PROPOSED FOUR STOREY LOW RISE RESIDENTIAL APARTMENT BUILDING SITE AT 4000 OLD RICHMOND ROAD

AND

PROPOSED 3 ½ STOREY STACKED DWELLING AT 572 MOODIE DRIVE CITY OF OTTAWA

SERVICEABILITY REPORT

REPORT R-819-106A

T.L. MAK ENGINEERING CONSULTANTS LTD.

OCTOBER 2021

REFERENCE FILE NUMBER 819-106

Introduction

The developer (Jami Omar Mosque) for this site plan application is proposing to develop an apartment building site at 4000 Old Richmond Road and re-develop the other site within the Mosque complex identified as 572 Moodie Drive which is currently the Imam's (Priest's) residence.

The site (±0.2428 ha.) at 4000 Old Richmond Road is proposed to be developed to house a four (4) storey low rise apartment building consisting of 59 units with underground parking. As for the existing lot at 572 Moodie Drive, this lot is proposed to be re-develop to house a 3 ½ storey stacked dwelling comprising of 6 residential units.

In addition to the four (4) storey residential building, the other development features will comprise of a concrete pedestrian walkway along the north side of the building, an amenity area is located along the south side yard, as well as, underground parking level below grade, interlock pavers at the main front entrance, 9 car parking space with a garbage room at the main level of the building and landscaped areas throughout the site, etc. to meet City of Ottawa site plan requirements.

The proposed re-development site (±0.0767 ha.) at 572 Moodie Drive abuts the existing 3990 Old Richmond Road Jami Omar Mosque complex. This site is located at the west side of Moodie Drive, south of Arnold Drive and north of Songbird Private. See site plan and legal survey plan in Appendix A for details. The proposed stacked building contains six (3) bedroom units. The other development features will consist of landscaped area at the front and rear of the building, a concrete access ramp to the main entrance, etc. to meet City of Ottawa's site plan requirements.

Legal property description of the (2) sites is referenced as Part of Lots 32 and 33 Concession 5 (Rideau Front) Geographical Township of Nepean City of Ottawa located in Ward 8 (College).

A site geotechnical report was prepared by the owner's soils engineer EXP entitled Geotechnical Investigation – Proposed Building Additions – 4000 Old Richmond Road, 572 Moodie Drive (Project No. OTT-00260904-AO) dated September 4, 2020 for this proposed development property.

This serviceability report will provide the City of Ottawa with our serviceability brief to address the proposed servicing scheme for this site. Refer also to the Proposed Overall Site Servicing Plan (Dwg. No. 819-106 S-1) for additional details.

Existing Site Conditions and Servicing

4000 Old Richmond Road

This property is presently vacant. Approximately ½ of the site is grass covered and the remaining parcel of land is covered by gravel. An existing ±600 mm wide pathway is found traversing north to south at the western portion of this lot. For additional details of the site's pre-development conditions, refer to the coloured Google Image and aerial photography from (GeoOttawa 2019) in Appendix B.

As for the availability of underground municipal services, there are existing municipal services along Old Richmond Road in front of this property consisting of a 750mm diameter storm sewer, a 250mm diameter sanitary sewer, and a 300mm diameter watermain for development of this property. Refer to the City of Ottawa Old Richmond Road UCC and As-Built plan and profile drawings included in Appendix C for details.

572 Moodie Drive

This property is currently occupied by a 1 ½ storey stucco siding residential building. The building is linked to Moodie Drive by an existing interlock pedestrian pathway. There exist a (2) car asphalt parking area located in front of the building which is adjacent to the existing asphalt access road into the Mosque at 3990 Old Richmond Road. The existing south half of the lot at the front and rear of the house is mostly covered with soft landscaping. Additionally, an existing interlock patio area of approximately ±90.0 sq.m is found at the rear north-west quadrant of the Imam's residence.

The existing topography of the land is found to be sloped primarily to drain from west to east (back to front) across the site. The existing gradient of the lot is found to be sloping at an approximate gradient of ±1.35%.

The existing house water and sanitary service lateral currently servicing the existing dwellings on 572 Moodie Drive will be removed. The existing water services shall be blanked at the main and the existing house laterals shall be capped at the front property line for re-development of this site.

As for the availability of underground municipal services, there are existing municipal services along Moodie Drive in front of this property consisting of a 750mm diameter storm sewer, a 250mm diameter sanitary sewer, and a 200mm diameter watermain for development of this property. Refer to the City of Ottawa Moodie Drive UCC and As-built plan and profile drawings included in Appendix C for details.

For additional details of the site's pre-development conditions, refer to the coloured Google Image and aerial photography from (GeoOttawa 2019) in Appendix B.

Because the (2) sites will be connecting to and outletting into the separated storm sewer system along Moodie Drive and Old Richmond Road in the City of Ottawa, therefore, the approval exemption under Ontario Regulations 525/98 would apply since storm water discharges from this site will outlet flow into a downstream storm sewer. Thus, an Environmental Compliance Approval (ECA) application will not be required to be submitted to the Ministry.

Proposed Low Rise Residential Apartment Building & Proposed Stacked Dwelling

A. Water Supply

The proposed buildings are located within Pressure Zone 2W, on the lot occupying the intersection of Old Richmond Road and Moodie Drive.

The proposed building at 4000 Old Richmond Road is a 4-storey apartment building with an underground parking. The building contains thirty-two bachelor units, twenty-four 1-bedroom units, and three 2-bedroom units. Each floor covers a gross floor area of 1,316 m^2/floor (14,165 ft^2/floor), and the underground parking occupies an area of 2,125 m^2 (22,873 ft^2). The building is to be serviced by the 300 mm diameter watermain along Old Richmond Road. The building will have sprinklers, considered to be fully automated, connected to a standard water supply, and fully supervised.

The ground elevation at the property in question will be approximately 100.1 m, as obtained from the proposed footing cross-section in the attached **Site Plan** in Appendix D.

The proposed building at 572 Moodie Drive is a 3.5 storey stacked dwelling. The building contains six 3-bedroom units. The total gross floor area is 1,184 m^2 (12,745 ft^2), equivalent to 296 m^2/floor (3,186 ft^2/floor). The building is to be serviced by the 200 mm diameter watermain along Moodie Drive. The building will not have sprinklers.

The ground elevation along Moodie Drive in front of the property in question is approximately 99.4 m, as provided by the City in the **Water Boundary Conditions Email** (See Appendix D) for details. The proposed development site at 4000 Old Richmond Road is part of the greater area of the Jami Omar Mosque complex identified as 3990 Old Richmond Road.

Demand Projections

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines, where the residential consumption rate of 350 L/cap/d was used to estimate average day

demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 2.5. Peak hour (PKHR) demands were calculated by multiplying MXDY by a factor of 2.2. Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines. **Table 1** and **Table 2** show the estimated domestic demands of the proposed buildings at 4000 Old Richmond Rd and 572 Moodie Dr, respectively.

Table 1: Estimated Domestic Demand at 4000 Old Richmond Rd

Unit Type	Unit Count	PPU	Consumption Rate (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, Bachelor	32	1.4	350	15,680	0.18	39,200	0.45	86,240	1.00
Apartment, 1-Bedroom	24	1.4		11,760	0.14	29,400	0.34	64,680	0.75
Apartment, 2-Bedroom	3	2.1		2,205	0.03	5,513	0.06	12,128	0.14
Total	***59***			***29,645***	***0.34***	***74,113***	***0.86***	***163,048***	***1.89***

Table 2: Estimated Domestic Demand at 572 Moodie Dr

Unit Type	Unit Count	PPU	Consumption Rate (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 3-Bedroom	6	3.1	350	6,510	0.08	16,275	0.19	35,805	0.41
Total	***6***			***6,510***	***0.08***	***16,275***	***0.19***	***35,805***	***0.41***

The fire flows required were determined following the Fire Underwriter Survey (FUS) method and are provided in the attached worksheets in Appendix D.

The proposed building at 4000 Old Richmond Road will be ordinary construction and will have sprinklers. The underground parking is more than 50% below ground level. The resulting total required FUS fire flow is 10,000 L/min (167 L/s) for a duration of 2 hours.

The proposed building at 572 Moodie Drive will be wood construction and will not have sprinklers. It is assumed that the basement will be more than 50% below ground level. The resulting total required FUS fire flow is 12,000 L/min (200 L/s) for a duration of 2.5 hours.

Details are provided in the **FUS Fire Flow Calculations** attached in Appendix D. **Figure 1** provides separation distances from adjacent buildings. The proposed **Site Plan** attached in Appendix D was used to determine distances from the proposed building to the property lines

In summary, for the building at 4000 Old Richmond Road:

- AVDY = 29,645 L/d (0.34 L/s)
- MXDY = 74,113 L/d (0.86 L/s);
- PKHR = 163,048 L/d (1.89 L/s); and,
- Fire Flow = 10,000 L/min (167 L/s).

For the building at 572 Moodie Drive:

- AVDY = 6,510 L/d (0.08 L/s)
- MXDY = 16,275 L/d (0.19 L/s);
- PKHR = 35,805 L/d (0.41 L/s); and,
- Fire Flow = 12,000 L/min (200 L/s).

Boundary Conditions

The hydraulic gradeline (HGL) boundary conditions for 4000 Old Richmond Road and 572 Moodie Drive, as presented in **Table 3** and **Table 4**, were provided by the City on April 29, 2021 (see attached **Water Boundary Conditions Email** in Appendix D).

Table 3: Boundary Conditions for 4000 Old Richmond Rd

Demand Scenario	Head (m)
Minimum HGL (Peak Hour)	126.8
Maximum HGL (Average Day)	132.1
Maximum Day + Fire Flow (167 L/s)	124.4

Table 4: Boundary Conditions for 572 Moodie Dr

Demand Scenario	Head (m)	Flow (L/s)
Minimum HGL (Peak Hour)	126.8	
Maximum HGL (Average Day)	132.1	
Available Fire Flow @ Residual 20 psi		117

Hydraulic Analysis

4000 Old Richmond Road

Peak Hour & Average Day

During peak hour demands, the resulting minimum hydraulic gradeline of 126.8 m corresponds to a peak hour pressure of 262 kPa (38 psi). This value is 14 kPa (2 psi) below the minimum pressure objective of 276 kPa (40 psi) for residential buildings up to two storeys. It is recommended that the service line be oversized to reduce the headloss entering the building, and therefore meet the minimum pressure objective. Adding 5 psi per floor above two stories, a minimum pressure of 345 kPa (50 psi) would be required for the fourth floor. The 5 psi per floor value is determined by accounting for additional elevation head and additional pipe

headloss required to reach each additional floor. The proponent will have to consider providing internal booster pumping to ensure adequate pressure throughout the building.

During average day demands, the resulting maximum hydraulic gradeline of 132.1 m corresponds to a maximum pressure of 314 kPa (46 psi). This value is less than the maximum pressure objective of 552 kPa (80 psi) and therefore considered acceptable. However as noted above for peak hour demands, 314 kPa (46 psi) is below the minimum pressure of 345 kPa (50 psi) that would be required for the fourth floor and therefore appropriate measures are required to provide adequate service pressures and internal booster pumping is recommended.

Supporting hydraulic calculations are attached in Appendix D.

Maximum Day + Fire Flow

A maximum day plus fire flow hydraulic gradeline of 124.4 m corresponds to a residual pressure of 238 kPa (35 psi) at this location and is well above the minimum residual pressure requirements of 140 kPa (20 psi).

Based on Table 1 of Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02 and a desktop review (i.e., Google Street View) to confirm hydrant class, the combined hydrant flow coverage for the building is estimated to be 13,248 L/min, which exceeds the FUS required fire flow (RFF) of 10,000 L/min.

Hydrant coverage and classes are illustrated in **Figure 2** attached in Appendix D. A breakdown of available hydrant flow is summarized in **Table 5**.

Table 5: Fire Hydrant Coverage for 4000 Old Richmond Rd

Building	Calculated FUS Fire Flow Demand (L/min)	Fire Hydrants					Combined Hydrant Flow Coverage (L/min)
		Hydrant Class	Within 76 m		Between 76 m and 122 m		
			Quantity	Contrib. to RFF	Quantity	Contrib. to RFF	
3990 Old Richmond Rd	10,000	AA	1	5,678	2	3,785	13,248
		A					
		B					
		C					

572 Moodie Drive

Peak Hour & Average Day

During peak hour demands, the resulting minimum hydraulic gradeline of 126.8 m corresponds to a peak hour pressure of 269 kPa (39 psi). This value is 6 kPa (1 psi) below the minimum pressure objective of 276 kPa (40 psi) for residential buildings up to two storeys. It is recommended that the service line be oversized to reduce the headloss entering the building, and therefore meet the minimum pressure objective. Adding 5 psi per floor above two stories, a minimum pressure of 310 kPa (45 psi) would be required for the third floor. In addition to oversizing the service line, the proponent will have to implement measures to ensure sufficient pressures to the third floor and this may include individual internal booster pumping and/or oversized internal plumbing within the building.

During average day demands, the resulting maximum hydraulic gradeline of 132.1 m corresponds to a maximum pressure of 321 kPa (46 psi). This value is less than the maximum pressure objective of 552 kPa (80 psi) and therefore considered acceptable. This value is also above the minimum pressure value of 310 kPa (45 psi) recommended for a three-storey building.

Supporting hydraulic calculations are attached in Appendix D.

Maximum Day + Fire Flow

The reported available fire flow at a residual pressure of 20 psi is 117 L/s (7,020 L/min).

Based on Table 1 of Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02 and a desktop review (i.e., Google Street View) to confirm hydrant class, the combined hydrant flow coverage for the building is estimated to be 13,248 L/min, which exceeds the FUS required fire flow (RFF) of 12,000 L/min. However, it should be noted that hydrant flow coverages are limited to the available flow per the City's Boundary Condition.

Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02 specifies that an RFF of 10,000 L/min is required to protect a block of townhouses up to 600 m^2 in footprint. Based on the boundary conditions provided by the City, a flow of 10,000 L/min at a residual pressure above the minimum of 140 kPa (20 psi) would be available from the Old Richmond Rd watermain, and the proponent could consider connecting to that watermain to provide the RFF.

Alternatively, to reduce the RFF to the available 7,000 L/min or less, the proponent could separate the stacked dwellings with firewalls. If wood construction is maintained, using two firewalls would reduce the RFF to 6,000 L/min to 7,000 L/min, depending on the unit

considered. This configuration is illustrated in **Figure 3** in Appendix D and supporting **FUS Fire Flow Calculations** are provided (calculations #3 to #5).

If instead of wood, ordinary construction is adopted, one firewall could be installed, reducing the RFF to 4,000 L/min to 6,000 L/min, depending on the configuration and the units considered. This is illustrated in **Figure 4** and in **Figure 5**, and supporting **FUS Fire Flow Calculations** are provided (calculations #6 to #9) in Appendix D.

Hydrant coverage and classes are illustrated in **Figure 6** attached in Appendix D. A breakdown of available hydrant flow is summarized in **Table 6**.

Table 6: Fire Hydrant Coverage for 572 Moodie Dr

Building	Calculated FUS Fire Flow Demand (L/min)	Fire Hydrants					Combined Hydrant Flow Coverage (L/min)
		Hydrant Class	Within 76 m		Between 76 m and 122 m		
			Quantity	Contrib. to RFF	Quantity	Contrib. to RFF	
572 Moodie Dr	12,000	AA	1	5,678	2	3,785	13,248
		A					
		B					
		C					

Conclusions

In conclusion, based on the boundary conditions provided, the watermain along Old Richmond Rd provides adequate fire flow capacity as per the Fire Underwriters Survey for the proposed 4000 Old Richmond Road apartment building. Anticipated pressures during basic day demand conditions are within the pressure objectives as per the City of Ottawa's Drinking Water Design Guidelines. During peak hour demand conditions, the minimum pressure is below the required pressure. To meet the minimum pressure requirements, the proponent will need to consider providing an internal booster.

For the proposed stacked dwellings at 572 Moodie Drive, the watermain along Moodie Drive can provide adequate fire flow capacity as per the Fire Underwriters Survey provided that the stacked dwellings are separated by firewalls and/or are built using ordinary construction methods as defined by the FUS. Anticipated demand pressures during basic day demand conditions are within the pressure objectives as per the City of Ottawa's Drinking Water Design Guidelines. During peak hour demand conditions, the minimum pressure is slightly below the required pressure. To meet the minimum pressure requirements, it is recommended to oversize the service line and the internal plumbing to reduce headlosses. Individual booster pumps could also be considered.

B. Sanitary Flow

4000 Old Richmond Road

The peak sanitary flow for the 59 units, which comprise of three (2)-bedroom, twenty-four (1)-bedroom apartment, and thirty-two, is estimated at Q = 1.18 L/s with an infiltration rate of 0.08 L/s. Refer to Appendix E sheet 1 of 2 regarding sanitary flow calculations. This flow will enter the existing 250mm diameter sanitary sewer on Old Richmond Road via the proposed 150mm diameter PVC sanitary service lateral from the four (4)-storey residential apartment building.

The existing peak sanitary flow of the **vacant** site is Q = 0.08 L/s with an infiltration rate of 0.08 L/s. The net increase in flow from this proposed development is 1.10 L/s which is not expected to negatively impact the existing 250mm dia. sanitary sewer.

At the front property line, a waste-water sampling and inspection chamber is proposed as per City requirements and as per City of Ottawa detail S18.1.

Waste water from the Old Richmond Road 250mm dia. sanitary sewer then in turn outlets north into the existing downstream 525mm dia. PVC sanitary collector sewer located along Moodie Drive which further outlets north to the 900mm dia. sanitary collector sewer that crosses HWY 417.

572 Moodie Drive

The peak sanitary flow for the 3 unit stacked dwelling, which comprise of six (3)-bedroom apartment is estimated at Q = 0.27 L/s for the site with an infiltration rate of 0.03 L/s. Refer to Appendix E sheet 2 of 2 regarding sanitary flow calculations. This flow will enter the existing 250mm diameter sanitary sewer on Moodie Drive via the proposed 125mm diameter PVC sanitary service lateral from each of the three individual units of the stacked dwelling.

The existing peak sanitary flow of the site for the existing single detached dwelling unit is Q = 0.07 L/s with an infiltration rate of 0.03 L/s. The net increase in flow from this proposed development is 0.20 L/s which is not expected to negatively impact the existing 250mm dia. AC sanitary sewer.

Waste water from the Moodie Drive 250mm dia. sanitary sewer then in turn outlets north into the existing downstream 525mm dia. PVC sanitary collector sewer located along Moodie Drive which further outlets north to the 900mm dia. sanitary collector sewer that crosses HWY 417.

C. Storm Flow

4000 Old Richmond Road

The storm-water outlet for the proposed development property will be the existing 750mm diameter concrete storm sewer located along Old Richmond Road. Storm-water attenuation on site will be accomplished by means of rooftop storage with controlled roof drains that regulate flow off site.

The building foundation weeping-tile drainage system shall have its own separate pipe for gravity flow where weeping-tile water is outletted via a 150mm diameter storm pipe to the existing 750mm diameter storm sewer. The storm-water outlet for the main building rooftop water from roof drains and landscaped drain over the underground parking garage rooftop will be a separately designated proposed 150mm diameter PVC pipe that will also be outletted directly into the existing 750mm diameter storm sewer.

Three (3) roof drains are proposed for this apartment building to restrict flow at a rate of 1.26 L/s each or 3 x 1.26 L/s = 3.78 L/s into the Old Richmond Road storm sewer. The calculated allowable release rate from this site is estimated at 32.35 L/s.

Based on the residential site plan from the owner's architect, the average post-development runoff coefficient is estimated at C = 0.72 and A = 0.2428 hectares.

An estimation of the pre-development flow condition was carried out using the criteria accepted by the City of Ottawa. If post-development C valve exceeds the lesser of the C_{pre} = 0.46 or C_{allow} = 0.5 (max) then SWM is required. So from our calculations, the C_{pre} = 0.46 value will be used at t_c = 10 minutes for pre-development allowable flow calculation off-site.

The pre-development flow rate calculation into the 750mm dia. storm sewer for this residential area is the lesser of either the five (5)-year storm event where C_{allow} = 0.5 (max.) runoff value or the average C_{pre} value which is 0.46 using t_c = 10 minutes. Because this site C_{post} = 0.72 and C_{pre} = 0.46 then SWM measures are required.

Therefore, based on our calculation, on-site retention is required for this proposed development site, because the site post-development C value of 0.72 is greater than the C_{pre} = 0.46.

The storage volume for the five (5)-year and up to the 100-year storm event will be stored by means of flat rooftop at the top of the low rise apartment building. Also refer to the site storm drainage report (Report No. R-819-106) for further details.

4000 Old Richmond Road

At this proposed residential site and to develop this lot to house a 59 unit apartment building on a 0.2428 ha. parcel of land, the estimated allowable flow off-site is calculated at 32.35 L/s based on City of Ottawa drainage and Stormwater Management (SWM) criteria. For on-site SWM attenuation, the flat roof top of the proposed apartment building will be utilized and (3) controlled roof drains are incorporated each with a maximum controlled release rate of 1.26 L/s (20.0 U.S. gal/min.). The estimated net allowable controlled flow from the rooftop of this site totals to 2.03 L/s for the post development condition. Given the limiting roof drain model required to drain the roof areas within a certain height and within a reasonable time period, the model selected will exceed the estimated allowable flow by 1.75 L/s for the 100 Year post development storm event. The 5 Year post development flow of 18.25 L/s will be less than the allowable of 32.35 L/s.

During the five (5)-year storm event for the flat rooftop storage, the ponding depth of rooftop area 1, 2 and 3 is estimated at 120 mm at the drain and 0mm at the roof perimeter, assuming a 1.0% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 9.00 m^3, at Roof Area 2 is 10.79 m^3 and the rooftop storage available at Roof Area 3 is 11.41 m^3, for a total of 31.20 m^3, which is greater than the required volume of 29.05 m^3.

During the 100-year storm event for the flat rooftop storage, the ponding depth of Roof Area 1 is estimated at 156 mm at the drain and 0mm at the roof perimeter and the ponding depth at Roof Area 2 and 3 is estimated at 152 mm at the drain and 0 mm at the roof perimeter, assuming a 1.0% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 19.64 m^3, Roof Area 2 is 24.78 m^3 and the rooftop storage available at Roof Area 3 is 22.56 m^3, for a total of 66.98 m^3, which is greater than the required volume of 64.46 m^3.

Therefore, by means of flat building rooftop storage and grading the site to the proposed grades as shown on the Proposed Grading and Servicing Plan and Proposed Rooftop Stormwater Management Plan Dwg. 819-106 G-1 and 819-106 SWM-1 respectively, the desirable five (5)-year storm and 100-year storm event rooftop detention volume of 31.20 m^3 and 66.98 m^3 respectively will be available on site.

The building weeping tile drainage will outlet via its separate 150mm diameter PVC storm lateral. The main building roof drains as well as the landscaped drains at the rooftop of the underground parking level at the amenity area will be outletted also via a separate 150mm PVC storm lateral, where upon both laterals are connected directly to the existing Old Richmond Road 750mm diameter storm sewer. The City of Ottawa recommends that pressurized drain pipe material be used in the building for the roof drain leader pipe in the event of surcharging in the City Storm sewer system. Refer to the proposed site grading and servicing plan (Dwg.

819-106 G-1) for details. The proposed reversed sloped down ramp to the underground garage parking level will have a trench drain with a 150mm diameter internal building storm pipe to drain the ramp area. Stormwater outlet for this reversed slope ramp area is the existing 250mm diameter Old Richmond Road sanitary sewer via the building's sanitary sewage pit and pumping system. Stormwater from the ramp drain cannot be connected to and outlet into the existing Old Richmond Road storm pipe due to potential oil content in the ramp area storm water collected.

572 Moodie Drive

The storm water outlet for the proposed development property will be the existing 750mm diameter concrete storm sewer located on Moodie Drive. The proposed 3 ½ storey three unit stacked dwelling is designed with pitched roofs and therefore on-site flat rooftop attenuation is not achievable with this proposed building on a small parcel of land ±0.0767 ha.

The building foundation weeping tile drainage system shall have its own separate pipe for gravity flow where weeping tile water is outletted via a 125mm diameter storm lateral to the existing 750mm diameter storm sewer from each of the (3) units.

Based on the residential site plan from the owner's architect, the average post development runoff coefficient is estimated at C = 0.71 and A = 0.0767 hectares.

The pre-development C_{pre} is estimated at C_{pre} = 0.58. Discussions were held with City Engineering staff and they recognize the limited lot size to building area of this site. Therefore, the site is to be designed with as much soft landscaping as possible so as to minimize post development flow impact and achieve where possible flows approximating to that of the pre-development levels into the existing Moodie Drive ditching and storm piping system.

In comparing the magnitude of the 5 Year and 100 Year pre and post development flow, the 5 Year post development flow of 15.78 L/s is slightly higher than the 5 Year pre-development flow of 12.89 L/s. As for the 100 Year post development flow of 30.47 L/s it is 7.24 L/s greater than the 100 Year pre-development flow of 23.23 L/s. Therefore, drainage from this proposed site development without rooftop SWM attenuation will increase the 5 Year flow by ±22.0% for the 5 Year event and ±31.0% for the 100 Year event in comparison to the current stormwater loading to the existing municipal storm sewer system.

The building weeping tile drainage system will outlet via its separate 125mm diameter PVC storm lateral for each of the (3) separate stacked units, where upon the (3) laterals are connected directly to the existing Moodie Drive 750mm diameter storm sewer. Refer to the Proposed Site Grading and Servicing Plan (Dwg. 819-106 G-2) for details.

Erosion and Sediment Control

The contractor shall implement Best Management Practices to provide for protection of the receiving storm sewer during construction activities. These practices are required to ensure no sediment and/or associated pollutants are released to the receiving watercourse. These practices include installation of a "siltsack" catch basin sediment control device or equal in catch basins as recommended by manufacturer on-site and off-site within the Moodie Drive and Old Richmond Road road right of way adjacent to this property. Siltsack shall be inspected every 2 to 3 weeks and after major storm. The deposits will be disposed of as per the requirements of the contract. See Dwg. 819-106 ESC-1 for details.

Refer to Appendix F for the summary of the Development Servicing Study Checklist that is applicable to this development.

PREPARED BY T.L. MAK ENGINEERING CONSULTANTS LTD.

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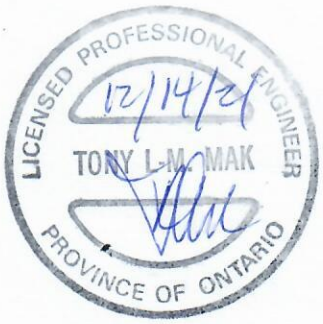


PROPOSED FOUR STOREY LOW RISE

RESIDENTIAL APARTMENT BUILDING SITE AT

4000 OLD RICHMOND ROAD

AND

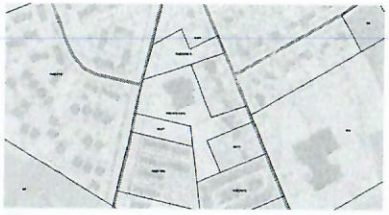
PROPOSED 3 ½ STOREY STACKED DWELLING AT

572 MOODIE DRIVE

CITY OF OTTAWA

APPENDIX A

SITE PLAN AND LEGAL SURVEY PLAN



0 SP ZONING MAP
Scale: NTS

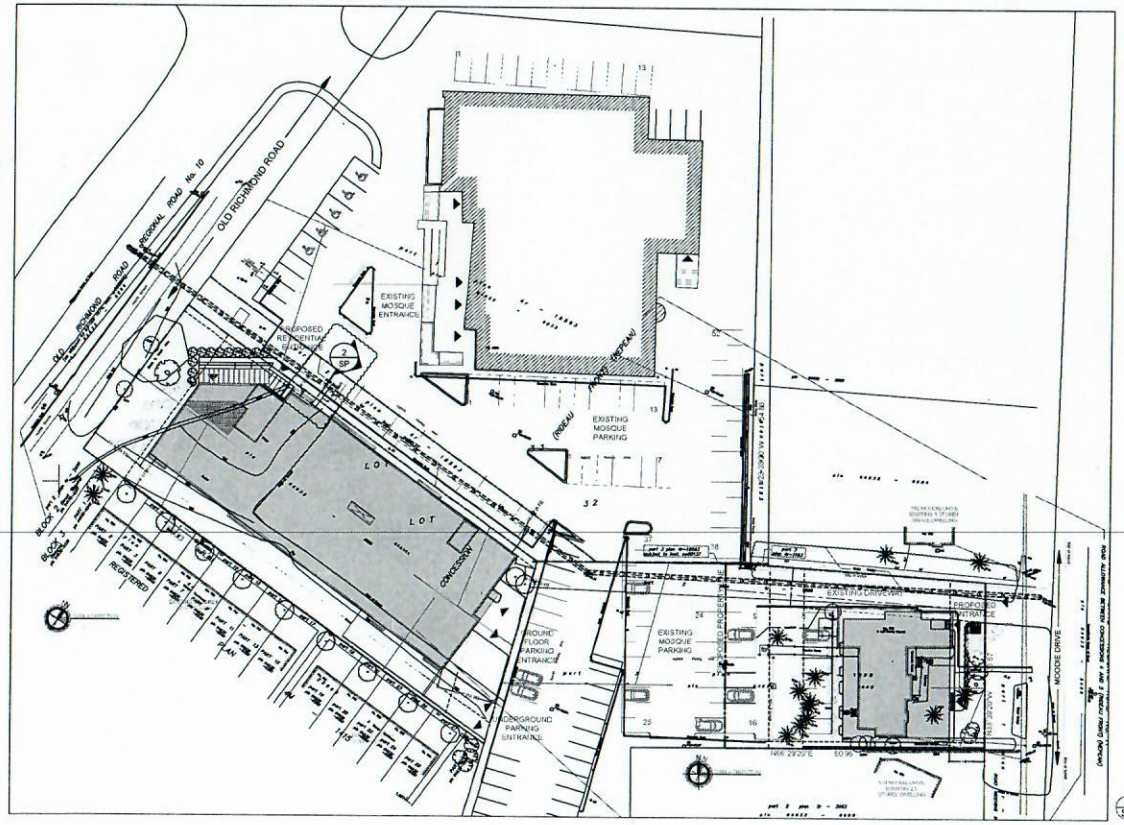
GROSS FLOOR AREA		
USE	GFA (M²)	UNITS
ASSISTED LIVING/ APARTMENT BUILDING	1,316	69
GROUND FLOOR PARKING	139	5
BASEMENT PARKING	2,126	84 SPACES
STACKED DWELLING	1,184	6
TOTAL	4,764	69+6 UNITS
EXISTING MOSQUE	4,404	

BICYCLE PARKING REQUIREMENTS			
BICYCLE PARKING	RATE	REQUIRED	PROPOSED
BUILDING "A"	0.5/UNIT	30	30
STACKED DWELLING	0.5/UNIT	3	3
TOTAL		30 + 3	30 + 3

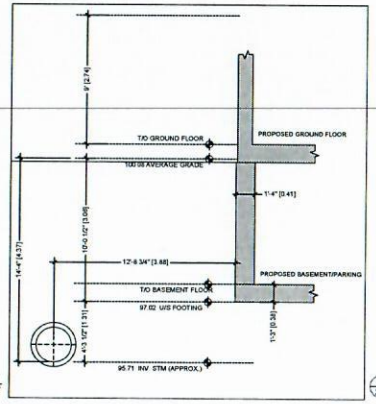
PARKING DIMENSIONS		
PARKING	DIMENSIONS	PROPOSED
BARRIER FREE TYPE A	3.4 M x 5.2 M W/ 1.5 M AISLE	1
BARRIER FREE TYPE B	2.4 M x 5.2 M W/ 1.5 M AISLE	2
PARKING SPACE	2.6 M x 5.2 M	70
SMALL PARKING SPACE	2.4 M x 5.2 M	3

PARKING REQUIREMENTS			
PARKING	RATE	REQUIRED	PROPOSED
EXISTING (MOSQUE)		185	181 EXISTING
ACCESIBLE PARKING			5 EXISTING
NUMBER OF REMOVED PARKING SPACES			11 REMOVED
TOTAL			175 REMAINED
ASSISTED LIVING-BUILDING "A"	(1.2 x 0.25)/2+0.725/UNIT, 1.2-APARTMENT BLDG, 0.25-RETIREMENT HOME	0.725x60=43.5	
GROUND FLOOR LEVEL			9
BASEMENT LEVEL			64
ACCESIBLE PARKING	N/A	N/A	3
TOTAL			73
STACKED DWELLING	1.2/UNIT	7.2	7.2
VISITOR PARKING	RATE	REQUIRED	PROPOSED
VISITOR PARKING (BUILDING "A")	0.2/UNIT	12	12
VISITOR PARKING (STACKED DWELLING)	0.2/UNIT	1.2	1.2
SUBTOTAL		13.2	13
EXTERIOR			0 NEW PARKING SPACES
INDOOR (GROUND FLOOR + BASEMENT)			73 NEW
TOTAL			73 NEW PARKING SPACES
LANDSCAPE BUFFER	RATE	REQUIRED	PROPOSED
BUILDING "A"	N/A	N/A	N/A
STACKED DWELLING	NOT ABUTTING A STREET	1.5 M	1.5 M
STACKED DWELLING	15% OF THE AREA OF ANY PARKING LOT	EXISTING	EXISTING=42.6 M²

ZONING REQUIREMENTS			
LOW-RISE APARTMENT BUILDING	EXISTING REQUIREMENT FOR R3F	REQUIREMENT FOR R4Z	PROPOSED
MINIMUM LOT WIDTH	19.5 M	18 M	30.37 M
MINIMUM LOT AREA	600 M²	450 M²	2,396 M²
MINIMUM FRONT YARD SETBACK	6 M	3 M	9.14 M
MINIMUM REAR YARD SETBACK	30% OF LOT DEPTH=23.76 M	THE MINIMUM REQUIRED REAR YARD SETBACK IS 6 METRES. NOTWITHSTANDING THE FOREGOING, WHERE THE REAR LOT LINE ABUTS THE INTERIOR SIDE LOT LINE OF AN ABUTTING LOT, THE MINIMUM REQUIRED REAR YARD SETBACK IS EQUAL TO THE MINIMUM REQUIRED INTERIOR SIDE YARD SETBACK OF THE ABUTTING LOT ALONG EACH POINT OF THE SHARED LOT LINE	3.39 M - 10.15 M
MINIMUM INTERIOR SIDE YARD SETBACK	MIN. TOTAL IS 2.1 M, ONE SIDE NO LESS THAN 0.9 M	1.5 M (FOR HEIGHT LESS THAN 11 M), 3 M FOR HEIGHT GREATER THAN 11), OTHERWISE 6M	5.9 M & 1.22 M
MINIMUM CORNER SIDE YARD SETBACK	4.5 M	N/A	N/A
MAXIMUM HEIGHT	9.5 M	14.5 M	12 M
CONDITIONAL USE	N/A	N/A	N/A
PERMITTED PROJECTIONS INTO REQUIRED YARDS - BALCONIES, MAX. PROJECTION		2 METRES, BUT NO CLOSER THAN 1 METRE FROM ANY LOT LINE	0.6 M
		1.8 M INTO AN INTERIOR SIDE YARD, BUT NOT CLOSER THAN 0.6 M TO A SIDE LOT LINE	0.6 M
PERMITTED PROJECTIONS INTO REQUIRED YARDS - CANOPIES AND AWNINGS		A DISTANCE EQUAL TO ½ THE DEPTH OF A FRONT, REAR OR CORNER SIDE YARD BUT NOT CLOSER THAN 0.6 M TO A LOT LINE.	0.6 M
AMENITY AREA	N/A	6 M² PER DWELLING UNIT = 360 M² COMMUNAL AMENITY AREA-A MINIMUM OF 50% OF THE REQUIRED TOTAL AMENITY AREA	361 M² (50% COMMUNAL)



1 SP SITE PLAN
Scale: 1/32"=1'-0"



2 SP FOOTING/STM SECTION
Scale: 1/4"=1'-0"

LOW-RISE APARTMENT BUILDING
3990 OLD RICHMOND ROAD

STACKED DWELLING
572 MOODIE DRIVE

NO	REVISION	DATE
10		
09		
08		
07		
06		
05	REISSUED FOR BUILDING PERMIT	
04	ISSUED FOR BUILDING PERMIT	
03	ISSUED FOR ZONING AMENDMENT	
02	REVISED FOR COORDINATION	01/06/2021
01	ISSUED FOR PRELIMINARY DESIGN REVIEW	19/02/2020

NOTE:
1. All dimensions are to be checked onsite. Discrepancies or ambiguities should be reported prior to work on site or ordering materials.
2. All work to comply with Ontario Building Code.
3. All dimensions include thickness of gypsum board on stud walls.
4. Drawings to be read in conjuction with structural drawings.

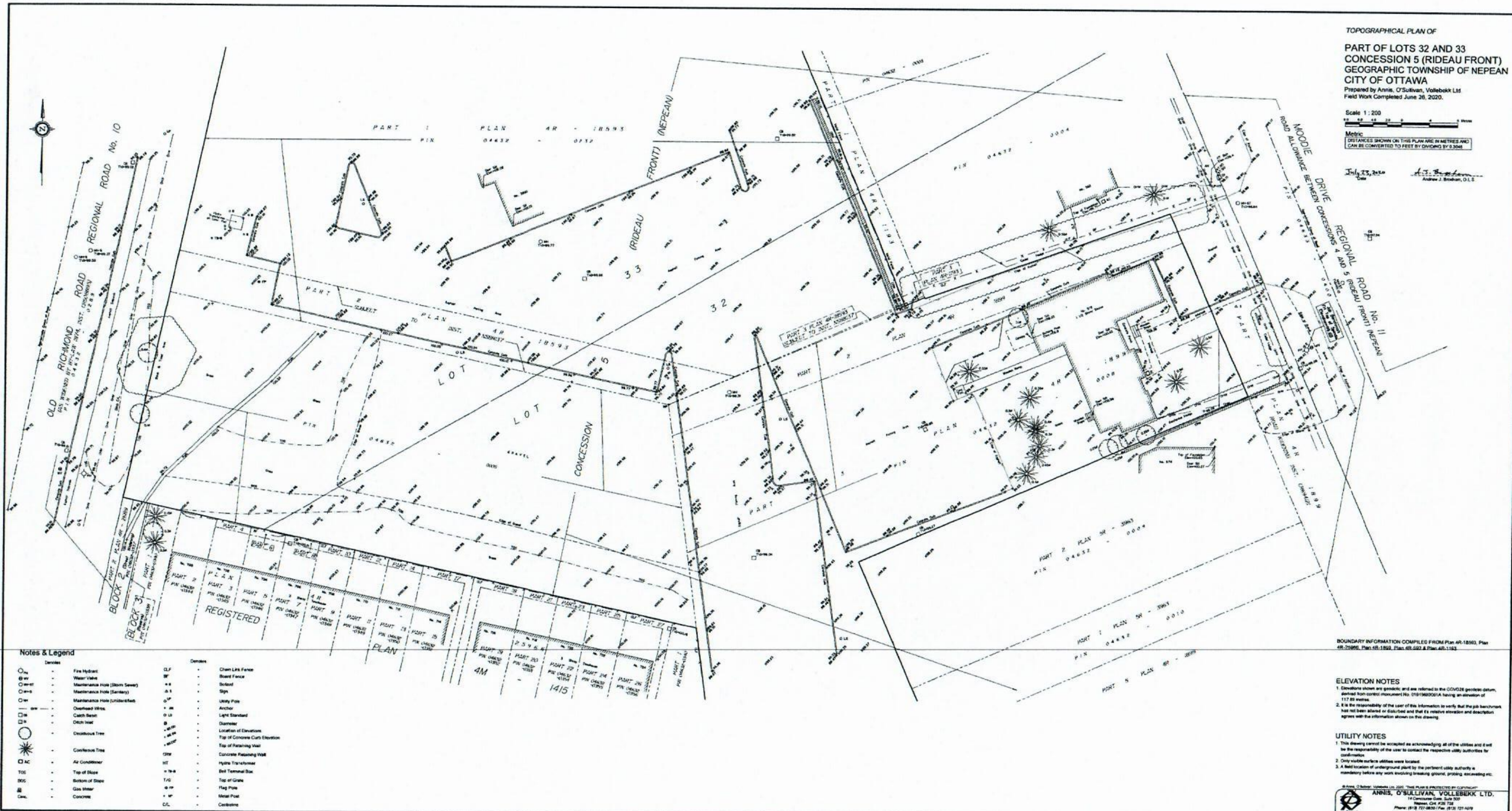
SUSAN D. SMITH ARCHITECT
941 MERIVALE RD,
OTTAWA, ON, K1Z 6A1
613.722.5327
s.smith@sdsarch.ca

PROJECT TITLE:
ZONING AMENDMENT
3990 OLD RICHMOND ROAD &
572 MOODIE DRIVE

DRAWING TITLE:

PROJECT START DATE: APRIL, 2019	DRAWN BY: ZK
SCALE: 3/16" = 1'-0"	JOB No.: 1917
REVIEWED BY:	SHEET No.: SP

PRELIMINARY



TOPOGRAPHICAL PLAN OF
PART OF LOTS 32 AND 33
CONCESSION 5 (RIDEAU FRONT)
GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA
Prepared by Annis, O'Sullivan, Vollebekk Ltd.
Field Work Completed June 26, 2020.
Scale 1 : 200
Metric
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048
Andrew J. Brookam, O.L.S.
MOODIE DRIVE REGIONAL ROAD No. 11
ROAD ALLOWANCE BETWEEN CONCESSIONS 4 AND 5 (RIDEAU FRONT) (NEPEAN)
OLD RICHMOND ROAD REGIONAL ROAD No. 10
PART 1 PLAN 4R - 18593
(RIDEAU FRONT) (NEPEAN)
LOT 33
LOT 32
LOT 5
CONCESSION
REGISTERED PLAN 4M - 1415
BLOCK 2
BLOCK 3
PART 2 PLAN 5R - 3863
PART 1 PLAN 5R - 3863
BOUNDARY INFORMATION COMPILED FROM Plan 4R-18593, Plan 4R-25986, Plan 4R-1869, Plan 4R-597 & Plan 4R-1163
ELEVATION NOTES
1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum, derived from control monument No. 01919680081A having an elevation of 117.89 metres.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.
UTILITY NOTES
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
Ontario Land Surveyors
Notes & Legend
Denotes
Fire Hydrant
Water Valve
Maintenance Hole (Storm Sewer)
Maintenance Hole (Sanitary)
Maintenance Hole (Unidentified)
Overhead Wires
Catch Basin
Ditch Inlet
Deciduous Tree
Coniferous Tree
Air Conditioner
TOS - Top of Slope
BOS - Bottom of Slope
Gas Meter
Conc. - Concrete
CLF - Chain Link Fence
BF - Board Fence
Bollard
Sign
Utility Pole
Anchor
Light Standard
Diameter
Location of Elevations
Top of Concrete Curb Elevation
Top of Retaining Wall
CRW - Concrete Retaining Wall
HT - Hydro Transformer
Bell Terminal Box
T/G - Top of Grate
Flag Pole
Metal Post
C/L - Centreline

PROPOSED FOUR STOREY LOW RISE

RESIDENTIAL APARTMENT BUILDING SITE AT

4000 OLD RICHMOND ROAD

AND

PROPOSED 3 ½ STOREY STACKED DWELLING AT

572 MOODIE DRIVE

CITY OF OTTAWA

APPENDIX B

SITE PRE-DEVELOPMENT CONDITION

GOOGLE IMAGE (2019)

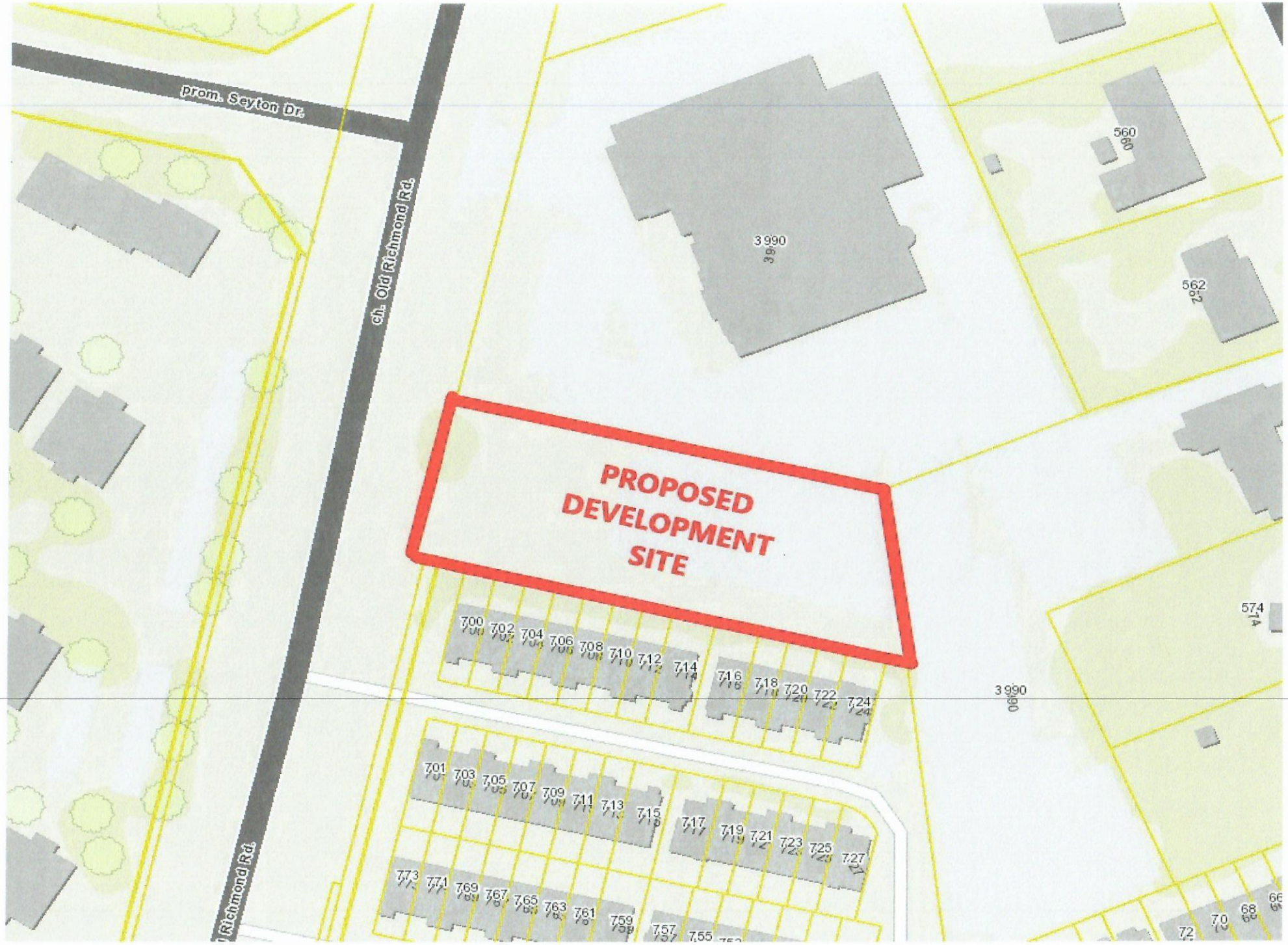
AND

AERIAL PHOTOGRAPHY 2019 (GEOOTTAWA)

2019


prom. Seyton Dr.
ch. Old Richmond Rd.
ch. Old Richmond Rd.
prom. Moodie Dr.
PROPOSED DEVELOPMENT SITE
3990
3990
560
562
574
578
68
prive Sanibel Priv.
prive Songbird Priv.
700 702 704 706 708 710 712 714 716 718 720 722 724
701 703 705 707 709 711 713 715 717 719 721 723 725 727
773 771 769 767 765 763 761 759 757 755 753 751 749 747 745
50 52 54 56 58 60 62 64 66 68 70 72 74 76 78
57 55 123 131

2019


prom. Seyton Dr.
ch. Old Richmond Rd.
Richmond Rd.
PROPOSED DEVELOPMENT SITE
3 990
560
562
574
700 702 704 706 708 710 712 714
716 718 720 722 724
701 703 705 707 709 711 713 715
717 719 721 723 725 727
773 771 769 767 765 763 761 759
757 755
70 68 72

2019

2019

2019


562
591
PROPOSED
DEVELOPEMENT
SITE
prom. Moodie Dr.
prom. Moodie Dr.
574
3990

2019

PROPOSED FOUR STOREY LOW RISE

RESIDENTIAL APARTMENT BUILDING SITE AT

4000 OLD RICHMOND ROAD

AND

PROPOSED 3 ½ STOREY STACKED DWELLING AT

572 MOODIE DRIVE

CITY OF OTTAWA

APPENDIX C

OLD RICHMOND ROAD AND MOODIE DRIVE

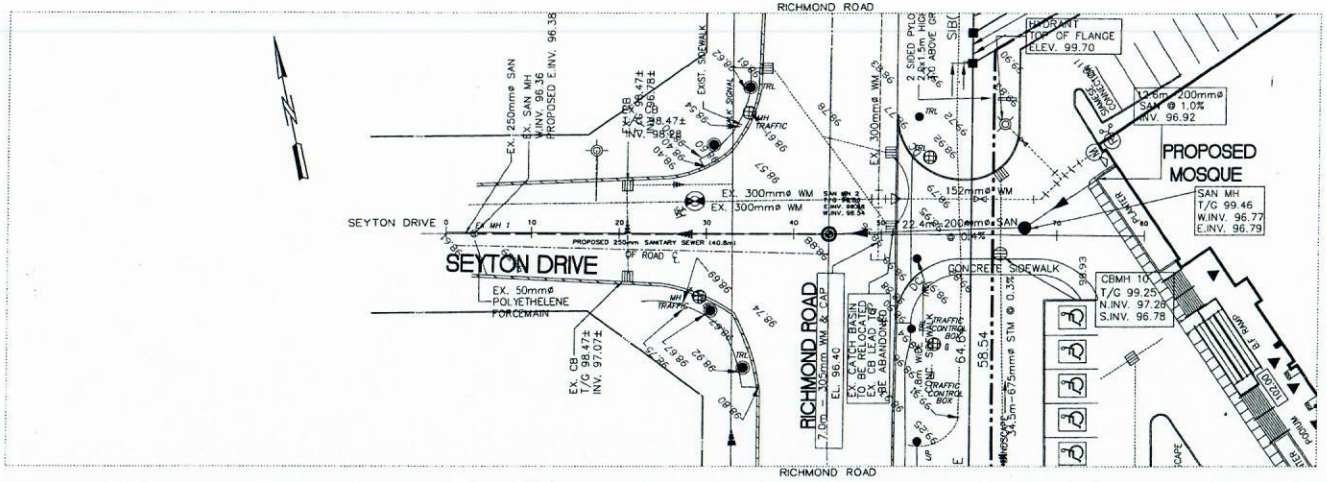
CITY OF OTTAWA

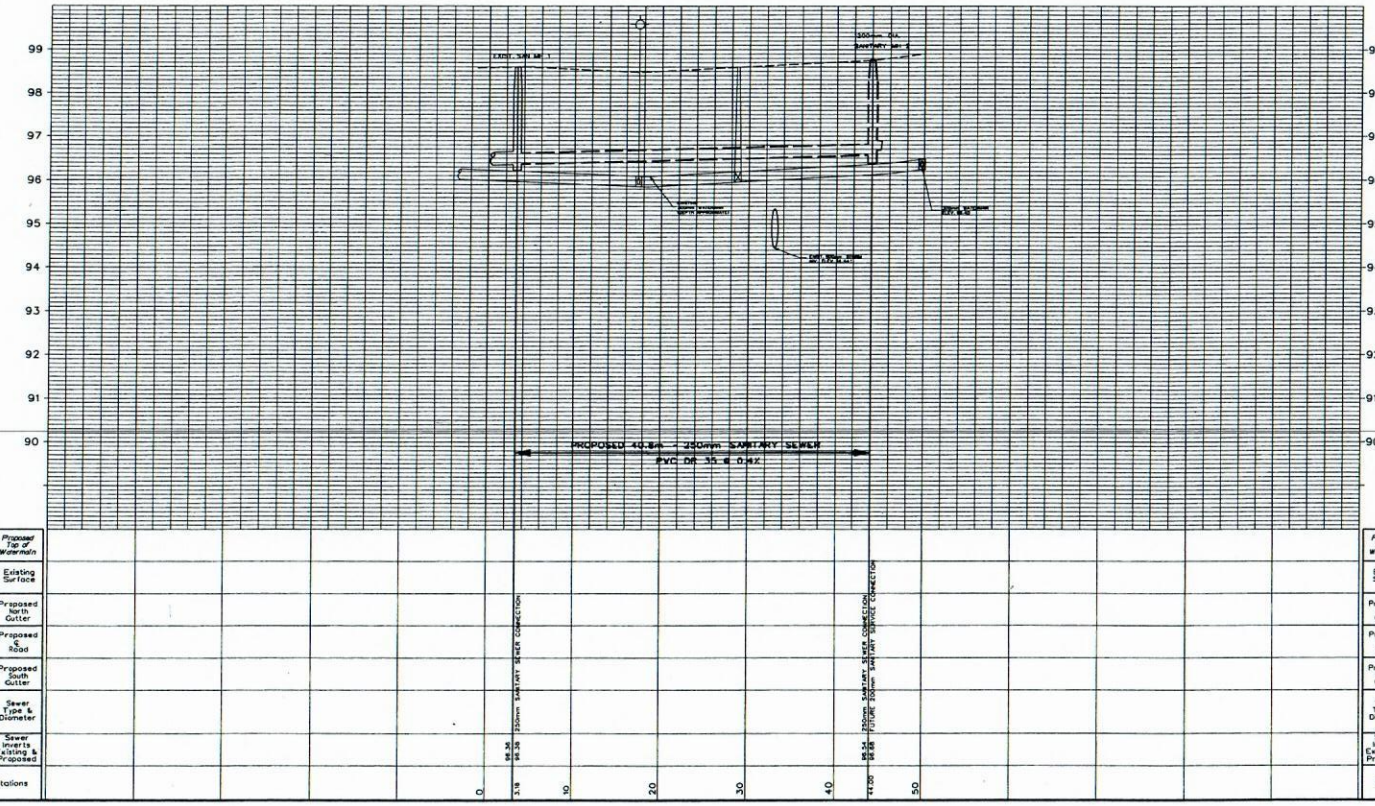
PLAN AND PROFILE

AND

UCC DRAWINGS

SEYTON DRIVE





Revisions:

No.	Date	Description	Drawn By	Approved By
3	NOV. 2005	REVISED PER CITY OF OTTAWA COMMENTS	MF	PDR
2	SEPT. 2005	REVISED BUILDING LOCATION	MF	PDR
1	NOV. 2004	ISSUED FOR APPROVAL	MF	PDR

Design:

Designed By K. ADAMS, C.I.T.	Date	Checked By P.D. REEVE, P.ENG.	Date
Survey Detail By	Date	Field Checked By	Date
Drafting By M. FASSBENDER	Date	Checked By	Date

P. D. REEVE — 2004-NOV-26 — PROVINCE OF ONTARIO

Construction Services Manager

Final Measurements:

Construction Type		Inspector	
Work Commenced		Project Manager	
Work Completed		Field Book #	
Contractor		Data	
Drafting Revisions	Date	Checked By	

Tender Notes:

1. Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
2. Soil information taken from : TROW ASSOCIATES
3. Date of television inspection :
4. This plan supercedes (in whole or in part) plan #
5. While illustrations and utilities shown are taken from the best available information, they cannot be guaranteed.
6. The contractor is requested to check with all utility companies.

Infrastructure Review by the Approvals Division
Signed
Date 2006/05/30
Drawing # 14032

J.L. Richards & Associates Limited
Consulting Engineers, Architects & Planners
864 LADY ELLEN PLACE, OTTAWA, CANADA K1Z 5M2
JLR# 19787-03

Watermain Notes:

1. All watermain materials and construction methods shall be in accordance with the latest edition of the City of Ottawa Standard Specifications and Standard Drawings.

Legal Survey Notes:

Boundary information shown hereon has been compiled and calculated from Teranet data and not based on an actual survey.
Distances shown to survey monuments are for reference purposes only, survey monuments may not define property boundaries.

THIS IS NOT A PLAN OF SURVEY

This plan was compiled from plans and documents recorded in the Land Registry System and has been prepared for property indexing purposes only.

Ottawa

Public Works and Services Department
Construction Services Development
110 LAURIER AVENUE WEST, OTTAWA, ONTARIO, K1P 1J1

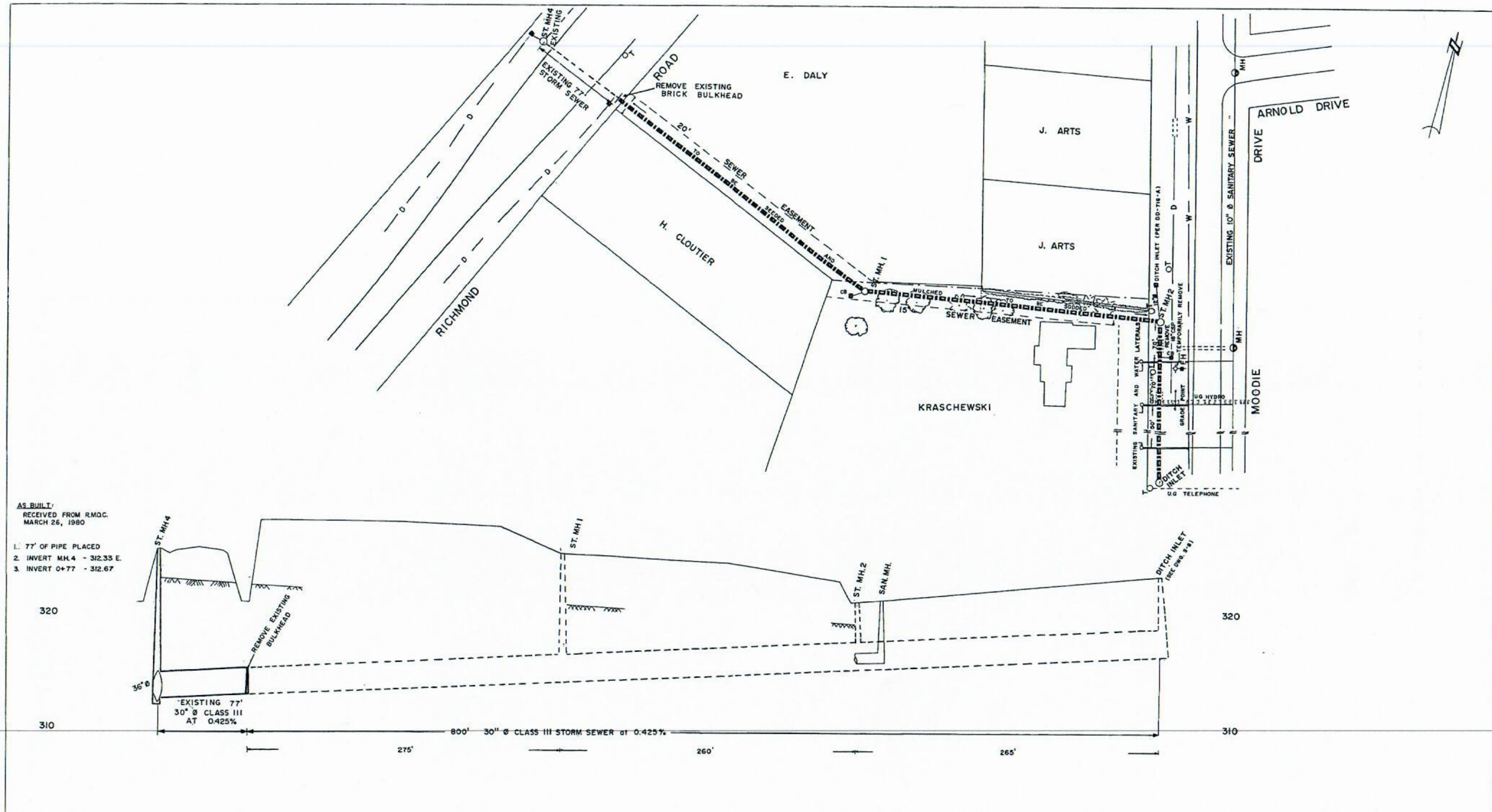
Rosemarie Leclair, General Manager	Richard Hewitt, P.Eng., Branch Director

SEYTON DRIVE
PLAN AND PROFILE
STA. 0.00 TO 50.00

Contract No.	Survey Books	Scale	Plan No.
		HOR. 1:250 VERT. 1:50	19787-03 Sheet 1 of 1

Filename: 19787-03.DGN

14032



STATIONS	SURFACE	STORM INVERT
22+05	325.70	311.83
22+16	32505	312.33
22+40	325.56	
22+72	320.80	
22+80		312.67
22+90	328.00	
24+00	327.90	
25+00	327.40	
25+55	325.10	313.82
26+00	324.70	
27+00	324.30	
28+00	322.60	
28+15	320.80	314.90
30+80	323.40	316.07

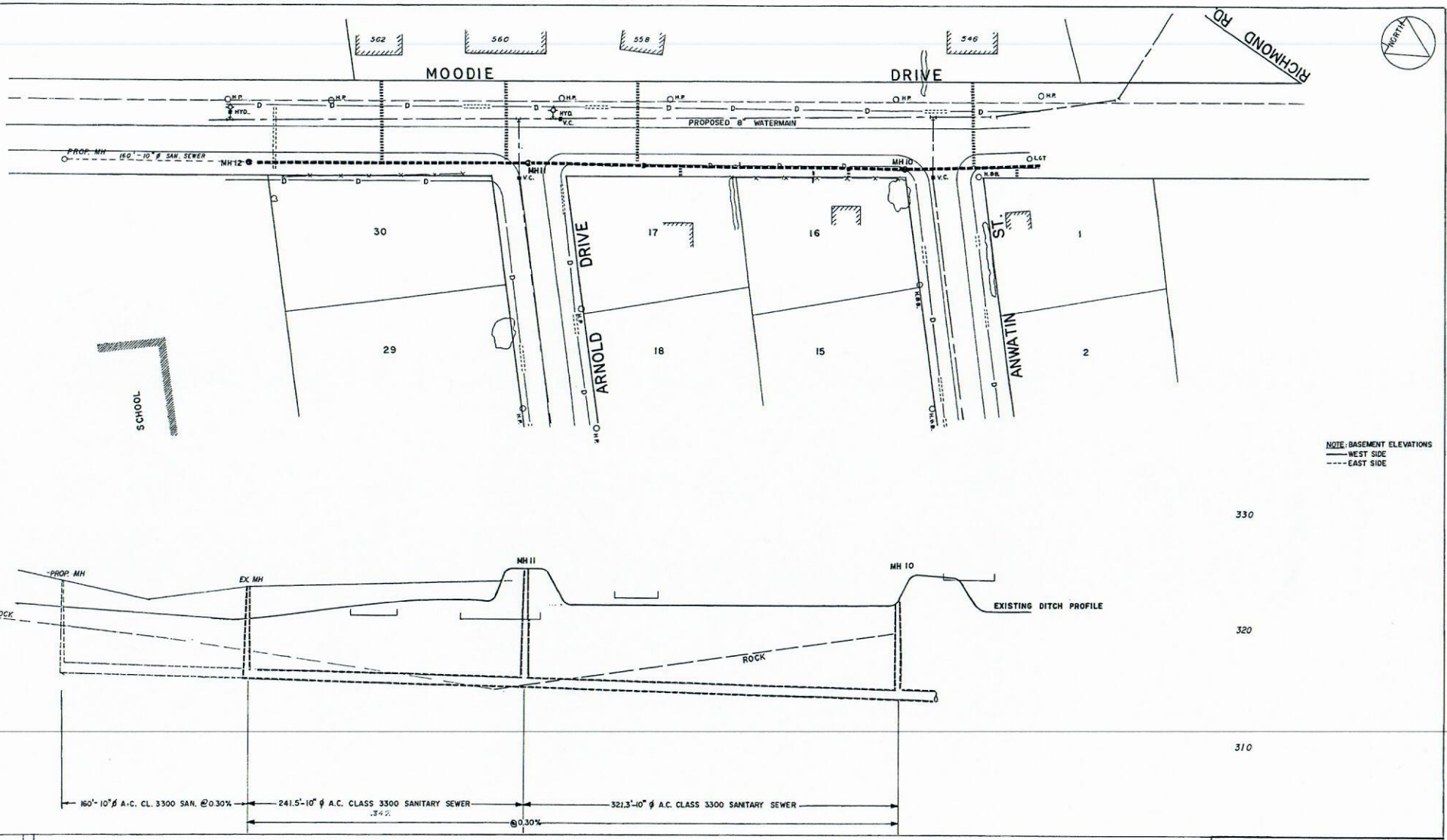
ELEVATIONS

CITY OF NEPEAN
WORKS DEPARTMENT

MOODIE DRIVE
STORM SEWERS

A.C. BELLINGER, P. ENG.
COMMISSIONER OF WORKS

DWG c.B.
CKD. R.
DATE 14-3-80
SCALE H1" = 40' V1" = 4'
DWG NO.



SURFACE ELEVATIONS	324.90	322.50	323.50	322.2	322.6	325.1	322.0	322.0	322.0	324.6
SANITARY INVERT	316.15		315.67			314.98			314.00	
STATIONS	32+00	31+00	30+00	29+00	28+00	27+74.5	27+00	26+00	25+00	

TOWNSHIP OF NEPEAN
DEPARTMENT OF ENGINEERING

ARBEATHA PARK

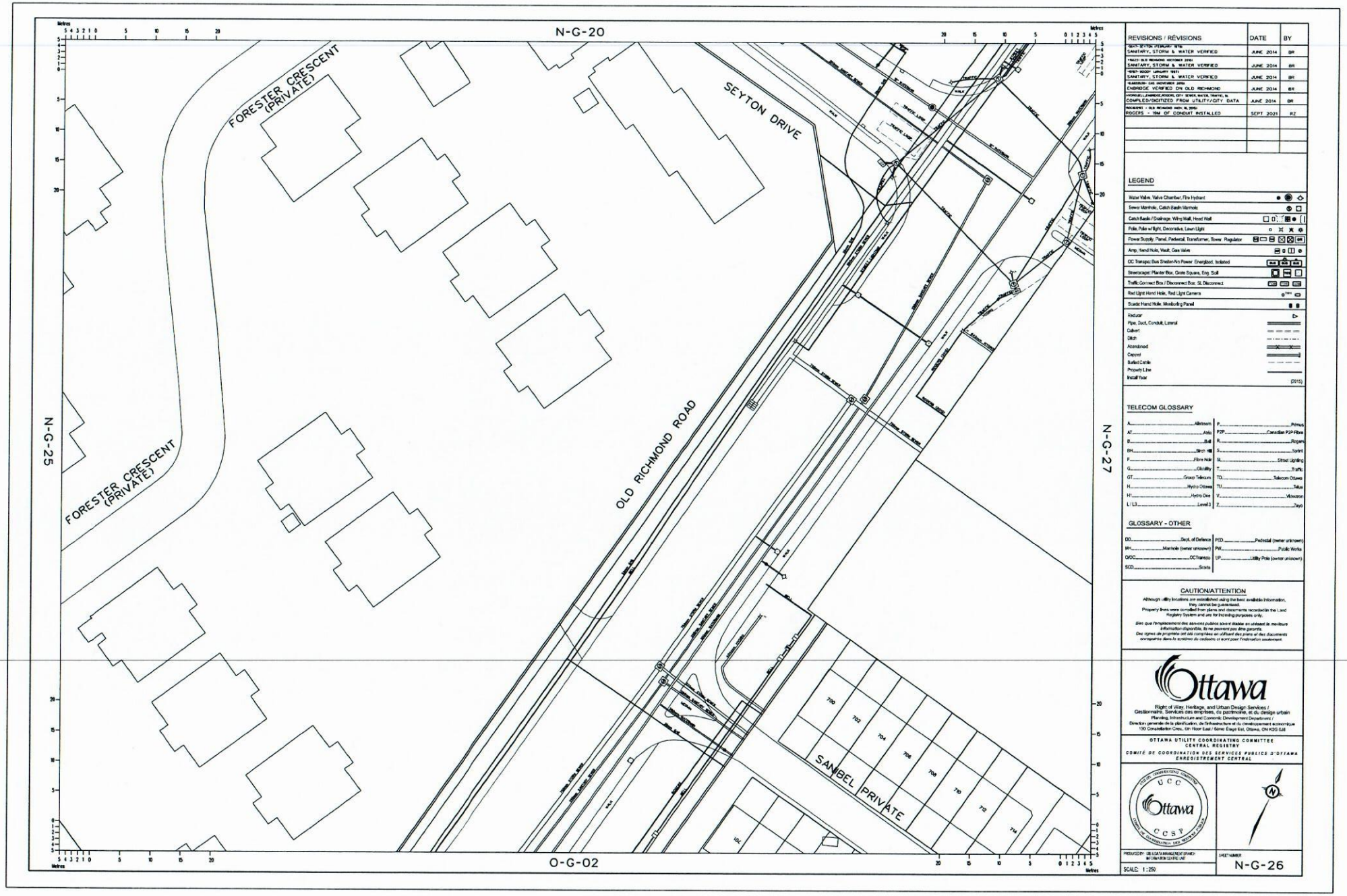
SANITARY SEWERS
(NEW SCHOOL)

E. J. COLE P. ENG.
COMMISSIONER OF WORKS

DWG 122
CKD
DATE 13-4-71

SCALE H 1"=40'
V 1"=4'

DWG NO. 9405-4



REVISIONS / RÉVISIONS	DATE	BY
SANITARY, STORM & WATER VERIFIED	JUNE 2014	BR
SANITARY, STORM & WATER VERIFIED	JUNE 2014	BR
SANITARY, STORM & WATER VERIFIED	JUNE 2014	BR
ENBRIDGE VERIFIED ON OLD RICHMOND	JUNE 2014	BR
COMPLETED/DIGITIZED FROM UTILITY/CITY DATA	JUNE 2014	BR
RIDGERS - 19M OF CONDUIT INSTALLED	SEPT 2021	RZ

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
- Amp, Hand Hole, Vault, Gas Valve
- OC Transpo: Bus Shelter-No Power, Energized, Isolated
- Streetscape: Planter Box, Grate Square, Eng. Soil
- Traffic Connect Box / Disconnect Box, SL Disconnect
- Red Light Hand Hole, Red Light Camera
- Scada: Hand Hole, Monitoring Panel
- Reducer
- Pipe, Duct, Conduit, Lateral
- Culvert
- Ditch
- Abandoned
- Capped
- Bailed Cable
- Property Line
- Install Year (2015)

TELECOM GLOSSARY

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

GLOSSARY - OTHER

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

CAUTION/ATTENTION

Although utility locations are established using the best available information, they cannot be guaranteed.
Property lines were compiled from plans and documents recorded in the Land Registry System and are for tracing purposes only.

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 du cadastre et sont pour l'instruction seulement.

Ottawa

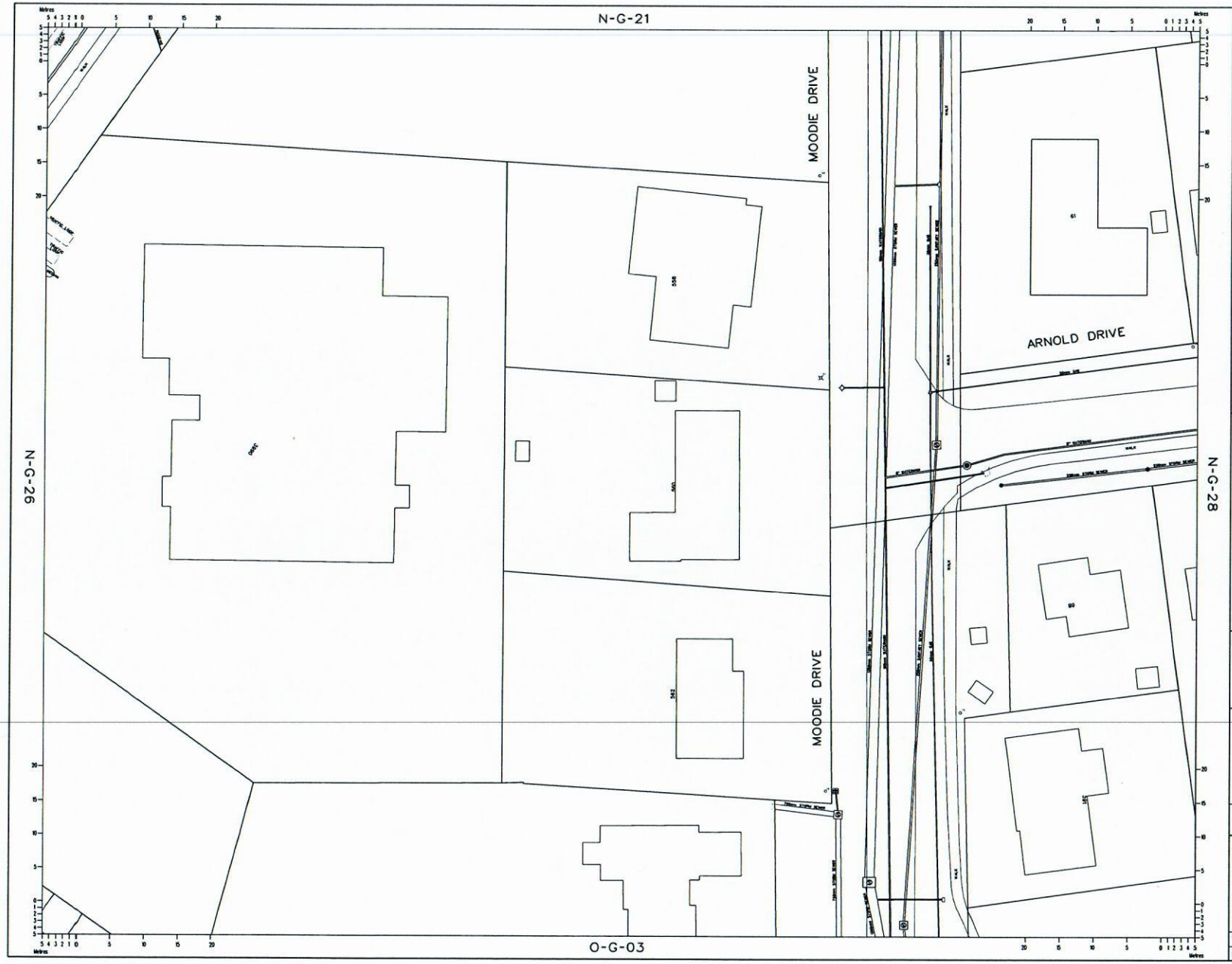
Right of Way, Heritage, and Urban Design Services / Gestionnaire, Services des emprises, du patrimoine, et du design urbain
Planning, Infrastructure and Economic Development Department / Direction générale de la planification, de l'infrastructure et du développement économique
100 Constellation Cres., 6th Floor East / 6ème Étage Est, Ottawa, ON K2G 5J8

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

PRODUCED BY: GIS DATA MANAGEMENT BRANCH
INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
N-G-26



REVISIONS / RÉVISIONS	DATE	BY
SANITARY, STORM & WATER VERIFIED	JUNE 2014	BR
SANITARY, STORM & WATER VERIFIED	JUNE 2014	BR
CATCH BASIN CONDUIT VERIFIED	JUNE 2014	BR
COMPILED/DIGITIZED FROM UTILITY/CITY DATA	JUNE 2014	BR

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	
Amp, Hand Hole, Vault, Gas Valves	
OC Transpo, Bus Shelter-No Power, Energized, Isolated	
Streetscape: Planter Box, Grate Square, Eng. Soil	
Traffic Connect Box / Disconnect Box, SL Disconnect	
Red Light Hand Hole, Red Light Camera	
Scada: Hand Hole, Monitoring Panel	
Reducer	
Pipe, Duct, Conduit, Lateral	
Culvert	
Ditch	
Abandoned	
Carpool	
Buried Cable	
Property Line	
Install Year	(2015)

TELECOM GLOSSARY

A	Allstream	P	Primus
AT	Aliant	P2P	Canadian P2P Fibre
B	Bell	R	Rogers
BH	Birch Hill	S	Sprint
F	Fibre Hub	SL	Street Lighting
G	Globility	T	Traffic
GT	Group Telecom	TO	Telecom Ottawa
H	Hydro Ottawa	TU	Telus
H1	Hydro One	V	Videotron
L / L1	Level 3	Z	Zayo

GLOSSARY - OTHER

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

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Les 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

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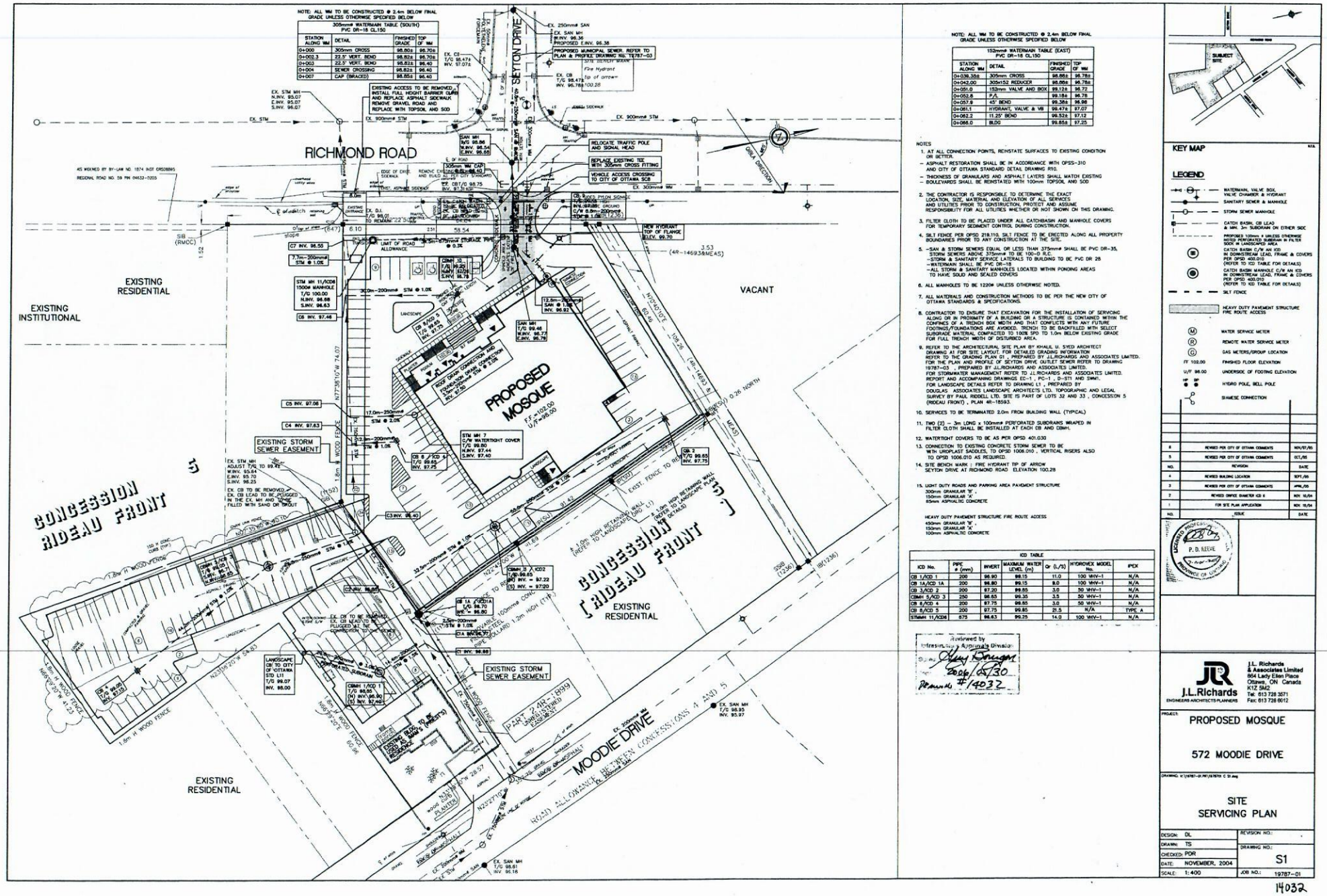
Planning, Infrastructure and Economic Development Department /
Direction générale de la planification, de l'infrastructure et du développement économique
100 Constellation Cres., 6th Floor East / 6ème Étage Est, Ottawa, ON K2G 6J8

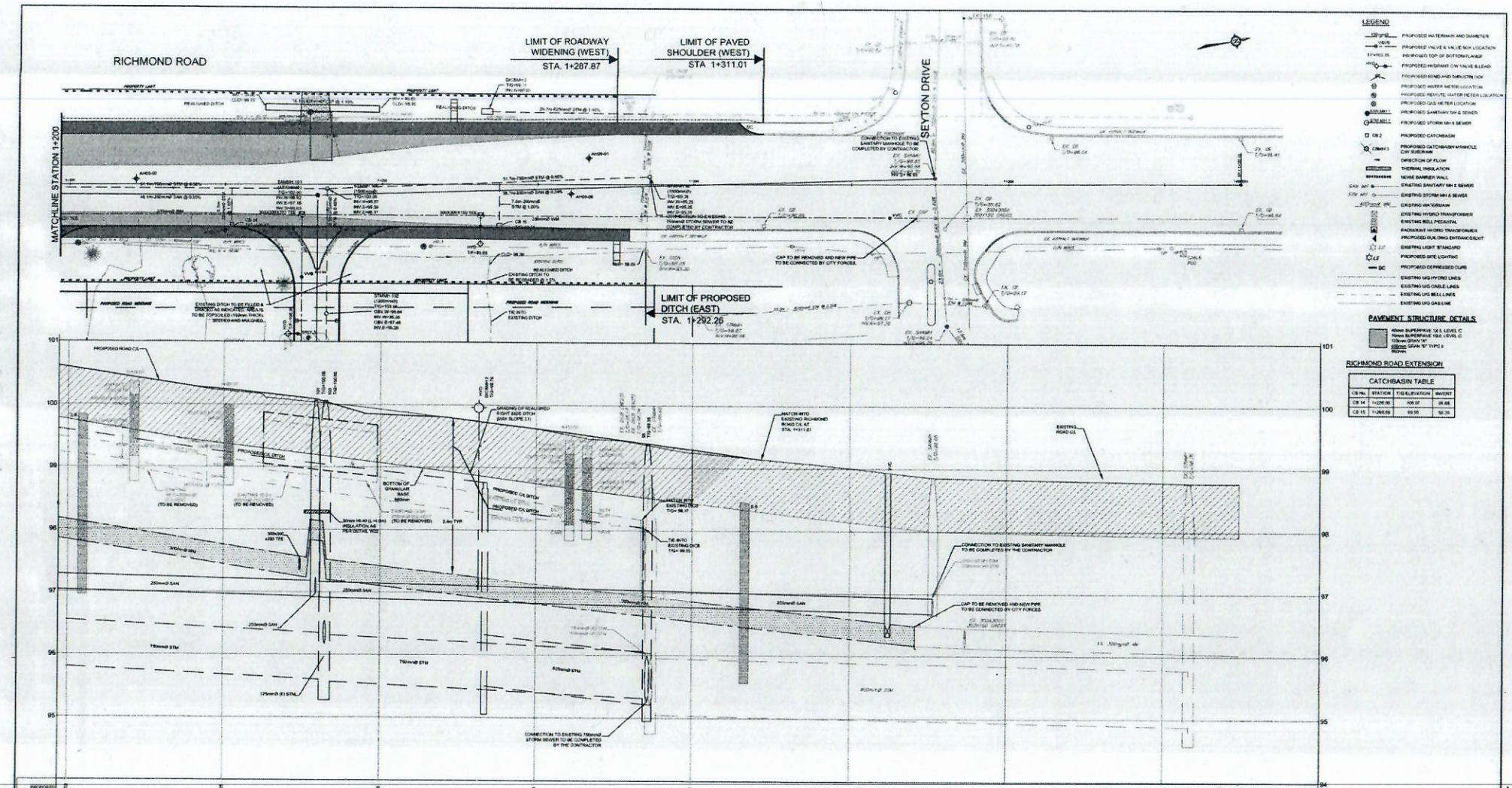
OTTAWA UTILITY COORDINATING COMMITTEE
CENTRAL REGISTRY
COMITÉ DE COORDINATION DES SERVICES PUBLICS D'OTTAWA
ENREGISTREMENT CENTRAL

PREPARED BY: GIS & DATA MANAGEMENT BRANCH
INFORMATION CENTRE, LMT

SCALE: 1:250

SHEET NUMBER
N-G-27


RICHMOND ROAD
SETTON DRIVE
MOODIE DRIVE
EXISTING RESIDENTIAL
EXISTING INSTITUTIONAL
VACANT
PROPOSED MOSQUE
CONCESSION RIDEAU FRONT 5
CONCESSION RIDEAU FRONT 5 J
EXISTING STORM SEWER EASEMENT
EXISTING RESIDENTIAL
EXISTING RESIDENTIAL
NOTE: ALL WM TO BE CONSTRUCTED @ 2.4m BELOW FINAL GRADE UNLESS OTHERWISE SPECIFIED BELOW
305mm Ø WATERMAIN TABLE (SOUTH) PVC DR-18 CL150
STATION ALONG WM | DETAIL | FINISHED TOP GRADE OF WM
0+000 | 305mm CROSS | 98.80± | 98.70±
0+002.3 | 22.5° VERT. BEND | 98.82± | 98.70±
0+003 | 22.5° VERT. BEND | 98.82± | 98.40
0+004 | SEWER CROSSING | 98.82± | 98.40
0+007 | CAP (BRACED) | 98.85± | 98.40
NOTE: ALL WM TO BE CONSTRUCTED @ 2.4m BELOW FINAL GRADE UNLESS OTHERWISE SPECIFIED BELOW
152mm Ø WATERMAIN TABLE (EAST) PVC DR-18 CL150
STATION ALONG WM | DETAIL | FINISHED TOP GRADE OF WM
0+039.35± | 305mm CROSS | 98.95± | 98.78±
0+042.00 | 305x152 REDUCER | 98.88± | 98.78±
0+051.0 | 152mm VALVE AND BOX | 99.12± | 98.72
0+052.8 | P.I. | 99.18± | 98.78
0+057.9 | 45° BEND | 99.38± | 98.98
0+061.1 | HYDRANT, VALVE & WB | 99.47± | 97.07
0+062.2 | 11.25° BEND | 99.52± | 97.12
0+066.0 | BLOW | 99.85± | 97.25
NOTES
1. AT ALL CONNECTION POINTS, REINSTATE SURFACES TO EXISTING CONDITION OR BETTER.
– ASPHALT RESTORATION SHALL BE IN ACCORDANCE WITH OPSS-310 AND CITY OF OTTAWA STANDARD DETAIL DRAWING R10.
– THICKNESS OF GRANULARS AND ASPHALT LAYERS SHALL MATCH EXISTING
– BOULEVARDS SHALL BE REINSTATED WITH 100mm TOPSOIL AND SOD
2. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL SERVICES AND UTILITIES PRIOR TO CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. FILTER CLOTH TO BE PLACED UNDER ALL CATCHBASIN AND MANHOLE COVERS FOR TEMPORARY SEDIMENT CONTROL DURING CONSTRUCTION.
4. SILT FENCE PER OPSD 219.110. SILT FENCE TO BE ERECTED ALONG ALL PROPERTY BOUNDARIES PRIOR TO ANY CONSTRUCTION AT THE SITE.
5. –SAN & STORM SEWERS EQUAL OR LESS THAN 375mm SHALL BE PVC DR-35, STORM SEWERS ABOVE 375mm TO BE 100-D R.C.
–STORM & SANITARY SERVICE LATERALS TO BUILDING TO BE PVC DR 28
–WATERMAIN SHALL BE PVC DR-18
–ALL STORM & SANITARY MANHOLES LOCATED WITHIN PONDING AREAS TO HAVE SOLID AND SEALED COVERS
6. ALL MANHOLES TO BE 1220ø UNLESS OTHERWISE NOTED.
7. ALL MATERIALS AND CONSTRUCTION METHODS TO BE PER THE NEW CITY OF OTTAWA STANDARDS & SPECIFICATIONS.
8. CONTRACTOR TO ENSURE THAT EXCAVATION FOR THE INSTALLATION OF SERVICING ALONG OR IN PROXIMITY OF A BUILDING OR A STRUCTURE IS CONTAINED WITHIN THE CONFINES OF A TRENCH BOX WIDTH AND THAT CONFLICTS WITH ANY FUTURE FOOTINGS/FOUNDATIONS ARE AVOIDED. TRENCH TO BE BACKFILLED WITH SELECT SUBGRADE MATERIAL COMPACTED TO 100% SPD TO 1.0m BELOW EXISTING GRADE FOR FULL TRENCH WIDTH OF DISTURBED AREA.
9. REFER TO THE ARCHITECTURAL SITE PLAN BY KHALIL U. SYED ARCHITECT DRAWING A1 FOR SITE LAYOUT. FOR DETAILED GRADING INFORMATION REFER TO THE GRADING PLAN D1 , PREPARED BY J.L.RICHARDS AND ASSOCIATES LIMITED. FOR THE PLAN AND PROFILE OF SEYTON DRIVE OUTLET SEWER REFER TO DRAWING 19787–03 , PREPARED BY J.L.RICHARDS AND ASSOCIATES LIMITED. FOR STORMWATER MANAGEMENT REFER TO J.L.RICHARDS AND ASSOCIATES LIMITED. REPORT AND ACCOMPANYING DRAWINGS EC–1 , PC–1 , D–ST1 AND SWM1. FOR LANDSCAPE DETAILS REFER TO DRAWING L1 , PREPARED BY DOUGLAS ASSOCIATES LANDSCAPE ARCHITECTS LTD. TOPOGRAPHIC AND LEGAL SURVEY BY PAUL RIDDELL LTD. SITE IS PART OF LOTS 32 AND 33 , CONCESSION 5 (RIDEAU FRONT) , PLAN 4R–18593.
10. SERVICES TO BE TERMINATED 2.0m FROM BUILDING WALL (TYPICAL)
11. TWO (2) – 3m LONG x 100mm PERFORATED SUBDRAINS WRAPED IN FILTER CLOTH SHALL BE INSTALLED AT EACH CB AND CBMH.
12. WATERTIGHT COVERS TO BE AS PER OPSD 401.030
13. CONNECTION TO EXISTING CONCRETE STORM SEWER TO BE WITH UNIQPLAST SADDLES, TO OPSD 1006.010 , VERTICAL RISERS ALSO TO OPSD 1006.010 AS REQUIRED.
14. SITE BENCH MARK : FIRE HYDRANT TIP OF ARROW SEYTON DRIVE AT RICHMOND ROAD ELEVATION 100.28
15. LIGHT DUTY ROADS AND PARKING AREA PAVEMENT STRUCTURE
300mm GRANULAR 'B'
150mm GRANULAR 'A'
85mm ASPHALTIC CONCRETE
HEAVY DUTY PAVEMENT STRUCTURE FIRE ROUTE ACCESS
450mm GRANULAR 'B' ,
150mm GRANULAR 'A'
100mm ASPHALTIC CONCRETE
ICD TABLE
ICD No. | PIPE # (mm) | INVERT | MAXIMUM WATER LEVEL (m) | Qr (L/S) | HYDROVEX MODEL NO. | IPEX
CB 1/ICD 1 | 200 | 96.90 | 99.15 | 11.0 | 100 VHV–1 | N/A
CB 1A/ICD 1A | 200 | 96.80 | 99.15 | 8.0 | 100 VHV–1 | N/A
CB 3/ICD 2 | 200 | 97.20 | 99.85 | 3.0 | 50 VHV–1 | N/A
CBMH 5/ICD 3 | 250 | 96.65 | 99.35 | 3.5 | 50 VHV–1 | N/A
CB 8/ICD 4 | 200 | 97.75 | 99.85 | 3.0 | 50 VHV–1 | N/A
CB 8/ICD 5 | 200 | 97.75 | 99.85 | 21.5 | N/A | TYPE A
STMMH 11/ICD6 | 675 | 96.63 | 99.25 | 14.0 | 100 VHV–1 | N/A
Reviewed by Infrastructure Approvals Division
2006/05/30
Permit #14032
KEY MAP
SUBJECT SITE
LEGEND
WATERMAIN, VALVE BOX, VALVE CHAMBER & HYDRANT
SANITARY SEWER & MANHOLE
STORM SEWER MANHOLE
CATCH BASIN, CB LEAD & MIN. 3m SUBDRAIN ON EITHER SIDE
PROPOSED 100mm ø UNLESS OTHERWISE NOTED PERFORATED SUBDRAIN IN FILTER SOCK IN LANDSCAPED AREA
CATCH BASIN C/W AN ICD IN DOWNSTREAM LEAD, FRAME & COVERS PER OPSD 400.010 (REFER TO ICD TABLE FOR DETAILS)
CATCH BASIN MANHOLE C/W AN ICD IN DOWNSTREAM LEAD, FRAME & COVERS PER OPSD 400.010 (REFER TO ICD TABLE FOR DETAILS)
SILT FENCE
HEAVY DUTY PAVEMENT STRUCTURE FIRE ROUTE ACCESS
WATER SERVICE METER
REMOTE WATER SERVICE METER
GAS METERS/GROUP LOCATION
FF 102.00 FINISHED FLOOR ELEVATION
U/F 98.00 UNDERSIDE OF FOOTING ELEVATION
HYDRO POLE, BELL POLE
SIAMESE CONNECTION
8 REVISED PER CITY OF OTTAWA COMMENTS NOV/07/05
5 REVISED PER CITY OF OTTAWA COMMENTS OCT./05
NO. REVISION DATE
4 REVISED BUILDING LOCATION SEPT./05
3 REVISED PER CITY OF OTTAWA COMMENTS APRIL/05
2 REVISED ORIFICE DIAMETER ICD 6 NOV. 10/04
1 FOR SITE PLAN APPLICATION NOV. 10/04
NO. ISSUE DATE
P. D. REEVE
PROFESSIONAL ENGINEER PROVINCE OF ONTARIO
J.L. Richards & Associates Limited 864 Lady Ellen Place Ottawa, ON Canada K1Z 5M2 Tel: 613 728 3571 Fax: 613 728 6012
ENGINEERS ARCHITECTS-PLANNERS
PROJECT:
PROPOSED MOSQUE
572 MOODIE DRIVE
SITE SERVICING PLAN
DESIGN: DL
DRAWN: TS
CHECKED: PDR
DATE: NOVEMBER, 2004
SCALE: 1:400
REVISION NO.:
DRAWING NO.: S1
JOB NO.: 19787–01
14032



CATCHBASIN TABLE			
CB No.	STATION	TIG ELEVATION	INVERT
CB 14	1+226.66	100.97	95.68
CB 15	1+265.69	99.95	96.35

REFER TO 107080-PR1 FOR NOTES

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

No.	REVISION	DATE	BY
10.	ISSUED FOR CONSTRUCTION	OCT 8/10	MSP
9.	ISSUED FOR CONTRACT EXECUTION	SEP 15/10	MSP
8.	ISSUED FOR WIC APPROVAL	AUG 23/10	MSP
7.	ISSUED FOR SITE PLAN APPROVAL	AUG 23/10	MSP
6.	REISSUED FOR CITY APPROVAL	JAN 29/10	MSP
5.	REISSUED FOR TENDER	JAN 7/10	MSP
4.	ISSUED FOR FINAL APPROVAL	JAN 4/10	MSP
3.	ISSUED FOR TENDER	DEC 17/09	MSP
2.	ISSUED AS PER CITY COMMENTS	AUG 28/09	MSP
1.	ISSUED FOR SITE PLAN SUBMISSION	-	MSP

J.G. RIDDELL — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

M.J. PETERENCE — 100073354 — LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive, Ottawa, Ontario, Canada, K2M 1P6
Telephone: (613) 254-9643
Facsimile: (613) 254-5867

DESIGN	CV
DRAWN	MSP
CHECKED	CV
REVIEWED	MGP
APPROVED	JGR

SCALE: 1 : 250 (HORIZONTAL) / 1 : 25 (VERTICAL)

CITY OF OTTAWA
4016 and 4022 RICHMOND ROAD
RICHMOND ROAD EXTENSION
PROFILE STA.1+200 TO 1+387.13

PROJECT NO.	107080
DATE	NOVEMBER 2009
DRAWING NO.	107080-PR2

D07-12-08-0232

15622

PROPOSED FOUR STOREY LOW RISE

RESIDENTIAL APARTMENT BUILDING SITE AT

4000 OLD RICHMOND ROAD

AND

PROPOSED 3 ½ STOREY STACKED DWELLING AT

572 MOODIE DRIVE

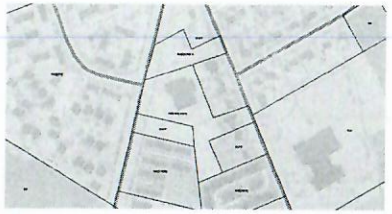
CITY OF OTTAWA

APPENDIX D

CITY OF OTTAWA

- SITE PLAN AND ARCHITECTURAL DRAWINGS
- FUS FIRE FLOW CALCULATIONS
- FUS EXPOSURE DISTANCE (FIGURE 1)
- WATER BOUNDARY CONDITIONS
- SUPPORTING HYDRAULIC CALCULATIONS
- HYDRANT SPACING FOR 4000 OLD RICHMOND ROAD (FIGURE 2)
- FIGURE 3 – FIREWALL CONFIGURATION FOR WOOD CONSTRUCTION AT 572 MOODIE DRIVE
- FIGURE 4 – FIREWALL CONFIGURATION FOR WOOD CONSTRUCTION AT 572 MOODIE DRIVE (1)
- FIGURE 5 – FIREWALL CONFIGURATION FOR WOOD CONSTRUCTION AT 572 MOODIE DRIVE (2)
- FIGURE 6 – HYDRANT SPACING FOR 572 MOODIE DRIVE

ATTACHMENT 1: SITE PLAN



0 SP ZONING MAP
Scale: NTS

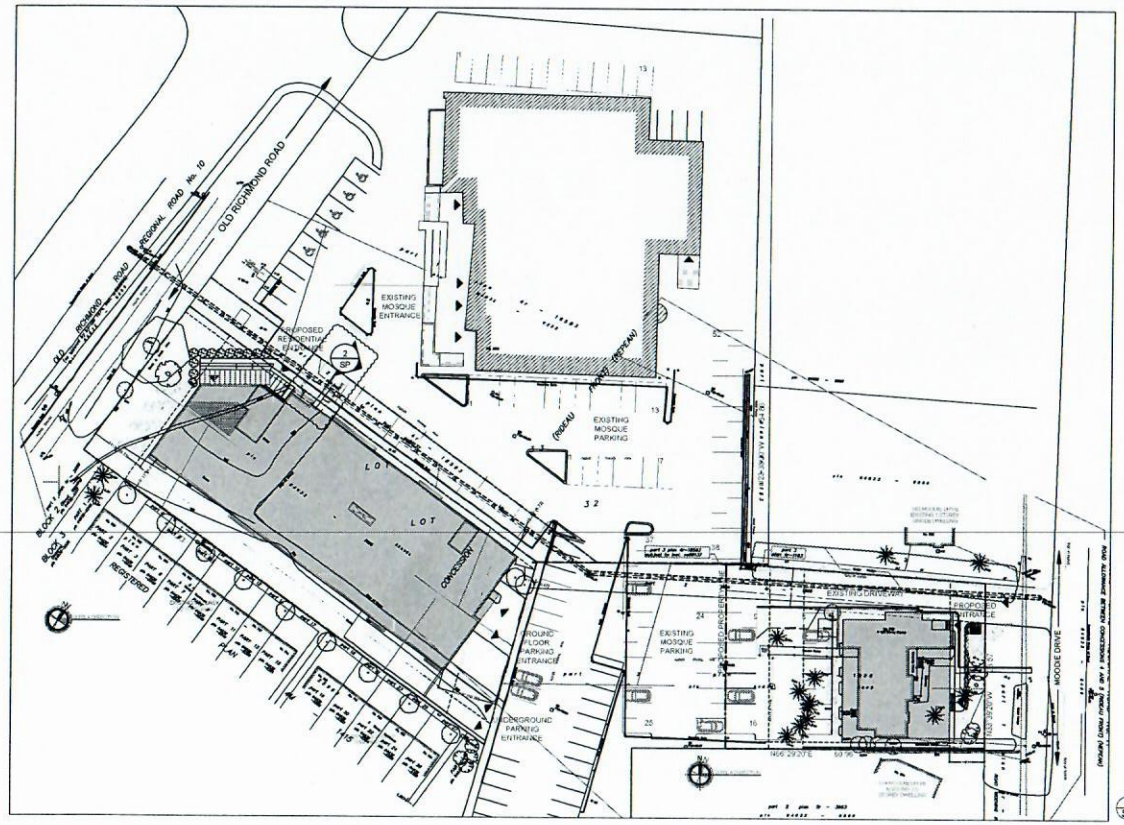
GROSS FLOOR AREA		
USE	GFA (M²)	UNITS
ASSISTED LIVING/ APARTMENT BUILDING	1,316	60
GROUND FLOOR PARKING	139	9
BASEMENT PARKING	2,125	64 SPACES
STACKED DWELLING	1,184	6
TOTAL	4,764	60+6 UNITS
EXISTING MOSQUE	4,404	

BICYCLE PARKING REQUIREMENTS			
BICYCLE PARKING	RATE	REQUIRED	PROPOSED
BUILDING "A"	0.5/UNIT	30	30
STACKED DWELLING	0.5/UNIT	3	3
TOTAL		30 + 3	30 + 3

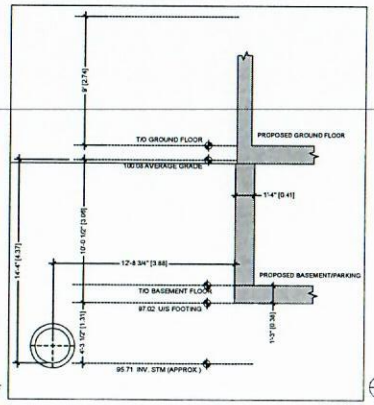
PARKING DIMENSIONS		
PARKING	DIMENSIONS	PROPOSED
BARRIER FREE TYPE A	3.4 M x 5.2 M W/ 1.5 M AISLE	1
BARRIER FREE TYPE B	2.4 M x 5.2 M W/ 1.5 M AISLE	2
PARKING SPACE	2.6 M x 5.2 M	70
SMALL PARKING SPACE	2.4 M x 5.2 M	3

PARKING REQUIREMENTS			
PARKING	RATE	REQUIRED	PROPOSED
EXISTING (MOSQUE)		165	181 EXISTING
ACCESIBLE PARKING			5 EXISTING
NUMBER OF REMOVED PARKING SPACES			11 REMOVED
TOTAL			175 REMAINED
ASSISTED LIVING-BUILDING "A"	(1.2 + 0.25)*2=0.725/UNIT, 1.2-APARTMENT BLDG, 0.25-RETIREMENT HOME	0.725x60=4 3.5	
GROUND FLOOR LEVEL			9
BASEMENT LEVEL			64
ACCESIBLE PARKING	N/A	N/A	3
TOTAL			73
STACKED DWELLING	1.2/UNIT	7.2	7.2
VISITOR PARKING	RATE	REQUIRED	PROPOSED
VISITOR PARKING (BUILDING "A")	0.2/UNIT	12	12
VISITOR PARKING (STACKED DWELLING)	0.2/UNIT	1.2	1.2
SUBTOTAL		13.2	13
EXTERIOR			0 NEW PARKING SPACES
INDOOR (GROUND FLOOR + BASEMENT)			73 NEW
TOTAL			73 NEW PARKING SPACES
LANDSCAPE BUFFER	RATE	REQUIRED	PROPOSED
BUILDING "A"	N/A	N/A	N/A
STACKED DWELLING	NOT ABUTTING A STREET	1.5 M	1.5 M
STACKED DWELLING	15% OF THE AREA OF ANY PARKING LOT	EXISTING	EXISTING=42.8 M²

ZONING REQUIREMENTS			
LOW-RISE APARTMENT BUILDING	EXISTING REQUIREMENT FOR R1FF	REQUIREMENT FOR R4Z	PROPOSED
MINIMUM LOT WIDTH	19.5 M	18 M	30.37 M
MINIMUM LOT AREA	600 M²	450 M²	2,396 M²
MINIMUM FRONT YARD SETBACK	6 M	3 M	9.14 M
MINIMUM REAR YARD SETBACK	30% OF LOT DEPTH=23.78 M	THE MINIMUM REQUIRED REAR YARD SETBACK IS 6 METRES. NOTWITHSTANDING THE FOREGOING, WHERE THE REAR LOT LINE ABUTS THE INTERIOR SIDE LOT LINE OF AN ABUTTING LOT, THE MINIMUM REQUIRED REAR YARD SETBACK IS EQUAL TO THE MINIMUM REQUIRED INTERIOR SIDE YARD SETBACK OF THE ABUTTING LOT ALONG EACH POINT OF THE SHARED LOT LINE.	3.39 M - 10.15 M
MINIMUM INTERIOR SIDE YARD SETBACK	MIN. TOTAL IS 2.1 M, ONE SIDE NO LESS THAN 0.9 M	1.5 M (FOR HEIGHT LESS THAN 11 M), 3 M FOR HEIGHT GREATER THAN 11), OTHERWISE 6M	5.9 M & 1.22 M
MINIMUM CORNER SIDE YARD SETBACK	4.5 M	N/A	N/A
MAXIMUM HEIGHT	9.5 M	14.5 M	12 M
CONDITIONAL USE	N/A	N/A	N/A
PERMITTED PROJECTIONS INTO REQUIRED YARDS - BALCONIES, MAX. PROJECTION		2 METRES, BUT NO CLOSER THAN 1 METRE FROM ANY LOT LINE	0.6 M
		1.8 M INTO AN INTERIOR SIDE YARD, BUT NOT CLOSER THAN 0.6 M TO A SIDE LOT LINE	0.6 M
PERMITTED PROJECTIONS INTO REQUIRED YARDS - CANOPIES AND AWNINGS		A DISTANCE EQUAL TO ¼ THE DEPTH OF A FRONT, REAR OR CORNER SIDE YARD BUT NOT CLOSER THAN 0.6 M TO A LOT LINE.	0.6 M
AMENITY AREA	N/A	6 M² PER DWELLING UNIT + 360 M² COMMUNAL AMENITY AREA A MINIMUM OF 50% OF THE REQUIRED TOTAL AMENITY AREA	391 M² (50% COMMUNAL)



1 SP SITE PLAN
Scale: 1/32"=1'-0"



2 SP FOOTING/STM SECTION
Scale: 1/4"=1'-0"

LOW-RISE APARTMENT BUILDING 3990 OLD RICHMOND ROAD

STACKED DWELLING 572 MOODIE DRIVE

NO	REVISION	DATE
10		
09		
08		
07		
06		
05	REISSUED FOR BUILDING PERMIT	
04	ISSUED FOR BUILDING PERMIT	
03	ISSUED FOR ZONING AMENDMENT	
02	REISSUED FOR COORDINATION	01/26/2021
01	ISSUED FOR PRELIMINARY DESIGN REVIEW	10/22/2020

NOTE:
1. All dimensions are to be checked onsite. Discrepancies or ambiguities should be reported prior to work on site or ordering materials.
2. All work to comply with Ontario Building Code.
3. All dimensions include thickness of gypsum board on stud walls.
4. Drawings to be read in conjuction with structural drawings.

SUSAN D. SMITH ARCHITECT
941 MERIVALE RD,
OTTAWA, ON, K1Z 6A1
613.722.5327
s.smith@sdsarch.ca

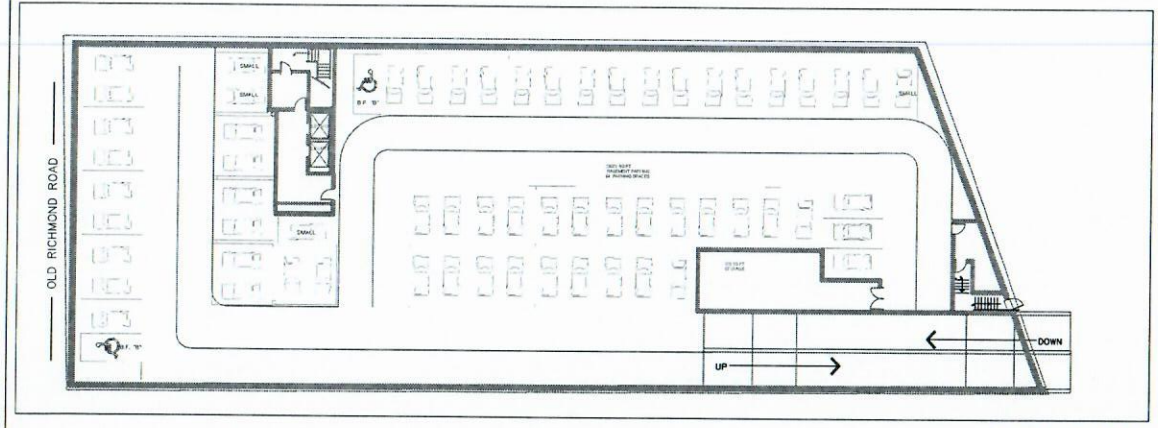
PROJECT TITLE
ZONING AMENDMENT
3990 OLD RICHMOND ROAD &
572 MOODIE DRIVE

DRAWING TITLE:

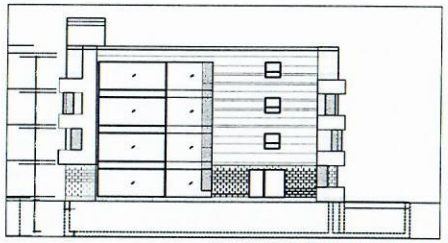
PROJECT START DATE:	DRAWN BY:
APRIL, 2019	ZK
SCALE:	JOB No.:
3/16" = 1'-0"	1917
REVIEWED BY:	SHEET No.

PRELIMINARY

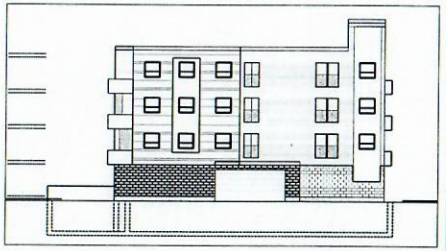
SP



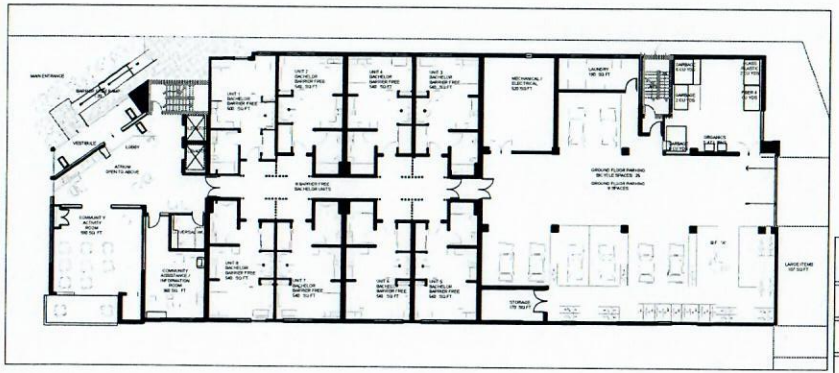
1 BASEMENT PARKING LAYOUT
Scale: 1/16"=1'-0"



4 WEST (OLD RICHMOND ROAD) ELEVATION
Scale: 1/16"=1'-0"

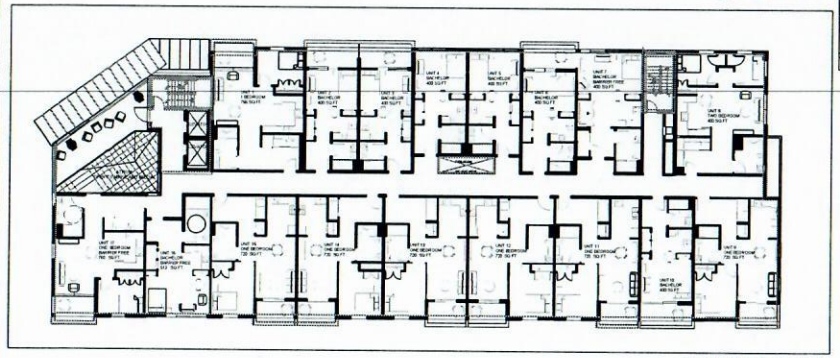


5 EAST ELEVATION
Scale: 1/16"=1'-0"



2 GROUND FLOOR
Scale: 1/16"=1'-0"

6 SOUTH (REAR) ELEVATION
Scale: 1/16"=1'-0"



3 TYPICAL 2ND -4TH FLOOR
Scale: 1/16"=1'-0"

7 NORTH (VIEW FROM MOSQUE) ELEVATION
Scale: 1/16"=1'-0"

LOW-RISE APARTMENT BUILDING
3990 OLD RICHMOND ROAD

STACKED DWELLING
572 MOODIE DRIVE

NO	REVISION	DATE
10		
09		
08		
07		
06		
05	REISSUED FOR BUILDING PERMIT	
04	ISSUED FOR BUILDING PERMIT	
03	ISSUED FOR ZONING AMENDMENT	
02	REISSUED FOR COORDINATION	01/28/2021
01	ISSUED FOR PRELIMINARY DESIGN REVIEW	10/22/2020

NOTE:
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3. All dimensions include thickness of gypsum board on stud walls.
4. Drawings to be read in conjuction with structural drawings.

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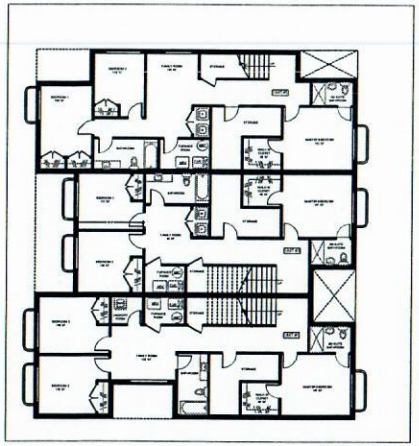
PROJECT TITLE
ZONING AMENDMENT
3990 OLD RICHMOND ROAD &
572 MOODIE DRIVE

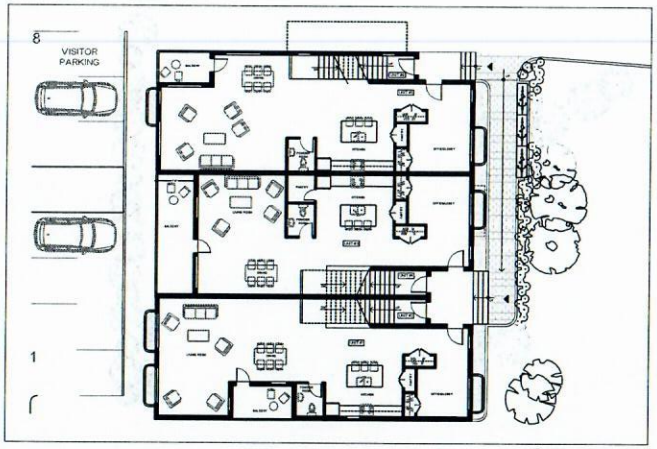
DRAWING TITLE

PROJECT START DATE:	DRAWN BY:
APRIL, 2019	ZK
SCALE:	JOB No.
3/16" = 1'-0"	1917
REVIEWED BY	SHEET No.:

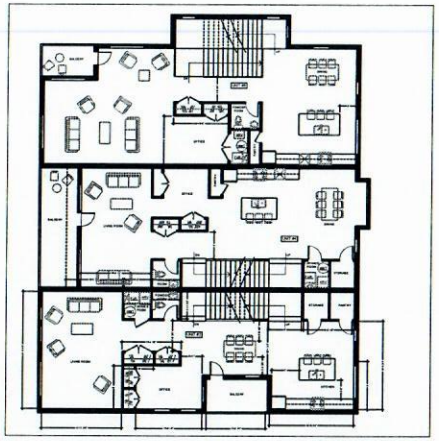
A1



1 BASEMENT
Scale: 3/32"=1'-0"

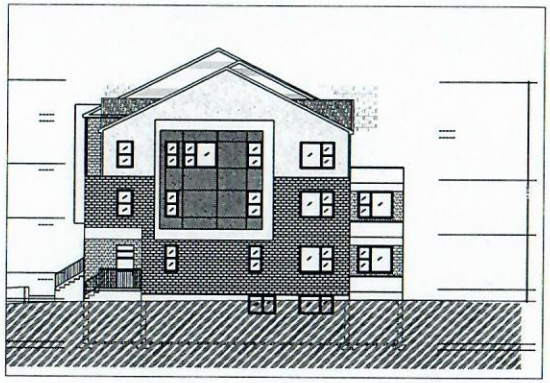


2 GROUND FLOOR
Scale: 3/32"=1'-0"

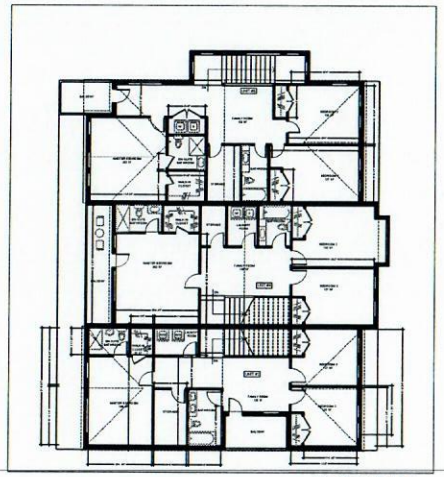


3 SECOND FLOOR
Scale: 3/32"=1'-0"

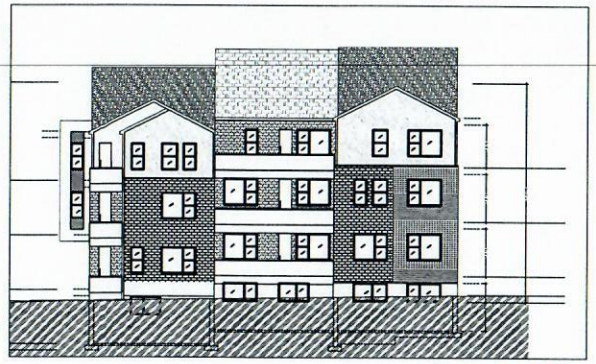
5 FRONT (EAST) ELEVATION
Scale: 3/32"=1'-0"



6 NORTH ELEVATION
Scale: 3/32"=1'-0"



4 FOURTH FLOOR
Scale: 3/32"=1'-0"



7 REAR (WEST) ELEVATION
Scale: 3/32"=1'-0"

8 SOUTH ELEVATION
Scale: 3/32"=1'-0"

LOW-RISE APARTMENT BUILDING
3990 OLD RICHMOND ROAD

STACKED DWELLING
572 MOODIE DRIVE

NO	REVISION	DATE
10		
09		
08		
07		
06		
05	REISSUED FOR BUILDING PERMIT	
04	ISSUED FOR BUILDING PERMIT	
03	ISSUED FOR ZONING AMENDMENT	
02	REISSUED FOR COORDINATION	01/26/2021
01	ISSUED FOR PRELIMINARY DESIGN REVIEW	10/22/2020

NOTE:
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4. Drawings to be read in conjuction with structural drawings

SUSAN D. SMITH ARCHITECT
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613 722 5327
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PROJECT TITLE:
ZONING AMENDMENT
3990 OLD RICHMOND ROAD &
572 MOODIE DRIVE

DRAWING TITLE:
FLOOR PLANS
ELEVATIONS

PROJECT START DATE:	DRAWN BY:
APRIL, 2019	ZK
SCALE: 3/16" = 1'-0"	JOB No.: 1917
REVIEWED BY:	SHEET No.: A3

ATTACHMENT 2: FUS FIRE FLOW CALCULATIONS

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 3990 Old Richmond Rd
Date: April 21, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 1
Building Type/Description/Name: Residential

Notes: *Basement is more than 50% below grade.*
Sprinklers required, as per OBC.

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
		Framing Material						
1	Choose Frame Used for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary construction	1	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	59	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	59				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade)			4	4	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based on design with one hour rating for vertical openings and exterior vertical communications:			1,316 Square Metres (m2)	5,264	Area in Square Meters (m^2)	
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1,000 L/min						16,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	13,600
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	Adequate Sprinkler conforms to NFPA13	-0.3	N/A	-4,080
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is standard for sprinkler and fire dept. hose line	-0.1	N/A	-1,360
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler system is fully supervised	-0.1	N/A	-1,360
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	20.1 to 30.1m	0.1	0.25	m	3,400
			East Side	45.1m or greater	0			
			South Side	10.1 to 20.0m	0.15			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						10,000
		Total Required Fire Flow (above) in L/s:						167
		Required Duration of Fire Flow (hrs)						2.00
		Required Volume of Fire Flow (m^3)						1,200

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: April 21, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 2
Building Type/Description/Name: Residential

Notes: Basement is more than 50% below grade.

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			296	888	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						10,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	8,500
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	10.1 to 20.0m	0.15	0.45	m	3,825
			East Side	30.1 to 45.0m	0.05			
			South Side	0 to 3.0m	0.25			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						12,000
		Total Required Fire Flow (above) in L/s:						200
		Required Duration of Fire Flow (hrs)						2.50
		Required Volume of Fire Flow (m^3)						1,800

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 3
Building Type/Description/Name: Residential

Notes: *Basement is more than 50% below grade.*
Wood construction with 2 firewalls (fire flow for stacked units #3 &#4)

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			99	296	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						6,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	5,100
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	Fire Wall	0.1	0.25	m	1,275
			East Side	30.1 to 45.0m	0.05			
			South Side	Fire Wall	0.1			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						6,000
		Total Required Fire Flow (above) in L/s:						100
		Required Duration of Fire Flow (hrs)						2.00
		Required Volume of Fire Flow (m^3)						720

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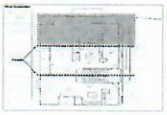
FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 4
Building Type/Description/Name: Residential



Notes: *Basement is more than 50% below grade.*
Wood construction with 2 firewalls (fire flow for stacked units #5 & #6)

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			99	296	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						6,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	5,100
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	10.1 to 20.0m	0.15	0.3	m	1,530
			East Side	30.1 to 45.0m	0.05			
			South Side	Fire Wall	0.1			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						7,000
		Total Required Fire Flow (above) in L/s:						117
		Required Duration of Fire Flow (hrs)						2.25
		Required Volume of Fire Flow (m^3)						945

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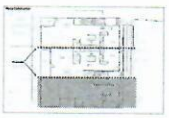
FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 5
Building Type/Description/Name: Residential



Notes: *Basement is more than 50% below grade.*
Wood construction with 2 firewalls (fire flow for stacked units #1 & #2)

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
		Framing Material						
1	Choose Frame Used for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			99	296	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						6,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	5,100
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	Fire Wall	0.1	0.4	m	2,040
			East Side	30.1 to 45.0m	0.05			
			South Side	0 to 3.0m	0.25			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						7,000
		Total Required Fire Flow (above) in L/s:						117
		Required Duration of Fire Flow (hrs)						2.25
		Required Volume of Fire Flow (m^3)						945

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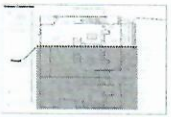
FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 6
Building Type/Description/Name: Residential



Notes: *Basement is more than 50% below grade.*
Ordinary construction with 1 firewall (fire flow for stacked units #1 & #2, #3 & #4)

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary construction	1	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			197 Square Metres (m2)	592	Area in Square Meters (m^2)	
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						5,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	4,250
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	Fire Wall	0.1	0.4	m	1,700
			East Side	30.1 to 45.0m	0.05			
			South Side	0 to 3.0m	0.25			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						6,000
		Total Required Fire Flow (above) in L/s:						100
		Required Duration of Fire Flow (hrs)						2.00
		Required Volume of Fire Flow (m^3)						720

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 7
Building Type/Description/Name: Residential

Notes: *Basement is more than 50% below grade.*
Ordinary construction with 1 firewall (fire flow for stacked units #5 & #6

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
		Framing Material						
1	Choose Frame Used for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary construction	1	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			99	296	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1,000 L/min						4,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	3,400
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	10.1 to 20.0m	0.15	0.3	m	1,020
			East Side	30.1 to 45.0m	0.05			
			South Side	Fire Wall	0.1			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						4,000
		Total Required Fire Flow (above) in L/s:						67
		Required Duration of Fire Flow (hrs)						1.50
		Required Volume of Fire Flow (m^3)						360

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 8
Building Type/Description/Name: Residential

Notes: *Basement is more than 50% below grade.*
Ordinary construction with 1 firewall (fire flow for stacked units #3 & #4, #5 & #6)

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary construction	1	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			197	592	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						5,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	4,250
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	10.1 to 20.0m	0.15	0.3	m	1,275
			East Side	30.1 to 45.0m	0.05			
			South Side	Fire Wall	0.1			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						6,000
		Total Required Fire Flow (above) in L/s:						100
		Required Duration of Fire Flow (hrs)						2.00
		Required Volume of Fire Flow (m^3)						720

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 9
Building Type/Description/Name: Residential

Notes: *Basement is more than 50% below grade.*
Ordinary construction with 1 firewall (fire flow for stacked units #1 & #2)

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
		Framing Material						
1	Choose Frame Used for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary construction	1	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	6	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	6				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			99	296	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						4,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	3,400
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	Fire Wall	0.1	0.4	m	1,360
			East Side	30.1 to 45.0m	0.05			
			South Side	0 to 3.0m	0.25			
			West Side	45.1m or greater	0			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						5,000
		Total Required Fire Flow (above) in L/s:						83
		Required Duration of Fire Flow (hrs)						1.75
		Required Volume of Fire Flow (m^3)						525

ATTACHMENT 3: FIGURE 1 – FUS EXPOSURE DISTANCES

Figure 1: FUS Exposure Distances for 3990 Old Richmond Rd and 572 Moodie Dr (Property Line to Adjacent Buildings) Source: geoOttawa 2020; *Contains information licensed under the Open Government Licence – City of Ottawa.*

ATTACHMENT 4: WATER BOUNDARY CONDITIONS

Razafimaharo, Christene

From: Armstrong, Justin <justin.armstrong@ottawa.ca>
Sent: Thursday, April 29, 2021 4:13 PM
To: Alemany, Kevin; TL MaK
Cc: Razafimaharo, Christene
Subject: RE: 3990 Old Richmond Road Water Boundary Conditions
Attachments: 3990 Old Richmond Road April 2021.pdf

Hi Tony,

See boundary condition results below.

The following are boundary conditions, HGL, for hydraulic analysis at 3990 Old Richmond Road (zone 2W2C) assumed to be connected to the 305mm on Old Richmond Road and the 203mm on Moodie Drive (see attached PDF for location).

Both Connections:

Minimum HGL = 126.8m

Maximum HGL = 132.1m

Old Richmond Road Connection: Max Day + Fire Flow (167 L/s) = 124.4m

Moodie Drive Connection: Available Fire Flow @ 20psi = 117 L/s assuming a ground elevation of 99.1m.

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

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Regards,

During this period of uncertainty surrounding COVID-19, we are following best practices recommended to minimize the risk of exposure, while ensuring that service to our clients remains as uninterrupted as possible. For the most part I am working from home and will respond to emails at my earliest opportunity. Should there be delays due to internet connectivity, I thank your understanding and patience.

Justin Armstrong, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - West Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 21746, justin.armstrong@ottawa.ca

From: Armstrong, Justin
Sent: April 21, 2021 3:31 PM
To: Alemany, Kevin <kevin.alemany@stantec.com>; TL MaK <tlmakecl@bellnet.ca>

Cc: Razafimaharo, Christene <Christene.Razafimaharo@stantec.com>
Subject: RE: 3990 Old Richmond Road Water Boundary Conditions

Thank you all.

I have forwarded off the request for boundary conditions and will provide the results once I am in receipt.

Regards,

Justin

From: Alemany, Kevin <kevin.alemany@stantec.com>
Sent: April 21, 2021 3:18 PM
To: TL MaK <tlmakecl@bellnet.ca>; Armstrong, Justin <justin.armstrong@ottawa.ca>
Cc: Razafimaharo, Christene <Christene.Razafimaharo@stantec.com>
Subject: RE: 3990 Old Richmond Road Water Boundary Conditions

Good afternoon Tony & Justin,

In the most recent boundary condition request, the gross floor area (GFA) was reduced to 3,948 m2, assuming that vertical separation would be provided every 3rd floor, as described in the Ontario Building Code (OBC) 1.1.3.2, thus limiting the number of storeys to 3 in the FUS calculations. However, recognizing that no vertical separation has been specified in the plans for the building at 3990 Old Richmond Rd, it is preferred to account for all 4 storeys of the building in the FUS calculations as noted by Justin, resulting in a GFA of 5,264 m2.

We therefore agree with the proposed modification, resulting in an RFF for the 3990 Old Richmond building of 10,000 L/min (167 L/s). Attached are supporting revised calculations.

In summary, the following are the demands for the boundary conditions:

For the building at 3990 Old Richmond Rd:
•AVDY = 29,645 L/d (0.34 L/s);
•MXDY = 74,113 L/d (0.86 L/s);
•PKHR = 163,048 L/d (1.89 L/s); and,
•Fire Flow = 10,000 L/min (167 L/s)

For the building at 572 Moodie Dr:
•AVDY = 6,510 L/d (0.08 L/s);
•MXDY = 16,275 L/d (0.19 L/s);
•PKHR = 35,805 L/d (0.41 L/s); and,
•Fire Flow = 12,000 L/min (200 L/s).

Thanks for the follow up.

Regards, Kevin

Kevin Alemany
Principal, Water

Direct: 613 724-4091
Mobile: 613 292-4226
Fax: 613 722-2799
kevin.alemany@stantec.com

Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

From: TL MaK <tlmakecl@bellnet.ca>
Sent: Wednesday, April 21, 2021 1:43 PM
To: Alemany, Kevin <kevin.alemany@stantec.com>
Subject: RE: 3990 Old Richmond Road Water Boundary Conditions

Hi Kevin,

Can you please answer Justin's questions.

Thank you,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca

From: Armstrong, Justin [mailto:justin.armstrong@ottawa.ca]
Sent: April 21, 2021 11:27 AM
To: TL MaK
Cc: 'Susan Smith'; 'anver.malam anver.malam'; 'Zuzana Keslerova'
Subject: RE: 3990 Old Richmond Road Water Boundary Conditions

Hi Tony,

As it relates to the FUS requirement for the 3990 Old Richmond building, why has the gross floor area changed from 5,264 m^2 in the first boundary condition request to 3,948 m^2 in this most recent request? Your description below, and the architectural plans provided indicate that this building is to be a 4-storey building with GFA/floor of 1,316m^2. At 4 storeys, this equates to a total GFA for the building of 5,264m^2. The new FUS calculations should use this GFA. If I apply this GFA, it results in an RFF for the 3990 Old Richmond building of 10,000 L/min (166.67 L/s). If you are in agreement with this modification, please let me know and I can make the change to the demands as follows and send off for boundary conditions:

In summary, for the building at 3990 Old Richmond Rd:

- AVDY = 29,645 L/d (0.34 L/s);
- MXDY = 74,113 L/d (0.86 L/s);
- PKHR = 163,048 L/d (1.89 L/s); and,
- Fire Flow = 10,000 L/min (166.67 L/s)

For the building at 572 Moodie Dr:

- AVDY = 6,510 L/d (0.08 L/s);
- MXDY = 16,275 L/d (0.19 L/s);
- PKHR = 35,805 L/d (0.41 L/s); and,
- Fire Flow = 12,000 L/min (200 L/s).

Otherwise, please modify the FUS calculations for Building A (3990 Old Richmond) using the proper GFA so that I may request boundary conditions.

All other concerns have been addressed.

Regards,

Justin

During this period of uncertainty surrounding COVID-19, we are following best practices recommended to minimize the risk of exposure, while ensuring that service to our clients remains as uninterrupted as possible. For the most part I am working from home and will respond to emails at my earliest opportunity. Should there be delays due to internet connectivity, I thank your understanding and patience.

Justin Armstrong, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - West Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2400 ext./poste 21746, justin.armstrong@ottawa.ca

From: TL MaK <tlmakecl@bellnet.ca>
Sent: April 21, 2021 10:04 AM
To: Armstrong, Justin <justin.armstrong@ottawa.ca>
Cc: 'Susan Smith' <s.smith@sdsarch.ca>; 'anver.malam anver.malam' <anver.malam@sympatico.ca>; 'Zuzana Keslerova' <z.keslerova@sdsarch.ca>
Subject: RE: 3990 Old Richmond Road Water Boundary Conditions

Hi Justin,

Further to the City's review comments of March 26 ,2021, we have updated and revised our water boundary condition for 3990 Old Richmond Road and 572 Moodie Drive. Please note the proposed building at 3990 Old Richmond Road will be ordinary construction and will have sprinklers and the proposed building at 572 Moodie Drive will be wood construction and will not have sprinklers.

Here is the revised boundary condition request for 3990 Old Richmond Rd and 572 Moodie Dr:

The proposed buildings are located within Pressure Zone 2W, on the lot occupying the intersection of Old Richmond Rd and Moodie Dr.

The proposed building at 3990 Old Richmond Rd is a 4-storey apartment building with an underground parking. The building contains thirty-two bachelor units, twenty-four 1-bedroom units, and three 2-bedroom units. Each floor covers a gross floor area of 1,316 m^2/floor (14,165 ft^2/floor), and the underground parking occupies an area of 2,125 m^2 (22,873 ft^2). The building is to be serviced by the 300-mm diameter watermain along Old Richmond Rd. The building will have sprinklers, considered to be fully automated, connected to a standard water supply, and fully supervised.

The proposed building at 572 Moodie Dr is a 3.5-storey stacked dwelling. The building contains six 3-bedroom units. The total gross floor area is 1,184 m^2 (12,745 ft^2), equivalent to 296 m^2/floor (3,186 ft^2/floor). The building is to be serviced by the 200-mm diameter watermain along Moodie Dr. The building will not have sprinklers.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines, where the residential consumption rate of 350 L/cap/d was used to estimate average day demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 2.5. Peak hour (PKHR) demands were calculated by multiplying MXDY by a factor of 2.2. Persons per unit (PPU) for each unit were estimated based on the

City of Ottawa's Water Design Guidelines. **Table 1** and **Table 2** show the estimated domestic demands of the proposed buildings at 3990 Old Richmond Rd and 572 Moodie Dr, respectively.

Table 1: Estimated Domestic Demand at 3990 Old Richmond Rd

Unit Type	Unit Count	PPU	Consumption Rate (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, Bachelor	32	1.4	350	15,680	0.18	39,200	0.45	86,240	1.00
Apartment, 1-Bedroom	24	1.4		11,760	0.14	29,400	0.34	64,680	0.75
Apartment, 2-Bedroom	3	2.1		2,205	0.03	5,513	0.06	12,128	0.14
Total	***59***			***29,645***	***0.34***	***74,113***	***0.86***	***163,048***	***1.89***

Table 2: Estimated Domestic Demand at 572 Moodie Dr

Unit Type	Unit Count	PPU	Consumption Rate (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 3-Bedroom	6	3.1	350	6,510	0.08	16,275	0.19	35,805	0.41
Total	***6***			***6,510***	***0.08***	***16,275***	***0.19***	***35,805***	***0.41***

The fire flows required were determined following the Fire Underwriter Survey (FUS) method and are provided in the attached worksheets.

The proposed building at 3990 Old Richmond Rd will be ordinary construction and will have sprinklers. The underground parking is more than 50% below ground level. The resulting total required FUS fire flow is 9,000 L/min (150 L/s) for a duration of 1.75 hours.

The proposed building at 572 Moodie Dr will be wood construction and will not have sprinklers. It is assumed that the basement will be more than 50% below ground level. The resulting total required FUS fire flow is 12,000 L/min (200 L/s) for a duration of 2.5 hours.

In summary, for the building at 3990 Old Richmond Rd:

- AVDY = 29,645 L/d (0.34 L/s);
- MXDY = 74,113 L/d (0.86 L/s);
- PKHR = 163,048 L/d (1.89 L/s); and,
- Fire Flow = 9,000 L/min (150 L/s)

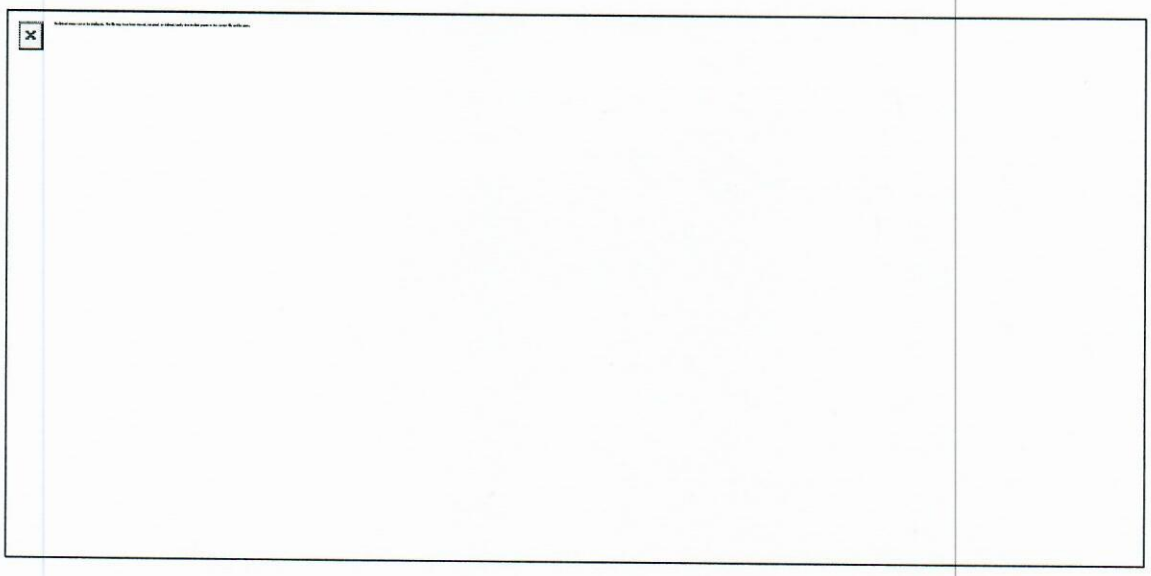
For the building at 572 Moodie Dr:

- AVDY = 6,510 L/d (0.08 L/s);
- MXDY = 16,275 L/d (0.19 L/s);
- PKHR = 35,805 L/d (0.41 L/s); and,
- Fire Flow = 12,000 L/min (200 L/s).

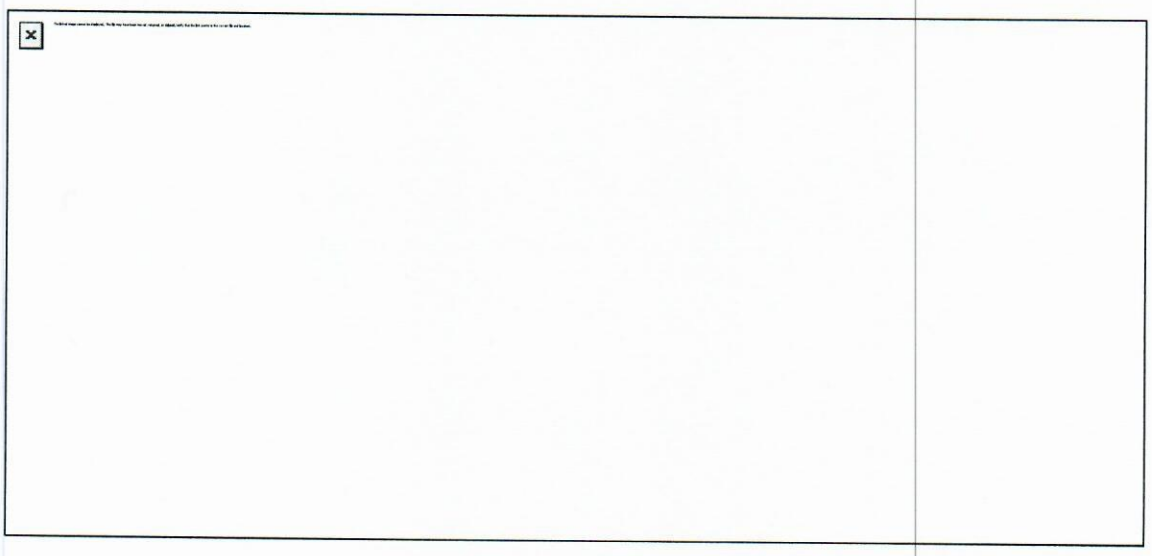
The City is requested to provide boundary conditions for the Average Day, Maximum Day, Peak Hour and Fire Flow conditions indicated above.

Furthermore, we have reviewed the City's comments and questions regarding the exposure distances. Below are our responses.

Regarding the exposure distances from the planned building on 572 Moodie Dr to existing neighbouring buildings, we have verified the distances on the draft plan. It is estimated that the planned 572 Moodie Dr building will be approximately 3.3m away from the existing 574 Moodie Dr building on the southern side, and therefore they were considered separate fire areas.



It is estimated that the planned 572 Moodie Dr building will be approximately 11m away from the existing 562 Moodie Dr building on the north side. This results in a northern exposure within the 10.1 to 20.0m range, as used in the fire flow calculations.



As requested, a geoOttawa snippet of the approximate proposed connection location for each site is attached (see dashed blue lines).

The City is requested to provide boundary conditions for the Average Day, Maximum Day, Peak Hour and Fire Flow conditions indicated above.

Thank you for your prompt attention to this matter. Please forward the boundary conditions as soon as possible.

Regards,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca

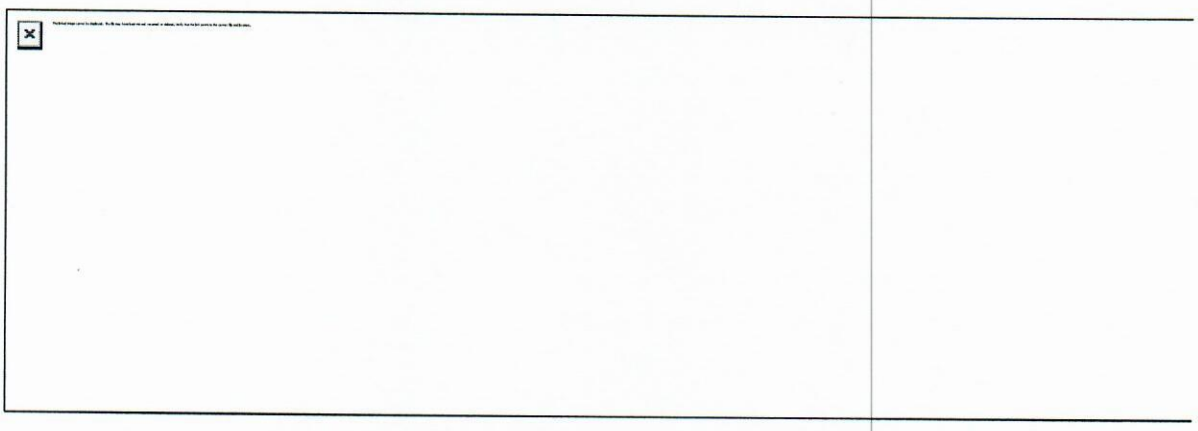
From: Armstrong, Justin [mailto:justin.armstrong@ottawa.ca]
Sent: March 26, 2021 1:36 PM
To: TL MaK
Cc: 'Susan Smith'
Subject: RE: 3990 Old Richmond Road Wwater Boundary Conditions

Hi Tony,

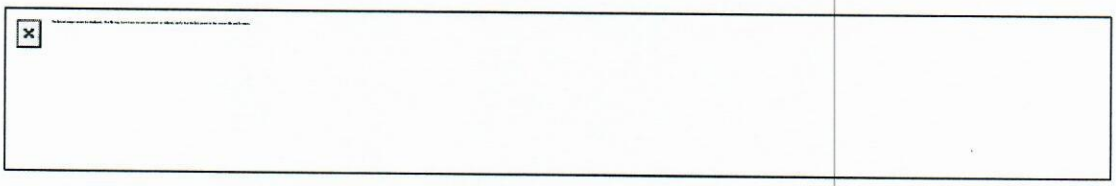
Thanks for this – appreciate the detailed description.

After looking at the below and attached, there are a couple items that need clarification before forwarding off for boundary conditions:

- The attached FUS Fire Flow Calculation sheet identifies that the Required Fire Flow (RFF) for 572 Moodie was assessed under two possible scenarios: 1 – Wood construction without firewalls, and 2 – Wood construction with firewalls. Clarification is needed on what is meant by the inclusion of firewalls (i.e. proposed location, fire resistive rating, etc.). Consider the below excerpt from the City of Ottawa Water Distribution Guidelines Technical Bulletin ISTB-2018-02:



As described in the excerpt, a firewall can be implemented to separate closely spaced buildings into separate fire areas, however, this does not seem to be how it was applied in the FUS calculations for both 572 Moodie scenarios. Under both scenarios 1 and 2, the total floor space areas remained the same (888 m^2) while the construction class went from *wood frame (1.5)* for scenario 1 to *ordinary construction (1)* for scenario two. The implementation of firewalls, as described above, should not change the construction class. Again, consider the following excerpt from the Technical Bulletin:



This excerpt indicates that a construction class of *ordinary construction (1)* can be used for wood frame construction if the exterior walls are masonry or non-combustible. Is this what was meant for scenario 2 – Wood construction with firewalls? If so, please confirm this and the use of construction class *ordinary construction (1)* is okay for scenario 2.

Further, if the future 572 Moodie building is proposed to be within 3.0 metres of any adjacent wood-frame building, the adjacent building's area should be included in the FUS calculation. The proposed 572 Moodie building looks to be within 3.0 metres of the existing 574 Moodie building. In order to separate the continuous fire area between these two buildings, a proposed location for a 2-hr rated firewall should be indicated along the southern wall of the proposed 572 Moodie building. This would provide a break to the continuous fire area and the 572 Moodie building can be considered as a single fire area.

- The northern exposure distance for the proposed 572 Moodie building looks like it could be less than 10 metres, however it is provided as 10.1 to 20.0m in the attached FUS Fire Flow Calculation sheet. Please confirm that 10.1 to 20.0m is acceptable for the northern exposure.

- Please provide a GeoOttawa snippet showing the approximate proposed connection location to the City watermain in Old Richmond and in Moodie.

- For Site Plan Control submission: Note that prior to site plan approval, a stamped and signed memo will need to be provided from the mechanical consultant confirming that the sprinkler system for 3990 Old Richmond will be fully supervised.

- For Site Plan Control submission: Note that for the 3990 Old Richmond Building, a redundant water supply will need to be provided as the number of dwelling units exceeds 50.

Following a response to the above points, I will forward off for boundary conditions.

Thanks, and have a great weekend.

Justin

Justin Armstrong, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - West Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2400 ext./poste 21746, justin.armstrong@ottawa.ca

From: TL MaK <tlmakecl@bellnet.ca>
Sent: March 25, 2021 4:17 PM
To: Armstrong, Justin <justin.armstrong@ottawa.ca>
Cc: 'Susan Smith' <s.smith@sdsarch.ca>
Subject: 3990 Old Richmond Road Wwater Boundary Conditions

Hi Justin,

Regarding this site, we are requesting for water boundary conditions from the City of Ottawa to be provided for our hydraulic analysis. The particulars are as follows:

The proposed buildings are located within Pressure Zone 2W, on the lot occupying the intersection of Old Richmond Rd and Moodie Dr.

The proposed building at 3990 Old Richmond Rd is a 4-storey apartment building with an underground parking. The building contains thirty-two bachelor units, twenty-four 1-bedroom units, and three 2-bedroom units. Each floor covers a gross floor area of 1,316 m^2/floor (14,165 ft^2/floor), and the underground parking occupies an area of 2,125 m^2 (22,873 ft^2). The building is to be serviced by the 300-mm diameter watermain along Old Richmond Rd. The building will have sprinklers.

The proposed building at 572 Moodie Dr is a 3.5-storey stacked dwelling. The building contains six 3-bedroom units. The total gross floor area is 1,184 m^2 (12,745 ft^2), equivalent to 296 m^2/floor (3,186 ft^2/floor). The building is to be serviced by the 200-mm diameter watermain along Moodie Dr. The building will not have sprinklers.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines, where the residential consumption rate of 350 L/cap/d was used to estimate average day demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 2.5. Peak hour (PKHR) demands were calculated by multiplying MXDY by a factor of 2.2. Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines. **Table 1** and **Table 2** show the estimated domestic demands of the proposed buildings at 3990 Old Richmond Rd and 572 Moodie Dr, respectively.

Table 1: Estimated Domestic Demand at 3990 Old Richmond Rd

Unit Type	Unit Count	PPU	Consumption Rate (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, Bachelor	32	1.4	350	15,680	0.18	39,200	0.45	86,240	1.00
Apartment, 1-Bedroom	24	1.4		11,760	0.14	29,400	0.34	64,680	0.75
Apartment, 2-Bedroom	3	2.1		2,205	0.03	5,513	0.06	12,128	0.14
Total	***59***			***29,645***	***0.34***	***74,113***	***0.86***	***163,048***	***1.89***

Table 2: Estimated Domestic Demand at 572 Moodie Dr

Unit Type	Unit Count	PPU	Consumption Rate (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 3-Bedroom	6	3.1	350	6,510	0.08	16,275	0.19	35,805	0.41
Total	***6***			***6,510***	***0.08***	***16,275***	***0.19***	***35,805***	***0.41***

The fire flows required were determined following the Fire Underwriter Survey (FUS) method and are provided in the attached worksheets.

The proposed building at 3990 Old Richmond Rd will be wood construction and will have sprinklers. The underground parking is more than 50% below ground level. The resulting total required FUS fire flow is 15,000 L/min (250 L/s) for a duration of 3.25 hours. However, considering the building could be categorized as a "Group C - Retirement Home, up to 4 storeys, Sprinklered" building in the Ontario Building Code (Section 3.2.2.48C), firewalls would likely be required. Additionally, it was indicated that the proposed

building could also be steel construction. In these cases, required fire flow may be reduced to 10,000 L/min (167 L/s) for a duration of 2 hours.

The proposed building at 572 Moodie Dr will be wood construction and will not have sprinklers. It is assumed that the basement will be more than 50% below ground level. The resulting total required FUS fire flow is 12,000 L/min (200 L/s) for a duration of 2.5 hours. If built with firewalls, required FUS fire flow can be reduced to 9,000 L/min (150 L/s) for a duration of 1.75 hours.

In summary, for the building at 3990 Old Richmond Rd:

- AVDY = 29,645 L/d (0.34 L/s);
- MXDY = 74,113 L/d (0.86 L/s);
- PKHR = 163,048 L/d (1.89 L/s); and,
- Fire Flow:
    - Fire Flow for wood construction without firewalls: 15,000 L/min (250 L/s)
    - Fire Flow for wood or steel construction with firewalls: 10,000 L/min (167 L/s)

For the building at 572 Moodie Dr:

- AVDY = 6,510 L/d (0.08 L/s);
- MXDY = 16,275 L/d (0.19 L/s);
- PKHR = 35,805 L/d (0.41 L/s); and,
- Fire Flow = 12,000 L/min (200 L/s).
    - Fire Flow for wood construction without firewalls: 12,000 L/min (200 L/s)
    - Fire Flow for wood construction with firewalls: 9,000 L/min (150 L/s)

The City is requested to provide boundary conditions for the Average Day, Maximum Day, Peak Hour and Fire Flow conditions indicated above.

Thank you for your prompt attention to this matter. Please forward the boundary conditions as soon as possible.

Regards,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca

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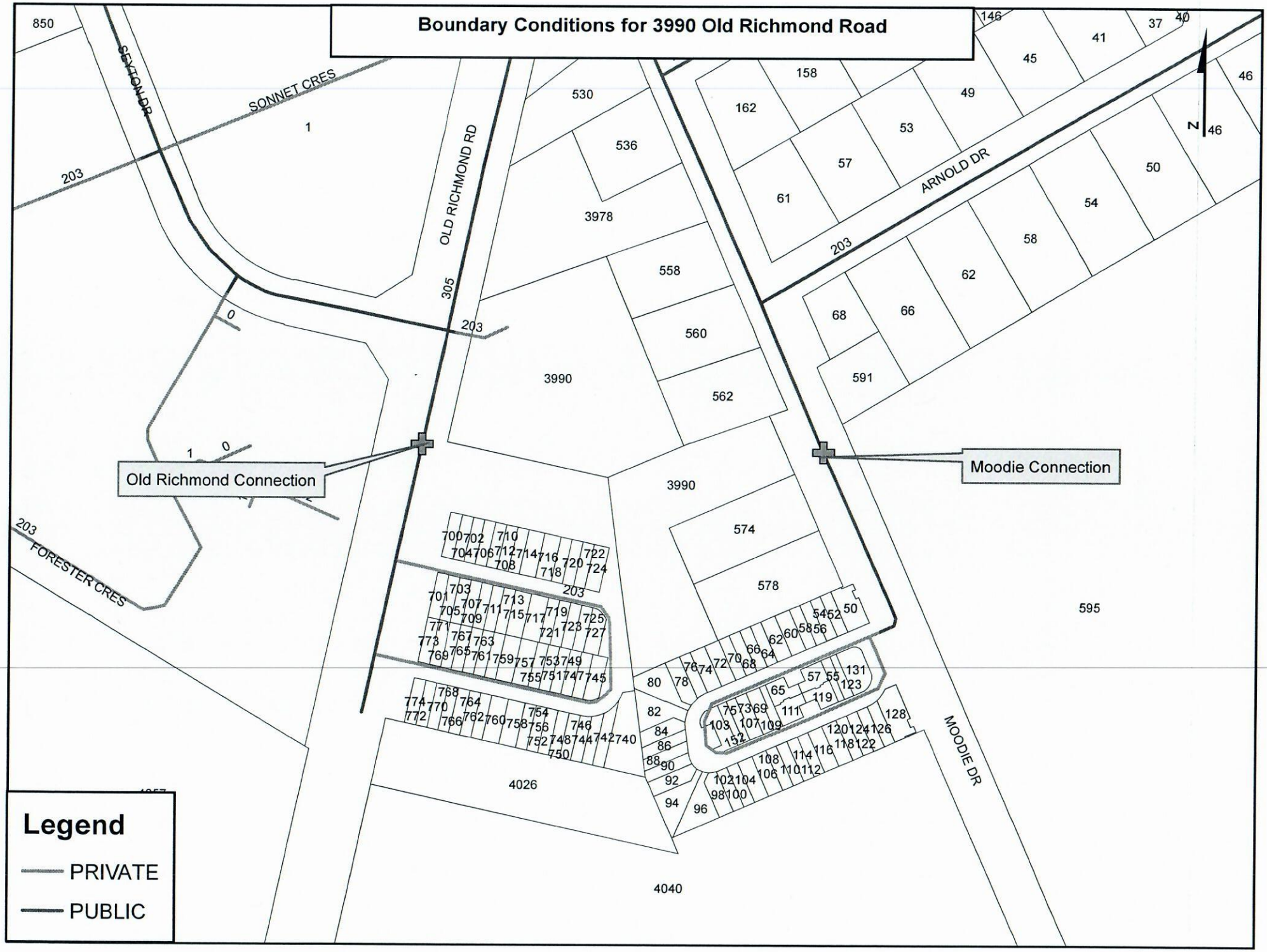

Boundary Conditions for 3990 Old Richmond Road
Old Richmond Connection
Moodie Connection
SEXTON DR
SONNET CRES
OLD RICHMOND RD
ARNOLD DR
FORESTER CRES
MOODIE DR
3990
4026
4040
595
Legend
PRIVATE
PUBLIC

ATTACHMENT 5: SUPPORTING HYDRAULIC CALCULATIONS

Stantec

Supporting Hydraulic Calculations

Stantec Project #: 163401084
Project Name: 3990 Old Richmond Rd
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Boundary Conditions provided by the City:

Scenario 1: Peak Hour (Min HGL): 126.8 m;
Scenario 2: Average Day (Max HGL): 132.1 m; and
Scenario 3: Maximum Day plus Fire Flow: 124.4 m.

Sample Calculations

$HGL\ (m) = hp + hz$ *(1)*

where: hp = Pressure Head (m); and hz = Elevation Head (m), estimated from topography.

For Scenario 1, we have:

HGL(m) = 126.8 and hz (m) = 100.08.

Rearranging Equation 1, we can calculate the Pressure Head (hp) as follow:

$hp\ (m) = HGL - hz$

∴ hp = 126.8 - 100.1 m = 26.7 m.

To convert from Pressure Head (m) to a pressure value (kPa), the following equation can be used:

$P\ (kPa) = (\rho * g * hp) / 1000$ *(2)*

where: ρ = density of water = 1000 kg/m^3; and g = gravitational acceleration = 9.81 m/s^2.

Using Equation 2, we can calculate the Pressure (P) as follow:

P (kPa) = (1000 * 9.81 * 26.72) / 1000

∴ P = 262 kPa.

Considering that 1 kPa = 0.145 psi, the pressure under Scenario 1 is equal to:

P = 38 psi.

Applying the same procedures, the pressures under Scenario 2 and Scenario 3 are calculated as follows:
Scenario 2: P = 46 psi; and Scenario 3: P = 35 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 262 kPa (38 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 314 kPa (46 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 238 kPa (35 psi)

Stantec

Supporting Hydraulic Calculations

Stantec Project #: 163401084
Project Name: 572 Moodie Dr
Date: May 3, 2021
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Boundary Conditions provided by the City:

Scenario 1: Peak Hour (Min HGL): 126.8 m;
Scenario 2: Average Day (Max HGL): 132.1 m; and
Scenario 3: Maximum Day plus Fire Flow: 113.5 m.

Sample Calculations

$HGL\ (m) = hp + hz$ *(1)*

where: hp = Pressure Head (m); and hz = Elevation Head (m), estimated from topography.

For Scenario 1, we have:

HGL(m) = 126.8 and hz (m) = 99.4.

Rearranging Equation 1, we can calculate the Pressure Head (hp) as follow:

$hp\ (m) = HGL - hz$

$\therefore$ hp = 126.8 - 99.4 m = 27.4 m.

To convert from Pressure Head (m) to a pressure value (kPa), the following equation can be used:

$P\ (kPa) = (\rho * g * hp) / 1000$ *(2)*

where: ρ = density of water = 1000 kg/m^3; and g = gravitational acceleration = 9.81 m/s^2.

Using Equation 2, we can calculate the Pressure (P) as follow:

P (kPa) = (1000 * 9.81 * 27.4) / 1000

$\therefore$ P = 269 kPa.

Considering that 1 kPa = 0.145 psi, the pressure under Scenario 1 is equal to:

P = 39 psi.

Applying the same procedures, the pressures under Scenario 2 and Scenario 3 are calculated as follows:
Scenario 2: P = 46 psi; and Scenario 3: P = 20 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 269 kPa (39 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 321 kPa (46 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 138 kPa (20 psi)

ATTACHMENT 6: FIGURE 2 – HYDRANT SPACING FOR 4000 OLD RICHMOND ROAD

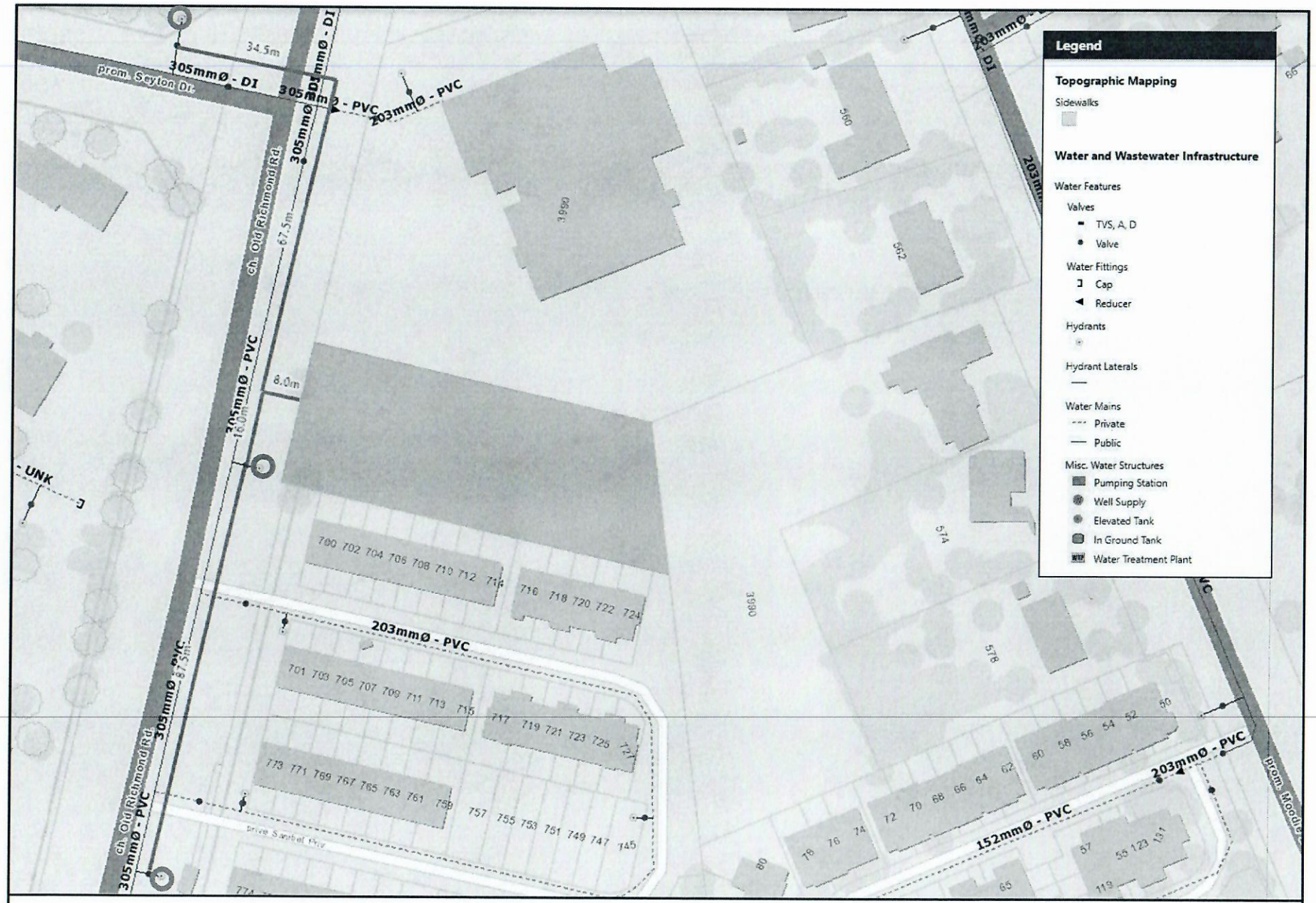


Figure 2: Hydrant Spacing for 3990 Old Richmond Rd

Source: geoOttawa 2020; *Contains information licensed under the Open Government Licence – City of Ottawa.*

ATTACHMENT 7: FIGURE 3 – FIREWALL CONFIGURATION FOR WOOD CONSTRUCTION AT 572 MOODIE DRIVE

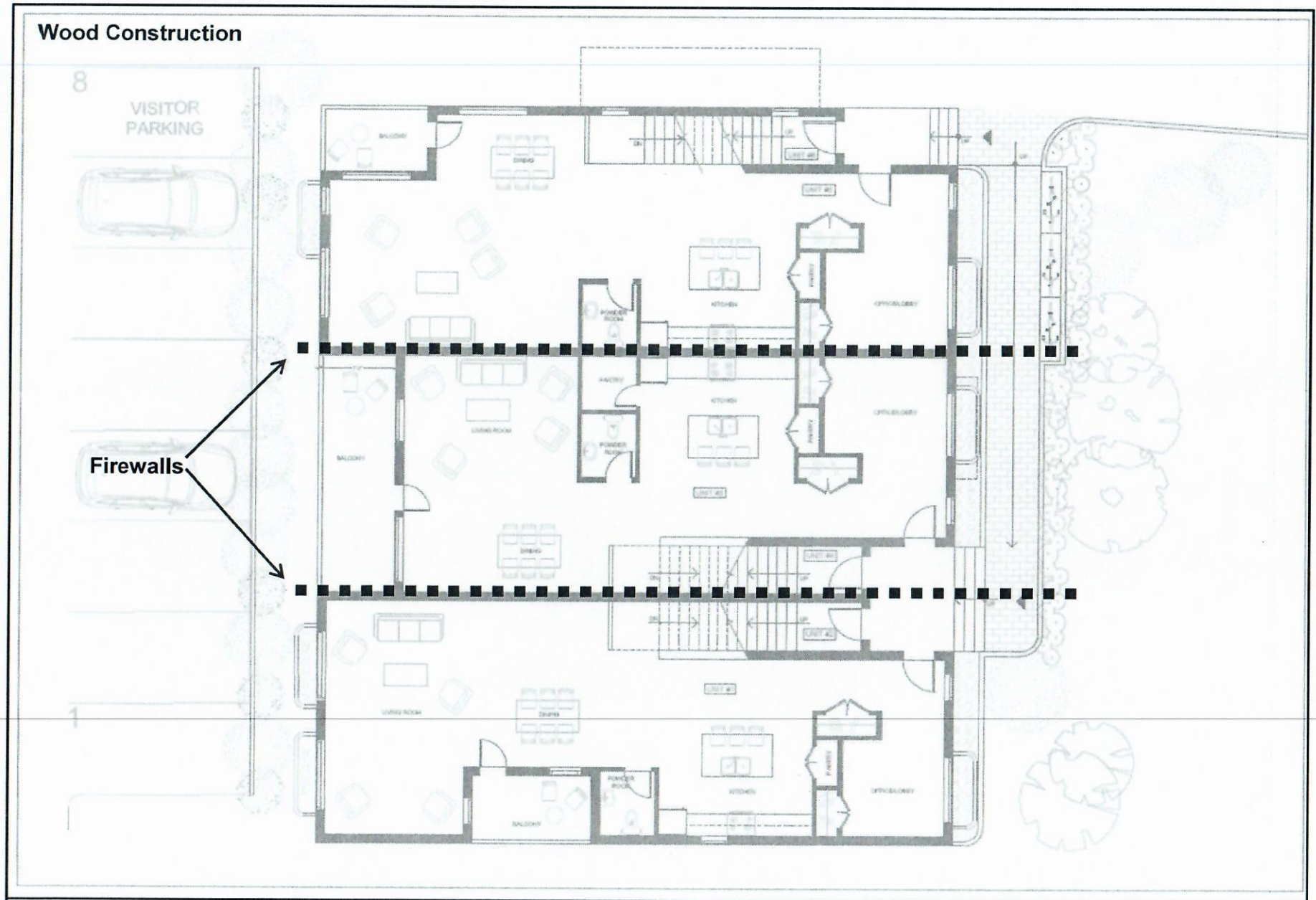


Figure 3: Firewall Configuration for Wood Construction at 572 Moodie Dr

ATTACHMENT 8: FIGURE 4 – FIREWALL CONFIGURATION FOR WOOD CONSTRUCTION AT 572 MOODIE DRIVE (1)

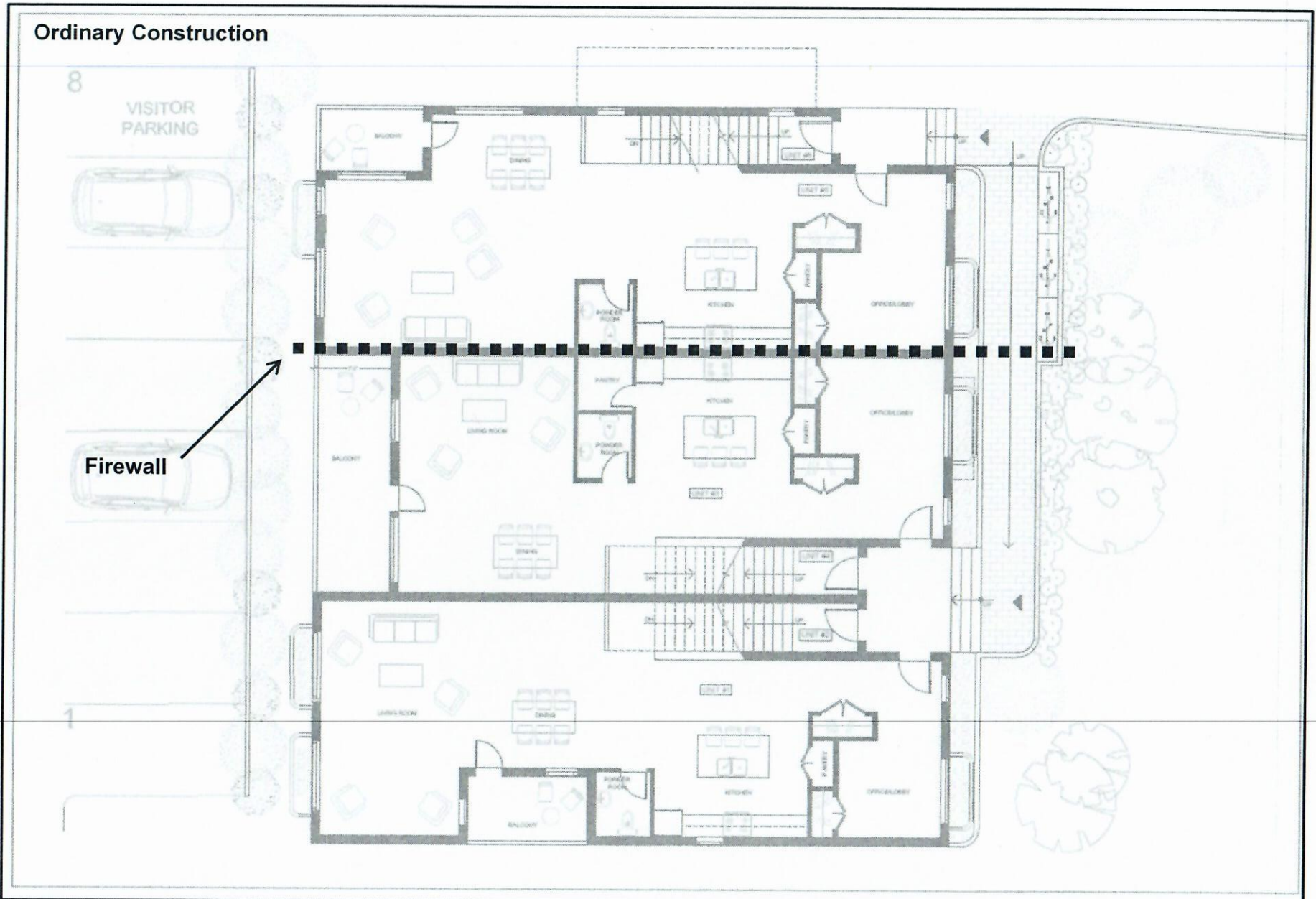


Figure 4: Firewall Configuration for Ordinary Construction at 572 Moodie Dr (1)

ATTACHMENT 9: FIGURE 5 – FIREWALL CONFIGURATION FOR WOOD CONSTRUCTION AT 572 MOODIE DRIVE (2)

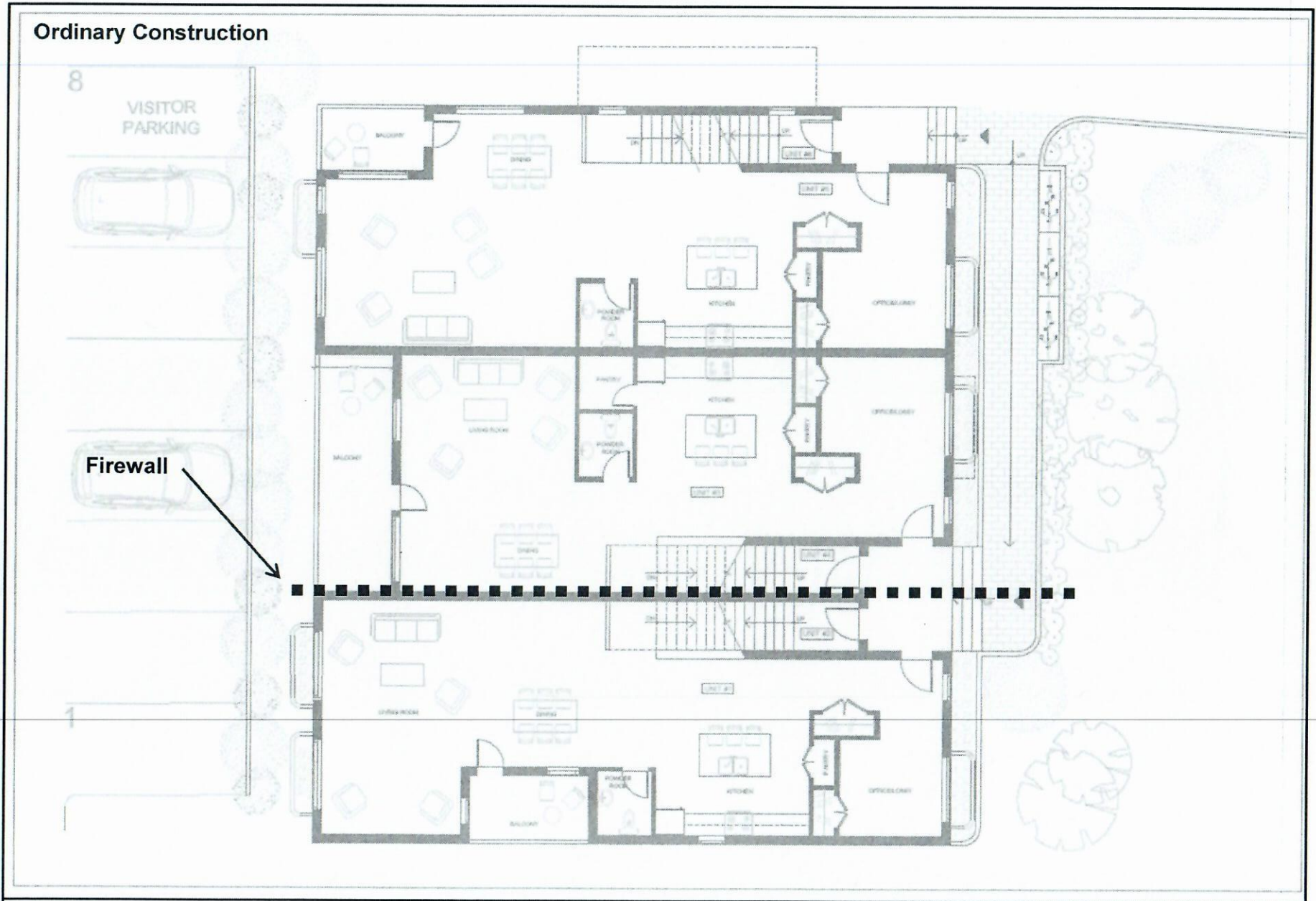


Figure 5: Firewall Configuration for Ordinary Construction at 572 Moodie Dr (2)

ATTACHMENT 10: FIGURE 6 – HYDRANT SPACING FOR 572 MOODIE DRIVE

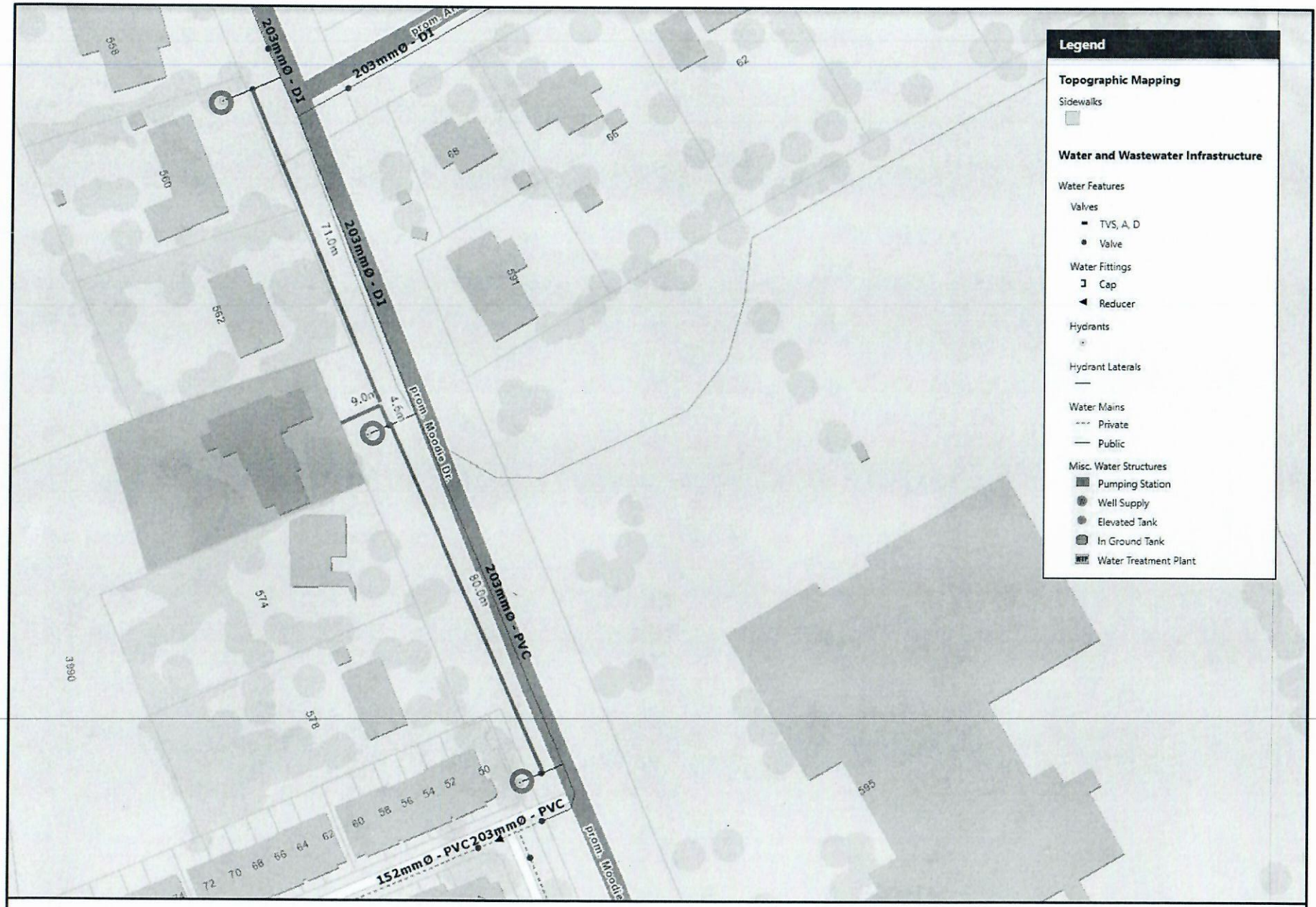


Figure 6: Hydrant Spacing for 572 Moodie Dr

Source: geoOttawa 2020; *Contains information licensed under the Open Government Licence – City of Ottawa.*

PROPOSED FOUR STOREY LOW RISE

RESIDENTIAL APARTMENT BUILDING SITE AT

4000 OLD RICHMOND ROAD

AND

PROPOSED 3 ½ STOREY STACKED DWELLING AT

572 MOODIE DRIVE

CITY OF OTTAWA

APPENDIX E

CITY OF OTTAWA

SANITARY SEWER DESIGN SHEET

SHEET No. 1 OF 2

AND

SHEET No. 2 OF 2

SANITARY SEWER DESIGN SHEET

q = average daily per capita flow (280 L/cap. d)
I = unit of peak extraneous flow (0.33 L/ha. s)
M = peaking factor 4 (MAX.)
Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow

RESIDENTIAL DENSITY
2 BEDROOM – 2.1 PPU
1 BEDROOM – 1.4 PPU
BACHLOR APT – 1.4 PPU

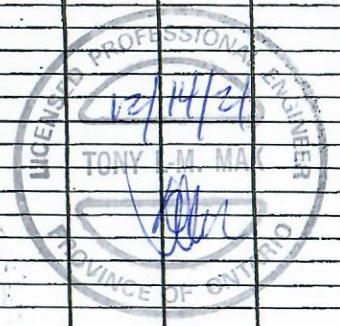
$M = 0.8 + \frac{14}{4 + \sqrt{P}}$ where P population in 1000's

$Q(p) = \frac{PqM}{86.4}$ (L/s)

Q(i) = IA (L/s) where A = area in hectares

Q(d) = Q(p) + Q(i) (L/s)

LOCATION			INDIVIDUAL		CUMULATIVE		Peaking factor M	Pop. flow Q(p) (L/s)	Peak extraneous flow Q(i) (L/s)	Peak design flow Q(d) (L/s)	PROPOSED SEWER						
STREET	FROM	TO	Pop.	Area A (hectares)	Pop.	Area A (hectares)					Length (m)	Pipe size (mm)	Type of pipe	Grade %	Capacity (L/s) n=0.013	Full flow velocity (m/s)	Actual velocity at Q(d)
3990 OLD RICHMOND ROAD	SITE	EX 250Ø SANITARY SEWER	84.7	0.24	84.7	0.24	4	1.10	0.08	1.18	22.5	150	PVC	1.0 (min)	19.8	1.12	



(FILE# 819-106)

DESIGN	TLM	PROJECT	4000 OLD RICHMOND ROAD
CHECKED	TLM		PROPOSED 4 STOREY LOW RISE
DATE	NOV., 2021		RESIDENTIAL APARTMENT SITE

SHEET No. 1 of 2

SANITARY SEWER DESIGN SHEET

q = average daily per capita flow (280 L/cap. d)
I = unit of peak extraneous flow (0.33 L/ha. s)
M = peaking factor 4 (MAX.)
Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow

RESIDENTIAL DENSITY
3 BEDROOM - 3.1 PPU

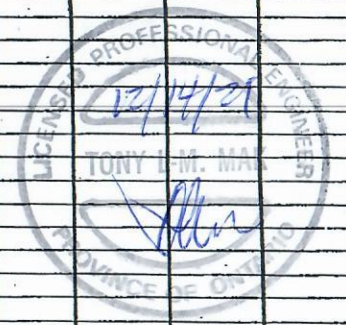
$M = 0.8 + \frac{14}{4 + \sqrt{P}}$ where P population in 1000's

$Q(p) = \frac{PqM}{86.4}$ (L/s)

Q(i) = IA (L/s) where A = area in hectares

Q(d) = Q(p) + Q(i) (L/s)

LOCATION			INDIVIDUAL		CUMULATIVE		Peaking factor	Pop. flow	Peak extraneous flow	Peak design flow	PROPOSED SEWER						
STREET	FROM	TO	Pop.	Area A (hectares)	Pop.	Area A (hectares)	M	Q(p) (L/s)	Q(i) (L/s)	Q(d) (L/s)	Length (m)	Pipe size (mm)	Type of pipe	Grade %	Capacity (L/s) n=0.013	Full flow velocity (m/s)	Actual velocity at Q(d)
572 MOODLE DRIVE	SITE	EX. 2500 SANITARY SEWER	18.6	0.08	18.6	0.08	4	0.24	0.03	0.27	±26.0	125	PVC	1.0 (min)			



(FILE # 819-106)

DESIGN	TLM
CHECKED	TLM
DATE	NOV. 2021

PROJECT: 572 MOODLE DRIVE
PROPOSED 3½ STOREY RESIDENTIAL STACKED DWELLING SITE

SHEET No. 2 of 2

PROPOSED FOUR STOREY LOW RISE

RESIDENTIAL APARTMENT BUILDING SITE AT

4000 OLD RICHMOND ROAD

AND

PROPOSED 3 ½ STOREY STACKED DWELLING AT

572 MOODIE DRIVE

CITY OF OTTAWA

APPENDIX F

DEVELOPMENT SERVICING STUDY CHECKLIST SUMMARY

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- ☐ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☐ 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.
- ☐ Summary of Pre-consultation Meetings with City and other approval agencies.
- ☐ 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.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ 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).

☐ 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.

☐ 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.

☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ 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

4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available

☒ Availability of public infrastructure to service proposed development

☒ Identification of system constraints.

☒ Identify boundary conditions

☒ Confirmation of adequate domestic supply and pressure

☒ 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.

☒ 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.

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

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

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

☒ 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

☒ 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.

☐ 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.

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

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

4.3 Development Servicing Report: Wastewater

☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).

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

☐ 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.

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

☐ 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)

☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.

☐ Description of proposed sewer network including sewers, pumping stations, and forcemains.

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

4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☐ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ 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.
- ☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.

- [x] Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- [ ] Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- [x] 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.
- [ ] Any proposed diversion of drainage catchment areas from one outlet to another.
- [x] Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- [ ] 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.
- [ ] Identification of potential impacts to receiving watercourses
- [ ] Identification of municipal drains and related approval requirements.
- [x] Descriptions of how the conveyance and storage capacity will be achieved for the development.
- [x] 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.
- [ ] Inclusion of hydraulic analysis including hydraulic grade line elevations.
- [x] Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- [ ] 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.
- [ ] Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

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

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

4.6 Conclusion Checklist

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