent: December 11, 2019 11:26 AM
To: Matina Sakoutsiou <matinas@lithosgroup.ca>
Cc: 'Fel Petti' <fel@mainandmain.ca>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: FW: 29 Selkirk Street - boundary conditions

Hi Matina,
Please see the email below related to the requested water boundary conditions.
Sanitary sewer capacity,
The sanitary sewer on Dundas, down street of Selkirk Street, has very limited capacity and will not be able to handle the proposed 17.0l l/s while Montgomery has reasonable capacity, which can handle more than the proposed discharge (4.22 L/s) according to the received information form the Wastewater Modeling Group.
I would suggest that you reverse the discharges i.e. 17.01 l/s into Montgomery and 4.22 l/s into Selkirk if possible. If not, please split the total discharge into halfway and discharge into two sewers.
Thanks,
Mohammad Abdul Mottalib, P. Eng.
Extension: 27798

From:
Sent: November 27, 2019 11:09 AM
To: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: 29 Selkirk Street - boundary conditions

The following are boundary conditions, HGL, for hydraulic analysis at 29 Selkirk (zone 1E) assumed to be connected to the 152mm on Montgomery and the 152mm on Selkirk (see attached PDF for location).

Minimum HGL = 107.2m

Maximum HGL = 118.2m. The maximum pressure is estimated to be close to 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

Available Flow @ 20psi = 90 L/s assuming a ground elevation of 56.5m

Note: Boundary conditions the same at both connections

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.

From: Matina Sakoutsiou <matinas@lithosgroup.ca>
Sent: November 18, 2019 4:16 PM
To: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Cc: ''Maria Siali'' <marias@lithosgroup.ca>; 'Fel Petti' <fel@mainandmain.ca>
Subject: 29 Selkirk Street - boundary conditions

Nice to meet you!
In order for you to be able to provide us with the boundary conditions regarding the subject property, please refer to the information requested below in green:

1. Location of Service Indicated in the attached connection figure.
2.A sketch of the proposed water service to the city watermain Indicated in the attached connection figure.
3.Street Number & Name 29 Selkirk Street
4.Type of development and units 750 residential units and 28,000m^2 retail area (based on preliminary site statistics)
5.Amount of fire flow required 183.33 l/s (Calculation as per the FUS Method).
6.Average daily demand: 0.81 L/s commercial area and 6.38 L/s residential area
7.Maximum daily demand: 29.70L/s
8.Maximum hourly daily demand: 29.70L/s
9.Amount of wastewater calculated: 20.74L/s

Feel free to contact me should you have any questions or should you require any additional information.

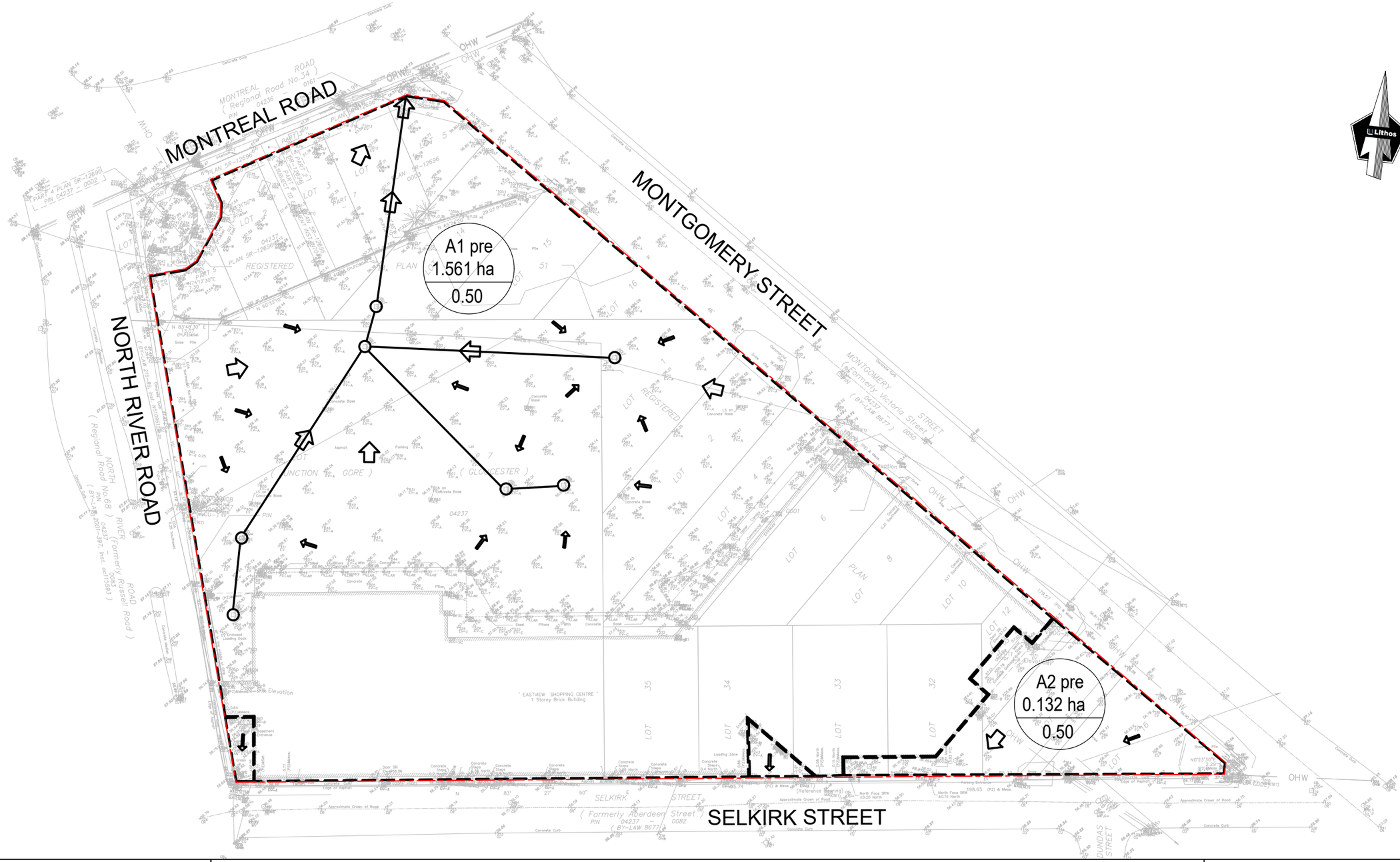
Sincerely,

Matina Sakoutsiou, M.Arch
Project Design Manager

Lithos Group Inc.
150 Bermondsey Rd, Unit #200
Toronto, Ontario M4A 1Y1
Direct: (647) 367-3848, T: (416) 750-7769
MatinaS@LithosGroup.ca
www.LithosGroup.ca

Appendix C

Storm Analysis



LEGEND

- A1 pre / 0.132 ha / 0.50 — STORM DRAINAGE AREA NUMBER; DRAINAGE AREA (ha); COMPOSITE RUNOFF COEFFICIENT
- PRE-DEVELOPMENT STORM DRAINAGE AREA
- PROPERTY LINE
- OVERLAND FLOW ROUTE
- MAJOR DRAINAGE PATTERN

Lithos

150 Bermondsey Road, Toronto, Ontario M4A 1Y1

STORM DRAINAGE AREA PLAN

MIXED USE DEVELOPMENT
29 SELKIRK STREET
OTTAWA, ONTARIO

DATE: JUNE 2020	PROJECT No: UD19-079
SCALE: N.T.S.	FIGURE No: DAP 1

Lithos

Prepared By: John Tsalidis, P. E., M.A.Sc.
Reviewed by: Nick Moutzouris, P.Eng., M.A.Sc.

Rational Method
Pre-Development Flow Calculation

29 Selkirk Street
File No. UD19-079
City of Ottawa
Date: June 2020

Input Parameters

Area Number	Area (ha)	C	Tc (min.)
A1 pre (towards Montgomery Street)	1,561	0,50	20

Rational Method Calculation

Event 2 yr
IDF Data Set City of Ottawa
a = 732,95
b = 6,199
c = 0,810

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)
A1 pre (towards Montgomery Street)	1,561	0,50	0,78	20	52,0	0,113	112,8

Event 5 yr
IDF Data Set City of Ottawa
a = 998,07
b = 6,053
c = 0,814

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)
A1 pre (towards Montgomery Street)	1,561	0,50	0,78	20	70,3	0,152	152,3

Event 100 yr
IDF Data Set City of Ottawa
a = 1735,69
b = 6,014
c = 0,820

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)
A1 pre (towards Montgomery Street)	1,561	0,50	0,78	20	120,0	0,260	260,1

Lithos

Prepared By: John Tsalidis, P. E., M.A.Sc.
Reviewed by: Nick Moutzouris, P.Eng., M.A.Sc.

Rational Method
Pre-Development Flow Calculation

29 Selkirk Street
File No. UD19-079
City of Ottawa
Date: June 2020

Input Parameters

Area Number	Area (ha)	C	Tc (min.)
A2 pre (towards Selkirk Street)	0,132	0,50	20

Rational Method Calculation

Event 2 yr
IDF Data Set City of Ottawa
a = 732,95
b = 6,199
c = 0,810

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)
A2 pre (towards Selkirk Street)	0,132	0,50	0,07	20	52,0	0,010	9,5

Event 5 yr
IDF Data Set City of Ottawa
a = 998,07
b = 6,053
c = 0,814

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)
A2 pre (towards Selkirk Street)	0,132	0,50	0,07	20	70,3	0,013	12,9

Event 100 yr
IDF Data Set City of Ottawa
a = 1735,69
b = 6,014
c = 0,820

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m^3/s)	Q (L/s)
A2 pre (towards Selkirk Street)	0,132	0,50	0,07	20	120,0	0,022	22,0

MONTREAL ROAD

MONTGOMERY STREET

NORTH RIVER ROAD

SELKIRK STREET

A1 post
1.693 ha
0.90

LEGEND

- STORM DRAINAGE AREA NUMBER
- DRAINAGE AREA (ha)
- COMPOSITE RUNOFF COEFFICIENT
- POST-DEVELOPMENT STORM DRAINAGE AREA
- PROPERTY LINE

Lithos
150 Bermondsey Road, Toronto, Ontario M4A 1Y1

STORM DRAINAGE AREA PLAN
MIXED USE DEVELOPMENT
29 SELKIRK STREET
OTTAWA, ONTARIO

DATE: JUNE 2020	PROJECT No: UD19-079
SCALE: N.T.S.	FIGURE No: DAP 2

Modified Rational Method - Two Year Storm

Site Flow and Storage Summary

29 Selkirk Street, Ottawa

Prepared By: John Tsalidis, P. E., M.A.Sc.
Reviewed By: Nick Moutzouris, P.Eng., M.A.Sc.

Date: June 2020

Drainage Area A1 Post - Towards Montgomery Street

Drainage Areas	A1 Post	
Area =	**1,693**	ha
"C" =	**0,90**	
AC =	**1,52**	
Tc =	**10,0**	min
Time Increment =	**5,0**	min
Allowable Release Rate =	**152,3**	**L/s**
Min. Storage =	**103,7**	**m^3**

2-Year Design Storm	
a=	732,95
b=	6,199
c=	0,810
I =	$a / (T_C + b)^c$

(1)	(2)	(3)	(4)	(5)	(6)
Time	**Rainfall Intensity**	**Storm Runoff**	**Runoff Volume**	**Target Released Volume**	**Released Volume**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3)**	**(m^3)**
10,0	76,8	0,325	195,05	91,38	103,66
15,0	61,8	0,261	235,29	137,08	98,21
20,0	52,0	0,220	264,27	182,77	81,50
25,0	45,2	0,191	286,75	228,46	58,29
30,0	40,0	0,169	305,07	274,15	30,92
35,0	36,1	0,153	320,50	319,85	0,66
40,0	32,9	0,139	333,83	365,54	0,00
45,0	30,2	0,128	345,57	411,23	0,00
50,0	28,0	0,119	356,05	456,92	0,00
55,0	26,2	0,111	365,53	502,62	0,00
60,0	24,6	0,104	374,18	548,31	0,00
65,0	23,2	0,098	382,15	594,00	0,00
70,0	21,9	0,093	389,53	639,69	0,00
75,0	20,8	0,088	396,41	685,39	0,00
80,0	19,8	0,084	402,86	731,08	0,00
85,0	18,9	0,080	408,93	776,77	0,00
90,0	18,1	0,077	414,67	822,46	0,00
95,0	17,4	0,074	420,10	868,16	0,00
100,0	16,7	0,071	425,27	913,85	0,00
105,0	16,1	0,068	430,20	959,54	0,00
110,0	15,6	0,066	434,91	1005,23	0,00
115,0	15,0	0,064	439,43	1050,93	0,00
120,0	14,6	0,062	443,76	1096,62	0,00
125,0	14,1	0,060	447,93	1142,31	0,00
130,0	13,7	0,058	451,95	1188,00	0,00
135,0	13,3	0,056	455,82	1233,70	0,00
140,0	12,9	0,055	459,56	1279,39	0,00
145,0	12,6	0,053	463,19	1325,08	0,00
150,0	12,3	0,052	466,70	1370,77	0,00
155,0	11,9	0,051	470,10	1416,47	0,00
160,0	11,7	0,049	473,41	1462,16	0,00
165,0	11,4	0,048	476,62	1507,85	0,00

Modified Rational Method - Five Year Storm

Site Flow and Storage Summary

29 Selkirk Street, Ottawa

Prepared By: John Tsalidis, P. E., M.A.Sc.
Reviewed By: Nick Moutzouris, P.Eng., M.A.Sc.

Date: June 2020

Drainage Area A1 Post - Towards Montgomery Street

Drainage Areas	**A1 Post**	
Area =	**1,693**	ha
"C" =	**0,90**	
AC =	**1,52**	
Tc =	**10,0**	min
Time Increment =	**5,0**	min
Allowable Release Rate =	**152,3**	**L/s**
Min. Storage =	**181,2**	**m^3**

5-Year Design Storm	
a=	998,07
b=	6,053
c=	0,814
I =	$a / (T_C + b)^c$

(1)	(2)	(3)	(4)	(5)	(6)
Time	**Rainfall Intensity**	**Storm Runoff**	**Runoff Volume**	**Target Released Volume**	**Released Volume (A1 Post)**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3)**	**(m^3)**
10,0	104,2	0,441	264,60	91,38	173,21
15,0	83,6	0,354	318,29	137,08	181,21
20,0	70,3	0,297	356,81	182,77	174,04
25,0	60,9	0,258	386,61	228,46	158,15
30,0	53,9	0,228	410,85	274,15	136,69
35,0	48,5	0,205	431,24	319,85	111,39
40,0	44,2	0,187	448,83	365,54	83,29
45,0	40,6	0,172	464,29	411,23	53,06
50,0	37,7	0,159	478,10	456,92	21,18
55,0	35,1	0,149	490,58	502,62	0,00
60,0	32,9	0,139	501,96	548,31	0,00
65,0	31,0	0,131	512,43	594,00	0,00
70,0	29,4	0,124	522,13	639,69	0,00
75,0	27,9	0,118	531,17	685,39	0,00
80,0	26,6	0,112	539,63	731,08	0,00
85,0	25,4	0,107	547,60	776,77	0,00
90,0	24,3	0,103	555,12	822,46	0,00
95,0	23,3	0,099	562,25	868,16	0,00
100,0	22,4	0,095	569,03	913,85	0,00
105,0	21,6	0,091	575,49	959,54	0,00
110,0	20,8	0,088	581,66	1005,23	0,00
115,0	20,1	0,085	587,58	1050,93	0,00
120,0	19,5	0,082	593,25	1096,62	0,00
125,0	18,9	0,080	598,71	1142,31	0,00
130,0	18,3	0,077	603,97	1188,00	0,00
135,0	17,8	0,075	609,04	1233,70	0,00
140,0	17,3	0,073	613,94	1279,39	0,00
145,0	16,8	0,071	618,68	1325,08	0,00
150,0	16,4	0,069	623,27	1370,77	0,00
155,0	15,9	0,067	627,72	1416,47	0,00
160,0	15,6	0,066	632,05	1462,16	0,00
165,0	15,2	0,064	636,25	1507,85	0,00

Modified Rational Method - Hundred Year Storm

Site Flow and Storage Summary

29 Selkirk Street, Ottawa

Prepared By: John Tsalidis, P. E., M.A.Sc.

Date: June 2020

Reviewed By: Nick Moutzouris, P.Eng., M.A.Sc.

Drainage Area A1 Post - Towards Montgomery Street

Drainage Areas	**A1 Post**	
Area =	**1,693**	ha
"C" * =	**1,00**	
AC =	**1,69**	
Tc =	**10,0**	min
Time Increment =	**5,0**	min
Allowable Release Rate =	**152,3**	**L/s**
Min. Storage =	**504,1**	**m^3**

100-Year Design Storm	
a=	1735,69
b=	6,014
c=	0,820
I =	$a / (T_C + b)^c$

* C value for the 100 year storm event is increased by 25%, with a maximum of 1.0 per City's Sewer Design Guidelines

(1)	(2)	(3)	(4)	(5)	(6)
Time	**Rainfall Intensity**	**Storm Runoff**	**Runoff Volume**	**Target Released Volume**	**Released Volume**
(min)	**(mm/hr)**	**(m^3/s)**	**(m^3)**	**(m^3)**	**(m^3)**
10,0	178,6	0,840	503,83	91,38	412,45
15,0	142,9	0,672	604,80	137,08	467,72
20,0	120,0	0,564	676,92	182,77	494,15
25,0	103,8	0,488	732,55	228,46	504,09
30,0	91,9	0,432	777,66	274,15	503,51
35,0	82,6	0,388	815,53	319,85	495,68
40,0	75,1	0,353	848,14	365,54	482,60
45,0	69,1	0,325	876,77	411,23	465,54
50,0	64,0	0,301	902,29	456,92	445,36
55,0	59,6	0,280	925,31	502,62	422,69
60,0	55,9	0,263	946,30	548,31	397,99
65,0	52,6	0,248	965,58	594,00	371,58
70,0	49,8	0,234	983,43	639,69	343,73
75,0	47,3	0,222	1000,04	685,39	314,66
80,0	45,0	0,212	1015,60	731,08	284,52
85,0	43,0	0,202	1030,21	776,77	253,44
90,0	41,1	0,193	1044,01	822,46	221,55
95,0	39,4	0,185	1057,08	868,16	188,92
100,0	37,9	0,178	1069,50	913,85	155,65
105,0	36,5	0,172	1081,33	959,54	121,78
110,0	35,2	0,166	1092,63	1005,23	87,39
115,0	34,0	0,160	1103,44	1050,93	52,52
120,0	32,9	0,155	1113,82	1096,62	17,20
125,0	31,9	0,150	1123,79	1142,31	0,00
130,0	30,9	0,145	1133,40	1188,00	0,00
135,0	30,0	0,141	1142,66	1233,70	0,00
140,0	29,2	0,137	1151,60	1279,39	0,00
145,0	28,4	0,133	1160,25	1325,08	0,00
150,0	27,6	0,130	1168,62	1370,77	0,00
155,0	26,9	0,127	1176,74	1416,47	0,00
160,0	26,2	0,123	1184,62	1462,16	0,00
165,0	25,6	0,120	1192,27	1507,85	0,00

Appendix D

Sanitary Data Analysis

SANITARY SEWER DESIGN SHEET (towards Montgomery Street)

29 Selkirk Street

CITY OF OTTAWA

LOCATION		RESIDENTIAL							COMMERCIAL		INFILTRATION			SEWER DESIGN				
	SECTION (ha.)	1 BED @1.4 ppu	2 BED @2.1 ppu	3 BED @3.1 ppu	TOTAL RESIDENTIAL POPULATION population	AVERAGE RES. FLOW @ 280 L/c/d (L/s)	HARMON PEAKING FACTOR	RES. PEAK FLOW (L/s)	COMMERCIAL AREA (ha.)	AVERAGE COMMERCIAL FLOW @50000/L/ha/d (L/s)	TOTAL ACCUM. AREA (ha.)	INFILT. @ 0.28 L/s/ha. (ha.)	TOTAL DESIGN FLOW (L/s)	PIPE LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	FULL FLOW CAPACITY n = 0.013 (L/sec)	% of DESIGN CAPACITY (%)
column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Existing Condition																		
Retail	1,693	0	0	0	0,00	0,00	4,00	0,00	0,56	0,32	1,69	0,16	0,48	-	-	-	-	-
Proposed Condition																		
Tower A	1,693	213	106	27	605	2	3,93	7,70	0,24	0,14	1,69	0,47	8,41		200	2,0%	46,38	18,14%
Tower C		244	122	31	694	2	3,90	8,76	0,00	0,00	1,69	0,47	9,24		200	2,0%	46,38	19,91%
									NET FLOW TOWARDS MONTGOMERY STREET				17,17					

Average Residential Flow Rate - 280 Litres / capita / day
Average Daily Flow Commercial - 50,000 Litres / gross ha / d
Site Area: 1,693 Ha

Infitration Allowance (Dry Weather) - 0.05 Litres / s / grosss ha
Infitration Allowance (Wet Weather) - 0.28 Litres / s / grosss ha
Infitration Allowance (Total I/I) - 0.33 Litres / s / grosss ha
Peaking Factor = 1 + [14 / (4 + $P^{0.5}$)], P=Population in thousands

Prepared By: John Tsalidis, P. E., M.A.Sc.
Reviewed by: Nick Moutzouris, P.Eng., M.A.Sc.
Date: June 2020

Project: 29 Selkirk Street
Project: UD19-079
City of Ottawa

SANITARY SEWER DESIGN SHEET (towards Selkirk Street)

29 Selkirk Street

CITY OF OTTAWA

LOCATION		RESIDENTIAL							COMMERCIAL		INFILTRATION			SEWER DESIGN				
	SECTION (ha.)	1 BED @1.4 ppu	2 BED @2.1 ppu	3 BED @3.1 ppu	TOTAL RESIDENTIAL POPULATION population	AVERAGE RES. FLOW @ 280 L/c/d (L/s)	HARMON PEAKING FACTOR	RES. PEAK FLOW (L/s)	COMMERCIAL AREA (ha.)	AVERAGE COMMERCIAL FLOW @50000/L/ha/d (L/s)	TOTAL ACCUM. AREA (ha.)	INFILT. @ 0.28 L/s/ha. (ha.)	TOTAL DESIGN FLOW (L/s)	PIPE LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	FULL FLOW CAPACITY n = 0.013 (L/sec)	% of DESIGN CAPACITY (%)
column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Existing Condition																		
Retail	0,000	0	0	0	0,00	0,00	4,00	0,00	0,00	0,00	0,00	0,00	0,00	-	-	-	-	-
Proposed Condition																		
Tower B	1,693	160	80	20	454	1	4,00	5,88	0,06	0,04	1,69	0,47	6,42		200	2,0%	46,38	13,83%
									NET FLOW TOWARDS SELKIRK STREET				6,42					

Average Residential Flow Rate - 280 Litres / capita / day
Average Daily Flow Commercial - 50,000 Litres / gross ha / d
Site Area: 1,693 Ha

Infitration Allowance (Dry Weather) - 0.05 Litres / s / grosss ha
Infitration Allowance (Wet Weather) - 0.28 Litres / s / grosss ha
Infitration Allowance (Total I/I) - 0.33 Litres / s / grosss ha
Peaking Factor = $1 + [14 / (4 + P^{0.5})]$, P=Population in thousands

Prepared By: John Tsalidis, P. E., M.A.Sc.
Reviewed by: Nick Moutzouris, P.Eng., M.A.Sc.
Date: June 2020

Project: 29 Selkirk Street
Project: UD19-079
City of Ottawa

Appendix E

Water Data Analysis

WATER DEMAND

29 Selkirk Street
File No: UD19-079
Date: June 2020
Prepared by: John Tsalidis, P.E., M.A.Sc.
Reviewed By: Nick Moutzouris, P.Eng., M.A.Sc.

Fire Flow Calculation

Tower A

1 $F = 220\ C\ (A)^{1/2}$

Where F= Fire flow in Lpm
C= construction type coefficient
= 0.6
A = total floor area in sq.m. excluding basements

			Area Applied
Level 1=	5485.54	m^2	100%
Level 2=	900.00	m^2	25%
P1=	0.00	m^2	25%
=	5,710.5	sq.m.	
F =	9,974.99	L/min	*F(No.1) = 220C √A*
F =	10,000	L/min	*F(No.1) Round to nearest 1000 l/min*

Note: The levels indicated, reference the floors with the largest areas (refer to architectural design)

2 Occupancy Reduction
25% reduction for non-combustible occupancy
F = 7500 L/min *F(No.2) = F(No.1) x occupancy reduction/charge(%)*

3 Sprinkler Reduction
30% Reduction for NFPA Sprinkler System
F = 5250 l/min *F(No.3) = F(No.2) x sprinkler reduction(%)*

4 Separation Charge

0%	West	Road
0%	North	Road
0%	South	Road
25%	East	0-3m
25%	Total Separation Charge	

F = 1,875.00 L/min *F (No.4) = F(No.2) x separation charge(%)*
F = 7,125.00 L/min *F (tot) = F(No.3) + F(No.4)*
F = 7,000 L/min *F(tot) Round to nearest 1000 l/min*
116.67 L/s
F = 1849 US GPM

Domestic Flow Calculations

Population=	1753	Persons		
Commercial Area =	3030.0	m^2		
Average Day Demand (Residential) =	350.0	L/person/day		
Average Day Demand (Commercial) =	2.5	L/m^2/day	(OBC)	1 US Gallon=3.785 L
Average Residential Water Demand=	7.10	L/s		
	113	US GPM		1 US GPM=15.852L/s
Average Commercial Water Demand=	0.09	L/s		
	1	US GPM		

Max. Daily Residential Demand Peaking Factor= 2.75
Max. Daily Commercial Demand Peaking Factor = 2.75
Max. Daily Demand = 19.77 L/s = 313 US GPM
or
Max. Hourly Residential Demand Peaking Factor = 4.13
Max. Hourly Commercial Demand Peaking Factor = 4.1
Max. Hourly Demand = 29.69 L/s = 471 US GPM

Max Daily Demand = 19.77 L/s
Fire Flow = 116.67 L/s

Required 'Design' Flow = 136.44 L/s
2163 US GPM

Note: Required 'Design' Flow is the maximum of either:
1) Fire Flow + Maximum Daily Demand
2) Maximum Hourly Demand

WATER DEMAND

29 Selkirk Street
File No: UD19-079
Date: June 2020
Prepared by: John Tsalidis, P.E., M.A.Sc.
Reviewed By: Nick Moutzouris, P.Eng., M.A.Sc.

Fire Flow Calculation

Tower B

1 $F = 220\ C\ (A)^{1/2}$

Where F= Fire flow in Lpm
C= construction type coefficient
= 0.6
A = total floor area in sq.m. excluding basements

			Area Applied
Level 2=	4837.20	m^2	100%
Level 3=	899.99	m^2	25%
Level 1=	5654.84	m^2	25%
=	6,475.9	sq.m.	
F =	10,622.44	L/min	*F(No.1) = 220C √A*
F =	11,000	L/min	*F(No.1) Round to nearest 1000 l/min*

Note: The levels indicated, reference the floors with the largest areas (refer to architectural design)

2 Occupancy Reduction
25% reduction for non-combustible occupancy
F = 8250 L/min *F(No.2) = F(No.1) x occupancy reduction/charge(%)*

3 Sprinkler Reduction
30% Reduction for NFPA Sprinkler System
F = 5775 l/min *F(No.3) = F(No.2) x sprinkler reduction(%)*

4 Separation Charge

25%	West	0-3m
0%	North	Road
0%	South	Road
0%	East	Road
25%	Total Separation Charge	

F = 2,063.00 L/min *F (No.4) = F(No.2) x separation charge(%)*
F = 7,838.00 L/min *F (tot) = F(No.3) + F(No.4)*
F = 8,000 L/min *F(tot) Round to nearest 1000 l/min*
133.33 L/s
F = 2114 US GPM

Domestic Flow Calculations

Population=	1753	Persons		
Commercial Area =	3030.0	m^2		
Average Day Demand (Residential) =	350.0	L/person/day		
Average Day Demand (Commercial) =	2.5	L/m^2/day	(OBC)	1 US Gallon=3.785 L
Average Residential Water Demand=	7.10	L/s		
	113	US GPM		1 US GPM=15.852L/s
Average Commercial Water Demand=	0.09	L/s		
	1	US GPM		

Max. Daily Residential Demand Peaking Factor= 2.75
Max. Daily Commercial Demand Peaking Factor = 2.75
Max. Daily Demand = 19.77 L/s = 313 US GPM
or
Max. Hourly Residential Demand Peaking Factor = 4.13
Max. Hourly Commercial Demand Peaking Factor = 4.1
Max. Hourly Demand = 29.69 L/s = 471 US GPM

Max Daily Demand =	**19.77**	**L/s**
Fire Flow =	**133.33**	**L/s**
Required 'Design' Flow =	**153.10**	**L/s**
	2427	**US GPM**

Note: Required 'Design' Flow is the maximum of either:
1) Fire Flow + Maximum Daily Demand
2) Maximum Hourly Demand

WATER DEMAND

29 Selkirk Street
File No: UD19-079
Date: June 2020
Prepared by: John Tsalidis, P.E., M.A.Sc.
Reviewed By: Nick Moutzouris, P.Eng., M.A.Sc.

Fire Flow Calculation

Tower C

1 $F = 220\ C\ (A)^{1/2}$

Where F= Fire flow in Lpm
C= construction type coefficient
= 0.6
A = total floor area in sq.m. excluding basements

			Area Applied
Level 2=	1066.21	m^2	100%
Level 3=	900.00	m^2	25%
Level 1=	684.96	m^2	25%
=	1,462.4	sq.m.	
F =	5,047.94	L/min	*F(No.1) = 220C √A*
F =	5,000	L/min	*F(No.1) Round to nearest 1000 l/min*

Note: The levels indicated, reference the floors with the largest areas (refer to architectural design)

2 Occupancy Reduction
25% reduction for non-combustible occupancy
F = 3750 L/min *F(No.2) = F(No.1) x occupancy reduction/charge(%)*

3 Sprinkler Reduction
30% Reduction for NFPA Sprinkler System
F = 2625 l/min *F(No.3) = F(No.2) x sprinkler reduction(%)*

4 Separation Charge

0%	West	Road
25%	North	0-3m
0%	South	Road
25%	East	0-3m
50%	Total Separation Charge	

F = 1,875.00 L/min *F (No.4) = F(No.2) x separation charge(%)*
F = 4,500.00 L/min *F (tot) = F(No.3) + F(No.4)*
F = 5,000 L/min *F(tot) Round to nearest 1000 l/min*
83.33 L/s
F = 1321 US GPM

Domestic Flow Calculations

Population=	1753	Persons		
Commercial Area =	3030.0	m^2		
Average Day Demand (Residential) =	350.0	L/person/day		
Average Day Demand (Commercial) =	2.5	L/m^2/day	(OBC)	1 US Gallon=3.785 L
Average Residential Water Demand=	7.10	L/s		
	113	US GPM		1 US GPM=15.852L/s
Average Commercial Water Demand=	0.09	L/s		
	1	US GPM		

Max. Daily Residential Demand Peaking Factor= 2.75
Max. Daily Commercial Demand Peaking Factor = 2.75
Max. Daily Demand = 19.77 L/s = 313 US GPM
or
Max. Hourly Residential Demand Peaking Factor = 4.13
Max. Hourly Commercial Demand Peaking Factor = 4.1
Max. Hourly Demand = 29.69 L/s = 471 US GPM

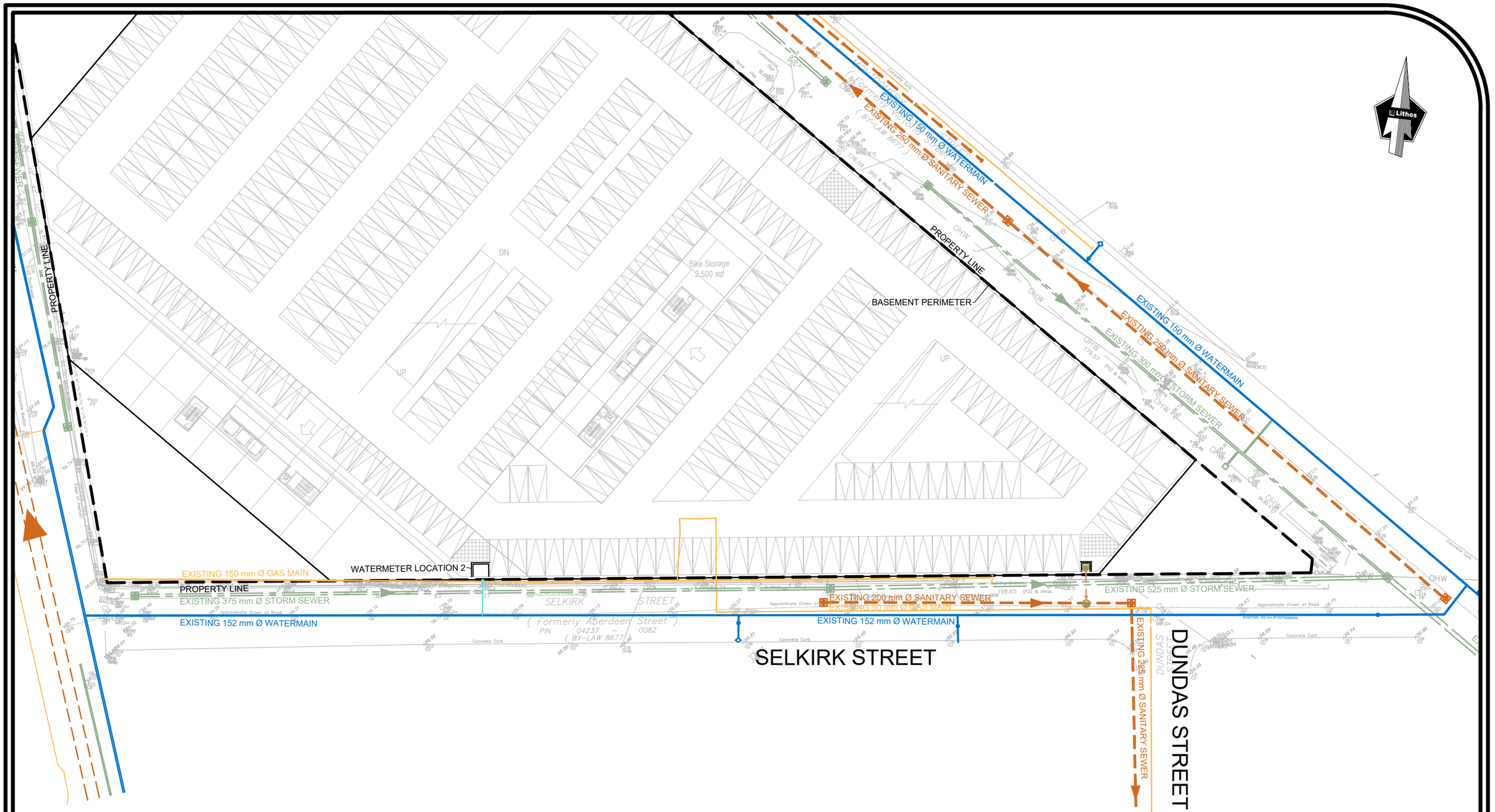
Max Daily Demand = 19.77 L/s
Fire Flow = 83.33 L/s

Required 'Design' Flow = 103.10 L/s
1634 US GPM

Note: Required 'Design' Flow is the maximum of either:
1) Fire Flow + Maximum Daily Demand
2) Maximum Hourly Demand

Appendix F

Engineering Figures



Lithos

150 Bermondsey Road, Toronto, Ontario M4A 1Y1

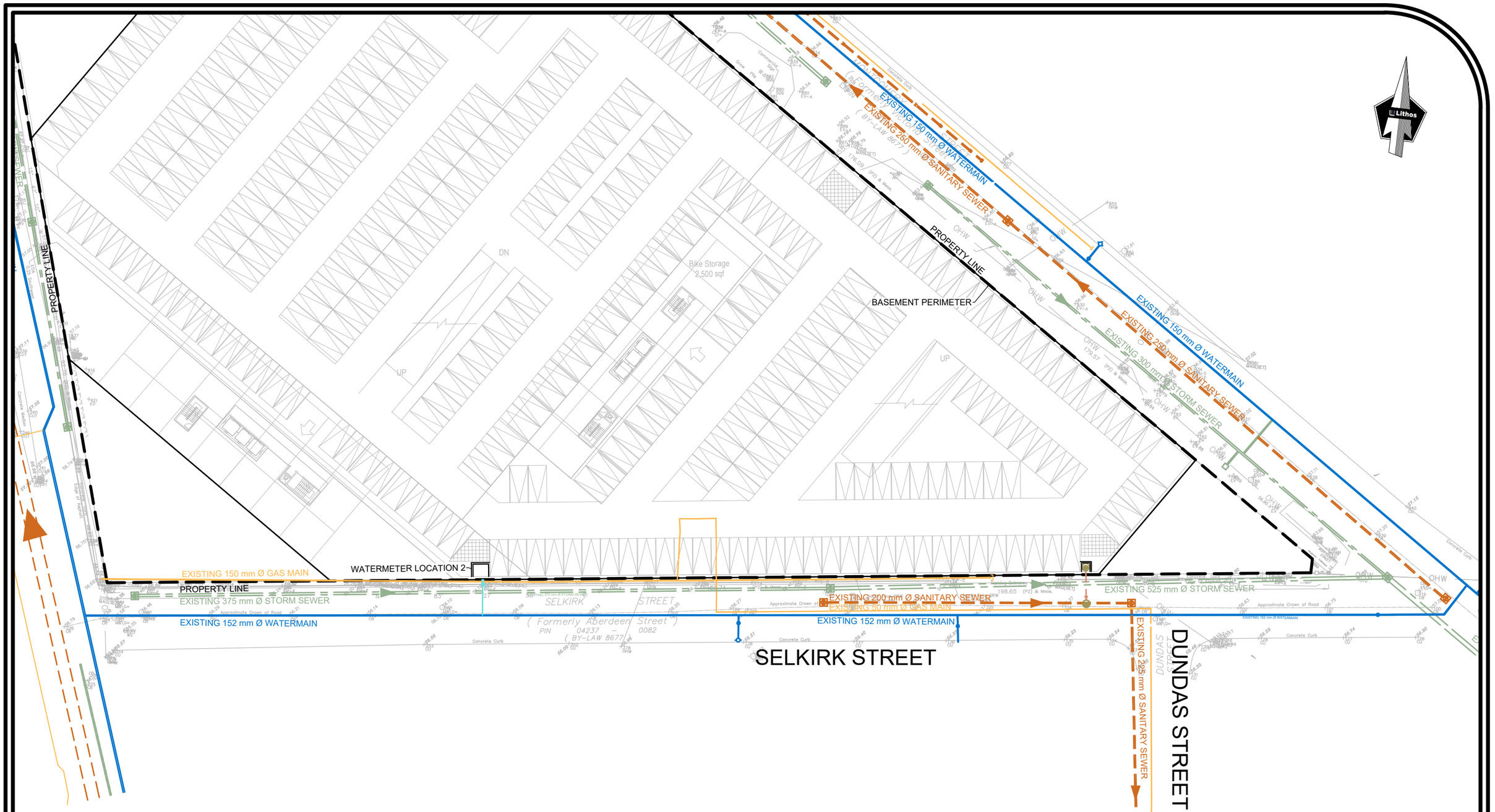
LEGEND

- PROPERTY LINE
- EXISTING GASMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- ABANDONED SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING COMBINED SEWER
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED TANK PERIMETER
- PROPOSED WATERMAIN

PROPOSED SERVICING FIGURE

MIXED USE DEVELOPMENT
29 SELKIRK STREET
OTTAWA, ONTARIO

DATE: JUNE 2020	PROJECT No: UD19-079
SCALE: N.T.S.	FIGURE No: FIG 3B



Lithos

150 Bermondsey Road, Toronto, Ontario M4A 1Y1

LEGEND

- PROPERTY LINE
- EXISTING GASMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- ABANDONED SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING COMBINED SEWER
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED TANK PERIMETER
- PROPOSED WATERMAIN

PROPOSED SERVICING FIGURE

MIXED USE DEVELOPMENT
29 SELKIRK STREET
OTTAWA, ONTARIO

DATE: JUNE 2020	PROJECT No: UD19-079
SCALE: N.T.S.	FIGURE No: FIG 3B