

**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA
APPLICATION FILE No. : D07-12-22-0160**

**SERVICEABILITY REPORT
REPORT No. R-822-100A (REVISION 1)
FEBRUARY 2023**

**T.L. MAK ENGINEERING CONSULTANTS LTD.
OCTOBER 2022
REFERENCE FILE NUMBER 822-100**

Introduction

The developer of this property is proposing to redevelop the existing residential lot described as Part of Lot 4 in Block A R-Plan 102 by constructing a three (3) storey mixed use building with a mezzanine above the third floor consisting of one (1) 2-bedroom unit, four (4) 1-bedroom units and one commercial unit totalling six (6) units. This proposed mixed used building will abut with the existing 184 Main Street mixed used building owned by the same owners along the south wall of the proposed building. The 180 and 184 Main Street building will not merge on land title as one property, therefore, they are to be serviced with separate independent building services.

The municipal address of this property is referenced as 180 Main Street and it is located in the City Ward (17 - Capital). The site is situated on the west side of Main Street, north of Hazel Street and south of Oblats Avenue, see site plan and legal survey plan in Appendix A for details.

The area of this property is ± 0.03 hectares. In addition to the (3)-storey mixed use building, the other development features will comprise of asphalt surface access to the front commercial and residential entrance including interlock paver along the north side yard to access the side and rear entrance of the building, an amenity area in the rear yard, as well as landscaped areas throughout the site, etc., to meet the City of Ottawa's site plan requirements.

A site geotechnical report was prepared for this site by the owner's soils engineer, Paterson Group, entitled Geotechnical Investigation Report.

This serviceability report will provide the City of Ottawa with our serviceability brief to address the proposed servicing scheme for this site.

Existing Site Conditions and Servicing

This property is currently occupied by a two storey residential building, which is a two (2)-storey brick sided dwelling encompassed by concrete surfaces with gravelled laneway located along the south side of the lot including a parking area and wooden shed located at the rear of the property. For additional details of the site's pre-development conditions, refer to the coloured Google Image (2022) and aerial photography from (GeoOttawa 2021) in Appendix B.

The site is primarily semi-permeable and permeable surfaced that are covered with building roof areas, gravel laneway, concrete walkway surfaces with the remainder of the lot generally grass or landscape areas. Pre-development coefficient of runoff is estimated at $C = 0.53$.

The topography of the land is found to be gently sloping from west to east or (back to front) with an average slope of $\pm 1.4\%$.

The existing sanitary service lateral currently servicing the existing dwelling on 180 Main Street will be removed. The existing sanitary house lateral shall be blanked and shall be capped at the front property line for re-development of this lot. An existing 300mm dia. storm lateral and 50mm dia. water service were pre-installed by the previous landowner in 2016 for re-development of this lot.

As for the availability of underground municipal services, there are existing municipal services along Main Street in front of this property consisting of a 1350mm diameter storm sewer, a 375mm diameter sanitary sewer and a 400mm diameter watermain for development of this property. Refer to the City of Ottawa Main Street UCC drawing and As-Built plan and profile drawings included in Appendix C for details.

Because the site is located within a separated sewer shed, therefore, the approval exemption under Ontario Regulations 525/98 would apply since storm water discharges from this site will outlet flow into a storm sewer. Thus, an Environmental Compliance Approval (ECA) application will not be required to be submitted to the Ministry.

Proposed Residential Apartment Building Site

Vehicle access to this site will not be required for development of this property. Asphalt surface is proposed for access to the commercial and residential entrance at the front of the building. Interlock pavers are proposed along the north side of the new building for pedestrian access to the side and rear entrances.

A. Water Supply

The proposed building located within Pressure Zone 1W at 180 Main Street is a 4-storey mixed-use building. The first floor will house a commercial area, while the upper floors are residential. A mezzanine is found on the 4th floor.

The building contains six (6) total units, namely four (4) 1-bedroom units, one (1) 2-bedroom unit, and one (1) commercial unit. The 1st floor covers an area of approximately 199 m², in addition to a 73 m² mezzanine, for a total area of 272 m². The 2nd and 3rd floors cover an area of approximately 220 m² each. Lastly, the mezzanine/loft on the 4th floor is 123 m². As such, the total gross floor area of approximately 836 m². The building is to be serviced by the 406 mm diameter watermain along Main Street.

The ground elevation on the property is approximately 65.5 m, as obtained from GeoOttawa elevation contours (**Figure 1** in Appendix D), and the Site Survey Plan provided to Stantec (see attached **Site Survey Plan** in Appendix D).

Demand Projections

The domestic demands were calculated using the City of Ottawa’s Water Design Guidelines. For residential units, a consumption rate of 280 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, and 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. For the commercial unit, a consumption rate of 28,000 L/gross hectare/d was used to estimate AVDY demands. Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 1.8. Peak hour (PKHR) demands were calculated by multiplying MXDY by a factor of 1.8. Table 1 shows the estimated domestic demands of the proposed building.

Table 1: Estimated Domestic Demand

Unit Type	Unit Count	PPU	Consumption (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 1-Bedroom	4	1.4	280	1,568	0.02	3,920	0.05	8,624	0.10
Apartment, 2-Bedroom	1	2.1		588	0.01	1,470	0.02	3,234	0.04
<i>Sub-total (Residential)</i>	5			2,156	0.02	5,390	0.06	11,858	0.14
Unit Type	Unit Count	Area (m ²)	Consumption (L/gross ha/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Commercial	1	272	28,000	762	0.01	1,142	0.01	2,056	0.02
Total	6			2,918	0.03	6,532	0.08	13,914	0.16

The fire flow requirement was determined following the Fire Underwriter Survey (FUS) method. For this analysis, the building was classified as wood frame construction with building contents that are limited in combustibility. It is understood that the building will not have a sprinkler system.

Based on available data, the proposed building at 180 Main Street will be connected to the adjacent building located at 184 Main Street. As such, two scenarios were considered for the fire flow requirement calculations, namely: Scenario A considered a firewall between the proposed building at 180 Main Street, and the adjacent building at 184 Main Street; while Scenario B considered both buildings as a single fire block. Note that in both scenarios, adjacent buildings within 3 m of the proposed unit were considered in the FUS exposure distances calculations, but their areas were not considered in the FUS requirement calculations.

As such, the resulting total required fire flow (RFF) for Scenario A is 13,000 L/min (213 L/s) for a duration of 2.75 hours. For Scenario B, the resulting total required fire flow is 17,000 L/min (283 L/s) for a duration of 3.75 hours. Details are provided in the attached **FUS Fire Flow Calculations** in Appendix D. **Figures 2 and 3** in Appendix D 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, the estimated water demands for the proposed building are as follows:

- AVDY = 2,918 L/d (0.03 L/s)
- MXDY = 6,532 L/d (0.08 L/s);
- PKHR = 13,914 L/d (0.16 L/s);
- Fire Flow (FUS) Scenario A = 13,000 L/min (213 L/s); and
- Fire Flow (FUS) Scenario B = 17,000 L/min (283 L/s).

Boundary Conditions

The hydraulic gradeline (HGL) boundary conditions for 180 Main Street, as presented in **Table 2**, were provided by the City on September 20, 2022 (see attached **Water Boundary Conditions Email** in Appendix D).

Table 2: Boundary Conditions

Demand Scenario	Head (m)
Minimum HGL (Peak Hour)	105.4
Maximum HGL (Average Day)	115.7
Maximum Day + Fire Flow – Scenario A (213 L/s)	107.7
Maximum Day + Fire Flow – Scenario B (283 L/s)	107.1

Hydraulic Analysis

Peak Hour & Average Day

During peak hour demands, the resulting minimum hydraulic gradeline of 105.4 m corresponds to a peak hour pressure of 391 kPa (57 psi). This value is above the minimum pressure objective of 276 kPa (40 psi) for residential buildings up to two storeys. The peak hour pressure exceeds this objective and is therefore considered acceptable. Given that this building consists of a total of 4 storeys, further consideration will be needed to service the higher floors. Adding 5 psi per floor above two stories (i.e., 2 additional floors), a minimum pressure of 346 kPa (50 psi) would be required for the fourth floor. The peak hour pressure calculated is greater than this objective and is therefore considered acceptable.

During average day demands, the resulting maximum hydraulic gradeline of 115.7 m corresponds to a maximum pressure of 492 kPa (71 psi). This value is less than the maximum pressure objective of 552 kPa (80 psi) and is therefore considered acceptable.

Supporting hydraulic calculations are attached in Appendix D.

Maximum Day + Fire Flow

A maximum day plus fire flow hydraulic gradeline of 107.7 m (Scenario A) corresponds to a residual pressure of 414 kPa (60 psi) at this location. Similarly, the hydraulic gradeline of 107.1 m for Scenario B corresponds to a residual pressure of 408 kPa (59 psi) at this location. As such, both scenarios are 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, four (4) hydrants are located in the vicinity of the proposed building, two (2) within 75 m and two (2) others within 150 m from the site. All hydrants appear to be unrated and are not included in the City of Ottawa Open Data database. However, based on the boundary conditions provided (residual pressure of 59 psi for a fire flow of 283 L/s), it is assumed that all are Class AA hydrants. Thus, up to 5,700 L/s is assumed for the capacity of the hydrants within 75 m, while up to 3,800 L/s is assumed for hydrants within 150 m. The hydrant capacity should be tested in accordance with NFPA standard 291 and confirmed by the City. Based on our assumptions, the combined hydrant flow coverage for 180 Main Street is therefore 19,000 L/min, which is above the FUS required fire flow of 17,000 L/min (FUS Scenario B).

The hydrant coverage is illustrated in **Figure 4** attached in Appendix D. A breakdown of the hydrant coverage is summarized in **Table 3**. As discussed, the capacity of the hydrants should be tested to confirm adequate hydrant coverage.

Table 3: Minimum Fire Hydrant Coverage

Building	Calculated Fire Flow Demand (L/min)	Fire Hydrants					Minimum Combined Hydrant Flow Coverage (L/min)
		Hydrant Class	Within 75 m		Between 75 m and 150 m		
			Quantity	Contrib. to RFF	Quantity	Contrib. to RFF	
180 Main Street	17,000 (FUS)	AA	2*	5,700	2*	3,800	19,000
		A					
		B					
		C					

* Assumed hydrant class based on boundary condition.

A 50mm dia. water service line was pre-installed in about 2016 for this site and will be used to service the proposed 3-storey mixed use building. Based on the provided fixture counts, the total hydraulic load of 90 was estimated. Therefore, under a peak hour pressure of 391 kPa (57 psi) the maximum water fixture units for a 15.5m long - 50mm dia. (2 inches) water service line is approximately 186. This value is greater than the estimated 90 total hydraulic load. As such the 50mm dia. (2 inches) water line can adequately service the building at 180 Main Street.

In conclusion, based on the boundary condition provided, the 406 mm diameter watermain on Main Street (intended service line connection) provides adequate fire flow capacity as per the Fire Underwriters Survey (FUS) method to the proposed development at 180 Main Street. Based on our assumptions as noted, the combined hydrant flow coverage should be above the required fire flow, nevertheless hydrant capacity will need to be confirmed by the City. Anticipated demand flows meet the pressure objectives during average and peak demand conditions, as per the City of Ottawa's Drinking Water Design Guidelines.

B. Sanitary Flow

The peak sanitary flow for the proposed six (6) units, which comprise of four (4) 1-bedroom units, one (1) 2-bedroom unit and one (1) commercial unit, is estimated at $Q = 0.12$ L/s with an infiltration rate of 0.01 L/s. Please refer to Appendix E regarding sanitary flow calculations. This flow will enter the existing 375mm diameter sanitary sewer on Main Street via a proposed new 150mm diameter PVC sanitary service lateral from the three (3)-storey mixed use commercial/residential building.

The existing peak sanitary flow of the site for single detached dwelling unit is $Q = 0.05$ L/s with an infiltration rate of 0.01 L/s. The net increase in flow from this proposed development is 0.07 L/s.

Waste water from the Main Street 375mm dia. sanitary sewer then in turn outlets further north on Main Street then east along Springhurst Avenue and into the existing 1350mm dia. Rideau River interceptor. Waste water flow from this collector sewer then flows further north into existing 1500mm dia. Rideau River Interceptor.

C. Storm Flow

The storm-water outlet for the proposed development property will be the existing 1350mm diameter storm sewer located on Main Street. Stormwater attenuation on site will be accomplished by means of rooftop storage with controlled roof drains that regulate flow off site.

Two (2) roof drains are proposed for this apartment building that will restrict maximum flow to a rate of 0.32 L/s each or 2×0.32 L/s = 0.64 L/s under a head of 150mm and into the Main

Street storm sewer. The calculated net allowable controlled release rate from this site is estimated at 3.22 L/s under the 2 year pre-development event.

At this development site, for storm events up to the 100-year event the maximum post development flow draining off-site is the controlled roof top flow plus the 100-year uncontrolled flow from the site draining to the front and peak sanitary flow which totals to 7.74 L/s (0.64 L/s + 7.10 L/s) and is 4.52 L/s greater than the allowable flow of 3.22 L/s.

Based on the residential site plan from the owner's architect, the average post-development runoff coefficient is estimated at $C = 0.89$ and $A = 0.03$ hectares.

An estimation of the 2-year pre-development flow condition was carried out using the criteria accepted by the City of Ottawa. If post-development C value exceeds the lesser of the $C_{pre} = 0.53$ or $C_{allow} = 0.5$ (max) then SWM is required. So from our calculations, the $C_{allow} = 0.5$ (max) value will be used at $t_c = 10$ minutes for pre-development allowable flow calculation off-site.

The pre-development flow rate calculated into a storm sewer for this residential area is the lesser of the two (2)-Year storm event where $C_{allow} = 0.5$ (max.) runoff value and $t_c = 10$ minutes or the average C_{pre} value which is 0.53 using $t_c = 10$ minutes. Because this site $C_{post} = 0.89$ and $C_{allow} = 0.5$ (max) 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 0.89 is greater than the $C_{allow} = 0.5$.

The storage volume for the two (2)-year and up to the 100-year storm event will be stored by means of flat rooftop on the top of the fourth floor of the apartment building. Also refer to the site storm drainage report (Report No. R-822-100) for further details.

To control the two (2)-Year storm-water release rate off-site from roof top to a rate of 0.64 L/s, a site storage volume of approximately 1.79 m³ minimum is required during the two (2)-year event.

During the two (2)-year storm event for the flat rooftop storage, the ponding depth of rooftop area 1 and 2 is estimated at 100 mm at the drain and 0mm at the roof perimeter, assuming a 2.0% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 1.26 m³ and the rooftop storage available at Roof Area 2 is 1.25 m³, for a total of 2.51 m³, which is greater than the required volume of 1.79 m³.

During the 100-year storm event for the flat rooftop storage, the ponding depth of Roof Area 1 and 2 is estimated at 150 mm at the drain and 0mm at the roof perimeter, assuming a 2.0%

minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 3.96 m³ and the rooftop storage available at Roof Area 2 is 3.95 m³, for a total of 7.91 m³, which is greater than the required volume of 6.81 m³.

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. 822-100 G-1 and 822-100 SWM-1 respectively, the desirable two (2)-year storm and 100-year storm event detention volume of 2.51 m³ and 7.91 m³ respectively will be available on site. Refer to Appendix D in the Storm Drainage Report (Report No. R-822-100) for detailed calculations of available storage volumes.

At this development site, for storm events up to the 100-year event the maximum post development flow draining off-site is the controlled roof top flow plus the 100-year uncontrolled flow from the site draining to the front of the lot totals to 7.74 L/s (0.64 L/s + 7.10 L/s) which is approximately 4.52 L/s greater than the allowable flow of 3.22 L/s.

In comparing the pre-development flow of the current site conditions to the post development flow, the SWM regulated flow plus uncontrolled flow from the proposed site under the post development conditions at the 2-Year event = 3.31 L/s and the 100-Year event = 7.74 L/s whereupon the post development flow events are approximately equal at the 2-Year event and less than the current 100-Year event pre-development flow estimate for the site at 2-Year $_{pre}$ = 3.22 L/s and 100-Year $_{pre}$ = 9.38 L/s. Therefore with this proposed development, stormwater flow off-site is considered improved from that of the existing conditions.

The building weeping tile drainage will outlet via its separate 200mm diameter PVC storm lateral. The roof drains will be outletted also via a separate 150mm PVC storm lateral which “we” into the proposed 200mm diameter storm lateral, where upon both laterals are outletting stormwater directly to the existing Main Street 1350 mm diameter storm sewer via an existing 300 mm diameter PVC storm pipe pre-installed by the previously land owner in 2016. 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. 822-100 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 Main Street 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. #822-100 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.

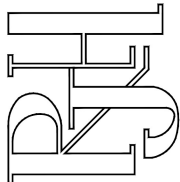


TONY L. MAK, P.ENG



**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA**

**APPENDIX A
SITE PLAN AND LEGAL SURVEY PLAN**



Rosaline J. Hill Architect Inc.

414 Church Hill Ave. N. Ottawa, ON, K1Z 5G6 • 613-853-2822
www.rjhil.ca • rosahill@rjhil.ca

No.	Y / M / D	REVISION
2.	2023.02.28	SITE PLAN COMMENTS
1.	2022.11.07	SITE PLAN APPLICATION

Consultants:

- ZONING:**
- TM2Z(8Z) ZONING DESIGNATION
 - AREA 7 ON SCHEDULE 1A (INNER URBAN MAIN STREET) AND DWELLING UNITS
 - 6.7-5m BUILDING HEIGHT PROVIDED
 - 7.5m MAX SIDE YARD SETBACK, 4m PROVIDED
 - 2m MAX FRONT YARD SETBACK
 - 50% MIN. GROUND FLOOR FACADE TO BE GLAZED (MEASURED PROVIDED WITH BIKE PARKING)
 - 1m MIN. REAR LANDSCAPE BUFFER (WITH 1.4m FENCE)

- AT LEAST ONE ACTIVE ENTRANCE SERVING EACH RESIDENTIAL OR NON-RESIDENTIAL USE OCCUPYING ANY PART OF THE BUILDING
- A RESTAURANT USE LOCATED ON THE GROUND FLOOR OF A BUILDING REQUIRES NO PARKING SPACES FOR THE FIRST 150 SQUARE METRES OF GROUND FLOOR AREA AND 15 METRES GROUND FLOOR AREA, GRND 144m², MEZZ 31.5m² PROVIDED, TO BE CONFIRMED

- EXISTING BUILDING:**
- 2 STOREY DWELLING
 - TO BE DEMOLISHED
- PROPOSED BUILDING:**
- TYPE: MIXED USE (RESTAURANT IN GROUND FLOOR, CONSTRUCTION METHANE, WOOD FRAME)
 - FIRE SUPPRESSION: NOT SPRINKLERED
 - BUILDING HEIGHT (OBC): 3 STOREYS TBC
 - NUMBER OF UNITS: 8 LEVELS: 1
 - NUMBER OF BEDROOMS: 8
 - ROOF: FLAT
 - LIFT: YES

SURVEY INFORMATION:
PART 1 PLAN OF REGISTERED PLAN 102 CITY OF OTTAWA

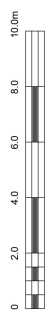
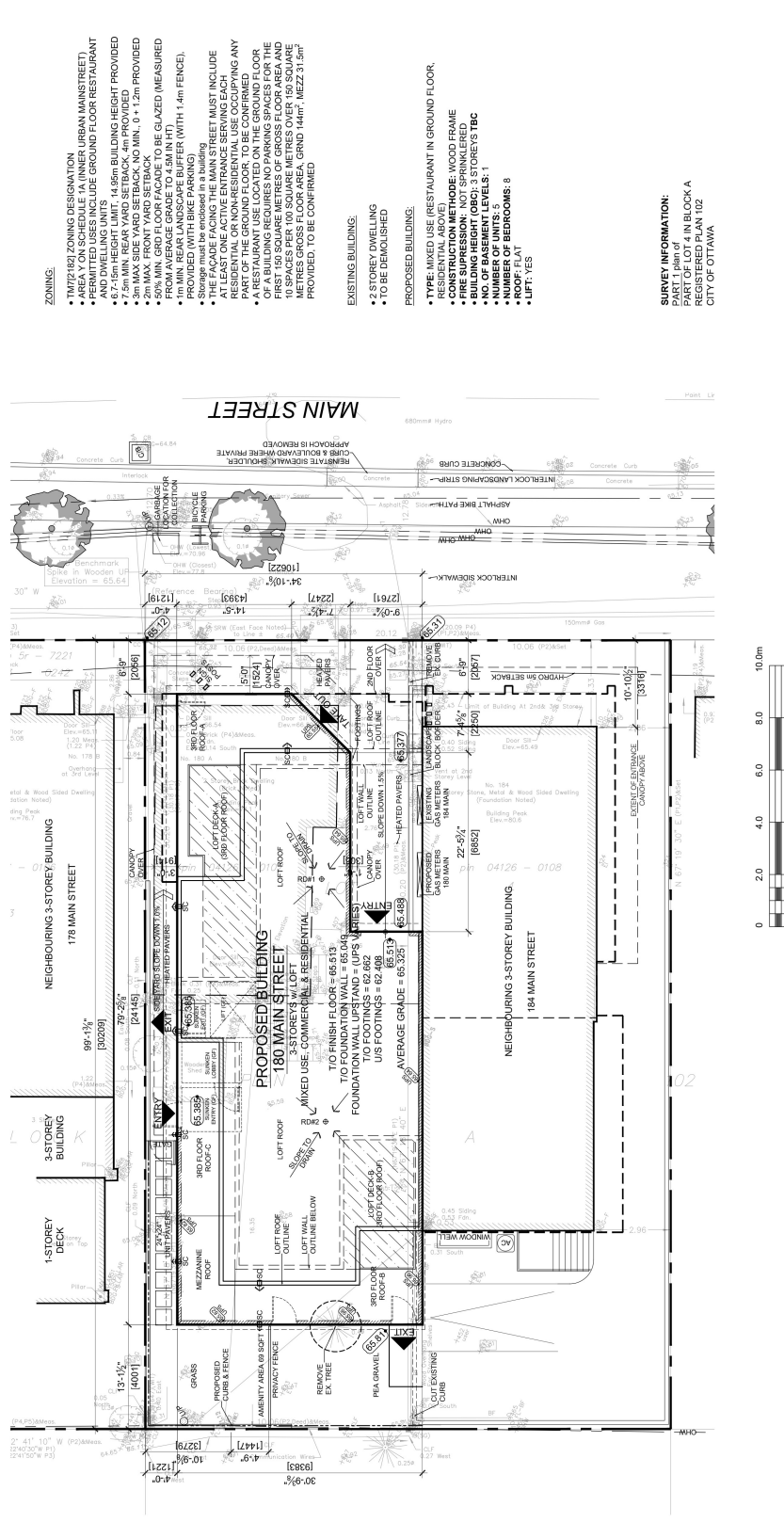
It is the responsibility of the appropriate contractor to check the drawings for compliance with all pertinent codes & by-laws, & use proprietary products as directed by the manufacturer. Do not scale drawings. Copyright reserved.



3 STOREY MIXED USE BUILDING
180 Main Street, Ottawa, Ontario

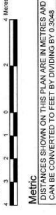
SITE PLAN

Drawn By: MP/RV
Date: NOV. 2022
Project No.: 2208
Scale: 1:125
A1.0



SURVEYOR'S REAL PROPERTY REPORT
PART I Plan of
REGISTERED PLAN 102
CITY OF OTTAWA
 Surveyed by Annis, O'Sullivan, Vollebek, Ltd.

Scale 1: 100



NOTICES SHOWN ON THIS PLAN ARE INTENDED AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Surveyor's Certificate

- I, the undersigned, being a duly qualified and licensed Surveyor in the Province of Ontario, have surveyed the above described lands and have caused the same to be laid down on the accompanying plan in accordance with the Survey Act and the Regulations under the Act, and I certify that the same are true and correct to the best of my knowledge and belief.
- Dated this 8th day of July, 2022.

E. H. Weisgerber
 Ontario Land Surveyor

PART I PLAN MUST BE READ IN CONJUNCTION WITH SURVEY REPORT DATED JULY 8, 2022

ANNIS, O'SULLIVAN, VOLLEBEK LTD. (pin 614), that address, telephone and other contact information is set out in the Survey Report and the Surveyor's Certificate. Any person wishing to obtain a copy of the Survey Report should contact the Surveyor at the address set out in the Survey Report and the Surveyor's Certificate.

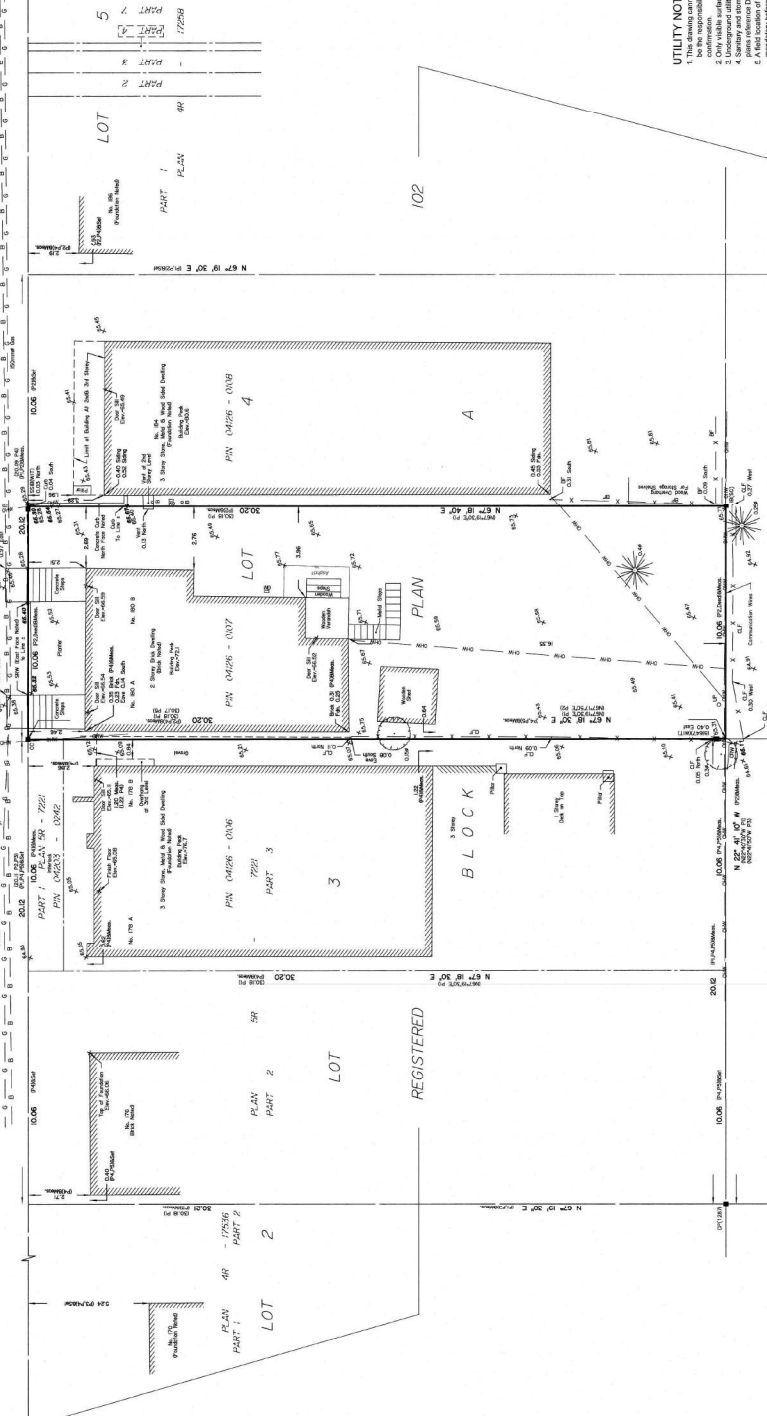
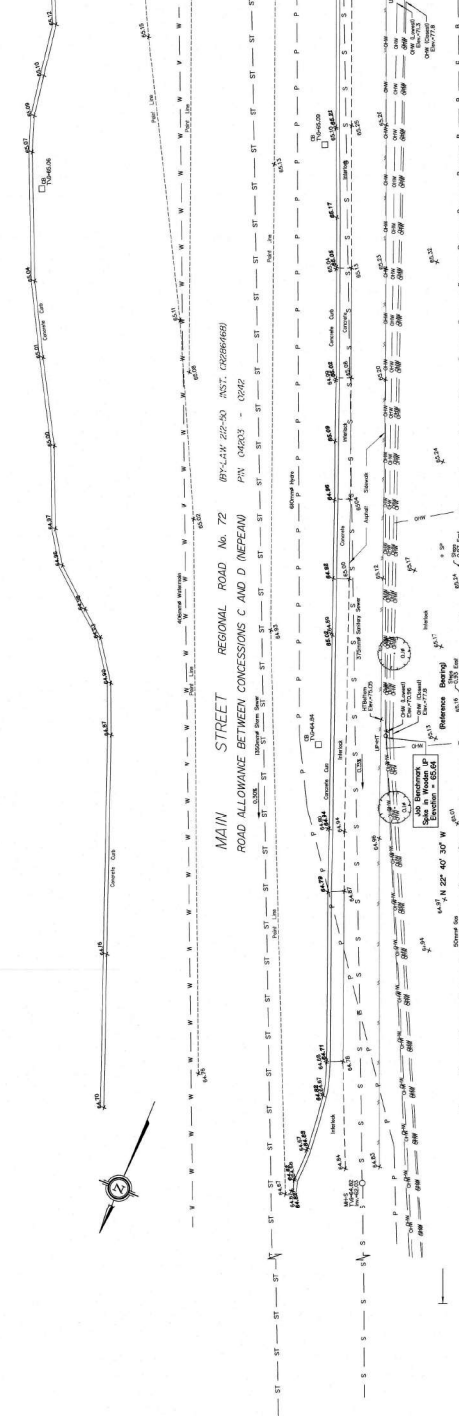
Notes & Legend

Symbol	Description
—○—	Sunny Monument Platemark
SB	Standard Iron Bar
IR	Iron Bar
CC	Cut Cross
CC	Cut Cross
WT	Witness Pin
M	Measured
U006	ANNIS, O'SULLIVAN, VOLLEBEK LTD.
PR1	Reference Point
PR2	(S2) Plan October 26, 2015
PR3	Plan 4671208
PR4	Plan 66-22-21
PR5	Plan 86-7301
D	Dead
OH	Oil Heat
OS	Overhead Lines
OS	Overhead Lines
ST	Underground Storm Sewer
S	Underground Sanitary Sewer
W	Water
E	Electrical Cables
OW	Overhead Wires
P	Underground Power
M	Underground Mains
CL	Underground Cell
CB	Catch Basin
IN	Invert
T/G	Top of Gate
DT	Deciduous Tree
CT	Coniferous Tree
BL	Belted Link Fence
BF	Board Fence
GI	Gas Meter
HT	Hydro Transformer Mounted on Utility Pole
CE	Corner
LE	Location of Elevations
VE	Tip of Concrete Curb / Wall Elevation
CL	Cement
SM	Stone Retaining Wall
FW	Foundation

Notes: See my field notes and plan sheets (part of this plan) which shall be in full effect with this plan. This plan is subject to the provisions of the Survey Act and the Regulations thereunder. The Survey Report and the Surveyor's Certificate are available to the public at the Survey Office, 122 Wellington Street West, Toronto, Ontario, M5E 1A6.



ANNIS, O'SULLIVAN, VOLLEBEK LTD.
 14 Commerce Court, Suite 500
 4500 Sheppard Avenue East
 Scarborough, Ontario M1S 1T7
 Phone: (416) 277-8807 / Fax: (416) 277-5799



UTILITY NOTES
 1. This plan was prepared on the basis of an aerial photograph and all utility lines shown are assumed to be in accordance with the utility companies' records. The user is advised that the utility companies are responsible for the accuracy of their records and the user should verify the location and depth of all utility lines before any work involving grading, paving, planting, etc.
 2. Only visible surface utility lines are shown.
 3. Utility lines shown are assumed to be in accordance with the utility companies' records.
 4. Utility lines shown are assumed to be in accordance with the utility companies' records.
 5. Utility lines shown are assumed to be in accordance with the utility companies' records.

ELEVATION NOTES
 1. Elevations shown are generic and are intended to be used as a general guide only. The user is advised that the utility companies are responsible for the accuracy of their records and the user should verify the location and depth of all utility lines before any work involving grading, paving, planting, etc.
 2. The responsibility for the use of this information to verify the job location and elevation is on the user.

LOT 2
 PLAN 4671208 - PART 1
 PLAN 66-22-21 - PART 1
 PLAN 86-7301 - PART 1
 PLAN 4671208 - PART 2
 PLAN 66-22-21 - PART 2
 PLAN 86-7301 - PART 2
 PLAN 4671208 - PART 3
 PLAN 66-22-21 - PART 3
 PLAN 86-7301 - PART 3
 PLAN 4671208 - PART 4
 PLAN 66-22-21 - PART 4
 PLAN 86-7301 - PART 4
 PLAN 4671208 - PART 5
 PLAN 66-22-21 - PART 5
 PLAN 86-7301 - PART 5

LOT 3
 PLAN 4671208 - PART 1
 PLAN 66-22-21 - PART 1
 PLAN 86-7301 - PART 1
 PLAN 4671208 - PART 2
 PLAN 66-22-21 - PART 2
 PLAN 86-7301 - PART 2

LOT 4
 PLAN 4671208 - PART 1
 PLAN 66-22-21 - PART 1
 PLAN 86-7301 - PART 1
 PLAN 4671208 - PART 2
 PLAN 66-22-21 - PART 2
 PLAN 86-7301 - PART 2

LOT 5
 PLAN 4671208 - PART 1
 PLAN 66-22-21 - PART 1
 PLAN 86-7301 - PART 1
 PLAN 4671208 - PART 2
 PLAN 66-22-21 - PART 2
 PLAN 86-7301 - PART 2

LOT 6
 PLAN 4671208 - PART 1
 PLAN 66-22-21 - PART 1
 PLAN 86-7301 - PART 1
 PLAN 4671208 - PART 2
 PLAN 66-22-21 - PART 2
 PLAN 86-7301 - PART 2

LOT 7
 PLAN 4671208 - PART 1
 PLAN 66-22-21 - PART 1
 PLAN 86-7301 - PART 1
 PLAN 4671208 - PART 2
 PLAN 66-22-21 - PART 2
 PLAN 86-7301 - PART 2

HAZEL STREET

LOT 102

LOT 11

LOT 10
 PLAN 04296 - 0326

LOT 9
 PLAN 04296 - 0326

REGISTERED

REGISTRATION INFORMATION

**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA**

**APPENDIX B
SITE PRE-DEVELOPMENT CONDITION
GOOGLE IMAGE (2022)
AND
AERIAL PHOTOGRAPHY 2021 (GEOOTTAWA)**







**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA**

**APPENDIX C
MAIN STREET
CITY OF OTTAWA
PLAN AND PROFILE
AND
UCC DRAWINGS**

GRABING & DRAINAGE 5
 MAIN STREET
 STA. 10+580 TO STA. 10+720

W.S. Nowak, P. Eng.
 J. V. ...
PARSONS

NO.	REVISIONS	DESCRIPTION	DATE	BY	CHKD.
1	DESIGNED FOR CONSTRUCTION				
2	AS BUILT				

NOTE: THE DESIGNER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES AND AGENCIES. THE DESIGNER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES AND AGENCIES. THE DESIGNER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES AND AGENCIES.

NOTE: ALL NUMERICAL VALUES THAT ARE NOT STROKED OUT AND REPLACED IN THESE DRAWINGS SHALL BE CONSIDERED TO BE DESIGN VALUES ONLY AND NOT MEASURED IN THE FIELD.

SANITARY MAINTENANCE HOLE DATA

NO.	STATION	OFFSET	COVER	STRUCTURE	INVERT ELEVATION	TOP OF STRUCTURE
M/S-06-02	0+362.02	4.51 LT	5 FT	EXIST.	64.8	64.8
M/S-06-03	0+412.03	4.51 LT	5 FT	EXIST.	64.8	64.8
M/S-06-04	0+462.04	4.51 LT	5 FT	EXIST.	64.8	64.8

STORM MAINTENANCE HOLE DATA

NO.	STATION	OFFSET	COVER	STRUCTURE	INVERT ELEVATION	TOP OF STRUCTURE
S/M-07-01	0+362.01	4.51 LT	5 FT	EXIST.	64.8	64.8
S/M-07-02	0+412.02	4.51 LT	5 FT	EXIST.	64.8	64.8
S/M-07-03	0+462.03	4.51 LT	5 FT	EXIST.	64.8	64.8

CATCH BASIN DATA

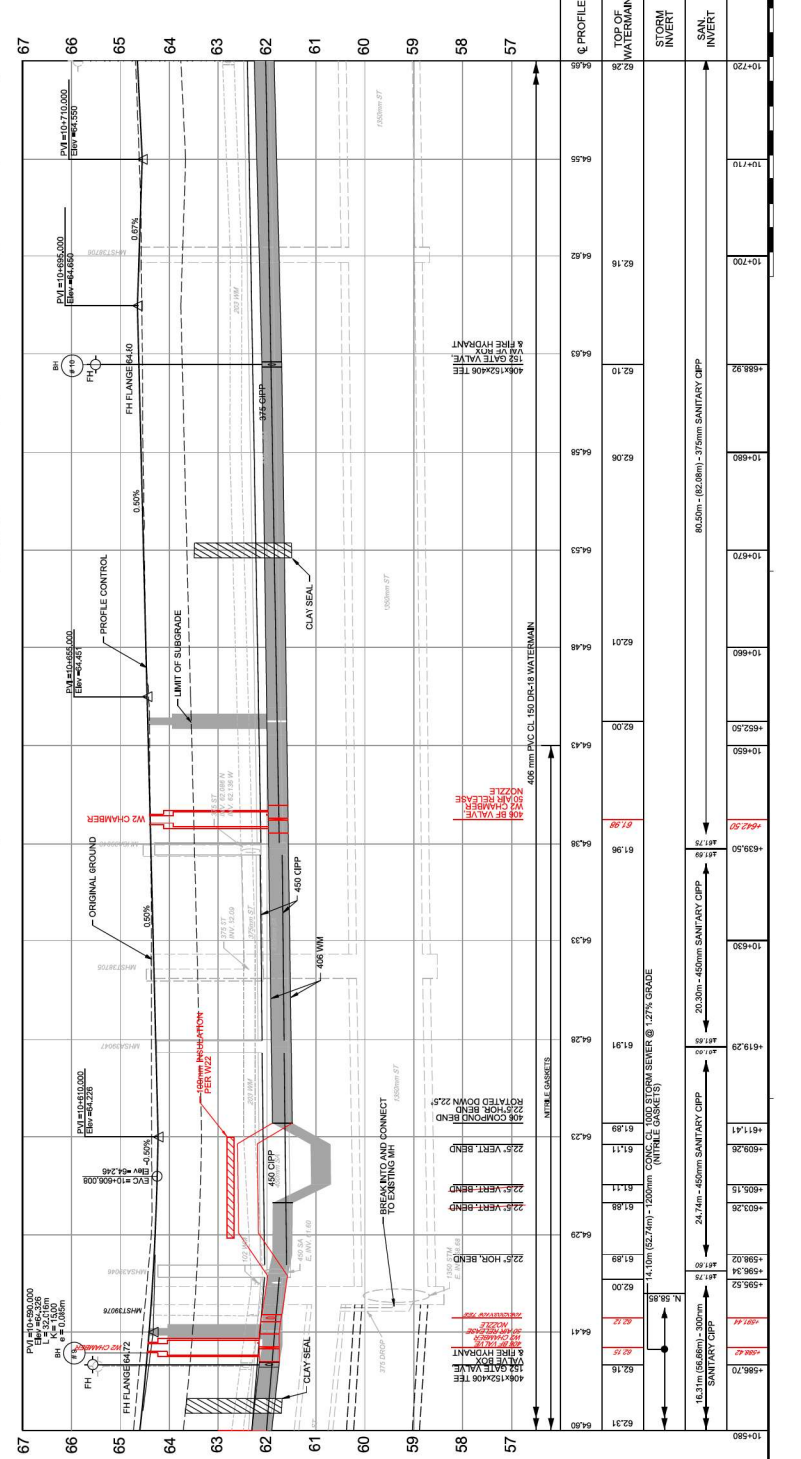
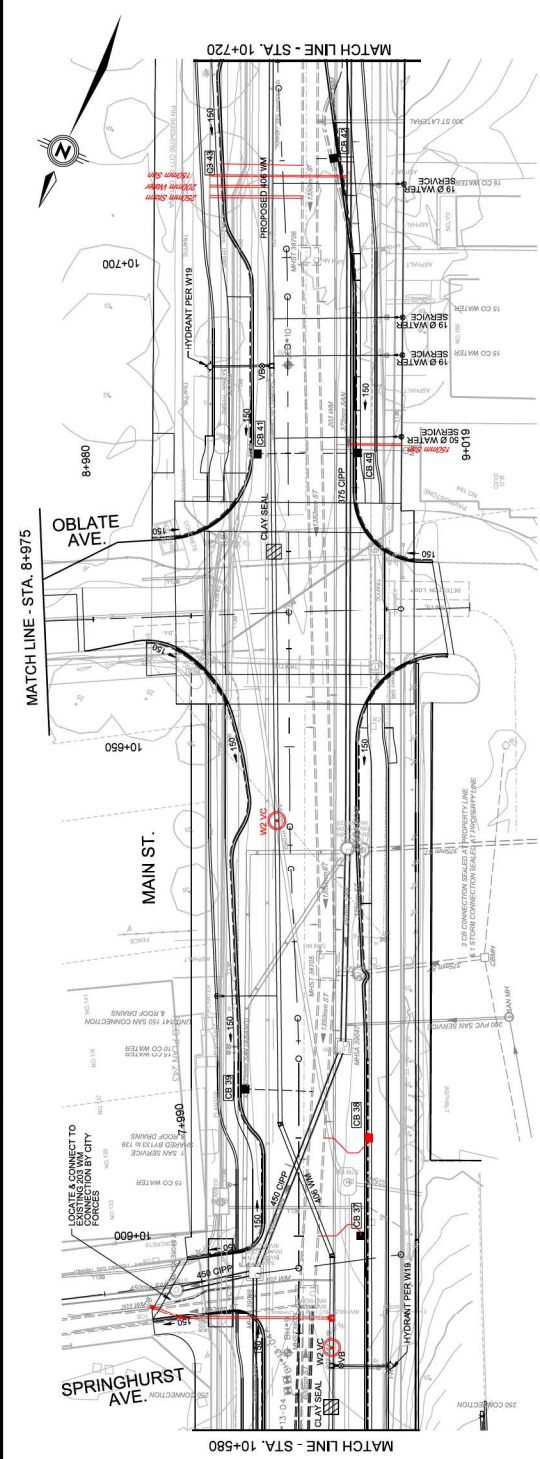
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION	INVERT ELEVATION
CB-37	10+460.00	6.25 RT	5 FT	75x20.0 B	64.22	62.24
CB-38	10+480.00	6.25 RT	5 FT	75x20.0 B	64.16	62.18
CB-39	10+500.00	6.25 RT	5 FT	75x20.0 B	64.10	62.12
CB-40	10+520.00	6.25 RT	5 FT	75x20.0 B	64.04	62.06
CB-41	10+540.00	6.25 RT	5 FT	75x20.0 B	63.98	62.00
CB-42	10+560.00	6.25 RT	5 FT	75x20.0 B	63.92	61.94
CB-43	10+580.00	6.25 RT	5 FT	75x20.0 B	63.86	61.88
CB-44	10+600.00	6.25 RT	5 FT	75x20.0 B	63.80	61.82
CB-45	10+620.00	6.25 RT	5 FT	75x20.0 B	63.74	61.76
CB-46	10+640.00	6.25 RT	5 FT	75x20.0 B	63.68	61.70
CB-47	10+660.00	6.25 RT	5 FT	75x20.0 B	63.62	61.64
CB-48	10+680.00	6.25 RT	5 FT	75x20.0 B	63.56	61.58
CB-49	10+700.00	6.25 RT	5 FT	75x20.0 B	63.50	61.52
CB-50	10+720.00	6.25 RT	5 FT	75x20.0 B	63.44	61.46

CATCH BASIN CONNECTION

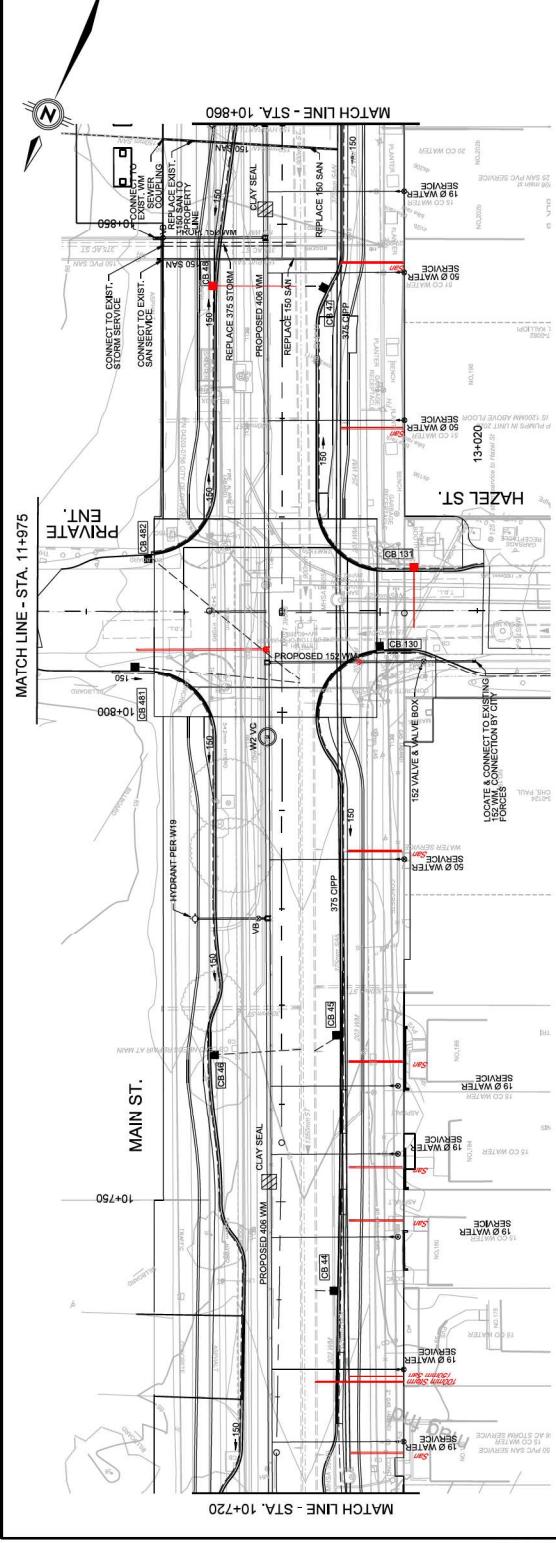
NO.	LOCATION	TYPE	LENGTH	INVERT ELEVATION	TOP OF WATERMAIN ELEVATION
CB-37-MAN	3.03 RT	CONCRETE	4.47	62.34	63.2
CB-38-MAN	3.03 RT	CONCRETE	4.47	62.28	63.14
CB-39-MAN	3.03 RT	CONCRETE	4.47	62.22	63.08
CB-40-MAN	3.03 RT	CONCRETE	4.47	62.16	63.02
CB-41-MAN	3.03 RT	CONCRETE	4.47	62.10	62.96
CB-42-MAN	3.03 RT	CONCRETE	4.47	62.04	62.90
CB-43-MAN	3.03 RT	CONCRETE	4.47	61.98	62.84
CB-44-MAN	3.03 RT	CONCRETE	4.47	61.92	62.78
CB-45-MAN	3.03 RT	CONCRETE	4.47	61.86	62.72
CB-46-MAN	3.03 RT	CONCRETE	4.47	61.80	62.66
CB-47-MAN	3.03 RT	CONCRETE	4.47	61.74	62.60
CB-48-MAN	3.03 RT	CONCRETE	4.47	61.68	62.54
CB-49-MAN	3.03 RT	CONCRETE	4.47	61.62	62.48
CB-50-MAN	3.03 RT	CONCRETE	4.47	61.56	62.42

TABLE OF WATERMAIN FITTINGS

NO.	LOCATION	TYPE	LENGTH	INVERT ELEVATION	TOP OF WATERMAIN ELEVATION
W-01	3.03 RT	CONCRETE	4.47	62.34	63.2
W-02	3.03 RT	CONCRETE	4.47	62.28	63.14
W-03	3.03 RT	CONCRETE	4.47	62.22	63.08
W-04	3.03 RT	CONCRETE	4.47	62.16	63.02
W-05	3.03 RT	CONCRETE	4.47	62.10	62.96
W-06	3.03 RT	CONCRETE	4.47	62.04	62.90
W-07	3.03 RT	CONCRETE	4.47	61.98	62.84
W-08	3.03 RT	CONCRETE	4.47	61.92	62.78
W-09	3.03 RT	CONCRETE	4.47	61.86	62.72
W-10	3.03 RT	CONCRETE	4.47	61.80	62.66
W-11	3.03 RT	CONCRETE	4.47	61.74	62.60
W-12	3.03 RT	CONCRETE	4.47	61.68	62.54
W-13	3.03 RT	CONCRETE	4.47	61.62	62.48
W-14	3.03 RT	CONCRETE	4.47	61.56	62.42



Ottawa
 Contract No. IS2755110 003
 Sheet 33 of 47
 Project: MAIN STREET RECONSTRUCTION
 STA. 10+720 TO STA. 10+860
 W.S. Number: P.E. Reg. J. V. P. P. Reg. 100907
PARSONS
 Check: MK 2/20/2013
 Drawn: MK 2/20/2013
 Scale: HORIZONTAL 1"=10'-0"
 VERTICAL 1"=10'-0"



SANITARY MAINTENANCE HOLE DATA

NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION
MS400004	10+727.27	7.41 RT	3.00	2.00	64.27
MS400004	10+811.52	6.53 RT	3.21	2.50	65.28

STORM MAINTENANCE HOLE DATA

NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION
MS400004	10+804.84	1.56 RT	1.56	1.56	65.33
MS400004	10+813.17	1.56 RT	1.56	1.56	65.33

CATCH BASIN DATA

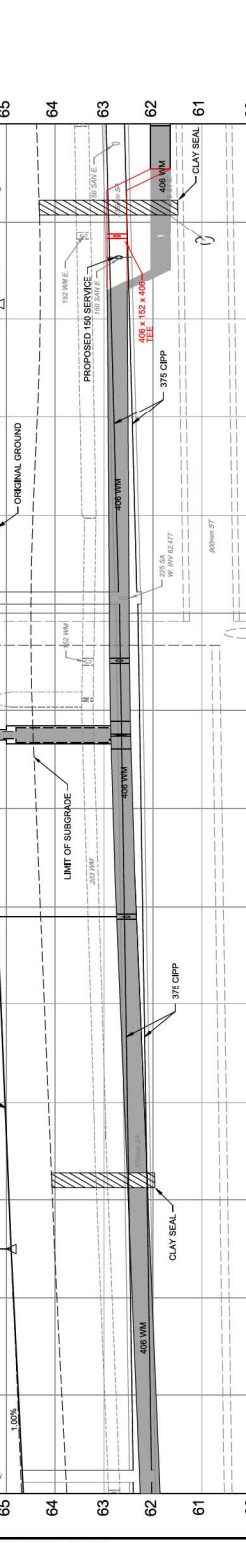
NO.	STATION	COVER STRUCTURE	ITEM	ELEVATION
CB 44	10+720.00	PVC BRD/45	2.60	65.38
CB 45	10+720.00	PVC BRD/45	3.30	66.32
CB 46	10+760.00	7.27 LT	519	70.00
CB 47	10+813.17	4.63 RT	519	70.00
CB 48	10+862.28	15.62 LT	519	70.00
CB 49	10+862.28	15.62 LT	519	70.00
CB 50	10+862.28	15.62 LT	519	70.00

CATCH BASIN CONNECTION

LOCATION	W.M.	TYPE	LENGTH	INVERT	OUTLET	ELEVATION
CB 44-45	48" W.M.	PVC BRD/45	2.60	65.38	2.60	66.25
CB 45-46	48" W.M.	PVC BRD/45	3.30	66.32	3.30	67.25
CB 46-47	48" W.M.	PVC BRD/45	2.22	65.31	2.22	66.15
CB 47-48	48" W.M.	PVC BRD/45	8.25	65.74	8.25	66.15
CB 48-49	48" W.M.	PVC BRD/45	1.72	65.38	1.72	66.15
CB 49-50	48" W.M.	PVC BRD/45	2.17	65.38	2.17	66.15

TABLE OF WATERMAIN FITTINGS

STATION	OFFSET	FITTING	TOP OF WATERMAIN	ELEVATION
10+720.00	0.00	22.5° VERT. BEND	62.84	62.84
10+720.00	0.00	22.5° VERT. BEND	62.84	62.84
10+760.00	0.00	22.5° VERT. BEND	62.84	62.84
10+760.00	0.00	22.5° VERT. BEND	62.84	62.84
10+862.28	0.00	22.5° VERT. BEND	62.84	62.84
10+862.28	0.00	22.5° VERT. BEND	62.84	62.84



STORM INVERT

STATION	ELEVATION
10+720	62.84
10+760	62.84
10+862.28	62.84

SAN. INVERT

STATION	ELEVATION
10+720	62.84
10+760	62.84
10+862.28	62.84

**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA**

**APPENDIX D
CITY OF OTTAWA**

- **SITE PLAN AND ARCHITECTURAL DRAWINGS**
- **SITE SURVEY PLAN**
- **ELEVATION CONTOURS (FIGURE 1)**
- **FUS FIRE FLOW CALCULATIONS**
- **FUS EXPOSURE DISTANCES – SCENARIO A (FIGURE 2)**
- **FUS EXPOSURE DISTANCES – SCENARIO B (FIGURE 3)**
- **WATER DATA BOUNDARY CONDITIONS**
- **SUPPORTING HYDRAULIC CALCULATIONS**
- **HYDRANT SPACING (FIGURE 4)**

ATTACHMENT 1 : SITE PLAN AND ARCHITECTURAL DRAWINGS

3 STOREY MIXED USE BUILDING

180 Main Street, Ottawa, Ontario

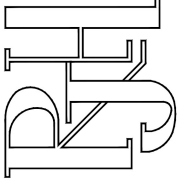
SITE PLAN



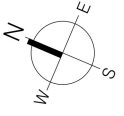
It is the responsibility of the appropriate contractor to check PART I plan of this drawing against the approved drawings and to obtain all necessary permits and approvals from the appropriate authorities. All contractors must comply with all pertinent codes & by-laws, & use proprietary products as directed by the manufacturer. Do not scale drawings. Copyright reserved.

No.	Y / M / D	REVISION
1.	2022.11.07	SITE PLAN APPLICATION
2.	2023.02.28	SITE PLAN COMMENTS

Rosaline J. Hill Architect Inc.



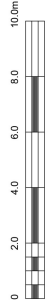
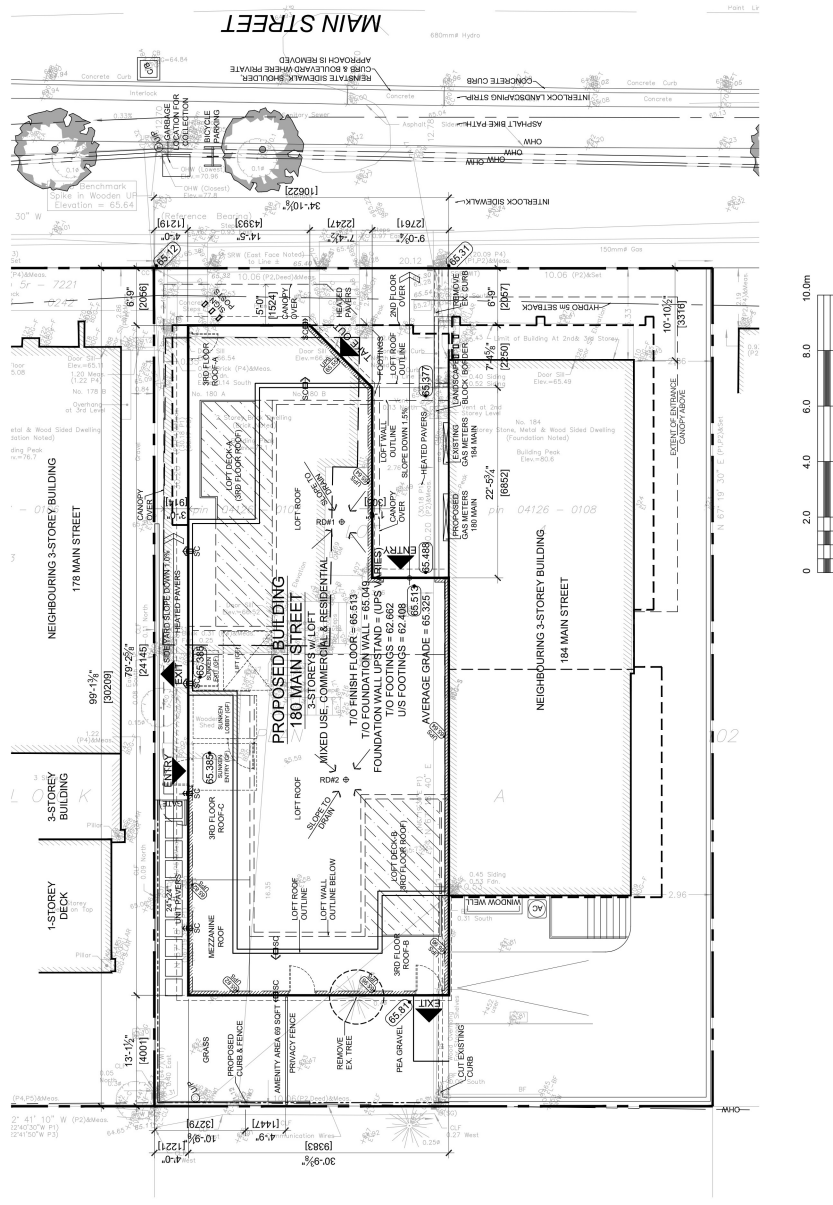
1414 Churchhill Ave. N. Ottawa, ON, K1Z 5C6 • 613-853-2822
www.rjhll.ca • roseline@rjhll.ca

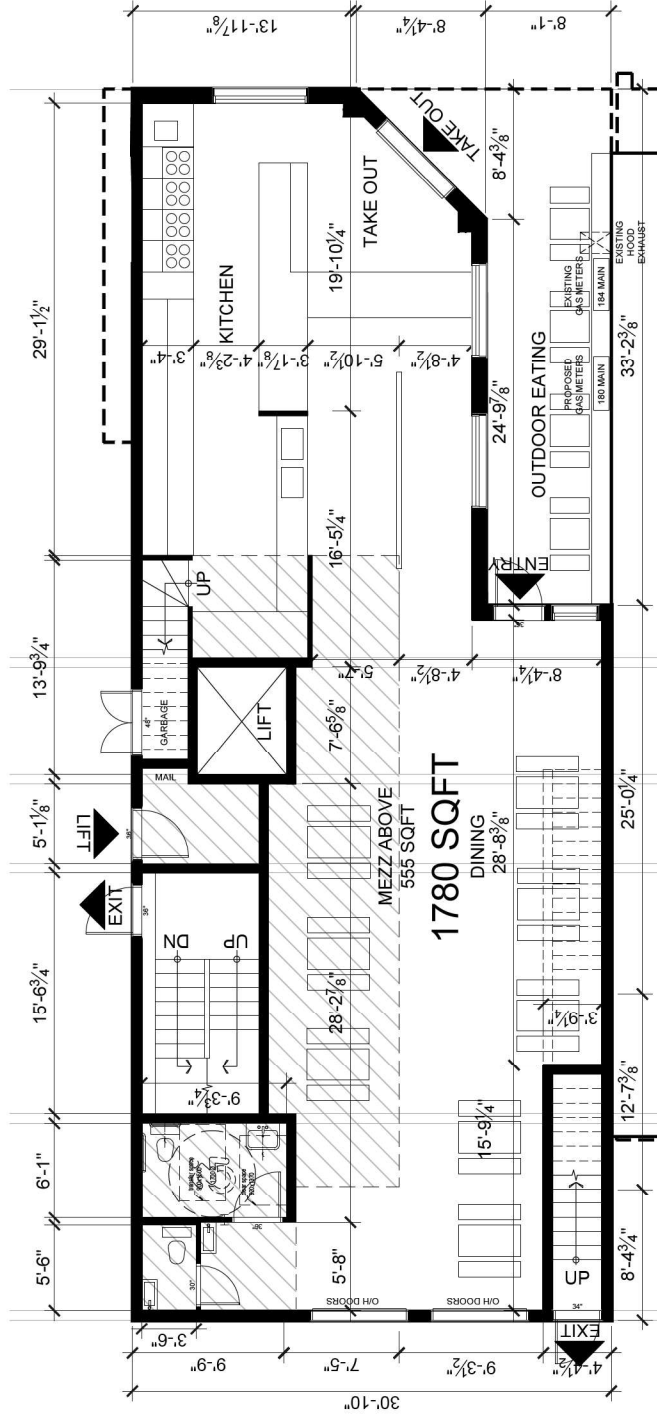
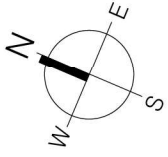


- ZONING:**
- TM21(82) ZONING DESIGNATION
 - AREA 7, ON SCHEDULE 1A (INNER URBAN MAIN STREET), AND DWELLING UNITS
 - 6.7-5m HEIGHT LIMIT, 4.9m BUILDING HEIGHT PROVIDED
 - 7.5m MAX SIDE YARD SETBACK, 4m PROVIDED
 - 2m MAX FRONT YARD SETBACK
 - 50% MIN. GROUND FLOOR FACADE TO BE GLAZED (MEASURED PROVIDED WITH BIKE PARKING)
 - 1m MIN. REAR LANDSCAPE BUFFER (WITH 1.4m FENCE), AT LEAST ONE ACTIVE ENTRANCE SERVING EACH RESIDENTIAL OR NON-RESIDENTIAL USE OCCUPYING ANY PART OF LOT 4 IN BLOCK A
 - A RESTAURANT USE LOCATED ON THE GROUND FLOOR OF A BUILDING REQUIRES NO PARKING SPACES FOR THE FIRST 150 SQUARE METRES OF GROUND FLOOR AREA AND METRES GROUND FLOOR AREA, GRND 144m², MEZZ 31.5m² PROVIDED, TO BE CONFIRMED

- EXISTING BUILDING:**
- 2 STOREY DWELLING
 - TO BE DEMOLISHED
- PROPOSED BUILDING:**
- TYPE MIXED USE (RESTAURANT IN GROUND FLOOR, CONSTRUCTION METHADONE, WOOD FRAME)
 - FIRE SUPPRESSION: NOT SPRINKLERED
 - BUILDING HEIGHT (OBC): 3 STOREYS TBC
 - NUMBER OF UNITS: 8 LEVELS: 1
 - NUMBER OF BEDROOMS: 8
 - ROOF: FLAT
 - LIFT: YES

SURVEY INFORMATION:
PART I plan of REGISTERED PLAN 102 CITY OF OTTAWA





GROUND FLOOR (RESTAURANT)

3-STORY MIXED USE W/ LOFT
COMMERCIAL / RESIDENTIAL

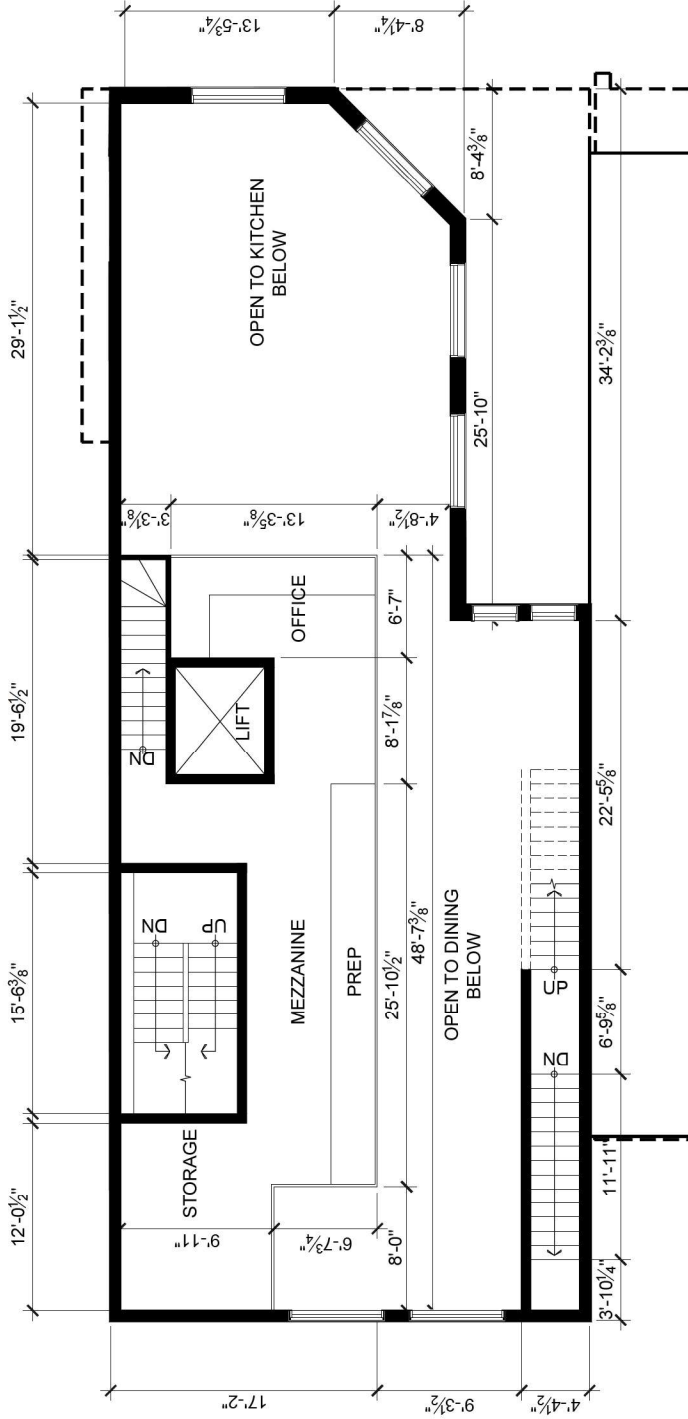
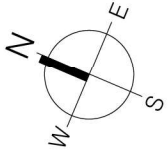
180 Main Street, Ottawa, Ontario
AUGUST 30, 2022 SCALE: 1/8" = 1'-0"

GROUND FLOOR



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MEZZANINE (RESTAURANT)

3-STORY MIXED USE w/ LOFT
COMMERCIAL / RESIDENTIAL

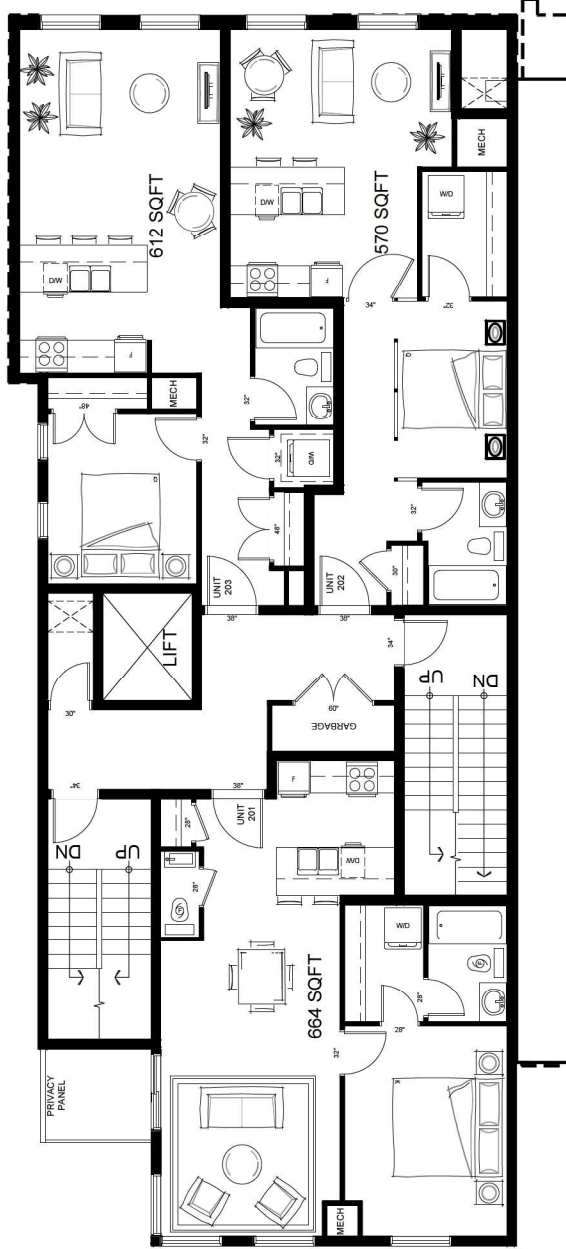
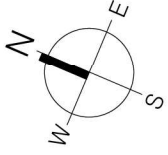
180 Main Street, Ottawa, Ontario
AUGUST 29, 2022 SCALE: 1/8" = 1'-0"

MEZZANINE (RESTAURANT)

PRINTED ON: 30 Aug 2022



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SECOND FLOOR

3-STORY MIXED USE w/ LOFT
COMMERCIAL / RESIDENTIAL

180 Main Street, Ottawa, Ontario
AUGUST 30, 2022 SCALE: 1/8" = 1'-0"

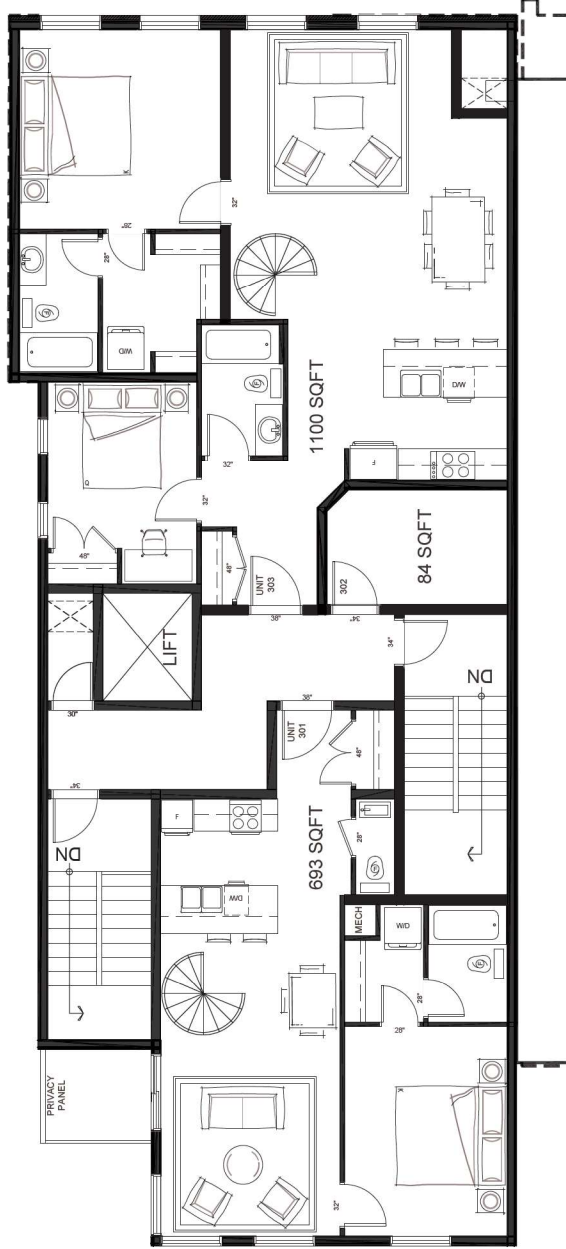
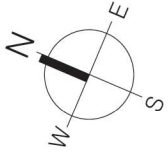
SECOND FLOOR

PRINTED Tue, 30 Aug 2022



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THIRD FLOOR

3-STORY MIXED USE w/ LOFT
COMMERCIAL / RESIDENTIAL

180 Main Street, Ottawa, Ontario
AUGUST 30, 2022 SCALE: 1/8" = 1'-0"

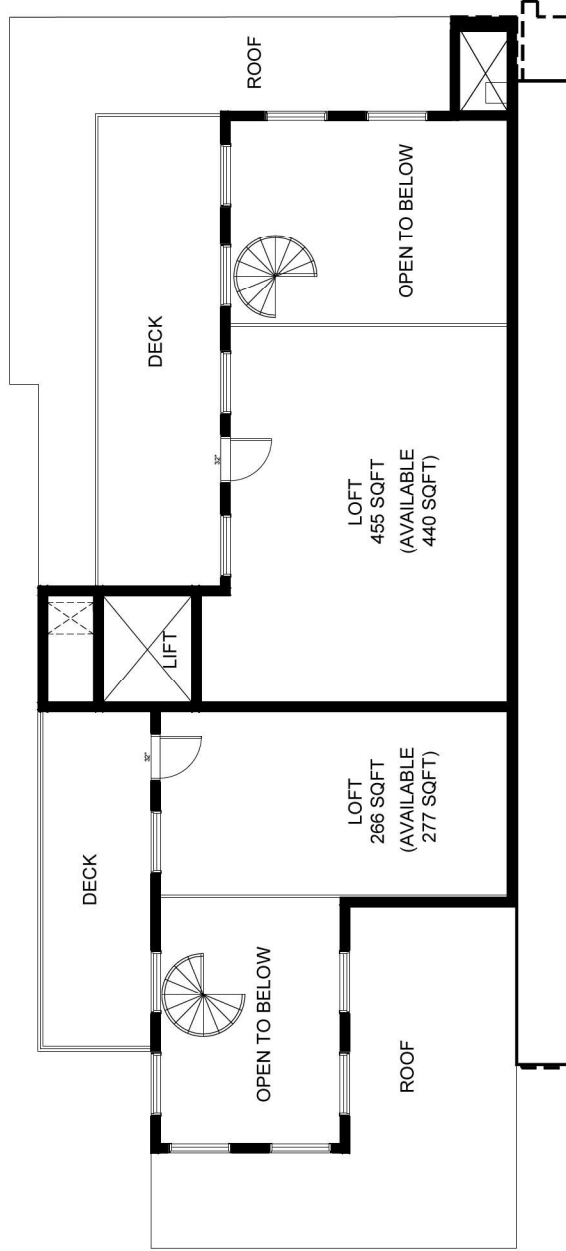
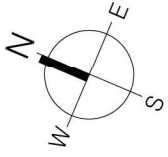
THIRD FLOOR

PLOTTED Tue, 30 Aug 2022



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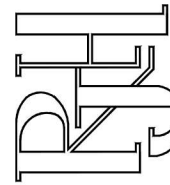
LOFT

3-STORY MIXED USE w/ LOFT
COMMERCIAL / RESIDENTIAL

180 Main Street, Ottawa, Ontario
AUGUST 30, 2022 SCALE: 1/8" = 1'-0"

LOFT

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Rosaline J. Hill Architect Inc.

ATTACHMENT 2 : SITE SURVEY PLAN

SURVEYOR'S REAL PROPERTY REPORT
PART 1 Plan of
REGISTERED PLAN 102
 CITY OF OTTAWA
 Surveyed by Annis, O'Sullivan, Vollebek Ltd.

Scale 1 : 100
 METERS
 DISTANCES SHOWN ON THIS PLAN ARE MEASURED AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Surveyor's Certificate
 I, the undersigned, am a duly qualified and licensed Surveyor under the Survey Act and the Survey Regulations and the regulations made under them.
 The survey was completed on the 26th day of July, 2022.
 July 8, 2022
 E. H. Nevegger
 Ottawa Land Surveyor

PART 1
ANNIS, O'SULLIVAN, VOLLEBEK LTD. MUST BE READ IN CONJUNCTION WITH SURVEY REPORT DATED JULY 8, 2022.

ANNIS, O'SULLIVAN, VOLLEBEK LTD. (pin 141) has obtained all necessary consents, permits, approvals, easements, and other third party consents to use, occupy, and use the land shown on this plan for the purposes of this survey.

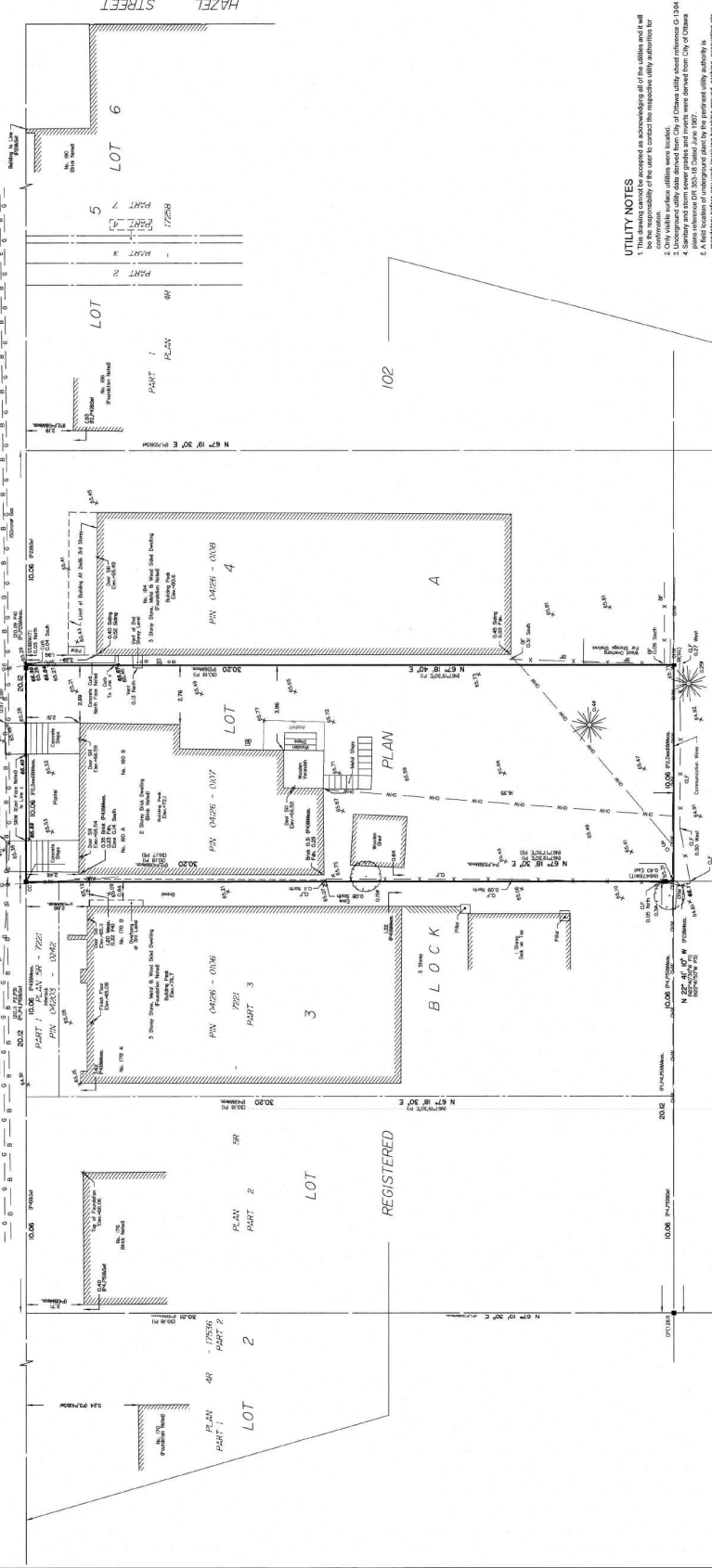
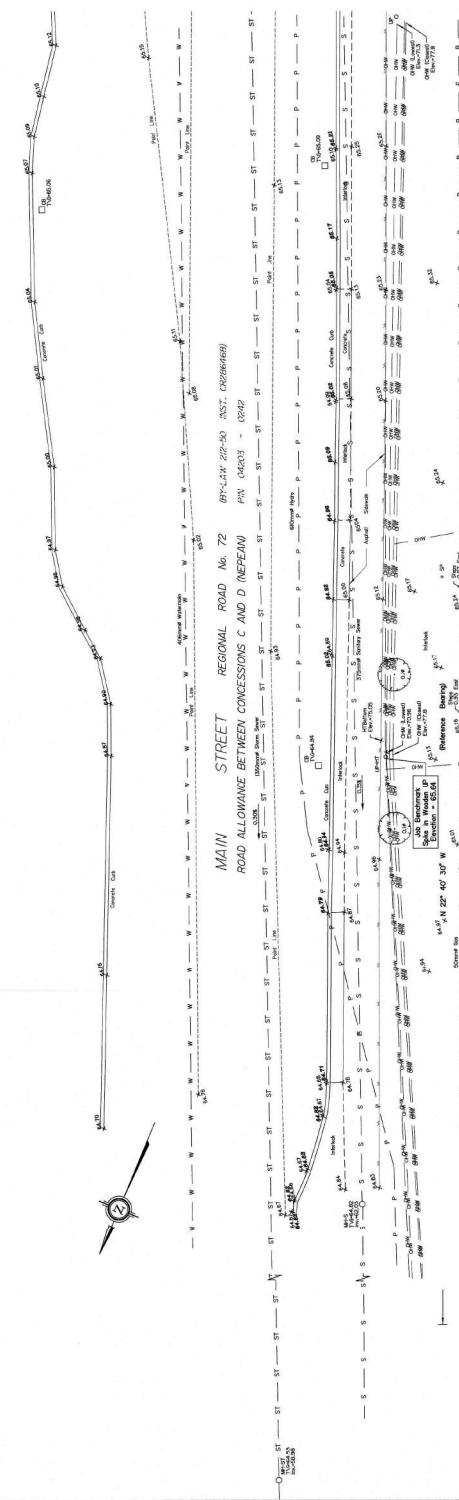
Notes & Legend

- □— Deciduous
- □— Spruce Movement Planned
- □— Standard Post Hole
- □— Iron Bar
- □— Cast Cross
- □— Cast Cross
- □— Vertical Pin
- □— Measured
- □— AMN, O'SULLIVAN, VOLLEBEK LTD.
- □— Registered Plan 102
- □— (S) Plan October 28, 2015
- □— Plan 4817208
- □— Plan 5812241
- □— IRL 0487828
- □— Maintenance Hole (Storm Sewer)
- □— Maintenance Hole (Sewer)
- □— Maintenance Hole (Hatch)
- □— Underground Storm Sewer
- □— Underground Sanitary Sewer
- □— Underground Gas
- □— Overhead Water
- □— Overhead Power
- □— Underground Well
- □— Catch Basin
- □— Invert
- □— Top of Gate
- □— Deciduous Tree
- □— Coniferous Tree
- □— Chain Link Fence
- □— Board Fence
- □— Gas Meter
- □— Hydro Transformer Mounted on Utility Pole
- □— Location of Elevations
- □— Tip of Concrete Curb / Wall Elevation
- □— Centreline
- □— Stone Retaining Wall
- □— Foundation

Notwithstanding anything to the contrary herein, the user of this plan shall be responsible for obtaining all necessary consents, permits, approvals, easements, and other third party consents to use, occupy, and use the land shown on this plan for the purposes of this survey.



ANNIS, O'SULLIVAN, VOLLEBEK LTD.
 14 Concession Circle, Suite 500
 Ottawa, Ontario K1V 1B2
 Phone: (613) 277-8807 / Fax: (613) 277-5779
 Land Surveyors Lic. No. 22898-02, 18, 19, 20, 21, 22



UTILITY NOTES
 The user of this plan shall be responsible for obtaining all necessary consents, permits, approvals, easements, and other third party consents to use, occupy, and use the land shown on this plan for the purposes of this survey.

ELEVATION NOTES
 1. Elevations shown are generic and are referred to the CGVD08 geoid datum. Allowed to be used for general information only.
 2. It is the responsibility of the user of this information to verify the job boundaries and to obtain all necessary consents, permits, approvals, easements, and other third party consents to use, occupy, and use the land shown on this plan for the purposes of this survey.

LOT 11
LOT 10
LOT 9
LOT 8
LOT 7
LOT 6
LOT 5
LOT 4
LOT 3
LOT 2

ATTACHMENT 3 : FIGURE 1 – ELEVATION CONTOURS

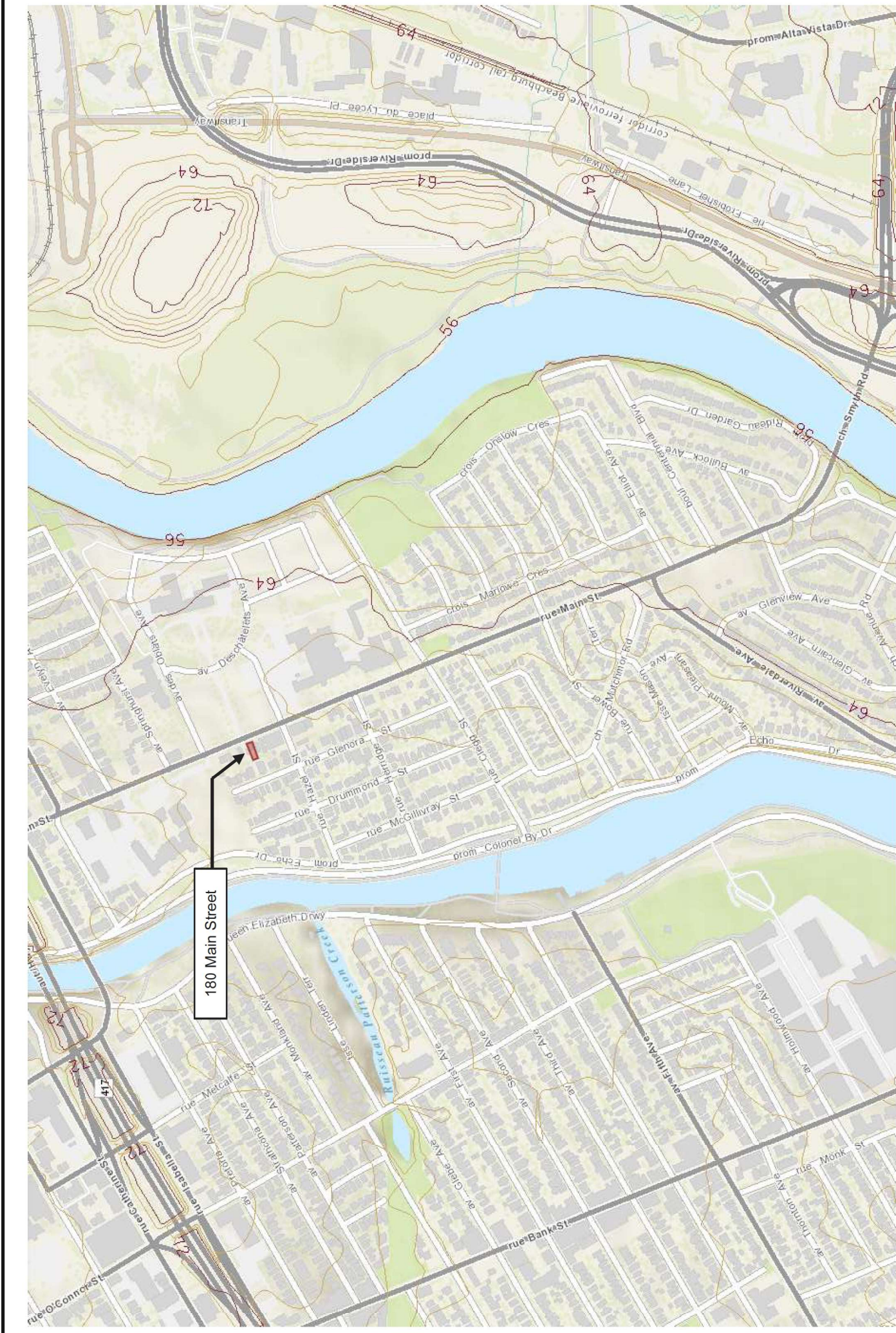


Figure 1: Elevation Contours

Source: geoOttawa 2022; Contains information licensed under the Open Government License – City of Ottawa.

ATTACHMENT 4 : FUS FIRE FLOW CALCULATIONS



FUS Fire Flow Calculation - Long Method

Calculations based on: "Water Supply for Public Fire Protection" by Fire Underwriters' Survey, 2020

Stantec Project #: 163401084

Project Name: 180 Main Street

Date: September 6, 2022

Data inputted by: Alexandre Mineault-Guitard, ing., P.Eng.

Data reviewed by: Kevin Alemany, P.Eng.

Mixed-Use Building. Wood frame. Not sprinklered.

Notes: 4 storeys, no basement. Gross floor area of 2,141 to 2,372 sqf (floor 1 to 3), plus 1,325 loft (floor 4). Includes a 787 sqf mezzanine on the 1st floor. Building setbacks per site plan (dated 2022/08/26). Assumed Fire Wall along right side of the building (adjacent to 184 Main Street).

Fire Flow Calculation #: 1

Building Type/Description/Name: Residential

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	Coefficient related to type of construction (C)	Framing Material						
			Type V - Wood Frame	1.5	Type V - Wood Frame	1.5	m		
			Type IV-A - Mass Timber	0.8					
			Type IV-B - Mass Timber	0.9					
			Type IV-C - Mass Timber	1					
			Type IV-D - Mass Timber	1.5					
			Type III - Ordinary construction	1					
			Type II - Non-combustible construction	0.8					
Type I - Fire resistive construction	0.6								
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Floor Space Area						
			Single Family	0	Other (Comm, Ind, Apt etc.)	1	Units		
			Townhouse - indicate # of units	0					
Other (Comm, Ind, Apt etc.)	1								
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 total floor area of all floors for one unit (non-fire resistive construction):			2,249	2,249	Area in Square Metres (m ²)		
		Square Feet (ft ²)							
3.1	Obtain Total Effective Building Area	Total Effective Building Area (# of Storeys x # of Units (if single family or townhouse) x Average Floor Area):			836	836			
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 Presence of Sprinklers for Exposures within 30m	Sprinkler Conforms to NFPA13	Adequate sprinkler for exposures conforms to NFPA13		None for exposures		N/A	0	
			None for exposures						
		Water Supply	Water supply is standard for sprinkler and fire dept. hose line of exposures		Water supply is not standard or N/A for exposures	0	N/A		0
			Water supply is not standard or N/A for exposures						
		Sprinkler Supervision	Sprinkler system of exposures is fully supervised		Sprinkler not fully supervised or N/A for exposures	0	N/A		0
			Sprinkler not fully supervised or N/A for exposures						
5.4	Choose Separation Distance Between Units	Exposure Distance Between Units	Front Yard	30.1m or greater	0	0.55	m	4,675	
			Right Side	Fire Wall	0.1				
			Rear Yard	3.1 to 10.0m	0.2				
			Left Side	0 to 3.0m	0.25				
6	Obtain Required Fire Flow, Duration & Volume	Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:						13,000	
		Total Required Fire Flow (above) in L/s:						217	
		Required Duration of Fire Flow (hrs)						2.75	
		Required Volume of Fire Flow (m³)						2,145	



FUS Fire Flow Calculation - Long Method

Calculations based on: "Water Supply for Public Fire Protection" by Fire Underwriters' Survey, 2020

Stantec Project #: 163401084

Project Name: 180 Main Street

Date: September 6, 2022

Data inputted by: Alexandre Mineault-Guitard, ing., P.Eng.

Data reviewed by: Kevin Alemany, P.Eng.

Mixed-Use Building. Wood frame. Not sprinklered.

Notes: 4 storeys, no basement. Gross floor area of 2,141 to 2,372 sqf (floor 1 to 3), plus 1,325 loft (floor 4). Includes a 787 sqf mezzanine on the 1st floor. Building setbacks per site plan (dated 2022/08/26). Added adjacent building (184 Main Street, assumed 1,500 spf) to consider 1 fire block.

Fire Flow Calculation #: 2

Building Type/Description/Name: Residential

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	Coefficient related to type of construction (C)	Framing Material						
			Type V - Wood Frame	1.5	Type V - Wood Frame	1.5	m		
			Type IV-A - Mass Timber	0.8					
			Type IV-B - Mass Timber	0.9					
			Type IV-C - Mass Timber	1					
			Type IV-D - Mass Timber	1.5					
			Type III - Ordinary construction	1					
			Type II - Non-combustible construction	0.8					
Type I - Fire resistive construction	0.6								
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Floor Space Area						
			Single Family	0	Other (Comm, Ind, Apt etc.)	1	Units		
			Townhouse - indicate # of units	0					
Other (Comm, Ind, Apt etc.)	1								
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 total floor area of all floors for one unit (non-fire resistive construction):			3,424	3,424	Area in Square Metres (m ²)		
		Square Feet (ft ²)							
3.1	Obtain Total Effective Building Area	Total Effective Building Area (# of Storeys x # of Units (if single family or townhouse) x Average Floor Area):			1,272	1272			
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						12,000	
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	10,200	
			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 Presence of Sprinklers for Exposures within 30m	Sprinkler Conforms to NFPA13	Adequate sprinkler for exposures conforms to NFPA13		None for exposures		N/A	0	
			None for exposures						
		Water Supply	Water supply is standard for sprinkler and fire dept. hose line of exposures		Water supply is not standard or N/A for exposures	0	N/A		
			Water supply is not standard or N/A for exposures						
		Sprinkler Supervision	Sprinkler system of exposures is fully supervised		Sprinkler not fully supervised or N/A for exposures	0	N/A		
			Sprinkler not fully supervised or N/A for exposures						
5.4	Choose Separation Distance Between Units	Exposure Distance Between Units	Front Yard	30.1m or greater	0	0.7	m	7,140	
			Right Side	0 to 3.0m	0.25				
			Rear Yard	3.1 to 10.0m	0.2				
			Left Side	0 to 3.0m	0.25				
6	Obtain Required Fire Flow, Duration & Volume	Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:						17,000	
		Total Required Fire Flow (above) in L/s:						283	
		Required Duration of Fire Flow (hrs)						3.75	
		Required Volume of Fire Flow (m³)						3,825	

ATTACHMENT 5 : FIGURE 2 – FUS EXPOSURE DISTANCES (SCENARIO A)



Figure 2: FUS Exposure Distances (Property Line to Adjacent Buildings) – Scenario A

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ATTACHMENT 6 : FIGURE 3 – FUS EXPOSURE DISTANCES (SCENARIO B)

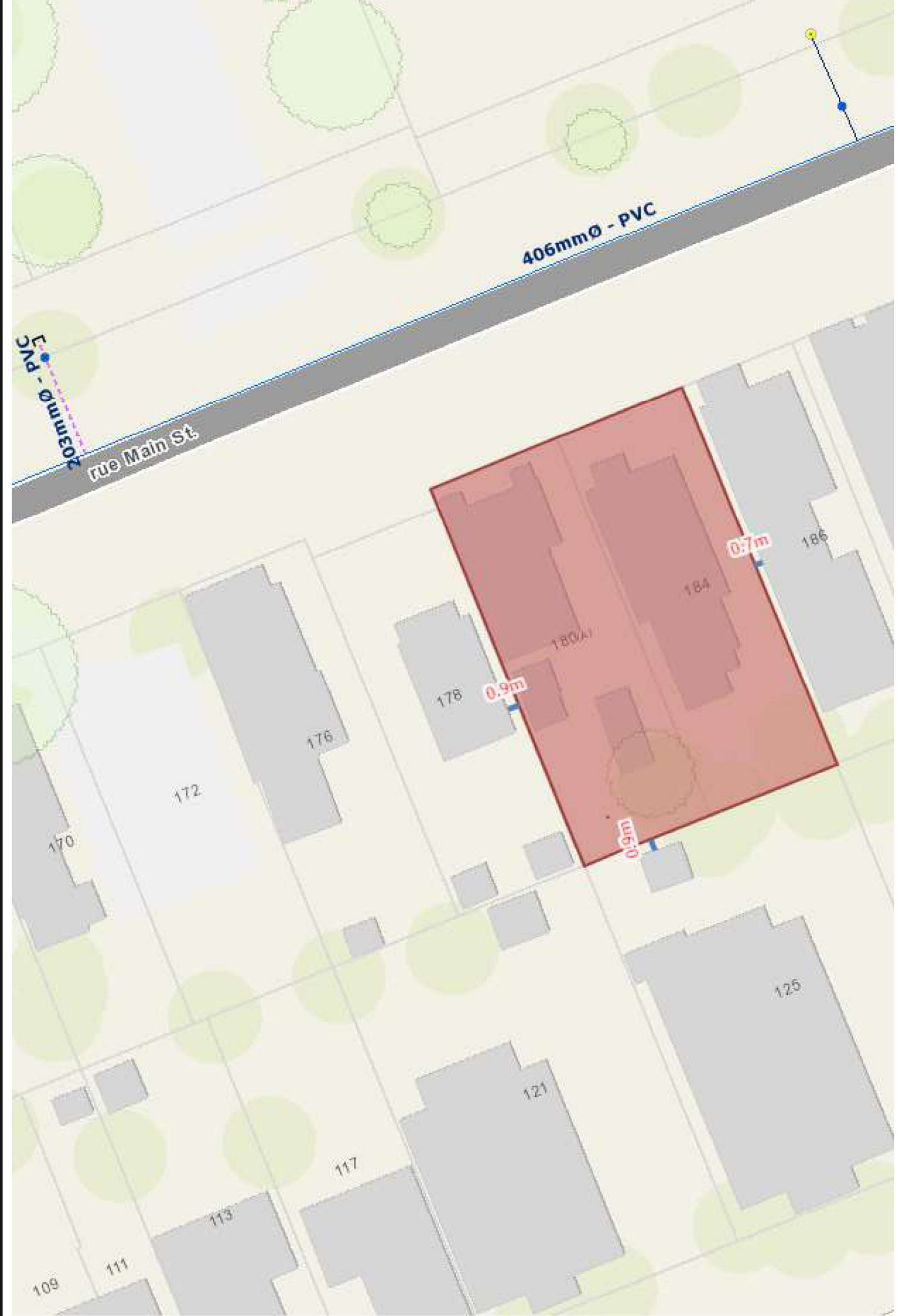


Figure 3: FUS Exposure Distances (Property Line to Adjacent Buildings) – Scenario B

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ATTACHMENT 7 : WATER DATA BOUNDARY CONDITIONS

Mineault-Guitard, Alexandre

From: TL MaK <tlmakecl@bellnet.ca>
Sent: Monday, September 19, 2022 11:28 AM
To: Mineault-Guitard, Alexandre
Cc: Alemany, Kevin
Subject: FW: 180 Main Street - Water Boudary Conditions Request
Attachments: 180 Main Street September 2022.pdf

Hi Alex,

Attached please find the City's water boundary conditions for your calculations.

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: Fawzi, Mohammed [mailto:mohammed.fawzi@ottawa.ca]
Sent: September 19, 2022 11:16 AM
To: TL MaK
Cc: 'Marcel Pelletier'
Subject: RE: 180 Main Street - Water Boudary Conditions Request

Hi Tony,

The following are boundary conditions, HGL, for hydraulic analysis at 180 Main Street (zone 1W) assumed to be connected to the 406 mm watermain on Main Street (see attached PDF for location).

Minimum HGL: 105.4 m

Maximum HGL: 115.7 m

Max Day + Fire Flow (213 L/s): 107.7 m

Max Day + Fire Flow (283 L/s): 107.1 m

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

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

Best Regards,

Mohammed Fawzi, P.Eng.

Project Manager

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review - Central Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

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

From: TL MaK <tlmakecl@bellnet.ca>

Sent: September 15, 2022 6:04 PM

To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>

Cc: 'Marcel Pelletier' <marcel@rjhill.ca>

Subject: RE: 180 Main Street - Water Boudary Conditions Request

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Hi Mohammed,

We are just following up on our request on September 7, 2022. Do you have any results of the water boundary conditions for our calculation use?

Please follow up with the City computer modeler on this matter ASAP.

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: Fawzi, Mohammed [<mailto:mohammed.fawzi@ottawa.ca>]

Sent: September 8, 2022 11:56 AM

To: TL MaK

Subject: RE: 180 Main Street - Water Boudary Conditions Request

Hi Tony,

Thank you for your request. This is to confirm it has been received.

Best Regards,

Mohammed Fawzi, P.Eng.

Project Manager

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review - Central Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

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

From: TL MaK <tlmakecl@bellnet.ca>

Sent: September 07, 2022 4:10 PM

To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>

Subject: 180 Main Street - Water Boudary Conditions Request

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Hi Mohammed,

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 building is located within Pressure Zone 1W at 180 Main Street is a 4-storey residential apartment building. The first floor will house a commercial area, while the upper floors are residential. Note that there is a mezzanine on the 4th floor.

The building contains six (6) total units, namely four (4) 1-bedroom units, one (1) 2-bedroom unit, and one (1) commercial unit. The 1st floor covers an area of approximately 199 m², in addition to a 73 m² mezzanine, for a total area of 272 m². The 2nd and 3rd floors cover an area of approximately 220 m². Lastly, the mezzanine/loft on the 4th floor is 123 m². As such, the total gross floor area of approximately 836 m². The building is to be serviced by the 406 mm diameter watermain along Main Street.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines. For residential units, a consumption rate of 280 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. For the commercial unit, a consumption rate of 28,000 L/gross hectare/d was used to estimate AVDY demands. Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 1.8. Peak

hour (PKHR) demands were calculated by multiplying MXDY by a factor of 1.8. Table 1 shows the estimated domestic demands of the proposed building.

Table 1: Estimated Domestic Demand

Unit Type	Unit Count	PPU	Consumption (L/c/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 1-Bedroom	4	1.4	280	1,568	0.02	3,920	0.05	8,624	0.10
Apartment, 2-Bedroom	1	2.1		588	0.01	1,470	0.02	3,234	0.04
<i>Sub-total (Residential)</i>	5			2,156	0.02	5,390	0.06	11,858	0.14
Unit Type	Unit Count	Area (m ²)	Consumption (L/gross ha/d)	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Commercial	1	272	28,000	762	0.01	1,142	0.01	2,056	0.02
Total	6			2,918	0.03	6,532	0.08	13,914	0.16

The fire flow requirement was determined following the Fire Underwriter Survey (FUS) method and is provided in the attached worksheet. For this analysis, the building was classified as wood frame construction with building contents that are limited in combustibility. It is understood that the building will not have a sprinkler system.

Based on available data, the proposed building at 180 Main Street will be connected to the adjacent building located at 184 Main Street. As such, two scenarios were considered for the fire flow requirement calculations, namely: Scenario A considered a firewall between the proposed building at 180 Main Street, and the adjacent building at 184 Main Street; while Scenario B considered both building as a single fire block. Note that in both scenarios, adjacent buildings within 3 m of the proposed unit were considered in the FUS exposure distances calculations, but their areas were not considered in the FUS requirement calculations.

As such, the resulting total required fire flow for Scenario A is 13,000 L/min (213 L/s) for a duration of 2.75 hours. For Scenario B, the resulting total required fire flow is 17,000 L/min (283 L/s) for a duration of 3.75 hours.

In summary:

- AVDY = 2,918 L/d (0.03 L/s);
- MXDY = 6,532 L/d (0.08 L/s);
- PKHR = 13,914 L/d (0.16 L/s);
- Fire Flow (FUS) Scenario A= 13,000 L/min (213 L/s); and
- Fire Flow (FUS) Scenario B= 17,000 L/min (283 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.

Have a good day.

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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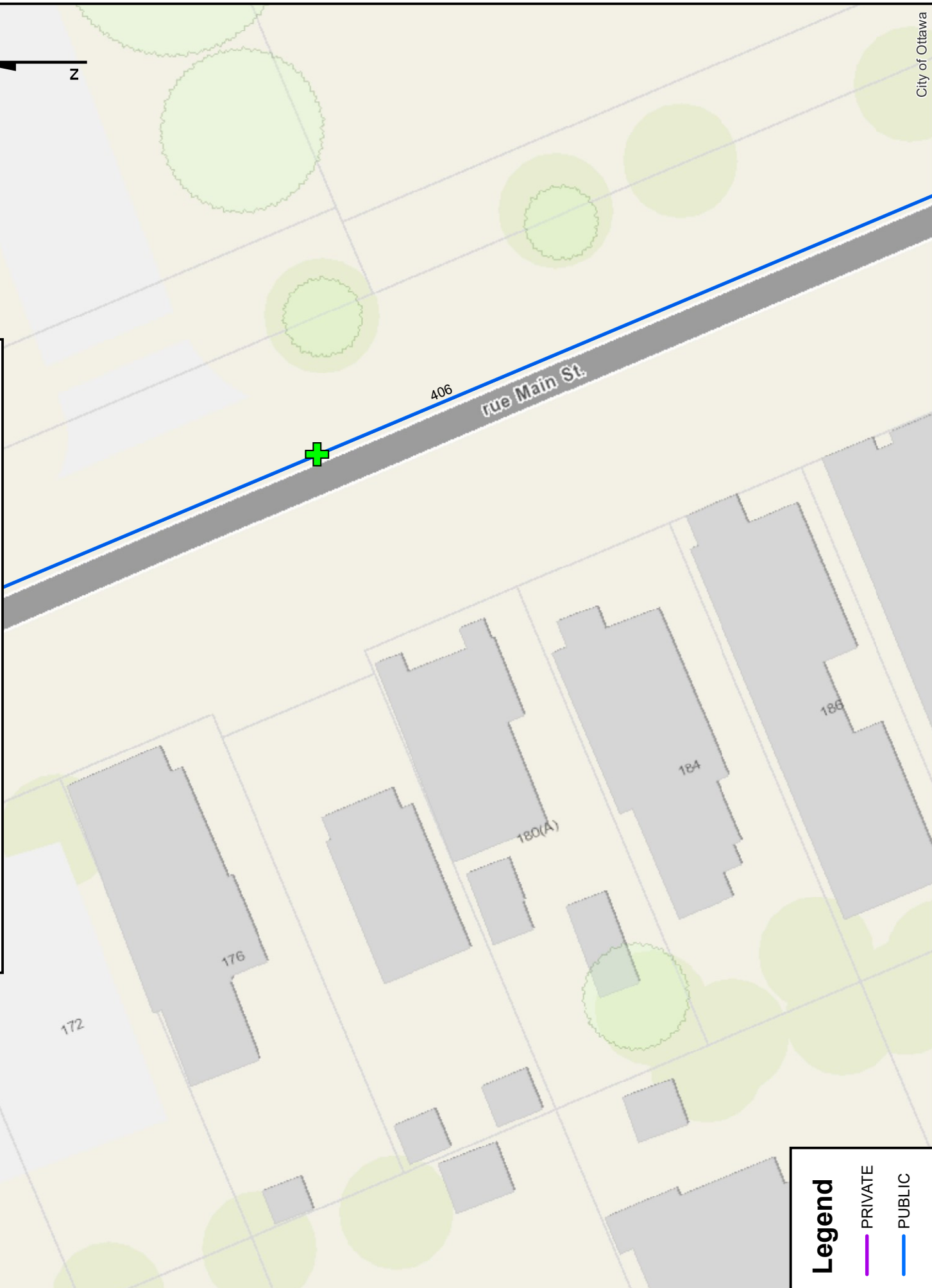
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Boundary Conditions for 180 Main Street



Legend

- PRIVATE (purple line)
- PUBLIC (blue line)

ATTACHMENT 8 : SUPPORTING HYDRAULIC CALCULATIONS



Supporting Hydraulic Calculations

Stantec Project #: 163401084

Project Name: 180 Main Street

Date: September 20, 2022

Data inputted by: Alexandre Mineault-Guitard, ing., P.Eng.

Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Boundary Conditions provided by the City:

Scenario 1: Peak Hour (Min HGL): 105.4 m;

Scenario 2: Average Day (Max HGL): 115.7 m; and

Scenario 3: Maximum Day plus Fire Flow: 107.1 m.

Sample Calculations

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

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

For Scenario 1, we have:

$$HGL(m) = 105.4 \text{ and } hz (m) = 65.5.$$

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

$$hp (m) = HGL - hz$$

$$\therefore hp = 105.4 - 65.5 \text{ m} = 39.9 \text{ m}.$$

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

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

where: ρ = density of water = 1000 kg/m³; and g = gravitational acceleration = 9.81 m/s².

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

$$P (kPa) = (1000 * 9.81 * 39.9) / 1000$$

$$\therefore P = 391 \text{ kPa}.$$

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

$$P = 57 \text{ psi}.$$

Applying the same procedures, the pressures under Scenario 2 and Scenario 3 are calculated as follows:

Scenario 2: P = 71 psi; and Scenario 3: P = 59 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 391 kPa (57 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 492 kPa (71 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 408 kPa (59 psi)

ATTACHMENT 9 : FIGURE 4 – HYDRANT SPACING

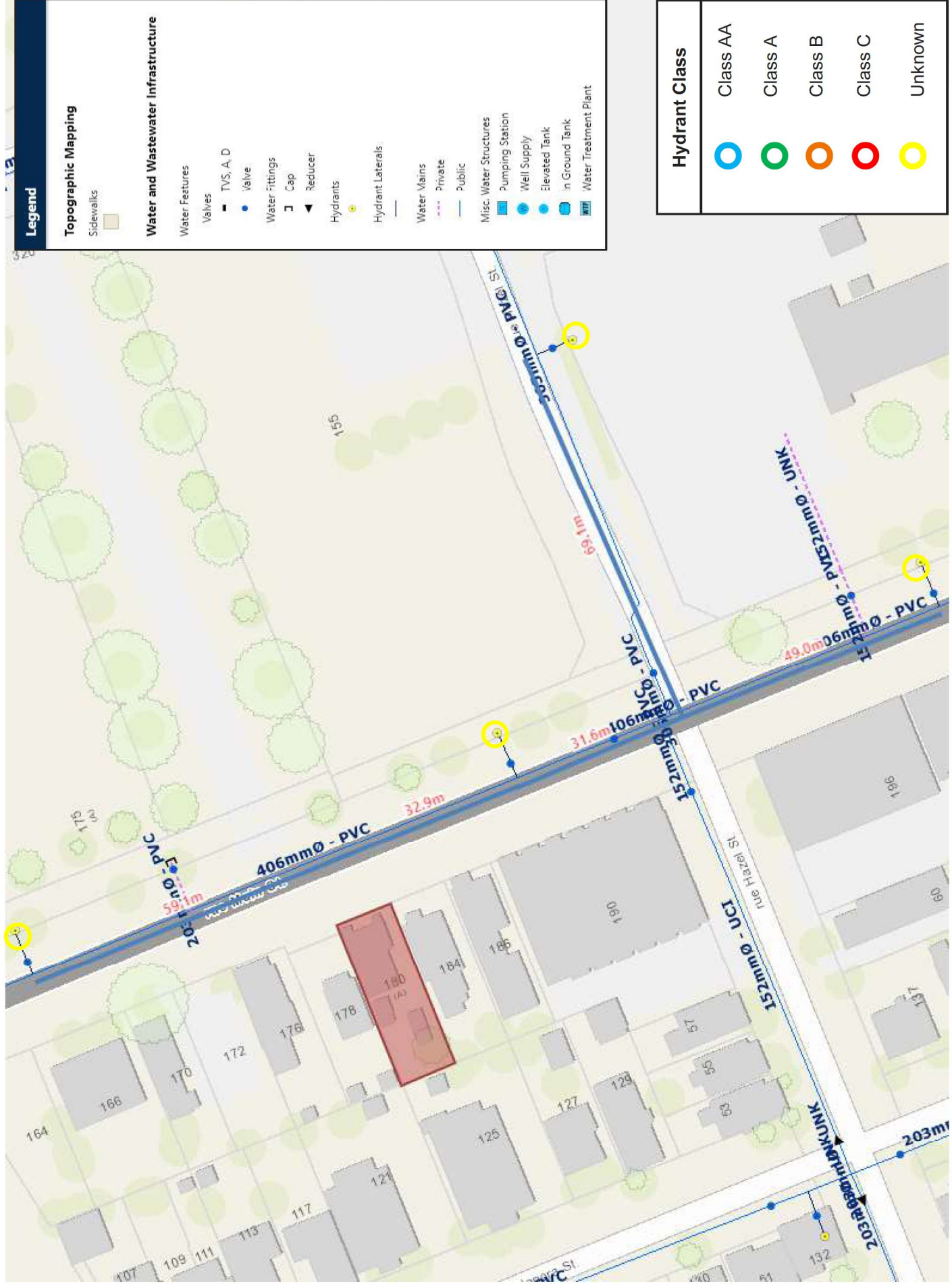


Figure 4: Hydrant Spacing

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**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA**

**APPENDIX E
CITY OF OTTAWA
SANITARY SEWER DESIGN SHEET
SHEET No. 1 OF 1**

SANITARY SEWER DESIGN SHEET

$M = 1 + \frac{1.4}{4 + \sqrt{P}} * K$ where P = population in 1000's
 $K = 0.8$
 $Q(p) = \frac{PqM}{86.4}$ (L/s)
 $Q(l) = IA$ (L/s) where A = area in hectares
 $Q(d) = Q(p) + Q(l)$ (L/s)

DENSITY
 RESIDENTIAL
 PE = 1.5
 AVA - FLOW
 = 50,000 L/day

1 BEDROOM = 1.4
 2 BEDROOM = 2.1

q = average daily per capita flow (280 L/cap. d)
 I = unit of peak extraneous flow (23 L/he. s)
 M = peaking factor 4 (MAX)
 Q (p) = peak population flow (L/s)
 Q (l) = peak extraneous flow (L/s)
 Q (d) = peak design flow

LOCATION		INDIVIDUAL		CUMULATIVE		Peaking factor M	Pop. flow Q(p) (L/s)	Peak extraneous flow Q(l) (L/s)	Peak design flow 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)
STREET	FROM	TO	Area A (hectares)	Area A (hectares)	Pop.											
180 MAIN STREET	SITE	EX 3150 SANITARY SEWER														
			RESIDENTIAL													
			(4X1.4) (1X2.1)													
			7.7	0.03	7.7	0.03	3.54	0.09	0.01							
			COMMERCIAL													
			A = 0.02	2 ha												
			Qc = 0.016	1.5				0.02								
										11.5	150	PVC	1.0	42.6	1.36	



**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA**

**APPENDIX F
DEVELOPMENT SERVICING STUDY CHECKLIST SUMMARY**

Servicing study guidelines for development applications

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 defensible 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 feeder mains, 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.
- 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.
- 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.
- 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.
- Descriptions of how the conveyance and storage capacity will be achieved for the development.
- 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.
- 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