Site Servicing & Storm Water Management Report

797 Richmond Apartments

Ainley Group
Project No. 21006-1

Prepared for:
Dentech Holdings Inc.

Rev. May 19, 2021
May 7, 2021

Ainley CONSULTING ENGINEERS PLANNERS

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1.0 INTRODUCTION

The Ainley Group has been retained by Dentech Holdings Inc. to prepare a Site Servicing & Stormwater Management report addressing the Site Plan Approval process requirements of the City of Ottawa.

The subject site is located at 797 Richmond Road approximately 540m east of Woodroffe Avenue, on the north side of Richmond Road. (See Key Map in Appendix A).

The subject site is currently used as retail use (i.e. denture clinic), with a total site area of 0.116 ha. The proposed development will be a 9 storey (28.5m, 31.5m including roof amenities) apartment building with 3 retail units on the ground floor, for a total combined floor area of approx. 5,175sq.m and 51 residential units. The 51 residential units will be divided into one-bedroom, one-bedroom & den and two-bedroom apartments.

This report will address the sanitary, storm, and water servicing requirements for the proposed 9 storey apartment building as well as the stormwater management requirements.

2.0 MUNICIPAL DRINKING & FIRE PROTECTION WATER SERVICES

Only one 150mm diameter water service is proposed to service the 9 storey apartment building off of the existing 203mm diameter watermain along Richmond Road, since the average daily demand is less than 50cu.m/day (0.57 L/s). The proposed layout can be seen on drawing 21006–S1 in Appendix D.

Using the City of Ottawa guidelines, the following water demands have been calculated:

<u>Average Daily Demand</u>:

Residential:	51 units X 1.8 persons per unit = 92 persons
	92 persons X 350 L/person/day = 32,200 L/day = 0.37 L/s
Commercial:	2,500L/1,000sq.m/day X 349sq.m = 873 L/day = 0.01 L/s
Total:	32,200 L/day + 873 l/day = 33,073 L/day = **0.38 L/s.**

<u>Max. Daily Demand:</u>

Residential:	0.37 L/s X 4.9 (peaking factor for 50 residential units) = 1.81 L/s
Commercial:	0.01 L/s X 1.5 (peaking factor for commercial use) = 0.02 L/s
Total:	1.81 L/s (residential) + 0.02 L/s (commercial) = **1.83 L/s**

Max. Hourly Daily Demand (Peak Hour):

Residential: 0.37 L/s X 7.4 (peaking factor for 50 residential units) = 2.74 L/s
Commercial: 0.01 L/s X 1.8 (peaking factor for commercial use) = 0.02 L/s
Total: 2.74 L/s (residential) + 0.02 L/s (commercial) = **2.76 L/s.**

We note that the peaking factors used above to calculate the anticipated residential maximum daily demand and maximum hourly daily demand (peak hour) is based on MOE Table 3.3 – Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People.

The anticipated fire flow (based on the Fire Underwriters Survey - 1999) was calculated to be 7,000 L/min or **116.7 L/s.** A detailed calculation can be seen in Appendix B.

An existing fire hydrant is located along the west property line of the subject property, between 797 and 801 Richmond Road. The location of the existing fire hydrant can be seen on drawing 21006–S1 in Appendix D.

A boundary condition analysis has been provided by the City of Ottawa. The results are as follows and can be seen in Appendix B:

Minimum HGL = 108.7m
Maximum HGL = 115.3m
Max Day + Fire Flow = 91.5m

Based on a ground elevation of 63.90m:

Minimum HGL = 63.7 psi
Maximum HGL = 73.1 psi
Max Day + Fire Flow = 39.2 psi

Ainley has reviewed the results of the City of Ottawa hydraulic analysis and find that they meet the requirements set out by the ODG for water distribution, as seen below:

- Normal operating pressure ranges between 50 psi and 80 psi under a condition of maximum daily flow.
- Under maximum hourly demand conditions, the pressures are not less than 40 psi.

- During periods of maximum day and fire flow demand, the residual pressure at any point in the distribution system shall not be less than 20 psi.
- The maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall not exceed 80 psi.
- The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 100 psi.

We also note that an existing 1200mm high pressure watermain is located just outside the rear of the property. This watermain is considered to be a major (backbone) and sensitive infrastructure that any construction activities in the vicinity of the pipe would require extra monitoring and procedures / care. Since the building excavation / foundation is in close proximity to the rear property line, we anticipate a watermain protection plan (i.e. possibly a contingency plan as well) will be prepared and submitted for review / approval by others.

3.0 SANITARY SEWER SERVICES

A 150mm diameter sanitary service is proposed to service the 9 storey apartment building off of the existing 225mm diameter sanitary sewer located within the Richmond / Byron median, close to Richmond Road. This existing sewer is a local high-level sanitary sewer which ultimately drains into the 1500mm trunk sanitary sewer below it. The proposed layout can be seen on drawing 21006–S1 in Appendix E.

Based on the proposed population of 92 persons (i.e. 51 units at 1.8 persons per unit) and the proposed commercial use on the first floor, the anticipated peak sanitary flow has been calculated at **1.61 L/s**.

Residential: 92 persons X 350 L/person/day = 32,200 L/day = 0.37 L/s
0.37 L/s X 4.0 (peaking factor) = 1.48 L/s

Commercial: 50,000 L/gross ha/d X 0.116ha (area of the site) = 5,800 L/day = 0.067 L/s
0.067 L/s X 1.5 (commercial peak factor) = 0.10 L/s

Total: 1.48 L/s (res.) + 0.10 L/s (com.) + 0.28 L/s/gross ha X 0.116 ha (inf.) = 1.61 L/s

A peaking factor of 4.0 was used for the residential flow, 1.5 for the commercial flow and the standard 0.28 L/s/gross ha was used for infiltration allowance.

Due to the small nature of this project, we don't anticipate that the negligible increase in sanitary flow will adversely affect the capacity of the existing 225mm diameter sewer and/or the 1500mm diameter trunk sewer below it.

4.0 DRAINAGE & STORM SEWER SYSTEM

With regards to stormwater management, we note that the site (i.e. based on the pre-consultation meeting which took place with the City of Ottawa) was to be controlled up to and including the 100 year storm event to a 2 year pre-development level.

Rational Method

Q = R x A x I x N

Total Site Area	A =	0.116 hectares
Runoff Coefficient	R =	0.90 (actual)
	R =	0.50 (used)
Time of Concentration	T_c =	10 min (based on correspondence with the City)
2 year Rainfall Intensity	I =	76.8 mm/hr

2 year Pre-Development Flow: Q = 0.50 x 0.116 x 76.8 x 2.78
Q = 12.4 L/s

Thus, the total 100 year Post-Development release rate for the site shall be less or equal to **12.4 L/s**.

This has been achieved by providing a storm water tank (i.e. cistern) inside the building.
(Refer to the Storm Water Management Plan Dwg. 21006 – SWM1" in Appendix 'D')

Storm water tank storage requirements including maximum release rate has been determined for the building and shall be implemented by the Mechanical Engineer as follows:

Storm Water Tank 100 year Storage volume requirements = **30.0 cu.m**
Storm Water Tank Controlled Release Rate = **7.5 L/s**

Storage volume requirements were determined by applying the 5-year and 100-year rainfall intensity values at 10-minute intervals until a peak storage volume was attained, (Refer to Storage tables 2 through 5 in Appendix 'C').

Table 1 "Stormwater Management Summary Sheet" in appendix 'C' summarizes the drainage areas, composite 'C' values, and controlled release rates. The resulting 100-year release rate from the site is **12.4 L/s**, which is equal to the allowable release rate of 12.4 L/s.

Based on the proposed site plan, and further to our discussion / correspondence with the RVCA, it was confirmed that no on-site stormwater quality requirements will be required for this site (please see attached correspondence / email in Appendix C).

Also, based on our review, it's our understanding that the exemptions set out under Ontario Regulations 525/98 - Approval Exemptions are satisfied and that this project will not be subject to an Environmental Compliance Approval (ECA). Correspondence has been sent to the MECP to confirm our above noted statement as requested by the City. It was noted that since the City of Ottawa participates in the ToR program, it's the Ministry's expectation that the ECA requirement determination would be completed by the City's review engineer/project manager. In situations where the review engineer/project manager is unsure of the requirements, it is expected that the City would contact MECP Ottawa District Office for clarification.

5.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures shall be implemented during construction to minimize the migration of sediments from the proposed construction. To accomplish this task, items such as silt fences, and geo-textile membranes shall be installed to capture sediment before it leaves the construction areas. In addition, all stockpiles shall be covered and located away from waterways and exposed areas and shall be vegetated as soon as possible. During construction, all erosion control features shall be maintained and repaired as necessary and adjacent roadways kept free of debris and sediment as required. A mud mat may be required on construction entrances to the site, depending on frequency of heavy vehicle travel and condition of the site.
(Refer to the Grading and Drainage Plan "Dwg. 21006 – GR1" in Appendix 'D').

6.0 CONCLUSION

1. The max daily and fire flow water demands for the site were calculated to be 1.83 L/s and 116.7 L/s respectfully. A building fire sprinkler system is anticipated in this development.

2. The peak wastewater flow for the site was calculated to be 1.61 L/s including the infiltration allowance.

3. The stormwater management measures proposed will result in a 100 year post-development release rate of 12.4 L/s, which is equal to the allowable release rate of 12.4 L/s. A storm water tank (i.e. cistern) will be constructed in the building to achieve the 100 year stormwater storage requirement of 30.0 cu.m.

We trust that this Site Servicing & Stormwater Management report meets all of your requirements. Should you have any questions or require further clarification, please do not hesitate to contact our office.

Sincerely,

Prepared by:

Ainley Graham and Associates Ltd.

Professional Engineers
Ontario
May 19, 2021
Limited Licensee
Name: J.W.XU
Number: 100171806
Category: CIVIL: see limitation
Limitations:
This licence is subject to the limitations as detailed on the certificate.
Association of Professional Engineers of Ontario

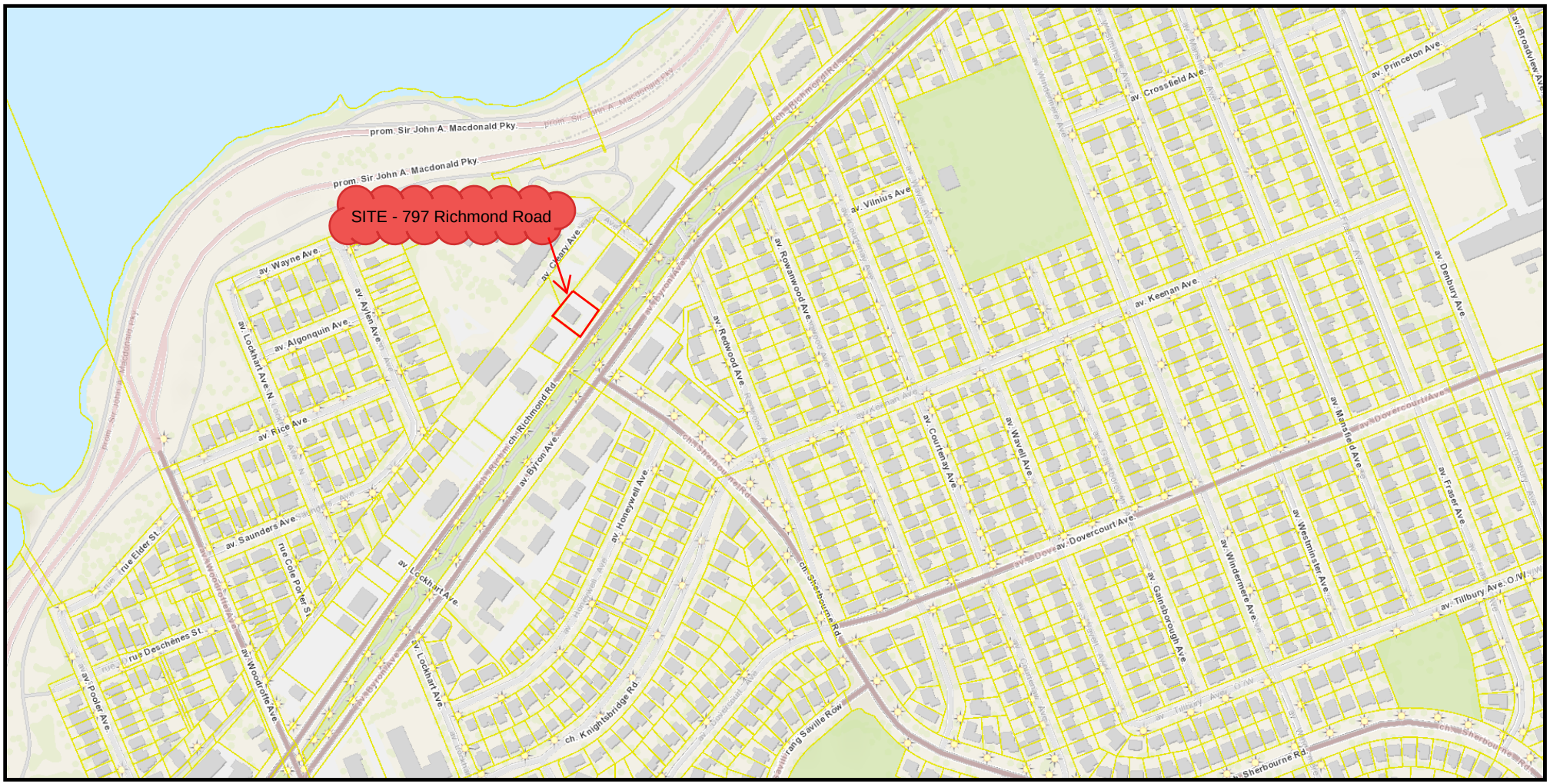
Jiawu Xu, LEL, C.E.T.
Project Manager

Reviewed by:

Ainley Graham and Associates Ltd.

Guy Ste-Croix, LEL, C.E.T., PMP
Branch Manager

APPENDIX A


SITE - 797 Richmond Road
prom. Sir John A. Macdonald Pky.
prom. Sir John A. Macdonald Pky.
av. Wayne Ave.
av. Algonquin Ave.
av. Lockhart Ave. N
av. Rice Ave
av. Saunders Ave
rue Elder St.
rue Deschênes St.
av. Pooler Ave.
av. Woodroffe Ave.
rue Cole Porter St.
av. Lockhart Ave
av. Lockhart Ave
av. Byron Ave.
ch. Richmond Rd.
av. Honeywell Ave.
ch. Knightsbridge Rd.
av. Rowanwood Ave.
av. Redwood Ave.
av. Vilnius Ave.
av. Keenan Ave.
av. Courtenay Ave.
av. Wavell Ave.
av. Dovercourt Ave.
ch. Sherbourne Rd.
av. Crossfield Ave.
av. Princeton Ave.
av. Denbury Ave.
av. Mansfield Ave.
av. Fraser Ave.
av. Westminster Ave.
av. Windermere Ave.
av. Gainsborough Ave.
av. Tillbury Ave. O./W.
av. Broadview Ave.

APPENDIX B

FUS Calculations

797 Richmond Apartments

$F = 220 \times C \times \sqrt{A}$

Where C = 0.6 for fire-resistive construction (fully protected frame, floors, roof)

For fire-resistive building, consider the two largest adjoining floors plus 50 percent of each of any floors immediately above them up to eight, when the vertical openings are inadequately protected. If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25 percent of each of the two immediately adjoining floors.

We note the following statements will apply for this project / building:

- The exterior will only have a fire rating of 1 hour if close to an interior property line. The exterior wall against the street (and possibly others) will not require a fire rating.

Therefore, it's our interpretation that the underlined requirement noted above shall apply for this project / building.

Floor area = 575 m^2
A = (2 X 575) + (0.5 X 7 X 575)
A = 3,162 m^2

$F = 220 \times 0.6 \times \sqrt{3{,}162}$

$F = 7{,}423\ L/min$

$F \sim 7{,}000\ L/min$

FUS Reductions / Increases:

Occupancy

It is noted that 'Apartments' are examples of Low Hazard Occupancies.

Therefore, a "*limited combustibility*" reduction of 15% (1,050 L/min) will be applied.

$F = 5{,}950\ L/min$

Modifier for Sprinkler System

A conservative modifier of 25% will be applied under the assumption that the sprinkler system will conform to the current standards required by the NFPA. It is possible to increase this credit by either providing a standard water supply for both the system and fire department hose lines, and/or providing a fully supervised system.

$M_1 = 1{,}487\ L/min$

Modifier for Exposure

The proposed building will have the following approximate clearances to existing structures:

East: bet'w 10.1 and 20m *15% increase*
West: bet'w 10.1 and 20m *15% increase*
North: bet'w 30.1 and 45m *5% increase*
South: over 45m *0% increase*
Total Increase: *35%*

$M_2 = 2{,}082\ L/min$

The final fire flow, according to the FUS, will be the fire flow as a result of the Occupancy reduction (5,950 L/s), minus the value M_1, and plus the value M_2.

$F = 5{,}950\ L/\min - 1{,}487\ L/\min + 2{,}082\ L/min$

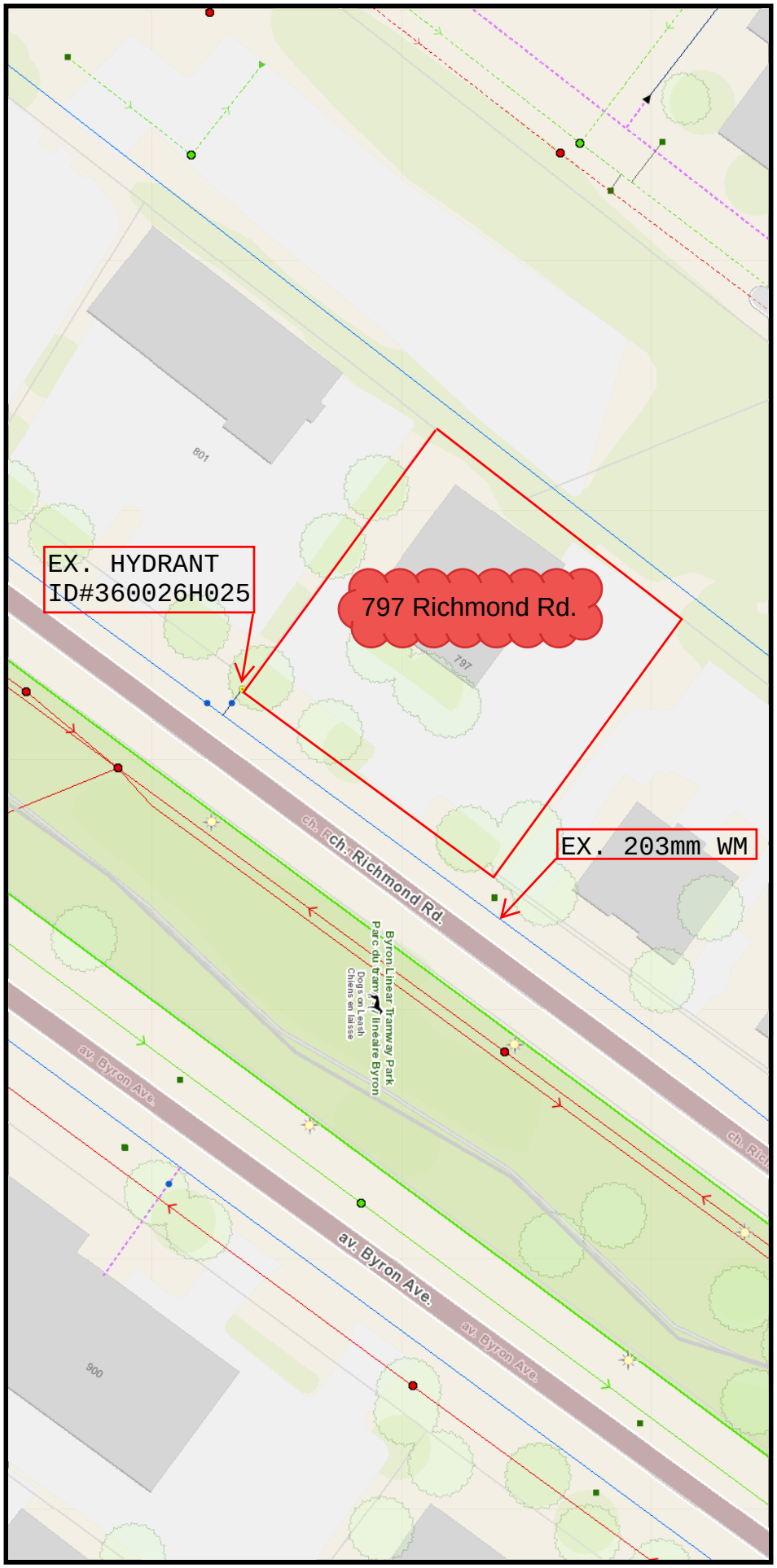
$F = 6{,}545\ L/min$

$F \sim 7{,}000\ L/min$

$F \sim 116.7\ L/s$

Conclusion:

The conservative FUS fire flow requirement for this building (based on our assumptions noted above) is **116.7 L/s.**


EX. HYDRANT
ID#360026H025
797 Richmond Rd.
EX. 203mm WM
ch. Rch. Richmond Rd.
av. Byron Ave.
Byron Linear Tramway Park
Parc du tram linéaire Byron
Dogs on Leash
Chiens en laisse
801
797
900

Guy Ste-Croix

From: Bakhit, Reza <reza.bakhit@ottawa.ca>
Sent: April 1, 2021 7:39 AM
To: Guy Ste-Croix
Subject: RE: 797 Richmond Road - Boundary Conditions
Attachments: 797 Richmond April 2021.pdf

Good morning Guy,

The following are boundary conditions, HGL, for hydraulic analysis at 797 Richmond (zone 1W) assumed to be connected to the 203 mm on Richmond Road (see attached PDF for location).

Minimum HGL = 108.7 m

Maximum HGL = 115.3 m

Max Day + Fire Flow (116.7 L/s) = 91.5 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.

Kind 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 - Centeral 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 easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Guy Ste-Croix <stecroix@ainleygroup.com>
Sent: Thursday, March 25, 2021 8:00 AM
To: Bakhit, Reza <reza.bakhit@ottawa.ca>
Subject: 797 Richmond Road - Boundary Conditions

At this time, we ask that the City provide boundary conditions for the 797 Richmond Road project. We note that the proposed development will be a 9 storey apartment building with 3 retail units on the ground floor and 51 residential units. The 51 residential units will be divided into one-bedroom, one-bedroom & den and two-bedroom apartments.

We provide the following information as requested:

- Average Daily Demand = 0.38 L/s
- Max. Daily Demand = 1.83 L/s
- Peak Hour Demand = 2.76 L/s
- Fire Flow req'm = 116.7 L/s (see attached)
- Ex. fire hydrant location / ID (see attached)

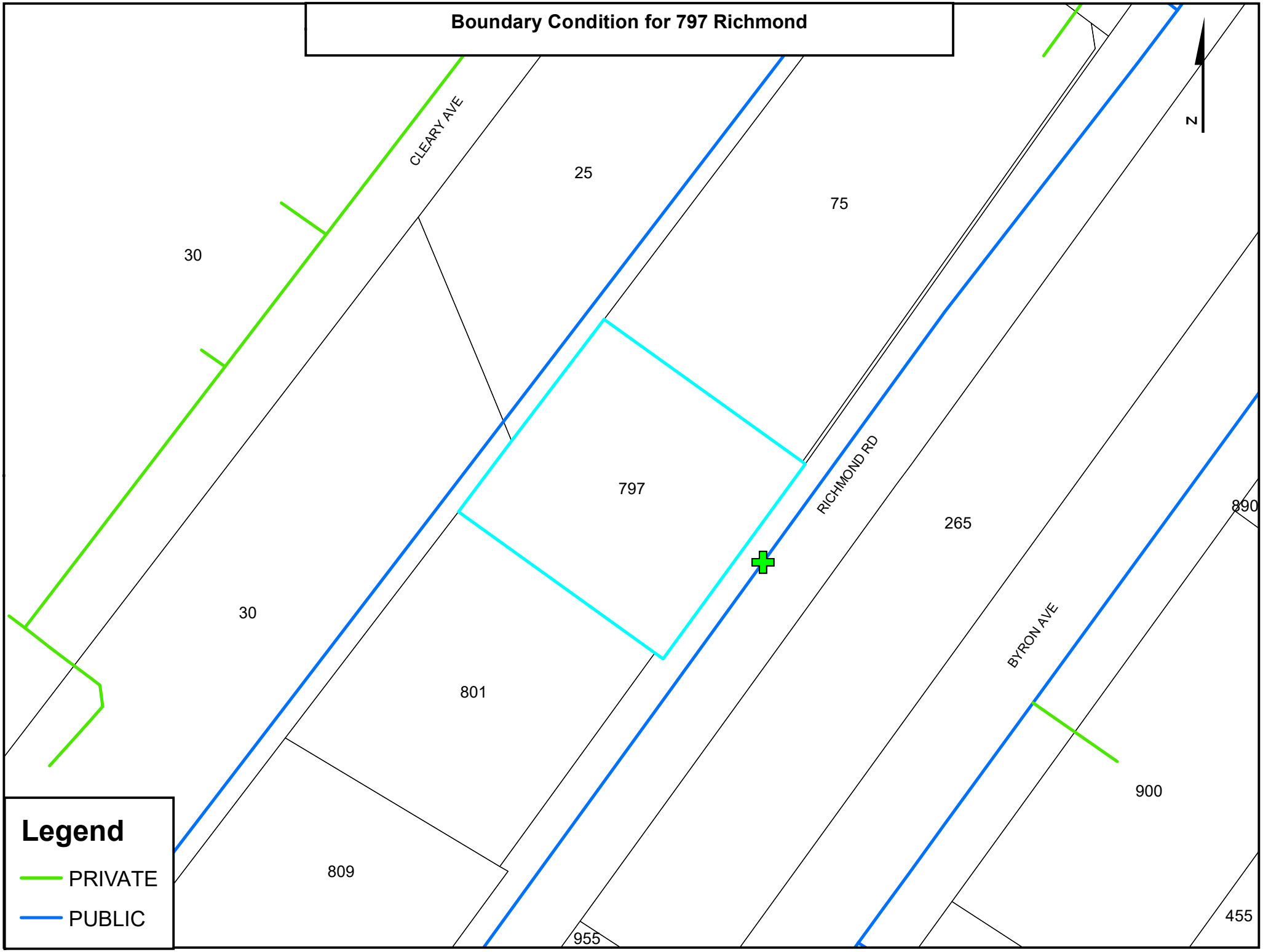
We note that the peaking factors used to calculate the anticipated residential maximum daily demand and maximum hourly daily demand (peak hour) is based on MOE Table 3.3 – Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People.

Should you have any questions, please don't hesitate to call.

Regards,

Guy Ste-Croix, LEL, C.E.T., PMP
Branch Manager

Ainley Graham & Associates Limited
2724 Fenton Road
Ottawa, Ontario, K1T 3T7
~~Tel: (613) 822-1052 ext. 225~~
~~Fax: (613) 822-1573~~
Cell: (613) 858-8943
stecroix@ainleygroup.com


Boundary Condition for 797 Richmond
CLEARY AVE
25
75
30
797
RICHMOND RD
265
890
30
801
BYRON AVE
900
809
955
455
N
Legend
PRIVATE
PUBLIC

APPENDIX C

AINLEY Project: 21006 - 1
Location:797 Richmond Road
Client:

Table 1. Stormwater Management Summary Sheet

Sub Area I.D.	Sub Area (ha)	C = 0.2	C = 0.6	C = 0.9	5 Year Composite 'C'	100 Year Composite 'C'	Outlet Location	Controlled Release (L/s)	Top of Grate (m)	Ponding Depth (m)	Invert or Pan Elev. (m)	Pipe dia (if plug type) (mm)	Head on Orifice (if plug) (m)	Diameter of Orifice (mm)
A1	0.095	0.000	0.000	0.095	0.90	1.00	BUILDING	7.50						
A2	0.003	0.001	0.000	0.002	0.73	0.91	FREE FLOW	0.59						
A3	0.016	0.000	0.000	0.016	0.90	1.00	FREE FLOW	4.12						
A4	0.003	0.003	0.000	0.000	0.20	0.25	FREE FLOW	0.19						
	0.117	0.004	0.000	0.113	0.88			12.40						

Table 2 - Storage Requirements for A1 (BUILDING)

Area **0.095** hectares
Runoff Coefficient = **0.90** post developmen 100 year ave C 1.00

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Release	Net Runoff To Be Stored (L/s)	Storage Req'd m3
2 Year	10	76.81	18.20	7.50	10.7	6.4
	20	52.03	12.33	7.50	4.8	5.8
	30	40.04	9.49	7.50	2.0	3.6
	40	32.86	7.79	7.50	0.3	0.7
	50	28.04	6.64	7.50	-0.9	-2.6
5 Year	10	104.19	24.69	7.50	17.2	10.3
	20	70.25	16.65	7.50	9.1	11.0
	30	53.93	12.78	7.50	5.3	9.5
	40	44.18	10.47	7.50	3.0	7.1
	50	37.65	8.92	7.50	1.4	4.3
100 Year	10	178.56	47.01	7.50	39.5	23.7
	20	119.95	31.58	7.50	24.1	28.9
	30	91.87	24.19	7.50	16.7	30.0
	40	75.15	19.78	7.50	12.3	29.5
	50	63.95	16.84	7.50	9.3	28.0

Table 3 - Storage Requirements for A2 (FREE FLOW)

Area **0.003** hectares
Runoff Coefficient = **0.73** post developmen 100 year ave C 0.91

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Release	Net Runoff To Be Stored (L/s)	Storage Req'd m3
2 Year	10	76.81	0.43	0.43	0.0	0.0
	20	52.03	0.29	0.43	-0.1	-0.2
	30	40.04	0.23	0.43	-0.2	-0.4
	40	32.86	0.19	0.43	-0.2	-0.6
	50	28.04	0.16	0.43	-0.3	-0.8
5 Year	10	104.19	0.59	0.59	0.0	0.0
	20	70.25	0.40	0.59	-0.2	-0.2
	30	53.93	0.30	0.59	-0.3	-0.5
	40	44.18	0.25	0.59	-0.3	-0.8
	50	37.65	0.21	0.59	-0.4	-1.1
100 Year	10	178.56	1.26	1.26	0.0	0.0
	20	119.95	0.85	1.26	-0.4	-0.5
	30	91.87	0.65	1.26	-0.6	-1.1
	40	75.15	0.53	1.26	-0.7	-1.8
	50	63.95	0.45	1.26	-0.8	-2.4

Table 4 - Storage Requirements for A3 (FREE FLOW)

Area **0.016** hectares
Runoff Coefficient = **0.90** post developmen 100 year ave C 1.00

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Release	Net Runoff To Be Stored (L/s)	Storage Req'd m3
2 Year	10	76.81	3.04	3.04	0.0	0.0
	20	52.03	2.06	3.04	-1.0	-1.2
	30	40.04	1.58	3.04	-1.5	-2.6
	40	32.86	1.30	3.04	-1.7	-4.2
	50	28.04	1.11	3.04	-1.9	-5.8
5 Year	10	104.19	4.12	4.12	0.0	0.0
	20	70.25	2.78	4.12	-1.3	-1.6
	30	53.93	2.13	4.12	-2.0	-3.6
	40	44.18	1.75	4.12	-2.4	-5.7
	50	37.65	1.49	4.12	-2.6	-7.9
100 Year	10	178.56	7.84	7.84	0.0	0.0
	20	119.95	5.27	7.84	-2.6	-3.1
	30	91.87	4.04	7.84	-3.8	-6.8
	40	75.15	3.30	7.84	-4.5	-10.9
	50	63.95	2.81	7.84	-5.0	-15.1

Table 5 - Storage Requirements for A4 (FREE FLOW)

Area **0.003** hectares
Runoff Coefficient = **0.20** post developmen 100 year ave C 0.25

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Controlled Release	Net Runoff To Be Stored (L/s)	Storage Req'd m3
2 Year	10	76.81	0.14	0.14	0.0	0.0
	20	52.03	0.09	0.14	0.0	-0.1
	30	40.04	0.07	0.14	-0.1	-0.1
	40	32.86	0.06	0.14	-0.1	-0.2
	50	28.04	0.05	0.14	-0.1	-0.3
5 Year	10	104.19	0.19	0.19	0.0	0.0
	20	70.25	0.12	0.19	-0.1	-0.1
	30	53.93	0.10	0.19	-0.1	-0.2
	40	44.18	0.08	0.19	-0.1	-0.3
	50	37.65	0.07	0.19	-0.1	-0.4
100 Year	10	178.56	0.40	0.40	0.0	0.0
	20	119.95	0.27	0.40	-0.1	-0.2
	30	91.87	0.20	0.40	-0.2	-0.4
	40	75.15	0.17	0.40	-0.2	-0.6
	50	63.95	0.14	0.40	-0.3	-0.8

Guy Ste-Croix

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: April 8, 2021 10:58 AM
To: Guy Ste-Croix
Subject: RE: Richmond Apartments - 797 Richmond Road

Hi Guy,

The RVCA does not require on-site water quality protection based on the proposed site plan. Best management practices are encouraged where possible.

Thank you,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: Evelyn Liu <evelyn.liu@rvca.ca>
Sent: Thursday, March 25, 2021 9:37 AM
To: Eric Lalande <eric.lalande@rvca.ca>
Subject: Re: Richmond Apartments - 797 Richmond Road

morning Eric

Thought the site if under your site scope? Can you please response , with anything may be required for the application? thanks

---

From: Guy Ste-Croix <stecroix@ainleygroup.com>
Sent: Thursday, March 25, 2021 9:25 AM
To: Evelyn Liu <evelyn.liu@rvca.ca>
Subject: Richmond Apartments - 797 Richmond Road

Hi Evelyn,

I'm not sure if you're the right person I should be sending this to, but in speaking with the RVCA receptionist, with thought we'd start here.

We are working on a proposed development (i.e. 9 storey residential building) at 797 Richmond Road in Ottawa. The building will take up most of the property. No outside parking lots are proposed, just a laneway on the east side of the building to access the ramp going down to the underground parking lot. We attach the proposed site plan for your reference. The site will be controlled to the 2-year pre-development level. That being said, with regards to water quality control, the City of Ottawa has requested: *"Please contact with the local conservation authority (RVCA) regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report."*

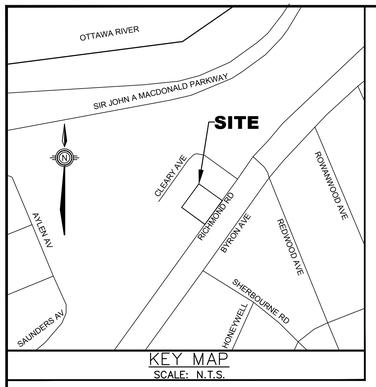
Any assistance you can provide in this regard is greatly appreciated. Please feel free to forward my email on to whomever is responsible for this… if not yourself.

Rega s,

y Ste-Croix, LEL, C.E.T., PMP
Branch Manager

Ainley Graham & Associates Limited
2724 Fenton Road
Ottawa, Ontario, K1T 3T7
~~Tel: (613) 822-1052 ext. 225~~
~~Fax: (613) 822-1573~~
Cell: (613) 858-8943
stecroix@ainleygroup.com

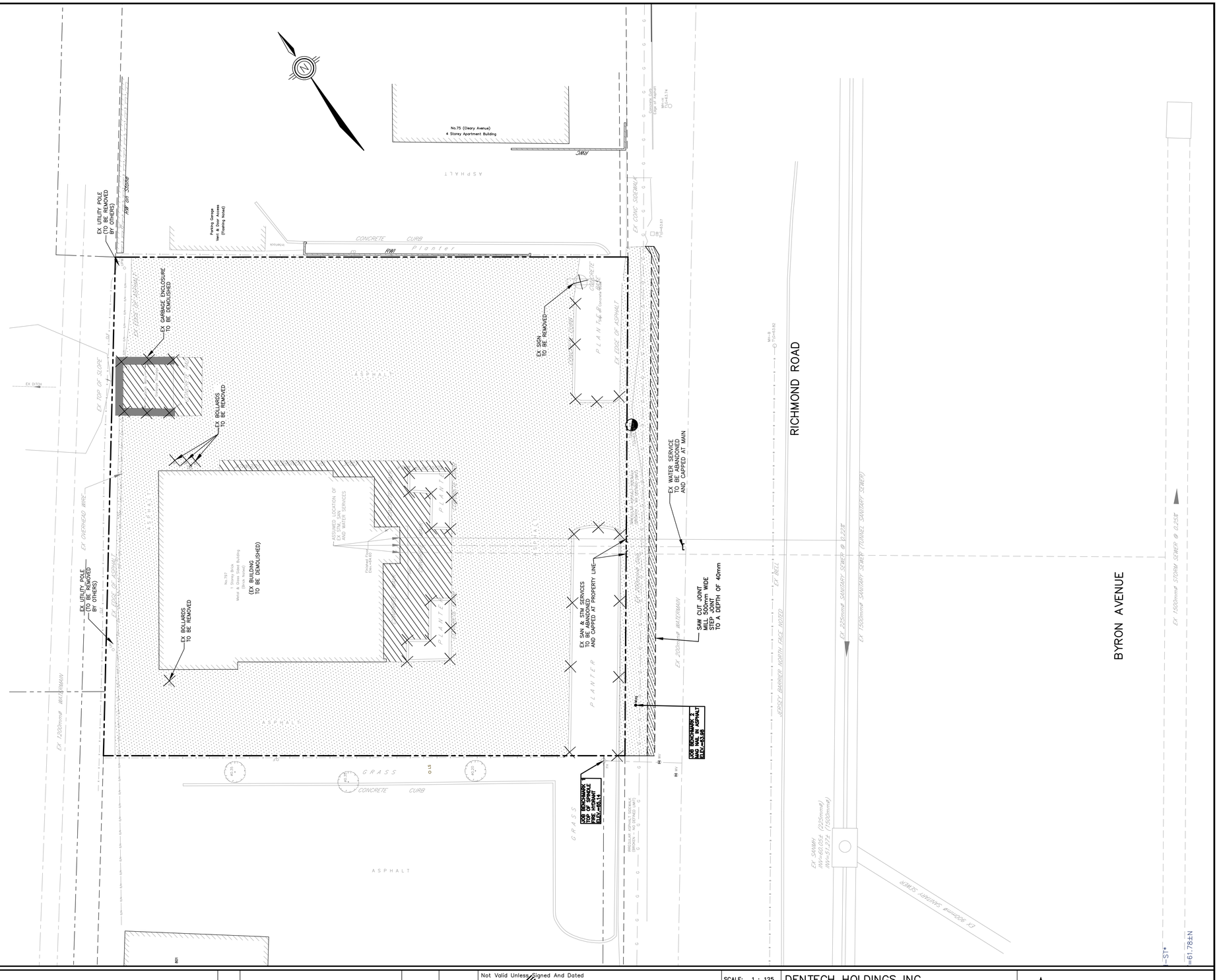
APPENDIX D



KEY MAP
SCALE: N.T.S.

REMOVALS

- ASPHALT REMOVAL (ROAD, DRIVEWAYS, PARKING AREAS)
- CONCRETE SIDEWALK REMOVAL
- REMOVE EXISTING CONCRETE CURB
- CAP
- REMOVE MANHOLE, UTILITY POLE CATCHBASIN, VALVE, HYDRANT, ETC.
- ADJUST MANHOLE/CATCHBASIN
- STEP JOINT



NO.	REVISIONS	DATE	INITIAL
2	ISSUED FOR SITE PLAN APPROVAL	MAY 19/21	JX
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MAY 19, 2021
Limited Licensee
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Association of Professional Engineers of Ontario

SCALE:	1 : 125
DESIGN:	JX
DRAWN:	MH
CHECKED:	GSC/JX
DATE:	MARCH 2021

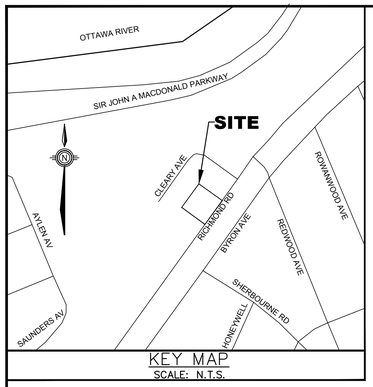
DENTECH HOLDINGS INC
PROPOSED APARTMENT
797 RICHMOND ROAD
CITY OF OTTAWA

EXISTING CONDITIONS/REMOVALS PLAN

Ainley GROUP CONSULTING ENGINEERS PLANNERS

CONTRACT No. 21006 | 001-21006-REM1

May 19, 2021 C:\Users\jxu\Desktop\Working projects\21006-1 797 Richmond Road\Design\001-21006-REM1.dwg



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4. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCHBASIN OUTLETS ARE PROVIDED.
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18. THE CONTRACTOR SHALL VERIFY ALL SURFACE AND SUBSURFACE CONDITIONS PRIOR TO COMMENCING CONSTRUCTION BY REVIEWING THE GEOTECHNICAL INVESTIGATION REPORT PREPARED BY PATERSON GROUP, DATED APRIL 26, 2021.
19. THE CONTRACTOR SHALL APPRAISE HIS/HER SELF OF ALL SURFACE AND SUBSURFACE CONDITIONS TO BE ENCOUNTERED AND SHALL CARRY OUT THEIR OWN TEST PITS AS REQUIRED TO MAKE THEIR OWN INDEPENDENT ASSESSMENT OF GROUND CONDITIONS. THE CONTRACTOR SHALL NOT MAKE ANY CLAIM FOR ANY EXTRA COST DUE TO ANY SUCH GROUND CONDITIONS VARYING FROM THOSE ANTICIPATED BY THE CONTRACTOR.
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24. THE CONTRACTOR IS TO PROVIDE 'AS-CONSTRUCTED' INFORMATION (i.e. ASPHALT GRADES, TOP OF CURB GRADES, WATERMAIN OBVERTS, SEWER INVERTS, ETC.) TO THE ENGINEER AND/OR CLIENT.
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27. A MUD MAT IS TO BE INSTALLED AT EACH CONSTRUCTION ENTRANCE AND SHALL BE MAINTAINED UNTIL THE PLACEMENT OF THE GRANULAR SUB-BASE. MUD MAT SHALL BE CONSTRUCTED OF 100mm ø CLEAR STONE, 400mm THICK. MUD MAT SHALL BE OF SUFFICIENT LENGTH TO ENSURE THAT A MINIMUM AMOUNT OF MATERIALS IS TRUCKED OFF SITE ONTO ADJACENT ROADS.

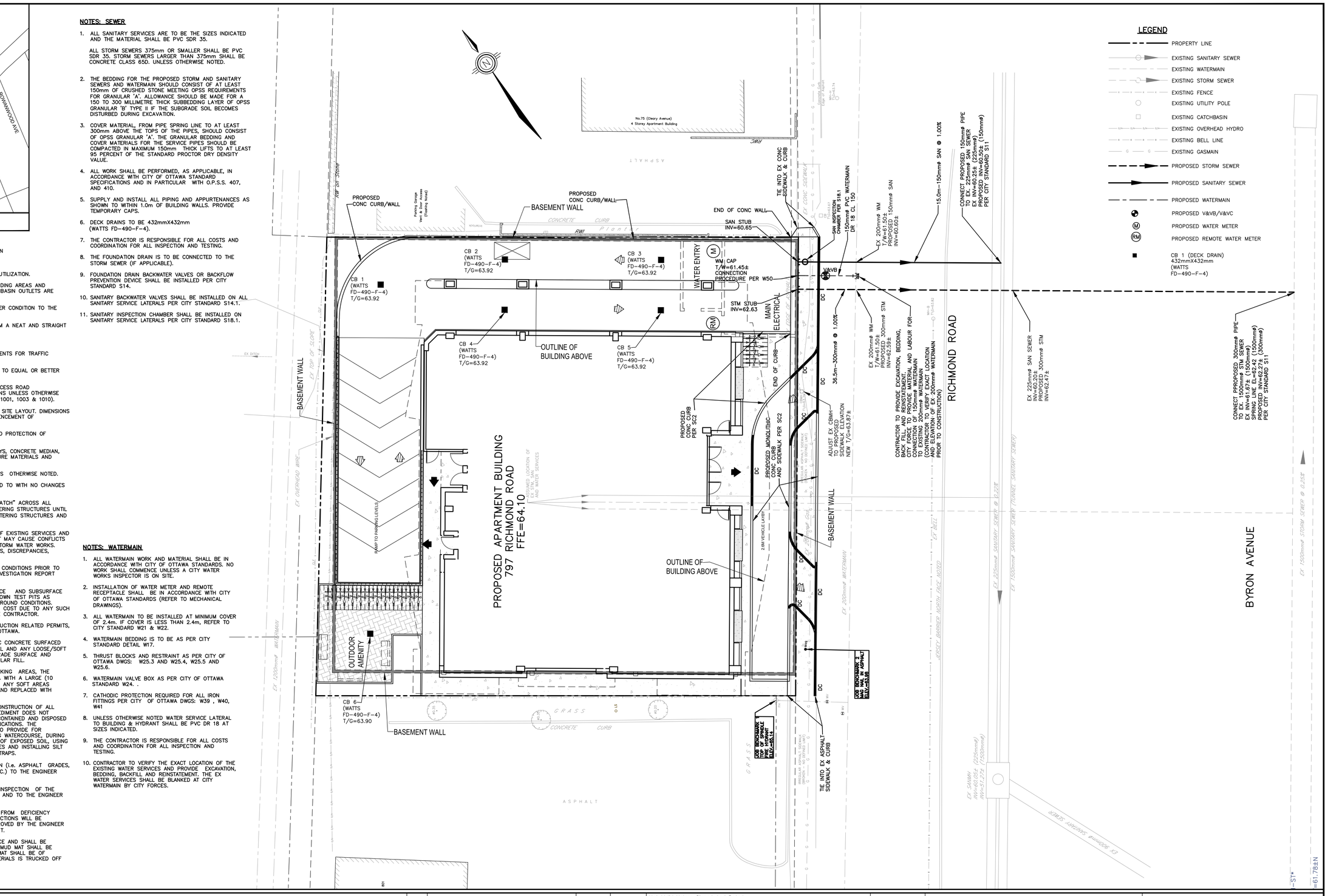
NOTES: SEWER

1. ALL SANITARY SERVICES ARE TO BE THE SIZES INDICATED AND THE MATERIAL SHALL BE PVC SDR 35.

   ALL STORM SEWERS 375mm OR SMALLER SHALL BE PVC SDR 35. STORM SEWERS LARGER THAN 375mm SHALL BE CONCRETE CLASS 65D. UNLESS OTHERWISE NOTED.
2. THE BEDDING FOR THE PROPOSED STORM AND SANITARY SEWERS AND WATERMAIN SHOULD CONSIST OF AT LEAST 150mm OF CRUSHED STONE MEETING OPSS REQUIREMENTS FOR GRANULAR 'A'. ALLOWANCE SHOULD BE MADE FOR A 150 TO 300 MILLIMETRE THICK SUBBEDDING LAYER OF OPSS GRANULAR 'B' TYPE II IF THE SUBGRADE SOIL BECOMES DISTURBED DURING EXCAVATION.
3. COVER MATERIAL, FROM PIPE SPRING LINE TO AT LEAST 300mm ABOVE THE TOPS OF THE PIPES, SHOULD CONSIST OF OPSS GRANULAR 'A'. THE GRANULAR BEDDING AND COVER MATERIALS FOR THE SERVICE PIPES SHOULD BE COMPACTED IN MAXIMUM 150mm THICK LIFTS TO AT LEAST 95 PERCENT OF THE STANDARD PROCTOR DRY DENSITY VALUE.
4. ALL WORK SHALL BE PERFORMED, AS APPLICABLE, IN ACCORDANCE WITH CITY OF OTTAWA STANDARD SPECIFICATIONS AND IN PARTICULAR WITH O.P.S.S. 407, AND 410.
5. SUPPLY AND INSTALL ALL PIPING AND APPURTENANCES AS SHOWN TO WITHIN 1.0m OF BUILDING WALLS. PROVIDE TEMPORARY CAPS.
6. DECK DRAINS TO BE 432mmX432mm (WATTS FD-490-F-4).
7. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS AND COORDINATION FOR ALL INSPECTION AND TESTING.
8. THE FOUNDATION DRAIN IS TO BE CONNECTED TO THE STORM SEWER (IF APPLICABLE).
9. FOUNDATION DRAIN BACKWATER VALVES OR BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED PER CITY STANDARD S14.
10. SANITARY BACKWATER VALVES SHALL BE INSTALLED ON ALL SANITARY SERVICE LATERALS PER CITY STANDARD S14.1.
11. SANITARY INSPECTION CHAMBER SHALL BE INSTALLED ON SANITARY SERVICE LATERALS PER CITY STANDARD S18.1.

NOTES: WATERMAIN

1. ALL WATERMAIN WORK AND MATERIAL SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS. NO WORK SHALL COMMENCE UNLESS A CITY WATER WORKS INSPECTOR IS ON SITE.
2. INSTALLATION OF WATER METER AND REMOTE RECEPTACLE SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS (REFER TO MECHANICAL DRAWINGS).
3. ALL WATERMAIN TO BE INSTALLED AT MINIMUM COVER OF 2.4m. IF COVER IS LESS THAN 2.4m, REFER TO CITY STANDARD W21 & W22.
4. WATERMAIN BEDDING IS TO BE AS PER CITY STANDARD DETAIL W17.
5. THRUST BLOCKS AND RESTRAINT AS PER CITY OF OTTAWA DWGS: W25.3 AND W25.4, W25.5 AND W25.6.
6. WATERMAIN VALVE BOX AS PER CITY OF OTTAWA STANDARD W24. .
7. CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS PER CITY OF OTTAWA DWGS: W39 , W40, W41
8. UNLESS OTHERWISE NOTED WATER SERVICE LATERAL TO BUILDING & HYDRANT SHALL BE PVC DR 18 AT SIZES INDICATED.
9. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS AND COORDINATION FOR ALL INSPECTION AND TESTING.
10. CONTRACTOR TO VERIFY THE EXACT LOCATION OF THE EXISTING WATER SERVICES AND PROVIDE EXCAVATION, BEDDING, BACKFILL AND REINSTATEMENT. THE EX WATER SERVICES SHALL BE BLANKED AT CITY WATERMAIN BY CITY FORCES.



LEGEND

- PROPERTY LINE
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EXISTING FENCE
- EXISTING UTILITY POLE
- EXISTING CATCHBASIN
- EXISTING OVERHEAD HYDRO
- EXISTING BELL LINE
- EXISTING GASMAIN
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- PROPOSED V&VB/V&VC
- PROPOSED WATER METER
- PROPOSED REMOTE WATER METER
- CB 1 (DECK DRAIN) 432mmX432mm (WATTS FD-490-F-4)

NO.	REVISIONS	DATE	INITIAL
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Not Valid Unless Signed And Dated
Professional Engineers Ontario
MAY 19, 2021
Limited Licensee
Name: J.W.XU
Number: 100171806
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SCALE:	1 : 125
DESIGN:	JX
DRAWN:	MH
CHECKED:	GSC/JX
DATE:	MARCH 2021

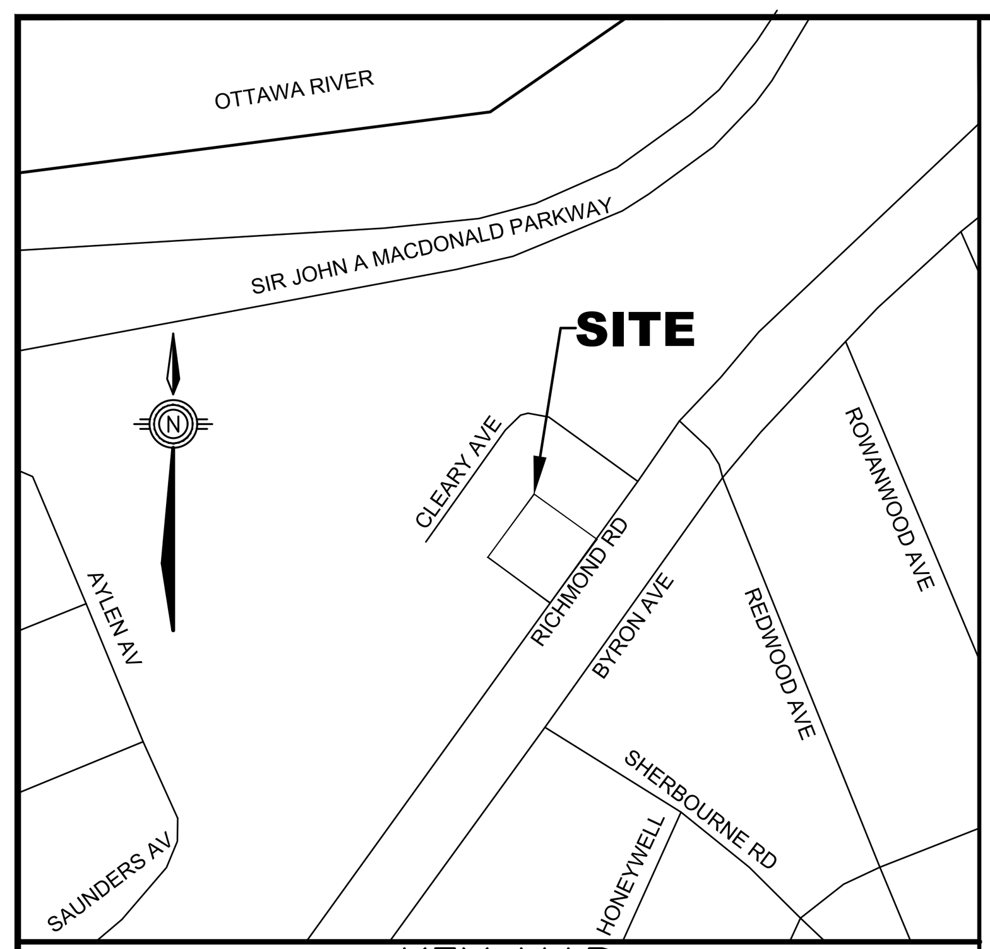
DENTECH HOLDINGS INC
PROPOSED APARTMENT
797 RICHMOND ROAD
CITY OF OTTAWA

SITE SERVICING PLAN

Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No. 21006 | 002-21006-S1

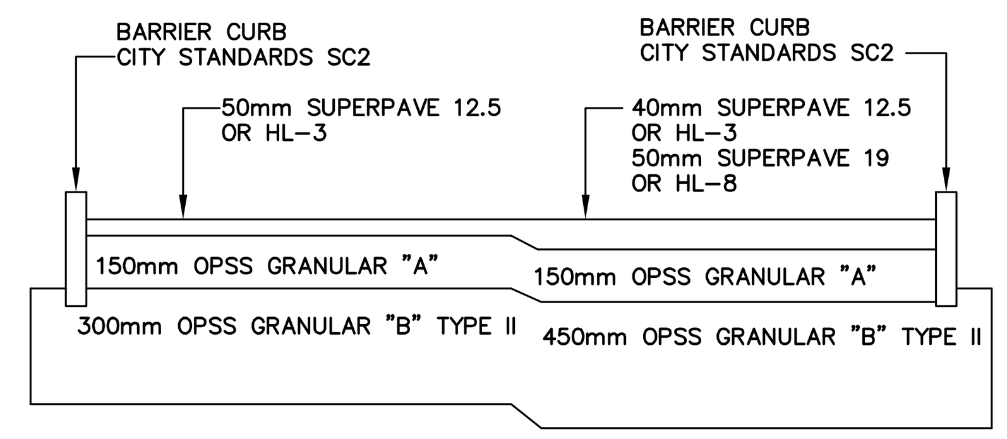
May 19, 2021 C:\Users\jxu\Desktop\Working projects\21006-1 797 Richmond Road\Design\002-21006-S1.dwg



KEY MAP
SCALE: N.T.S.

LEGEND

- PROPERTY LINE
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EXISTING FENCE
- EXISTING UTILITY POLE
- EXISTING CATCHBASIN
- EXISTING OVERHEAD HYDRO
- EXISTING BELL LINE
- EXISTING GASMAIN
- x 64.51 — EXISTING ELEVATION
- PROPOSED PARKING DECK DRAIN FD-490-F-4 (WATTS)
- 63.90 — PROPOSED GRADE
- 2.0% — DIRECTION AND SLOPE
- 63.91 — EP/TC/SW GRADE
- PROPOSED V&VB
- OVERLAND FLOW
- SILT FENCE (PER OPSD-219.110)
- CB 1 (DECK DRAIN) 432mmX432mm (WATTS FD-490-F-4)
- H.P. — RIDGE LINE
- B.L. — BREAK LINE



PARKING AREAS (LIGHT DUTY) N.T.S.

ACCESS LANES (HEAVY DUTY) N.T.S.

(REFER TO GEOTECHNICAL INVESTIGATION REPORT PREPARED BY PATERSON GROUP DATED APRIL 26, 2021)

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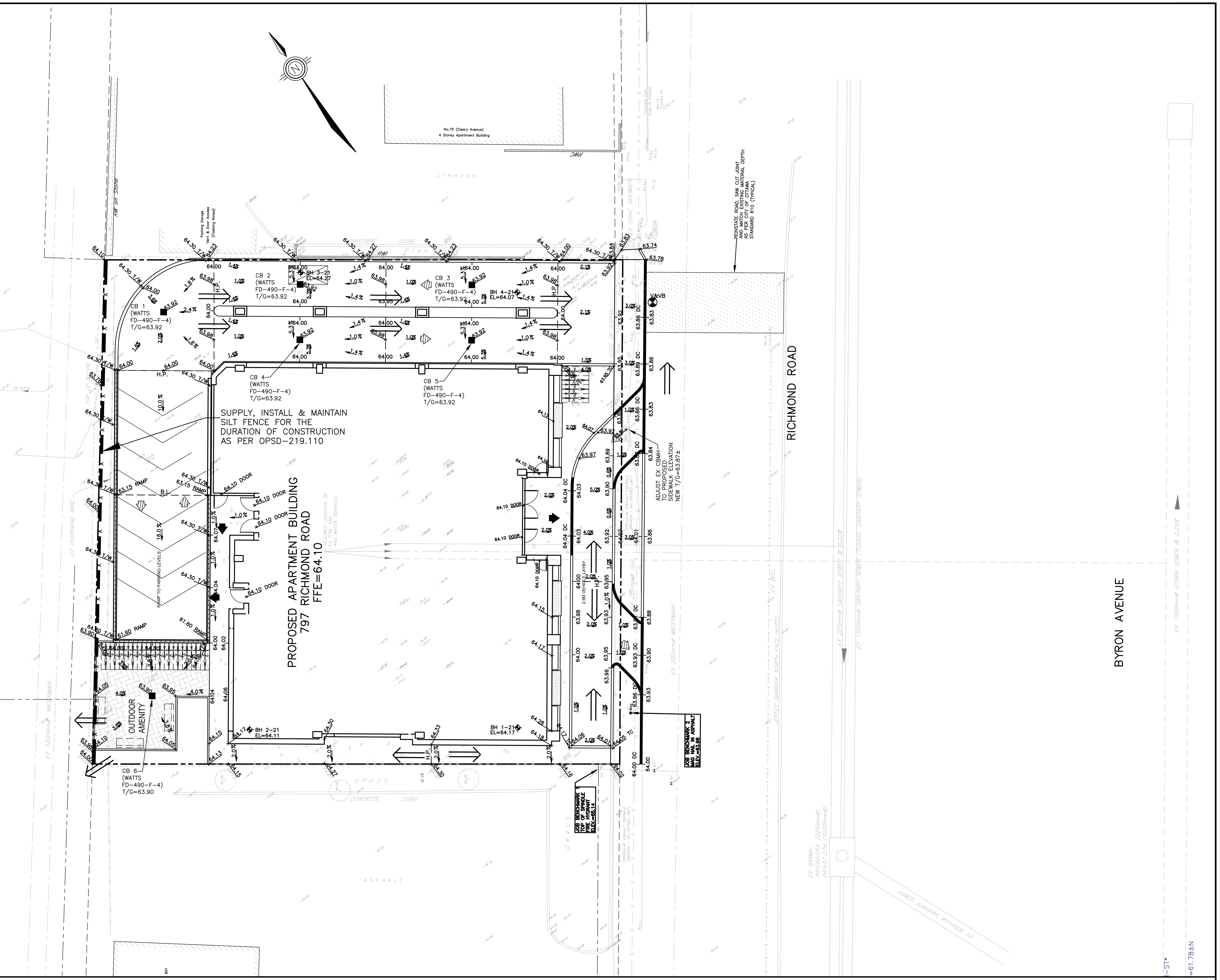

CONTRACT DRAWINGS:
Contractor must verify all dimensions and be responsible for same. Any discrepancies must be reported to the Engineer before commencing work. Drawings are not to be scaled. Drawings may not be used for any purpose other than that stipulated in the contract agreement between the owner/client and the Engineer without the express written consent of Ainley Graham & Associates Limited. Use of these drawings by any party for any other purpose is subject to the following caution.

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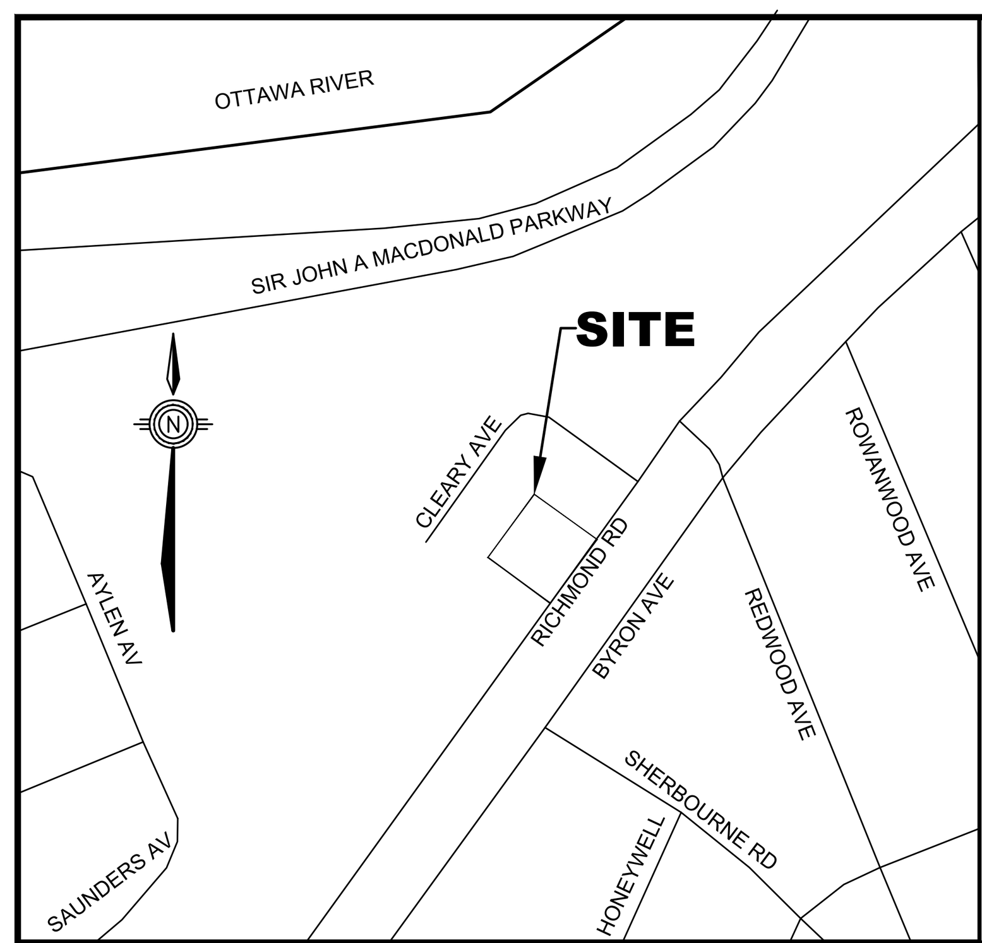
DENTECH HOLDINGS INC
PROPOSED APARTMENT
797 RICHMOND ROAD
CITY OF OTTAWA

GRADING AND DRAINAGE PLAN

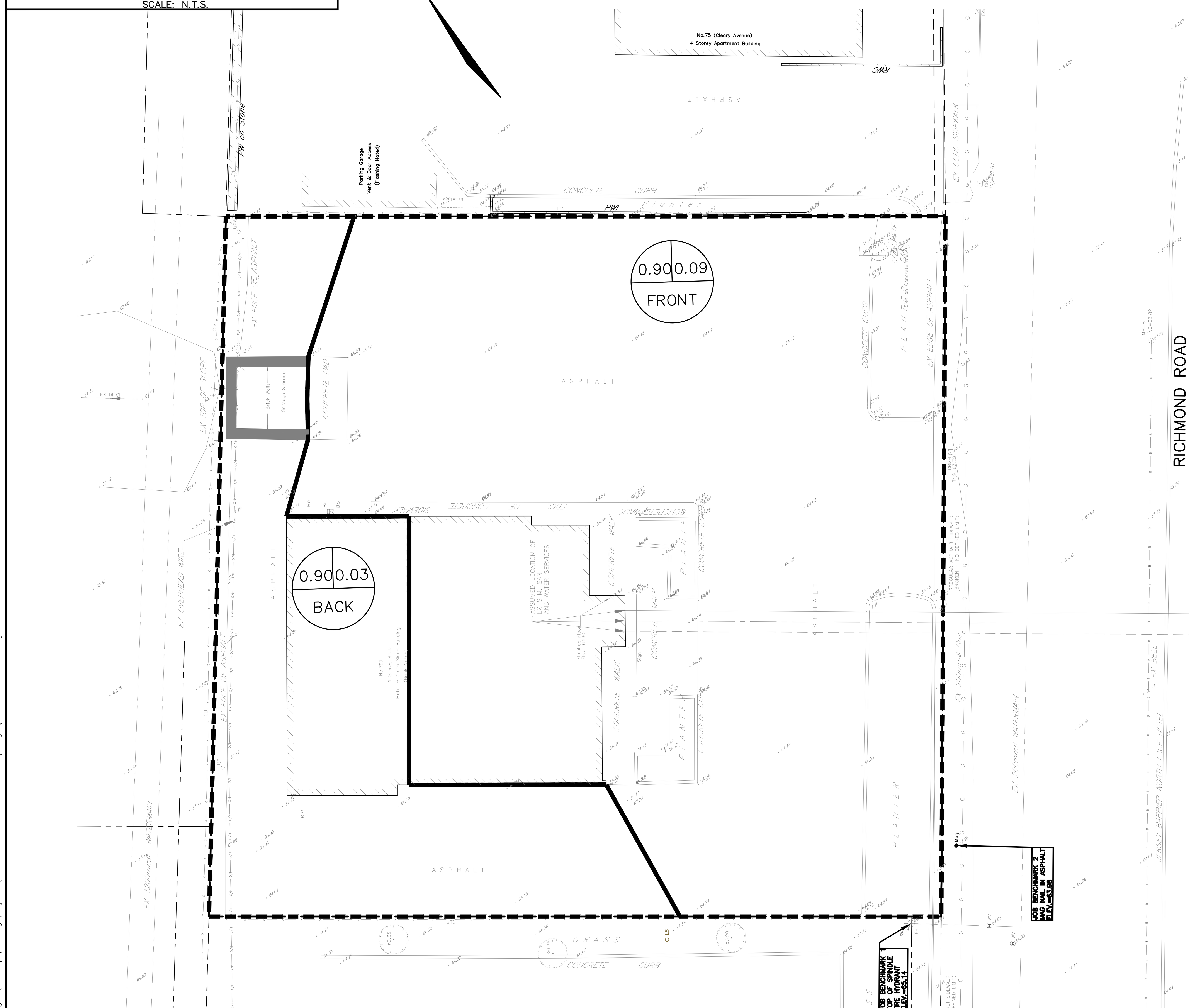
Ainley GROUP — CONSULTING ENGINEERS PLANNERS

CONTRACT No. 21006 | 003-21006-GR1



KEY MAP
SCALE: N.T.S.

PRE-DEVELOPMENT DRAINAGE AREA PLAN



ORIFICE SUMMARY

AREA NO	LOCATION	TYPE	RELEASE & HEAD
A1	BUILDING	BUILDING CISTERN WITH SUBM. PUMP	7.50 L/S
A2	CLEARY AVENUE	FREE FLOW	0.59 L/S
A3	RICHMOND ROAD	FREE FLOW	4.12 L/S
A4	CLEARY AVENUE	FREE FLOW	0.19 L/S

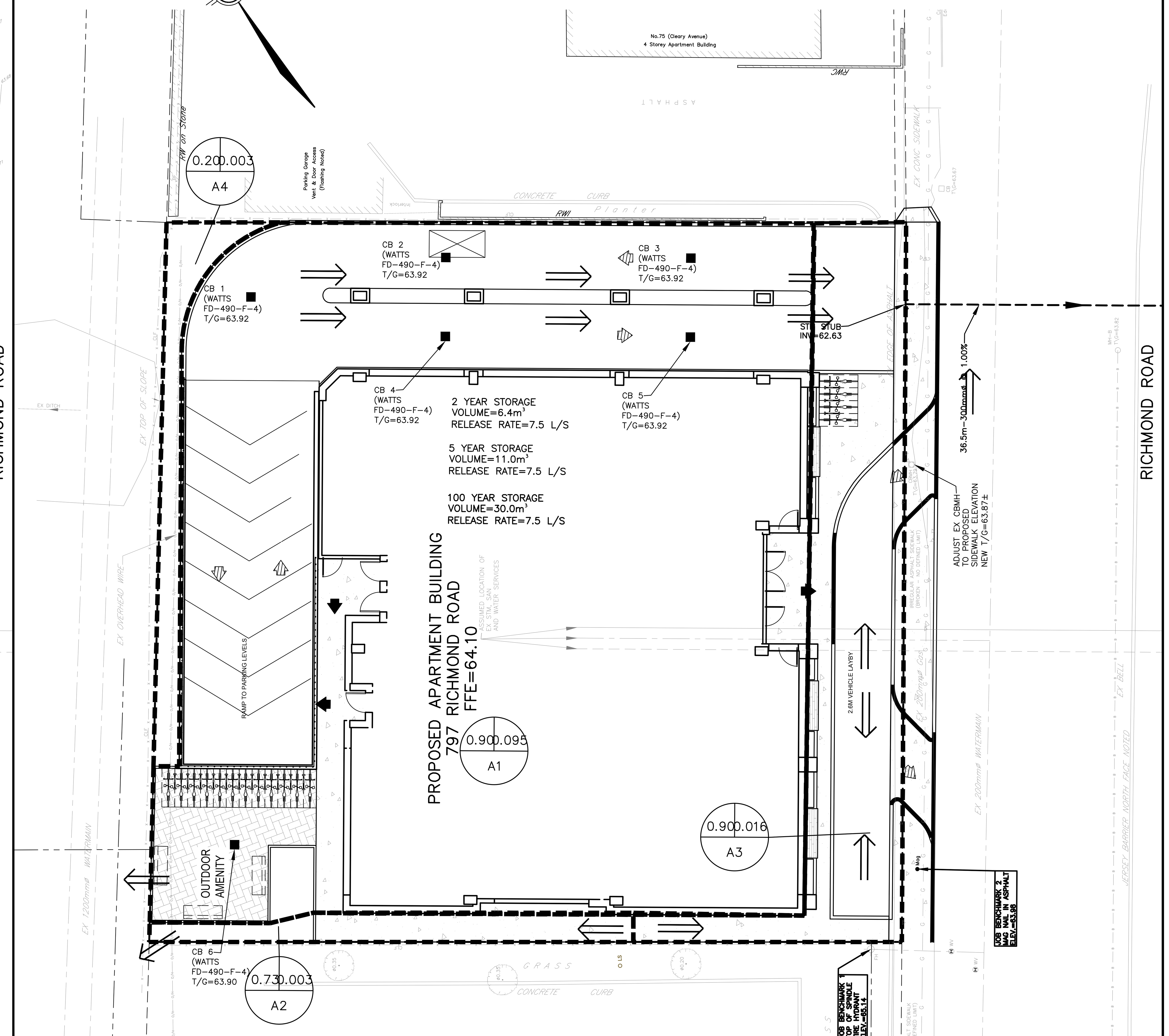
LEGEND

STORM DRAINAGE AREA

RUNOFF COEFFICIENT
AREA (ha)
AREA NUMBER
(0.90 0.095 / A1)

OVERLAND FLOW

POST-DEVELOPMENT DRAINAGE AREA PLAN



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NO.	REVISIONS	DATE	INITIAL
2	ISSUED FOR SITE PLAN APPROVAL	MAY 19/21	JX
1	ISSUED FOR REVIEW/COORDINATION	APR 26/21	JX

Not Valid Unless Signed And Dated
Professional Engineers Ontario
MAY 19, 2021
Limited Licensee
Name: J.W.XU
Number: 100171806
Category: CIVIL: see limitation
Limitations:
This licence is subject to the limitations as detailed on the certificate.
Association of Professional Engineers of Ontario

SCALE:	1 : 125
DESIGN:	JX
DRAWN:	MH
CHECKED:	GSC/JX
DATE:	MARCH 2021

DENTECH HOLDINGS INC
PROPOSED APARTMENT
797 RICHMOND ROAD
CITY OF OTTAWA

PRE-DEVELOPMENT DRAINAGE AREA PLAN
POST-DEVELOPMENT DRAINAGE AREA PLAN

Ainley GROUP
CONSULTING ENGINEERS PLANNERS

CONTRACT No. 21006 | 004-21006-STM1