

**PROPOSED
THREE-STOREY APARTMENT BUILDING ADDITION
LOT RE-DEVELOPEMENT SITE
PART OF LOT "D"
R-PLAN 82717
314 BELL STREET SOUTH
CITY OF OTTAWA**

**SERVICEABILITY REPORT
REPORT R-821-102A**

T.L. MAK ENGINEERING CONSULTANTS LTD.

FEBRUARY 2022

REFERENCE FILE NUMBER 821-102

Introduction

The developer of this property is proposed to redevelop the existing residential lot described as Part of Lot D R-Plan 82717 by constructing a new three-storey residential apartment building addition consisting of eight (2)-bedroom apartments to the existing 3-storey apartment building which currently occupies the south half of the lot.

The municipal address of this property is referenced as 314 Bell Street South and it is located in the City Ward (17 – Capital). The site is situated on the east side of Bell Street South, the lot is south of Champlain Street, and north of Henry Street, see site plan and legal survey plan in Appendix A for details.

The total area of this property is ± 0.0497 hectares. In addition to the three-storey residential building addition the other development features will comprise of an interlock paver access to the front and south side entrance of the building, an amenity area in the rear yard, bicycle parking, 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 Report (Report No. PG5905-1) dated August 23, 2021.

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

Existing Site Conditions and Servicing

This property is currently occupied by a three-storey brick and vinyl side 3-storey apartment residential building, which houses four (2)-bedroom units and with the remaining surfaces of the lot being asphalted for vehicle parking and vehicle access along the south side of the existing building. For additional details of the site's pre-development condition, refer to the Google Image (2020) and aerial photography from (GeoOttawa-2019) in Appendix B.

The site is mainly hard impermeable surfaces that are covered with roof areas, asphalt laneway walkway, and rear yard parking.

The topography of the land is found to be entirely sloping from east to west or front to back.

There are existing water and sanitary service laterals currently servicing the existing apartment on Bell Street South which will be removed and interconnected to the proposed new services. The existing water service shall be blanked at the main and the existing building laterals shall be capped at the front property line for re-development of this lot.

As for the availability of underground municipal services, there are existing municipal services along Bell Street South in front of this property consisting of a 600mm diameter combined sewer and a 200mm diameter watermain for development of this property. Refer to the City of Ottawa Bell Street plan and profile drawings included in Appendix C for details.

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

Proposed Residential Apartment Building Site

There are no requirements for vehicle access or parking for this site. Interlock pavers are proposed at the front and south side of the new building for pedestrian access. Bicycle parking and spaces and covered garage enclosure are proposed at the rear yard of the new building addition area.

A. Water Supply

The proposed building addition located within Pressure Zone 1W at 314 Bell Street South will be a 3-storey residential apartment building with a basement. The building contains four (2)-bedroom units. Each floor covers an area of approximately 1,375 ft² (127.7 m²) for a gross floor area of 5,500 ft² (511 m²). The building is to be serviced by the 200 mm diameter watermain along Bell Street South.

The ground elevation on the property in question is approximately 73.98 m, as obtained from the attached **Topographic Plan** in Appendix D.

Demand Projections

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines and 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 demands 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	4	2.1	280	2,352	0.03	5,880	0.07	12,936	0.15
Total	4			2,352	0.03	5,880	0.07	12,936	0.15

The fire flow required was determined following the Fire Underwriter Survey (FUS) method and is provided in the attached worksheet. For this analysis, the building was classified as wood frame construction with building contents that are limited in combustibility. It is understood that it will not have a sprinkler system. The basement is 45% (less than 50%) below ground level. The resulting total required fire flow is 10,000 L/min (167 L/s) for a duration of 2.00 hours. Should the basement be built 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.

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

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

- AVDY = 2,352 L/d (0.03 L/s)
- MXDY = 5,880 L/d (0.07 L/s);
- PKHR = 12,936 L/d (0.15 L/s);
- Fire Flow for basement less than 50% below ground level = 10,000 L/min (167 L/s), and
- Fire Flow for basement more than 50% below ground level = 8,000 L/min (133L/s).

Boundary Conditions

The hydraulic gradeline (HGL) boundary conditions for 314 Bell Street South, as presented in **Table 2**, were provided by the City on October 28, 2021 (see attached **Water Boundary Conditions Email** in Appendix D).

Table 2: Boundary Conditions

Demand Scenario	Head (m)
Minimum HGL (Peak Hour)	106.7
Maximum HGL (Average Day)	115.1
Maximum Day + Fire Flow (133 L/s)	104.6
Maximum Day + Fire Flow (167 L/s)	102.0

Hydraulic Analysis

Peak Hour & Average Day

During peak hour demands, the resulting minimum hydraulic gradeline of 106.7 m corresponds to a peak hour pressure of 321 kPa (47 psi). This value is above the minimum pressure objective of 276 kPa (40 psi) for residential buildings up to two storeys. The peak hour pressure exceeds this objective and is therefore considered acceptable. Given that this building addition 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 115.1 m corresponds to a maximum pressure of 403 kPa (58 psi). This value is below the maximum pressure objective of 552 kPa (80 psi) and is therefore considered acceptable.

Supporting hydraulic calculations are attached in Appendix D.

Maximum Day + Fire Flow

A maximum day plus fire flow hydraulic gradeline of 102.0 m corresponds to a residual pressure of 275 kPa (40 psi) at this location and is well above the minimum residual pressure requirements of 140 kPa (20 psi).

The combined hydrant flow coverage for the building was estimated 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 identify hydrant class. Two Class AA hydrants are located within 76 m from the site, with a capacity of up to 5,678 L/min each. A third Class AA hydrant is located within 76 m to 122 m from the site, with a capacity of up to 3,785 L/min. The combined hydrant flow coverage for 314 Bell St S is therefore 15,141 L/min, which is above the FUS required fire flow (RFF) of 10,000 L/min (if the basement is less than 50% below ground level).

Hydrant coverage and classes are illustrated in **Figure 2** attached in Appendix D. 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	
314 Bell St S	8,000 ⁽¹⁾ -10,000 ⁽²⁾	AA	2	5,678	1	3,785	15,141
		A					
		B					
		C					
Notes (1) Basement more than 50% below ground level. (2) Basement less than 50% below ground level.							

In conclusion, based on the boundary conditions provided, the watermain along Bell Street South 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.

B. Sanitary Flow

The peak sanitary flow for the 4 unit apartment building addition, which compromise of four (2)-bedroom apartment units, is estimated at $Q = 0.13$ L/s with an infiltration rate of 0.02 L/s. Refer to Appendix E regarding details of sanitary flow calculations. By combining peak sanitary flow from the existing (4) unit apartment building, the total peak sanitary flow for this site is **0.24 L/s**. This flow will enter the existing 600mm dia. combined sewer on Bell Street South via the proposed 150 mm dia. PVC sanitary lateral from the combined two (2) residential apartment buildings.

Presently the existing peak sanitary flow of the site from the existing apartment building is $Q = 0.13$ L/s with an infiltration rate of 0.2 L/s. The net increase in flow from this proposed development is **0.11 L/s**.

The peak sanitary flow of 0.24 L/s will be subtracted from the net allowable controlled release rate regarding stormwater management controlled flow for this site into the existing combined sewer.

Waste water from the Bell Street South 600mm dia. combined sewer then in turn outlets north then westward into the existing 1650mm dia. concrete combined sewer located along Preston Street.

C. Storm Flow

The storm-water outlet for the proposed development property will be the existing 600mm dia. combined sewer located on Bell Street South. Stormwater attenuation on-site for the new building addition will be accomplished by means of rooftop storage with controlled roof drains that regulate flow off-site.

The building foundation weeping-tile drainage system shall have its own separate pipe for gravity flow where weeping-tile water is outletted via a 150mm diameter storm pipe to the existing 600mm diameter combined sewer. The stormwater outlet for the rooftop water from roof drains will be a separately designated proposed 150mm diameter PVC pipe that will also be outletted directly into the existing 600mm diameter combined sewer.

For on-site Storm Water Management attenuation measures, three (3) roof drains are proposed for the new 3-storey apartment building addition with flat roof to restrict flow at a rate of 0.32 L/s per drain or $3 \times 0.32 \text{ L/s} = 0.96 \text{ L/s}$ into the Bell Street South combined sewer. The calculated net allowable controlled release rate from this site is 5.07 L/s ($5.31 \text{ L/s} - 0 \text{ L/s} - 0.24 \text{ L/s}$). Therefore, the designed restricted flow of 0.96 L/s proposed for this site is less than the net allowable controlled release rate calculated at 5.07 L/s. See Storm Drainage Report (R-821-102) for details.

Based on the residential site plan from the owner's architect, the average post-development runoff coefficient for this lot is estimated at $C = 0.66$ and $A = 0.0497$ hectares.

An estimation of the pre-development flow condition was carried out using the criteria accepted by the City of Ottawa. If post-development C value exceeds the lesser of the $C_{pre} = 0.89$ or $C_{allow} = 0.5$ (max) then SWM is required. So from our calculations, the $C_{allow} = 0.5$ value will be used at $t_c = 10$ minutes for pre-development allowable flow calculation off-site.

The pre-development flow rate calculation into the 600mm dia. combined sewer for this residential area is the lesser of the two (2)-year storm event where $C_{allow} = 0.5$ (max.) runoff value and $t_c = 10$ minutes or the average C_{pre} value which is 0.89 using $t_c = 10$ minutes. Because this site $C_{post} = 0.66$ and $C_{pre} = 0.5$ then SWM measures are required.

Therefore, based on our calculation, on-site retention is required for the proposed new building, because the site post-development C value of 0.66 is greater than the $C_{pre} = 0.5$.

In assessing the 2-Year up to the 100-Year storm events under pre-development conditions to the same storm events under post-development conditions with implementation of the proposed on-site SWM measures (flat rooftop storage with (3) specified controlled drains) it was determined that post development release rates has been improved for the site compared with the current existing flow rates.

The pre-development flow at the 2-Year storm event is estimated at 9.44 L/s and 24.68 L/s for the 100-Year event. By incorporating the proposed SWM attenuation measures, the post development 2-Year flow off-site is estimated at 5.54 L/s (4.34 L/s + 0.96 L/s + 0.24 L/s) and the 100-Year flow is estimated at 12.87 L/s (11.67 L/s + 0.96 L/s + 0.24 L/s).

Therefore for this proposed development site, the two (2)-Year post development release rate of 5.54 L/s is less than the 2-Year pre-development flow rate of 9.44 L/s. For storm events up to and including the 100-Year event, the total 100-Year post-development release rate of 12.87 L/s is less than the 100-Year pre-development flow of 24.68 L/s.

The storage volume for the two (2)-year, five (5)-year and up to the 100-year storm event will be stored by means of flat rooftop at the third floor of the new 3-storey apartment building addition. Also refer to the site storm drainage report (Report No. R-821-102) for further details.

To control the two (2)-year storm water release rate to a flow rate of 0.96 L/s, a site storage volume of approximately 1.17 m³ minimum is required during the two (2)-year event. For this site, three (3) flat rooftop storage areas will be used for stormwater management attenuation.

During the two (2)-year storm event for the flat rooftop storage, the ponding depth of rooftop area 1, 2, and 3 is estimated at 100mm at the drain and 0mm at the roof perimeter, assuming a 2.0% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 0.63 m³, roof storage available at Roof Area 2 is 0.71 m³ and the rooftop storage available at Roof Area 3 is 0.60 m³, for a total of 1.94 m³, which is greater than the required volume of 1.17 m³.

To control the five (5)-year stormwater release rate off-site to a net allowable rate of 0.96 L/s, a site storage volume of approximately 1.97 m³ minimum is required during the five (5)-year event.

During the five (5)-year storm event for the flat rooftop storage, the ponding depth of Roof Area 1, 2 and 3 is estimated at 120 mm at the drain and 0mm at the roof perimeter, assuming a 2.0% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 1.01 m³, Roof Area 2 is 1.23 m³ and the rooftop storage available at Roof Area 3 is 0.95 m³, for a total of 3.19 m³, which is greater than the required volume of 1.97 m³.

To control the 100-year stormwater release rate off-site to a net allowable rate of 0.96 L/s, a site storage volume of approximately 4.90 m³ minimum is required during the 100-year event.

During the 100-year storm event for the flat rooftop storage, the ponding depth of Roof Area 1, 2 and 3 is estimated at 150 mm at the drain and 0mm at the roof perimeter, assuming a 2.0% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 2.09 m³, Roof Area 2 is 2.37 m³ and the rooftop storage available at Roof Area 3 is 1.90 m³, for a total of 6.36 m³, which is greater than the required volume of 4.90 m³.

Therefore, by means of flat building rooftop storage and grading the site to the proposed grades as shown on the Proposed Grading and Servicing Plan and Proposed Rooftop Stormwater Management Plan Dwg. 821-102 G-1 and 821-102 SWM-1 respectively, the desirable two (2)-year, five (5)-year storm and 100-year storm event detention volume of 1.94 m³, 3.19 m³ and 6.36 m³ respectively will be available on site.

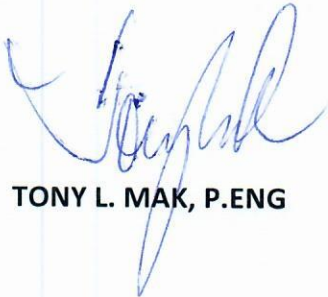
The building weeping tile drainage will outlet via its separate 150mm diameter PVC storm lateral. The roof drains will be outletted also via a separate 150mm PVC storm lateral, where upon both laterals are connected directly to the existing Bell Street South 600mm diameter combined sewer. Refer to the proposed Grading and Servicing Plan Dwg. 821-102 G-1 for details.

Erosion and Sediment Control

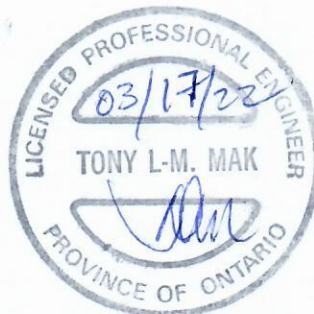
The contractor shall implement Best Management Practices to provide for protection of the receiving storm sewer during construction activities. These practices are required to ensure no sediment and/or associated pollutants are released to the receiving watercourse. These practices include installation of a "silt sack" catch basin sediment control device or equal in catch basins as recommended by manufacturer on-site and off-site within the Bell Street South 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. #821-102 ESC-1 for details.

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

PREPARED BY T.L. MAK ENGINEERING CONSULTANTS LTD.

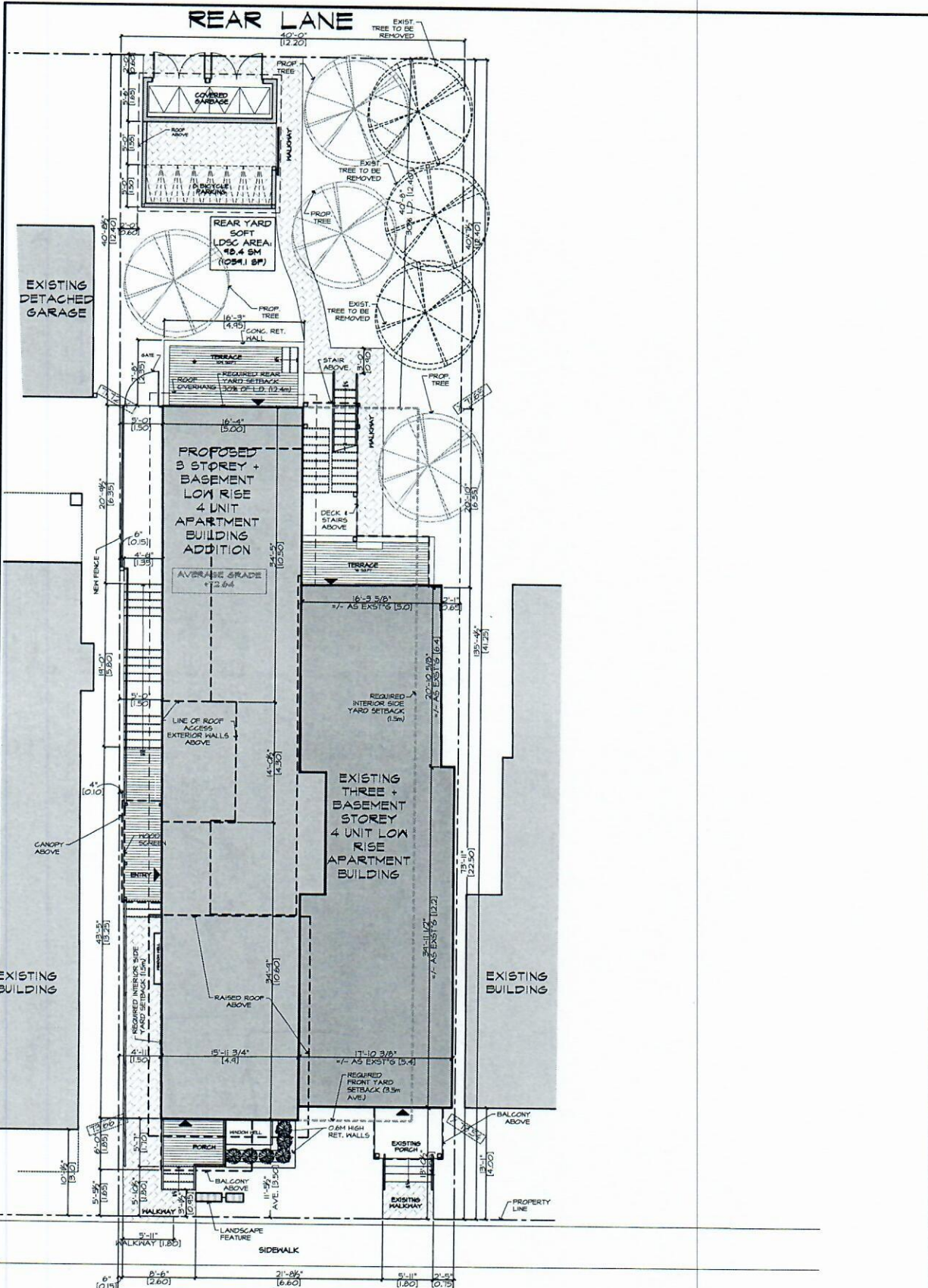


TONY L. MAK, P.ENG

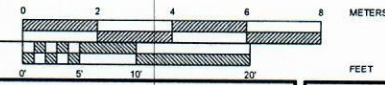


**PROPOSED
THREE-STOREY APARTMENT BUILDING ADDITION
LOT RE-DEVELOPEMENT SITE
PART OF LOT "D"
R-PLAN 82717
314 BELL STREET SOUTH
CITY OF OTTAWA**

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



BELL STREET S.
SITE PLAN
 SCALE: 3/32" = 1'-0"



A1

DWG No.

DATE	2018-09-28
CHECKED	JPH
DWG BY	AS
PROJECT No.:	2018-22

1	CLIENT REVIEW	28.02	2018
2	CLIENT REVIEW	05.02	2000
3	PLANNING REVIEW	11.06	2000
4	CLIENT REVIEW	22.08	2000
5	CLIENT REVIEW	01.09	2001
6	CLIENT REVIEW	12.02	2001
7	CLIENT REVIEW	09.08	2001
8	SFC SUB.	05.07	2000
9	SFC REV.	12.01	2000
10	2A REV.	02.12	2012

314 BELL ST. S.

PROJECT TITLE

314 Bell Street S. S.
 0410 320 0000
 0410 320 0000
 0410 320 0000

TOPOGRAPHICAL PLAN OF

PART OF LOT D
REGISTERED PLAN 82717
CITY OF OTTAWA

Prepared by
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

13 2009
Date

E.H. Heneyer O.L.S.
Date

Revised to update schedule (last December 4, 2009)
Revised to show building under construction March 23, 2010



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

Notes & Legend

- Lin
 - S
 - W
 - G
 - CHW
 - P-W
 - CB
 - SP
 - Invert
 - T/G
 - Invert
 - Deciduous Tree
 - Chain Link Fence
 - Diameter
 - Location of Elevations
 - Location of Elevations (Top of Concrete Wall)
 - Centreline
 - Property Line
- Manhole (Combined)
 - Underground Combined Sewer
 - Underground Water
 - Underground Gas
 - Overhead Wires
 - Wooden Pole
 - Conduit Bases
 - Water Stand Post
 - Invert
 - Top of Grate
 - Deciduous Tree
 - Chain Link Fence
 - Diameter
 - Location of Elevations
 - Location of Elevations (Top of Concrete Wall)
 - Centreline
 - Property Line

SITE AREA = 496.8 m²

NOTES

Topographic data was collected under Winter Conditions. Snow cover and ice preclude determining location and elevation of some topographical data that is otherwise visible.

ELEVATION NOTES

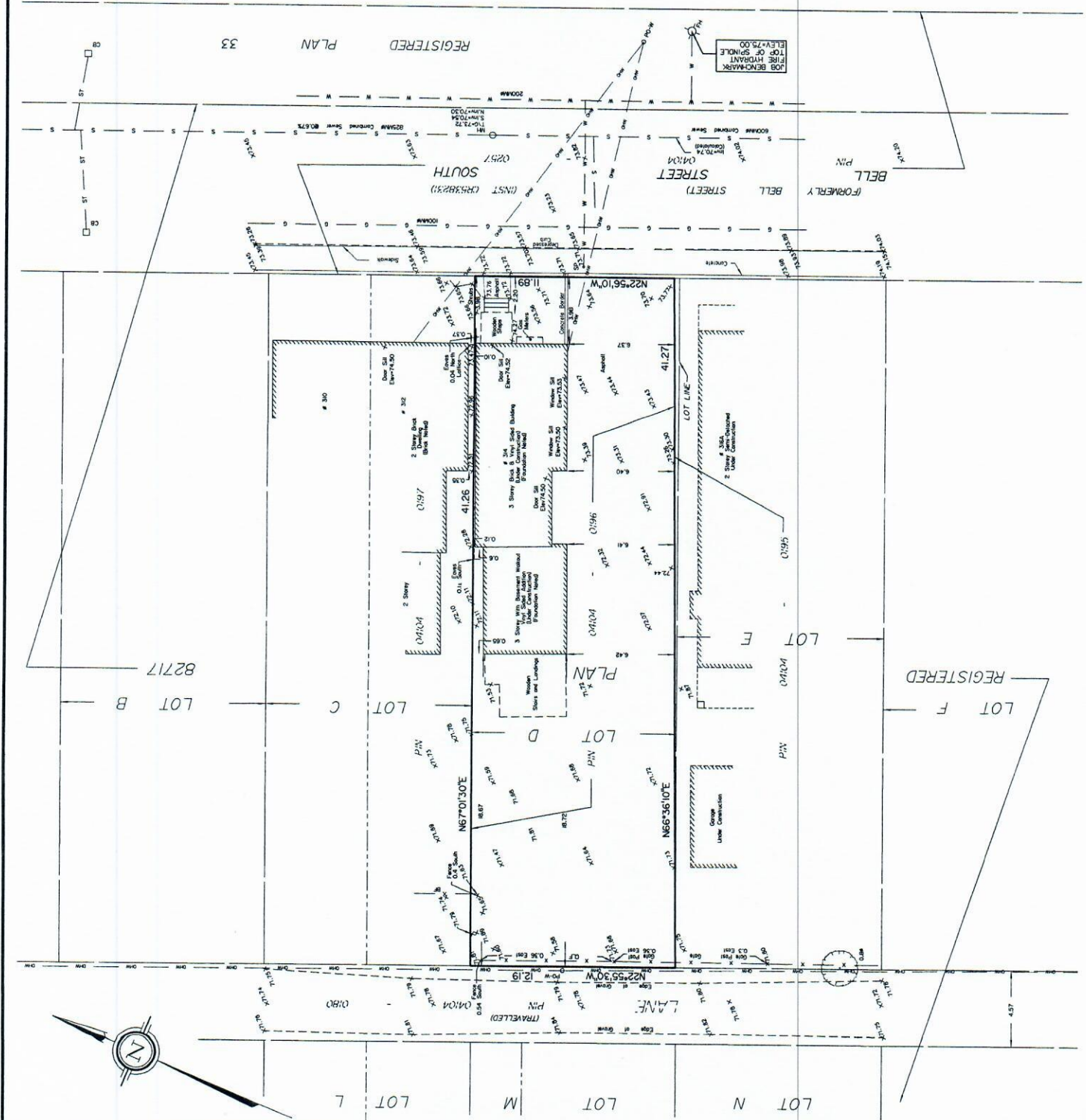
1. Elevations shown are referred to geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and bear its relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. Utility drawings 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.
4. Underground utilities and inverts are taken from City of Ottawa Engineering drawing 2807 Sheet 4 of 16.

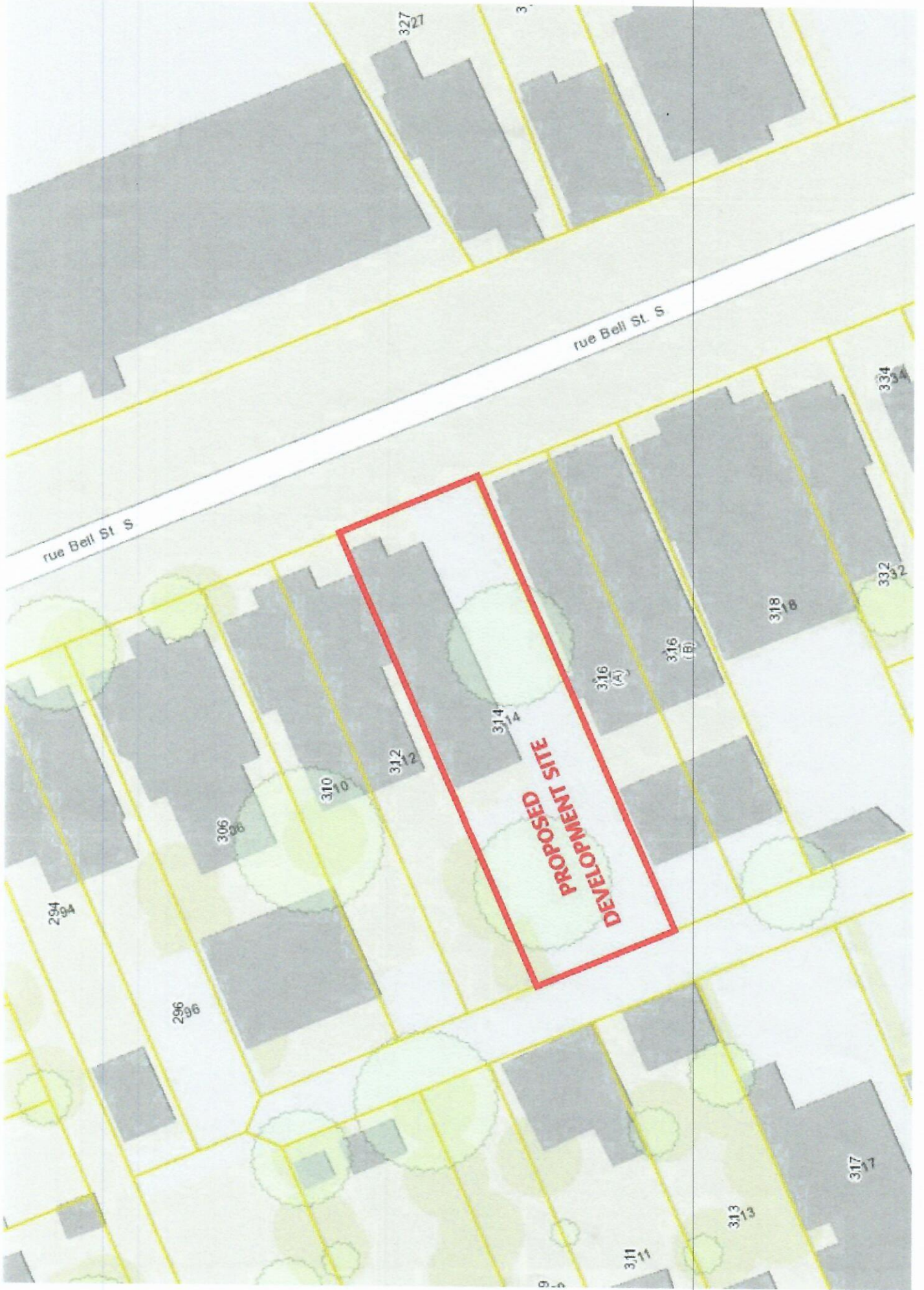
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

14 Concession Road, Suite 500
Newmarket, Ont. R2E 7S8
Phone: (905) 721-0800 / Fax: (905) 721-0709
Land Surveyors (Lic. No. 9968-08, P.Eng. P.O. 24,6777-3-10 P.1)



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THREE-STOREY APARTMENT BUILDING ADDITION
LOT RE-DEVELOPEMENT SITE
PART OF LOT "D"
R-PLAN 82717
314 BELL STREET SOUTH
CITY OF OTTAWA**

**APPENDIX B
SITE PRE-DEVELOPMENT CONDITION
GOOGLE IMAGE (2020)
AND
AERIAL PHOTOGRAPHY 2019 (GEOOTTAWA)**



rue Bell St. S.

DEVELOPMENT SITE

284

296

306

310

312

314

316 (A)

316 (B)

318

322

324

309

311

313

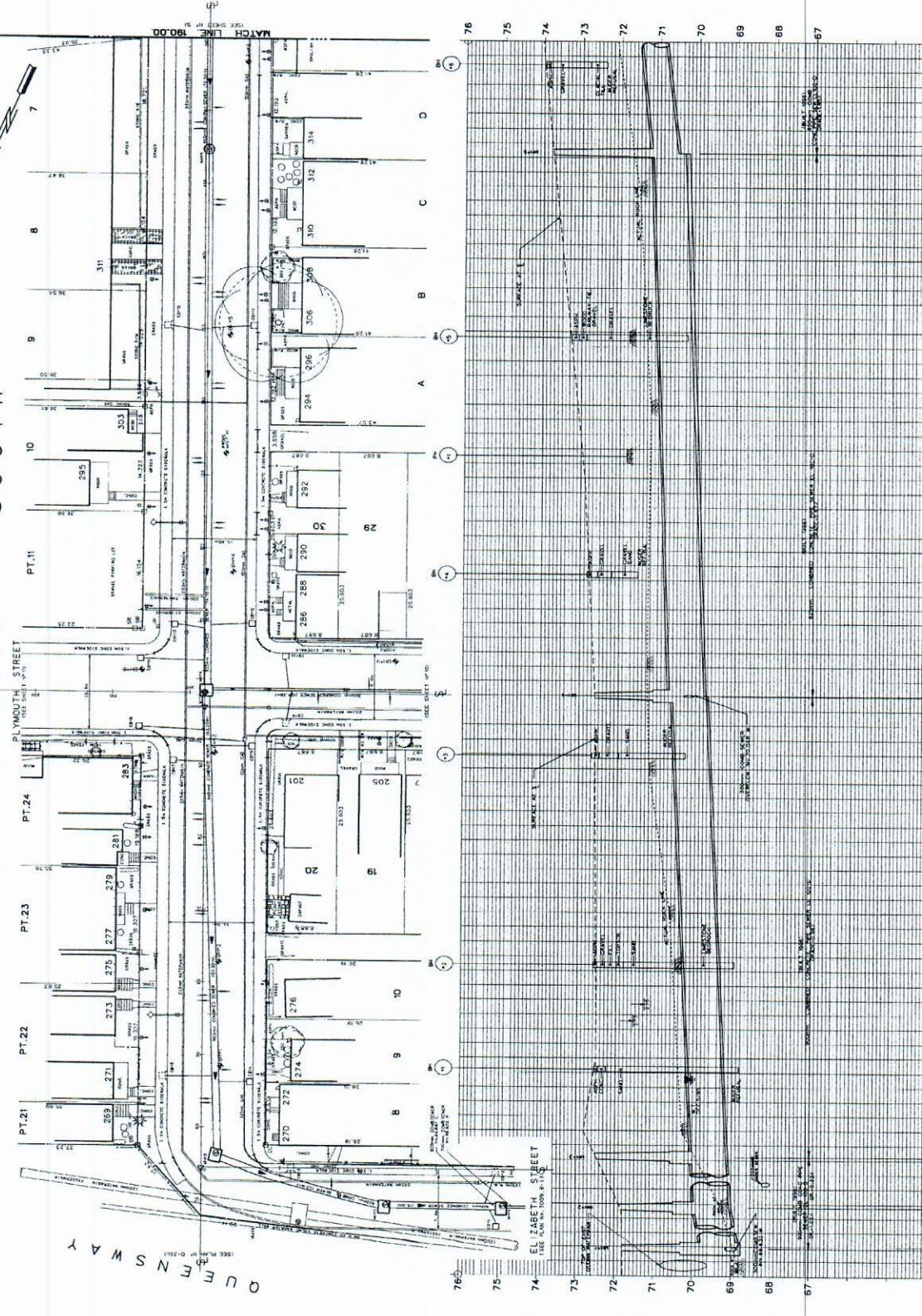
317



**PROPOSED
THREE-STOREY APARTMENT BUILDING ADDITION
LOT RE-DEVELOPEMENT SITE
PART OF LOT "D"
R-PLAN 82717
314 BELL STREET SOUTH
CITY OF OTTAWA**

**APPENDIX C
BELL STREET SOUTH
CITY OF OTTAWA
PLAN AND PROFILE
AND
UCC DRAWING**

BELL STREET SOUTH



Station	Existing Water	Existing Sewer	Existing Gas	Proposed Water	Proposed Sewer	Proposed Gas	Elevation
76+00							
75+00							
74+00							
73+00							
72+00							
71+00							
70+00							
69+00							
68+00							
67+00							

Revisions

No.	Date	By	Checked By	Drawn By	Approved By
1	10/20/07	W.P.	W.P.	W.P.	W.P.

Design

Prepared by: W.P.
 Checked by: W.P.
 Drawn by: W.P.
 Approved by: W.P.

Field Measurements:

Checked by: W.P.
 Date: 10/20/07
 Station: 2907
 Project: 2907

Notes:

- While illustrations and utilities shown are based from the best available information, they cannot be guaranteed.
- The contractor is responsible to check with utility companies before digging.
- These are not proposed and connections are shown to collect additional information in proposed locations.
- The actual work to be performed during construction of the existing sewer.
- Information taken from: 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 2953, 2954, 2955, 2956, 2957, 2958, 2959, 2960, 2961, 2962, 2963, 2964, 2965, 2966, 2967, 2968, 2969, 2970, 2971, 2972, 2973, 2974, 2975, 2976, 2977, 2978, 2979, 2980, 2981, 2982, 2983, 2984, 2985, 2986, 2987, 2988, 2989, 2990, 2991, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 2999, 3000.

City of Ottawa
 Ville d'Ottawa

Department of Engineering and Works
 Engineering Branch
 Design and Construction Division

110 SUSSEX DRIVE, SUITE 1000, OTTAWA, ONTARIO, CANADA K1S 4L6

E.M. Robinson
 CONSULTANT

W.R. Cole, P.Eng.
 CONSULTANT

BELL STREET SOUTH
 FROM ELIZABETH STREET TO CH. 190.00

Project No: 2907
 Date: 10/20/07
 Scale: 1:500
 Sheet: 4 of 18

REVISIONS / REVISIONS	DATE	BY
ISSUED FROM TOWN OF OTTAWA PLAN		
REVISION FROM TOWN OF OTTAWA PLAN		
APPROVED FOR THE TOWN OF OTTAWA		
APPROVED FOR THE TOWN OF OTTAWA		
APPROVED FOR THE TOWN OF OTTAWA		
APPROVED FOR THE TOWN OF OTTAWA		
APPROVED FOR THE TOWN OF OTTAWA		
APPROVED FOR THE TOWN OF OTTAWA		

DATE	BY
MAY 2006	SC
SEPT 2004	EC
MAY 2009	SC

STANDARD SYMBOLOLOGY

- Proposed Pavement
- Proposed Sidewalk
- Proposed Walkway
- Proposed Footway
- Proposed Utility
- Proposed Fence
- Proposed Wall
- Proposed Gate
- Proposed Deck
- Proposed Pool
- Proposed Spa
- Proposed Hot Tub
- Proposed Shed
- Proposed Porch
- Proposed Patio
- Proposed Terrace
- Proposed Stair
- Proposed Ramp
- Proposed Elevation
- Proposed Contour
- Proposed Spot Elevation
- Proposed Benchmark
- Proposed Manhole
- Proposed Catch Basin
- Proposed Valve
- Proposed Meter
- Proposed Transformer
- Proposed Pole
- Proposed Tower
- Proposed Mast
- Proposed Sign
- Proposed Marker
- Proposed Monument
- Proposed Furb
- Proposed Pipe
- Proposed Conduit
- Proposed Cable
- Proposed Duct
- Proposed Raceway
- Proposed Tray
- Proposed Ladder
- Proposed Vault
- Proposed Chamber
- Proposed Basin
- Proposed Tank
- Proposed Reservoir
- Proposed Pond
- Proposed Lake
- Proposed Stream
- Proposed River
- Proposed Canal
- Proposed Ditch
- Proposed Trench
- Proposed Channel
- Proposed Drain
- Proposed Gully
- Proposed Curb
- Proposed Edge
- Proposed Sill
- Proposed Step
- Proposed Threshold
- Proposed Landing
- Proposed Platform
- Proposed Walk
- Proposed Path
- Proposed Trail
- Proposed Road
- Proposed Highway
- Proposed Street
- Proposed Avenue
- Proposed Drive
- Proposed Lane
- Proposed Way
- Proposed Court
- Proposed Place
- Proposed Circle
- Proposed Loop
- Proposed Turn
- Proposed Junction
- Proposed Intersection
- Proposed Roundabout
- Proposed Roundover
- Proposed Roundabout
- Proposed Roundover
- Proposed Roundabout
- Proposed Roundover
- Proposed Roundabout
- Proposed Roundover
- Proposed Roundabout
- Proposed Roundover

CAUTION/WARNING

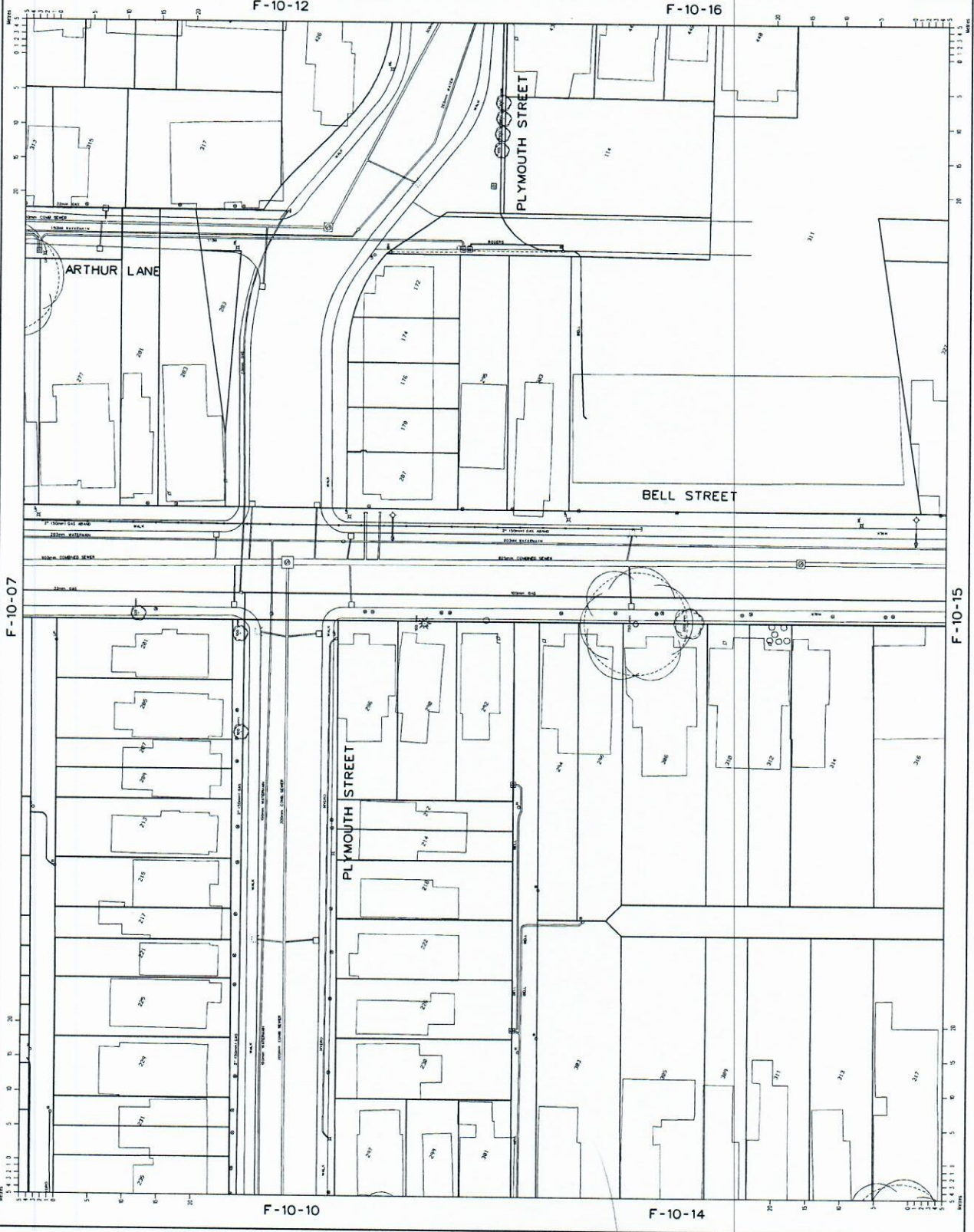
THIS PLAN IS THE PROPERTY OF THE CORPORATION OF OTTAWA. IT IS TO BE USED ONLY FOR THE PROJECT AND AT THE LOCATION INDICATED THEREON. ANY OTHER USE IS STRICTLY PROHIBITED.

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THIS PLAN IS THE PROPERTY OF THE CORPORATION OF OTTAWA. IT IS TO BE USED ONLY FOR THE PROJECT AND AT THE LOCATION INDICATED THEREON. ANY OTHER USE IS STRICTLY PROHIBITED.



DATE	BY
MAY 2006	SC
SEPT 2004	EC
MAY 2009	SC

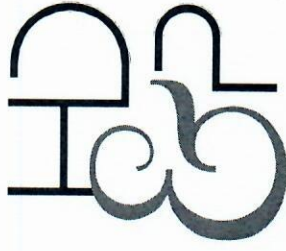


**PROPOSED
THREE-STOREY APARTMENT BUILDING ADDITION
LOT RE-DEVELOPEMENT SITE
PART OF LOT "D"
R-PLAN 82717
314 BELL STREET SOUTH
CITY OF OTTAWA**

**APPENDIX D
CITY OF OTTAWA**

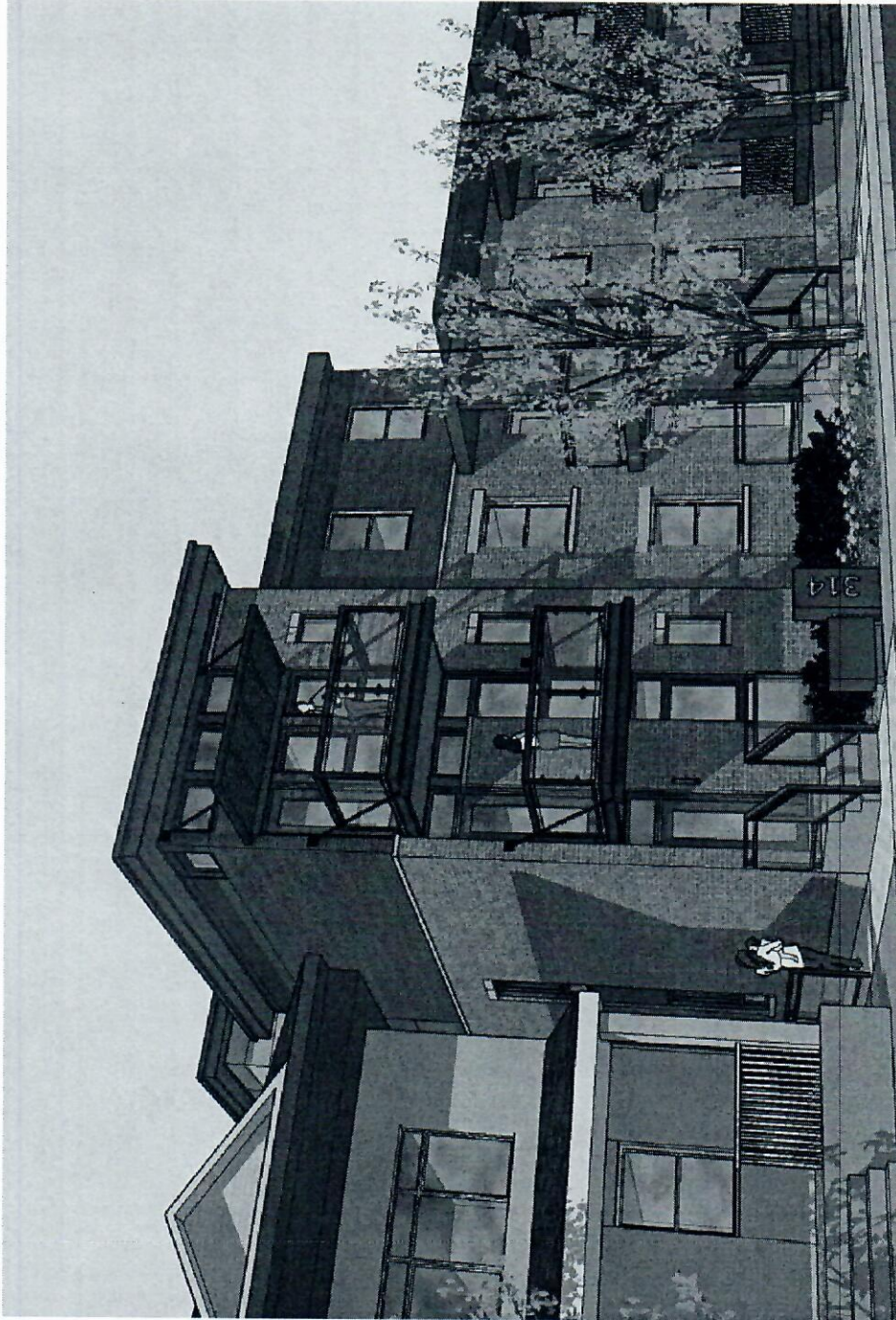
- **SITE PLAN AND TOPOGRAPHIC PLAN**
- **FUS FIRE FLOW CALCULATIONS**
- **FUS EXPOSURE DISTANCE (FIGURE 1)**
- **WATER BOUNDARY CONDITIONS**
- **SUPPORTING HYDRAULIC CALCULATIONS**
- **HYDRANT SPACING (FIGURE 2)**

ATTACHMENT 1: SITE PLAN AND TOPOGRAPHIC PLAN



MODERN | INTELLIGENT
DESIGNS | PLANNING

170 MAIN STREET
OTAWA, ON K1S 1C2
(613) - 232-9081
www.HDandP.ca



314 BELL STREET SOUTH

3 STOREY LOW RISE APARTMENT BUILDING ADDITION
(4 UNIT ADDITION)

R4UD

ZONING

2018-22

PR. NO.

8

REV. NO.

2021-06-16

DATE

314 BELL STREET S.

LOCATION



WINNER



170 Main Street
Ottawa, Ontario
K1P 1K1
info@top.com PLANNING

ALL WORK TO BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL BUILDING CODE (NBC).

IF A PROFESSIONAL ENGINEER OR ARCHITECT APPROVED CONTRACTOR TO EXECUTE THE WORK, THE CONTRACTOR SHALL BE RESPONSIBLE TO REPORT ALL ERRORS AND OMISSIONS TO THE DESIGNER.

ALL PROTECTIVE CODES AND BY-LAWS SHALL BE OBSERVED AND ALL NECESSARY EXCAVATION SERVICES PROVIDED TO THE DESIGNER.

DO NOT SCALE DRAWINGS. CONTACT DESIGNER FOR CLARIFICATION.

SYMBOL LEGEND

+	WATER
○	WELL
⊕	SEWER (SANS HATCHING)
⊖	WATER (SANS HATCHING)
⊗	SMOKE & CO. DETECTOR
⊙	FIRE ALARM
⊚	EMERGENCY LIGHTS
⊛	REGISTER ABOVE
⊜	REGISTER BELOW
⊝	ELECTRICAL PANEL
⊞	FLOOR DRAIN
⊟	AIR BARRIER
⊠	AIR / VAPOUR BARRIER
⊡	SEALANT FOR PERIMETER

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02	
01	SPC SUBMISSION
No.	DATE

PROJECT TITLE:
314 BELL STREET SOUTH OTTAWA, ON

DRAWING TITLE:
SITE PLAN ZONING CHART DEVELOPMENT INFO CONTEXT MAP TABLE OF CONTENTS

PROJECT NO.: 2018-22
DATE: 2021-06-14
SCALE: NOTED
DWG BY: LT

TABLE OF CONTENTS

A1 SITE PLAN ZONING CHART, CONTEXT MAP

A2 BASEMENT PLAN

A3 MAIN FLOOR PLAN

A4 SECOND FLOOR PLAN

A5 THIRD FLOOR PLAN

A6 FOURTH FLOOR PLAN

A7 SECTION

A8 EAST ELEVATION

A9 WEST ELEVATION

A10 NORTH ELEVATION

A11 SOUTH ELEVATION

A12 PERSPECTIVES

DEVELOPMENT INFORMATION

ZONING: R4D
LOT AREA: 496.6 SF (22.96 x 21.67 SF)
EXISTING: 4 UNITS

3 STOREY LEAD + DMPT:
BASEMENT AREA: 1271.65 SF (144.8' x 86.9')
MAIN FLOOR AREA: 1029.65 SF (144.8' x 71.0')
2ND FLOOR AREA: 1029.65 SF (144.8' x 71.0')
TOTAL EXISTING BUILDING AREA: 3330.95 SF (144.8' x 229.69')

3 STOREY LEAD + BASEMENT:
PROPOSED BUILDING AREA:
FOOTPRINT: 1271.65 SF (144.8' x 86.9')
MAIN FLOOR: 1029.65 SF (144.8' x 71.0')
SECOND FLOOR: 1029.65 SF (144.8' x 71.0')
ROOF FLOOR: 1029.65 SF (144.8' x 71.0')
TOTAL PROPOSED ADDITION 6764.48 (BASEMENT U.L.C.) (144.8' x 464.69')

PROPOSED ADDITION UNIT AREAS:
UNIT 1: 2 BEDROOMS (1271.65 SF)
UNIT 2: 2 BEDROOMS (1029.65 SF)
UNIT 3: 2 BEDROOMS (1029.65 SF)
UNIT 4: 2 BEDROOMS (1029.65 SF)
TOTAL: 4 UNITS (8 BEDROOMS) (6764.48 SF)

PARKING REQUIRED:
PROVIDED: 0
BICYCLE PARKING: 6 (PROVIDED IN BRP04)

ZONING CHART

314 Bell Street South - Proposed 3 Storey + 4 Unit Low Rise Apartment Addition to an Existing 3 Storey 4 Unit Low Rise Apartment Building

Performance Standard	Required	Provided
Section 102 Table 10.2A	1500 SM	1500 SM
Max. Lot Area	500 SM	496.6 SM
Max. Building Height	11M	11.0M
Max. Floor-to-Floor Height	4.0M (Average)	3.5M (Average)
Max. Storey Front Setback	1.5M	1.5M
Max. Rear Yard Setback	1.5M	1.5M

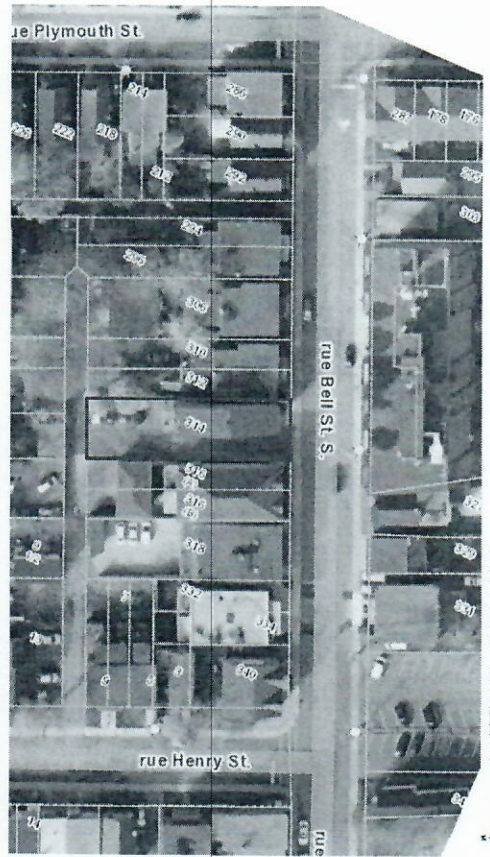
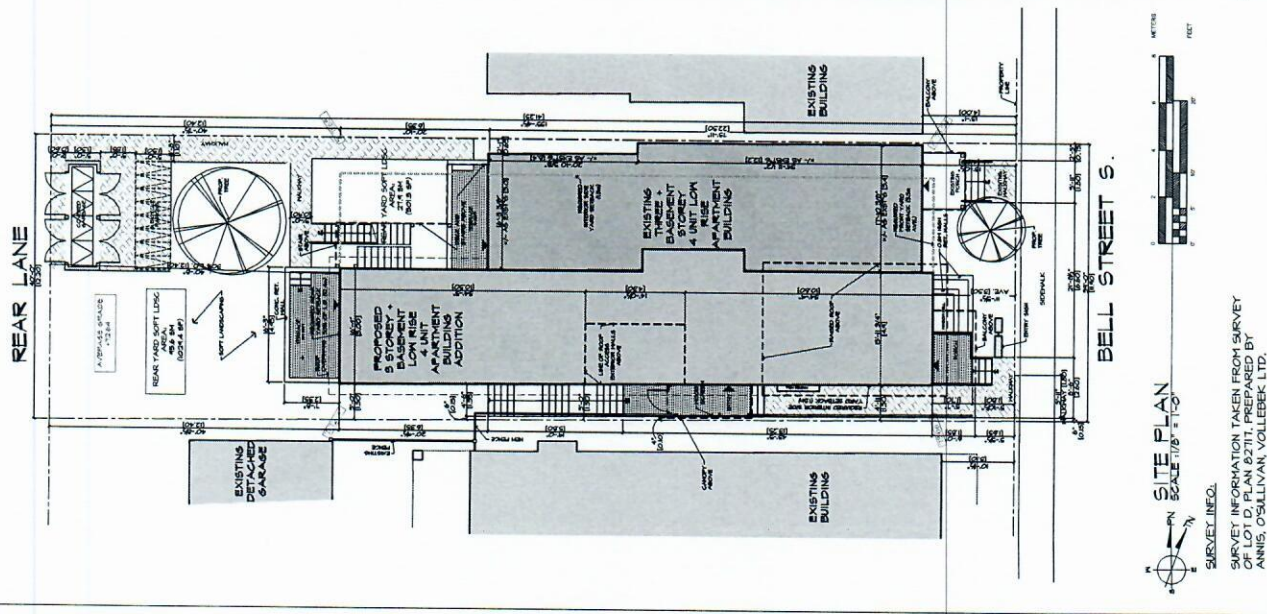
Front Yard Landscaping (Section 101)
(1) Except for a tree that is 400 mm in diameter at 1.37 m above the ground surface, all trees to be removed shall be replaced with a tree of similar or greater size and species, or a shrub of similar or greater size and species, or a combination of trees and shrubs, within a period of 90 days of the completion of the removal of the trees to be replaced.

Front Yard Landscaping (Section 101)
(1) The minimum area of soft landscaping in the front yard is per lot area as follows:
(a) 10% of the lot area, but not less than 20 m² for lots less than 1200 m² and 3% of the lot area, but not less than 120 m² for lots greater than 1200 m².
(b) The minimum area of soft landscaping shall be 3 metres wide and shall be planted with a minimum of 3 trees, or a combination of trees and shrubs, or a combination of trees and shrubs, within a period of 90 days of the completion of the removal of the trees to be replaced.

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(1) The minimum area of soft landscaping in the front yard is per lot area as follows:
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Section 101	1500 SM	1500 SM
Section 102	500 SM	496.6 SM
Section 103	11M	11.0M
Section 104	4.0M (Average)	3.5M (Average)
Section 105	1.5M	1.5M
Section 106	1.5M	1.5M
Section 107	1.5M	1.5M
Section 108	1.5M	1.5M
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Section 110	1.5M	1.5M
Section 111	1.5M	1.5M
Section 112	1.5M	1.5M
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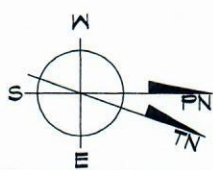
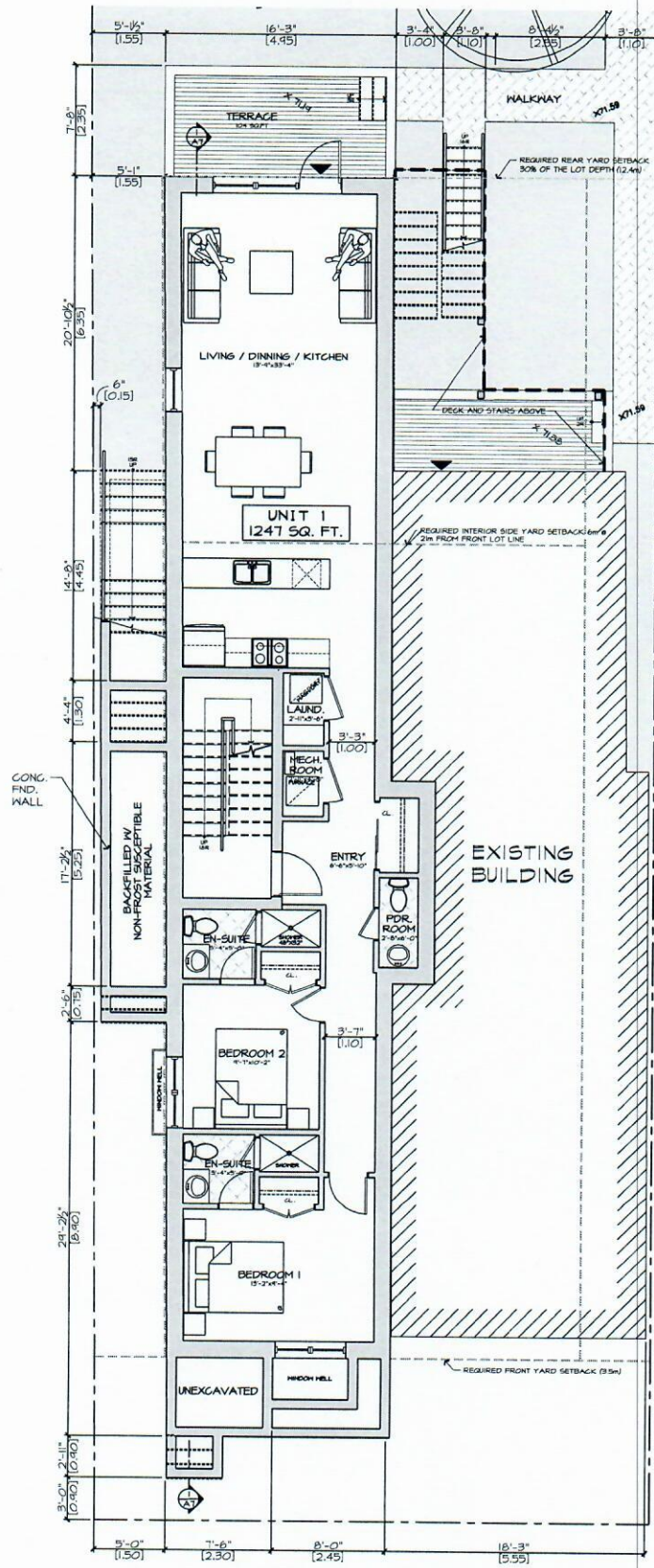


CONTEXT GEO MAP

SITE PLAN
SCALE: 1/8" = 1'-0"

SURVEY INFO.
SURVEY INFORMATION TAKEN FROM SURVEY OF LOT D, PLAN 82711, PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEK LTD.

PLOT DATE: 2021-06-14



BASEMENT FLOOR PLAN-OPT.A
 SCALE: 1/8" = 1'-0"
 1375 65F

A2
 DWG NO.

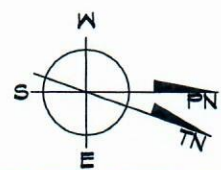
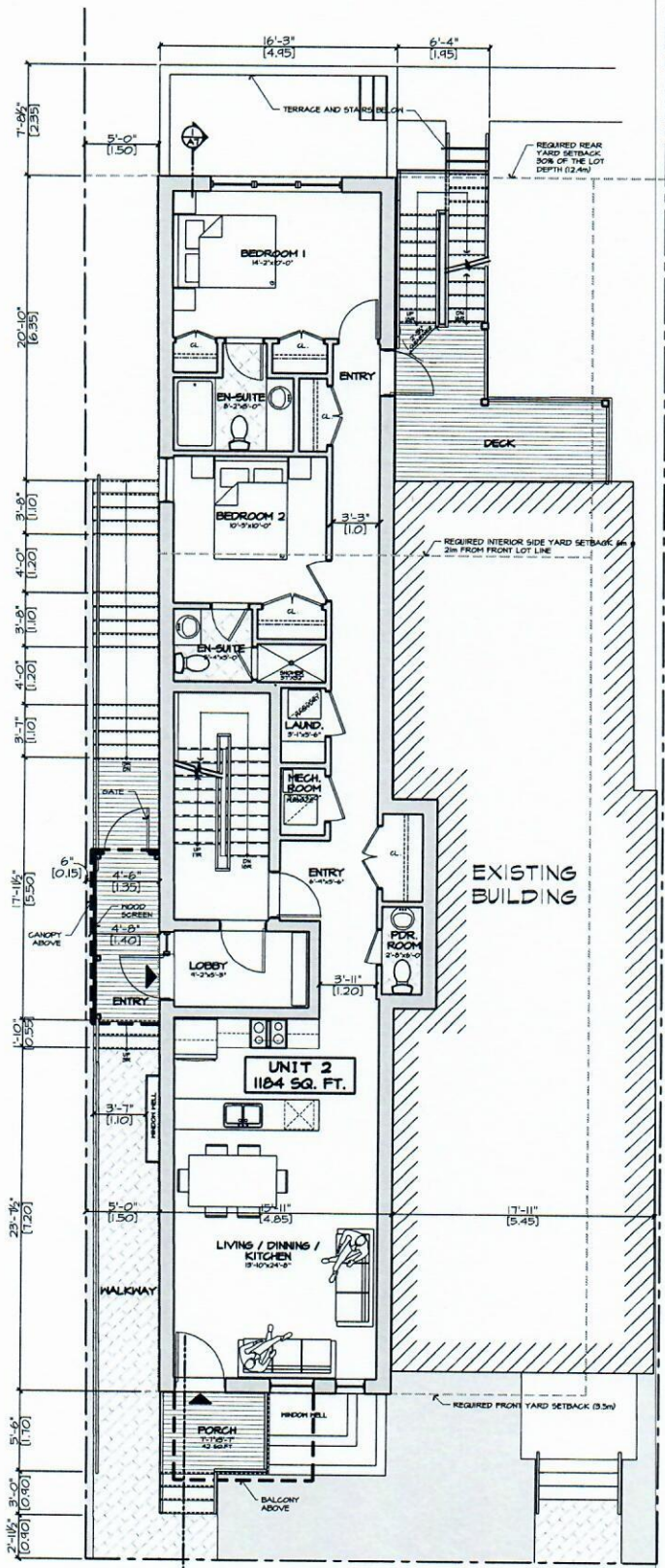
DATE	2018-09-28
CHECKED	JFH
DWG BY	AS

PROJECT NO.:
2018-22

1	CLIENT	28-09-2018
2	CLIENT	05-03-2020
3a	PERMITS	2020
4	CLIENT	24-08-2020
5	CLIENT	2020
6	CLIENT	2020
7	REVIEW	28-01-2021
8	SPC SUB	16-09-2021

314 BELL ST. S.

PROJECT TITLE



FIRST FLOOR PLAN
 SCALE: 1/8" = 1'-0" 1375 GSF

A3

DATE: 2018-05-28
 CHECKED: JPH
 DWG BY: AS

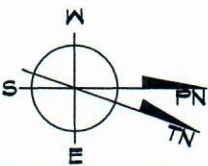
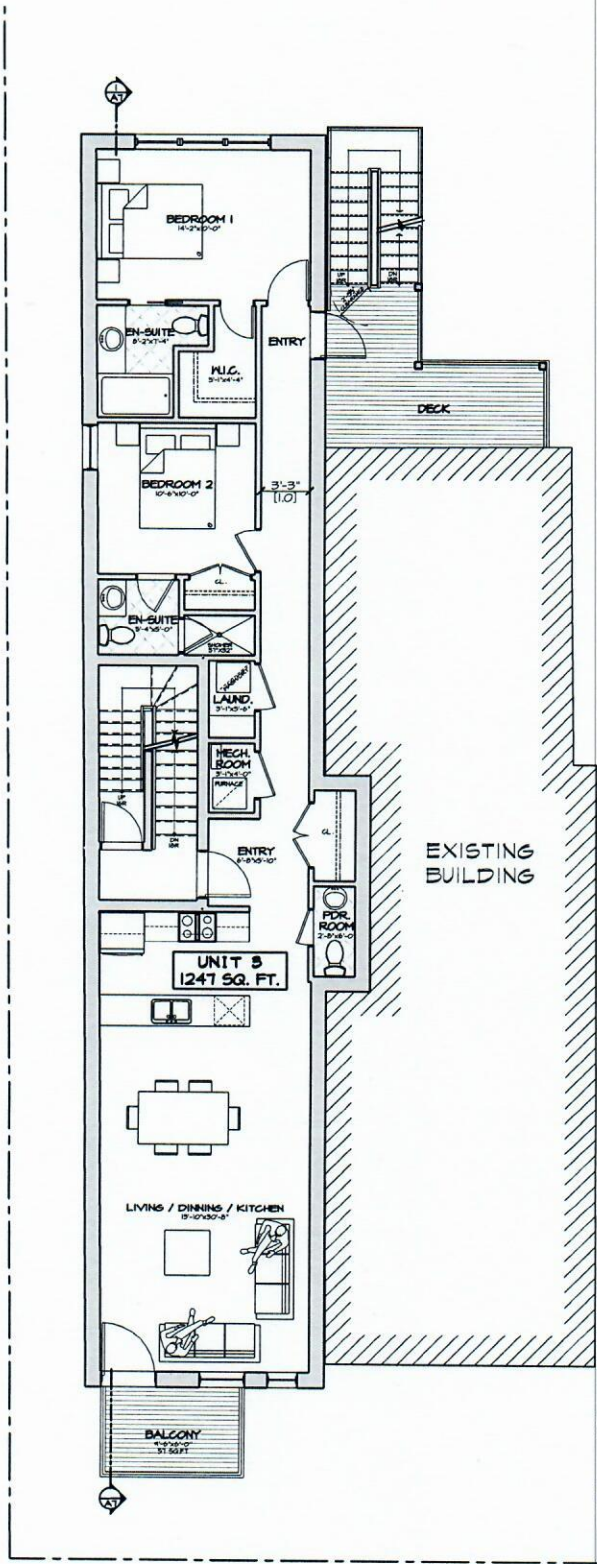
PROJECT No.: 2018-22

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2	CLIENT REVIEW	05-03-2020
3	CLIENT REVIEW	05-03-2020
3B	PLANNING REVIEW	11-06-2020
4	CLIENT REVIEW	24-09-2020
5	CLIENT REVIEW	01-09-2021
6	CLIENT REVIEW	13-05-2021
7	CLIENT REVIEW	09-06-2021
8	SPEC SUB. REVIEW	16-06-2021

314 BELL ST. S.

PROJECT TITLE





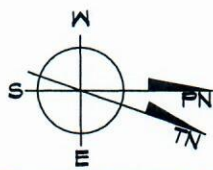
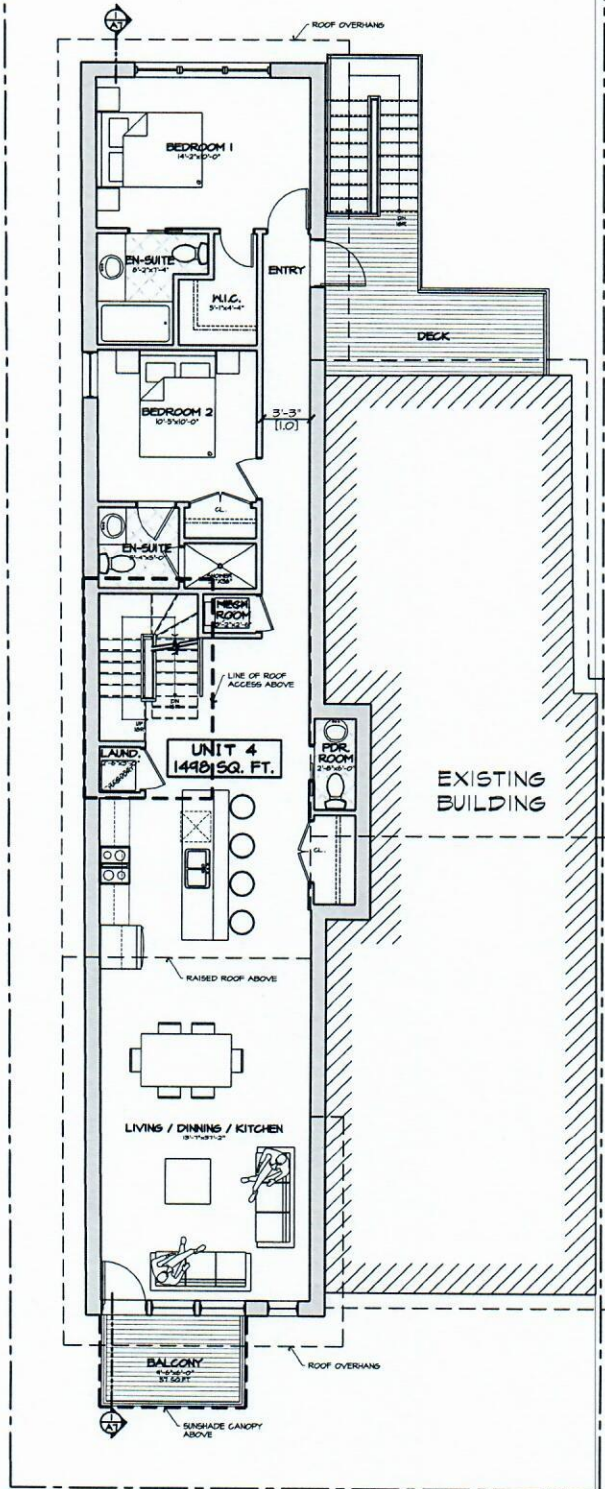
SECOND FLOOR PLAN
 SCALE: 1/8" = 1'-0"
 1375 GSF

A4	DATE:	2018-09-28
	CHECKED:	JPH
DWG BY:	AS	
PROJECT No.: 2018-22		

1	CLIENT REVIEW	2018
2	CLIENT REVIEW	2020
3	CLIENT REVIEW	2020
4	CLIENT REVIEW	2020
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99	CLIENT REVIEW	2021
100	CLIENT REVIEW	2021

314 BELL ST. S.

PROJECT TITLE



THIRD FLOOR PLAN
 SCALE : 1/8" = 1'-0" 1375 GSF

DWG No. **A5**

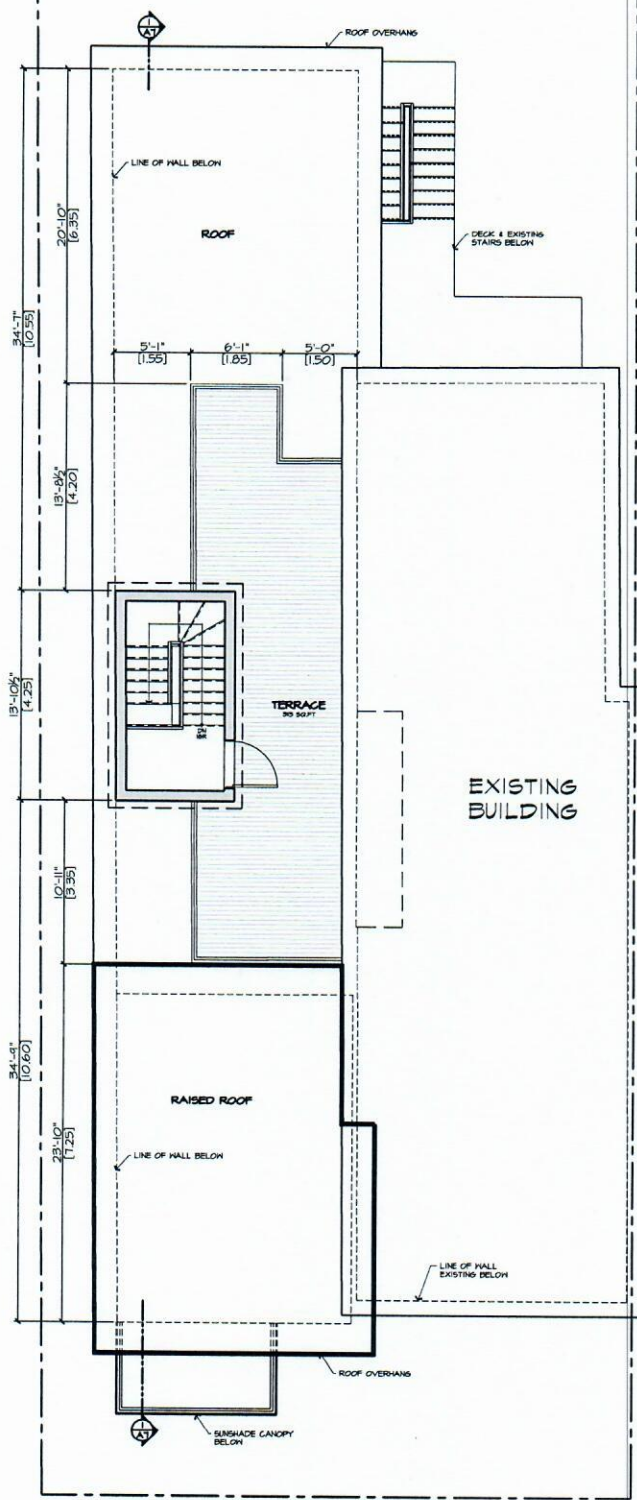
DATE:	2018-09-28
CHECKED:	JPH
DWG BY:	AS

PROJECT No. :
2018-22

8	SPEC SUB.	2021	18-06
7	REVIEW	2021	09-06
6	CLIENT	2021	13-05
5	CLIENT	2021	01-08
4	CLIENT	2020	24-08
3a	PLANNING	2020	11-06
2	CLIENT	2020	05-03
1	CLIENT	2018	28-09

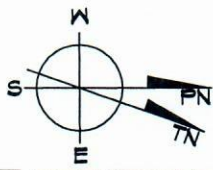
314 BELL ST. S.

PROJECT TITLE



ROOF FLOOR PLAN

SCALE: 1/8" = 1'-0" 123 GSF



A6
DWG No.

DATE: 2018-08-28
CHECKED: JPH
DWG BY: AS

PROJECT No.: 2018-22

8	SFC SUB.	16-06-2021
7	REVIEW	09-06-2021
6	CLIENT REVIEW	13-05-2021
5	CLIENT REVIEW	07-08-2020
4	CLIENT REVIEW	24-08-2020
3a	PLANNING	11-1-2020
2	CLIENT REVIEW	05-03-2020
1	CLIENT REVIEW	28-09-2018

PROJECT TITLE: 314 BELL ST. S.





CIVIL PLANNING & TITLE
 1000 W. 14TH ST. SUITE 200
 DENVER, CO 80202
 PHONE: 303.733.7140
 WWW.CPTDENVER.COM

PROJECT TITLE

314 BELL ST. S.

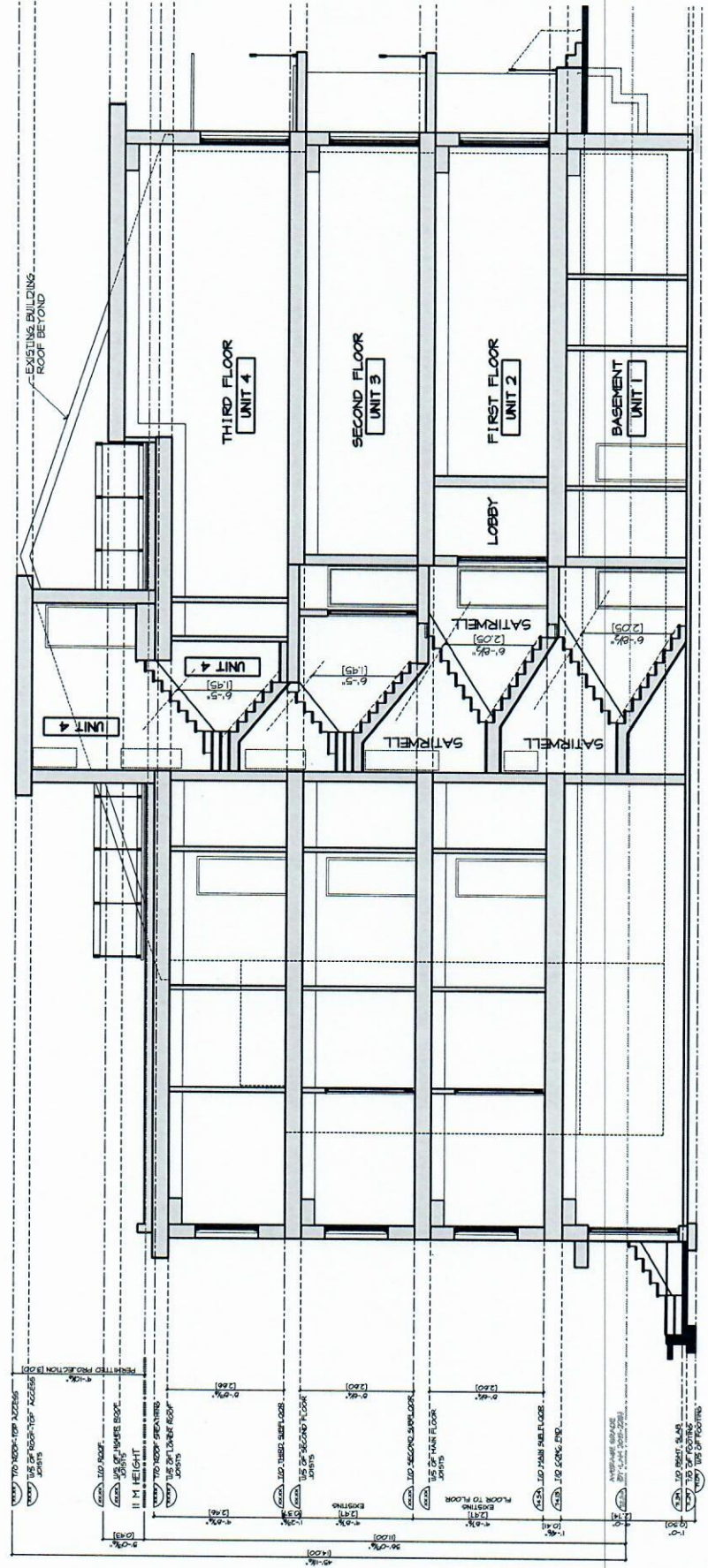
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7	REVIEW	09-05-2021
6	CLIENT REVIEW	13-05-2021
5	CLIENT REVIEW	01-09-2020
4	CLIENT REVIEW	24-08-2020
3a	PLANNING REVIEW	11-06-2020
2	CLIENT REVIEW	05-03-2020
1	CLIENT REVIEW	28-09-2018

PROJECT No.:
 2018-22

DATE	2018-09-28
CHECKED	JPH
DWG BY	AS

DWG No:

A7



SECTION I
 SCALE: 1/8" = 1'-0"



THE ARCHITECTURAL PARTNERS
 CONSULTING ARCHITECTS
 314 BELL ST. S.
 BOSTON, MA 02108
 TEL: 617.552.0100
 WWW.ARPARTNERS.COM

PROJECT TITLE

314 BELL ST. S.

8	SPC SUB.	18-06-2021
7	REVIEW	09-06-2021
6	CLIENT REVIEW	13-05-2021
5	CLIENT REVIEW	01-08-2020
4	CLIENT REVIEW	24-08-2020
3a	PLANNING REVIEW	11-06-2020
2	CLIENT REVIEW	05-03-2020
1	CLIENT REVIEW	28-09-2018

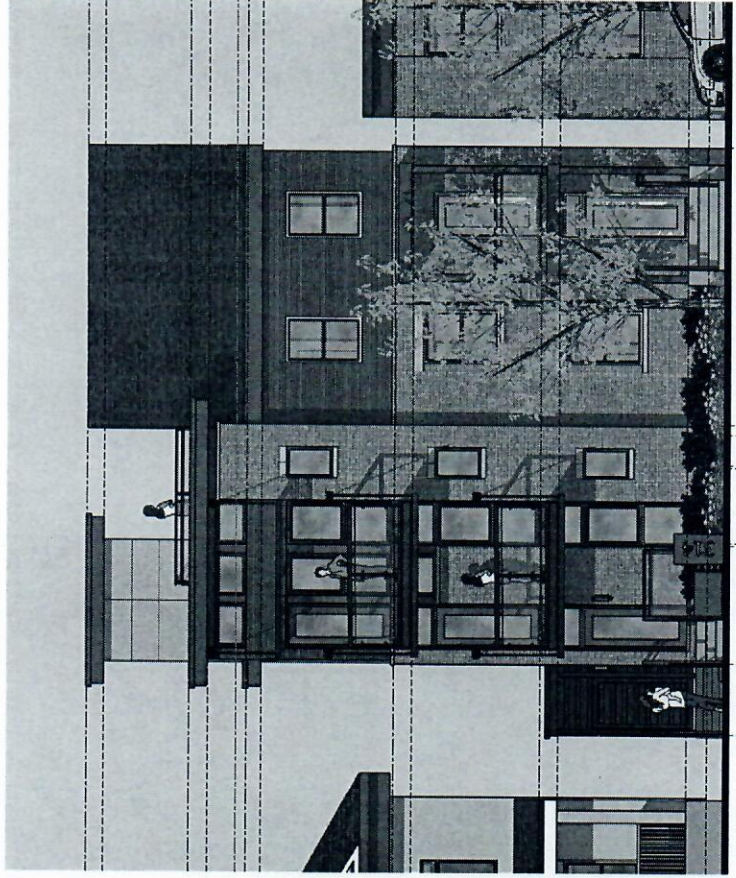
PROJECT No.:

2018-22

DATE:	2018-09-28
CHECKED:	JPH
DWG BY:	AS

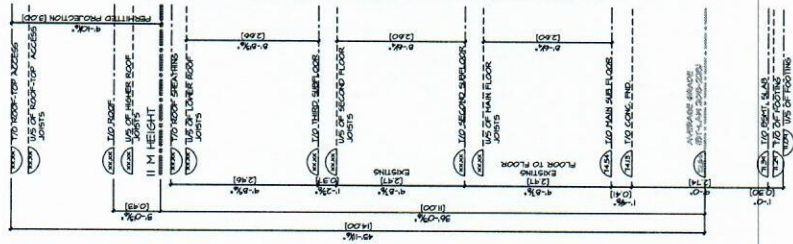
DWG No.:

A8



EAST ELEVATION

SCALE: 1/8" = 1'-0"





JPH ARCHITECTURE
 1000 14TH STREET, SUITE 200
 BOSTON, MA 02122
 TEL: 617.552.1234
 WWW.JPHARCHITECT.COM

PROJECT TITLE

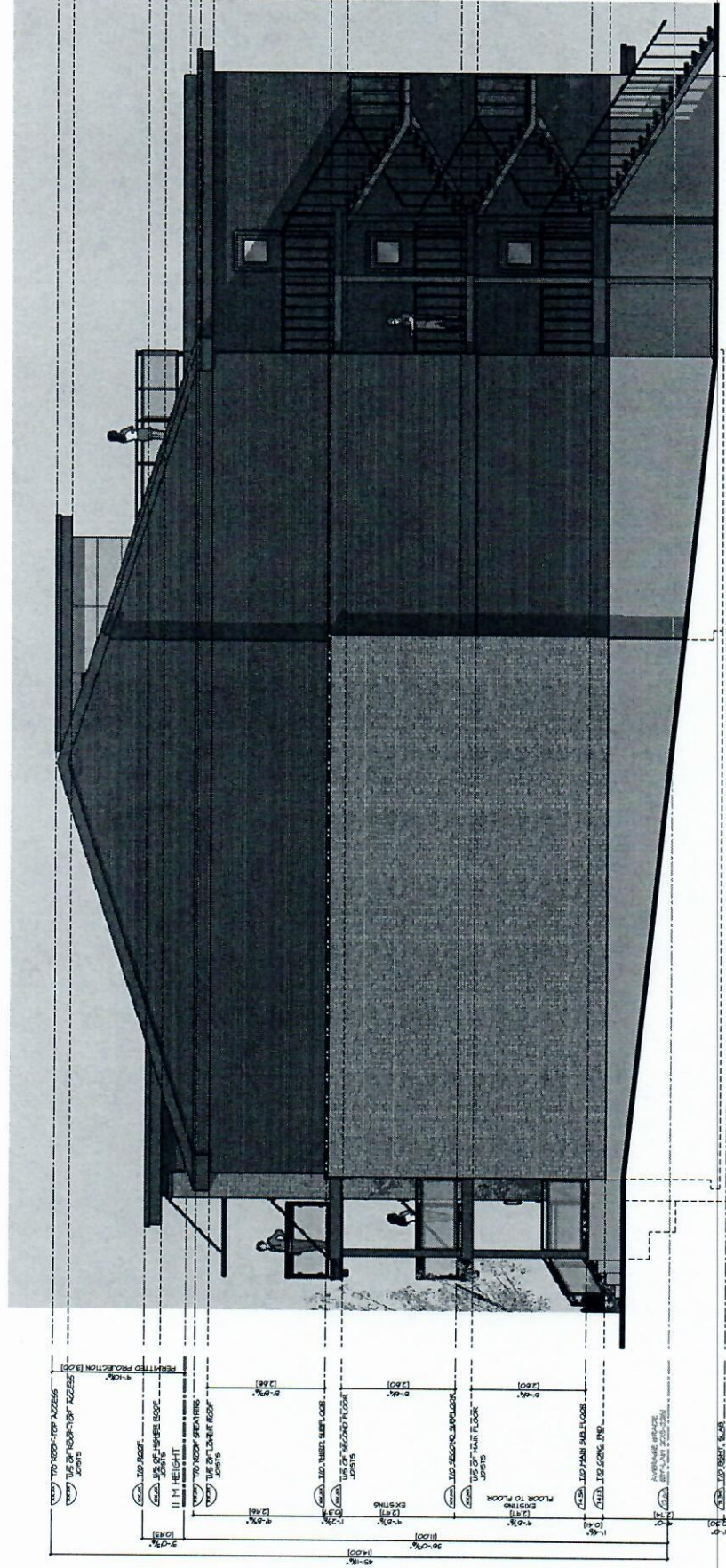
314 BELL ST. S.

8	SPC SUB.	16-06-	2021
7	REVIEW	09-06-	2021
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5	CLIENT REVIEW	01-09-	2020
4	CLIENT REVIEW	24-08-	2020
3a	PLANNING REVIEW	11-06-	2020
2	CLIENT REVIEW	05-03-	2020
1	CLIENT REVIEW	28-09-	2018

PROJECT No.:
 2018-22

DATE:	2018-09-28
CHECKED:	JPH
DWG BY:	AS

DWG No.:
 A10



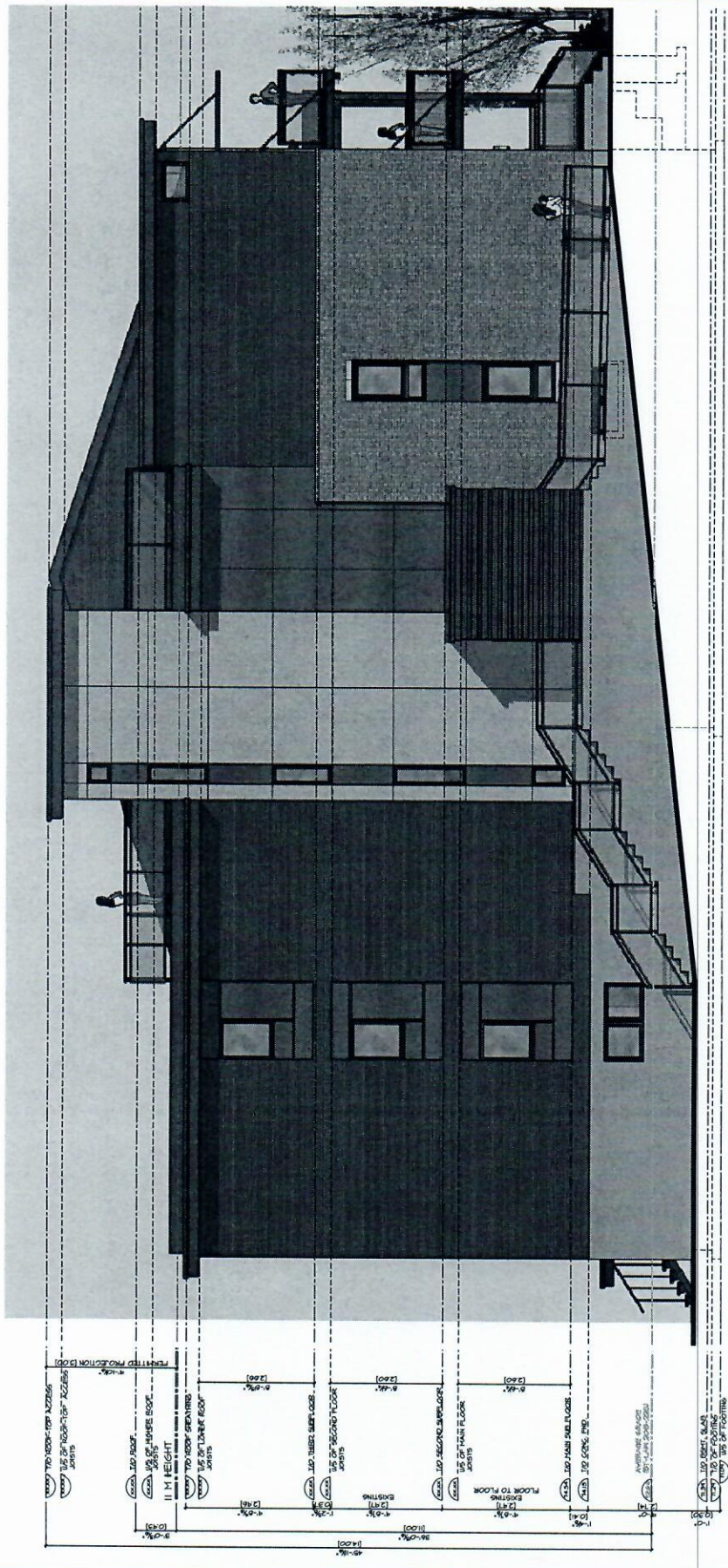
NORTH ELEVATION
 SCALE: 1/8" = 1'-0"



PROJECT TITLE
314 BELL ST. S.

NO.	DESCRIPTION	DATE
8	SPC SUB.	16-08-2021
7	REVIEW	09-08-2021
6	CLIENT REVIEW	13-05-2021
5	CLIENT REVIEW	01-09-2020
4	CLIENT REVIEW	24-08-2020
3a	PLANNING REVIEW	11-06-2020
2	CLIENT REVIEW	05-03-2020
1	CLIENT REVIEW	28-09-2018

PROJECT No.:
2018-22
DATE: 2018-09-28
CHECKED: JPH
DWG BY: AS
DWG No.:
A11



SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



1100 W. UNIVERSITY AVENUE
ANN ARBOR, MI 48106-1500
PH: 734.769.1100
WWW.GANDTARCH.COM

PROJECT TITLE

314 BELL ST. S.

8	SPC SUB.	16-06-2021
7	REVIEW	09-06-2021
6	CLIENT REVIEW	13-05-2021
5	CLIENT REVIEW	01-06-2020
4	CLIENT REVIEW	24-08-2020
3a	PLANNING	11-06-2020
2	CLIENT REVIEW	05-03-2020
1	CLIENT REVIEW	28-08-2018

PROJECT No. :

2018-22

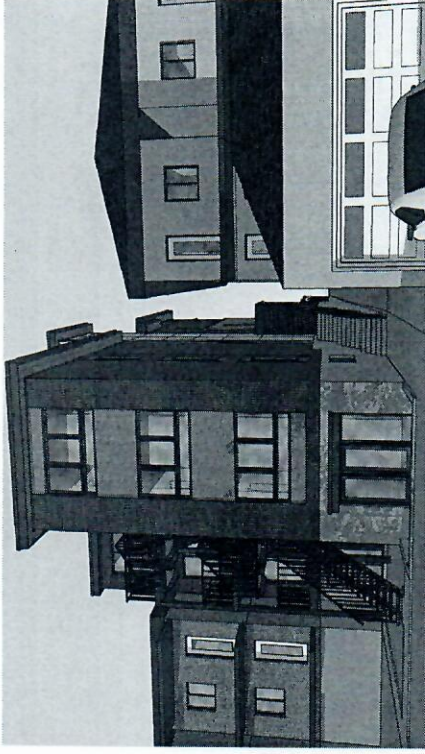
DATE: 2018-06-28

CHECKED: JPH

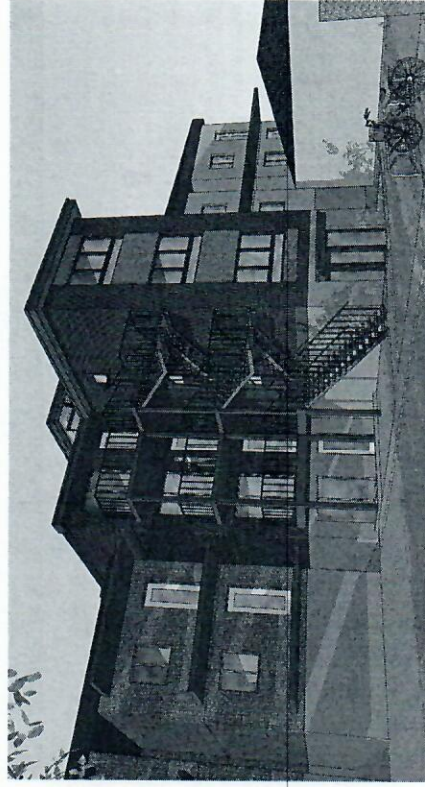
DWG BY: AS

DWG No:

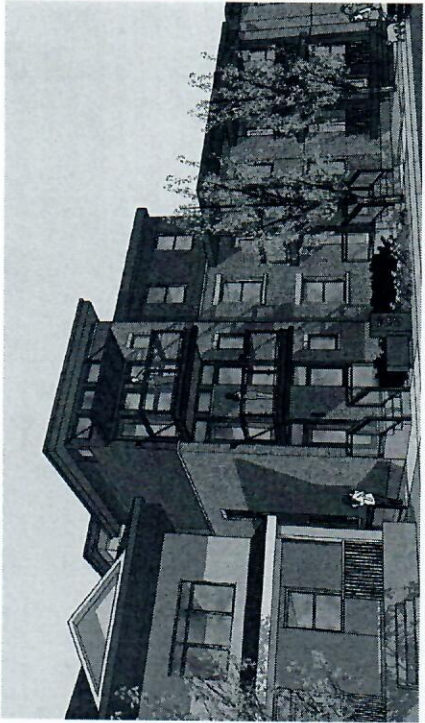
A12



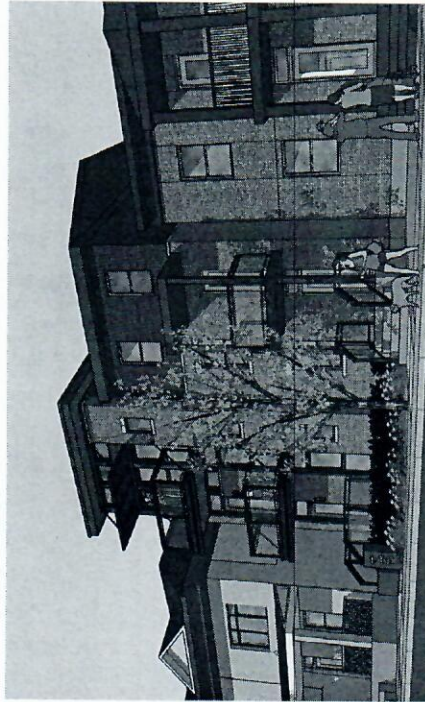
NORTH EAST ELEVATION



NORTH WEST ELEVATION



SOUTH EAST ELEVATION



SOUTH WEST ELEVATION

TOPOGRAPHICAL PLAN OF

PART OF LOT D
REGISTERED PLAN 82717
CITY OF OTTAWA

Prepared by
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

13/2/09
Date
E.H. Herweyer O.L.S.

Revised to update authority limit December 4, 2009
Revised to show building under construction March 23, 2010

Scale 1 : 150
0 0.5 1.0 1.5 2 3 4 5 6 Meters

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

Notes & Legend

- Drainage**
- MH
 - S
 - W
 - C
 - OW
 - P/O
 - S
 - SP
 - T/G
 - T/C
 - T
 - CLF
 - D
 - E
 - C/L
- Other**
- Maintenance Hole (Combined)
 - Underground Water
 - Underground Gas
 - Overhead Wires
 - Wooden Pole
 - Catch Basin
 - Water Stand Pipe
 - Invert
 - Top of Grate
 - Deciduous Tree
 - Chain Link Fence
 - Diameter
 - Location of Elevations
 - Location of Elevations (Top of Concrete Wall)
 - Centreline
 - Property Line

SITE AREA = 496.0 m²

NOTES

Topographic data was collected under Winter Conditions. Snow cover and ice preclude determining location and elevation of some topographical data that is otherwise visible.

ELEVATION NOTES

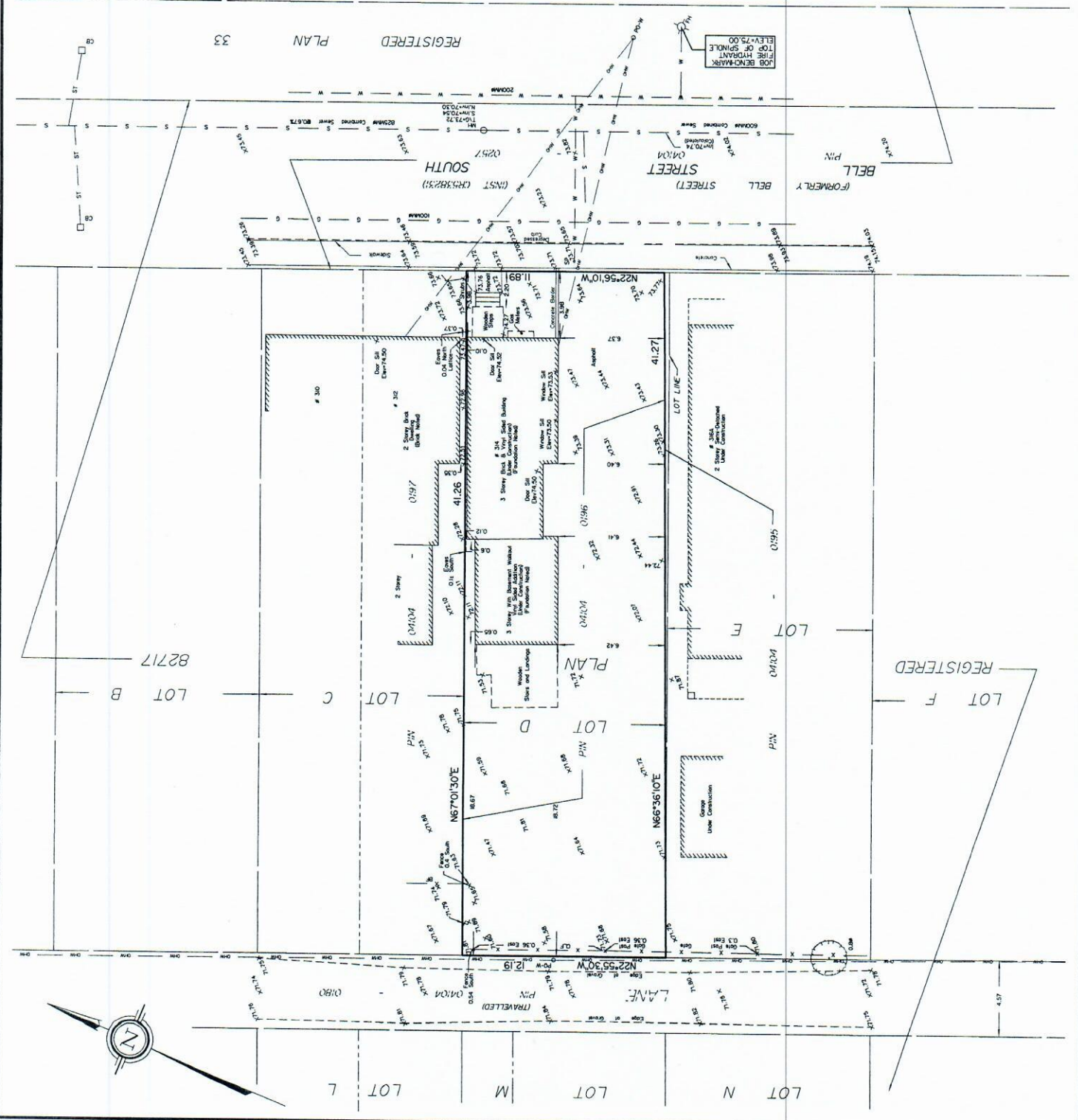
1. Elevations shown are referred to geoidetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that its relative elevation and description agrees with the information shown on this drawing.

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.
4. Underground utilities and inverts are taken from City of Ottawa Engineering drawing 2307 Sheet 4 of 16.



ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concession Road, Suite 500
Newmarket, Ont. A2E 7S8
Phone: (613) 727-8800 / Fax: (613) 727-1079
Land Surveys (Ont. Reg. No. 2966) - P. Eng. 2007, B.S.P. 93



ATTACHMENT 2: FUS FIRE FLOW CALCULATIONS



FUS Fire Flow Calculation

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

Stantec Project #: 163401084

Project Name: 314 Bell St S

Date: October 1, 2021

Data inputted by: Chr st ne Razafimaharo, M.Sc., EIT

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

Fire Flow Calculation #: 1

Building Type/Description/Name: Residential

Building addition. Fire separation to be provided between building addition and existing building.

Notes: Basement total height = 74.13 ft - 71.39 ft = 2.74 ft; basement height below grade = 72.64 ft - 71.39 ft = 1.25 ft. Basement is therefore 45% below grade, i.e. less than 50% below grade.

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

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	Framing Material						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
Fire resistive construction (> 2 hrs)	0.6							
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Floor Space Area						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	4	Units	
			Townhouse - indicate # of units	1				
	Other (Comm, Ind, Apt etc.)	4						
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 total floor area of all floors (non-fire resistive construction):			128	511	Area in Square Meters (m ²)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						7,000
5	Apply Factors Affecting Burning	Reductions/Increases Due to Factors Affecting Burning						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	5,950
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0
Sprinkler not fully supervised or N/A	0							
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	Fire Wall	0.1	0.6	m	3,570
			East Side	20.1 to 30.1m	0.1			
			South Side	0 to 3.0m	0.25			
			West Side	10.1 to 20.0m	0.15			
6	Obtain Required Fire Flow, Duration & Volume	<i>Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:</i>						10,000
		<i>Total Required Fire Flow (above) in L/s:</i>						167
		<i>Required Duration of Fire Flow (hrs)</i>						2.00
		<i>Required Volume of Fire Flow (m³)</i>						1,200



FUS Fire Flow Calculation

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

Stantec Project #: 163401084
 Project Name: 314 Bell St S
 Date: October 1, 2021
 Data inputted by: Christène Razafimaharo, M.Sc., EIT
 Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

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

Notes: Building addition. Fire separation to be provided between building addition and existing building.
 Assuming basement is built 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	Coefficient related to type of construction (C)	Framing Material						m
			Wood Frame	1.5	Wood Frame	1.5			
			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)	Type of Housing	Floor Space Area						
			Single Family	1	Other (Comm, Ind, Apt etc.)	4	Units		
			Townhouse - indicate # of units	1					
			Other (Comm, Ind, Apt etc.)	4					
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):						3	3
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			128	383	Area in Square Meters (m ²)		
					Square Metres (m2)				
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1,000 L/min						6,000	
5	Apply Factors Affecting Burning	Reductions/Increases Due to Factors Affecting Burning							
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	5,100	
			Limited combustible	-0.15					
			Combustible	0					
			Free burning	0.15					
			Rapid burning	0.25					
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	0	
			None	0					
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0	
			Water supply is not standard or N/A	0					
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0	
			Sprinkler not fully supervised or N/A	0					
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	Fire Wall	0.1	0.6	m	3,060	
			East Side	20.1 to 30.1m	0.1				
			South Side	0 to 3.0m	0.25				
			West Side	10.1 to 20.0m	0.15				
6	Obtain Required Fire Flow, Duration & Volume	Total Required Fire Flow, rounded to nearest 1,000 L/min, with max/min limits applied:						8,000	
		Total Required Fire Flow (above) in L/s:						133	
		Required Duration of Fire Flow (hrs)						2.00	
		Required Volume of Fire Flow (m ³)						960	

ATTACHMENT 3: FIGURE 1 – FUS EXPOSURE DISTANCES

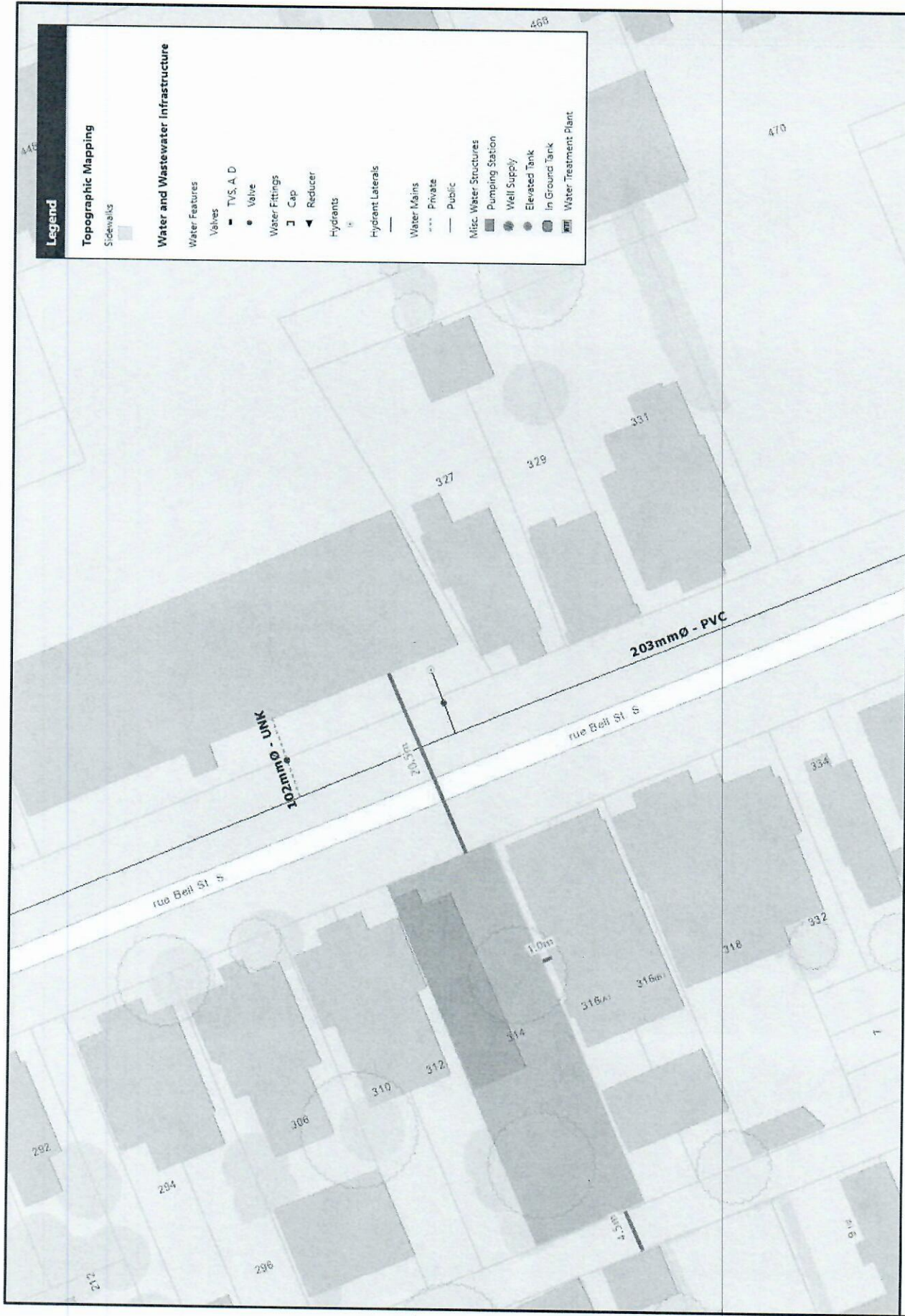


Figure 1: FUS Exposure Distances (Property Line to Adjacent Buildings)

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

ATTACHMENT 4: WATER BOUNDARY CONDITIONS

Razafimaharo, Christene

From: TL MaK <tlmakecl@bellnet.ca>
Sent: Thursday, October 28, 2021 11:15 AM
To: Alemany, Kevin
Cc: Razafimaharo, Christene
Subject: FW: 314 Bell Street - Water Boundary Conditions Request
Attachments: 314 Bell Street South October 2021.pdf

Hi Kevin,

Attached please find water boundary conditions received on October 28, 2021 from the City of Ottawa regarding 314 Bell 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: Bakhit, Reza [<mailto:reza.bakhit@ottawa.ca>]
Sent: October 28, 2021 10:10 AM
To: TL MaK
Subject: 314 Bell Street - Water Boundary Conditions Request

Hi Tony,

The following are boundary conditions, HGL, for hydraulic analysis at 314 Bell Street South North (zone 1W) assumed to be connected to the 203 mm watermain on Bell Street South (see attached PDF for location).

Minimum HGL: 106.7 m

Maximum HGL: 115.1 m

Max Day + FF (133 L/s): 104.6 m

Max Day + FF (167 L/s): 102.0 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.

Regards,

Reza Bakhit, P.Eng, C.E.T

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

613.580.2400 ext./poste 19346, reza.bakhit@ottawa.ca

Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

Boundary Conditions for 314 Bell Street South



- PRIVATE
- PUBLIC

ATTACHMENT 5: SUPPORTING HYDRAULIC CALCULATIONS



Supporting Hydraulic Calculations

Stantec Project #: 163401084

Project Name: 314 Bell St S

Date: October 28, 2021

Data inputted by: Christène Razafimaharo, M.Sc., EIT

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

Boundary Conditions provided by the City:

Scenario 1: Peak Hour (Min HGL): 106.7 m;

Scenario 2: Average Day (Max HGL): 115.1 m; and

Scenario 3: Maximum Day plus Fire Flow: 102.0 m.

Sample Calculations

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

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

For Scenario 1, we have:

$$HGL(m) = 106.7 \text{ and } hz (m) = 73.98.$$

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

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

$$\therefore hp = 106.7 - 74.0 \text{ m} = 32.7 \text{ m.}$$

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

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

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

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

$$P (\text{kPa}) = (1000 * 9.81 * 32.72) / 1000$$

$$\therefore P = 321 \text{ kPa.}$$

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

$$P = 47 \text{ psi.}$$

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

Scenario 2: P = 58 psi; and Scenario 3: P = 40 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 321 kPa (47 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 403 kPa (58 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 275 kPa (40 psi)

ATTACHMENT 6: FIGURE 2 – HYDRANT SPACING



Legend

Topographic Mapping

Sidewalks

Water and Wastewater Infrastructure

Water Features

- Valves
 - TVS, A, D
 - Valve
- Water Fittings
 - Cap
 - Reducer
- Hydrants

Hydrant Laterals

Water Mains

- Private
- Public

Misc. Water Structures

- Pumping Station
- Well Supply
- Elevated Tank
- In Ground Tank
- Water Treatment Plant

Figure 2: Hydrant Spacing

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

**PROPOSED
THREE-STOREY APARTMENT BUILDING ADDITION
LOT RE-DEVELOPEMENT SITE
PART OF LOT "D"
R-PLAN 82717
314 BELL STREET SOUTH
CITY OF OTTAWA**

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

SANITARY SEWER DESIGN SHEET

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

q = average daily per capita flow (L/cap. d)
 I = unit of peak extraneous flow (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

STREET	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)	Length (m)	Pipe size (mm)	Type of pipe	Grade %	Capacity (L/s) <small>n = 0.013</small>	Full flow velocity (m/s)	Actual velocity at Q(d)
	FROM	TO	Area A (hectares)	Pop.	Area A (hectares)	Pop.											
314 BELL STREET	SITE (NEW BLDG)	EX. BLDG COMBINED SEWER	8.4	8.4	0.05	8.4	4	0.11	0.02	0.13	12.5	150	PVC	1.0	19.8	1.12	
	EX. BLDG		8.4	8.4			4	0.11		0.24							



DESIGN: TLM
 CHECKED: TLM
 DATE: FEB. 2022

PROJECT: 314 BELL STREET
 PROPOSED 3 STOREY APARTMENT
 BUILDING ADDITION - CITY OF OTTAWA

(FILE # 821-102)

**PROPOSED
THREE-STOREY APARTMENT BUILDING ADDITION
LOT RE-DEVELOPEMENT SITE
PART OF LOT "D"
R-PLAN 82717
314 BELL STREET SOUTH
CITY OF OTTAWA**

**APPENDIX F
DEVELOPMENT SERVICING STUDY CHECKLIST SUMMARY**

4. Development Servicing Study Checklist

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

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

4.1 General Content

- Executive Summary (for larger reports only).
- Date and revision number of the report.
- Location map and plan showing municipal address, boundary, and layout of proposed development.
- Plan showing the site and location of all existing services.
- Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- Summary of Pre-consultation Meetings with City and other approval agencies.
- Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.
- Statement of objectives and servicing criteria.
- Identification of existing and proposed infrastructure available in the immediate area.
- Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).

- Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- Proposed phasing of the development, if applicable.
- Reference to geotechnical studies and recommendations concerning servicing.
- All preliminary and formal site plan submissions should have the following information:
 - Metric scale
 - North arrow (including construction North)
 - Key plan
 - Name and contact information of applicant and property owner
 - Property limits including bearings and dimensions
 - Existing and proposed structures and parking areas
 - Easements, road widening and rights-of-way
 - Adjacent street names

4.2 Development Servicing Report: Water

- Confirm consistency with Master Servicing Study, if available
- Availability of public infrastructure to service proposed development
- Identification of system constraints
- Identify boundary conditions
- Confirmation of adequate domestic supply and pressure
- Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
- Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
- Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
- Address reliability requirements such as appropriate location of shut-off valves
- Check on the necessity of a pressure zone boundary modification.

- Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range
- Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- Confirm consistency with Master Servicing Study and/or justifications for deviations.
- Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.
- Description of proposed sewer network including sewers, pumping stations, and forcemains.

- Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

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

- Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- Any proposed diversion of drainage catchment areas from one outlet to another.
- Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.
- Identification of potential impacts to receiving watercourses
- Identification of municipal drains and related approval requirements.
- Descriptions of how the conveyance and storage capacity will be achieved for the development.
- 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.
- Inclusion of hydraulic analysis including hydraulic grade line elevations.
- Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- Identification of floodplains - proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

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

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

4.6 Conclusion Checklist

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