

TECHNICAL MEMORANDUM

DATE: MARCH 13, 2019

TO: JOHN WU (CITY OF OTTAWA)

FROM: FRANÇOIS THAUVETTE

RE: ADEQUACY OF PUBLIC SANITARY SERVICES
PROPOSED MIXED-USE DEVELOPMENT- 472 BYRON PLACE

PROJECT: 118024 (NOVATCH REPORT REF. # R-2019-012)

As part of the City of Ottawa Site Plan approval process, Novatech has been asked to review the adequacy of existing public sanitary sewer system to service the proposed mixed-use development. The analysis includes approximately 865m of the municipal sanitary sewer from the subject site to the outlet to the West Nepean Trunk Collector, located at the intersection of Tweedsmuir Avenue and Scott Street.

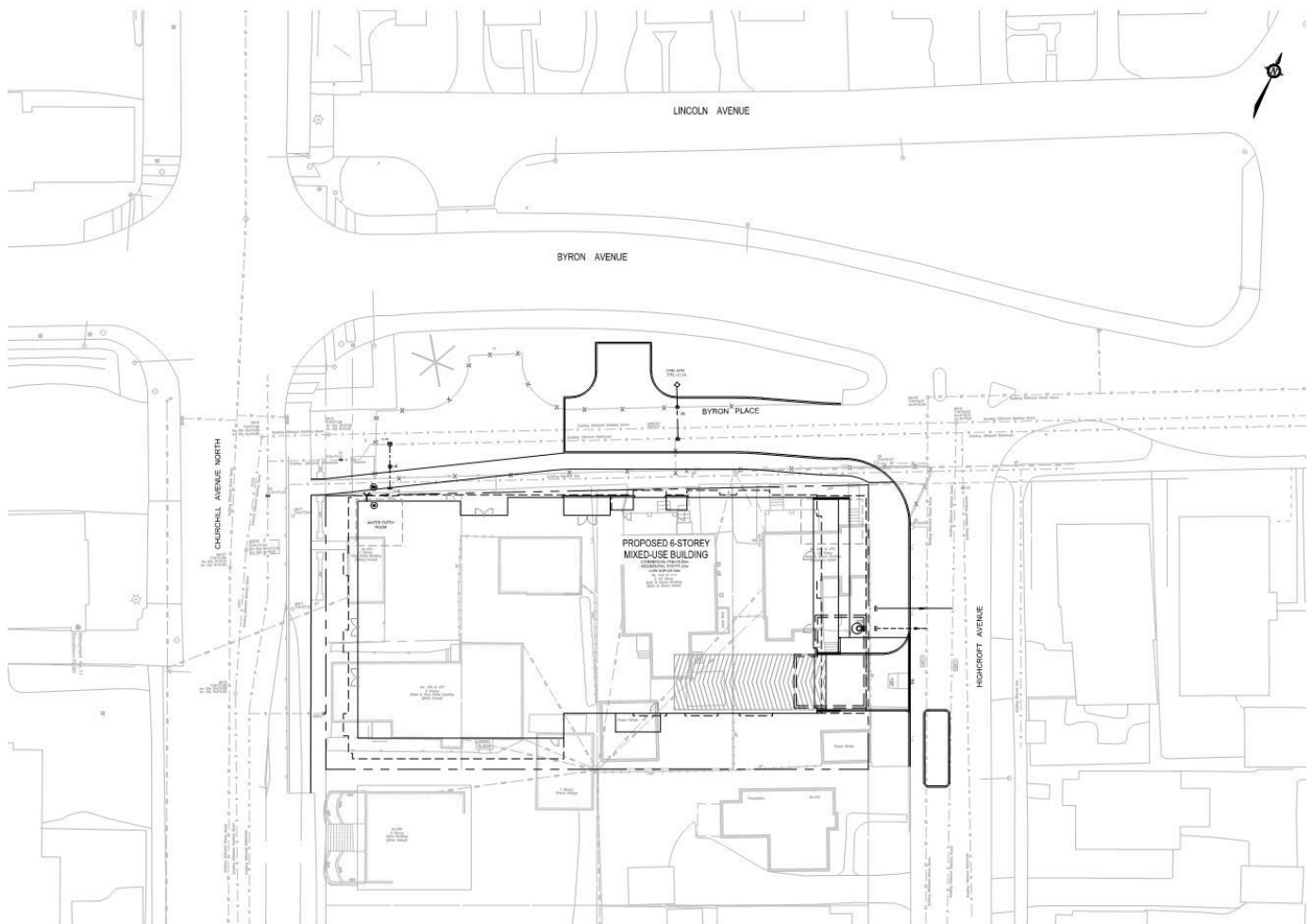
Figure 1: Aerial View of the Subject Site



The subject site is approximately 0.191 hectares in size and currently consists of three residential lots and a used car lot. The properties (formerly 433, 435 Churchill Avenue North and 468, 472 Byron Place) will be merged to accommodate the proposed mixed-use development. The subject site is located at 472 Byron Place, between Churchill Avenue North and Highcroft Avenue. Residential lots about the property to the south. The legal description of the subject site is designated as Lots 1, 2, 3 and 4, Registered Plan 269, City of Ottawa.

The proposed development will consist of a 6-storey residential building with commercial space on the ground floor. All existing buildings occupying the subject site will be demolished. The proposed 6-storey building will be serviced by extending new services to the municipal sanitary and storm sewers in Highcroft Avenue and to the municipal watermain in Byron Place. Refer to **Figure 2** for the proposed site servicing.

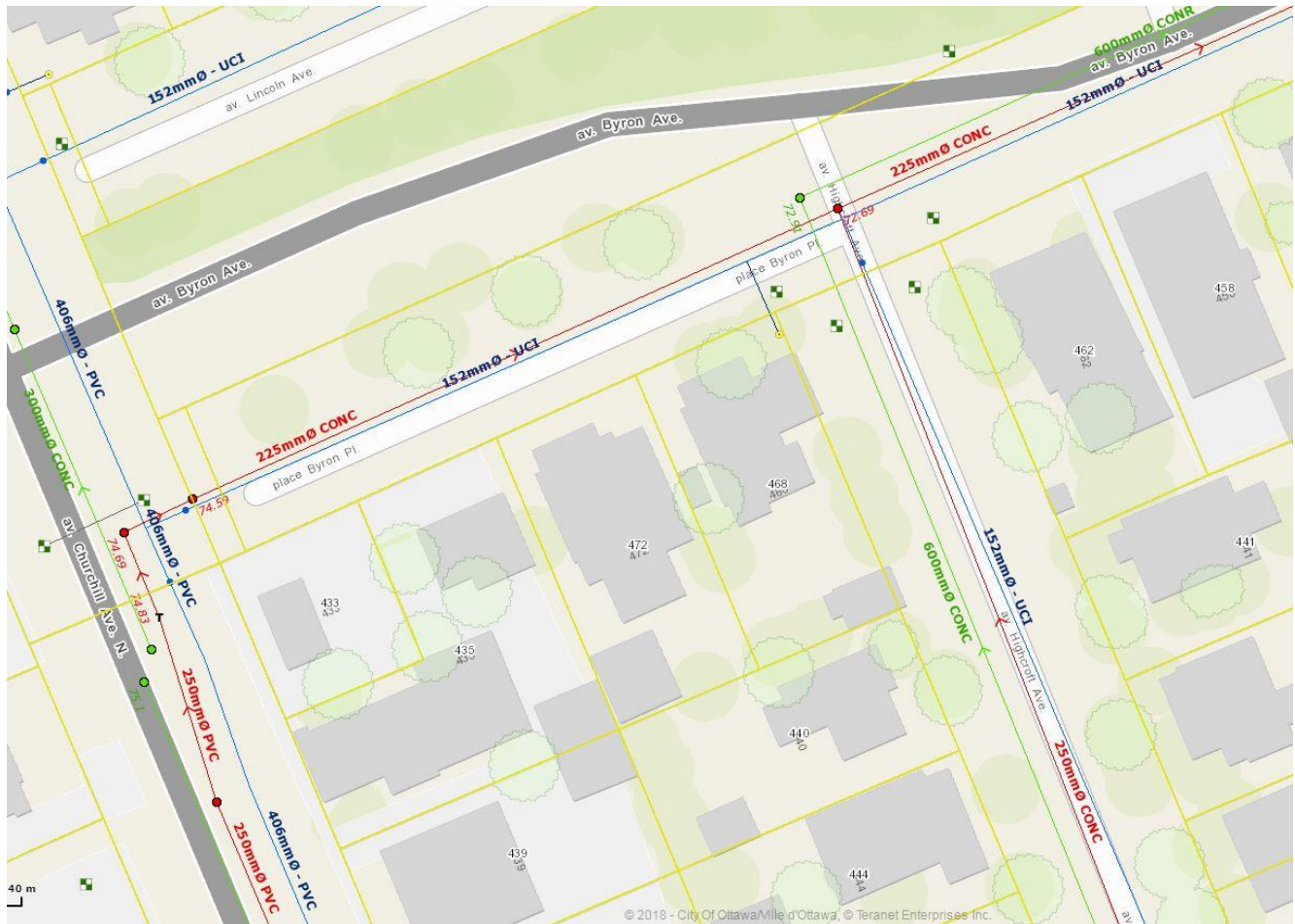
Figure 2: Site Servicing Sketch



SANITARY SERVICING

An existing 250mm dia. sanitary sewer in Churchill Avenue and a 225mm diameter sanitary sewer in Byron Place currently services the existing properties. The proposed development will be serviced off the existing 250mm diameter sanitary sewer in Highcroft Avenue. Refer to **Figure 3** for a sketch of the existing municipal services.

Figure 3: Existing Municipal Services



The peak sanitary flow from the on-site existing residential and commercial uses was calculated to be approximately 0.28 L/s based on a tributary commercial area of 943 m² at 50,000 L/ha/day with a peaking factor of 1.5 and four (4) duplex units with a population equivalent of 2.7 persons/unit and a peaking factor of 4.0 including an infiltration allowance of 0.06 L/s.

- Peak existing commercial flows $((943/10,000) \times 50,000)/86400 \times 1.5 = 0.08 \text{ L/s}$
- Peak existing residential flows $((4 \times 2.7) \times 280)/86400 \times 4.0 = 0.14 \text{ L/s}$
- Existing extraneous flows $0.191 \times 0.33 = 0.06 \text{ L/s}$
- Total Peak existing flow = $0.08 + 0.06 + 0.14 = 0.28 \text{ L/s}$

The peak sanitary flow from the proposed development was calculated to be approximately 1.56 L/s, which represents a theoretical sanitary sewage increase of 1.28 L/s. The sanitary flow calculations are based on criteria provided in the City of Ottawa Sewer Design Guidelines. Refer to **Appendix B** for detailed calculations.

A downstream analysis of the existing sanitary sewers was completed to confirm the capacity in the existing sewer system. The City of Ottawa As-built plans and information from the City's geoOttawa website was used to determine existing sanitary sewer sizes, inverts, and the tributary drainage areas. According to the information on the geoOttawa website, the existing sanitary sewer system consists of 225mm dia., 250mm dia., 300mm dia. and 375mm diameter pipe network that outlets into the existing 1500mm dia. West Nepean Trunk Collector sewer in Scott Street. The drainage area figures are provided in **Appendix A** and the sanitary sewer design sheet is provided in **Appendix B**.

Analysis of the downstream municipal sanitary sewer system demonstrates that existing municipal infrastructure has enough excess capacity to service the proposed mixed-use development. Since the proposed development increases the sanitary sewage flows by approximately 1.28 L/s, when compared to the existing condition, there are no concerns that the proposed development flows will have any adverse effects on the existing infrastructure to the outlet at the municipal trunk sewer.

CONCLUSION

Based on our analysis of the available information, the existing municipal sanitary sewer system appears to have enough capacity from the subject site to the outlet point at the West Nepean Trunk Collector to service the proposed mixed-use development.

NOVATECH

Prepared by:



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Senior Design Technologist

Servicing Reviewed by:



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Senior Project Manager

List of Appendices:

Appendix A: Sketches EX-SAN-1 through EX-SAN-4: Sanitary Drainage Area Plans
Appendix B: Figure B1: Sanitary Flow Calculations

APPENDIX A

Sketches EX-SAN-1 through EX-SAN-4: Sanitary Drainage Area Plans

LEGEND



DRAINAGE AREA (ha)
DOWNSTREAM MAINTENANCE HOLE
of RESIDENTIAL UNITS / POPULATION

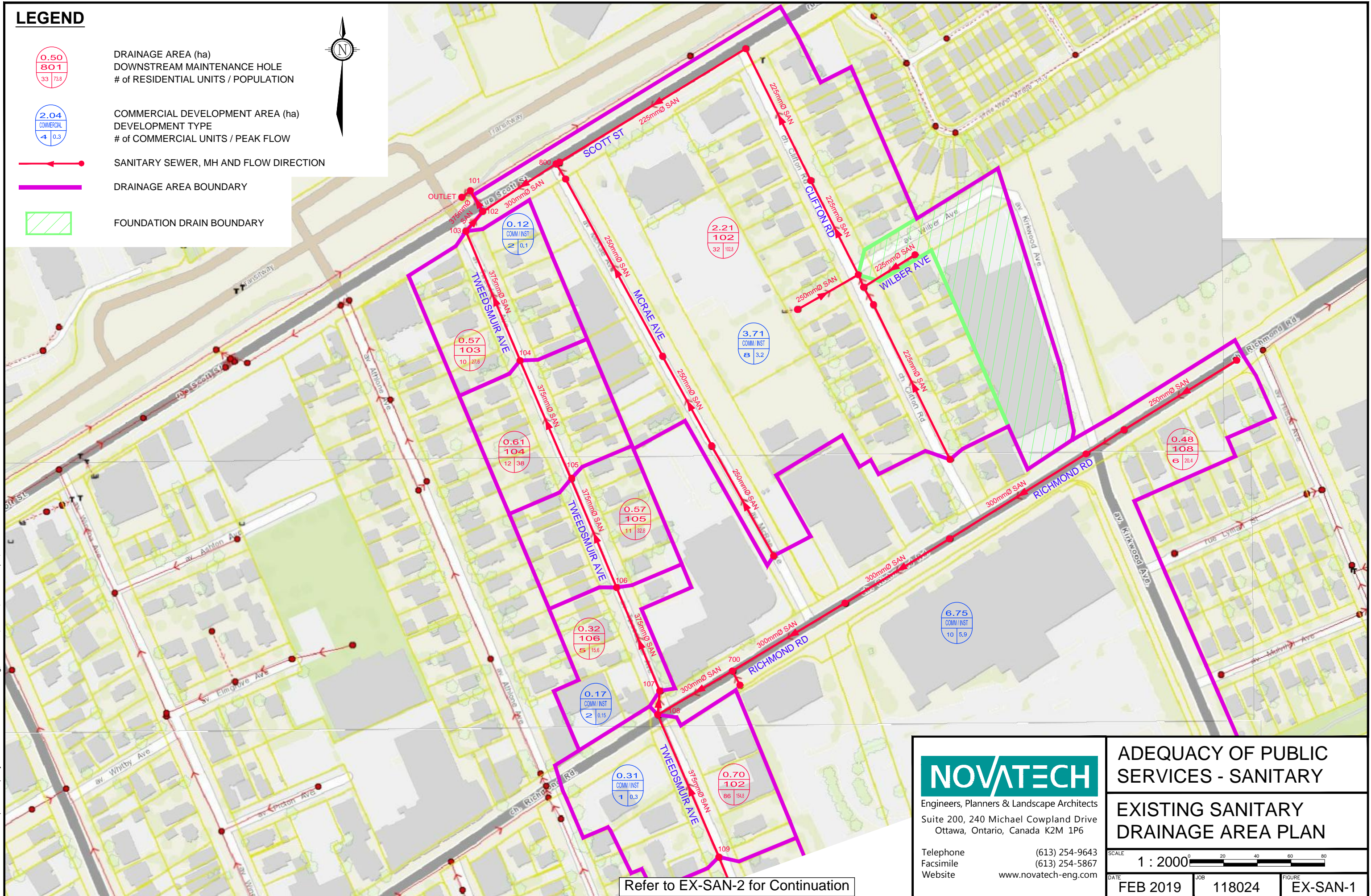


COMMERCIAL DEVELOPMENT AREA (ha)
DEVELOPMENT TYPE
of COMMERCIAL UNITS / PEAK FLOW

SANITARY SEWER, MH AND FLOW DIRECTION

DRAINAGE AREA BOUNDARY

FOUNDATION DRAIN BOUNDARY



Refer to EX-SAN-2 for Continuation

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ADEQUACY OF PUBLIC SERVICES - SANITARY

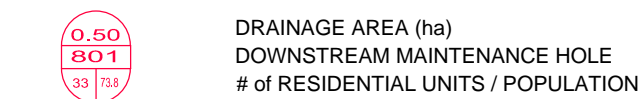
EXISTING SANITARY DRAINAGE AREA PLAN

SCALE 1 : 2000

DATE	JOB	FIGURE
FEB 2019	118024	EX-SAN-1

SHT11X17.DWG - 279mmX432mm

LEGEND



SANITARY SEWER, MH AND FLOW DIRECTION

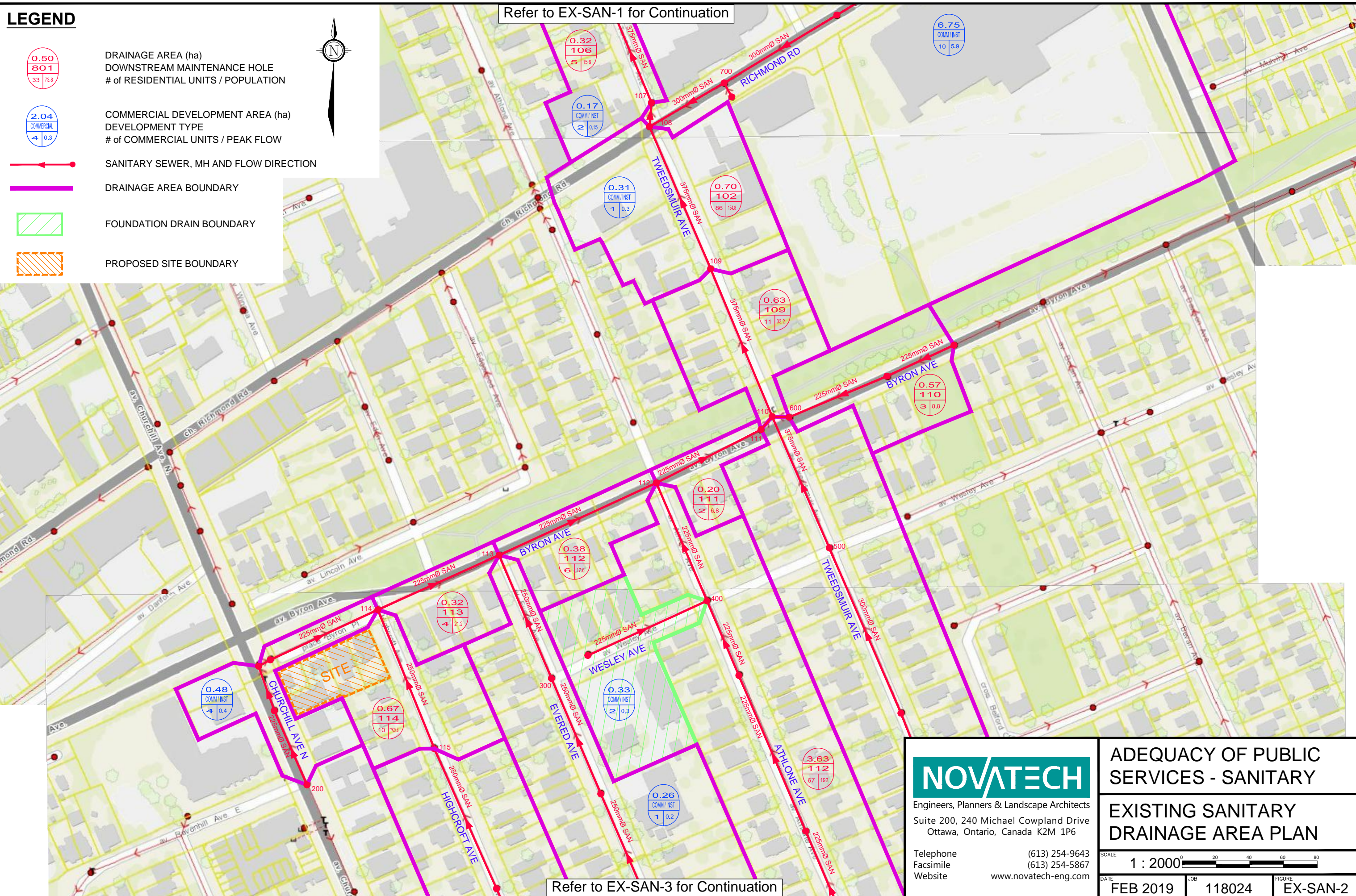
DRAINAGE AREA BOUNDARY

FOUNDATION DRAIN BOUNDARY

PROPOSED SITE BOUNDARY



Refer to EX-SAN-1 for Continuation



Refer to EX-SAN-3 for Continuation



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ADEQUACY OF PUBLIC SERVICES - SANITARY

EXISTING SANITARY DRAINAGE AREA PLAN

SCALE 1 : 2000

DATE	JOB	FIGURE
FEB 2019	118024	EX-SAN-2

LEGEND



DRAINAGE AREA (ha)
DOWNSTREAM MAINTENANCE HOLE
of RESIDENTIAL UNITS / POPULATION



COMMERCIAL DEVELOPMENT AREA (ha)
DEVELOPMENT TYPE
of COMMERCIAL UNITS / PEAK FLOW



SANITARY SEWER, MH AND FLOW DIRECTION



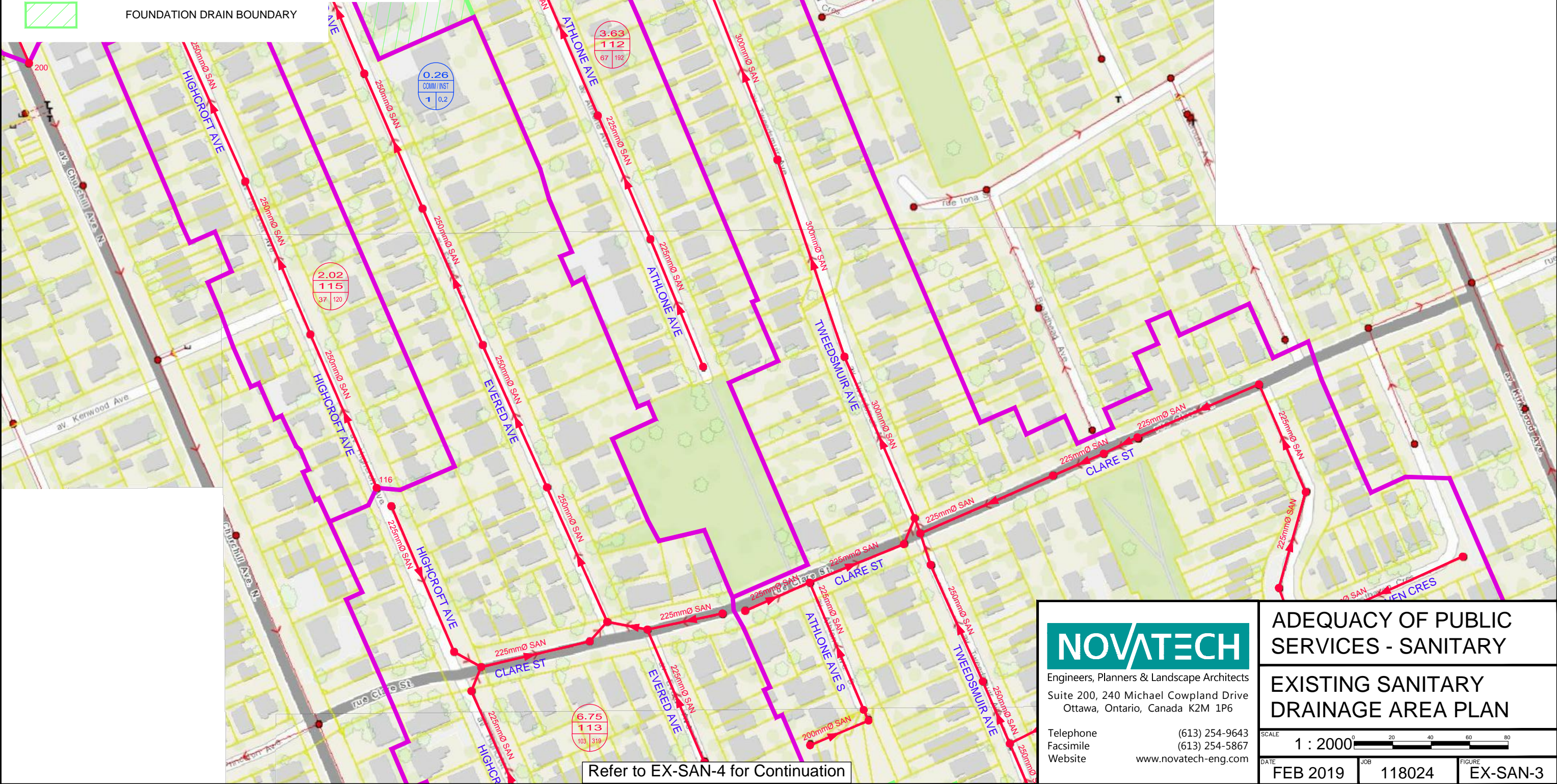
DRAINAGE AREA BOUNDARY



FOUNDATION DRAIN BOUNDARY



Refer to EX-SAN-2 for Continuation



Refer to EX-SAN-4 for Continuation

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ADEQUACY OF PUBLIC
SERVICES - SANITARY

EXISTING SANITARY
DRAINAGE AREA PLAN

SCALE 1 : 2000

DATE FEB 2019 JOB 118024 FIGURE EX-SAN-3

LEGEND



DRAINAGE AREA (ha)
DOWNSTREAM MAINTENANCE HOLE
of RESIDENTIAL UNITS / POPULATION



COMMERCIAL DEVELOPMENT AREA (ha)
DEVELOPMENT TYPE
of COMMERCIAL UNITS / PEAK FLOW



SANITARY SEWER, MH AND FLOW DIRECTION



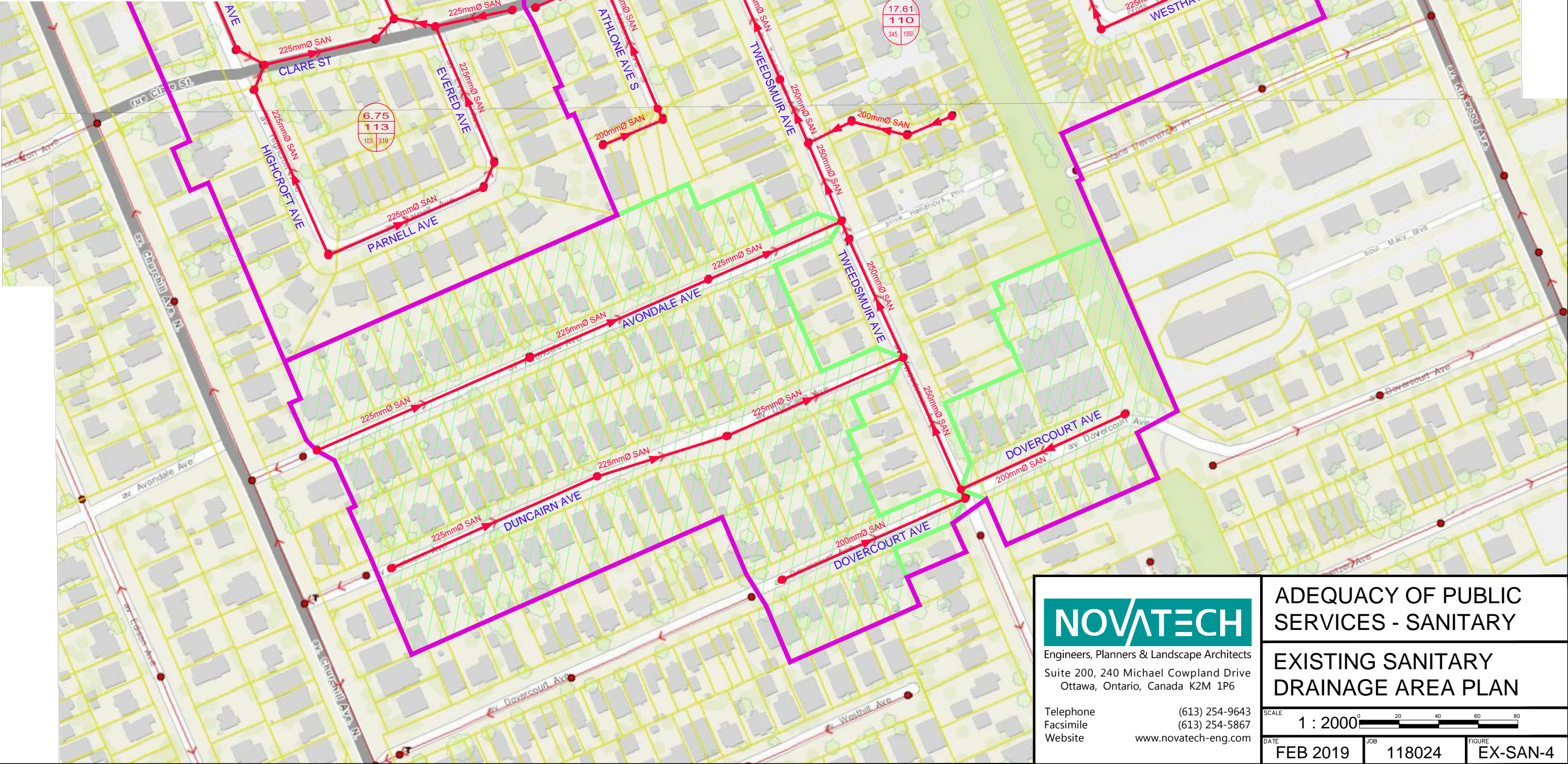
DRAINAGE AREA BOUNDARY



FOUNDATION DRAIN BOUNDARY



Refer to EX-SAN-3 for Continuation



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ADEQUACY OF PUBLIC
SERVICES - SANITARY

EXISTING SANITARY
DRAINAGE AREA PLAN

SCALE 1 : 2000

DATE FEB 2019 JOB 118024 FIGURE EX-SAN-4

APPENDIX B

Figure B1: Sanitary Flow Calculations

FIGURE B1: Sanitary Flow Calculations

Location			Residential		Commercial / Institutional		Residential Cumulative		Peak Factor		Commercial / Institutional		Residential	Infiltration		Foundation		PEAK DESIGN FLOW (l/s)	Pipe Data					
Street / Area	From	To	Population	Area (ha)	Area (ha)	Accu. Area (ha)	Pop.	Area (ha)	Res Peak Factor	Comm Peak Factor	Peak Flow (l/s)	Accu. Peak Flow	Acc. Peak Flow (l/s)	Infil. Flow (l/s)	Accu Infil. Flow	Found. Flow (l/s)	Accu Found. Flow		Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q _{full} (%)
Highcroft Avenue	115	114	151.8	0.67	0.03	0.03	272.0	2.69	3.3	1.5	0.03	0.03	2.89	0.23	0.23	0.00	0.00	3.15	250	0.4	88.1	37.6	0.77	8.4%
Byron Avenue	114	113	21.2	0.32	0.00	0.51	293.2	3.01	3.3	1.5	0.00	0.44	3.10	0.11	0.34	0.00	0.00	3.88	225	1.0	79.1	44.9	1.13	8.7%
Byron Avenue	113	112	17.6	0.38	0.00	0.77	310.8	3.39	3.3	1.5	0.00	0.67	3.28	0.13	0.46	0.00	0.00	4.41	225	2.6	102.2	72.3	1.82	6.1%
Byron Avenue	112	111	6.8	0.20	0.00	1.10	317.6	3.59	3.3	1.5	0.00	0.95	3.35	0.07	0.53	0.00	0.00	4.83	225	0.6	70.1	34.7	0.87	13.9%
Byron Avenue	111	110	0.0	0.00	0.00	1.10	317.6	3.59	3.3	0.0	0.00	0.95	3.35	0.00	0.53	0.00	32.30	37.13	300	0.4	10.4	61.1	0.87	60.8%
Tweedsmuir Avenue	110	109	33.2	0.63	0.00	1.10	350.8	4.22	3.2	1.5	0.00	0.95	3.68	0.21	0.74	0.00	32.30	37.67	375	1.1	95.0	183.7	1.66	20.5%
Tweedsmuir Avenue	109	108	154.8	0.70	0.31	1.41	505.6	4.92	3.2	1.5	0.27	1.22	5.21	0.33	1.07	0.00	32.30	39.80	375	1.2	91.7	191.9	1.74	20.7%
Tweedsmuir Avenue	108	107	0.0	7.23	0.00	8.16	505.6	12.15	3.2	1.5	0.00	7.08	5.21	2.39	3.46	0.00	32.30	48.04	375	0.8	14.4	154.7	1.40	31.1%
Tweedsmuir Avenue	107	106	15.6	0.32	0.17	8.33	521.2	12.47	3.2	1.5	0.15	7.23	5.36	0.16	3.62	0.00	32.30	48.51	375	1.0	66.4	175.2	1.59	27.7%
Tweedsmuir Avenue	106	105	32.8	0.57	0.00	8.33	554.0	13.04	3.2	1.5	0.00	7.23	5.67	0.19	3.80	0.00	32.30	49.01	375	0.5	69.4	123.9	1.12	39.6%
Tweedsmuir Avenue	105	104	38.0	0.61	0.00	8.33	592.0	13.65	3.1	1.5	0.00	7.23	6.04	0.20	4.01	0.00	32.30	49.58	375	0.4	76.1	110.8	1.00	44.7%
Tweedsmuir Avenue	104	103	27.6	0.57	0.12	8.45	619.6	14.22	3.1	1.5	0.10	7.34	6.30	0.23	4.23	0.00	32.30	50.17	375	0.9	83.6	166.2	1.51	30.2%
Scott Street	103	102	0.0	0.00	0.00	8.45	619.6	14.22	3.1	1.5	0.00	7.34	6.30	0.00	4.23	0.00	36.45	54.32	375	0.7	15.6	146.6	1.33	37.1%
Scott Street	102	101	0.0	3.71	0.00	12.16	619.6	17.93	3.1	1.5	0.00	10.56	6.30	1.22	5.46	0.00	36.45	58.77	375	1.1	14.1	183.7	1.66	32.0%
Scott Street	101	100	0.0	0.10	0.00	12.16	619.6	18.03	3.1	1.5	0.00	10.56	6.30	0.03	5.49	0.00	36.45	58.80	375	0.4	6.2	110.8	1.00	53.1%
			cells include the proposed site development numbers																		shading denotes assumed pipe slope			

Upstream Tributary Areas

Highcroft Avenue	116	115	120.2	2.02	0.00	0.00	120.2	2.02	3.4	1.5	0.0	0.0	1.32	0.67	0.67	0.00	0.00	1.98
Churchill Ave./ Byron Pl.	200	114	0.0	0.00	0.48	0.48	0.0	0.00	3.6	1.5	0.4	0.4	0.00	0.16	0.16	0.00	0.00	0.58
Evered Avenue	300	113	318.8	6.75	0.26	0.26	318.8	6.75	3.3	1.5	0.2	0.2	3.36	2.31	2.31	0.00	0.00	5.90
Athlone Avenue	400	112	192.0	3.63	0.33	0.33	192.0	3.63	3.3	1.5	0.3	0.3	2.07	1.31	1.31	32.30	32.30	35.96
Tweedsmuir Avenue	500	110	1049.9	17.61	0.00	0.00	1049.9	17.61	3.0	1.5	0.0	0.0	10.31	5.81	5.81	0.00	0.00	16.12
Byron Avenue	600	110	8.8	0.57	0.00	0.00	8.8	0.57	3.5	1.5	0.0	0.0	0.10	0.19	0.19	0.00	0.00	0.29
Richmond Road	700	108	20.4	0.48	6.75	6.75	20.4	0.48	3.5	1.5	5.9	5.9	0.23	2.39	2.39	0.00	0.00	8.48
Scott Street	800	102	102.8	2.21	3.71	3.71	102.8	2.21	3.4	1.5	3.2	3.2	1.13	1.95	1.95	4.15	4.15	10.45

City of Ottawa Sewer Design Guidelines

Single Family Lot	3.4	persons/unit
Average Townhome or Semi-Detached Unit	2.7	persons/unit
Average Apartment Unit	1.8	persons/unit
Average Domestic Flow	280	L/person/day
Institutional / Commercial Flow	50000	L/ha/day
Extraneous Flows	0.33	L/s/ha
Foundation Drain Allowance	5.0	L/s/ha (use 5.0 L/s/ha for tributary areas < 10 ha; 3.0 L/s/ha for tributary areas >10 ha < 100 ha; 2.0 L/s/ha for tributary areas >100 ha)
Residential Peaking Factor	Harmon Equation, Correction Factor = 0.8	
Institutional / Commercial Peaking Factor	1.5	

Notes:

Used the Average Apt./Persons Per Unit Value of 1.8 when determining the apartment populations.

The number of units in an apartment buildings are assumed values.

Existing pipe information has been taken from the City As-builts and/or geoOttawa website. Where invert information was not available, a minimum pipe slope of 0.4% was assumed.

A foundation drain allowance has been accounted for along only those existing streets that do not have a separated storm sewer as indicated on the geoOttawa website.