PROPOSED FOUR STOREY

RESIDENTIAL APARTMENT BUILDING SITE

LOT 23 (SOUTH MURRAY STREET)

R-PLAN 42482

168 – 174 MURRAY STREET

CITY OF OTTAWA

SERVICEABILITY REPORT

REPORT R-822-43A (REV. #1)

DECEMBER 2023

T.L. MAK ENGINEERING CONSULTANTS LTD.

JUNE 2023

REFERENCE FILE NUMBER 822-43

Introduction

The developer of this site is proposing to redevelop the existing (2) residential lots described as Lot 23 (South Murray Street) Registered Plan 42482 City of Ottawa by constructing a (4) storey residential apartment building consisting of twenty (20)-units, including seven (2)-bedroom units and thirteen (1)-bedroom units.

The municipal address of the (2) properties are referenced as 168 and 174 Murray Street and it is located in the City Ward (Ward 12 – Rideau-Vanier). A portion of the existing building at 168 and 174 Murray Street will be kept while the remaining will be demolished and be replaced by new construction. The site is situated on the south side of Murray Street, west of Cumberland Street and east of Dalhousie Street. See site plan and legal survey plan in **Appendix A** for details.

The area of this property is ±0.0654 hectares. In addition to the four (4) storey residential apartment building, the other development features will comprise of a hard surface pathway to the front of the building and along east limit of the site with pedestrian access to the rear yard, amenity area is proposed in the rear yard, as well as (3) proposed bicycle parking spaces at the front of the lot including landscaped areas throughout the site, etc., to meet the City of Ottawa's site plan requirements.

A site geotechnical report was prepared by the owner's soils engineer Paterson Group entitled Geotechnical Investigation – Proposed Residential Building (Project No. PG6242-1) dated August 11, 2022 for this proposed development property.

The City of Ottawa requires the owner to apply and consolidate the parcels (168 and 174 Murray Street) of land into one ownership otherwise the proposed stormwater works will be servicing more than one parcel of land and thus does not meet the exemption set out in O.Reg. 525/98. This would mean an Environmental applications for Certification of Approval (ECA) would be required regardless of who owns the parcels. However, the owners have confirmed that the two (2) properties at 168 and 174 Murray Street is under one ownership and therefore no ECA would be required for this site development.

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 amalgamated property is presently occupied by two residential buildings. Each of the building shares a centrally located gravelled driveway for vehicle access and parking. Approximately one half of the existing site is currently hard surface covered and consisting of

roof areas, concrete/gravel areas with the remaining areas being porches, decks, sheds, grass and landscaped areas. For additional details of the site's pre-development conditions, refer to the coloured Google Image and aerial photography from (GeoOttawa 2021) in **Appendix B**.

The existing topography of the land is found to be sloped primarily to drain from south to north (back to front) across the site. The existing average gradient of the properties are sloping at an approximate gradient of 2.1%.

Existing water service and sanitary lateral currently servicing the existing dwelling on 168 and 174 Murray Street will be removed. The existing water services shall be blanked at the main and the existing house laterals shall be capped at the front property line for re-development of this site.

As for the availability of underground municipal services, there are existing municipal services along Murray Street in front of this property consisting of a 675mm diameter storm sewer, a 375mm diameter sanitary sewer, and a 200mm diameter watermain for development of this property. Refer to the City of Ottawa Murray Street UCC and As-Built plan and profile drawings included in **Appendix C** for details.

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

Proposed Residential Apartment Building Site

Pedestrian access to the front entrance and east side yard entrance and rear yard are provided by means of interlock pathway. Bicycle parking, (3) spaces are available at the front yard. A hard surface pathway and hard landscaping area are proposed at the rear yard including landscaped and amenity areas.

A. Water Supply

The proposed building located within Pressure Zone 1W at 168-174 Murray Street is a 4-storey residential building, with a basement. A portion of the existing buildings at 168 and 174 Murray Street will be kept, while the remaining will be demolished and be replaced by new construction.

The proposed building contains twenty (20) residential units, namely thirteen (13) 1-bedroom units, and seven (7) 2-bedroom units. The total gross floor area of the proposed building is

approximately 1,292.0m^2, excluding the basement. The building is to be serviced by the 203mm diameter watermain along Murray Street, via a 10.5m long service line.

The ground elevation on the property is approximately 59m, as obtained from geoOttawa elevation contours (See **Figure 1** – Elevation Contours 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). Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines. Following discussions with the City, peaking factors are to be estimated from Table 3-3 of the MECP Design Guidelines for Drinking-Water Systems, given that the proposed development population is less than 500 people. Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 9.4. Peak hour (PKHR) demands were calculated by multiplying AVDY by a factor of 14.1. **Table 1** shows the estimated domestic demands of the proposed building.

Table 1 : Estimated Domestic Demand

Unit Type	Unit Count	PPU	Consumption	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 1-Bedroom	13	1.4	280	5,096	0.06	47,845	0.55	72,023	0.83
Apartment, 2-Bedroom	7	2.1	280	4,116	0.05	38,644	0.45	58,172	0.67
Total	***20***			***9,212***	***0.11***	***86,490***	***1.00***	***130,195***	***1.51***

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 have a sprinkler system. The anticipated sprinkler demand for the proposed building shall be assessed at the design stage by the sprinkler designer, as per NFPA 13[1]. For reference, using the Hydraulically Calculated Systems method described in NFPA 13, a flow rate of 950 L/min (15.8 L/s) is suggested for ordinary hazard, and 1,900 L/min (31.7 L/s) for extra hazard (see Table 19.2.3.1.2).

Note that the proposed building is proposed to be within 3 m of the adjacent property (166 Murray Street). The recently updated 2020 FUS Guidelines do not consider wood frame structures separated by less than 3 metres as a single fire area. As such, only the effective building area of the proposed building was considered in the calculations.

[1] **NFPA. (2022) Standard for the Installation of Sprinkler System. NFPA 13.**

The resulting total required fire flow (RFF) is 14,000 L/min (233 L/s) for a duration of 3 hours. Details are provided in the attached **FUS Fire Flow Calculations** in **Appendix D**. The proposed **Site Plan** attached in **Appendix D** was used to determine distances from the proposed building to the property lines. **Figure 2** in **Appendix D** provides separation distances from adjacent buildings.

In summary, the estimated water demands for the proposed building are as follows:

- AVDY = 9,212 L/d (0.11 L/s)
- MXDY = 86,490 L/d (1.00 L/s);
- PKHR = 130,195 L/d (1.31 L/s); and,
- Fire Flow FUS = 14,000 L/min (233 L/s)

Boundary Conditions

The hydraulic gradeline (HGL) boundary conditions for 168-174 Murray Street, as presented in **Table 2**, were provided by the City on June 22, 2023 (see attached **Water Boundary Conditions Email** in **Appendix D**). It should be noted that the boundary condition values presented in **Table 2** were provided for previously identified water demands, using different peaking factors, as per the attached **Water Boundary Conditions Email** in **Appendix D**. However, given the marginal difference in flows (less than 1 L/s), it is assumed that the values listed in Table 2 are representative of the expected hydraulic conditions at the proposed site.

Table 2 : Boundary Conditions

Demand Scenario	Head (m)
Minimum HGL (Peak Hour)	106.3
Maximum HGL (Average Day)	115.4
Maximum Day + Fire Flow (FUS – 14,000 L/min)	98.1

Hydraulic Analysis

Peak Hour & Average Day Demand

During average day demands, the resulting maximum hydraulic gradeline of 115.4 m corresponds to a maximum pressure of 553 kPa (80 psi). This value is marginally higher than the maximum pressure objective of 552 kPa (80 psi) and is therefore considered acceptable.

During peak hour demands, the resulting minimum hydraulic gradeline of 106.3 m corresponds to a peak hour pressure of 464 kPa (67 psi). This value is above the minimum pressure objective of 276 kPa (40 psi) for residential buildings up to two storeys. From a servicing perspective, 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 345 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. **Supporting Hydraulic Calculations** are attached in **Appendix D**.

For the proposed building (20 units), about 257 fixture units are to be considered based on the Ontario Building Code (Table 7.6.3.2.A) and the hydraulic load per fixture. **Table 3** summarizes the fixture units estimated based on the attached **Site Plan** in **Appendix D**. For domestic flows, a minimum service line of 1 ½ inches (40 mm) can service up to 286 fixture units, based on the National Plumbing Code[2] (see Table A-2.6.3.1.(2)-A).

Table 3 : Fixture Counts

Fixture Type	No. of Fixtures	Hydraulic Load/Fixture	Hydraulic Load/Fixture Units
Lavatory	33	1.2	49.5
Toilet	33	2.2	72.6
Hose Bib (5/8)	4	2.5	10.0
Tub/Shower	33	1.5	49.5
Dishwasher	20	1.4	28.0
Sink	20	1.4	28.0
Washer	20	1.0	20.0
		Total	***257.6***

However, a larger service line is needed due to the sprinkler system servicing the proposed building. The sprinkler line size shall be validated upon identification of the sprinkler flow at the design stage. For reference, the lower 950 L/min (15.8 L/s) flow for ordinary hazard would result in 0.9 m/s velocity and 0.1 m of head losses through a 150 mm diameter line (10.5 m long). A flow of 1,900 L/min (31.7 L/s) for extra hazard would result in 1.8 m/s velocity and 0.4 m of head losses through a 150 mm diameter line.

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[2] **National Research Council of Canada (2020). National Plumbing Code of Canada. Issued by the Canadian Commission on Building and Fire Codes. 11th Edition.**

Maximum Day + Fire Flow

A maximum day plus fire flow (14,000 L/min) hydraulic gradeline of 98.1 m corresponds to a residual pressure of 383 kPa (56 psi) at this location, which is above the minimal residual pressure requirement 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, five (5) hydrants are located in the vicinity of the proposed building. Two (2) Class AA hydrants are within 75 m, both with a

capacity contribution of up to 5,700 L/min. Three (3) others Class AA hydrants are within 150 m from the site, both with a capacity contribution of up to 3,800 L/min. The combined hydrant flow coverage for 168-174 Murray Street is therefore 22,800 L/min, which is above the RFF obtained from the FUS (14,000 L/min) methods.

The hydrant coverage is illustrated in **Figure 3** attached in **Appendix D**. A breakdown of the hydrant coverage is summarized in **Table 4**.

Table 4 : 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	
168-174 Murray Street	14,000 (FUS)	AA	2	5,700	3	3,800	22,800
		A					
		B					
		C					

In conclusion, based on the boundary condition provided, 203 mm diameter watermain along Murray Street provides adequate fire flow capacity, as per the Fire Underwriters Survey (FUS) method, to the proposed development at 168-174 Murray Street. Resulting pressures during 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 20 units, which comprise of seven (2)-bedroom units and thirteen (1)-bedroom units, is estimated at Q = 0.45 L/s with an infiltration rate of 0.02 L/s. Refer to **Appendix E** sheet 1 of 1 regarding sanitary flow calculations. This flow will enter the existing 375 mm diameter sanitary sewer on Murray Street via the proposed 150 mm diameter PVC sanitary service lateral from the four (4)-storey residential apartment building.

The existing peak sanitary flow of the site for the (2) existing single detached dwelling units is Q = 0.13 L/s with an infiltration rate of 0.02 L/s. The net increase in flow from this proposed development is 0.32 L/s which is not expected to negatively impact the existing 375 mm dia. sanitary sewer.

Waste water from the Murray Street 375 mm dia. sanitary sewer then in turn outlets north into the existing downstream 450/525 mm dia. sanitary sewer located along Cumberland Street where the waste water further outlets northward to the existing 2100 mm dia. sanitary trunk sewer situated just north of Cathcart Street.

C. Storm Flow

The storm-water outlet for the proposed development property will be the existing 675mm diameter storm sewer located on Murray Street. Stormwater attenuation on site will be accomplished by means of rooftop storage with controlled roof drains that regulate flow off site.

Four (4) roof drains are proposed for this apartment building that will restrict maximum flow to a rate of 1.28 L/s (4 × 0.32 L/s) under a head of 150mm and into the Murray Street storm sewer. The calculated net allowable controlled release rate from this site is estimated at 7.01 L/s under the 2 year pre-development event.

Based on the residential site plan from the owner's architect, the average post-development runoff coefficient is estimated at C = 0.72 and A = 0.0654 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 valve exceeds the lesser of the C_{pre} = 0.57 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 allowable C = 0.5 (max) flow rate calculated into the existing storm sewer for re-development of 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 versus the average C_{pre} value which is 0.57 using t_c = 10 minutes. Because the site C_{post} = 0.72 and C_{pre} = 0.57 then SWM measures are required.

Therefore, based on our calculation, on-site retention is required for this proposed development site, because the site post-development C value of 0.72 is greater than the C_{pre} = 0.57.

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-822-43) for further details.

To control the two (2)-Year storm-water release rate off-site from roof top to a rate of 1.28 L/s, a site storage volume of approximately 3.49 m^3 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, 2, 3 and 4 is estimated at 100mm at the drain and 0mm at the roof perimeter, assuming a 1.6% minimum roof pitch to the drain and controlling the flow rate at 0.32 L/s per drain. The

rooftop storage available at Roof Area 1 is 1.12 m^3, rooftop storage available at Roof Area 2 is 1.35 m^3, rooftop storage available at Roof Area 3 is 1.40 m^3 and the rooftop storage available at Roof Area 4 is 0.70 m^3, for a total storage volume of 4.57 m^3, which is greater than the required volume of 3.49 m^3.

During the 100-year storm event for the flat rooftop storage, the ponding depth of Roof Area 1, 2, 3 and 4 is estimated at 150 mm at the drain and 0mm at the roof perimeter, assuming a 1.6% minimum roof pitch to the drain and controlling the flow rate at 0.32 L/s per drain. The rooftop storage available at Roof Area 1 is 3.65 m^3, rooftop storage available at Roof Area 2 is 4.55 m^3, rooftop storage available at Roof Area 3 is 5.0 m^3 and the rooftop storage available at Roof Area 4 is 2.46 m^3, for a total storage volume of 15.66 m^3, which is greater than the required volume of 13.13 m^3.

Therefore, by means of flat building rooftop storage as shown on the Proposed Rooftop Stormwater Management Plan and grading the site to the proposed grades as shown on the Proposed Grading and Servicing Plan Dwg. 822-43 SWM-1 and 822-43 G-1 respectively, the desirable two (2)-year storm and 100-year storm event detention volume of 4.57 m^3 and 15.66 m^3 respectively will be available on site. Refer to Appendix D in the Storm Drainage Report (Report No. R-822-43) 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 which totals to 11.75 L/s (1.28 L/s + 10.47 L/s) and is 4.74 L/s greater than the allowable flow of 7.01 L/s.

In comparing the pre-development flow of the current site conditions to the post development flow and with the SWM regulated flow plus uncontrolled flow from the proposed site under the post development conditions at the 2-Year event = 5.22 L/s and the 100-Year event = 11.75 L/s whereupon the post development flow events are less than the current 2-Year event and less than the current 100-Year event pre-development flow estimate for the site at 2-Year $_{Pre}$ = 7.01 L/s and 100-Year $_{Pre}$ = 21.43 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 a proposed 150mm dia. PVC storm lateral. The roof drains will also be outletted via a separate 150mm dia. PVC lateral from the building which is then wyed into the proposed 150mm dia. storm lateral on private property and connected to the existing Murray Street 675mm dia. storm sewer. The City of Ottawa recommends that pressurized drain pipe material be used in the building for the roof drain leader pipe in the event of surcharging in the City Storm sewer system. Refer to the proposed site grading and servicing plan Dwg. 822-43 G-1 for details.

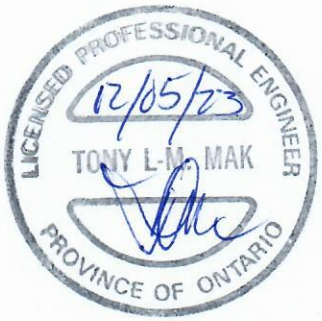
Erosion and Sediment Control

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 Murray 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. #822-43 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 FOUR STOREY

RESIDENTIAL APARTMENT BUILDING SITE

LOT 23 (SOUTH MURRAY STREET)

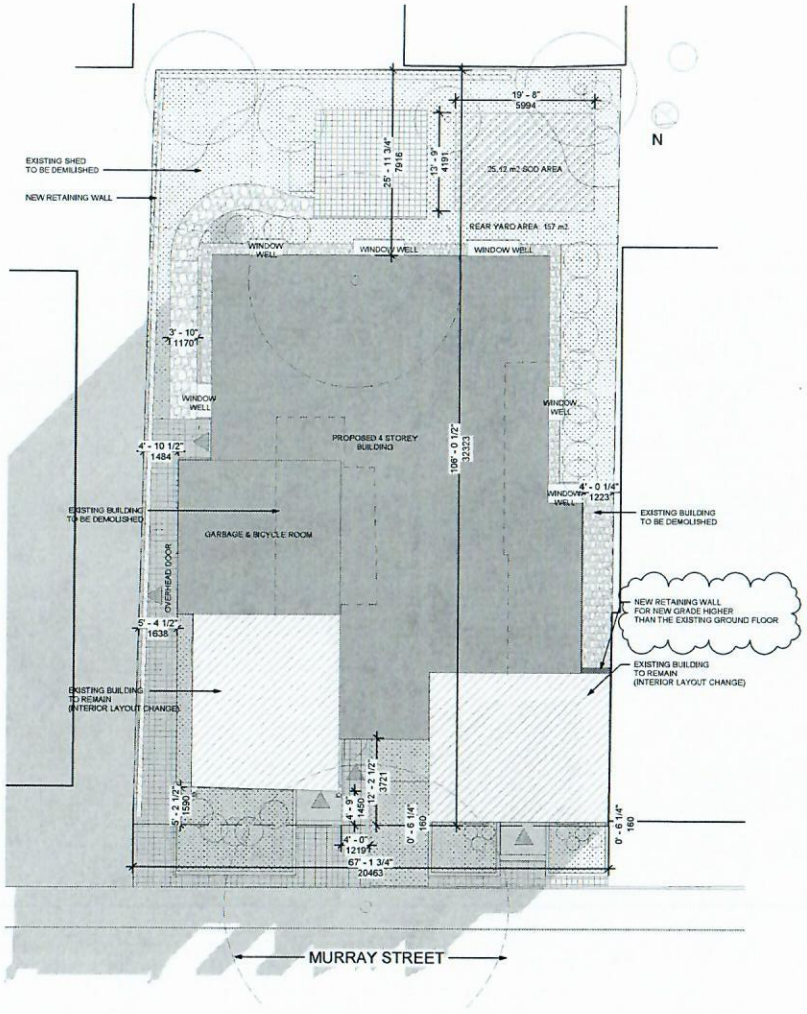
R-PLAN 42482

168 – 174 MURRAY STREET

CITY OF OTTAWA

APPENDIX A

SITE PLAN AND LEGAL SURVEY PLAN



1 SITE PLAN
SCALE:1/100

168-174 MURRAY ST.				
SITE PLAN OF SURVEY LOT 23 REGISTERED PLAN 42482, CITY OF OTTAWA	SURVEY INFO TAKEN FROM LOT 23 REGISTERED PLAN 42482 CITY OF OTTAWA PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. COMPLETED on JANUARY 7th, 2021			
R4UD[902] 674- RESIDENTIAL FOURTH DENSITY ZONE (SEC. 161-162) CITY OF OTTAWA, DWELLING TYPE 4 STOREY LOW RISE RESIDENTIAL BUILDING				
ZONING MECHANISMS	**REQUIREMENT**	**PROVIDED**		**NOTES**
A) MINIMUM LOT AREA	450 m²	654.2 m²		
B) MINIMUM LOT WIDTH	15 m	20.46 m		
C) MINIMUM LOT DEPTH	N/A	32.32 m		
D) MINIMUM FRONT YARD SET BACK (AVERAGE SETBACK OF NEIGHBOURS)	0.2 m+ 1.63 m / 2 = 0.915 m	EXISTING BUILDING & 3.721 m		
E) MINIMUM INTERIOR SIDE YARD SETBACK	1.5 m	1.22 m		MINOR VARIANCE
F) MINIMUM REAR YARD SET BACK	Min. 9.69 m & must be 163.5 m2 in area	7.916 m & 158.77 m2 in area		MINOR VARIANCE
G) MAXIMUM BUILDING HEIGHT	168 Murray 8.8 metres (to a depth of 9.14 m from front lot line) 9.3 metres (rear) 174 Murray 7.9 metres (to a depth of 9.14 m from front lot line) 10.5 metres (rear)	13.38 m		
H) VEHICULE PARKING (RESIDENTS)	0	0		
VEHICULE PARKING (VISITOR)	20-12 = 8 units x 0.1=0.8 (1)	0		MINOR VARIANCE
VEHICULE PARKING (TOTAL)	0			
K) BIKE SPACES	20x0.5=10	22 (STACKED) INDOOR		
L) AMENITY AREA	6.0 x 20 units = 120m² 50% of 120m² = 60m² required as communal	157 m² @ BACK		
M) FRONT YARD, SOFTSCAPING PERCENTAGE	40%	28.8%		MINOR VARIANCE
N) REAR YARD, SOFTSCAPING PERCENTAGE	50%	75.7%		
BUILDING AREAS				
BASEMENT BUILDING AREA (NEW) 280 m²	**PROPOSED SITE DEVELOPMENT INFO.**		**GARBAGE REQUIREMENT**	
GROUND FLOOR BUILDING AREA (NEW) 280 m² BUILDING AREA (EXISTING) 97 m²	PROPOSED STOREYS	4	GARBAGE, RECYCLING AND COMPOSTING ARE TO BE STORED IN THE BASEMENT AND REMOVED PRIVATELY DURING COLLECTION	
SECOND FLOOR BUILDING AREA (NEW) 280 m² BUILDING AREA (EXISTING) 97 m²	LOT COVERAGE	57.3%		
THIRD FLOOR BUILDING AREA (NEW) 269 m²	SOFT LANDSCAPING	25.6%	**SNOW REMOVAL REQUIREMENT**	
FOURTH FLOOR BUILDING AREA (NEW) 269 m²	HARD LANDSCAPING	16.6%		
	STAIR & LANDING	0.5%		

	1 BED	2 BED	3 BED	TOTAL
EXISTING BUILDING (RENOVATED)	8	0	2	2
PROPOSED ADDITION	13	5	0	18
TOTAL	13	5	2	20
REQUIRED 2+ BEDROOM		5	5	
PROPOSED 2+ BEDROOM		5	5	

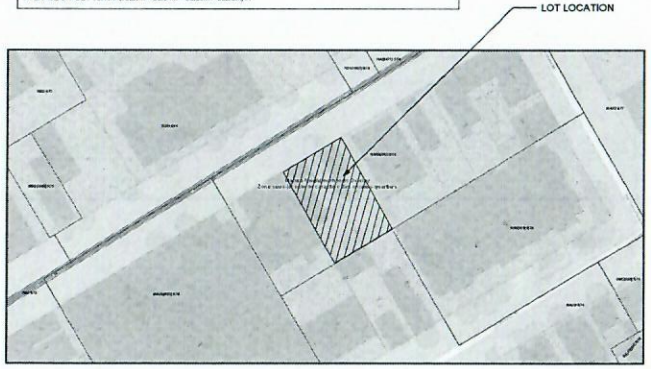
AVERAGE GRADE

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

AVERAGE GRADE : 58.48m (58.20m + 58.34m + 58.65m + 58.53m) /4

LEGEND

- NEW TREE
- EX. TREE TO BE REMOVED
- PROPOSED BUILDING
- EXISTING BUILDING TO REMAIN
- PROPOSED / EXISTING ENTRY / EXIT
- PROPERTY LINE
- DENOTES HARD LANDSCAPING
- DENOTES SOFT LANDSCAPING



RA REDLINE ARCHITECTURE

REDLINE ARCHITECTURE INC.

RESPONSIBILITIES

DO NOT SCALE DRAWING(S)

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

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

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

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT

COPYRIGHT RESERVED

GENERAL NOTES

ONTARIO ASSOCIATION OF ARCHITECTS LEVINE TATAR LEGENCE 9642

168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS

CONSULTANTS
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE
1	ISSUED FOR CPA	2019-08-23

PROJECT
168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS
168-174 MURRAY ST.
OTTAWA, ON K1N 5N8

SITE PLAN

DRAWN BY:
DATE (M-D-Y): 2021-
SCALE: AS NOTED

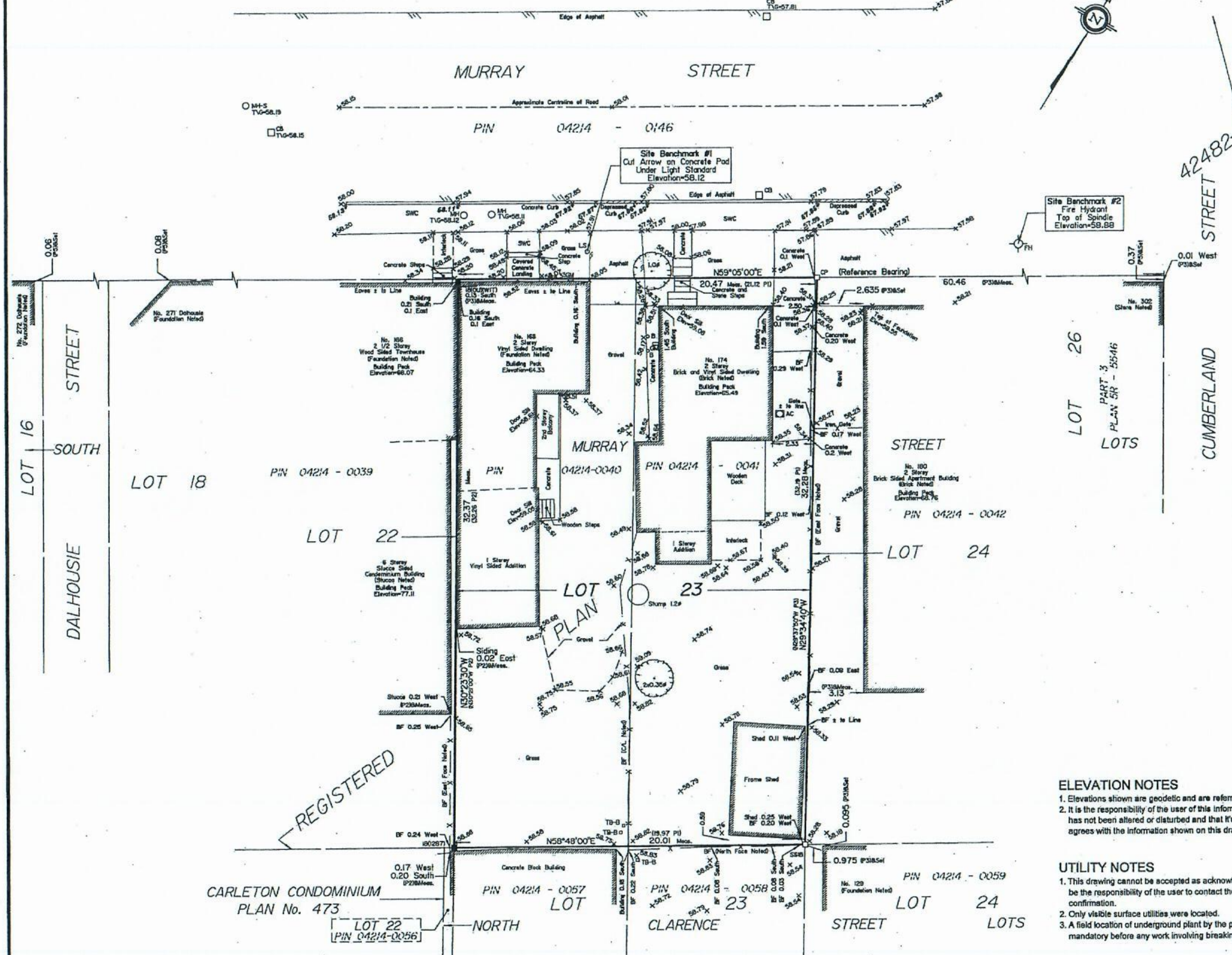
SHEET
A0

TOPOGRAPHIC PLAN OF SURVEY OF
LOT 23 (South Murray Street)
REGISTERED PLAN 42482
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 150

6 4.5 3.0 1.5 0 3 6 Metres



Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act and the Surveyors Act and the regulations made under them.
2. The survey was completed on the 7th day of January, 2021.

Jan 12/21
Date

T. Hartwick
Ontario Land Surveyor

Notes & Legend

Symbol	Denotes	
—□—	-	Survey Monument Planted
—■—	-	Survey Monument Found
SIB	-	Standard Iron Bar
SSIB	-	Short Standard Iron Bar
IB	-	Iron Bar
CC	-	Cut Cross
CP	-	Concrete Pin
(WIT)	-	Witness
Meas.	-	Measured
(AOG)	-	Annis, O'Sullivan, Vollebekk Ltd.
(OU)	-	Origin Unknown
(PI)	-	Registered Plan 42482
(P2)	-	(1692) Plan dated February 3, 2004
(P3)	-	Plan 4R-11580
(P4)	-	Plan 5R-5546
(P5)	-	Plan 5R-14850
◯	-	Deciduous Tree
FH	-	Fire Hydrant
MH-S	-	Maintenance Hole (Sanitary)
MH	-	Maintenance Hole (Unidentified)
CB	-	Catch Basin
T\G	-	Top of Grate
GM	-	Gas Meter
TB-B	-	Bell Terminal Box
B	-	Bollard
BF	-	Board Fence
SWC	-	Concrete Sidewalk
LS	-	Light Standard
AC	-	Air Conditioner
Ø	-	Diameter
+65.00	-	Location of Elevations
+65.00*	-	Top of Concrete Curb Elevation
C/L	-	Centreline
——	-	Property Line

Bearings are astronomic and are referred to the southerly limit of Murray Street, shown to be N59°05'00"E on Registered Plan 42482.

ELEVATION NOTES

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

UTILITY NOTES

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

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2150043

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

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 2122-20 Tca PL123 PL42482 T F | AR

PROPOSED FOUR STOREY

RESIDENTIAL APARTMENT BUILDING SITE

LOT 23 (SOUTH MURRAY STREET)

R-PLAN 42482

168 – 174 MURRAY STREET

CITY OF OTTAWA

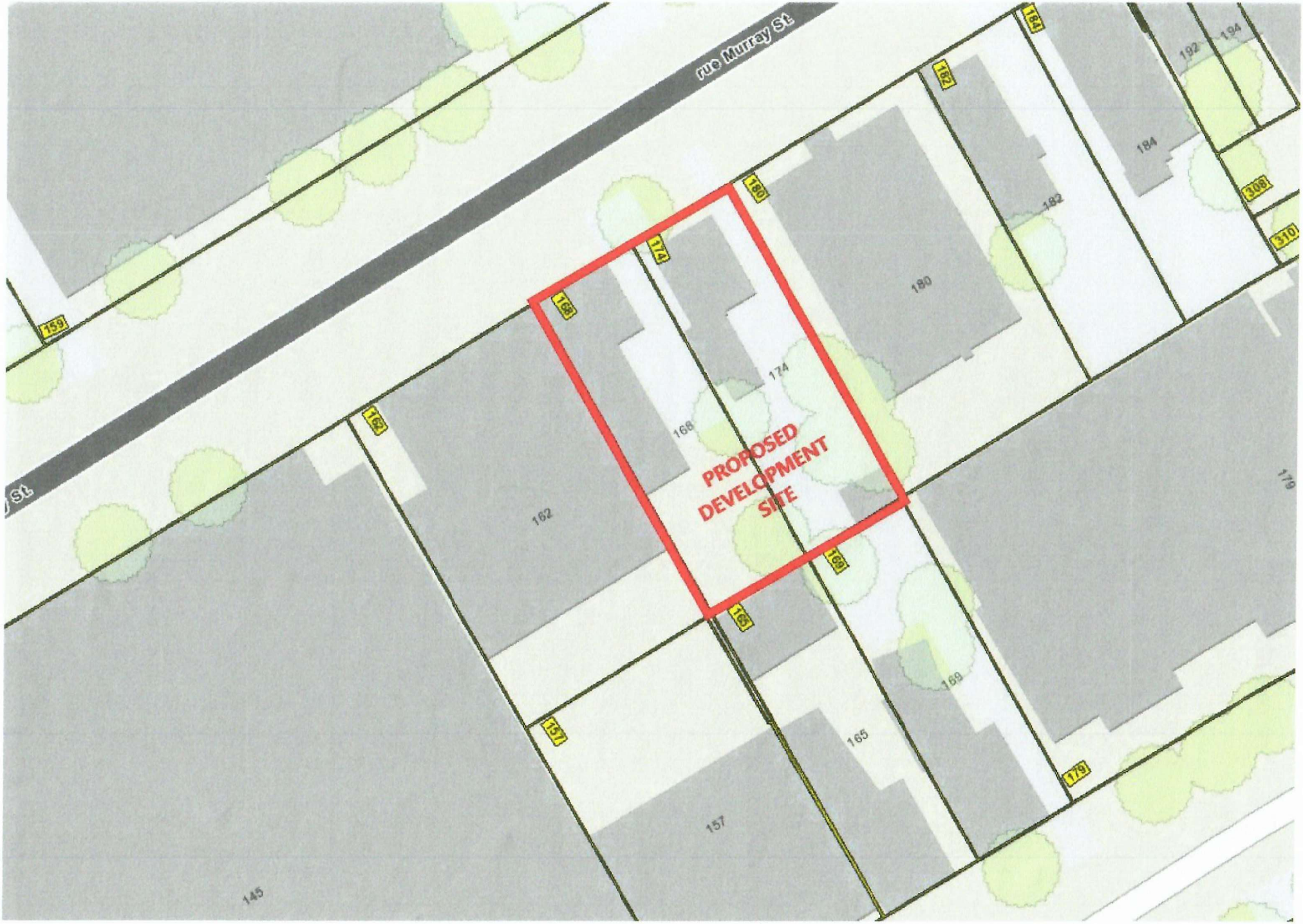
APPENDIX B

SITE PRE-DEVELOPMENT CONDITION

GOOGLE IMAGE (2021)

AND

AERIAL PHOTOGRAPHY 2021 (GEOOTTAWA)


rue Murray St
PROPOSED DEVELOPMENT SITE
159
160
162
164
165
167
168
169
174
179
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182
184
192
194
308
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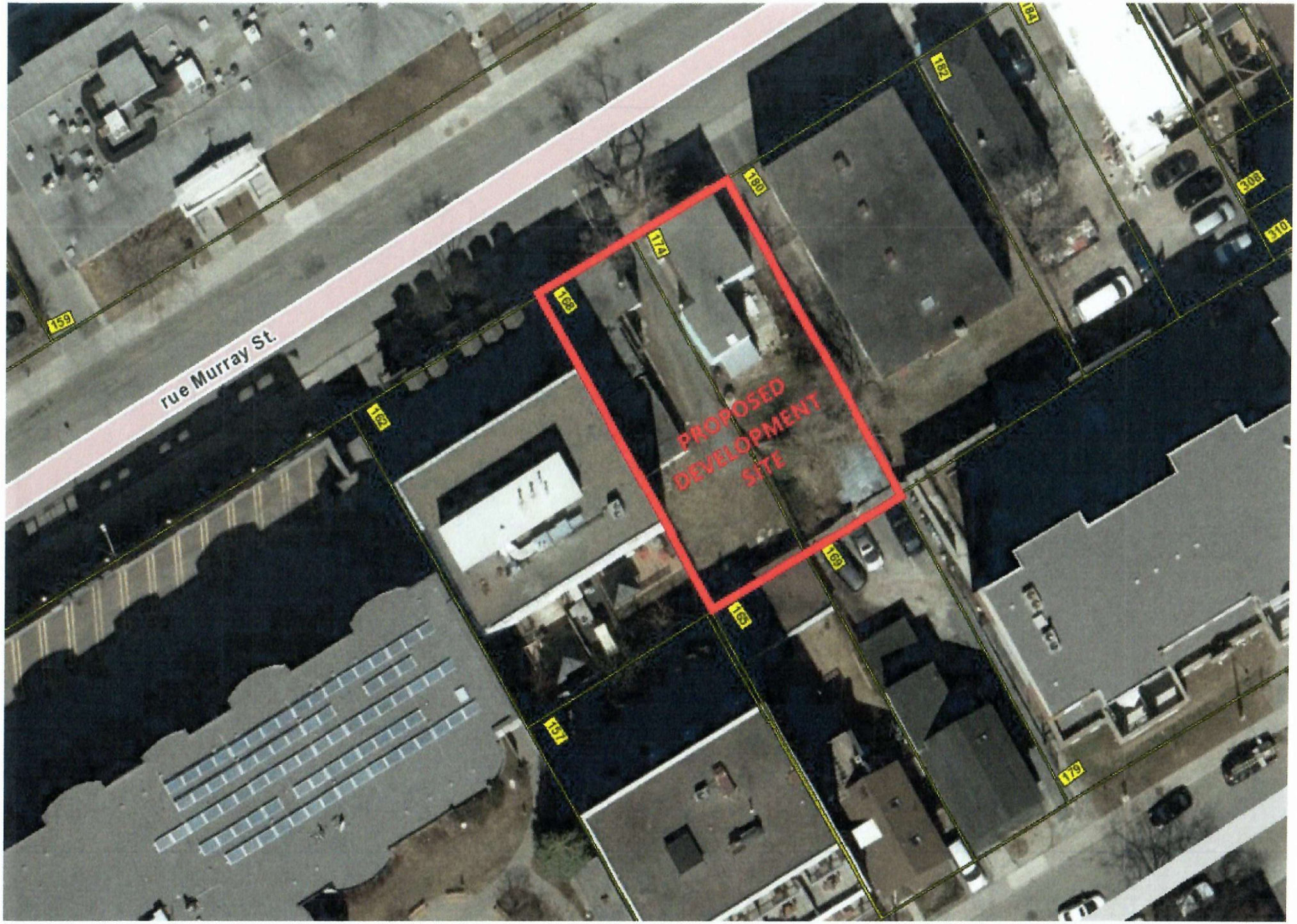
145
157
165
169
174
180
176

2021


rue Murray St.
PROPOSED DEVELOPMENT SITE
159
164
167
174
180
308
310
169
163
157
179

2021

2021

PROPOSED FOUR STOREY

RESIDENTIAL APARTMENT BUILDING SITE

LOT 23 (SOUTH MURRAY STREET)

R-PLAN 42482

168 – 174 MURRAY STREET

CITY OF OTTAWA

APPENDIX C

MURRAY STREET

CITY OF OTTAWA

PLAN AND PROFILE

AND

UCC DRAWINGS

2401-10 10 OF 26

NOTE:

The location of the utilities is approximate only, and the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REGISTERED PROFESSIONAL ENGINEER — R. CHARTRAND — PROVINCE OF ONTARIO

NOVATECH
ENGINEERING CONSULTANTS LTD.
OTTAWA, ONTARIO

NO	REVISION	BY	DATE
1	ISSUED FOR M.O.E. APPROVAL & TRANS. DESIGN CIRCULATION	ERD	15/01/90
2	ISSUED FOR TENDER	ERD	28/02/90
3	'AS BUILT' REV. MH#106 & LOCATION	RJD	27/02/90

AS BUILT

M 372-4

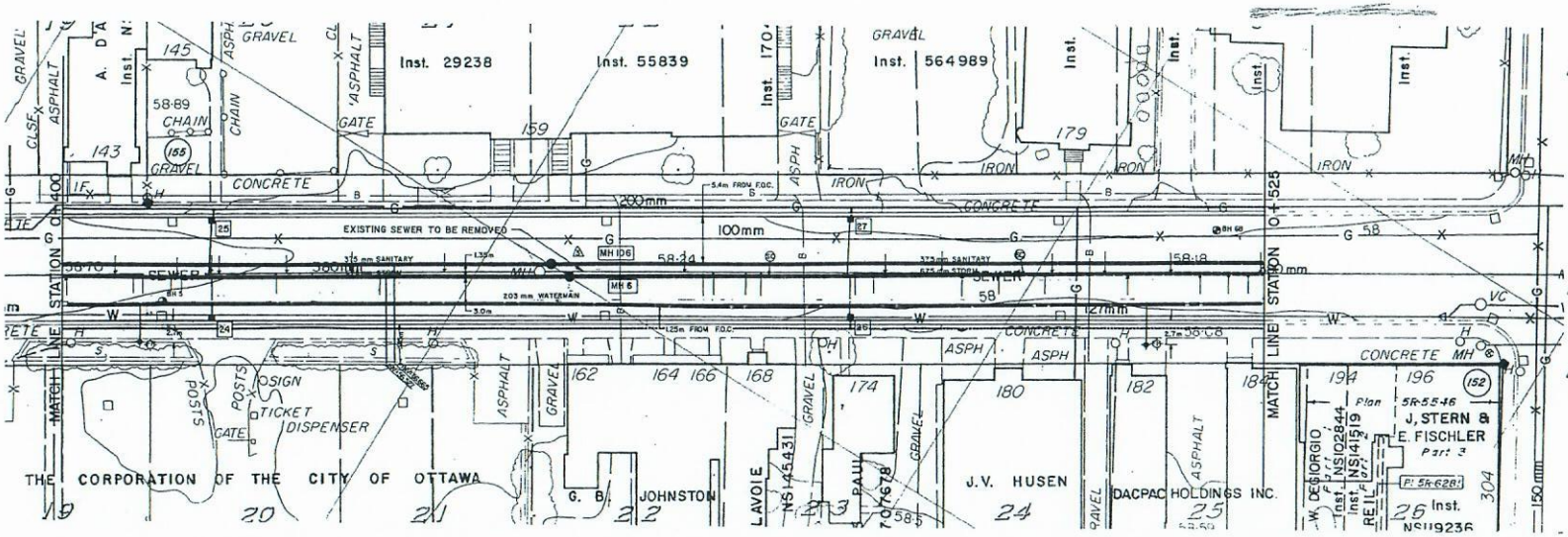
THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON
TRANSPORTATION DEPARTMENT
Design & Construction Division

MURRAY STREET
RECONSTRUCTION
SUSSEX DRIVE TO KING EDWARD AVENUE

GRADING AND DRAINAGE
STA. 0+400 TO STA. 01525

R. CHARTRAND, P. ENG. — Director Roadways & Structures
N. M. SEP, P. ENG. — Chief Roadway Design & Constr. Engineer

DWG. NO. R 1730-R-10
SHEET 10 OF 26
CONTRACT NO. 89-507
DATE: JANUARY 1990
HORIZONTAL 0m 2.5 5 10
VERTICAL 0m 1 2



STORM MANHOLE & CATCH BASIN DATA

NO.	STATION	OFFSET	TYPE	ELEVATION TOP SHAFT	ELEVATION LOW INVT.
6	0+413	1.25 RT.	OPSD-701.010	58.240	50.886
24	0+415	5.5 RT.	"	58.070	57.175
26	0+416	5.5 LT.	"	58.470	57.175
28	0+488	5.5 RT.	"	57.80	56.53
27	0+488	6.5 LT.	"	57.93	56.66

* CATCH BASIN TYPE - OPSD 705.01 TYPE 'A' WITH INSERT AS SPECIFIED. LEAD CONNECTIONS AS PER "RMOC" 2.5.5

OFFSETS ARE FROM BASELINE TO FACE OF CURB FOR CATCH BASINS AND TO CENTRE OF STRUCTURE FOR MANHOLES.

STORM SEWER DATA

SEWER	DIA.	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
MH 6 - MH 7	675	CL IV	86.2	56.65	54.360

DOWNSTREAM ELEVATIONS FOR CONNECTIONS TO THE TRUNK SEWER ARE SPRINGLINE OF PIPE.

SANITARY MANHOLE DATA

NO.	STATION	OFFSET	TYPE	ELEVATION TOP SHAFT	ELEVATION LOW INVERT
106	0+431	0.20 LT.	OPSD-701.01	58.590	55.115

OFFSETS ARE FROM BASELINE TO CENTRE OF STRUCTURE FOR MANHOLES.

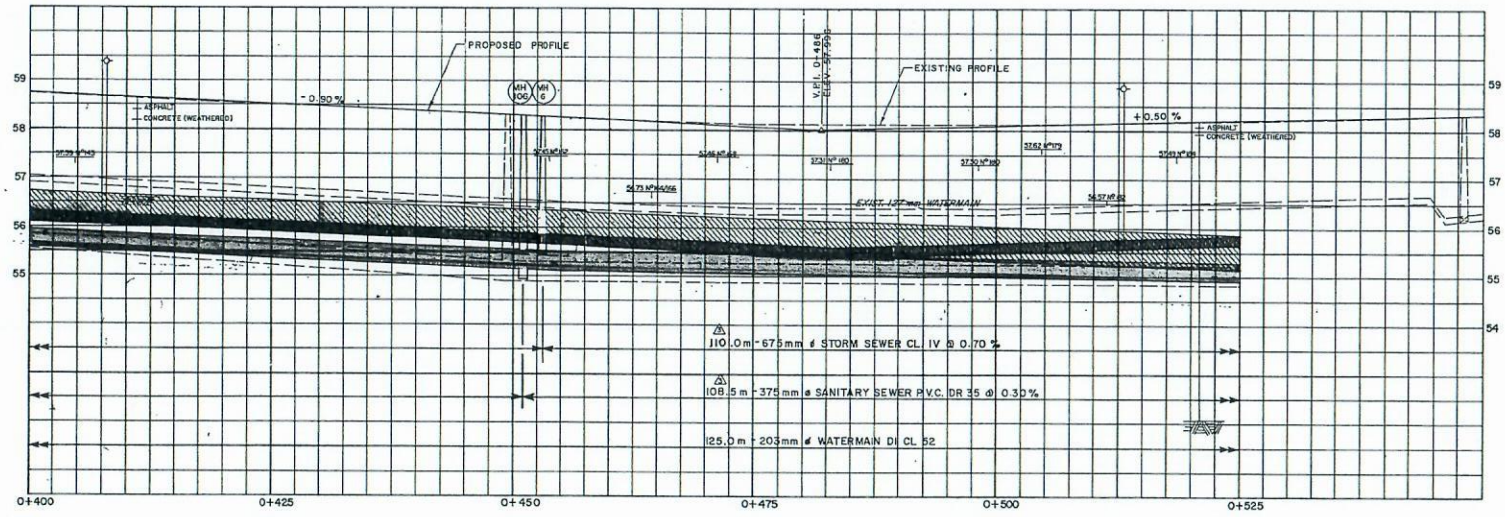
SANITARY SEWER DATA

SEWER	DIA.	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
MH 106 - MH 107	375	PVC DR35	108.5	55.115	54.800

DOWNSTREAM ELEVATIONS FOR CONNECTIONS TO THE TRUNK SEWER ARE SPRINGLINE OF PIPE.

NOTES AND SPECIFICATIONS

1. Existing combined sewer is to be removed and replaced by separate sewers as indicated, without service interruption.
2. Existing watermain to be abandoned during construction: A temporary overland distribution system will be implemented and maintained by the Regional Municipality of Ottawa-Carleton Works Branch.
3. The abandoned watermain shall be removed during excavation operation and disposed of off-site. The trench shall be backfilled with acceptable native material or imported material, as directed by the Engineer.
4. All hydrants and valves to be removed shall be salvaged and delivered to Regional Municipality of Ottawa-Carleton maintenance yard.
5. Where available, existing servicing information from site plans has been shown.



STORM SEWER
SANITARY SEWER
WATERMAIN
61.72 N°30 — BASEMENT FLOOR ELEVATION AND CORRESPONDING CIVIC ADDRESS
SERVICE CONNECTION AS IDENTIFIED IN VIDEO INSPECTION
SERVICE CONNECTION TO OBVERT OF PIPE AS IDENTIFIED IN VIDEO INSPECTION OF SEWER

STATION	0+400	0+425	0+450	0+475	0+500	0+525
℄ PROFILE	58.775	58.703 HYDRANT	58.550	58.325	58.100	58.066	57.841 HYDRANT	57.616
TOP OF WATERMAIN	58.37	56.30 HYDRANT	56.15	55.925	55.700	55.66	55.79 HYDRANT	55.79

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

TYPE-A1 DWG. FRAME: 790mm X 574 mm

#2401

M 372-4

NOTE:
The location of the utilities is approximate only, and the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

NOVATECH
ENGINEERING CONSULTANTS LTD.
OTTAWA, ONTARIO

NO	REVISION	BY	DATE
1	ISSUED FOR MOE APPROVAL & TRANS. DESIGN CIRCULATION	ERD	01/16/90
2	ISSUED FOR TENDER	ERD	28/02/90
3	STORM SEWER REVISIONS	ERD	21/05/91
4	'AS BUILT' REV MH7A,7B LOCATION	RJD	28/02/92

THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON
TRANSPORTATION DEPARTMENT
Design & Construction Division

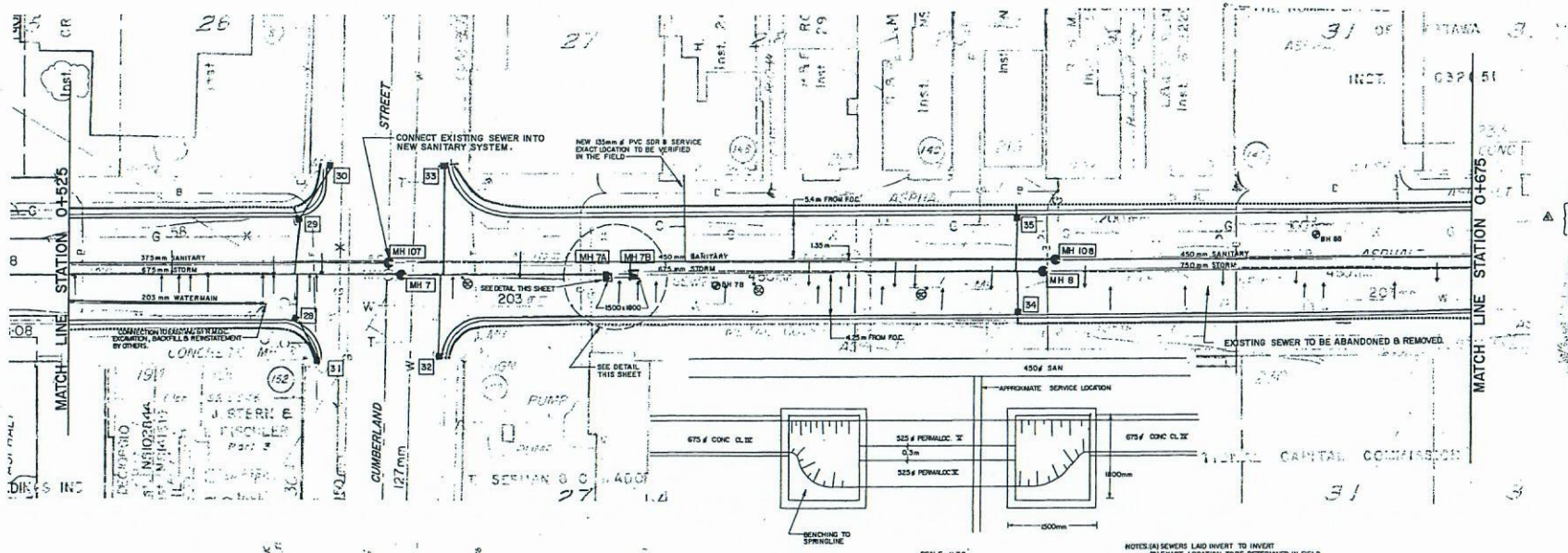
DWG. NO. R 1730-R-11
SHEET 11 OF 26
CONTRACT NO. 89-507
DATE: JANUARY 1990

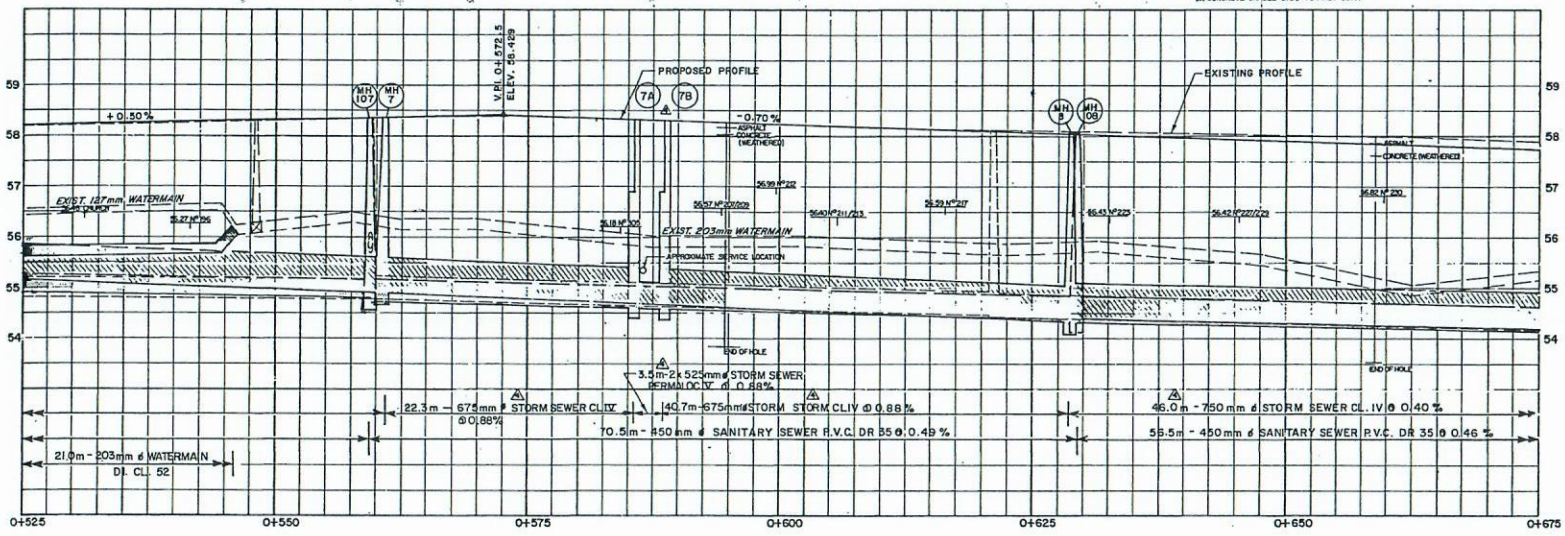
MURRAY STREET
RECONSTRUCTION
SUSSEX DRIVE TO KING EDWARD AVENUE

GRADING AND DRAINAGE
STA. 0+525 TO STA. 0+675

HORIZONTAL 0m 2.5 5 10
VERTICAL 0m 2

R. CHARTRAND, P. ENG. — Director Roadways & Structures
M.M. SEP, P. ENG. — Chief Roadway Design & Constr. Engineer





STATION	0+525	0+544.5	0+548	0+550	0+575	0+600	0+625	0+650	0+675
℄ PROFILE	58.191	58.289			58.412	58.637	58.062	57.887	57.712
TOP OF WATERMAIN	55.73	55.99	EX 406ø CAST IRON	CONNECTION TO EXISTING MAIN	56.01	55.84	55.66	55.49	55.31

STORM MANHOLE & CATCHBASIN DATA

No.	STATION	OFFSET	TYPE	ELEVATION TOP GRATE	ELEVATION LOW INV.
7A	0+562	1.85 RT	OPSD-701.02 (600×600)	0.041	54.751
7B	0+566	1.85 RT	OPSD-701.02 (600×600)	57.618	54.696
7	0+548	1.23 RT.	OPSD-100.02	58.302	54.996
8	0+632	1.23 RT.	OPSD-100.02	58.182	54.345
38	0+520	8.0 RT.	*	58.151	54.861
39	0+558	8.5 LT.	*	58.152	54.861
30	0+553	11.0 LT.	*	to be established in field	
31	0+583	8.0 RT.	*	to be established in field	
32	0+598	8.0 RT.	*	to be established in field	
33	0+596	11.0 LT.	*	to be established in field	
34	0+697	8.0 RT.	*	57.888	54.866
35	0+697	3.5 LT.	*	57.803	54.540

* CATCH BASIN TYPE - OPSD 705.02 TYPE 'A' WITH INSERT AS SPECIFIED. LEAD CONNECTIONS AS PER SSCC 2-13.2.

OFFSETS ARE FROM BASELINE TO FACE OF CURB FOR CATCH BASINS AND TO CENTRE OF STRUCTURE FOR MANHOLES.

STORM SEWER DATA

SEWER	DIA	TYPE	LENGTH	ELEVATION UP STR	ELEVATION DOWN STR
MH 7 - 7A	675	CL. IV	8	54.909	54.756
MH 7A - 7B	2x525	PERMALOC 'X'	2.5	54.87	54.64
MH 7B - 8	675	CL. IV	43	54.63	54.348
MH 8 - 8A	750	CL. IV	48.5	54.346	54.06

DOWNSTREAM ELEVATIONS FOR CONNECTION TO THE TRUNK SEWER ARE SPRINGLINE OF PIPE.

SANITARY MANHOLE DATA

NO.	STATION	OFFSET	TYPE	ELEVATION TOP GRATE	ELEVATION LOW INVERT
107	0+558.5	8.10 LT.	OPSD-1001.01	58.348	54.738
108	0+693	8.10 LT.	OPSD-1001.01	58.810	54.388

OFFSETS ARE FROM BASELINE TO CENTRE OF STRUCTURE FOR MANHOLES.

SANITARY SEWER DATA

SEWER	DIA	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
MH 107 - MH 108	450	PVC DR35	78.5	54.738	54.360
MH 108 - MH 109	450	PVC DR35	85.5	54.308	54.118

DOWNSTREAM ELEVATIONS FOR CONNECTIONS TO THE TRUNK SEWER ARE SPRINGLINE OF PIPE.

NOTES AND SPECIFICATIONS

1. Existing combined sewer is to be removed and replaced by separate sewers as indicated, without service interruption.
2. Existing watermain to be abandoned during construction: A temporary overland distribution system will be implemented and maintained by the Regional Municipality of Ottawa-Carleton Works Branch.
3. The abandoned watermain shall be removed during excavation operation and disposed of off-site. The trench shall be backfilled with acceptable native material or imported material, as directed by the Engineer.
4. All hydrants and valves to be removed shall be salvaged and delivered to Regional Municipality of Ottawa-Carleton maintenance yard.
5. Where available, existing servicing information from site plans has been shown.

STORM SEWER
SANITARY SEWER
WATERMAIN
61.72 N°30 — BASEMENT FLOOR ELEVATION AND CORRESPONDING CIVIC ADDRESS
SERVICE CONNECTION AS IDENTIFIED IN VIDEO INSPECTION
SERVICE CONNECTION TO OBVERT OF PIPE AS IDENTIFIED IN VIDEO INSPECTION OF SEWER

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

TYPE-A1 DWG. FRAME: 790mm X 574 mm

2401-11 11 of 26

NOTE

The location of the utilities is approximate only, and the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

NOVATECH
ENGINEERING CONSULTANTS LTD.
OTTAWA, ONTARIO

NO	REVISION	BY	DATE
1	ISSUED FOR MOE APPROVAL & TRANS. DESIGN CIRCULATION	ERD	01/16/90
2	ISSUED FOR TENDER	ERD	28/02/90
3	STORM SEWER REVISIONS	ERD	21/05/91
4	AS BUILT' REV MH#7A & 7B LOCATION	RJD	28/02/92

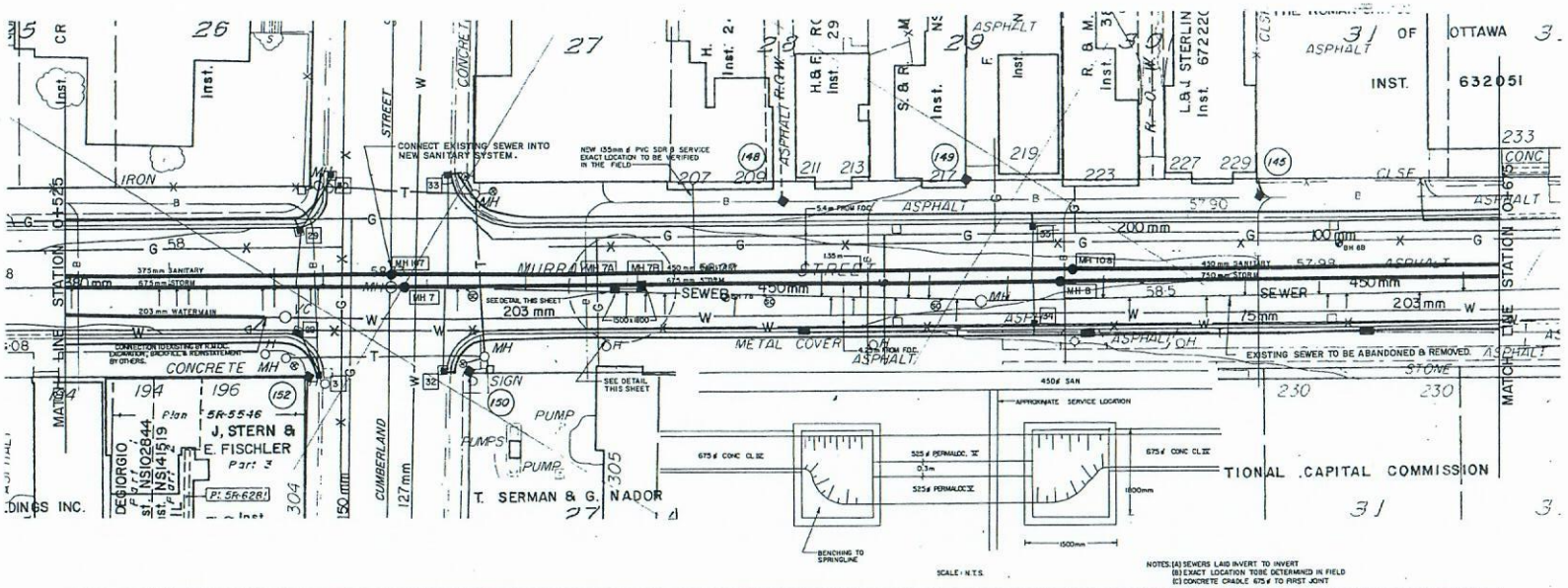
THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON
TRANSPORTATION DEPARTMENT
Design & Construction Division

MURRAY STREET
RECONSTRUCTION
SUSSEX DRIVE TO KING EDWARD AVENUE

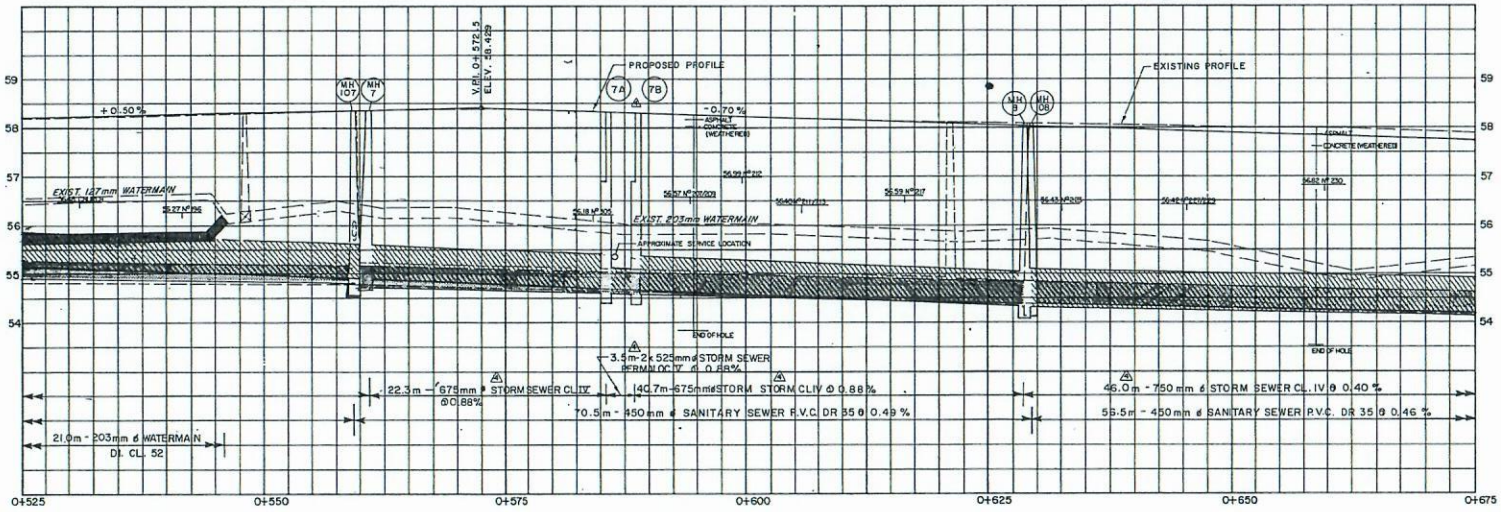
GRADING AND DRAINAGE
STA. 0+525 TO STA. 0+675

R. CHARTRAND, P. ENG. — Director Roadways & Structures
M.M. SEP, P. ENG. — Chief Roadway Design & Constr. Engineer

M 372-4
DWG. NO. R 1730-R-11
SHEET 11 OF 26
CONTRACT NO. 89-507
DATE: JANUARY 1990
HORIZONTAL 0m 2.5 5 10
VERTICAL 0m



NOTES: (A) SEWERS LAID INVERT TO INVERT
(B) EXACT LOCATION TO BE DETERMINED IN FIELD
(C) CONCRETE CRADLE 675ø TO FIRST JOINT



STATION	0+525	0+545	0+546	0+550	0+575	0+600	0+625	0+650	0+675
℄ PROFILE	58.191	58.289	45° BEND	58.316	58.412	58.537	58.662	57.887	57.712
TOP OF WATERMAIN	55.79	55.89	45° BEND - CONNECTION TO EXISTING MAIN	55.92	56.01	55.84	55.66	55.49	55.31

STORM MANHOLE & CATCHBASIN DATA

No.	STATION	OFFSET	TYPE	ELEVATION TOP MH/TC	ELEVATION LOW INV.
7A	0+562	1.25 RT	OPSD-705.02 (600-900)	5.241	54.731
7B	0+586	1.25 RT	OPSD-705.02 (600-900)	57.213	54.696
7	0+602	1.25 RT.	OPSD-1001.05	56.350	54.895
8	0+635	1.25 RT.	OPSD-1001.05	55.100	54.315
35	0+900	3.0 RT.	"	58.181	58.061
36	0+945	5.5 LT.	"	58.130	58.061
39	0+753	11.0 LT.	"	to be established in field	
31	0+553	9.0 RT.	"	to be established in field	
32	0+584	8.0 RT.	"	to be established in field	
33	0+588	11.0 LT.	"	to be established in field	
34	0+827	8.0 RT.	"	57.888	56.540
35	0+827	5.0 LT.	"	57.883	56.540

* CATCH BASIN TYPE - OPSD 705.03 TYPE 'A' WITH INSERT AS SPECIFIED. LEAD CONNECTIONS AS PER SKETCH 2-3.3

OFFSETS ARE FROM BASELINE TO FACE OF CURB FOR CATCH BASINS AND TO CENTRE OF STRUCTURE FOR MANHOLES.

STORM SEWER DATA

SEWER	DIA	TYPE	LENGTH	ELEVATION UP STR	ELEVATION DOWN STR
MH 7 - 7A	675	CL IV	25	54.923	54.881
MH 7A - 7B	0-525 PERMALOC	CL IV	3.5	54.57	54.51
MH 7B - 8	675	CL IV	+5	54.63	54.398
MH 8 - 8A	750	CL IV	46.0	54.35	54.03

DOWNSTREAM ELEVATIONS FOR CONNECTION TO THE TRUNK SEWER ARE DEPENDENT ON PIPE.

SANITARY MANHOLE DATA

NO.	STATION	OFFSET	TYPE	ELEVATION - TOP CASTE.	ELEVATION - LOW INVERT
107	0+550	0.45 LT.	OPSD-1001.01	58.248	54.725
108	0+602.5	0.45 LT.	OPSD-1001.01	58.012	54.380

OFFSETS ARE FROM BASELINE TO CENTRE OF STRUCTURE FOR MANHOLES

SANITARY SEWER DATA

SEWER	DIA	TYPE	LENGTH	INVERT ELEVATION - UP STR.	INVERT ELEVATION - DOWN STR.
MH 107 - MH 108	450	CONCRETE	53.5	54.725	54.380
MH 108 - MH 109	200	PVC	55.5	54.380	54.118

DOWNSTREAM ELEVATIONS FOR CONNECTIONS TO THE TRUNK SEWER ARE DEPENDENT ON PIPE.

NOTES AND SPECIFICATIONS

1. Existing combined sewer is to be removed and replaced by separate sewers as indicated, without service interruption.
2. Existing watermain to be abandoned during construction: A temporary overland distribution system will be implemented and maintained by the Regional Municipality of Ottawa-Carleton Works Branch.
3. The abandoned watermain shall be removed during excavation operation and disposed of off-site. The trench shall be backfilled with acceptable native material or imported material, as directed by the Engineer.
4. All hydrants and valves to be removed shall be salvaged and delivered to Regional Municipality of Ottawa-Carleton Maintenance yard.
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STORM SEWER
SANITARY SEWER
WATERMAIN
61.72 N°30 — BASEMENT FLOOR ELEVATION AND CORRESPONDING CIVIC ADDRESS
SERVICE CONNECTION AS IDENTIFIED IN VIDEO INSPECTION
SERVICE CONNECTION TO OBVERT OF PIPE AS IDENTIFIED IN VIDEO INSPECTION OF SEWER

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

TYPE-A1 DWG. FRAME 790mm X 574mm

#2401

M 372-4

NOTE:

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ENGINEERING CONSULTANTS LTD.
OTTAWA, ONTARIO

NO	REVISION	BY	DATE
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2	ISSUED FOR TENDER	ERD	28/02/90
⚠	'AS BUILT' REV. MH106&6 LOCATION	RJD	27/02/92

THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON
TRANSPORTATION DEPARTMENT
Design & Construction Division

MURRAY STREET
RECONSTRUCTION
SUSSEX DRIVE TO KING EDWARD AVENUE

GRADING AND DRAINAGE
STA. 0+400 TO STA. 0+525

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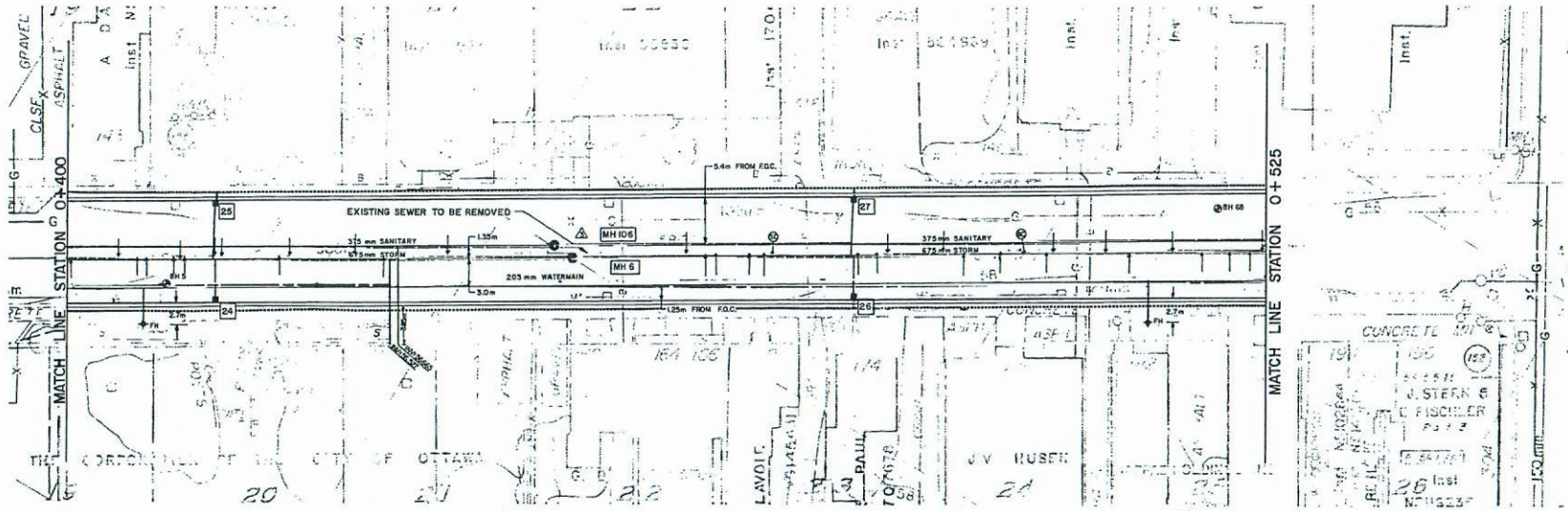
M. M. SEP, P. ENG. — Chief Roadway Design & Constr. Engineer

DWG. NO. R 1730-R-10
SHEET 10 OF 26
CONTRACT NO. 89-507
DATE: JANUARY 1990
HORIZONTAL 0m 2.5 5 10
VERTICAL 0m 1 2



STORM MANHOLE & CATCHBASIN DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION	
				TOP GRATE	LOW INVT.
5	0+463	1.85 RT.	OPSD-400.02	59.340	55.855
24	0+413	5.3 RT.	*	58.405	57.175
26	0+413	5.3 LT.	*	58.475	57.175
25	0+488	5.3 RT.	*	57.30	56.53
27	0+488	5.3 LT.	*	57.20	56.53

* CATCH BASIN TYPE - OPSD 705.02 TYPE 'A' WITH INSERT AS SPECIFIED. LEAD CONNECTIONS AS PER SSCC 2-5.5

OFFSETS ARE FROM BASELINE TO FACE OF CURB FOR CATCH BASINS AND TO CENTRE OF STRUCTURE FOR MANHOLES.

STORM SEWER DATA					
SEWER	DIA	TYPE	LENGTH	INVERT ELEVATION	
				UP STR.	DOWN STR.
MH 6 - MH 7	675	CLV	102.0	54.855	54.355

DOWNSTREAM ELEVATIONS FOR CONNECTIONS TO THE TRUNK SEWER ARE SPRINGLINE OF PIPE.

SANITARY MANHOLE DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION	
				TOP GRATE	LOW INVERT
105	0+481	0.30 LT.	OPSD-1001.01	58.200	55.115

OFFSETS ARE FROM BASELINE TO CENTRE OF STRUCTURE FOR MANHOLES.

SANITARY SEWER DATA					
SEWER	DIA	TYPE	LENGTH	INVERT ELEVATION	
				UP STR.	DOWN STR.
MH 105 - MH 107	375	PVC DR35	169.0	55.115	54.600

DOWNSTREAM ELEVATIONS FOR CONNECTIONS TO THE TRUNK SEWER ARE SPRINGLINE OF PIPE.

NOTES AND SPECIFICATIONS

1. Existing combined sewer is to be removed and replaced by separate sewers as indicated, without service interruption.
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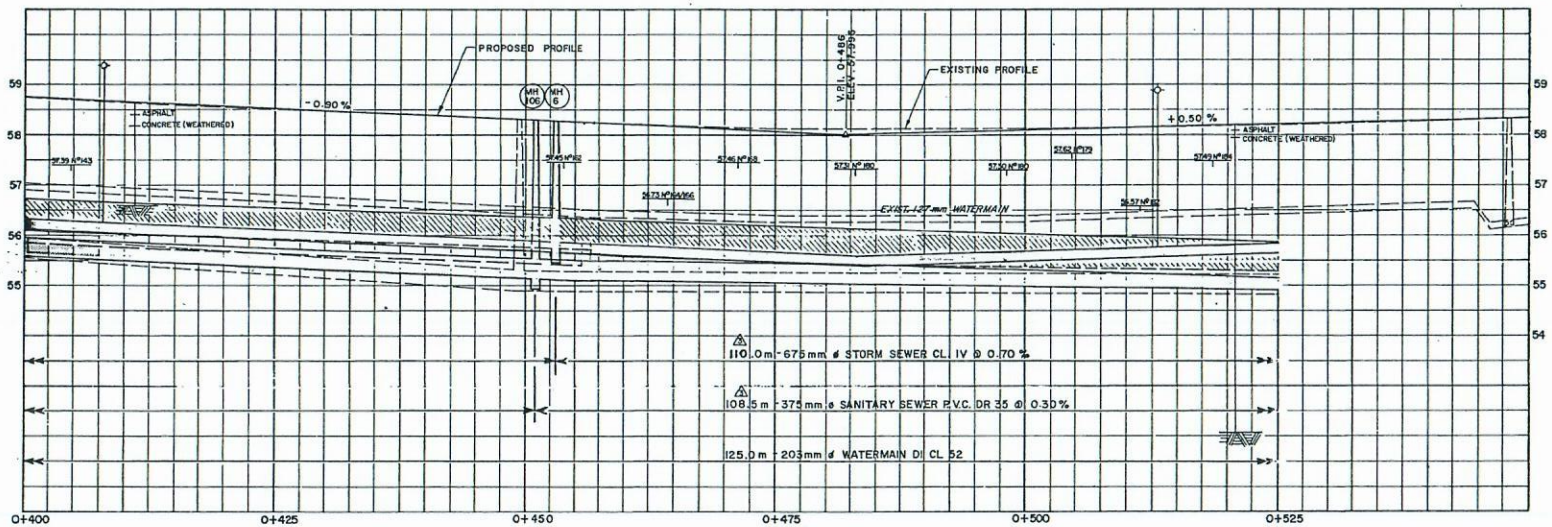
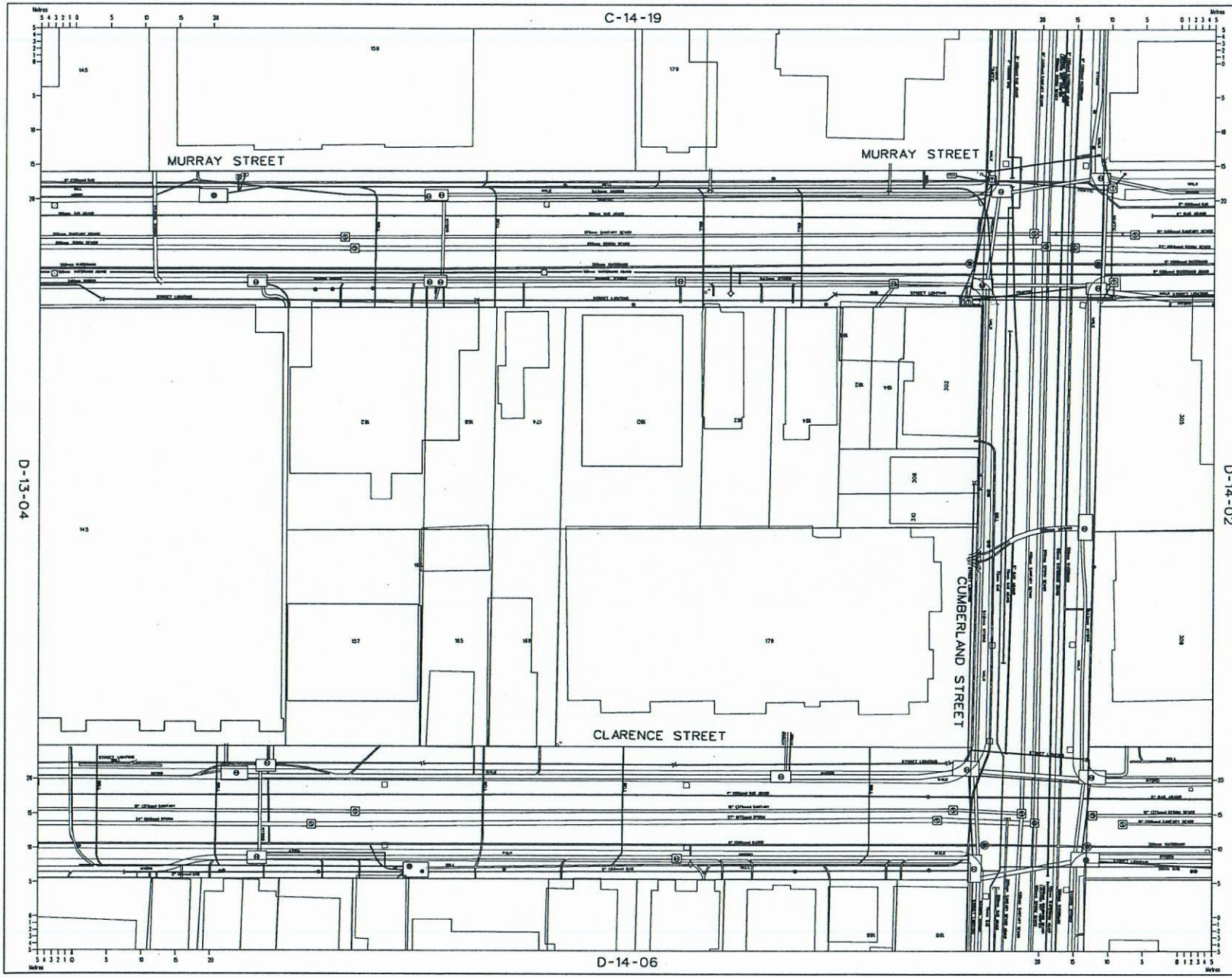


STORM SEWER
SANITARY SEWER
WATERMAIN
61.72 N°30 — BASEMENT FLOOR ELEVATION AND CORRESPONDING CIVIC ADDRESS
SERVICE CONNECTION AS IDENTIFIED IN VIDEO INSPECTION
SERVICE CONNECTION TO OBVERT OF PIPE AS IDENTIFIED IN VIDEO INSPECTION OF SEWER

STATION	0+400		0+425		0+450		0+475		0+500		0+525	
℄ PROFILE	58.775	58.703 HYDRANT	0+409	58.550	0+425	58.325	0+450	58.100	0+475	58.096	0+500	58.191 HYDRANT	0+525
TOP OF WATERMAIN	56.37	56.30		56.15		55.925		55.700		55.66		55.79	

EARTH EXCAVATION	
ROCK EXCAVATION	
EARTH FILL	

TYPE-A1 DWG. FRAME: 790mm X 574mm



REVISIONS / RÉVISIONS	DATE	BY
REDRAWN FROM VOICES UTILITY PLANS D-13-04/05 & D-14-01/05	APR 2009	DC
TELECOM OTTAWA RELOCATE 144F FIBRE TRENCH INSTALLED YORK ST.	JUNE 2009	MH
ADM. STREETS WEST 2009 CONDUIT ADDED TO CLARENCE ST.	JULY 2010	DC
HYDRO/BELL/ENBRIDGE/ROGERS, MTY SEWER, WATER, TRAFFIC, IS COMPILED/DIGITIZED FROM UTILITY/CITY DATA	JAN 2015	KJ

LEGEND

- Water Valve, Valve Chamber, Fire Hydrant
- Sewer Manhole, Catch Basin Manhole
- Catch Basin / Drainage, Wing Wall, Head Wall
- Pole, Pole w/ light, Decorative, Lawn Light
- Power Supply, Panel, Pedestal, Transformer, Tower, Regulator
- Amp, Hand Hole, Vault, Gas Valve
- OC Transpo: Bus Shelter-No Power, Energized, Isolated
- Streetscape: Planter Box, Grate Square, Eng. Soil
- Traffic Control Box / Disconnect Box, IS, Disconnect
- Red Light Hand Hole, Red Light Camera
- Scada: Hand Hole, Monitoring Panel
- Reducer
- Pipe, Duct, Conduit, Lateral
- Culvert
- Ditch
- Abandoned
- Capped
- Buried Cable
- Property Line
- Install Year (2010)

TELECOM GLOSSARY

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

GLOSSARY - OTHER

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

CAUTION/ATTENTION

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

Bien que l'emplacement des services publics soient établis en utilisant le meilleure information disponible, ils ne peuvent pas être garantis.
Des lignes de propriété ont été compilées en utilisant des plans et des documents enregistrés dans le système de cadastre et sont pour l'inscription seulement.

Ottawa

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

OTTAWA UTILITY COORDINATING COMMITTEE
CENTRAL REGISTRY

COMITÉ DE COORDINATION DES SERVICES PUBLICS D'OTTAWA
ENREGISTREMENT CENTRAL

UCC Ottawa CCSP

PRODUCED BY: GIS & DATA MANAGEMENT BRANCH
INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
D-14-01

PROPOSED FOUR STOREY

RESIDENTIAL APARTMENT BUILDING SITE

LOT 23 (SOUTH MURRAY STREET)

R-PLAN 42482

168 – 174 MURRAY STREET

CITY OF OTTAWA

APPENDIX D

CITY OF OTTAWA

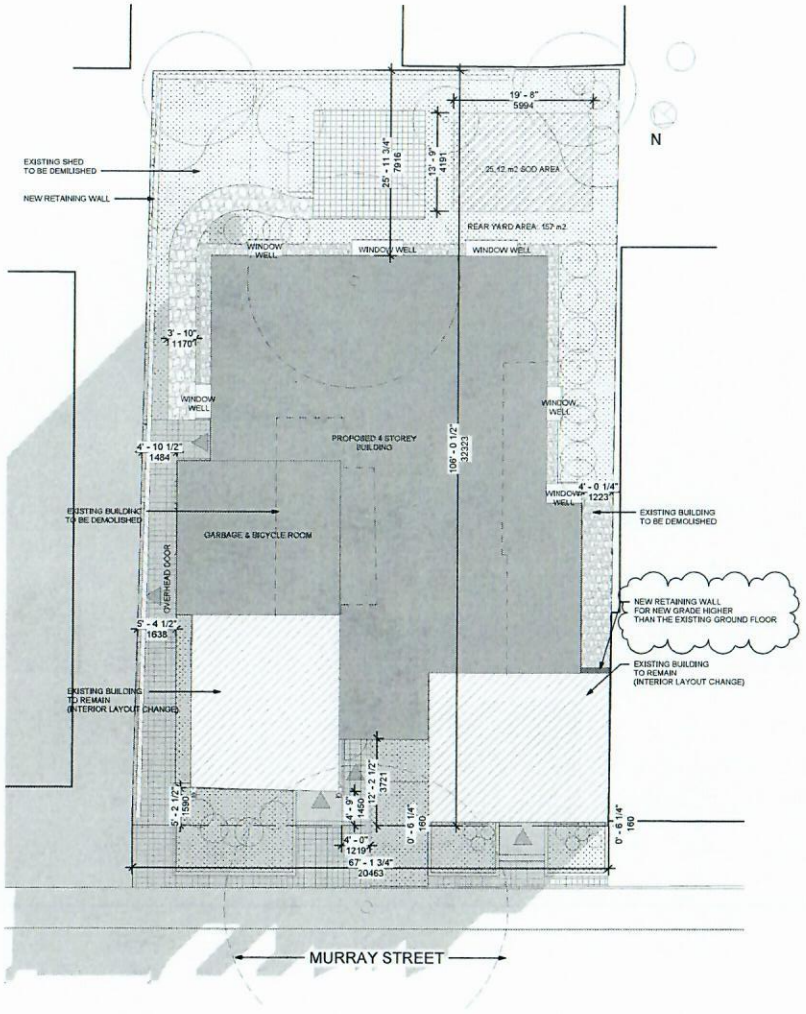
- ELEVATION CONTOURS (FIGURE 1)
- SITE PLAN AND ARCHITECTURAL DRAWINGS
- FUS FIRE FLOW CALCULATION
- FUS EXPOSURE DISTANCES (FIGURE 2)
- WATER BOUNDARY CONDITIONS
- SUPPORTING HYDRAULIC CALCULATIONS
- HYDRANT SPACING (FIGURE 3)

ATTACHMENT 1: FIGURE 1 – ELEVATION CONTOURS

Figure 1: Elevation Contours

Source: geoOttawa 2023; *Contains information licensed under the Open Government License – City of Ottawa.*

ATTACHMENT 2: SITE PLAN AND ARCHITECTURAL DRAWINGS



1 SITE PLAN
SCALE: 1/100

168-174 MURRAY ST.

SITE PLAN OF SURVEY LOT 23 REGISTERED PLAN 42482, CITY OF OTTAWA	SURVEY INFO TAKEN FROM LOT 23 REGISTERED PLAN 42482 CITY OF OTTAWA PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. COMPLETED on JANUARY 7th, 2021

R4UD[982] S74- RESIDENTIAL FOURTH DENSITY ZONE (SEC. 161-162) CITY OF OTTAWA.
DWELLING TYPE: 4 STOREY LOW RISE RESIDENTIAL BUILDING

ZONING MECHANISMS	REQUIREMENT	PROVIDED	NOTES
A) MINIMUM LOT AREA	450 m²	654.2 m²	
B) MINIMUM LOT WIDTH	15 m	20.46 m	
C) MINIMUM LOT DEPTH	N/A	32.32 m	
D) MINIMUM FRONT YARD SET BACK (AVERAGE SETBACK OF NEIGHBOURS)	0.2 m+ 1.63 m / 2 = 0.915 m	EXISTING BUILDING & 3.721 m	
E) MINIMUM INTERIOR SIDE YARD SETBACK	1.5 m	1.22 m	MINOR VARIANCE
F) MINIMUM REAR YARD SET BACK	Min. 9.69 m & must be 163.5 m2 in area	7.916 m & 156.77 m2 in area	MINOR VARIANCE
G) MAXIMUM BUILDING HEIGHT	168 Murray: 5.8 metres (to a depth of 9.14 m from front lot line) & 3 metres (rear) 174 Murray: 7.0 metres (to a depth of 9.14 m from front lot line) 10.5 metres (rear)	13.36 m	
H) VEHICULE PARKING (RESIDENTS)	0	0	
VEHICULE PARKING (VISITOR)	20-12 = 8 units x 0.1=0.8 (1)	0	MINOR VARIANCE
VEHICULE PARKING (TOTAL)	0		
K) BIKE SPACES	20x0.5=10	22 (STACKED) INDOOR	
L) AMENITY AREA	6.0 x 20 units = 120m² 50% of 120m² = 60m² requied as communal	157 m² @ BACK	
M) FRONT YARD, SOFTSCAPING PERCENTAGE	40%	28.8%	MINOR VARIANCE
N) REAR YARD, SOFTSCAPING PERCENTAGE	50%	75.7%	

BUILDING AREAS			
BASEMENT BUILDING AREA (NEW) 280 m²	PROPOSED SITE DEVELOPMENT INFO.		GARBAGE REQUIREMENT
GROUND FLOOR BUILDING AREA (NEW) 280 m² BUILDING AREA (EXISTING) 97 m²	PROPOSED STOREYS	4	GARBAGE, RECYCLING AND COMPOSTING ARE TO BE STORED IN THE BASEMENT AND REMOVED PRIVATELY DURING COLLECTION
SECOND FLOOR BUILDING AREA (NEW) 280 m² BUILDING AREA (EXISTING) 97 m²	LOT COVERAGE	57.3%	
THIRD FLOOR BUILDING AREA (NEW) 269 m²	SOFT LANDSCAPING	25.8%	
FOURTH FLOOR BUILDING AREA (NEW) 269 m²	HARD LANDSCAPING	16.6%	SNOW REMOVAL REQUIREMENT
	STAIR & LANDING	0.5%	

	1 BED	2 BED	3 BED	TOTAL
EXISTING BUILDING (RENOVATED)	0	0	2	2
PROPOSED ADDITION	13	5	0	18
TOTAL	13	5	2	20
REQUIRED 2+ BEDROOM		5	5	
PROPOSED 2+ BEDROOM		5	5	

AVERAGE GRADE:

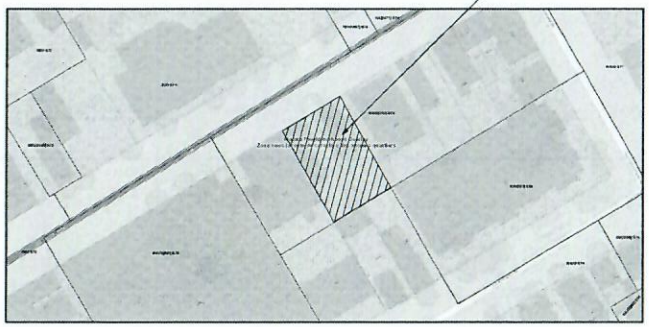
CALCULATED FROM EXISTING ELEVATION POINTS AT A DISTANCE EQUAL TO THE MINIMUM FRONT YARD & REAR YARD SETBACKS, AT THE INTERIOR SIDE PROPERTY LINES

AVERAGE GRADE: 58.48m (58.20m + 58.34m + 58.85m + 58.53m) /4

LEGEND

- NEW TREE
- EX. TREE TO BE REMOVED
- PROPOSED BUILDING
- EXISTING BUILDING TO REMAIN
- PROPOSED / EXISTING ENTRY / EXIT
- PROPERTY LINE
- DENOTES HARD LANDSCAPING
- DENOTES SOFT LANDSCAPING

LOT LOCATION



RA REGLINE ARCHITECTURE

REGLINE ARCHITECTURE INC.

Tel: 613-413-2237
info@reglinearchitecture.ca
www.reglinearchitecture.ca

RESPONSIBILITIES

DO NOT SCALE DRAWINGS

ALL DESIGN AND CONSTRUCTION TO BEAR ASSOCIANCE WITH THE ONTARIO BUILDING CODE 2012

ALL CONTRACTORS MUST WORK IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS, AND BYLAWS IN FORCE

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO THE WORK BEING UNDERTAKEN

THESE DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED BY THE ARCHITECT

COPYRIGHT RESERVED

GENERAL NOTES

ONTARIO ASSOCIATION OF ARCHITECTS LEVENT TATAR LICENCE 8649

168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS

CONSULTANTS
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE
9		
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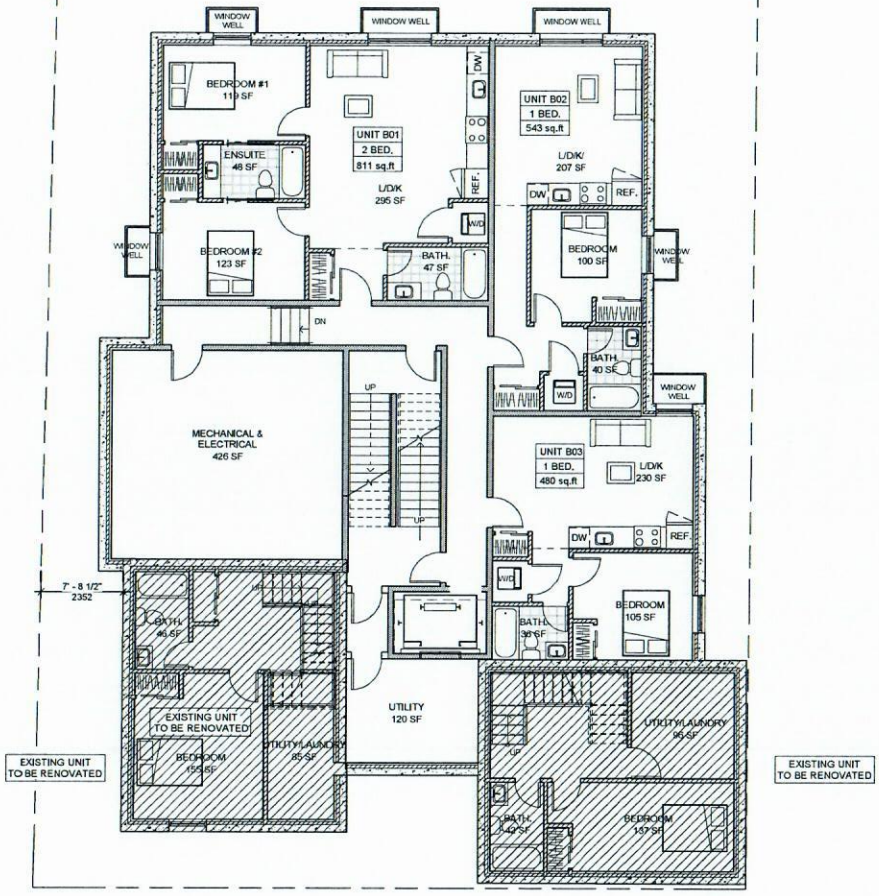
1	ISSUED FOR SPA	07/JULY

PROJECT
168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS
168-174 MURRAY ST.
OTTAWA, ON K1N 5W6

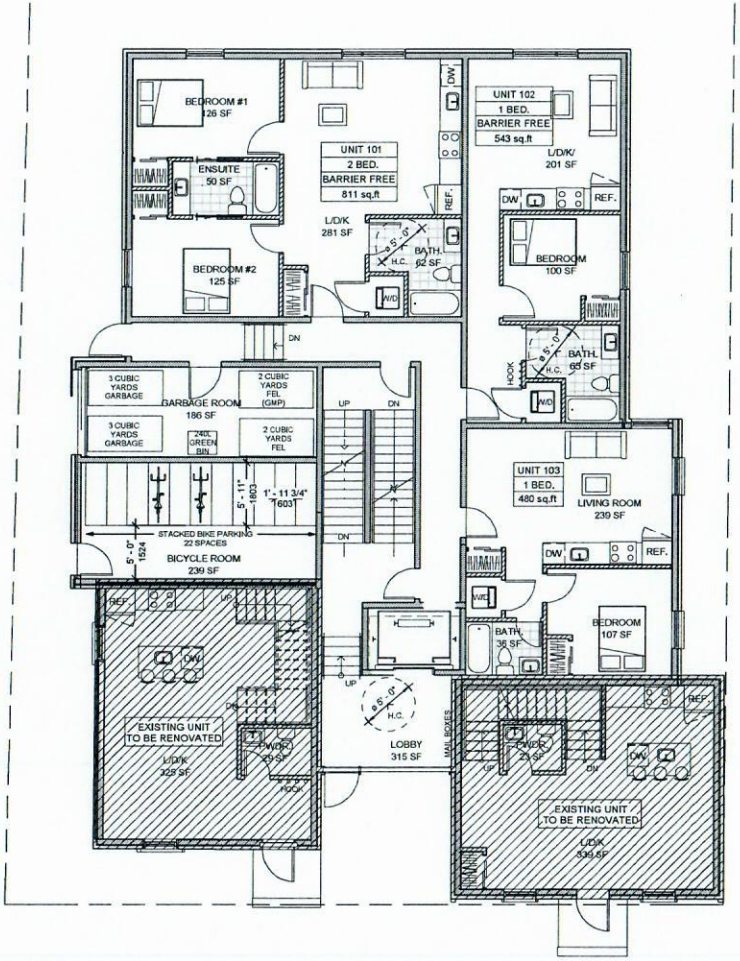
SITE PLAN

DRAWN BY
DATE: MAY 11, 2021
SCALE: AS NOTED
SHEET: A0



2 BASEMENT
3/16" = 1'-0"

EXISTING BUILDING TO REMAIN



1 GROUND FLOOR
3/16" = 1'-0"

168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS

RAI REDLINE ARCHITECTURE INC.

RESPONSIBILITIES
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GENERAL NOTES

ONTARIO ASSOCIATION OF ARCHITECTS
LORENT TATAR
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9047

CONSULTANTS
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

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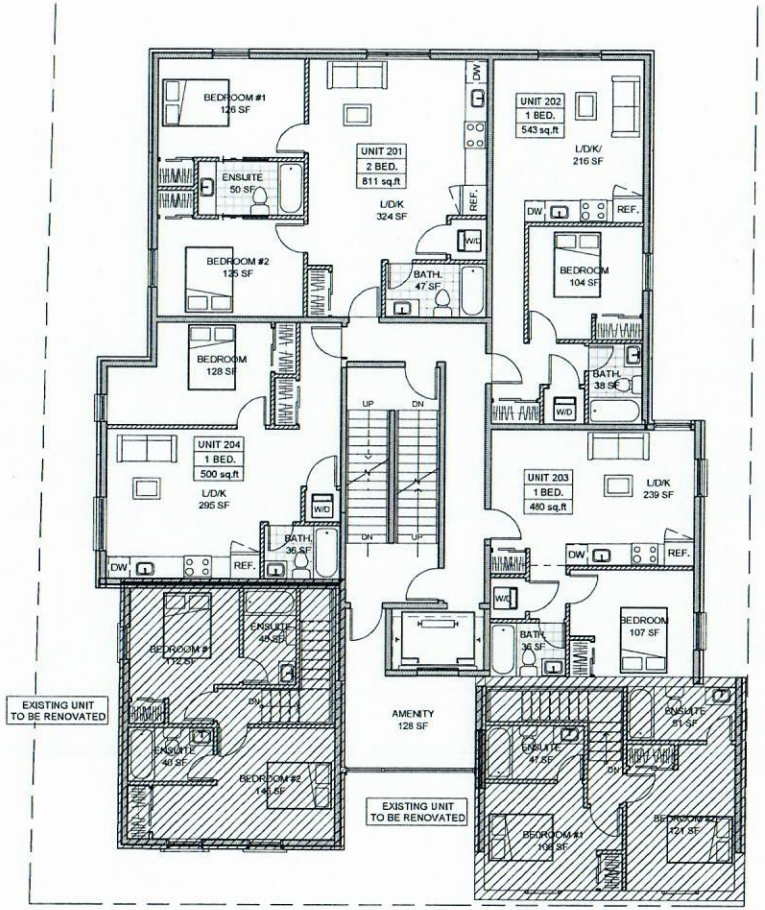
NO.	REVISION/ISSUE	DATE
1	ISSUED FOR SPA	

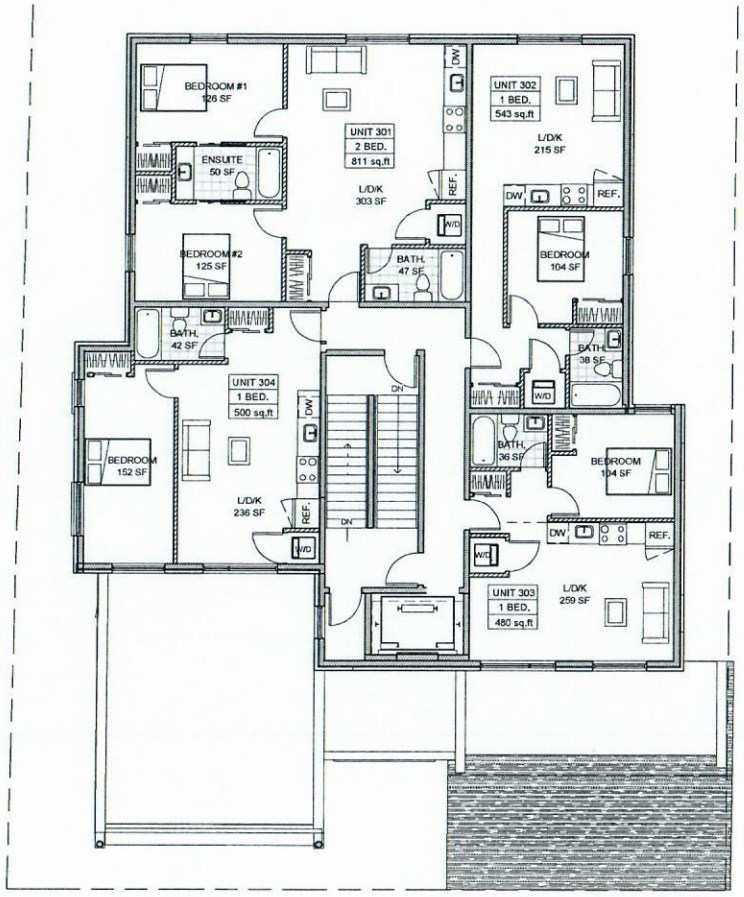
PROJECT
168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS
168-174 MURRAY ST
OTTAWA, ON K1N 6N6

FLOOR PLANS

DRAWN BY
DATE MAY 11, 2021
SCALE AS NOTED
SHEET
A2



2 SECOND FLOOR
3/16" = 1'-0"



EXISTING BUILDING TO REMAIN

1 THIRD & FOURTH FLOORS
3/16" = 1'-0"

RAI routine architecture

ROUTINE ARCHITECTURE INC.
tel 613.413.2232
info@routinearchitecture.ca
www.routinearchitecture.ca

RESPONSIBILITIES
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ALL CONTRACTORS MUST WORK IN ACCORDANCE WITH ALL LAWS, REGULATIONS AND BY-LAWS HAVING JURISDICTION
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ONTARIO ASSOCIATION OF ARCHITECTS
LICENCE HATAM
LICENCE 9048

168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS

CONSULTANTS
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

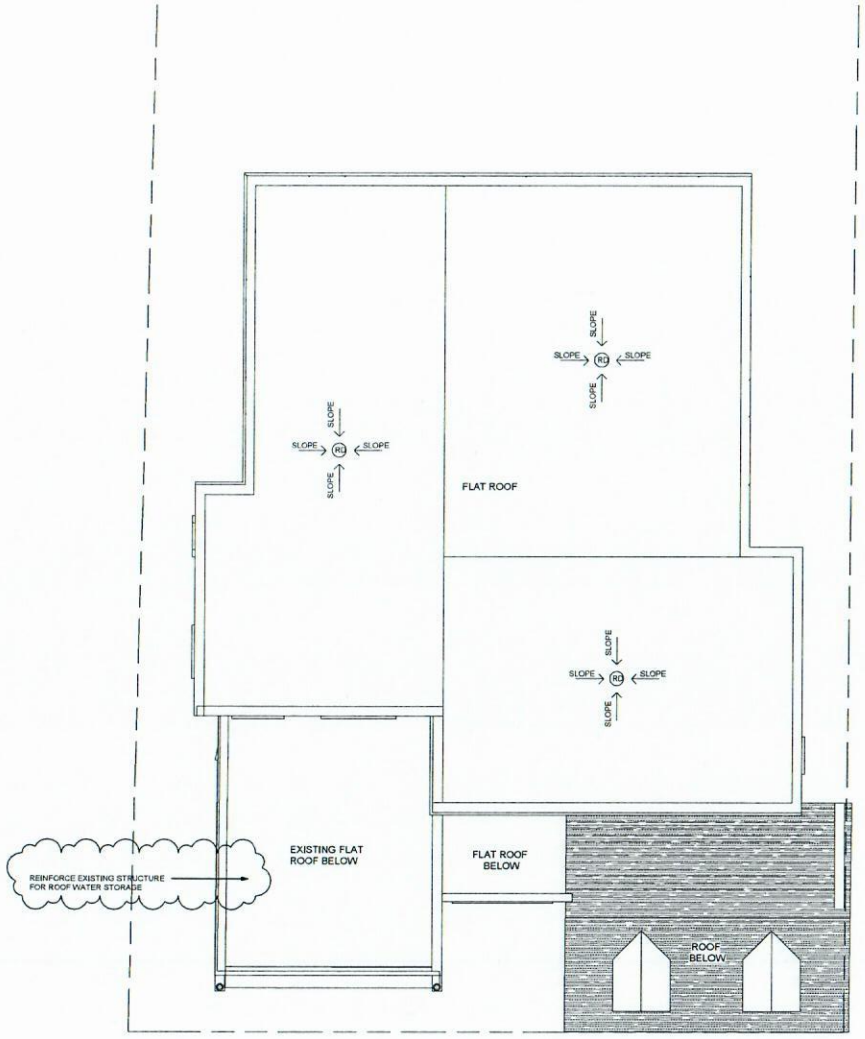
NO.	REVISION ISSUE	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10	ISSUED FOR SPA	DRAFT

PROJECT
168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS
168-174 MURRAY ST.
OTTAWA, ONTARIO

FLOOR PLANS

DRAWN BY
DATE MAY 17, 2021
SCALE AS NOTED

SHEET
A3



1 ROOF
3/16" = 1'-0"

RAI REDLINE ARCHITECTURE

REDLINE ARCHITECTURE INC.

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LICENCE TAXATION
LICENCE
3947

168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS

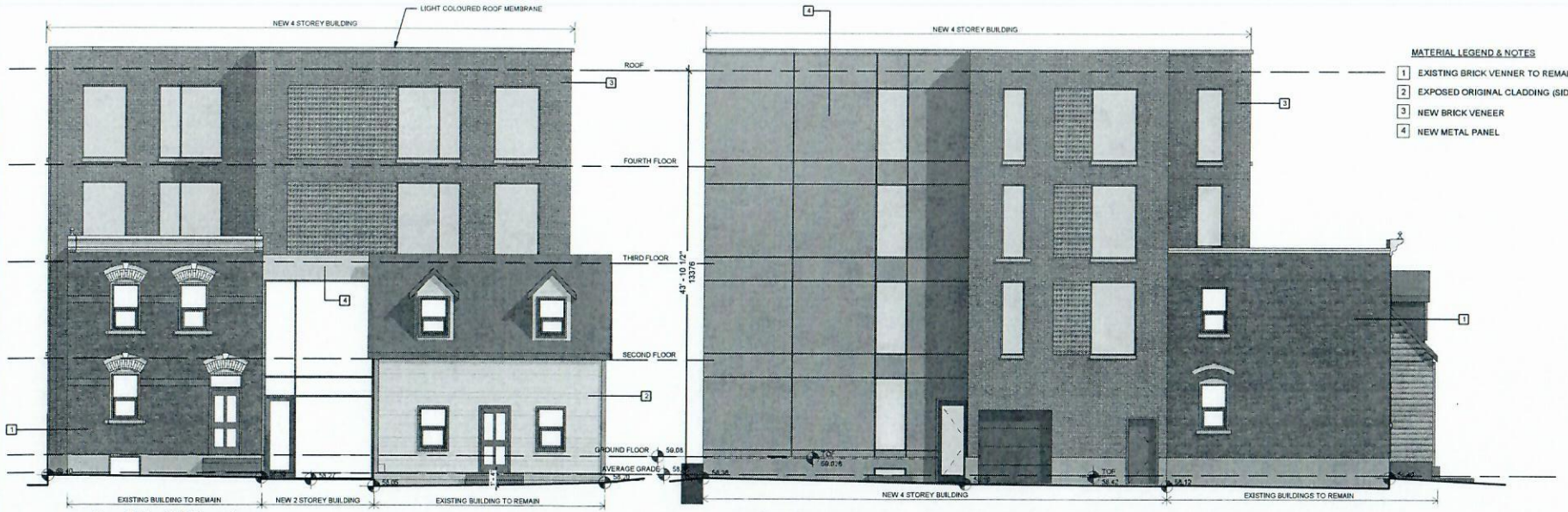
CONSULTANTS
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE
9		
8		
7		
6		
5		
4		
3		
2		
1	ISSUED FOR SPA	2024-12

PROJECT: 168-174 MURRAY ST.
4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS
168-174 MURRAY ST.
OTTAWA, ON K1N 5N8

FLOOR PLANS

DRAWN: | SHEET: A4
DATE: MAY 11, 2021
SCALE: AS NOTED

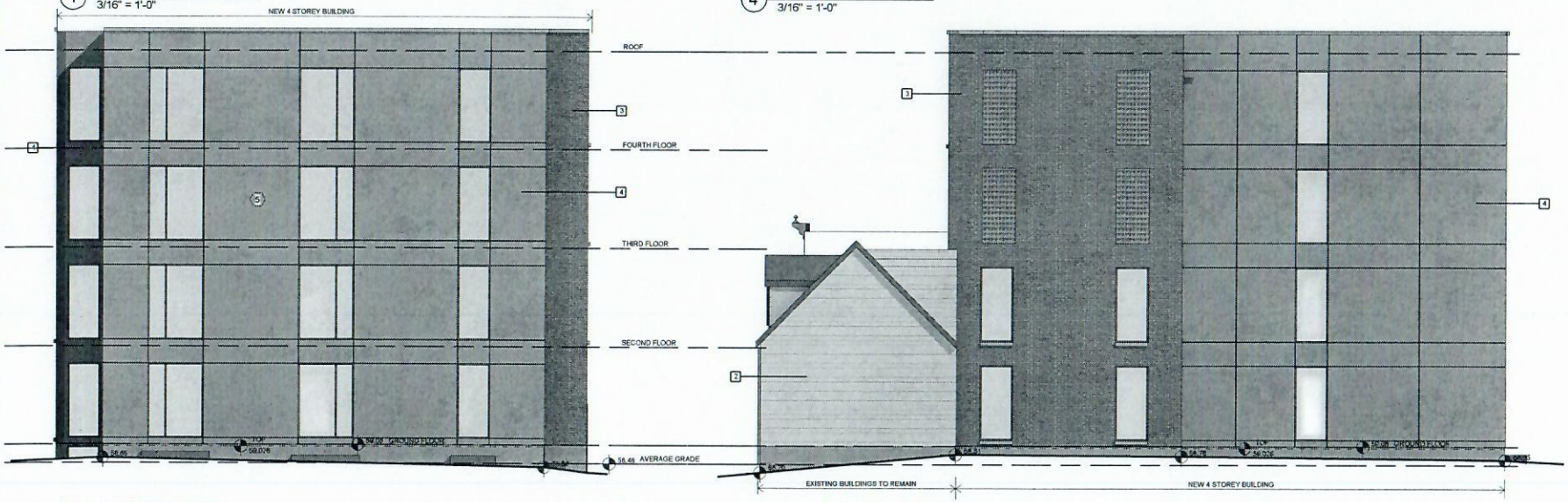


MATERIAL LEGEND & NOTES

1. EXISTING BRICK VENNER TO REMAIN
2. EXPOSED ORIGINAL CLADDING (SIDING)
3. NEW BRICK VENEER
4. NEW METAL PANEL

1 Front (North) Elevation
3/16" = 1'-0"

4 Side (East) Elevation
3/16" = 1'-0"



3 Rear (South) Elevation
3/16" = 1'-0"

5 Side (West) Elevation
3/16" = 1'-0"

168-174 MURRAY ST.

4 STOREY ADDITION TO EXISTING TWO STOREY BUILDINGS

ELEVATIONS

A5

ATTACHMENT 3: FUS FIRE FLOW CALCULATION

Stantec

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: 168-174 Murray Street
Date: January 4, 2023
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

Notes: *Residential Building. Wood Frame, Sprinklered building.*
4 storeys + basement.
Building setbacks per site plan (dated 2021/05/11).

Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	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)	**Floor Space Area**						
		Type of Housing	Single Family	0	Other (Comm, Ind, Apt etc.)	20	Units	
			Townhouse - indicate # of units	0				
			Other (Comm, Ind, Apt etc.)	20				
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):			323	323	Area in Square Metres (m^2)	
					Square Metres (m2)			
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):			1,292	1292		
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1,000 L/min						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	Adequate Sprinkler conforms to NFPA13	-0.3	N/A	-3,060
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is standard for sprinkler and fire dept. hose line	-0.1	N/A	-1,020
			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		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		N/A	
			Sprinkler not fully supervised or N/A for exposures					
5.4	Choose Separation Distance Between Units	Exposure Distance Between Units	Front Yard	20.1 to 30.1m	0.1	0.75	m	7,650
			Right Side	3.1 to 10.0m	0.2			
			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:*						14,000
		Total Required Fire Flow (above) in L/s:						233
		Required Duration of Fire Flow (hrs)						3.00
		Required Volume of Fire Flow (m^3)						2,520

ATTACHMENT 4: FIGURE 2 – FUS EXPOSURE DISTANCES

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

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ATTACHMENT 5: WATER BOUNDARY CONDITIONS

Mineault-Guitard, Alexandre

From: TL MaK <tlmakecl@bellnet.ca>
Sent: Thursday, June 22, 2023 9:57 AM
To: Mineault-Guitard, Alexandre
Cc: Alemany, Kevin
Subject: FW: 168-174 Murray Street - Water Boundary Conditions Request
Attachments: 168-174 Murray Street January 2023.pdf

Hi Alex,

Attached please find the City's water boundary conditions for your calculations received on June 22, 2023.

Could you please proceed with your calculations ASAP for our serviceability report preparation.

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: June 22, 2023 8:52 AM
To: 'TL MaK'
Subject: RE: 168-174 Murray Street - Water Boundary Conditions Request

Hi Tony,

The following are boundary conditions, HGL, for hydraulic analysis at 168-174 Murray Street (zone 1W) assumed to be connected to the 203 mm on Murray Street (see attached PDF for location).

Minimum HGL: 106.3 m

Maximum HGL: 115.4 m

Max Day + FF (150 L/s): 104.3 m

Max Day + FF (233 L/s): 98.1 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: Fawzi, Mohammed
Sent: January 11, 2023 2:47 PM
To: TL MaK <tlmakecl@bellnet.ca>
Subject: RE: 168-174 Murray Street - Water Boundary Conditions Request

Hi Tony,

Thank you. Your request is being processed.

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: January 09, 2023 4:31 PM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Subject: 168-174 Murray Street - Water Boundary Conditions Request

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 located within Pressure Zone 1W at 168-174 Murray Street is a 4-storey residential building, with a basement. A portion of the existing buildings at 168 & 174 Murray Street will be kept, while the remaining will be demolished and be replaced by new construction.
The proposed building contains twenty (20) residential units, namely thirteen (13) 1-bedroom units, and seven (7) 2-bedroom units. The total gross floor area of the proposed building is approximately 1,292 m^2, excluding the basement. The building is to be serviced by the 203 mm diameter watermain along Murray 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. 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	13	1.4	280	5,096	0.06	12,740	0.15	28,028	0.32
Apartment, 2-Bedroom	7	2.1		4,116	0.05	10,290	0.12	22,638	0.26
Total	***20***			***9,212***	***0.11***	***23,030***	***0.27***	***50,666***	***0.59***

The fire flow requirement was determined following the Fire Underwriter Survey (FUS, 2020) method and is provided in the attached worksheet. It is understood that the building will have a sprinkler system, and the basement will be more than 50% below grade. For this analysis, the building was analyzed under two construction types (both with building contents that are limited in combustibility): Wood Frame Construction (Scenario A), and Ordinary Mass Timer Construction (Scenario B). As defined by the 2020 FUS Guidelines, an Ordinary Mass Timber Construction consists of a building with:

- Exterior walls are of Mass Timber Construction with at least 1-hour fire-resistance rating, and
- Other structural elements, such as interior bearing walls and the roof may not have a fire-resistance rating.

Note that the proposed building is proposed to be within 3 m of the adjacent property (166 Murray Street). For separation distances less than 3 m, the recently updated 2020 FUS only considers the effective building area of the proposed building and the respective exposure correction factor which is 0.25 for 0 to 3 m distances.

The resulting total required fire flow (RFF) for Scenario A is 14,000 L/min (233 L/s) for a duration of 3 hours, while the RFF for Scenario B is 9,000 L/min (150 L/s) for a duration of 2 hours.

In summary:

- AVDY = 9,212 L/d (0.11 L/s);

- MXDY = 23,030 L/d (0.27 L/s);
- PKHR = 50,666 L/d (0.59 L/s); and
- Fire Flow (FUS)
    - Scenario A = 14,000 L/min (233 L/s).
    - Scenario B = 9,000 L/min (150 L/s).

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

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

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


Boundary Conditions for 168-174 Murray Street
305mm
rue Murray St.
rue Murray St.
rue Murray St.
152mm
203mm
rue Cumberland St
203mm
152mm
152mm
rue Clarence St
N
Legend
Private
Public
City of Ottawa

ATTACHMENT 6: SUPPORTING HYDRAULIC CALCULATIONS

Stantec

Supporting Hydraulic Calculations

Stantec Project #: 163401084
Project Name: 168-174 Murray Street
Date: June 23, 2023
Data inputted by: Alexandre Mineault-Guitard M.A.Sc., 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): 106.3 m;
Scenario 2: Average Day (Max HGL): 115.4 m; and
Scenario 3: Maximum Day plus Fire Flow: 98.1 m.

Sample Calculations

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

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

For Scenario 1, we have:

HGL(m) = 106.3 and hz (m) = 59.

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

$hp\ (m) = HGL - hz$

$\therefore$ hp = 106.3 - 59.0 m = 47.3 m.

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

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

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

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

P (kPa) = (1000 * 9.81 * 47.3) / 1000

$\therefore$ P = 464 kPa.

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

P = 67 psi.

Applying the same procedures, the pressures under Scenario 2 and Scenario 3 are calculated as follows:
Scenario 2: P = 80 psi; and Scenario 3: P = 56 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 464 kPa (67 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 553 kPa (80 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 383 kPa (56 psi)

ATTACHMENT 7: FIGURE 3 – HYDRANT SPACING

Figure 3: Hydrant Spacing

Source: geoOttawa 2023; *Contains information licensed under the Open Government License – City of Ottawa.*

PROPOSED FOUR STOREY

RESIDENTIAL APARTMENT BUILDING SITE

LOT 23 (SOUTH MURRAY STREET)

R-PLAN 42482

168 – 174 MURRAY STREET

CITY OF OTTAWA

APPENDIX E

CITY OF OTTAWA

SANITARY SEWER DESIGN SHEET

SHEET No. 1 OF 1

SANITARY SEWER DESIGN SHEET

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

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

$M = 1 + \frac{14}{4 + \sqrt{P}}$ where P population in 1000's
$Q(p) = \frac{PqM}{86.4}$ (L/s)
Q(i) = IA (L/s) where A = area in hectares
Q(d) = Q(p) + Q(i) (L/s)

LOCATION			INDIVIDUAL		CUMULATIVE		Peaking factor M	Pop. flow Q(p) (L/s)	Peak extraneous flow Q(i) (L/s)	Peak design flow Q(d) (L/s)	PROPOSED SEWER						
STREET	FROM	TO	Pop.	Area A (hectares)	Pop.	Area A (hectares)					Length (m)	Pipe size (mm)	Type of pipe	Grade %	Capacity (L/s) n=0.013	Full flow velocity (m/s)	Actual velocity at Q(d)
168-174 MURRAY STREET	SITE	EX. 375Ø SAN. SWR	32.9	0.065±	32.9	0.065±	4	0.43	0.02	0.45	14.5	150	PVC	1.0 (MIN)	19.8	1.12	

(FILE# 922-43)

DESIGN	TLM	PROJECT	168-174 MURRAY STREET PROPOSED FOUR STOREY APARTMENT BUILDING, SITE - CITY OF OTTAWA
CHECKED	TLM		
DATE	JUNE 2023		

SHEET No. 1 of 1

PROPOSED FOUR STOREY

RESIDENTIAL APARTMENT BUILDING SITE

LOT 23 (SOUTH MURRAY STREET)

R-PLAN 42482

168 – 174 MURRAY 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 defendable design criteria.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- ☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- ☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- ☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available
☒ Availability of public infrastructure to service proposed development
☒ Identification of system constraints
☒ Identify boundary conditions
☒ Confirmation of adequate domestic supply and pressure
☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
☐ Address reliability requirements such as appropriate location of shut-off valves
☒ Check on the necessity of a pressure zone boundary modification.
☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

- ☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- ☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- ☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- ☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- ☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- ☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.
- ☐ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- ☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- ☐ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- ☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.
- ☐ Description of proposed sewer network including sewers, pumping stations, and forcemains.
- ☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- ☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- ☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- ☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- ☐ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☐ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ 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