Windmill Development Group Ltd.

Site Servicing and Stormwater Management Report

384 Arlington Avenue

City of Ottawa, Ontario





CIMA+ file number: A001272 (370) October 7^{th,} 2024 (Rev. 0)

Windmill Development Group Ltd.

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384 Arlington Avenue City of Ottawa, Ontario

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1. Introduction

CIMA+ was retained by Windmill Development Group Ltd. to prepare an Assessment of Adequacy of Public Services Report for the proposed construction of a 24-storey residential (ground floor amenity space and 296 residential units) building located at 384 Arlington Avenue in Ottawa, Ontario.

The purpose of this assessment is to confirm that the proposed development can be adequately serviced by the existing municipal infrastructure (water and sewer) surrounding the site. This assessment shall be used in support of a Zoning By-law Amendment (ZBLA), to allow for multi-use development, on the site which is currently zoned for Minor Institutional.

1.1 Site Description and Proposed Development

The site is located along the north side of the Queensway near Bronson Avenue (refer to **Figure 1** below). 384 Arlington Avenue is currently owned and occupied by the Ottawa Korean Church. The site area (384 Arlington Avenue) measures approximately 0.213 ha.

Generally, the site is bounded by Arlington Ave to the North, Bell Street N. to the West, Arthur Lane N. to the East and Raymond Street to the South.



Figure 1: Site Location - Plan View.



The proposed development is a 24-storey, residential tower with 296 residential units, expected to include approximately 508 residents, and three (3) underground parking levels comprising the entire site area. The total communal amenity space (Activity room, Common Area, Gym, Lobby and Yoga) measures approximately 942 m² on the 3rd, 4th and 7th floors. The total private amenities/Balconies measure approximately 1179 m². Refer to **Figure 2** for a conceptual site plan of the proposed development (prepared by NEUF architect(e)s + FOTENN + WINDMILL).

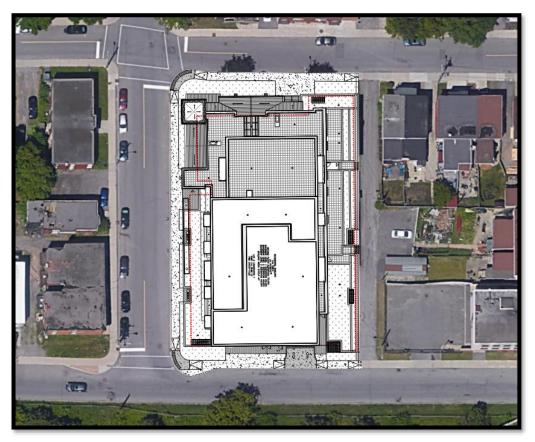


Figure 2: Conceptual Site Plan.

1.2 Review of Available Background Documentation

The following design guidelines have been used to estimate the theoretical servicing requirements for the proposed development; while geoOttawa and the available utility drawings provided by the City of Ottawa Information Centre have been used to determine the existing municipal services fronting the site. Refer to **Appendix A** for available utility plans provided by the City.

- + Ottawa Sewer Design Guidelines (October 2012), including
 - Technical Bulletins ISTB-2018-01.
- + Ottawa Design Guidelines Water Distribution (2010), including
 - Technical Bulletins ISTB-2021-03, ISTB-2018-02, ISDTB-2014-02 and ISD 2010-02.
- + Ministry of the Environment Design Guidelines for Sewage Works (2008).
- + Ministry of the Environment Stormwater Management Planning and Design Manual (2003).
- + Ministry of the Environment Design Guidelines for Drinking-Water Systems (2008); and
- + Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (2020).



1.3 Existing Infrastructure

As identified using geoOttawa and the available Utility Record Drawings provided by the City of Ottawa Information Centre, the following municipal infrastructure is available within the right-of-way fronting the proposed development site (refer to **Appendix B** for Existing Conditions Plan).

Arlington Avenue

- + 203 mm diameter PVC watermain installed 2003 (primary and secondary water connection point).
- + 300 mm diameter PVC combined sewer (sanitary connection point).

Bell Street North

- + 152 mm diameter PVC watermain.
- + 300 mm diameter PVC combined sewer (storm primary and emergency overflow connection point).

1.4 Consultation and Permits

In response to the pre-consultation requirements defined in the City's Development Servicing Study Checklist, the following agencies were consulted in support of the preparation of this report. The Development Servicing Study Checklist as well as all relevant correspondence with the consulted agencies can be found in **Appendix A**.

City of Ottawa

The City of Ottawa Information Centre was contacted by Stantec to obtain any Reports, Studies, Engineering, and/or Utility Plans including sanitary sewer, storm sewer, watermain, gas, etc. within or adjacent to the site location. The available engineering plans and utility plans were provided and can be found in **Appendix B**.

CIMA+ also contacted Mohammed Fawzi from the City of Ottawa's Planning, Infrastructure and Economic Development Department to obtain any site-specific servicing and stormwater management design criteria for the proposed development. The provided comments and criteria relevant to the Assessment of Adequacy of Public Services are referenced within the appropriate sections of this report.

Rideau Valley Conservation Authority (RVCA)

The subject site falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA). CIMA+ contacted Eric Lalande from the RVCA to identify any Natural Heritage/Hazards features that may impact the development as well as any Storm Water Management Criteria for the site and required approvals/permits. These criteria are addressed in *Section 4* of this Report.

Ministry of the Environment, Conservation and Parks (MECP)

CIMA+ has determined that the proposed development will require an Environmental Compliance Approval (ECA) as the development does not meet the exemption requirements per O.Reg. 525/98, section 3(b), when considering the property will discharge into a combined sewer.



Note: CIMA+ has initiated the process for obtaining Environmental Compliance Approval (ECA) as required. A pre-consultation was held with Emily Diamond of the MECP on May 15 2024, followed by additional correspondence up to August 21. A summary of our discussions is included in **Appendix A**. The official ECA application will be submitted to the MECP in the coming weeks.

2. Water Servicing

2.1 Water Supply Design Criteria

The design criteria for determining the water demand requirements for the proposed development follow the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008). Namely, the following parameters have been used in determining the water demands:

Design Criterion ¹	Residential Areas	Commercial Areas
Average Day Demand	280 L/capita/day	28,000 L/gross hectare/day
Maximum Daily Demand	3.0 × average daily demand ¹	1.5 × average daily demand
Maximum (Peak) Hour Demand	4.5 × average daily demand ¹	1.8 × maximum daily demand
Populations – 1 Bedroom Apartment	1.4 Persons Per Unit	N/A
Populations – 2 Bedroom Apartment	2.1 Persons Per Unit	N/A
Populations – 3 Bedroom Apartment	3.1 Persons Per Unit	N/A
Desired Operating Pressure under Normal Operating Conditions	50 to	70 psi
Minimum Operating Pressure under Normal Operating Conditions	40	psi
Maximum Operating Pressure under Normal Operating Conditions	80 psi	
Minimum Operating Pressure under Maximum Daily Demand + Fire Flow	20	psi

Table 2-1: Water Supply Design Criteria

In addition to those design criteria identified in **Table 2-1**, the following comments and criteria identified by the City as part of the pre-consultation must be considered in the water supply servicing strategy:

+ The subject site is located within the 1W pressure zone.

¹ Note that residential peaking factors were selected from **Table 3-3** of the MECP Design Guidelines for Drinking-Water Systems for 0 to 500 persons.



- Residential buildings with a basic day demand greater than 50 m³/day (0.57 L/s) are required to be connected to a minimum of two (2) water services separated by an isolation valve to avoid a vulnerable service area.
- Fire flow demand requirements shall be based on the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 2020 and Technical Bulletins ISTB-2018-02.

A primary fire hydrant is required to be within 45 m of the Siamese connection and within 90 m (travel path not radius) of the front door of each building as per OBC and Ottawa Fire Services requirements.

- Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF).
- Hydrant capacity shall be assessed if relying on any public hydrants to provide fire protection, particularly if high design fire flows are being proposed, to demonstrate the Required Fire Flow (RFF) can be achieved. Identification of which hydrants are being considered to meet the RFF on a fire hydrant coverage figure is required as part of the boundary conditions request.

2.2 **Proposed Water Supply Servicing and Calculations**

Water Demands

The water supply demands for the proposed development are presented in **Table 2-2** below. The demands were developed utilizing the development statistics (i.e., residential units and commercial floor area) provided by NEUF architect(e)s + FOTENN + WINDMILL and those design criteria identified in *Section 2.1*. Refer to **Appendix D** for detailed calculations.

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Residential	1.646	4.939	7.408
Commercial	0.031	0.046	0.082
Total	1.68	4.98	7.49

Table 2-2: Water Demands

Given the basic day demand exceeds 50 m³/day (or 0.57 L/s) a minimum of two (2) water service connections, separated by an isolation valve, are required to provide redundant supply, and avoid a vulnerable service area.

Proposed Water Supply Connection Point(s)

In order to provide redundancy, a primary and a secondary water service connection separated by a new isolation valve are proposed on Arlington Avenue. Refer to **Appendix C** for the proposed connection points.

Given that the watermain connection on the west side is within 2.4m of an existing catch basin (i.e. ± 1.0 m), the portion of the watermain within proximity to the catch basin will be insulated as per City of Ottawa W23 detail.

Primary Hydrant and Siamese Location



The Fire Department (Siamese) Connection is proposed at the northwest corner of the building. The nearest hydrant is located just west of the intersection of Arlington Avenue and Bell Street on the south side of Arlington Avenue, approximately 35 m from the proposed Siamese location and well within 90 m of the front door. Refer to **Appendix D** (Figure 2 – Hydrant Coverage) for location of existing hydrant.

Required Fire Flow (RFF)

The required fire flow for the site was developed using the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 2020 and associated City of Ottawa Technical Bulletins.

Due to the recently updated FUS Water Supply for Public Fire Protection document, the City has updated their acceptance criteria for a construction coefficient (C) of 0.6, which has been used for RFF calculations for similar buildings according to the 1999 FUS document. Following a City internal meeting, there was a consensus that, to accept a C value of 0.6, the developer's structural engineer and architect would have to provide verification and sign-off to confirm that the building was designed with all structural elements, walls, arches, floors, and roofs with a minimum two (2) hour fire resistance rating, and all materials used in the construction of the structural elements, walls, arches, floors, and roofs are constructed with noncombustible materials. If these criteria cannot be met or verified at the planning stage, a C value of 0.8 shall be used in all RFF calculations submitted to the City for boundary condition request and hydrant coverage confirmation.

As a result of this decision, for the purposes of this project, CIMA+ had provided the RFF assuming a C value of 0.6 and a C value of 0.8 such that a range of RFF can be assessed at this stage. Upon advancement of the architectural and structural plans during the Site Plan approval process the RFF will then be confirmed. The results are as follows:

- Assuming a C value of 0.6, it was determined that an RFF of 5,000 L/min (83.33 L/s) would be required to provide adequate protection.
- Assuming a C value of 0.8, it was determined that an RFF of 12,000 L/min (200.00 L/s) would be required to provide adequate protection.

It was assumed that multiple municipal hydrants would be required to meet the fire flow requirements, and a fire hydrant coverage figure was prepared in support of the boundary conditions request from the City.

From the hydrant coverage plan it was confirmed that the aggregate flow of hydrants in the area would be sufficient to meet the required fire flow demands for each scenario. Maximum flow to be considered from each hydrant has been determined in accordance with City of Ottawa Technical Bulletin IST-2018-02 Appendix I Table 1. Refer to **Table 2-3** below for a summary of hydrants considered as well as the individual and aggregate flow of the contributing hydrants.



Hydrant No./Location	Hydrant Class	Distance to Building (m)	Contributing Flow (L/min)
1 (Arlington at Bell)	AA	< 75	5,700
2 (Raymond at Bell)	AA	< 75	5,700
3 (Cambridge and Arlington)	AA	> 75 and ≤ 150	3,800
4 (Bell at Louisa)	AA	> 75 and ≤ 150	3,800
Total Contributing Flow (L/min)	19,000		

Table 2-3: Hydrant Coverage Summary

Refer to **Appendix D** for detailed calculations, including supporting figures for exposure distances and hydrant coverage.

Municipal Boundary Conditions

Using the proposed demands and the required fire flow, along with supporting figures, the City provided boundary conditions for hydraulic analysis of current conditions based on computer model simulations. The boundary conditions are as follows:

Hydraulic Condition (HGL = Hydraulic Grade	Boundary Condition (Head) (m)
Line)	Arlington Avenue 203 mm dia.
Minimum HGL	107.0
Maximum HGL	115.2
Opt.1: Maximum Day + Fire Flow (C=0.6)	108.6
Opt.2: Maximum Day + Fire Flow (C=0.8)	103.7

Note: The Required Fire Flow (RFF) values displayed in the previous section are slightly lower than those provided in the SPC #3 submission from June 6, 2024. Despite this minor discrepancy, it is assumed that the provided Boundary Conditions will still be applicable, as the decrease in RFF is not significant enough to affect the system's ability to meet fire protection requirements (i.e. Opt.1 = reduced from 100.00 L/s to 83.33L/s, and Opt. 2 = reduced from 233.33 L/s to 200.00 L/s).



Hydraulic Analysis – Water Supply Adequacy

A hydraulic analysis was completed utilizing the boundary condition information provided by the City for the proposed development to confirm that there is adequate flow and pressure in the water distribution system to meet the required water demands. The following Tables summarize the available flow and pressure in the system under each demand scenario:

		Available Flow/Pressure			
Demand Type	Proposed Demand (L/s)	Design Operating Pressure (Relative Head) (m)	Design Operating Pressure (psi)	Desired Flow/Pressure Objective	Flow/Pressure Objective Achieved?
Average Daily Demand	1.68	43.4	61.7	50 to 70 psi	Yes
Opt.1: Maximum Day + Fire Flow (C=0.6)	88.32	36.8	52.3	≥ 20 psi	Yes
Opt.2: Maximum Day + Fire Flow (C=0.8)	204.98	31.9	45.4	≥ 20 psi	Yes
Maximum (Peak) Hour Demand	7.49	35.2	50.1	50 to 70 psi	Yes
NOTES: 1. Boundary conditions at connections with a ground elevation of 71.8 m.					

Table 2-5: Water Supply Adequacy - Hydraulic Analysis – Arlington Connection

2.3 Water Supply Summary and Conclusions

The water supply design for the proposed development follows the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008).

There is adequate flow and pressure in the water distribution system to meet the required water demands as well as a sufficient number of contributing hydrants within the area to meet the demands for each fire flow scenario for the proposed development.

3. Sanitary Servicing

3.1 Sanitary Servicing Design Criteria

The design criteria for determining the sanitary peak flow rates for the proposed development follow the parameters outlined in the City of Ottawa Sewer Design Guidelines, 2012 and City of Ottawa Technical Bulletin ISTB-2018-01. Namely, the following parameters have been used in determining the peak sanitary flow rates:



Design Criterion	Residential Areas	Commercial Areas	
Base Flow	280 L/capita/day	28,000 L/gross hectare/day	
Populations – 1 Bedroom Apartment	1.4 Persons Per Unit	N/A	
Populations – 2 Bedroom Apartment	2.1 Persons Per Unit	N/A	
Populations – 3 Bedroom Apartment	3.1 Persons Per Unit	N/A	
Peaking Factor	Determined by Harmon Equation $P.F. = 1 + \left[\frac{1}{4 + \left(\frac{P}{1,000}\right)^{\frac{1}{2}}}\right] \times 0.8$ (P = population; P.F. = peaking factor) Maximum P.F. = 4.0 Minimum P.F. = 2.0	1.5 if Commercial Contribution > 20% 1.0 if Commercial Contribution < 20%	
Dry Weather Infiltration Rate	0.05 L/s/effective gross hectare (for all areas)		
Wet Weather Infiltration	0.28 L/s/effective gross hectare (for all areas)		
Total Infiltration Allowance	0.33 L/s/effective gross hectare (for all areas)		

Table 3-1: Sanitary Peak Flow Determination Design Criteria

3.2 Proposed Sanitary Servicing and Calculations

Proposed Sanitary Peak Flows

The estimated peak flows from the proposed development based on the design criteria listed in **Table 3-1** are outlined in the following Table.

Flow Type	Total Flow Rate (L/s)
Total Estimated Average Dry Weather Flow Rate	1.68
Total Estimate Peak Dry Weather Flow Rate	5.57
Total Estimate Peak Wet Weather Flow Rate	5.64

Refer to Appendix E for detailed calculations.

Proposed Sanitary Service Connection Point

The proposed sanitary service will connect to the existing 300 mm diameter PVC combined sewer within the right-of-way of Arlington Ave. Refer to **Appendix C** for proposed connection points.



Considering the mainline sewer is PVC a new maintenance hole will not be required at the point of connection.

Furthermore, a monitoring maintenance hole will be installed on the property line.

3.3 Sanitary Servicing Summary and Conclusions

The sanitary servicing design for the proposed development conforms to the requirements of the City of Ottawa Sewer Design Guidelines, 2012, and Technical Bulletin ISTB-2018-01.

Peak wastewater demands were provided to the City, who confirmed that there is adequate residual capacity in the city system to accommodate the proposed wastewater flow (refer to **Appendix A**).

Given the determined peak sanitary flows are quite high, it is expected that self-cleansing velocity will be achieved within the sanitary sewer system and thus a sewer maintenance and flushing program is not required.

4. Storm Servicing and Stormwater Management

4.1 Background

As previously mentioned, the subject site of 384 Arlington Avenue currently occupies the Ottawa Korean Community Church with surface parking. The gradient is from south to north with an approximate change in gradient of 0.7 m across the site. The site is nearly entirely impervious with no existing stormwater measures on site (i.e., catch basins, sewers, etc.) and it is thus assumed that there are no current stormwater management controls on site. As such storm runoff generally sheet flows to the surrounding roadways.

Considering there are no current stormwater systems on site and that it is assumed that there are no flow attenuation controls the anticipated peak flows for the existing site are as follows (refer to **Appendix F**):

Storm Event	Release Flow (L/s)
2-year	40.96 (with a C=0.90)
100-year	105.80 (with a C=1.00)

Table 4-1:	Pre-Development	Peak Release	Flows -	Existing Site
10010 1 1.	1 10 00101001110110	1 001111010000	110110	Exioting One

4.2 Storm Servicing Strategy and Design Criteria

The design of the major and minor storm systems must ensure that the following criteria are upheld under post-development conditions, in keeping with the requirements of the City and the Rideau Valley Conservation Authority (refer to **Appendix A**).

- The allowable release rate for the site shall coincide with the 2-year storm event under predevelopment conditions.
- The allowable release rate shall take into consideration any increase in uncontrolled runoff from the boulevard being converted to a hard surface (concrete, interlocking paving stone, etc.).



- + The pre-development runoff coefficient (C) shall be a maximum equivalent 'C' of 0.40, or the actual existing site runoff coefficient, whichever is less.
- The pre-development Time of Concentration (Tc) shall be calculated using an appropriate method and must not be less than 10 minutes.
- + A Tc of 10 minutes shall be used for all post-development calculations.
- Storm runoff in excess of the allowable 2-year pre-development release rate, up to and including the 100-year storm event, must be detained on site.
- Where an underground storage tank or cistern is proposed and calculated utilizing the Modified Rational Method, the required volume will be estimated based on 100% of the peak allowable release rate, given a pump is proposed for the discharge to the municipal system.
- + To address concerns about roadway drainage spilling into the underground parking, the entrance to the underground parking will be equipped with a trench drain that will redirect the stormwater in the underground cistern that will pump the stormwater into the combined sewer in Bell Street.
- Foundation drains will be pumped into the proposed cistern with appropriate back up power, sufficient sized pump, and backflow prevention thus negating the need for a second storm connection to the combine sewer main in Bell Street.
- The roof drain leaders will be utilizing a pressurized drainpipe type to provide additional protection in the event of surcharge in the municipal system.
- Considering the site will connect to the municipal combined sewer system, no long-term surface parking spots are being proposed and rainwater from landscaping and rooftop drainage is considered to be clean for the purpose of protecting water quality and aquatic habitat, the RVCA would not require any onsite water quality control measures save and except best management practices.

4.3 Proposed Storm Servicing and Stormwater Management Design and Calculations

Proposed Storm Service Connection Point

Based on communications with the City, the preferred and anticipated stormwater connection from the proposed development will discharge to the existing 300 mm combined sewer on Bell Street. More precisely, the building stormwater will outlet into the proposed underground cistern that will in turn be pumped into the Bell Street combined sewer via a PVC DR-35 200Ø service lateral. A second PVC DR-35 200Ø pipe will be connected to the Bell Street combined sewer to act as an emergency overflow. Refer to **Appendix C** for proposed connection points.

- + The underground cistern access holes will act as a monitoring maintenance hole.
- Considering the mainline sewer is made of PVC, a new maintenance hole will not be required at the point of connection.

Pre-development (Allowable) Release Rates

For this sector, the City requires that the storm runoff under post-development conditions for the site area must be controlled to the 2-year pre-development release rate of **18.2 L/s**, up to and including the 100-year storm event. This release rate was determined using a runoff coefficient of 0.4 (the actual existing site runoff coefficient being 0.90). This overdesign was requested by the City due to concerns about the capacity of the receiving combined sewer.



The pre-development release rates are summarized in the following Table:

Catchment ID	Area (ha)	Runoff Coefficient (C)	Time of Concentration (Tc) (minutes)	Rainfall Intensity (mm/hr)	Release Rate (L/s)
Subject Site	0.213	0.40	10	76.81	18.2

Post Development Flow Rates and Stormwater Quantity Control

As indicated above, the existing site has no current stormwater management controls and primarily consists of impermeable surfaces. The proposed development brings additional efforts towards improving the existing unattenuated areas. Table 4-3 below provides a comparison between pre-development and post-development conditions for these areas.

Table 4-3: Release Rate Summary - Unattenuated Areas - Pre Vs Post-Development

Design Event	Area (ha)	Runoff Coefficient (C)	Weighted Runoff Coefficient (C)	100-year Release Rate (L/s)	100-year Release Flow Per Unit Area (L/s/ha)
Pre-development (NC1)	0.0272	0.90	1.00	13.5	496.00
Post-development (NC1)	0.0272	0.79	0.98	13.2	486.08
Variance (Post minus Pre)				-0.3	-9.92

Since significant improvements have been incorporated into the proposed development, and the unattenuated comparison indicates a slight enhancement over the existing conditions by replacing impermeable surfaces with permeable ones, the uncontrolled flow was not considered within the 18.2 L/s allowable release rate, as shown in Table 4-2 above. Please refer to Appendix A for the City's confirmation. Refer to **Appendix A** for city confirmation.

 The anticipated post-development flow rates and required storage when controlled to the allowable pre-development release rate are summarized in the following Table.

Control Area	100-year Release Rate – PUMPED (L/s)	100-year Storage Volume – PUMPED (m³)
Building Roof Drains, Surface Drains, Air Well Drains, Trench Drain, and Foundation Drain to Underground Cistern	18.2	53.2

Table 1 1	Doot doval	opmont [Jour Data	and Starge	Cummon.
Table 4-4.	Post-aever	opment r	-IOW Rate	ana Storag	e Summary



Total 18.2 53.2

As demonstrated in **Table 4-3**, an anticipated storage volume of **53.2** m³ would be required onsite. This will be achieved with an underground storage cistern to restrict stormwater discharge to the allowable release rate of **18.2** L/s. Refer to **Appendix F** for detailed stormwater storage calculations.

The underground cistern's storage volume is currently anticipated at $\pm 55 \text{ m}^3$. The exact volume is dependent on the following factors:

- + Cistern details and information including detailed cross-section, exact dimensions, etc.
- Blue-green roof design options are still being considered. If a blue-green roof option is implemented, roof retention may be required for irrigation purposes, which could, in turn, reduce the required cistern volume. The overall stormwater retained on site would remain the same, but the volume would be split between the underground cistern and roof retention.

At this time, a backflow check valve is proposed to be added to the 200 mm diameter outlet of the stormwater cistern to protected it in the event that the 300 mm diameter combined sewer main in Bell Street becomes surcharged. Additionally, the cistern will be equipped with a 200 mm diameter emergency overflow that will also connect to the Bell Street sewer main. This emergency overflow will also be equipped with a backflow check valve.

Stormwater from landscaping and rooftop drainage is considered to be clean for the purpose of protecting water quality and aquatic habitat.

Through consultation with the Rideau Valley Conservation Authority (RVCA) (refer to **Appendix A**) it was confirmed that they would not require any additional onsite water quality control measures save and except best management practices.

4.4 Storm Servicing and Stormwater Management Summary and Conclusions

The storm servicing design for the proposed development conforms to the requirements of the City of Ottawa Sewer Design Guidelines, 2012, and associated Technical Bulletins.

The proposed discharge to the storm sewer was provided to the City, who confirmed that there is adequate capacity in the city system to accommodate the proposed flow (refer to **Appendix A**).

An anticipated on-site storage volume of **53.2** m^3 would be achieved via a ±55.0 m^3 underground storage cistern (or a smaller cistern combined with roof retention for irrigation purposes) to restrict stormwater discharge to the allowable release rate of **18.2** L/s.

Roof Flow Control Declaration will be provided upon completion of the Mechanical and Structural design.

5. Conclusion

The purpose of this assessment is to confirm that the proposed development can be adequately serviced using the existing municipal infrastructure (water, sanitary and storm) surrounding the site. This assessment shall be used in support of a Zoning By-law Amendment (ZBLA) to allow for the construction of one (1) 24-storey residential tower with ground floor amenity space.



The important information and findings as a result of this assessment are as follows:

- The proposed residential building is expected to include 296 apartment units with a population of approximately 508 persons and have a total communal amenity area of approximately 942 m² and a total private amenities/Balconies of approximately 1179 m². There will be three (3) levels of underground parking spanning the entirety of the site area.
- The required Environmental Compliance Approval (ECA) application was initiated in relation to O.Reg. 525/98, section 3(c).
- The anticipated water demands for the proposed site are 1.68 L/s (average day), 204.98 L/s (max day + fire flow), and 7.49 L/s (peak hour). The boundary conditions received from the City of Ottawa indicate that the existing watermain network can provide the required water demands for the proposed site. From the hydrant coverage plan it was confirmed that the aggregate flow of hydrants in the area would be sufficient to meet the required fire flow demands for each scenario.
- The estimated sanitary flow for the proposed development is 1.68 L/s (average dry weather),
 5.57 L/s (peak dry weather), and 5.64 L/s (peak wet weather). The City of Ottawa has indicated that the existing sanitary sewer network near the proposed site can accept the peak wet weather sanitary flow of the proposed development.
- Storm runoff in excess of the allowable 2-year pre-development release rate, up to and including the 100-year storm event, will be detained on site via an internal cistern prior to being discharged to the municipal combined sewer system.
- The allowable stormwater release rate for the proposed site is 18.2 L/s. It is expected that this will be achieved by means of underground retention (cistern) or a combination of roof retention and underground retention depending on if stormwater need to be retained of the roof for irrigation purposes for a blue-green roof option. To achieve this release rate, a total storage volume of 53.2 m³ is required on-site. The City of Ottawa has indicated that they have no issue with the proposed discharge rate.
- The existing site is nearly entirely impervious with no existing stormwater measures on site (i.e., catch basins, sewers, etc.) and it is assumed that there are no current stormwater management controls on site. Thus, stormwater flows from the redeveloped site are to be considerably less than the stormwater flows from the existing site.
- Quality control of stormwater is not required for the site given rainwater from landscaping and rooftop drainage is considered to be clean for the purpose of protecting water quality and aquatic habitat. Furthermore, the discharge point will rely on municipal infrastructure considering the connection to the combined sewer system.
- As a result of the conclusions drawn by the previous points, it is expected that the proposed development can be serviced by the existing municipal services network surrounding the site.

We trust this Site Servicing and Stormwater Management Report is to your satisfaction. If you have any questions regarding this report, please do not hesitate to contact any of the signatories.





Appendix A Pre-consultation Correspondence





Appendix A

1A - WATER DEMANDS BOUNDARY CONDITIONS



Éric Potvin

De:	Whelan, Amy <amy.whelan@ottawa.ca></amy.whelan@ottawa.ca>
Envoyé:	27 mai 2024 14:40
À:	Éric Potvin
Cc:	Jessica.bellissimo@windmilldevelopments.com;
	kristen.jorgensen@windmilldevelopments.com; Pardis Parsa; Martin Fréchette
Objet:	RE: 384 Arlington Avenue
Pièces jointes:	384 Arlington Avenue REVISED May 2024.pdf

EXTERNAL EMAIL

Hi Eric,

Literally just received this from drinking water services five minutes ago.

****The following information may be passed on to the consultant, but do NOT forward this e-mail directly.****

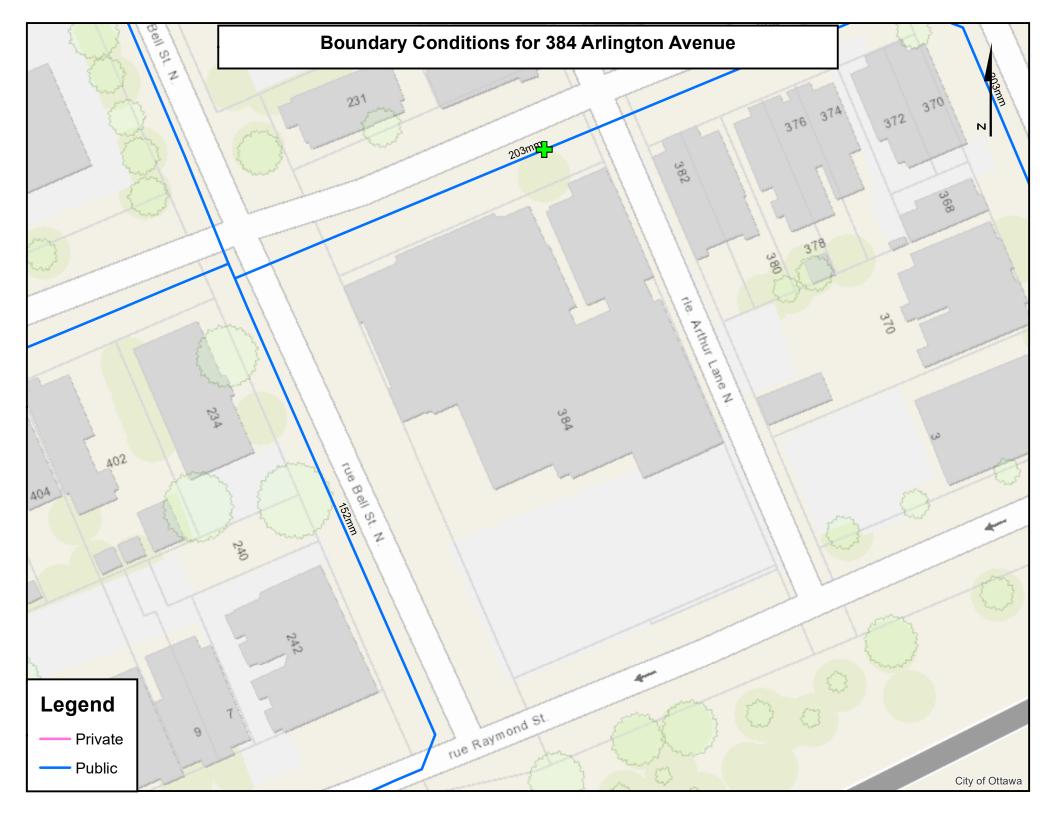
The following are boundary conditions, HGL, for hydraulic analysis at 384 Arlington Avenue (zone 1W) assumed to be <u>a dual connection</u> connected to the 203mm watermain on Arlington Avenue (see attached PDF for location).

Minimum HGL: 107.0 m Maximum HGL: 115.2 m Max Day+ Fire Flow (100.00 L/s): 108.6 m Max Day+ Fire Flow (233.33 L/s): 103.7 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,



Éric Potvin

De:	Éric Potvin
Envoyé:	25 avril 2024 17:29
À:	Fawzi, Mohammed
Cc:	Pardis Parsa
Objet:	RE: 384 Arlington Av Water Demands - Boundary Condition Request
Pièces jointes:	6_230310_Figure 3 - Hydrant Coverage.pdf; 1_240425_Water Demands.pdf; 2_240425 _Fire Flow (C=0.6).pdf; 3_240425_Fire Flow (C=0.8).pdf; 5_220728_Figure 2 - Exposure Separation Distances.pdf; 240425_preferred connection sketch.pdf

Hello Mohammed,

As a follow-up to my colleague Jameson's coordination below regarding the proposed conversion development at 384 Arlington Avenue, we are preparing to submit a revised Adequacy of Serving report for the SPC Phase 3, the proposed building statistics (area and number of residential units) have changed slightly. We would like to kindly request updated boundary conditions. Please find the proposed development information below, along with our detailed calculations and associated figures attached. These include Water Demand Calculations, Fire Flow Calculations (coefficient = 0.8 and 0.6), Location of Service (Figure 1), Exposure Separation Distances (Figure 2), Fire Hydrant Coverage (Coefficient = 0.8, Figure 3), and the Architectural Site Plan for reference.

1. Type of Development and Units: The proposed development involves the construction of one (1) 24-storey mixed-use building (residential and commercial space). There are a total of **297 residential units** with an underground 3-level parking garage.

2. Site Address: 384 Arlington Avenue

3. Location of Services: Two connections to existing 203mmØ PVC municipal watermain in Arlington Avenue. The primary and redundancy services would be separated by a new isolation valve on the municipal main.

- 4. Average Daily Demand: 1.68 L/s
- 5. Maximum Daily Demand: 4.99 L/s
- 6. Peak Hour Demand: 7.50 L/s
- 7. Required Fire Flow (RFF) (C = 0.8): 14,000 L/min
- 8. Required Fire Flow (RFF) (C = 0.6): 6,000 L/min

If you have any questions or concerns, please do not hesitate to contact me. Would you also be able to confirm receipt of this request for wastewater capacity confirmation?

Best Regards,

ERIC POTVIN, P.Eng., ing. (PEO, OIQ, APEY) Project Manager / Infrastructure Chargé de projet / Infrastructures

M 613-863-7340 **F** 613-860-1870 600–1400 Blair Towers Place, Ottawa, ON K1J 9B8 CANADA

-





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Appendix A

1B - FIRE FLOW HYPOTHESES BACKUP FROM ARCHITECT



From:	Antoine Cousineau
To:	Jaymeson Adams; Hugues Bisson; Kristen Jorgensen
Cc:	Samuel Pouliot; Stephen Savell; Tim Kennedy
Subject:	RE: A001272 - Redevelopment 384 Arlington - Civil Design Questions and Considerations
Date:	Friday, July 15, 2022 7:50:03 AM

EXTERNAL EMAIL

Jaymeson

See my comments in blue bellow within the yellow section

А



ANTOINE COUSINEAU OAQ, OAA, AAA, NCARB, IRAC, LEED, AP Architecte associé . Partner architect T 514 847 1117 #250 F 514 847 2287 C 514 515 2048 630, boul. René-Lévesque O. 32^e étage, Montréal (QC) H3B 1S6 NEUF ARCHITECTES INC <u>Confidentialité + Transmission</u> Montréal. Ottawa. Toronto

50 ANS ET TOUJOURS NEUF . 50 YEARS AND STILL NEUF

De : Jaymeson Adams < Jaymeson.Adams@cima.ca>

Envoyé : 13 juillet 2022 14:18

À : Hugues Bisson < Hugues. Bisson@cima.ca>; Kristen Jorgensen < kristen.jorgensen@windmilldevelopments.com>; Antoine Cousineau < antoine@neufarchitectes.com>

Cc: Samuel Pouliot <spouliot@neufarchitectes.com>; Stephen Savell

<Stephen.Savell@windmilldevelopments.com>; Tim Kennedy <Tim.Kennedy@cima.ca>

Objet: RE: A001272 - Redevelopment 384 Arlington - Civil Design Questions and Considerations

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Caution: This is an external email and has a suspicious subject or content. Please take care when clicking links or opening attachments. When in doubt, contact your IT Department at <u>it@neufarchitectes.com</u>.

Bonjour Antoine,

Please see, in the email string below, what we would like to confirm for our fire flow calculations (in yellow highlight).

Merci,

Upcoming vacation notice: 14 to 22 July 2022

JAYMESON ADAMS, P.Eng. Engineer / Infrastructure Ingénieur / Infrastructures

Water and Fire Protection Considerations and Questions:

- For required fire flow determination (RFF) we will assume the building will be constructed of either Noncombustible Construction or Fire Resistive Construction as follows:
 - Fire Resistive Construction: where all structural elements, walls, arches, floors, and roofs are constructed with a minimum 2-hour fire resistance rating and all materials used in the construction of the structural elements, walls, arches, floors, and roofs are constructed with noncombustible materials. [Antoine Cousineau] Building will be non combustible with 2h fire- resistance for structural, floors walls and exits
 - Fire Resistive Construction also assumes all vertical openings and exterior vertical communications (ex. Interconnected floor spaces, atria, elevators, escalators, etc.) are properly **protected** in accordance with the National Building Code (NBC). That is (i.) Enclosures have walls of masonry or other limited or noncombustible construction with a fire resistance rating of not less than one hour, (ii.) openings including doors shall be protected with automatic closing devices and (iii.) elevator doors shall be of metal or metal-covered construction, so arranged that the doors must normally be closed for operation of the elevator.
 - Noncombustible Construction: where all structural elements, walls, arches, floors, and roofs are constructed with a minimum 1-hour fire resistance rating and are constructed with noncombustible materials. [Antoine Cousineau] OK, see above
 - Noncombustible Construction assumes any vertical openings in the building are <u>unprotected</u>. That is any opening through horizontal separations that are unprotected or otherwise have closures that do not meet the minimum requirements for protected openings, above.

We will assume the building is sprinklered, but system **not fully supervised** (i.e., continuously monitored). For a fully supervised system a supervisory signal is required to ensure that malfunctions of the automatic sprinkler system will be discovered and corrected promptly, while a water flow alarm is required to notify emergency services of the fire as soon as the automatic sprinkler system additional information as follows: [Antoine Cousineau] building is a high rise and will be fully sprinklered, supervised and connected to firestation

- The supervisory signal is to sound and be displayed, either at a location within the building that
 is constantly attended by qualified personnel (such as a security room), or at an approved
 remotely located receiving facility (such as a monitoring facility of the sprinkler system
 manufacturer); and
- The water flow alarm must indicate that the sprinkler has been activated, which is to be transmitted to an approved, proprietary alarm-receiving facility, a remote station, a central station or the fire department.

Let me know if you want to discuss any of these items and if we should proceed with communicating directly with the client or through you on this one.

Thanks, Tim

TIM KENNEDY, P.Eng. Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870 110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA



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KINCENTRIC> Best Employer Appendix A

2A - SANITARY CAPACITY CONFIRMATION



Pardis Parsa

From:	Whelan, Amy <amy.whelan@ottawa.ca></amy.whelan@ottawa.ca>
Sent:	May 15, 2024 11:18 AM
То:	Pardis Parsa; Éric Potvin
Cc:	Jessica.bellissimo@windmilldevelopments.com;
	kristen.jorgensen@windmilldevelopments.com
Subject:	RE: 384 Arlington Avenue

EXTERNAL EMAIL

Good morning Pardis,

I have not received a response from the water department regarding the boundary condition request however I just followed up with them. Typically the wait time for this request is about ten business days. I will follow up with you as soon as I receive a response.

I did hear back from the modeling group for the combined sewer capacity, please see the response below:

The flow of 5.66 L/s is fine, but this being a combined pipe means that they must control the storm runoff to the 2 year events and the max allowable release rate is based on C=0.4

Kind regards,

Amy

From: Pardis Parsa <Pardis.Parsa@cima.ca>
Sent: May 15, 2024 10:44 AM
To: Whelan, Amy <amy.whelan@ottawa.ca>; Éric Potvin <Eric.Potvin@cima.ca>
Cc: Jessica.bellissimo@windmilldevelopments.com; kristen.jorgensen@windmilldevelopments.com
Subject: RE: 384 Arlington Avenue

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Hi Amy,

I'm following up on the water boundary condition and combined sewer capacity requests. We haven't received the information yet and were wondering if there are any updates.

Could you possibly provide an estimate of when we might expect a response?

Best regards,









De : Fawzi, Mohammed <<u>mohammed.fawzi@ottawa.ca</u>>
Envoyé : 26 avril 2024 07:40
À : Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>; Éric Potvin <<u>Eric.Potvin@cima.ca</u>>
Cc : Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Objet : RE: 384 Arlington Avenue - Peak Wastewater Demand - Capacity Confirmation

EXTERNAL EMAIL

Hi Éric,

Thank you for your email.

I am copying this email to my colleague Amy (cc'd) as she is looking after this file moving forward.

Thank you.

Best Regards,

Mohammed Fawzi, P.Eng.

Project Manager, Infrastructure - Gestionnaire de projet, Projets d'infrastructure Development Review All Wards (DRAW) | Direction de l'examen des projets d'aménagement - Tous les quartiers (EPATQ) Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB) City of Ottawa | Ville d'Ottawa 110 Laurier Avenue West | 110 Avenue Laurier Ouest Ottawa, ON K1P 1J1 613.580.2424 ext./poste 20120, <u>Mohammed.Fawzi@ottawa.ca</u>

From: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>
Sent: Thursday, April 25, 2024 5:14 PM
To: Fawzi, Mohammed <<u>mohammed.fawzi@ottawa.ca</u>>
Cc: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Subject: RE: 384 Arlington Avenue - Peak Wastewater Demand - Capacity Confirmation

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Hello Mohammed,

As a follow-up to my colleague Jameson's coordination below regarding the proposed conversion development at 384 Arlington Avenue, we are preparing to submit a revised Adequacy of Serving report for the SPC Phase 3, the proposed building statistics (area and number of residential units) have changed slightly. Please find below an updated summary of the proposed development of information and anticipated sanitary demands. I've also attached our detailed calculations and the Architectural Site Plan for reference.

1. Type of Development and Units: The proposed development involves the construction of one (1) 24-storey mixed-use building (residential and commercial space). There are a total of **297 residential units** with an underground 3-level parking garage.

2. Site Address: 384 Arlington Avenue

3. Location of Services: Proposed sanitary is connecting to the 300mmØ PVC municipal combined sewer main in Arlington Avenue. FYI, the proposed storm would connect to Bell Street North on another 300mmØ PVC combined municipal main sewer.

4. Total Estimated Average Dry Weather Flow: 1.68 L/s

5. Total Estimated Peak Dry Weather Flow: 5.59 L/s

6. Total Estimated Peak Wet Weather Flow: 5.66 L/s

Could you please confirm if there is enough capacity in the City system to accommodate the modified proposed wastewater flow for this lot? Would you also be able to confirm receipt of this request for wastewater capacity confirmation?

Best regards,

ERIC POTVIN, P.Eng., ing. (PEO, OIQ, APEY) Project Manager / Infrastructure Chargé de projet / Infrastructures

M 613-863-7340 F 613-860-1870 600–1400 Blair Towers Place, Ottawa, ON K1J 9B8 CANADA



De : Fawzi, Mohammed <<u>mohammed.fawzi@ottawa.ca</u>>
Envoyé : 15 juillet 2022 12:12
À : Jaymeson Adams <<u>Jaymeson.Adams@cima.ca</u>>
Cc : Tim Kennedy <<u>Tim.Kennedy@cima.ca</u>>; Gavin Joseph <<u>Gavin.Joseph@cima.ca</u>>
Objet : RE: 384 Arlington Avenue - Peak Wastewater Demand - Capacity Confirmation



Hi Jaymeson,

This is to confirm there are no capacity concerns.

Appendix A

2B - SANITARY SERVICE CONNECTION INSPECTION CHAMBER



Éric Potvin

De:Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>Envoyé:11 juillet 2022 12:31À:Jaymeson AdamsCc:Tim Kennedy; Gavin JosephObjet:RE: 384 Arlington Avenue - Peak Wastewater Demand - Capacity Confirmation

EXTERNAL EMAIL

Hi Jaymeson,

Please see my comments in red below.

Best Regards,

Mohammed Fawzi, P.Eng.

Project Manager Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique Development Review - Central Branch City of Ottawa | Ville d'Ottawa 110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1 613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

From: Jaymeson Adams <Jaymeson.Adams@cima.ca>
Sent: July 06, 2022 5:24 PM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Cc: Tim Kennedy <tim.kennedy@cima.ca>; Gavin Joseph <Gavin.Joseph@cima.ca>
Subject: RE: 384 Arlington Avenue - Peak Wastewater Demand - Capacity Confirmation

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Hi Mohammed,

Regarding the sanitary and storm connections for the below development, I have a couple questions:

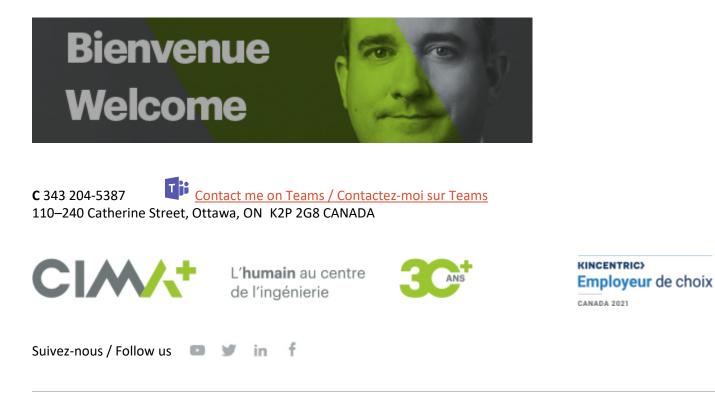
- 1. The proposed building is expected to encompass the entire site area. Therefore, there would not be space to install a monitoring maintenance hole within the property line. To rectify this, we propose to install a wastewater sampling / inspection chamber on the sanitary connection as per City Detail S18.1. Do you agree with this approach? Agreed.
- 2. We assume that there would need to be separate sanitary and storm connections to the combined sewer (see attached sketch for proposed connection points) in case the City installs separate sanitary and storm sewers in the area in the future. This would also require two manholes on the combined sewer, one for each connection. Could you please confirm this approach? We have not had many projects in the past where we have had to connect to a combined sewer, so any information you could provide would be helpful and greatly appreciated. Looking into this with Asset Management and will get back to you.

If you would like, I am available for further discussion on these points. Feel free to give me a call on my cell (343-204-5387) or we could organize a Teams meeting.

Thanks,

Upcoming vacation notice: 14 to 22 July 2022

JAYMESON ADAMS, P.Eng. Engineer / Infrastructure Ingénieur / Infrastructures



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Appendix A

3 - SWM - Uncontrolled Drainage Confirmation



From:	Hughes, Brett <brett.hughes@ottawa.ca></brett.hughes@ottawa.ca>
Sent:	August 15, 2024 10:52 AM
То:	Éric Potvin
Cc:	Whelan, Amy; Martin Fréchette; Howlader, Nazrul
Subject:	FW: 384 Arlington Av SPC Phase 3 Civil Comment

EXTERNAL EMAIL

Eric,

Please see response from the City's modelling group. Please advise if you require anything else.

Regards, **Brett Hughes BEng.** Project Manager, Infrastructure Development Review Central PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS) 110 Laurier Ave West | 4th Floor | Ottawa, ON | K1P 1J1 City of Ottawa | Ville d'Ottawa 4613.580.2424 ext./poste 32541

From: Jhamb, Nishant <<u>nishant.jhamb@ottawa.ca</u>>
Sent: August 14, 2024 10:53 AM
To: Hughes, Brett <<u>brett.hughes@ottawa.ca</u>>
Subject: RE: 384 Arlington Av. - SPC Phase 3 Civil Comment

Hello Brett,

Without looking at the plans, I don't see any issues with small uncontrolled area draining to the Row if they are improving existing conditions be reducing the runoff.

Thanks Nishant From: Hughes, Brett <<u>brett.hughes@ottawa.ca</u>> Sent: August 12, 2024 9:57 AM To: Jhamb, Nishant <<u>nishant.jhamb@ottawa.ca</u>> Cc: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>; Martin Fréchette <<u>Martin.Frechette@cima.ca</u>>; Howlader, Nazrul <<u>Nazrul.Howlader@ottawa.ca</u>> Subject: RE: 384 Arlington Av. - SPC Phase 3 Civil Comment

Nishant,

Please see below for a modelling inquiry received from Eric Potvin last week in Amy's absence (email attached detailing inquiry). Are you able to investigate and provide feedback to the Applicant? Please advise.

Regards,

Brett Hughes BEng.

Project Manager, Infrastructure Development Review Central PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS) 110 Laurier Ave West | 4th Floor | Ottawa, ON | K1P 1J1 City of Ottawa | Ville d'Ottawa 613.580.2424 ext./poste 32541

From: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>
Sent: August 09, 2024 4:43 PM
To: Hughes, Brett <<u>brett.hughes@ottawa.ca</u>>
Cc: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>; Martin Fréchette <<u>Martin.Frechette@cima.ca</u>>
Subject: RE: 384 Arlington Av. - SPC Phase 3 Civil Comment

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Hi Brett,

Yes, that's right. It would be appreciated.

Thank you and have a good weekend,

ERIC POTVIN, P.Eng., ing. (PEO, OIQ, APEY) Project Manager / Infrastructure – Civil Chargé de projet / Infrastructures – Civil

C 613-863-7340 F 613-860-1870 600–1400 Blair Towers Place, Ottawa, ON K1J 9B8 CANADA



De : Hughes, Brett <<u>brett.hughes@ottawa.ca</u>>
Envoyé : 9 août 2024 16:29
À : Éric Potvin <<u>Eric.Potvin@cima.ca</u>>
Cc : Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>; Martin Fréchette <<u>Martin.Frechette@cima.ca</u>>
Objet : RE: 384 Arlington Av. - SPC Phase 3 Civil Comment

EXTERNAL EMAIL

Eric,

Forgive my ignorance, I have zero knowledge about this application. To clarify, you are just looking to connect with a one the City modelers for confirmation? Please confirm.

If my interpretation is accurate, I will be track down a contact for you early next week to assist with your inquiry.

Regards, Brett Hughes BEng. Project Manager, Infrastructure Development Review Central PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS) 110 Laurier Ave West | 4th Floor | Ottawa, ON | K1P 1J1 City of Ottawa | Ville d'Ottawa 4 613.580.2424 ext./poste 32541

From: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>
Sent: August 08, 2024 9:58 AM
To: Hughes, Brett <<u>brett.hughes@ottawa.ca</u>>
Cc: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>; Martin Fréchette <<u>Martin.Frechette@cima.ca</u>>
Subject: RE: 384 Arlington Av. - SPC Phase 3 Civil Comment

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Hi Brett,

Not sure if you can help me in Amy's absence, but I'm doing a follow up on a comment we received on the 384 Arlington Site Plan Control application. See the attached email.

Please let me know if you can help or if we will need to wait for Amy's return.

Kind Regards,

ERIC POTVIN, P.Eng., ing. (PEO, OIQ, APEY) Project Manager / Infrastructure Chargé de projet / Infrastructures

M 613-863-7340 F 613-860-1870 600–1400 Blair Towers Place, Ottawa, ON K1J 9B8 CANADA



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De : Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>
Envoyé : 8 août 2024 09:25
À : Éric Potvin <<u>Eric.Potvin@cima.ca</u>>
Objet : Automatic reply: 384 Arlington Av. - SPC Phase 3 Civil Comment

EXTERNAL EMAIL

I will be **out** of the **office** Tuesday August 6th, 2024 returning Monday August 19th, 2024. I will responed to your emails upon my return. If you require an immediate response please contact Brett Huges (<u>brett.hughes@ottawa.ca</u>).

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From:	Éric Potvin
Sent:	August 8, 2024 9:24 AM
То:	'Whelan, Amy'
Cc:	Martin Fréchette
Subject:	RE: 384 Arlington Av SPC Phase 3 Civil Comment
Attachments:	Feedback Form - Phase 3.pdf

Hi Amy,

I'm just doing a follow-up to my email below.

For your reference, it's the comment No. 56 of the attached review feedback letter.

Regards,

ERIC POTVIN, P.Eng., ing. (PEO, OIQ, APEY)
Project Manager / Infrastructure
Chargé de projet / Infrastructures
M 613-863-7340 F 613-860-1870
600–1400 Blair Towers Place, Ottawa, ON K1J 9B8 CANADA



De : Éric Potvin Envoyé : 2 août 2024 15:50 À : Whelan, Amy <<u>amy.whelan@ottawa.ca</u>> Cc : Martin Fréchette <<u>Martin.Frechette@cima.ca</u>> Objet : 384 Arlington Av. - SPC Phase 3 Civil Comment

Hi Amy,

We received the following civil comment as part of our latest SPC submission:

"As per the Phase 1 Pre-consultation notes the entire site is required to be controlled to the predevelopment 2-year release rate with a C=0.4 and a minimum Tc of 10min. Discussion with City modeling will be required to determine if it is acceptable to allow area NC1 to release to the right of way uncontrolled."

Could you assist us in contacting the City modeling group to confirm whether they have any objections to the area at the edge of our site remaining uncontrolled?

Our report, which follows the same approach used in previous projects with the City, shows that the uncontrolled area will feature more pervious landscaping than it currently does. Consequently, it will release less stormwater than it does now in this uncontrolled area. The remainder of the site will be controlled to the 2-year pre-development release rate. Please see the attached pre-development and post-development SWM drawings for reference. We estimate that the post-development runoff for the uncontrolled area (named NC1) will be reduced by approximately 1.9 L/s compared to existing conditions.

Additionally, it's important to note that the site currently does not retain any stormwater – it is all uncontrolled and mostly impervious. Thus, the overall situation of this property will be significantly improved.

Please be aware that the site plan is being modified by the architect, so we will need to adjust our drawings and calculations before resubmitting. However, we plan to maintain the same approach regarding the uncontrolled/unattenuated area.

Thank you for your assistance.

Best regards,



De : Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>> Envoyé : 2 août 2024 11:14 À : Whelan, Amy <<u>amy.whelan@ottawa.ca</u>> Cc : Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Anthony Tarabay <<u>Anthony.Tarabay@cima.ca</u>> Objet : RE: Question About ECA Submission for Property Acquisition

Hi Amy,

Thanks so much for your quick response! I'll reach out to the Ministry for further details. I really appreciate you looking into this and offering to ask around.

Have a great day and enjoy the long weekend ahead!

Best, Pardis

PARDIS PARSA

Engineering Graduate / Infrastructure



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CONFIDENTIALITY WARNING This email is confidential. If you are not the intended recipient, please notify the sender immediately and delete it in its entirety.

From: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>
Sent: Friday, August 2, 2024 10:42 AM
To: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Cc: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Anthony Tarabay <<u>Anthony.Tarabay@cima.ca</u>>
Subject: RE: Question About ECA Submission for Property Acquisition

EXTERNAL EMAIL

Good morning Pardis,

I am not sure what the ministry requirements are so I suggest that you reach out to the ministry to confirm. Apologies that I can not be of more help in this regard. I will also ask around and let you know if anyone in the City may be able to answer.

Best,

Amy

From: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Sent: August 02, 2024 9:56 AM
To: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>
Cc: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Anthony Tarabay <<u>Anthony.Tarabay@cima.ca</u>>
Subject: Question About ECA Submission for Property Acquisition

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Hi Amy,

I hope you're having a great day!

I have a quick question about the ECA application process. Our client is in the process of acquiring a property, but they don't own it yet. Would it be sufficient to include a signed letter from the current owner (a Church) authorizing our client to submit the ECA? If there's a better approach or any additional steps we should consider, I'd appreciate your advice.

I appreciate your help and have a great weekend!

PARDIS PARSA Engineering Graduate / Infrastructu	ıre	
	CIMAN L'humain au centre de l'ingénierie Engineering for people	
T 613 860-2462 / ⊠ pardis.parsa@ 600–1400 Blair Towers Place, Otta		
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Appendix A

4 - PRE-CONSULTATION WITH MECP FOR ECA APPLICATION



From:	Pardis Parsa
Sent:	August 21, 2024 4:10 PM
То:	Whelan, Amy
Cc:	Éric Potvin; Anthony Tarabay
Subject:	RE: Question About ECA Submission for Property Acquisition

Hi Amy,

Thank you for the information and for getting back to me. I'll get the confirmation letter from the landowner.

Kind regards,

PARDIS PARSA Engineering Graduate / Infrastructu	ıre		
	CIM L' humain au centre de Engineering for p	l'ingénierie	
T 613 860-2462 / ⊠ <u>pardis.parsa@</u> 600–1400 Blair Towers Place, Otta		IADA	
	Engineering for people	YEARS	KINCENTRIC> Best Employer
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From: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>> Sent: Wednesday, August 21, 2024 11:18 AM To: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>> **Cc:** Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Anthony Tarabay <<u>Anthony.Tarabay@cima.ca</u>> **Subject:** RE: Question About ECA Submission for Property Acquisition

EXTERNAL EMAIL

Good morning Pardis,

Apologies for the late reply I was away on vacation. An application for an ECA can be made by a person that does not own the land.

It simply requires confirmation from the landowner. Usually in a letter.

Kind regards,

Amy Whelan, E.I.T

Project Manager, Infrastructure Approvals Development Review, Central | Examen des projets d'aménagement, Central Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB) 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 26642, <u>amy.whelan@ottawa.ca</u>

From: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Sent: August 02, 2024 11:14 AM
To: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>
Cc: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Anthony Tarabay <<u>Anthony.Tarabay@cima.ca</u>>
Subject: RE: Question About ECA Submission for Property Acquisition

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PARDIS PARSA

Engineering Graduate / Infrastructure



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From: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>
Sent: Friday, August 2, 2024 10:42 AM
To: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Cc: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Anthony Tarabay <<u>Anthony.Tarabay@cima.ca</u>>
Subject: RE: Question About ECA Submission for Property Acquisition

EXTERNAL EMAIL

Good morning Pardis,

I am not sure what the ministry requirements are so I suggest that you reach out to the ministry to confirm. Apologies that I can not be of more help in this regard. I will also ask around and let you know if anyone in the City may be able to answer.

Best,

Amy

From: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Sent: August 02, 2024 9:56 AM
To: Whelan, Amy <<u>amy.whelan@ottawa.ca</u>>
Cc: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Anthony Tarabay <<u>Anthony.Tarabay@cima.ca</u>>
Subject: Question About ECA Submission for Property Acquisition

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Hi Amy,

I hope you're having a great day!

I have a quick question about the ECA application process. Our client is in the process of acquiring a property, but they don't own it yet. Would it be sufficient to include a signed letter from the current owner (a Church) authorizing our client to submit the ECA? If there's a better approach or any additional steps we should consider, I'd appreciate your advice.

I appreciate your help and have a great weekend!



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Pardis Parsa

From:	Funakoshi, Didier (MECP) <didier.funakoshi@ontario.ca></didier.funakoshi@ontario.ca>
Sent:	May 29, 2024 10:00 AM
То:	Pardis Parsa
Cc:	Environmental Permissions (MECP); Diamond, Emily (MECP)
Subject:	RE: Request for ECA and MECP Approval Forms for Development Project at 384
	Arlington Avenue (A001272)

EXTERNAL EMAIL

Hi Paradis,

Thank you for reaching out.

In addition to the sections you have highlighted, please include also the following:

- 1) Section 3: EBR, EAA and indigenous consultation
- 2) Section 6.1 (yes or no)
- Authorization page: sections 7.1, 7.2 and 7.3. If the ECA Applicant is the City of Ottawa (Municipality), only section 7.1 is required (no need to complete section 7.2). CIMA will have to complete, sign and date 7.3

If there are any other inquiries, please let me know.

Regards,

Didier Funakoshi | Environmental Assessment and Permissions Division |Ministry of the Environment, Conservation and Parks: 135 St. Clair Ave W. 1st Floor Toronto, Ontario, M4V 1P5 | ☎ (437) 237-7618 | 墨 (416) 314-8452 | ⊠ didier.funakoshi@ontario.ca

From: Environmental Permissions (MECP) <enviropermissions@ontario.ca>
Sent: Wednesday, May 29, 2024 9:12 AM
To: Funakoshi, Didier (MECP) <Didier.Funakoshi@ontario.ca>
Cc: Environmental Permissions (MECP) <enviropermissions@ontario.ca>
Subject: FW: Request for ECA and MECP Approval Forms for Development Project at 384 Arlington Avenue (A001272)

Hello Didier,

Could you please assist with the inquiry below? To meet our Service Standards, please CC <u>enviropermissions@ontario.ca</u> on your response to the client. If a final response cannot be provided immediately, provide an interim response to the client within 2 business days and a complete answer within 15 business days.

Thank you,

Isaac Foley (on behalf of Environmental Permissions)

Client Service Representative

Client Services & Permissions Branch (CSPB)

Ministry of the Environment, Conservation and Parks

135 St. Clair Avenue West, 1st Floor

Toronto, ON M4V 1P5

General Inquiries: E: enviropermissions@ontario.ca | P: 416-314-8001 | F: 416-314-8452

New Environmental Permissions Online Services – Videos

If you have any accommodation needs or require communication supports or alternate formats, please let me know.

Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

Did you know? At this time, the ministry strongly encourages online submissions for some environmental permissions. You can submit your application and supporting documents, make payments, and track application progress online. For more information, please visit the <u>ministry</u> <u>website</u> or you may contact the Client Services and Permissions Branch by phone at 416-314-8001 or 1-800-461-6290, or by email at <u>enviropermissions@ontario.ca</u>.

From: Pardis Parsa <<u>Pardis.Parsa@cima.ca</u>>
Sent: Monday, May 27, 2024 4:41 PM
To: Environmental Permissions (MECP) <<u>enviropermissions@ontario.ca</u>>
Cc: Éric Potvin <<u>Eric.Potvin@cima.ca</u>>; Martin Fréchette <<u>Martin.Frechette@cima.ca</u>>
Subject: FW: Request for ECA and MECP Approval Forms for Development Project at 384 Arlington Avenue (A001272)

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender. Hello,

I'm contacting you on behalf of CIMA+ and the City of Ottawa regarding the proposed development at 384 Arlington Ave. As per Emily Diamond's email below, we need to complete an ECA application due to our proposed Combined Sewer Connection. We want to ensure we're filling out all required sections for this type of application.

Could you please confirm the highlighted sections are correct or if additional sections need to be completed?

For your reference, please find the proposed development information below.

Type of Development and Units: The proposed development involves the construction of a 24-storey mixed-use building (residential and commercial space) with an underground 2-level parking garage.
 Site Address: 384 Arlington Avenue

3. *location of services:* The development will connect sanitary and storm sewers separately to the existing 300 mm diameter PVC combined sewer in Bell Street North.

4. Stormwater Management: Stormwater will be stored in an underground tank, with release rates controlled to the 2year pre-development condition and storage provided up to the 100-year post-development condition.

Thank you for your assistance.

Best regards,



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From: Diamond, Emily (MECP) < Emily.Diamond@ontario.ca
 Sent: Wednesday, May 15, 2024 3:35 PM
 To: Pardis Parsa < pardis.parsa@cima.ca
 ; Éric Potvin < Eric.Potvin@cima.ca
 Subject: RE: Request for ECA and MECP Approval Forms for Development Project at 384 Arlington Avenue (A001272)

EXTERNAL EMAIL

Good Afternoon Pardis and Eric,

This email is in regards to the pre-consultation meeting that was held today. I have no concerns about the proposed project going forward and agree that an Environmental Compliance Approval for

the stormwater management is required due to the discharge to the combined sewers. You may use this email as a record of pre-consultation.

You have likely come across this page already, but the information on this page may be useful as you are going through the application process:

Environmental Compliance Approval | ontario.ca

The completed application should be sent to the following email, <u>ECA.submission@ontario.ca</u>. Feel free to copy me on it as well.

If you have any further questions for me, please let me know. If you have any questions regarding the application form, please reach out to the Client Services and Permissions Branch at 416-314-8001 or by email at <u>enviropermissions@ontario.ca</u>

Thank you and have a great rest of the day.

Emily Diamond

Environmental Compliance Officer | Ottawa District Office | Eastern Region Ministry of the Environment, Conservation and Parks| Government of Ontario (613)-866-0938 | <u>firstname.lastname@ontario.ca</u>

2430 Don Reid Drive Ottawa ON K1H 1E1



We want to hear from you. How was my service? You can provide feedback at 1-888-745-8888 or <u>www.ontario.ca/inspectionfeedback</u>. Nous attendons vos commentaires. Qu'avez-vous pensé de mon service? Vous pouvez nous faire part de vos commentaires au 1-888-745-8888 ou à <u>www.ontario.ca/retroactioninspection</u>.

Are reporting a spill? Please contact the Ministry of the Environment, Conservation and Parks, Spills Action Centre at (416)325-3000 or 1(800) 268-6060.

Are you reporting a pollution incident or environmental concern? Please use the ministry's <u>online pollution reporting tool</u> or for more urgent matters contact the Pollution Hotline at 1(866) 663-8477.

From: Pardis Parsa < Pardis.Parsa@cima.ca>

Sent: April 23, 2024 3:38 PM

To: Primeau, Charlie (MECP) <<u>Charlie.Primeau@ontario.ca</u>>; Diamond, Emily (MECP) <<u>Emily.Diamond@ontario.ca</u>> Subject: Request for ECA and MECP Approval Forms for Development Project at 384 Arlington Avenue (A001272)

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender. Hello,

I hope this email finds you well. I am reaching out on behalf of CIMA+ and the City of Ottawa regarding a project in Ottawa, Ontario.

We've recently wrapped up an assessment confirming that the proposed 24-storey residential tower with 274 units at 384 Arlington Avenue can be well serviced by existing municipal infrastructure in terms of water and combined sewer systems. We are aiming to get Environmental Compliance Approval (ECA) for the project.

Could you please help us out by providing the necessary forms and documentation for the approval process? Your assistance would be greatly appreciated. If there's anything more you need from our end, please let me know.

PARDIS PARSA

Engineering Graduate / Infrastructure



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Appendix A

5 - PRE-CONSULTATION WITH RVCA



Appendix A



EXTERNAL EMAIL

Hi Tim,

Based on the proposed site plan details, and combined sewer outlet, the RVCA has no water quality control requirements, as it will rely on municipal infrastructure. Further, there are no natural features identified on the subject site.

Thanks,

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

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Monday, July 18, 2022 3:24 PM
To: Eric Lalande <eric.lalande@rvca.ca>
Cc: Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: FW: 384 Arlington Av. - Servicing Capacity Assessment - RVCA Pre-consult Importance: High

Hi Eric,

Please see below and attached.

Are you able to provide a response in Jamie's absence?

Thanks, Tim

TIM KENNEDY, P.Eng. Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870 110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA









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CONFIDENTIALITY WARNING This email is confidential. If you are not the intended recipient, please notify the sender immediately and delete it in its entirety.

From: Tim Kennedy
Sent: Monday, July 18, 2022 3:19 PM
To: Jamie Batchelor <<u>jamie.batchelor@rvca.ca</u>>
Cc: Jaymeson Adams <<u>Jaymeson.Adams@cima.ca</u>>; Gavin Joseph <<u>Gavin.Joseph@cima.ca</u>>
Subject: 384 Arlington Av. - Servicing Capacity Assessment - RVCA Pre-consult
Importance: High

Hi Jamie,

We are working on another development project in the City of Ottawa, and I wanted to get your input on Natural Heritage/Hazards features that may impact the development as well as any Stormwater Management Criteria for the site and required approvals/permits.

The proposed development involves the construction of a twenty-four (24) storey mixed use commercial and residential development at 384 Arlington Avenue in Ottawa, Ontario, with underground parking (no proposed surface parking spots).

A few specific items for your consideration as follow:

- 1. The development will connect to the existing 300 mm ø combined sewer within Bell Street North.
- 2. Stormwater will be stored in an underground tank/cistern. Allowable release rate will be controlled to the 2-year pre-development condition and storage provide up to the 100-year post development condition.
- 3. The proposed underground parking will encompass the entire site.
- 4. Considering the above we do not expect that on-site water quality control would be required.

I have attached a key plan with the site location (PDF document) for your reference.

Please do not hesitate to contact me if you have any questions, want to discuss or need clarification. Hoping to have a quick response on this one as I would like to submit the Servicing Report to our client for review by end of this week.

Thanks, Tim

TIM KENNEDY, P.Eng. Senior Project Manager / Infrastructure

T 613-860-2462 ext. 6620 M 613-462-3627 F 613-860-1870 110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA



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Appendix A

6 - PRE-CONSULTATION WITH CITY



Subject:	FW: Pre-con Follow-up - 384 Arlington
Date:	Monday, February 7, 2022 at 2:46:31 PM Eastern Standard Time
From:	Ghada Zaki
То:	Miguel Tremblay, Justin George, Stephen Savell, Kristen Jorgensen
CC:	Tamara Nahal
·	

Attachments: 384 Arlington - Study and Plan Identification List.pdf, design_brief_submission requirements_384 Arlington.pdf, torwindanalysis_en.pdf, image001.gif, image003.jpg

Good afternoon,

Please note that we have just received the Pre-con follow-up and minutes. Please see below and attached

Thanks and looking forward to our discussion tomorrow,

Ghada Zaki, RPP, MCIP

Senior Planner T 613.730.5709 ext. 226 **As I am working remotely, please email me to set up a phone call**

From: Nadeau, Jeff <jeff.nadeau@ottawa.ca>
Sent: February 7, 2022 2:39 PM
To: Ghada Zaki <zaki@fotenn.com>; Tamara Nahal <nahal@fotenn.com>
Cc: Kotarba, Ashley <Ashley.Kotarba@ottawa.ca>; Wang, Randolph <Randolph.Wang@ottawa.ca>; Gervais, Josiane <josiane.gervais@ottawa.ca>; Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>; thesycamore <thesycamore@sympatico.ca>
Subject: Pre-con Follow-up - 384 Arlington

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CC: Ashley Kotarba, Randolph Wang, Mohammed Fawzi, Josiane Gervais, David Seaborn

Hello Ghada & Tamara,

Please refer to the below [and/or attached notes] regarding the Pre-Application Consultation ("precon") Meeting held on January 14 for the property at 384 Arlington Avenue for Site Plan Control and Zoning By-law Amendment in order to allow the development of a 12-storey residential building by Windmill. I have also attached the required Plans & Study List for application submission.

Below are staff's preliminary comments based on the information available at the time of pre-con meeting:

PLANNING

- Under the current Official Plan, the lands are designated General Urban. Under the new Official Plan, the site is Downtown Core (Section 5.1) / Neighbourhood (Section 6.3). Applications submitted before Ministry approval of the new Official Plan will be evaluated on the basis of the existing Official Plan with regard for the new Official Plan; the more restrictive policies will apply.
 - Policies 2 and 3 of Section 6.3.1 in the new Official Plan stipulate that building heights in Neighbourhood may exceed the generally low-rise format (a) where existing zoning or secondary plans allow for greater heights, or (b) in areas already

characterized by taller buildings. It is thus the view of the Department, based on Policy 2(b), that no OPA is required for this proposal given the proximity of a 12-storey building on Bell Street and that the additional height may be sought through ZBLA.

- The site is zoned I1A. The intent to rezone it as R5 is understood, and staff concur that it is appropriate.
- The massing of the proposed building will need to be resolved.
 - Heritage and Urban Design have raised concerns about the relationship of the proposed building to the existing church, which will be reviewed for potential *Heritage Act* designation during the 60-day notice period described in the Heritage notes below. Pending any designation arising from that process, Planning is neutral with regard to the church. In the absence of a designation, the Department's priority must be a building form and program that contributes to a high-quality urban place and complies with Official Plan direction relating to design and compatibility.
 - Retention of the existing building in a way that adds value to the project would nonetheless be viewed as a positive – Section 6.3.2 of the new Official Plan includes adaptive reuse as an example of innovative building forms to be supported.
 - The relationship to the east lot line, and to neighbouring buildings sharing Arthur Lane should be reconsidered. It appears that this concept treats its parcel as a standalone city block, with Arthur Lane functioning as a street, whereas given that this is a narrow laneway a rear-yard condition would be expected. Consider, for example, the setbacks of the large buildings to the north from Arthur Lane. Another analogous condition, as mentioned in our meeting, would be the lanes between Breezehill, Bayswater and Spadina Avenues in Hintonburg. Lot lines abutting these lands are treated as rear lot lines with the attendant setbacks and landscaping. It is understood that the context for this site is a more urban condition, however some sort of built-form transition would be advisable.
 - As such, staff recommend exploring different expressions of the volume of this building.
 - This application is not subject to the UDRP by default, but we have the option of recommending it. In the event that a follow-up preconsult meeting proves inconclusive, review and comment from the UDRP may illuminate a path forward.
- It seems likely that community benefits ("Section 37") will be triggered by the density increase being proposed.
- For a Zoning By-law Amendment, the Applicant must now provide a proposed strategy for public consultation as directed by Bill 73.

URBAN DESIGN

- A Design Brief is required for the submission. The Terms of Reference of Design Brief is attached for convenience.
 - Please study massing options.
 - Please note wind and shadow studies are required.
- With respect to the preliminary concept presented at the meeting, the incorporation of some aspects of the heritage attributes into the design and the provision of a public accessible space are appreciated. However, the overall site plan and massing appears to be overwhelming for the heritage assets, the site and the surroundings.

- The 12-storey "slab" does not forester a good relationship with the narrow lane of Author and the adjacent low-rise neighbourhood.
- The small 20m × 20m "public space" is a little bit squashed comparing with the 9 storey and 12 storey buildings surrounding it.
- The addition above the proposed reconstructed heritage building is unconvincing.
- In the new Official Plan, the site is within the Neighbourhood designation of the Downtown Transect. The new OP supports low-rise development in this designation but also allows for opportunities to explore taller building options in an area that is characterized by taller buildings. When exploring options on this site, please consider the following in addition to many policies and practical considerations:
 - Locate taller building away from low-rise residential areas and the narrow lane;
 - Respect the low-rise scale and character of Arlington and Bell, where the heritage building is situated.
 - Provide effective transition from any tall buildings to the low-rise areas, in this case, transition to areas east of Author and west of Bell should both be considered. Please refer to the relevant OP policies for guidance.
 - If a high-rise building is considered, please refer to the Urban Design Guidelines for High-Rise Buildings for guidance, and use angular plane as a tool to guide the design for built form transition.
 - Include a 2 or 3-storey podium to reflect on the scale of the adjacent low-rise residential areas.
 - Incorporate grade-related units to reflect the architectural rhythm of the adjacent lowrise residential areas.
 - Include a publicly accessible space at grade, and make sure optimal microclimate conditions.
 - Allow for landscaping opportunities on all public streets and lane, particularly Raymond Street.
- The site is not within a designated Design Priority Area and generally it is not subject to the review by the City's Urban Design Review Panel. However, due to the complexity of the proposed development and the inclusion of heritage resources on site, the applicant can benefit from the review(s) of the UDRP.
- As indicated above, the currently proposed site plan and massing option is unconvincing and problematic in a number of ways. It is recommended that the applicants explore additional site plan and massing options and return for a second staff preconsultation. The merits and process of UDRP review(s) can be determined at the second staff preconsulation where such alternative site plan and massing options are presented and discussed.

HERITAGE

- The property at 384 Arlington Street is listed on the City's Heritage Register as a nondesignated listing. This includes both the church and the manse. The property was added for having potential cultural heritage value or interest. Being listed on the Heritage Register means that the owner needs to provide the City with 60 day's notice of their intention to demolish either building. The owner will need to complete the Form for Buildings Listed on the Heritage Register (link below), and provide supporting documentation (rationale for demolition, any supporting historical documents, photos to document the building). A Heritage Impact Assessment and Conservation Plan may be useful to support the demolition and development applications. These documents should look at the historical and architectural interest of the church and manse, and evaluate how the proposal will impact any each resource. Also, a conservation plan should look at the structural integrity of the church, and recommend an approach that salvages as much original material as possible, while rebuilding areas that are severely compromised.
- Form for Buildings Listed on the Heritage Register (ottawa.ca)
- During the 60 days, staff will determine if the building(s) warrants designation under Part IV of the Ontario Heritage Act. If it does not, the 60 days will be allowed to expire. Please note that building/demolition permits cannot be issued until the 60 days have lapsed. For these reasons, it is recommended that the applicant submit the form at the time of the site plan application.
- Heritage staff are pleased to see development on this site, however there is strong concern over the limited conservation of the church building and the massing proposed on top. This is not in alignment with *Parks Canada's Standards and Guidelines for the Conservation of Historic Places*, nor the City's Official Plan.
- Heritage staff encourage the applicant to consider shifting the massing from on top of the church and redistributing it elsewhere on the site. See comments from Urban Design for direction.
- Further, more of the original brick church building should be conserved and integrated into the development. Any parts that are structurally unsound can be rebuilt. See example below of St. Charles Church in Vanier. The new mass is located next to the church, and the entire church building is kept, and integrated into the development.



ENGINEERING

Available Infrastructure:

Arlington Avenue:

Combined: 300mm PVC (Install 2003)

Water: 200mm PVC (Install 2003)

Bell Street North

Combined: 300mm PVC (Install 2002)

Water: 150mm PVC (Install 2002)

Water Boundary Conditions:

Will be provided at request of consultant. Requests must include the location of the service and the expected loads required by the proposed development. Please provide the following and <u>submit Fire</u> <u>Flow Calculation Sheet</u> per FUS method with the request:

- Location of service
- Type of development and amount of required fire flow (per FUS method <u>include FUS</u> <u>calculation sheet with request</u>)
- Average Daily Demand (I/s)
- Maximum Hourly Demand (I/s)
- Maximum Daily Demand (I/s)
- Water Supply Redundancy Fire Flow:
 - Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m³ / day (0.5787 l/s per day)

Water services larger than 19 mm require a Water Data Card. Please complete card and submit.

Stormwater Management:

- Coefficient (C) of runoff determined as per existing conditions but in no case more than 0.4.
- TC = To be calculated, minimum 10 minutes
- Any storm events greater than 2 year, up to 100 year, and including 100-year storm event must be detained on site.
- Foundation drains are to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.
- Roof drains are to be connected downstream of any incorporated ICD within the SWM system.

Stormwater Management Criteria (Quality Control)

Include a section in the SWM report concerning quality control requirements. It is the consultant's responsibility to check with the relevant Conservation Authority for quality control issues and include this information in the SWM report.

Noise and Vibration Study:

Noise Study required due to proximity of 417 Highway.

Phase I and Phase II ESA:

- Phase I ESA is required; Phase II ESA may be required depending on the results of the Phase I ESA. Phase I ESA must include an EcoLog ERIS Report.
- Phase I ESA and Phase II ESAs must conform to clause 4.8.4 of the Official Plan that requires

that development applications conform to Ontario Regulation 153/04.

Required Studies

- Stormwater Management Report
- Site Servicing Study
- Geotechnical Study
- Phase I ESA
- Phase II ESA (depends on outcome of Phase I)
- Noise Study

Required Plans

- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan (Can be combined with grading plan)

ECA Application will be required

Please provide one copy the following (following approval):

- MECP ECA Application Form TOR or Direct Submission tied to SPC Fees Certified Cheque made out to "City of Ottawa"
- Proof of Applicant's Identification
- Certificate of Incorporation (if Applicable)
- NAICS Code (If Applicable)
- Plan & Profile
- Grading and Servicing Plans
- Survey Plan
- Pipe Data Form
- Relevant information

General

- The Servicing Study Guidelines for Development Applications are available at the following address: <u>https://ottawa.ca/en/city-hall/planning-and-development/informationdevelopers/development-application-review-process/development-applicationsubmission/guide-preparing-studies-and-plans#servicing-study-guidelines-developmentapplications
 </u>
- 2. Servicing and site works shall be in accordance with the following documents:
 - Ottawa Sewer Design Guidelines (October 2012)
 - 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 Park and Pathway Development Manual (2012)
 - City of Ottawa Accessibility Design Standards (2012)
 - Ottawa Standard Tender Documents (latest version)
 - Ontario Provincial Standards for Roads & Public Works (2013)
- 3. 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-

2424 x.44455).

4. Any proposed work in utility easements requires written consent of easement owner.

Feel free to contact the Infrastructure Project Manager, Mohammed Fawzi, at <u>mohammed.fawzi@ottawa.ca</u>, for follow-up questions.

TRANSPORTATION

- Follow Transportation Impact Assessment Guidelines
 - A TIA is required. The scoping report can be submitted together to <u>Josiane.Gervais@ottawa.ca</u> at your earliest convenience.
 - The site is located within the "Urban" area designation, as referenced on the Transportation Master Plan 'Inner Urban' area (i.e. 400m Radius for study area).
 - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
 - Request base mapping asap if RMA is required. Contact Engineering Services (<u>https://ottawa.ca/en/city-hall/planning-and-development/engineering-services</u>)
 - An update to the TRANS Trip Generation Manual has been completed (October 2020). This manual is to be utilized for this TIA. A copy of this document can be provided upon request.
- Corner triangles as per OP Annex 1 Road Classification and Rights-of-Way at the following locations on the final plan will be required (measure on the property line/ROW protected line; no structure above or below this triangle): Local Road to Local Road: 3 m x 3 m
- Sight triangle as per Zoning by-law Section 57 is to be measured on the curb line.
- Corner clearances should follow minimum distances set out within TAC Figure 8.8.2.
- TMP includes:
 - Future LRT Station at Corso Italia (2031 Affordable Network), this station is located within an 800m radius of the site.
 - Transit Priority Corridor (Isolated Measures) (2031 Affordable Network) along Bronson Ave

Transit Priority Corridor (Isolated Measures) (Ultimate Network) along Bronson Ave

- On site plan:
 - Ensure site access meets the City's Private Approach Bylaw.
 - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
 - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
 - Turning movement diagrams required for internal movements (loading areas, garbage) where applicable.
 - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).
 - Show dimensions for site elements (i.e. lane/aisle widths, access width, parking stalls, sidewalks, pedestrian pathways, etc.)
 - Sidewalk is to be continuous across access as per City Specification 7.1.
 - Show slope of garage ramp on site plan. Note that underground ramps should be limited to a 12% grade and must contain a subsurface melting device when exceeding 6%. Ramp grades greater than 15% can be psychological barriers to some drivers.
 - Parking stalls at the end of dead-end parking aisles require adequate turning around space
 - Grey out any area that will not be impacted by this application.

 As the site proposed is residential, AODA legislation applies for all areas accessible to the public (i.e. outdoor pathways, parking, etc.). Consider using the City's Accessibility Design Standards.

Feel free to contact the Transportation Project Manager, Josiane Gervais, at josiane.gervais@ottawa.ca, for follow-up questions.

CITY SURVEYOR

- The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
- Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at <u>bill.harper@ottawa.ca</u>.

OTHER

- Plans are to be standard A1 size (594 mm x 841 mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- All PDF submitted documents are to be unlocked and flattened.
- For sites containing one or more buildings with a total GFA greater than 2000 square metres: a Waste Reduction Workplan Summary is required for the construction project as required by O.Reg. 102/94, being "Waste Audits and Waste Reduction Work Plans" made under the Environmental Protection Act, RSO 1990, c E.19, as amended.
- You are encouraged to contact the Ward Councillor, Councillor McKenney, at <u>catherine.mckenney@ottawa.ca</u> about the proposal. You may also consider contacting the Dalhousie Community Association.

Please refer to the links to <u>Guide to preparing studies and plans</u> and <u>fees</u> for further information. Additional information is available related to <u>building permits</u>, <u>development charges</u>, <u>and the</u> <u>Accessibility Design Standards</u>. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting <u>informationcentre@ottawa.ca</u>.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact me if you have any questions.

Regards,

Jeff Nadeau

 Planner II | Urbaniste II

 Development Review, Central | Examen des projets d'aménagement, Central

 Planning, Real Estate and Economic Development Department | Services de la planification, des biens immobiliers

 et du développement économique

 City of Ottawa | Ville d'Ottawa

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

 C 613.580.2424 ext./poste 16802

 ottawa.ca/planning / ottawa.ca/urbanisme

Please note that, while my work hours may be affected by the current situation, I have regular access to email and check telephone messages periodically. Email is currently the best way to contact me

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

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Appendix A

7 - DEVELOPMENT SERVICING STUDY CHECKLIST



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		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	

	Servicing Study Guidelines for Development Applications	
	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 feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.3
	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A
	opment Servicing Report: Wastewater	
Required Co		Reference Location
I	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).	Section 3.1
	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
7	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.	Section 3.3, Appendix A & Appendix E
7	Description of existing sanitary sewer available for discharge of wastewater from proposed development	Section 1.3, 3.2 & Appendix B
7	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)	Section 3.3
7	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 3.2 & Appendix E
1	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 3.2
	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.	N/A
4.4 Develo	opment Servicing Report: Stormwater Checklist	
Required Co		Reference Location
7	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 4.1
Image: A start of the start	Analysis of available capacity in existing public infrastructure.	Section 4.1
	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Appendix C & F
V	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.	Section 4.2
V	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 4.2
v	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.3, 4.4 & Appendix C
	Set-back from private sewage disposal systems.	N/A
	Watercourse and hazard lands setbacks.	N/A
7	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A

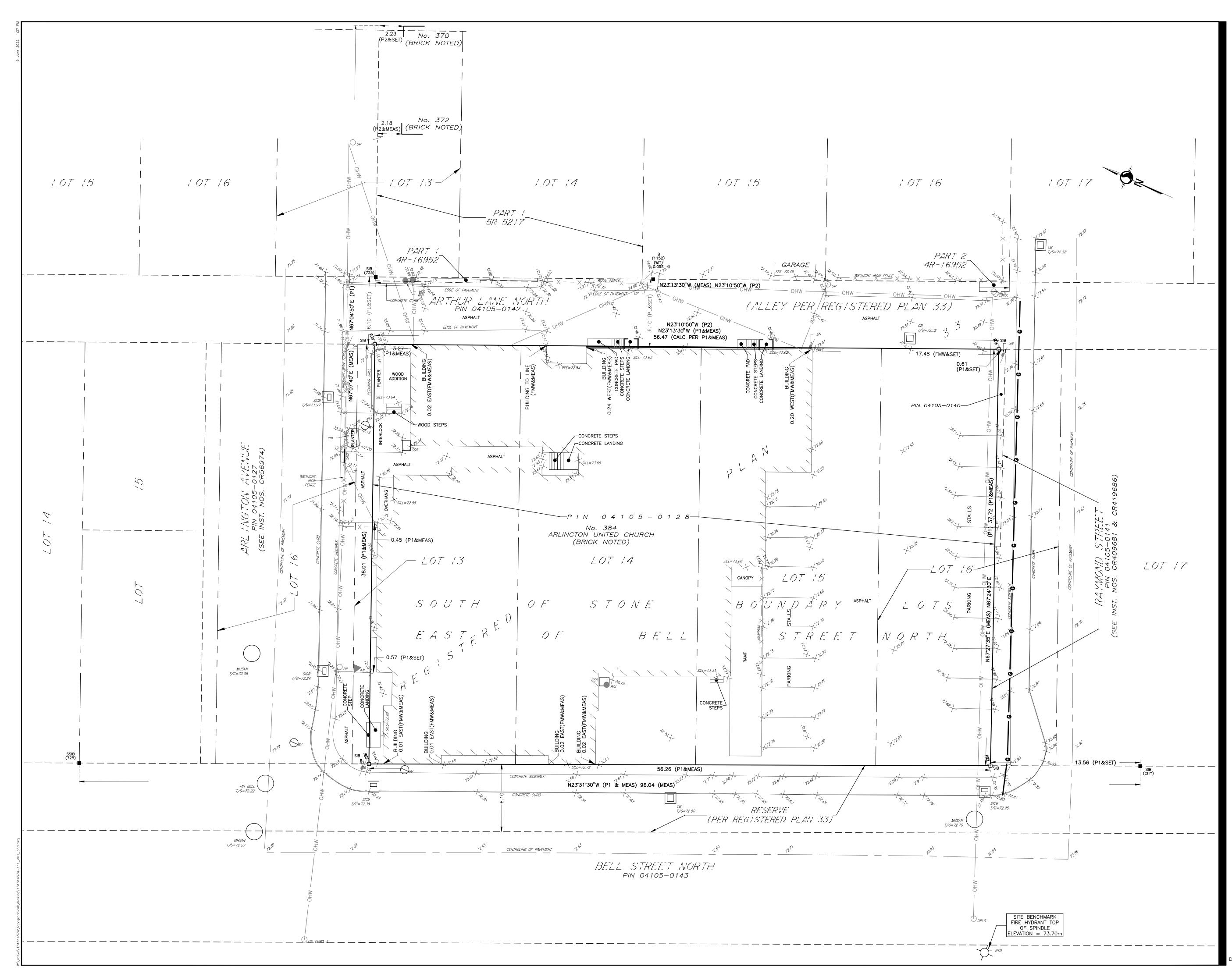
	Servicing Study Guidelines for Development Applications	
	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year	Section 4.3 & Appendix F
	return period) and major events (1:100 year return period).	
	Identification of watercourses within the proposed development and how watercourses will be protected,	N/A
	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	Section 4.1, 4.3 & Appendix
	proposed impervious areas and drainage catchments in comparison to existing conditions.	F
	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	N/A
	post-development flows up to and including the 100 year return period storm event.	
	Identification of potential impacts to receiving watercourses	N/A
	Identification of municipal drains and related approval requirements.	N/A
	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 4.3 and 4.4
	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.	N/A
	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.	N/A
	val and Permit Requirements: Checklist	
Required Co	ntent	Reference Location
	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.)	N/A
4.6 Conclu	sion Checklist	
Required Co	ntent	Reference Location
	Clearly stated conclusions and recommendations	Section 5.0
	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.	N/A
V	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	Cover Sheet



Appendix B Existing Conditions Plan









Stantec Geomatics Ltd. 300-1331 Clyde Avenue Ottawa ON Tel. 613.722.4420 www.stantec.com

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TOPOGRAPHIC SURVEY OF OF LOTS 14 & 15 AND PART OF LOTS 13 & 16 (SOUTH OF STINE BOUNDARY LOTS) EAST OF BELL STREET NORTH REGISTERED PLAN 33

CITY OF OTTAWA

Scale 1:150

2 0 2 4 6 8 10 METRES

Stantec Geomatics Ltd. ONTARIO LAND SURVEYORS

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM THE CAN-NET VRS NETWORK OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76°30' WEST LONGITUDE MTM ZONE 9. NAD83 (ORIGINAL) (2010.0).

19773035 N:5006060.00 E:324888.04 19680191 N:5033563.88 E:388064.92

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA ELEVATION=95.230.

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

ROTATION NOTE

BEARINGS ARE GRID AND A 0°35'00" ANGLE HAS BEEN APPLIED COUNTERCLOCKWISE TO PLANS P1 AND P2.

LEGEND		
	DENOTES	Found monuments
	"	SET MONUMENTS
IB		IRON BAR
IBø		ROUND IRON BAR
SIB		STANDARD IRON BAR
SSIB		SHORT STANDARD IRON BAR
CC		CUT CROSS
CP		CONCRETE PIN
WIT		WITNESS
PIN		PROPERTY IDENTIFICATION NUMBER
M/MEAS		MEASURED
PROP		PROPORTIONED
OU		ORIGIN UNKNOWN
STANTEC		STANTEC GEOMATICS LTD.
P1		PLAN BY FAIRHALL, MOFFAT & WOODLAND,
		DATED FEBRUARY 2nd, 1995
P2		PLAN BY ANNIS O'SULLIVAN VOLLEBEKK,
		DATED APRIL 19th ,2021
725	**	R.W. ARNETT O.L.S.
CITY	**	CITY OF OTTAWA
FMW	**	FAIRHALL, MOFFATT AND WOODLAND O.L.S.
-		,
AN		ANCHOR
BOL		BOLLARD
🗆 CB		CATCH BASIN
SICB		SIDE INLET CB
🔲 GSR		GAS SERVICE REGULATOR
\bigcirc MHSAN		MAINTENANCE HOLE SANITARY
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$\ominus WV$		WATER VALVE
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GASMAIN

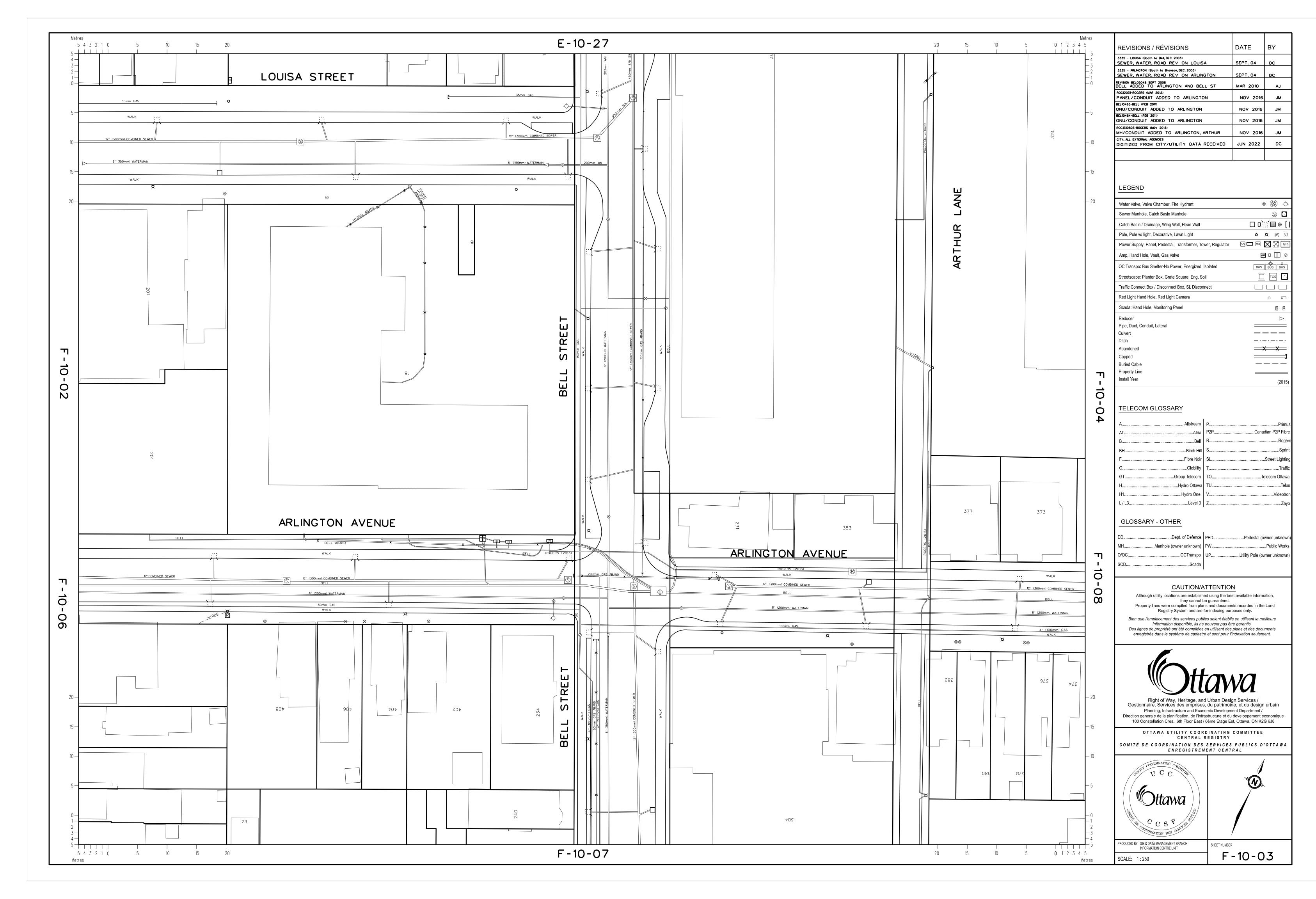
OVERHEAD WIRE

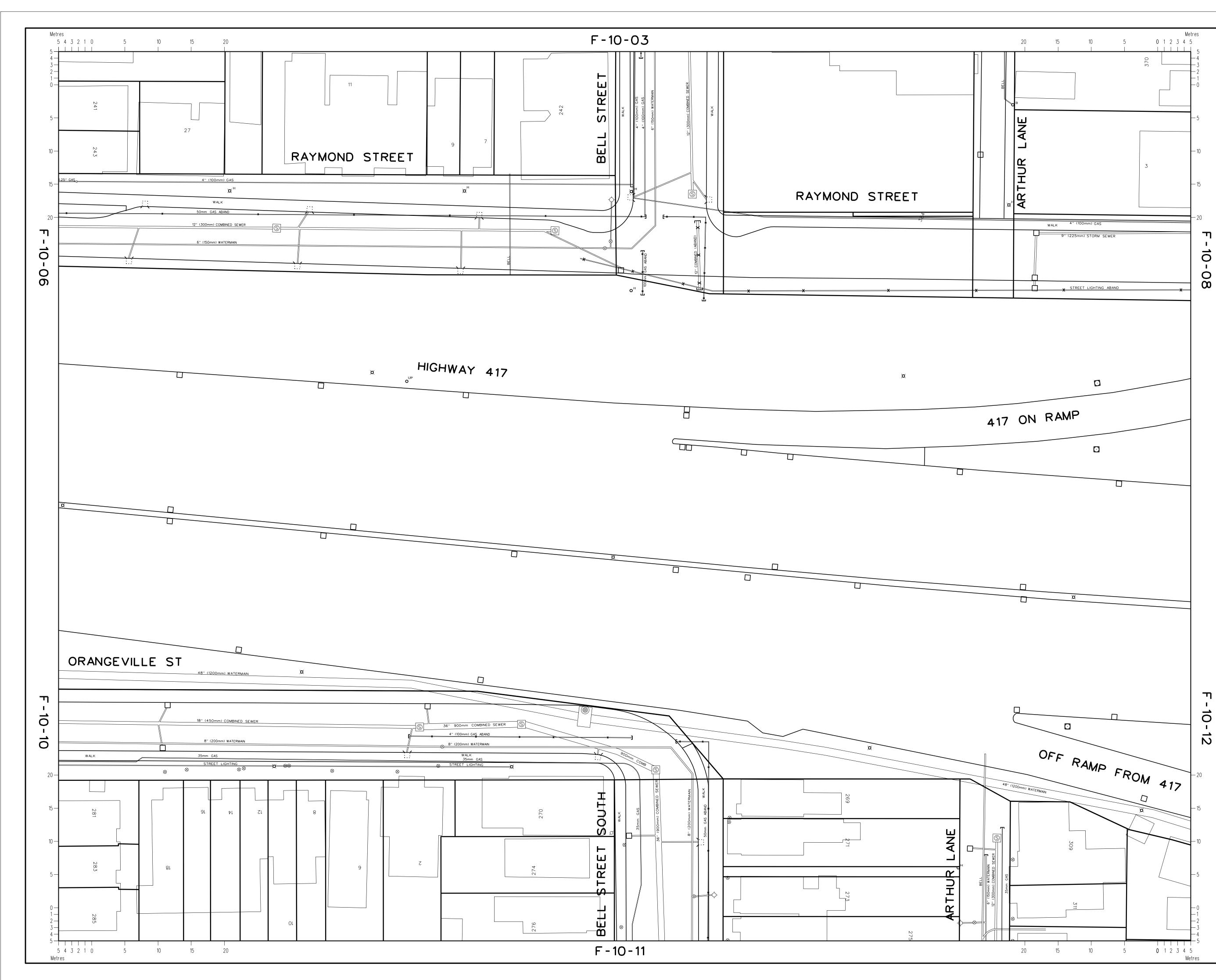
SURVEYOR'S CERTIFICATE

I CERTIFY THAT : 1. THE SURVEY WAS COMPLETED ON THE 30th DAY OF MAY, 2022.

DATE R. G. BENNETT ONTARIO LAND SURVEYOR THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER V-28656.

DRAWN: RG CHECKED: GB PM: CT FIELD: CA PROJECT No.: 161614574-111





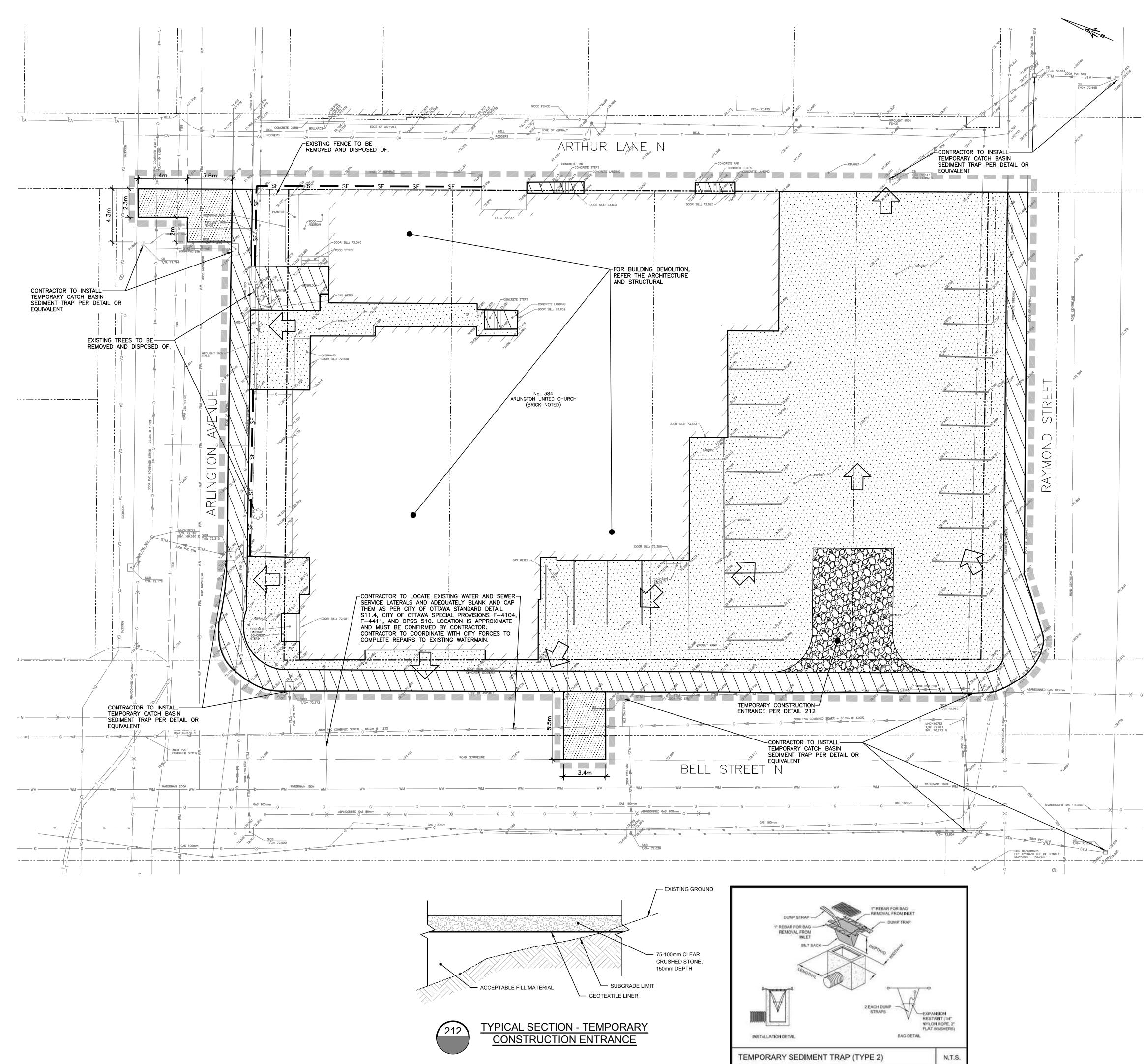
2907 · BELL S. (Coring to Orangeville, JUNE 1997) SEWER, WATER, ROAD REVISED ON B		DATE	BY
	FU	SEPT. 04	DC
3335 - BELL N. (Glodstone - Roymond, DEC. 2003) SEWER, WATER, ROAD REVISED ON B		SEPT. 04	DC
3335 - RAYMOND (Booth to Combridge N., DEC. 2003) SEWER, WATER, ROAD REV ON RAYM		SEPT. 04	DC
CITY, ALL EXTERNAL AGENCIES DIGITIZED FROM CITY/UTILITY DATA		JUN 2022	DC
LEGEND			
Water Valve, Valve Chamber, Fire Hydrant		(⊗ ⊗ -⇔
Sewer Manhole, Catch Basin Manhole			s D
Catch Basin / Drainage, Wing Wall, Head Wall			∭∎⊜ (
Pole, Pole w/ light, Decorative, Lawn Light		•	× × ×
Power Supply, Panel, Pedestal, Transformer, To	wer, Regulator		
Amp, Hand Hole, Vault, Gas Valve			
OC Transpo: Bus Shelter-No Power, Energized,		BUS	BUS BUS
Streetscape: Planter Box, Grate Square, Eng. S Traffic Connect Box / Disconnect Box, SL Discon		ТСВ	
Red Light Hand Hole, Red Light Camera			<u>отнн</u> гд
Scada: Hand Hole, Monitoring Panel			SM
Reducer			\triangleright
Pipe, Duct, Conduit, Lateral Culvert		=	
Ditch			
Abandoned Capped			× ×
Buried Cable			
Property Line Install Year			(0045
			(2015
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AAllstream	P		Primu
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BBell BHBirch Hill			Ū.
FFibre Noir			·
GGlobility			
GTGroup Telecom		Т	
H1Hydro One	V		Videotro
L / L3Level 3	Z		Zay
GLOSSARY - OTHER			
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DDDept. of Defence		Pedestal (c	
			PUDIC VVORK
MHOCTranspo		Utility Pole (o	
MHManhole (owner unknown)			
MHOCTranspo			
MHOCTranspo O/OCOCTranspo SCDScada		Utility Pole (oʻ <u>N</u>	wner unknowr
MHOCTranspo O/OCScada SCDScada <u>CAUTION/A</u> Although utility locations are establish they cannot	UP	Utility Pole (o <u>N</u> st available inform	wner unknowr
MHOCTranspo O/OCScada SCDScada <u>CAUTION//</u> Although utility locations are establish they cannot Property lines were compiled from pla Registry System and are	UP ATTENTIO hed using the be be guaranteed. ns and docume for indexing pur	Utility Pole (or N est available inform nts recorded in the poses only.	wner unknowr nation, e Land
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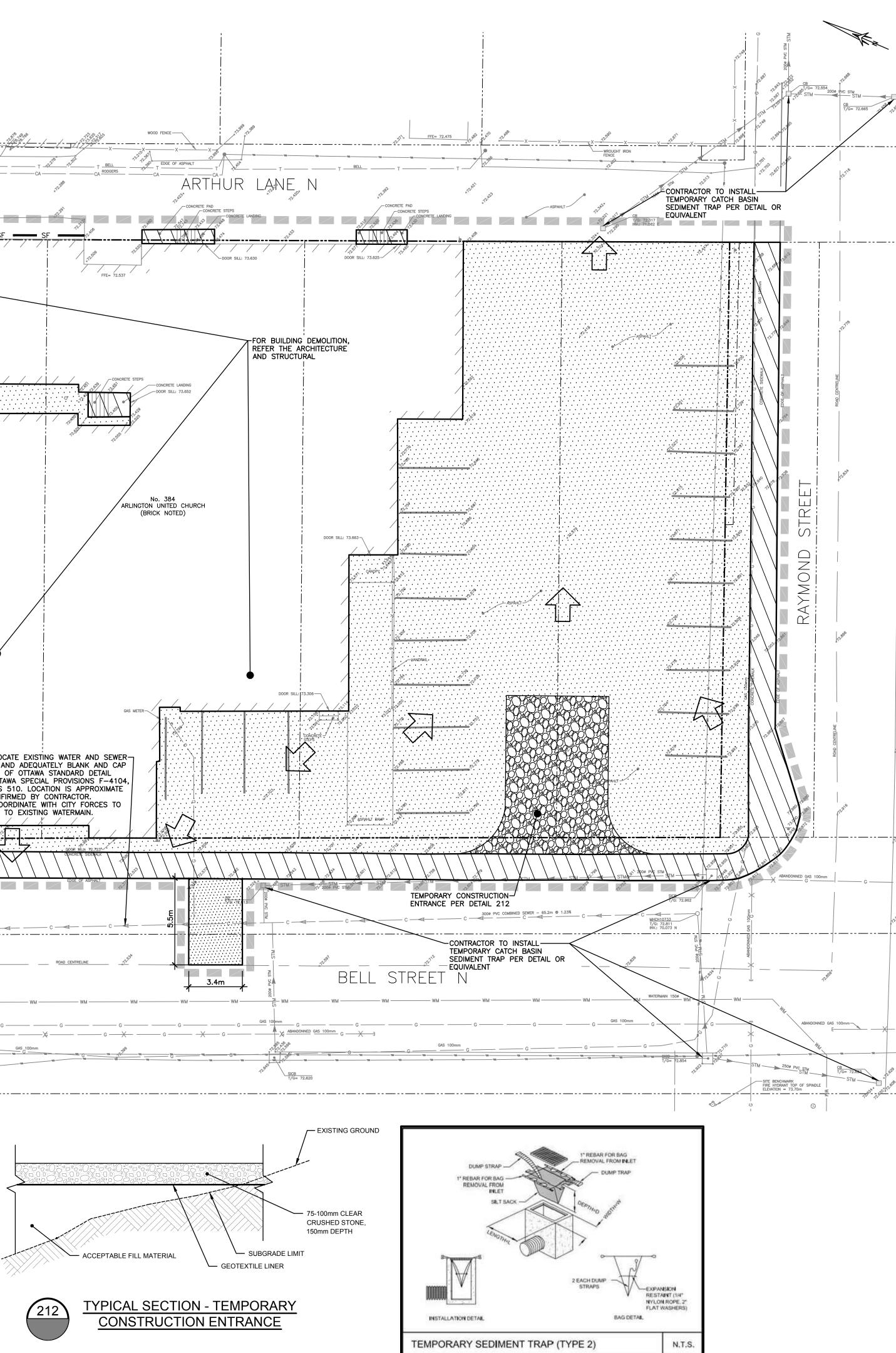


Appendix C Detailed Design Civil Plans

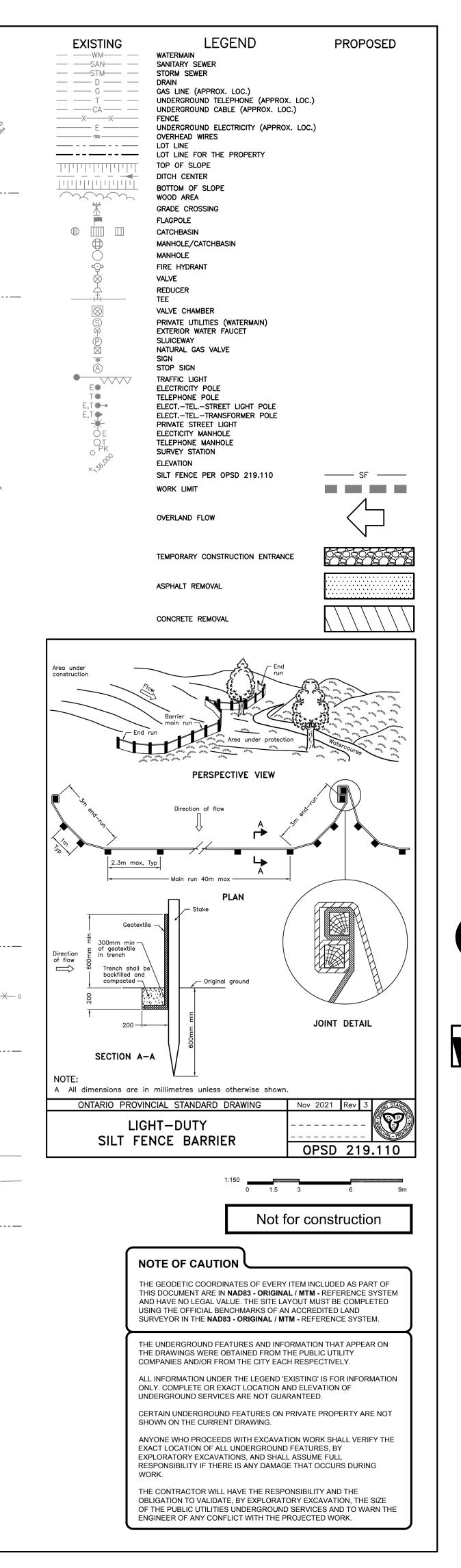












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 Veuillez aviser l'architecte de toute dimension documents et ceux des autres professionnels. errors, omissions and discrepancies between others professionnals. 	erreur et/ou divergences entre ces / The architect must be notified of all
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MECHANICAL / ELECTRICAL	
Smith + Andersen 600 Carling Avenue, Suite 530 Ottawa, ON K1Z 1G3 7 613-230-1186 smithandandersen.com	3
CIVIL CIMA+ 600-1400 Blair Towers Place Ottawa, ON K1J 9B8 T 613-860-2462 cima.ca	
GEOTECHNICAL PATERSON GROUP 154 Colonnade Rd S, Nepean, On. K2E 7J5 T 613 226 7381 patersongroup.ca	
STRUCTURAL D+M Structural Engineers 333 Preston Street, Suite 110 Ottawa, ON K1S 5N4 7613-651-9490 dm-structural.ca	6
ENVIRONMENTAL Pinchin Ltd. 1 Hines Road, Suite 200 Kanata, ON K2K 3C7	
T 855-746-2446 pinchin.com HERITAGE Bray Heritage	
837 Princess Street, Suite 400 Kingston, ON K7L 10 T 613-542-3393 brayheritage.ca GENERAL CONTRACTOR Doran Contractors Ltd.	³⁸
3187 Albion Rd S Ottawa, ON K1T 1W9 T 613-526-2400 doran.ca ENERGY MODELING EQ Building Perfomance	Inc
20 Floral Parkway Concord, ON L4K 4R1 T 416-645-1186 eqbuilding.com	
NEUF architect(e)S 630, boul. René-Lévesque O. 32e étages, Montréal T 514 847 1117 neuf.ca SCEAU / Seal	QC H3B 1S6
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TOPOGRAPHICAL SEDIMENT, EROSI AND DEMOLITION	ON CONTROL
RÉVISION Revision	

1. <u>GENERAL</u>

- 1.1. The Contractor must conform to all laws, codes, ordinances, and regulations adopted by federal, provincial or municipal government councils and government agencies, applying to work to be carried out.
- 1.2. Unless otherwise indicated, all materials and construction methods to be in accordance with the requirements of the latest edition of the Ontario Provincial Standard Specifications and Drawings (OPSS and OPSD), the Ontario Ministry of Environment, Conservation and Parks (MECP), applicable Conservation Authorities (CA), the municipal standard specifications and drawings, and all other governing authorities as they apply.
- 1.3. Wherever standards, laws and/or regulations are mentioned they refer to their current versions, modifications included.
- 1.4. The Contractor is responsible for obtaining all permits required to complete all works and bear cost of same, including road cut permit and water permit and their associated costs
- 1.5. The Contractor is responsible for the coordination of his activities with others on
- 1.6. Independent géotechnical laboratory for quality control: 1.6.1. An independent geotechnical laboratory hired by the Owner will perform material testing, inspection and quality control services.
- 1.6.2. Geotechnical laboratory to review asphalt and concrete mix designs as requested.
- 1.6.3. The Contractor must provide equipment required for executing inspection and testing by appointed geotechnical firm.
- The Contractor must provide labour and facilities to obtain and handle 1.6.4. samples and materials on site. Provide sufficient space to store and cure test samples.
- 1.6.5. Employment of geotechnical laboratory does not relax responsibility to perform work in accordance with Contract Documents.
- 1.6.6. If defects are revealed during inspection and/or testing, appointed geotechnical firm will request additional inspection and/or testing to ascertain full degree of defect. Contractor to correct defect and irregularities at no cost to Owner. Contractor to pay costs for retesting and reinspection.
- 1.7. The location of existing underground municipal services and public utilities as shown on the plans are approximate. The Contractor must determine the exact location, size, material and elevation of all existing utilities (on-site and off-site) prior to any excavation work. Damage to any existing services and/or existing utilities during construction, whether or not shown on the drawings must be repaired by the Contractor at his own expense.
- 1.8. Site preparation includes clearing, grubbing, stripping of topsoil, demolition, removal of unsuitable materials, cut, fill and rough grading of all areas to receive finished surfaces
- 1.9. All material must be compacted as per the requirements of the governing authority and be approved by the Consultant prior to delivery to the site.
- 1.10. Compaction must conform to the following requirements: Exposed subgrade: 95% Standard Proctor maximum dry density (SPMDD) <u>Subgrade fill</u> (landscaping areas): 95% Standard Proctor Maximum Dry Density (SPMDD) - <u>Subgrade fill</u> (pavement areas - OPSS Select Subgrade Material): 98% Standard Proctor Maximum Dry Density (SPMDD) - Pavement Granular Subbase foundations: 100% Standard Proctor maximum dry density (SPMDD) Pavement Granular Base foundations 100% Standard Proctor maximum dry density (SPMDD) Asphalt pavement
 - City of Ottawa Special Provisions F-3130
 - <u>Structural fill</u> (building and light standard footprints OPSS Granular 'A' or Granular 'B' Type II Material): 98% Standard Proctor Maximum Dry Density (SPMDD)
- 1.11. It is anticipated that groundwater infiltration into excavations should be low to moderate and controllable using open sumps. The contractor should be prepared to direct water away from all subgrades, regardless of the source to prevent disturbance to the founding medium. Dewatering of excavations to be as per OPSS.MUNI 517. As required under the "Ontario Water Resources Act (OWRA)", the Contractor must register all water taking activities on Ontario's "Environmental Activity and Sector Registry (EASR)" if water taking exceeds 50,000 I/day, and obtain a "Permit to Take Water (PTTW)" if water taking exceeds 400,000 l/day. Furthermore, Contractor must provide all necessary measures required to ensure dewatering operations does not affect in any way the integrity of the existing surrounding buildings and must plan his work accordingly. Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16.
- 1.12. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements and as
- 1.12.1. Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials to within the required parameters of the receiving body before discharging to storm sewers, watercourses or drainage areas.
- 1.12.2. Before discharging to storm sewers, watercourses or drainage areas, discharge water must be sampled and tested to ensure quality requirements in accordance with City of Ottawa Sewer Use By-Law No. 2003-514 and the MECP are adhered to. The Contractor is to perform all additional sampling and testing as required by City of Ottawa. All associated fees to be paid by the Contractor.
- 1.12.3. Where water is not suitable for discharge into the adjacent storm sewers, watercourses or drainage areas it must be discharged into the on-site sanitary sewer collection system, or disposed off-site at an approved disposal facility.
- 1.12.4. Combined Sewer Discharge: When discharging to the combined sewer, the Contractor must obtain a Sanitary/Combined Sewer Agreement for Dewatering from the City of Ottawa in accordance with City of Ottawa Sewer Use By-Law No. 2003-514 and pay all associated fees.
 - A copy of the signed Combined Sewer Agreement for Dewatering must be provided to the Departmental Representative in advance of dewatering and discharge.
 - The Contractor must ensure all requirements of the Discharge Agreement are adhered to and all prerequisite requirements of the
 - Agreement are in place prior to commencing dewatering. - Provide flow meter and record discharge rate in accordance with City of
 - Ottawa requirements. Dewatering discharge rate to combined sewer not to exceed rate
 - specified by City.
- 1.13. The Contractor must maintain benchmarks and landmark references as is. Otherwise these references will be repositioned by a certified land surveyor at the Contractor's expense.
- Contractor is responsible for providing adequate protection of the workers, other personnel and the general public, protection of materials, as well as maintaining in good condition the completed works and works to be completed. The Contractor must supply, install and maintain an appropriate safety fence along the work perimeter until the work is complete.
- The Contractor must provide at any time:
- A sufficient number barriers, posters, guards and others to ensure safety; Necessary conveniences for the completion of the work such as heating, lighting, ventilation, etc.
- 1.15. Temporary excavations in the overburden must be completed as per the equirements of the Occupational Health and Safety Act (OHSA), O. Reg. 213/91, Part III - Excavations.

The side slopes of excavations in the soil and fill overburden materials should either be cut back at acceptable slopes or should be retained by shoring systems from the star of the excavation until the structure is backfilled. The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsurface soil is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects. Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

- 1.16. The Contractor must pace deliveries and removals in order to minimize and control stockpiles
- 1.17. Stockpile material must be stored away from excavations at a distance at least equal to the depth of the excavation. Construction traffic should be limited near open excavation

1 18 Cleanliness on the site

- The Contractor must clean roadways at his own cost as directed by the Owner's representative - All site roads and walkways to and from the construction zone must be
- kept clean at all times, from mud, dirt, granular material, debris, etc.; - The Contractor must leave the work area clean at the end of each day; - Materials and equipment must be laid out in an organized and safe
- manner: - All material, equipment and temporary structures which are no longer necessary for the execution of the Contract must be removed from the
- If required the Contractor must reduce noise, dust, interference, obstruction, etc., in conformity with the requirements of the provincial and municipal authorities having jurisdiction.
- 1.19. During the construction period the Contractor is responsible for installing and maintaining temporary traffic signage, including traffic signs, traffic markings and temporary traffic lights, and flagmen, as required by the Owner, the Consultant, the Municipality and other governing authorities.
- 1.20. The Contractor must control surface runoff from precipitation during construction

SEDIMENT AND EROSION CONTROL

- 2.1. Specifically, sediment and erosion control measures to be constructed as per OPSS.MUNI 805
- 2.2. The Contractor must implement best management practices, to provide for protection of the area drainage system and the receiving watercourse as well as air pollution from dust and particle matter, during construction activities. The contractor acknowledges that failure to implement appropriate erosion and sediment control measures may be subject to penalties imposed by any applicable regulatory agency.
- The Contractor must set up the measures shown on the plan, inspect them frequently and clean and repair or replace the deteriorated structures.
- 2.4. The light duty silt fence barrier must be installed as per OPSD 219.110.
- 2.5. Provisions must be made for sediment and erosion control measures prior to stripping the site of vegetation and other deleterious materials. Measures such as silt fences, etc. must be constructed and maintained in order to control sediment, as required by the provincial and municipal governing authorities.
- 2.6. When the sediment and erosion control measures have to be removed in order to complete a portion of the work, these same measures must be reinstated.
- 2.7. When storing soil on site in piles the Contractor must cover each pile with tarps, straw or a geotextile fabric to avoid fine particle transport by wind and/or streaming rainwater
- 2.8. During the construction period, sediment capture silt sacks or filter cloths must be installed and maintained between the frame and cover of all catchbasins and catchbasin/manholes to minimize sediments entering the storm sewer system All landscaping areas must be completed prior to the removal of the silt sacks or filter cloths.
- 2.9. At all times the Contractor is responsible to maintain the municipal access roads clean and free of mud, debris and sediments. When cleaning the access roads the Contractor must take the necessary precautions to clear the surfaces covered with sediment prior to cleaning with water.
- 2.10. At the end of the construction period, the Contractor is responsible for removal of the temporary sediment and erosion control measures and reconditioning the affected areas.
- 2.11. This plan is a "Living Document" which may be revised in the event that the control measures are not sufficient

DEMOLITION AND REMOVALS

- 3.1. The Contractor must visit the premises in order to be fully aware of existing conditions on site, including all elements to be removed and demolished. No claim will be accepted due to a poor evaluation of the work to be completed.
- 3.2. The Contractor must protect and maintain in service the existing works which must remain in place. If they are damaged, the Contractor must immediately make the replacements and necessary repairs to the satisfaction of the Owner's representative and without additional expense to the Owner.
- 3.3. The Contractor must perform the nessessary clearing and grubbing in accordance with OPSS.MUNI 201.

accordance with OPSS.MUNI 180 and OPSS.MUNI 510.

- 3.4. The Contractor must carry out necessary saw cuts even if they are not shown on the drawings.
- 3.5. The Contractor must entirely remove the demolition wreckage from the construction site in accordance with the requirements of the MECP and in
 - The Contractor must discard recyclable demolition materials in collaboration with a regional recycling company. The Contractor must be able to provide proof, upon request, that the materials were properly recycled and that the chosen recycling company is recognized in the recycling field.
 - All other demolition materials must be disposed off-site at authorized licensed landfills and in conformity with the applicable laws and regulations. The Contractor must be able to provide, upon request, copies of the disposal tickets.
- 3.6. The Contractor is responsible for locating existing public utilities and (if required) submit a request for the interruption of public utility services, such as gas, telephone, power, cable, sewers, watermain, etc.
- 3.7. Sewer and water laterals to be abandoned must be blanked, capped, and fill with unshrinkable concrete conforming to City of Ottawa Special Provisions F-4104, F-4411, and OPSS 510 as well as the City of Ottawa Standard Detail
- 3.8. The Contractor must conduct all removals required to make the work complete. 3.9. Unless otherwise specified, all materials, products and others coming from the
- 1.14. The Contractor is the only person in charge of safety on the building site. The 3.10. Surfaces and works located outside of the construction work limit must be reinstated as they were before beginning of work.

GENERAL SUBGRADE PREPARATION

demolition belong to the Contractor.

- 4.1. Earth removal must be inspected by an experienced Geotechnical Engineer to ensure that all unsuitable materials are removed prior to the placement of fill. including concrete and/or others, and to confirm the compaction degree and condition of the founding soils. All unsuitable materials must be hauled off site and disposed as per provincial and municipal regulations.
- 4.2. Subgrade must be approved by experienced geotechnical personnel before proceeding with placement of fill.

All soft, wet or disturbed areas revealed under surface compaction must be 43 removed to a minimum depth of 500 mm and replaced with compacted suitable subgrade fill as directed by the Geotechnical Engineer and/or an approved non-woven Class 1 geotextile, as per OPSS 1860.MUNI. Transition around sub-excavation, where backfill and native material are not of similar nature, must be sloped at 3 horizontal to 1 vertical, within 1.2 m of finished surface.

quickly as possible.

4.6.

4.7.

Excess soils generated must be managed in accordance O.Reg. 406/19 made under the Environmental Protection Act, R.S.O. 1990, c.E19 (EPA) and the adopted by reference "Rules for Soil Management and Excess Soil Quality Standards" (the 'Soil Rules') as well as other regulatory amendments related to the management of excess soil. Excess soil is defined as non-hazardous soil, or soil mixed with rock, that has been excavated as part of a project and removed from the project area for the project. As it relates to this Contract, the Project Leader is "the Client", as per the definition under O.Reg. 406/19.

Where excess soils are anticipated to be generated, a notice is to be filed to the Resource Productivity and Recovery Authority (RPRA or successor organization) Excess Soils Registry (the 'Registry') prior to the removal of excess soil from the project area unless exempt in accordance with the Regulation. The Contractor is to provide "the Client" all information required for filing the notice to the Registry. - A Soil Management Plan is to be developed by the Contractor for submission to "the Client". Where applicable, the Soil Management Plan is to be prepared in accordance with the MECP Management of Excess Soil - A Guide for Best Management Practices and in accordance with O.Reg. 406/19. - The Contractor is responsible for retaining a Qualified Person (QP_{ESA}, as per the definition under O.Reg. 153/04) to evaluate and provide all the necessary services required in accordance with O.Reg. 406/19. The services may include but not be limited to an Assessment of Past Uses Sampling and Analysis Plan, Soil Characterization Report, and Excess Soil Destination Assessment Report, collectively described as the 'Planning Documents', as specified within the Soil Rules. The Contractor may rely on existing Planning Documents and/or site characterization reports where provided "within the Contract Documents OR by the Engineer" in relation to Excess Soils. The Contractor is responsible to finalize any preliminary Planning Document reports required, identify proposed soil destination site(s) for "the Client" approval, and satisfy all associated requirements specified by the selected destination site. - The Contractor is responsible to notify "the Client" if actual construction activities and/or site conditions encountered are not consistent, or appear not to be consistent, with the information presented within the Planning Documents. - The Contractor is responsible to implement a tracking system in

accordance with O.Reg. 406/19, to track each load of excess soil during its transportation and deposit at the approved destination site (i.e. reuse site, Class 1 soil management site, local waste transfer facility, landfilling site or dump, and any transportation to and from a Class 2 soil management site).

and zinc.

EXCAVATION AND BACKFILI Subgrade Preparation"

settlement sensitive structures

Subgrade fill used for grading beneath asphalt or concrete pavement must 5.4. consist of OPSS Select Subgrade Material or equivalent, approved by the Geotechnical Engineer prior to delivery to the site. Subgrade fill used below rigid surfaces, such as concrete sidewalks and concrete slabs, must not contain more than 25% silt.

5.5.

5.6. Structural fill used for grading beneath the footings of buildings, signs and light standards must consist of OPSS Granular 'A' or Granular 'B' Type II Material.

5.7. It is expected that line-drilling in conjunction with hoe-ramming, rock grinding and controlled blasting will be required to remove the bedrock for the underground parking levels. In areas of weathered bedrock and where only a small quantity of bedrock is to be removed, bedrock removal may be possible by hoe-ramming. Pre-Construction Survey (Piling/Hoe Ramming, Rock Anchors, Shoring and/or close proximity to City Assets) or Pre-Blasting Survey will be required for any buildings/dwellings within proximity of 75m of the site. Circulation of notice of vibration/noise is required to residents within 150 m of site. Conditions for Pre-Construction/ Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled Use of

Explosives, as amended. 5.8.

carried out.

5.9. Construction operations could cause vibrations, and possibly, sources of nuisance to the community. Vibrations caused by blasting or construction operations (e.g. piling equipment, hoe ram, compactors, dozers, cranes, etc.) could cause detrimental vibrations on the adjoining buildings and structures as well as being a source of nuisance to the community. Therefore, means to reduce the vibration levels as much as possible must be incorporated in the construction operations to maintain a cooperative environment with the residents. As a general guideline to reduce the risks of damage to the existing structures,

peak particle velocity (measured at the structures) during construction must not exceed 20 mm/s for frequencies below 40 Hz, and 50 mm/s for frequencies 40 Hz and higher. The warning level limits are 10 mm/s for frequencies below 40 Hz, and 40 mm/s for frequencies 40 Hz and higher.

elevation

If construction is required during freezing temperatures, the native soils should be protected immediately from freezing using straw, propane heaters, polystyrene insulation, insulated tarpaulins, or other suitable means that prevent the underlying native soils from freezing, which could cause significant frost

4.5. All granular fill must be placed in maximum 300 mm thick loose lifts and compacted using suitable methods as per the requirements.

All heavy equipment must not operate directly on the subgrade. A minimum of 500 mm of fill must be used to allow traffic over subgrade. Subgrade surfaces will be prone to disturbance by weather and traffic, therefore preparation of the subgrade must be scheduled such that the granular materials are placed as

4.8. If contaminated material is encountered during the work, the Contractor must dispose off-site all materials from the contaminated area in accordance with the equirements of the MECP and OPSS.MUNI 180. Prior to the start of work the Contractor must provide the name and location of landfill(s) where the contaminated materials will be disposed to the Consultant. The Contractor must obtain from the landfill Owner documents confirming that he has the right to accept the contaminated material. During the work, the contractor must provide the Consultant copies of all check-in receipts issued by the landfill Owner.

The Contractor is responsible for providing a confirmation that the imported material used as subgrade fill is free of any contaminants such as Petroleum Hvdrocarbons (C10-C50), PAH (Polycyclic Aromatic Hydrocarbons), MAH (Monocyclic Aromatic Hydrocarbons) and metals like mercury, silver, arsenic cadmium, cobalt, chromium, copper, tin, manganese, molybdenum, nickel, lead

5.1. Subgrade preparation must be completed as per Section "4.0 General

5.2. The management of excess materials to comply with OPSS.MUNI 180 and any excess soils with O.Reg 406/19.

5.3. Topsoil and deleterious fill, such as those containing organic materials, must be stripped from under any buildings, paved areas, pipe bedding, and other

Non-specified fills and on-site excavated soils may be used in landscaping areas where settlement of the ground surface is of minor concern. This material must be spread in thin lifts and compacted by the tracks of spreading equipment to minimize voids. When used to build up subgrade level in areas to be paved fill should be compacted in thin lifts.

Rock excavation must conform to OPSS 403.MUNI and to all laws, codes, ordinances and regulations adopted by federal, provincial and municipal government councils and government agencies, applying to the work to be

5.10. Excavation side slopes in sound bedrock may be completed with almost vertical side walls. A minimum of 1 m horizontal ledge must remain between the bottom of the overburden and the top of the bedrock surface to provide an area for potential sloughing. The 1 m horizontal ledge set back can be eliminated with a shoring program which has drilled piles extending below the proposed founding

PAVEMENT STRUCTURES, CURBS, AND SIDEWALKS

6.1. Construction of granular foundation must conform to City of Ottawa Special

- 6.2. Granular materials used on site must conform to the requirements of OPSS.MUNI 1010.
- 6.3. Road cut reinstatement as per City of Ottawa Detail R10.
- 6.4. Construction of asphalt must conform to City of Ottawa Special Provision F-3130.
- 6.4.1. Paving must not be carried out if the roadbed is frozen or wet.
- The granular grade must be free of standing water at the time of hot mix 6.4.2. asphalt placement. The surface of a pavement upon which hot mix asphalt is to be placed must be dry at the time of hot mix asphalt placement. Following the final compaction of a hot mix asphalt course, a 4 hour minimum time laps must be respected before placing a new new hot mix asphalt course. Additionally, the temperature of the previous course must be 60°C or less.
- 6.4.3. The asphalt base coarse must not be placed unless the air temperature at the surface of the road is a minimum of 2°C and rising.
- The asphalt surface coarse must not be placed unless the air temperature 6.4.4. at the surface of the road is a minimum of 7°C, except for SMA and Superpave 12.5 FC2, where the air temperature at the surface of the road shall be minimum 12°C.
- Asphalt concrete material must conform to City of Ottawa Special Provision 6.5. F-3104 and OPSS.MUNI 1150 for HL hot mix asphalt mixtures, and City of Ottawa Special Provision F-3106 for Superpave hot mix asphalt mixtures. Minimum Performance Graded (PG) 58-34 asphalt cement must be used for this project.
- Asphalt mix design must be reviewed and approved by a Geotechnical 6.6. Engineer before paving
- 6.7. Concrete curbs must conform to OPSS 353.MUNI and City of Ottawa Special Provisions F-3531, F-9040 and F-9045.
- 6.8. Concrete curbs to be constructed as per City of Ottawa Detail SC1.1.
- 6.9. Concrete sidewalks must conform to City of Ottawa Special Provisions F-3510, F-9040 and F-9045
- 6.10. Concrete sidewalks to be constructed as per City of Ottawa Details SC2, SC5, SC6 and SC7.1.
- 6.11. For all concrete placement during cold weather Contractor must place material in accordance to City of Ottawa Special Provision F-9040.

MISCELLANEOUS

- 7.1. Free standing signs to comply with Detail 401.
- Existing pavement markings in municipal right-of-way to be reinstated if erased/partially removed during construction. Pavement markings to be "Organic Solvent Based" as per OPSS.MUNI 710 and OPSS.MUNI 1712.
- 7.3. Tactile Walking Surface Indicators (TWSI) to be constructed as per detail SC7.3. Product shall be from the following list or approved equivalent:

Manufacturer		Specific Model (when applicable)
ADA Solutions	→	Irondome
Advantage Cast Iron		
Bibby Ste. Croix	\rightarrow	Safety Detection System
Cedar Infrastructure		
East Jordan	\rightarrow	Duralast
Ironped		
Neenah		
OUC		
Star Pipe Products		

8. MUNICIPAL SERVICES - GENERAL

- 8.1. The location of existing underground municipal services and public shown on the plans are approximate, the contractor must determine location, size, material and elevation of all existing utilities (on-site a prior to any excavation work. Damage to any existing services and/ utilities during construction, whether or not shown on the drawings r repaired by the contractor at his own expense. 8.2. Terminate and plug water and sanitary service connections at 1.0 m edge of the building/underground parking. Terminate storm service of at the cistern. 8.3. Combined service lateral trenches must be as per City of Ottawa De 8.4. The Contractor must complete trench and backfill compaction as per OPSS.MUNI 401 and OPSS.MUNI 501: MATERIALS COMPACTION Pipe bedding 98% SPMDD 98% SPMDD Pipe cover Trench backfill 98% SPMDD 98% SPMDD Structure bedding 8.5. The Contractor is responsible for making or arranging all connection existing sewers as per municipal requirements. Prior to connection. Contractor must provide, to the Engineer and the City for approval, results performed on the internal services. Test results must include inspection of sewers, infiltration/exfiltration tests for sewers and man
- 8.6 Advise the City Public Works at least 72 hours in advance before at connection to the City services. Coordinate with City as required.

- 8.7. The Contractor must determine the exact invert (geodetic elevation) and construction material of the existing conduits at the proposed co He must also carry out, if necessary, exploratory excavations in orde determine the exact location and inverts of existing duck banks. Thi must immediately be provided to the Engineer prior to start undertal municipal services work and a 48 hour period must be allocated to for design review.
- 8.8. The Contractor is responsible for all excavation, backfill and reinstate areas disturbed during construction to existing conditions or better a associated works to the satisfaction of the Engineer and municipal a
 - Asphalt reinstatement must be in accordance with OPSS.MUNI City of Ottawa Standard Detail R10. Landscape areas to be reinstated in accordance to landscaping and specifications.
- 8.9. Within landscaping areas, backfill for service trenches may consist of material replaced and compacted in lifts.
- 8.10. A minimum of 150 mm of OPSS Granular A must be used for pipe to sewer and water pipes and must extend to the spring line of the pipe material from the spring line to at least 300 mm above the pipe obvert must also consist of Granular A material. Bedding and cover material must be placed in maximum 225 mm lifts.
- 8.11. Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) and above the cover material should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 225 mm thick loose lifts. All cobbles larger than 200 mm in their longest direction should be segregated from re-use as trench backfill.
- 8.12. All existing sewer and water services are to be adequately blanked as per City of Ottawa Special Provision F-4104, F-4411, OPSS 510 and Drawing S11.4. Refer to Topographical Survey, Sediment, Erosion Control and Demolition plan.

9. <u>WATERMAIN</u>

- 9.1. Water pipe materials must be Pressure Class 150, DR 18, manufactured to WWA C-900 and CSA B137.3 or Pressure Class 235psi/1620 kPA AWW C-909 and CSA B137.3.1 standards. Pipe shall have the cast iron outside diameter dimensions, be blue in colour and supplied complete with gaskets Furthermore, watermain, water service connections and associated appurtenances must be constructed in accordance with the OPSS.MUNI 441.
- 9.2. All watermain must be installed with a minimum of 2.40 metres cover from finished grade. Where a minimum of 2.40 metres cover is not reached, thermal insulation is required as per City of Ottawa Details W22 and W23. Insulation for use in roads over pipe trenches shall: - be type Extruded Polystyrene Foam Insulation Boards (XPS) in 600 x 2400
 - x 50mm size;
 - meet the requirements of OPSS.MUNI 1605; Grade A (275 kPa compressive strength shall meet ASTM C578 Type VI;
- Grade B (400 kPa compressive strength shall meet ASTM C578 Type VII.
- 9.3. Tracer wire to be as per City of Ottawa Detail W36.
- 9.4. Cathodic protection must be installed as per City of Ottawa Details W40 and
- 9.5. Thrust block and restraints must be as per City of Ottawa Details W25.3, W25.4, W25.5 and W25.6.
- 9.6. Valves to be installed as per City of Ottawa Special Provision F-4413 and conform to the following:
- All valves must open in a clockwise direction; Valves between 100-300mm range to be resilient seat gate valves (AWWA C515) with mechanical joint connections.
- 9.7. Valve box assembly to be as per City of Ottawa Detail W24. In asphalt, install floating valve boxes equivalent to Bibby-Ste-Croix equipped with a ductile iron floating top extension (i.e. adjustable road leveler). In concrete, installed sliding valve boxes equivalent to Bibby-Ste-Croix equipped with stantard sliding flat top (no floating extension).
- 9.8. When a watermain pipe crosses a sewer pipe, installation must be as per City of Ottawa Details W-25 and/or W-25.2.
- 9.9. All watermains must be thoroughly flushed and cleaned to remove all dirt and debris prior to the disinfection process
- 9.10. All watermains must be hydrostatically and bacteriologically tested as per provincial and municipal regulations. It is the Contractor's responsibility to ensure that all requirements are followed.
- 9.11. The Contractor must make arrangements with and give a minimum of 24 hours' notice to the City for the closing off of necessary valves in the water distribution system. The City will operate valves at the time of tie-ins, etc. at no expense to the Contractor under normal conditions; however the Contractor will be responsible for all costs associated with emergency shutdowns if they occur outside of the normal working hours of the City forces (Monday to Friday, 7:00 a.m. to 5:00 p.m.)
- 9.12. Hydrostatic testing to be completed as per OPSS 441.07.24. Testing must be completed under the supervision of the Contract Administrator. The test section will be either a section between valves or the completed watermain. Test pressure to be 1035 kPa.
- 9.13. The Contractor must obtain a permit from the City before using an existing fire hydrant located within the City's territory.
- 9.14. The Contractor must coordinate and pay the cost of connection, inspection and lisinfection by municipal personnel. Service connection to be as per City of Ottawa Special Provision F-4411 and F-4418 as well as Detail W50.
- 9.15. Contractor must coordinate the supply and installation of water meter and remote water meter for the building with the mechanical engineer.

ICIPAL SERVICES - GENERAL		10. <u>STORM SEWER</u>		
shown on the plans are ap location, size, material and prior to any excavation wo	derground municipal services and public utilities as proximate. the contractor must determine the exact l elevation of all existing utilities (on-site and off-site) rk. Damage to any existing services and/or existing , whether or not shown on the drawings must be at his own expense.	10.1.	Storm pipe materials must be SDR 35 conforming to OPSS 1841, unless noted otherwise on the drawings. Sewer pipe and fittings must be certified to CSA standards B182.2 or CSA B182.7. Furthermore, storm sewer, storm lateral and associated appurtenances must be constructed in accordance with the OPSS.MUNI 410.	
	and sanitary service connections at 1.0 meter from ground parking. Terminate storm service connections	10.2.	The allowable deflected pipe diameter when using flexible pipe is as follows:Pipes 100 to 750 mm: 7.5% of the base inside diameter of the pipe.	
Combined service lateral t	renches must be as per City of Ottawa Detail S7.	10.3.	Final backfill material for storm sewers must be approved native material or select subgrade material in conformance with OPSS.MUNI 212 and City of Other Second Provision F 2120	
The Contractor must comp OPSS.MUNI 401 and OPS	elete trench and backfill compaction as per SS.MUNI 501:	10.4.	Ottawa Special Provision F-2120. All storm sewers to be C.C.T.V. inspected by the Contractor as per	
MATERIALS	COMPACTION 98% SPMDD		OPSS.MUNI 409 and City of Ottawa Special Provision F-4090. Report must be provided to the Engineer in two (2) copies and the C.C.T.V. inspection in DVD format only.	
Pipe cover	98% SPMDD			
Trench backfill	98% SPMDD	10.5.	Adjustment or rebuilding of manholes, manhole/catchbasins, catchbasins, ditch	
Structure bedding	98% SPMDD		inlets and valve chambers to be completed as per OPSS.MUNI 408 and City of Ottawa Special Provisions F-4080 and F-4081.	
existing sewers as per mu Contractor must provide, to results performed on the ir inspection of sewers, infiltr deformation tests of sewer	ble for making or arranging all connections to the nicipal requirements. Prior to connection, the o the Engineer and the City for approval, all test nternal services. Test results must include C.C.T.V. ration/exfiltration tests for sewers and manholes, rs, watermain hydrostatic leakage test, flushing and d bacteriological water analysis.	10.6. 10.7.	The Contractor must implement best management practices to provide for protection of receiving storm sewer or drainage during construction activities (i.e. catchbasin inserts (or approved equivalent), straw bale check dams, any other sediment control measures required around all disturbed areas). Dewatering must be sumped into sediment traps.	
	rks at least 72 hours in advance before any rices. Coordinate with City as required.	10.8	drawings.	
,		10.8.	For the storm cistern specifications, refer to architectural and mechanical.	
and construction material of He must also carry out, if r	mine the exact invert (geodetic elevation), diameter of the existing conduits at the proposed connections. necessary, exploratory excavations in order to	11. <u>SA</u>	NITARY SEWER	
must immediately be provi municipal services work ar for design review.	on and inverts of existing duck banks. This information ded to the Engineer prior to start undertaking any nd a 48 hour period must be allocated to the Engineer	11.1.	Sanitary pipe materials must be SDR 35 conforming to OPSS 1841, unless noted otherwise on the drawings. Sewer pipe and fittings must be certified to CSA standards B182.2 or CSA B182.7. Furthermore, sanitary sewer, sanitary lateral and associated appurtenances must be constructed in accordance with the OPSS.MUNI 410.	
areas disturbed during cor	ble for all excavation, backfill and reinstatement of all struction to existing conditions or better and all tisfaction of the Engineer and municipal authorities.	11.2.	The allowable deflected pipe diameter when using flexible pipe is as follows: - Pipes 100 to 750 mm: 7.5% of the base inside diameter of the pipe.	
City of Ottawa Standa	t must be in accordance with OPSS.MUNI 310 and ard Detail R10. e reinstated in accordance to landscaping drawings	11.3.	Final backfill material for sanitary sewers must be approved native material or select subgrade material in conformance with OPSS.MUNI 212 and City of Ottawa Special Provision F-2120.	
Within landscaping areas, material replaced and com	backfill for service trenches may consist of excavated pacted in lifts.	11.4.	Il sanitary sewers to be C.C.T.V. inspected by the Contractor as per OPSS.MUNI 409 and City of Ottawa Special Provision F-4090. Report must be provided to the Engineer in two (2) copies and the C.C.T.V. inspection in DVD format only.	
	DPSS Granular A must be used for pipe bedding for a must extend to the spring line of the pipe. Cover	11.5.	Sanitary manholes to be installed as per OPSS.MUNI 407 and conform to	

- OPSS 1351 and City of Ottawa Special Provisions F-4070. 11.6. Excavating, backfilling, and compacting for sanitary manholes to be completed as per OPSS.MUNI 402.
- 11.7. Sanitary manholes to be backfilled with OPSS Granular 'B'. Joints between sections must be wrapped in a non-woven geotextile.
- 11.8. Sanitary manholes to be as per OPSD 701.010 (sizes specified on drawings) and must be equipped with safety platform as per OPSD 404.020 when exceeding 5.0 m to the lowest invert.
- 11.9. Sanitary manhole frame and cover to be as per OPSD 401.010 Type "A" closed
- 11.10. Sanitary service connections to main sewer pipe to be as per City of Ottawa Detail S11.1 (for flexible main).
- 11.11. Benching is required inside the concrete bottom of sanitary manholes as per

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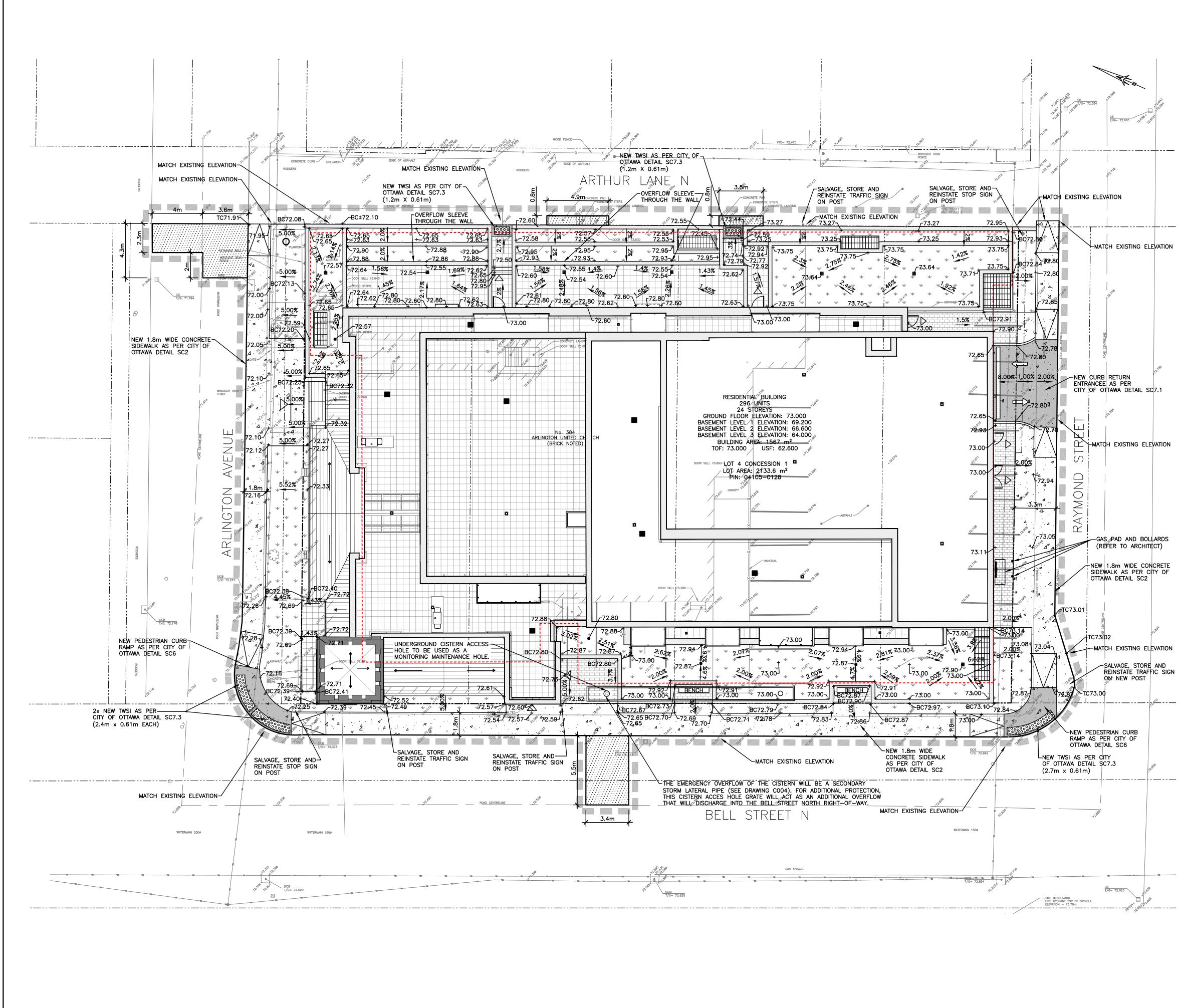
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RÉVISION Revision

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TITRE DU DESSIN Drawing Title NOTES AND SPECIFICATIONS

NO. DESSIN Dwg Number



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E ()	NATURAL GAS VALVE SIGN ELECTRICITY POLE		SPRUCE LAB 500 Bayview Ave, Suite 300 Toronto, ON M4W 3X8 sprucelab.ca	
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	MAIN ENTRANCE		154 Colonnade Rd S, Nepean, On. K2E 7J5 T 613 226 7381 patersongroup.ca	
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			Doran Contractors Ltd. 3187 Albion Rd S Ottawa, ON K1T 1W9 T 613-526-2400 doran.ca	
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			ARCHITECT NEUF architect(e)s	
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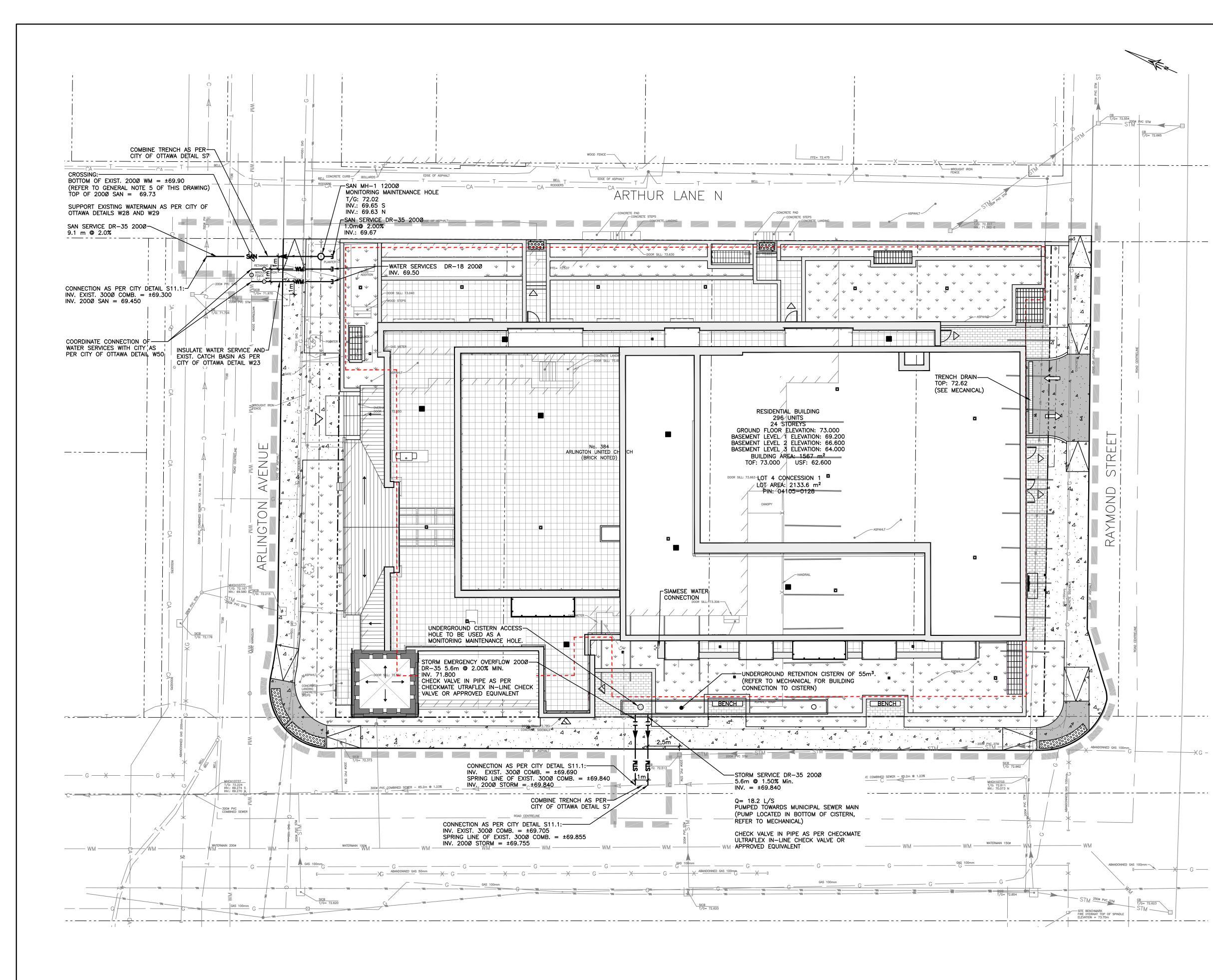
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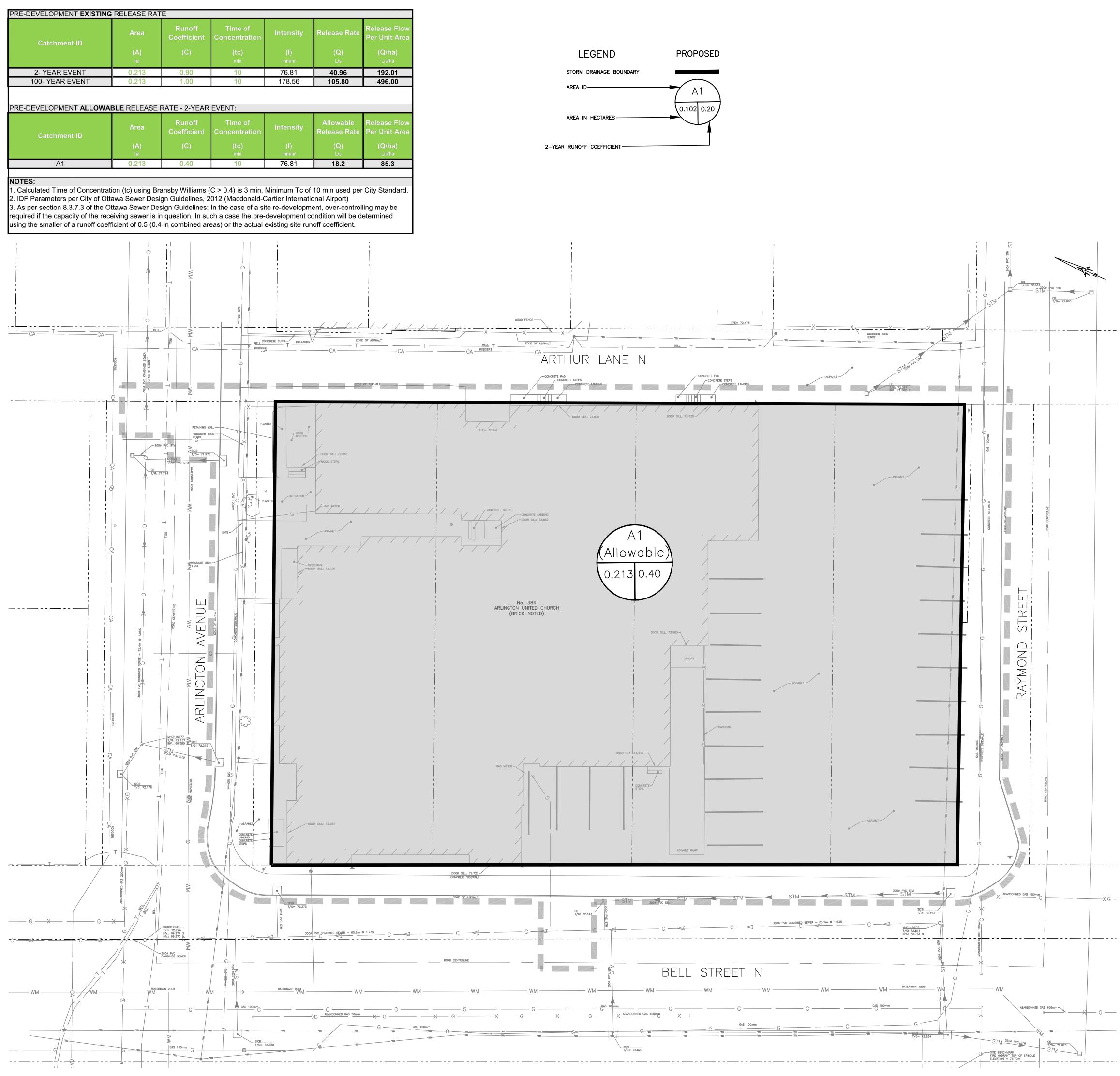
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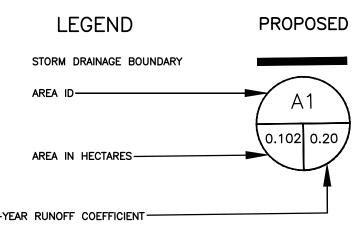


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384 ARLINGTON AVENUE

EMPLACEMENT Location Adresse / Address

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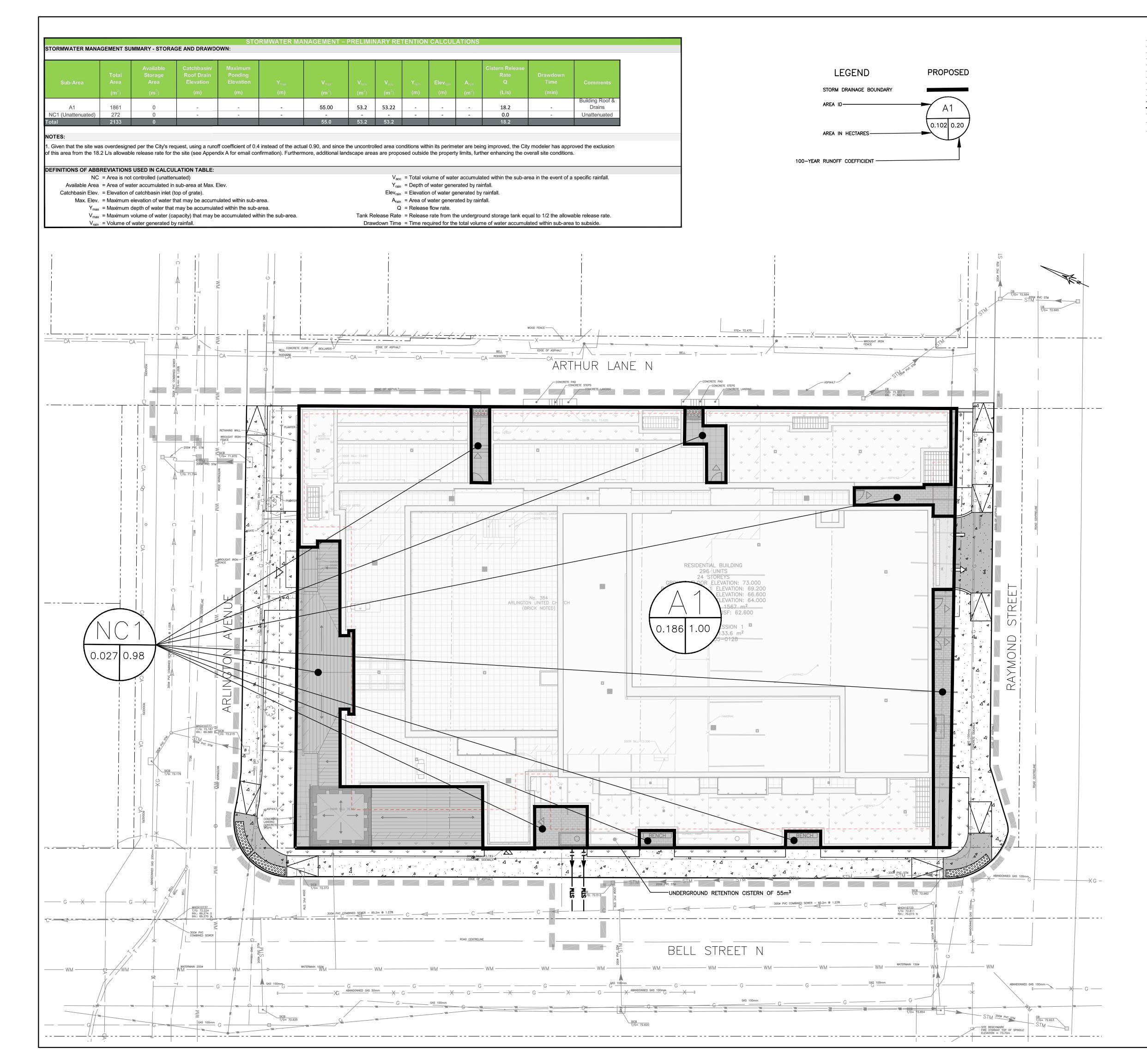
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EMPLACEMENT Location
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Appendix D Water Supply Design Calculations







Redevelopment of 384 Arlington Ave Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

WATER CONSUMPTION CALCULATIONS

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)

2. City of Ottawa Technical Bulletin ISTB-2021-03, ISTB-2018-02, ISDTB-2014-02 and ISD-2010-02

3. MOE Design Guidelines for Drinking-Water Systems

RESIDENTIAL AND COMMERCIAL WATER DEMANDS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Day Demand:	280	L/c/day
Maximum Day Peaking Factor:	3.0	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	4.5	x Average Daily Demand

EQUIVALENT POPULATION :

Unit Type	Number of Units	Persons Per Unit	Population
Bachelor Apartments	19	1.4	27
1-Bedroom Apartments	130	1.4	182
1-Bedroom + Den Apartments	17	1.4	24
2-Bedroom Apartments	126	2.1	265
2-Bedroom + Den Apartments	2	2.1	4
3-Bedroom Apartments	2	3.1	6
Total	296		508

Table 4.1 Per Unit Populations				
Unit Type Persons Per U				
Single Family	3.4			
Semi-detached	2.7			
Duplex	2.3			
Townhouse (row)	2.7			
Apartments:				
Bachelor	1.4			
1 Bedroom	1.4			
2 Bedroom	2.1			
3 Bedroom	3.1			
Average Apt.	1.8			

COMMERCIAL DESIGN CRITERIA:

Contributing Commercial Area:	0.0942	gross ha (including activities room, gym and yoga)
Commercial Average Day Demand:	28,000	L/gross ha/d
Maximum Day Peaking Factor:	1.5	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	1.8	x Maximum Daily Demand

WATER DEMANDS:

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Residential	1.646	4.939	7.408
Commercial	0.031	0.046	0.082
Total	1.68	4.98	7.49

NOTES:

1. Maximum Day and Maximum Hour residential peaking factors determined using Table 3-3 of the MOE Design Guidelines for Drinking-Water System for 0 to 500 persons.

2. Given basic day demand greater than 50 m³/day (0.57 L/s), two connections, separated by an isolation valve required.

Prepared by: Martin Frechette, EIT Date: 2024-10-04

Verified by: Éric Potvin, P.Eng. PEO# 100208490

Date: 2024-10-04



PROJECT NAME:RedevelorCIMA+ PROJECT NUMBER:A001272CLIENT:WindmillPROJECT STATUS:Prelimina

Redevelopment of 384 Arlington Ave A001272 Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT

APPLICABLE DESIGN GUIDELINES:

- 1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
- 2. Ottawa Design Guidelines Water Distribution (2010) including Appendix H per ISTB-2018-02
- 3. City of Ottawa Technical Bulletin ISTB-2021-03 and ISTB-2018-02
- 4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 2 hours)	0.6	
Non-combustible Construction	0.8	0.6
Ordinary Construction	1.0	0.0
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m²)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m ²)
Gross Construction Area (GCA) Ground Level:	16,867	1,567			1,567
GCA Level 2:	16,124 1,4	1,498			374
GCA Level 3:	16,103	1,496			374
GCA Level 4:	14,833	1,378			-
GCA Level 5:	11,604	1,078			-
GCA Level 6:	11,582	1,076			-
GCA Level 7:	11,302	1,050			-
GCA Level 8:	8,514	791	-		-
GCA Level 9:	8,514	791			-
GCA Level 10:	8,514	791			-
GCA Level 11:	8,514	791			-
GCA Level 12:	8,514	791	YES	YES	-
GCA Level 13:	8,514	791	TES	YES YES	-
GCA Level 14:	8,514	791	-		-
GCA Level 15:	8,514	791	-		-
GCA Level 16:	8,514	791			-
GCA Level 17:	8,514	791			-
GCA Level 18:	8,514	791			-
GCA Level 19:	8,514	791			-
GCA Level 20:	8,514	791			-
GCA Level 21:	8,514	791			-
GCA Level 22:	8,514 791 8,514 791			-	
GCA Level 23:				-	
GCA Level 24:	8,514	791	1		
TOTAL FLOOR AREA (A):	243,157	22,589			2,315



PROJECT NAME:RedevelorCIMA+ PROJECT NUMBER:A001272CLIENT:WindmillPROJECT STATUS:Preliminal

Redevelopment of 384 Arlington Ave
A001272
Windmill Development Group Ltd.
Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	100%
Level 2:	1	25%
Level 3:	1	25%
Level 4:	1	-
Level 5:	1	-
Level 6:	1	-
Level 7:	1	-
Level 8:	1	-
Level 9:	1	-
Level 10:	1	-
Level 11:	1	-
Level 12:	1	-
Level 13:	1	-
Level 14:	1	-
Level 15:	1	-
Level 16:	1	-
Level 17:	1	-
Level 18:	1	-
Level 19:	1	-
Level 20:	1	-
Level 21:	1	-
Level 22:	1	-
Level 23:	1	-
Level 24:	1	-
HEIGHT IN STOREYS:	24	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

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

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient Related to Type of Construction (C) =	0.6
Floor Area Considered (A) =	2,315 m ²

REQUIRED (BASE) FIRE FLOW (F) = 6,000 L/min (Rounded to Nearest 1,000 L/min)

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	
Limited combustible	0.85	
Combustible	1.00	1.00
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) = 6,000 L/min (Not rounded)



FIRE FLOW ASSESSMENT

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler Design Charge	Value Selected (C)	Total Charge
-30%	Yes	-30%
-10%	Yes	-10%
-10%	No	0%
		-40%
	Design Charge -30% -10%	Design DesignSelected (C)-30%Yes-10%Yes

DECREASE FOR SPRINKLER PROTECTION = -2,400 L/min (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	of Exposed	Total Charge
North Façade	16.0	54	Ordinary with Unprotected Openings	7%
East Façade	8.1	33	Ordinary with Unprotected Openings	11%
South Façade	>30	0	N/A	0%
West Façade	21.0	84	Ordinary with Unprotected Openings	4%
TOTAL CHARGE FOR EXPOSURES				22%

INCREASE FOR EXPOSURES = 1,320 L/min (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

 TOTAL REQUIRED FIRE FLOW (RFF) =
 5,000
 L/min (Rounded to Nearest 1,000 L/min)

 83.33
 L/s

1,321 USGPM



FIRE FLOW ASSESSMENT

NOTES/COMMENTS: STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. No notes or comments

STEP B - DETERMINE THE FLOOR AREA

1. Assumed vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, thus only the area of the largest floor plus 25% of each of the two immediately adjoining floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. Two levels of underground parking not considered as they are at least 50% below grade (Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020)

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected assuming commercial establishment will fall under C-3 occupancy type.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND) 1. Assumes sprinkler system will not be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND) 1. No notes or comments.

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min) 1. No notes or comments.

1. NO HOLES OF COMMENTS.

Prepared by: Martin Fréchette EIT Date: 2024-10-04

Verified by:

Éric Potvin, P.Eng. PEO# 100208490 Date: 2024-10-04

Z:\Cima-C10\Ott_Projects\\A001000-A001499\A001272_Redevelopment of 384 Artington Avenue\360_Calc/240920_Servicing & SWM_Report\03_WM\[241004_Water Demands and Analysis_revuMF_R5.xlsx]Hydraulic Analysis



Redevelopment of 384 Arlington Ave A001272 Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT

APPLICABLE DESIGN GUIDELINES:

- 1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
- 2. Ottawa Design Guidelines Water Distribution (2010) including Appendix H per ISTB-2018-02
- 3. City of Ottawa Technical Bulletin ISTB-2021-03 and ISTB-2018-02
- 4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 2 hours)	0.6	
Non-combustible Construction	0.8	0.8
Ordinary Construction	1.0	0.0
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m²)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m²)
Gross Construction Area (GCA) Ground Level:	16,867	1,567			1,567
GCA Level 2:	16,124	1,498			1,498
GCA Level 3:	16,103	1,496		748	
GCA Level 4:	14,833	1,378			689
GCA Level 5:	11,604	1,078	-		539
GCA Level 6:	11,582	1,076	-		538
GCA Level 7:	11,302	1,050	-		525
GCA Level 8:	8,514	791	-	YES	395
GCA Level 9:	8,514	791			395
GCA Level 10:	8,514	791			395
GCA Level 11:	8,514	791			-
GCA Level 12:	8,514	791	YES		-
GCA Level 13:	8,514	791	TES	TES	-
GCA Level 14:	8,514	791			-
GCA Level 15:	8,514	791	-		-
GCA Level 16:	8,514	791		Γ	-
GCA Level 17:	8,514	791			-
GCA Level 18:	8,514	791			-
GCA Level 19:	8,514	791			-
GCA Level 20:	8,514	791			-
GCA Level 21:	8,514	791	1		-
GCA Level 22:	8,514	791]		-
GCA Level 23:	8,514	8,514 791	1		-
GCA Level 24:	8,514	791			
TOTAL FLOOR AREA (A):	243,157	22,589			7,290



PROJECT NAME:RedevelorCIMA+ PROJECT NUMBER:A001272CLIENT:WindmillPROJECT STATUS:Preliminal

Redevelopment of 384 Arlington Ave
A001272
Windmill Development Group Ltd.
Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	100%
Level 2:	1	100%
Level 3:	1	50%
Level 4:	1	50%
Level 5:	1	50%
Level 6:	1	50%
Level 7:	1	50%
Level 8:	1	50%
Level 9:	1	50%
Level 10:	1	50%
Level 11:	1	-
Level 12:	1	-
Level 13:	1	-
Level 14:	1	-
Level 15:	1	-
Level 16:	1	-
Level 17:	1	-
Level 18:	1	-
Level 19:	1	-
Level 20:	1	-
Level 21:	1	-
Level 22:	1	-
Level 23:	1	-
Level 24:	1	-
HEIGHT IN STOREYS:	24	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

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

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient Related to Type of Construction (C) =	0.8
Floor Area Considered (A) =	7,290 m ²

REQUIRED (BASE) FIRE FLOW (F) = 15,000 L/min (Rounded to Nearest 1,000 L/min)

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	
Limited combustible	0.85	
Combustible	1.00	1.00
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) = 15,000 L/min (Not rounded)



FIRE FLOW ASSESSMENT

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler Design Charge	Value Selected (C)	Total Charge
-30%	Yes	-30%
-10%	Yes	-10%
-10%	No	0%
		-40%
	Design Charge -30% -10%	Design ChargeSelected (C)-30%Yes-10%Yes

DECREASE FOR SPRINKLER PROTECTION = -6,000 L/min (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	Assumed Construction of Exposed Wall of Adiacent	Total Charge
North Façade	16.0	54	Ordinary with Unprotected Openings	7%
East Façade	8.1	33	Ordinary with Unprotected Openings	11%
South Façade	>30	0	N/A	0%
West Façade	21.0	84	Ordinary with Unprotected Openings	4%
TOTAL CHARGE FOR EXPOSURES				22%

INCREASE FOR EXPOSURES = 3,300 L/min (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

 TOTAL REQUIRED FIRE FLOW (RFF) =
 12,000
 L/min (Rounded to Nearest 1,000 L/min)

 200.00
 L/s
 3,170
 USGPM



FIRE FLOW ASSESSMENT

NOTES/COMMENTS:

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. No notes or comments

STEP B - DETERMINE THE FLOOR AREA

1. Assumed some vertical openings in the building are unprotected, thus only the area of the two largest adjoining floors plus 50% of all floors immediately above them to a maximum of eight (8) floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. Two levels of underground parking not considered as they are at least 50% below grade (Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020)

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected assuming commercial establishment will fall under C-3 occupancy type.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND) 1. Assumes sprinkler system will not be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND) 1. No notes or comments.

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min) 1. No notes or comments.

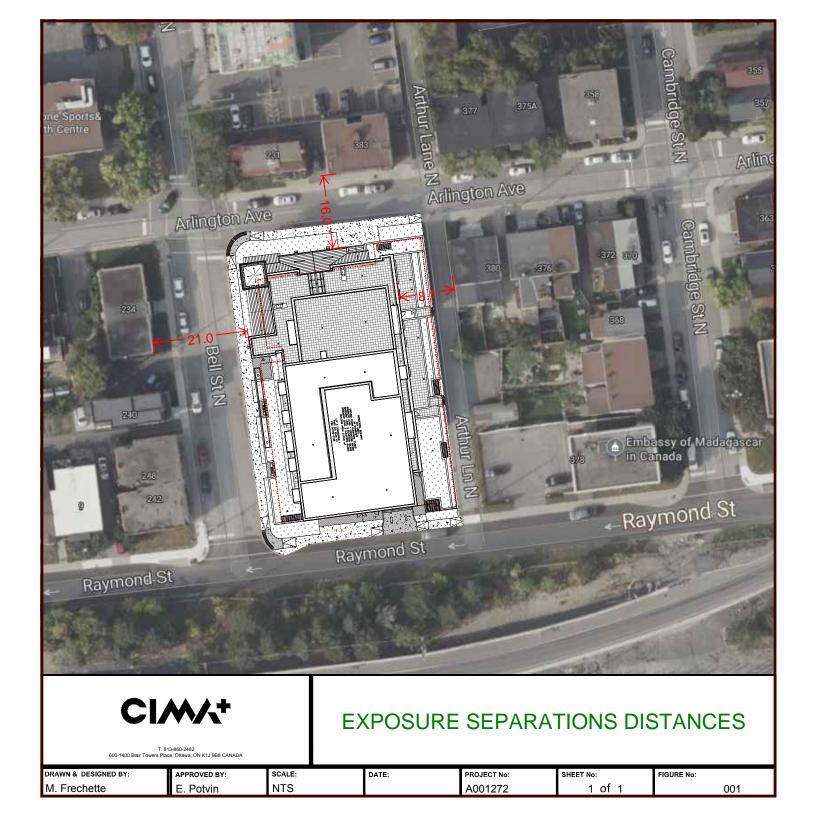
1. No notes of comments.

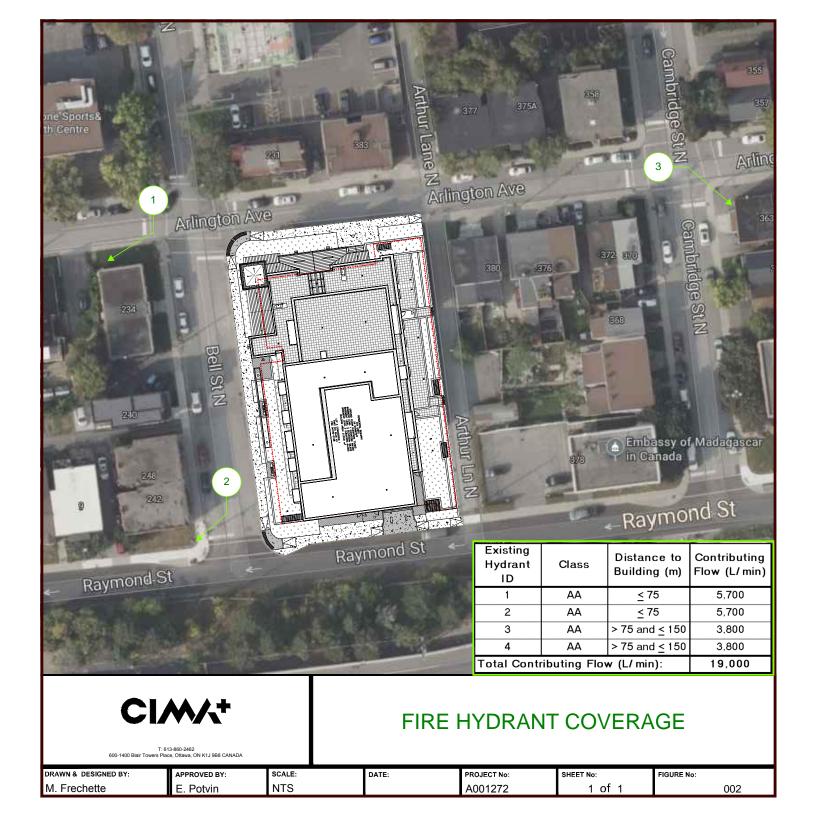
Prepared by: Martin Fréchette EIT Date: 2024-10-04

Verified by:

Éric Potvin, P.Eng. PEO# 100208490 Date: 2024-10-04

Z:\Cima-C10\Ott_Projects\A\A001000-A001499\A001272_Redevelopment of 384 Arlington Avenue\360_Calc\240920_Servicing & SWM_Report\03_WM(241004_Water Demands and Analysis_revuMF_R5.xlsx)Hydraulic Analysis







Appendix E Sanitary Servicing Design Calculations







PROJECT NAME:RedeveloCIMA+ PROJECT NUMBER:A001272CLIENT:WindmillPROJECT STATUS:Prelimina

Redevelopment of 384 Arlington Ave A001272 Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION

APPLICABLE DESIGN GUIDELINES:

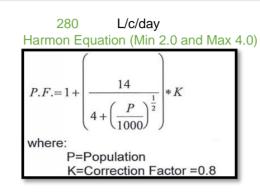
1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

DOMESTIC CONTRIBUTIONS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Flow: (1) Residential Peak Factor (P.F.):



Per Unit Populations:

Table 4.2 Per Unit Populations			
Unit Type	Persons Per Unit		
Single Family	3.4		
Semi-detached	2.7		
Duplex	2.3		
Townhouse (row)	2.7		
Apartments:			
Bachelor	1.4		
1 Bedroom	1.4		
2 Bedroom	2.1		
3 Bedroom	3.1		
Average Apt.	1.8		
Average Apt.	1.0		

AVERAGE FLOW - DOMESTIC:

Unit Type	Number of Units	Persons Per Unit	Population	Average Flow (L/s)
Bachelor Apartments	19	1.4	27	0.09
1-Bedroom Apartments	130	1.4	182	0.59
1-Bedroom + Den Apartments	17	1.4	24	0.08
2-Bedroom Apartments	126	2.1	265	0.86
2-Bedroom + Den Apartments	2	2.1	4	0.01
3-Bedroom Apartments	2	3.1	6	0.02
Total	296		508	1.65

PEAK FLOW - DOMESTIC:			
Population: (2)	508	persons	
Average Dry Weather Flow: (3) = (1) x (2)	1.65	L/s	
Peaking Factor (P.F.): (4)	3.38		
Peak Domestic Flow: (5) = (3) x (4)	5.54	L/s	
COMMERCIAL & INSTITUTIONAL CONTRI	DUTIONS.		
COMMERCIAL & INSTITUTIONAL CONTRI		14.	
Commercial Average Flow: (6)	28,000	L/gross ha/d	
Commercial Peak Factor:	1.5	if commercial contribution >20%, otherwise use	1.0
Commercial Feak Factor.	1.5	II commercial commonion >20%, otherwise use	1.0
AVERAGE FLOW - COMMERCIAL:			
Contributing Commercial Area: (7)	0.0942	gross ha (including activities room, gym and yoga)	
Average Dry Weather Flow: $(8) = (6) \times (7)$	0.03	L/s	
PEAK FLOW - COMMERCIAL:			
Percent Commercial Area Contribution:	4%	(GFA/Commercial Floor Area)	
Peaking Factor: (9)	1.00		
Peak Commercial Flow: (10) = (8) x (9)	0.03	L/s	
EXTRANEOUS FLOW CONTRIBUTION - IN	FLOW AND	INFILTRATION:	
EXTRANEOUS DESIGN CRITERIA:			
Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)	
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)	
PEAK FLOW - EXTRANEOUS:			
Effective Gross Area: (11)	0.22	ha	
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)	
Peak Extraneous Flow: (13) = (11) x (12)	0.07	L/s	



PROJECT NAME:RedeveloCIMA+ PROJECT NUMBER:A001272CLIENT:WindmillPROJECT STATUS:Prelimina

Redevelopment of 384 Arlington Ave A001272 Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION

Total Estimated Avg. Dry Weather Flow Rate:	1.68	L/s
Total Estimated Peak Dry Weather Flow Rate:	5.57	L/s
Total Estimated Peak Wet Weather Flow Rate:	5.64	L/s

Prepared by: Martin Frechette, EIT

Date: 2024-10-04

Verified by: Éric Potvin, P.Eng. PEO# 100208490 Date: 2024-10-04



Appendix F Storm Servicing and Stormwater Management Calculations







Redevelopment of 384 Arlington Ave A001272 Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (PRE-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (2-year)	Weighted Runoff Coefficient (100-year)
A1	12	0.20	2121	0.90	2133	0.90	1.00
TOTAL	12	0.20	2121	0.90	2133	0.90	1.00

NOTES:

For 25 year storms add 10% to C value

For 50 year storms add 20% to C value

For 100 year storms add 25% to C value

Prepared by:	Jaymeson Adams, P.Eng. PEO# 100519478	Date:	2022/07/07
Verified by: _	Tim Kennedy, P.Eng. PEO# 100173201	Date:	2022/07/21

https://cimao365.sharepoint.com/sites/A001272-Redevelopment384ArlingtonAvenue/Documents partages/General/300_DESIGN/360_Calc/220613_Adequacy of Servicing Calculations/02_STM/1. Pre-development/[1_220706_Storm Runoff Coefficients_Predev_revuJA.xisx]TABLEAU



STORM PRE-DEVELOPMENT FLOW

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT FLOW DETERMINATION: DESIGN CRITERIA:

Design Storm (year):	2					
IDF Regression Constants: (a)	732.951					
(b)	6.199					
(c)	0.810					
IDF Curve Equation (mm/hr):	I = a / (Time	e in min + b) ^c				
		where: $Q = Flow (L/s)$				
		C = Runoff Coefficient				
Rational Formula (L/s):	Q = 2.78C*I*A	I = Rainfall Intensity (mm/hr)				
		A = Area (hectares)				

ALLOWABLE RELEASE RATE - SUMMARY:

Verified by:

Catchment ID	Area (A) _{ha}	Runoff Coefficient (C)	Time of Concentration (tc) ^{min}	Intensity (I) ^{mm/hr}		Release Flow Per Unit Area (Q/ha) L/s/ha
A1	0.213	0.40	10	76.81	18.2	85.3
Total	0.213				18.2	85.3

NOTES:

1. Calculated Time of Concentration (tc) using Bransby Williams (C > 0.4) is 3 min. Minimum Tc of 10 min used per City Standard.

2. IDF Parameters per City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier International Airport)

Prepared by: Jaymeson Adams, P.Eng.

PEO# 100519478

Tim Kennedy, P.Eng. PEO# 100173201 Date: 2022-07-06

Date: 2022-07-06

https://cimao365.sharepoint.com/sites/A001272-Redevelopment384ArlingtonAvenue/Documents partages/General/300_DESIGN/360_Calc/220613_Adequacy of Servicing Calculations/02_STM/1. Pre-development/[2_210427_Storm Pre-Development Flow_5yr Allowable.xisx]Débit Pré-développement



STORM PRE-DEVELOPMENT FLOW - EXISTING SITE FLOWS

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT FLOW DETERMINATION - 2-YEAR EVENT: DESIGN CRITERIA

DESIGN CRITERIA:					
Design Storm (year):	2				
IDF Regression Constants: (a)	732.951				
(b)	6.199				
(C)	0.810				
IDF Curve Equation (mm/hr):	I = a / (Time in min + b) ^c				
		where: C	2 = Flow (L/s)		
Rational Formula (L/s):	Q = 2.78C*I*A	C	c = Runoff Coefficient		
		I	= Rainfall Intensity (mm/hr)		
		A	A = Area (hectares)		

EXISTING RELEASE RATE - SUMMARY:

Catchment ID	Area	Runoff Coefficient	Time of Concentration	Intensity	Release Rate	Release Flow Per Unit Area
Gatonment ib	(A) ha	(C)	(tc) min	(l) mm/hr	(Q) L/s	(Q/ha) L/s/ha
Subject Site	0.213	0.90	10	76.81	40.96	192.01

PRE-DEVELOPMENT FLOW DETERMINATION - 5-YEAR EVENT:

DESIGN CRITERIA:

Design Storm (year):	5
IDF Regression Constants: (a)	998.071
(b)	6.053
(C)	0.814

EXISTING RELEASE RATE - SUMMARY:

Catchment ID	Area	Runoff Coefficient	Time of Concentration	Intensity	Release Rate	Release Flow Per Unit Area
	(A) ha	(C)	(tc) _{min}	(l) mm/hr	(Q) L/s	(Q/ha) L/s/ha
Subject Site	0.213	0.90	10	104.19	55.56	260.48

PRE-DEVELOPMENT FLOW DETERMINATION - 100-YEAR EVENT: DESIGN CRITERIA:

Design Storm (year):	100				
IDF Regression Constants: (a)	1735.688				
(b)	6.014				
(c)	0.820				

EXISTING RELEASE RATE - SUMMARY:

Catchment ID	Area	Runoff Coefficient	Time of Concentration	Intensity	Release Rate	Release Flow Per Unit Area
	(A) ha	(C)	(tc) min	(l) mm/hr	(Q) L/s	(Q/ha) L/s/ha
Subject Site	0.213	1.00	10	178.56	105.80	496.00



Redevelopment of 384 Arlington Ave A001273 Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

STORM PRE-DEVELOPMENT FLOW - EXISTING SITE FLOWS

NOTES:

- 1. Calculated Time of Concentration (tc) using Bransby Williams (C > 0.4) is 3 min. Minimum Tc of 10 min used per City Standard.
- 2. Calculated runoff coefficient (C) equal to 0.88 for 2-year event and 1.00 for 100-year event.
- 3. IDF Parameters per City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier International Airport)

Prepared by: Jaymeson Adams, P.Eng.

PEO# 100519478

Date: 2022/07/07

Verified by: Tim Kennedy, P.Eng. PEO# 100173201

Date: 2022/07/21



Redevelopment of 384 Arlington Ave A001272 Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (POST-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

POST-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m ²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (2-year)	Weighted Runoff Coefficient (100-year)
Roof & Drains (A1)	14	0.20	1847	0.90	1861	0.89	1.00
Unattenuated Area (NC1)	45	0.20	228	0.90	272	0.79	0.98
TOTAL	59	0.20	2075	0.90	2133	0.88	1.00

NOTES:

For ~25 year storms add 10% to C value ~

For 50 year storms add 20% to C value

For 100 year storms add 25% to C value

Prepared by: Martin Frechette, EIT Date: 2024-09-30

Verified by: Eric Potvin, P.Eng. PEO# 100208490 Date: 2024-09-30



Redevelopment of 384 Arlington Ave

CIMA+ PROJECT NUMBER: A001272 CLIENT: **PROJECT STATUS:**

Windmill Development Group Ltd. Preliminary Design (Assessment of Adequacy of Public Services)

STORM PRE- VS POST DEVELOPMENT FLOW - UNATTENUATED AREA NC1 (100-YEAR)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE- vs POST-DEVELOPMENT FLOW DETERMINATION FOR UNATTENUATED AREAS: **DESIGN CRITERIA:**

Design Storm (year):	100	
IDF Regression Constants: (a) (b) (c)	1735.688 6.014 0.820	
IDF Curve Equation (mm/hr):	l = a / (Time	a in min + b) ^c
Rational Formula (L/s):	Q = 2.78C*I*A	where: Q = Flow (L/s) C = Runoff Coefficient I = Rainfall Intensity (mm/hr) A = Area

RELEASE RATE SUMMARY - UNATTENUATED AREAS - PRE- vs POST-DEVELOPMENT (100-year):

	Area	Runoff Coefficient	Weighted Runoff Coefficient	Time of Concentration	Intensity	Release Rate	Release Flow Per Unit Area	
	(A) ha	(C)	(C)	(tc) min	(l) mm/hr	(Q) L/s	(Q/ha) L/s/ha	
Pre-development (NC1)	0.0272	0.90	1.00	10	178.56	13.5	496.00	
Post-development (NC1)	0.0272	0.79	0.98	10	178.56	13.2	486.08	
Variance (Post minus Pre)						-0.3		

NOTES:

1. Calculated Time of Concentration (tc) using Bransby Williams (C > 0.4) is 7 min. Minimum Tc of 10 min used per City Standard.

2. IDF Parameters per City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier International Airport)

3. The proposed development will improve the condition of the unattenuated area by replacing existing impermeable surfaces with permeable ones.

Prepared by:

Martin Frechette, EIT

Date: 2024-09-30

Verified by: Eric Potvin, P.Eng.

PEO# 100208490

Date: 2024-09-30



PROJECT NAME:

CIMA+ PROJECT NUMBER: A00 CLIENT: Wir PROJECT STATUS: Pre

384 Arlington Avenue
 Residential Development
 BER: A001272
 Windmill Development Group Ltd.
 Preliminary Design (Assessment of Adequacy of Public Services)

STORMWATER MANAGEMENT – PRELIMINARY RETENTION CALCULATIONS

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018

STORMWATER MANAGEMENT SUMMARY - STORAGE AND DRAWDOWN: DESIGN CRITERIA:

DESIGN CIVITENIA.	
Rainfall event	100 years
Flows from Tank	18.2 L/s
Unattenuated Flow (100 year)	0.0 L/s
Allowable Release Rate	18.2 L/s

Sub-Area	Total Area (m²)	Available Storage Area (m ²)	Catchbasin/ Roof Drain Elevation (m)	Maximum Ponding Elevation (m)	Y _{max} (m)	V _{max} (m ³)	V _{rain} (m ³)	V _{acc} (m ³)	Y _{rain} (m)	Elev _{rain} (m)	A _{rain} (m²)	Cistern Release Rate Q (L/s)	Drawdown Time (min)	Comments
A1	1861	0	-	-	-	55.00	53.2	53.2	-	-	-	18.2	-	Building Roof & Drains
NC1 (Unattenuated)		0	-	-	-	-	-	-	-	-	-	0.0	-	Unattenuated
Total	2133	0				55.0	53.2	53.2				18.2		

NOTES:

1. Given that the site was overdesigned per the City's request, using a runoff coefficient of 0.4 instead of the actual 0.90, and since the uncontrolled area conditions within its perimeter are being improved, the City modeler has approved the exclusion of this area from the 18 L/s allowable release rate for the site (see Appendix A for email confirmation). Furthermore, additional landscape areas are proposed outside the property limits, further enhancing the overall site conditions.

DEFINITIONS OF ABBREVIATIONS USED IN CALCULATION TABLE:	
NC = Area is not controlled (unattenuated)	V _{acc} = Total volume of water accumula
Available Area = Area of water accumulated in sub-area at Max. Elev.	Y_{rain} = Depth of water generated by ra
Catchbasin Elev. = Elevation of catchbasin inlet (top of grate).	Elev _{rain} = Elevation of water generated b
Max. Elev. = Maximum elevation of water that may be accumulated within sub-area.	A_{rain} = Area of water generated by rair
Y_{max} = Maximum depth of water that may be accumulated within the sub-area.	Q = Release flow rate.
V_{max} = Maximum volume of water (capacity) that may be accumulated within the sub-area.	Tank Release Rate = Release rate from the undergro
V_{rain} = Volume of water generated by rainfall.	Drawdown Time = Time required for the total volu

Prepared by: Martin Frechette, EIT

Date: 2024-10-30

Verified by: Eric Potin, P.Eng. PEO# 100208490

Date: 2024-10-30

ulated within the sub-area in the event of a specific rainfall. rainfall.

by rainfall.

ainfall.

ground storage tank equal to 1/2 the allowable release rate. Jume of water accumulated within sub-area to subside.