

Site Servicing & Storm Water Management Report

797 Richmond Apartments

Ainley Group
Project No. 21006-1

Prepared for:
Dentech Holdings Inc.

Rev. Feb 07, 2022
May 7, 2021



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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 (please see attached correspondence / email in Appendix D).

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. The Geotechnical Investigation was completed by Paterson Group, report dated April 26, 2021. The City of Ottawa pre-consultation notes and Servicing Study Guidelines have been included in Appendix D for reference. We note that the proposed LRT development near the site will change the servicing infrastructure at the Richmond / Byron Median; that being said, is not anticipated until late 2023. Therefore, the proposed services (i.e. storm, sanitary and water) for this site will be connected to the existing infrastructure along Richmond Road in the interim and will be redirected / reconstructed by the LRT Design-Build team once the new main line sewers / watermain have been constructed.

2.0 MUNICIPAL DRINKING & FIRE PROTECTION WATER SERVICES

Using the City of Ottawa guidelines, the anticipated average daily demand for the 9 storey apartment building has been calculated at **0.41 L/s** as follows:

- 11 units (1 bedroom) X 1.4 persons per unit X 350 L/person/day = 5,390 L/day = 0.06 L/s
- 8 units (1 bed + den) X 2.1 persons per unit X 350 L/person/day = 5,880 L/day = 0.07 L/s
- 32 units (2 bedrooms) X 2.1 persons per unit X 350 L/person/day = 23,520 L/day = 0.27 L/s
- 349sq.m (commercial) X 2,500 L/1,000sq.m = 873 L/day = 0.01 L/s

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 E. Also, with the LRT project, a new watermain is anticipated in the near future.

The maximum daily demand and maximum hourly daily demand (peak hour) based on peaking factors from MOE Table 3.3 – Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People for residential use and City of Ottawa guidelines for commercial use will be **1.98 L/s** and **2.98 L/s** respectively.

- Average Daily Demand: 0.40 L/s (residential) + 0.01 L/s (commercial) = 0.41 L/s
- Max. Daily Demand: 0.40 L/s X 4.9 (peaking factor for 50 units serviced) + 0.01 L/s X 1.5 (commercial) = 1.98 L/s
- Max. Hourly Daily Demand (Peak Hour): 0.40 L/s X 7.4 (peaking factor for 50 units serviced) + 0.01 L/s X 1.8 (commercial) = 2.98 L/s

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 E. According to the preliminary LRT design drawings, the fire hydrant is proposed to remain in the same location.

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. 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 average daily demand of 0.41 L/s calculated above in section 2.0 (i.e. 0.40 L/s - residential and 0.01 L/s - commercial), the anticipated peak sanitary flow has been calculated at **1.65 L/s**.

- $0.40 \text{ L/s} \times 4.0$ (peaking factor for domestic flow) + $0.01 \text{ L/s} \times 1.5$ (peaking factor for commercial flow) = 1.62 L/s
- $1.62 \text{ L/s} + (0.116 \text{ ha} \times 0.28 \text{ L/s/gross ha}) = 1.65 \text{ L/s}$

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. Also, with the LRT project, a new sanitary sewer is anticipated in the near future.

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

$$Q = R \times A \times I \times N$$

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 shall be achieved by providing a storm water tank (i.e. cistern) inside the building to accommodate the full storm water storage requirements for the site. Therefore, no roof top retention (i.e. no controlled roof drains) are anticipated for this building. (Refer to the Storm Water Management Plan Dwg. 21006 – SWM1” in Appendix ‘E’)

Storm water tank storage requirements including maximum release rate have been determined for the building and shall be implemented / designed 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**

A submersible pump with a constant release rate (no greater than 7.5 L/s) is anticipated. Also, the storm water tank shall have an emergency spill outlet towards the Right of Way should the cistern or outlet fail. Foundation and/or under slab drains are to be connected downstream of any cistern controls. Storage volume requirements were determined by applying the 2-year, 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 4 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.

A 300mm diameter storm service is proposed to service the 9 storey apartment building off of the 750mm diameter temporary storm sewer located within the Richmond Road ROW. As mentioned previously, the LRT Design-Build team will be installing new main line sewers along Richmond Road in the near future as part of the overall LRT project and will be responsible for redirecting / reconstruction the storm service accordingly. The proposed temporary layout can be seen on drawing 21006–S1 in Appendix E.

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 D).

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 ‘E’).

6.0 CONCLUSION

1. The max daily and fire flow water demands for the site were calculated to be 1.98 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 1.65 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:

Reviewed by:

Ainley Graham and Associates Ltd.

Ainley Graham and Associates Ltd.



Professional Engineers
Ontario February 07, 2022
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

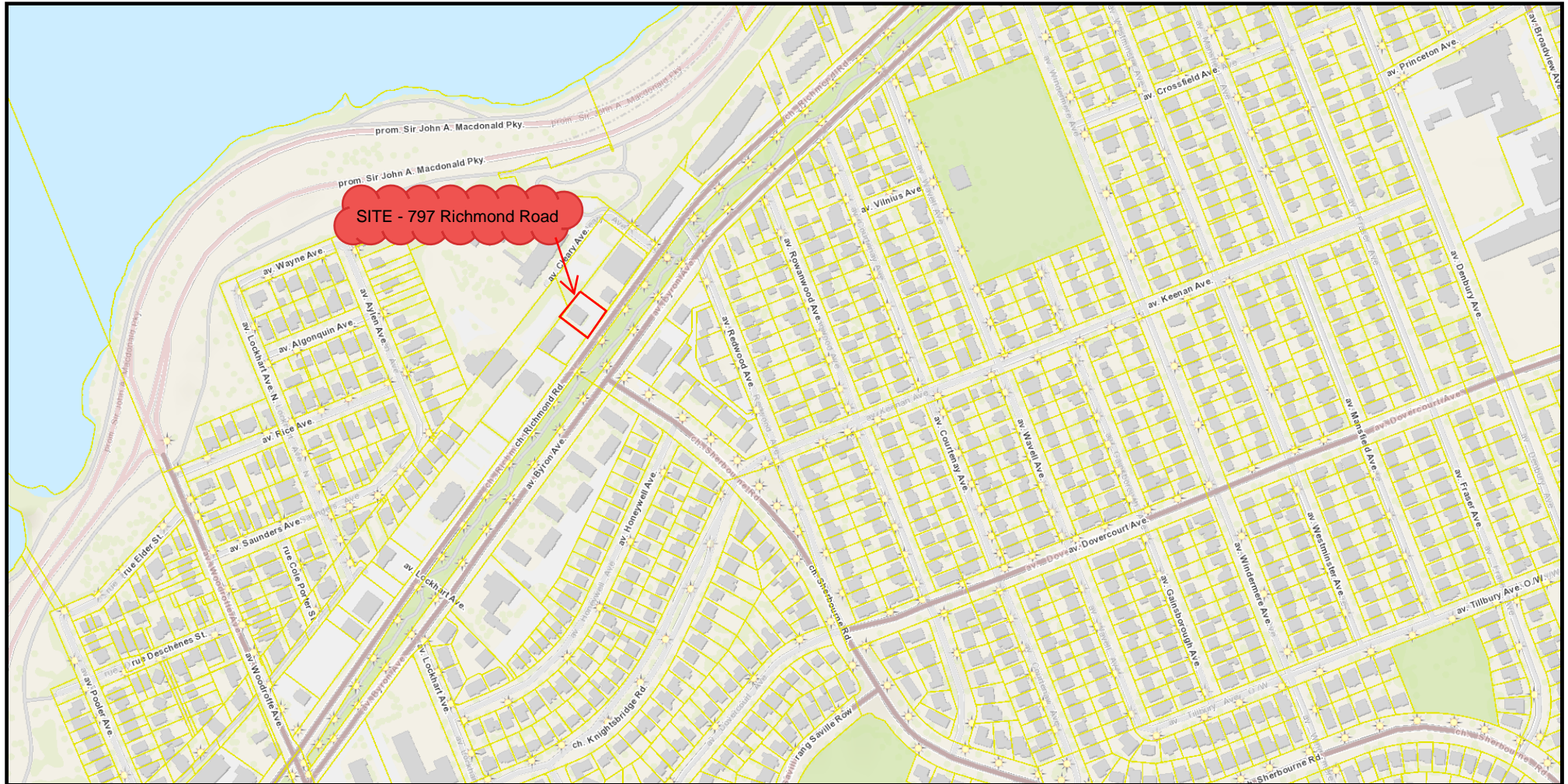


Jiawu Xu, LEL, C.E.T.
Project Manager / Senior Designer

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

APPENDIX A

APPENDIX A



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 m²

$$A = (2 \times 575) + (0.5 \times 7 \times 575)$$

$$A = 3,162 \text{ m}^2$$

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

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

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

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.

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

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.

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

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%

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

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 .

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

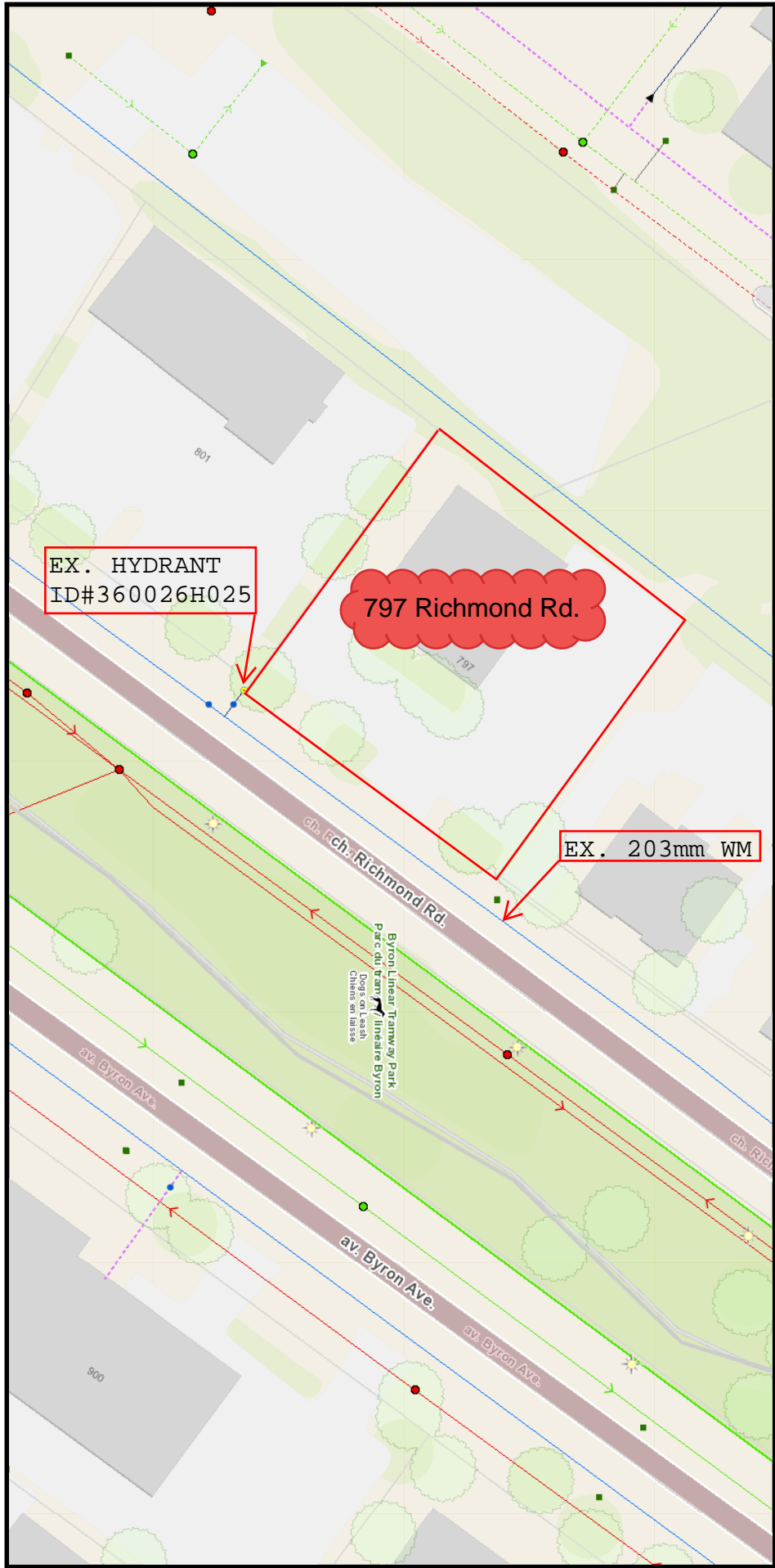
$$F = 6,545 \text{ L/min}$$

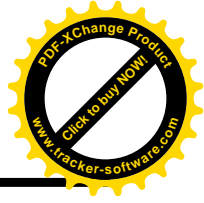
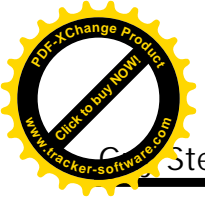
$$F \sim 7,000 \text{ L/min}$$

$$F \sim 116.7 \text{ L/s}$$

Conclusion:

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





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 - Central Branch

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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

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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



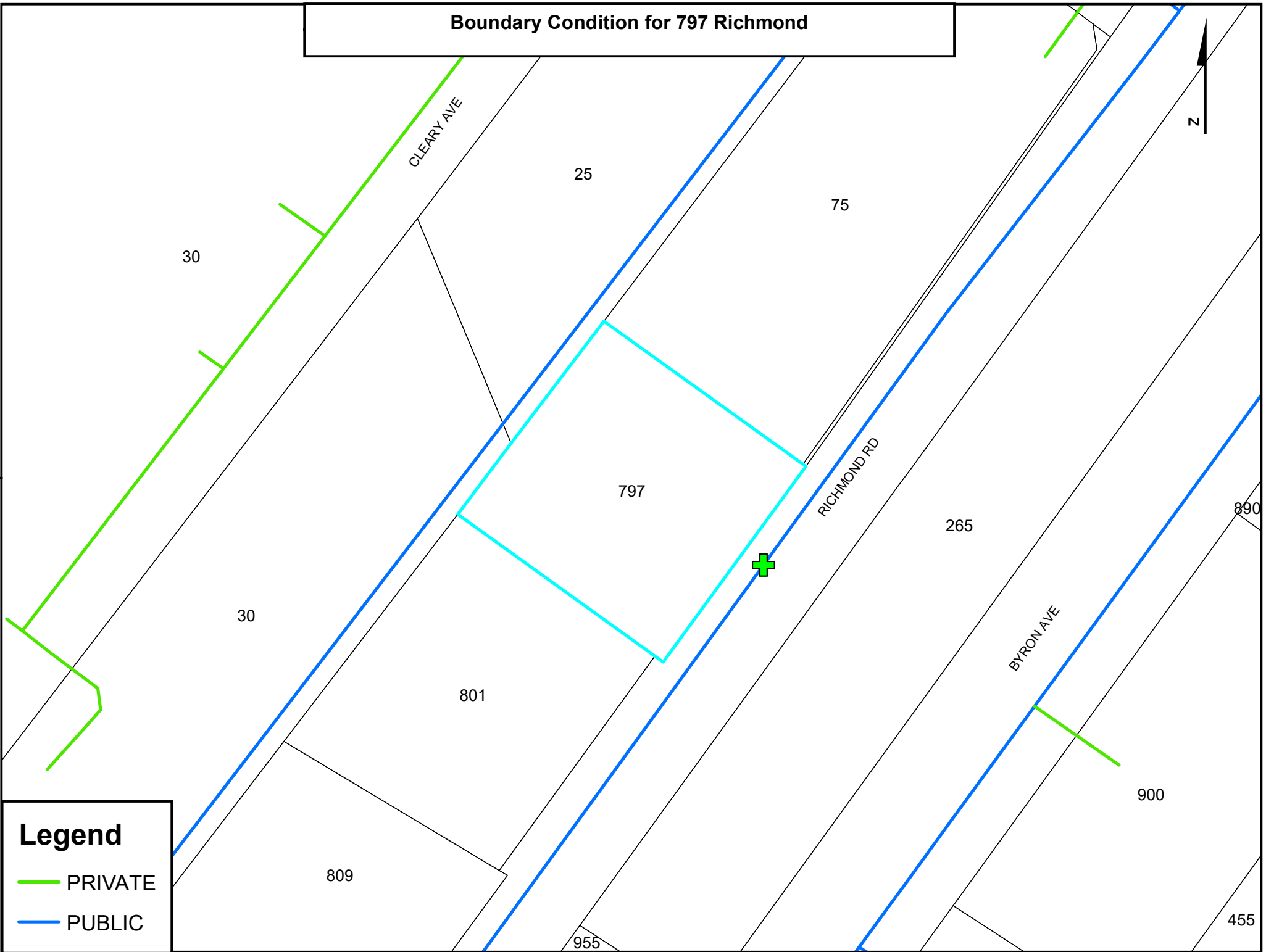
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Boundary Condition for 797 Richmond



Legend

- PRIVATE
- PUBLIC

APPENDIX C

AINLEY Project: 21006 - 1
Location: 797 Richmond Road
Client: Dentech Holdings Inc.

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 development 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 development 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 development		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 development		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

APPENDIX D

Guy Ste-Croix

From: Guy Ste-Croix
Sent: December 16, 2021 9:44 AM
To: Guy Ste-Croix
Subject: FW: 20-1881 - 797 Richmond Apartments - Shared Folder: 21-03-23 - CAD Plans

Project Name: 797 Richmond Apartments
Project Number: 20-1881

From: Maximilian Allen (Chmiel Architects)
To: Joe Tallis
CC:
Subject: 21-03-23 - CAD Plans
Sent via: Info Exchange
Expiration Date: 4/22/2021
Remarks: Hi Joe,

I've attached the CAD Plans. We're testing out this method of file transfer, so give me a call if you have any issues.

Here are the unit breakdowns:

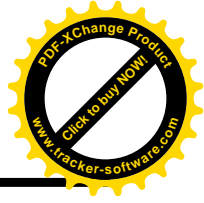
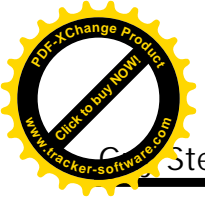
797 Richmond Apartments Residential Unit Breakdown	1 BED	1 BED + DEN	2 BED
2nd Floor	2	1	4
3rd Floor	2	1	4
4th Floor	2	1	4
5th Floor	1	1	4
6th Floor	1	1	4
7th Floor	1	1	4
8th Floor	1	1	4
9th Floor	1	1	4

Cheers,

Max Allen Dpl.Arch.Tech

Chmiel Architects Incorporated

t: 613. 234. 3585 x224 | f: 613. 234. 6224
Suite 200, 109 Bank Street Ottawa, Ontario. K1P 5N5
email: maxa@chmielarchitects.com web: www.chmielarchitects.com



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.

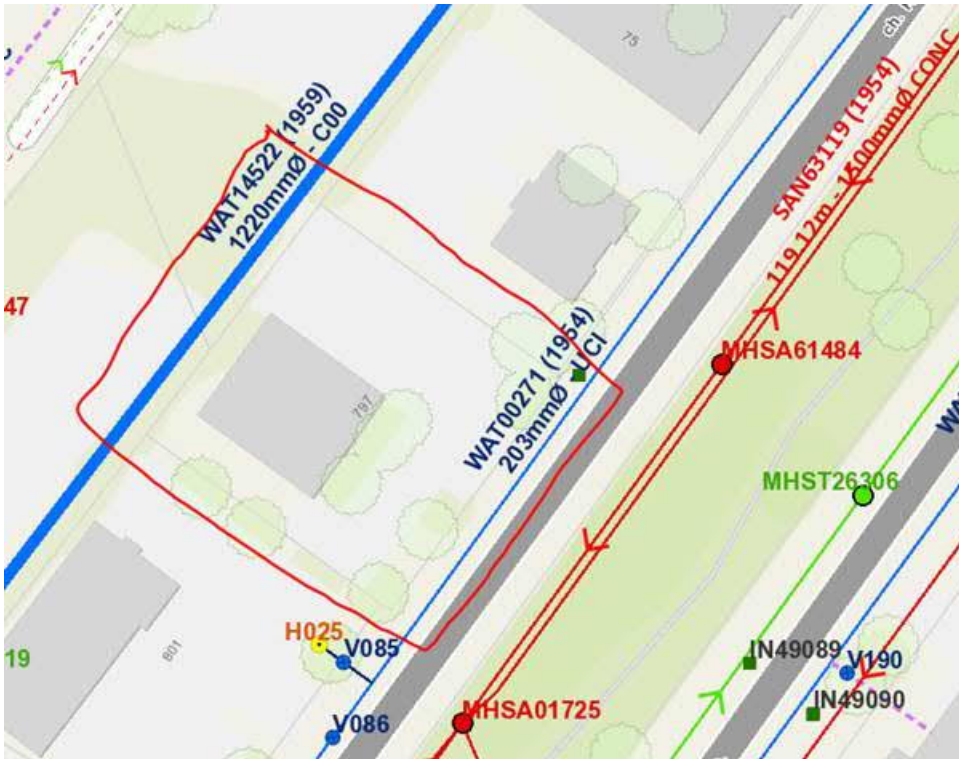
From: Bakhit, Reza <reza.bakhit@ottawa.ca>
Sent: November 19, 2020 11:47 AM
To: McCreight, Andrew
Subject: 797 Richmond Pre-consultation notes

Hi Andrew,

Please forward the below information to the applicant regarding a development proposal at 797 Richmond road. for a 9-12 story apartment building. Note that the information is considered preliminary and the assigned Development Review Project Manager may modify and/or add additional requirements and conditions upon review of an application if deemed necessary.

General:

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.
- Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided and all easements shall be shown on the engineering plans.
- Please provide an **Existing Conditions/Removals Plan** as part of the engineering drawing set. Existing services are to be removed or abandoned in accordance with City standards AND service sizes to be documented.
- Please note that the proposed servicing design and site works shall be in accordance with the following documents:
 - Ottawa Sewer Design Guidelines (October 2012)
 - Technical Bulletin PIEDTB-2016-01
 - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
 - Ottawa Design Guidelines - Water Distribution (2010)
 - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
 - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
 - City of Ottawa Environmental Noise Control Guidelines (January 2016)
 - City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
 - Ottawa Standard Tender Documents (latest version)
 - Ontario Provincial Standards for Roads & Public Works (2013)
 - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).



Disclaimer:

The City of Ottawa does not guarantee the accuracy or completeness of the data and information contained on the above image(s) and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the image(s) provided. This image is for schematic purposes only.

Stormwater Management Criteria and Information:

- **Water Quantity Control:** In the absence of area specific SWM criteria please control post-development runoff from the subject site, up to and including the **100-year storm event, to a 2-year pre-development level.** The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than 0.5. **[If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5].** The time of concentration (T_c) used to determine the pre-development condition shall be 20min or can be calculated. *[T_c of 20 minutes should be used for all pre-development calculations without engineering justification, T_c should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; T_c of 10 minutes shall be used for all post-development calculations].*
- Any storm events greater than the established **2-year allowable release rate, up to and including the 100-year storm event,** shall be detained on-site. The SWM measures required to avoid impact on downstream sewer system will be subject to review.
- Please note that foundation drainage is to be independently connected to sewermain unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. **It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.**
- **Water Quality Control:** Please consult 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.

- **Underground Storage:** Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**

In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

- Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.
- Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.
- Please provide a **Pre-Development Drainage Area Plan** to define the pre-development drainage areas/patterns. **Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution.**
- If rooftop control and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a **Roof Drain Plan** as part of the submission.
- Investigate the implementation of LID features (i.e. permeable IPS) to reduce runoff however no credit shall be given in terms of stormwater management.
- For proposed 9 stories and higher buildings , a **wind analysis** is required.
- **It should be noted that the stage 2 LRT will be depressed between Richmond and Byron and that could impact existing local infrastructure. Please make sure to coordinate your design with Joshua White the program manager (Transportation Utilities Lead) Joshua.White@ottawa.ca for detailed instructions on the process and to request information regarding the LRT Stage 2 project.**

Storm Richmond Byron:

- A 1500mm dia. CONC storm sewer (1955) is available within the median at Richmond close to Byron Ave.
- As-built drawings of the existing services within the vicinity of the site shall be obtained and reviewed in order to determine proper servicing and SWM plan for the subject site(s).
- The storm service connection is to have backwater valve.

Sanitary Richmond Byron:

- A 225mm dia. CONC sanitary sewer (1961) is available within **Richmond Byron median.**
- A 1500mm dia. CONC sanitary sewer (1954) is available within Richmond Byron median. (**Trunk Pipe**)

- **An analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater system is required to be provided.** Needs to be demonstrated that there is adequate capacity to support any increase in wastewater flow.
- Please apply the wastewater design flow parameters *in Technical Bulletin PIEDTB-2018-01*.
- Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.
- A backwater valve is required on the sanitary service for protection.

Water :

- A 203mm dia. UCI watermain (1954) is available within Richmond Rd.
- Existing residential service to be blanked at the main.
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m³/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration*. The basic day demand for this site not expected to exceed 50m³/day.
- Please **review Technical Bulletin ISTB-2018-0**, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A **hydrant coverage figure** shall be provided and **demonstrate there is adequate fire protection for the proposal**. Two or more public hydrants are anticipated to be required to handle fire flow.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
 - Type of Development and Units
 - Site Address
 - A plan showing the proposed water service connection location.
 - **Average Daily Demand (L/s)**
 - **Maximum Daily Demand (L/s)**
 - **Peak Hour Demand (L/s)**
 - **Fire Flow (L/min)**

[Fire flow demand requirements shall be based on **Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 1999**]

Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).

- **Hydrant capacity shall be assessed to demonstrate the RFF can be achieved.** Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.
- The subject site is located within the 1W Pressure Zone.

Water:

Please note that a 1200mm high pressure water main located at the rear of the property. This pipe 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 . Therefore , a watermain protection plan as well as a contingency plan prepared by a qualified professional would be required. These plans will be reviewed both by development review as well as asset management groups and that could add extra time for completion of the SPC review process.

Snow Storage:

- Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patterns or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

Permits and Approvals:

- The consultant shall determine if this project will be subject to an Environmental Compliance Approval (ECA) for Private Sewage Works. It shall be determined if the exemptions set out under Ontario Regulation 525/98: *Approval Exemptions* are satisfied. **All regulatory approvals shall be documented and discussed in the report.**

Required Engineering Plans and Studies in Support of SPC Application:

PLANS:

- Existing Conditions and Removals Plan
- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan
- Pre-Development Drainage Area Plan
- Post-Development Drainage Area Plan
- Roof Drainage Plan
- Foundation Drainage System Detail
- Topographical Plan of Survey
- Legal Survey Plan
- Site Lighting Plan and Photometric Plan

REPORTS:

- Site Servicing and Stormwater Management Report
- Geotechnical Study/Investigation
- Noise Control Study (assessment of stationary and transportation noise) (due to proximity (within 100m) of an existing arterial road).
- Phase I ESA
- Phase II ESA (Depending on recommendations of Phase I ESA)
- Wind analysis (Must be prepared, signed and stamped by an engineer who specializes in pedestrian level wind evaluation.)

Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:**

<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#gravity-pipe-design-guidelines>

Please ensure you are using current guidelines, by-laws and standards.

Phase One Environmental Site Assessment:

- A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.
- The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.
- Official Plan Section 4.8.4:

<https://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety>

Geotechnical Investigation:

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long term damages associated with lowering the groundwater in this area.
- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.

<https://documents.ottawa.ca/sites/default/files/documents/cap137602.pdf>

Noise Study:

- A Phase 2 Noise Control Detailed Study is required as the subject site is within 100m of an arterial road that is considered a surface transportation noise source. Any existing and/or new stationary noise sources shall be identified and analyzed.
- Please note that an environmental noise assessment of any stationary noise sources (Stationary Noise Assessment) of the proposed development will be required to determine the affects of any proposed roof top units, etc. for this building as this noise may subject the tenants/owners of the upper level of the residential building, and the surrounding neighbours, to static noise levels that are beyond the acceptable limits.
- Noise Study shall be consistent with the City's **Environmental Noise Control Guidelines**.

https://documents.ottawa.ca/sites/default/files/documents/enviro_noise_guide_en.pdf

Exterior Site Lighting:

- Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a **Site Lighting Plan, Photometric Plan and Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

Please note that these comments are considered preliminary based on the information available to date and therefore maybe amended as additional details become available and presented to the City. It is the responsibility of the applicant to verify the above information. The applicant may contact me for follow-up questions related to engineering/infrastructure prior to submission of an application if necessary.

If you have any questions or require any clarification please let me know.

Regards,

Reza Bakhit, E.I.T, C.E.T.

Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d’infrastructures

Planning, Infrastructure and Economic Development Department - Services de la planification, de l’infrastructure et du développement économique

Development Review

City of Ottawa | Ville d’Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 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

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

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

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

4.1 General Content

N/A 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.

N/A 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.

N/A 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.

N/A 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.

N/A 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.

N/A 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

- N/A** 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.
- N/A** 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
- N/A** 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

- N/A** 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.
- N/A** 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).
- N/A** 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.
- N/A** 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)
- N/A** 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.
- N/A** 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).
- N/A** Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- N/A** Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- N/A** Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- N/A** Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- N/A Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- N/A Analysis of available capacity in existing public infrastructure.
- N/A 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.
- N/A Set-back from private sewage disposal systems.
- N/A 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.
- N/A 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).
- N/A 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.
- N/A Any proposed diversion of drainage catchment areas from one outlet to another.
- N/A Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- N/A 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.
- N/A Identification of potential impacts to receiving watercourses
- N/A Identification of municipal drains and related approval requirements.
- Descriptions of how the conveyance and storage capacity will be achieved for the development.
- N/A 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

N/A 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.

N/A 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.

N/A 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.

N/A Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.

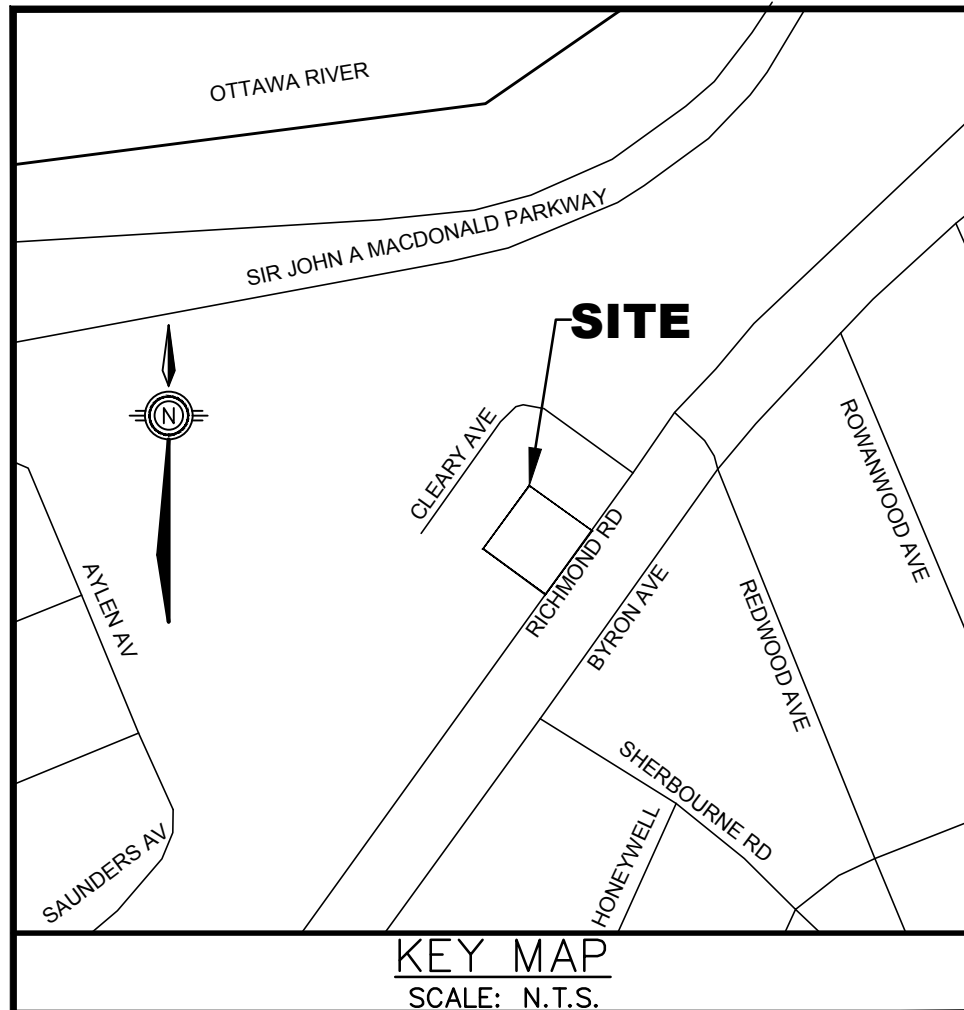
N/A Changes to Municipal Drains.

N/A Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)


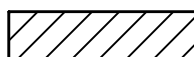
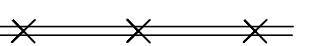


4.6 Conclusion Checklist

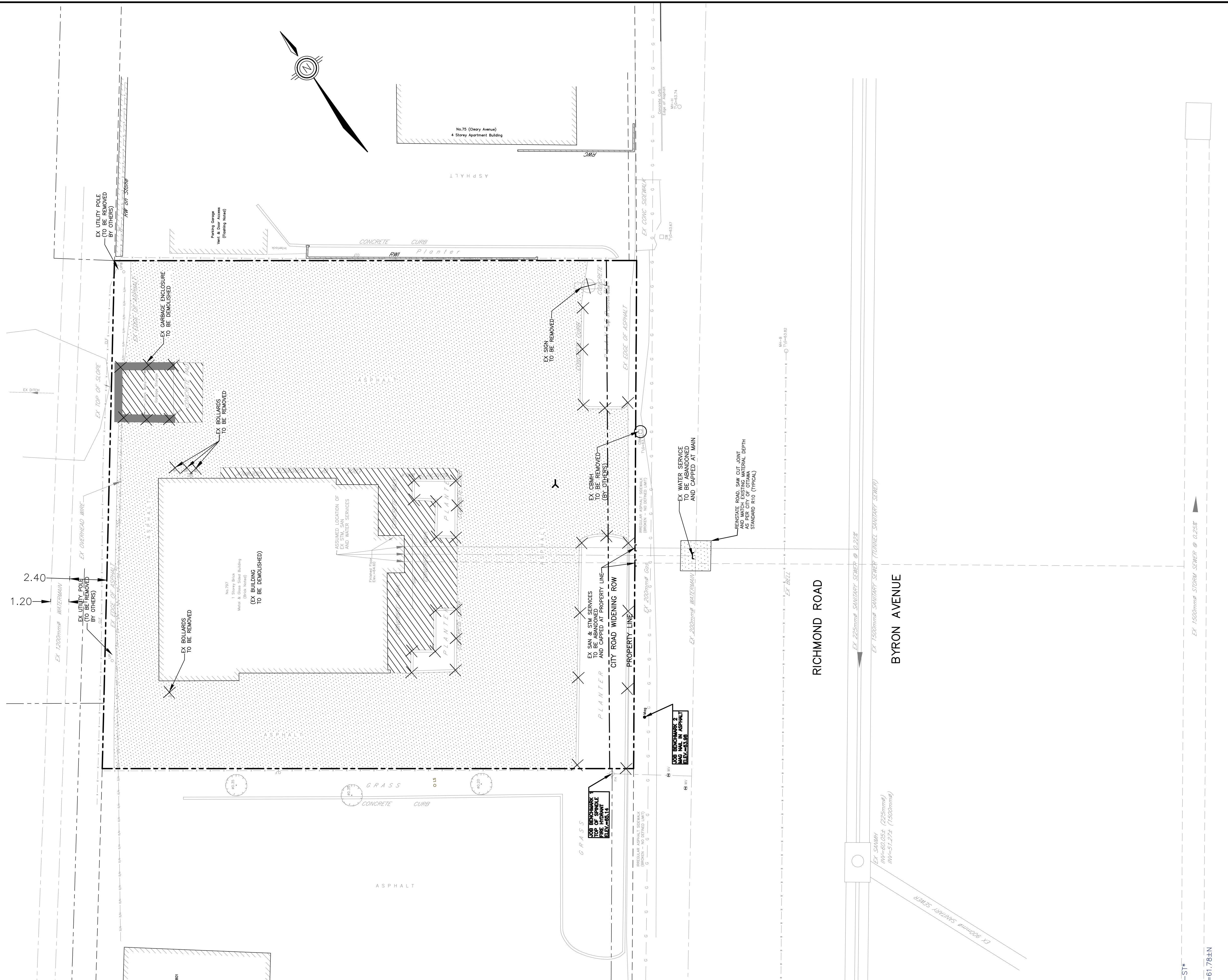
- Clearly stated conclusions and recommendations
- Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- All draft and final reports shall be signed and stamped by a professional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

APPENDIX E



REMOVALS

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



Feb 07, 2022 1: DRAWINGS\21006-1 797 Richmond Road\Design\03-21006-REM1.dwg

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Not Valid Unless Signed And Dated


Professional Engineers
Ontario
FEBRUARY 07, 2022
Limited Licensee

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Number: 100171806
Category: CIVIL - see limitation
Limitations:
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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



CONSULTING ENGINEERS PLANNERS

CONTRACT No. 21006 003-21006-REM1

NOTES: GENERAL

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- CURBS TO BE AS PER CITY OF OTTAWA STANDARD SC2.
- CONTRACTOR IS TO COMPLY WITH THE CITY OF OTTAWA REQUIREMENTS FOR TRAFFIC CONTROL WHEN WORKING ON PUBLIC ROAD.
- RESTORE PAVEMENT STRUCTURE AND SURFACES ON PUBLIC ROAD TO EQUAL OR BETTER CONDITION TO THE SATISFACTION OF THE CITY OF OTTAWA.
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- THE CONTRACTOR IS TO PROVIDE 'AS-CONSTRUCTED' INFORMATION (i.e. ASPHALT GRADES, TOP OF CURB GRADES, WATERMAIN OVERBETS, SEWER INVERTS, ETC.) TO THE ENGINEER AND/OR CLIENT.
- ASPHALTIC CONCRETE SHALL NOT BE PLACED UNTIL FINAL CCTV INSPECTION OF THE SEWERS IN ACCORDANCE WITH OPSS 409 HAVE BEEN COMPLETED AND TO THE ENGINEER AND/OR CLIENT.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL RE-CCTV RESULTING FROM DEFICIENCY REPAIRS AS DEEMED NECESSARY BY THE ENGINEER. CCTV INSPECTIONS WILL BE CONDUCTED UNTIL SUCH TIME AS THE RESULTS HAVE BEEN APPROVED BY THE ENGINEER AND/OR CITY OF OTTAWA AT NO ADDITIONAL COST TO THE CLIENT.
- 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.
- THE CONTRACTOR IS RESPONSIBLE TO KEEP THE ROADS FREE AND CLEAN FROM MUD OR DEBRIS.

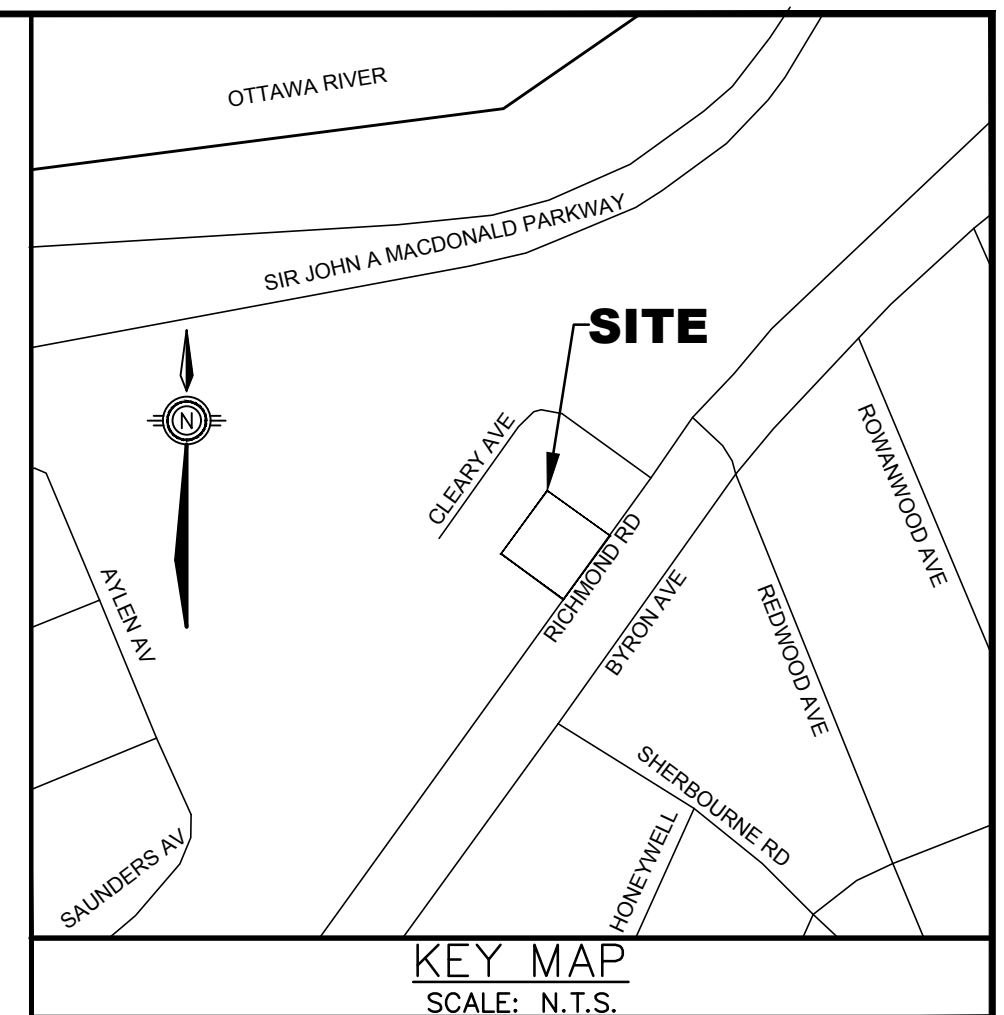
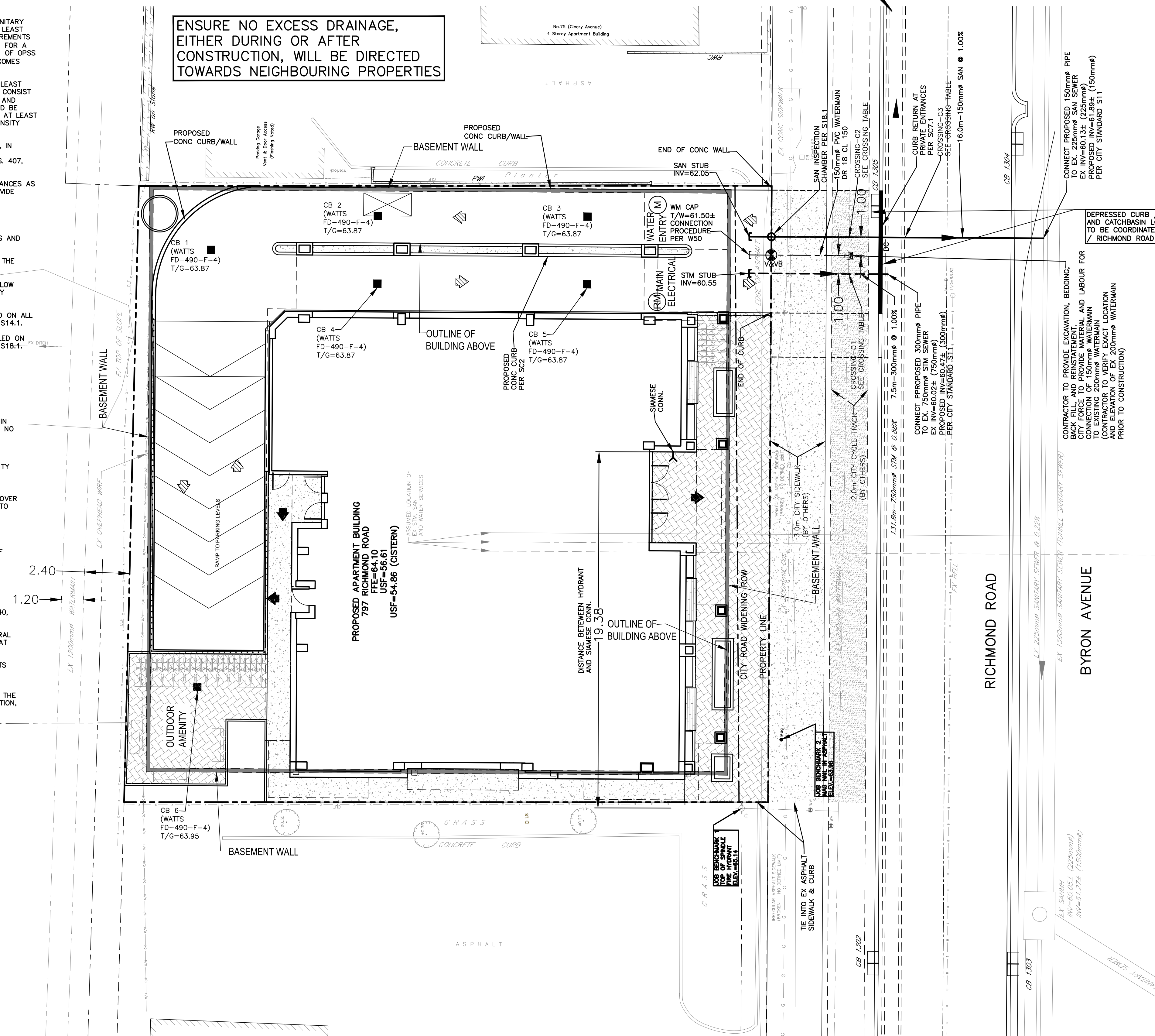
NOTES: SEWER

- SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH CURRENT CITY OF OTTAWA (CoA) STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS (OPSS & OPSD); ROAD PUBLIC WORKS.
- 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.
- SEWER TRENCH AS PER CITY OF OTTAWA STANDARDS S6 & S7
- 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.
- 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.
- 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.
- SUPPLY AND INSTALL ALL PIPING AND APPURTENANCES AS SHOWN TO WITHIN 1.0m OF BUILDING WALLS. PROVIDE TEMPORARY CAPS.
- DECK DRAINS TO BE 432mmx432mm (WATTS FD-490-F-4).
- THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS AND COORDINATION FOR ALL INSPECTION AND TESTING.
- THE FOUNDATION DRAIN IS TO BE CONNECTED TO THE STORM SEWER (IF APPLICABLE).
- FOUNDATION DRAIN BACKWATER VALVES OR BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED PER CITY STANDARD S14.
- SANITARY BACKWATER VALVES SHALL BE INSTALLED ON ALL SANITARY SERVICE LATERALS PER CITY STANDARD S14.1.
- SANITARY INSPECTION CHAMBER SHALL BE INSTALLED ON SANITARY SERVICE LATERALS PER CITY STANDARD S18.1.

NOTES: WATERMAIN

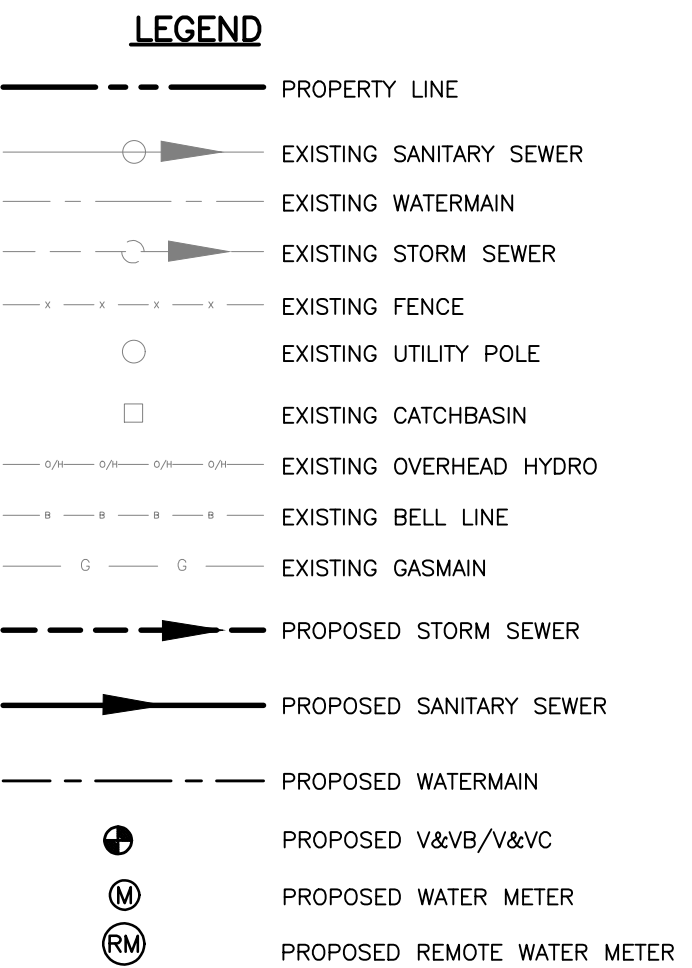
- ALL WATERMAIN WORK AND MATERIAL SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS. NO WORK SHALL COMMENCE UNLESS A CITY WATER WORKS INSPECTOR IS ON SITE.
- INSTALLATION OF WATER METER AND REMOTE RECEPTACLE SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS (REFER TO MECHANICAL DRAWINGS).
- ALL WATERMAIN TO BE INSTALLED AT MINIMUM COVER OF 2.4m. IF COVER IS LESS THAN 2.4m, REFER TO CITY STANDARD W21 & W22.
- THRUST BLOCKS AND RESTRAINT AS PER CITY OF OTTAWA DWS: W25.3 AND W25.4, W25.5 AND W25.6.
- WATERMAIN VALVE BOX AS PER CITY OF OTTAWA STANDARD W24.
- CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS PER CITY OF OTTAWA DWS: W39, W40, W41
- UNLESS OTHERWISE NOTED WATER SERVICE LATERAL TO BUILDING & HYDRANT SHALL BE PVC DR 18 AT SIZES INDICATED.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS AND COORDINATION FOR ALL INSPECTION AND TESTING.
- 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.

ENSURE NO EXCESS DRAINAGE, EITHER DURING OR AFTER CONSTRUCTION, WILL BE DIRECTED TOWARDS NEIGHBOURING PROPERTIES



CROSSING TABLE

CROSSING LOCATION	CROSSING TYPE	STM INVERT	SAN INVERT	TOP OF WATERMAIN	SEPARATION
C1	300mm Ø STM CROSS UNDER EX 200mm Ø WM	300mm Ø INV=60.49± OBV=60.79±	-----	200mm Ø WM T/W=61.50± B/W=61.30±	0.51m±
C2	150mm Ø SAN CROSS OVER EX 200mm Ø WM	-----	150mm Ø INV=62.00±	200mm Ø WM T/W=61.50±	0.50m±
C3	150mm Ø SAN CROSS OVER 750mm Ø STM	750mm Ø INV=60.00± OBV=60.75±	150mm Ø INV=61.97±	-----	1.22m±



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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

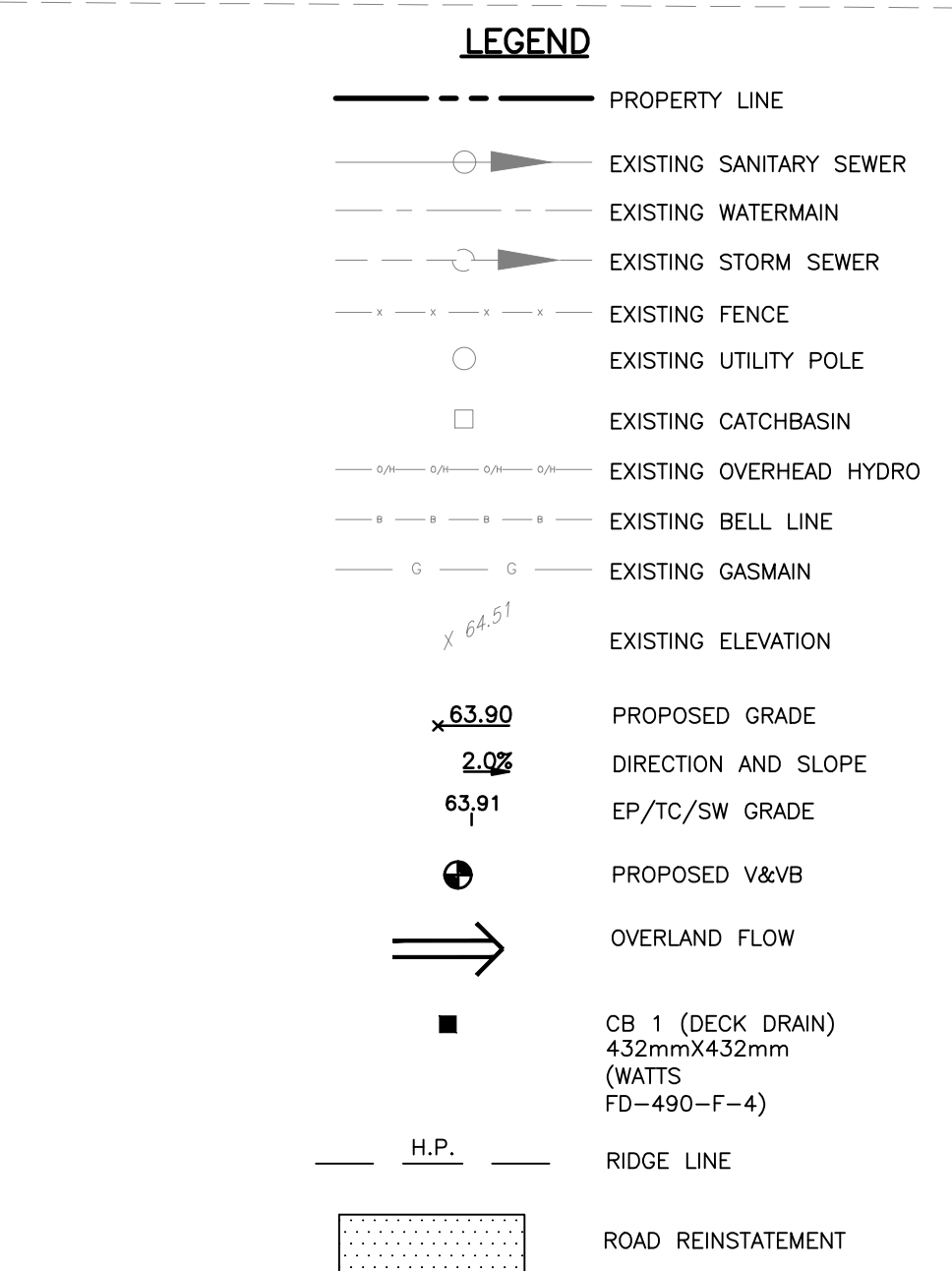
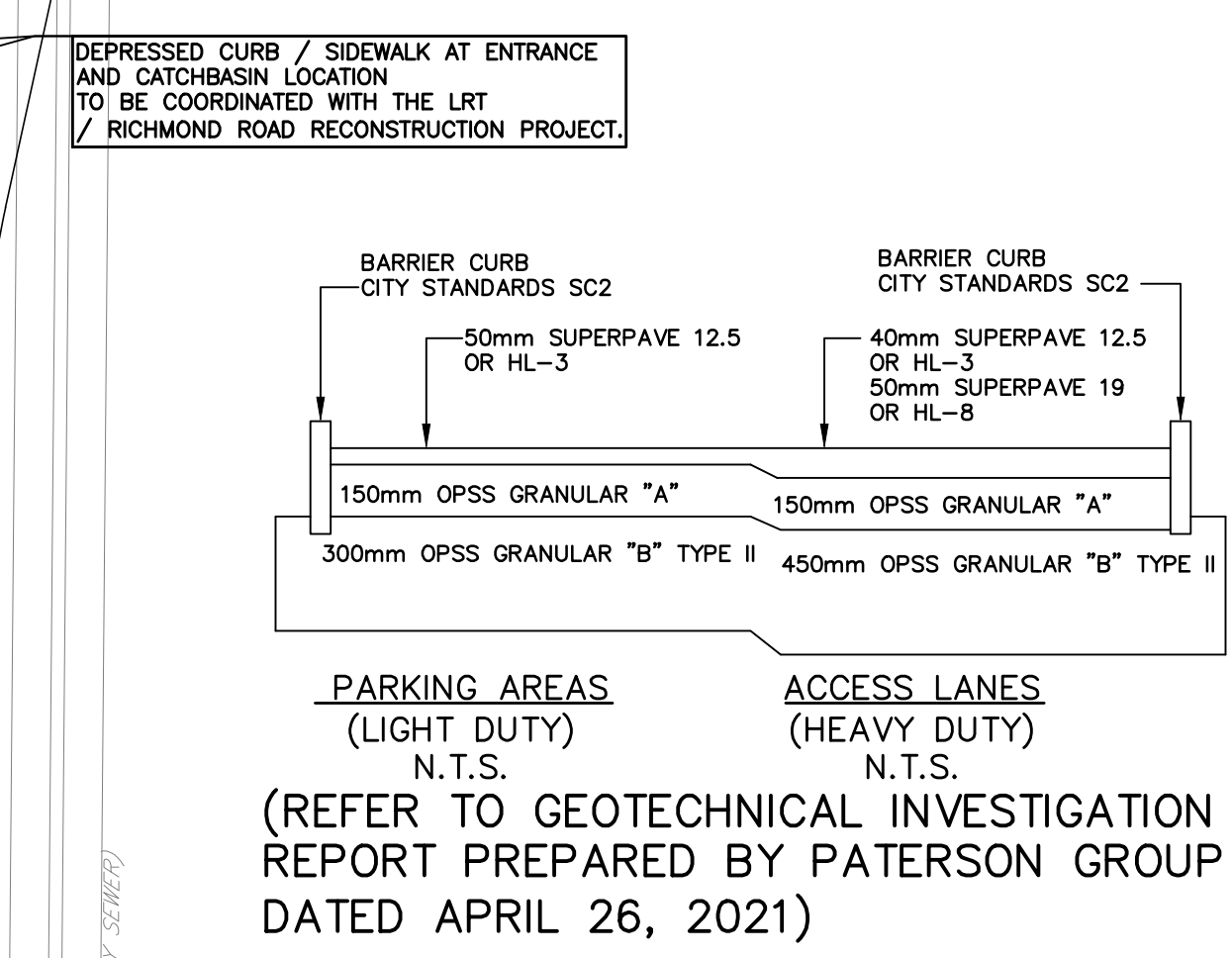
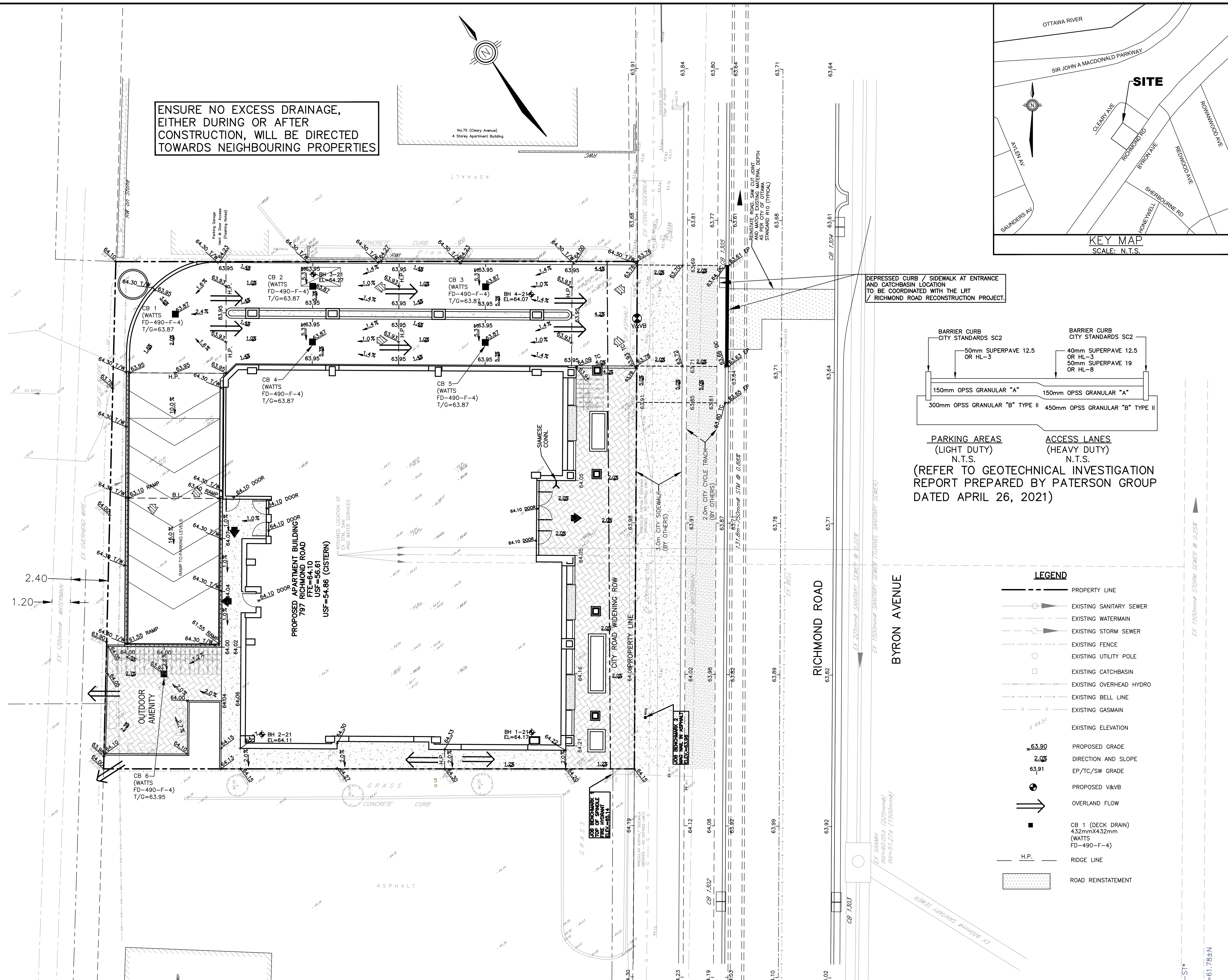
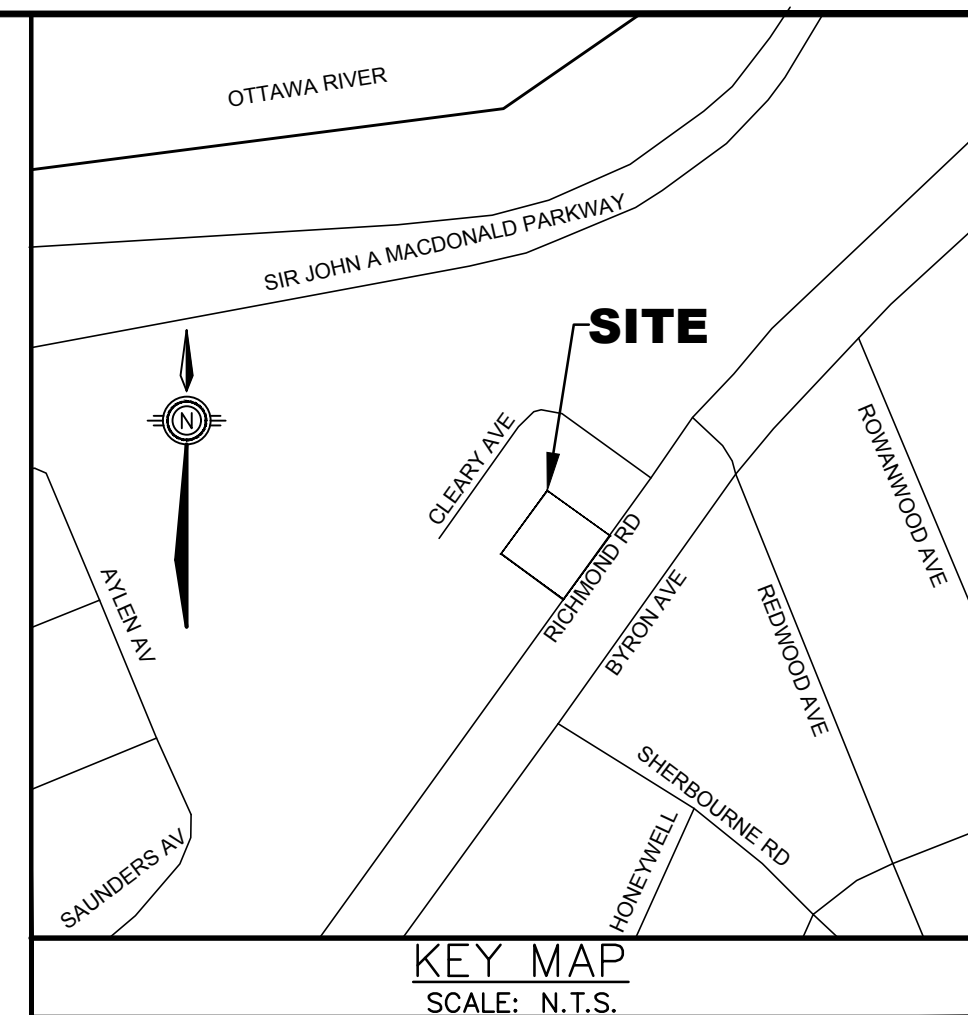
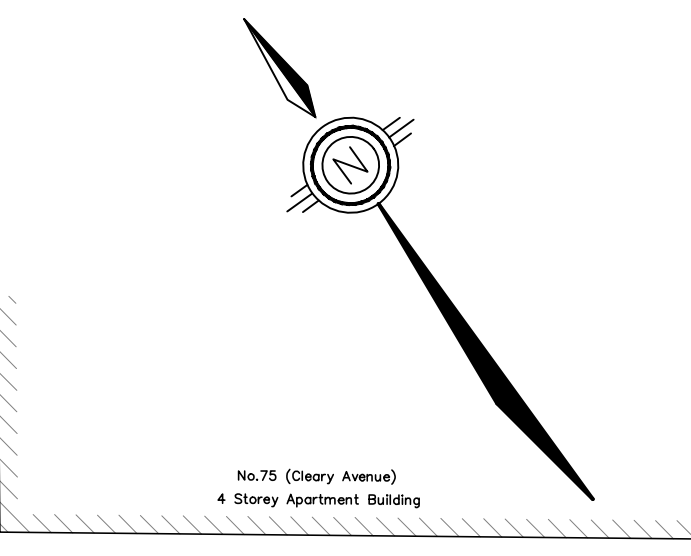


CONTRACT No. 21006 004-21006-S1

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Feb 07, 2022 1: D:\DRAWINGS\21006-1 797 Richmond Road\Design\005-21006-GR1.dwg

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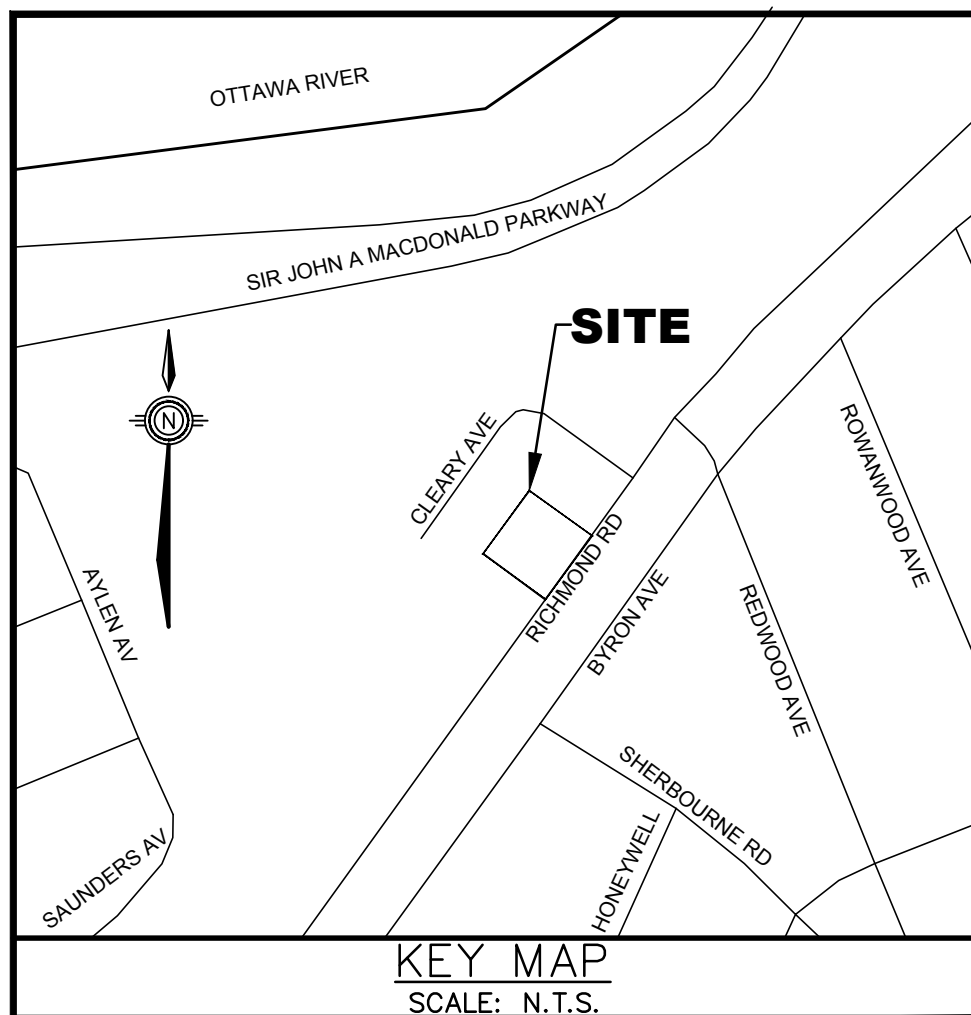
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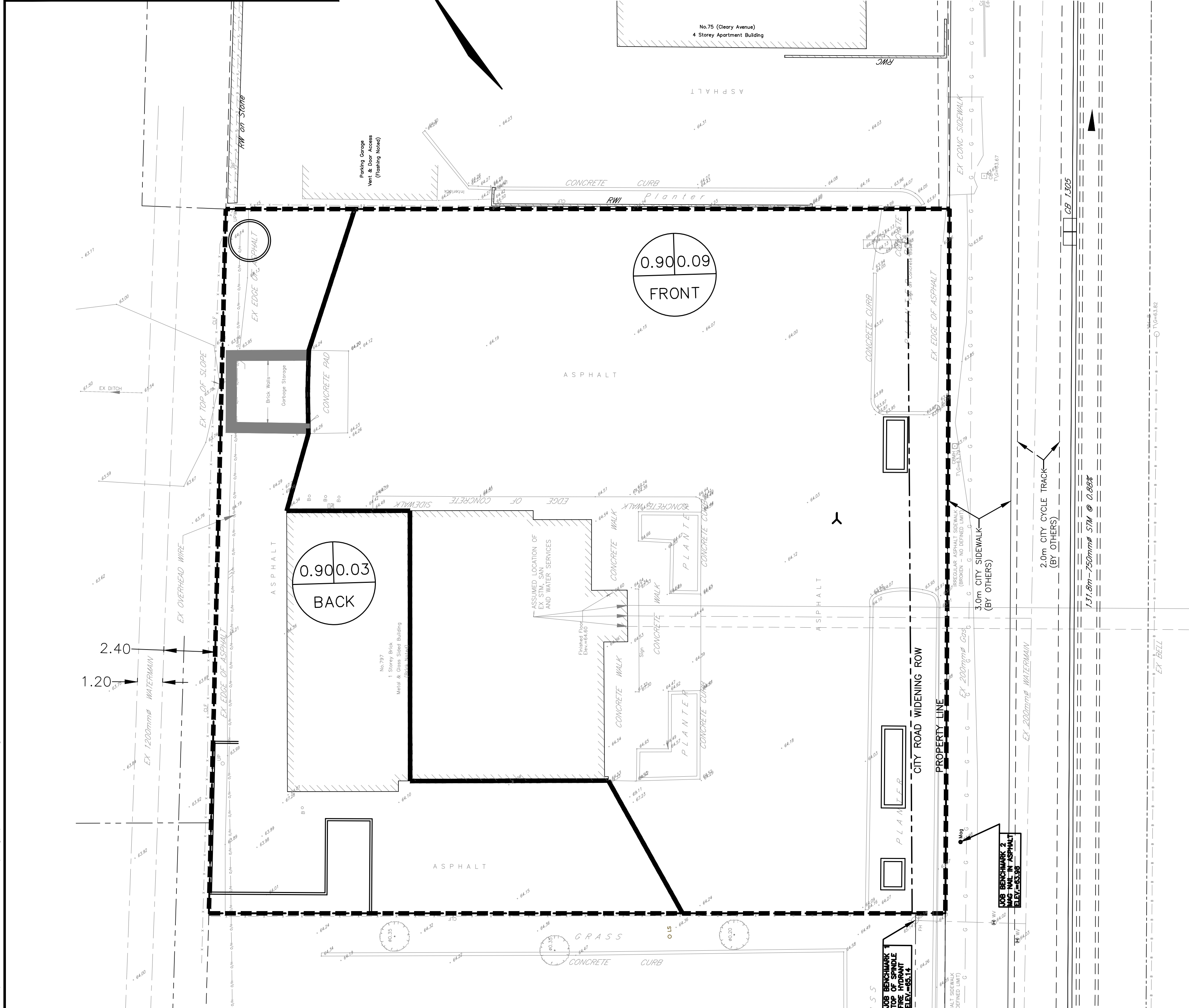
GRADING AND DRAINAGE PLAN

CONSULTING ENGINEERS PLANNERS

CONTRACT No. 21006 005-21006-GR1

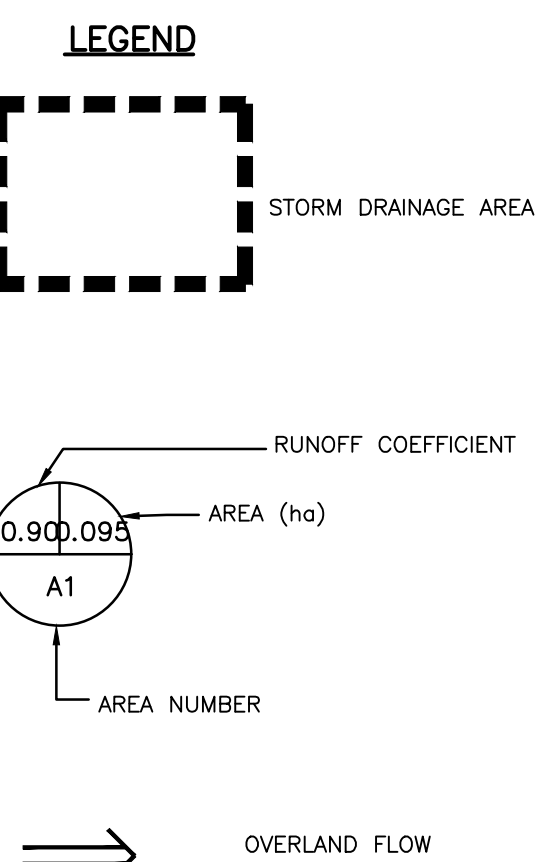


PRE-DEVELOPMENT DRAINAGE AREA PLAN

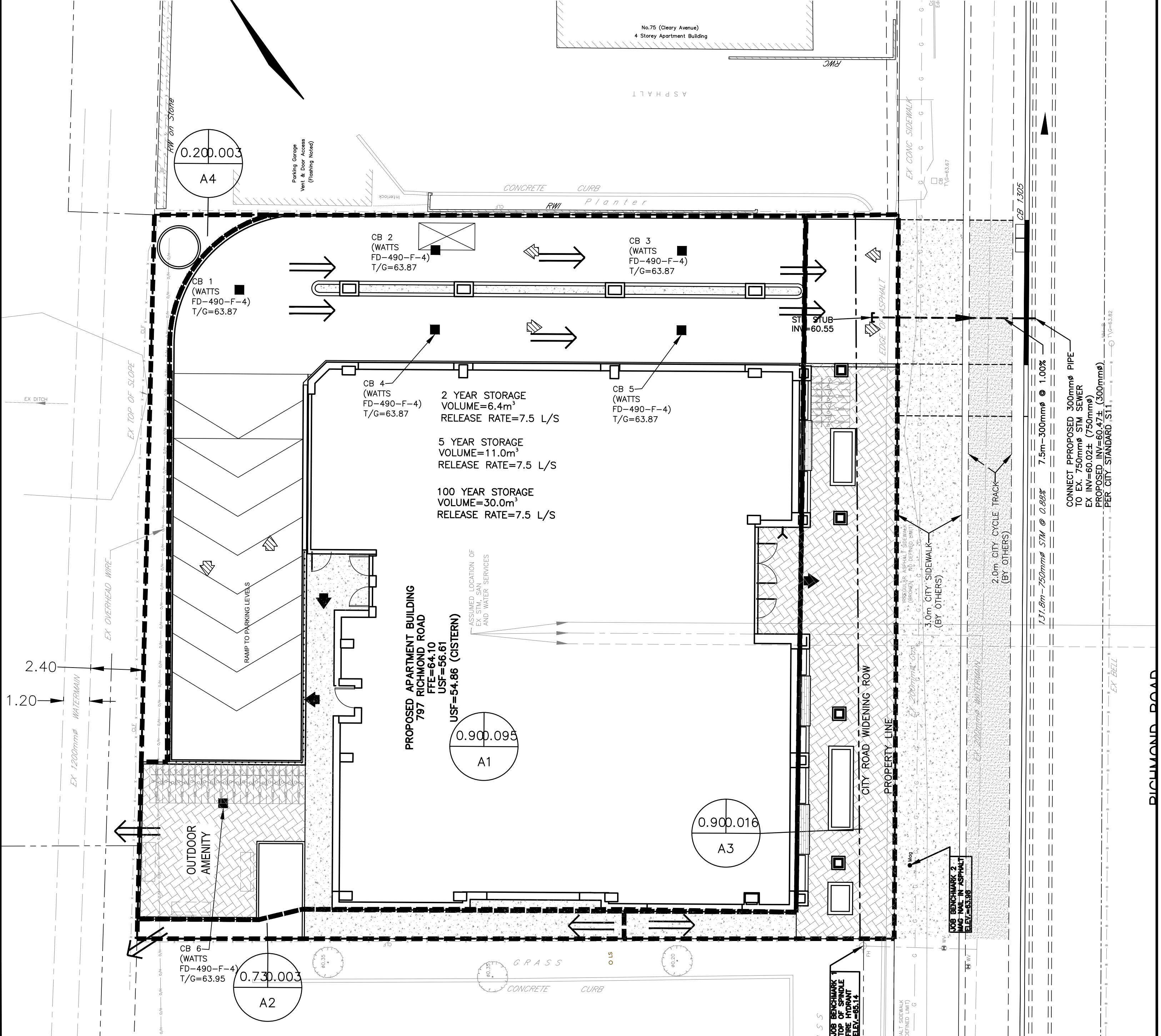


ORIFICE SUMMARY

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



POST-DEVELOPMENT DRAINAGE AREA PLAN



CONTRACT DRAWINGS:
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NO.	REVISIONS	DATE	INITIAL
4	RE-ISSUED FOR SITE PLAN APPROVAL	FEB 07/22	JX
3	REVISED PER CITY COMMENTS	JAN 03/22	JX
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
FEBRUARY 07, 2022
Limited Licensee
Name: J.W.XU
Number: 100171806
Category: CIVIL-see limitation
Limitations:
This license 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

CONSULTING ENGINEERS PLANNERS

CONTRACT No. 21006 006-21006-STM1