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Prepared for:

SMART LIVING PROPERTIES
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Site Servicing Report

280 Laurier Avenue East

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

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1.0 INTRODUCTION

1.1 Background

In 2021, J.L. Richards & Associates Limited (JLR) was retained by Smart Living Properties (SLP) to prepare a Site Servicing Report (SSR) and detailed design drawings of municipal infrastructure in support of a three-storey building addition to the east side of the existing six-storey residential apartment building sited at 280 Laurier Avenue East, in the City of Ottawa. It is noted that the new building addition will be given a different municipal address (282 Laurier Avenue East) however the lot will not be severed from the existing building. This SSR has been prepared to document the detailed civil engineering design for the Site Plan Application (SPA) to the City of Ottawa. It has been assumed that this SSR can also be used as a Design Brief to support a Zoning By-Law Amendment (ZBLA), should one be required.

This report has been prepared to outline the design objectives and criteria, servicing constraints and strategies for developing the subject lands with water, wastewater, storm and stormwater management services in accordance with:

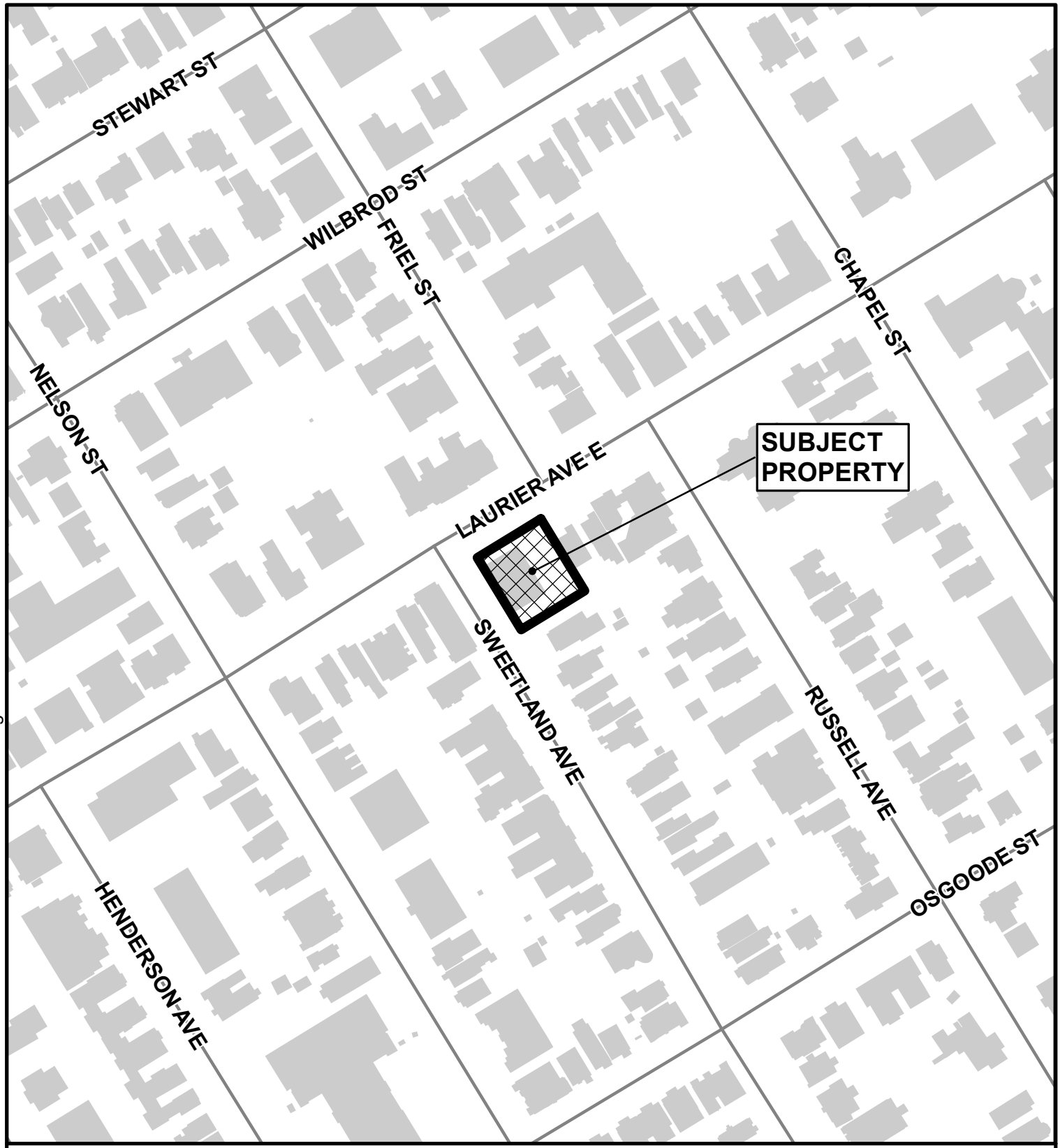
i) The November 2009 Servicing Study Guidelines for Development Applications in the City of Ottawa (City);
ii) The Ottawa Sewer Design Guidelines (2012) and associated Technical Bulletins;
iii) The discussions held during a pre-consultation meeting (April 30, 2021) with City staff, and
iv) Subsequent email correspondence with the owner (SLP), its architect and the City.

A copy of the Topographical Survey is included in Appendix ‘A’ while a copy of the pre-consultation meeting and follow-up email correspondence has been included in Appendix ‘B’.

1.2 Site Description

The subject property is located within the urban limits of the City of Ottawa. The site is bounded by Laurier Avenue East to the north and by Sweetland Avenue to the west (refer to Figure 1 for Location Plan). The subject site currently consists of an existing building which is surrounded by a paved “L” shaped parking area. Based on the aerial image, the subject site currently consists primarily of asphalt and the building with a small strip of grass adjacent to the neighbouring property on Laurier Avenue East.

A topographical survey was completed by Annis, O’Sullivan, Vollebekk (AOV) Limited and compiled on February 12, 2021 (refer to Appendix ‘A’). The current topography of the subject property indicates an existing drainage boundary to the east of the existing building, which causes the current parking area to slope north towards Laurier Avenue East and west towards Sweetland Avenue. Currently, storm runoff generated on the site either sheet flows onto Laurier Avenue East, sheet flows onto Sweetland Avenue, or is collected by an on-site catch basin that discharges into the Sweetland Avenue storm sewer system. The existing building roof is assumed to discharge into the Sweetland Avenue storm sewer system. There is also an existing drain at the bottom of the exterior basement stairs which is assumed to be a standalone sump pit that infiltrates into the ground.



PROJECT:

SMART LIVING PROPERTIES - 280 LAURIER AVE. E.

280 LAURIER AVE. E., OTTAWA, ON

DRAWING:

LOCATION PLAN

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FIGURE 1

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1.3 Building Configuration and Zoning

SLP wishes to construct a three-storey building addition (17 units) to the east side of the existing six-storey building (40 units), for which all of the existing building services (sanitary, storm, water) are proposed to remain.

The subject property is currently zoned Residential Fourth Density Zone, Subzone UD [R4UD (480)], which allows for a maximum building height of 14.5 m (By-law 2020-290). It has been assumed that this SSR can also be used as a Design Brief to support a Zoning By-Law Amendment (ZBLA), should one be required.

1.4 Existing Infrastructure

This report was prepared to demonstrate that the site redevelopment can be supported by the existing municipal infrastructure. The subject property is bounded by existing municipal infrastructure as illustrated below in Figure 2, which consists of the following (refer to Appendix 'C' for a copy of the background drawings):

Watermain

- Existing 203 mm diameter PVC watermain along Laurier Avenue East;
- Existing 203 mm diameter PVC/DI watermain along Sweetland Avenue.

Sanitary

- Existing 250 mm diameter PVC sanitary sewer along Laurier Avenue East;
- Existing 225/250 mm diameter PVC sanitary sewer along Sweetland Avenue.

Storm

- Existing 1050 mm diameter CONC storm sewer along Laurier Avenue East;
- Existing 375 mm diameter CONC storm sewer along Sweetland Avenue.

Figure 2: Existing Infrastructure

The Sewer CCTV Inspection Report and accompanying CCTV footage completed by Clean Water Works (CWW) on October 13, 2021 indicated that the sanitary and storm service laterals from the existing building discharged into the sewers along Sweetland Avenue.

Based on the CCTV footage, three (3) sanitary service laterals connect to the existing 250 mm diameter sanitary sewer on Sweetland Avenue in the vicinity of the existing building. Upon review, it has been assumed that the two (2) sanitary laterals between MHSA38944 and MHSA39430 are inactive. Meanwhile, there is a 200 mm diameter service lateral located ±1.8 m south of MH38944 which appears to be the active sanitary service lateral for the existing building. The length of this lateral is ±11 m. A camera view from the mainline sewer into the assumed sanitary service lateral for the existing building was provided in the CCTV footage. There is very little debris shown in the lateral and clear water is flowing out of it. Hence, the lateral appears to be in acceptable condition. The wastewater plumbing for the building addition will be serviced from the existing building.

Water supply to the existing building is provided by a 76 mm (3 in.) diameter water service lateral that connects to the 203 mm diameter watermain on Sweetland Avenue. The size and location of this lateral has been confirmed by the Owner (refer to Appendix ‘D3’). The water supply for the building addition will be serviced from the existing building.

Also based on the CCTV footage, there appears to be one (1) 200 mm diameter storm service lateral extending from the existing 375 mm diameter storm sewer on Sweetland Avenue toward the existing building. This storm lateral is ±1.7 m south of MHST39435 and is ±13 m in length. The assumed locations of the existing services are shown on the Site Servicing, Grading, Erosion & Sediment Control Plan (Drawing C1).

As shown on the Site Plan (Appendix ‘A’), the new residential building addition would replace the current asphalt parking area, with rooftop stormwater storage being provided for the building addition. The new roof drains and foundation drains (weeping tile) for the building addition will connect to the on-site storm pipe (catch basin lead) and convey stormwater into the existing storm sewer on Sweetland Avenue. As noted on the Site Servicing, Grading, Erosion & Sediment Control Drawing (Drawing C1), the existing catch basin lead that discharges into the storm sewer on Sweetland Avenue will be removed and reinstated with a 200 mm diameter sewer pipe.

1.5 Pre-Consultation, Permits and Approvals

A pre-consultation meeting was held between the Owner’s representatives and staff from the City on April 30, 2021. A copy of the pre-consultation meeting notes has been provided in Appendix ‘B’. As per the consultation notes, the Rideau Valley Conservation Authority (RVCA) was consulted to determine the stormwater quality criterion. The City also provided subsequent comments regarding stormwater management. The updated relevant comments are listed below:

- Coefficient (C) of runoff determined as per existing conditions but in no case more than 0.5.
- Time of Concentration (Tc) = To be calculated, minimum 10 minutes.
- Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.
- Roof shall be controlled to the 2-year storm event with a C-value of 0.5.
- Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

- Remainder of the site can be left uncontrolled as confirmed by the City.
- Noise study required – property fronts on Major Collector Road (Laurier Avenue).
- If the property is not to be severed only one set of municipal services are permitted.
- No stormwater quality measures are required.

1.6 Engineering Drawings

Engineering drawings have been prepared in support of a Site Plan Application to the City of Ottawa and a Zoning By-Law Amendment should one be required. The following two (2) drawings are included in this application:

- Site Servicing, Grading, Erosion & Sediment Control Plan (Drawing C1); and
- Drainage and Ponding Plan (Drawing SWM).

2.0 WATER SERVICING

2.1 Water Supply and Design Criteria

A Hydraulic Network Analysis (HNA) was carried out for the proposed site to confirm that the existing watermain and water service can provide adequate supply while complying with both the Ottawa Design Guidelines for Water Distribution (July 2010) and Technical Bulletins ISDTB-2014-02, ISTB-2018-02 and ISTB-2021-03.

Section 4.2.2 of the Water Design Guidelines requires that all new development additions to the public water distribution system be designed such that the minimum and maximum water pressure, as well as the fire flow rates, conform to the following:

- Under maximum hourly demand conditions (peak hour), the pressures shall not be less than 276 kPa;
- During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 140 kPa (20 psi);
- In accordance with the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi);
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi); and
- Feedermains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand.

Table 2-1 summarizes the design criteria for water servicing, which will serve as the basis of the detailed design for the site.

Table 2-1: Water Design Criteria

Design Criteria	Design Value
Density (apt) 1-bedroom	1.4
Density (apt) 2-bedroom	2.1
Density (apt) 3-bedroom	3.1
Population < 500	
Residential average day demand	280 L/cap/day
Peaking Factors	MECP Table 3-3
Fire Flow Requirements	
Municipal ROW	FUS
Within Private Property	OBC
Scenario	
Peak hour	>275 kPa (40 psi)
Maximum day plus fire flow	>140 kPa (20 psi)
Minimum hour (maximum HGL)	<552 kPa (80 psi)

2.2 Domestic Water Demands

The water demands presented in this section reflect the unit count proposed on the Site Plan. Domestic water demands were calculated for both the existing building and proposed three-storey addition, which includes 42 bachelor units, 11 1-bedroom units and 4 2-bedroom units for a total of 57 units. A corresponding total population of 83 people was calculated based on population densities from Section 4.2.8 of the Water Design Guidelines. The water demand calculation sheet can be found in Appendix 'D1'.

The residential consumption rate for average day demand was set to 280 L/c/d as per the Water Design Guidelines. Since the proposed population for the entire site is less than 500 people, peaking factors interpolated from Table 3-3 of the Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines were used to generate the maximum day and peak hour demands. Since receiving the boundary conditions from the City (Appendix 'D2'), the following revisions were made to the water demand calculations:

- two (2) bachelors and one (1) 1-bedroom unit were removed and one (1) 2-bedroom unit was included thus reducing the overall number of units by 2; and
- the peaking factors were recalculated and interpolated based on equivalent populations from Table 3-3 of the MECP Design Guidelines.

As a result of these revisions, both the maximum day demand and peak hour demand increased by less than 2 L/s. Considering that the changes in these demands are minor, the boundary conditions provided by the City (Appendix 'D2') are still expected to remain applicable. Table 2-2 summarizes the water consumption rates and peaking factors used in the HNA.

Table 2-2: Water Consumption Rates and Peaking Factors

Demand Scenario	Residential
Average Day	280 L/c/d
Maximum Day	7.43 x Avg Day
Peak Hour	11.20 x Avg Day

Table 2-3 summarizes the water demands based on the proposed site details and the peaking factors from Table 2-2 (refer to Appendix D1 for detailed calculations).

Table 2-3: Water Consumption Rates and Peaking Factors

Demand Scenario	Water Demand (L/s)
Average Day	0.27
Maximum Day	2.02
Peak Hour	3.04

2.3 Existing Water Service

As discussed in Section 1.4, water supply to the existing building is currently provided by a 76 mm diameter water service lateral. This service is proposed to be used for both the existing building and the building addition. The assumed location of the existing water service from Sweetland Avenue is shown on the Site Servicing, Grading, Erosion & Sediment Control Plan (Drawing C1).

The watermain roughness coefficient for the existing 76 mm diameter water service was taken to be 100 and the internal pipe diameter of the water service was analyzed as 76 mm.

2.4 Required Fire Flow

For the required fire flow (RFF), water supply within the municipal right-of-way (ROW) must comply with the *Water Supply for Public Fire Protection* guidelines (1999) developed by the Fire Underwriters Survey (FUS) as well as Technical Bulletins ISDTB-2014-02, ISTB-2018-02 and ISTB-2021-03. More specifically, the latest Technical Bulletin ISTB-2021-03 recognizes that fire protection for buildings within private property is to be established in accordance with the Ontario Building Code (OBC). It reads as follows:

> "The requirements for levels of fire protection on private property in urban areas are covered in Section 7.2.11 of the OBC. If this approach yields a fire flow greater than 9,000 L/min then the Fire Underwriters Survey method shall be used to determine these requirements instead."

Based on the excerpt above and the site's usage as a privately owned mid-rise residential apartment building, servicing within this private property must comply with the OBC. In accordance with the OBC, the maximum fire flow requirement for units within a private site are calculated using the *OFM-TG-03-1999 – Fire Protection Water Supply Guideline for Part 3*. The RFF per the OBC was calculated in accordance with the OFM-TG-03-1999 and was found to be 9,000 L/min (150 L/s). The OBC fire flow calculations are presented in Appendix 'D3'.

Initially, the required fire flow (RFF) was calculated using the FUS method for the existing six-storey building and the proposed three-storey addition together while considering material, height of structure, exposure, etc. in accordance with ISTB-2018-02. It was assumed that both the existing building and the proposed addition were composed of wood frame construction, therefore, an anticipated RFF of 23,000 L/min (383 L/s) was calculated. Boundary conditions were

requested from the City at the assumed existing water service connection location on Laurier Avenue East using the high fire flow. The boundary conditions received from the City are summarized in Table 2-4 and a copy of the email correspondence can be found in Appendix 'D2'.

Table 2-4: Hydraulic Boundary Conditions

Water Demand Scenario	HGL Laurier Avenue East (m)
Peak Hour	106.1
Maximum HGL	115.4
Max. Day + Fire Flow	97.6

Since receiving the boundary conditions from the City, it was found that the existing building is classified as non-combustible construction (concrete). Therefore, the RFF per the FUS (2020) was re-calculated as 11,000 L/min (183 L/s) for the proposed three-storey addition alone (refer to Appendix 'D3' for detailed FUS calculations). Furthermore, the location of the existing water service was subsequently confirmed by the Owner as a connection off Sweetland Avenue (Appendix 'D3'). The boundary condition provided on Laurier Avenue East is still considered applicable for this subject site. The length of pipe from the boundary condition location to the existing water service is included in the headloss calculations in Section 2.5.

2.5 Headloss Calculations

The proposed functional servicing as presented on Drawing C1 was evaluated under the demand scenarios listed in Section 2.2. The existing water service is assumed to connect from the existing watermain on Sweetland Avenue. The length of the service lateral is ±9 m. This length has been used to evaluate the expected headloss along the service lateral.

As noted in Section 2.4, since receiving the boundary conditions from the City, the location of the existing water service has been confirmed by the Owner as a connection off Sweetland Avenue. Thus, the existing 200 mm diameter watermains on Sweetland Avenue and Laurier Avenue East from the boundary condition location to the existing service location were included in the headloss calculations.

Headlosses were calculated using the Hazen-Williams headloss equation. The operating pressures at the building (finished floor elevation) were calculated under the water demand scenarios listed in Table 2-4. The Headloss Calculation Spreadsheet (Appendix 'D4') summarizes the operating pressures estimated at the building under peak hour and maximum pressure scenarios. Detailed calculations for both water demand scenarios are shown in Appendix 'D4'.

2.5.1 Peak Hour

The peak hour demand shown in Table 2-3 was applied at the boiler room where the existing service lateral is assumed to be located. Using the boundary conditions shown in Table 2-4, the anticipated pressure at the building was found to be 336 kPa (48.7 psi). Based on the calculated results, the minimum pressure criterion of 276 kPa (40 psi) is exceeded.

2.5.2 Maximum Day Plus Fire Flow

A total fire flow of 9,000 L/min (150 L/s) per the OBC is required for the site. There are three (3) existing hydrants (refer to Appendix 'D3' for aerial image of hydrant location) located within 75 m of the proposed building addition (on Laurier Avenue East (±52 m), Friel Street (±33 m), and Sweetland Avenue (±38 m)). Based on ISTB-2018-02, each of these hydrants can supply 5,700 L/min (95 L/s) and the aggregate sum of the hydrant flow from these three (3) hydrants is 17,100 L/min (285 L/s), which exceeds the fire flow requirement of 9,000 L/min (150 L/s) as per the OBC. It is noted that the total hydrant flow available also exceeds the FUS fire flow requirement of 11,000 L/min (183 L/s).

2.5.3 Maximum HGL

The Water Design Guidelines require that a high pressure check (maximum hydraulic grade elevation) be performed to ensure that the maximum pressure constraint of 552 kPa (80 psi) is not exceeded. Based on a zero (0 L/s) demand condition and maximum HGL boundary condition (refer to Table 2-4), a maximum pressure of 429 kPa (62.1 psi) is expected at the building. This result is below the maximum pressure constraint of 552 kPa (80 psi) and no pressure reducing valve (PRV) is required.

2.6 Summary and Conclusions

Based on the HNA presented above, it is expected that the existing 76 mm diameter watermain service lateral can provide adequate domestic water supply and the existing municipal hydrants can satisfy the fire flow requirement for the subject site.

3.0 WASTEWATER SERVICING

3.1 Existing Conditions

Wastewater flows generated by the site are assumed to be conveyed to the existing 250 mm diameter sanitary sewer on Sweetland Avenue via an existing 200 mm diameter sanitary service lateral as discussed in Section 1.4 and depicted on the Site Servicing, Grading, Erosion & Sediment Control Plan (Drawing C1). The corresponding sanitary drainage area for the subject property is shown on Figure 3.

3.2 Design Criteria

The sanitary service lateral was assessed based on the City of Ottawa Sewer Design Guidelines (OSDG - October 2012) and associated Technical Bulletins. Key design parameters have been summarized in Table 3-1.

Table 3-1: Wastewater Servicing Design Criteria

Design Criteria	Design Value	Reference
Residential average flow	280 L/cap/day	ISTB-2018-01
Residential peaking factor	Harmon Formula x 0.8	City Section 4.4.1
Infiltration Allowance 0.05 L/s/ha (dry I/I) 0.28 L/s/ha (wet I/I)	0.33 L/s/ha	ISTB-2018-01
Minimum velocity	0.6 m/s	OSDG Section 6.1.2.2
Maximum velocity	3.0 m/s	OSDG Section 6.1.2.2
Manning Roughness Coefficient (for smooth wall pipes)	0.013	OSDG Section 6.1.8.2
Minimum allowable slopes	Varies	OSDG Table 6.2, Section 6.1.2.2

3.3 Theoretical Sanitary Peak Flow and Proposed Sanitary Servicing

Wastewater flows from the existing six-storey building and the proposed three-storey addition is assumed to be collected by a series of internal drains that will converge into the boiler room. The captured wastewater flows are assumed to discharge into the existing 250 mm diameter sanitary sewer on Sweetland Avenue through the same service lateral as assumed for existing conditions.

Based on the proposed densities for apartment buildings (as recommended by the OSDG), the peak wastewater flow was calculated based on the design value of 280 L/c/d and an overall population of 83 as per the design parameters listed in Table 3-1. The sanitary service lateral has a length of ±11 m and was assessed based on the City of Ottawa Sewer Design Guidelines (OSDG – October 2012) and associated Technical Bulletins. Key design parameters have been summarized in Table 3-1. The peak wastewater flow of 0.98 L/s was calculated based on a peaking factor of 3.61. A total infiltration allowance of 0.02 L/s was calculated based on 0.33 L/s/ha (dry and wet I/I), in accordance with the OSDG and ISTB-2018-01.

It is proposed that the existing 200 mm diameter sanitary lateral continue to be used to convey the captured flows. Assuming the existing lateral has a slope of 1.0%, the free-flowing capacity of the pipe is 34.2 L/s, which exceeds the design flow of 0.98 L/s. A copy of the sanitary design sheet for 280 Laurier Avenue East can be found in Appendix ‘E’.

PROPOSED 3 STOREY BUILDING
FF=71.72
TOF=71.26
USF=68.17

0.0494 | 200mmØ
TO SWEETLAND

TRANSFORMER PAD

LEGEND

AREA IN HECTARES

0.0494 | 200mmØ
TO SWEETLAND

PIPE DIAMETER

SURFACE DESC.

DRAINAGE BOUNDARY

PROJECT:

280 LAURIER AVENUE EAST

DRAWING:

SANITARY DRAINAGE PLAN

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FIGURE 3

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3.4 Summary and Conclusions

Based on the above wastewater servicing details, it is anticipated that the existing 200 mm diameter sanitary service shown on the Site Servicing, Grading, Erosion & Sediment Control Plan (Drawing C1) can adequately provide sanitary servicing for the existing six-storey building and the proposed three-storey addition.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Strategy

The existing six-storey building on the site is proposed to remain undisturbed. The existing rooftop is assumed to outlet through a storm service to Sweetland Avenue. The existing building frontage sheet drains to Laurier Avenue East and the grading in this area is proposed to be maintained. Since this portion of the site shall remain undisturbed, only the proposed disturbed area is considered for the stormwater management analysis.

Storm runoff generated by the disturbed portion of the site will be conveyed either to Laurier Avenue East or to Sweetland Avenue. The storm sewers on these two streets are not connected at the ROW intersection and are therefore considered as two separate systems. The existing topography (Appendix ‘A’) indicates that the disturbed portion of this site currently drains toward both systems.

At the direction of the City (refer to Appendix ‘B’ for email correspondence), only the proposed building’s rooftop will need to be controlled to the 1:2 year pre-development allowable release rate based on a C-factor of 0.5. As such, under post-development conditions, there will be no requirement for storage outside of the rooftop and the rest of the site will sheet flow to either Laurier Avenue East or Sweetland Avenue.

The building addition will outlet stormwater via roof drains into the storm lead at the back of the site (south portion). Runoff from the south portion of the site will be collected by one (1) on-site catch basin (CB1) which will discharge into the Sweetland Avenue storm sewer system via the reinstated 200 mm diameter storm lead. Furthermore, stormwater from the small corridor area between the existing building and the proposed addition will be collected by a trench drain and conveyed to the Sweetland Avenue storm system via the reinstated 200 mm diameter storm lead. The foundation drainage will also be directed to the Sweetland Avenue storm system via the uncontrolled storm lead. At the request of the City (Appendix ‘B’), a maintenance hole (MH1) will be required at the connection between the reinstated catch basin lead and the existing storm sewer on Sweetland Avenue. A copy of the Storm Sewer Design Sheet can be found in Appendix ‘F1’.

Storm flows generated from the disturbed surfaces are to be controlled to the criterion described in the pre-consultation meeting notes and subsequent correspondence with the City (refer to Appendix ‘B’ for email correspondence).

4.2 Storm Criteria

During the pre-consultation meeting held on April 30, 2021 (refer to Appendix 'B'), the following storm servicing criteria for the proposed redevelopment was provided by the City, which consists of the following:

- The Coefficient (C) of runoff determined as per existing conditions but in no case more than 0.5.
- Time of Concentration (TC) to be calculated, with a minimum of TC = 10 minutes.
- Any storm events greater than 5 year, up to 100 year, and including 100-year storm event must be detained on site.
- Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, a sufficiently sized pump and back flow prevention.
- Roof drains are to be connected downstream of any incorporated ICD within the SWM system.
- Stormwater quality control measures not required per the RVCA.

Since this meeting, the City has provided additional direction on the storm servicing requirements for this project (refer to Appendix 'B'). It should be noted that these comments have amended some of the criteria presented during the pre-consultation meeting. In summary, the additional comments are as follows:

- The proposed roof will need to be controlled to the 1:2 year storm event, using a C-factor of 0.5, while the remainder of the site can be left uncontrolled;
- An inlet control device (ICD) in the rear yard CB is not required to control flows since the flow rate of 3.55 L/s is too small and will likely clog up with debris and sediments over time.
- The proposed 200mm catch basin lead connecting to the storm sewer on Sweetland Ave would require a manhole connection. This is required because the lead is greater than 50% of the diameter of the mainline sewer.

The storm servicing identified on Drawings C1 and SWM have been developed to meet the above criteria.

4.3 Allowable Release Rate

Storm servicing and stormwater management for the subject site is to be controlled to the criteria listed in Section 4.2. The proposed roof will need to be controlled to the 1:2 year pre-development release rate of the proposed building footprint while the rest of the site will sheet flow uncontrolled to the existing trunk sewers on Laurier Avenue East and Sweetland Avenue. A Pre-Development Drainage Plan for the disturbed surfaces is shown on Figure 4. It should be noted that the proposed building footprint is currently all pavement (i.e., having a runoff coefficient of 0.9). However, as requested by the City, a maximum runoff coefficient of 0.5 was used to calculated the allowable release rate of this catchment area. The calculations for the pre-development release rate at 280 Laurier are provided in Appendix 'F2'.

Since the site area is small, the allowable peak flow was calculated based on the minimum time of concentration of 10.00 minutes. The pre-development release rate of the proposed building

area under a 1:2 year design event was estimated at 2.14 L/s. Hence, as per the City's instructions, the proposed roof top storage must be controlled to this rate, and the rest of the site will flow uncontrolled to the mainline sewers.

4.4 Storm Servicing

The general storm and stormwater servicing constraints used to develop the detailed design for the site are listed in Table 4-1.

Table 4-1: Storm Servicing Design Criteria

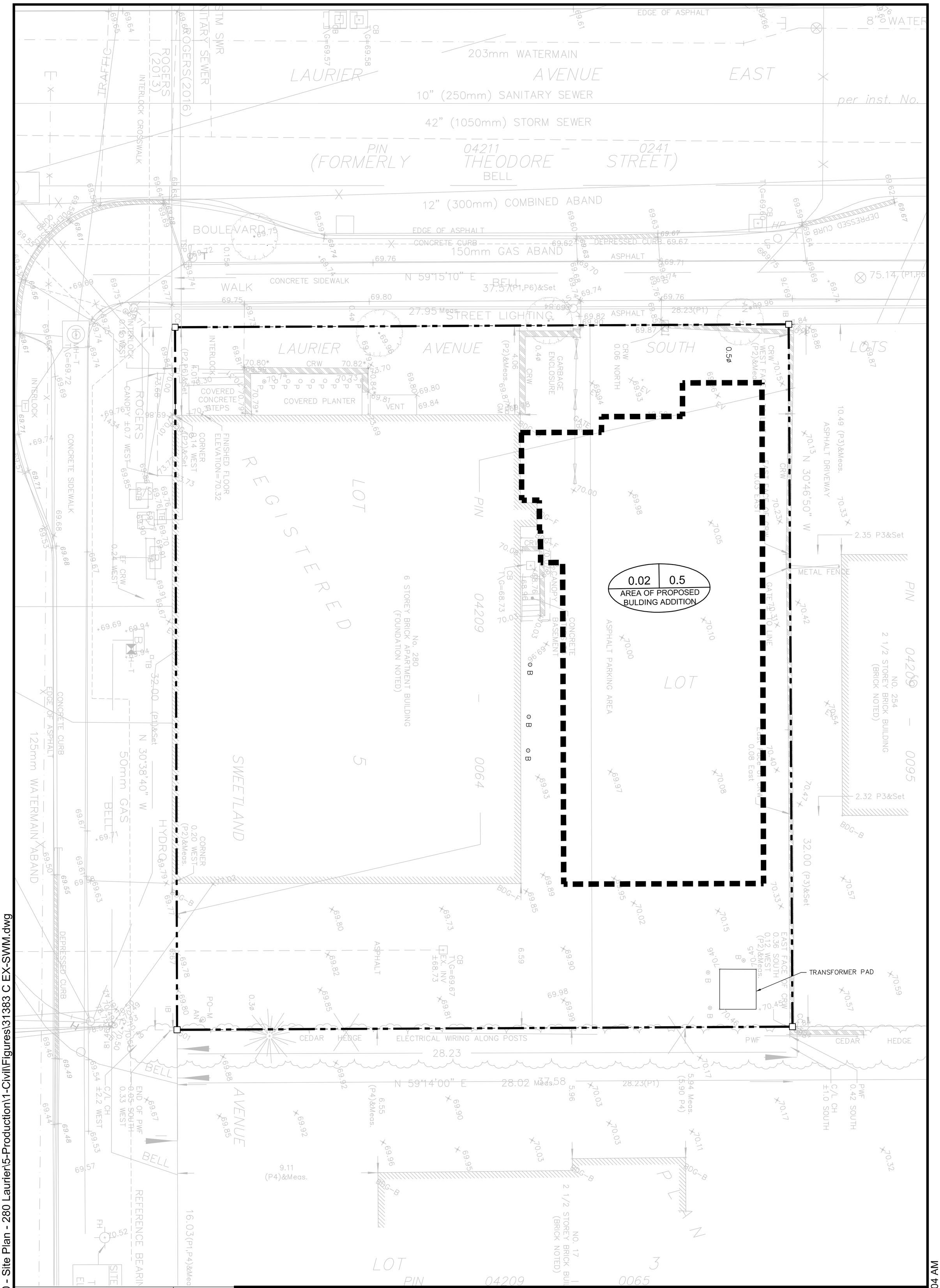
General Design Criteria
Storm drains are to be designed by the mechanical engineer to convey the calculated flows presented herein in accordance with the Ontario Building Code. The calculated peak flows were estimated with the Rational Method and the City of Ottawa Intensity-Duration-Frequency (IDF) curves.
Peak flows estimated based on an inlet time of ten (10) minutes, as per the Technical Bulletin ISDTB-2012-4.
Calculated peak flows to be estimated based on weighted average C-Factors. The weighted C-Factors have been calculated based on 0.90 for all hard surfaces and 0.20 for all landscaped areas.
The 1:100-year peak flows to be detained by means of on-site retention measures of rooftop storage.
Provide measures to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

4.5 Proposed Stormwater Management Solution and Calculations

4.5.1 Water Quantity

Storm servicing and stormwater management was developed to limit the proposed rooftop to the allowable peak flow of 2.14 L/s while allowing the rest of the site to sheet flow uncontrolled. In order to achieve this criterion, rooftop restrictors were deemed necessary to allow for rooftop storage.

The disturbed surfaces under post-development conditions are shown on the Storm Drainage and Ponding Plan (Drawing SWM). This drawing illustrates the various drainage areas along with their C-Factor and outlet. Drawing SWM also shows the ponding limits at the rooftop as described in the detailed stormwater management calculations (Appendix 'F3') using the Modified Rational Method (MRM). In accordance with the OSDG, the runoff coefficients under the 1:100-year MRM calculation were increased by 25% up to the maximum of 0.90. The grass areas were therefore, accounted for at a C-Factor of 0.25 (125% x 0.20). Table 4-2 and Table 4-3 summarize the runoff volume requirements as estimated by the MRM and detailed in Appendix 'F3'.



LEGEND

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AREA 3

AREA IN HECTARES
RUNOFF COEFFICIENT (1:2YR)
SURFACE DESC.
DRAINAGE BOUNDARY

PROJECT:

280 LAURIER

DRAWING:

PRE-DEVELOPMENT DRAINAGE CONDITION OF PROPOSED BUILDING AREA

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ENGINEERS · ARCHITECTS · PLANNERS

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DESIGN:	MM
DRAWN:	KT
CHECKED:	AW
JLR #:	31383-000

DRAWING #:

FIGURE 4

File Location: P:\31000\31383-000 - Site Plan - 280 Laurier\5-Production\1-Civil\Figures\31383 C EX-SWM.dwg

PLOT DATE: March 17, 2022 11:21:04 AM

Table 4-2: Flow to Laurier Avenue East (1:100 year)

Area Type	Area (m^2)	Controlled Peak Flow (L/s)	Uncontrolled Peak Flow (L/s)	Storage Required (m^3)	Storage Provided (m^3)
Uncontrolled Sheet Flow	62.5	N/A	1.71	N/A	N/A

Table 4-3: Flow to Sweetland Avenue (1:100 year)

Area Type	Area (m^2)	Controlled Peak Flow (L/s)	Uncontrolled Peak Flow (L/s)	Storage Required (m^3)	Storage Provided (m^3)
Uncontrolled Sheet Flow	231.8	N/A	7.25	N/A	N/A
Roof Top	200.0	2.14	N/A	4.64	4.64

Based on the SWM calculations, and by designing the roof scupper elevations to provide enough rooftop storage for the 1:100 year storm event, sufficient roof storage will be provided. Furthermore, under the 1:100 year condition, 1.71 L/s will sheet flow uncontrolled to Laurier Avenue East and 7.25 L/s will sheet flow uncontrolled to Sweetland Avenue.

4.5.2 Climate Change Event (CCE)

Under a climate change event (CCE - +20% above the 1:100 year), the stormwater management calculations (Appendix 'F3') show the available storage difference between the CCE and 1:100-year storm. Table 4-4 and Table 4-5 summarize the runoff volume requirements as estimated by the MRM and detailed in Appendix 'F3'.

Table 4-4: Flow to Laurier Avenue East (CCE)

Area Type	Area (m^2)	Controlled Peak Flow (L/s)	Uncontrolled Peak Flow (L/s)	Storage Required (m^3)	Storage Provided (m^3)
Uncontrolled Sheet Flow	62.5	N/A	2.05	N/A	N/A

Table 4-5: Flow to Sweetland Avenue (CCE)

Area Type	Area (m^2)	Controlled Peak Flow (L/s)	Uncontrolled Peak Flow (L/s)	Storage Required (m^3)	Storage Provided (m^3)
Uncontrolled Sheet Flow	231.8	N/A	8.70	N/A	N/A
Roof Top	200.00	2.14	N/A	6.15	4.64

Based on the SWM calculations and rooftop scupper design, sufficient roof storage will be provided to detain the 1:100 year storm event on the roof and the additional volume of 1.51 cubic meters will outlet via the scuppers. Meanwhile, under the CCE condition 2.05

L/s will sheet flow uncontrolled to Laurier Avenue East and 8.70 L/s will sheet flow uncontrolled to Sweetland Avenue.

4.5.3 Water Quality

The RVCA was consulted to determine whether quality measures were necessary for this redevelopment. Based on an email correspondence from the RVCA (Appendix 'B'), the stormwater servicing does not require any quality measures.

4.6 Summary and Conclusions

The detailed storm and stormwater servicing as well as the proposed grading will meet the design criteria highlighted in Section 4.2. As per the City comments (Appendix 'B'), the proposed rooftop will be controlled to an allowable release rate of 2.14 L/s using roof drains. The remaining post development flows will discharge uncontrolled to the Laurier Avenue East and Sweetland Avenue outlets. Rooftop ponding limits are shown in Drawing SWM, however the exact scupper elevations and ponding surface elevations on the roof of the new building addition shall be set by the architect in consultation with the mechanical engineer and structural engineer. The maximum scupper elevations shall be set at the 100-year ponding elevation.

5.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures, as outlined in the Ontario Ministry of Natural Resources (MNR) Guidelines on Erosion and Sediment Control for Urban Construction Sites, will be implemented to trap sediment on site. The following erosion and sediment control measures could be implemented during construction (refer to Drawing C1):

- Supply and installation of a silt fence barrier, as per OPSD 219.110, if required;
- Supply and installation of filter fabric between the frame and cover of catch basins and maintenance holes adjacent to the project area during construction, to prevent sediment from entering the sewer system. The filter fabric is to be inspected regularly and corrected as required;
- Sandbags are to be placed blocking part of the sewer pipe in the existing catch basin to eliminate construction debris from entering the existing storm sewer system. The sandbags are to be removed after the proposed storm sewers have been fully cleaned.

The proposed removal and reinstatement measures as well as the erosion control measures shall conform to the following documents:

- "Guidelines on Erosion and Sediment Control for Urban Construction Sites" published by Ontario Ministries of Natural Resources, Environment, Municipal Affairs, and Transportation & Communication, Association of Construction Authorities of Ontario and Urban Development Institute, Ontario, May 1987.
- "MTO Drainage Manual", Chapter F: "Erosion of Materials and Sediment Control", Ministry of Transportation & Communications, 1985.
- "Erosion and Sediment Control" Training Manual by Ministry of Environment, Spring 1998.
- Applicable Regulations and Guidelines of the Ministry of Natural Resources.

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J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

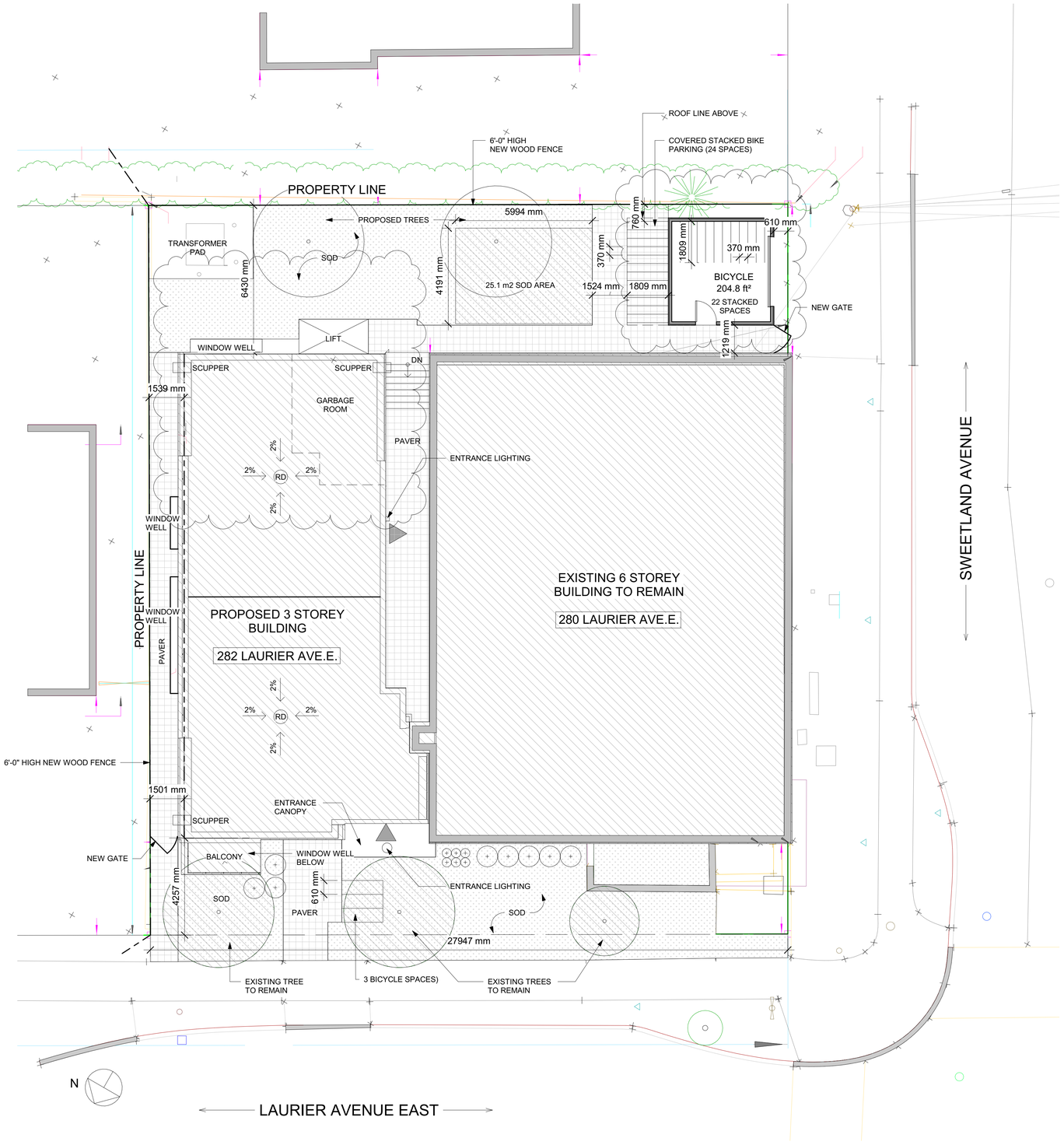
Mahad Musse, E.I.T.
Civil Engineering Intern

Reviewed by:

Annie Williams, P.Eng.
Civil Engineer

Appendix 'A'

Site Plan, Site Topography and Site Servicing Checklist



SITE PLAN

SCALE: 1:100

280 LAURIER AVE. E.

SITE PLAN OF SURVEY LOT 5 AND PART OF LOT 6 (SOUTH LAURIER AVENUE) REGISTERED PLAN 14349, CITY OF OTTAWA

SURVEY INFO TAKEN FROM LOT 5 AND PART OF LOT 6 (SOUTH LAURIER AVENUE) REGISTERED PLAN 14349, CITY OF OTTAWA

PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. COMPLETED FEBRUARY 5, 2021

R4UD [480]- RESIDENTIAL FOURTH DENSITY ZONE (SEC. 161-162) CITY OF OTTAWA;
DWELLING TYPE: NEW ADDITION TO EXISTING 6 STOREY MID RISE APARTMENT BUILDING (RENTALS)

ZONING MECHANISMS	REQUIREMENT	PROVIDED	NOTES
A) MINIMUM LOT AREA	450 m²	895.5 m²	
B) MINIMUM LOT WIDTH	15 m	27.95 m	
C) MINIMUM LOT DEPTH	N/A	32 m	
D) MINIMUM FRONT YARD SET BACK	AVERAGE (4.5m+4.01m) /2 =4.255m	4.25 m	
E) MINIMUM CORNER YARD SET BACK	AVERAGE (3m+0m) /2 =1.5m	0 m (EXISTING)	
F) MINIMUM INTERIOR SIDE YARD SETBACK	1.5 m	1.5 m	
G) MINIMUM REAR YARD SET BACK	8 m	6.43 m	BY-LAW 2022-291
H) MINIMUM REAR YARD AREA	25% of 895.5 m² = 223.875 m²	180.16 m²	BY-LAW 2022-291
I) MAXIMUM BUILDING HEIGHT	14.5 m	11.261 m	
J) VEHICULE PARKING (RESIDENTS)	44x0.5=22	0	BY-LAW 2022-291
VEHICULE PARKING (VISITOR)	44x0.1=4.4	0	BY-LAW 2022-291
VEHICULE PARKING (TOTAL)	26.4	0	BY-LAW 2022-291
K) BIKE SPACES	56x0.5=28	22 (STACKED) INDOOR +24 (STACKED) OUTDOOR +3 STANDARD OUTDOOR	

	REQUIREMENT	PROVIDED	EXISTING
L) AMENITY AREA	0	91.4 m² @ BACK & 15.6 m² BALCONIES TOTAL = 107 m²	
M) FRONT YARD, SOFTSCAPING PERCENTAGE	40%	60.8%	
N) REAR YARD, SOFTSCAPING PERCENTAGE	50%	50.15%	

BUILDING AREA

FLOOR NAME	EXISTING	PROPOSED ADDITION	TOTAL
BASEMENT	341 m²	193.6 m²	534.6 m²
GROUND FLOOR	341 m²	193.6 m²	534.6 m²
SECOND FLOOR	341 m²	193.6 m²	534.6 m²
THIRD FLOOR	341 m²	193.6 m²	534.6 m²
FOURTH FLOOR	341 m²	0 m²	341 m²
FIFTH FLOOR	341 m²	0 m²	341 m²
SIXTH FLOOR	341 m²	0 m²	341 m²
TOTAL	2387 m²	774.4 m²	3161.4 m²

	BACHELOR	1 BED	2 BED	TOTAL
EXISTING BUILDING	**29**	**11**	**0**	**40**
PROPOSED ADDITION	**13**	**0**	**4**	**17**
TOTAL	**42**	**11**	**4**	**57**
REQUIRED 2 BEDROOM			**4**	
PROPOSED 2 BEDROOM			**4**	

AVERAGE GRADE:

CALCULATED FROM EXISTING ELEVATION POINTS AT A DISTANCE EQUAL TO THE MINIMUM FRONT YARD & REAR YARD SETBACKS, AT THE INTERIOR SIDE PROPERTY LINES

AVERAGE GRADE : 70.045m (69.87m + 70.13m + 69.85m + 70.33m) /4

OTTAWA CARLETON CONSTRUCTION

(DESIGN ONLY)

OTTAWA CARLETON CONSTRUCTION GROUP LTD. - BCIN#: 112782
337 SUNNYSIDE AVE, SUITE 101, OTTAWA, ON K1S 0R9

FERNANDO MATOS - BCIN#: 22431
613-884-4425

QUALIFICATION INFO
SMALL BUILDINGS

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to be a designer.

RESPONSIBILITIES:

DO NOT SCALE DRAWINGS

ALL DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE 2012

ALL CONTRACTORS MUST WORK IN ACCORDANCE WITH ALL LAWS, REGULATIONS AND BYLAWS HAVING JURISDICTION

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT/DESIGNER

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GENERAL NOTES:

282 LAURIER AVE. E.

NEW ADDITION TO
EXISTING 6 STOREY BUILDING

CONSULTANTS

STRUCTURAL -
MECHANICAL -
ELECTRICAL -

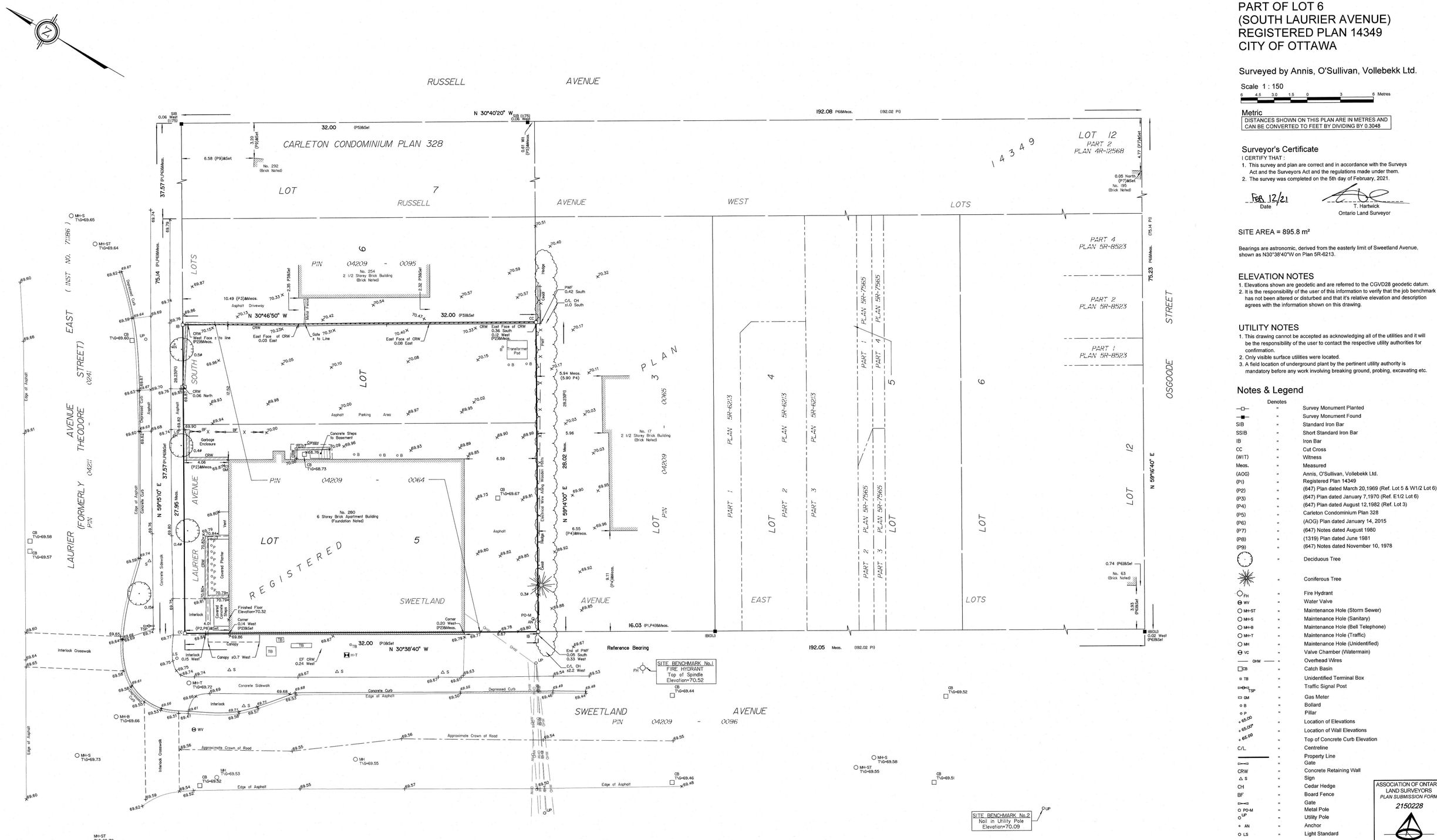
M/D/Y

NO.	REVISION/ISSUE	DATE
9		
8		
7		
6		
5		
4		
3		
2		
1	ISSUED FOR PERMIT	02/24/23

PROJECT:
282 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
282 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

SITE PLAN

DRAWN BY: L.T.
DATE: MARCH 29, 2021
SCALE: AS NOTED
SHEET: A0



TOPOGRAPHICAL PLAN OF SURVEY OF

LOT 5 AND PART OF LOT 6 (SOUTH LAURIER AVENUE) REGISTERED PLAN 14349 CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 150

6 4.5 3.0 1.5 0 3 6 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 and the Surveyors Act and the regulations made under them.
2. The survey was completed on the 5th day of February, 2021.

Feb 12/21
Date

T. Hartwick
Ontario Land Surveyor

SITE AREA = 895.8 m²

Bearings are astronomic, derived from the easterly limit of Sweetland Avenue, shown as N30°38'40"W on Plan 5R-6213.

ELEVATION NOTES

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

UTILITY NOTES

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

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.
(P1)	=	Registered Plan 14349
(P2)	=	(647) Plan dated March 20,1969 (Ref. Lot 5 & W1/2 Lot 6)
(P3)	=	(647) Plan dated January 7,1970 (Ref. E1/2 Lot 6)
(P4)	=	(647) Plan dated August 12,1982 (Ref. Lot 3)
(P5)	=	Carleton Condominium Plan 328
(P6)	=	(AOG) Plan dated January 14, 2015
(P7)	=	(647) Notes dated August 1980
(P8)	=	(1319) Plan dated June 1981
(P9)	=	(647) Notes dated November 10, 1978
	=	Deciduous Tree
	=	Coniferous Tree
FH	=	Fire Hydrant
WV	=	Water Valve
MH-ST	=	Maintenance Hole (Storm Sewer)
MH-S	=	Maintenance Hole (Sanitary)
MH-B	=	Maintenance Hole (Bell Telephone)
MH-T	=	Maintenance Hole (Traffic)
MH	=	Maintenance Hole (Unidentified)
VC	=	Valve Chamber (Watermain)
OHW	=	Overhead Wires
CB	=	Catch Basin
TB	=	Unidentified Terminal Box
TSP	=	Traffic Signal Post
GM	=	Gas Meter
B	=	Bollard
P	=	Pillar
+69.50	=	Location of Elevations
+69.50*	=	Location of Wall Elevations
+69.50	=	Top of Concrete Curb Elevation
C/L	=	Centreline
	=	Property Line
	=	Gate
CRW	=	Concrete Retaining Wall
S	=	Sign
CH	=	Cedar Hedge
BF	=	Board Fence
	=	Gate
PO-M	=	Metal Pole
UP	=	Utility Pole
AN	=	Anchor
LS	=	Light Standard
Ø	=	Diameter

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2150228

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Email: Nepean@aovltd.com

Ontario Land Surveyors

Job No. 21-06-20 Sml\vg Pnt\ls5,6&Pt4349 280 LaurierAveE T_DWG

SMART LIVING PROPERTIES – 280 LAURIER AVENUE EAST

DEVELOPMENT SERVICING STUDY CHECKLIST

REFERENCED STUDIES AND REPORTS	REFERENCE
Site Servicing Report for Smart Living Properties, 280 Laurier Avenue East (J.L. Richards & Associates Limited, November 17, 2021)	SSR

4.1	GENERAL CONTENT	REFERENCE
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	SSR (Title Page)
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	SSR (Figure 1) Site Servicing, Grading, ESC Plan (C1)
☒	Plan showing the site and location of all existing services.	Site Servicing, Grading, ESC Plan (C1)
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	SSR (Section 1.3)
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	SSR (Appendix 'B')
☐	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.	N/A
☒	Statement of objectives and servicing criteria.	SSR (Section 1.5, 2.1, 3.2, 4.2, 4.4)
☒	Identification of existing and proposed infrastructure available in the immediate area.	SSR (Section 1.4, 2.3, 3.3, 4.5) Site Servicing, Grading, ESC Plan (C1)
☒	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).	SSR (Section 1.5, 4.2) Site Servicing, Grading, ESC Plan (C1)
☒	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.	Site Servicing, Grading, ESC Plan (C1)

☐	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.	To be confirmed
☒	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	All Drawings

4.2	**DEVELOPMENT SERVICING REPORT: WATER**	**REFERENCE**
☐	Confirm consistency with Master Servicing Study, if available.	N/A
☒	Availability of public infrastructure to service proposed development.	SSR (Section 1.4, 2.3) Site Servicing, Grading, ESC Plan (C1)
☒	Identification of system constraints.	SSR (Section 2.4)
☒	Identify boundary conditions.	SSR (Section 2.4, Appendix 'D')
☒	Confirmation of adequate domestic supply and pressure.	SSR (Section 2.5)
☒	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.	SSR (Section 2.5, Appendix 'D')
☒	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.	SSR (Section 2.5)
☐	Definition of phasing constraints. Hydraulic modelling 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 shutoff valves.	SSR (Section 2.3)
☐	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.	SSR (Section 2, Appendix 'D')
☒	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.	SSR (Section 2.3) Site Servicing, Grading, ESC Plan (C1)
☐	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.	SSR (Section 2.1, 2.2)
☒	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	SSR (Appendix 'D')

4.3	DEVELOPMENT SERVICING REPORT: WASTEWATER	REFERENCE
☒	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).	SSR (Section 3.2)
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☒	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the Guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	SSR (Section 3.2)
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	SSR (Section 1.4, 3.1, 3.3)
☒	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.)	SSR (Section 3.3)
☒	Calculations related to dry weather and wet weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	SSR (Appendix 'E')
☒	Description of proposed sewer network, including sewers, pumping stations and forcemains.	SSR (Section 3.3) Site Servicing, Grading, ESC Plan (C1)

☒	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).	SSR (Appendix 'B')
☐	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	REFERENCE
☒	Description of drainage outlets and downstream constraints, including legality of outlets (i.e., municipal drain, right-of-way, watercourse, or private property).	SSR (Section 1.4, 4.1)
☒	Analysis of available capacity in existing public infrastructure.	SSR (Section 4.2, 4.3)
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Storm Drainage and Ponding Plan (SWM)
☒	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.	SSR (Section 4.3)
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	SSR (Section 4.5.3)
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	SSR (Section 4) Storm Drainage and Ponding Plan (SWM)
☐	Setback 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.	SSR (Appendix 'B')

☐	Confirm consistency with subwatershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:2 year return period) and major events (1:100 year return period).	SSR (Section 4, Appendix 'F')
☐	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.	SSR (Section 4, Appendix 'F')
☒	Any proposed diversion of drainage catchment areas from one outlet to another.	SSR (Section 4, Appendix 'F')
☒	Proposed minor and major systems, including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Site Servicing, Grading, ESC Plan (C1) Storm Drainage and Ponding Plan (SWM)
☐	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.	Quantity control proposed per SSR (Section 4)
☐	Identification of potential impacts to receiving watercourses.	N/A
☐	Identification of municipal drains and related approval requirements.	N/A
☒	Description of how the conveyance and storage capacity will be achieved for the development.	SSR (Section 4)
☒	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	SSR (Section 4) Site Servicing, Grading, ESC Plan (C1) Storm Drainage and Ponding Plan (SWM)
☒	Inclusion of hydraulic analysis, including hydraulic grade line elevations.	SSR (Section 4, Appendix 'F')
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	SSR (Section 5) Site Servicing, Grading, ESC Plan (C1)
☐	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	REFERENCE
The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development, as well as the relevant issues affecting such approval. The approval and permitting shall include but not be limited to the following:		
☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams, as defined in the Act.	SSR (Section 1.5, Appendix 'B')
☐	Application for Environmental Compliance Approval (ECA) 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	REFERENCE
☒	Clearly stated conclusions and recommendations.	SSR (Section 2.6, 3.4, 4.6)
☒	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.	Comment Response Letter to City of Ottawa
☒	All draft and final reports shall be signed and stamped by a Professional Engineer registered in Ontario.	SSR Site Servicing, Grading, ESC Plan (C1) Storm Drainage and Ponding Plan (SWM)

Appendix ‘B’

Pre-Consultation Notes and
Email Correspondences

Pre-Application Consultation Meeting Notes

Property Address: 280 Laurier Ave. E.
File No: PC2021-0121
Date: April 30, 2021, Via Microsoft Teams

Attendees:

City of Ottawa: Kimberley Baldwin (File Lead – Planner), Christopher Moise (Urban Design), Mohammed Fawzi (Project Manager – Infrastructure)

Applicant Team: Jeremy Silbert (Smart Living Properties), Tamer Abaza (Smart Living Properties), Lisa Dalla Rosa (FOTENN – Planner)

Action Sandy Hill: John Verbaas

Meeting notes:

Opening & attendee introduction

- Introduction of meeting attendees
- **Overview of proposal:**
  - The proposal is for a three-storey, 15-unit addition on the east side of the 6 storey residential building. The existing building currently contains 41 residential units (for a total of 56 units)
  - Proposal would be subject to a Site Plan Control, Complex process. Relief from the zoning by-Law will also be required.

Preliminary comments and questions from staff and agencies, including follow-up actions:

- **Planning** (Kimberley Baldwin)
  - Official Plan
    - Designated General Urban Area
      - Policies found in Section 3.6.1. See also Section 2.5.1 and 4.11 (Urban Design and Compatibility policies)
  - Sandy Hill Secondary Plan
    - Designated 'Low Profile Residential Area'
    - See 'Site Development' policies in 5.3.6 of Secondary Plan.
      - Provide internal and external on-site amenity areas
      - Enhance development with landscaping
      - New development respecting the scale of Laurier Avenue.

- Zoning Bylaw
    - Residential Fourth Density Zone, Subzone UD [R4UD (480)]
        - Several new zoning regulations about front façade articulation, landscaping in front and rear yards, and waste management. Please review and confirm compliance in your planning rationale
        - Interior side yard for low-rise apartment is 1.5m. Relief required.
        - Variety of unit sizes? Zoning requires at least 25% of the dwelling units to have at least two bedrooms.
    - Area X for parking

- General planning comments
    - Proposed addition would help fill in a gap in the Laurier streetscape
    - Carefully consider how 56 units on this relatively small lot will function (ie. provide sufficient area for waste management, amenities, vehicle/ bicycle parking relative to the number of units existing/proposed)
    - What is the planning rationale for providing few vehicle parking spaces? Site is not within 600 m of rapid transit. Will ample bicycle parking spaces be provided to compensate for the low vehicle parking rate?
    - Large mature trees along Laurier Ave. Entrance and assumed pathway leading to the sidewalk potentially conflict. Consider providing a pathway that loops around the tree
    - As the driveway along Laurier would be removed, the curb would need to reinstated to sidewalk height through the site plan control process.
    - Consider relocating the garbage enclosure to behind the addition so that it is not visible from the street. If it is to remain in that location, it will have to have an enclosure as per the Property Maintenance Bylaw.
    - Cash-in-lieu of parkland will be required for the net increase in units

- **Urban Design** (Christopher Moise)
    - This proposal is replacing surface parking with a new residential building and we have the following comments/questions:
        - **Building separation**: We recommend some illustration showing that sufficient space is being provided between the two buildings to maintain access to natural light to the existing building units;
        - **Amenity**: Where will amenity space be provided for this project? Rear yard is one option while providing balconies may also achieve some relief from the over-all need;
        - **Landscaping/Trees**: We recommend that the proposal indicate where the landscaping requirement will be met. Trees are also an important element to help soften the project into the neighbourhood;
        - **Bike parking**: We encourage a ratio of 1:1 bike parking to units for the over-all development;
        - **Vehicular parking**: Is it better to keep 4 spaces or provide landscaping and trees in the rear yard?

        - **Side yard setback**: We recommend that this not be reduced below 1.5m as this may be encroached by side-yard window wells;
        - **Window wells**: Please show window wells on the drawings. We would like to understand how much surrounding landscaping would be lost with these encroachments;
        - **Amenity on the roof**: Although there is some concern with roof-top amenity in the neighbourhood, amenity space is currently very deficient in the proposal and there may be an argument for providing it in this case where the building is adjacent to a mid-rise built form which may provide some protection to the surrounding community;
        - **Street facade articulation**: Adding balconies (projecting, Juliet or inset) will provide additional articulation, however, we recommend moving forward with the material choice, scale and proportion of the proposed as it fits well with the existing building and will work towards transitioning the non-conforming mid-rise to the neighbouring low-rise properties on Laurier;
        - **Scale**: We recommend the neighbouring property (outline) be illustrated in the elevation drawings to better understand the future relationship in design and scale;
    - A Design Brief is a required submittal for all Site Plan/Re-zoning applications. Please see the Design Brief Terms of Reference provided and consult the City's website for details regarding the UDRP schedule (if applicable).

    This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. We are happy to assist and answer any questions regarding the above. Good luck.

- **Heritage** (Luis Juarez)
    - I have reviewed the Pre-Con submission for 280 Laurier with my team and we do not have any major issues with the proposed addition. The property is not designated under Part IV or V of the Ontario Heritage Act, and not listed on the City's Heritage Register.
    - We provide the following general comments for the applicant:
        - Heritage Staff are supportive of infill on this property and encourage the removal of the portion of the parking lot that fronts onto Laurier Avenue.
        - 280 Laurier Avenue is located within the Sandy Hill Cultural Heritage Character Area. Please refer to sections 5.3 (alterations and additions), 5.4 (infill), and 5.5 (streetscape) of the Character Area guidelines (attached) to help inform the detailed design.
        - Ensure that the existing street trees are maintained to preserve the continuity of streetscape that exists within the Character Area.
        - The proposed addition is located immediately adjacent to the Sweetland Avenue Heritage Conservation District (to the south) and to 284 Laurier Street (to the east), a property listed on the City's Heritage Register. Ensure that the addition is sympathetic to the character of these heritage resources and the overall neighbourhood.

- **Engineering** (Mohammed Fawzi)
  - Detailed comments will be attached as a separate document in the pre-con follow-up email, including plan and study requirements.

    Available Infrastructure:

    Laurier Avenue:
    Sanitary: 250mm PVC (Install 1997)
    Storm: 1050mm Conc (Install 1997)
    Water: 200mm PVC (Install 1997)

  - Noise study required – property fronts on Major Collector Road (Laurier Avenue)
  - If the property is not to be severed only one set of municipal services are permitted.

- **City Surveyor**
  - The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
  - Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

  Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

- **Forestry** (Mark Richardson)

  TCR requirements:

  - Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
    - an approved TCR is a requirement of Site Plan approval.
  - As of January 1 2021, any removal of privately or publicly (City) owned trees 10cm or larger in diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
  - The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
    - If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
    - Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
  - the TCR must list all trees on site by species, diameter and health condition
  - the TCR must list all trees on adjacent sites if they have a critical root zone that extends onto the development site

- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
- All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
    - securities may be required for retained trees
    - the location of tree protection fencing must be shown on a plan
    - show the critical root zone of the retained trees
    - if excavation will occur within the critical root zone, please show the limits of excavation
- the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
- For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

LP tree planting requirements:

For additional information on the following please contact Tracy.Smith@Ottawa.ca

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
- Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please ensure adequate soil volumes are met:

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

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Action Sandy Hill Community Association Comments

John Verbaas

- Does the design meet the articulation requirements of the R4 zone?
- Improve landscaping, add trees across the whole frontage
- If there's a tradeoff for parking and amenity space, on-site amenity space would be desirable.

Next steps

- City Staff encourage the applicant to discuss the proposal with Councillor, community groups and neighbours
- City staff to send follow-up email confirming submission requirements

Application Submission Information

Development Application(s) Required:

Site Plan Control, Complex, Managed Approval with Public Consultation Application

Zoning By-law Amendment Application

For information on Site Plan Control Thresholds under the Site Plan Control By-law, please visit: https://documents.ottawa.ca/sites/documents/files/siteplan_thresholds_en.pdf

For information on Applications, including fees, please visit: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/fees-and-funding-programs/development-application-fees

The application processing timeline generally depends on the quality of the submission. For more information on standard processing timelines, please visit: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/development-application-forms#site-plan-control

Application Submission Requirements

For information on the preparation of Studies and Plans and the City's Planning and Engineering requirements, please visit: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans

Please provide electronic copy (PDF) of all plans and studies required.

Note that many of the plans and studies collected with this application must be signed, sealed and dated by a qualified engineer, architect, surveyor, planner or designated specialist.

280 Laurier Avenue – Infrastructure Notes

Available Infrastructure:

Laurier Avenue:

Sanitary: 250mm PVC (Install 1997)
Storm: 1050mm Conc (Install 1997)
Water: 200mm PVC (Install 1997)

Water Boundary Conditions:

Will be provided at request of consultant. Requests must include the location of the service and the expected loads required by the proposed development. Please provide the following and submit Fire Flow Calculation Sheet per FUS method with the request:

- Location of service
- Type of development and amount of required fire flow (per FUS method – include FUS calculation sheet with request)
- Average Daily Demand (l/s)
- Maximum Hourly Demand (l/s)
- Maximum Daily Demand (l/s)
- Water Supply Redundancy – Fire Flow:
  Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)

Water services larger than 19 mm require a Water Data Card. Please complete card and submit.

Stormwater Management (Quantity Control):

- Coefficient (C) of runoff determined **as per existing conditions** but in no case more than 0.5.
- TC = To be calculated, minimum 10 minutes
- Any storm events greater than 5 year, up to 100 year, and including 100-year storm event must be detained on site.
- Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.
- Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

Stormwater Management (Quality Control):

- Rideau Valley Conservation Authority to provide Quality Controls.

Noise Study:

- Noise study required – property fronts Major Collector Road (Laurier Avenue)

Phase I and Phase II ESA:

- Phase I ESA is required; Phase II ESA may be required depending on the results of the Phase I ESA. Phase I ESA must include an EcoLog ERIS Report.
- Phase I ESA and Phase II ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

Required Studies

- Stormwater Management Report
- Site Servicing Study
- Geotechnical Study
- Phase I ESA
- Phase II ESA (depends on outcome of Phase I)
- Noise Study

Required Plans

- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan (Can be combined with Grading Plan)

Relevant information

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications
2. Servicing and site works shall be in accordance with the following documents:
   - ⇨ Ottawa Sewer Design Guidelines (October 2012)
   - ⇨ Ottawa Design Guidelines – Water Distribution (2010)
   - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
   - ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
   - ⇨ City of Ottawa Environmental Noise Control Guidelines (January 2016)
   - ⇨ City of Ottawa Park and Pathway Development Manual (2012)
   - ⇨ City of Ottawa Accessibility Design Standards (2012)
   - ⇨ Ottawa Standard Tender Documents (latest version)
   - ⇨ Ontario Provincial Standards for Roads & Public Works (2013)
3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
4. Any proposed work in utility easements requires written consent of easement owner.
5. **If the property is not to be severed only one set of municipal services are permitted.**

Mahad Musse

From: Annie Williams
Sent: July 14, 2021 2:19 PM
To: Eric Lalande
Cc: Jeremy Silburt; Mahad Musse
Subject: RE: 280 Laurier Avenue East - Stormwater Quality

Hi Eric,

Thank you for confirming.

Take care,
Annie

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: Wednesday, July 14, 2021 1:55 PM
To: Annie Williams <awilliams@jlrichards.ca>
Subject: RE: 280 Laurier Avenue East - Stormwater Quality

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Hi Annie,

The RVCA has reviewed the site plan provided. Based on this plan the RVCA would have no water quality control requirements. Best management practices are encouraged to be implemented where possible to encourage on-site protection and low impact design.

Thanks,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: Matt Jokiel <matt.jokiel@rvca.ca>
Sent: Friday, June 25, 2021 3:48 PM
To: Eric Lalande <eric.lalande@rvca.ca>; Hal Stimson <hal.stimson@rvca.ca>
Subject: FW: 280 Laurier Avenue East - Stormwater Quality

Hi all,

Please see below and attached.

Given the proposal, do either of you have any concerns to note? Please let me know if you would like me to respond direct to JL Richards, as I'd be happy to do so.

Take care, and enjoy the weekend.

Matt

From: LRC Info <info@lrconline.com>
Sent: Friday, June 25, 2021 3:43 PM
To: Matt Jokiel <matt.jokiel@rvca.ca>
Subject: FW: 280 Laurier Avenue East - Stormwater Quality

From: RVCA Info <info@rvca.ca>
Sent: Friday, June 25, 2021 3:27 PM
To: LRC Info <info@lrconline.com>
Subject: Fw: 280 Laurier Avenue East - Stormwater Quality

From: Annie Williams <awilliams@jlrichards.ca>
Sent: June 25, 2021 1:52 PM
To: RVCA Info <info@rvca.ca>
Cc: Jeremy@smartlivingproperties.ca <Jeremy@smartlivingproperties.ca>; Mahad Musse <mmusse@jlrichards.ca>
Subject: 280 Laurier Avenue East - Stormwater Quality

Good afternoon,

We are completing the detailed design for a proposed site plan located at 280 Laurier Avenue East in downtown Ottawa (see attached Site Plan). The redevelopment consists of constructing a 3-storey building addition to the east side of an existing 6-storey building. The new residential building addition would replace the current asphalt parking area, with rooftop stormwater storage being provided for the new building addition.

The existing building contains 40 residential units, while the proposed 3-storey addition will add 19 units, resulting in a total of 59 residential units. Currently, it appears that some stormwater runoff drains overland towards Laurier Avenue East (there is also an existing catch basin that picks up a low area at the basement stairs), while another portion of the runoff drains to an existing on-site catch basin which presumably outlets to Sweetland Avenue.

Based on the above description of the site and the accompanying site plan and considering that we are replacing an asphalt parking area with a building rooftop, we would like to confirm that the proposed project will not require any stormwater quality control measures.

Please let me know if you have any questions.

Thank you,
Annie

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4523

J.L. Richards & Associates Limited
ENGINEERS • ARCHITECTS • PLANNERS

BEST MANAGED COMPANIES
Platinum member

J.L. Richards & Associates Limited is proactively doing our part to protect the wellbeing of our staff and communities while improving our communication technology. ***We are pleased to announce that we have implemented direct phone lines for all of our staff, allowing you to connect with us regardless of whether we are working remotely or in the office.*** *We are dedicated to delivering quality services to you through value and commitment, as always. Please reach out to us if you have any questions about your project.*

From: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Sent: March 16, 2022 2:52 PM
To: Annie Williams
Cc: Mahad Musse
Subject: RE: 280 Laurier Ave - 2nd Engineering City Comments

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Hi Annie,

As per our discussion, I can confirm the manhole is required as we cannot downsize the lead to a 150mm.

Thanks Annie.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

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From: Fawzi, Mohammed
Sent: March 16, 2022 2:16 PM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Mahad Musse <mmusse@jlrichards.ca>
Subject: RE: 280 Laurier Ave - 2nd Engineering City Comments

Hi Annie,

My apologies but I did forgot to mention that the proposed 200mm catch basin lead connecting to the storm sewer on Sweetland would require a manhole connection. This is required because the lead is greater than 50% of the diameter of the mainline sewer.

Thanks Annie.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

---

From: Fawzi, Mohammed
Sent: March 16, 2022 10:47 AM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Mahad Musse <mmusse@jlrichards.ca>; Tousignant, Eric <Eric.Tousignant@ottawa.ca>
Subject: RE: 280 Laurier Ave - 2nd Engineering City Comments

Hi Annie,

That is correct.

The roof will need to be controlled to the 2-year, with a c-value of 0.5, while the remainder of the site can be left uncontrolled. The reason being that the proposed ICD in the rear yard with a flow rate of 3.55 L/s is too small and will likely clog up with debris and sediments over time. Please note that is this only permitted on a case by case basis and does not set a precedent for future development applications.

I also kindly request to have a note on the servicing plan that indicates that the foundation lateral will be equipped with an appropriate backwater valve as per the relevant City of Ottawa Standard Drawing.

Lastly, as per our conversation, I wanted to confirm that after internal discussions, the residential average water demand parameter can indeed be 280 L/cap/day. Just thought I would let you know for future applications, no need to revise it back to 280.

Thanks Annie.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

---

From: Annie Williams <awilliams@jlrichards.ca>
Sent: March 15, 2022 9:06 AM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Cc: Mahad Musse <mmusse@jlrichards.ca>
Subject: 280 Laurier Ave - 2nd Engineering City Comments

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Hello Mohammed,

We are working to prepare our 3rd engineering submission for 280 Laurier. In reviewing the 2nd City comment letter (attached), could you please clarify the first bullet in Comment 2.3? It appears that the City's Stormwater Modelling Group has requested the removal of the proposed ICD in the rear yard. Please note that this ICD as well as surface ponding and catch basin storage were proposed to limit our allowable release rate to Sweetland Avenue to 4.71 L/s.

Can you confirm that the City's Stormwater Modelling Group is stating that we can discharge the total 1:100 year post-development flows calculated for Sweetland into Sweetland's mainline sewer system without control? Thus, stating that the ICD and surface ponding will not be required for this project.

Thank you,
Annie

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4523

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Appendix ‘C’

Background Drawings

BOREHOLE LEGEND

ASPHALT	SAND
FILL	ORGANICS
CLAY	WOOD
CONCRETE	CONC. & WOOD
GRAVEL	CLAY & SILT
SILT	SAND & SILT

LEGEND

- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- 292 68.22 — CIVIC ADDRESS/BASEMENT ELEV.
- 94-1 — BOREHOLE FROM SOILS REPORT BY JACQUES WHITFORD LTD. 1994
- 88-19 — BOREHOLE BY R.M.O.C. 1988
- EX. SERVICE CONNECTION AS PER CCTV INSPECTION
- EX. SERVICE CONNECTION @ PIPE OBVERT AS PER CCTV INSPECTION
- CLAY SEEPAGE BARRIER

ELECTRICAL LEGEND

- (L1) LIGHT FIXTURE C/W 2.4M ARM SUPPLIED, INSTALLED AND WIRED BY OTTAWA HYDRO
- (L2) LIGHT FIXTURE C/W 2.4M ARM SUPPLIED, INSTALLED AND WIRED BY OTTAWA HYDRO. CONCRETE BASE BY GENERAL TRADES TO OTTAWA HYDRO DRAWING 5146-48 C/W GROUNDING
- 1-75mm CONCRETE ENCASED RIGID PVC DUCT BANK TO OTTAWA HYDRO DRAWING UG-3-16A
- 1-75mm RIGID PVC DUCT DIRECT BURIED UNDER SIDEWALK TO OTTAWA HYDRO DRAWING UG-3-16A
- PP RMOC TRAFFIC HANDHOLE DRAWING J-6-1
- GROUND ROD 19mm x 3.0M C/W EXOTHERMIC BOND AND BARE 2/0 CU CONNECTION TO POLE

NOTE: 1. ALL STREET LIGHT POLE BASES ARE TO BE INSTALLED AT THE BACK OF PROPOSED SIDEWALK.
2. STREET LIGHT BASES ARE TO BE INSTALLED AT THE FOLLOWING STATIONS (LAURIER AVE. EAST):

STATION	STATION
1+632.64 RT	1+710.28 RT
1+673.33 RT	1+737.12 RT
1+689.23 RT	

LICENSED PROFESSIONAL ENGINEER
S.D. BABB
Sept. 4/97
PROVINCE OF ONTARIO

DS-Lea Associates Ltd.
Consulting Engineers • Planners

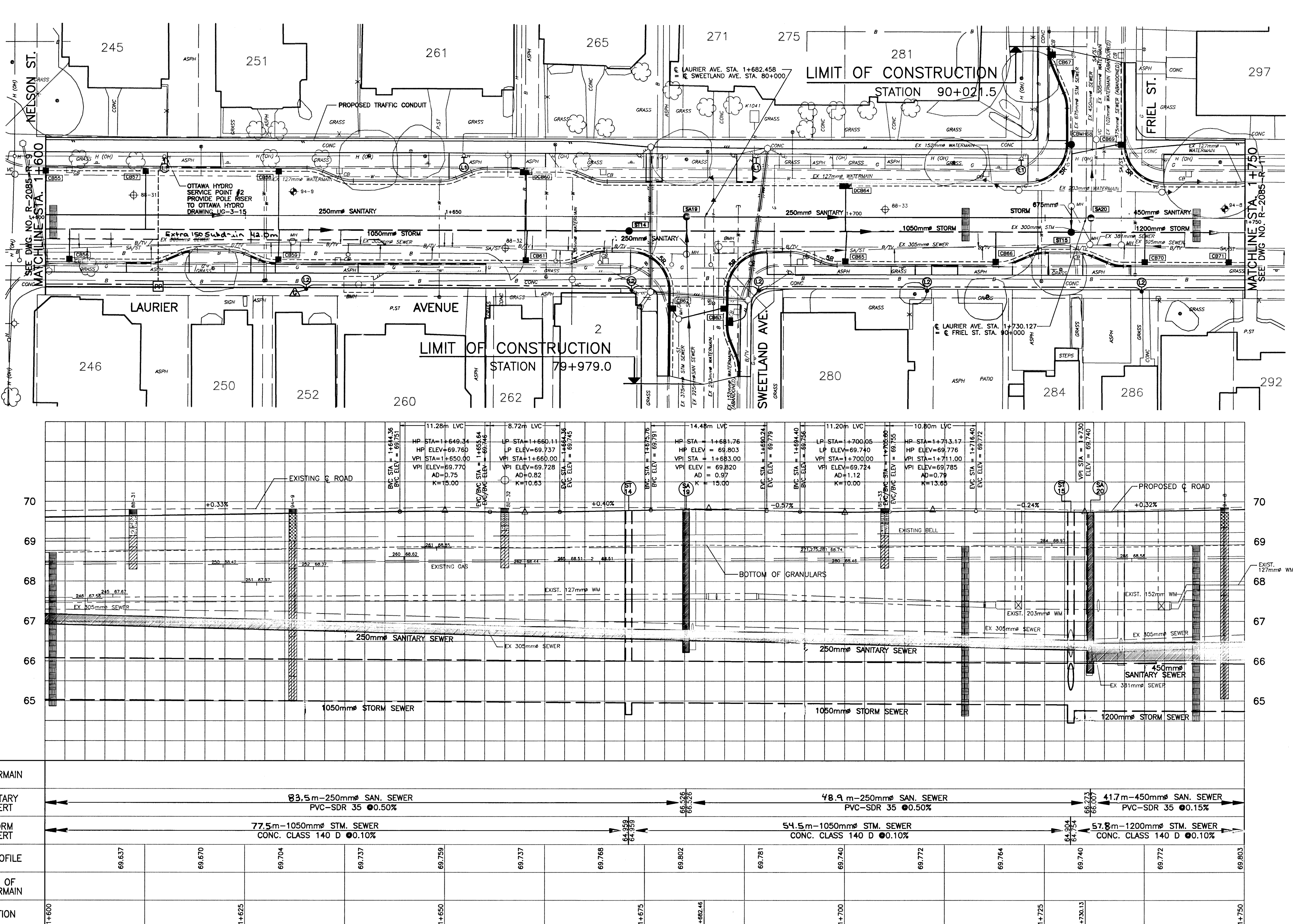
NO.	REVISIONS	BY	DATE
1	Revised sewer profiles SA18 to SA20 and storm lateral in ST15	SB	7/30/97
2	Revised frame and cover type for CBMH68	SB	7/30/97
3	Added metal halide street light design prepared by Goodkey, Weedmark & Assoc.	SB	8/27/97
	ASBUILT	MT	01/00

Ottawa-Carleton

LAURIER AVENUE EAST REHABILITATION
NELSON ST. TO CHARLOTTE ST.
GRADING AND DRAINAGE PLAN STATION 1+600 TO STATION 1+750

J.M. MILLER, P.ENG. — *Director Engineering Division*
D. MARETT, P.ENG. — *Mgr., Capital Core Area Projects Br.*

DWG. NO. R-2085-R-10
SHEET 10 OF 51
CONTRACT NO. 97-507
Des: PK Chkd: SB
Dwn: GS Chkd: PK
Date: APRIL 1997
Scale: Hor 1:250 Vert 1:50



CATCH BASIN DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION T/GRATE	ELEVATION LOW/INV.
CB56	1+603.00	5.90 RT	OPSD 705.02	69.496	68.096
CB57	1+612.50	5.90 LT	OPSD 705.02	69.527	68.127
CB58	1+629.15	5.90 LT	OPSD 705.02	69.583	68.183
CB59	1+629.15	5.90 RT	OPSD 705.02	69.583	68.183
DCB60	1+660.11	5.90 LT	OPSD 705.01	69.619	68.219
CB61	1+660.11	5.90 RT	OPSD 705.02	69.619	68.219
DCB64	1+700.05	4.30 LT	OPSD 705.01	69.654	68.254
CB65	1+700.05	5.90 RT	OPSD 705.02	69.622	68.222
CB66	1+718.85	5.90 RT	OPSD 705.02	69.646	68.246
CB70	1+737.50	5.90 RT	OPSD 705.02	69.638	68.238
CB71	1+748.00	5.90 RT	OPSD 705.02	69.679	68.279

OFFSETS ARE FROM CENTRE LINE TO FACE OF CURB FOR CATCH BASINS

STORM MANHOLE DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION T/GRATE	ELEVATION LOW/INV.
ST14	1+673.00	1.80 RT	1800øOPSD-701.02	69.745	64.959
ST15	1+728.28	1.80 RT	M-CON M5 *	69.708	64.754

* OR APPROVED EQUAL
OFFSETS ARE FROM CENTRE LINE TO CENTRE OF STRUCTURE

STORM SEWER DATA					
SEWER	DIA.	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
ST14 TO ST15	1050	CL. 140 D	55.3m	64.959	64.904
CBMH68 TO ST15	675	CL. 140 D	11.0m	65.389	65.279
ST15 TO ST17	1200	CL. 140 D	58.5m	64.754	64.696

SANITARY MANHOLE DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION T/GRATE	ELEVATION LOW/INV.
SA19	1+680.17	0.00	1200øOPSD-1001.01	69.802	66.526
SA20	1+730.75	0.00	1200øOPSD-1001.01	69.742	65.947

OFFSETS ARE FROM CENTRE LINE TO CENTRE OF STRUCTURE

SANITARY SEWER DATA					
SEWER	DIA.	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
STUB TO SA19	250	PVC-SDR35	4.7m	66.700	66.653
SA19 TO SA20	250	PVC-SDR35	50.6m	66.526	66.273
SA21 TO SA20	450	PVC-SDR35	41.3m	66.069	66.007

NOTES AND SPECIFICATIONS

GENERAL

1. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY, AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR IS RESPONSIBLE TO PROVE THE LOCATION AND STATUS OF UNDERGROUND UTILITY PLANT AND EQUIPMENT AND ENCASEMENT MATERIAL. THE CONTRACTOR IS TO TAKE NECESSARY PRECAUTIONS AND SHALL BE RESPONSIBLE TO PROVIDE ADEQUATE PROTECTION FOR PLANT AND EQUIPMENT FROM DAMAGE.
2. BOREHOLE LOCATIONS ARE APPROXIMATE ONLY. FOR FURTHER INFORMATION REFER TO GEOTECHNICAL INFORMATION IN JACQUES, WHITFORD LIMITED REPORT NO. 10551, DATED DECEMBER 6, 1994.
3. SOIL INFORMATION IS NOT GUARANTEED. CONTRACTORS ARE ADVISED TO COLLECT ADDITIONAL SOIL INFORMATION AS DEEMED NECESSARY.
4. MANHOLES AND VALVE CHAMBERS ON ABANDONED SEWERS AND WATERMAINS TO BE REMOVED TO BOTTOM OF SUBGRADE AND REMAINDER BACKFILLED WITH GRANULAR MATERIAL, AS SPECIFIED.
5. THE CONTRACTOR IS TO MAINTAIN TWO WAY TRAFFIC, AS SPECIFIED.
6. EXISTING TREES DESIGNATED TO BE RETAINED ARE TO BE PRESERVED AND PROTECTED DURING THE CONSTRUCTION PERIOD.
7. LIMITS OF GRADING MAY VARY FROM THAT INDICATED, DEPENDING ON FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
8. WHERE AVAILABLE, EXISTING SERVICING INFORMATION TO PRIVATE PROPERTY HAS BEEN SHOWN.
9. PARKING METERS AND SIGNS TO BE REMOVED AND INSTALLED BY OTHERS.

STORM AND SANITARY SEWERS

1. EXISTING COMBINED SEWER IS TO BE ABANDONED AND REPLACED BY SEPARATE STORM AND SANITARY SEWERS AS SPECIFIED, WITHOUT SERVICE INTERRUPTION.
2. THE CONTRACTOR WILL BE REQUIRED TO LOCATE AND VERIFY THE STATUS OF EXISTING SERVICE PIPES. DYE TESTING OR OTHER METHODS (TO THE SATISFACTION OF THE ENGINEER) SHALL BE USED TO DETERMINE THE STATUS (ABANDONED, IN USE, SANITARY, STORM) AND/OR THAT THE EXISTING SERVICES ARE CONNECTED TO EXISTING BUILDINGS.
3. ALL STORM AND SANITARY SERVICES SHALL BE REPLACED TO PROPERTY LINE, OR FURTHER AS REQUIRED. TIE-IN LOCATION BEYOND PROPERTY LINE TO BE APPROVED BY THE ENGINEER. WHERE NEW STORM LATERALS ARE TO BE TERMINATED AT THE PROPERTY LINE, THEY SHALL BE CAPPED WITH A WATER TIGHT SEAL.
4. ALL CATCH BASINS TO HAVE A SUMP OF 0.6m (MINIMUM) (C/W 200mm LEAD) STORM MANHOLES TO HAVE 0.3m SUMP.
5. SUBDRAIN OUTLETS INTO CATCH BASINS OR MANHOLES SHALL BE LOCATED TO SUIT FIELD CONDITIONS.
6. ALL SEWERS TO HAVE CLASS "B" BEDDING, AND BACKFILL AS SPECIFIED. SEE COMMON TRENCH DETAIL.

DWG. FRAME 790mm x 534mm RMOC-06/93-WG

BOREHOLE LEGEND	
ASPHALT	SAND
FILL	ORGANICS
CLAY	WOOD
CONCRETE	CONC. & WOOD
GRAVEL	CLAY & SILT
SILT	SAND & SILT

LEGEND

- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- 297 68.22 CIVIC ADDRESS/BASEMENT ELEV.
- 94-1 BOREHOLE FROM SOILS REPORT BY JACQUES WHITFORD LTD. 1994
- 88-19 BOREHOLE BY R.M.O.C. 1988
- EX. SERVICE CONNECTION AS PER CCTV INSPECTION
- EX. SERVICE CONNECTION @ PIPE OBVERT AS PER CCTV INSPECTION
- CLAY SEEPAGE BARRIER

Approved by: J. VINCELLI, Manager of Engineering Services

Date:

LICENSED PROFESSIONAL ENGINEER M.A. ROSS 22 May 97 PROVINCE OF ONTARIO

DWN.: P.G. DES.: P.G.

CHKD.: M. ROSS P.ENG.

Date: OCTOBER/96

Ottawa-Carleton Environmental and Transportation Department

WATER SYSTEM ONLY

DS-Lea Associates Ltd. Consulting Engineers • Planners

NO.	REVISIONS	BY	DATE
	AS BUILT	MT	02/00

Ottawa-Carleton

LAURIER AVENUE EAST REHABILITATION NELSON ST. TO CHARLOTTE ST.

305&203mm WATERMAIN STATION 1+600 TO STATION 1+750

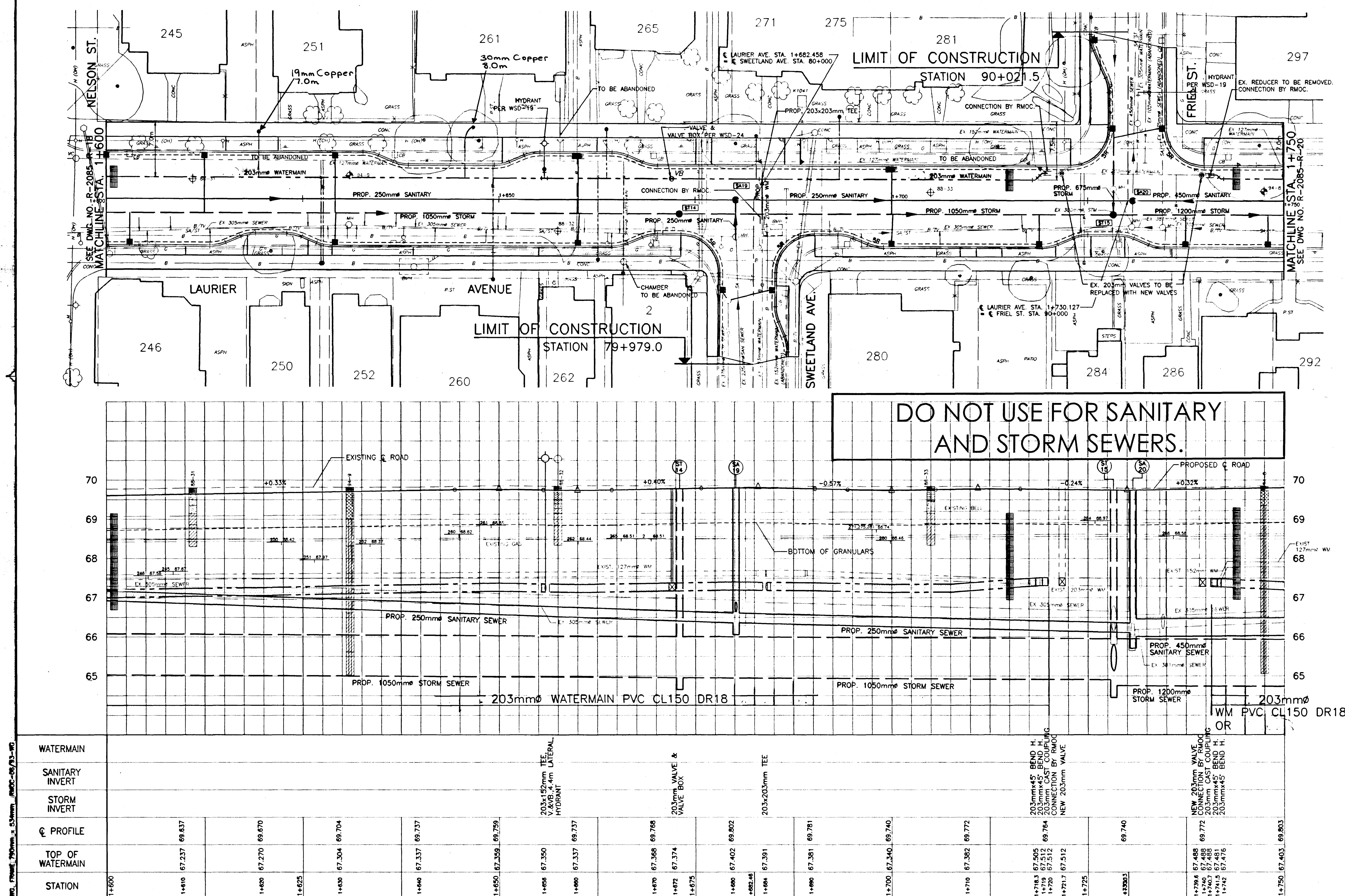
J.M. MILLER P.Eng.
Director Engineering Division

DWG. NO. R-2085-R-19

SHEET 19 OF 51

CONTRACT NO. 97-507

Des: PK Chkd: SB
Dwn: GS Chkd: PK
Date: APRIL 1997
Scale: Hor 1:250 Vert 1:50



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CB66	1+718.85	5.90 RT	OPSD 705.02	69.646	68.246
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CBMH68 TO ST15	675	CL. 140 D	11.0m	65.349	65.129
ST15 TO ST17	1200	CL. 140 D	58.5m	64.754	64.696

SANITARY MANHOLE DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION T/GRATE	ELEVATION LOW/INV
SA19	1+680.17	0.00	1200øOPSD-1001.01	69.802	66.360
SA20	1+730.75	0.00	1200øOPSD-1001.01	69.742	65.947

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SEWER	DIA.	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
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SA19 TO SA20	250	PVC-SDR35	50.6m	66.360	66.107
SA21 TO SA20	450	PVC-SDR35	41.3m	66.069	66.007

NOTES AND SPECIFICATIONS

WATERMAIN ONLY

1-ALL WATERMAIN MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE R.M.O.C. STANDARD SPECIFICATIONS AND STANDARD DRAWINGS.

2-ALL CONNECTIONS OF NEW WM TO EXIST. WM AND ALL BLANKINGS OF EXIST. MAINS AND SERVICES SHALL BE PERFORMED BY R.M.O.C. FORCES. THE CONTRACTOR SHALL PROVIDE EXCAVATION, BACKFILL AND REINSTATEMENT.

3-RESTRAINING RINGS AND THRUST BLOCKING SHALL BE UTILIZED ON ALL BENDS, TEES AND PLUGS IN ACCORDANCE WITH THE LATEST EDITION OF THE R.M.O.C. STANDARD SPECIFICATIONS AND STANDARD DRAWINGS.

4-ALL COPPER SERVICES (19mm TO 51mm) SHALL BE INSTALLED BY R.M.O.C. STAFF AFTER THE WM HAS BEEN SUCCESSFULLY DISINFECTED.

5-ALL NEW WATER SERVICES SHALL BE INSTALLED AT 2.4m COVER.

6-ALL WATER SERVICES THAT CONFLICT WITH SANITARY AND STORM SEWERS AT CROSSINGS SHALL BE INSTALLED UNDER THE SEWERS UNLESS OTHERWISE DIRECTED BY THE R.M.O.C. PROJECT MANAGER.

7-THE PROPOSED WM SHALL BE INSULATED AT SPECIFIED LOCATIONS AS PER R.M.O.C. SPECIFICATION WSD-22.

8-A MINIMUM 2m SEPARATION IS REQUIRED BETWEEN ALL NEW WATER SERVICES AND CATCHBASINS OR OPEN STRUCTURES AND SHALL BE INSULATED PER R.M.O.C. SPECIFICATION WSD-23 AS APPLICABLE.

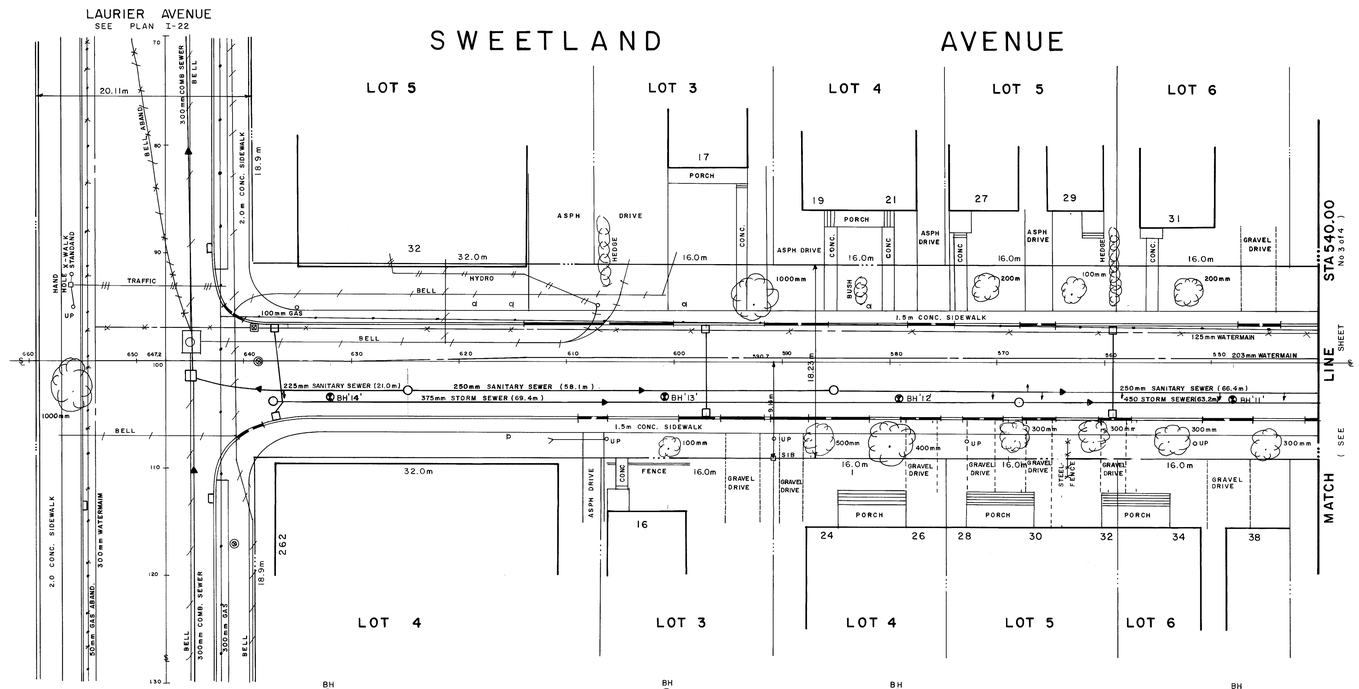
9-A MINIMUM 2m SEPARATION IS REQUIRED BETWEEN ALL NEW HYDRANTS AND CATCHBASINS OR OPEN STRUCTURES AND SHALL BE INSULATED PER R.M.O.C. SPECIFICATION WSD-23 AS APPLICABLE.

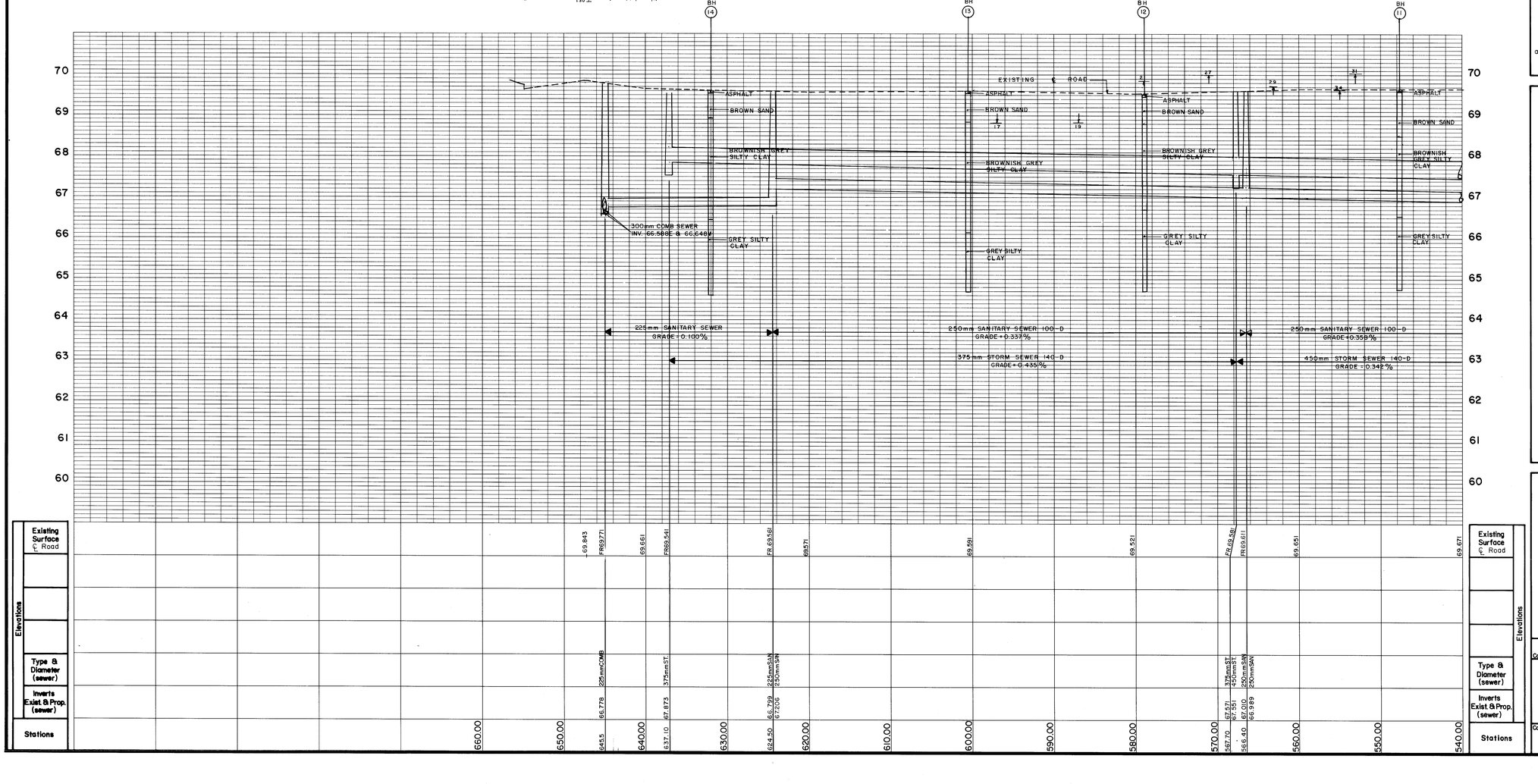
10-THE CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE VIA EXCAVATION THE EXACT LOCATION AND ELEVATION OF THE EXISTING WATERMAINS AS REQUIRED FOR ALL CONNECTIONS, RELOCATIONS AND BLANKING.

11-SOIL INFORMATION, IF SHOWN, IS NOT GUARANTEED. CONTRACTORS ARE ADVISED TO COLLECT ADDITIONAL SOIL INFORMATION AS DEEMED NECESSARY.

12-REINSTATEMENT SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE LOCAL MUNICIPAL AUTHORITY, OR AS SPECIFIED.

2350 SWEETLAND AVENUE 4of4





Elevations	660.00	650.00	640.00	630.00	620.00	610.00	600.00	590.00	580.00	570.00	560.00	550.00	540.00
Existing Surface ℄ Road	69.843 FR 69.771	69.681 FR 69.541	FR 69.561	69.571	69.591	69.521	FR 69.321 FR 69.611	69.651	69.671
Type & Diameter (sewer)	225mmCOMB	375mmST	225mmSAN 250mmSAN				375mmST 450mmST 250mmSAN	250mmSAN	
Inverts Exist & Prop. (sewer)	66.778 645.5	67.873 637.10	66.799 624.50 67.206				67.571 567.70 67.551 566.40 67.010	66.989	
Stations													

Revisions:

No.	Date	Description	Drawn By	Appr'd By

Final Measurements:

Construction Type: STORM, SANITARY SEWERS & ROAD	Inspector: K. ROGERS
Work Commenced: JULY 1990	Instrumentman: B. MONGEON
Work Completed: NOV. 1990	Field Book #: 5175, 5176
Contractor: GREENBELT	Date: NOV. 1990
Drafting Revisions: J.H. GIRARD	Checked By

Designed By: P. HOWE	Date: APRIL 1990	Structural Check By	Date
Survey Detail By: R. MONGEON	Date: OCT. 1989	Checked By	Date
Drafting By: J.H. GIRARD	Date: MARCH 1990	Checked By	Date

Chief Design & Const. Eng. W.D. TAYLOR

Senior Const. Coord.

Notes:

Utilities shown are taken from best available records. Contractor is requested to check with all utility companies before digging.

- Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
- Reference bench mark:
- Proposed storm and sanitary sewers may be constructed in a common trench provided that a minimum horizontal distance of 460mm is maintained between outside barrels of pipe.
- All pipes shall conform to the Canadian Standards Association A257.2 (CSA) reinforced concrete sewer pipe with approved rubber gaskets.
- A minimum of 460 mm vertical clearance to be maintained between sewers and watermains where practical.
- Borehole soil descriptions are not based on sieve analysis but on visual inspection only, except where otherwise noted.
- Soil information taken from:
- Date of television inspection:
- This plan supercedes (in whole or in part) plan no:
- Actual rock line recorded during construction of existing sewer.
- Registered plan no.:
- Caution, while illustrations and utilities shown are taken from best available information, they cannot be guaranteed.
- See additional notes on sheet # 1

City of Ville d' Ottawa

Department Of Engineering And Works
Engineering Branch
Design And Construction Division
1600 SCOTT STREET · OTTAWA ONTARIO · K1Y 4N7

C. Sim P. Eng. — Commissioner
W.R. Cole P. Eng. — Branch Director

SWEETLAND AVENUE

FROM SOMERSET STREET TO LAURIER AVENUE

Contract No.:	Survey Books:	Scales:	Plan No.:
90-15	5090, 5091	HOR. 1:250 VERT. 1:50	2350 Sheet 4 of 4

Appendix ‘D1’

Water Demand Calculations

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : 280 LAURIER
LOCATION : CITY OF OTTAWA
DEVELOPER : SMART LIVING PROPERTIES

NODE	RESIDENTIAL					NON-RESIDENTIAL			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			PEAK HOUR DEMAND (l/s)		
	UNITS				POP'N	COMM. (ha.)	INST. (ha.)	Park	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total
	Bachelor	1-Bedroom	2-Bedroom	Total Units													
280 Laurier																	
Existing Building	29	11	0	40	56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Addition	13	0	4	17	27	0.00	0.00	0.00	0.27	0.00	0.27	2.02	0.00	2.02	3.04	0.00	3.04
TOTALS	**42**	**11**	**4**	**57**	**83**	**0.00**	**0.00**	**0.00**	**0.27**	**0.00**	**0.27**	**2.02**	**0.00**	**2.02**	**3.04**	**0.00**	**3.04**

ASSUMPTIONS

RESIDENTIAL DENSITIES
- Bachelor & 1-Bedroom: 1.4 p / p / u
- 2-Bedroom: 2.1 p / p / u

AVG. DAILY DEMAND
- Residential: 280 l / cap / day

PEAKING FACTORS
- Maximum Day Peaking Factor: 7.48 x Avg Day (Table 3-3, MOE 2008)
- Peak Hour Peaking Factor: 11.28 x Avg Day (Table 3-3, MOE 2008)

TABLE 3-3, MOE 2008

Eq Pop	Mx Day	Pk Hr
30	9.5	14.3
150	4.9	7.4

Appendix ‘D2’

Hydraulic Boundary Conditions
– Email Correspondences

Annie Williams

From: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Sent: Monday, July 12, 2021 2:58 PM
To: Mahad Musse
Cc: Annie Williams; Guy Forget; Jeremy@smartlivingproperties.ca
Subject: RE: 280 Laurier Ave E. - Request for Boundary Conditions
Attachments: 280 Laurier Avenue E July 2021.pdf

[CAUTION] This email originated from outside JLR. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt, please forward suspicious emails to Helpdesk.

Hi Mahad,

The following are boundary conditions, HGL, for hydraulic analysis at 280 Laurier Avenue East (zone 1W) assumed to be connected to 203 mm watermain on Laurier Avenue (see attached PDF for location).

Minimum HGL: 106.1 m

Maximum HGL: 115.4 m

Max Day + Fire Flow (383 L/s): 97.6 m

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.

Please note that the fire demand is high –ways to reduce the fire demand should be investigated.

Thank you.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch

City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

---

From: Fawzi, Mohammed
Sent: July 06, 2021 1:37 PM
To: Mahad Musse <mmusse@jlrichards.ca>
Cc: Annie Williams <awilliams@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>; Jeremy@smartlivingproperties.ca
Subject: RE: 280 Laurier Ave E. - Request for Boundary Conditions

Hi Mahad,

Thank you for reaching out.

This email is to confirm the request has been initiated – results will be forwarded when completed.

Thank you.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

---

From: Mahad Musse <mmusse@jlrichards.ca>
Sent: July 06, 2021 1:25 PM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Cc: Annie Williams <awilliams@jlrichards.ca>; Guy Forget <gforget@jlrichards.ca>; Jeremy@smartlivingproperties.ca
Subject: 280 Laurier Ave E. - Request for Boundary Conditions

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

We are carrying out a detailed design for a proposed site plan located at 280 Laurier Avenue East in downtown Ottawa (see attached Location Plan). The redevelopment consists of constructing a 3-storey building addition with 19 apartment units on the east side of an existing 6-storey apartment building with 40 units.

The building is serviced by an existing 200 mm watermain on Laurier Avenue, while another 200 mm watermain is available on Sweetland Avenue. Since the property will not be severed, the entire property will be supplied by the existing water service.

We request hydraulic boundary conditions for the building at 280 Laurier Avenue East at the existing water service connection location on Laurier Avenue East (see attached RFF Results).

Based on the City Design Guidelines, the following demands are anticipated:

Average Day = 0.28 L/s

Maximum Day = 1.31 L/s

Peak Hour = 1.97 L/s

Required Fire Flow (RFF) = 383 L/s

The RFF was calculated in accordance with the Fire Underwriters Survey (FUS) and City Technical Bulletin ISTB-2018-02. The water demand and fire flow calculations are attached.

It is noted that the RFF was also calculated per the Ontario Building Code (OBC) which yielded a requirement of 9,000 L/min (150 L/s). The fire flow calculations per the OBC are attached.

If we could receive the requested boundary conditions at your earliest convenience it would be much appreciated.

Should you have any questions or require anything further, please do not hesitate to call.

Regards,

Mahad

Mahad Musse

Civil Engineering Designer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-633-1501

J.L. Richards & Associates Limited is proactively doing our part to protect the wellbeing of our staff and communities while improving our communication technology. ***We are pleased to announce that we have implemented direct phone lines for all of our staff, allowing you to connect with us regardless of whether we are working remotely or in the office.*** *We are dedicated to delivering quality services to you through value and commitment, as always. Please reach out to us if you have any questions about your project.*

'

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

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

'


Boundary Conditions for 280 Laurier Avenue East
av. Laurier Ave. E.
av. Sweetland Ave.
203
280
284
286
292(A)
17
19
2
262
N
Legend
PRIVATE
PUBLIC
City of Ottawa

Appendix ‘D3’

Fire Flow Requirements

FUS Fire Flow Calculations

280 Laurier - Apartment
(JLR 31383-000)

Step	Parameter	Value		Note
A	Type of Construction	Wood Frame		
	Coefficient (C)	1.5		
B	Floor Area	193.6	m^2	From Site Plan
C	Height in storeys	3	storeys	100% of Floors 1,2,3. Basement is excluded.
	Total Floor Area	581	m^2	
D	Fire Flow Formula	$F=220C\sqrt{A}$		
	Fire Flow	7953	L/min	
	Rounded Fire Flow	8000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Mid-Rise Residential
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-1200		
	Fire Flow	6800	L/min	No rounding applied.
F	Sprinkler Protection	None		
	Sprinkler Credit	0%		
	Decrease for Sprinkler	0	L/min	
G	*South Side Exposure*			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	8.0	m	
	Height of Exposed Wall:	3	storeys	
	Length-Height Factor	24.0	m-storeys	
	Separation Distance	11.92	m	
	South Side Exposure Charge	12%		
	West Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:	22.5	m	
	Height of Exposed Wall:	6	storeys	
	Length-Height Factor	135.0	m-storeys	
	Separation Distance	0	m	
	West Side Exposure Charge	25%		
	North Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	8.5	m	
	Height of Exposed Wall:	3	storeys	
	Length-Height Factor	25.5	m-storeys	
	Separation Distance	20	m	
	North Side Exposure Charge	12%		
	East Side Exposure			
	Exposing Wall:	Wood Frame		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	13.0	m	
	Height of Exposed Wall:	3	storeys	
	Length-Height Factor	39.0	m-storeys	
	Separation Distance	3.72	m	
	East Side Exposure Charge	18%		
	Total Exposure Charge	67%		The total exposure charge is below the maximum value of 75%.
	Increase for Exposures	4556	L/min	
H	Fire Flow	11356	L/min	
	Rounded Fire Flow	11000	L/min	Flow rounded to nearest 1000 L/min.
City Cap	**Required Fire Flow (RFF)**	**11000**	**L/min**	The City of Ottawa's cap does not apply since the building is a mid-rise apartment.
		183	**L/s**	

Fire Underwriters Survey (FUS) Fire Flow Calculations
In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 dated March 21, 2018

280 Laurier Apartment Fire Flow Calculation
(per OFM/OBC Guidelines)

Type of Structure:	Mid rise apartment building of combustible construction and no fire-resistance rating
A=	Existing building has an area of 2387 m2 (incl. basement area), proposed extension has an area of 774.4 m2 (incl. basement area) Existing building is 6 storeys (plus basement), proposed extension is 3 storeys (plus basement) Wood Frame Combustible Construction Exposure: 10.02 m northside, 2.09 m eastside, 6.98 m southside, 10 m westside

Q= **= Required fire flow (litres)** **374496 L**

= K V S_{tot}

"K" - Water Supply Coefficient from Table 1 **K =** **23**

"V" - Total building volume in cubic meters **V =** **9046 m^3**

341 m^2 x 2.88 m x 6-storeys for existing building + 199.6 m2 x 2.73 m x 3 storeys for proposed extension + 540.6 m2 x 2.90 m x 1 floor for basement

9046

"S_{tot}" - total of spatial coefficient values from Figure 1 **S_{tot} =** **1.8**

1 + 0.5 (for eastside exposure) + 0.3 (for southside exposure) + 0 for northside and westside exposure

Fire Flow Requirement from Table 2 =
Since Q > 270,000 L required fire flow = 9,000 L/min

9000 L/min
2378 USGPM
150 L/s

Mahad Musse

From: Jeremy Silburt <Jeremy@smartlivingproperties.ca>
Sent: June 25, 2021 4:33 PM
To: Annie Williams; Levent Tatar
Cc: Mahad Musse
Subject: RE: 280 Laurier - Building Properties
Attachments: Basement - Existing building.jpg

Hi Annie,

New construction will be part 9 building, wood – non sprinklered.

No windows on the west side of the addition.

I have attached a layout of the basement. I can only suspect that the water supply is in the boiler room.

Cheers,

Jeremy Silburt
Senior Consultant, Developments

SMART LIVING
PROPERTIES

226 Argyle Avenue| Ottawa, ON | K2P 1B9
Mob: 613-880-5491 | Tel: (613) 244-1551 | Fax: (613) 900 -1100
Email: jeremy@smartlivingproperties.ca
Website: www.smartlivingproperties.ca

COVID-19 Update
We will be encouraging our people to practice **Social Distancing** and as a way to minimize COVID-19 transmission in the community, the Smart Living Team will be working remotely. We remain fully accessible by phone and email, but this means minimizing face to face meetings and encouraging electronic delivery of all information.

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Friday, June 25, 2021 4:02 PM
To: Levent Tatar <levent@ottawacarletonconstruction.com>
Cc: Jeremy Silburt <Jeremy@smartlivingproperties.ca>; Mahad Musse <mmusse@jlrichards.ca>
Subject: 280 Laurier - Building Properties

EXTERNAL EMAIL Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Levent,

Thank you for the quick response!

With regards to the building properties, we would like to confirm some information which will allow us to carry out fire flow calculations for our water supply analysis.

- What is the Construction type for both existing and proposed building (wood frame, ordinary, non-combustible, fire-resistive)?
    - From inspection report of existing building: The exterior curtain wall consists of brick veneer.
- Are there windows on all 4 sides of the building addition (or no openings on west side)?
- Assumed no sprinkler system – please confirm.
- Assumed no firewalls – please confirm.
- Where is the mechanical room located within the existing building (existing water supply entrance)?

Thank you,
Annie

Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Direct: 343-803-4523

J.L. Richards & Associates Limited is proactively doing our part to protect the wellbeing of our staff and communities while improving our communication technology. ***We are pleased to announce that we have implemented direct phone lines for all of our staff, allowing you to connect with us regardless of whether we are working remotely or in the office.*** *We are dedicated to delivering quality services to you through value and commitment, as always. Please reach out to us if you have any questions about your project.*

From: Levent Tatar <levent@ottawacarletonconstruction.com>
Sent: Friday, June 25, 2021 11:22 AM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Jeremy@smartlivingproperties.ca; Mahad Musse <mmusse@jlrichards.ca>; Kendra Tyhurst <ktyhurst@jlrichards.ca>
Subject: RE: 280 Laurier - Request for CAD

[CAUTION] This email originated from outside JLR. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt, please forward suspicious emails to Helpdesk.

Hi,

Attached the cad file.

Thank you,

Mahad Musse

From: Mahad Musse
Sent: April 13, 2023 8:31 AM
To: Mahad Musse
Subject: FW: 282 Laurier - JLR Civil - Scope Change Request 1

From: Corey Kou <corey@smartlivingproperties.ca>
Sent: April 4, 2023 5:15 PM
To: Annie Williams <awilliams@jlrichards.ca>
Cc: Ahmad Saltaji <ahmadsa@smartlivingproperties.ca>
Subject: RE: 282 Laurier - JLR Civil - Scope Change Request 1

[CAUTION] This email originated from outside JLR. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt, please forward suspicious emails to Helpdesk.

Hi Annie,

Sorry to get back you late. Please see signed scope change and proceed the revision.

- Can you please confirm the offset of the existing water service lateral on Sweetland from the NW building corner? This will help us to update our drawing. About 28ft

Thank you,

SMART LIVING PROPERTIES

Corey Kou
Associate, Development

613-244-1551 ext. 628
226 Argyle Avenue, Ottawa, ON
corey@smartlivingproperties.ca
http://smartlivingproperties.ca

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Monday, April 3, 2023 10:55 AM
To: Corey Kou <corey@smartlivingproperties.ca>
Subject: 282 Laurier - JLR Civil - Scope Change Request 1

EXTERNAL EMAIL Do not click links or open attachments unless you recognize the sender and know the content is safe.

From: Annie Williams
Sent: March 15, 2022 1:49 PM
To: Mahad Musse
Subject: FW: Water supply line size - 280 Laurier

Hi Mahad,

See below. Please update our design and report accordingly.

Thank you,
Annie

From: Jeremy Silburt <Jeremy@smartlivingproperties.ca>
Sent: Tuesday, March 15, 2022 1:31 PM
To: Annie Williams <awilliams@jlrichards.ca>
Subject: Fwd: Water supply line size - 280 Laurier

[CAUTION] This email originated from outside JLR. Do not click links or open attachments unless you recognize the sender and know the content is safe. If in doubt, please forward suspicious emails to Helpdesk.

3" for the water

Jeremy Silburt
Senior Consultant, Developments

226 Argyle Avenue| Ottawa, ON | K2P 1B9
Mob: 613-880-5491 | Tel: (613) 244-1551 | Fax: (613) 900 -1100
Email: jeremy@smartlivingproperties.ca
Website: www.smartlivingproperties.ca

COVID-19 Update
We will be encouraging our people to practice **Social Distancing** and as a way to minimize COVID-19 transmission in the community, the Smart Living Team will be working remotely. We remain fully accessible by phone and email, but this means minimizing face to face meetings and encouraging electronic delivery of all information.

Begin forwarded message:

From: Zaid Khalifeh <Zaid@smartlivingproperties.ca>
Date: March 15, 2022 at 1:23:55 PM EDT
To: Ahmad Tuqan <Ahmad@smartlivingproperties.ca>
Cc: Jeremy Silburt <Jeremy@smartlivingproperties.ca>, Jason Weatherall <jasonw@smartlivingproperties.ca>, Jason Curran <Jason@smartlivingproperties.ca>
Subject: RE: Water supply line size - 280 Laurier

Hi Jeremy,

The main is 3”s.

Zaid

From: Ahmad Tuqan <Ahmad@smartlivingproperties.ca>
Sent: March 15, 2022 12:20 PM
To: Zaid Khalifeh <Zaid@smartlivingproperties.ca>
Cc: Jeremy Silburt <Jeremy@smartlivingproperties.ca>; Jason Weatherall <jasonw@smartlivingproperties.ca>; Jason Curran <Jason@smartlivingproperties.ca>
Subject: RE: Water supply line size - 280 Laurier

Hi Zaid,
Can you please help with this

Best Regards;

Ahmad A. Tuqan
Project Manager /
Procurement Coordinator

TEL 613.244.1551 | CEL 613.869.9775
FAX 613.900.1100 |

226 ARGYLE AVENUE | OTTAWA, ONTARIO | K2P 1B9

ahmad@smartlivingproperties.ca
www.smartlivingcanada.com

From: Jeremy Silburt <Jeremy@smartlivingproperties.ca>
Sent: March 15, 2022 12:09 PM
To: Jason Weatherall <jasonw@smartlivingproperties.ca>; Jason Curran <Jason@smartlivingproperties.ca>; Ahmad Tuqan <Ahmad@smartlivingproperties.ca>
Subject: Water supply line size - 280 Laurier

Hey Guys,

Can someone who is on site confirm the size of the water supply line at 280 Laurier. We need it for our civil studies.

Thanks,

Jeremy Silburt
Senior Consultant, Developments


613-880- 5491


226 Argyle Avenue | Ottawa, ON



jeremy@smartlivingproperties.ca


http://smartlivingproperties.ca



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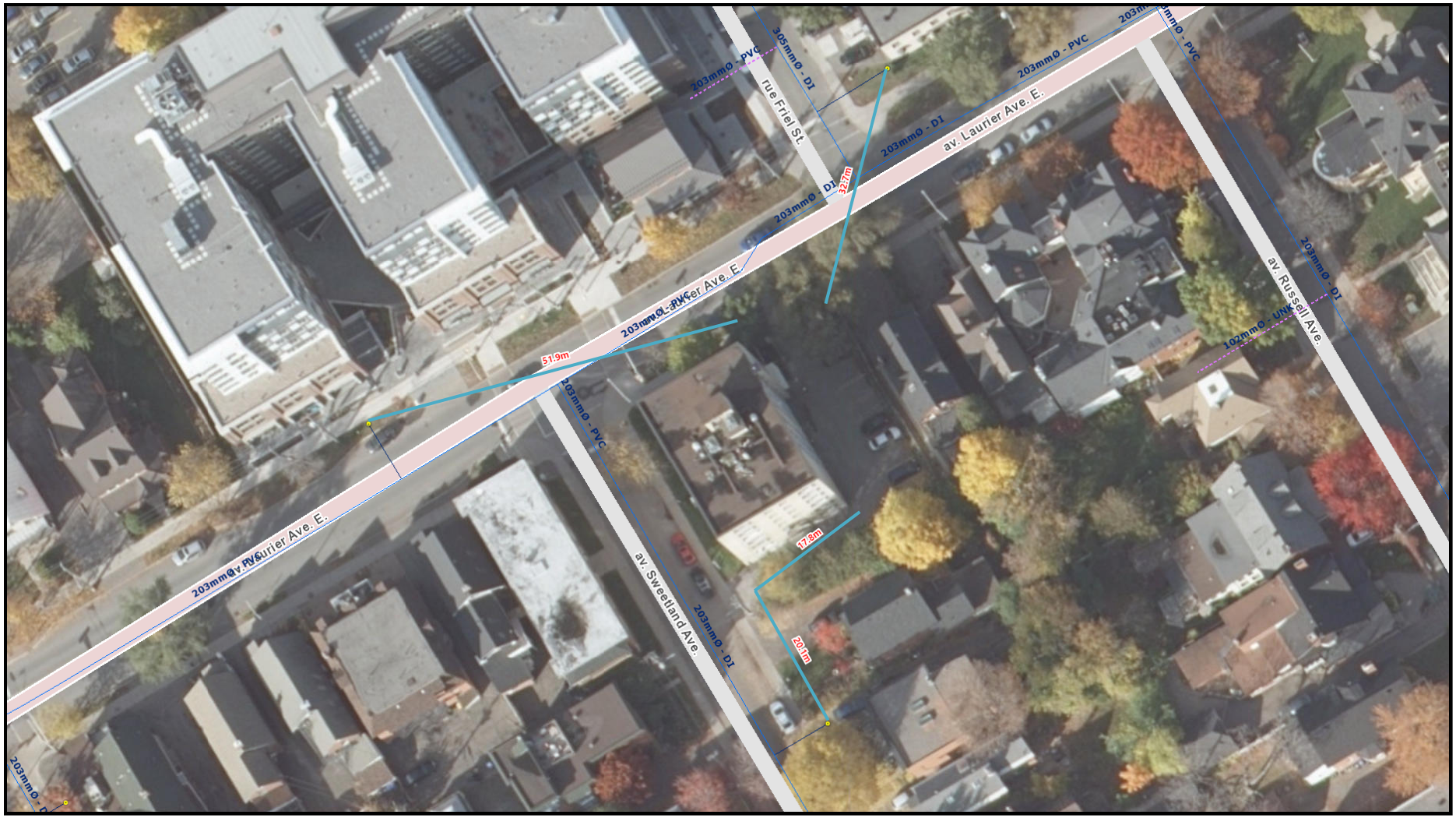
av. Laurier Ave. E.
av. Laurier Ave. E.
av. Laurier Ave. E.
rue Friel St.
av. Sweetland Ave.
av. Russell Ave.
203mmØ - PVC
203mmØ - DI
305mmØ - DI
102mmØ - UNK
51.9m
32.7m
17.8m
20.1m

Appendix ‘D4’

Headloss Calculations

J.L. Richards & Associates Limited

HEAD LOSS - HAZEN-WILLIAMS

280 Laurier - Apartment
(JLR 31383-000)

Information to City (July 6, 2021)

Demand Scenario	Demand (L/s)
Average Day	0.28
Maximum Day	1.31
Required FF (OBC)	150.0
Required FF (FUS)	383.0
Peak Hour	1.97

Boundary Conditions (Email from City, July 12, 2021):

Water Demand Scenario	Demands (L/s)	Head (m) on Laurier Ave. E.
Peak Hour	1.97	106.1
Maximum HGL	0.00	115.4
Max Day + FF (FUS)	383.00	97.6

Water Demands calculated for April 2023 Submission

Water Demand Scenario	Demands (L/s)
Average Day	0.27
Maximum Day	2.02
Peak Hour	3.04
Max Day + FF (FUS)	102.02

Headloss Calculations (Hazen Williams Equation)

Hazen Williams equation (Mays, 1999; Streeter et al., 1998; Viessman and Hammer, 1993)
where k=0.85 for meter and seconds units or 1.318 for feet and seconds units:

$$H = L\left[\frac{V}{kC\left(\frac{4}{D}\right)^{0.63}}\right]^{1/0.54} \qquad V = \frac{Q}{A} \qquad A = \frac{\pi}{4}D^2$$

Where,

HL = Headloss (m)

Q - Flow (m^3/s)
L - Length (m)
C - Hazen Williams "C"
D - Watermain Diameter (m)
V - Velocity (m/s)
A - Watermain Cross-Sectional Area (m^2)

280 Laurier Avenue E. Headloss Calculations

Water Demand Condition	Flow (Q) (L/s)	Flow (Q) (m^3/s)	Length (m)	C	D (m)	V (m/s)	A (m^2)	Head Loss (m)	HGL (m)	Calculated HGL (m) (after Headlosses)	Elevation (m) at 280 Laurier	Pressure @ Node (m)	(kPa)	(psi)	ODG 4.2.2 Requirement	Criteria Acheived?
Peak Hour (200mm WM on Laurier and Sweetland)	3.04	0.00304	50	110	0.204	0.093	0.03269	0.00444	106.100	106.096	N/A	N/A	N/A	N/A	N/A	N/A
Peak Hour (76 mm WM Service to Building)	3.04	0.00304	9	100	0.076	0.670	0.00454	0.11680	106.096	105.979	71.72	34.259	336	48.7	276 kPa	Yes
Max HGL (200mm WM on Laurier and Sweetland)	0.00	0.00000	50	110	0.204	0.000	0.03269	0.00000	115.400	115.400	N/A	N/A	N/A	N/A	N/A	N/A
Max HGL (76 mm WM Service to Building)	0.00	0.00000	9	100	0.076	0.000	0.00454	0.00000	115.400	115.400	71.72	43.680	429	62.1	552 kPa	Yes

Appendix ‘E’

Sanitary Design Sheet

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Smart Living Properties
280 LAURIER AVENUE EAST

SANITARY SEWER DESIGN SHEET
JLR NO. 31383-000

DESIGNED BY: MM
CHECKED BY: AW
2023-04-13

Maintenace Hole No.		Residential								Infiltration			Peak Design Flow L/s	Pipe Data								Upstream Geometry				Downstream Geometry			
From	To	Bachelor	1 Bedroom	2 Bedroom	Area (ha)	Pop.	Cum. Pop.	Cum. Area (ha)	Peaking Factor	Residential Flow (L/s)	Area (ha)	Cum. Area (ha)	Peak Extr. Flow L/s		Dia	Type	Slope	Q Full (L/s)	V Full	Length	Residual Capacity	% Full	TG From	Obvert	Invert	Cover	TG To	Obvert	Invert	Cover
OUTLET TO SWEETLAND AVENUE																													
280 Laurier Building	Sweetland Connection	42	11	4	0.0494	83	83	0.0494	3.61	0.97	0.0494	0.0494	0.02	0.98	200	Circular	1.0%	34.2	1.1	11.3	33.2	3%	69.71	67.56	67.36	2.15	69.56	67.45	67.25	2.11
Sweetland Connection	Sweetland Downstream MH					0	83	0.0494	3.61	0.97	0.00	0.0494	0.02	0.98	250	Circular	0.3%	36.4	0.7	54.5	35.4	3%	69.56	67.45	67.20	2.11	69.58	67.26	67.01	2.32
	Outlet to Sweetland Ave:				**0.0494**						**0.0494**			**0.98**																

Design Parameters		
Bachelor Population =	1.4	ppu
1 Bedroom Population =	1.4	ppu
2 Bedroom Population =	2.1	ppu
Residential Flows =	280	L/cap/day
Harmon Pk Factor =	0.8	
Infiltration Flows =	0.33	L/s/ha
Manning's Coefficient N =	0.013	

*Assuming 12 hrs/day operation

Legend	
	Building Service Lateral

Existing INV at Sanitary Connection to Sweetland	67.20
Existing Sanitary INV at Downstream MH	67.01

Appendix ‘F1’

Storm Design Sheet

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Smart Living Properties
280 LAURIER AVENUE EAST

DESIGNED BY: MM
CHECKED BY: AW
2023-04-13

STORM SEWER DESIGN SHEET
JLR NO. 31383-000

Street Name	Maintenace Hole No.		1:5 Year Storm		Total Areas	Total Area (ha)	Cum. Total Area (ha)	Inlet Time (min.)	In Pipe Flow Time (min)	Total Time	1:5 Year Peak Flow				Total Peak Flow	Pipe Data										Upstream Geometry					Downstream Geometry					
	From	To	0.20	0.90	1:5 Yr						2.78AR	Cum. 2.78AR	1:5 Yr Intensity	Peak Flow		REQ'D DIA.	REQ'D ACTUAL DIA.	Type	Actual Diameter	Slope	Q Full (L/s)	V Full	Length		% Full	TG From	Obvert	Invert	Springline Elev	Cover	TG To	Drop	Obvert	Invert	Springline Elev	Cover
OUTLET TO SWEETLAND AVENUE																																		
ON SITE	Roof Outlet	Tee Connection 1		0.0214	0.0214	0.0214	0.0214	10.00	0.06	10.06	0.05	0.05	104.19	5.59	5.59	150	152.4	Circular	152.40	1.0%	15.89	0.90	3.0	10.30	35%	69.92	68.17	68.01	68.09	1.75	69.64		68.14	67.98	68.06	1.50
ON SITE	CB1	Tee Connection 1	0.0096	0.0109	0.0205	0.0205	0.0205	10.00	0.01	10.01	0.03	0.03	104.19	3.40	3.40	200	203.2	Circular	203.20	1.0%	34.22	1.09	0.9	30.82	10%	69.62	68.14	67.94	68.04	1.48	69.64		68.14	67.93	68.03	1.50
ON SITE	Tee Connection 1	Tee Connection 2			0.0000	0.0000	0.0420	10.06	0.02	10.08	0.00	0.09	103.90	8.96	8.96	200	203.2	Circular	203.20	1.0%	34.22	1.09	1.3	25.26	26%	69.64	68.14	67.93	68.03	1.50	69.67		68.12	67.92	68.02	1.54
ON SITE	Trench Drain	Tee Connection 2		0.0012	0.0012	0.0012	0.0012	10.00	0.20	10.20	0.00	0.00	104.19	0.32	0.32	100	101.6	Circular	101.60	0.5%	3.81	0.49	5.7	3.49	8%	68.48	68.10	68.00	68.05	0.38	69.67		68.07	67.97	68.02	1.59
SWEETLAND AVENUE	Tee Connection 2	MH1			0.0000	0.0000	0.0432	10.20	0.62	10.81	0.00	0.09	103.17	9.21	9.21	200	203.2	Circular	203.20	0.5%	25.14	0.80	29.7	15.93	37%	69.67	68.12	67.92	68.02	1.54	69.52		67.96	67.76	67.86	1.56
SWEETLAND AVENUE	MH1	Downstream MH			0.0000	0.0000	0.0432	10.81	0.67	11.48	0.00	0.09	100.08	8.94	8.94	375	381	Circular	381.00	0.4%	120.26	1.09	43.6	111.32	7%	69.52	68.14	67.76	67.95	1.38	69.55		67.95	67.57	67.76	1.60

Existing Invert at Sweetland Connection	67.76
Existing Invert at Downstream MH on Sweetland	67.57

Appendix ‘F2’

Existing Peak Flow and
Allowable Peak Flow
Calculations

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

280 Laurier

Exisitng Peak Flow Calculations

Guidance on Approach to Estimate Allowable Peak Flow and SWM Calculations:

1 Allowable peak flow shall be estimated based on a 1:2 year intensity and based on a C-Factor of 0.5.
2 The 1:2-year intensity shall be calculated based on IDF statistics (per the OSDG).
3 Time of Concentration (Tc) calculated based on current conditions. Tc shall not be less than 10 mins.
4 Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.
5 At direction of City (refer to Appendix B), proposed roof is to be controlled to 1:2 year rate at proposed building area and the rest of site to flow uncontrolled to existing sewers.
6 Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

Pre-Development Calculations (Proposed Building Area)

1:2 Year Pre-Development Rate

Type of Area	Area (ha)	C-Factor	C-Factor (Eff)
Pavement	0.02000	0.9	
Grass	0.00000	0.2	
Total	0.02000	0.90	0.50

Time of Concentration (existing):

Flow Path: Given size of site, the time of concentration will be significantly less than 10 mins. Therefore the minimum Tc = 10 min is used in calculations

Total Tc,	<<10 minutes	
Total Tc, (existing)	10.00 minutes	** min Tc = 10 minutes
$Intensity_{(2yr)}$ (I) =	76.81 mm/hr	

Allowable Peak Flow (2 Yr) Calculations (C-Factor = 0.50)

$Q2_{yr} = 2.78CAI$

$Q2_{yr} = (2.78) \times (0.50) \times (0.02\ ha) \times (76.81)$

$Q2_{yr} =$ 2.14 L/s

Appendix ‘F3’

Stormwater Management
Calculations

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

280 Laurier
Allowable Peak Flow & SWM Calculations

Post-Development Drainage Areas

To Laurier Ave. E. 1050 mm dia. Storm Sewer			
Description	**Area (ha)**	**C-Factor (5 yr)**	**C-Factor (100 yr)**
Pavers/Hard Surface	0.00290	0.90	0.90
SOD	0.00336	0.20	0.25
--	-	-	-
Total	0.00625	0.52	0.55

To Sweetland Ave. 375 mm dia. Storm Sewer			
Description	**Area (ha)**	**C-Factor (5 yr)**	**C-Factor (100 yr)**
Roof Top of Proposed 3-Storey	0.02000	0.90	0.90
Pavement/Hard Surface	0.01355	0.90	0.90
SOD	0.00963	0.20	0.25
Total	0.04318	0.74	0.76

SWM Calcs for Areas Tributary to Laurier Ave. E. 1050 mm dia. Storm Sewer

Uncontrolled Sheet Flow to Laurier Avenue E.	
Paved Area (m2)	29.0
SOD Area (m2)	33.6
Total Area (m2)	62.5
C Factor (100 Yr)	0.55
Storage Volume (m3)	0.00

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m^3)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m^3)	Qp CCE - Qp100yr (L/s)
10	178.56	1.71	N/A	N/A	N/A	2.05	N/A	N/A	0.34
15	83.56	0.80	N/A	N/A	N/A	0.96	N/A	N/A	0.16
20	70.25	0.67	N/A	N/A	N/A	0.81	N/A	N/A	0.13
25	60.90	0.58	N/A	N/A	N/A	0.70	N/A	N/A	0.12
30	53.93	0.52	N/A	N/A	N/A	0.62	N/A	N/A	0.10
35	48.52	0.46	N/A	N/A	N/A	0.56	N/A	N/A	0.09
40	44.18	0.42	N/A	N/A	N/A	0.51	N/A	N/A	0.08
45	40.63	0.39	N/A	N/A	N/A	0.47	N/A	N/A	0.08
50	37.65	0.36	N/A	N/A	N/A	0.43	N/A	N/A	0.07
55	35.12	0.34	N/A	N/A	N/A	0.40	N/A	N/A	0.07
60	32.94	0.32	N/A	N/A	N/A	0.38	N/A	N/A	0.06
65	31.04	0.30	N/A	N/A	N/A	0.36	N/A	N/A	0.06
70	29.37	0.28	N/A	N/A	N/A	0.34	N/A	N/A	0.06

The 1:100 year event of 1.71 L/s and CCE of 2.05 L/s will sheet flow uncontrolled to Laurier Ave East Trunk Sewer.

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

280 Laurier
Allowable Peak Flow & SWM Calculations

SWM Calcs for Areas Tributary to Sweetland Ave. 375 mm dia. Storm Sewer

Roof Top of Proposed 3-Storey	
Roof Top Area (sq-m)	200.00
C Factor (100 Yr)	0.90
Roof Flow (L/s)	2.14
Available Storage Volume (m3)	17.4

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Rooftop ICD (L/s)	Qp stored (L/s)	Max Volume Requirement (m^3)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m^3)	Qp CCE - Qp100yr (L/s)
10	178.56	8.94	2.14	6.80	4.08	10.72	8.59	5.15	1.79
15	142.89	7.15	2.14	5.02	4.51	8.58	6.45	5.80	1.43
20	119.95	6.00	2.14	3.87	4.64	7.20	5.07	6.08	1.20
25	103.85	5.20	2.14	3.06	4.59	6.24	4.10	6.15	1.04
30	91.87	4.60	2.14	2.46	4.43	5.52	3.38	6.09	0.92
35	82.58	4.13	2.14	2.00	4.19	4.96	2.82	5.93	0.83
40	75.15	3.76	2.14	1.63	3.90	4.51	2.38	5.71	0.75
45	69.05	3.46	2.14	1.32	3.56	4.15	2.01	5.43	0.69
50	63.95	3.20	2.14	1.07	3.20	3.84	1.71	5.12	0.64
55	59.62	2.98	2.14	0.85	2.80	3.58	1.45	4.77	0.60
60	55.89	2.80	2.14	0.66	2.38	3.36	1.22	4.40	0.56
65	52.65	2.63	2.14	0.50	1.95	3.16	1.03	4.00	0.53
70	49.79	2.49	2.14	0.36	1.50	2.99	0.85	3.59	0.50

The following assumptions were made in regard to rooftop configuration:

Roof Top of Proposed 3-Storey	
Rooftop flow (L/s)	2.14
Area of Roof (m2) (from Architect)	193.6
60% of roof for storage (m2)	116.2
Vol. @ 0.15 m ponding (m3)	17.4

The SWM Calculations show rooftop storage volume requirements of 4.64m3 under the 1:100 year event.

Uncontrolled Flow to Sweetland Avenue	
Paved Area (m2)	135.5
SOD Area (m2)	96.3
Total Area (m2)	231.8
C (weighted 100 Yr)	0.63

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp 200 mm (L/s)	Qp stored (L/s)	Max Volume Requirement (m^3)	Qp CCE (L/s)	Qp stored (L/s)	Volume CCE Requirement (m^3)	Qp CCE - Qp100yr (L/s)
10	178.56	7.25	N/A	N/A	N/A	8.70	N/A	N/A	1.45
15	142.89	5.80	N/A	N/A	N/A	6.96	N/A	N/A	1.16
20	119.95	4.87	N/A	N/A	N/A	5.84	N/A	N/A	0.97
25	103.85	4.21	N/A	N/A	N/A	5.06	N/A	N/A	0.84
30	91.87	3.73	N/A	N/A	N/A	4.47	N/A	N/A	0.75
35	82.58	3.35	N/A	N/A	N/A	4.02	N/A	N/A	0.67
40	75.15	3.05	N/A	N/A	N/A	3.66	N/A	N/A	0.61
45	69.05	2.80	N/A	N/A	N/A	3.36	N/A	N/A	0.56
50	63.95	2.60	N/A	N/A	N/A	3.11	N/A	N/A	0.52
55	59.62	2.42	N/A	N/A	N/A	2.90	N/A	N/A	0.48
60	55.89	2.27	N/A	N/A	N/A	2.72	N/A	N/A	0.45
65	52.65	2.14	N/A	N/A	N/A	2.56	N/A	N/A	0.43
70	49.79	2.02	N/A	N/A	N/A	2.42	N/A	N/A	0.40

The 1:100 year event of 7.25 L/s and CCE of 8.70 L/s will sheet flow uncontrolled to Sweetland Avenue Trunk Sewer.

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