

**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**

**SERVICEABILITY REPORT
REPORT No. R-822-100A**

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.

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	
Commercial	1	272	28,000	L/d	L/s	L/d	L/s	L/d	L/s
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.

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 the proposed 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.

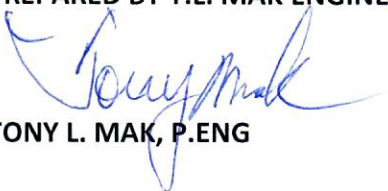
The building weeping tile drainage will outlet via its separate 200mm diameter PVC storm lateral. The roof drains will be outletted also via a separate 150mm PVC storm lateral which "we" into the proposed 200mm diameter storm lateral, where upon both laterals are outletting stormwater directly to the 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 combined 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 "silsack" 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. Silsack 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.

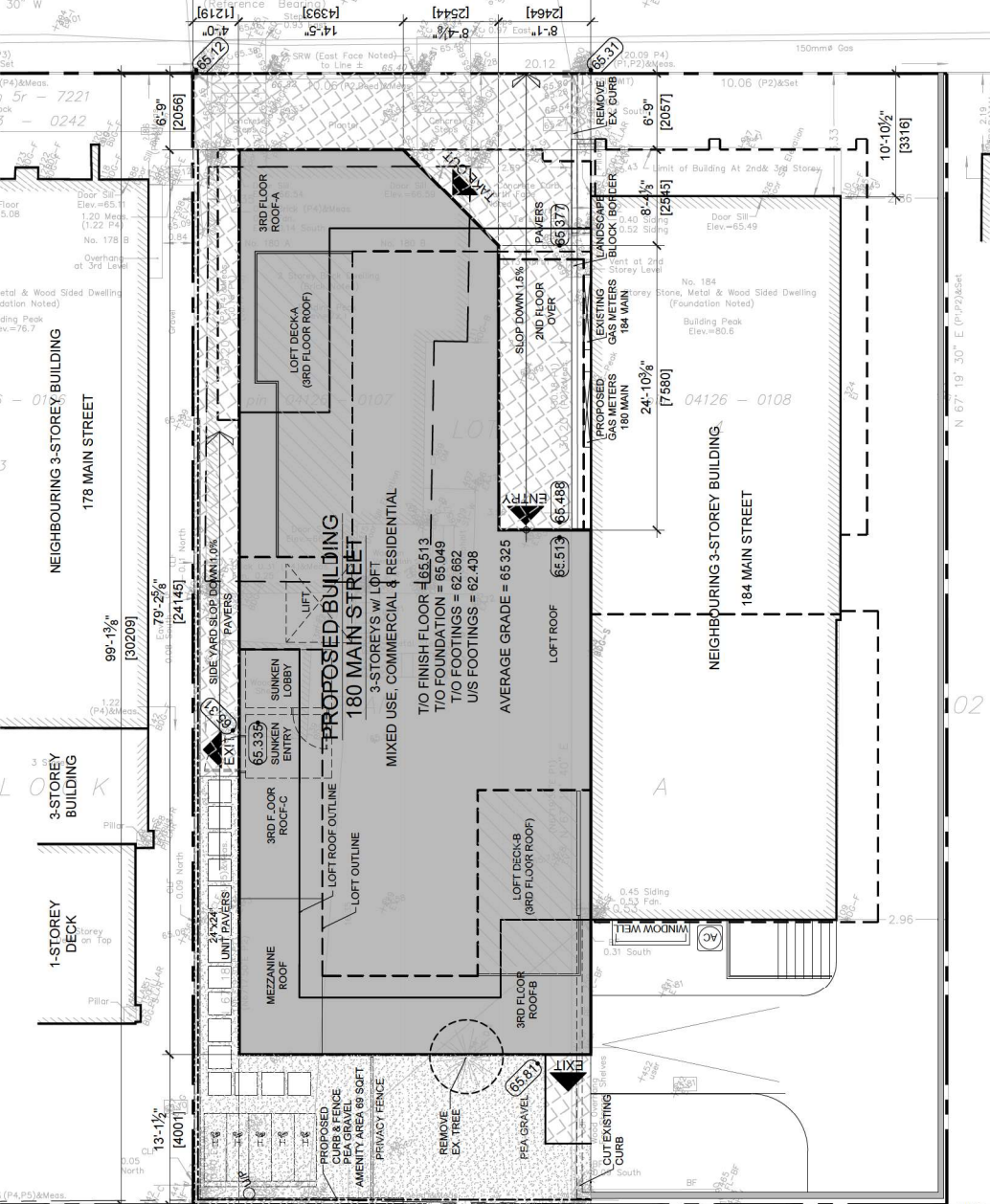
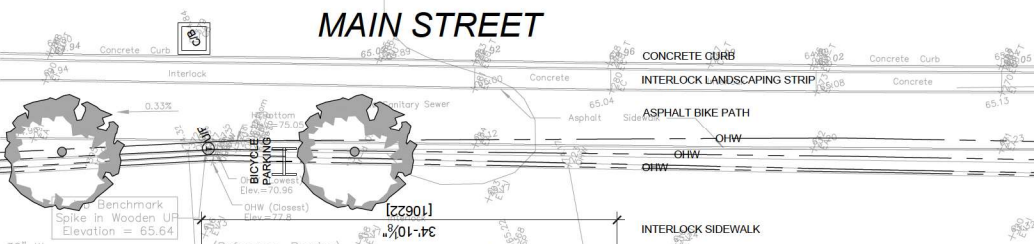

TONY L. MAK, P.ENG



**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**

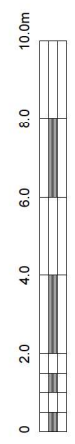
**APPENDIX A
SITE PLAN AND LEGAL SURVEY PLAN**

MAIN STREET REGIONAL ROAD No. 72 (BY-LAW 212-50 INST. CR286468)
 ROAD ALLOWANCE BETWEEN CONCESSIONS C AND D (NEPEAN) pin 04203 - 0242



3-STOREY MIXED USE W/ LOFT
 180 Main Street, Ottawa, Ontario
 SEPT 27, 2022 SCALE: 1:125

SITE PLAN



RJH
 Rosaline J. Hill Architect Inc.
 414 Churchill Ave. N. Ottawa,
 ON, K1Z 5G6 • 613-853-2822
 www.rjh.ca • rosaline@rjh.ca

REVISED PLAN 04 OCT 2022

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



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

Surveyor's Certificate

- This survey and plan are prepared in accordance with the Survey Act and the Surveyors Act and the regulations made under them.
- The survey was completed on the 26th day of July, 2022.

July 28, 2022
 E. H. Weisberg
 Ottawa Land Surveyor

PART 1
 THIS PLAN MUST BE READ IN CONJUNCTION WITH
 SURVEY REPORT DATED: July 8, 2022

ANNIS, O'SULLIVAN, VOLLEBEK LTD. (INCORPORATED IN ONTARIO)
 1400 SHEPPARD AVENUE EAST, SUITE 100, SCARBOROUGH, ONTARIO M1S 1T5
 TEL: (416) 291-1100 FAX: (416) 291-1101
 WWW.AOSVLTD.COM

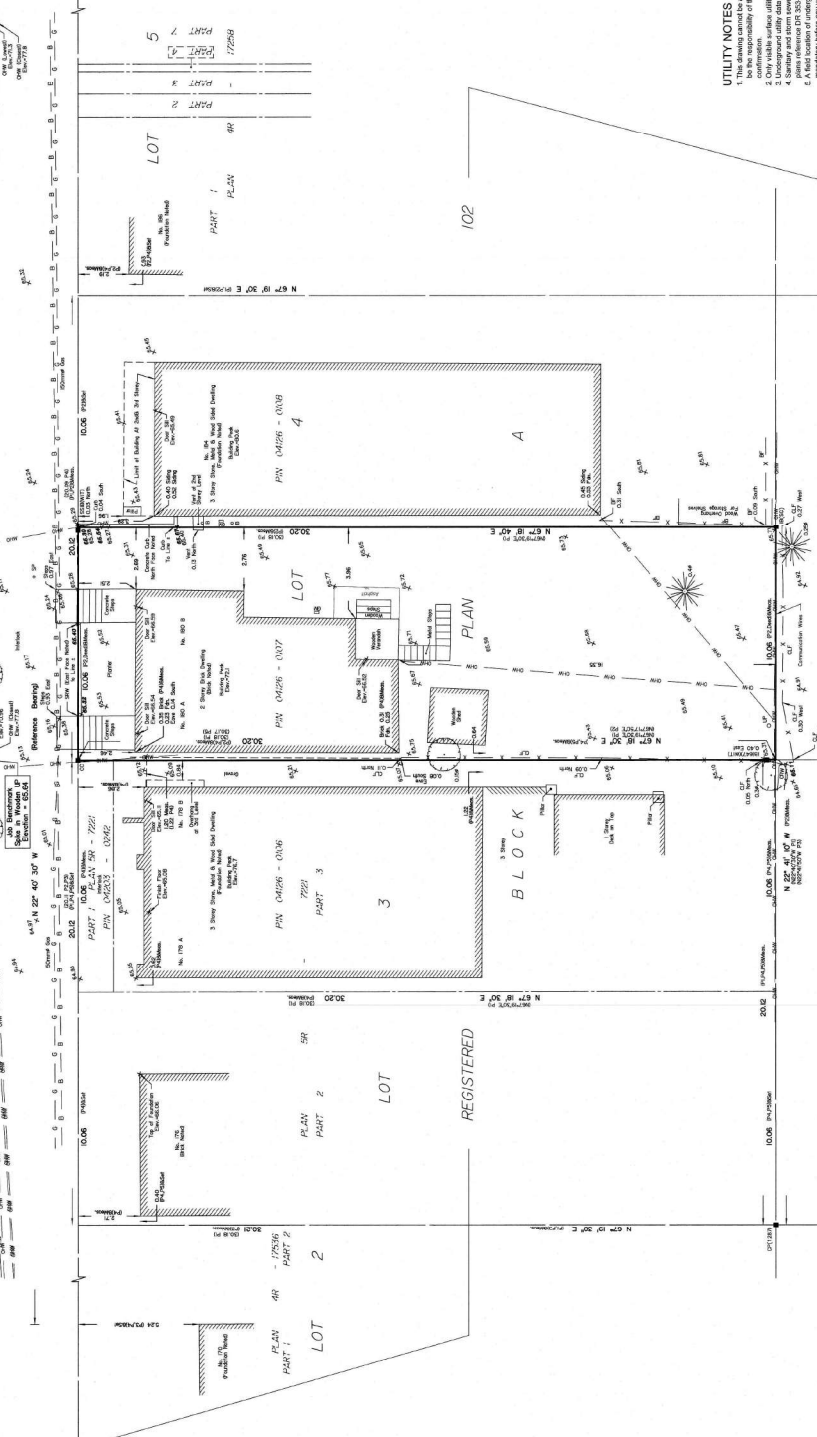
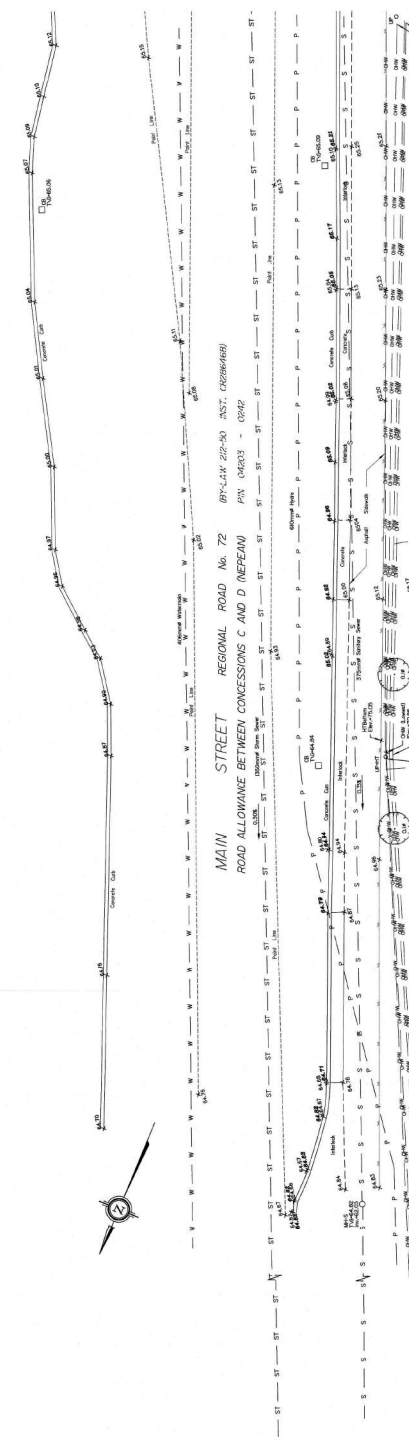
Notes & Legend

—□—	Survey Monument Planted
—□—	Standard Iron Nail
—□—	Iron Bar
—□—	Cut Cross
—□—	Vertical Pin
—□—	Measured
—□—	ANIS, O'SULLIVAN, VOLLEBEK LTD.
—□—	Registered Plan 102
—□—	(S) Plan October 26, 2015
—□—	Plan 4817208
—□—	Plan 5812221
—□—	INT. CANTREX
—□—	Maintenance Hole (Storm Sewer)
—□—	Underground Storm Sewer
—□—	Maintenance Hole (Water)
—□—	Underground Water Sewer
—□—	Underground Sanitary Sewer
—□—	Underground Gas
—□—	Overhead Water
—□—	Overhead Power
—□—	Underground Heat
—□—	Underground Gas
—□—	Catch Basin
—□—	Invert
—□—	Top of Grade
—□—	Deciduous Tree
—□—	Coniferous Tree
—□—	Electric Line
—□—	Board Fence
—□—	Gas Meter
—□—	Hydro Transformer Mounted on Utility Pole
—□—	Location of Elevations
—□—	Top of Concrete Curb / Wall Elevation
—□—	Centreline
—□—	Stone Retaining Wall
—□—	Foundation

Notwithstanding to whomsoever the same may be conveyed, the Surveyor shall be held to be the Surveyor of the City of Ottawa and shall be responsible to the City of Ottawa for the accuracy of the survey and plan. The Surveyor shall be responsible to the City of Ottawa for the accuracy of the survey and plan. The Surveyor shall be responsible to the City of Ottawa for the accuracy of the survey and plan.



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 WWW.AOSVLTD.COM



UTILITY NOTES
 1. The user has accepted as authoritative all of the utilities and will be responsible for the accuracy of the information shown on this plan.
 2. Only visible surface utilities were located.
 3. Underground utility data derived from City of Ottawa utility sheets (reference O-1344) and other sources were used to locate and identify utilities.
 4. Utility lines shown on this plan are not shown to scale and are not necessarily shown in their true location, depth, or orientation.

ELEVATION NOTES
 1. Elevations shown are geoid and are referred to the CGD2011 geoid datum. All elevations are in meters.
 2. It is the responsibility of the user of this information to verify the job location and to ensure that the information shown on this plan is accurate.

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PART OF LOT 4 IN BLOCK A
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180 MAIN STREET
CITY OF OTTAWA**

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







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

Ottawa
 Contract No. IS17-55-110-032
 Sheet 32 of 39
 Project: MAIN STREET RECONSTRUCTION
 ECHO DRIVE TO GEORGE McILRATH BRIDGE

GRADING & DRAINAGE 5 MAIN SERVICES
 STA. 10+580 TO STA. 10+720

W.S. Number: P.E. Reg. No. 10455 J. Veloso, P.E. Reg. No. 4553
 3160 University Ave. #101
PARSONS

Date: MAR 16 2018
 Drawn By: MAR 16 2018
 Check By: MAR 16 2018
 City: MAR 16 2018
 UPR: No. 1000
 Scale: 1" = 10' HORIZONTAL, 1" = 4' VERTICAL

BY: MK 2/23/2018
 MK 2/23/2018
 MK 2/23/2018

No. 1 REVISION FOR CONSTRUCTION
 2 ASSEMBLY

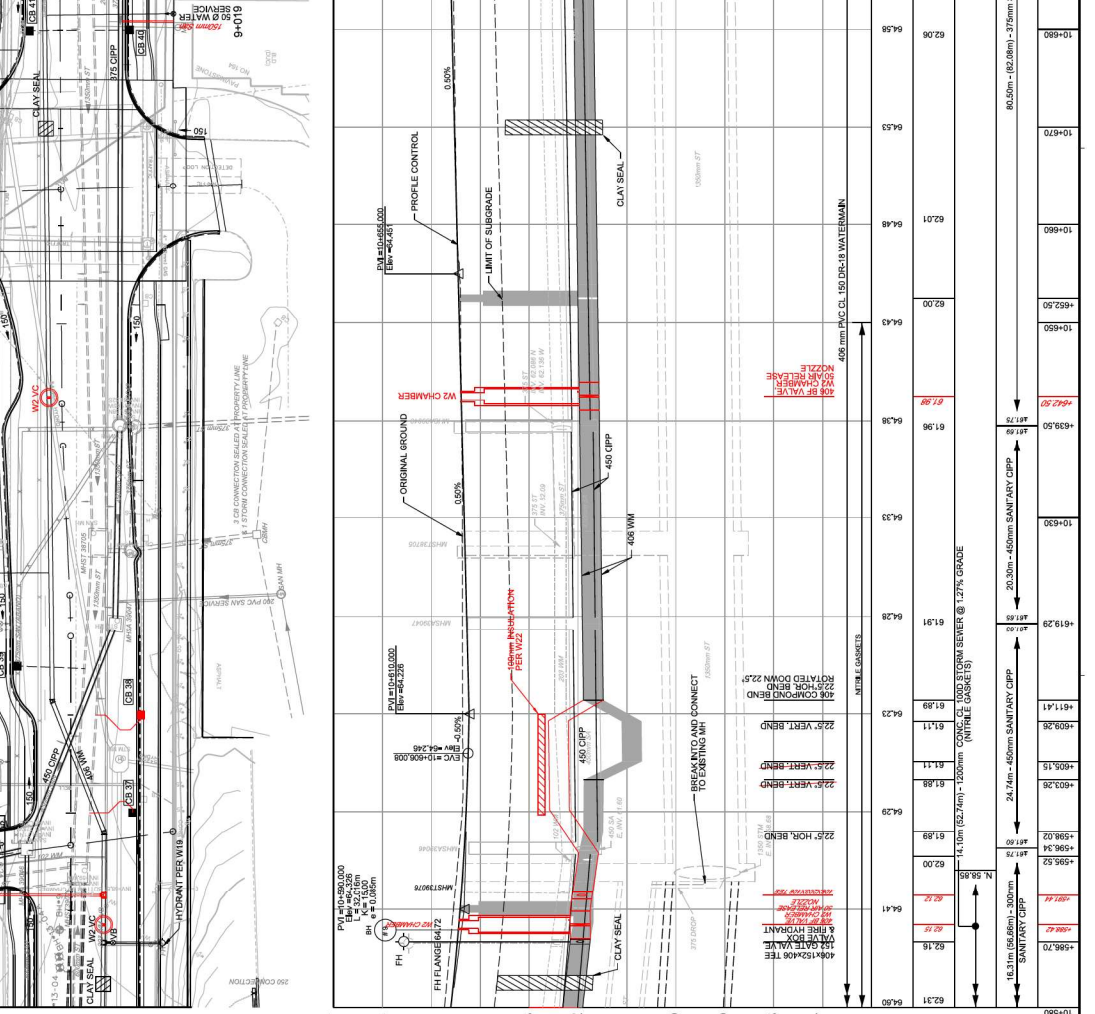
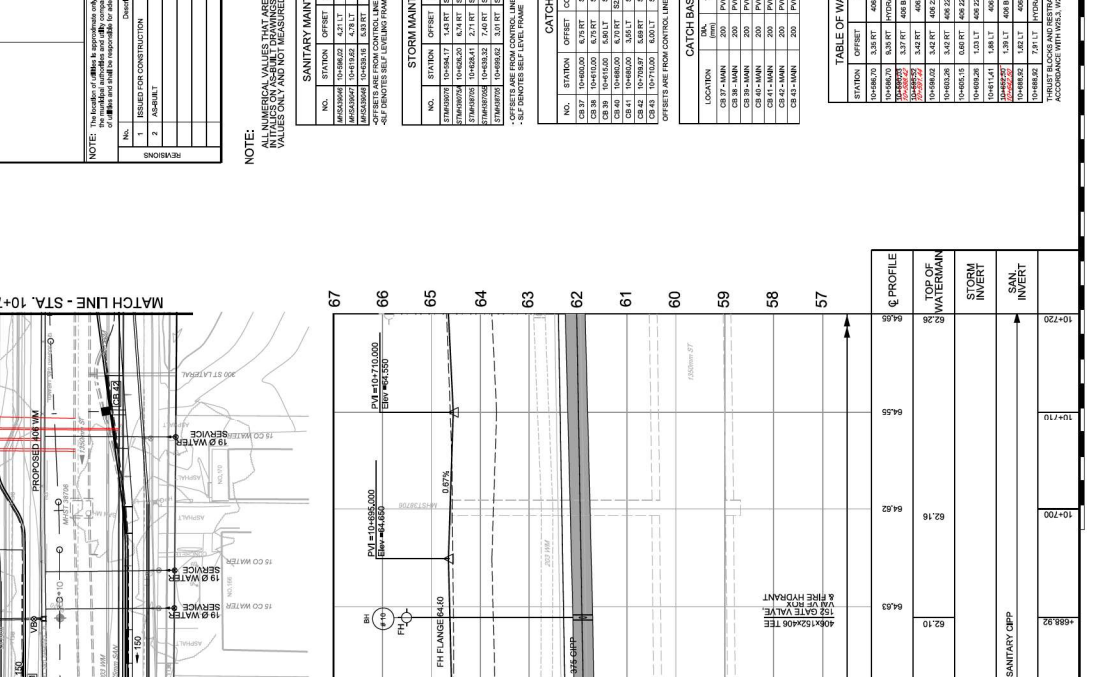
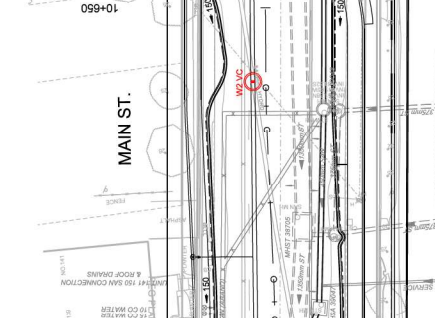
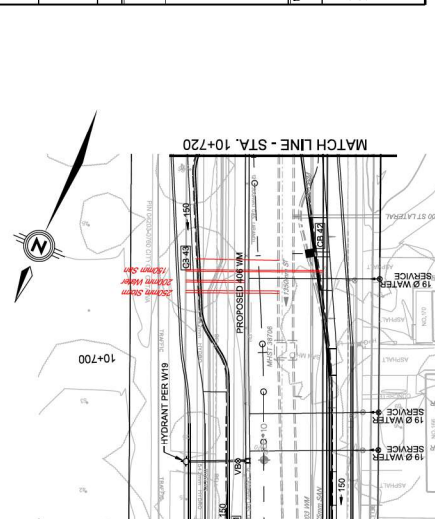


TABLE OF WATERMAIN FITTINGS

STATION	OFFSET	FITTING	TOP OF WATERMAIN ELEVATION
10+580.00	3.85 RT	90° ELBOW	62.2
10+580.00	3.85 RT	HYDRANT VALVE & AIR	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
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10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2
10+580.00	3.85 RT	400x152x408 TEE	62.2

Ottawa

MAIN STREET RECONSTRUCTION
ECHO DRIVE TO GEORGE McILRATH BRIDGE

Contract No. IS17-5110 003
Sheet 33 of 40

Project Name: **GRADING & DRAINAGE 6 MAIN STREET**
STA. 10+720 TO STA. 10+860

Client: J. W. W. P.E. Inc.
Project Manager: J. W. W. P.E. Inc.

PARSONS

Checked By:	DATE:
Drawn By:	DATE:
Design By:	DATE:
Reviewed By:	DATE:
Approved By:	DATE:

Scale: 1" = 20'-0" HORIZONTAL
1" = 2'-0" VERTICAL

Notes: 1. ALL NUMERICAL VALUES THAT ARE NOT STROKED OUT AND REPLACED IN THESE DRAWINGS OR AS BUILT DRAWINGS ARE CONSIDERED TO BE DESIGN VALUES SINCE THEY HAVE NOT BEEN REVISIONED IN THE FIELD.

REVISIONS

No.	Description	By	Date
1	DESIGNED FOR CONSTRUCTION	JK	2020/03/10
2	AS BUILT	JK	2020/07/19

SANITARY MAINTENANCE HOLE DATA

No.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION
MS405001	10+727.27	7.61 FT	3.00 FT	6007	62.67
MS405002	10+811.52	6.53 FT	3.00 FT	6007	62.58
MS405003	10+845.27	6.53 FT	3.00 FT	6007	62.58

STORM MAINTENANCE HOLE DATA

No.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION
MS405004	10+727.27	7.61 FT	3.00 FT	6007	62.67
MS405005	10+811.52	6.53 FT	3.00 FT	6007	62.58
MS405006	10+845.27	6.53 FT	3.00 FT	6007	62.58

CATCH BASIN DATA

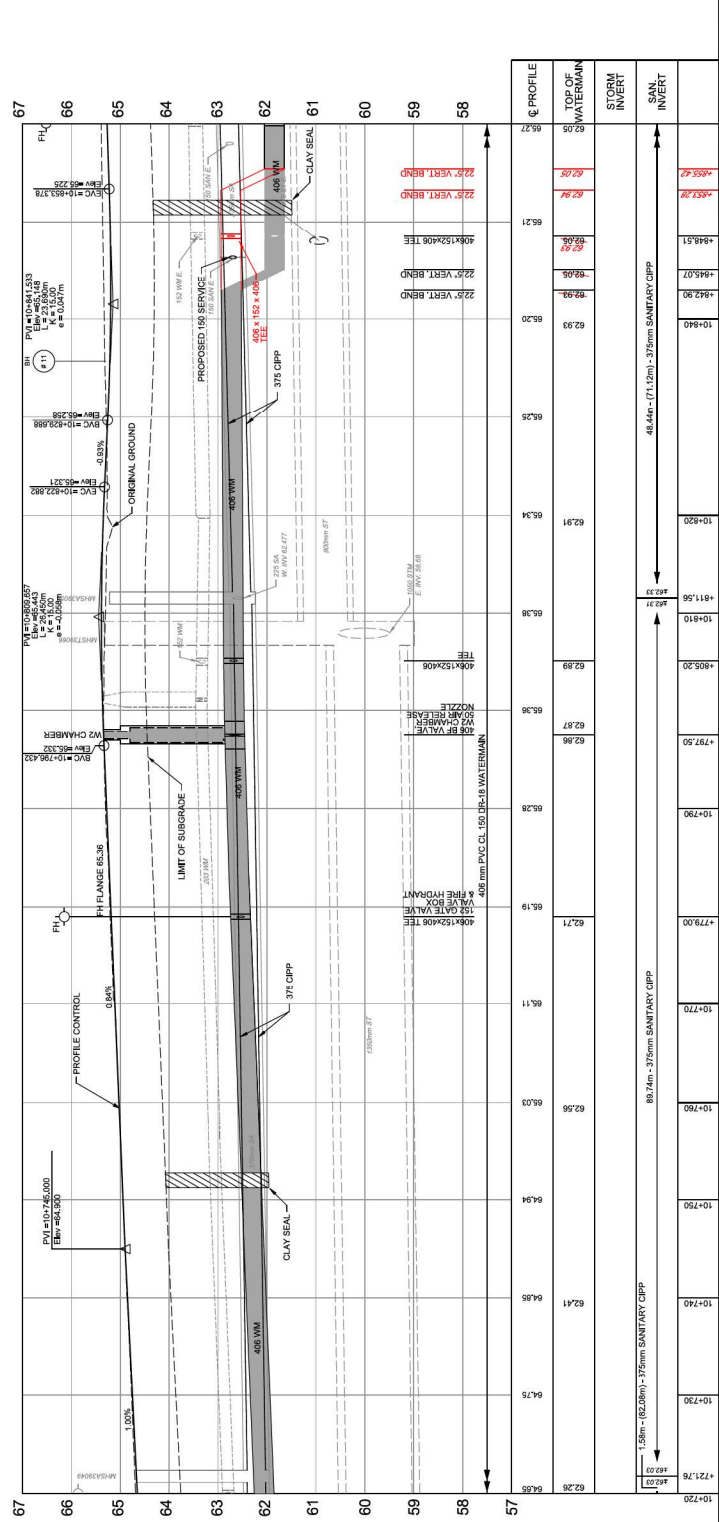
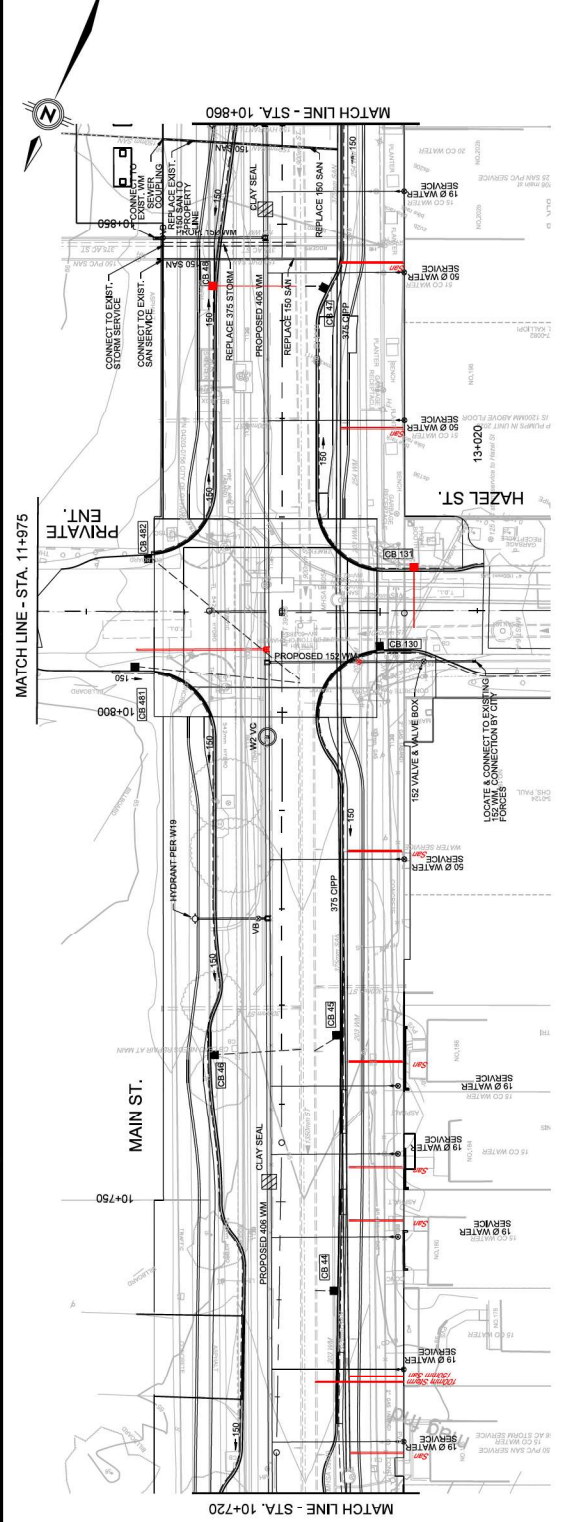
No.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION
CB 44	10+740.00	6.00 FT	3.00 FT	6007	62.58
CB 45	10+760.00	6.00 FT	3.00 FT	6007	62.58
CB 46	10+780.00	6.00 FT	3.00 FT	6007	62.58
CB 47	10+800.00	6.00 FT	3.00 FT	6007	62.58
CB 48	10+820.00	6.00 FT	3.00 FT	6007	62.58
CB 49	10+840.00	6.00 FT	3.00 FT	6007	62.58
CB 50	10+860.00	6.00 FT	3.00 FT	6007	62.58

CATCH BASIN CONNECTION

No.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION
CB 44	10+740.00	6.00 FT	3.00 FT	6007	62.58
CB 45	10+760.00	6.00 FT	3.00 FT	6007	62.58
CB 46	10+780.00	6.00 FT	3.00 FT	6007	62.58
CB 47	10+800.00	6.00 FT	3.00 FT	6007	62.58
CB 48	10+820.00	6.00 FT	3.00 FT	6007	62.58
CB 49	10+840.00	6.00 FT	3.00 FT	6007	62.58
CB 50	10+860.00	6.00 FT	3.00 FT	6007	62.58

TABLE OF WATERMAIN FITTINGS

No.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION
W1	10+740.00	6.00 FT	3.00 FT	6007	62.58
W2	10+760.00	6.00 FT	3.00 FT	6007	62.58
W3	10+780.00	6.00 FT	3.00 FT	6007	62.58
W4	10+800.00	6.00 FT	3.00 FT	6007	62.58
W5	10+820.00	6.00 FT	3.00 FT	6007	62.58
W6	10+840.00	6.00 FT	3.00 FT	6007	62.58
W7	10+860.00	6.00 FT	3.00 FT	6007	62.58



Checklist: WCCAS/ST/CD/ST/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100

File Name: 17131917.dwg
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Date: 2020/07/19

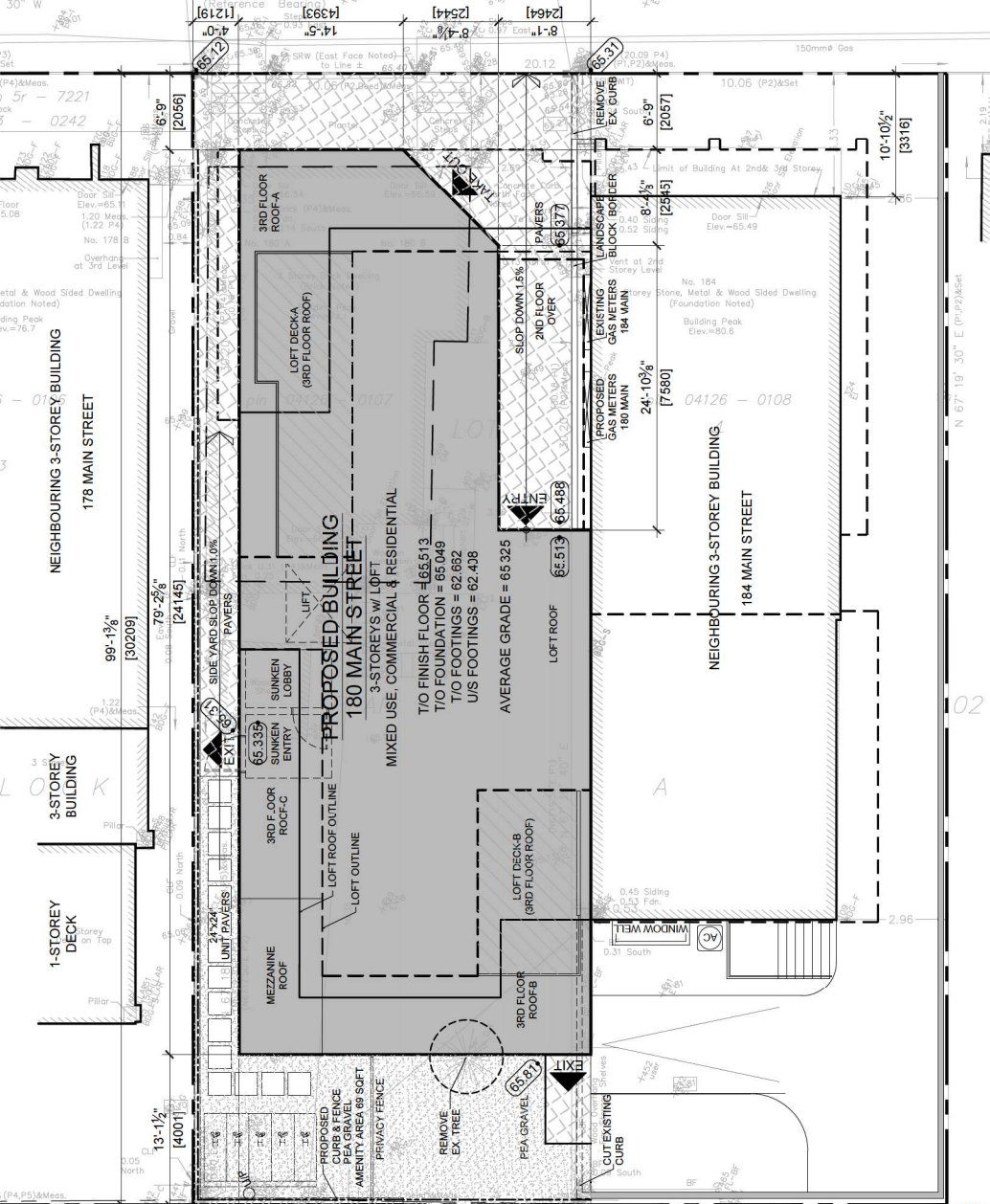
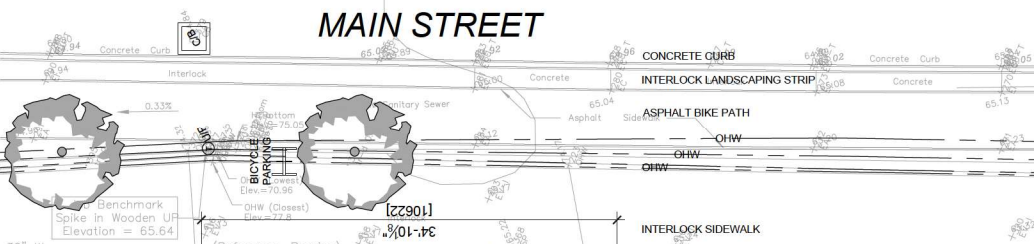
**PROPOSED
THREE STOREY W/ LOFT–MIXED USE
COMMERCIAL AND RESIDENTIAL BUILDING SITE
PART OF LOT 4 IN BLOCK A
R-PLAN 102
180 MAIN STREET
CITY OF OTTAWA**

**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)**

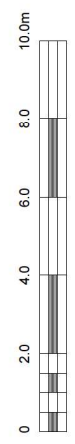
ATTACHMENT 1 : SITE PLAN AND ARCHITECTURAL DRAWINGS

MAIN STREET REGIONAL ROAD No. 72 (BY-LAW 212-50 INST. CR286468)
 ROAD ALLOWANCE BETWEEN CONCESSIONS C AND D (NEPEAN) pin 04203 - 0242



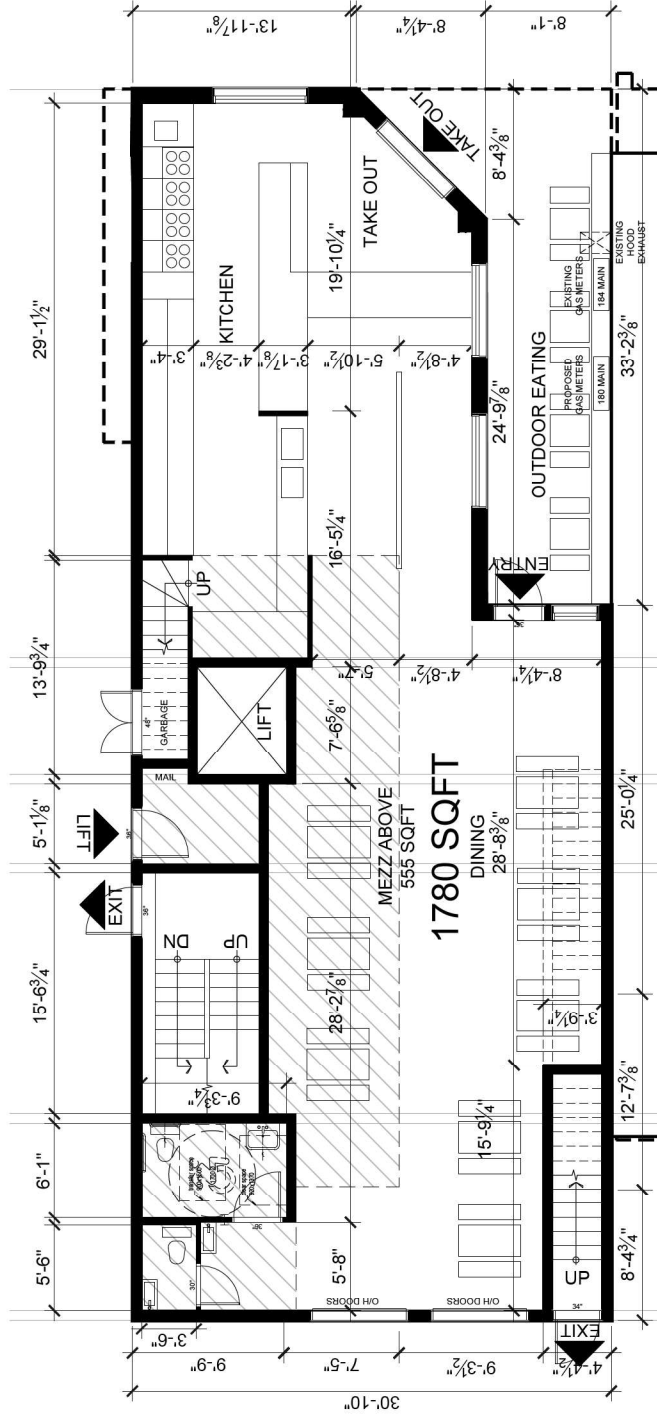
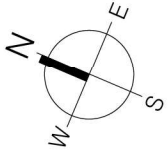
3-STOREY MIXED USE W/ LOFT
 180 Main Street, Ottawa, Ontario
 SEPT 27, 2022 SCALE: 1:125

SITE PLAN



RJH
 Rosaline J. Hill Architect Inc.
 414 Churchill Ave. N. Ottawa,
 ON, K1Z 5G6 • 613-853-2822
 www.rjh.ca • rosaline@rjh.ca

PROTIED.PL 4 Oct 2022



GROUND FLOOR (RESTAURANT)

3-STOREY MIXED USE W/ LOFT
COMMERCIAL / RESIDENTIAL

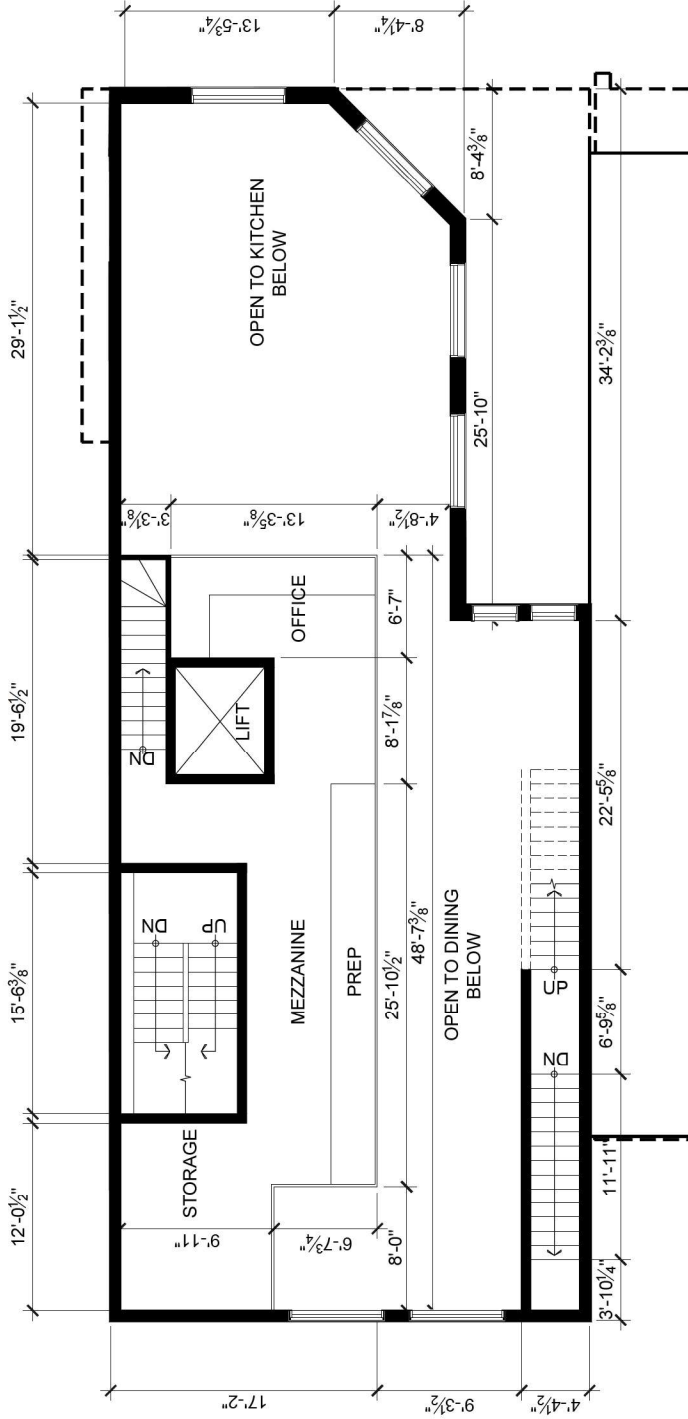
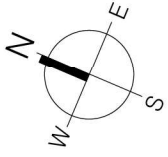
180 Main Street, Ottawa, Ontario
AUGUST 30, 2022 SCALE: 1/8" = 1'-0"

GROUND FLOOR



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www.rjh.ca • rosaline@rjh.ca



MEZZANINE (RESTAURANT)

3-STOREY MIXED USE w/ LOFT
COMMERCIAL / RESIDENTIAL

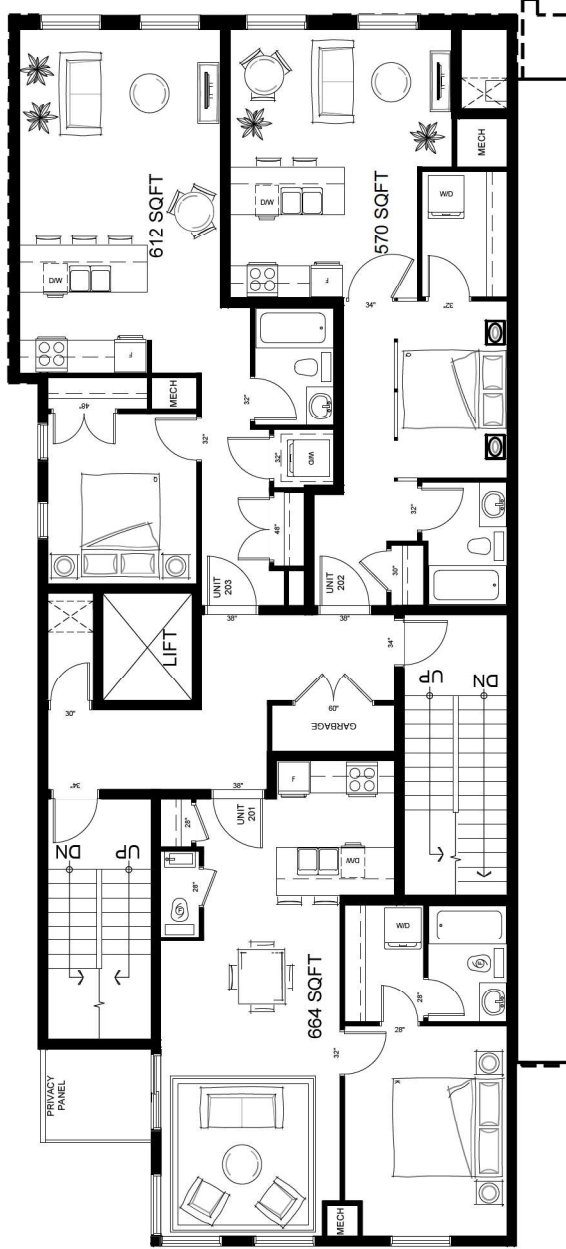
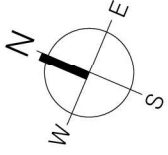
180 Main Street, Ottawa, Ontario
AUGUST 29, 2022 SCALE: 1/8" = 1'-0"

MEZZANINE (RESTAURANT)

PRINTED ON: 30 Aug 2022



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www.rjhil.ca • rosaline@rjhil.ca



SECOND FLOOR

3-STORY MIXED USE w/ LOFT
COMMERCIAL / RESIDENTIAL

180 Main Street, Ottawa, Ontario

AUGUST 30, 2022 SCALE: 1/8" = 1'-0"

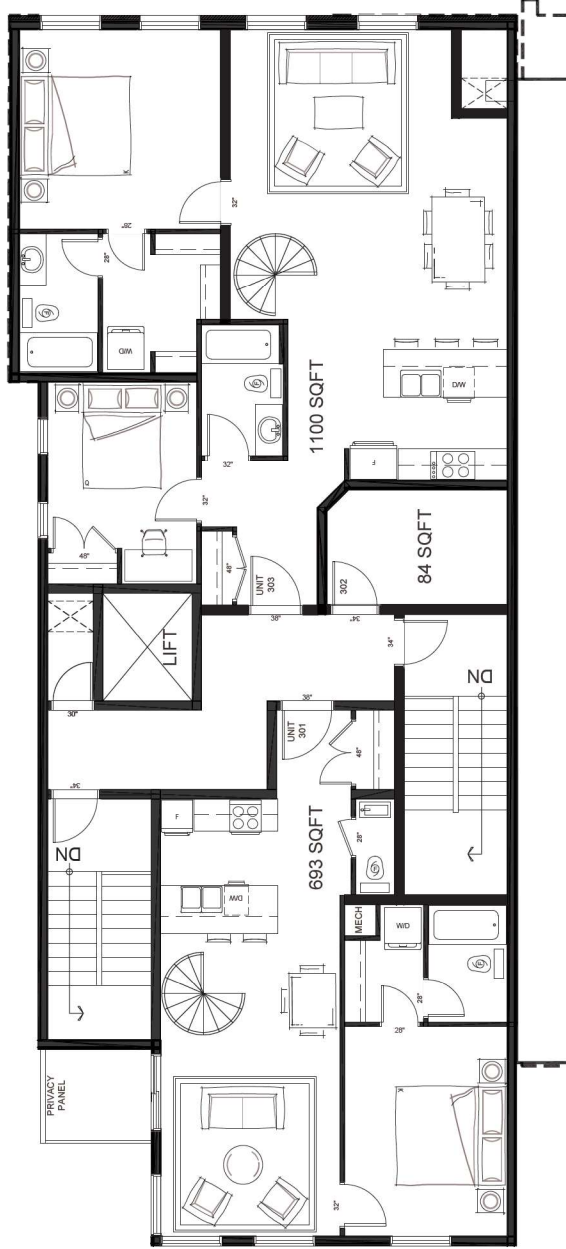
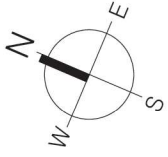
SECOND FLOOR

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"

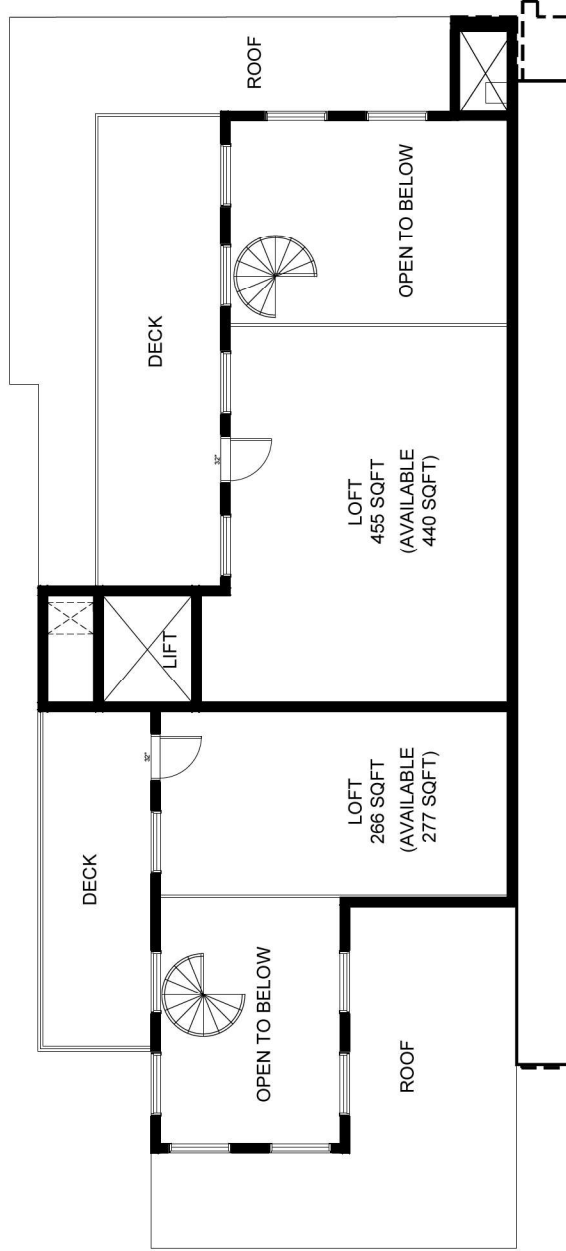
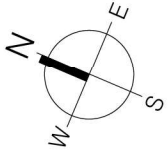
THIRD FLOOR

PLOTTED Tue, 30 Aug 2022



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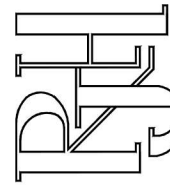
LOFT

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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ON, K1Z 5G6 • 613-853-2822
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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



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

Surveyor's Certificate

- This survey and plan are prepared in accordance with the Survey Act and the Surveyors Act and the regulations made under them.
- The survey was completed on the 26th day of July, 2022.

July 28, 2022
 E. H. Weisberger
 Ottawa Land Surveyor

PART 1
 THIS PLAN MUST BE READ IN CONJUNCTION WITH
 SURVEY REPORT DATED... JULY 8, 2022

ANNIS, O'SULLIVAN, VOLLEBEK LTD. (INCORPORATED IN ONTARIO)
 14 CONNORS CIRCLE, SUITE 500
 MISSISSAUGA, ONTARIO L4X 1L7
 TEL: (905) 277-8800 / FAX: (905) 277-9799
 www.aovltd.com

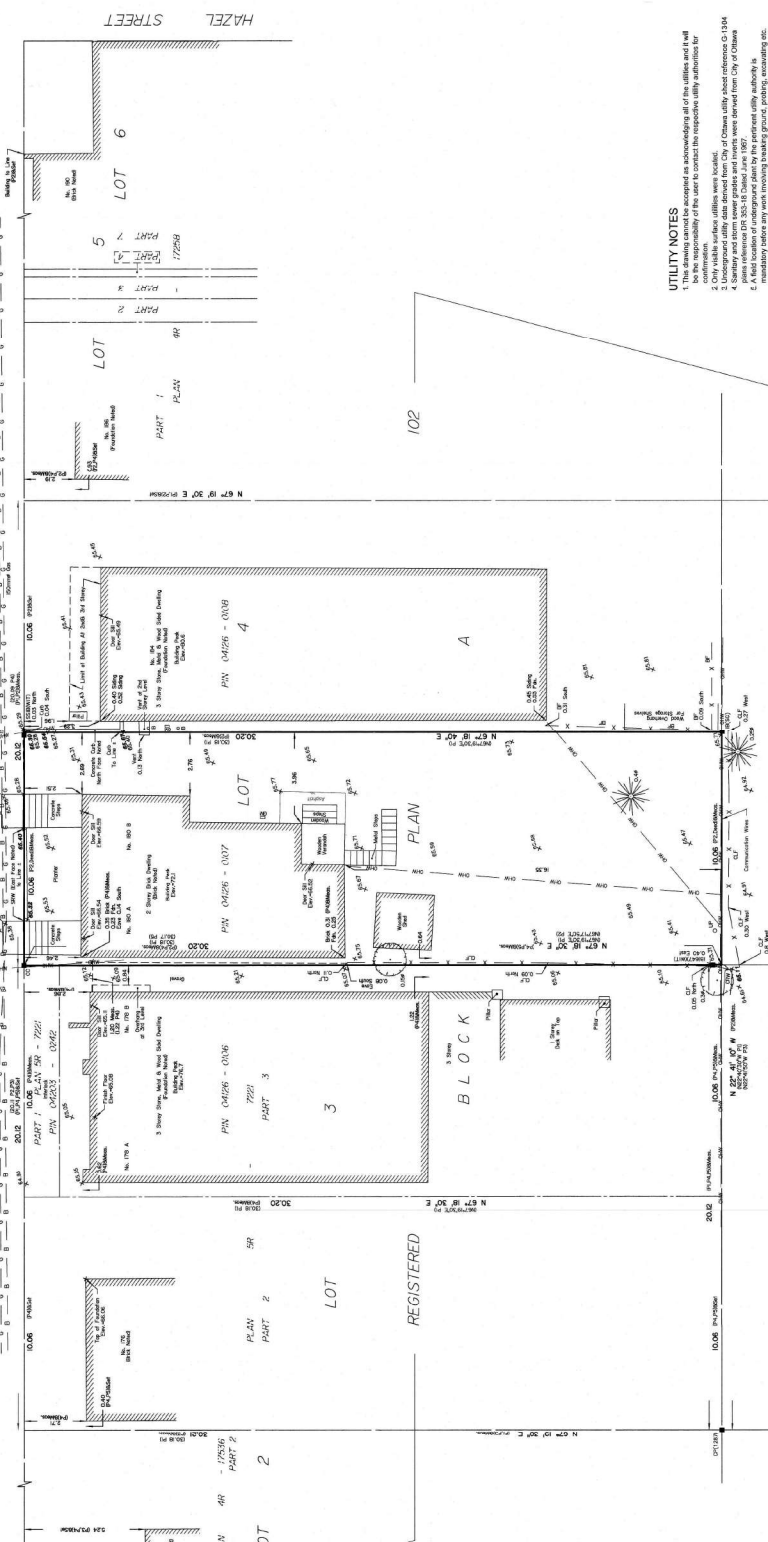
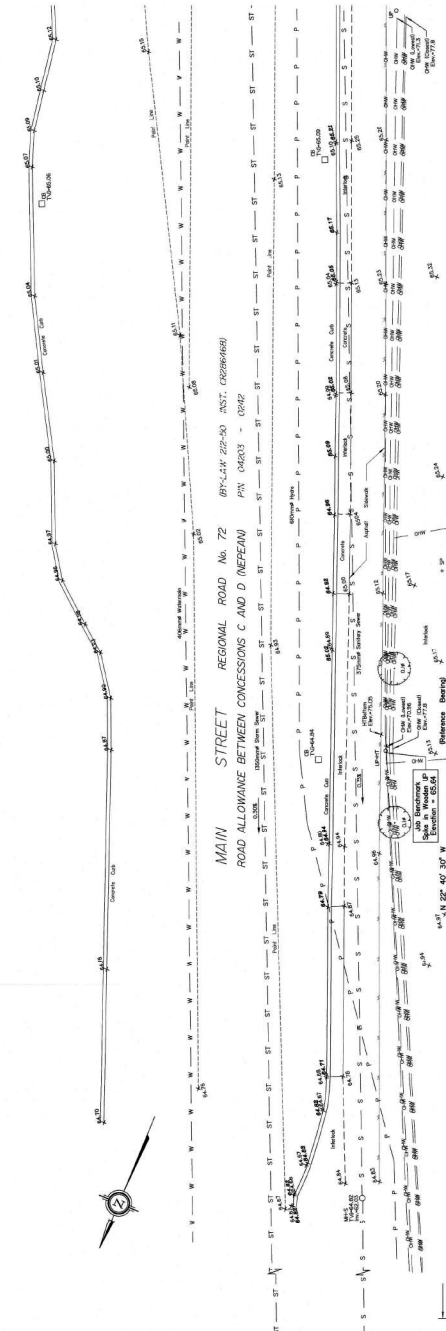
Notes & Legend

- Survey Monument Planned
- Standard Iron Bar
- Iron Bar
- Cut Cross
- Verticality Pin
- Measured
- ANIS, O'SULLIVAN, VOLLEBEK LTD.
- Registered Plan 102
- Plan 4817208
- Plan 5817221
- Plan 5817223
- Maintenance Hole (Storm Sewer)
- Underground Storm Sewer
- Underground Sanitary Sewer
- Underground Gas
- Overhead Water
- Overhead Power
- Underground Heat
- Underground Gas
- Catch Basin
- Invert
- Top of Grade
- Deciduous Tree
- Coniferous Tree
- Electric Line
- Board Fence
- Gas Meter
- Hydro Transformer Mounted on Utility Pole
- Location of Elevations
- Top 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 the accuracy of the information shown hereon and shall be deemed to have accepted the responsibility of the user to contact the respective utility authorities for the location of all utilities shown hereon.



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 14 CONNORS CIRCLE, SUITE 500
 MISSISSAUGA, ONTARIO L4X 1L7
 TEL: (905) 277-8800 / FAX: (905) 277-9799
 www.aovltd.com



UTILITY NOTES

- The user of this plan shall be responsible for the accuracy of the information shown hereon and shall be deemed to have accepted the responsibility of the user to contact the respective utility authorities for the location of all utilities shown hereon.
- Only visible surface utilities were located.
- Underground utility data derived from City of Ottawa utility sheets (reference O1344) and other utility sheets (reference O1344) were used to locate utilities shown hereon.
- The user of this plan shall be responsible for the accuracy of the information shown hereon and shall be deemed to have accepted the responsibility of the user to contact the respective utility authorities for the location of all utilities shown hereon.

ELEVATION NOTES

- Elevations shown are geoidic and are referred to the CGD2011 geoid datum. All elevations are in meters.
- The user of this plan shall be responsible for the accuracy of the information shown hereon and shall be deemed to have accepted the responsibility of the user to contact the respective utility authorities for the location of all utilities shown hereon.

ATTACHMENT 3 : FIGURE 1 – ELEVATION CONTOURS

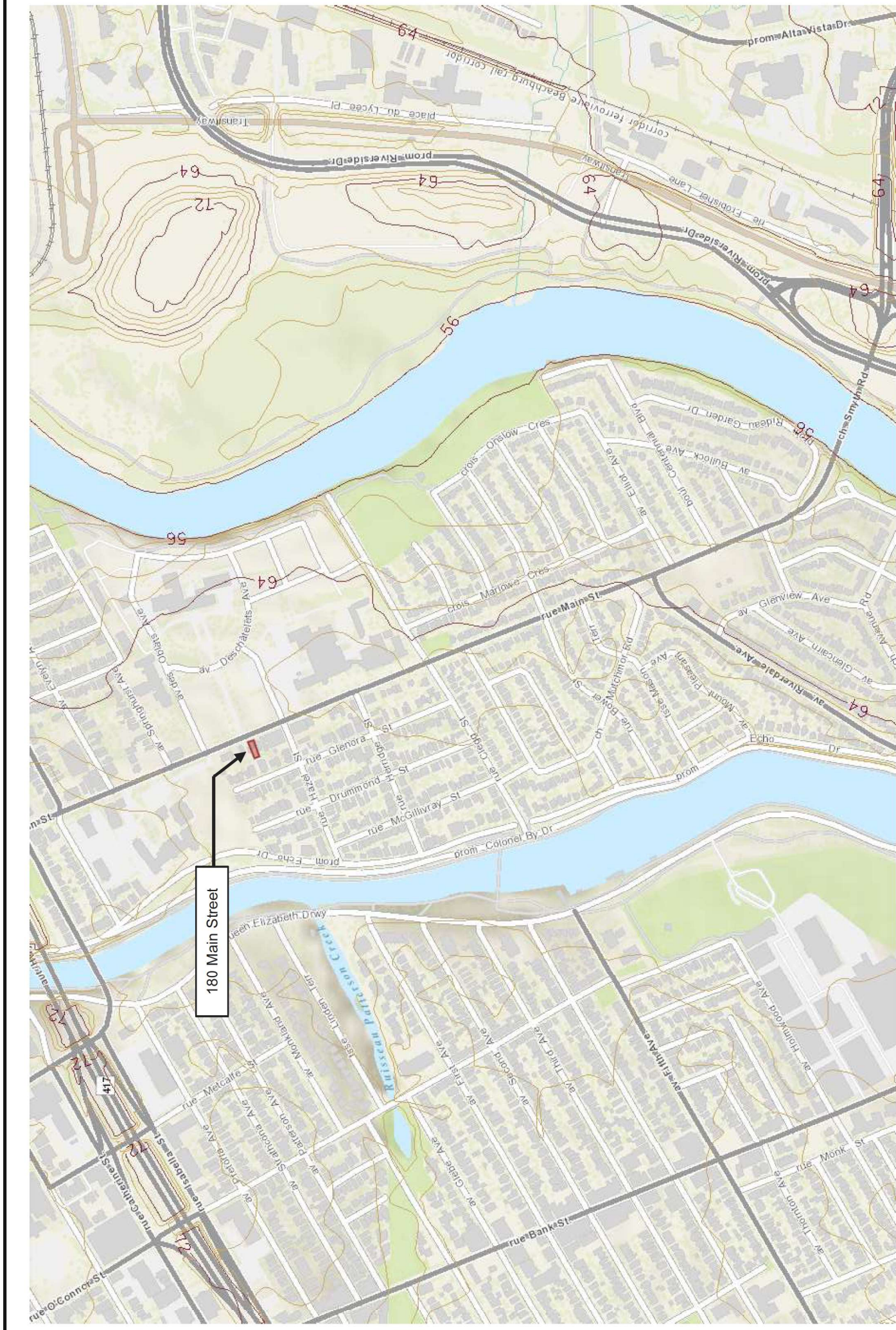


Figure 1: Elevation Contours

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.

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

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 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		0	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					
			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					
			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)

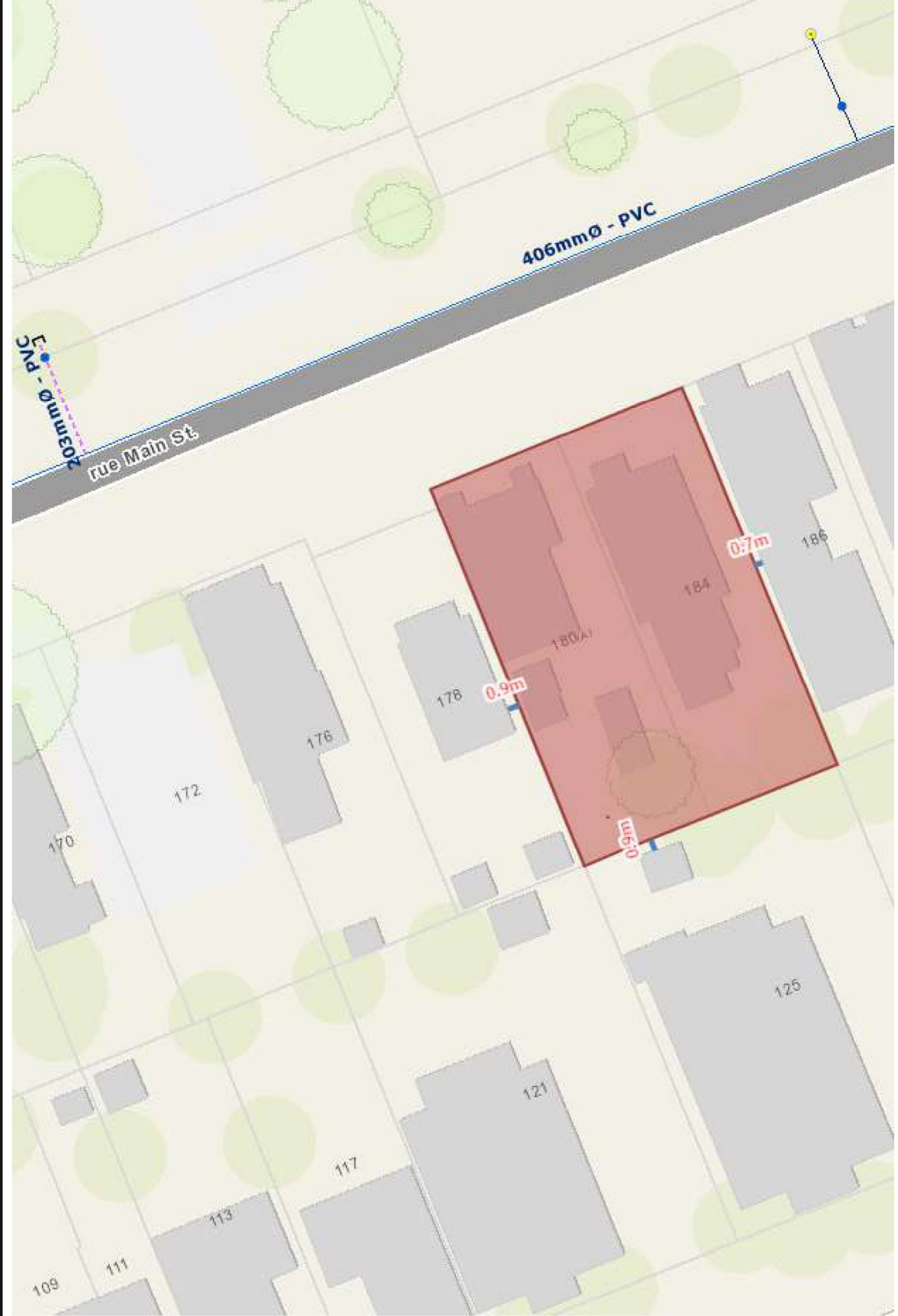


Figure 3: FUS Exposure Distances (Property Line to Adjacent Buildings) – Scenario B

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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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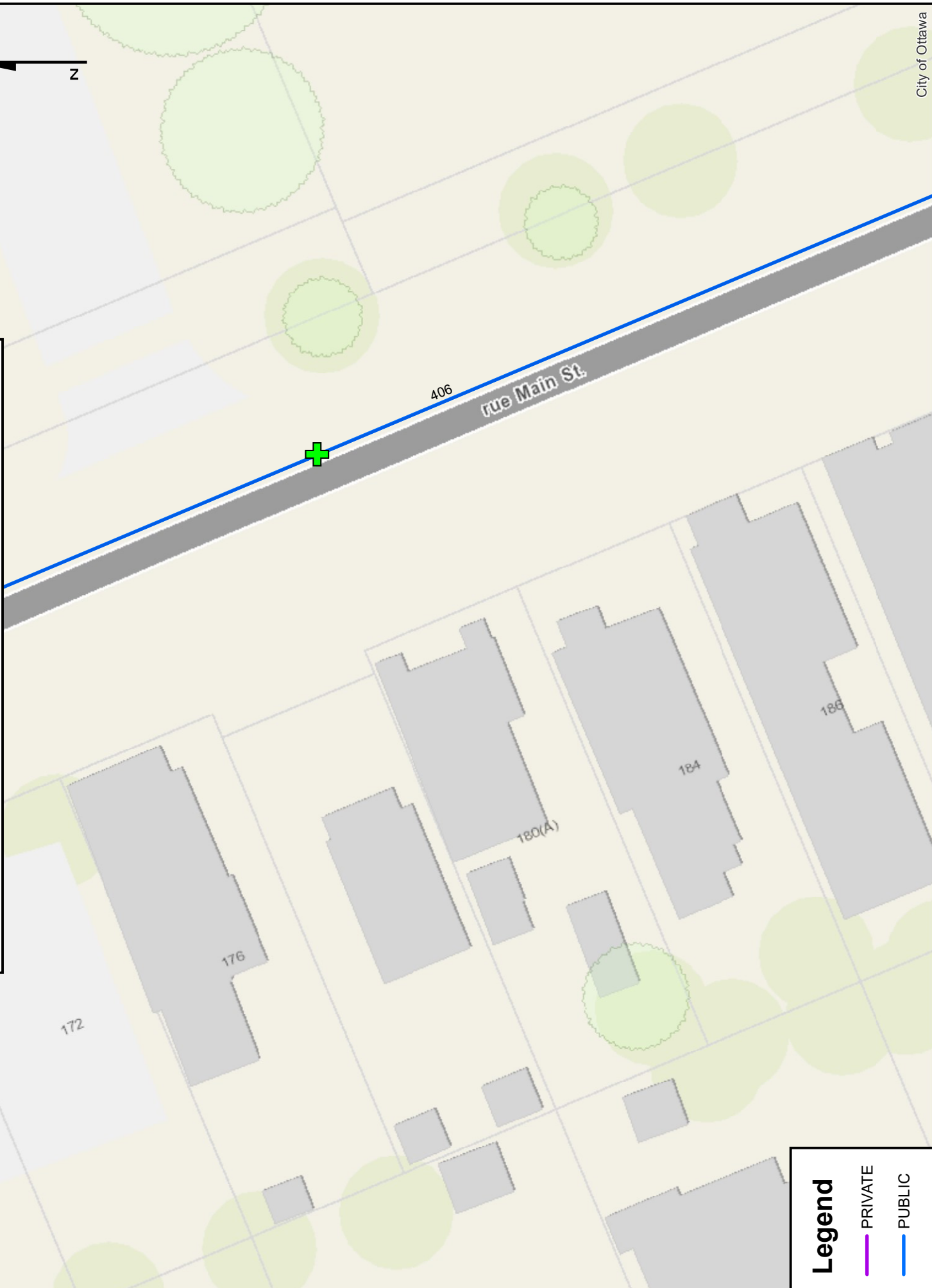
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Boundary Conditions for 180 Main Street



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:

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

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:

$$P (\text{kPa}) = (1000 * 9.81 * 39.9) / 1000$$

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

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

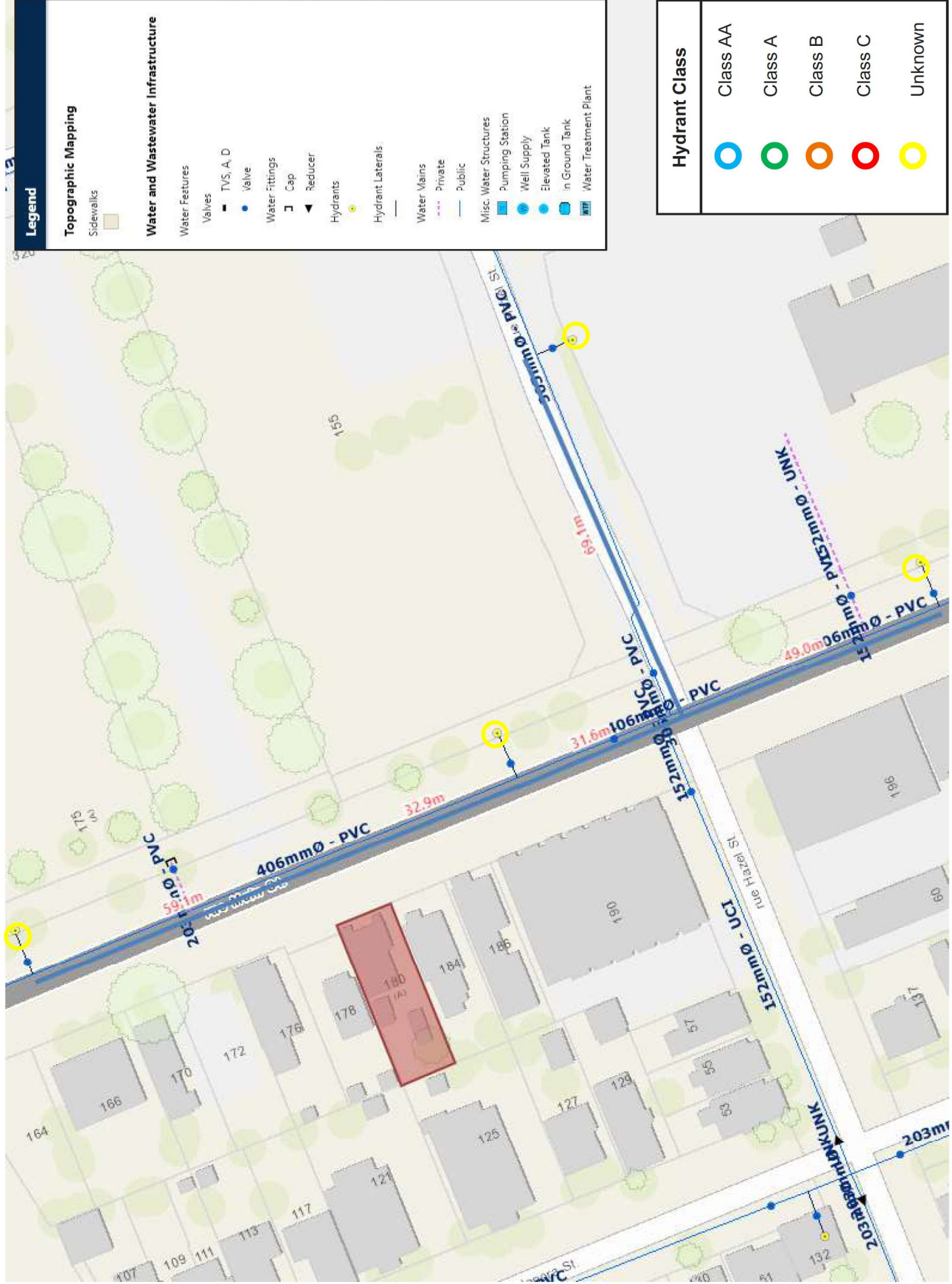


Figure 4: Hydrant Spacing

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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**

**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