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SITE SERVICING AND STORMWATER MANAGEMENT

FOR

TAGGART REALTY MANAGEMENT
989 SOMERSET STREET

CITY OF OTTAWA

PROJECT NO.: 21-1239

APRIL 2022 – REV 5

SITE SERVICING AND STORMWATER MANAGEMENT
FOR
989 SOMERSET STREET

TAGGART REALTY MANAGEMENT

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FOR
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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Taggart Realty Management to prepare a Site Servicing and Stormwater Management report in support of the application for a Site Plan Control (SPC) at 989 Somerset Street.

The subject property is located within the City of Ottawa urban boundary, in the Somerset ward. As illustrated in ***Figure 1***, below, the subject property is bounded by Somerset Street to the south, City Centre Avenue to the west, Spruce Street to the north, and existing commercial building and residential buildings to the east. The subject property measures approximately ***0.26 ha*** and is designated Mixed-Use Centre Zone (MC S169) under the current City of Ottawa zoning by-law.

Figure 1: Site Location

The proposed development involves the construction of a 15-storey residential building, consisting of ***232 apartment units***. 3 levels of underground parking are proposed as shown by the ***Site Plan*** prepared by Hobin Architecture included in Drawings and Figures.

The objective of this report is to provide sufficient detail to demonstrate that the proposed development is supported by existing municipal services and that the site design conforms to current City of Ottawa design standards.

1.1 Existing Conditions

The subject site currently consists of paved surface parking and an existing 2-storey commercial building.

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

Spruce Street:

- 203 mm diameter PVC watermain;
- 250 mm diameter PVC sanitary sewer;
- 450 mm diameter PVC storm sewer; and
- 1500 mm diameter concrete combined sewer.

City Centre Avenue:

- 406 mm diameter PVC watermain;
- 300 mm diameter concrete combined sewer; and
- 1500 mm diameter concrete combined sewer.

Somerset Street:

- 305 mm diameter PVC watermain;
- 375 mm diameter PVC combined sewer; and
- 600 mm diameter concrete storm sewer.

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, is located in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

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

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

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

  - **Technical Bulletin ISTB-2018-03**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-03*)

  - **Technical Bulletin ISTB-2019-01**
    City of Ottawa, January, 2019.
    (*ISTB-2019-01*)

  - **Technical Bulletin ISTB-2019-02**
    City of Ottawa, July 8, 2019.
    (*ISTB-2019-02*)

- **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 ISTB-2018-02**
  City of Ottawa, March 21, 2018.
  (*ISTB-2018-02*)

- **Technical Bulletin ISTB-2021-03**
  City of Ottawa, August 18, 2021
  (ISTB-2021-03)

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

- **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)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 1W pressure zone, as shown by the Pressure Zone map, located in ***Appendix B.*** A 203 mm diameter watermain exists within the Spruce Street right-of-way and a 406 mm diameter watermain exists within City Centre Avenue.

Table 1, below, estimates the water demand of the existing building, assuming the ground floor consists of commercial units, and is based on the ***Water Supply Guidelines*** shown in ***Table 2.*** See ***Appendix B*** for detailed calculations.

Table 1
Existing Water Demand

Design Parameter	Anticipated Demand[1] (L/min)
Average Daily Demand	2.6
Max Day	3.9
Peak Hour	7.0

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.

3.2 Water Supply Servicing Design

The subject property is proposed to have two connections to the municipal watermain; a 150 mm diameter service lateral connected to the existing 203 mm diameter watermain within Spruce Street and a 150 mm diameter service lateral connected to the existing 406 mm watermain within City Centre Avenue.

In accordance with City of Ottawa technical bulletin ***ISDTB-2014-02***, redundant service connections will be required due to an anticipated design flow of greater than 50 m^3/day. The existing valve box within the Spruce Street right-of-way allows for isolation of the private services should the watermain close within Spruce Street or City Centre Avenue.

The development will be serviced by the existing fire hydrants located at Spruce Street near the City Centre Avenue intersection, Somerset Street and the private hydrant located within the adjacent property to the north-east. Refer to drawing ***EX-1*** for hydrant locations.

Table 2, below, summarizes the ***Water Supply Guidelines*** employed in the preparation of the preliminary water demand estimate.

Table 2
Water Supply Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Residential Average Daily Demand	280 L/d/P
Residential Maximum Daily Demand	3 x Average Daily *
Residential Maximum Hourly	4.5 x Average Daily *
Commercial Retail	2.5 L/m^2/d
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa

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-2010-2

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 3, below, summarizes the estimated water supply demand and boundary conditions for the proposed development based on the ***Water Supply Guidelines***.

Table 3
Water Demand and Boundary Conditions
Proposed Conditions

	Design	Boundary Conditions				
Design Parameter	**Estimated Demand[1] (L/min)**	**Estimated Demand[2] (L/min)**	**Connection 1[3] (m H_2O / kPa)**		**Connection 2[4] (m H_2O / kPa)**	
Average Daily Demand	73.5	68.6	115.0	588.6	115.0	580.8
Max Day + Fire Flow (per FUS)	220.5+ 20,000 = 20,220.5	205.9+20000 =20,205.9	97.0	412.0	105.0	482.7
Peak Hour	330.8	308.9	107.5	515.0	107.5	507.2

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Estimated demand parameters used to determine boundary conditions vary slightly from estimated demand parameters derived from the final design. The minor differences would not result in a significant change to the boundary conditions and as such the original boundary conditions have been maintained.
3) Boundary conditions above for connection 1 to Spruce Street assumed ground elevation equal to 55.0 m
4) Boundary conditions above for connection 2 to City Centre Avenue assumed ground elevation equal to 55.8 m

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow, as indicated by the correspondence in ***Appendix B***. As demonstrated in ***Table 3***, pressures in average day scenario exceed the recommended pressures, as per the ***Water Supply Guidelines,*** therefore pressure reducing controls are required. Testing at construction is recommended to confirm pressure controls. Based on the boundary conditions provided by the City of Ottawa, sufficient supply is available for fire flow.

Fire flow requirements are to be determined in accordance with City of Ottawa ***Water Supply Guidelines*** and the Ontario Building Code.

Fire flow requirements were estimated per City of Ottawa Technical Bulletin ***ISTB-2018-02***. The following parameters were coordinated with the architect:

- Type of construction – Non-Combustible Construction;
- Occupancy type – Limited Combustibility; and
- Sprinkler Protection – Supervised Sprinklered System.

The above assumptions result in an estimated fire flow of approximately ***20,000 L/min***, refer to supporting calculation in ***Appendix B***. A certified fire protection system specialist would need to be employed to design the building fire suppression system and confirm the actual fire flow demand.

Multiple hydrant are required to meet the required fire flow per ***ISTB-2018-02.*** There are three hydrants within 76m of the subject property located at;

- City Centre 25m south of the subject property,
- Somerset 10m east of the subject property, and
- Spruce – directly north of the subject property.

There are two hydrants within 152m of the subject property located at;

- Spruce, 90m east of the site, and
- City Centre, 90m north of the site.

The proximity of the existing hydrants provides 24,604 L/min to the subject property, exceeding the required fire flow.

3.3 Water Supply Conclusion

The subject property is proposed to have a dual connection to the municipal watermain within Spruce Street and City Centre Avenue via 150 mm diameter services.

It is proposed that the development will be serviced by the nearest existing fire hydrants located on Spruce Street, Somerset Street and City Centre.

The anticipated water demand was submitted to the City of Ottawa for establishing boundary conditions. The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow. Pressures in average day scenario exceed the recommended pressures, therefore pressure reducing controls are required.

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

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject property lies within the Booth Street Trunk catchment area, as shown by the ***Trunk Sanitary Sewers and Collection Areas Map,*** included in ***Appendix C***. An existing 250 mm sanitary sewer exists within Spruce Street.

Table 4, below, summarizes the estimated wastewater flows for the existing buildings within the subject site.

Table 4
Summary of Estimated Existing Peak Wastewater Flow

Design Parameter	Existing Flow (L/s)
Estimated Average Dry Weather Flow	0.19
Estimated Peak Dry Weather Flow	0.19
Estimated Peak Wet Weather Flow	0.26

The existing building was estimated to have a peak wastewater flow of ***0.26 L/s***, and is serviced by the existing 300 mm diameter combined sewer within City Centre Avenue.

4.2 Wastewater Design

The development is proposed to connect to the existing 250 mm sanitary sewer within Spruce Street via an existing 250 mm sanitary service. Refer to drawing ***SSP-1,*** located in ***Drawings/Figures***, for a detailed servicing layout. Wastewater flow from the development is proposed to ultimately discharge into the Booth Street Trunk within Spruce Street via the local sanitary sewer system.

Table 5, below***,*** summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 5
Wastewater Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon's Corrector Factor 0.8
Commercial Floor Space	5 L/m^2/d
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28 L/s/ha (Wet Weather) 0.33 L/s/ha (Total)
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	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 6, below, demonstrates the estimated peak flow from the proposed development. See ***Appendix C*** for associated calculations.

Table 6
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	1.24
Estimated Peak Dry Weather Flow	4.21
Estimated Peak Wet Weather Flow	4.28

The estimated sanitary flow based on the ***Site Plan,*** included in ***Drawings/Figures,*** results in a peak wet weather flow of ***4.28 L/s***.

DSEL reviewed the available capacity of a section of the sewers from the subject property to the existing 1500 mm diameter combined sewer within Spruce Street. Refer to the sanitary drainage plan in ***Appendix C***, for the extents of the existing sanitary sewer analysis.

Based on available information, DSEL found that the most restrictive section that was evaluated of the local sewer system is located in front of 110 Spruce Street with a residual capacity of ***30.4 L/s***. Detailed calculations are included in ***Appendix C***.

It is proposed to increase the peak wastewater flow to 4.28 L/s. Based on the available information and desktop analysis there is sufficient residual capacity available in the receiving sewers.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Booth Street Trunk Sewer. The development is estimated to generate a peak wet weather flow of ***4.28 L/s,*** to be directed to the 250 mm sanitary sewer within Spruce Street, and ultimately discharging into the Booth Street Trunk.

Based on the sanitary analysis completed, there is a residual capacity of ***30.4 L/s*** within the most controlling section of sewer therefore, there is sufficient capacity within the existing infrastructure to accommodate the flow from the proposed development.

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

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system located within the Ottawa River sub-watershed. As such, approvals for proposed development within this area are under the approval authority of the City of Ottawa.

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

The existing stormwater runoff from the site area generally drains north and is collected by the existing 450 mm storm sewer located within Spruce Street. Stormwater is directed overland north-east of the subject site towards the Trillium Rail Corridor.

The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized in ***Table 7,*** below:

Table 7
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	45.2
5-year	61.3
100-year	126.6

5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were reviewed with the City of Ottawa. As the outlet is a combined system, the City has established the following requirements for the proposed development:

- Meet an allowable release rate based on the existing Rational Method Coefficient no greater than 0.40, employing the City of Ottawa IDF parameters for a 2-year storm with a calculated time of concentration equal to or greater than 15 minutes; and
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site.

Quality control are not required as the site discharges to the Booth Street Trunk combined sewer.

Based on the above the total allowable release rate for the proposed development is ***17.5 L/s***.

5.3 Proposed Stormwater Management System

The proposed development consists predominantly of rooftop and parking lot above an underground parking garage. It is proposed that flow from the roof area directed to an internal stormwater cistern.

5.3.1 Grading Constraints

Based on coordination with City staff, 989 Somerset sits within a 14.3 ha drainage area with a history of high stormwater ponding levels. JFSA reviewed the potential ponding elevation during a 100-year 24-hour SCS design event to estimate the ponding levels in the entire 14.3 ha catchment, including this site. As per the JFSA memorandum included in ***Appendix D***, the maximum water level estimated for the 14.3 ha drainage area during a 100-year storm is 56.23 m and the spill elevation of 56.05 located downstream of the site. As a result, building openings have been elevated at or above 56.53 m to provide a minimum 0.3 m of freeboard above the predicted ponding elevation. It should be noted that the spill elevation of the site in question (989 Somerset St.) is set at 55.36. As such, it was established through discussions with the City that the parking area (U2) will discharge downstream of site controls to ensure that off-site stormwater from the City ROW does not enter the proposed cistern during the larger storm events.

5.3.2 Allowable release rate

Based on the current Site Plan, the development is expected to generate a peak dry weather sanitary flow ***of 4.21 L/s***, as discussed in ***section 4.2.*** Based on coordination with Paterson Group***,*** post-development groundwater flows will be less than ***30,000 L/day*** or ***0.3 L/s***, with peak periods noted after rain events. A conservative estimate of 30,000 L/day was included within the total post-development site release rate. Refer to ***Appendix D*** for geotechnical recommendations. As such, the revised stormwater release rate is set to 17.5 L/s - 4.21 L/s - 0.3 L/s = 12.99 L/s. An underground cistern equipped with a pump has been designed to respect this release rate.

The allowable release rate for the stormwater generated from the site will need to be restricted to 12.99 L/s for the combination of both attenuated and un-attenuated flows and does not include the aforementioned parking drainage referred to as area U2. ***Table 8,*** summarizes post-development flow rates. A portion of the unattenuated area will be compensated for in areas with flow attenuation controls.

Table 8
Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Storage
	(L/s)	(m^3)	(L/s)	(m^3)
Unattenuated Areas (U1)	3.7	0.0	7.8	0.0
Attenuated Areas	2.7	43.5	5.1	81.9
Total	**6.3**	**43.5**	**12.9**	**81.9**
Parking Area (U2)	14.3	0	27.3	0

The stormwater cistern is to be pumped with a maximum 5-year release rate of **2.7 *L/s*** and a maximum 100-year release rate ***5.1 L/s*** and proposed to discharge to the existing 375 mm storm lateral. The 375 mm service outlets to the 450 mm storm sewer within Spruce Street. Refer to the drawing ***SSP-1*** for a detailed servicing layout and ***Appendix D*** for a cistern detail prepared by Quadrant Engineering.

It is anticipated that approximately ***82 m^3*** of storage will be required on site to attenuate flow to the established release rate of ***12.9 L/s*** and that a portion of site will remain uncontrolled; storage calculations are contained within ***Appendix D***.

5.4 Stormwater Quality Control

Quality controls are not required for the proposed development due to the combined sewer outlet; correspondence with the RVCA is included in ***Appendix A***.

5.5 Stormwater Servicing Conclusions

Post development stormwater runoff will be required to be restricted to the allowable target release rate for storm events up to and including the 100-year for attenuated areas. The post-development allowable release rate for stormwater surface drainage was calculated as ***12.9 L/s***. It is estimated that ***82 m^3*** of storage will be required to meet this release rate.

Quality controls are not required for the proposed development due to the combined sewer outlet.

6.0 COMBINED SEWER SYSTEM FLOW

Under existing conditions, the site contains no stormwater management system for flow attenuation. Therefore, the pre-development “design” combined flow during the 5-year storm event was estimated to be approximately ***61.6 L/*** and during the 100-year event, is calculated as ***126.86 L/s. Table 9*** below summarizes the allowable and proposed release rates from the development.

Table 9
Summary of Existing and Proposed Release Rates

City of Ottawa Design Storm	Existing Peak Flow Rate (5 year) (L/s)	Proposed Peak Flow Rate (5 year) (L/s)	Existing Peak Flow Rate (100 year) (L/s)	Proposed Peak Flow Rate (100 year) (L/s)
Wastewater	0.26	4.21	0.26	4.21
Stormwater*	61.3	6.6*	126.6	13.2*
U2 Parking (unattenuated)		14.3		27.3
Combined	61.56	25.11	126.86	44.71
**Including 30,000 L/day (0.30 L/s) groundwater infiltration as indicated by Paterson Group*				

As indicated by ***Table 9***, above, based on the proposed combined flow rate of ***44.71 L/s*** during the 1:100 year event, the post-development combined flow will result in a net reduction to the existing combined sewer by approximately **82.15** ***L/s*** or ***65%***.

7.0 UTILITIES

Gas, Hydro, Streetlighting and Bell services exist within Spruce Street right-of-way.

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

8.0 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.

9.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Taggart Realty Management to prepare a Site Servicing and Stormwater Management report in support of the application for a Site Plan Control (SPC) at 989 Somerset Street. The preceding report outlines the following:

- Based on boundary conditions provided by the City, the existing municipal water infrastructure is capable of providing the proposed development with water. Pressures are anticipated to be above the desired pressure, as such pressure controls are required;
- The FUS method for estimating fire flow indicated ***20,000 L/min*** is required for the residential apartment building. As indicated by the boundary conditions provided by the City, the municipal system is capable of providing the required flow;
- The proposed development is anticipated to have a peak wet weather flow of ***4.28 L/s***. Based on the sanitary analysis conducted, the existing municipal sewer infrastructure has sufficient capacity to support the development;
- It is proposed that stormwater objective be met through storm water retention via cistern storage, it is calculated that ***82.0 m^3*** of onsite storage will be required to attenuate flow to the established release rate above and will be provided via an internal cistern;
- Quality controls are not required for the proposed development due to the combined sewer outlet, correspondence with the RVCA is included in ***Appendix A***;
- The development proposes a set of service laterals to service the proposed development. As a result, an Environmental Compliance Application (ECA) is not required.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Alexandre Tourigny, P.Eng.

APPENDIX A

Pre-Consultation

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DEVELOPMENT SERVICING STUDY CHECKLIST

21-1239 28/06/2021

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.	Drawings/Figures
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	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 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

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

☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 3.2
☐	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.3
☐	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	N/A
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☒	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 4.2
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

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

☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☐	Analysis of available capacity in existing public infrastructure.	N/A
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.3
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☐	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

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

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

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

patersongroup **memorandum**

consulting engineers

re:	**City of Ottawa Review Comment** **Proposed Multi-Storey Building** **989 Somerset Street West - Ottawa**
to:	DSEL - **Ms. Alison Gosling** - AGosling@dsel.ca
cc:	Alex Turner - **Mr. Alex Turner -** aturner@taggart.ca
date:	June 28, 2021
file:	PG5885-MEMO.01

Further to your request and authorization, Paterson Group (Paterson) reviewed the City of Ottawa comment for the aforementioned site and would like to provide the following response, from a geotechnical perspective.

City Comment

This is a combined sewer area. The storm water management criteria should use c 0.4, 2 years to control up to 100 year's storm event (including sanitary sewer, and ground water from the foundation).

Paterson Response

Paterson reviewed the soil profile encountered at the test hole locations at site. Based on the soil profile, it is understood that the third level of basement will be below the bedrock surface. Paterson has designed a waterproofing requirement for the building levels below grade. Based on the successful implementation of the waterproofing system, an infiltration rate of 30,000 L/day is expected, which would account for any potential groundwater that by-passes the waterproofing system.

We trust that this information is satisfactory to meet your immediate requirements.

Best Regards,

Paterson Group Inc.

June 28-2021

Yolanda Tang, MSc.Eng.

David J. Gilbert, P.Eng.

Paterson Group Inc.

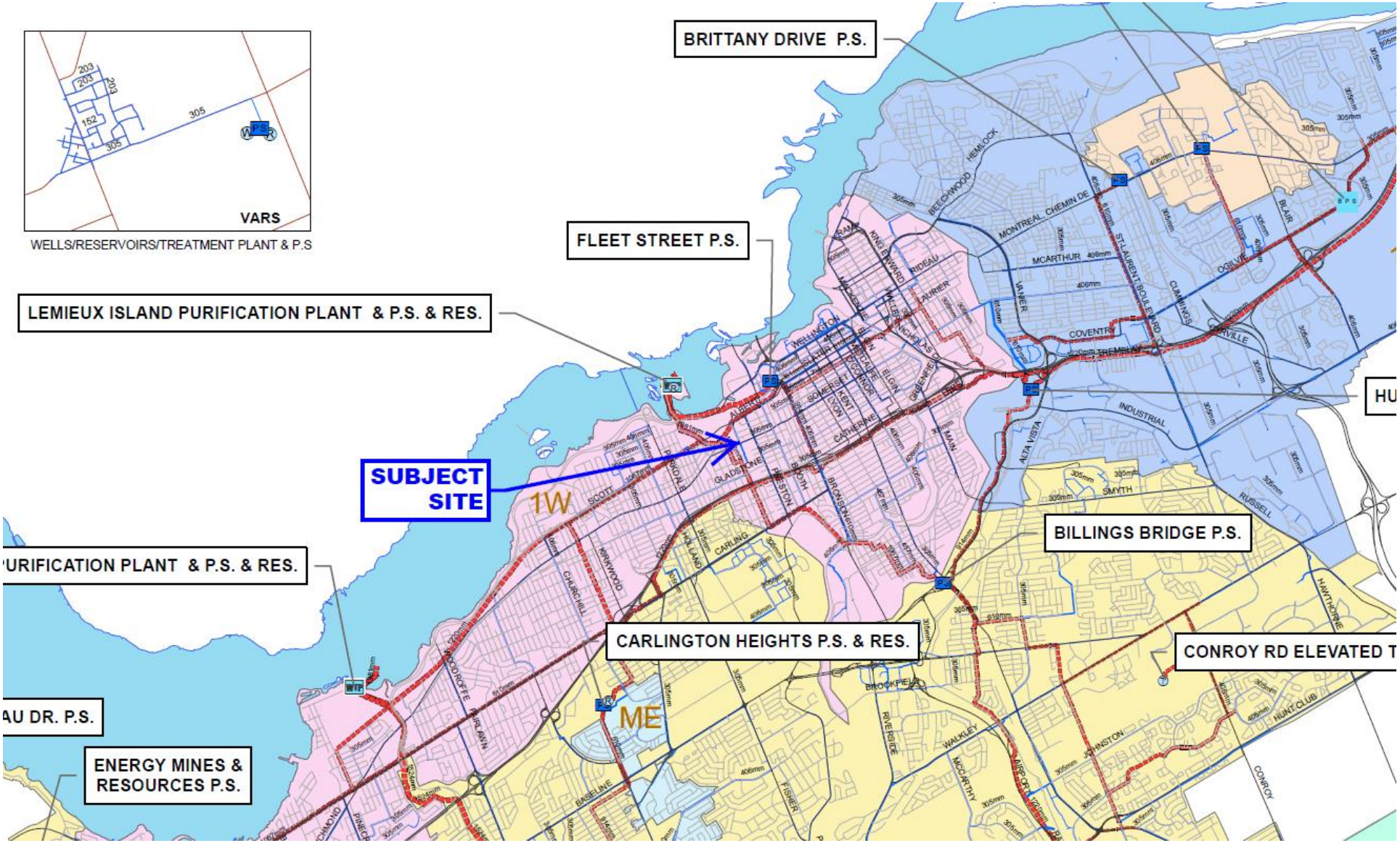
Head Office
154 Colonnade Road South
Ottawa - Ontario - K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

Northern Office and Laboratory
63 Gibson Street
North Bay - Ontario - P1B 8Z4
Tel: (705) 472-5331 Fax: (705) 472-2334

Ottawa Laboratory
28 Concourse Gate
Ottawa - Ontario - K2E 7T7
Tel: (613) 226-7381

APPENDIX B

Water Supply


VARS
WELLS/RESERVOIRS/TREATMENT PLANT & P.S
BRITTANY DRIVE P.S.
FLEET STREET P.S.
LEMIEUX ISLAND PURIFICATION PLANT & P.S. & RES.
SUBJECT SITE
1W
URIFICATION PLANT & P.S. & RES.
BILLINGS BRIDGE P.S.
CARLINGTON HEIGHTS P.S. & RES.
CONROY RD ELEVATED T
AU DR. P.S.
ENERGY MINES & RESOURCES P.S.
ME

Brandon Chow

To: Robert Freel
Subject: RE: 989 Somerset St - Boundary Conditions Request - D07-12-13-0221

From: Wu, John <John.Wu@ottawa.ca>
Sent: March 6, 2019 10:45 AM
To: Robert Freel <RFreel@dsel.ca>
Subject: RE: 989 Somerset St - Boundary Conditions Request - D07-12-13-0221

Here it is.

The following are boundary conditions, HGL, for hydraulic analysis at 989 Somerset (zone 1W) assumed to be connected to the 203mm on Spruce St and 406mm on City Centre (see attached PDF for location).

Minimum HGL = 107.5m, same for both connections

Maximum HGL = 115.0m , same for both connections. The maximum pressure is estimated to be above 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

MaxDay + Fireflow (333 L/s) = 97.0m, connection 1

MaxDay + Fireflow (333 L/s) = 105.0m, connection 2

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.

John

From: Robert Freel <RFreel@dsel.ca>
Sent: February 11, 2019 11:17 AM
To: Wu, John <John.Wu@ottawa.ca>
Cc: Brandon Chow <BChow@dsel.ca>
Subject: 989 Somerset St - Boundary Conditions Request - D07-12-13-0221

Good morning John,

Domicile indicated you were looking after this file (D07-12-13-0221), can you confirm?

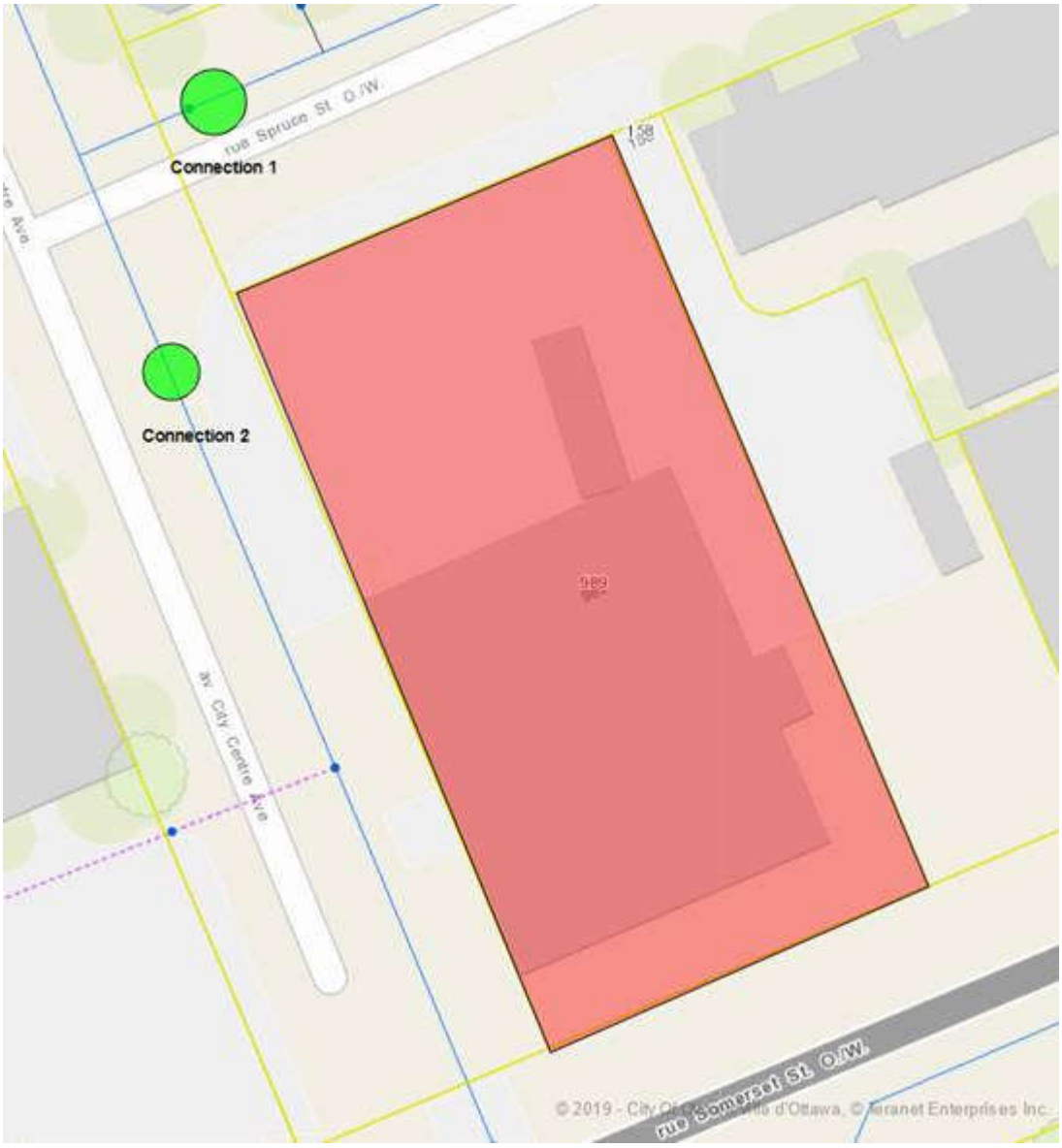
If so we would kindly like to request boundary conditions for the proposed development at **989 Somerset Street** using the following proposed development demands:

1. Location of Service / Street Number: **989 Somerset Street**

2. Type of development: **The proposed mixed-use development involves a 15-storey residential tower consisting of a <u>total of 196 residential units</u>.** An underground parking garage is also proposed. *Please find attached the Site Plan for reference***.**

3. Proposed Connection point:

- **Connection to existing 203 mm diameter watermain in Spruce Street**
- **Connection to existing 406 mm diameter watermain in City Center Avenue**
  Please see the diagram below for reference.



4**.** **<u>Please provide pressures for the following water demand scenarios required for the proposed development</u>**:

As the development dose not propose to extend the existing municipal infrastructure, both the FUS and NFPA methods have been utilized to review the required fire flow. The table below summarized the resulting demands.

	L/min	L/s
Avg. Daily	68.6	1.14

Max Day + OBC	205.9 + 4150 = 4355.9	3.43 + 69.17 = 72.60
Max Day + FUS	205.9 + 20000 = 20205.9	3.43 + 333.33 = 336.76
Peak Hour	308.9	5.15

Please feel free to let me know if there are any questions.

Thank you,

Bobby Freel, 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.558
cell: (613) 314-7675
email: rfreel@DSEL.ca

Alex Tourigny

From: Wu, John <John.Wu@ottawa.ca>
Sent: April 4, 2022 10:54 AM
To: Alex Tourigny
Cc: Alex Turner
Subject: RE: D07-12-13-0221 - 989 Somerset Street -BC Update

No objections.

John

From: Alex Tourigny <ATourigny@dsel.ca>
Sent: April 4, 2022 10:09 AM
To: Wu, John <John.Wu@ottawa.ca>
Cc: Alex Turner <aturner@taggart.ca>
Subject: D07-12-13-0221 - 989 Somerset Street -BC Update

Hi John,

Taggart Realty Management have updated their site plan for their 989 Somerset Street project. The updates result in a slight increase in water demand for the site (see table below). The water connections however will remain the same. Given the relatively small increase in demands, and the more than adequate pressures received on the previous boundary conditions, we're hoping to complete the report without updated boundary conditions. We've listed the differences below.

	2019 BC Requests	Revised Demands	
	L/min	L/min	% Increase
Avg. Daily	68.6	73.1	6.56
Max day + OBC	4355.9	4369.3	0.31
Max day + FUS	20205.9	20219.3	0.07
Peak Hour	308.9	329	6.51

Please advise if the City has any objections to this approach.

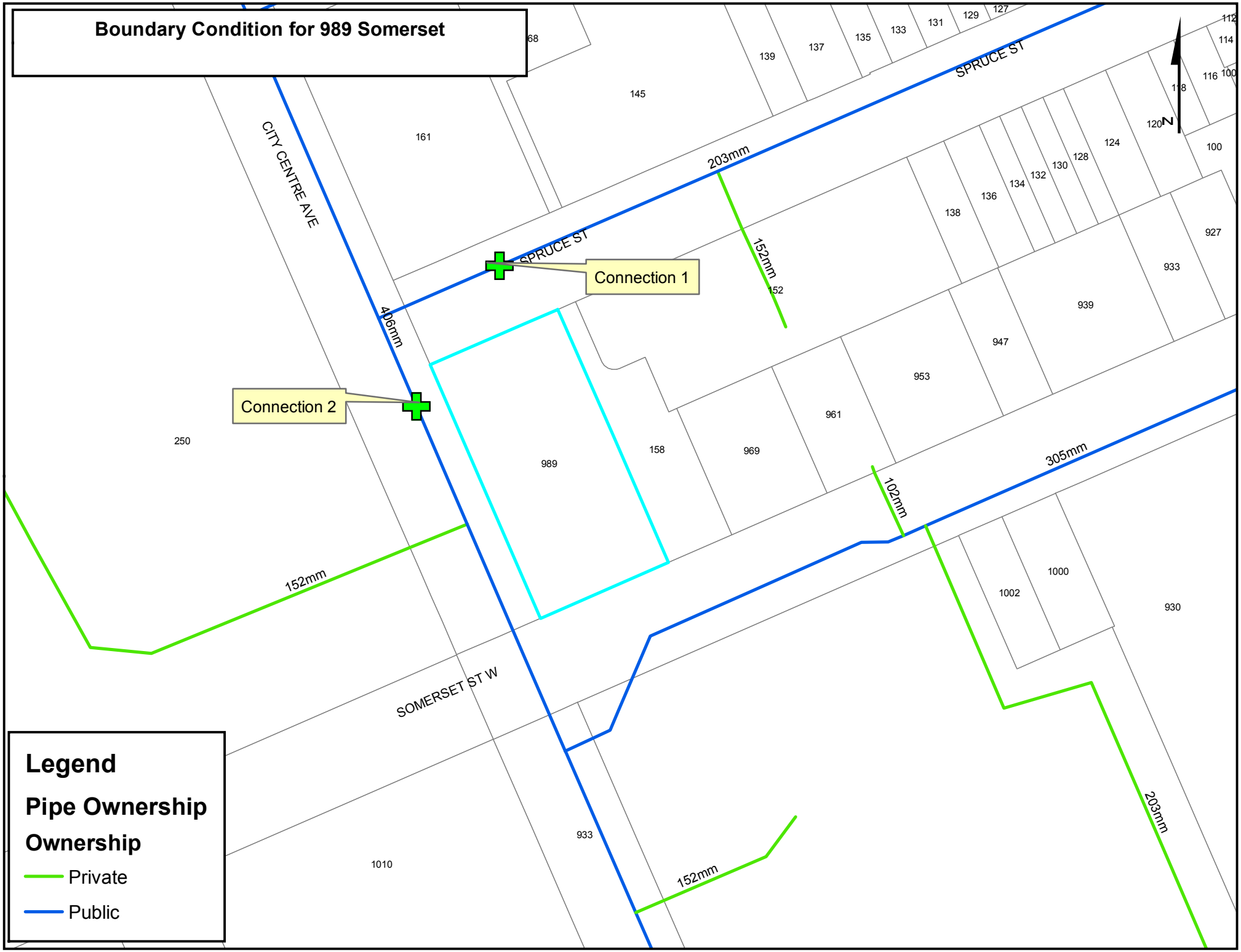
Thank you,

Alex Tourigny, P.Eng.

DSEL
david schaeffer engineering ltd.

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

phone: (613) 836-0856
cell: (343) 542-8847
e-mail: atourigny@dsel.ca


Boundary Condition for 989 Somerset
SPRUCE ST
CITY CENTRE AVE
SPRUCE ST
SOMERSET ST W
Connection 1
Connection 2
203mm
152mm
406mm
305mm
102mm
152mm
152mm
203mm
N
68
139
137
135
133
131
129
127
145
161
112
114
116
100
118
120
124
128
130
132
134
136
138
100
927
933
939
947
953
961
969
158
989
250
1000
1002
930
933
1010
Legend
Pipe Ownership
Ownership
Private
Public

Taggart Realty Management
989 Somerset Street
Existing 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	-	0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	0	0.0	0.0	0.0	0.0	0.0	0.0

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial floor space	2.5 $L/m^2/d$	1,490	3.73	2.6	5.6	3.9	10.1	7.0
Office	75 $L/9.3m^2/d$	-	0.00	0.0	0.0	0.0	0.0	0.0
Restaurant*	125 L/seat/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			3.7	2.6	5.6	3.9	10.1	7.0
Total Demand			**3.7**	**2.6**	**5.6**	**3.9**	**10.1**	**7.0**

Taggart Realty Management
989 Somerset Street
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	21	30
1 Bedroom	1.4	138	194
2 Bedroom	2.1	73	154
3 Bedroom	3.1		0
Average	1.8		0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	378	105.8	73.5	317.5	220.5	476.3	330.8

Institutional / Commercial / Industrial Demand

			Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**	**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial floor space	2.8 $L/m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Office	75 $L/9.3m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0	0.0	0.0	0.0
		Total Demand	**105.8**	**73.5**	**317.5**	**220.5**	**476.3**	**330.8**

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	20200.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	25014.3	L/min	
	25000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**21250.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-10625**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	20.1m-30m	43.1	2	87	9%	
S	Non-Combustible	30.1m-45m	45	2	90	5%	
E	Non-Combustible	0m-3m	57.6	1	58	23%	
W	Non-Combustible	20.1m-30m	27.5	1	28	8%	
		% Increase				**45%**	*value not to exceed 75%*

Increase	**9562.5**	**L/min**

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

Total Fire Flow

Fire Flow	20187.5	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	20000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Alex Tourigny

From: Wu, John <John.Wu@ottawa.ca>
Sent: April 4, 2022 10:54 AM
To: Alex Tourigny
Cc: Alex Turner
Subject: RE: D07-12-13-0221 - 989 Somerset Street -BC Update

No objections.

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From: Alex Tourigny <ATourigny@dsel.ca>
Sent: April 4, 2022 10:09 AM
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Max day + FUS	20205.9	20219.3	0.07
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Thank you,

Alex Tourigny, P.Eng.

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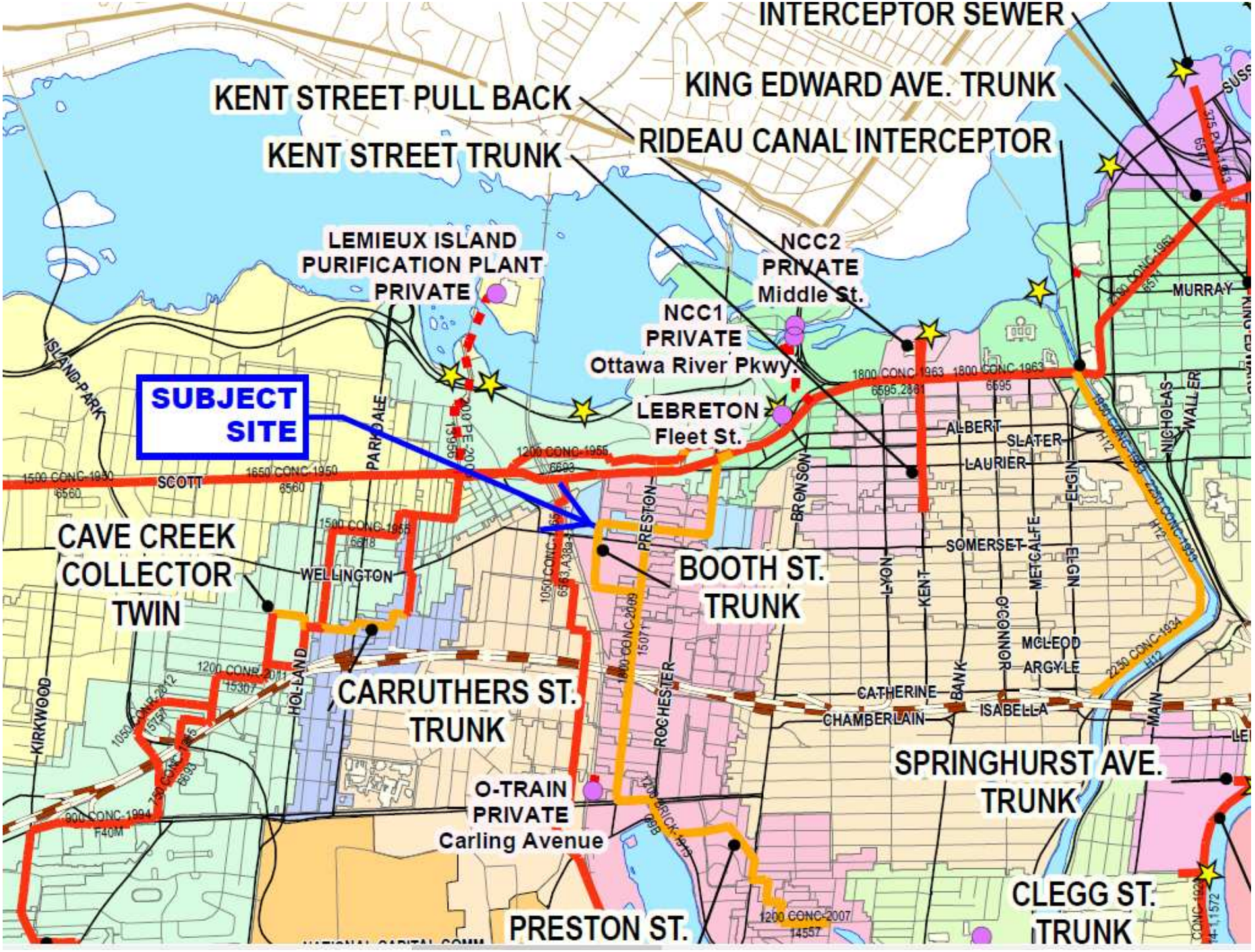
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856
cell: (343) 542-8847
e-mail: atourigny@dsel.ca

APPENDIX C

Wastewater Collection


INTERCEPTOR SEWER
KENT STREET PULL BACK
KING EDWARD AVE. TRUNK
KENT STREET TRUNK
RIDEAU CANAL INTERCEPTOR
LEMIEUX ISLAND
PURIFICATION PLANT
PRIVATE
NCC2
PRIVATE
Middle St.
NCC1
PRIVATE
Ottawa River Pkwy.
LEBRETON
Fleet St.
SUBJECT
SITE
CAVE CREEK
COLLECTOR
TWIN
BOOTH ST.
TRUNK
CARRUTHERS ST.
TRUNK
O-TRAIN
PRIVATE
Carling Avenue
SPRINGHURST AVE.
TRUNK
CLEGG ST.
TRUNK
PRESTON ST.
ISLAND PARK
PARKDALE
SCOTT
WELLINGTON
HOLLAND
KIRKWOOD
PRESTON
BRONSON
ROCHESTER
ALBERT
SLATER
LAURIER
SOMERSET
LYON
KENT
O'CONNOR
MCLEOD
ARGYLE
ELGIN
NICHOLAS
WALLER
MURRAY
CATHERINE
CHAMBERLAIN
BANK
ISABELLA
MAIN

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

Site Area 0.255 **ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.01 L/s**
Infiltration / Inflow (Wet)	**0.07 L/s**
Infiltration / Inflow (Total)	**0.08 L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		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	**0**
Average Domestic Flow	**0.00 L/s**
Peaking Factor	**3.80**
Peak Domestic Flow	**0.00 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5 $L/m^2/d$	1,490	0.17
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	**0.17**
Peak Institutional / Commercial Flow	0.17
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.17**

** 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	**0.19 L/s**
Total Estimated Peak Dry Weather Flow Rate	**0.19 L/s**
Total Estimated Peak Wet Weather Flow Rate	**0.26 L/s**

Taggart Realty Management
989 Somerset St
Proposed Site Conditions

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

Site Area	0.255	**ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.01**	**L/s**
Infiltration / Inflow (Wet)	**0.07**	**L/s**
Infiltration / Inflow (Total)	**0.08**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4	21	30
1 Bedroom	1.4	138	194
2 Bedroom	2.1	73	154
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**378**	
Average Domestic Flow	**1.23**	**L/s**
Peaking Factor	**3.43**	
Peak Domestic Flow	**4.20**	**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	**1.24**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**4.21**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**4.28**	**L/s**

SANITARY SEWER CALCULATION SHEET

CLIENT: **TAGGART REALTY MANAGEMENT**
LOCATION: **989 SOMERSET STREET**
FILE REF: **21-1239** 2021-06-28
DATE:

DESIGN PARAMETERS

Avg. Daily Flow Res.	280	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.33	L/s/ha
Avg. Daily Flow Comm.	28,000	L/ha/d	Peak Fact. Comm.	1.5	Min. Pipe Velocity	0.60	m/s full flowing
Avg. Daily Flow Instit.	28,000	L/ha/d	Peak Fact. Instit.	1.5	Max. Pipe Velocity	3.00	m/s full flowing
Avg. Daily Flow Indust.	35,000	L/ha/d	Peak Fact. Indust. per MOE graph		Mannings N	0.013	

Location			Residential Area and Population									Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Area ID	Up	Down	Area	Number of Units				Pop.	Cumulative		Peak.	Q_{res}	Area	Accu.	Area	Accu.	Area	Accu.	Q_{C+I+I}	Total	Accu.	Infiltration	Total	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
				by type					Area	Pop.	Fact.			Area		Area		Area				Flow	Flow								
			(ha)	Singles	Semi's	Town's	Apt's		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
EX1	EX SANMH 1	EX SANMH 2	0.330				36	65.0	0.330	65.0	4.00	0.84		0.00		0.00		0.00	0.0	0.330	0.330	0.092	0.93	250	0.30	42.8	0.049	0.063	0.66	32.6	0.03
EX2	EX SANMH 2	EX SANMH 3	0.270	6				20.0	0.600	85.0	4.00	1.10		0.00		0.00		0.00	0.0	0.270	0.600	0.168	1.27	250	0.30	52.7	0.049	0.063	0.66	32.6	0.04
EX3	EX SANMH 3	EX SANMH 4	0.560	6	10	4		58.0	1.160	143.0	4.00	1.85		0.00		0.00		0.00	0.0	0.560	1.160	0.325	2.18	250	0.30	88.0	0.049	0.063	0.66	32.6	0.07

**Ex. pipe information based on as-built plan dated May 2005, City of Ottawa contract No. ISBO3 - 5031*

989 Somerset Street – Sanitary Analysis

AREA ID	Total Area (Ha)	Residential Area (Ha)
EX1	0.33	0.33
EX2	0.27	0.27
EX3	0.56	0.56

APPENDIX D

Stormwater Management

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

Existing Drainage Charateristics From Internal Site

Area*	0.255	ha	
C	0.83	Rational Method runoff coefficient	
L	80	m	
Up Elev	57.80	m	
Dn Elev	55.05	m	
Slope	3.4	%	
Tc	5.2	min	
Tc	10.0	min	* Tc of 10 minutes minimum, per City of Ottawa standards

1) Time of Concentration per Federal Aviation Administration

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

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

Estimated Peak Flow

	2-year	5-year	100-year	
i	76.8	104.2	178.6	mm/hr
Q	45.2	61.3	126.6	L/s

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)

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

Target Flow Rate

Area 0.255 ha
C 0.40 Rational Method runoff coefficient
t_c 15.0 min

2-year
i 61.8 mm/hr
Q 17.5 L/s

Wastewater Flow
Q 4.3 L/s

Groundwater Flow
Q 0.3 L/s **30,000 L/day per geotechnical recommendations.*

Resulting SWM Flow ***(2-year minus wastewater demand & groundwater rate)***
Q 12.9 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID U1
Total Area 0.023 ha
C 0.55 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	3.7	3.7	0.0	0.0	178.6	7.8	7.8	0.0	0.0

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)

Area ID U2
Total Area 0.055 ha
C 0.90 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	14.3	14.3	0.0	0.0	178.6	27.3	27.3	0.0	0.0

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

Estimated Post Development Peak Flow from Attenuated Areas

Area ID A1
Total Area 0.177 ha
C 0.90 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	46.1	2.7	43.5	26.1	178.6	87.8	5.1	82.7	49.6
20	70.3	31.1	2.7	28.4	34.1	120.0	59.0	5.1	53.9	64.7
30	53.9	23.9	2.7	21.2	38.1	91.9	45.2	5.1	40.1	72.2
40	44.2	19.6	2.7	16.9	40.5	75.1	36.9	5.1	31.9	76.5
50	37.7	16.7	2.7	14.0	42.0	64.0	31.4	5.1	26.4	79.2
60	32.9	14.6	2.7	11.9	42.8	55.9	27.5	5.1	22.4	80.7
70	29.4	13.0	2.7	10.3	43.3	49.8	24.5	5.1	19.4	81.6
80	26.6	11.8	2.7	9.1	43.5	45.0	22.1	5.1	17.1	81.9
90	24.3	10.7	2.7	8.1	43.5	41.1	20.2	5.1	15.2	81.9
100	22.4	9.9	2.7	7.2	43.4	37.9	18.6	5.1	13.6	81.5
110	20.8	9.2	2.7	6.5	43.1	35.2	17.3	5.1	12.3	80.9
120	19.5	8.6	2.7	5.9	42.7	32.9	16.2	5.1	11.1	80.1
130	18.3	8.1	2.7	5.4	42.1	30.9	15.2	5.1	10.1	79.1
140	17.3	7.6	2.7	4.9	41.6	29.2	14.3	5.1	9.3	78.0
150	16.4	7.2	2.7	4.5	40.9	27.6	13.6	5.1	8.5	76.7
160	15.6	6.9	2.7	4.2	40.2	26.2	12.9	5.1	7.8	75.4
170	14.8	6.6	2.7	3.9	39.4	25.0	12.3	5.1	7.2	73.9
180	14.2	6.3	2.7	3.6	38.6	23.9	11.8	5.1	6.7	72.4
190	13.6	6.0	2.7	3.3	37.8	22.9	11.3	5.1	6.2	70.8
200	13.0	5.8	2.7	3.1	36.9	22.0	10.8	5.1	5.8	69.1
210	12.6	5.6	2.7	2.9	36.0	21.1	10.4	5.1	5.3	67.3
220	12.1	5.4	2.7	2.7	35.0	20.4	10.0	5.1	5.0	65.6

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)

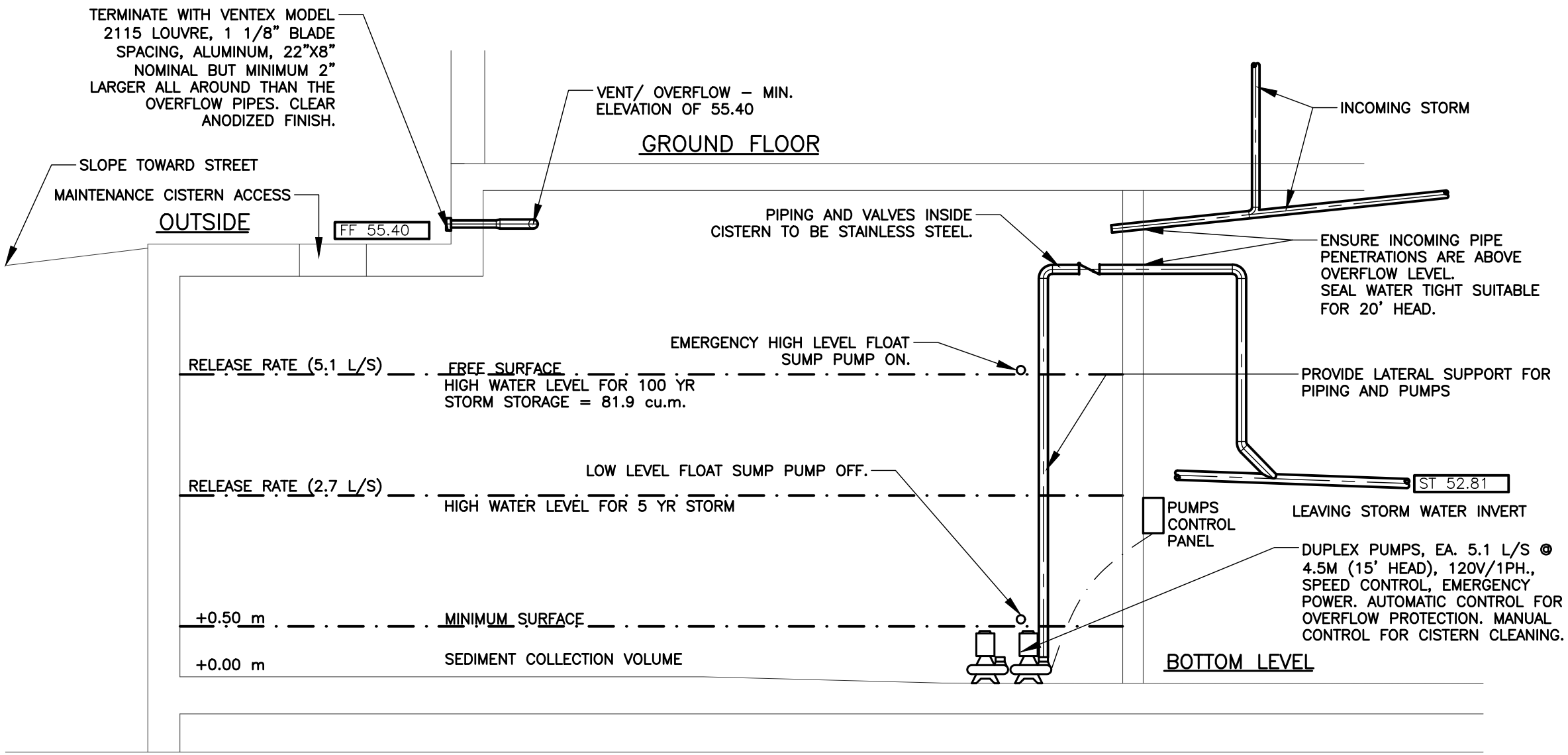
5-year $Q_{attenuated}$ 2.68 L/s **100-year $Q_{attenuated}$ 5.05 L/s**
5-year Max. Storage Required 43.5 m^3 **100-year Max. Storage Required 81.9 m^3**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m^3)	100-Year Release Rate (L/s)	100-Year Storage (m^3)
Unattenuated Areas	3.7	0.0	7.8	0.0
Attenutated Areas	2.7	43.5	5.1	81.9
Total	**6.3**	**43.5**	**12.9**	**81.9**

CISTERN NOTES

1. REFER TO SITE SERVICING REPORT AND STORM WATER MANAGEMENT REPORT FOR ADDITIONAL SUPPORTING INFORMATION FOR THIS SYSTEM. THAT REPORT SHALL FORM PART OF THE SUPPORTING DOCUMENTS FOR THIS CONTRACT. CONTRACTOR SHALL READ THE REPORT PRIOR TO SUBMITTING CONTRACT PRICE.
2. MECHANICAL CONTRACTOR TO PROVIDE PIPING, CONTROLS, CONDUIT, WIRING AND EQUIPMENT FOR THE CISTERN, CISTERN TO BE PROVIDED BY GENERAL CONTRACTOR.
3. ALL PIPING SHALL BE METALLIC PRESSURE PIPING INCLUDING STORM UP TO THE FLOOR INDICATED.
4. MECHANICAL CONTRACTOR TO PROVIDE CONTROLS WITH INDICATOR LIGHTS FOR ALL FLOAT LEVELS AND PUMP OPERATION INDICATOR. PROVIDE MANUAL OVERRIDE FOR THE PUMP TO ALLOW COMPLETE DRAINAGE OF THE CISTERN.
5. ALL PENETRATIONS OF THE CISTERN SHALL BE MADE PRESSURE AND WATER TIGHT.
6. MECHANICAL CONTRACTOR TO MEASURE AREA OF CISTERN AFTER IT IS FORMED AND DETERMINE HEIGHTS OF ALL WATER LEVELS, FLOAT LEVELS AND PIPE PENETRATIONS. SUBMIT FABRICATION SKETCH TO ENGINEER FOR REVIEW PRIOR TO STARTING WORK.



1 / M-01 CISTERN DETAIL
N.TS

21-Q046

NO.	REVISION	DATE
10		
9		
8		
7		
6		
5		
4	ISSUED FOR COORDINATION	2022-04-20
3	ISSUED FOR COORDINATION	2021-12-08
2	RE-ISSUED FOR SITE PLAN COORDINATION	2021-07-07
1	ISSUED FOR SITE PLAN COORDINATION	2021-06-09

PROJECT
CISTERN DESIGN
989 SOMERSET ST.
OTTAWA, ON

QUADRANT
an Instaelectric Company
2283 ST. LAURENT BLVD., UNIT 203, OTTAWA, ONT., K1G 5A2
TEL. (613) 567-1487 FAX. (613) 567-1493
E-Mail: mail@quadrantengineering.ca

DRAWING TITLE
CISTERN DETAIL

STAMP

CURRENT DATE	Wed, 20 Apr 2022, 17:01
SCALE	NTS
DRAWN	NK
DESIGNED	AR
CHECKED	CWC
PROJECT	21-Q046
DRAWING NUMBER	M-01

SHEET SIZE: ANSI B (11"x17")

Drawing name: G:\My Drive\QEL1\OneDrive\Jobs\2021\21-Q046 989 Somerset Cistern Design\03 Design\04 Drawings\Mechanical\Work in progress\21-Q046M Mechanical Cistern.dwg

J.F. Sabourin and Associates Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

June 25, 2021 Project Number: 2165-21

David Schaeffer Engineering Ltd
120 Iber Road, Unit 103
Ottawa, ON
K2S 1E9

Attention: **Alison Gosling**

Subject: **898 Somerset Street West – Flood Depth**

J.F. Sabourin and Associates Inc (JFSA) has been commissioned by David Schaeffer Engineering Ltd (DSEL) to determine the maximum flooding depth for the future development located at 898 Somerset Street West in Ottawa. The proposed development is near a localized natural depression that has been prone to flooding in the past. The following memo will calculate the approximate storage volume within this low point and the total runoff volume to this location under the 100-Year event to determine a maximum water surface elevation, and in turn, establish a safe finished floor level elevation for this development.

As mentioned above, this area has been prone to flooding due to major system flows from upstream drainage areas, which in the past have extended to Dows Lake (a figure of the former drainage area has been provided in Attachment A). As per correspondence with the City, the major system drainage to the 898 Somerset site has been greatly reduced through the recent implementation of a Stormwater management facility located at Plouffe Park (130 Preston St). Based on correspondence with the City, *"Plouffe Park can accommodate the 50-year event, but the ponding will also occur on Preston street, which will ensure no spillage downstream for events up to 100 years*". This new SWM facility significantly reduces the total drainage area to the depression near 898 Somerset Street West, as all major system flows upstream of Plouffe Park will be captured and retained within Plouffe Park/Preston Street. Based on the updated analysis completed by the City the total drainage area to this depression is now 14.3 ha (as outlined in correspondence provided in Attachment A).

To assess the total storage volume within the low point surrounding 898 Somerset street West, and ultimately determine the maximum water surface elevation, 1K mapping topographic data was converted into a digital terrain model (DTM). The DTM was then used to determine the extent of the low point and spill elevation near 898 Somerset Street West. As such Elevation/Area/Volume curves were then derived for this low-lying area. Table 1 below outlines these curves, with a full figure of contour lines provided in Figure 1.

Note that the City of Ottawa also completed a similar analysis which resulted in comparable results (provided in attachment A). Note discrepancies between JFSA's and the City's analysis are most likely due to different topographic data sources (JFSA used 1k mapping and the City most likely used LiDAR), and the fact that there are several different acceptable approaches to calculate storage volume of an irregular 3D surface. Additionally in the City's volumetric analysis any volume within the existing buildings was discounted, which would be fair if all these buildings were designed to be watertight, but this is most likely not the case given the number of garage/roller doors within the City Centre complex alone.

Irrespective of the above-noted items, overall the two curves independently derived show a good correlation. Note that as a part of this analysis it was determined that the spill point from within this depressing has an elevation of 56.05 m and was located in the west of the City Centre complex (indicated by the red triangle in Figure 1). The City in their independent analysis determined an additional spill point underneath the City Centre Complex ramp at an elevation of 56.35 m.

Table 1 Depression Area - Elevation/Depth/Area/Volume Summary

Elevation (m)	Ponding Depth (m)	Total Area (m^2)	Total Volume (m^3)
54.9	0.0	50	0
55.0	0.1	292	15
55.1	0.2	684	63
55.2	0.3	1,408	165
55.3	0.4	2,563	361
55.4	0.5	4,165	694
55.5	0.6	6,332	1,215
55.6	0.7	8,222	1,941
55.7	0.8	10,793	2,889
55.8	0.9	14,406	4,144
55.9	1.0	19,344	5,826
56.0	1.1	25,568	8,064
56.1	1.2	30,414	10,860
56.2	1.3	34,966	14,126
56.3	1.4	38,715	17,809
56.4	1.5	41,681	21,828
56.5	1.6	44,335	26,128
56.6	1.7	46,863	30,687
56.7	1.8	49,153	35,487
56.8	1.9	51,148	40,502
56.9	2.0	53,074	45,713
57.0	2.1	54,832	51,108

*Terrain data based on bare earth 1K mapping topography

To convert the low point storage volume into a maximum flooding elevation a simplistic yet conservative approach has been taken. Based on synthetic design storms for the City of Ottawa the 100-Year 3-hour Chicago storm has a total rainfall volume of 71.60 mm, while the 100-Year 24-hour SCS storm has a total rainfall volume of 106.7 mm, as such the 100-Year 24-hour SCS storm was determined to be the critical storm for this analysis.

Based on the total drainage area of 14.3 ha that discharges to this low point and simply assuming that this total drainage area is 100% impervious, has no initial wetting losses (Initial Abstraction) and no minor system capture, the maximum possible runoff volume to this low point for the 100-year event can be approximated by simply multiplying the total drainage area (m^2) by the total rainfall volume (m) to derive the maximum possible runoff volume (m^3) Table 2 below outlines the total runoff volume for this area based on the above assumptions. The runoff volume calculated was then cross-referenced with the storage volumes determined in Table 1 above, to approximate the maximum possible flooding depth for both the 100-year SCS and Chicago storm. Based on this analysis it was determined that the maximum flooding elevation in this area is 56.23 m. Note that this analysis does not consider any flow out of this depression through either the low points elevations of 56.05 m & 56.35 m identified above or through the storm sewer infrastructure within this area, again ensuring a conservative design. As an additional measure of safety, it is proposed that the building at 898 Somerset Street West has a finished floor level and/or building opening 0.3 m above the maximum 100-Year water surface elevation (56.23 m), taking the finished floor level and/or building opening to an elevation of 56.53 m.

Table 2: Runoff Volume/Ponding Depth

Design Storm	Total Rainfall (mm)	Maximum Runoff Volume* (m^3)	Maximum Ponding Elevation ** (m)
100YrCHI3Hr	71.60	10,239	56.08
100YrSCS24Hr	106.70	15,258	56.23

*Runoff volume calculated as 100% of rainfall volume and assumes no IA losses
** ponding elevation assumes no spilling from within the depression area or any outflows from this area via the existing minor system infrastructure

As outlined above, the storage volume within the existing low-lying area surrounding 898 Somerset Street West was determined based on 1K mapping. The maximum possible 100-Year runoff volume to this location was approximated, assuming that the total drainage area to this location is 100% impervious, has no initial wetting losses (Initial Abstraction) and no minor system capture. The total runoff volume was then cross-referenced with the Stage/Volume curve derived based on the topography to determine a maximum 100-year water level at this location. As an additional measure of safety, it is proposed that the building at 898 Somerset Street W will have a finished floor level and/or building opening 0.3m above the maximum 100-Year water surface elevation (56.23m), taking the finished floor level and/or building opening to an elevation of 56.53 m.

Yours truly,
J.F Sabourin and Associates Inc.

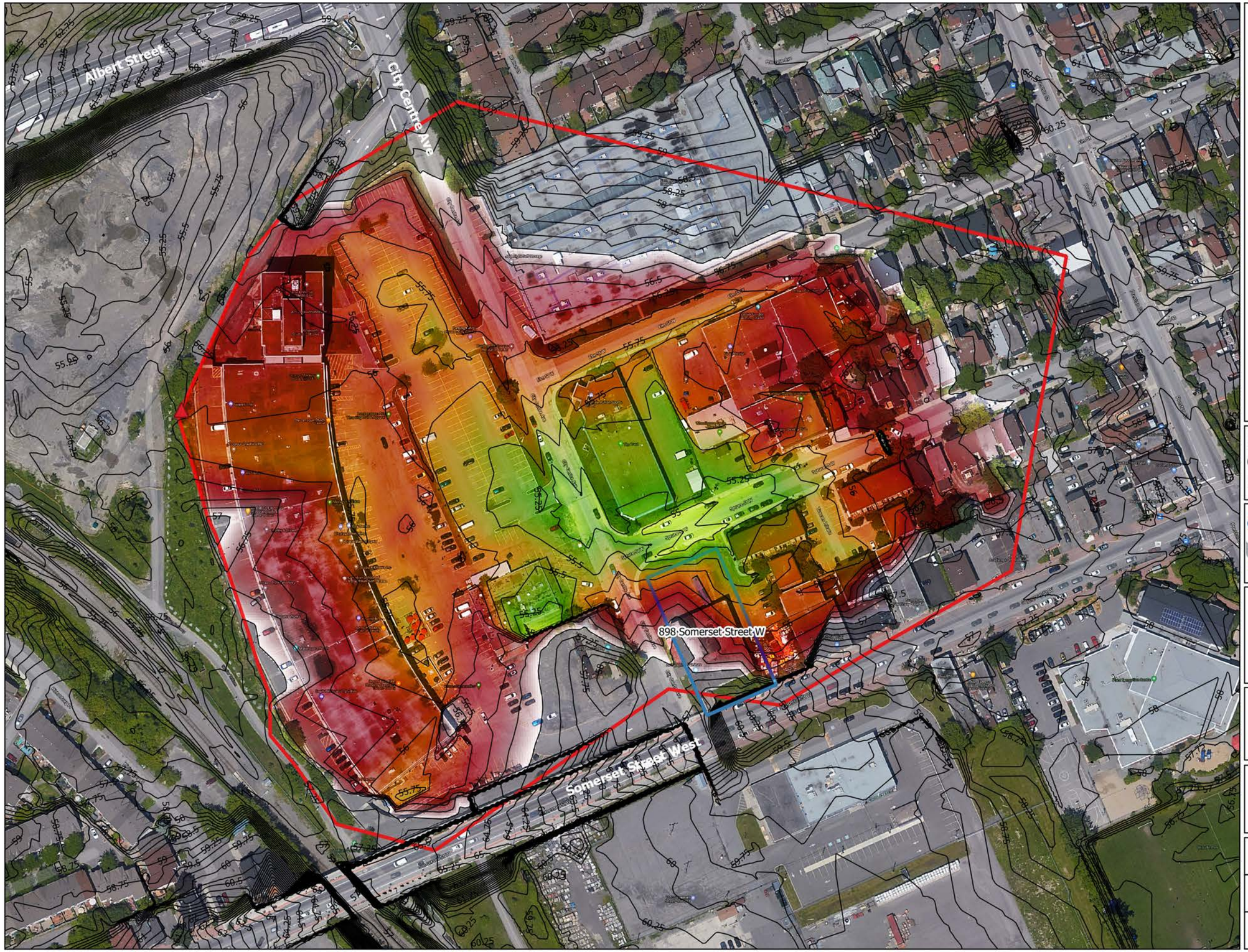
Jonathon Burnett, B.Eng, P.Eng
Water Resource Engineer

cc: J.F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

Figures

Tables

Attachments



Legend

- Study Area
- Site
- Spill Point (56.05 m)
- Contours (0.25 m)

Topography (1K Mapping)

- 54.5
- 54.75
- 55
- 55.25
- 55.5
- 55.75
- 56
- 56.25
- 56.5
- 56.75
- 57

N

SCALE: 1:1500

0 25 50 75 100

J.F. Sabourin and Associates Inc.
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DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS™

898 Somerset Street West – Flood Depth

Figure 1: Site Overview

PROJECT	2165-21
DRAWN	JB
DATE	June 2021

C:\OneDrive\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2165-21\Design\GIS\20210616-Depression Storage Volume

JFSA
WATER RESOURCES AND
ENVIRONMENTAL CONSULTANTS

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

Attachment A

Background Information – City Correspondence

From: Tousignant, Eric
To: catherine@lithosgroup.ca
Cc: "Matina Sakoutsiou"
Subject: RE: 989 Somerset Street West_ Stormwater management approach
Attachments: image002.jpg
image003.png
image004.png
Low Points.pdf
Streams and Drainage Area.pdf

Good Morning Catherine

Plouffe Park can accommodate the 50-year event, but the ponding will also occur on Preston street, which will ensure no spillage downstream for events up to 100 years. The Preston Street system has been upgraded in recent years with the replacement of the Preston Trunk Sewer and the implementation of Inlet Control Devices throughout the basin. The area North of Carling avenue can thus be allowed a 5-year release rate (as you stated in our email). You must therefore control the release rate to 5 year existing for events up to the 100-year storm with the use of on-site detention.

Below is an email that I sent to our development approvals group. It shows that the spill elevation for the area of your development is 57 m, but this is based on a DEM analysis and not field measurement. It may be in your best interests to confirm this in the field.

Regards

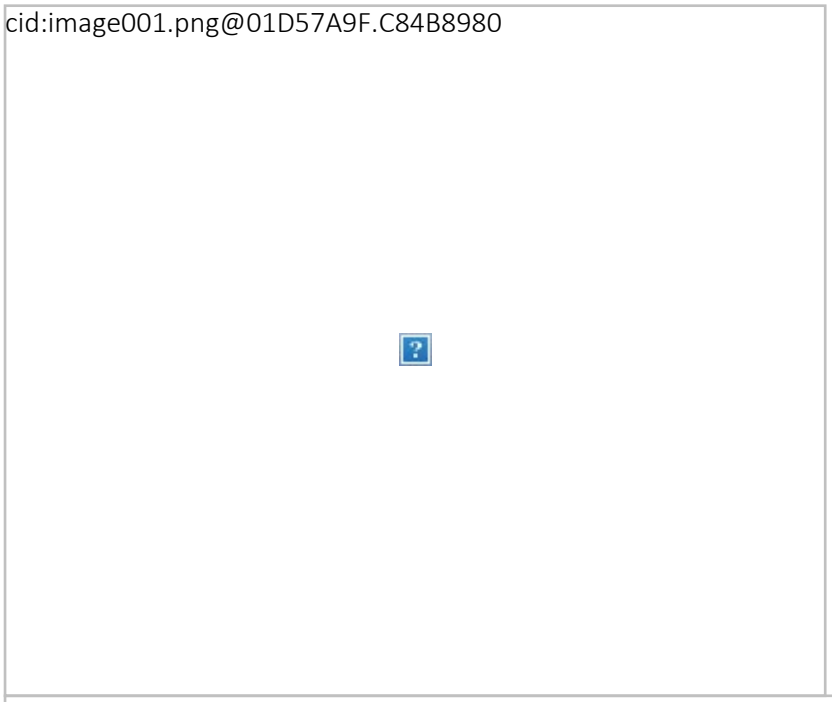
Eric Tousignant, P.Eng.
Senior Water Resources Engineer
Infrastructure Services
613-580-2424 ext 25129

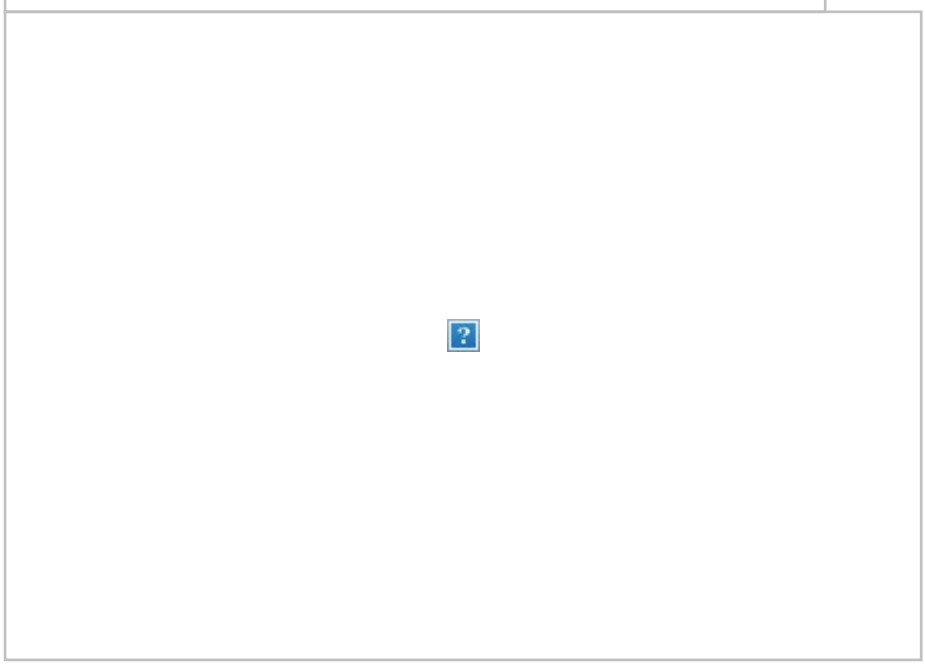
****

If you look at the Streams and Drainage area PDF, you can see that there is a huge overland drainage area leading to the low point on City Centre. This is why historically there has been significant ponding at this location. This was further exacerbated by adding ICDs in the drainage area after the 2004 flooding event. However, in 2009 the City converted Plouffe Park (corner of Preston and Anderson) to a SWM pond to capture the 50-year event (100 year if Preston Also floods). The spill to City Centre should therefore be much smaller, but this does not eliminate the risk of flooding on City Centre.

The Low point PDF shows significant ponding before water spills to 900 Albert. The yellow line bellow shows the rough spill path. The figure after that shows the profile along that path and the spill elevation is roughly 57 m. I don't know how much water will accumulate at this low point now that the Plouffe Park SWM pond is operational, but to be safe, the building at 989 Somerset should have its entry points higher than 57 m. Even if we compute the 100-year ponding elevation at this low point using the old 2009 model, it would just be an estimate and the risk would still be there. Let's say that a sewer backup or a CB blockage occurs, we

could see significant ponding there again.





From: catherine@lithosgroup.ca <catherine@lithosgroup.ca>
Sent: November 18, 2019 3:15 PM
To: Tousignant, Eric <Eric.Tousignant@ottawa.ca>
Cc: 'Matina Sakoutsiou' <matinas@lithosgroup.ca>
Subject: 989 Somerset Street West_ Stormwater management approach

Hello Eric,

Thank you for the time over the phone.

I wish to summarize our conversation here. To my understanding Plouffe Park has been designed to accommodate ponding for events up to 100-year. The City's modelers calculated the elevation of potential flooding in the area in the event that this system won't be able to perform properly (i.e. catch basin blockage). The analysis considered the biggest storm event recorded in the area and the FFE / openings elevation we should be considering due to this analysis for the subject property, is 57.0m.

Moreover, further to the Stormwater Management approach, our post-development peak flows for up to a 100-year storm event are to be controlled to the 5-year pre-development target flow.

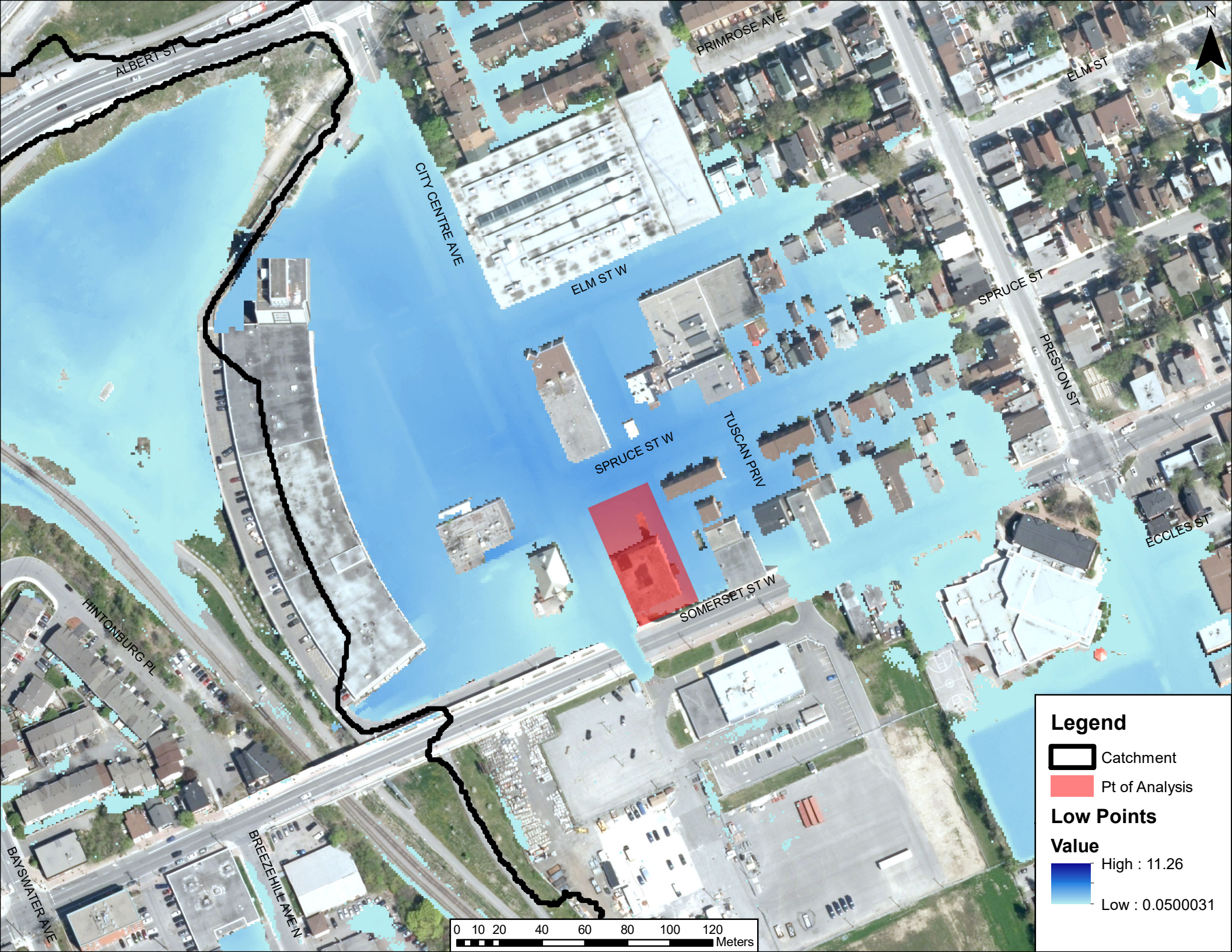
Kindly confirm you are in agreement with the above, prior we'll proceed with our design.

Your help is much appreciated.

Best Regards,

Catherine Agiou, P.E., M.A.Sc.
Project Designer / Coordinator

Lithos Group Inc.
150 Bermondsey Road, Unit #200
Toronto, Ontario M4A 1Y1
Direct: (437) 889-9950 T: (416) 750-7769
Catherine@LithosGroup.ca
www.LithosGroup.ca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ALBERT ST
PRIMROSE AVE
ELM ST
CITY CENTRE AVE
ELM ST W
SPRUCE ST
PRESTON ST
SPRUCE ST W
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ECCLES ST
SOMERSET ST W
HINTONBURG PL
BREEZEHILL AVE N
BAYSWATER AVE
0 10 20 40 60 80 100 120
Meters
Legend
Catchment
Pt of Analysis
Low Points
Value
High : 11.26
Low : 0.0500031


N
ALBERT ST
BOOTH ST
LORNE AVE
PRESS AVE
CAMBRIDGE ST N
ARTHUR ST
MACLAREN ST
GILMOUR ST
LYON ST N
JAMES ST
FLORENCE ST
GLADSTONE AVE
MCLEOD ST
KENT ST
BANK ST
BAY ST
CATHERINE ST
ARLINGTON AVE
FLORA ST
BRONSON AVE
PERCY ST
CHAMBERLAIN AVE
LYON ST
POWELL AVE
GLENDALE AVE
RENFREW AVE
GLEMOW AVE
IMPERIAL AVE
GLEBE AVE
FIRST AVE
SECOND AVE
THIRD AVE
FOURTH AVE
FIFTH AVE
CHRYSLER ST
ELLA ST
NEWTON ST
MURIEL ST
ORAIG ST
LAKESIDE AVE
QUEEN
DOWS LAKE RD
KIPPEWA DR
FREDERICK PL
PRINCE OF WALES DR
CARLING AVE
LINDENPARK PL
SHERWOOD DR
CIVIC PL
OLD IRVING PL
GWYNNE AVE
BARRIE AVE
REID AVE
PARKDALE AVE
ORRIN AVE
KENILWORTH ST
HUTCHISON AVE
RUSKIN ST
FULLER ST
KINNEAR ST
BEECH ST
OAKVALE AVE
FERN AVE
NOLAN AVE
BAYSWATER AVE
BREEZEHILL AVE S
LORETTA AVE S
CHAMPAGNE AVE S
RAILWAY ST
PRESTON ST
NORMAN ST
PAMILLA ST
ADELINE ST
SIDNEY ST
LEBRETON ST S
BELL ST S
CAMBRIDGE ST S
YOUNG ST
YOUNG ST E
HWY417 IC122 RAMP15
HWY417 IC121B RAMP16
HIGHWAY 417
ORANGEVILLE ST
PLYMOUTH ST
RAYMOND ST
ARTHUR LANE N
LEBRETON ST N
LOUISA ST
LOUISA ST W
LAUREL ST
LAUREL ST E
LARCH ST
BALSAM ST
WILLOW ST
POPLAR ST
OAK ST
ANDERSON ST
ECCLES ST
SOMERSET ST W
SPRUCE ST
ELM ST
PRINCE ARTHUR AVE
CITY CENTRE AVE
ROCHESTER ST
HINTONBURG PL
BAYVIEW STATION RD
HILDA ST
GARLAND ST
ARMSTRONG ST
WELLINGTON ST W
MERTON ST
PINHEY ST
BREEZEHILL AVE N
LORETTA AVE N
IRVING AVE
FAIRMONT AVE
ST FRANCIS ST
SPADINA AVE
MELROSE AVE
SHERBROOKE AVE
ROSEMOUNT AVE
BEVERLEY AVE
EDGAR ST
0 50 100 200 300 400 500 600
Meters
Legend
Streams
Catchment
Pt of Analysis

From:	Cooke, Ryan
To:	Tousignant, Eric
Subject:	City Centre Low Point Volume
Date:	Tuesday, 10 March 2020 1:54:10 PM
Attachments:	City_Center_Low_Point.txt City Centre Low Point.png

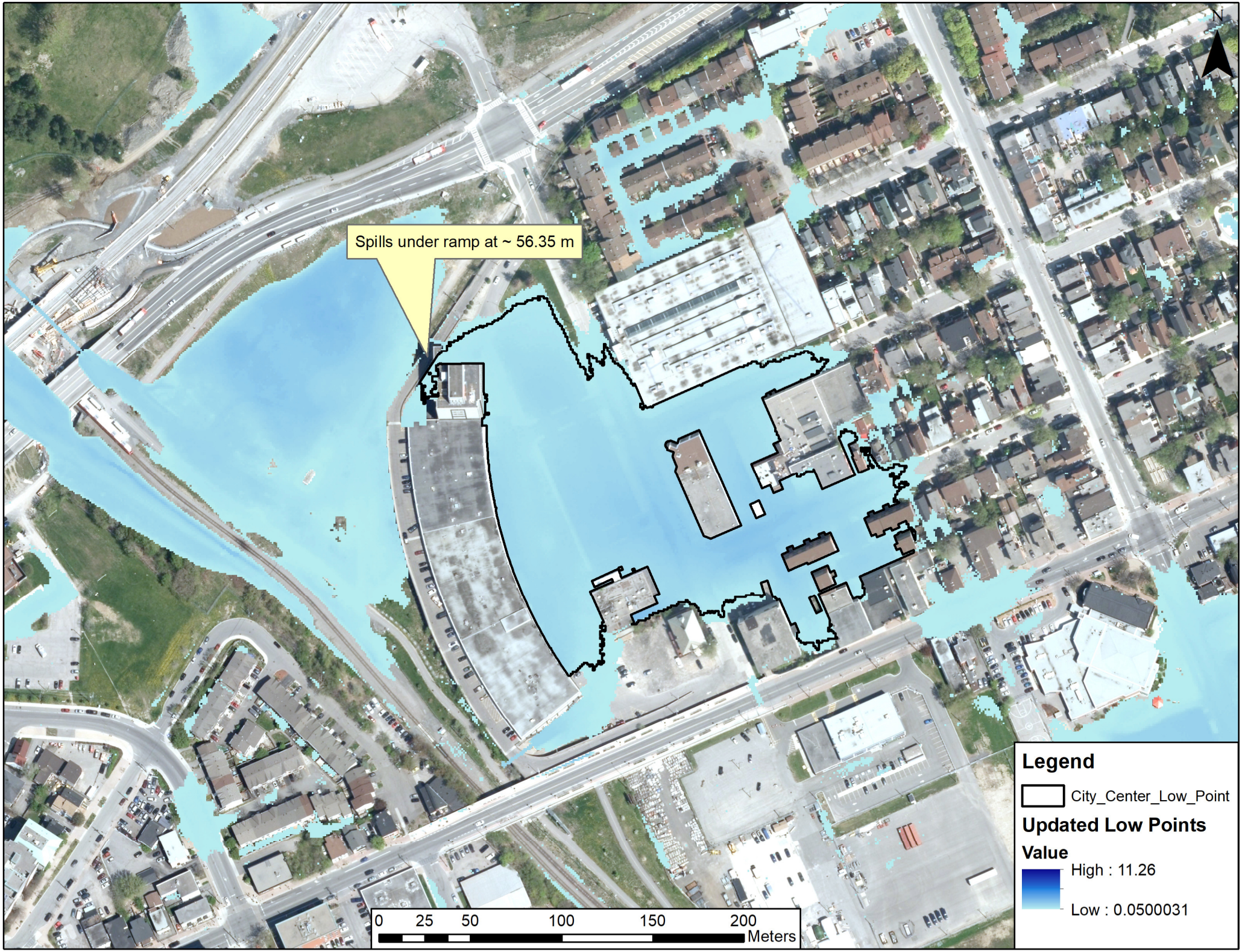
Hi Eric,

As discussed, I updated the DEM to correctly account for the spill point under the ramp.

I've attached a figure which shows the updated low points and the extent of the City Centre low point before it spills. The total volume in the City Centre low point shown outlined in black is 14,200 m^3. The stage storage table is also attached.

Let me know if you have any questions or need anything else.

Ryan


Spills under ramp at ~ 56.35 m
N
0 25 50 100 150 200
Meters
Legend
City_Center_Low_Point
Updated Low Points
Value
High : 11.26
Low : 0.0500031

Project Name/Pond Identification: City_Center_Low_Point

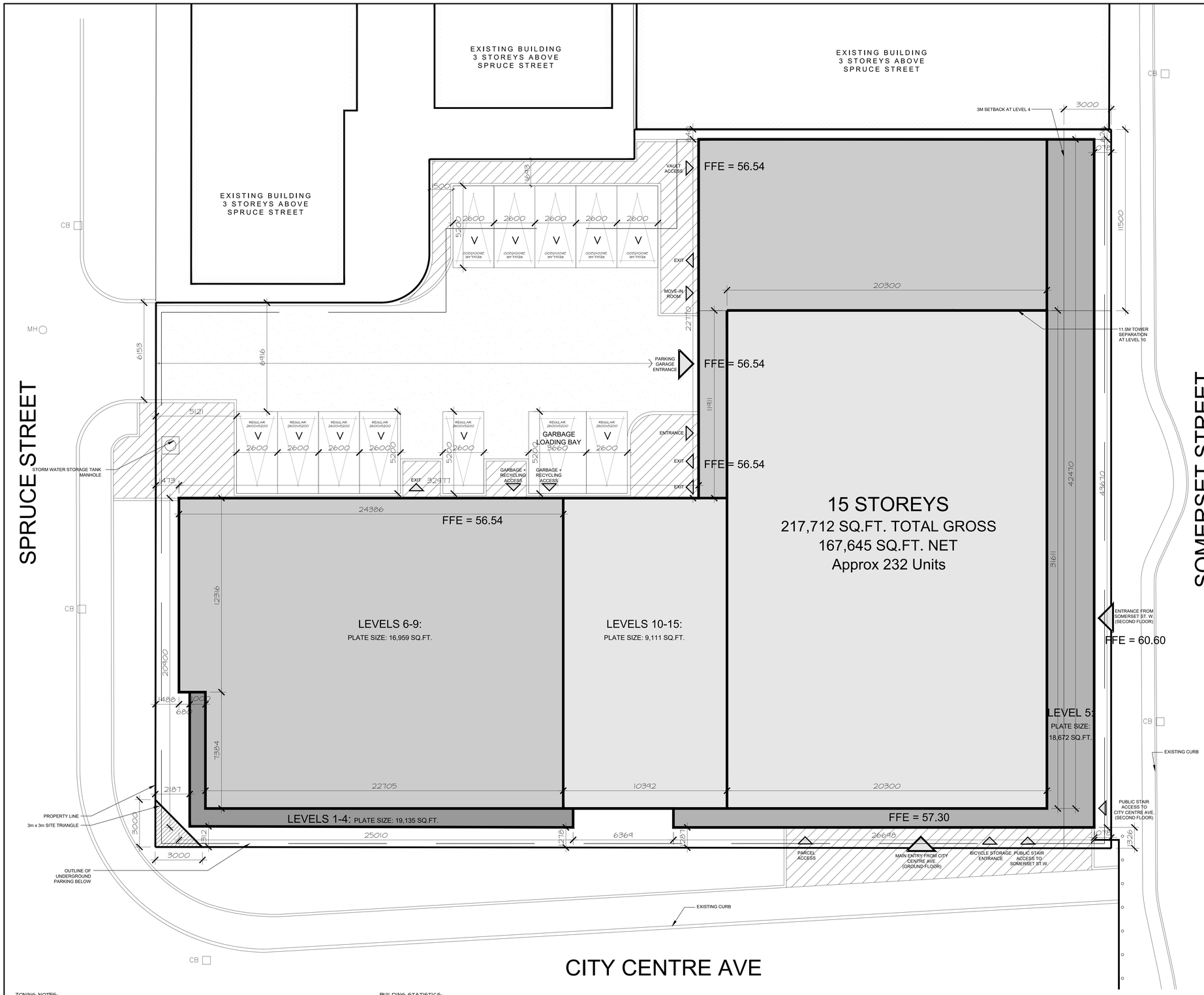
Minimum Elevation (m) : 54.6500

Maximum Elevation (m) : 56.3400

Step	Height (m)	Elevation (m)	Area (m2)	Volume (m3)
1	0.0000	54.6500	0.0000	0.0000
2	0.0500	54.7000	7.0759	0.0756
3	0.1000	54.7500	17.8106	0.7388
4	0.1500	54.8000	28.8040	1.8099
5	0.2000	54.8500	73.2570	4.0944
6	0.2500	54.9000	150.3356	9.3449
7	0.3000	54.9500	295.2072	20.0183
8	0.3500	55.0000	486.2804	38.9175
9	0.4000	55.0500	706.0459	68.4439
10	0.4500	55.1000	1000.5883	110.0471
11	0.5000	55.1500	1309.7308	167.4421
12	0.5500	55.2000	1655.1328	240.8516
13	0.6000	55.2500	2090.1726	333.2305
14	0.6500	55.3000	2627.5498	451.3891

15	0.7000	55.3500	3140.9264	594.8953
16	0.7500	55.4000	3738.8128	766.4323
17	0.8000	55.4500	4368.4734	968.8519
18	0.8500	55.5000	5105.1676	1205.6813
19	0.9000	55.5500	5998.5702	1482.6919
20	0.9500	55.6000	6995.3646	1806.1491
21	1.0000	55.6500	8144.2378	2181.9694
22	1.0500	55.7000	9551.2960	2621.7458
23	1.1000	55.7500	11120.7371	3137.2061
24	1.1500	55.8000	12764.5669	3733.9149
25	1.2000	55.8500	14282.9984	4410.2710
26	1.2500	55.9000	16024.4579	5164.6546
27	1.3000	55.9500	17506.0821	6005.5166
28	1.3500	56.0000	18665.2819	6912.4896
29	1.4000	56.0500	19564.3607	7869.3818
30	1.4500	56.1000	20374.9512	8868.3210
31	1.5000	56.1500	21207.1929	9907.7879
32	1.5500	56.2000	21980.3901	10989.6757
33	1.6000	56.2500	22669.0337	12107.3508
34	1.6500	56.3000	23284.3886	13258.3540
35	1.6900	56.3400	23531.9998	14197.5301

DRAWINGS / FIGURES



LOCATION PLAN - 1:2000

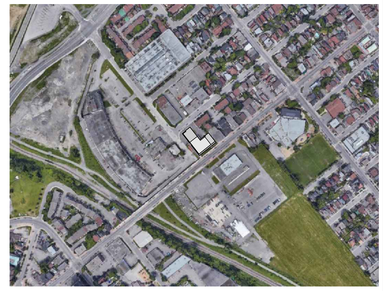
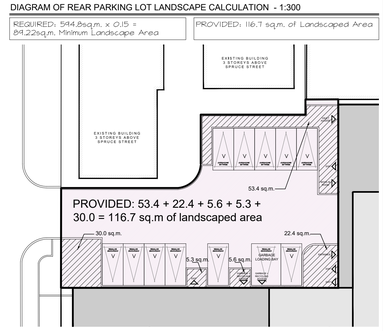


DIAGRAM OF REAR PARKING LOT LANDSCAPE CALCULATION - 1:300

REQUIRED: 584.8sq.m. x 0.15 = 84.22sq.m. Minimum Landscape Area

PROVIDED: 116.7 sq.m. of Landscaped Area



DRAFT

ZONING NOTES:

CURRENT ZONING: MC[2036] S169

LOT AREA : 2550 m^2

DEVELOPMENT STATS PHASE 1 + PHASE 2

		REQUIRED	PROPOSED
LOT WIDTH			45.6m IRREGULAR
LOT DEPTH			60.6m IRREGULAR
FRONT YARD SETBACK	SOMERSET AVE.	NO MINIMUM, 3m @ LEVEL4	VARIES 1.0, 4m @ LEVEL 4
REAR YARD SETBACK	SPRUCE ST.	NO MINIMUM	VARIES 1.4-2.2m
SIDE YARD SETBACK	CITY CENTRE AVE.	NO MINIMUM	VARIES 1.2-1.3m
INTERIOR SIDE YARD SETBACK		NO MINIMUM, 11.5m @ Level 10 FOR TOWER SEPARATION	VARIES - 0.6m, 11.5m @ LEVEL 10

AMENITY SPACE REQUIREMENTS

REQUIRED AMENITY SPACE : 6 m^2 REQUIRED PER UNIT
241 UNITS X 6 SQ.M. = 1446 SQ.M. TOTAL AMENITY REQUIRED
REQUIRED AMENITY SPACE TO BE COMMON - 723 SQ.M.
PROVIDED COMMON AMENITY SPACE - 723 SQ.M.

BUILDING STATISTICS:

BUILDING 1	REQUIRED	PROPOSED	
TOTAL UNIT COUNT		232	
STUDIOS		21	9.1%
1 BEDROOM		98	42.2%
1 BEDROOM + DEN		40	17.2%
2 BEDROOM (1 INBOARD BED)		24	10.3%
2 BEDROOM		49	21.1%
MAXIMUM HEIGHT		48m	
NUMBER OF STOREYS		15 STOREYS	
AREA - BUILDING AREA		1771 SQ.M.	
AREA - TYPICAL PODIUM		1771 SQ.M.	
AREA - TYPICAL PLATE		846 SQ.M	
AREA - TOTAL GFA		+/- 20,200 SQ.M.	

BUILDING PARKING REQUIREMENTS

LAND USE	PROVIDED VEHICLE PARKING
CONDO	152 RESIDENTIAL PARKING SPACES PROVIDED FOR 232 UNITS (0.65/UNIT) * LOCATED IN UNDERGROUND PARKING GARAGE

2. REQUIRED VISITOR PARKING

LAND USE	PROVIDED VISITOR PARKING
CONDO	24 VISITOR PARKING SPACES PROVIDED FOR 232 UNITS (0.1/UNIT) * LOCATED IN PARKING GARAGE AND AT GRADE
TOTAL PARKING PROVIDED	175 TOTAL PARKING PARKING SPACES (164 INTERIOR, 11 EXTERIOR)

BUILDING BICYCLE PARKING REQUIREMENTS

PROVIDED BICYCLE PARKING
184 BICYCLE PARKING SPACES PROVIDED FOR 232 UNITS (0.8/UNIT) * LOCATED IN UNDERGROUND PARKING GARAGE AND AT GRADE

BUILDING STORAGE REQUIREMENTS

PROVIDED BICYCLE PARKING
130 STORAGE LOCKERS PROVIDED FOR 232 UNITS (0.56/UNIT) * LOCATED IN UNDERGROUND PARKING GARAGE AND AT GRADE

no.	date	revision

Hobin Architecture Incorporated
63 Pamilla Street
Ottawa, Ontario
Canada K1S 3K7
T: 613-238-7200
F: 613-235-2005
E: mail@hobinarc.com
hobinarc.com

HOBIN ARCHITECTURE

PROJECT/LOCATION:
TAGGART
989 SOMERSET
OTTAWA ON.

DRAWING TITLE:
SITE PLAN

DRAWN BY:	DATE:	SCALE:
PB	22-04-04	1:200

PROJECT: 2110

DRAWING NO.: A1.00

REVISION NO.:

None
2115

Scale 1 : 200

8.0 6.0 4.0 2.0 0 4 8 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, the Land Titles Act and the regulations made under them.
2. The survey was completed on the 2nd day of July, 2013.

Date 5/13

V. Andrew Shelp
Ontario Land Surveyor

TOPOGRAPHICAL PLAN OF SURVEY OF

PART OF LOT 4 AND ALL OF LOT 5 (South Spruce Street Lots) AND ALL OF LOT 4 AND 5 (North Somerset Street West) REGISTERED PLAN 73 CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.
Field Work Completed July 2, 2013

NOTE : Proposed Road Widening added December 17, 2013

Notes & Legend

Denotes		
⊡	"	Survey Monument Planted
■	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
CC	"	Cut Cross
(WIT)	"	Witness
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(PI)	"	Registered Plan 73
(P2)	"	Plan 4R-19573
(P3)	"	(AOG) Plan dated June 15, 2011
(P4)	"	(AOG) Plan dated April 19, 2004
(P5)	"	(AOG) Plan dated May 6, 1969
(P6)	"	(AOG) Co-ordinate File for 2970-02
(P7)	"	(AOG) Plan dated December 18, 2002
○ MH-B	"	Maintenance Hole (Bell)
○ MH	"	Maintenance Hole (Unidentified)
FH	"	Fire Hydrant
WV	"	Water Valve
□ CB	"	Catch Basin
□ CBI	"	Catch Basin Inlet
T/G	"	Top of Grate
Ø	"	Diameter
+ 65.00	"	Location of Elevations
+ 65.00	"	Top of Curb Elevations
T/S	"	Top of Spindle
C/L	"	Centreline
○ UP	"	Utility Pole
○ LS	"	Light Standard
———	"	Property Line

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
1867816

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

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.999xx.

Bearings are MTM grid, derived from observed reference points A and B, shown hereon, having a bearing of N66°21'40"E and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

For bearing comparisons, a rotation of 0°36'20" counter-clockwise was applied to bearings on Plan 4R-19573.

Coordinate values are to urban accuracy in accordance with O. Reg. 216/10.

. Point A Northing 5030045.52 Easting 366099.08
. Point B Northing 5030063.81 Easting 366140.87

Caution: Coordinates cannot, in themselves, be used to re-establish corners or boundaries shown on this plan.

SITE AREA = 2553.7 m²

ELEVATION NOTES

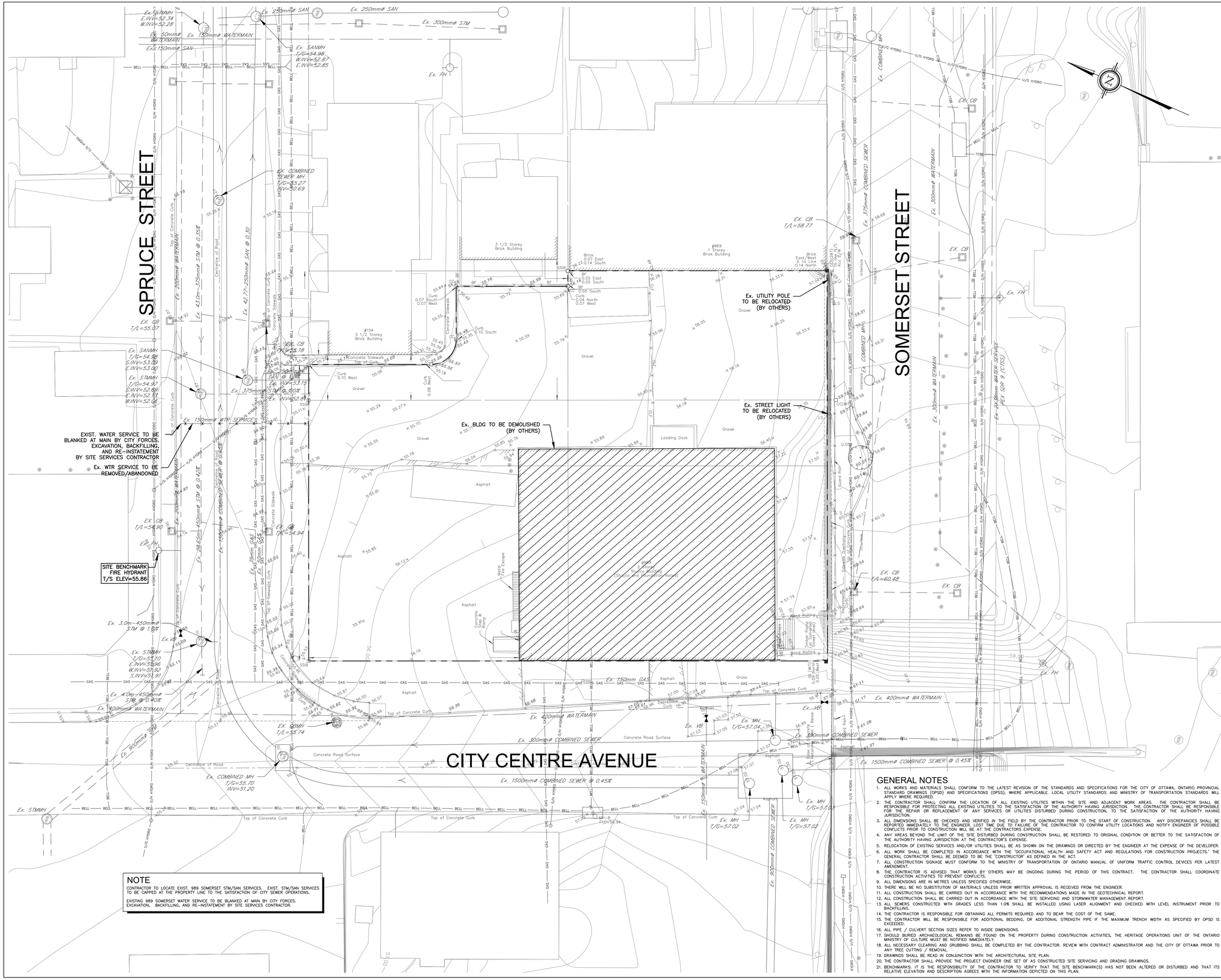
1. Elevations shown are referred to geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

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.

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

Job No. 13817-13 Domicile LM4-5 RP73 Topo F gzp

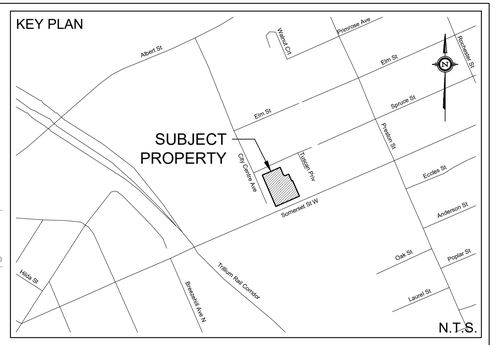


NOTE

CONTRACTOR TO LOCATE EXIST. 989 SOMERSET STM/SAN SERVICES. EXIST. STM/SAN SERVICES TO BE CAPPED AT THE PROPERTY LINE TO THE SATISFACTION OF CITY SEWER OPERATIONS.

EXISTING 989 SOMERSET WATER SERVICE TO BE BLANKED AT MAIN BY CITY FORCES. EXCAVATION, BACKFILLING, AND RE-INSTATEMENT BY SITE SERVICES CONTRACTOR.

KEY PLAN



LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING BELL
- EXISTING GAS
- EXISTING UNDERGROUND HYDRO
- EXISTING OVERHEAD HYDRO
- EXISTING MANHOLE
- EXISTING CATCH BASIN MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING VALVE BOX
- EXISTING SPOT ELEVATION

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD
PROJ. NO. 13817-13
DATED DECEMBER 17, 2013

SITE PLAN INFORMATION

SITE PLAN PROVIDED BY HOBIN ARCHITECTURE
PROJ. NO. 2110
DATED APRIL 4, 2022

GEOTECHNICAL STUDY

GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP
PROJ. NO. PG3158-1
DATED JANUARY 24, 2017

SITE SERVICING AND STORMWATER MANAGEMENT STUDY

SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 21-1239
DATED APRIL 2022

BENCH MARK

TOP OF SPINDLE OF FIRE HYDRANT LOCATED AT WEST END OF SPRUCE STREET NEAR CITY CENTRE INTERSECTION
ELEV=55.86

No.	BY	YY.MM.DD	DESCRIPTION
5	B.N.C.	22.04.12	REVISED PER SITE PLAN
4	A.D.F.	21.12.01	REVISED PER MUNICIPAL COMMENTS
3	A.D.F.	21.11.18	REVISED PER MUNICIPAL COMMENTS
2	B.N.C.	21.11.16	ISSUED FOR MUNICIPAL REVIEW
1	B.N.C.	21.06.29	ISSUED FOR MUNICIPAL REVIEW

GENERAL NOTES

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.
4. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
5. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE DEVELOPER.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS." THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE "CONSTRUCTOR" AS DEFINED IN THE ACT.
7. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
8. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
9. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
10. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
11. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
12. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
13. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
14. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
15. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
16. ALL PIPE / CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
17. SHOULD BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
18. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING / REMOVAL.
19. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL SITE PLAN.
20. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ONE SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
21. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

LICENSED PROFESSIONAL ENGINEER
S.L. MERRICK
100186523
2022-04-12
PROVINCE OF ONTARIO

PROJECT No21-1239

EXISTING CONDITIONS PLAN
989 SOMERSET STREET

TAGGART REALTY MANAGEMENT

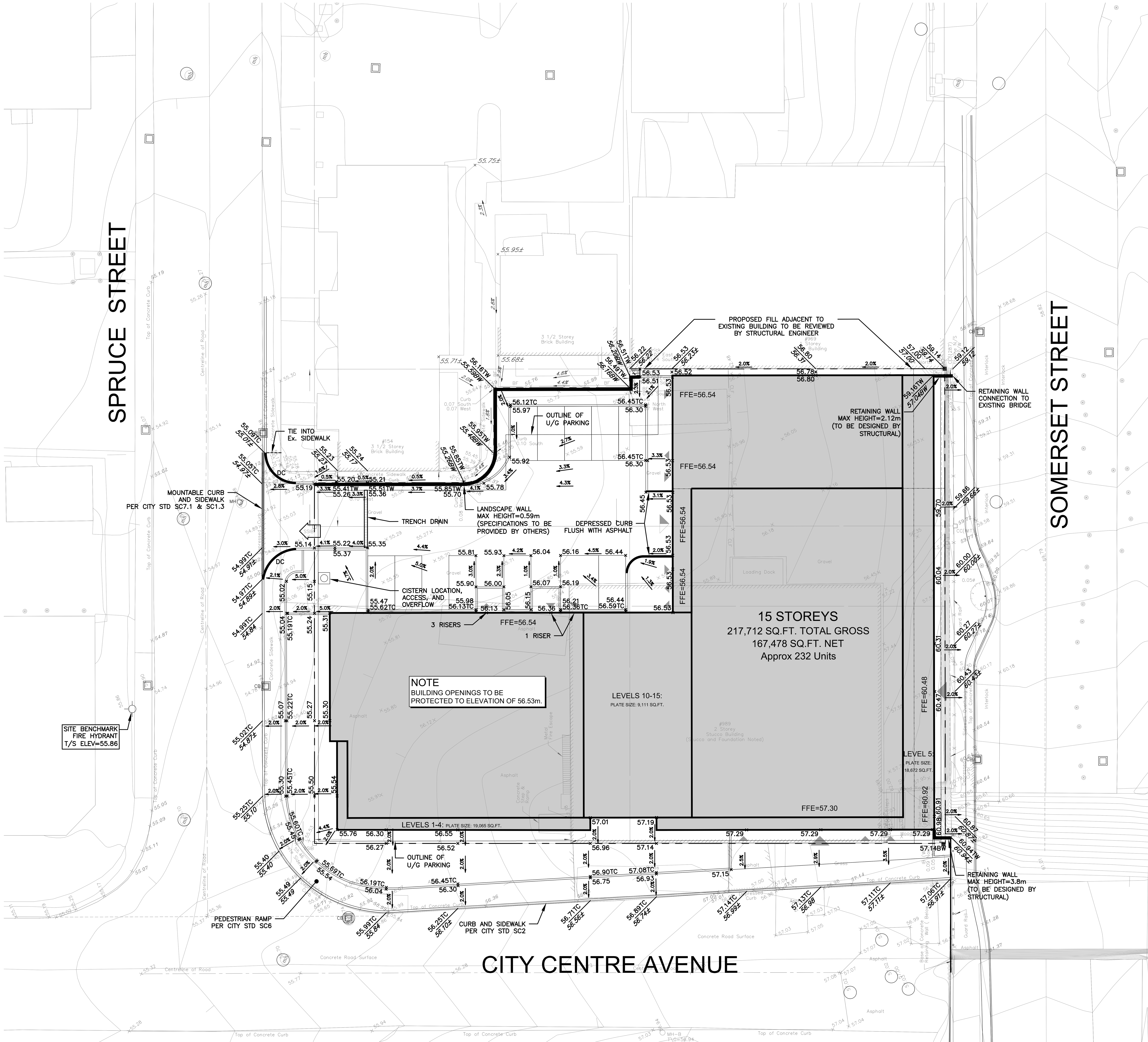
708-225 Metcalfe Street
Ottawa, Ontario, K2P 1P9

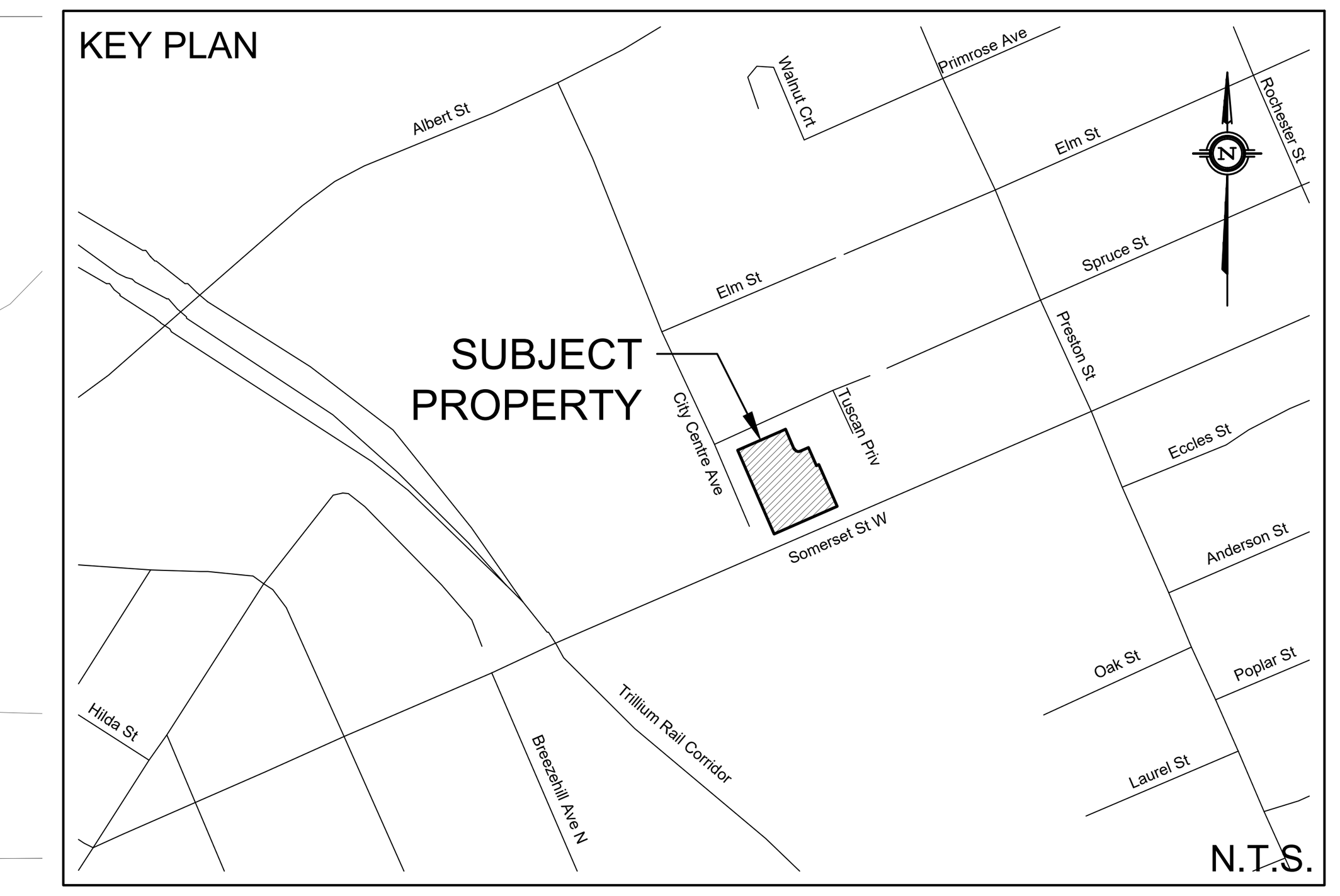
david schaeffer engineering ltd
SMART SUBDIVISIONS™
120 Iber Road Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY:	B.N.C.	CHECKED BY:	A.D.F.	DRAWING NO.	SHEET NO.
DESIGNED BY:	B.N.C.	CHECKED BY:	A.D.F.	EX-1	1 of 4
SCALE:	1:200	DATE:	JUNE 2021		

CITY FILE No.: D07-12-13-0221 CITY PLAN No.: XXXXX

z:\projects\21-1239_taggartrm_989-somerset\b_design\b2_drawings\b2-2_main (dsel)\spa_sub3\2022-04-12_1239_spa.dwg

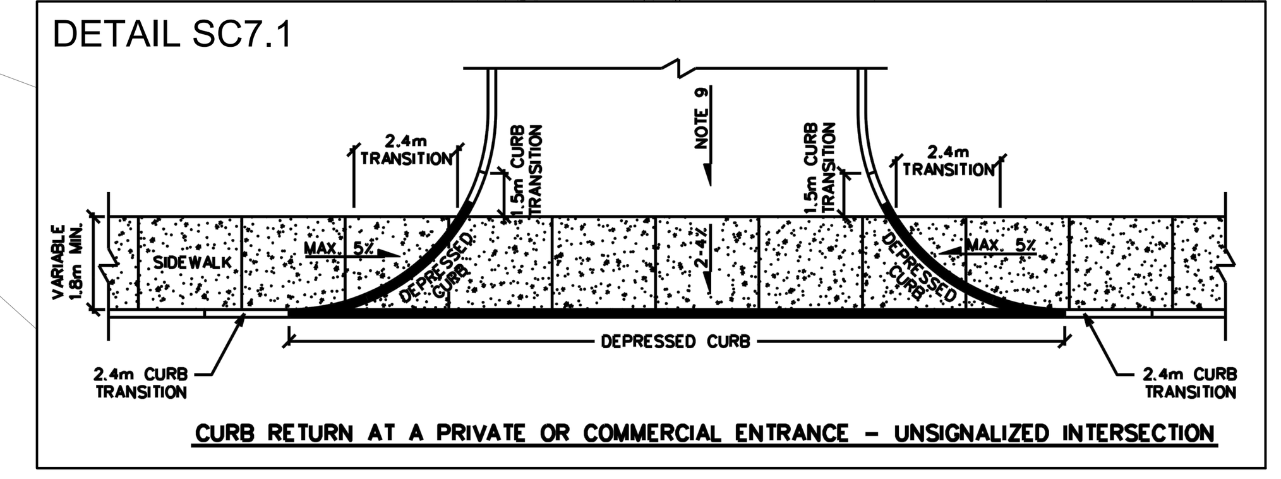




LEGEND

- PROPERTY LINE
- EXISTING SPOT ELEVATION (100.00)
- PROPOSED SPOT ELEVATION (100.00)
- PROPOSED TOP OF CURB ELEVATION (100.00TC)
- PROPOSED BOTTOM OF WALL ELEVATION (100.00BW)
- PROPOSED TOP OF WALL ELEVATION (100.00TW)
- PROPOSED TOP OF LID ELEVATION (100.00TL)
- EXISTING GRADE AND DIRECTION (1.0%)
- PROPOSED GRADE AND DIRECTION (1.0%)
- DEPRESSED CURB (DC)
- PROPOSED 3:1 TERRACING (3:1 SLOPE)
- PROPOSED/EXISTING SPOT ELEVATION (100.00 / 100.00)
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED CB 'T'
- PROPOSED FIRE HYDRANT
- EMERGENCY FLOW ROUTE

DETAIL SC7.1



GENERAL NOTES

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.
4. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
5. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE DEVELOPER.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.' THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE 'CONSTRUCTOR' AS DEFINED IN THE ACT.
7. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
8. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
9. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
10. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
11. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
12. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
13. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
14. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
15. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
16. ALL PIPE / CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
17. SHOULD BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
18. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING / REMOVAL.
19. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL SITE PLAN.
20. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ONE SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
21. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC1.1. PROVISION SHALL BE MADE FOR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN ON THIS DRAWING ARE TO BE PRICED IN THE SITEWORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010, AND OPSS 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 300mm AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300mm LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR TO BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
12. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
13. SIDEWALKS TO BE 13mm & BEVELED AT 2:1 OR 6mm WITH NO BEVEL REQUIRED BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES REQUIRED TO BE BARRIER-FREE, UNLESS OTHERWISE NOTED. ALL IN ACCORDANCE WITH OBC 3.8.1.3. & OTTAWA ACCESSIBILITY DESIGN STANDARDS.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS FOR RETAINING WALL (INCLUDE RAILINGS IF APPLICABLE) TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY STRUCTURAL AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD
PROJ. NO. 13817-13
DATED DECEMBER 17, 2013

SITE PLAN INFORMATION

SITE PLAN PROVIDED BY HOBIN ARCHITECTURE
PROJ. NO. 2110
DATED APRIL 4, 2022

GEOTECHNICAL STUDY

GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP
PROJ. NO. PG3158-1
DATED JANUARY 24, 2017

SITE SERVICING AND STORMWATER MANAGEMENT STUDY

SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 21-1239
DATED APRIL 2022

BENCH MARK

TOP OF SPINDLE OF FIRE HYDRANT LOCATED AT WEST END OF SPRUCE STREET NEAR CITY CENTRE INTERSECTION
ELEV=55.86

No.	BY	YY.MM.DD	DESCRIPTION
5	B.N.C.	22.04.12	REVISED PER SITE PLAN
4	A.D.F.	21.12.01	REVISED PER MUNICIPAL COMMENTS
3	A.D.F.	21.11.18	REVISED PER MUNICIPAL COMMENTS
2	B.N.C.	21.11.16	ISSUED FOR MUNICIPAL REVIEW
1	B.N.C.	21.06.29	ISSUED FOR MUNICIPAL REVIEW

PROJECT No21-1239

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2022-04-12
PROVINCE OF ONTARIO
JOB# 21-1239

GRADING PLAN
989 SOMERSET STREET

TAGGART REALTY MANAGEMENT
708-225 Metcalfe Street
Ottawa, Ontario, K2P 1P9

DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS™
120 Iber Road Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: B.N.C.	CHECKED BY: A.D.F.	DRAWING NO.	SHEET NO.
DESIGNED BY: B.N.C.	CHECKED BY: A.D.F.	GP-1	2 of 4
SCALE: 1:200	DATE: JUNE 2021		

CITY PLAN No.: XXXXX
CITY FILE No.: D07-12-13-0221

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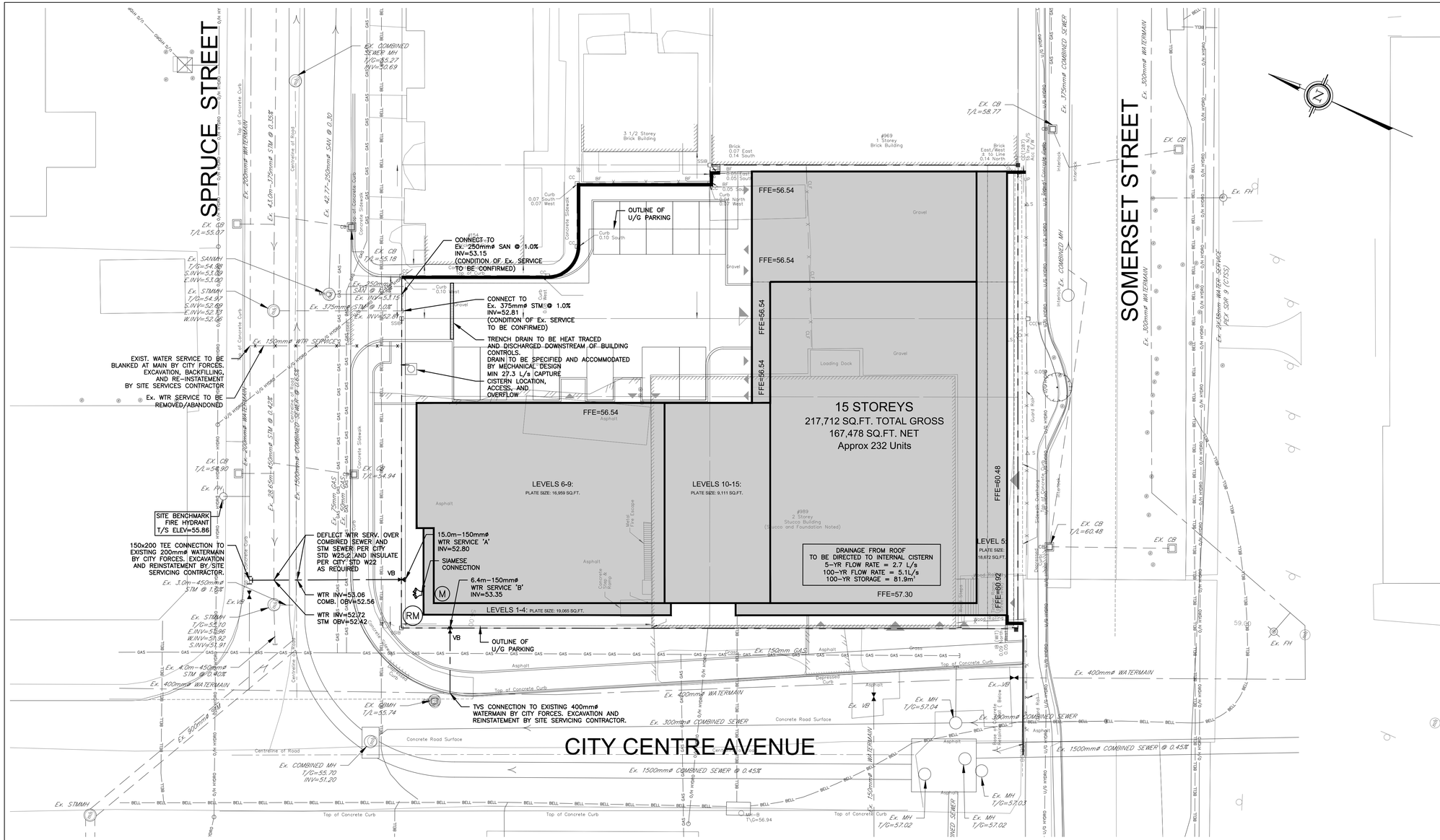

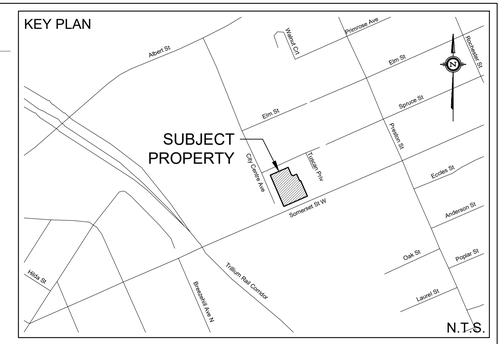

LEGEND

- PROPERTY LINE
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED VALVE BOX
- PROPOSED SIAMESE CONNECTION
- PROPOSED REMOTE WATER METER
- PROPOSED WATER METER
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED CB "I"

EXISTING UNDERGROUND SERVICES AND UTILITY LOCATIONS DERIVED FROM THE BEST AVAILABLE DATA, AS-CONSTRUCTED DRAWINGS, UTILITY DRAWINGS AND INFRASTRUCTURE MAPPING PROVIDED BY THE CITY OF OTTAWA.

CONTRACTOR TO CONFIRM ELEVATIONS AND LOCATIONS OF EXISTING UNDERGROUND SERVICES AND UTILITIES WITHIN THE RIGHT OF WAY PRIOR TO INSTALLATION OF SITE SERVICING INFRASTRUCTURE.

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT THE FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD
PROJ. NO. 13817-13
DATED DECEMBER 17, 2013

SITE PLAN INFORMATION

SITE PLAN PROVIDED BY HOBIN ARCHITECTURE
PROJ. NO. 2110
DATED APRIL 4, 2022

GEOTECHNICAL STUDY

GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP
PROJ. NO. PG3158-1
DATED JANUARY 24, 2017

SITE SERVICING AND STORMWATER MANAGEMENT STUDY

SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 21-1239
DATED APRIL 2022

BENCH MARK

TOP OF SPINDLE OF FIRE HYDRANT LOCATED AT WEST END OF SPRUCE STREET NEAR CITY CENTRE INTERSECTION
ELEV=55.86

GENERAL NOTES

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3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.
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11. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
12. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT PREPARED BY DSEL.
13. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
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15. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
16. ALL PIPE / CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
17. SHOULD BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
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19. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL SITE PLAN.
20. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ONE SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
21. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

PROPOSED 150mmØ WATER SERVICE 'A'			
STATION	FINISHED GROUND	TOP OF WATERMAIN	DESCRIPTION
0+000.00	55.03	52.63	CONNECT TO EXISTING WM
0+001.16	55.06	52.66	45° VERTICAL BEND
0+001.40	55.07	52.87	45° VERTICAL BEND
0+002.40	55.09	52.87	DEFLECT WTR SERVICE PER CITY STD W25.2 WTR INV=52.72 STM OBV=52.42 SEPARATION=0.30m
0+004.60	55.22	53.21	DEFLECT WTR SERVICE PER CITY STD W25.2 WTR INV=53.06 COMB OBV=52.56 SEPARATION=0.50m
0+006.45	55.18	53.21	45° VERTICAL BEND
0+006.71	55.17	52.77	45° VERTICAL BEND
0+014.95	55.49	53.09	150# VAB
0+015.33	55.50	53.10	CONNECTION TO PROP. BLDG

WATERMAIN NOTES

1. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
2. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, DR 18 OR APPROVED EQUIVALENT.
3. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE, BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
4. ALL PVC WATERMAINS SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
5. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD. W40 AND W42.
6. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
7. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
8. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
9. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
10. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. W25.2 AND W25, RESPECTIVELY.
11. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4m.
12. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER / UTILITY IS 0.50m PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
13. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OF 2.4m, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
14. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20
15. FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10m ABOVE PROPOSED FINISHED GRADE AT HYDRANT; FIRE HYDRANT LOCATION AS PER STD DWG W18 UNLESS OTHERWISE NOTED.
16. BUILDING SERVICE TO BE CAPPED 1.0m OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12m BACK FROM STUB.
17. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
18. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT THE ENVIRONMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
19. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50mm BLOW OFF UNLESS OTHERWISE NOTED.

PROPOSED 150mmØ WATER SERVICE 'B'			
STATION	FINISHED GROUND	TOP OF WATERMAIN	DESCRIPTION
0+000.00	55.85	53.45	CONNECT TO EXISTING WM
0+006.21	56.08	53.68	150# VAB
0+006.40	56.10	53.70	CONNECTION TO PROP. BLDG

SANITARY AND STORM SEWER NOTES

GENERAL

1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
2. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING S8. THE SEALS SHOULD BE AT LEAST 1.5m LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPACTABLE BROWN SILTY CLAY PLACED IN MAXIMUM 225mm LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT 60m INTERVALS IN THE SERVICE TRENCHES.
3. SERVICES TO BUILDINGS TO BE TERMINATED 1.0m FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
4. ALL MAINTENANCE STRUCTURE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY, A MINIMUM OF 300mm AROUND STRUCTURES.
5. "MODULOC" OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.
6. SAFETY PLATFORMS SHALL BE PER OPSD 404.02.
7. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01 AND 1003.02, IF APPLICABLE.
8. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO RECORDINGS IN A FORMAT ACCEPTABLE TO THE ENGINEER. ALL SEWERS ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS AND NECESSARY REPAIRS HAVE BEEN COMPLETED TO THE SATISFACTION OF THE ENGINEER.
9. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.
10. FROST PROTECTION RECOMMENDATIONS FOR STORM SEWERS WITH LESS THAN 1.5m AND SANITARY SEWERS WITH LESS THAN 1.8m FROM GROUND SURFACE TO PIPE OBVERT TO BE PROVIDED BY GEOTECHNICAL ENGINEER.

SANITARY

11. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
12. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX 'RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
13. EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
14. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7, CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
15. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
16. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.

STORM

17. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2, OR LATEST AMENDMENT. ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1, OR LATEST AMENDMENT. PIPE SHALL BE JOINED WITH STD. RUBBER GASKETS AS PER CSA A257.3, OR LATEST AMENDMENT.
18. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
19. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
20. CATCH BASINS SHALL BE IN ACCORDANCE WITH OPSD 705.010.
21. CATCH BASIN LEADS SHALL BE 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
22. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
23. ALL CATCH BASIN LEAD INVERTS TO BE 1.5m BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
24. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED, THE CONTRACTOR IS REQUIRED TO PROVIDE AND SHALL BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
25. PERFORATED SUBDRAIN FOR ROAD AND PARKING LOT CATCH BASIN SHALL BE INSTALLED PER CITY STD R1 AND GEOTECHNICAL RECOMMENDATIONS UNLESS OTHERWISE NOTED.
26. PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30, AND S31, WHERE APPLICABLE.
27. RIP-RAP TREATMENT FOR SEWER AND CULVERT OUTLETS PER OPSD 810.010.
28. ALL STORM SEWERS / CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
29. STORM MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD S25 AND S24.1, UNLESS OTHERWISE NOTED.
30. CATCH BASIN FRAME AND COVER SHALL BE PER OPSD 400.02 AND CITY STD S19.1, UNLESS OTHERWISE NOTED.

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1	B.N.C.	21.06.29	ISSUED FOR MUNICIPAL REVIEW

PROJECT No21-1239

LICENSED PROFESSIONAL ENGINEER S. L. MERRICK 100186523 2022-04-12 PROVINCE OF ONTARIO

REVIEWED BY

SITE SERVICING PLAN
989 SOMERSET STREET

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DESIGNED BY:	B.N.C.	CHECKED BY:	A.D.F.	SSP-1	3 of 4
SCALE:	1:200	DATE:	JUNE 2021		

CITY FILE No.: D07-12-13-0221 CITY PLAN No.: XXXXX

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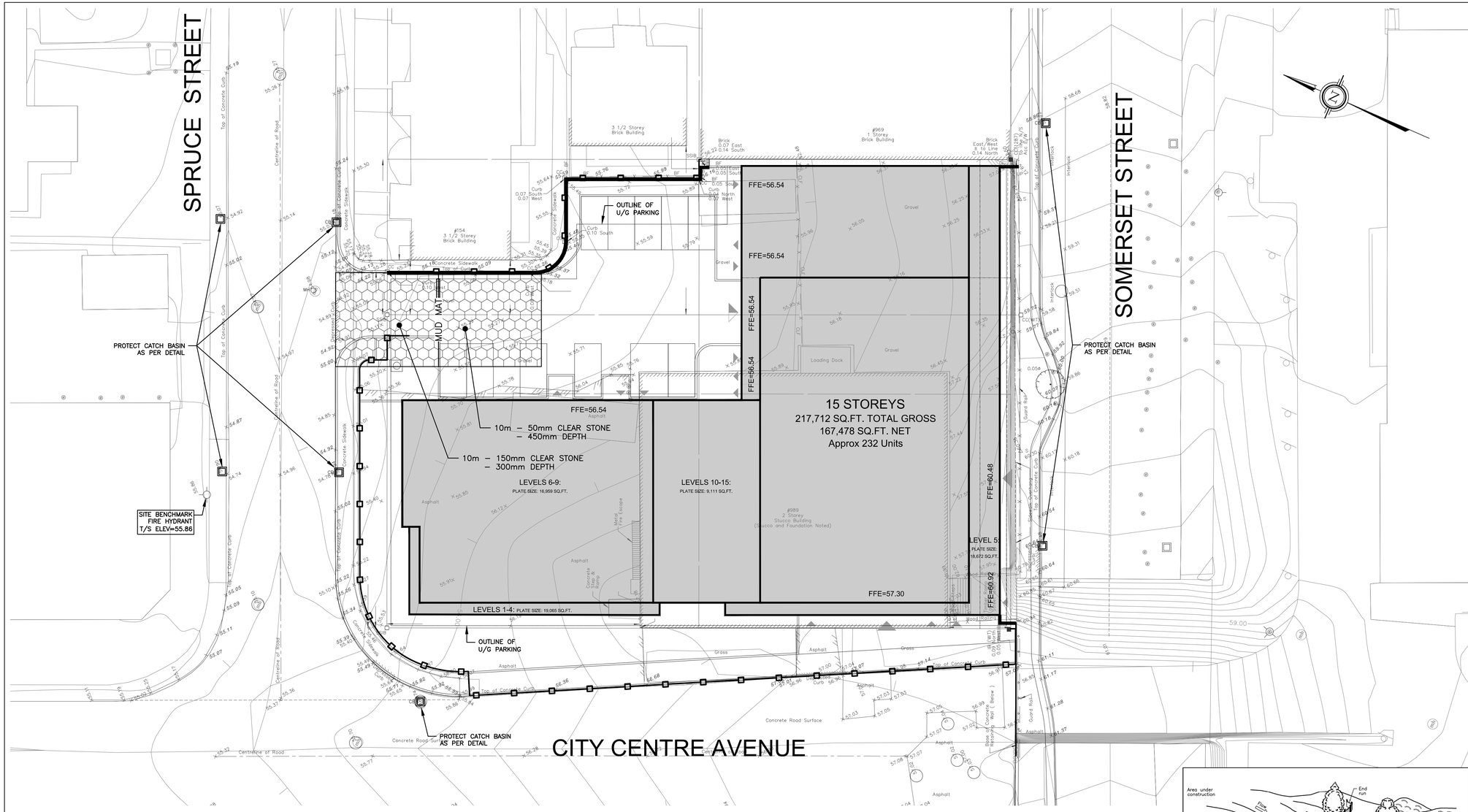
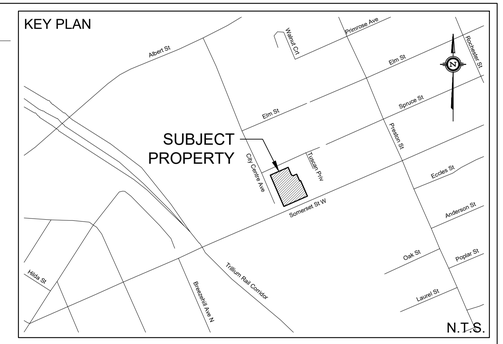




LEGEND

EROSION CONTROL FENCE PER OPSD 219.130

NOT FOR CONSTRUCTION

EROSION AND SEDIMENT CONTROL NOTES

GENERAL

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

THE CONTRACTOR ACKNOWLEDGES THAT SURFACE EROSION AND SEDIMENT RUNOFF RESULTING FROM THEIR CONSTRUCTION OPERATIONS HAS POTENTIAL TO CAUSE A DETRIMENTAL IMPACT TO ANY DOWNSTREAM WATERCOURSE OR SEWER, AND THAT ALL CONSTRUCTION OPERATIONS THAT MAY IMPACT UPON WATER QUALITY SHALL BE CARRIED OUT IN A MANNER THAT STRICTLY MEETS THE REQUIREMENTS OF ALL APPLICABLE LEGISLATION AND REGULATIONS.

AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THEIR OPERATIONS, AND SUPPLYING AND INSTALLING ANY APPROPRIATE CONTROL MEASURES, SO AS TO PREVENT SEDIMENT LADEN RUNOFF FROM ENTERING ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA.

THE CONTRACTOR ACKNOWLEDGES THAT NO ONE MEASURE IS LIKELY TO BE 100% EFFECTIVE FOR EROSION PROTECTION AND CONTROLLING SEDIMENT RUNOFF AND DISCHARGES FROM THE SITE. THEREFORE, WHERE NECESSARY THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES ARRANGED IN SUCH A MANNER AS TO MITIGATE SEDIMENT RELEASE FROM THE CONSTRUCTION OPERATIONS AND ACHIEVE SPECIFIC MAXIMUM PERMITTED CRITERIA WHERE APPLICABLE. SUGGESTED ON-SITE MEASURES MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING METHODS: SEDIMENT PONDS, FILTER BAGS, PUMP FILTERS, SETTLING TANKS, SILT FENCES, STRAW BALES, FILTER CLOTHS, CATCH BASIN FILTERS, CHECK DAMS AND/OR BERMS, OR OTHER RECOGNIZED TECHNOLOGIES AND METHODS AVAILABLE AT THE TIME OF CONSTRUCTION. SPECIFIC MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF OPSS 577 WHERE APPROPRIATE, OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

WHERE, IN THE OPINION OF THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, THE INSTALLED CONTROL MEASURES FAIL TO PERFORM ADEQUATELY, THE CONTRACTOR SHALL SUPPLY AND INSTALL ADDITIONAL OR ALTERNATIVE MEASURES AS DIRECTED BY THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY. AS SUCH, THE CONTRACTOR SHALL HAVE ADDITIONAL CONTROL MATERIALS ON SITE AT ALL TIMES WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED BY HIM AT A MOMENT'S NOTICE.

PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR SIX COPIES OF A DETAILED EROSION AND SEDIMENT CONTROL PLAN (ESCP). THE ESCP WILL CONSIST OF A WRITTEN DESCRIPTION AND DETAILED DRAWINGS INDICATING THE ON-SITE ACTIVITIES AND MEASURES TO BE USED TO CONTROL EROSION AND SEDIMENT MOVEMENT FOR EACH STEP OF THE WORK.

CONTRACTOR'S RESPONSIBILITIES

THE CONTRACTOR SHALL ENSURE THAT ALL WORKERS, INCLUDING SUB-CONTRACTORS, IN THE WORKING AREA ARE AWARE OF THE IMPORTANCE OF THE EROSION AND SEDIMENT CONTROL MEASURES AND INFORMED OF THE CONSEQUENCES OF THE FAILURE TO COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AGENCIES.

THE CONTRACTOR SHALL PERIODICALLY, AND WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENT DEPOSITS AS REQUIRED AT THE SEDIMENT CONTROL DEVICES, INCLUDING THOSE DEPOSITS THAT MAY ORIGINATE FROM OUTSIDE THE CONSTRUCTION AREA. ACCUMULATED SEDIMENT SHALL BE REMOVED IN SUCH A MANNER THAT PREVENTS THE DEPOSITION OF THIS MATERIAL INTO ANY SEWER OR WATERCOURSE AND AVOIDS DAMAGE TO THE CONTROL MEASURE. THE SEDIMENT SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL, AS SPECIFIED ELSEWHERE IN THE CONTRACT.

THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE CONTRACT ADMINISTRATOR ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO EITHER THE WATERCOURSE OR THE STORM SEWER SYSTEM. FAILURE TO REPORT WILL BE CONSTITUTE A BREACH OF THIS SPECIFICATION AND THE CONTRACTOR MAY ALSO BE SUBJECT TO THE PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.

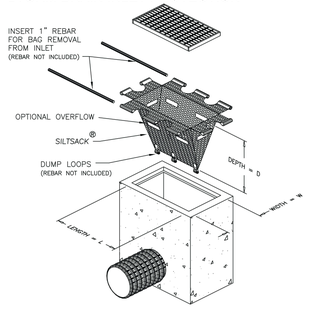
THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, THE MEASURE OR MEASURES, IS NO LONGER REQUIRED. NO CONTROL MEASURE MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED IN A MANNER THAT AVOIDS THE ENTRY OF ANY EQUIPMENT, OTHER THAN HAND-HELD EQUIPMENT, INTO ANY WATERCOURSE, AND PREVENTS THE RELEASE OF ANY SEDIMENT OR DEBRIS INTO ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WORKING AREA AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL.

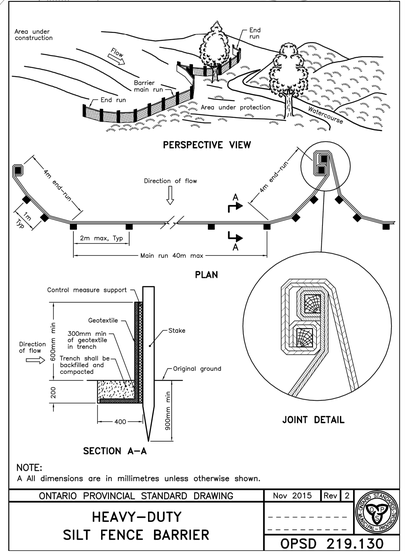
WHERE, IN THE OPINION OF EITHER THE CONTRACT ADMINISTRATOR OR A REGULATORY AGENCY, ANY OF THE TERMS SPECIFIED HEREIN HAVE NOT BEEN COMPLIED WITH OR PERFORMED IN A SUITABLE MANNER, OR AT ALL, THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY HAS THE RIGHT TO IMMEDIATELY WITHDRAW ITS PERMISSION TO CONTINUE THE WORK BUT MAY RENEW ITS PERMISSION UPON BEING SATISFIED THAT THE DEFAULTS OR DEFICIENCIES IN THE PERFORMANCE OF THIS SPECIFICATION BY THE CONTRACTOR HAVE BEEN REMEDIED.

SPILL CONTROL NOTES

1. ALL CONSTRUCTION EQUIPMENT SHALL BE RE-FUELED, MAINTAINED, AND STORED NO LESS THAN 30 METRES FROM WATERCOURSES, STREAMS, CREEKS, WOODLOTS, AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
2. THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
3. IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF A POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WITH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:
   - 3.1. IMMEDIATELY NOTIFY THE APPROPRIATE FEDERAL, PROVINCIAL, AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES, AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
   - 3.2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
   - 3.3. RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

STORM DRAIN INLET PROTECTION





NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
HEAVY-DUTY SILT FENCE BARRIER		OPSD 219.130

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD
PROJ. NO. 13817-13
DATED DECEMBER 17, 2013

SITE PLAN INFORMATION
SITE PLAN PROVIDED BY HOBIN ARCHITECTURE
PROJ. NO. 2110
DATED APRIL 4, 2022

GEOTECHNICAL STUDY
GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP
PROJ. NO. PG3158-1
DATED JANUARY 24, 2017

SITE SERVICING AND STORMWATER MANAGEMENT STUDY
SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL
PROJ. NO. 21-1239
DATED APRIL 2022

BENCH MARK
TOP OF SPINDLE OF FIRE HYDRANT LOCATED AT WEST END OF SPRUCE STREET NEAR CITY CENTRE INTERSECTION
ELEV=55.86

No.	BY	YY.MM.DD	DESCRIPTION
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REVIEWED BY

EROSION CONTROL PLAN
989 SOMERSET STREET

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SCALE:	1:200	DATE:	JUNE 2021		

CITY FILE No.: D07-12-13-0221 CITY PLAN No.: XXXXX

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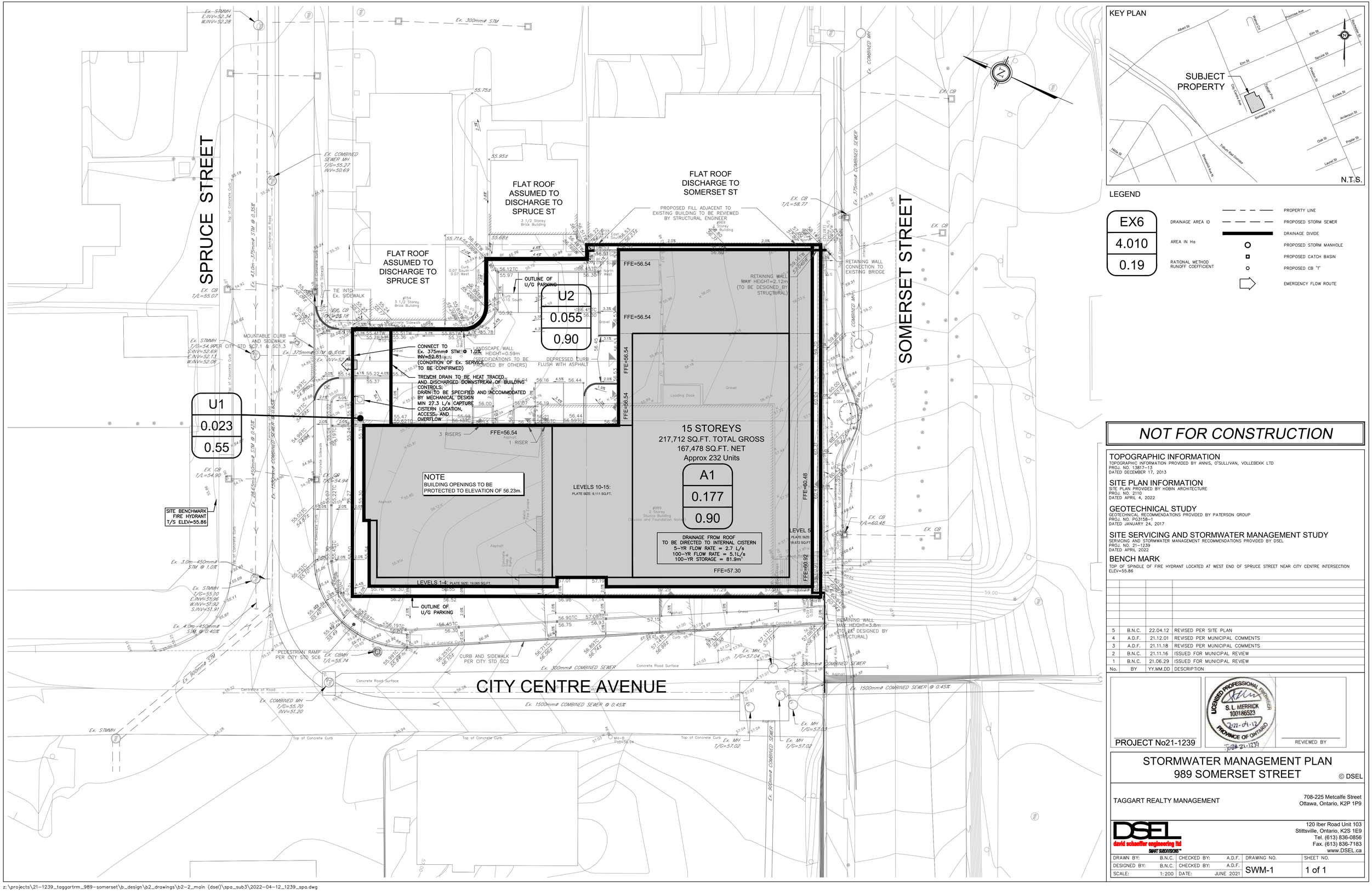

KEY PLAN

LEGEND

EX6
4.010
0.19

DRAINAGE AREA ID
AREA IN Ha
RATIONAL METHOD RUNOFF COEFFICIENT

- PROPERTY LINE
- PROPOSED STORM SEWER
- DRAINAGE DIVIDE
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED CB "I"
- EMERGENCY FLOW ROUTE

NOT FOR CONSTRUCTION

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