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Site Servicing Report

Walkley Road Apartments

2145 Walkley Road
Ottawa, ON

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Value through service and commitment

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1.0 Introduction

LS GP Inc. has retained the services of J.L. Richards & Associates Limited (JLR) to prepare a Site Servicing Report and detailed design of municipal infrastructure in support of the construction of an apartment building sited at 2145 Walkley Road, in the City of Ottawa (herein referred to as "2145 Walkley Road Apartments"). A copy of the proposed Site Plan is included in Appendix A.

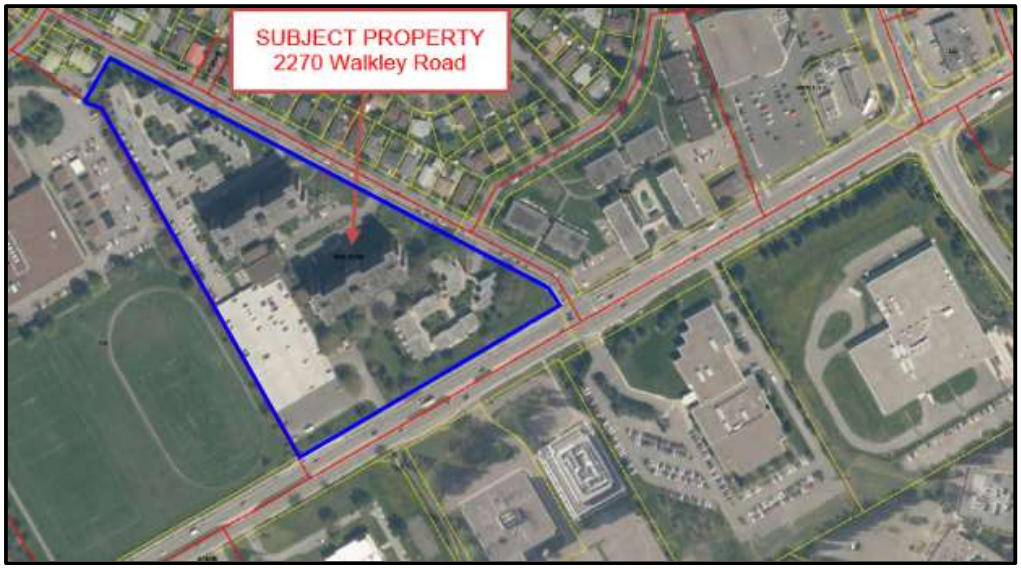
This Site Servicing Report has been prepared in support of the Site Plan Application to outline the design objectives and criteria, servicing constraints and strategies for developing the subject lands with water, wastewater, storm, and stormwater management services in accordance with the following municipal standards:

i) City of Ottawa Site Servicing Study Terms of Reference;
ii) the Ottawa Sewer Design Guidelines (2012) and associated Technical Bulletins; and
iii) Ottawa Design Guidelines – Water Distribution (2010) and associated Technical Bulletins.

1.1 Site Description and Background

The subject property is located within the urban limits of the City of Ottawa in the northwest quadrant of the Walkley Road and Halifax Drive intersection (refer to FIG. 1, for Location Plan). The subject site currently consists of a multi-unit residential property that includes; two (2) high-rise towers, five (5) townhouse blocks, an elevated parking garage as well as landscaped areas and other at-grade parking areas. The ownership of the existing residential units is comprised of one (1) single owner, LS GP Inc. As depicted on FIG. 1, the subject site is bounded by Walkley Road to the south, by Halifax Drive to the east, by the Canterbury High School lands to the west and by townhouse units to the north.

FIG. 1: Site Location



The overall property includes a significant portion of impermeable surfaces consisting of roofs, driveways, walkways, and parking areas with minor areas of permeable landscape intertwined within the site and bounding Walkley Road.

Topography of the subject property slopes easterly towards Halifax Drive. Currently, surface runoff generated by the 2145 Walkley Road property sheet flows towards two (2) separate outlet sewers:

- the Halifax Drive storm sewer system which provides the outlet for most of the property; and
- the Walkley Road storm sewer system which provides an outlet for a small portion of land bounding the Walkley Road right of way (ROW).

Site surface runoff tributary to the Halifax Drive trunk storm sewer system is captured by a series of on-site catch basins. These catch basins collect and convey the captured flows to one of the on-site storm servicing systems, that outlet to the Halifax Drive 1500 mm diameter municipal storm trunk sewer system. Once captured, storm flows conveyed by the Halifax Drive system discharge ±100 m downstream to the nearby Walkley Road 1650 mm diameter storm sewer travelling east. Runoff from the small area bounding the Walkley Road ROW sheet flows towards Walkley Road where it is captured by the roadway catch basins and conveyed to the Walkley Road storm system. Ultimately, site and surrounding area storm flows contributing to the Walkey Road storm sewer system discharge into a local tributary creek at the southeast corner of Walkley Road and St. Laurent Boulevard. From there, flow from the local creek continues to outlet to Ramsay Creek and then into Green's Creek before discharging into the Ottawa River, a drainage canal situated in the southeast area of Ottawa.

1.2 Proposed Site Plan, Building Configuration and Zoning

LS GP Inc. is proposing to redevelop a portion of the property consisting of an apartment building complete with new entrance drive aisles off of Walkley Road, an underground parking structure, and a landscaped podium. The disturbed area for the construction of the site accounts for ±0.572 ha. Additional details for the proposed disturbed surface are included in Section 4.3 in the allowable peak flow calculation.

1.3 Existing Infrastructure

This report was prepared to demonstrate that the site redevelopment can be supported by the existing municipal infrastructure. The 2145 Walkley Road property is bounded by existing municipal infrastructure as illustrated on FIG. 2, which consists of the following (refer to Appendix B for copy of the Background Drawings).

1.3.1 Watermain

- Existing 305 mm diameter CI watermain located along Halifax Drive;
- Existing on-site 152 mm diameter watermain; and
- Existing 406 mm diameter CI watermain along Walkley Road.

1.3.2 Sanitary

- Existing 450 mm diameter CONC sanitary sewer along Halifax Drive; and
- Existing 525 mm diameter CONC sanitary sewer along Walkley Road.

1.3.3 Storm

- Existing 1500 mm diameter CONC trunk storm sewer along Halifax Drive;
- Existing 1500 mm diameter CONC trunk storm sewer along Walkley Road.

A topographical survey was completed by Fairhall Moffatt & Woodland Limited compiled on May 24, 2018 (refer to Appendix A).

FIG 2: Existing Infrastructure

1.3.4 Onsite Removals

The extent of existing infrastructure to be removed or rerouted involves storm sewers onsite that are responsible for surface drainage. Refer to the Site Servicing Plan (Drawing S1) which identifies the storm network for removal. Surface drainage for the area will be controlled and routed to continue discharging to the Halifax Drive storm sewer, according to the servicing layout proposed (refer to Section 4 below for further information). The existing elevated parking podium drainage will be rerouted (to MH100) as part of the proposed servicing layout and will continue to discharge to the existing storm network outletting to the Halifax Drive trunk sewer. The parking garage outlet location and lead will remain.

A CCTV inspection was completed by Clean Water Works Inc. to confirm strong working conditions for the existing onsite storm sewers downstream of the proposed storm sewer network, for continued discharge to Halifax Drive following the construction of the site. A copy of the report is enclosed in Appendix F.

Existing sanitary and water services will remain for the existing apartment building and townhouses to the east of the proposed development. A gas service for the existing tower to the north will require rerouting (by others) to accommodate the development.

1.4 Pre-Consultation, Permits and Approvals

A pre-consultation meeting was held between the Owner's representatives and staff from the City on January 17th, 2018. A copy of the pre-consultation meeting notes has been provided in Appendix C. As per the consultation notes, the Rideau Valley Conservation Authority (RVCA) was consulted to determine the stormwater quality criterion. Criteria for stormwater management are as follows:

- The storm intensities (1:2 year, 1:5 year and 1:100 year) shall be set in accordance with the Ottawa Sewer Design Guidelines;
- Off-site sewers along Halifax Drive and Walkley Road were designed based on a 1:2 year storm;
- Pre-development runoff coefficient (C-Factor) to be set based on the current C-Factor but shall not exceed 0.5;
- The calculated time of concentration shall not be less than 10 minutes;
- Storm flows in excess of the 1:5 year to the 1:100 year storm event must be detained on-site; and
- The RVCA has informed that Best Management Practices be explored for water quality for the proposed site.

This Site Servicing Report has been prepared in support of a Site Plan Control application and as such, the City of Ottawa Development Servicing Study Checklist has been prepared. Refer to Appendix A.

1.5 Engineering Drawings

Engineering Drawings have been prepared in support of site plan control for the development of the 2145 Walkley Road property. The following five (5) drawings are included with this submission:

- Site Servicing Plan (Drawing S1),
- Grading Plan (Drawing G1),
- Drainage Plan (Drawing SWM1),
- Existing Drainage Plan (SWM2), and
- Erosion and Sediment Control Plan (Drawing ESC1)

2.0 Water Servicing

2.1 Design Criteria

A Hydraulic Network Analysis (HNA) was carried out for the proposed 2145 Walkley Road Apartment Site to confirm that the existing watermain and proposed water service can provide adequate supply while complying with both the Ottawa Design Guidelines (ODG) for Water Distribution (July 2010), and Technical Bulletins ISDTB-2014-02 and ISTB-2018-02. These documents have been referred to in this section as the ODG.

The ODG requires that a water supply system be designed to satisfy the following demand criteria:

- maximum day demand plus fire flow; and
- maximum hourly demand (peak hour demand).

2.2 System Pressure Requirements

Section 4.2.2 of the ODG requires that new development additions to the public water distribution system be designed such that the minimum and maximum water pressures, as well as flow rates, conform to the following:

i. Under maximum hourly demand conditions (peak hour), the pressures shall not fall below 276 kPa (40 psi).

ii. During periods of simultaneous 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).

iii. In accordance with the Ontario Code & Guide for Plumbing, the static pressure at any fixture shall not exceed 552 kPa (80 psi) in areas that may be occupied.

iv. The maximum pressure at any point in the distribution system shall not exceed 689 kPa (100 psi) in unoccupied areas.

v. Feedermains, which have been provided primarily for the purpose of redundancy, shall meet, at a minimum, the basic day plus fire flow demand. This criterion is irrelevant to this HNA as there are no feedermains proposed.

The HNA was carried out to fulfill the above watermain pressure and demand objectives.

2.3 Water Demands

The theoretical domestic demand for the 2145 Walkley Road Apartment was calculated based on the information provided by the Owner. A total of 260 apartments is proposed consisting of 221 x 1-bedroom, 30 x 2-bedroom and 9 x 3-bedroom apartments. Based on densities of 1.4 (1-bedroom), 2.1 (2-bedroom) and 3.1 (3-bedroom) persons per unit (Table 4.1 of the ODG – Water Distribution), a total population of 400 people was calculated (refer to Appendix D1). Table 1 summarizes the overall water demands used in the HNA based on a population of 400,

using peaking factors identified in MECP Design Guidelines for populations less than 500 (Table 3-3) and the daily water demand set to 280 L/cap/day, based on the City's Technical Bulletin ISTB-2018-01.

Table 1: Calculated Water Demands

Water Demand	MOE Design Guidelines (Table 3-3)
Average Day (L/s)	1.30
Maximum Day (L/s)	4.15 (avg x 3.20)
Peak Hour (L/s)	6.22 (avg x 4.80)

2.4 Fire Flow Demand

In terms of required fire flow (RFF), the Fire Underwriters Survey (FUS) 2020 method shall be used for any public or private site where watermains and fire hydrants are being designed. The required fire flow (RFF) per the FUS was calculated based on the building size, properties, exposure to adjacent structures, a fully supervised sprinkler protection system and Appendix I of TB-2018-02. The RFF was calculated to be 11,000 L/min (or 183 L/s) (refer to Appendix D2). The mechanical engineer has confirmed the building will be designed to have a fully supervised sprinkler system – refer to the mechanical letter enclosed in Appendix G.

2.5 Water Service Layout

The existing and proposed watermain layout for 2145 Walkley Road is shown on the Site Servicing Plan (Drawing S1). The site water servicing consists of the following components:

- Domestic supply to the proposed mechanical room will be provided by two (2) 200 mm diameter water service laterals that are connected to the Walkley Road 406 mm diameter watermain. The proposed 200 mm diameter water service laterals will connect directly into the building near the northwest corner where a domestic and fire suppression feed/pump will be sized by the mechanical engineer. Based on NFPA 13 and as calculated by the mechanical engineer, the fire suppression system will require 1,134 L/min (18.9 L/s).

- The fire suppression system will be supplemented by a proposed hydrant at the southwest corner of the site with two (2) existing hydrants located on the far side of Walkley Road less than 75 m away from the proposed building. Based on ISTB-2018-02, these hydrants will provide an additional 17,100 L/min (5,700 L/min from each hydrant) which combined with the fire suppression system, could provide a fire flow supply of 18,234 L/min for the proposed building. The fire flow supply exceeds the RFF of 11,000 L/min identified in Section 2.4.

- The siamese (fire department) connection is located on the western face of the building where both of the 200 mm diameter service laterals are proposed to connect.

2.6 Hydraulic Boundary Conditions

The HNA was carried out based on hydraulic boundary conditions provided by the City under various water demand conditions as described in Section 2.3 and 2.4 (refer to Appendix D3 for copy of the E-mail correspondence). Boundary conditions were requested based on a single feed connection which will be connected to the mechanical room of 2145 Walkley Road where it branches into two (2) services to be determined by the mechanical engineer. Boundary conditions received from the City are summarized in Table 2 below.

Table 2: Hydraulic Boundary Conditions

Water Demands	Walkley Road HGL (m)
Peak Hour	123.9
Maximum Day + Fire Flow (183 L/s)	124.5
Maximum HGL	130.0

2.7 Simulation Results

To assess the performance of the existing water distribution system (refer to Drawing S1the water demand scenarios were evaluated with respect to the pressure criteria listed in Section 2.2 using the Hazen-Williams Headloss calculation (refer to Appendix D4). The watermain roughness coefficients used in the Hazen-Williams Headloss calculation was 110 for the proposed 200 mm diameter watermains.The following Sections 2.7.1 to 2.7.3 summarize the results.

2.7.1 Peak Hour Demand

Based on the Hazen-Williams Headloss Calculation, the pressure on site under peak hour demand is 398 kPa (57.7 psi) as shown in Appendix D4. Based on the results, the minimum pressure criterion of 276 kPa (40 psi) is anticipated to be achieved for the proposed development.

2.7.2 Maximum Day Demand plus Fire Flow

Based on the Hazen-Williams Headloss Calculation, the calculated pressure at the on-site hydrant is 365 kPa (52.9 psi) as shown in Appendix D4. The calculated pressure at the building sprinkler connection is 362 kPa (52.5 psi). Based on the results, the minimum pressure criterion of 140 kPa (20 psi) is anticipated to be achieved.

The pressure at the building water service entry under maximum day demand (4.15 L/s) plus sprinkler flow (18.9 L/s) is 402 kPa (58.3 psi) as shown in Appendix D4. Based on the results, the minimum pressure criterion of 140 kPa (20 psi) is anticipated to be achieved for the proposed development.

2.7.3 High Pressure Check

Based on the Hazen-Williams Headloss Calculation, the pressure on site maximum HGL is 458 kPa (66.4 psi) as shown in Appendix D4. Based on the results, the pressure is below the maximum pressure constraint of 552 kPa (80 psi). Consequently, there is no need to incorporate a pressure reducing valve (PRV) as part of the building plumbing system.

2.8 Summary and Conclusions

Based on the above water servicing provisions, it is recommended that the water servicing shown on the Site Servicing Plan (Drawing S1) be implemented to service the proposed development.

3.0 Wastewater Servicing

3.1 Background

Wastewater flows generated by 2145 Walkley Road are to be conveyed to the existing Walkley Road 525 mm diameter trunk sanitary sewer via a proposed 250 mm diameter sanitary service lateral as depicted on the Site Servicing Plan (Drawing S1).

3.2 Design Criteria

The proposed sanitary service for 2145 Walkley Road was designed based on the City of Ottawa Sewer Design Guidelines (OSDG), latest revision October 2012 and associated Technical Bulletins. Key design parameters have been summarized in Table 3:

Table 3: Wastewater Servicing Design Criteria

Design Criteria	Design Value	Reference
Residential average flow	280 L per capita/day	ISTB-2018-01
Residential peaking factor	Harmon Formula x 0.8	ISTB-2018-01
Infiltration flow	0.33 L/s/effective gross 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 Proposed Sanitary Servicing and Calculations

As previously noted, the wastewater flows from the site will discharge into the municipal system (Walkley Road 525 mm diameter sanitary trunk) via a proposed 250 mm diameter sanitary service lateral. Based on a proposed equivalent population density of 400 people for residential buildings (as recommended by the OSDG), the peak wastewater flows were calculated with a design value of 280 L per capita per day (refer to Section 2.3 for details and calculation sheet provided in Appendix E).

As such, a peak flow of 4.62 L/s was calculated based on a peaking factor of 3.42 and a total infiltration allowance of 0.19 L/s (0.572 ha x 0.33 L/s/ha). To convey the peak design flow of 4.62 L/s, the proposed 250 mm diameter sanitary service connection at a slope of 1.0% can outlet the site flows to the 525 mm municipal sanitary sewer. The proposed peak wastewater flow of 4.62 L/s is representative of 1.9 % of the total capacity of the 525 mm diameter sanitary trunk on Walkley Road, sloped at 0.29 % with a total capacity of 241 L/s.

It should be noted, that the 525 mm diameter sanitary trunk on Walkley Road was designed and constructed prior to the 1990s when the City design parameters at the time consisted of a residential average flow of 450 L per capita per day. Using the total capacity of the 525 mm diameter trunk of 241 L/s and assuming the pipe was designed to full capacity, and that 30% of the total flow would be attributed to infiltration, this would have given approximate flows of 72.3 L/s for infiltration and 168.7 L/s residential peak flow. In turn, applying the former 450 L per capita per day design parameter would have generated a population of approximately 31,715 people. Using the current City design parameters of 280 L per capita per day with a correction factor of 0.8 (applied to the Harmon equation), this population of 31,715 people would generate a total residential peak flow of only 105 L/s which is 38% less than the original design flows of 168.7 L/s for the 525 mm diameter trunk. Given the above, it is assumed that there is residual capacity in the 525 mm diameter trunk at a minimum of 63.7 L/s. The proposed peak wastewater flow of 4.62 L/s is thus representative of only 7.2% of that residual capacity and it is anticipated that the 525 mm diameter trunk on Walkley Road will accommodate the proposed development peak flows.

3.4 Summary and Conclusions

Based on the above wastewater servicing provisions, it is recommended that the wastewater servicing shown on the Site Servicing Plan (Drawing S1) be implemented to service the proposed development.

4.0 Storm Servicing and Stormwater Management

4.1 Background

Storm runoff generated by the proposed 2145 Walkley Road apartment will be collected by on-site storm sewers that will be discharged into two (2) separate outlets; the Halifax Drive trunk storm sewer system and Walkley Road trunk storm sewer system.

4.2 Storm Criteria

Storm servicing developed for 2145 Walkley Road shall be designed to comply with the storm criteria provided by the City and described in the pre-consultation meeting notes (included in Appendix C), which consists of the following:

- The 5-yr storm event should be based on the intensity duration frequency (IDF) statistics derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997. All stormwater management calculations presented herein were completed using rainfall regressions included in the OSDG.

- The existing servicing along Walkley Road and Halifax Drive was built around 1962. For separated sewer system built pre-1970, the design of the storm sewers is equivalent to a 1:2-year design storm capture.

- The pre-development runoff coefficient (C-Factor) or a maximum equivalent C-Factor of 0.5, whichever is less (OSDG Section 8.3.7.3), shall be used to establish the allowable release rate.

- The time of concentration (Tc) should be calculated to establish the allowable peak flow; however, the Tc cannot be less than 10 minutes.

- Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.

- Stormwater quality control in accordance with the RVCA advice.

Storm servicing identified on Drawings S1, SWM1 and SWM2 have been developed to adhere to the above criteria.

4.3 Allowable Release Rate

Storm servicing and stormwater management for the subject site (disturbed areas) is to be controlled to the 1:2 year peak flow. Aerial imagery and the existing site topography indicate that most of the subject site is tributary to the Halifax Drive storm sewer system while a small area is tributary to the Walkley Road storm sewer system. As per the pre-consultation criterion in Section 1.4, the allowable peak flow shall be based on the lesser of the existing C-Factor or 0.5. A Pre-Development Drainage Plan for the disturbed surfaces is shown on Drawing SWM2. As illustrated, drainage areas 1 to 5 are tributary to the Halifax Drive trunk sewer system while drainage areas 6 to 8 are tributary to the Walkley Road trunk storm sewer system. **Error! Reference source not**

found.-1 below summarizes the areas for the various surface types and their associated runoff coefficient under existing conditions for both the Walkley Road and Halifax Drive trunk sewer systems.

Table 4-1: Existing Condition Surfaces

Area No.	Area (ha)	Surface Type	Runoff Coefficient (C)
Halifax Drive			
1	0.005	Landscape	0.20
2	0.036	Landscape	0.20
3	0.164	Landscape	0.20
4	0.055	Landscape	0.20
5	0.291	Asphalt	0.90
Total	**0.551**	**--**	**0.57**
Walkley Road			
6	0.029	Landscape	0.20
7	0.002	Asphalt	0.90
8	0.007	Landscape	0.20
Total	**0.038**	**--**	**0.24**

The allowable peak flow shall be estimated based on calculated C-Factors reflecting the existing conditions and shall not exceed 0.50. Based on the weighted C-Factors of 0.57 and 0.24 shown above, the allowable release rates shall be calculated based on C-Factors of 0.50 for Halifax Drive and 0.24 for Walkley Road (refer to Appendix F1 for Pre-Development Calculations).

Using the Uplands method, the calculations included in Appendix F1 show a time of concentration of 10.36 minutes for the Halifax Drive system and a time of concentration of 10 minutes for the Walkley Road system. As a result, the allowable release rates under a 1:2 year design event were estimated at 57.79 L/s and 1.92 L/s for the Halifax Drive and Walkley Road systems, respectively. As mentioned in Section 1.1, the flows from the Halifax Drive storm sewer discharge 100 m downstream into the Walkley Road storm sewer. Thus, the 1:100 year post-development peak flows must be detained on-site and be limited to the total combined flow of 59.71 L/s (57.79 L/s + 1.92 L/s).

4.4 Storm Servicing

The general storm and stormwater servicing constraints used to develop the detailed design for the 2145 Walkley Road development are listed in Table 4-2 below.

Table 4-2: Storm Servicing Design Criteria

General Design Criteria
Storm sewers sized to accommodate the 1:2 year peak flows calculated with the Rational Method and the City of Ottawa Intensity-Duration-Frequency (IDF) curves. Sewer sized to convey the restricted tower rooftop flow.
Storm sewers designed based on an inlet time of ten (10) minutes, as per the Technical Bulletin ISDTB-2012-4.
Minor system storm flows to be controlled to the 1:2 year recurrence for a maximum C-Factor of 0.50.
The 1:100 year peak flows to be detained on-site by means of on-site storage designed to limit the total outflows to the calculated 1:2 year peak flow.
Minimum swale grades at 1.5% (with lower grades, a sub-drain must be provided).
Minimum roadway profile grades at 0.5%.
Minimum of 0.30 m clearance between the underside of footing and the 1:100 year HGL elevation.
Sanitary maintenance holes located away from ponding areas to minimize extraneous flows. In locations where sanitary maintenance holes need to be located in ponding areas, watertight maintenance hole covers are provided.
Provide measures to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

A Storm Sewer Design Sheet was prepared (refer to Appendix F2), which demonstrates that the proposed sewers were sized to convey the 1:2 year peak flows. The Design Sheet was developed to take into consideration the rooftop restrictors, the landscaped podium, and the underground storage (oversized pipes) and restrictors (inlet control devices by way of orifice plates).

4.5 Green Roof

A green roof is proposed at the roof portion just north of the proposed landscape podium as identified on the landscape plan. The system will be comprised of a LiveRoof Standard System with 150 mm of soil depth. The supplier specifications have been included in Appendix F for reference.

4.6 Proposed Stormwater Management Solution and Calculations

4.6.1 Water Quantity

Storm servicing and stormwater management was developed to limit the 1:100 year post-development flows below the combined allowable peak flow of 59.71 L/s. To achieve this criterion, on-site restrictions (i.e., inlet control devices (ICDs) and tower rooftop restrictor) were necessary to allow for rooftop storage and underground storage.

The disturbed surfaces under post-development conditions are shown on the Drainage Plan (Drawing SWM1). This drawing illustrates the various drainage areas along with their C-Factor and outlet (i.e., Halifax Drive or Walkley Road). Drawing SWM1 also shows the tower area and locations for roof drains with restrictors (confirmed by the mechanical engineer), the underground storage and associated restrictors along the west parking area and north-south access road as described in the detailed stormwater management calculations (Appendix F3) using the Modified Rational Method (MRM). It should be noted that the MRM calculation for the areas that are tributary to the underground storage pipe, ICD discharge flows were further reduced by 50% to reflect the outflow reduction while the sewer fills. This methodology has been used and accepted within the City of Ottawa. 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 witha C-Factor of 0.25 (125% x 0.20). Additionally, the storage volume provided accounts for an additional 25% based on the Climate Change Event (CCE) requirements for the 100-year level of service, as expressed in the OSDG. Table 4-3 and Table 4-4 summarize the proposed storm controls and runoff volume requirements for the 1:100 year storm as estimated by the MRM and detailed in Appendix F3.

Table 4-3: Post-Development Flow to Halifax Drive (CCE Event)

Area Type	Area (ha)	C-Factor	Note	Peak Flow (L/s)	Storage Required (m^3)	Storage Provided (m^3)
Main Building Tower	0.133	0.90	Roof Drains	5.0	65.98	99.75
Drainage Area to MH103A-ICD (Including 0.100 ha Landscaped Podium)	0.320	0.72	MH103A ICD	31.00	107.59	115.01
Rear Hardscape	0.024	0.90	Uncontrolled	10.7	-	-
Total Flow to Halifax Drive (L/s) =				**46.70**	**-**	**-**

Table 4-4 Post-Development Flow to Walkley Road (CCE Event)

Area Type	Area (ha)	C-Factor	Note	Peak Flow (L/s)	Storage Required (m^3)	Storage Provided (m^3)
Drainage Area to CBMH2-ICD	0.095	0.78	CBMH2 ICD	12.00	32.09	36.41
Total ICD Controlled Flow to Walkley Road (L/s) =				**12.00**	**--**	**--**

Based on the SWM calculations, sufficient storage will be provided to detain the 1:100 year storm event that is tributary to the Halifax Drive and Walkley Road storm sewers. The mechanical engineer has confirmed roof drains will be Watts RD-100-A-ADJ, with restricted flows not to exceed 5.0 L/s and an available storage volume of 99.75 m^3. Refer to the mechanical letter provided in Appendix G for reference. The total site flow to the receiving municipal storm sewer system is 58.70 L/s, which is less than the allowable site flow of 59.71 L/s.

It is noted the total site area under proposed conditions is 0.572 ha versus the predevelopment value of 0.589 ha. The proposed area is considering a 0.17 ha land expropriation fronting Walkley Road to allow for future right-of-way widening/improvements. The land frontage conveyance is to be confirmed by the City.

4.6.2 Underground Storage

As shown on Drawings S1 and SWM1, underground storage will be used to detain stormwater flows to the drainage areas MH103A-ICD and CBMH2-ICD. Flows to the drainage area MH103A-ICD will be stored by a 1500 mm diameter Concrete (Class III 65-D) underground storage pipe equipped with a custom 68 mm diameter orifice plate. Similarly, flows to the drainage area CBMH2-ICD will be detained by a 1050 mm diameter HDPE underground storage pipe equipped with a custom 45 mm diameter orifice plate. A copy of the SWM calculations used to determine the sizing of the underground storage pipes and the sizing of the custom ICDs can be found in Appendix F4. Table 5b details that both underground storage systems will provide sufficient storage in the 1:100 year storm event.

4.6.3 Water Quality

Storm runoff generated by the proposed 2145 Walkley Road apartment will be collected and conveyed by on-site storm sewers that will eventually outlet into the Ottawa River via a series of trunk storm sewers, man-made ditches, and Green's and Ramsay Creek. As shown on SWM2, the site includes substantial pavement surfaces under existing conditions totalling 2,293 m^2 (refer to Table 4-1). The total impermeable surface is 4,420 m^2 under post-development conditions, of which 2,330 m^2 is rooftop (clean). The resulted 2,090 m2 of proposed hard surface is less than the existing 2,293 m^2.

The RVCA was consulted to get advice on water quality control given the above-noted information (refer to Appendix F). Given the distance of the Site to Green's Creek and the reduction of the unclean asphalt surfaces in the post-development condition, the RVCA accepted that water quality improvements can be achieved through Best Management Practices (BMP). As such, on oil-grit separator (OGS) cleaning device is not required for the site.

4.7 Summary and Conclusions

The storm and stormwater management solutions presented in this Site Servicing Report fulfill the water quantity and quality criterion presented in Section 4.2. The calculated 1:100 year restricted peak flow of 58.7 L/s is found to be below the allowable peak flow of 59.7 L/s while BMPs will be explored at detailed design as water quality improvements. In light of the above, it is recommended that the storm and stormwater management solution shown on the Site Servicing Plan and Drainage Plan (Drawings S1 and SWM1) be implemented to provide storm servicing for the proposed development.

5.0 Erosion and Sediment Control

During construction of the proposed site, appropriate 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. As a minimum, the following erosion and sediment control measures will be implemented and have been identified as part of Site Plan Control on the Erosion and Sediment Control Plan (Drawing ESC1). Measures will include:

- Supply and installation of a silt fence barrier, as per OPSD 219.110;
- Supply and Installation of a Mud Mat at site entrance (refer to ESC1 drawing for details);
- Supply and installation of filter fabric (Siltsack®) between the frame and cover of onsite and nearby 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;
- Stockpiling of material during construction is to be located along flat areas away from drainage paths. For material placed on sloped areas, stockpiles are to be enclosed with a silt fence to protect downstream sewer systems and watercourses;
- All catch basins are to be equipped with sumps, inspected frequently, and cleaned as required;
- Sandbags are to be placed blocking part of the sewer pipe in the connecting storm maintenance holes 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 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.

6.0 Closing

This report has been prepared by J.L. Richards & Associates Limited for LS GP Inc.'s exclusive use. Its discussions and conclusions are summary in nature and cannot properly be used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report is based on information, drawings, data, or reports provided by the named client, its agents, and certain other suppliers or third parties, as applicable, and relies upon the accuracy and completeness of such information. Any inaccuracy or omissions in information provided, or changes to applications, designs, or materials may have a significant impact on the accuracy, reliability, findings, or conclusions of this report.

This report was prepared for the sole benefit and use of the named client and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited, and anyone intending to rely upon this report is advised to contact J.L. Richards & Associates Limited in order to obtain permission and to ensure that the report is suitable for their purpose.

In closing, J.L. Richards & Associates Limited presents this report in support of a Site Plan Application for the development of 2145 Walkley Road and confirms the site can be graded and serviced and in conformance with municipal design regulations. Should any questions or further clarification be necessary, please do not hesitate to contact the undersigned.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Evan Way, P.Eng.
Civil Engineer

Reviewed by:

Annie Williams, P.Eng.
Senior Civil Engineer

Appendix A

Application Checklist, Site Plan
and Topographic Survey

Walkley Road Apartments – 2145 Walkley Road

DEVELOPMENT SERVICING STUDY CHECKLIST

REFERENCED STUDIES AND REPORTS	REFERENCE
Site Servicing Report for Walkley Road Apartments, 2145 Walkley Road (J.L. Richards & Associates Limited, December 18, 2024)	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 (ESC1)
☒	Plan showing the site and location of all existing services.	Site Servicing, Grading, ESC Plan (ESC1)
☒	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 1.0)
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	SSR (Appendix 'C')
☐	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, 3.1, 4.6) Site Servicing Plan S1,
☒	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)
☒	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.	Grading Plan (G1)

☐	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.	See Pavement structure on G1 and Notes on S1
☒	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 1.3, 1.4) Site Servicing Plan S1,
☒	Identification of system constraints.	SSR (Section 2.4)
☒	Identify boundary conditions.	SSR (Section 2.6, Appendix 'D3')
☒	Confirmation of adequate domestic supply and pressure.	SSR (Section 2.7)
☒	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 2.4, 2.7, 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 2.7)
☐	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 2.5)
☐	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 2.5) Site Servicing, Grading, ESC Plan (ESC1)
☐	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, 2.3)
☒	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 3.3)
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	SSR (Section 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 Plan S1
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
☐	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

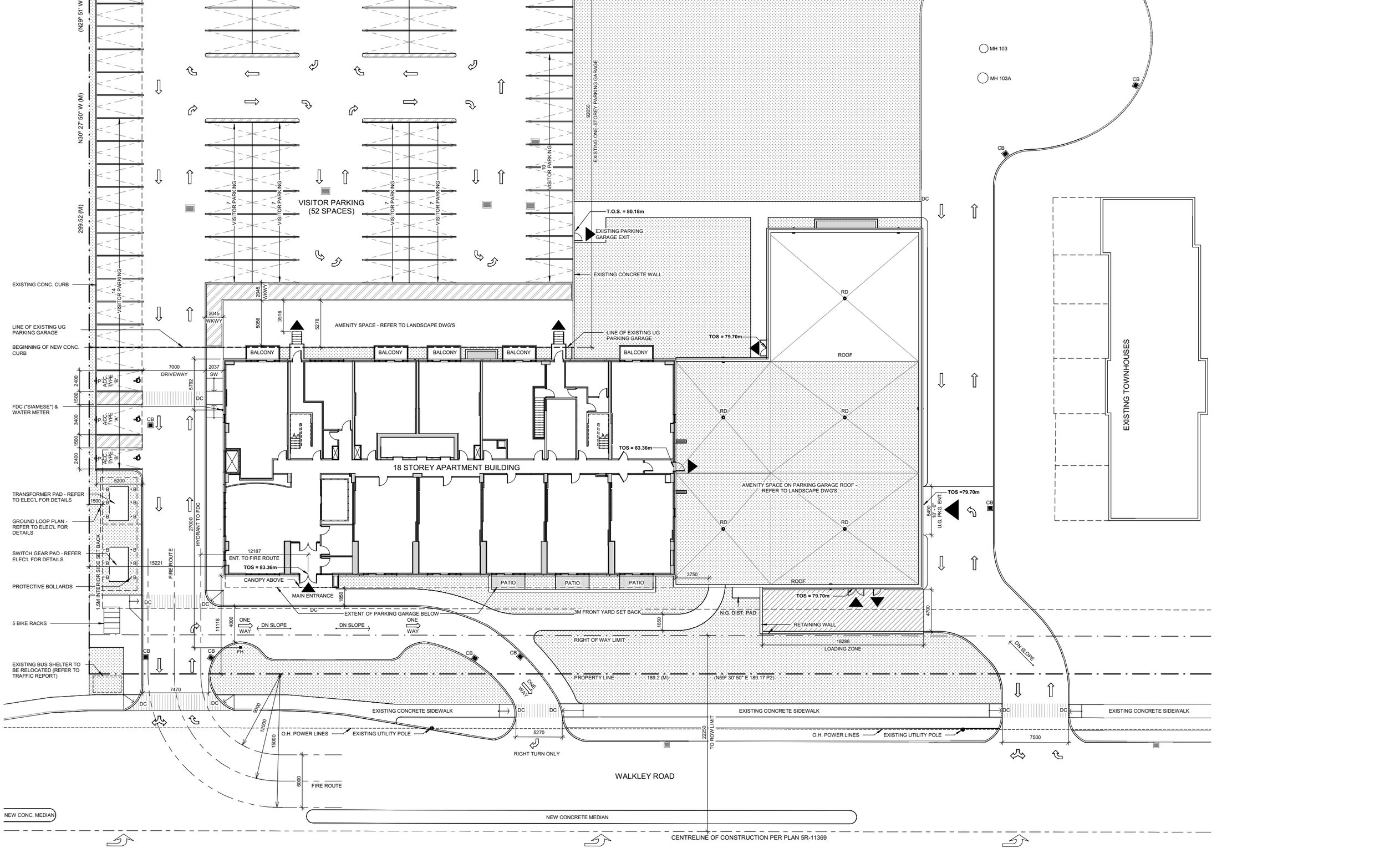
4.4	DEVELOPMENT SERVICING REPORT: STORMWATER	REFERENCE
☒	Description of drainage outlets and downstream constraints, including legality of outlets (i.e., municipal drain, right-of-way, watercourse, or private property).	SSR (Section 1.4, 4.1)
☒	Analysis of available capacity in existing public infrastructure.	SSR (Section 4.3, 4.4)
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Storm Drainage Plan (SWM1)
☒	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, 4.6.1)
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	SSR (Section 4.6.3)
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	SSR (Section 4) Storm Drainage Plan (SWM1)
☐	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 'C')
☐	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 (ESC1) Storm Drainage Plan (SWM1)
☐	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 (ESC1) Storm Drainage Plan (SWM1)
☒	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 (ESC1)

☐	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.	N/A
☐	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 2.8, 3.4, 4.7)
☒	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 (ESC1) Storm Drainage Plan (SWM1/SWM2)


(N29° 51' W)
N30° 27' 50" W (M)
299.52 (M)
VISITOR PARKING
(52 SPACES)
VISITOR PARKING
EXISTING ONE-STOREY PARKING GARAGE
92050
EXISTING CONC. CURB
LINE OF EXISTING UG PARKING GARAGE
BEGINNING OF NEW CONC. CURB
AMENITY SPACE - REFER TO LANDSCAPE DWG'S
BALCONY
7000
DRIVEWAY
2037
SW
5792
DC
FDC ("SIAMESE") & WATER METER
ACC. TYPE 'A'
ACC. TYPE 'B'
CB
18 STOREY APARTMENT BUILDING
TRANSFORMER PAD - REFER TO ELEC'L FOR DETAILS
GROUND LOOP PLAN - REFER TO ELEC'L FOR DETAILS
SWITCH GEAR PAD - REFER ELEC'L FOR DETAILS
PROTECTIVE BOLLARDS
1.5M INTERIOR SIDE SET BACK
5 BIKE RACKS
EXISTING BUS SHELTER TO BE RELOCATED (REFER TO TRAFFIC REPORT)
HYDRANT TO FDC
FIRE ROUTE
12187
ENT. TO FIRE ROUTE
TOS = 83.36m
CANOPY ABOVE
MAIN ENTRANCE
EXTENT OF PARKING GARAGE BELOW
PATIO
T.O.S. = 80.18m
EXISTING PARKING GARAGE EXIT
EXISTING CONCRETE WALL
TOS = 79.70m
ROOF
RD
AMENITY SPACE ON PARKING GARAGE ROOF REFER TO LANDSCAPE DWG'S
3M FRONT YARD SET BACK
N.G. DIST. PAD
RETAINING WALL
LOADING ZONE
RIGHT OF WAY LIMIT
PROPERTY LINE
189.2 (M)
(N59° 30' 50" E 189.17 P2)
EXISTING CONCRETE SIDEWALK
O.H. POWER LINES
EXISTING UTILITY POLE
RIGHT TURN ONLY
WALKLEY ROAD
FIRE ROUTE
NEW CONC. MEDIAN
NEW CONCRETE MEDIAN
CENTRELINE OF CONSTRUCTION PER PLAN 5R-11369
TO ROW LIMIT
ONE WAY
DN SLOPE
MH 103
MH 103A
EXISTING TOWNHOUSES

METRIC

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

COORDINATES WERE DERIVED FROM REAL TIME NETWORK OBSERVATIONS (SMARTNET) MTM ZONE 9, NAD83 ORIGINAL.

COORDINATES HAVE BEEN DETERMINED TO AN URBAN ACCURACY IN ACCORDANCE WITH SECTION 14(2) OF O.REG 216/10.

POINT ID	NORTHING	EASTING
1	5027698.17	373284.10
2	5027460.86	372878.28

COORDINATES CANNOT IN THEMSELVES BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

TOPOGRAPHIC SURVEY OF
PART OF BLOCK 'L', PART OF BLOCK L3, AND ONE FOOT RESERVE REGISTERED PLAN 728 AND PART OF LOT 19, JG, (GLOUCESTER) CITY OF OTTAWA

SCALE 1 : 500

0 10 20 50 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

ELEVATION NOTES

1. ELEVATIONS SHOWN HEREON ARE REFERRED TO GEODETIC DATUM (CGVD28).
2. ELEVATIONS FOR MANHOLE COVERS AND CATCH BASINS HAVE TO BE INDEPENDENTLY CONFIRMED BEFORE THEY CAN BE ACCEPTED FOR FINAL DESIGN OR CONSTRUCTION PURPOSES.
3. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT THEIR RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS DRAWING.

UTILITY NOTES

1. THIS DRAWING CANNOT BE ACCEPTED AS ACKNOWLEDGING ALL UNDERGROUND UTILITIES AND IT WILL BE THE RESPONSIBILITY OF THE USER TO CONTACT THE RESPECTIVE UTILITY AUTHORITIES FOR CONFIRMATION OR LOCATION.
2. BEFORE ANY WORK INVOLVING PROBING, EXCAVATING, ETC., A FIELD LOCATION OF UNDERGROUND PLANT BY THE PERTINENT UTILITY AUTHORITY IS MANDATORY.
3. ON SITE UNDERGROUND UTILITIES INFORMATION SHOWN ARE AS LOCATED BY MULTIVIEW LOCATES INC. UTILITIES HAVE BEEN LOCATED FOR A PORTION OF SITE ONLY.

NOTES

1. BEARINGS ARE GRID, DERIVED FROM OBSERVED REFERENCE POINTS (1) AND (2) BY REAL TIME NETWORK OBSERVATIONS AND ARE REFERRED TO THE CENTRAL MERIDIAN, 76°30'W LONGITUDE MTM ZONE 9, (NAD83 ORIGINAL).
2. DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR 0.999950.
3. ELEVATIONS ARE REFERRED TO GEODETIC DATUM (CGVD28).

LEGEND

□	– SURVEY MONUMENT SET
■	– SURVEY MONUMENT FOUND
SIB	– STANDARD IRON BAR
RIB	– ROUND IRON BAR
(P)	– REGISTERED PLAN 728
(P1)	– PLAN 5R–6261
(P2)	– PLAN 5R–11369
(M)	– MEASURED
(S)	– SET
(D)	INST. NB65606
PIN	– PROPERTY IDENTIFIER NUMBER
(SU)	– SOURCE UNKNOWN
(857)	– FAIRHALL, MOFFATT & WOODLAND LTD., O.L.S.
CB	– CATCH BASIN
MH	– MANHOLE
LS	– LAMP STANDARD
	– CONIFEROUS TREE
	– DECIDUOUS TREE
CV	– GAS VALVE
WV	– WATER VALVE
	– SIGN
UP	– UTILITY POLE
—W—	– WATERMAIN
	– OVERHEAD UTILITY WIRES
—UH—	– UNDERGROUND HYDRO
—UB—	– UNDERGROUND BELL
—G—	– GAS MAIN
—ST—	– STORM SEWER
—S—	– SANITARY SEWER
	– CURB
—E—	– UNDERGROUND ELECTRICAL

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON

2018/05/31
DATE

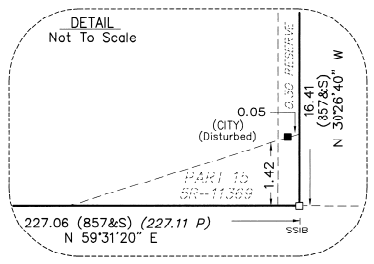
JOHN H. GUTRI
ONTARIO LAND SURVEYOR

THIS IS NOT A VALID COPY UNLESS EMBOSSED WITH SEAL

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2050403

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

DETAIL
Not To Scale



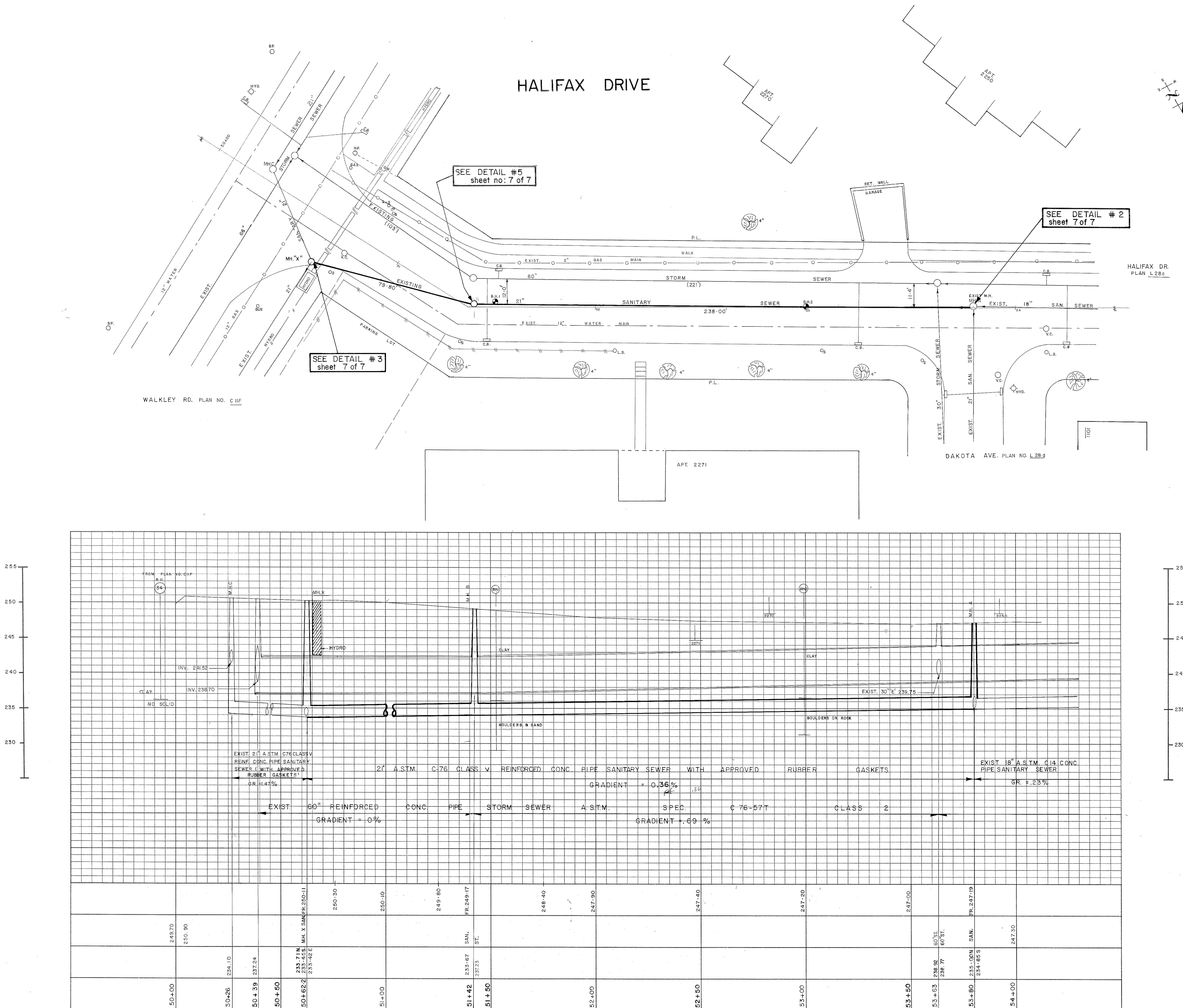
Fairhall Moffatt & Woodland
LIMITED
ONTARIO LAND SURVEYORS
OTTAWA
Surveying and Land Information Services
100–800 TERRY FOX DRIVE, KANATA, ONTARIO K2L 4B6
TEL: (613) 591–2580 FAX: (613) 591–1495
www.fmw.on.ca

JOB No. V15700
E373488.5, N5027833.0
REFERENCE No. 43 – 728 GR
S:\JOBS\V15700\CW\DWG
updated V157.2017.dwg (dj)
May 24, 2018

Appendix B

Plan and Profiles

NOTES



ELEVATIONS	ROAD GRADE
	SURFACE
	INVERT
STATIONS	

DESIGNED BY	DATE
ROAD GRADE:	
SANITARY SEWER J. D. McManus	OCT/74
J. F. Spear	Aug/76
STORM SEWER	

DATE	DESCRIPTION	DRAWN BY	APPROVED BY
JUNE 92	AS BUILT APPLIED, 27" SAN.	LRI(T.E.S.)BG	
SEPT 0/76	REALIGNED PROP. 21" SAN. INTER. WALKLEY RD.	G.Q.	

R E V I S I O N S

REGISTERED PROFESSIONAL ENGINEER J. F. SPEAR PROVINCE OF ONTARIO

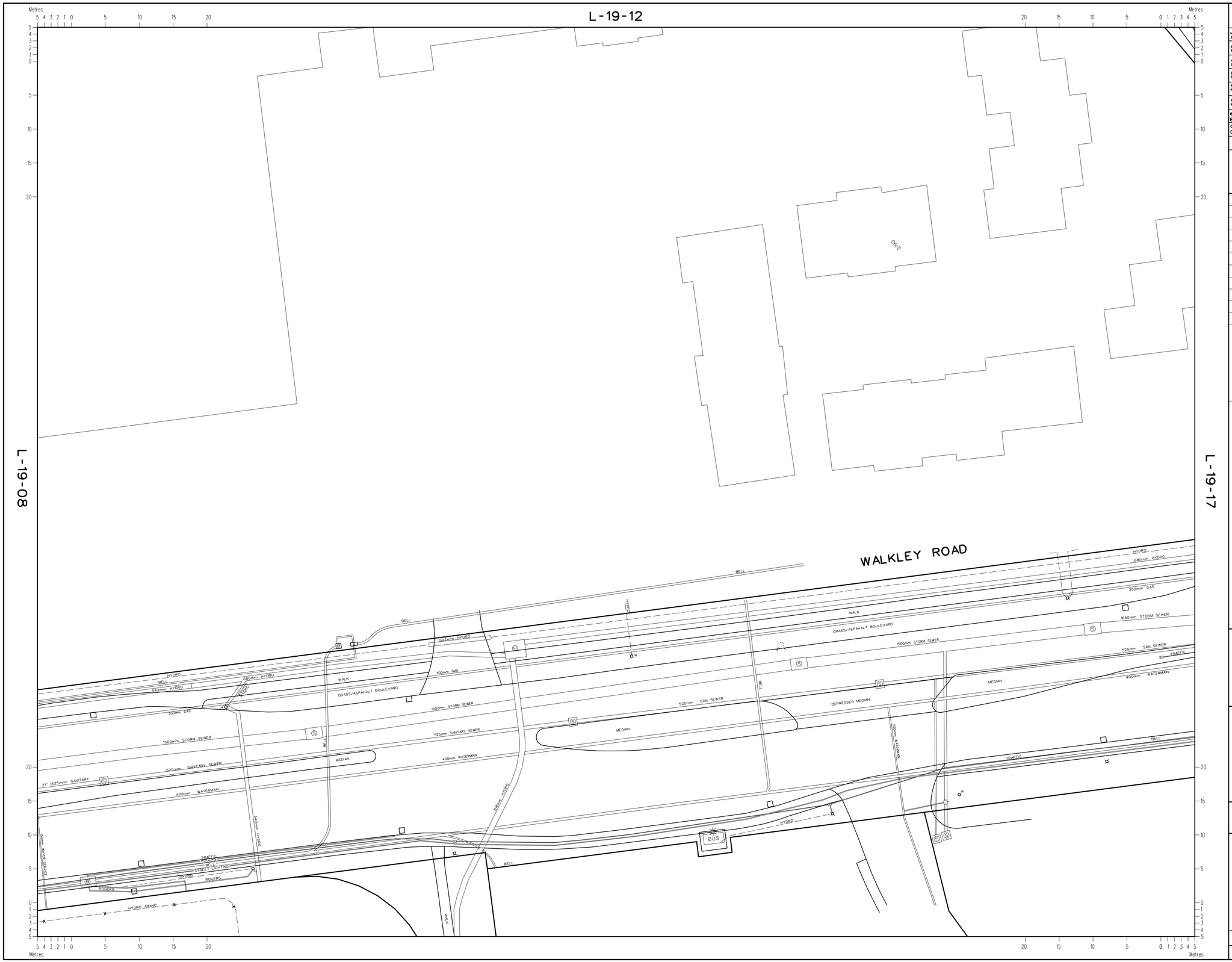
NOTES:
- A MINIMUM 1' CLEARANCE TO BE MAINTAINED BETWEEN SEWERS AND WATERMAINS.
- UTILITIES SHOWN ARE TAKEN FROM BEST AVAILABLE RECORDS. CONTRACTOR IS REQUESTED TO CHECK WITH ALL UTILITY COMPANIES BEFORE DIGGING.
- SOILS INFORMATION SHOWN IS NOT GUARANTEED AND CONTRACTORS ARE ADVISED TO COLLECT ADDITIONAL SOILS INFORMATION AS DEEMED NECESSARY.

CITY OF OTTAWA
DEPARTMENT OF PHYSICAL ENVIRONMENT
ENGINEERING AND SURVEYS BRANCH

HALIFAX DRIVE

FROM DAKOTA AVE. TO WALKLEY RD.

CHIEF DESIGN AND CONSTRUCTION ENGINEER		DESIGNED BY. D. McMANUS; DRAWN BY. L. J. L.	SCALES: HOR. 1"=20' VERT. 1"=6'
J.E. MacKenzie P.Eng. COMMISSIONER	L.D. Smith P.Eng. BRANCH DIRECTOR	CHECKED BY.	PLAN No.: 1327
CONTRACT No. 76-27	DATE. AUG. / 76	SURVEY BOOKS: 3578	SHEET 1 of 7



REVISIONS / RÉVISIONS	DATE	BY
HYDRO DATA DUMP - 2007 ADDED MISSING HYDRO DUCT	MARCH 08	DC
BELL - BEL020T108 (FEB 2003) NEW CUSTOMER CONDUIT ON S/S OF WALKLEY	MARCH 08	DC
CITY - OS104023 (NOV 2004) CONCRETE PAD ADDED TO S/S OF WALKLEY	MARCH 08	DC
BEL020T108 - WALKLEY (NOV 2002) NEW CONDUIT ADDED	JUL 2013	ZB
BEL09313 - WALKLEY (2009) NEW BELL HARDWARE INSTALLED	JUL 2013	ZB
ROG0207269 - WALKLEY (JAN. 2002) ROGERS 18m NEW CONDUIT ADDED	JUL 2013	ZB
BELL1510539-WALKLEY RD(SEPT, 2015) BELL CONDUIT AND HARDWARE ON WALKLEY RD	MAY 2018	KJ
CITY, ALL EXTERNAL AGENCIES DIGITIZED FROM CITY/UTILITY DATA RECEIVED	MAY 2017	KJ

LEGEND

- Water Valve, Valve Chamber, Fire Hydrant
- Sewer Manhole, Catch Basin Manhole
- Catch Basin / Drainage, Wing Wall, Head Wall
- Pole, Pole w/ light, Decorative, Lawn Light
- Power Supply, Panel, Pedestal, Transformer, Tower, Regulator (PYS, PED, GR)
- Amp, Hand Hole, Vault, Gas Valve (HH)
- OC Transpo: Bus Shelter-No Power, Energized, Isolated (BUS)
- Streetscape: Planter Box, Grate Square, Eng. Soil (TGS)
- Traffic Connect Box / Disconnect Box, SL Disconnect (TCB, TTHH, SDID)
- R.L Hand Hole, R.L. Camera (THH)
- Scada: Handhold, Monitoring Panel
- Reducer
- Pipe, Duct, Conduit, Lateral
- Culvert
- Abandoned
- Capped
- Buried Cable
- Property Line
- Install Year (2015)

TELECOM GLOSSARY

A.....Allstream	P.....Primus
AT.....Atria	P2P.....Canadian P2P Fibre
B.....Bell	R.....Rogers
BH.....Birch Hill	S.....Sprint
F.....Fibre Noir	SL.....Street Lighting
G.....Globility	T.....Traffic
GT.....Group Telecom	TO.....Telecom Ottawa
H.....Hydro Ottawa	TU.....Telus
H1.....Hydro One	V.....Videotron
L / L3.....Level 3	Z.....Zayo

GLOSSARY - OTHER

DD.....Dept. of Defence	PED.....Pedestal (owner unknown)
MH.....Manhole (owner unknown)	PW.....Public Works
O/OC.....OCTranspo	UP.....Utility Pole (owner unknown)
SCD.....Scada	

CAUTION/ATTENTION

Although utility locations are established using the best available information, they cannot be guaranteed.
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Bien que l'emplacement des services publics soient établis en utilisant la meilleure information disponible, ils ne peuvent pas être garantis.
Des lignes de propriété ont été compilées en utilisant des plans et des documents enregistrés dans le système de cadastre et sont pour l'indexation seulement.

Ottawa

Right of Way, Heritage, and Urban Design Services /
Gestionnaire, Services des emprises, du patrimoine, et du design urbain
Planning, Infrastructure and Economic Development Department /
Direction generale de la planification, de l'infrastructure et du developpement economique
100 Constellation Cres., 6th Floor East / 6ème Étage Est, Ottawa, ON K2G 6J8

OTTAWA UTILITY COORDINATING COMMITTEE
CENTRAL REGISTRY
COMITÉ DE COORDINATION DES SERVICES PUBLICS D'OTTAWA
ENREGISTREMENT CENTRAL

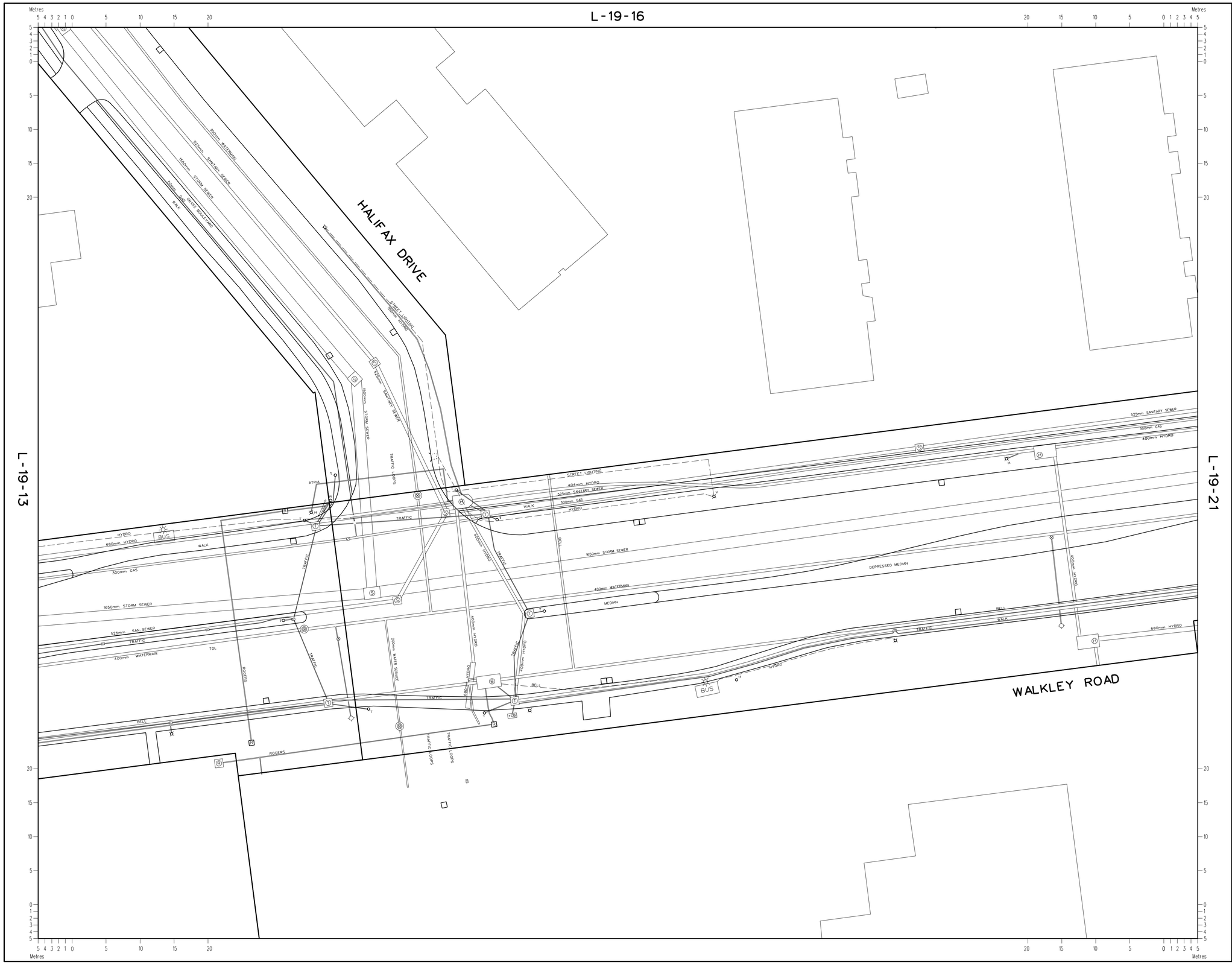
UCC Ottawa CCSP — UTILITY COORDINATING COMMITTEE / COMITÉ DE COORDINATION DES SERVICES PUBLICS

PRODUCED BY: GIS & DATA MANAGEMENT BRANCH
INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
L-19-13

L-19-16



REVISIONS / RÉVISIONS	DATE	BY
REDRAWN FROM VOIDED UTILITY PLAN L-19-17	MARCH 08	DC
ROGERS - ROG 601 (JULY 2003) NEW CONDUITE ADDED TO S/S OF WALKLEY	MARCH 08	DC
ATRI1030 - WALKLEY (2011) ATRIA 25.5m NEW CONDUIT ADDED	JUL 2013	ZB
CITY, ALL EXTERNAL AGENCIES DIGITIZED FROM CITY/UTILITY DATA RECEIVED	MAY 2018	KJ
BELO205108 - WALKLEY ROW2015) BELL MANHOLE AND CONDUIT ON WALKLEY RD	MAY 2018	KJ

LEGEND

- Water Valve, Valve Chamber, Fire Hydrant
- Sewer Manhole, Catch Basin Manhole
- Catch Basin / Drainage, Wing Wall, Head Wall
- Pole, Pole w/ light, Decorative, Lawn Light
- Power Supply, Panel, Pedestal, Transformer, Tower, Regulator — P/S, PED, GR
- Amp, Hand Hole, Vault, Gas Valve
- OC Transpo: Bus Shelter-No Power, Energized, Isolated — BUS, BUS, BUS
- Streetscape: Planter Box, Grate Square, Eng. Soil — TGS
- Traffic Connect Box / Disconnect Box, SL Disconnect — TCB, TDB, SDB
- R.L Hand Hole, R.L. Camera — THH
- Scada: Handhold, Monitoring Panel
- Reducer
- Pipe, Duct, Conduit, Lateral
- Culvert
- Abandoned
- Capped
- Buried Cable
- Property Line
- Install Year (2015)

TELECOM GLOSSARY

A	Allstream	P	Primus
AT	Atria	P2P	Canadian P2P Fibre
B	Bell	R	Rogers
BH	Birch Hill	S	Sprint
F	Fibre Noir	SL	Street Lighting
G	Globility	T	Traffic
GT	Group Telecom	TO	Telecom Ottawa
H	Hydro Ottawa	TU	Telus
H1	Hydro One	V	Videotron
L / L3	Level 3	Z	Zayo

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DD	Dept. of Defence	PED	Pedestal (owner unknown)
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SCD	Scada		

CAUTION/ATTENTION

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INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
L-19-17

Appendix C

Pre-Consultation Meeting Notes

Karla Ferrey

From: Marcel Denomme <mdenomme@urbandale.com>
Sent: January 24, 2019 11:15 AM
To: Lucie Dalrymple
Cc: Roger Tuttle
Subject: FW: 2190 Halifax Dr - Preconsult Follow-up
Attachments: Pland and Study List_2190 Halifax.docx

Hi Lucy

Below and attached are the minutes of the pre-consult meeting with the City. Can you also include a schedule with your proposal as to when you would be providing the appropriate plans and studies supporting our re-zoning and site plan application.

Thanks

Marcel Denomme
Vice President of Land Development
Urbandale Corporation
mdenomme@urbandale.com
T: 613-731-6712 ext: 1230
C: 613-889-6204

Urbandale
www.urbandale.com

From: Bernier, John [mailto:John.Bernier@ottawa.ca]
Sent: January-31-18 8:29 AM
To: Marcel Denomme <mdenomme@urbandale.com>
Subject: 2190 Halifax Dr - Preconsult Follow-up

Good morning Marcel,

It was nice meeting you on January 17th, 2018 for our pre-consultation meeting (PC2017-0350). We had discussed the development of a 15-storey rental apartment building at 2190 Halifax Drive. The proposal includes two additional entrances on Walkley Road, a reconfiguration of the internal drive aisles, and an expansion of the underground parking garage.

Planning Comments:

1. Zoned Residential Fifth Density, Subzone B, with a maximum height of 39 metres [**R5B H (39)**].
2. The Official Plan designates this property **General Urban Area**.
3. The current zoning does not support 15 storeys, as 39 metres translates to approximately 12 storeys. 12 is a height that is already above what we would normally see and allow in the General Urban Areas.

4. An OPA would be required for the additional three storeys. However, it is difficult to support at this time, as there is clear direction in OPA 150 to discourage intensification outside of Mainstreets or Transportation Corridors.
5. 12 storeys is allowed, but perhaps 9 storeys is a better fit in terms of the massing and design being proposed.
6. Think about loading areas and connections to the building from these.
7. Include more tree plantings and landscaping.
8. Explore opportunities for at-grade commercial space, which are allowed as of right in high-rise buildings. Permitted commercial uses include: Personal Service Business, Retail Store (limited to florist, pharmacy, newsstand), Restaurant.
9. Provide walkway connections to the street and to the internal areas of the site. For instance, a protected crossing (pavement markings and landscaped buffers on either side to facilitate this) to the pool link path.
10. Recommend consulting with Councillor Jean Cloutier.

Forestry Comments:

11. A 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
12. Any removal of privately-owned trees 10cm or larger in diameter require a tree permit issued under the Urban Tree Conservation Bylaw; the permit is based on the approved TCR
13. In this case, the TCR may be combined with the Landscape Plan,
14. the TCR must list all trees on site by species, diameter and health condition; if only a small portion of a property is being impacted, the TCR only needs to cover the area that may be impacted by the development. Note that the TCR must address all trees with a critical root zone that extends into the developable area.
15. If trees are to be removed, the TCR must clearly show where they are and document the reason they can not be retained
16. All retained trees must also be shown and all retained trees within the area impacted by the development process must be protected as per the City guidelines listed on Ottawa.ca
17. Trees with a trunk that crosses/touches a property line are considered co-owned by both property owners; permission from the adjoining property owner must be obtained prior to the removal of co-owned trees
18. The City does encourage the retention of healthy trees wherever possible; please ask your design/planning team to find opportunities for retention wherever possible if the trees are healthy and 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
19. The removal of City-owned trees will require the permission of Forestry Services who will also review the submitted TCR; note that Forestry Services may ask for compensation for any City-owned tree that has to be removed.

Transportation Comments:

20. Walkley Road is designated as an Arterial road within the City's Official Plan with a ROW protection of 44.5 metres. The ROW limits are to be shown on all the drawings and the offset distance (22.25 metres) to be dimensioned from the existing centerline of pavement.

21. ***ROW interpretation*** – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both

edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.

22. The TIA (Transportation Impact Assessment) Guidelines (2017) were approved by Transportation Committee and City Council on June 14, 2017. The new version of the TIA Guidelines (2017) that are posted on the web are now to be used for the TIA Submission for development applications.

    The following list highlights the significant changes to the 2006 TIA Guidelines
    a) A Screening Test (Step 1) quickly determines if a transportation study is required. Consultants should fill in the form in Appendix B.
    b) Study Scope (Step 2) is site specifically tailored; there are no longer three defined types of TIA reports. Scoping report is required and needs to be signed off by TPM before the consultant moves on to Forecasting volumes.
    c) Sign off from City Transportation Project Manager is required at key points in the review process prior to TIA Submission (Step 5). See Figure 1 on page 9 for a good flow chart of the process.
    d) Multi Modal Level of Service (MMLOS) and Complete Street analysis is required to assess the impact of all modes of travel rather than just vehicle traffic.
    e) There is no longer a requirement for consultant pre-approval. Consultants must now sign and submit the Credentials Form included in the Appendix A with each TIA report.
    f) The TIA Submission (report, drawings and/or monitoring plan) is required **with** the development application.

    Click on the website;

    http://documents.ottawa.ca/sites/documents.ottawa.ca/files/tia_guidelines_en.pdf

23. Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way.

24. The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed accesses (please refer to the City's sidewalk and curb standard drawing SC7.1 for unsignalized entrance).

25. Underground access ramp must be minimum 6.7 metres wide for 2-way traffic. If ramp exceeds 6% grade, a subsurface melting element will be required.

26. Show fire route on Site Plan. Minimum lane width for fire trucks is 6.0 metres. The fire route is to be approved by the Fire Chief.

27. The minimum clear throat length required is 15.0 metres from end of curb radius. Please refer to TAC Manual Part 2; Table 3.2.9.3 and Figure 3.2.5.2 for appropriate throat length and dimensioning.

28. Please note that Section 4.3 of the Official Plan requires that the proposed development include safe, direct and attractive pedestrian access form the public to the major building entrance. The plans must also include pedestrian connections to the optional additional developments should they proceed.

29. The distance between the nearest limits of a private approach intended for two-way vehicular traffic and any other private approach to the same property shall be a minimum of 9 metres measured at the street line, and at the curb line or roadway edge.

30. All one-way private approaches shall be designated with suitable signs erected in a conspicuous location adjacent to the highway to indicate the direction of traffic for which the private approach is intended, and all signs shall be erected and maintained by the owner to the satisfaction of the General Manager.

31. Curb returns are to be provided at the accesses with a minimum radius of 5.0 metres and are to be dimensioned on the drawings.

32. The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.

33. Please identify the type of delivery truck that would be servicing the site.

34. Lay-by is to be a minimum of 3.0 metres in width, corner radii of 5.0 metres and ensure for proper drainage.

35. Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.

Urban Design comments:

Please consider:

36. Place-making as a way to integrate the new building into the existing site with regard to connectivity and relationship to the pedestrian realm;
37. Relating the base of the new building to the existing low profile context on the site and in the neighbourhood as a whole through material and architectural treatment;
38. Improvements to the buffer area between the street and the building; ie sidewalks, tree planting etc.

Additional comment:

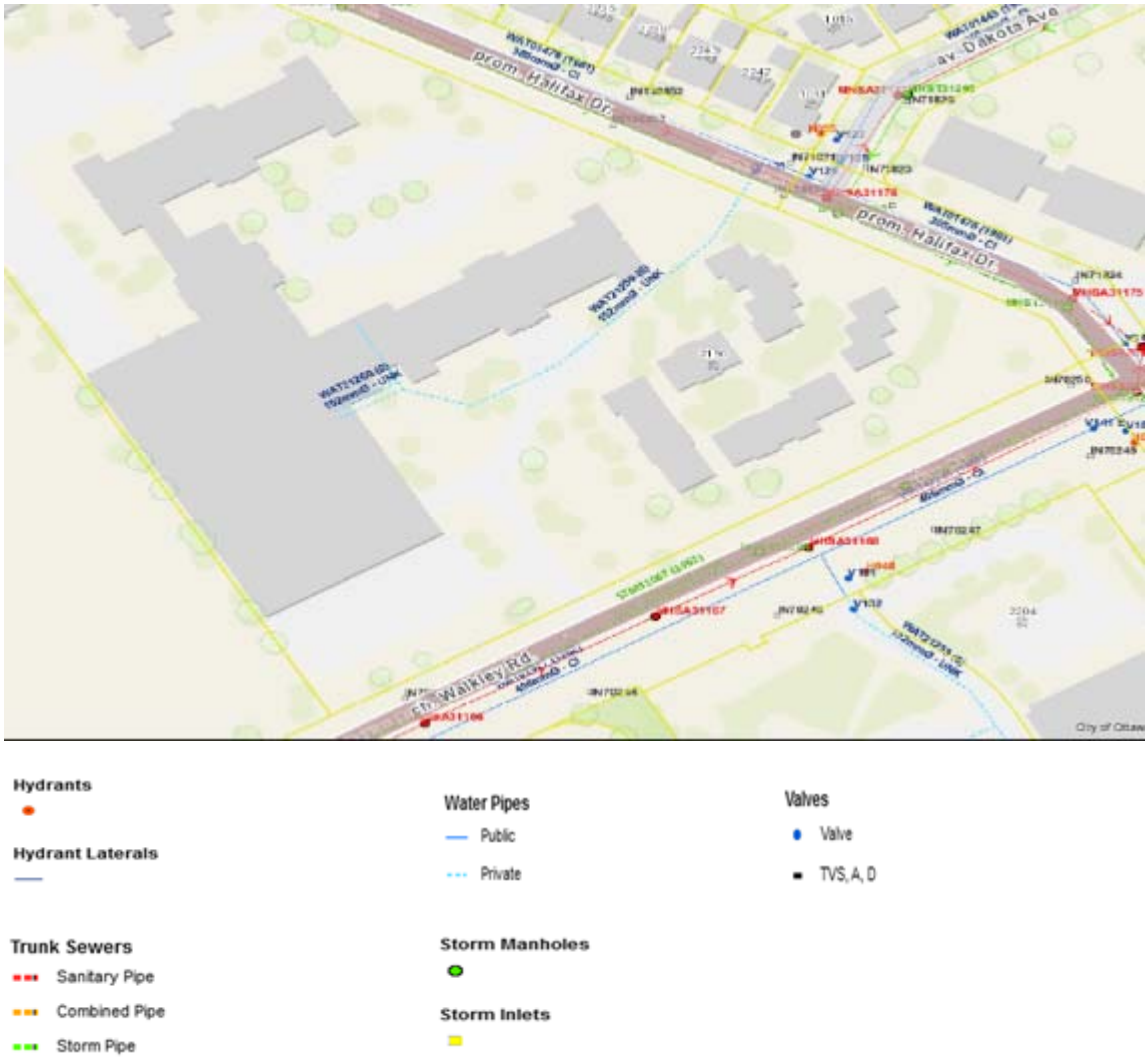
39. To better evaluate the additional height and building proposal on the site please provide some basic 3d modelling of the site and its immediate built context demonstrating the massing relationships

Engineering Comments:

40. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/how-develop-property/development-application-review-process-2/guide-preparing-studies-and-plans
41. Servicing and site works shall be in accordance with the following documents:
    - ⇨ Ottawa Sewer Design Guidelines (October 2012) and Technical Bulletin PIEDTB-2016-01
    - ⇨ Ottawa Design Guidelines – Water Distribution (2010) and Technical Bulletins ISD-2010-2 and ISDTB-2014-02

- ⇨ 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)

42. 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).
43. The Stormwater Management Criteria, for the subject site, is to be based on the following:
    i. The 5-yr storm event should be using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
    ii. The existing servicing under Walkley Road and Halifax Drive were built around 1962. For separated sewer system built pre-1970 the design of the storm, sewers are based on a 2-year storm.
    iii. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
    iv. A calculated time of concentration (Cannot be less than 10 minutes).
    v. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.
    vi. Stormwater quality control criteria must consult with Rideau Valley Conservation Authority (RVCA).
44. Deep Services (Storm, Sanitary & Water Supply)



i. A plan view of the existing services may be seen above. Services should ideally be grouped in a common trench to minimize the number of road cuts. The sizing of existing services is:

   a. Halifax Drive:

      i. Sanitary – 450 mm Conc.

      ii. Storm – 1500 mm Concrete Reinforced.

      iii. Water – 305 mm Concrete Reinforced.

   b. Walkley Road:

      i. Sanitary – 525 mm Concrete Reinforced.

      ii. Storm – 1500 mm Concrete Reinforced.

      iii. Water – 406 mm Concrete Reinforced.

ii. As per City's Sewer Design guideline a monitoring manhole shall be required just inside the property line located in an accessible location (ie. Not in a parking area) for all non-residential and multi residential buildings connections from a private sewer to a public sewer.

iii. As per City's Sewer Design guideline it is expected that the alternative of a high level sewer in a public right-of-way and connected to the collector sewer is the preferred method of servicing properties.

iv. New connections to sewer or watermain services within Walkey Road and Halifax Drive are subject to City approval and to be made above the springline of the sewermain as per:

a. Std Dwg S11.1 for flexible main sewers – *connections made using approved tee or wye fittings.*

b. Std Dwg S11 (For rigid main sewers) – *lateral must be less that 50% the diameter of the sewermain,*

c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – *for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,*

d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

e. No submerged outlet connections.

45. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

i. Location of service

ii. Type of development and the amount of fire flow required (as per FUS, 1999).

iii. Average daily demand: ___ l/s.

iv. Maximum daily demand: ___l/s.

v. Maximum hourly daily demand: ___ l/s.

vi. Hydrant location and spacing to meet City's Water Design guidelines.

46. MOECC ECA Requirements –

An MOECC Environmental Compliance Approval <u>may be required</u> for the proposed development. Please contact Ontario Ministry of the Environment and Climate Change, Ottawa District Office to arrange a pre-submission consultation:

For residential applications: Charlie Primeau

(613) 521-3450, ext. 251

Charlie.Primeau@ontario.ca

For I/C/I applications: Emily Diamond

(613) 521-3450, ext. 238

Emily.Diamond@ontario.ca

47. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
48. General comments –
    I. Note: from the aerial imagery, it seems water servicing under Walkley Road is close to the median. Design, excavation and construction should be planned accordingly.

Should you have any questions or require additional information, please contact Sharif (Project Manager) directly at (613) 580-2424, x 20763 or by email at sharif.sharif@ottawa.ca.

The proposed application will be a Site Plan Control Application (new - Manager Approval, Public Consultation), which costs **$21,508.66** (click here for exact fees), plus the engineering design review and inspection fee, legal fees, as well as conservation authority fee of $105.

Please find attached the "Applicant's Study and Identification List" including the number of copies required for each in order for the application to be deemed complete. Here is the link to the guide for preparing studies and plans: *http://ottawa.ca/en/city-hall/planning-and-development/how-develop-property/development-application-review-process-2-3*

Best regards,

John Bernier
Planner
Development Review - South
Planning, Infrastructure and Economic Development Department
City of Ottawa | Ville d'Ottawa
☎ 613.580.2424 ext/poste. 21576
ottawa.ca/planning / ottawa.ca/urbanisme

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Appendix D

Water Design Calculations

Water Demand Calculations
2270 Walkley Road (JLR 28584-001)

No. 1 bed room apartment	221	units
Density	1.4	p/p/u
No. Ppl	309	ppl
No. 2 bed room apartment	30	units
Density	2.1	p/p/u
No. Ppl	63	ppl
No. 3 bed rooms apartment	9	units
Density	3.1	p/p/u
No. Ppl	28	ppl
Population total	400	
Average Day Consumption Rate	280	L/c/d
Average Day Demand	**1.30**	**L/s**
Maximum Day Peaking Factor	3.20	x Avg Day (Table 3-3, MOE 2008)
Maximum Day Demand	**4.15**	**L/s**
Peak Hour Peaking Factor	4.80	x Avg Day (Table 3-3, MOE 2008)
Peak Hour Demand	**6.22**	**L/s**

FUS Fire Flow Calculations

2270 Walkley Road - JLR 22584-001

Step	Parameter	Value		Note
A	Type of Construction	Non-combustible		
	Coefficient (C)	0.8		
B	Ground Floor Area	750	m^2	
C	Height in storeys	17	storeys	
	Total Floor Area	12713	m^2	Exemption a) for noncombustible highrise
D	Fire Flow Formula	$F=220C\sqrt{A}$		
	Fire Flow	19844	L/min	
	Rounded Fire Flow	20000	L/min	Flow rounded to nearest 1000 L/min.
E	Occupancy Class	Limited Combustible		Residential buildings have a limited combustible occupancy
	Occupancy Charge	-15%		
	Occupancy Increase or Decrease	-3000		
	Fire Flow	17000	L/min	No rounding applied.
F	Sprinkler Protection	Automatic Fully Supervised		
	Sprinkler Credit	-50%		
	Decrease for Sprinkler	-8500	L/min	
G	*North Side Exposure*			Existing Bldg
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:	21.3	m	
	Height of Exposed Wall:	13	storeys	
	Length-Height Factor	276.9	m-storeys	
	Separation Distance	32.92	m	
	North Side Exposure Charge	5%		
	East Side Exposure			Existing townhouses
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	31.8	m	
	Height of Exposed Wall:	2	storeys	
	Length-Height Factor	63.6	m-storeys	
	Separation Distance	21.3	m	
	East Side Exposure Charge	9%		
	South Side Exposure			Bldg
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Non-combustible		
	Length of Exposed Wall:	0.0	m	
	Height of Exposed Wall:	0	storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance	50	m	
	South Side Exposure Charge	0%		
	West Side Exposure			Sports field
	Exposing Wall:	Non-combustible		
	Exposed Wall:	Wood Frame		
	Length of Exposed Wall:	0.0	m	
	Height of Exposed Wall:	0	storeys	
	Length-Height Factor	0.0	m-storeys	
	Separation Distance	50	m	
	West Side Exposure Charge	0%		
	Total Exposure Charge	14%		All seperations exceed 45 m
	Increase for Exposures	2380	L/min	
H	Fire Flow	10880	L/min	
	Rounded Fire Flow	11000	L/min	Flow rounded to nearest 1000 L/min.
	Required Fire Flow (RFF)	**11000**	**L/min**	
		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

Evan Way

From: Sharif, Golam <sharif.sharif@ottawa.ca>
Sent: November 19, 2024 1:42 PM
To: Evan Way
Cc: Annie Williams
Subject: RE: 2190 Walkley Road - Boundary Condition Request
Attachments: 2190 Walkley Road November 2024.pdf

Hi Evan,

Please see the requested boundary condition below:

"The following are boundary conditions, HGL, for hydraulic analysis at 2190 Walkley Road (zone 2W2C) assumed to be a dual connection connected to the 406 mm watermain on Walkley road (see attached PDF for location).

Min HGL: 123.9 m
Max HGL: 130.0 m
Max day + Fire Flow (183 L/s): 124.5 m

Please refer to Guidelines and Technical bulletin ISDTB-2014-02 concerning basic day demands greater than 0.5 L/s.

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."

Thank you,

Sharif

From: Evan Way <eway@jlrichards.ca>
Sent: November 18, 2024 10:41 AM
To: Sharif, Golam <sharif.sharif@ottawa.ca>

Cc: Annie Williams <awilliams@jlrichards.ca>
Subject: RE: 2190 Walkley Road - Boundary Condition Request

Golam,

Tried calling you and heard your message – can you please advise on that status of our boundary request below & attached?

We are in need of your assistance and your attention is greatly appreciated.

Thank you,
Evan

Evan Way, P.Eng.
Civil Engineer

1000-343 Preston Street
Ottawa, ON, K1S 1N4

Work: (343) 804-4386
eway@jlrichards.ca

From: Evan Way <eway@jlrichards.ca>
Sent: November 13, 2024 12:57 PM
To: sharif.sharif@ottawa.ca
Cc: Annie Williams <awilliams@jlrichards.ca>
Subject: RE: 2190 Walkley Road - Boundary Condition Request

Golam,

Revised flow calculations for boundary condition request are as follows:

Average Day = 1.30 L/s
Peak Hour = 6.22 L/s
Maximum Day = 4.15 L/s
Fire Flow (FUS) = 183 L/s

Max Day + Fire Flow = 187.15 L/s

Attached are the revised calculations. Apologies for any confusion.
Hopeful for the boundary conditions at your earliest convenience.

Thank you,
Evan

Evan Way, P.Eng.
Civil Engineer

1000-343 Preston Street
Ottawa, ON, K1S 1N4

Work: (343) 804-4386
eway@jlrichards.ca

From: Evan Way <eway@jlrichards.ca>
Sent: November 11, 2024 8:32 AM
To: sharif.sharif@ottawa.ca
Subject: 2190 Walkley Road - Boundary Condition Request

Hello Golam,

We would like to obtain hydraulic boundary conditions for the proposed development located at 2190 Walkley Road. The site consists of one (1) proposed residential building owned by Urbandale.

We are requesting the boundary conditions at the watermain connection shown in the attached.

Listed below are the average day, maximum day, and peak hour demands as well as the required fire flow:

Average Day = 1.30 L/s
Peak Hour = 6.22 L/s
Maximum Day = 4.15 L/s
Fire Flow (FUS) =217 L/s

Max Day + Fire Flow = 221.15 L/s

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

Should you have any questions or require any further information, please do not hesitate to contact myself.

Thank you,

Evan Way, P.Eng.
Civil Engineer

1000-343 Preston Street
Ottawa, ON, K1S 1N4

Work: (343) 804-4386
eway@jlrichards.ca

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'


Boundary Conditions for 2190 Walkley Road
305mm
prom. Halifax Dr.
152mm
102mm
152mm
203mm
ch. Walkley Rd.
203mm
406mm
102mm
102mm
152mm
152mm
ch. Walkley Rd.
2190
2204
2200
1015
2247
1011
N
Legend
Private
Public
City of Ottawa

J.L. Richards & Associates Limited

HEAD LOSS - HAZEN-WILLIAMS

2145 Walkley Road - Residential Development
(JLR 28584-000)

Demand Scenario (Nov 2024)	Building Demand (L/s)
Average Day	1.30
Maximum Day	4.15
Required Fire Flow (FUS)	183.00
Assumed Sprinkler Flow	18.90
Peak Hour	6.22

Boundary Conditions (Email from City, November 19, 2024):

Water Demand Scenario	Building Demand (L/s)	Head (m) on Walkley Road Connection
Peak Hour	6.22	123.9
Maximum HGL	0.00	130.0
Max Day + Fire Flow (FUS)	187.15	124.5

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)

2270 Walkley Road Headloss Calculations

Water Demand Condition	Flow (Q) (L/s)	Flow (Q) (m^3/s)	Length (m)	C	D (m)	V (m/s)	A (m2)	Head Loss (m)	HGL (m)	Calculated HGL (m)	Elevation (m) of Building	Pressure @ Node (m)	(kPa)	(psi)	ODG 4.2.2 Requirement	Criteria Achieved?
Peak Hour	6.22	0.006	41.4	110	0.203	0.192	0.032	0.014	123.900	123.886	83.36	40.526	398	57.7	276 kPa	Yes
Maximum HGL	0.00	0.000	41.4	110	0.203	0.000	0.032	0.000	130.000	130.000	83.36	46.640	458	66.4	552 kPa	Yes
Max Day + Sprinkler Flow (Sprinkler = 18.9 L/s) From hydrant to building connection	23.05	0.023	19.1	110	0.203	0.712	0.032	0.074	120.329	120.254	83.36	36.894	362	52.5	140 kPa	Yes
Max Day + Fire Flow to hydrant	187.15	0.187	22.3	110	0.203	5.782	0.032	4.171	124.500	120.329	83.16	37.169	365	52.9	140 kPa	Yes

Appendix E

Sanitary Servicing Calculations

Wastewater Demand Calculations
2145 Walkley Road (JLR 28584-001)

No. 1 bed room apartment	221	units
Density	1.4	p/p/u
No. Ppl	309	ppl
No. 2 bed rooms apartment	30	units
Density	2.1	p/p/u
No. Ppl	63	ppl
No. 3 bed rooms apartment	9	units
Density	3.1	p/p/u
No. Ppl	28	ppl
Population total	400	people
Average Day Consumption Rate	280	L/c/d
Average Day Demand	1.30	L/s
Harmon Peaking Factor	3.42	
Site Area	0.572	ha
Infiltration Allowance	0.33	L/s/ha
Total Peak Design Flow	**4.62**	**L/s**

Appendix F

Stormwater Management Calculations and Supporting Documentation – Green Roof Specs and CCTV

J.L.Richards
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2145 WALKLEY ROAD APARTMENT DEVELOPMENT
PRE-DEVELOPMENT FLOW CALCULATIONS (Revised - December 2024)

EXISTING CONDITIONS - AREA BREAKDOWN (Disturbed Surfaces)

Halifax Drive Catchment

Areas to 375 mm diameter on-site sewer, tributary to Halifax Drive sewer

Area No.	Areas (ha) to Halifax Drive	
	C = 0.20	C = 0.90
1	0.005	
2	0.036	
3	0.164	
4	0.055	
5		0.291
	A_{tot} =	0.551
	C_{avg} =	**0.57**

Total Site Disturbed Area (Pre-Development Condition) = 0.589

Walkley Road Catchment

Areas Sheet Flowing to Walkley Road

Area No.	Areas (ha) to Walkley Road	
	C = 0.20	C = 0.90
6	0.029	
7		0.002
8	0.007	
	A_{tot} =	0.038
	C_{avg} =	**0.24**

Time of Concentration Calculations - Halifax Outlet (Existing Conditions)

To Existing on-site 375 mm diameter sewer (15 in) outletting to Halifax Drive trunk sewer:

Tc = Inlet Time + Pipe travelling time

Pipe travelling time:

62 ft - 300 mm diameter (12 in) @ 2.0% : Velocity (full) = 1.96 m/s
128 ft - 375 mm diameter (15 in) @ 3.5%: Velocity (full) = 3.0 m/s

Tc = 10 mins + (18.90 m / 1.96 m/s) + (39.01 m / 3.0 m/s)
Tc = 10 mins + 0.16 mins + 0.2 mins = 10.36 mins

Tc : 10.36 mins

Rainfall Statistics OSDG (Section 5.4.2)

Return Period	A	C	B
2	732.951	6.199	0.810
5	998.071	6.053	0.814
100	1735.688	6.014	0.820
CCE	* Intensities increased by 25%		

Calculation of Existing Peak Flows to existing 300 mm diam (15 in) storm sewer at 2.3%:

Per pre-consultation notes, on-site retention between 1:2 year to 1:100 year

Evaluation of Allowable Flows:

Qp = 2.78 x C x I x A, where :
Area = 0.551 ha
C = 0.57 (Existing)
C = 0.50 (To be used as allowable)
Inlet time = 10.36 mins

Qp (1:2 year) = 57.79 L/s

Time of Concentration Calculations Walkley Outlet (Existing Conditions)

To Walkley Road 1500 mm diameter sewer:

Tc = Sheet flow time; from top of berm to ROW limit

Length of travel = 5 m

Top of berm elevation = 82.31, bottom of slope = 82.05 m
Slope = 5.2%; Velocity = 0.6 m/s

Tc = Length / velocity; Tc = 5 m / 0.6 m/s per Uplands Method
Tc = 0.15 mins, use Tc = 10 mins (minimum allowed)

Tc = 10 mins

Rainfall Statistics OSDG (Section 5.4.2)

Return Period	A	C	B
2	732.951	6.199	0.810
5	998.071	6.053	0.814
100	1735.688	6.014	0.820
CCE	1:100 Year Intensities increased by 25%		

Calculation of Existing Peak Flows to Walkley Road trunk sewer:

Per pre-consultation notes, on-site retention between 1:2 year to 1:100 year

Evaluation of Allowable Flows:

Qp = 2.78 x C x I x A, where :
Area = 0.038 ha
C = 0.24 (existing)
C = 0.24 (To be used as allowable)
Inlet time = 10 mins

Qp (1:2 year) = 1.92 L/s

Total Allowable Flow (Disturbed Areas at Walkley and Halifax) = 59.71 L/s

J.L.Richards
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2145 WALKLEY ROAD

URBANDALE CORPORATION
JLR NO. 28584.001

STORM SEWER DESIGN SHEET

Designed by: K.F.
Checked by: G.F
Date: April 2019
Revised: July 2019

Manning's Coefficient, n =	0.013
IDF CURVE =	2

STREET	Maintenance Hole Number		DRAINAGE AREAS							Inlet Time (min.)	In Pipe Flow Time (min.)	2 YR PEAK FLOW				TOTAL	SEWER DATA						Residual Capacity Q_{cap} - Q_d (L/s)	% Full	UPSTREAM				DOWNSTREAM				
			0.20	0.60	0.90	Total Area 2 Yr	Total Area 5 Yr	Cum. Area 2 YR (ha)	Cum. Area 5 YR (ha)			2.78AR	Cum. 2.78AR	2 Yr Intensity (mm/hr)	Peak Flow (L/s)	Peak Design Flow (L/s)	PIPE Dia (mm)	Actual Dia. (mm)	Slope (%)	Q full (L/s)	V full (m/s)	Length (m)			T/G	Obvert	Invert	Cover	T/G	Drop	Obvert	Invert	Cover
	FROM	TO																														
WALKEY OUTLET																																
Underground Storage Pipe	CBMH1	CBMH2	0.017		0.078	0.095		0.095	0.000	10.00	0.38	0.20	0.20	76.81	15.71	15.71	1050	1066.8	0.15	1103.33	1.23	27.9	1087.6	1%	82.26	81.16	80.09	1.10	82.48		81.12	80.05	1.36
										10.38																						
Connection to Existing	CBMH2	Walkley Rd.						0.095	0.000	10.38	0.27		0.20	75.39	15.43	15.43	250	254.0	0.50	43.87	0.87	14.2	28.4	35%	82.48	80.31	80.05	2.18	82.50		80.23	79.98	2.27
										10.65																						
																													Existing 1500mm dia. Storm on Walkley Road, approx Inv 79.35, OBV 80.85, assumed springline connection +/- INV 79.98 for new service				
HALIFAX OUTLET																																
Building Roof	MH100	EX CB			0.133	0.133		0.133	0.000	10.00	0.32	0.33	0.33	76.81	25.56	5.00	250	254.0	1.76	82.30	1.62	31.0	77.3	6%	79.89	77.60	77.35	2.29	77.84		77.05	76.80	0.79
Existing Courtyard Grass (External)	EX CB	MH103	0.140			0.140		0.273	0.000	10.32	0.29	0.08	0.41	75.60	31.04	10.49	250	254.0	1.00	62.04	1.22	21.5	51.6	17%	77.84	77.05	76.80	0.79	80.89	1.20	76.83	76.58	4.06
										10.61																						
Podium, Landscape and East Drive Aisle	MH104	MH103A	0.088		0.232	0.320		0.320	0.000	10.00	0.24	0.63	0.63	76.81	48.34	48.34	1500	1524.0	0.88	6917.90	3.79	54.6	6869.6	1%	79.63	77.32	75.80	2.31	78.03		76.84	75.32	1.19
Cul-de-sac	MH103A	MH103						0.320	0.000	10.24	0.08		0.63	75.90	47.77	47.77	450	457.2	0.24	145.71	0.89	4.2	97.9	33%	78.03	75.78	75.32	2.25	78.09	0.06	75.77	75.31	2.32
										10.32																						
Cul-de-sac and Connection to Existing	MH103	MH105						0.593	0.000	10.61	0.50		1.04	74.54	77.52	77.52	450	457.2	0.41	190.45	1.16	34.6	112.9	41%	78.09	75.71	75.25	2.38	77.90	0.05	75.57	75.11	2.33
Existing Storm Sewer (External Drainage)	MH105	EX ST 103	0.115			0.115		0.708	0.000	11.11	0.20	0.06	1.10	72.80	80.36	80.36	450	457.2	2.80	497.76	3.10	36.5	417.4	16%	77.90	75.50	75.04	2.40	77.58		74.46	74.00	3.12
Existing Storm Sewer	EX ST 103	Halifax Dr.						0.708	0.000	11.30	0.15		1.10	72.14	79.63	79.63	450	457.2	1.33	343.40	2.09	18.3	263.8	23%	77.58	74.46	74.00	3.12	74.75		74.22	73.76	0.53
																													Existing 450mm ST. INV @ Main 1500mm dia. Storm on Halifax, approx Inv 242.00', per JLR Plan 1968, +/- INV 73.76				

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2270 WALKLEY ROAD APARTMENTS
STORMWATER MANAGEMENT CALCULATIONS (Revised - December 2024)

Post-Development Area Breakdown:

Halifax Drive Outlet

	Description	Area (ha)	C-Factor (100 yr)	Note	ICD	Outlet
1	Main Building (Tower)	0.133	0.90	Roof Drains	5.0	Halifax
2	Drainage Area to MH103A-ICD	0.320	0.72	ICD4	31.0	Halifax
3	Rear Hardscape	0.024	0.90	Uncontrolled	10.7	Halifax
				Total Peak Flow (L/s) =	46.7	Halifax

Walkley Road Outlet

	Description	Area (ha)	C-Factor (100 yr)	Note	ICD	Outlet
4	Drainage Area to CBMH2-ICD	0.095	0.78	ICD5	12.0	Walkley
				Total Peak Flow (L/s) =	12.0	Walkley

SUMMARY OF DISTURBED AREAS (Post)		
Halifax Drive Disturbed Areas =	0.477	ha
Wakley Road Disturbed Areas =	0.095	ha
Sum of Disturbed Areas (Post) =	0.572	ha
Sum of Disturbed Areas (Pre) =	0.589	ha

Total Peak Flow (Halifax) =	46.7	L/s
Total Peak Flow (Walkley) =	12.0	L/s
Total Combined Post-Development Peak Flow (L/s) =	58.7	L/s
Total Allowable Release Rate (Halifax + Walkley) =	59.7	L/s
Total Peak Flow Above (+) or Below (-) Allowable Release Rate (L/s) =	-1.0	L/s

As shown above, the total allowable release rate is respected under post-development conditions.

Stormwater Management Calculations (Controlled Areas)

Rainfall Statistics OSDG (Section 5.4.2)

Return Period	A	C	B
2	732.951	6.199	0.810
5	998.071	6.053	0.814
100	1735.688	6.014	0.820
Climate Change Event (CCE)	1:100 Year Intensities increased by 25%		

1 **MAIN BUILDING (Tower) - To Halifax Drive Outlet:**

	2 year	5 year	100 year
Roof (ha)	0.133	0.133	0.133
C-Factor =	0.90	0.90	0.90

Time (min)	Intensity 1:100 Yr (mm/hr)	Qp 1:100 Yr (L/s)	Qp Roof Drains (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 less Qp100yr (L/s)
10	178.56	59.42	5.00	54.42	32.65	74.27	69.27	41.56	14.85
15	142.89	47.55	5.00	42.55	38.30	59.44	54.44	48.99	11.89
20	119.95	39.92	5.00	34.92	41.90	49.89	44.89	53.87	9.98
25	103.85	34.56	5.00	29.56	44.34	43.20	38.20	57.29	8.64
30	91.87	30.57	5.00	25.57	46.03	38.21	33.21	59.78	7.64
35	82.58	27.48	5.00	22.48	47.21	34.35	29.35	61.63	6.87
40	75.15	25.01	5.00	20.01	48.01	31.26	26.26	63.02	6.25
45	69.05	22.98	5.00	17.98	48.54	28.72	23.72	64.05	5.74
50	63.95	21.28	5.00	16.28	48.85	26.60	21.60	64.81	5.32
55	59.62	19.84	5.00	14.84	48.97	24.80	19.80	65.34	4.96
60	55.89	18.60	5.00	13.60	48.96	23.25	18.25	65.70	4.65
65	52.65	17.52	5.00	12.52	48.82	21.90	16.90	65.90	4.38
70	49.79	16.57	5.00	11.57	48.59	20.71	15.71	65.98	4.14
75	47.26	15.73	5.00	10.73	48.26	19.66	14.66	65.95	3.93

AVAILABLE ROOF TOP STORAGE (TOWER)	
Roof Top Area (m2)	1330.00
50% of Roof for Storage (m2)	665.00
Vol. @ 0.15 m for ponding (m3)	99.75

The storage volume requirement of 65.98 m3 under the CCE can be accommodated by the design

2 Drainage Area to MH103A-ICD (Including Podium Roof 0.100 ha) - To Halifax Drive Outlet:

	Area (ha)	C-Factor (100 yr)	ICD
Pervious	0.088	0.25	
Impervious & Podium Roof	0.232	0.90	
Total / Cavg	**0.320**	**0.72**	**31.0**

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 less Qp100yr (L/s)
10	178.56	114.50	15.50	99.00	59.40	143.12	127.62	76.57	28.62
15	142.89	91.63	15.50	76.13	68.52	114.54	99.04	89.13	22.91
20	119.95	76.92	15.50	61.42	73.70	96.15	80.65	96.78	19.23
25	103.85	66.59	15.50	51.09	76.64	83.24	67.74	101.61	16.65
30	91.87	58.91	15.50	43.41	78.14	73.64	58.14	104.65	14.73
35	82.58	52.95	15.50	37.45	78.65	66.19	50.69	106.45	13.24
40	75.15	48.19	15.50	32.69	78.45	60.23	44.73	107.36	12.05
45	69.05	44.28	15.50	28.78	77.70	55.35	39.85	107.59	11.07
50	63.95	41.01	15.50	25.51	76.53	51.26	35.76	107.29	10.25
55	59.62	38.23	15.50	22.73	75.02	47.79	32.29	106.56	9.56
60	55.89	35.84	15.50	20.34	73.23	44.80	29.30	105.49	8.96

Storage provided by the 1500 mm dia. underground pipe, CB leads, plus storage in the 1800 mm dia. MHs + 5 CBs = 115 m3 exceeds the CCE volume requirement of 107.59 m3

Concrete Pipe

UNDEGROUND STORAGE PIPE - MH103A - MH 104 - HALIFAX DRIVE OUTLET

Nominal Diameter	Inner Diameter	Pipe Radius	Pipe Length	Area (pi r2)	Volume
900	914	457.0	54.6	0.66	35.82
975	991	495.5	54.6	0.77	42.11
1050	1067	533.5	54.6	0.89	48.82
1200	1220	610.0	54.6	1.17	63.83
1350	1372	686.0	54.6	1.48	80.72
1500	1524	762.0	54.6	1.82	99.60

Storage Volume Available MH103A (1800 mm) to Elev 77.65 :	6.12	m^3
Storage Volume Available MH104 (1800 mm) to Elev 77.65 :	4.97	m^3
CB storage (600x600 mm) @ CB5, CB7, CB8 & lawn CBs to Elev 77.65:	2.47	m^3
TOTAL :	**115.01**	**m^3**

CB Leads

Nominal Diameter	Inner Diameter	Pipe Radius	Pipe Length	Area (pi r2)	Volume
250	254	127.0	36.7	0.05	**1.86**

3 Drainage Area to CBMH2-ICD - To Walkley Road Outlet:

	Area (ha)	C-Factor (100 yr)	ICD
Pervious	0.017	0.25	
Impervious	0.078	0.90	
Total / Cavg	**0.095**	**0.78**	**12.0**

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 less Qp100yr (L/s)
10	178.56	36.81	6.00	30.81	18.49	46.02	40.02	24.01	9.20
15	142.89	29.46	6.00	23.46	21.11	36.83	30.83	27.74	7.37
20	119.95	24.73	6.00	18.73	22.48	30.91	24.91	29.89	6.18
25	103.85	21.41	6.00	15.41	23.11	26.76	20.76	31.14	5.35
30	91.87	18.94	6.00	12.94	23.29	23.68	17.68	31.82	4.74
35	82.58	17.02	6.00	11.02	23.15	21.28	15.28	32.09	4.26
40	75.15	15.49	6.00	9.49	22.78	19.37	13.37	32.08	3.87
45	69.05	14.24	6.00	8.24	22.24	17.79	11.79	31.85	3.56
50	63.95	13.19	6.00	7.19	21.56	16.48	10.48	31.44	3.30
55	59.62	12.29	6.00	6.29	20.77	15.37	9.37	30.91	3.07
60	55.89	11.52	6.00	5.52	19.89	14.40	8.40	30.26	2.88
65	52.65	10.85	6.00	4.85	18.93	13.57	7.57	29.51	2.71

Storage provided by the 1050 mm dia. underground pipe plus storage in the 1800 mm dia. CBMHs + 3 CBs = 36.41m3 exceeds the CCE volume requirement of 32.09 m3

UNDERGROUND STORAGE PIPE - CBMH 1 -CBMH 2 - WALKLEY ROAD OUTLET

Nominal Diameter	Inner Diameter	Pipe Radius	Pipe Length	Area (pi r2)	Volume
900	914	457.0	27.9	0.66	18.31
975	991	495.5	27.9	0.77	21.52
1050	1067	533.5	27.9	0.89	24.95
1200	1220	610.0	27.9	1.17	32.61
1350	1372	686.0	27.9	1.48	41.25
1500	1524	762.0	27.9	1.82	50.89

Volume at CBMH 1 (1800 mm) to Elevation 82.01 :	5.04	m^3
Volume at MH 2 (1200 mm) to Elevation 82.01 :	2.12	m^3
CB storage (600x600 mm) @ CB1, CB3, CB4:	1.87	m^3
TOTAL :	**36.41**	**m^3**

CB Leads

Nominal Diameter	Inner Diameter	Pipe Radius	Pipe Length	Area (pi r2)	Volume
250	254	127.0	48.1	0.05	**2.44**

ORIFICE INLET CONTROL DEVICE SIZING

JLR No.: 28584-001
Project: 2270 Walkley Road
Date: September 13, 2021
Revised: n/a
Designed by: MM
Checked by:

Notes: Values in blue are user variables
Values in red are calculated

User Notes: Temporary ICD used to control flow in sanitary sewer until all facilities are installed.

ST MH103A

Q_{all} (L/s)	Outlet Pipe Dia. (mm)	Invert (m)	T/G (m)	Orifice Radius (m)	Head (m)
15.50	450	75.32	77.65	0.049	2.281

Solving for 'Q'

$$Q = CA\sqrt{2gh}$$

h= 2.281 Head (m) (input value calculated above)
C= 0.61 Coefficient of Discharge
D= 0.098 Diameter (m)
g= 9.8 Gravity (9.81 m/s^2)

A= 0.00754 Area of Flow (m^2)

Q= 0.031 Discharge (m^3/s)
30.77 Discharge (L/s)

Solving for 'r' (radius of orifice)

$$r = \sqrt{\frac{Q}{C\pi\sqrt{2gh}}}$$

Circular Orifice			Square Orifice		
Radius =	0.049	m	One side =	0.087	m
Diameter =	0.098	m	=	87	mm
=	98	mm			
=	3.86	in			

ORIFICE INLET CONTROL DEVICE SIZING

JLR No.:	28584-001
Project:	2270 Walkley Road
Date:	September 13, 2021
Revised:	n/a
Designed by:	MM
Checked by:	

Notes: Values in blue are user variables
Values in red are calculated

User Notes: Temporary ICD used to control flow in sanitary sewer until all facilities are installed.

ST CBMH2

Q_{all} (L/s)	Outlet Pipe Dia. (mm)	Invert (m)	T/G (m)	Orifice Radius (m)	Head (m)
5.00	250	80.05	82.01	0.031	1.929

Solving for 'Q'

$$Q = CA\sqrt{2gh}$$

h=	1.929	Head (m) (input value calculated above)
C=	0.61	Coefficient of Discharge
D=	0.062	Diameter (m)
g=	9.8	Gravity (9.81 m/s^2)
A=	0.00302	Area of Flow (m^2)
Q=	0.011	Discharge (m^3/s)
	11.32	Discharge (L/s)

Solving for 'r' (radius of orifice)

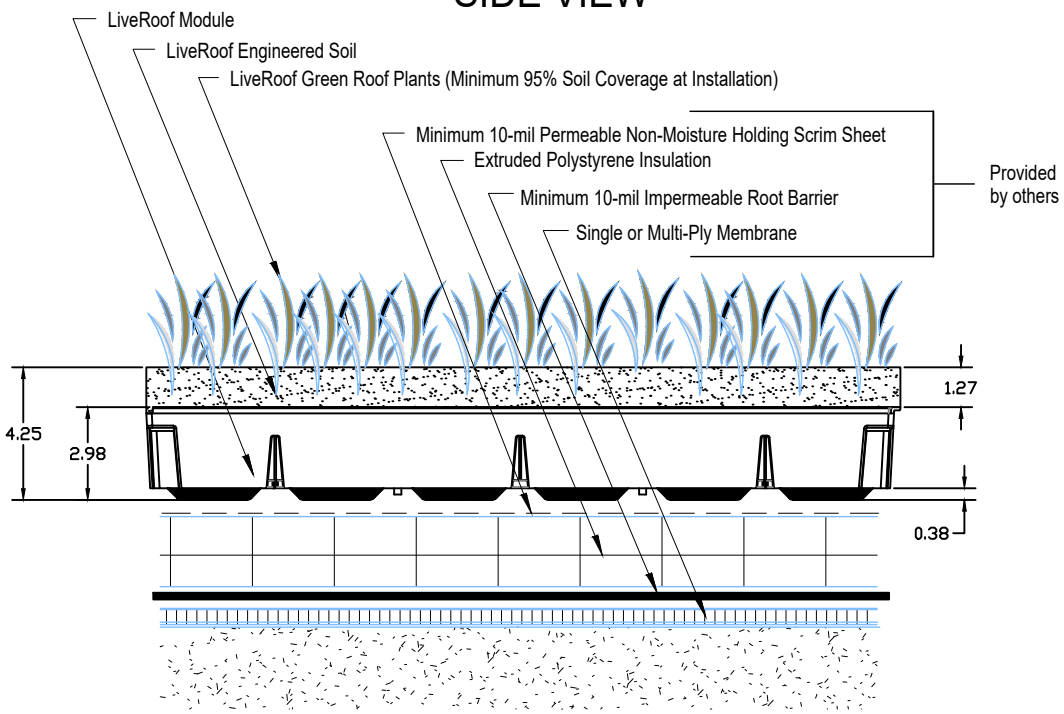
$$r = \sqrt{\frac{Q}{C\pi\sqrt{2gh}}}$$

Circular Orifice			Square Orifice		
Radius =	0.031	m	One side =	0.055	m
Diameter =	0.062	m	=	55	mm
=	62	mm			
=	2.44	in			

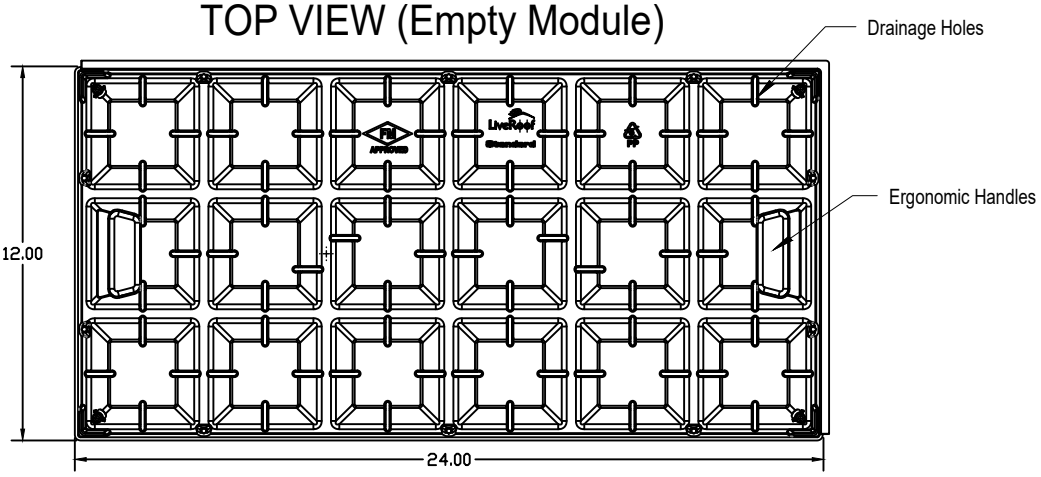
LiveRoof STANDARD SYSTEM

Over Protective Membrane Assembly

SIDE VIEW



TOP VIEW (Empty Module)



LiveRoof System Saturated Weight: 27-29 lbs / sf

NOT TO SCALE

STD Membrane
2022-11-8

LiveRoof, LLC
P.O. Box 533
Spring Lake, MI 49456

(800) 875-1392
www.liveroof.com

LiveRoof

Ottawa (Head Office)
1800 Bantree Street
Ottawa, Ontario K1B 5L6
☎ 613.745.2444
613.745.9994

Montreal
2700 Sabourin Street
St-Laurent, Quebec H4S 1M2
☎ 514.738.2666
514.738.9762

www.cwwcanada.com
1.866.695.0155

CLEAN WATER WORKS INC.

INTEGRATED SEWER SOLUTIONS

Urbandale Corporation

2240 Halifax
Ottawa, Ontario
Job No.: 80563

Drain Use
Storm

Inspection Date
March 19th 2019

DRAIN CCTV INSPECTION REPORT

THE WAY IS CLEAR™

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CLEAN WATER WORKS

MINI CAMERA CCTV INSPECTION REPORT

CUSTOMER:	URBANDALE CORPORATION	**START OF INSPECTION:**	STACK CLEANOUT #1
JOB NO.:	80563	**END OF INSPECTION:**	MAIN IN GARAGE
		SEWER USE:	STORM
LOCATION:	2240 HALIFAX	**PIPE DIAMETER(S):**	150MM
	OTTAWA, ONTARIO	**PIPE MATERIAL(S):**	CAST IRON / TRANSITE
		DIRECTION OF FLOW:	DOWNSTREAM
DATE:	MARCH 19TH 2019	**VIDEO FILENAME:**	Video #1
OPERATOR:	DON L.	**REPORT NUMBER:**	**1 of 4**

DISTANCE (M)	CODE	INSPECTION COMMENTS
0.0	C/O	START OF INSPECTION – STACK CLEANOUT #1
0.8	LBS	LINE BENDS STRAIGHT
1.0	DEB	START OF DEBRIS
14/6	MC	MATERIAL CHANGE: CAST IRON – TRANSITE
14.6	DEB	END OF DEBRIS
23.0	SC	SERVICE CONNECTION AT 3 O'CLOCK
23.8	LBD	LINE BENDS DOWN
25.0	LBS	LINE BENDS STRAIGHT
25.0	END	END OF INSPECTION

CODE	DESCRIPTION
AIF	ACTIVE INFILTRATION
BKJ	BROKEN JOINT
BSG	START OF SAG
BWV	BACKWATER VALVE
C/O	CLEANOUT
CAL	CALCITE
CFL	COLLAPSE
CRC	CIRCULAR CRACK
DC	DIAMETER CHANGE
DEB	DEBRIS
DEF	PIPE DEFORMATION
EIF	EVIDENCE OF INFILTRATION
ESG	END OF SAG
EXG	EXPOSED GASKET
EXR	EXPOSED REBAR
F/D	FLOOR DRAIN
FRC	FRACTURE
GRS	GREASE
HOLE	HOLE IN PIPE
LBD	LINE BENDS DOWN
LBL	LINE BENDS LEFT
LBR	LINE BENDS RIGHT
LBS	LINE BENDS STRAIGHT
LGC	LONGITUDINAL CRACK
MAIN	MAIN SEWER IN BUILDING
MC	MATERIAL CHANGE
MH	MANHOLE
MSP	MISSING PIPE PIECE
OBS	OBSTRUCTION IN PIPE
OFJ	OFFSET JOINT
OPJ	OPEN JOINT
PFL	PARTIAL COLLAPSE
PSC	PROTRUDING CONNECTION
PUN	PUNCTURE
RTS	ROOTS
SC	SERVICE CONNECTION
WYE	WYE CONNECTION

COMMENTS:

Video #1


-000.0ft A
-000.0m C


+003.5ft A
+001.0m C


+022.5ft A
+006.8m C


+048.0ft A
+014.6m C


+075.5ft A
+023.0m C


+082.0ft A
+025.0m C

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CLEAN WATER WORKS

MINI CAMERA CCTV INSPECTION REPORT

CUSTOMER:	URBANDALE CORPORATION	**START OF INSPECTION:**	STACK CLEANOUT #2
JOB NO.:	80563	**END OF INSPECTION:**	MAIN LINE
		SEWER USE:	STORM
LOCATION:	2240 HALIFAX	**PIPE DIAMETER(S):**	150MM
	OTTAWA, ONTARIO	**PIPE MATERIAL(S):**	CAST IRON
		DIRECTION OF FLOW:	DOWNSTREAM
DATE:	MARCH 19TH 2019	**VIDEO FILENAME:**	Video #2
OPERATOR:	DON L.	**REPORT NUMBER:**	**2 of 4**

DISTANCE (M)	CODE	INSPECTION COMMENTS
0.0	C/O	START OF INSPECTION – STACK CLEANOUT #2
2.4	DEB	DEBRIS
4.0	LBR	LINE BENDS RIGHT
6.6	LBR	LINE BENDS RIGHT
6.6	WYE	WYE CONNECTION
7.4	LBD	LINE BENDS DOWN
8.4	END	END OF INSPECTION – MAIN LINE

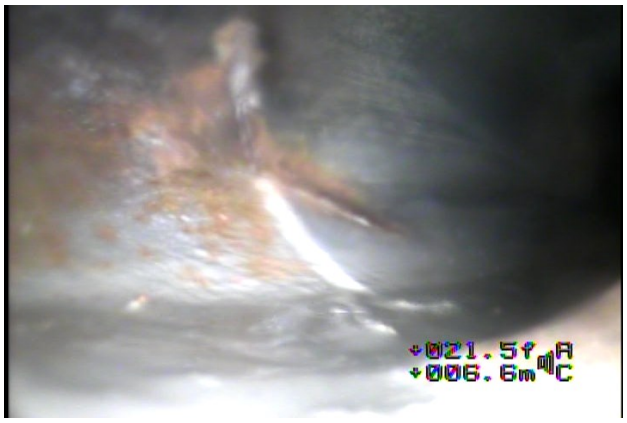
CODE	DESCRIPTION
AIF	ACTIVE INFILTRATION
BKJ	BROKEN JOINT
BSG	START OF SAG
BWV	BACKWATER VALVE
C/O	CLEANOUT
CAL	CALCITE
CFL	COLLAPSE
CRC	CIRCULAR CRACK
DC	DIAMETER CHANGE
DEB	DEBRIS
DEF	PIPE DEFORMATION
EIF	EVIDENCE OF INFILTRATION
ESG	END OF SAG
EXG	EXPOSED GASKET
EXR	EXPOSED REBAR
F/D	FLOOR DRAIN
FRC	FRACTURE
GRS	GREASE
HOLE	HOLE IN PIPE
LBD	LINE BENDS DOWN
LBL	LINE BENDS LEFT
LBR	LINE BENDS RIGHT
LBS	LINE BENDS STRAIGHT
LGC	LONGITUDINAL CRACK
MAIN	MAIN SEWER IN BUILDING
MC	MATERIAL CHANGE
MH	MANHOLE
MSP	MISSING PIPE PIECE
OBS	OBSTRUCTION IN PIPE
OFJ	OFFSET JOINT
OPJ	OPEN JOINT
PFL	PARTIAL COLLAPSE
PSC	PROTRUDING CONNECTION
PUN	PUNCTURE
RTS	ROOTS
SC	SERVICE CONNECTION
WYE	WYE CONNECTION

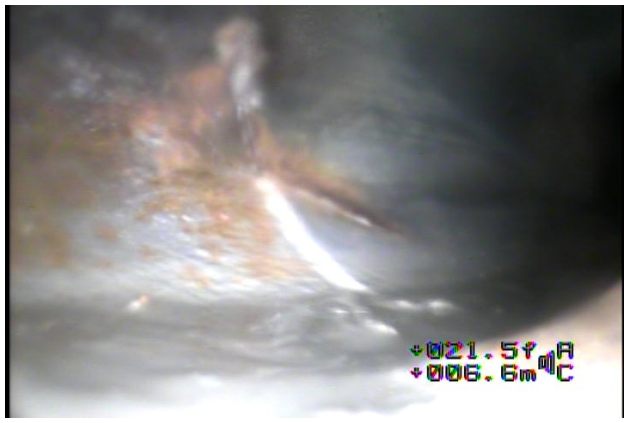
COMMENTS:

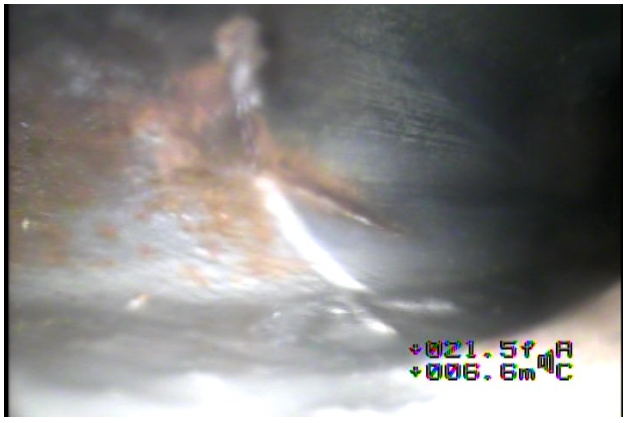
Video #2


-000.5ft A
-000.2m C


+011.5ft A
+003.4m C


+021.5ft A
+006.6m C


+021.5ft A
+006.6m C


+021.5ft A
+006.6m C


+021.5ft A
+006.4m C

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CLEAN WATER WORKS

MINI CAMERA CCTV INSPECTION REPORT

CUSTOMER:	URBANDALE CORPORATION	**START OF INSPECTION:**	STACK CLEANOUT #3
JOB NO.:	80563	**END OF INSPECTION:**	GARAGE
		SEWER USE:	STORM
LOCATION:	2240 HALIFAX	**PIPE DIAMETER(S):**	150MM
	OTTAWA, ONTARIO	**PIPE MATERIAL(S):**	CAST IRON / TRANSITE
		DIRECTION OF FLOW:	DOWNSTREAM
DATE:	MARCH 19TH 2019	**VIDEO FILENAME:**	Video #3
OPERATOR:	DON L.	**REPORT NUMBER:**	**3 of 4**

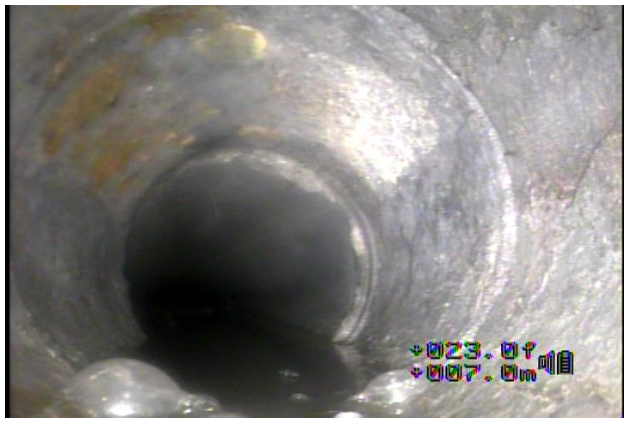
DISTANCE (M)	CODE	INSPECTION COMMENTS
0.0	C/O	START OF INSPECTION – STACK CLEANOUT #3
1.8	LBS	LINE BENDS STRAIGHT
7.0	MC	MATERIAL CHANGE: CAST IRON – TRANSITE
18.8	DEB	DEBRIS
18.8	END	END OF INSPECTION – CCTV OBSTRUCTED (DEBRIS)

CODE	DESCRIPTION
AIF	ACTIVE INFILTRATION
BKJ	BROKEN JOINT
BSG	START OF SAG
BWV	BACKWATER VALVE
C/O	CLEANOUT
CAL	CALCITE
CFL	COLLAPSE
CRC	CIRCULAR CRACK
DC	DIAMETER CHANGE
DEB	DEBRIS
DEF	PIPE DEFORMATION
EIF	EVIDENCE OF INFILTRATION
ESG	END OF SAG
EXG	EXPOSED GASKET
EXR	EXPOSED REBAR
F/D	FLOOR DRAIN
FRC	FRACTURE
GRS	GREASE
HOLE	HOLE IN PIPE
LBD	LINE BENDS DOWN
LBL	LINE BENDS LEFT
LBR	LINE BENDS RIGHT
LBS	LINE BENDS STRAIGHT
LGC	LONGITUDINAL CRACK
MAIN	MAIN SEWER IN BUILDING
MC	MATERIAL CHANGE
MH	MANHOLE
MSP	MISSING PIPE PIECE
OBS	OBSTRUCTION IN PIPE
OFJ	OFFSET JOINT
OPJ	OPEN JOINT
PFL	PARTIAL COLLAPSE
PSC	PROTRUDING CONNECTION
PUN	PUNCTURE
RTS	ROOTS
SC	SERVICE CONNECTION
WYE	WYE CONNECTION

COMMENTS:

Video #3


+001.0f
+000.2m


+023.0f
+007.0m


+032.5f
+009.8m


+031.0f
+009.4m


+061.5f
+018.8m

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CLEAN WATER WORKS

MINI CAMERA CCTV INSPECTION REPORT

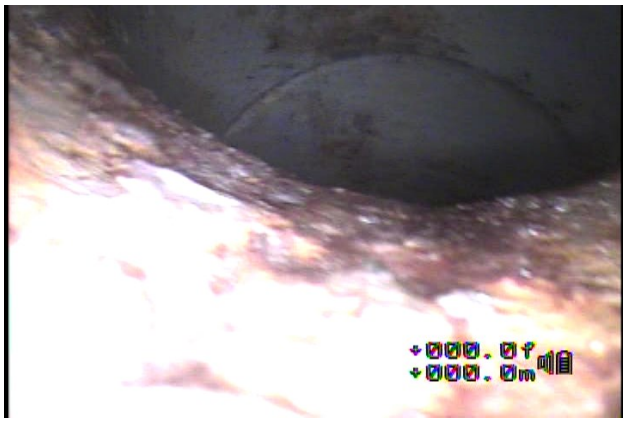
CUSTOMER:	URBANDALE CORPORATION	**START OF INSPECTION:**	STACK CLEANOUT #2
JOB NO.:	80563	**END OF INSPECTION:**	MAIN LINE
		SEWER USE:	STORM
LOCATION:	2240 HALIFAX	**PIPE DIAMETER(S):**	150MM / 200MM
	OTTAWA, ONTARIO	**PIPE MATERIAL(S):**	CAST IRON / TRANSITE
		DIRECTION OF FLOW:	DOWNSTREAM
DATE:	MARCH 19TH 2019	**VIDEO FILENAME:**	Video #4
OPERATOR:	DON L.	**REPORT NUMBER:**	**4 of 4**

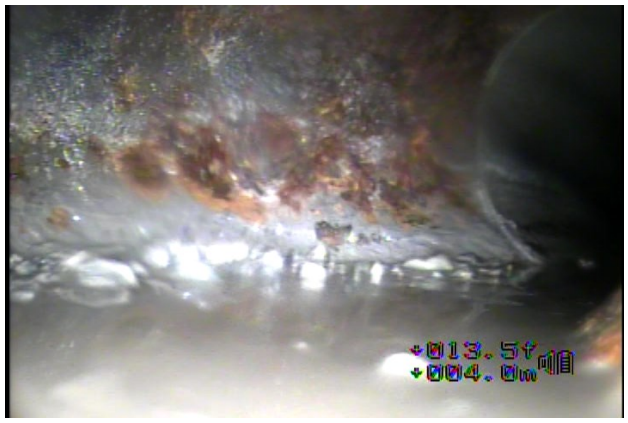
DISTANCE (M)	CODE	INSPECTION COMMENTS
0.0	C/O	START OF INSPECTION – STACK CLEANOUT #2
4.0	LBR	LINE BENDS RIGHT
6.6	LBR	LINE BENDS RIGHT
7.4	LBD	LINE BENDS DOWN
7.6	LBS	LINE BENDS STRAIGHT
7.6	DC	DIAMETER CHANGE: 150MM – 200MM
12.6	END	END OF INSPECTION

CODE	DESCRIPTION
AIF	ACTIVE INFILTRATION
BKJ	BROKEN JOINT
BSG	START OF SAG
BWV	BACKWATER VALVE
C/O	CLEANOUT
CAL	CALCITE
CFL	COLLAPSE
CRC	CIRCULAR CRACK
DC	DIAMETER CHANGE
DEB	DEBRIS
DEF	PIPE DEFORMATION
EIF	EVIDENCE OF INFILTRATION
ESG	END OF SAG
EXG	EXPOSED GASKET
EXR	EXPOSED REBAR
F/D	FLOOR DRAIN
FRC	FRACTURE
GRS	GREASE
HOLE	HOLE IN PIPE
LBD	LINE BENDS DOWN
LBL	LINE BENDS LEFT
LBR	LINE BENDS RIGHT
LBS	LINE BENDS STRAIGHT
LGC	LONGITUDINAL CRACK
MAIN	MAIN SEWER IN BUILDING
MC	MATERIAL CHANGE
MH	MANHOLE
MSP	MISSING PIPE PIECE
OBS	OBSTRUCTION IN PIPE
OFJ	OFFSET JOINT
OPJ	OPEN JOINT
PFL	PARTIAL COLLAPSE
PSC	PROTRUDING CONNECTION
PUN	PUNCTURE
RTS	ROOTS
SC	SERVICE CONNECTION
WYE	WYE CONNECTION

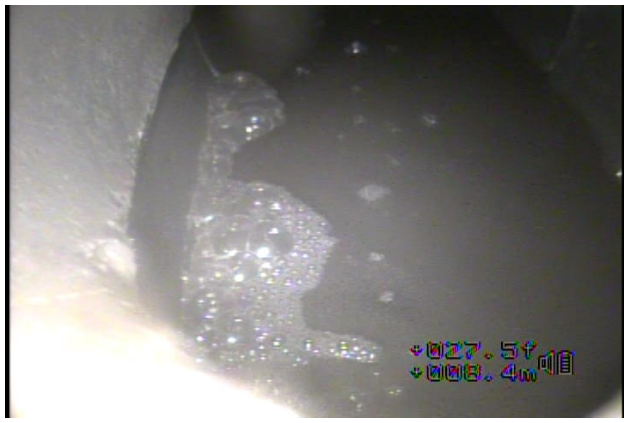
COMMENTS:

Video #4


+000.0ft
+000.0m


+013.5ft
+004.0m

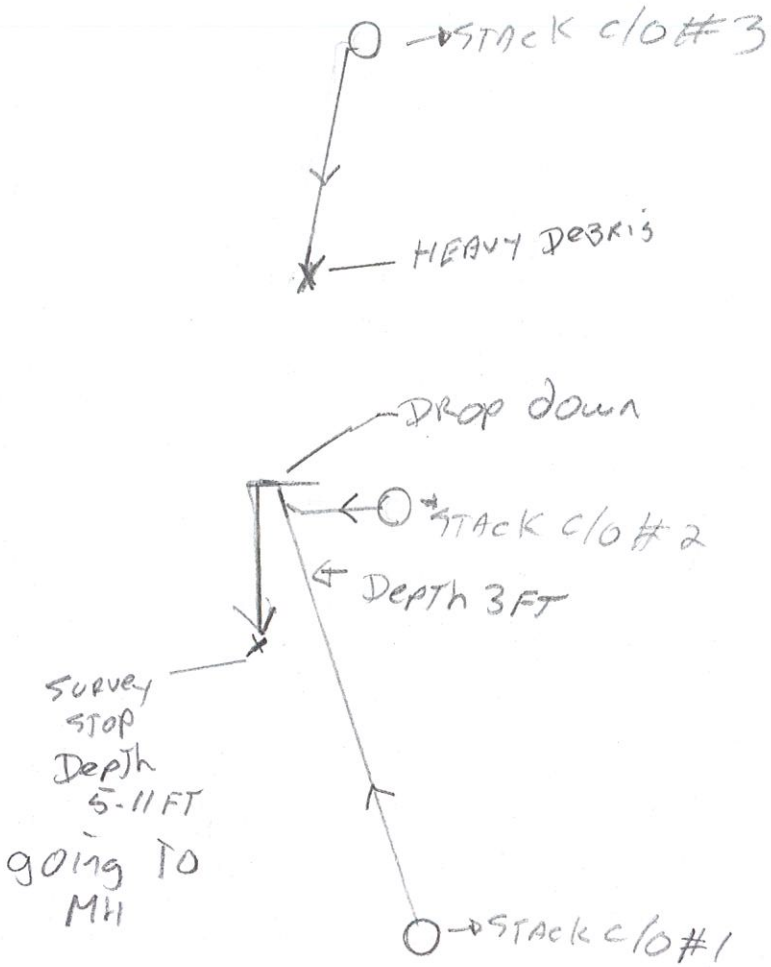

+022.0ft
+006.6m


+027.5ft
+008.4m


+040.0ft
+012.0m

Line Traces

CLEAN WATER WORKS INC.	PAGE 1 OF 1	SEWER LATERAL LOCATE FORM
CLIENT: URBANDALE	LOCATE PERFORMED BY: Dan	DATE: March 19/19
LOCATION: 2240 HALIFAX	MAY BE USED FOR EXCAVATION? ☐ YES ☒ NO	



LEGEND	
Building Line	--BL--
Street Line	--SL--
Fence Line	--FL--
Road Edge	--RE--
Sanitary Service	--SAN--
Manhole	MH
Catch Basin	CB
Sidewalk	--SW--
Pole	O
Pedestal	X
Gas Main	--GM--
Gas Service	--GS--
Hydrant	
Water/Sewer MH	

NOT TO SCALE

This is a locate for the Sanitary and Storm pipes only. Locates for other private and public utilities are required prior to any excavation (Ontario One Call 1-800-400-2255).

COMMENTS:

Appendix G

Letter from Mechanical Consultant

GWAL
Goodkey Weedmark & Associates Ltd.

Principal, Partners & Associates
F.W.A. Bann, P.Eng.
R.Lefebvre, P.Eng. LEED® AP
D.R. Vyas, P.Eng., MIEEE
S. Hamilton, P.Eng.
J. Moffat, P.Eng.
E. Pérusse, P.Eng., ing.
R. Boivin, P.Eng., ing.
R. Leonard, P.Eng.
M. Sarasin, P.Eng.

Executive Consultant
A. Bogdanowicz, P.Eng.
M.G. Carrière, C.E.T.
R. McIntyre, P.Eng.

December 18, 2024

J.L. Richards & Associates Limited
1000-343 Preston St.
Ottawa, Ontario
K1S 1N4

ATTENTION: ANNIE WILLIAMS, SENIOR CIVIL ENGINEER

SUBJECT: 2145 WALKLEY RD. - NEW APARTMENT BUILDING - URBANDALE
BUILDING APPLICATION NO. D07-12-19-0075
GWAL PROJECT NO. 2024-584

Please find herewith a response based on the City of Ottawa's comments for Site Plan for Building Application #D07-12-19-0075.

Site Servicing Report:

Item B4:

The building will have a fully supervised sprinkler protection system.

Item B6:

The roof drains to be used are Watts RD-100-A-ADJ, with the indicated flows provided in the stormwater management report.

Item B8:

The release rate for the tower roof is 5 L/s with a storage volume 99.75 m3 as indicated in the stormwater management report.

Yours very truly,

GOODKEY, WEEDMARK & ASSOCIATES LTD.

Mark Sarasin, P.Eng. | Director, Senior Mechanical Engineer

MS/sm

e.c.: Evan Way (J.L. Richards & Associates Limited)
Roger Tuttle (Urbandale Corporation)
Michele Dredge (Dredge Leahy Architects Inc.)
Björn Fries (Ron Eastern Construction Ltd.)
Karim Istanbouli (GWAL – Mechanical)

Enclosure: Consolidation of Engineering-related Comments – Five (5) pages

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