EXISTING THREE-STOREY

RESIDENTIAL APARTMENT BUILDING

157-159 JAMES STREET

CITY OF OTTAWA

SERVICEABILITY BRIEF

REPORT No. R-821-83A (REVISION 2)

JULY 2022

T. L. MAK ENGINEERING CONSULTANTS LTD.

OCTOBER 2021

REF. FILE No. 821-83

1.) INTRODUCTION

The owner of the said residential property is proposing to restructure the existing 7-unit three-storey apartment building consisting of (3) 2-bedroom and (4) 1-bedroom units to convert to a 12-unit apartment building. Application to the City of Ottawa for "Site Plan Control" is being made for further development of this site.

From the City of Ottawa's recent review comments, one of the requirements to complete this application is a serviceability brief and in particular for providing the water demands for the site (Avg. Day, Max. Day, Peak Hour and Fire Flow).

The existing residential dwelling at 157-159 James Street is a three-storey low-rise apartment building. It is our understanding that the basement of the building will not be converted into a finished space for occupancy. The existing building is to be restructured to house a total of 12 apartment units consisting of one 2-bedroom unit and eleven 1-bedroom units. The total gross floor area is 6,457 ft^2 (600 m^2).

T.L. Mak Engineering Consultants Ltd. has been retained to prepare a "Serviceability Brief" for this site as a supplement to the Site Plan Control Application.

2.) EXISTING SITE CONDITIONS AND SERVICING

Presently, a three-storey low-rise residential apartment building occupies the site. For details of the site's pre-restructuring conditions, refer to the Google image and aerial photography from (GeoOttawa 2019) in Appendix A.

The existing building is currently comprised of two (2) municipal addresses known as 157-159 James Street. Each half of the building has their own separate water service and sanitary lateral. No evidence of any existing storm lateral where found in the building for draining the building weeping tiles due to possibly age of construction. As part of the restructuring of the existing building to contain one (1) municipal address the (2) existing sets of services laterals is proposed to be abandoned and replaced with one set of services consisting of a 150mm dia. sanitary lateral, a 150mm dia. storm lateral and 50mm dia. water service meeting current pipe size and material standards.

As for the availability of underground municipal services, there are existing municipal services along James Street in front of this property consisting of a 300mm dia. combined sewer and a 200mm dia. watermain for development of this property. Refer to the City of Ottawa James Street UCC and As-built plan and profile drawings included in Appendix B for details.

Existing grading and drainage of the lot is primarily sloped from back to front (north to south direction) refer to the topographical survey attached in Appendix C for additional details. See also Proposed Servicing plan (Dwg. #821-83, S-1) with existing grades for further details.

Currently, there are (2) two-way vehicle entrances and laneway on-site. Along the west side yard is a private vehicle entranceway to the rear of this lot and along the east side yard is a shared

laneway with neighbouring 155 James Street in providing access to the rear parking of this property. Currently an asphalt parking area and a set of metal fire escape stairs are located at the rear of the building.

The existing asphalt laneway located along the west side of the building will be removed as well as approximately one half of the rear yard asphalt parking area and replaced with soft landscape material. Refer to the proposed Site Plan/Landscape Plan in Appendix C for details.

3.) POTABLE WATER

From discussions with the owner and the owner's house designer, the existing building will not have a sprinkler system. Our analysis will be based on a non-sprinklered building.

The existing building located within Pressure Zone 1W at 157-159 James Street is a 3-storey residential low-rise apartment building with a basement. The building will contain one 2-bedroom unit, and eleven 1-bedroom units. The gross floor area is 6,457 ft^2 (600 m^2). The building is to be serviced by the 200 mm diameter watermain along James Street.

The ground elevation on the property in question is approximately 73m, as obtained from the attached **Topographic Survey Plan** in Appendix C.

3a.) DEMAND PROJECTIONS

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines and the Technical Bulletin ISTB-2021-03, where the residential 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	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, 2-Bedroom	1	2.1	280	588	0.01	1,470	0.02	3,234	0.04
Apartment, 1-Bedroom	11	1.4		4,312	0.05	10,780	0.12	23,716	0.27
Total	***12***			***4,900***	***0.06***	***12,250***	***0.14***	***26,950***	***0.31***

The fire flow required was determined following the Fire Underwriter Survey (FUS) method and is provided in the attached worksheet. The existing building was classified as ordinary construction with building contents that are limited in combustibility. It is understood that the building does not have a sprinkler system. It was assumed that the basement is more than 50% below ground level. The resulting total required fire flow is 7,000 L/min (117 L/s) for a duration of 2.25 hours.

Details are provided in the attached **FUS Fire Flow Calculations** in Appendix C. **Figure 1** in Appendix C provides separation distances from adjacent buildings. The **Topographic Survey Plan** attached in Appendix C 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 = 4,900 L/d (0.06 L/s);
- MXDY = 12,250 L/d (0.14 L/s);
- PKHR = 26,950 L/d (0.31 L/s); and,
- Fire Flow = 7,000 L/min (117 L/s).

3b.) BOUNDARY CONDITIONS

The hydraulic gradeline (HGL) boundary conditions for 157-159 James Street, as presented in **Table 2**, were provided by the City on August 9, 2021 (see attached **Water Boundary Conditions Email** in Appendix C).

Table 2: Boundary Conditions

Demand Scenario	Head (m)
Minimum HGL (Peak Hour)	106.8
Maximum HGL (Average Day)	115.4
Maximum Day + Fire Flow (133 L/s)*	105.6
**Higher fire flow rate of 8,000 L/min (133 L/s) calculated for original boundary conditions request.*	

3c.) HYDRAULIC ANALYSIS

PEAK HOUR & AVERAGE DAY

During peak hour demands, the resulting minimum hydraulic gradeline of 106.8 m corresponds to a peak hour pressure of 331 kPa (48 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 apartment building consists of a total of 3 storeys, further consideration will be needed to service the higher floors. Adding 5 psi per floor above two stories, a minimum pressure of 310 kPa (45 psi) would be required for the third floor. The peak hour pressure exceeds this objective and is therefore considered acceptable.

During average day demands, the resulting maximum hydraulic gradeline of 115.4 m corresponds to a maximum pressure of 416 kPa (60 psi). This value is less than the maximum pressure objective of 552 kPa (80 psi) and therefore considered acceptable.

Supporting Hydraulic Calculations are attached in Appendix C.

MAXIMUM DAY + FIRE FLOW

A maximum day plus fire flow hydraulic gradeline of 105.6 m corresponds to a residual pressure of 325 kPa (46 psi) at this location and is well above the minimum residual pressure requirements of 140 kPa (20 psi).

Based on Table 1 of Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02 and a desktop review (i.e., Google Street View) to confirm hydrant class, the combined hydrant flow coverage for the building is estimated to be 11,356 L/min, which is above the FUS required fire flow (RFF) of 7,000 L/min.

Hydrant coverage and classes are illustrated in **Figure 2** attached in Appendix C. A breakdown of available hydrant flow is summarized in **Table 3**.

Table 3: Fire Hydrant Coverage

Building	Calculated FUS Fire Flow Demand (L/min)	Fire Hydrants					Combined Hydrant Flow Coverage (L/min)
		Hydrant Class	Within 76 m		Between 76 m and 122 m		
			Quantity	Contrib. to RFF	Quantity	Contrib. to RFF	
157-159 James St	7,000	AA	2	5,678			11,356
		A					
		B					
		C					

3d.) CONCLUSIONS

In conclusion, based on the boundary conditions provided, the watermain along James Street provides adequate fire flow capacity as per the Fire Underwriters Survey.

Anticipated pressures at the property line during basic day and peak hour demand conditions are within the pressure objectives as per the City of Ottawa's Drinking Water Design Guidelines.

4.) SANITARY FLOW

Peak sanitary flow for this proposed restructuring of the existing residential apartment building is estimated at Q = 0.22 L/s with an infiltration rate of 0.02 L/s. This flow will enter the existing 300mm diameter combined sewer via a 150 mm diameter PVC sanitary lateral sloped at 1.0% (min.).

The existing peak sanitary flow estimated for this lot prior to the proposed building conversion is Q = 0.17 L/s with a infiltration rate of 0.02 L/s. Therefore, the estimated net increase in peak flow from this proposed re-development property is 0.05 L/s.

In view that the existing combined sewer size is 300 mm diameter in front of this property, an increase in sanitary flow to the existing sewer system by 0.05 L/s from this site is not expected to negatively impact the existing James Street combined sewer.

The (2) existing 150mm dia. combined flow service laterals currently servicing this multi-unit building are proposed to be replaced by one new sanitary lateral to take sanitary flow only. Therefore, a newly proposed 150mm diameter PVC sanitary lateral is estimated to be able to convey the added flow and also meet the current pipe size and material standards. Refer to Appendix D for further details on sanitary flow calculations.

5.) STORM FLOW

Presently, the existing 150mm dia. gravity flow service lateral pipe servicing the 157-159 James Street multi-unit apartment building is outletting combined flow from sanitary sewage and storm water from (2) roof drains at this site. The existing building currently does not appear to have any storm lateral connection to the existing 300mm dia. combined sewer.

As part of the existing building renovation works, the owner is proposing to provide separated laterals to separate clear water from waste water flow from this building to the existing James Street combined sewer in order to accommodate potential future separation of the James Street combined sewer by the City.

The (2) existing roof drains along with weeping tile water drainage outlet for the proposed internal re-configured building is requested by the owner to be installed via a proposed 150mm diameter PVC storm lateral which will be connected to the existing 300mm diameter James Street combined sewer. This proposed storm lateral will separate clear water flow from grey water outletting from the renovated building which is currently not the case.

The current lot drainage on-site is primarily graded to surface drain across the site from north to south or (rear to front) where upon surface stormwater outlets to the City's road right of way on James Street.

From the site modification works proposed and to comply with zoning requirements, the applicant is proposing to remove the asphalt laneway currently located along the west side of the building and approximately one-half of the existing asphalt parking area at the rear of the lot and reinstating it with soft landscaping. See Site Plan/ Landscape Plan details shown in Appendix C. This newly added landscaping feature will help promote storm water infiltration on-site from current condition and thus reduce storm water loading into the existing combined sewer.

6.) CONCLUSIONS

In conclusion, based on the boundary conditions provided, the 200mm diameter watermain along James Street provides adequate fire flow capacity as per the Fire Underwriters Survey, as well as anticipated demand flows within the pressure objectives during peak demand and basic demand conditions as per the City of Ottawa's Drinking Water Design Guidelines.

The two (2) existing sets of water service and sanitary laterals which will be abandoned and replaced with one (1) set of new services consisting of a 50mm diameter water service, 150mm diameter sanitary lateral, and a 150mm diameter storm lateral that meets City of Ottawa current pipe size and material standards to service the proposed re-structured apartment building.

PREPARED BY T. L. MAK ENGINEERING CONSULTANTS LTD.

TONY L. MAK, P. ENG.

EXISTING THREE-STOREY

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157-159 JAMES STREET

CITY OF OTTAWA

APPENDIX A

SITE PRE-DEVELOPMENT CONDITION

GOOGLE IMAGE (2019)

AND

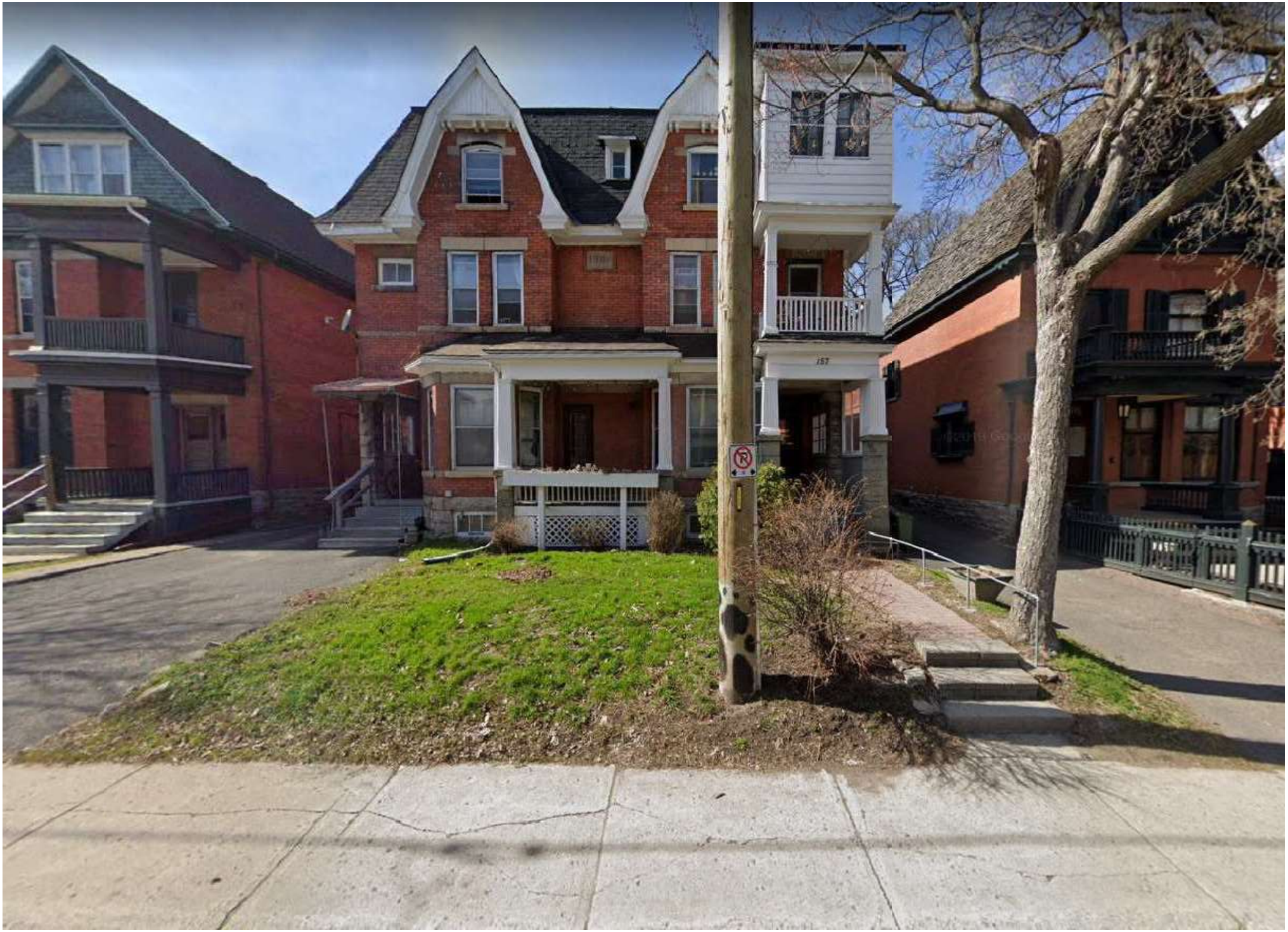
AERIAL PHOTOGRAPHY 2019 (GEOOTTAWA)


rue Gilmour St.
rue Lyon St. N.
rue Bay St.
rue James St.
PROPOSED DEVELOPMENT
157
161
155
163
167
559
561
563
555
540
544
548
550
552
554
558
590 (A)
590 (B)
370
376
382
396
398
143
145
138
140
142
144
146
148
150
152
158
160
162
164
172
165
416
417
419
422
436
438
420
424
179
183
171
173
175
177
107
109
111
113

2019

rue Gilmour St.
rue Lyon St. N.
rue James St.
rue Bay St.
157
161
163
165
167

2019



2019

EXISTING THREE-STOREY

RESIDENTIAL APARTMENT BUILDING

157-159 JAMES STREET

CITY OF OTTAWA

APPENDIX B

JAMES STREET

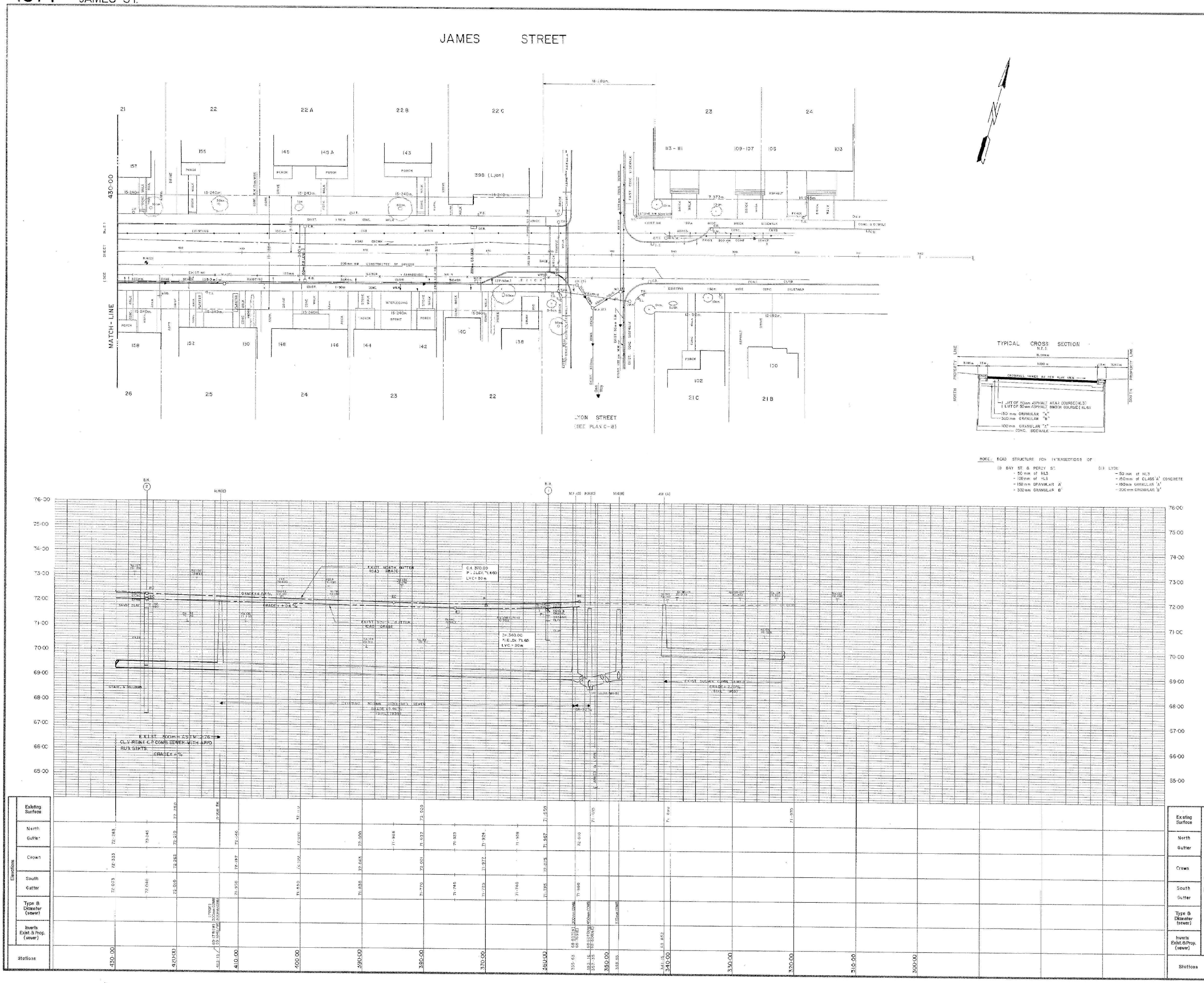
CITY OF OTTAWA

PLAN AND PROFILE

AND

UCC DRAWINGS

1677 JAMES ST.



City Of Ottawa

Department Of Physical Environment

Engineering And Surveys Branch

Notes:

- Utilities shown are taken from best available records. Contractor is requested to check with all utility companies before digging.
- Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
- Reference bench mark: B.M. Elevation 73·154
  Mon.No. 3523 (Tablet on Royal Canadian Legion - Gilmour & Kent)

Notes: (Sewer Construction Only)

- A minimum of 450 mm vertical clearance to be maintained between sewers and watermains where practical.
- Borehole soil descriptions are not based on sieve analysis but on visual inspection only, except where otherwise noted.
- Soil information taken from: Wilf Ohlman 1982
- Date of television inspection: Tamarack - 16th-20th Ap. & 8th-12th May 1981
- This plan supercedes (in whole or in part) plan no: B-21-a
- Actual rock line recorded during construction of existing sewer
- Registered plan no: 30671, 22855, 5558
- Proposed storm and sanitary sewers may be constructed in a common trench provided that a minimum horizontal distance of 460mm is maintained between outside barrels of pipe.

Legend: EXISTING / PROPOSED

STORM SEWER · SANITARY SEWER · STREET LINE · LOT LINE · ROADS & DRIVEWAYS · WALKS · DEPRESSED ACCESS · WATERMAIN · BELL · HYDRO · TRAFFIC · FIRE ALARM · CABLEVISION · STEAM LINE · HYDRANT · WATER VALVE · STAND PIPE · WATER VALVE CHAMBER · TRAFFIC MANHOLE · GUARD RAIL · RETAINING WALL · FENCE · HYDRO POLE · BELL POLE · TRAFFIC LIGHT · LIGHT STANDARD · TRAFFIC SIGN · STREET SIGN · CULVERT & DITCH · STANDARD CATCH BASIN & LEAD · HEAVY DUTY CATCH BASIN & LEAD · BENCHMARK · SQUARE IRON BAR · STANDARD IRON BAR · ROUND IRON BAR · TREES, SHRUBS & HEDGE · BOREHOLE · ROCK

Revisions:

No	Date	Description	Drawn By	Apprd By

P. E. SAUVE — Registered Professional Engineer — Province of Ontario

Designed By	[signature]	Structural Check By	
Survey Detail By	G. Barrey Feb./Mar. 82	Checked By	[signature] 30-6-82
Drafting By	T.J. Walker June. 82	Checked By	L. Lalonde 27/7/82

Final Measurements: Beaver Asphalt (Levy-Vallance)

Construction Type	Sewer & Road	Inspector	Laster
Work Commenced	Sept. / 82	Instrumentman	Mc Nab
Work Completed	July / 83	Field Book #	4209
Designer	Sauve	Date	Aug. / 83
Drafting Revisions	A. S.	Checked By	John France for T.A.

Design And Construction Division

C. Sim P.Eng, Commissioner — D.K. Donaldson P.Eng., Branch Director

Chief Design & Constr. Eng. — Senior Design & Constr. Eng. — Senior Const. Coord.

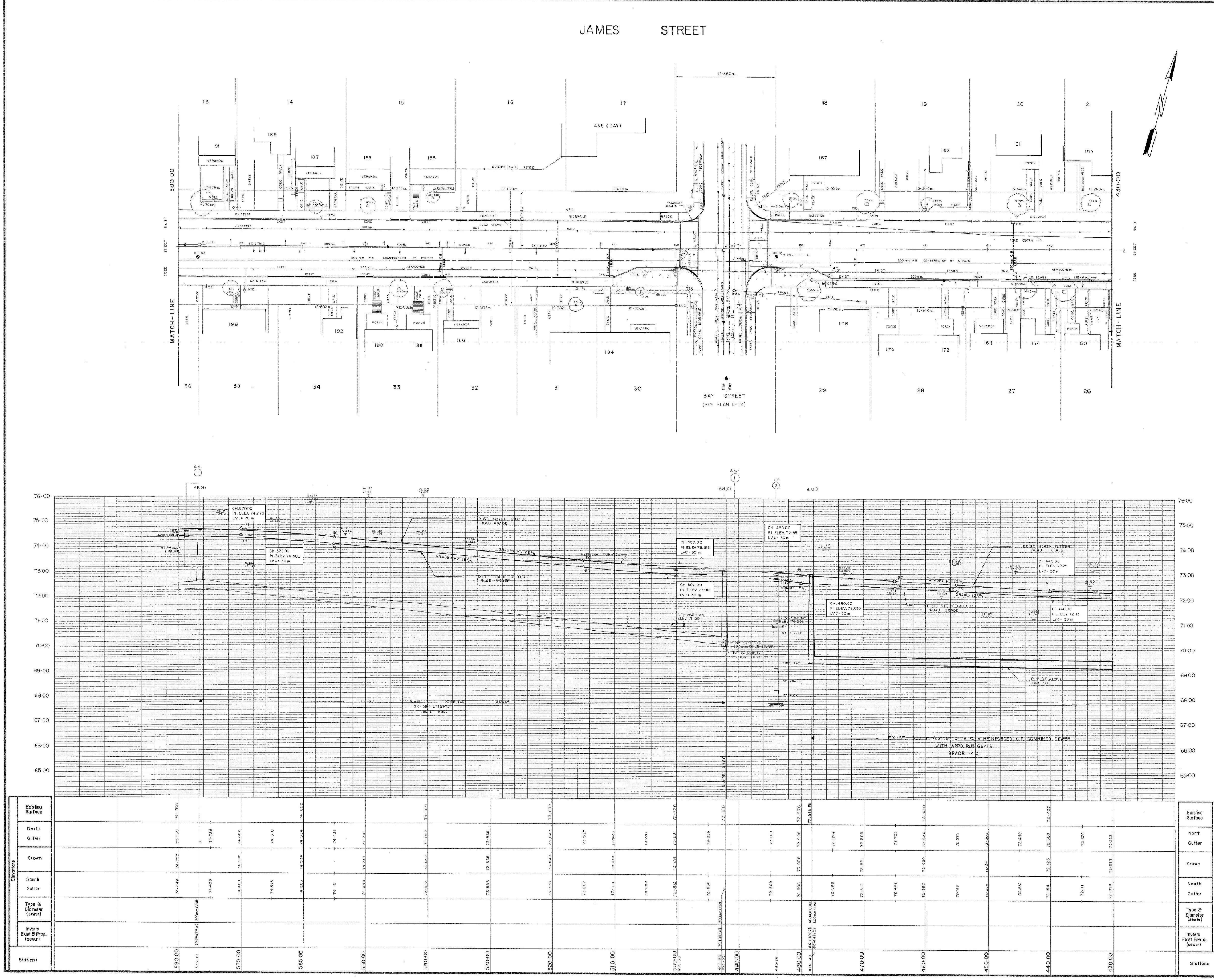
COMB. REPL. SEWER, ROAD & SIDEWALK RECONSTRUCTION

JAMES STREET

LYON STREET to PERCY STREET

Contract No:	Survey Books:	Scales:	Plan No:
82-38	4140 - 4141	HOR. 1=200, VERT. 1=50	1677, Sheet 1 of 3

1677 JAMES ST.



City Of Ottawa
Department Of Physical Environment
Engineering And Surveys Branch

Notes:

- Utilities shown are taken from best available records. Contractor is requested to check with all utility companies before digging.
- Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
- Reference bench mark: B.M. Elevation 73·154
  Mon. No. 3623 (Tablet on Royal Canadian Legion – Gilmour & Kent)

Notes: (Sewer Construction Only)

- A minimum of 460mm vertical clearance to be maintained between sewers and watermains where practical.
- Borehole soil descriptions are not based on sieve analysis but on visual inspection only, except where otherwise noted.
- Soil information taken from: Wilf Ohlmor 982
- Date of television inspection: Torncrack – 16th-20th Apl. & 8th-12th May 1981
- This plan supercedes (in whole or in part) plan no: 8-21-a
- Actual rock line recorded during construction of existing sewer.
- Registered plan no.: 30671, 22855, 15558
  See additional notes on sheet #1.
  Proposed storm and sanitary sewers may be constructed in a common trench provided that a minimum horizontal distance of 460mm is maintained between outside barrels of pipe.

Legend: EXISTING / PROPOSED

Revisions:

No	Date	Description	Drawn By	Apprd By

P. E. SAUVE — Registered Professional Engineer, Province of Ontario

Designed By		Structural Check By	
Survey Detail By	G. Barney Feb./Mar. 82	Checked By	
Drafting By	T.J. Walker June 82	Checked By	

Final Measurements: Beaver Asphalt (Levy-Vallance)

Construction Type	Sewer & Roads	Inspector	Lester
Work Commenced	Sept / 82	Instrumentman	McNab
Work Completed	July / 83	Field Book #	4209
Designer	Sauve	Date	Aug / 83
Drafting Revisions	A. S.	Checked By	John France for T.A.

Design And Construction Division

C. Sim P.Eng., Commissioner — D.K. Doraldson P.Eng., Branch Director

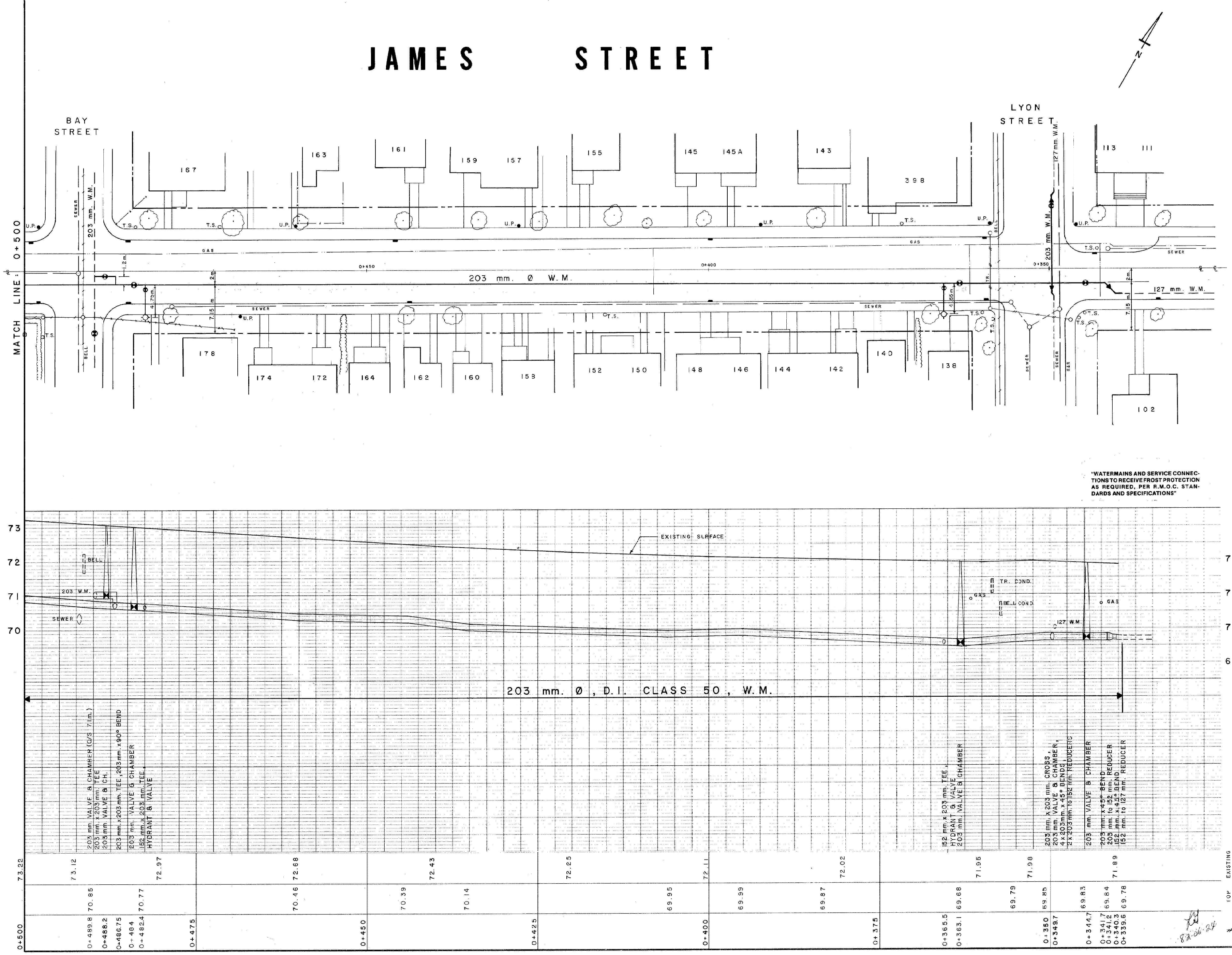
Chief Design & Constr. Eng. — Senior Design & Constr. Eng. — Senior Cons. Coord.

COMB. REPL. SEWER, ROAD & SIDEWALK RECONSTRUCTION

JAMES STREET

LYON STREET to PERCY STREET

Contract No	Survey Books	Scales	Plan No
82-38	4140-4141	HOR. 1=200 VERT. 1=50	1677 Sheet 2 of 3



Regional Municipality of Ottawa-Carleton Works Department

F.E. AYERS, Works Commissioner	W.L. KEAY, Director Pollution Control
Engineer in Charge of Design & Construction — Date 22/6/82	
Project Officer: Timothy J. Slack, P.Eng.	Date 21/6/82
Drawn by: J. CARMAN	Date 9/6/82
Approved by:	Date 23 JUNE 82

Notes

1. SERVICE CONNECTIONS TO RECEIVE FROST PROTECTION AS REQUIRED, PER R.M.O.C. STANDARDS.
2. PROP. 203 mm. W.M. IN LYON ST. TO BE LAID WITH 2.2 m. COVER FROM ℄ ROAD GRADE.

BASE PLAN INFORMATION TAKEN FROM DEPT. OF PHYSICAL ENVIRONMENT PLANS 1677 SH. 2 & 3, CONTRACT NO. 82-36.

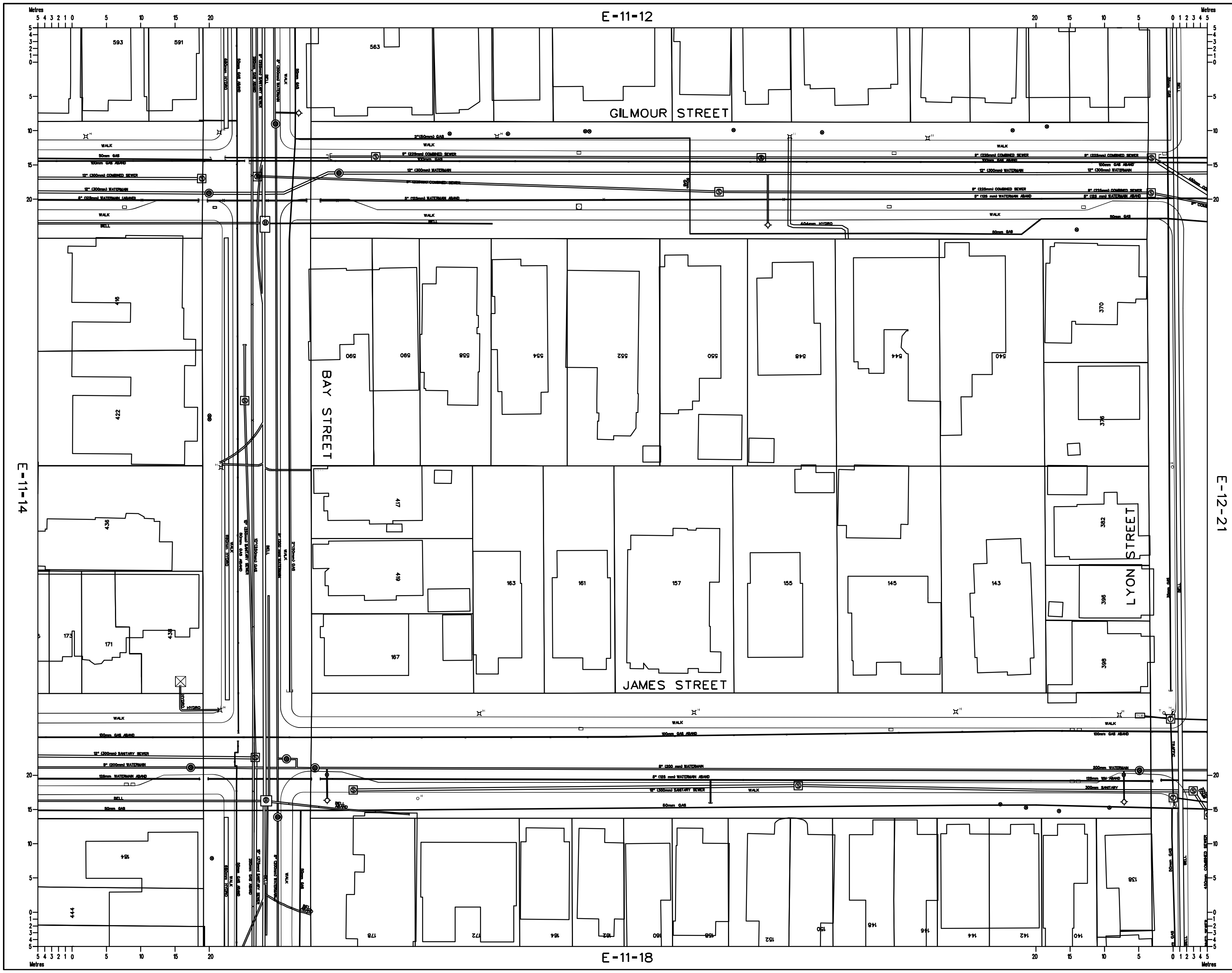
Scales
HOR. : 1:250
VERT. : 1:50

Revisions
1. "AS BUILT" FROM FIELD BOOK NO. 592 BY L. KENNEDY. J.C. - DEC./82

Legend

Project Title
203 mm. Ø W.M. IN JAMES STREET LYON STREET TO PERCY STREET

Drawing No.: 2880
Sheet: 3



REVISIONS / RÉVISIONS	DATE	BY
REDRAWN FROM VOIDED UTILITY PLAN E-11-15	AUG 2010	DC
HYDRO,BELL,ENBRIDGE,ROGERS, CITY SEWER, WATER, TRAFFIC, SL COMPILED/DIGITIZED FROM UTILITY/CITY DATA	JUN 2013	JM

LEGEND

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

TELECOM GLOSSARY

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

GLOSSARY - OTHER

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

CAUTION/ATTENTION

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

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

Ottawa

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

OTTAWA UTILITY COORDINATING COMMITTEE
CENTRAL REGISTRY

COMITÉ DE COORDINATION DES SERVICES PUBLICS D'OTTAWA
ENREGISTREMENT CENTRAL

UCC Ottawa CCSP — Utility Coordinating Committee / Comité de Coordination des Services Publics

PRODUCED BY: GIS & DATA MANAGEMENT BRANCH
INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
E-11-15

EXISTING THREE-STOREY

RESIDENTIAL APARTMENT BUILDING

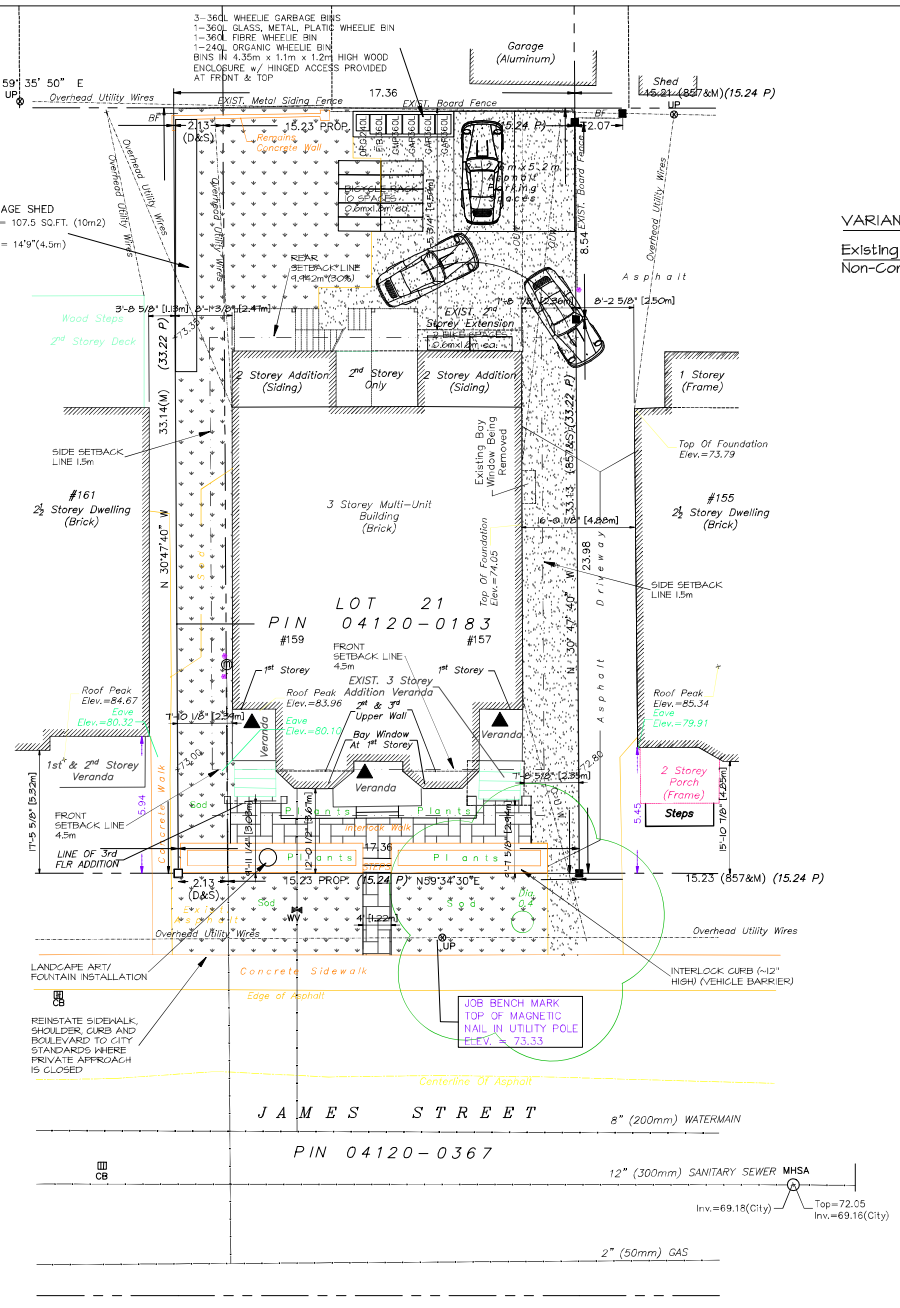
157-159 JAMES STREET

CITY OF OTTAWA

APPENDIX C

- **SITE PLAN / LANDSCAPE PLAN**
- **ARCHITECTURAL DRAWINGS AND TOPOGRAPHICAL SURVEY PLAN**
- **FUS FIRE FLOW CALCULATION**
- **FUS EXPOSURE DISTANCE (FIGURE 1)**
- **WATER BOUNDARY CONDITIONS**
- **SUPPORTING HYDRAULIC CALCULATIONS**
- **HYDRANT SPACING (FIGURE 2)**

ATTACHMENT 1 : SITE PLAN / LANDSCAPE PLAN



LEGEND

- ENTRANCE LOCATION
- WW — WINDOW WELL
- GENERAL LOT DRAINAGE
- 5' WOOD FENCE
- HP — HYDRO POLE
- OHW — OVERHEAD WIRE (HYDRO BELL CABLE)
- STB — 8" DIA. STEEL BOLLARD
- CB CBMH MH — CATCH BASIN, MANHOLE
- DC — DEPRESSED CURB
- DS — DOWN SPOUT
- HARD LANDSCAPE (ASPHALT)
- INTERLOCK
- SOFT LANDSCAPE

LEGEND

- □ — SURVEY MONUMENT SET
- ■ — SURVEY MONUMENT FOUND
- SSIB — SHORT STANDARD IRON BAR
- IB — IRON BAR
- CC — CUT CROSS
- CP — CONCRETE PIN
- (P) — REGISTERED PLAN 30671
- (D) — INST. N° CR571874
- (S) — SET
- (M) — MEASURED
- PROP. — PROPORTIONED
- (SU) — SOURCE UNKNOWN
- (WIT) — WITNESS
- (857) — FAIRHALL, MOFFATT & WOODLAND LIMITED, O.L.S. (REF. 45–30671, 45(c)–30671, 49–30671)
- (1319) — WEBSTER & SIMMONDS SURVEYING LTD., O.L.S.
- PIN — PROPERTY IDENTIFIER NUMBER
- * — REDUCED LENGTH MONUMENT SET DUE TO UNDERGROUND UTILITY HAZARD AND/OR RESTRICTIVE SITE CONDITIONS
- BF — BOARD FENCE
- DIA — DIAMETER
- ● — BOLLARD
- (W) — ELEVATION OF UTILITY WIRE
- CB — CATCHBASIN
- WV — WATER VALVE
- UP — UTILITY POLE
- FH — FIRE HYDRANT
- MH — MANHOLE
- DECIDUOUS TREE
- GAS METER
- —S— — SANITARY SEWER
- —W— — WATERMAIN
- —G— — GAS LINE
- —UH— — HYDRO
- —B— — BELL
- OVERHEAD UTILITY WIRES (OUW)
- CURB
- FENCE

The Property boundary information and topographic information on this plan came pre-integrated from the survey plan prepared by:
Fairhall, Moffatt & Woodland Limited
Survey Completed 2021/03/25
Reference No. 57-30671

BUILDING FOOTPRINT = 231.3m2 (2490.298ft2)
VEGETATION AREA (NOT INCL. BLVD) = 122.29m2 (1316.337ft2)

ZONING - R4-UD(478) - RESIDENTIAL FOURTH DENSITY LOW RISE APARTMENT - 9 units or more (12 Proposed)

VARIANCE REQ'D → Existing Non-Conformance

RESIDENTIAL FOURTH DENSITY SUBZONE UD	PROPOSED/EXIST.:
MIN. LOT WIDTH – 15m	17.36m
MIN. LOT AREA – 450m2	574.63m2
MAX. BUILDING HEIGHT – 14.5m	10.94m
MIN. FRONT YARD SETBACK – 4.5m or AVG.=5.6m 1/2 (4.5m–2.94m) = 3.72m	2.94m (EXISTING) 3.03m (3rd floor addition on left, 0.69m Variance req'd)
MIN. CORNER SIDE YARD SETBACK – N/A	N/A
MIN. REAR YARD SETBACK – 9.942m(30%)	9.59m(28.9%) (EXISTING)
MIN. INTERIOR SIDE YARD SETBACK – 1.5m	Left 2.39m, Right 2.35m

PART 4

SECTION 101 – PARKING
(3)(a) no off-street parking required for first 12 units

SECTION 102 – VISITOR PARKING
(2) no visitor parking required for first 12 units

SECTION 111 – BICYCLE PARKING
Table 111A(b)(i) 0.5 spaces /dwelling unit
5 required, 12 provided (0.6m×1.8m)
50% CAN BE IN LANDSCAPED AREA

PART 5

SECTION 137
AMENITY AREA – Does not fall under headings 1–11 in Table 137 therefore use 12 – other uses where amenity area NOT required.

SECTION 139
FRONT YARD LANDSCAPED AREA – current non-conforming setback 2.94m
therefore 20% of front yard to be soft landscaped
Front yard area = 73.8m2 (794.6ft2)
Front yard soft landscape = 22.33m2 (240.37ft2) = 30.2%

PART 6

SECTION 161
(8) 30% OF LOT AREA TO BE LANDSCAPED = 172.3m2 (1854.6ft2)
PROPOSED Combined front and rear yard landscaped area =181.6m2 (31.6%)

(15)(b)(iii)&(iv)
50% REAR YARD MUST BE SOFT LANDSCAPED (w/ a min. 25m2 rectangle where length is < 2x width)
REAR YARD AREA = 182.8m2, 50% = 91.4m2 (983.8ft2)
PROPOSED REAR YARD SOFT LANDSCAPED AREA = 92.21m2

(15)(d) Table 161
FRONT YARD LANDSCAPED AREA – current non-conforming setback 2.94m
therefore 20% of front yard to be soft landscaped
Front yard area = 73.8m2 (794.6ft2)
Front yard soft landscape = 22.33m2 (240.37ft2) = 30.2%

SITE PLAN / LANDSCAPE PLAN

0m 1m 2m 3m 4m 5m 10m

SCALE 1:100 (METRIC)

REV 4	REVISED FRONT YARD LANDSCAPED WALL AND ART INSTALLATION LOCATION	JUL. 26, 2022
REV 3	REVISED REAR YARD & FRONT YARD TO REFLECT AS CREATED LANDSCAPE AREA	JUL. 12, 2022
REV 2	LANDSCAPING REVISED AS WELL AS LANDSCAPE AREA CALCULATION UPDATED	MAR. 16, 2022
REV 1	ISSUED FOR SITE PLAN APPROVAL	JAN. 27, 2022

Developer/Owner:
Allerous Property Management
590 Queen Elizabeth Driveway,
Ottawa, ON, K1G 3N5
613-265-7286

Designer:
David Bekkers M.A.A.T.O.
161 Bay St, Suite 1008
Ottawa, Ontario
K1R 7T2
613-852-8438

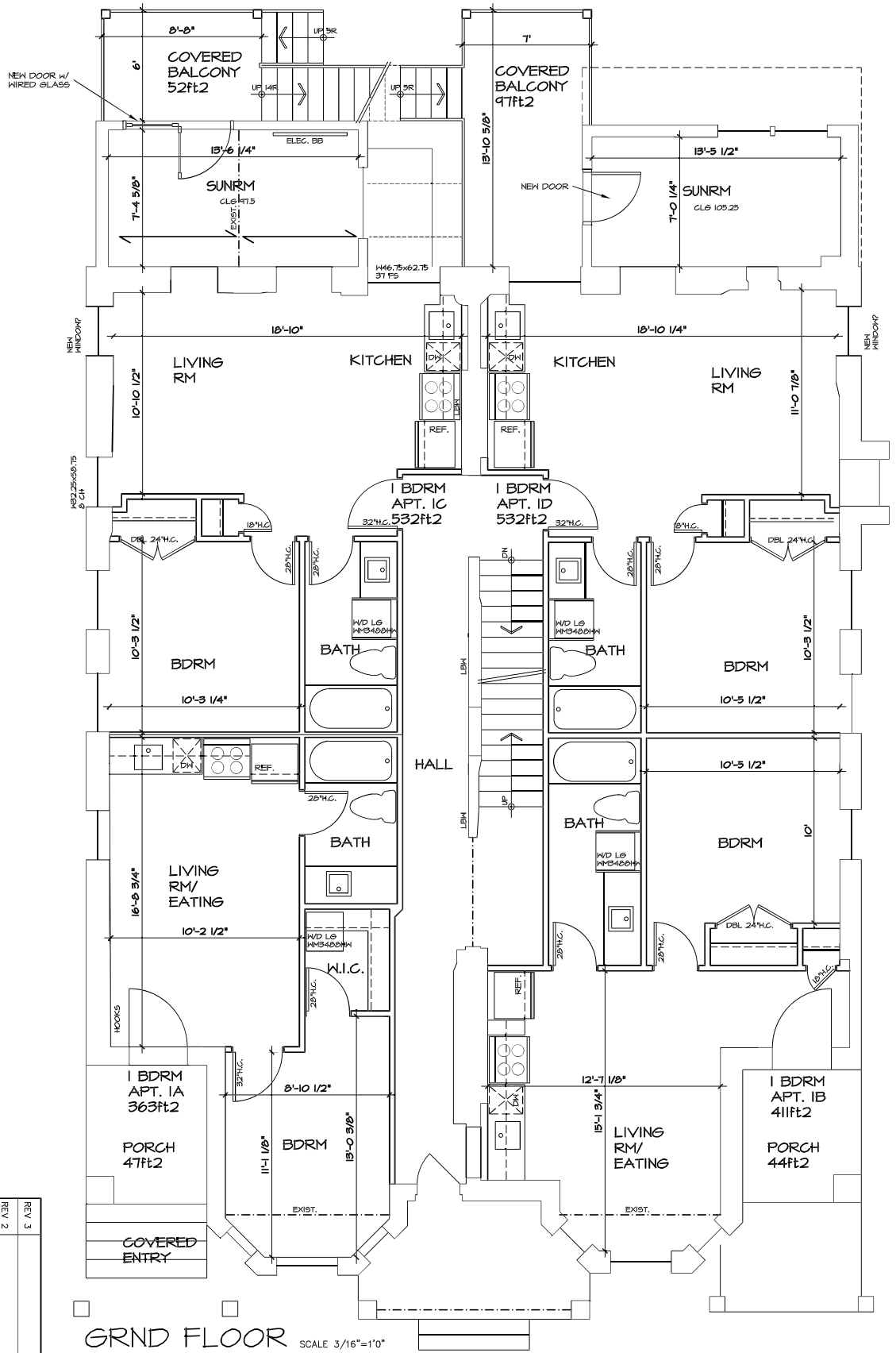
Project:
The "JAMES ST" Apartment
157, 159 James St.
Ottawa, ON, K1R 5N4
Lot 21 & Part Lot 20, RP 30671

Dwg. Title:
SITE PLAN

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code
Bekkers
M.A.A.T.O. 22480
NAME SIGNATURE BCIN

Drawn By: D.B. | Date:
Scale: 1:100 | Dwg. No.: A0
Job: n/a

ATTACHMENT 2 : ARCHITECTURAL DRAWINGS AND TOPOGRAPHICAL SURVEY PLAN



GRND FLOOR SCALE 3/16"=1'0"

GRND FLR GROSS AREA
2164ft2 (201.0m2)

GROSS AREA
6457ft2
(599.8m2)

REV #	DESCRIPTION	MMM. DD, YYYY
REV 1		
REV 2		
REV 3		

Job: n/a
Scale: AS SHOWN
Drawn By: D.B.
Date:
Dwg. No.: A2

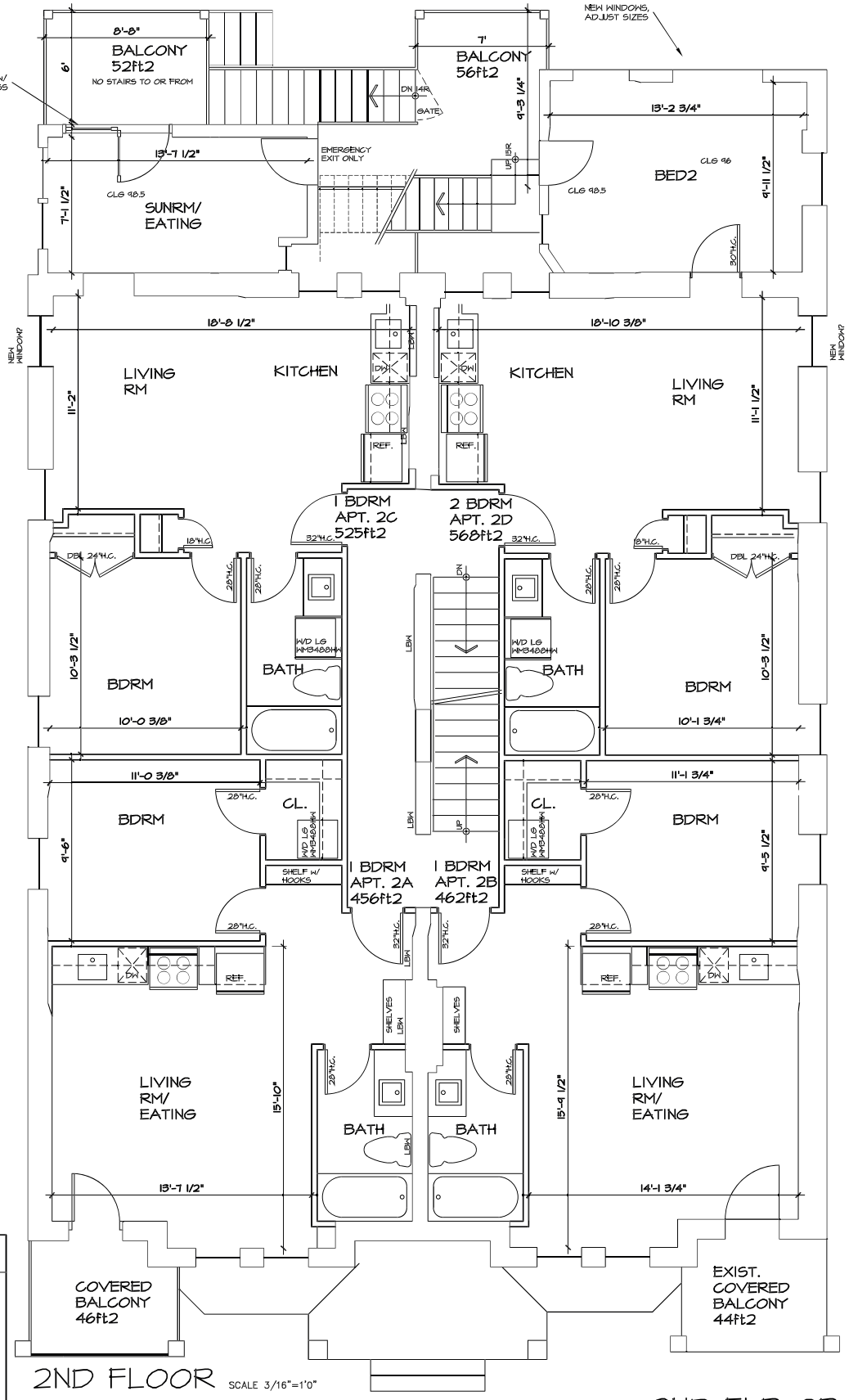
Project:
The "JAMES ST" Apartment
157, 159 James St.
Ottawa, ON. K1R 5M4
Lot 21 & Part Lot 20, RP 30611

The undersigned has reviewed and takes responsibility for this design and has the qualifications and meets the requirements set out in the Ontario Building Code

David Bekkers	22980
NAME	SIGNATURE
M.A.A.T.O.	BCIN

Designer:
David Bekkers M.A.A.T.O.
151 Bay St., Suite 1008
Ottawa, Ontario
K1R 7T2
613-852-8433

Developer/Owner:
Alterous Property Management
590 Queen Elizabeth Driveway
Ottawa, ON. K1S 3N5
613-265-7286



2ND FLOOR SCALE 3/16"=1'0"

2ND FLR GROSS AREA
2270ft2 (210.8m2)

REV #	DESCRIPTION	MMM. DD, YYYY
REV 1		
REV 2		
REV 3		

Project:
The "JAMES ST" Apartment
157, 159 James St.
Ottawa, ON. K1R 5M4
Lot 21 & Part Lot 20, RP 30611

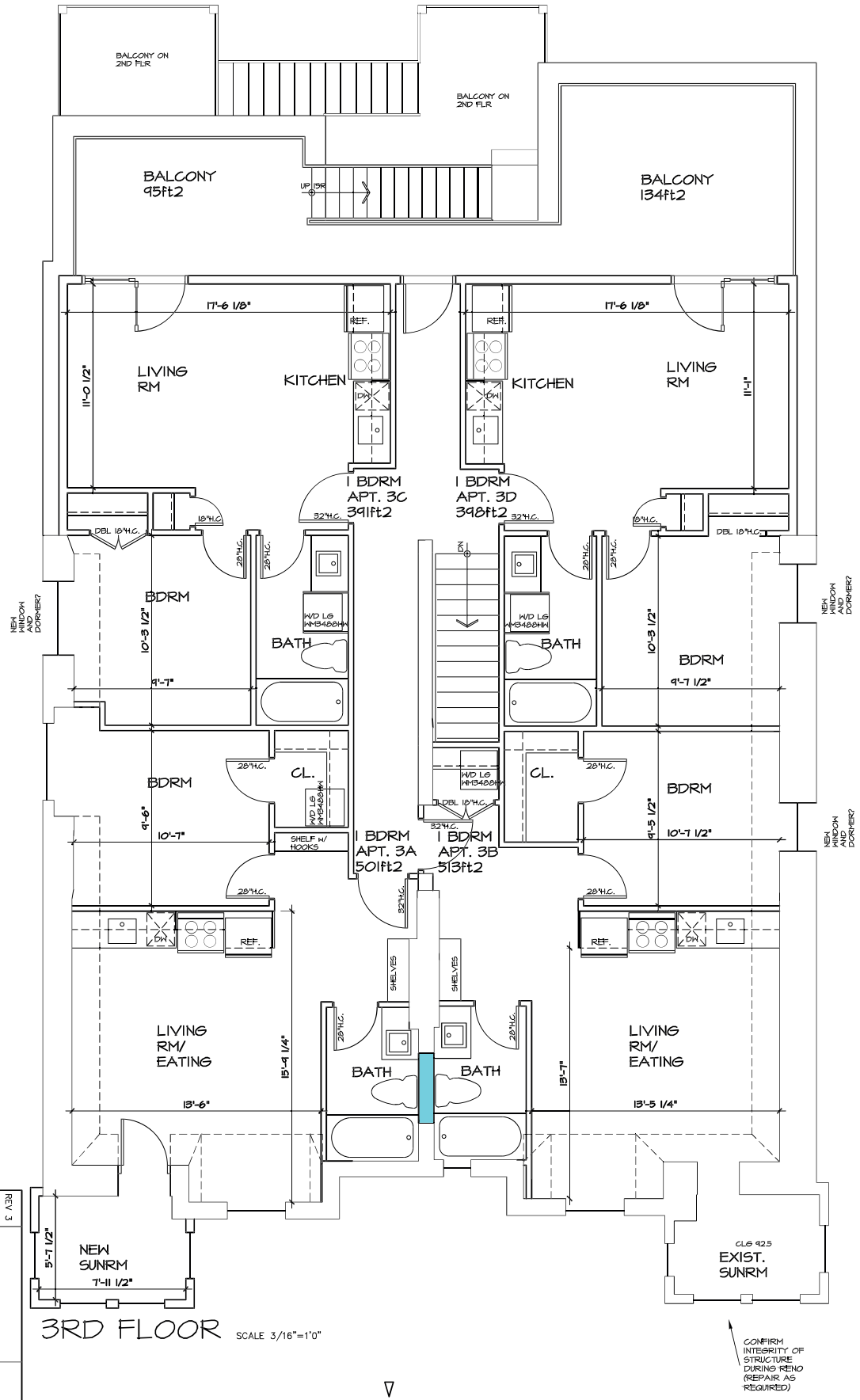
Designer:
David Bekkers M.A.A.T.O.
151 Bay St., Suite 1008
Ottawa, Ontario
K1R 7T2
613-852-8433

Developer/Owner:
Alterous Property Management
590 Queen Elizabeth Driveway,
Ottawa, ON. K1S 3N5
613-265-7286

The undersigned has reviewed and takes responsibility for this design and has the qualifications and meets the requirements set out in the Ontario Building Code

	NAME	SIGNATURE	22980 BCIN
David Bekkers M.A.A.T.O.			

Job: n/a
Scale: AS SHOWN
Drawn By: D.B.
Date:
Dwg. No.: A3



3RD FLOOR SCALE 3/16"=1'0"

CONFIRM INTEGRITY OF STRUCTURE DURING RENO (REPAIR AS REQUIRED)

3RD FLR GROSS AREA
2023ft2 (187.9m2)

REV #	DESCRIPTION	MMM. DD, YYYY
REV 1		
REV 2		
REV 3		

Project:
The "JAMES ST" Apartment
157, 159 James St.
Ottawa, ON. K1R 5M4
Lot 21 & Part Lot 20, RP 30611

Designer:
David Bekkers M.A.A.T.O.
151 Bay St., Suite 1008
Ottawa, Ontario
K1R 7T2
613-852-8433

Developer/Owner:
Allerous Property Management
590 Queen Elizabeth Driveway.
Ottawa, ON. K1S 3N5
613-265-7286

The undersigned has reviewed and takes responsibility for this design and has the qualifications and meets the requirements set out in the Ontario Building Code

	NAME	SIGNATURE	BCIN
	David Bekkers M.A.A.T.O.		22980

Job: n/a
Scale: AS SHOWN
Drawn By: D.B.
Date:
Dwg. No.: A4

Developer/Owner:
Alferous Property Management
590 Queen Elizabeth Driveway.
Ottawa, ON. K1S 3N5
613-265-7286

Designer:
David Bekkers M.A.A.T.O.
151 Bay St., Suite 1008
Ottawa, Ontario
K1R 7T2
613-852-8433

Project:
The "JAMES ST" Apartment
157, 159 James St.
Ottawa, ON. K1R 5M4
Lot 21 & Part Lot 20, RP 30671

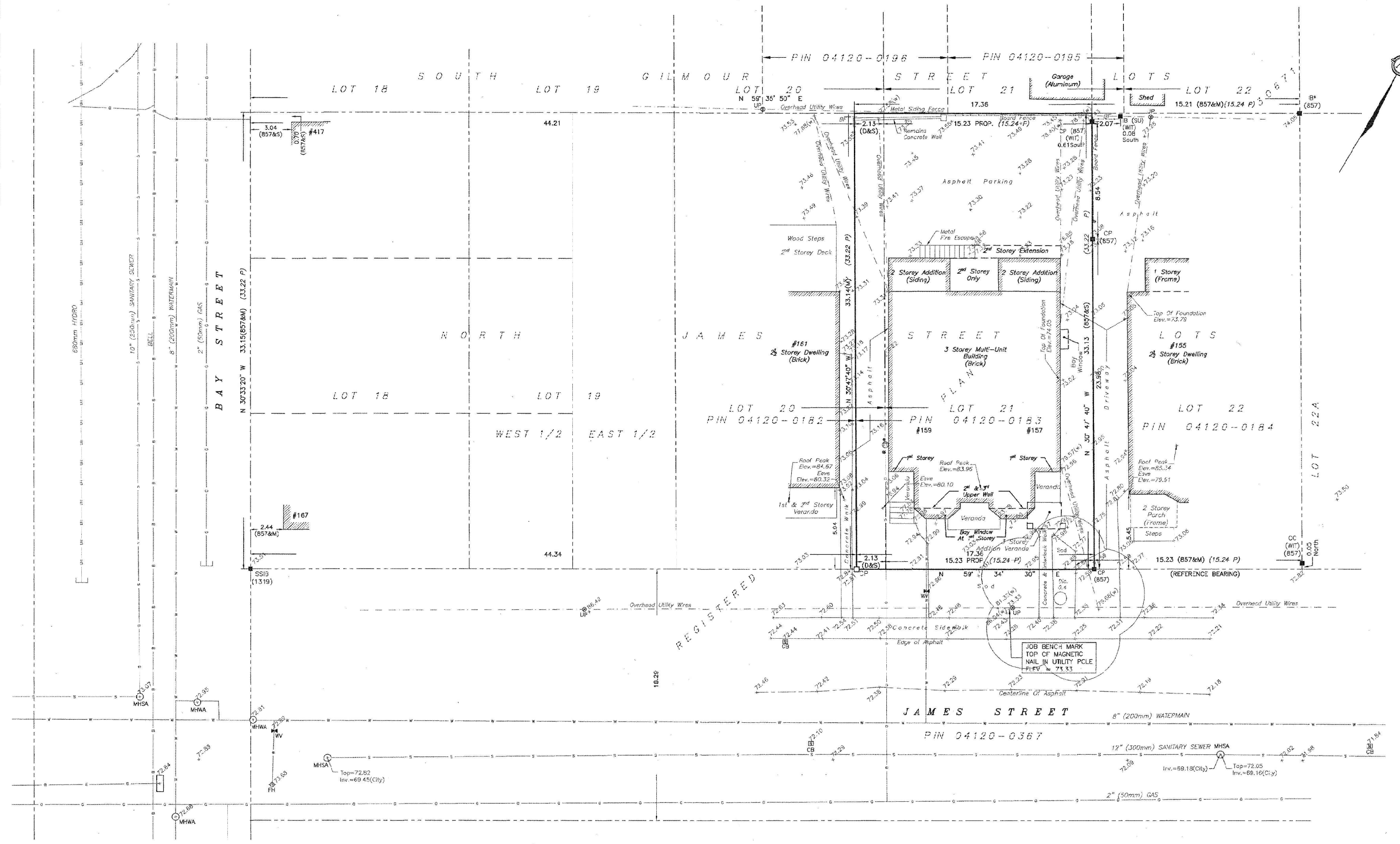
The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code

David Bekkers M.A.A.T.O.		22980
NAME	SIGNATURE	BCIN

REV #	DESCRIPTION	MMM. DD, YYYY
REV 3		
REV 2		
REV 1		

Drawn By: D.B.	Date:
Scale: AS SHOWN	Dwg. No.: A5
Job: n/a	

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



TOPOGRAPHIC SURVEY OF LOT 21 AND PART OF LOT 20 (North James Street) REGISTERED PLAN 30671 CITY OF OTTAWA

SCALE 1 : 150

0 1 2 5 10 15 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

NOTES

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE NORTHERLY LIMIT OF JAMES STREET AS SHOWN ON PLAN OF SURVEY BY FAIRHALL, MOFFATT & WOODLAND (REF. 45(a)-30671), HAVING A BEARING OF N 59°34'30" E.

ELEVATION NOTES

1. ELEVATIONS SHOWN HEREON ARE REFERRED TO GEODETIC DATUM (CVGD28).
2. ELEVATIONS FOR MANHOLE COVERS AND CATCH BASINS HAVE TO BE INDEPENDENTLY CONFIRMED BEFORE THEY CAN BE ACCEPTED FOR FINAL DESIGN OR CONSTRUCTION PURPOSES.
3. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT THEIR RELATIVE ELEVATION AND DESCRIPTION AGREE WITH THE INFORMATION SHOWN ON THIS DRAWING.

UTILITY NOTES

1. THIS DRAWING CANNOT BE ACCEPTED AS ACKNOWLEDGING ALL OF THE UNDERGROUND UTILITIES AND IT WILL BE THE RESPONSIBILITY OF THE USER TO CONTACT THE RESPECTIVE UTILITY AUTHORITIES FOR CONFIRMATION OR LOCATION.
2. UNDERGROUND UTILITIES, AS REPORTED ON THIS DRAWING, ARE NOT BASED ON AN ACTUAL 'FIELD LOCATE' BY THE RESPECTIVE UTILITY AGENCIES BUT HAVE BEEN COMPILED FROM DATA OBTAINED FROM THE FOLLOWING SOURCE:
   a) CITY OF OTTAWA PUBLIC UTILITIES REGISTRY.
3. BEFORE ANY WORK INVOLVING PROBING, EXCAVATING, ETC., A FIELD LOCATION OF UNDERGROUND PLANT BY THE PERTINENT UTILITY AUTHORITY IS MANDATORY.

LEGEND

□	– SURVEY MONUMENT SET	•	– BOLLARD
■	– SURVEY MONUMENT FOUND	(W)	– ELEVATION OF UTILITY WIRE
SSIB	– SHORT STANDARD IRON BAR	CB	– CATCHBASIN
B	– IRON BAR	WV	– WATER VALVE
CC	– CUT CROSS	UP	– UTILITY POLE
CP	– CONCRETE PIN	FH	– FIRE HYDRANT
(P)	– REGISTERED PLAN 30671	MH	– MANHOLE
(D)	– INST. N° CR571874		– DECIDUOUS TREE
(S)	– SET		– GAS METER
(M)	– MEASURED	—S—	– SANITARY SEWER
PROP.	– PROPORTIONED	—W—	– WATERMAIN
(SU)	– SOURCE UNKNOWN	—G—	– GAS LINE
(WIT)	– WITNESS	—UH—	– HYDRO
(857)	– FAIRHALL, MOFFATT & WOODLAND LIMITED, O.L.S. (REF. 45-30671, 45(c)-30671, 49-30671)	—B—	– BELL
(1319)	– WEBSTER & SIMMONDS SURVEYING LTD., O.L.S.	— · —	– OVERHEAD UTILITY WIRES
PIN	– PROPERTY IDENTIFIER NUMBER		– CURB
*	– REDUCED LENGTH MONUMENT SET DUE TO UNDERGROUND UTILITY HAZARD AND/OR RESTRICTIVE SITE CONDITIONS	—x—	– FENCE
BF	– BOARD FENCE		
DIA	– DIAMETER		

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON MARCH 25, 2021.

2021/05/03
DATE

JOHN H. GUTRI
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2167297

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

Fairhall Moffatt & Woodland LIMITED
ONTARIO LAND SURVEYORS OTTAWA
Surveying and Land Information Services
100-600 TERRY FOX DRIVE, KANATA, ONTARIO K2L 4B6
TEL: (613) 591-2580 FAX: (613) 591-1495
www.fmw.on.ca

JOB No. AB14300

E 367420, N 5030481

REFERENCE No. 57-30671

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TP_AB143.dwg (ss)

ATTACHMENT 3 : FUS FIRE FLOW CALCULATION

FUS Fire Flow Calculation

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

Stantec Project #: 163401084
Project Name: 157-159 James St
Date: January 6, 2022
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

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

Notes: Based on drawings received on 2021/12/23. Basement is more than 50% below grade.

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

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary construction	1	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	12	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	12				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			200	600	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1,000 L/min						5,000
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	4,250
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	10.1 to 20.0m	0.15	0.65	m	2,763
			East Side	3.1 to 10.0m	0.2			
			South Side	20.1 to 30.1m	0.1			
			West Side	3.1 to 10.0m	0.2			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:*						7,000
		Total Required Fire Flow (above) in L/s:						117
		Required Duration of Fire Flow (hrs)						2.25
		Required Volume of Fire Flow (m^3)						945

ATTACHMENT 4 : FIGURE 1 – FUS EXPOSURE DISTANCES

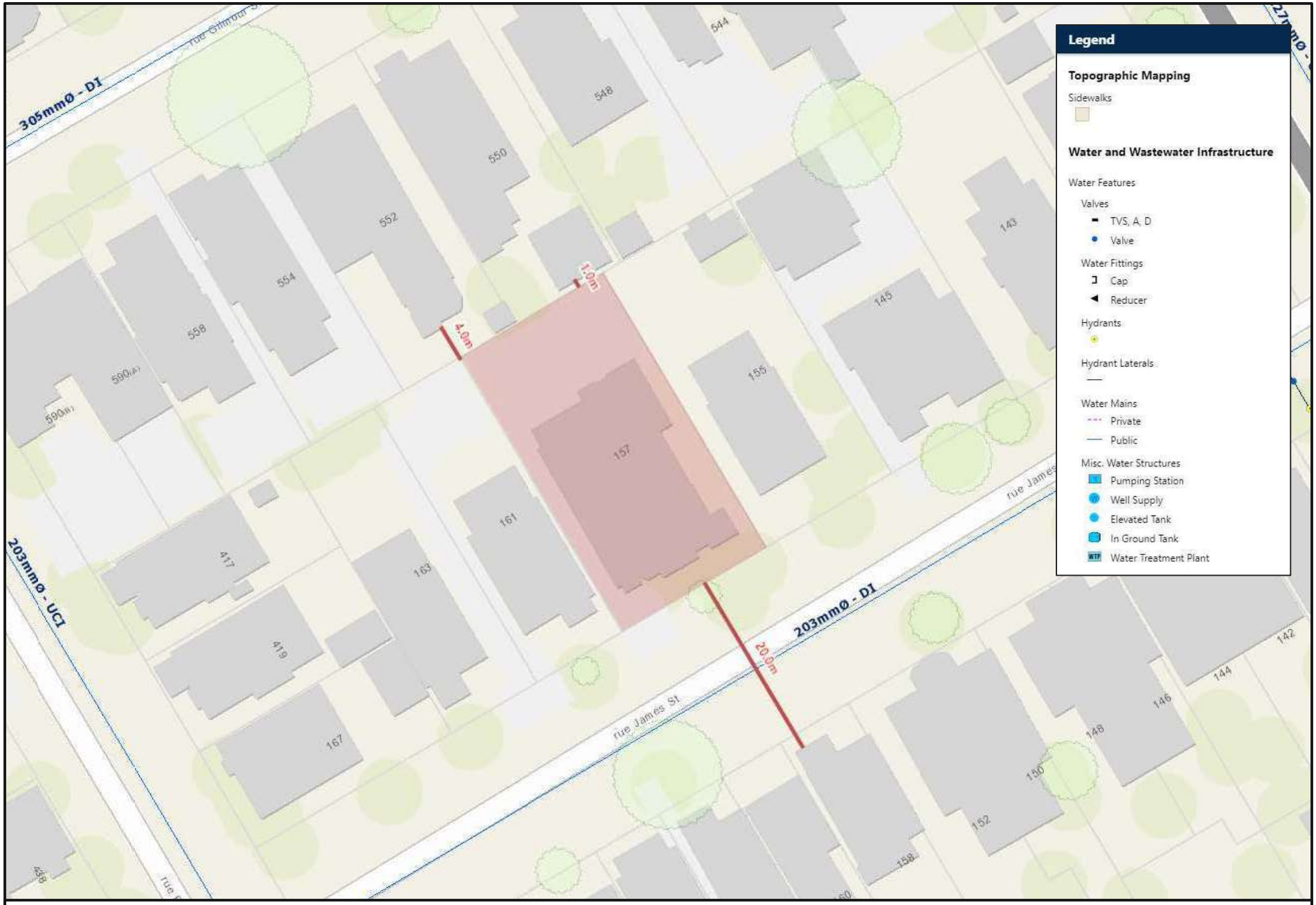

Figure 1: FUS Exposure Distances (Property Line to Adjacent Buildings)

Source: geoOttawa 2021; *Contains information licensed under the Open Government Licence – City of Ottawa.*

ATTACHMENT 5 : WATER BOUNDARY CONDITIONS

Razafimaharo, Christene

From: TL MaK <tlmakecl@bellnet.ca>
Sent: Monday, August 16, 2021 12:06 PM
To: Alemany, Kevin
Cc: Razafimaharo, Christene
Subject: RE: 157-159 James Street - Water Boundary Conditions Request
Attachments: 157-159 James Street August 2021.pdf

Hi Kevin,

Attached please find water boundary conditions received on August 9, 2021 from the City of Ottawa regarding 157-159 James Street.

Could you please proceed with your calculations at your earliest convenience for our serviceability report preparation.

Let us know if you have any questions or comments.

Regards,

Tony Mak

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

From: Jhamb, Nishant [mailto:nishant.jhamb@ottawa.ca]
Sent: August 9, 2021 10:15 AM
To: TL MaK
Cc: chaunei@aliferous.ca; christian szpilfogel
Subject: RE: 157-159 James Street - Water Boundary Conditions Request

Hi Tony,

The following are boundary conditions, HGL, for hydraulic analysis at 157-159 James Street (zone 1W) assumed connected to the 203 mm watermain on James Street (see attached PDF for location).

Minimum HGL: 106.8 m

Maximum HGL: 115.4 m

Max Day + FF (133 L/s): 105.6 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.

Thanks
Nishant Jhamb, P.Eng
Project Manager |Gestionnaire de projet
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 23112, nishant.jhamb@ottawa.ca
Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: TL MaK <tlmakecl@bellnet.ca>
Sent: July 30, 2021 4:43 PM
To: Wu, John <John.Wu@ottawa.ca>
Cc: christian szpilfogel <christian@aliferous.ca>; 'Chaunei Chan' <chaunei@aliferous.ca>
Subject: 157-159 James Street - Water Boundary Conditions Request

Hi John,

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 existing building located within Pressure Zone 1W at 157-159 James St is a 3-storey residential low-rise apartment building with a basement. The building will contain two bachelor units, and eight 1-bedroom units. Each floor covers an area of 2,325 ft^2 (216 m^2) for a gross floor area of 6,975 ft^2 (648 m^2). The building is to be serviced by the 200 mm diameter watermain along James St.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines, where the residential consumption rate of 350 L/cap/d was used to estimate average day demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 2.5. Peak hour (PKHR) demands were calculated by multiplying MXDY by a factor of 2.2. Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines. **Table 1** shows the estimated domestic demands of the existing 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, Bachelor	2	1.4	350	980	0.01	2,450	0.03	5,390	0.06
Apartment, 1-Bedroom	8	1.4		3,920	0.05	9,800	0.11	21,560	0.25
Total	***10***			***4,900***	***0.06***	***12,250***	***0.14***	***26,950***	***0.31***

The fire flow required was determined following the Fire Underwriter Survey (FUS) method and is provided in the attached worksheet. The existing building was classified as ordinary construction with building contents that are limited in combustibility. It is understood that the building does not have a sprinkler system. It was assumed that the basement is more than 50% below ground level. The resulting total required fire flow is 8,000 L/min (133 L/s) for a duration of 2.00 hours.

In summary:

- AVDY = 4,900 L/d (0.06 L/s);
- MXDY = 12,250 L/d (0.14 L/s);
- PKHR = 26,950 L/d (0.31 L/s); and,
- Fire Flow = 8,000 L/min (133 L/s)

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

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

Regards,

Tony Mak

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

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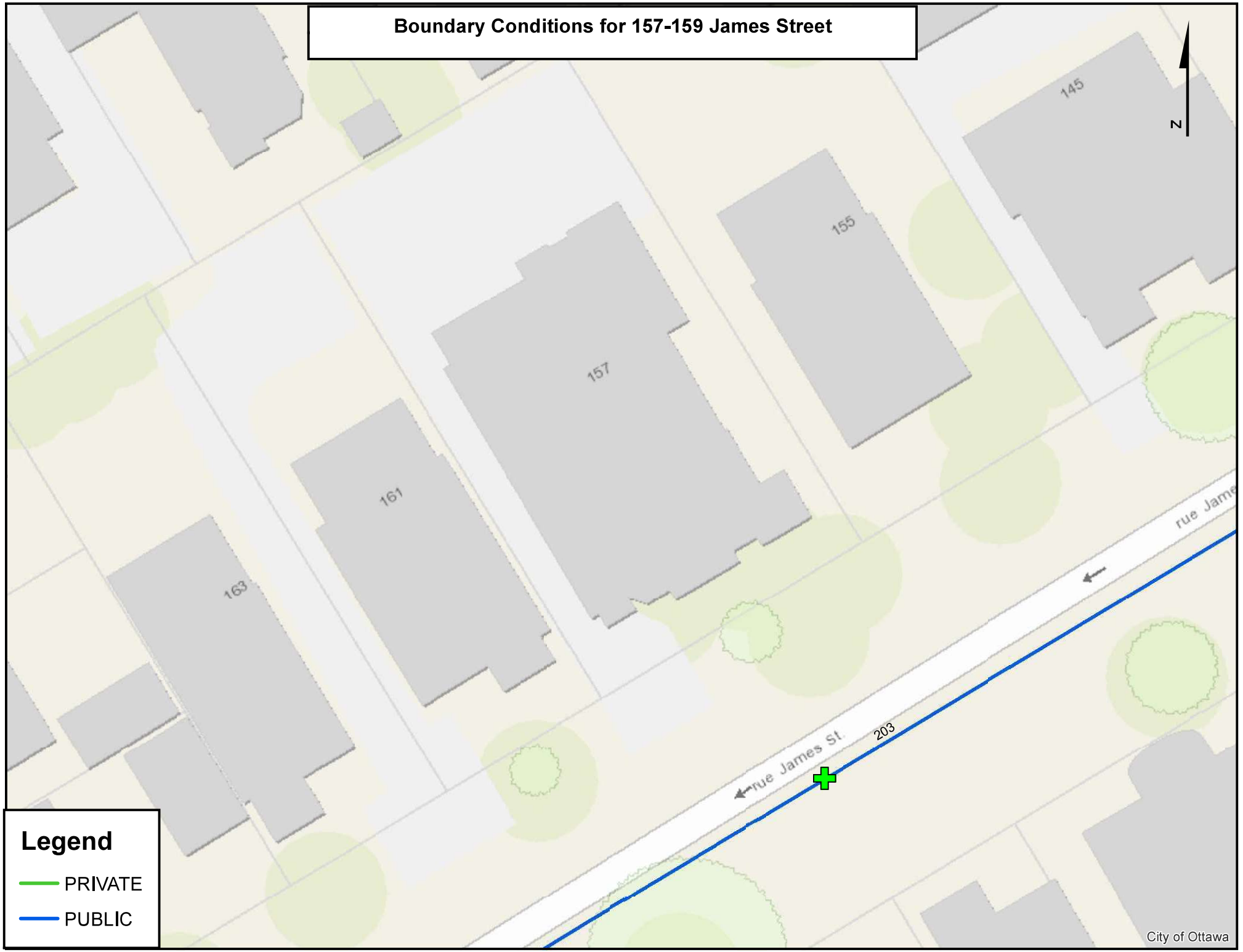
Boundary Conditions for 157-159 James Street
N
145
155
157
161
163
rue James St.
203
rue Jame
Legend
PRIVATE
PUBLIC
City of Ottawa

ATTACHMENT 6 : SUPPORTING HYDRAULIC CALCULATIONS

Supporting Hydraulic Calculations

Stantec Project #: 163401084
Project Name: 157-159 James St
Date: January 6, 2022
Data inputted by: Christène Razafimaharo, M.Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Boundary Conditions provided by the City:

Scenario 1: Peak Hour (Min HGL): 106.8 m;
Scenario 2: Average Day (Max HGL): 115.4 m; and
Scenario 3: Maximum Day plus Fire Flow: 105.6 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) = 106.8 and hz (m) = 73.

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

hp (m) = HGL - hz
∴ hp = 106.8 - 73.0 m = 33.8 m.

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

P (kPa) = (ρ * g * hp) / 1000 *(2)*

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

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

P (kPa) = (1000 * 9.81 * 33.8) / 1000
∴ P = 331 kPa.

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

P = 48 psi.

Applying the same procedures, the pressures under Scenario 2 and Scenario 3 are calculated as follows:
Scenario 2: P = 60 psi; and Scenario 3: P = 46 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 331 kPa (48 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 416 kPa (60 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 320 kPa (46 psi)

ATTACHMENT 7 : FIGURE 2 – HYDRANT SPACING

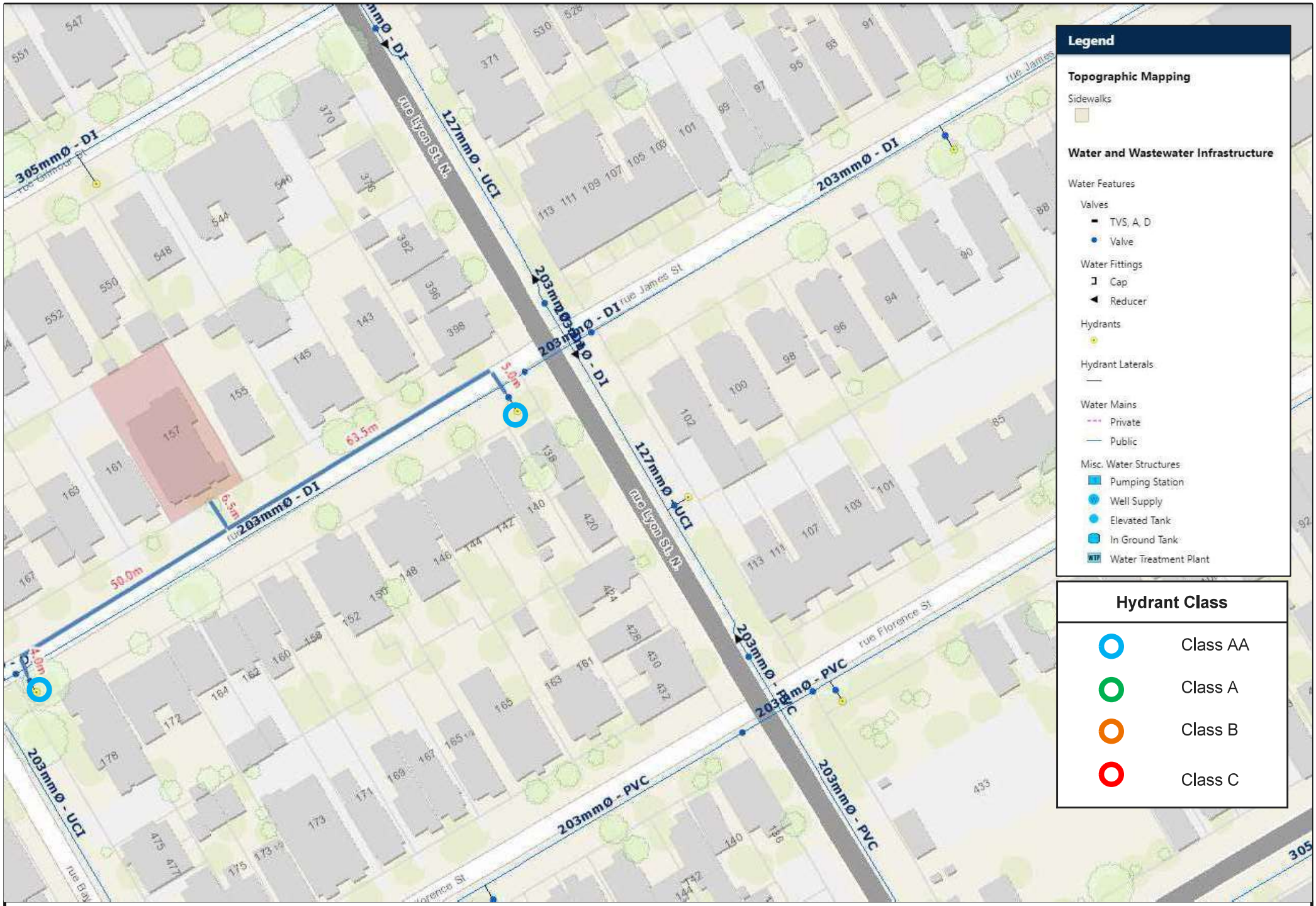

Figure 2: Hydrant Spacing

Source: geoOttawa 2021; *Contains information licensed under the Open Government Licence – City of Ottawa.*

EXISTING THREE-STOREY

RESIDENTIAL APARTMENT BUILDING

157-159 JAMES STREET

CITY OF OTTAWA

APPENDIX D

SANITARY SEWER DESIGN SHEET

PAGE 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

DENSITY
- 2 BEDROOM = 2.1 PPU
- 1 BEDROOM = 1.4 PPU

$M = 1 + \frac{14}{4 + \sqrt{P}} * K$ where P population in 1000's, K=0.8

$Q(p) = \frac{PqM}{86.4}$ (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)
157-159 JAMES STREET	SITE	EX. 300ø COMBINED SEWER	17.5	0.06	17.5	0.06	3.51	0.20	0.02	0.22	17.5	150	PVC	1.0 (min.)	19.8	1.12	

LICENSED PROFESSIONAL ENGINEER
10/20/21
TONY L-M. MAK
PROVINCE OF ONTARIO

File# 821-83	DESIGN TLM	PROJECT 157-159 JAMES STREET	SHEET No. 1 of 1
	CHECKED TLM	PROPOSED RE-DEVELOPMENT OF EX.	
	DATE OCT 2021	THREE STOREY APARTMENT BUILDING	

(REV.#1 JAN.2022)
(REV.#2 JULY, 2022)