

Stormwater Management Report and Servicing Brief

CIV-7 Storey Condo Redevelopment 424 Churchill Avenue, Ottawa, ON

Prepared for:

Churchill Properties Inc. 145 Select Avenue Unit 5, Toronto ON M1V 5M8

Attention: Jemmy Taing

LRL File No.: 220224

May 03, 2024

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1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Churchill Properties Inc to complete a Stormwater Management Analysis and Servicing Brief for the development of a 7-storey condo building with 2 level of underground garage parking. Part of the work will include the demolition of a one-storey commercial building located on the site.

The subject property consists of one (1) lot with an existing one-storey commercial building. The lot is legally described as being part of Lot 1 and Part of Lot 2 (South Danforth Avenue) Registered Plan 204, in the City of Ottawa. The subject lot is zoned TM H (24) (Traditional Mainstreet Zone).

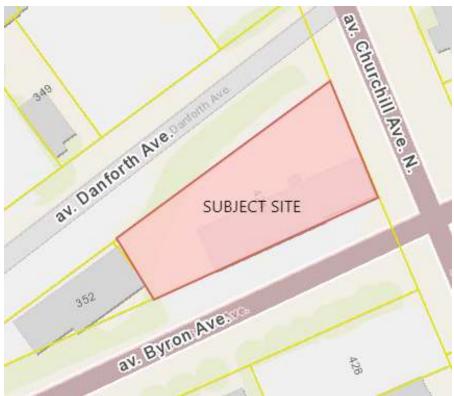


Figure 1: Aerial View of Subject Lands

The subject property is irregular shaped and measures approximately 55m in frontage along Danforth Avenue, 25.5m along Churchill Avenue and 50m along Byron Avenue. The total site area is approximately **0.101 Ha**.

The proposed development will be constructed in a single phase, which includes the demolition of the existing one-storey commercial building and the construction of the 7-storey condo building. Refer to *Site Plan* included in *Appendix F* for more details.

This report has been prepared in consideration of the terms and conditions noted above and with the civil drawings prepared for the new development. Should there be any changes in the design features, which may relate to the stormwater and servicing considerations, LRL Associates Ltd. should be advised to review the report recommendations.

2 EXISTING SITE AND DRAINAGE DESCRIPTION

The subject site measures **0.101 ha** and currently consists of a one-storey commercial building with associated asphalt parking and entrances, located along Byron Avenue and Churchill Avenue. The asphalt surface of the site is generally flat and slopes towards the North and East property lines. At the Northwest corner of the site there is a steep slope with tree cover that slopes down to Danforth Avenue. There is a drop of approximately 1m along the East property line, from the Southeast site corner and sloping down along Churchill Avenue towards Danforth Avenue. There is also a drop of approximately 6m along the northwest property line of the site, from the North property line down to Danforth Avenue. To accommodate for this drop there is an existing retaining wall which wraps around the northeast corner of the site and runs primarily along the North property line of the site. Part of the retaining wall is located just outside of the property line and part of it runs across the site along the treed area.

Sewer and watermain mapping, along with as-built information collected from the City of Ottawa indicate the following existing infrastructure located within the adjacent right-of-ways:

Churchill Avenue N:

- 300mm PVC sanitary sewer (2010)
- 300mm CONC storm sewer (2010)
- 400mm PVC watermain (2010)

Danforth Avenue:

- 225mm CONC sanitary sewer (1940)
- 150mm DI watermain (1984)

3 SCOPE OF WORK

As per applicable guidelines, the scope of work includes the following:

Stormwater management

- Calculate the allowable stormwater release rate.
- Calculate the anticipated post-development stormwater release rates.
- Demonstrate how the target quantity objectives will be achieved.

Water services

- Calculate the expected water supply demand at average and peak conditions.
- Calculate the required fire flow as per the Fire Underwriters Survey (FUS) method.
- Confirm the adequacy of water supply and pressure during peak flow and fire flow.
- Describe the proposed water distribution network and connection to the existing system.

Sanitary services

- Describe the existing sanitary sewers available to receive wastewater from the building.
- Calculate peak flow rates from the development.

- Describe the proposed sanitary sewer system.
- Review impact of increased sanitary flow on downstream sanitary sewer.

4 **REGULATORY APPROVALS**

An MECP Environmental Compliance Approval is not expected to be required for installation of the proposed storm and sanitary sewers within the site. A Permit to Take Water is not anticipated to be required for pumping requirements for sewer installation. The Rideau Valley Conservation Authority will need to be consulted to obtain municipal approval for site development. No other approval requirements from other regulatory agencies are anticipated.

5 WATER SUPPLY AND FIRE PROTECTION

5.1 Existing Water Supply Services and Fire Hydrant Coverage

The subject property lies within the City of Ottawa 1W water distribution network pressure zone. There is an existing 400 mm PVC watermain within Churchill Avenue N and a 150mm PVC watermain in Danforth Avenue. There are currently seven (7) existing fire hydrants within proximity to the subject property. Refer to *Appendix B* for the location of fire hydrants.

5.2 Water Supply Servicing Design

According to the City of Ottawa Water Distribution Guidelines (Technical Bulletin ISDTB-2014-02), since the subject site is anticipated to house more than 50 residential units, it is required to be serviced by two water service laterals, separated by an isolation valve, for redundancy and to avoid creation of a vulnerable service area. Additionally, considering the presence of automatic sprinkler system inside the building and a recommended size to service the sprinkler system, the subject property is proposed to be serviced via two (2) 150 mm diameter service laterals connected to the existing 406mm PVC watermain within Churchill Ave and the 152mm DI watermain located in Danforth Ave. Refer to *Site Servicing Plan* C.401 in *Appendix E* for servicing layout and connection points.

We have analyzed the water demand requirements for the proposed 7-storey condo building. The residential water demands, and anticipated population were determined using Appendix 4-A, Table 4.1 and Table 4.2 from the *City of Ottawa Water Distribution Design Guidelines* and Table 3-3 from the *MOE Design Guidelines for Drinking Water Systems*.

Through reviewing the architectural floor plans of the proposed building, it was determined that the building will have a total combined floorspace of **7,818** m^2 , **58** residential units, **1,670** m^2 of amenity space and **3** office spaces.

The water supply requirements for the residential units, office spaces and amenity space in the proposed development have been calculated using the following formulas:

 $Q = (q \times P \times M)$, for the residential and office spaces and $Q = (q \times A \times M)$, for the amenity space.

Where:

q = average water consumption (L/capita/day) or (L/ha/day)
P = design population (capita)
M = Peak factor

A = area (ha)

Residential

The proposed building will include **52** one-bedroom units and **6** two-bedroom units. Based on the City of Ottawa Design guidelines for population projection, this translates to approximately **85.4** residents. *Table 1* below summarizes the proposed residential population count as interpreted using Table 4-1 from the City of Ottawa Water Distribution Design Guideline.

Proposed Unit Type	Persons Per Unit	Number of Units	Total Population	
1 Bedroom	1.4	52	72.8	
2 Bedroom	2.1	6	12.6	
	Total	58	85.4	

Table 1: Development Residential Population Estimate

With reference to *Table 4.1 of the City of Ottawa Water Distribution Design Guidelines*, an average water consumption rate of 280 L/c/d was used. With reference to Table 3-3 of the MOE *Design Guidelines for Drinking Water Systems* a Maximum Daily Demand Factor and Maximum Hour Demand Factor were calculated to be 7.2 and 10.9, respectively. The anticipated residential demands were calculated as follows:

- > Average daily domestic water demand is **0.28** L/s,
- > Maximum daily demand is 2.00 L/s, and
- > Maximum hourly demand is **3.01** L/s.

Commercial/Institutional

Appendix 4-A and *Table 4.2 of the City of Ottawa Water Distribution Design Guidelines* were used to determine the consumption rates and peak factors of the amenity and office spaces. A water consumption rate of 75L/p/d was used for office employees and a consumption rate of 28,000L/ha/d was used for the amenity space. The Maximum Daily Demand Factor and the Maximum Hourly Demand Factor were 1.5 and 1.8 respectively. *Table 2* below summarizes the proposed institutional/ commercial demands.

Property Type	Unit	Rate	Units	Demand (L/d)
Office	75	L/p/d	3 people	225.0
Amenity Space	28,000	L/ha/d	0.0167 ha	467.6

Table 2: Institutional/	Commercial Demands
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Using the peak factors, the anticipated institutional and commercial demands were calculated as follows:

- > Average daily domestic water demand is **0.008** L/s,
- > Maximum daily demand is **0.012** L/s, and
- > Maximum hourly demand is **0.022**L/s.

Combined - Residential/Commercial/Institutional

The combined peak factors for the site are anticipated to equal the following:

- > Average daily domestic water demand is **0.28** L/s,
- > Maximum daily demand is **2.01** L/s, and
- > Maximum hourly demand is **3.03** L/s.

Refer to *Appendix B* for water demand calculations.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in *Appendix B*. *Table 3* below summarizes boundary conditions for the proposed development.

Design Parameter	Anticipated Demand (L/s)	Boundary Conditions @ Churchill Ave & Danforth Ave		
		Connection 1* (m H2O / kPa)	Connection 2** (m H2O / kPa)	
Average Daily Demand	0.28	41.21 / 404.13	44.04 / 431.88	
Max Day + Max Fire Flow (per FUS)	2.01 + 216.7	35.61 / 349.22	15.04 / 147.49	
Peak Hour	3.03	35.01 / 343.33	37.84 / 371.08	
*Ground Elevation assumed at 73.69m for Connection 1 @ Churchill Ave				
** Ground Elevation assumed at 70.86m for Connection 2 @ Danforth Ave				

As indicated in Table 3, pressures in all scenarios meet the required pressure range stated in the City of Ottawa Design Guidelines – Water Distribution (Section 4.2.2). Refer to **Appendix B** for Boundary Conditions.

The estimated fire flow for the proposed buildings was calculated in accordance with *ISTB-2018-02*. The following parameters were provided by the Architect:

- Type of construction Non-combustible construction
- Occupancy type Limited Combustible
- Sprinkler Protection –Fully Automatic Sprinkler System

The estimated fire flow demand was estimated to be **13,000 L/min**, see **Appendix B** for details.

There are six (6) existing fire hydrants in proximity to the proposed buildings that are available to provide the required fire flow demands of 13,000 L/min. Refer to *Appendix G* for fire hydrant locations. Table 4 below summarizes the aggregate fire flow of the contributing hydrants in proximity to the proposed development based on Table 18.5.4.3 of *ISTB-2018-02*.

	Max. Fire	Fire	Fire	Available
	Flow Demand	Hydrants(s)	Hydrant(s)	Combined Fire
	(L/min)	within 75m	within 150m	Flow (L/min)
Contemplated Development	13,000	2	4	(2 x 5678) + (4 x 3785) = 26,496

Table 4: Fire Protection Summary Table

The total available fire flow from contributing hydrants is equal to **26,496 L/min** which is sufficient to provide adequate fire flow for the proposed development. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

6 SANITARY SERVICE

6.1 Existing Sanitary Sewer Services

There is an existing 300mm PVC Sanitary sewer located in Churchill Ave N and a 225mm CONC Sanitary Sewer located in Danforth Ave. It is anticipated that the contemplated development will be connected to the existing 3000mm PVC sanitary sewer located within Churchill Ave N, to be connected to the proposed building.

6.2 Sanitary Sewer Servicing Design

The proposed development will be serviced via a 150 mm dia. sanitary service connected to the existing 300mm diameter sanitary sewer within Churchill Avenue N. Refer to LRL drawing C.401, included in **Appendix F**, for the proposed sanitary servicing.

The parameters used to calculate the anticipated sanitary flows are residential average population per unit of 1.4 person for single units, 2.1 persons for two-bedroom units and a residential daily demand of 280 L/p/day, a residential peaking factor of 3.5 and a total infiltration rate of 0.33 L/s/ha. Based on these parameters and the total site area of 0.101 ha, the total anticipated wet wastewater flow was estimated to be **1.04 L/s**. Refer to *Appendix C* for the site sanitary sewer design sheet.

As requested in the pre-consultation with City staff, the calculated sanitary demands for the proposed development were coordinated with the City of Ottawa to confirm there is sufficient

capacity in the downstream municipal sewers. As per correspondence attached, see *Appendix C*, the downstream municipal sewers can sufficiently accommodate the increase in sanitary flows from the proposed development.

7 STORMWATER MANAGEMENT

7.1 Existing Stormwater Infrastructure

The subject property is tributary to the Ottawa River West sub-watershed. Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system as such, approvals for the proposed development within this area are under the approval authority of the City of Ottawa.

There is an existing 300mm CONC storm sewer available in Churchill Avenue N. In the predevelopment conditions, drainage from the subject lot is depicted by existing watershed EWS-01 (0.101ha), which drains towards the North and West property lines. Refer to plan C701 included in **Appendix E** for pre-development drainage characteristics. Refer to **Appendix D** for predevelopment and post-development watershed information.

7.2 Design Criteria

The stormwater management criteria for this development are based on the pre-consultation with City of Ottawa officials, the City of Ottawa Sewer Design Guidelines including City of Ottawa Stormwater Management Design Guidelines, 2012 (City standards), as well as the Ministry of the Environment's Stormwater Management Planning and Design Manual, 2003 (SWMP Manual).

7.2.1 Water Quality

The subject property lies within the Ottawa River West sub-watershed and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). It was determined that water quality controls would not be required on this site as treatment would be handled by municipal infrastructure. Correspondence with RVCA is included in *Appendix A*.

7.2.2 Water Quantity

Based on pre-consultation with the City, correspondence included in *Appendix A*, the following stormwater management requirements were identified for the subject site:

- Meet an allowable release rate based on a Rational Method Coefficient of 0.50, employing the City of Ottawa IDF parameters for a 2-year storm with a calculated time of concentration equal to 10 minutes; and
- > Attenuate all storms up to and including the City of Ottawa 100-year storm event on site.
- Water quality treatment will not be required on this site as the water being collected and conveyed to the storm system is rooftop water.

As per the pre-application consultation meeting with the City of Ottawa, it was recommended that it would be acceptable to control only the roof portion of the building up to the 100-year storm

event, to a 2-year pre-development level and that the remainder of the site could be left uncontrolled as long as the uncontrolled portion is directed towards the right of way. Based on these stormwater objectives for the subject site, it was determined that the allowable release rate for the site is **10.81 L/s** for all storms up to and including the 100-year storm. Refer to **Appendix D** for calculations.

7.3 Method of Analysis

The Modified Rational Method has been used to calculate the runoff rate from the site to quantify the detention storage required for quantity control of the development. Refer to *Appendix D* for storage calculations.

7.4 Proposed Stormwater Quantity Controls

The proposed stormwater management quantity control for this development will be accomplished using rooftop storage and roof drains with controls. A proposed 250 mm PVC diameter storm sewer pipe will outlet stormwater flows from the site to the existing 300mm PVC storm sewer located within Churchill Avenue N. The proposed servicing layout and connection points are shown on drawing C.401 in *Appendix E*, and detailed calculations can be found in *Appendix D*.

The site has been analyzed and six (6) post-development watersheds have been allocated.

WS-01 to WS-05 (0.070 ha) consist of the proposed building's roof envelope and will be captured via roof drains with controls.

WS-06 (0.031 ha) is uncontrolled and consists of the remainder of the site that is not part of the roof. Runoff from this area will be directed to the City Right of Way.

Refer to C601, Stormwater Management Plan and C702, Post-Development Watershed Plan C702 in *Appendix E* for reference.

Table 5 below summarizes post-development drainage areas. Calculations can be seen in *Appendix D.*

WATERSHED	C = 0.90 Building Area/ Asphalt & Concrete (m ²)	Total Area (ha)	Weighted Runoff Coefficient (C)
WS-01(ROOF)	116.29	0.012	0.90
WS-02 (ROOF)	141.44	0.014	0.90
WS-03 (ROOF)	248.09	0.025	0.90
WS-04 (ROOF)	62.07	0.006	0.90
WS-05 (ROOF)	130.54	0.013	0.90
WS-06(UN- CONTROLLED)	313.97	0.031	0.90
TOTAL	1012.4	0.101	0.90

Table 5: Post-Development Estimated Areas & Runoff Coefficients

The proposed building's rooftop was analysed, and it was determined that there would be 33.53m³ of roof storage available. A total of **ten (10)** roof drains would be used, each roof drain would have

a restricted discharge rate of **0.63L/s**, resulting in a total release rate from the roof of **6.30 L/s** with a proposed head of 0.15m. The proposed roof drains are to be fully closed WATTS Adjustable Accutrol RD-100-A1. For calculations for available area of rooftop storage and for more information regarding the selected roof drain and flow restrictor, refer to *Appendix D*. For additional details on the roof storage areas refer to drawing *C.601* in **Appendix E**.

Table 6 below summarizes the release rates and storage volumes required to meet the allowable release rate of **10.81 L/s** for 100-year flow rates.

CATCHMENT AREAS	DRAINAGE AREAS (ha)	100-YEAR RELEASE RATE (L/s)	100-YEAR REQUIRED STORAGE (m ³)	TOTAL AVAILABLE STORAGE (m ³)
WS-01(ROOF)	0.012	1.26	3.15	6.03
WS-02 (ROOF)	0.014	1.26	4.23	4.55
WS-03 (ROOF)	0.025	1.26	9.46	13.17
WS-04 (ROOF)	0.006	1.26	1.09	3.14
WS-05 (ROOF)	0.013	1.26	3.76	6.64
TOTAL CONTROLLED	0.070	6.30	21.69	33.53
WS-06 (UNCONTROLLED)	0.031	15.59	0	0
TOTAL UNCONTROLLED	0.031	15.59	0.00	0.00
TOTAL	0.101	21.89	21.68	33.53

Table 6: Stormwater Release Rate & Storage Volume Summary (100 Year)

To attenuate flows to the allowable release rate of **10.81 L/s**, it is calculated that a total of **19.53** m^3 of storage will be required on the roof top. The required storage is proposed to be met via the building rooftop ponding. The total required storage, storage available and allowable release rate is the following;

- 19.53 m³ is required for rooftop storage in WS-01 corresponding to a maximum restricted flow of 6.30 L/s via roof drain controls;
- > There is **33.53** m^3 of available rooftop storage.

The 100-year maximum ponding extents can be found on drawing "C601 – Stormwater Management Plan" in *Appendix E*.

8 EROSION AND SEDIMENT CONTROL

During construction, erosion and sediment controls will be provided primarily via a sediment control fence to be erected along the perimeter of the site where runoff has the potential of leaving the site. Inlet sediment control devices are also to be provided in any catch basin and/or manholes in and around the site that may be impacted by the site construction. Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification OPSS 577. For more details refer to drawing C101 Erosion and Sediment Control Plan in *Appendix E*.

9 CONCLUSION

This Stormwater Management and Servicing Report for the development proposed at 424 Churchill Avenue N presents the rationale and details for the servicing requirements for the subject property.

In accordance with the report objectives, the servicing requirements for the development are summarized below:

Water Service

- The maximum required fire flow was calculated to be **13,000 L/min** using the FUS method.
- There are six (6) existing fire hydrants available to service the proposed development. They will provide a combined fire flow of **26,496 L/min** to the site.
- The new development will be serviced via two (2) 150mm diameter services connected to the existing 406mm PVC watermain within Churchill Ave N and the 152mm DI watermain located in Danforth Ave.
- Boundary conditions received from the City of Ottawa indicate that sufficient pressure is available to service the proposed site.

Sanitary Service

- The total calculated wet wastewater flow from the proposed development is **1.04 L/s**.
- The proposed development will discharge **1.04 L/s** to the existing 300 mm PVC sanitary sewer within Churchill Avenue N via a proposed 150mm PVC sanitary service lateral.

Stormwater Management

- The stormwater release rates from the proposed development will meet the calculated allowable release rate of **10.81L/s**.
- As per the pre-application consultation meeting with the City of Ottawa, only the roof portion of the building will be controlled up to the 100-year storm event, to a 2-year predevelopment level and the remainder of the site will be left uncontrolled and will be directed towards the right of way
- The site stormwater quantity control objectives will be met through ponding on the roof. 21.69m³ of storage will be required and there will be 33.53m³ of available rooftop storage. Ten (10) area drains will be used to control the flows to 0.63L/s each, which when combined will produce a controlled 100-year release rate of 6.30L/s.
- The roof drains will each be WATTS Adjustable Accutrol RD-100-A1 that are fully closed.

10 REPORT CONDITIONS AND LIMITATIONS

The report conclusions are applicable only to this specific project described in the preceding pages. Any changes, modifications or additions will require a subsequent review by LRL Associates Ltd. to ensure the compatibility with the recommendations contained in this document.

If you have any questions or comments, please contact the undersigned.

Prepared by: LRL Associates Ltd.

Tamara Harb, EIT, SPESC-IT Civil Designer



Virginia Johnson, P. Eng. Civil Engineer

APPENDIX A

Pre-consultation / Correspondance

Tamara Harb

From:	Bakhit, Reza <reza.bakhit@ottawa.ca></reza.bakhit@ottawa.ca>
Sent:	September 22, 2022 7:37 AM
То:	Tamara Harb
Cc:	Amr Salem
Subject:	RE: LRL220224 - CIV 7-Storey Condo Redevelopment Boundary Conditions Request (Water and Sanitary)
Attachments:	424 Churchill Avenue September 2022.pdf

Hi,

The following are boundary conditions, HGL, for hydraulic analysis at 424 Churchill Avenue (zone 1W) assumed to be connected to the 406 mm watermain on Churchill Avenue and the 152 mm on Danforth Avenue (see attached PDF for location).

Both Connections:

Minimum HGL: 108.7 m

Maximum HGL: 114.9 m

Max Day + Fire Flow (216.7 L/s): 109.3 m (Churchill Connection) and 85.9 m (Danforth connection)

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.

Reza Bakhit, P.Eng, C.E.T Project Manager Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique Development Review - Centeral Branch City of Ottawa | Ville d'Ottawa 110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1 613.580.2424 ext./poste 19346, <u>reza.bakhit@ottawa.ca</u> Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Tamara Harb <tharb@lrl.ca>
Sent: Wednesday, September 07, 2022 11:03 AM
To: Bakhit, Reza <reza.bakhit@ottawa.ca>
Cc: Amr Salem <asalem@lrl.ca>
Subject: LRL220224 - CIV 7-Storey Condo Redevelopment Boundary Conditions Request (Water and Sanitary)

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Tamara Harb

From:	Bakhit, Reza <reza.bakhit@ottawa.ca></reza.bakhit@ottawa.ca>
Sent:	September 19, 2022 7:36 AM
То:	Tamara Harb
Cc:	Amr Salem
Subject:	RE: LRL220224 - CIV 7-Storey Condo Redevelopment Boundary Conditions Request (Water and Sanitary)

Hi Tamara,

Not sure if I sent you this email, but just in case, please note that there is no concern with the proposed SAN flow .

Thanks,

Reza Bakhit, P.Eng, C.E.T Project Manager Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique Development Review - Centeral Branch City of Ottawa | Ville d'Ottawa 110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1 613.580.2424 ext./poste 19346, <u>reza.bakhit@ottawa.ca</u> Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Tamara Harb <tharb@lrl.ca>
Sent: Wednesday, September 07, 2022 11:03 AM
To: Bakhit, Reza <reza.bakhit@ottawa.ca>
Cc: Amr Salem <asalem@lrl.ca>
Subject: LRL220224 - CIV 7-Storey Condo Redevelopment Boundary Conditions Request (Water and Sanitary)

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Good morning Reza,

I would like to request boundary conditions for the development of a 7-storey condo building located at 424 Churchill Ave, Ottawa ON.

Water Connection

We are proposing two water service laterals connected to the existing 400mm municipal watermain in Churchill Avenue and the existing 150mm municipal watermain in Danforth Avenue. Please provide the boundary conditions for the proposed building using the following proposed development demands:

• Type of development: 7 Storey condo building with 2 levels of underground parking and 58 units

(52 one-bedroom & 6 two-bedroom)

From:	Bakhit, Reza
То:	Gauthier, Steve
Subject:	PC2022-0016 Pre-application Consultation Meeting 424 Churchill Avenue N
Date:	Tuesday, March 8, 2022 4:48:37 PM
Attachments:	oledata.mso
	image021.png
	image001.emz
	image003.png

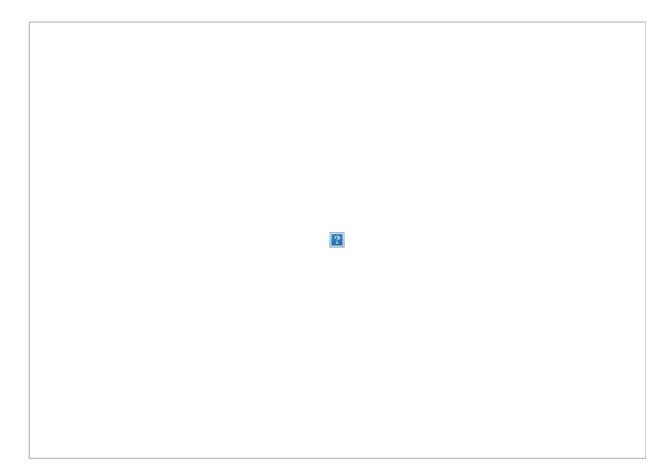
Hi Steve

Please forward the below information to the applicant regarding a development proposal at **424 Churchill Avenue N, Ottawa for the 9 story apartment building.** Note that the information is considered **preliminary** and the assigned Development Review Project Manager may modify and/or add additional requirements and conditions upon review of an application if deemed necessary.

General:

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an Existing Conditions Plan.
- Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A legal survey plan shall be provided and all easements shall be shown on the engineering plans.
- A deep excavation and dewatering operations have the potential to cause damages to the neighboring adjacent buildings/ City infrastructure. Document that construction activities (excavation, dewatering, vibrations associated with construction, etc.) will not have an impact on any adjacent buildings and infrastructure.
- A Record of Site Condition (RSC) in accordance with O.Reg. 153/04 will be required to be filed and acknowledged by the Ministry prior to issuance of a building permit due to a change to a more sensitive property use.
- 0. Reference documents for information purposes :
 - Ottawa Sewer Design Guidelines (October 2012)
 - Technical Bulletin PIEDTB-2016-01
 - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
 - Ottawa Design Guidelines Water Distribution (2010)
 - Technical Bulletin ISTB-2021-03
 - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
 - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
 - City of Ottawa Environmental Noise Control Guidelines (January 2016)
 - City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
 - Ottawa Standard Tender Documents (latest version)
 - Ontario Provincial Standards for Roads & Public Works (2013)
 - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at <u>InformationCentre@ottawa.ca</u> or by phone at (613) 580-424 x.44455).

Please note that this is the applicant responsibility to refer to the latest applicable guidelines while preparing reports and studies.



Disclaimer:

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

Stormwater Management Criteria and Information:

- Water Quantity Control: In the absence of area specific SWM criteria please control postdevelopment runoff from the subject site, up to and including the 100-year storm event, to a 2-year pre-development level. The pre-development runoff coefficient will need to be determined as per existing conditions but in no case more than 0.5. [If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5]. The time of concentration (T_c) used to determine the pre-development condition should be calculated. *Tc should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; T_c of 10 minutes shall be used for all post-development calculations].*
- Any storm events greater than the established 2-year allowable release rate, up to and including the 100-year storm event, shall be detained on-site. The SWM measures required to avoid impact on downstream sewer system will be subject to review.
- Please note that foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.

Water Quality Control: Please consult with the local conservation authority (RVCA) regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report.

- Please note that as per Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14) there shall be no surface ponding on private parking areas during the 5-year storm rainfall event.
- If Underground Storage proposed: Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

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

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

Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?

Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.

Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2- and 100-year event storage requirements.

In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

- Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.
- Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A topographical plan of survey shall be provided as part of the submission and a note provided on the plans.
- Please provide a Pre-Development Drainage Area Plan to define the pre-development drainage areas/patterns. Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution.
- If rooftop control and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the

foundation drain system. Provide a **Roof Drain Plan** as part of the submission.

- Considering the size of the site, it would be acceptable to control the roof portion only (100-year storm event, to a 2-year pre-development level) and leave the remainder of the site uncontrol as long as the uncontrolled portion is directed towards the right of way. This approach should be discussed in the SWM report. Also, the grading plan should clearly demonstrate that the runoff from the uncontrolled portion of the site will be directed towards the ROW
- If Window wells are proposed, they are to be indirectly connected to the footing drains. A
 detail of window well with indirect connection is required, as is a note at window well location
 speaking to indirect connection.
- There must be at least 15cm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

Storm Sewer:

• A 300mm dia. CONC storm sewer (2010) is available within Churchill Avenue N.

Sanitary Sewer Maclaren St:

- A 250 mm dia. PVC Sanitary sewer (2010) is available within Churchill Avenue N.
- A 225 mm dia. CONC Sanitary sewer (1940) is available within Danforth Avenue.
- Please provide the new Sanitary sewer discharge and we confirm if sanitary sewer main has the capacity. An analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater system is required to be provided. Needs to be demonstrated that there is adequate capacity to support any increase in wastewater flow.
- Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.
- Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.
- A backwater valve is required on the sanitary service for protection.

Water :

- A 406 mm dia. PVC watermain (2010) is available within Churchill Avenue N.
- A 152 mm dia. DI watermain (1984) is available within Danforth Avenue.
- Existing residential service to be blanked at the main.
- Water Supply Redundancy: Residential buildings with a basic day demand greater than 50m³/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the Ottawa Design Guidelines Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration.
- Please review Technical Bulletin ISTB-2018-0, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal. Two or more public hydrants are anticipated to be required to handle fire flow.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of

the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.

- 0. Type of Development and Units
- 1. Site Address
- 2. A plan showing the proposed water service connection location.
- 3. Average Daily Demand (L/s)
- 4. Maximum Daily Demand (L/s)
- 5. Peak Hour Demand (L/s)
- 6. Fire Flow (L/min)

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

[Fire flow demand requirements shall be based on ISTB-2021-03]

<u>Note: The OBC method can be used if the fire demand for the private property is less than 9,000</u> <u>L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used</u>. Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).

7. Hydrant capacity shall be assessed to demonstrate the RFF can be

achieved. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

Snow Storage:

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

Gas pressure regulating station

A gas pressure regulating station may be required depending on HVAC needs (typically for 12+ units). Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is to ensure that there are no barriers for overland flow routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.

Regarding Quantity Estimates:

Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities. In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

CCTV sewer inspection

CCTV sewer inspection required for pre and post construction conditions to ensure no damage to City Assets surrounding site.

Pre-Construction Survey

Pre-Construction (Piling/Hoe Ramming or close proximity to City Assets) and/or Pre-Blasting (if applicable) Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise 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.

Road Reinstatement

Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By-Law 2003-445 and City Standard Detail Drawing R10. The amount of overlay will depend on condition of roadway and width of roadway(s).

Required Engineering Plans and Studies:

PLANS:

- Existing Conditions and Removals Plan
- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan
- Roof Drainage Plan (When rooftop storage is proposed)
- Topographical survey

REPORTS:

- Site Servicing and Stormwater Management Report (is required per section 4.7.1, policy 6 and section 4.7.1, policy 23 of the OP
- Geotechnical Study/Investigation (including sensitive marine clays and unstable slopes) is required per section 10.1.4 of OP
- Noise Control Study required as per section 10.2.1
- Phase I ESA 4) A Phase 1 and, where required, a Phase 2 ESA are required per section 10.1.6 OP
- Phase II ESA (Depending on recommendations of Phase I ESA). It appears the site is contaminated.
- RSC (Record of the site Conditions)
- Site lighting certificate
- Wind analysis
- Shadow Study

Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:** Specific information has been incorporated into both the <u>Guide to Preparing Studies and Plans</u> for a site plan. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Added to the general information for servicing and grading plans is a note that an **O.L.S**. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an O.L.S. for development projects is emphasized.

Phase One Environmental Site Assessment:

• A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in

support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.

- The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.
- Official Plan Section 4.8.4:

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

RSC (Record of the site Conditions)

 A RSC is required when changing the land use (zoning) of a property to a more sensitive land use.

Submitting a record of site condition | Ontario.ca

Geotechnical Investigation:

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

https://documents.ottawa.ca/sites/documents/files/geotech_report_en.pdf

Noise Study:

- A Transportation Noise Assessment is required as the subject development is located within 100m proximity of an Arterial Road
- A Stationary Noise Assessment is required in order to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.

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

Wind analysis:

0. A wind analysis must be prepared, signed and stamped by an engineer who specializes in pedestrian level wind evaluation. Where a wind analysis is prepared by a company which do not have extensive experience in pedestrian level wind evaluation, an independent peer review may be required at the expense of the proponent.

Terms of Reference: Wind Analysis (ottawa.ca)

Shadow Study

When greater than 9 storey in height, a Shadow Study required for all buildings/dwellings.

Exterior Site Lighting:

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

Fourth (4th) Review Charge:

Please be advised that additional charges for each review, after the 3rd review, will be applicable to each file. There will be no exceptions.

Construction approach – Please contact the Right-of-Ways Permit Office <u>TMconstruction@ottawa.ca</u> early in the Site Plan process to determine the ability to construct site and copy File Lead <u>Steve.Gauthier@ottawa.ca</u> on this request.

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

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

Regards,

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

Project Manager

Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique

Development Review - Centeral Branch

City of Ottawa | Ville d'Ottawa

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

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

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

APPENDIX B

Water Supply Calculations



Water Supply Calculations

LRL File No. 220224 2022-09-07 Prepared by Tamara Harb

Water Demand based on the City of Ottawa Design Guidelines-Water Distribution, 2010

Date

Domestic Demand									
Unit Type	Persons Per Unit	Number of Units	Population						
1 Bedroom Apartment	1.4	52	72.8						
2 Bedroom Apartment	2.1	6	12.6						
	Total	58	85.4						

*Based on a daily demand of 280L/day per person as identified by Appendix 4-A of the Sewer design guidelines.

Average Water Consumption Rate	280 L/	_/c/d
Average Day Demand	23,912 L/	L/d 0.28 L/s
Maximum Day Factor	7.2	Table (3-3) MOE Peaking Factors
Maximum Daily Demand	172,910 L/	L/d 2.00 L/s
Peak Hour Factor	10.9	Table (3-3) MOE Peaking Factors
Maximum Hour Demand	260,015 L/	L/d 3.01 L/s

	Institutional / Commercial / Industrial Demand								
Property Type	Unit Rate	Units	Demand (L/d)						
Office	75 L/p/d	3 people	225.0						
Amenities	28000 L/ha/d	0.0167 ha	467.6						

Average Day Demand	693	L/d	0.008	L/s
Maximum Day Factor	1.5	(Design G	uidelines-Water Dist	ribution Table 4.2)
Maximum Daily Demand	1,039	L/d	0.012	L/s
Peak Hour Factor	1.8	(Design G	uidelines-Water Dist	ribution Table 4.2)
Maximum Hour Demand	1,870	L/d	0.022	L/s
	TOTAL I	DEMAND		

	TOTAL DEMAND							
Average Day Demand	24,605 L/d	0.28	L/s					
Maximum Daily Demand	173,949 L/d	2.01	L/s					
Maximum Hour Demand	261,885 L/d	3.03	L/s					

Water Service Pipe Sizing

Q = VA

Where: V = velocity A = area of pipe Q = flow rate

Assuming a maximum velocity of 1.8m/s, the diameter of pipe is calculated as:

Minimum pipe diameter (d) =	(4Q/πV) ^{1/2}	
=	0.046	m
=	46	mm
Proposed pipe diameter (d) =	150	mm
= =	6	Inches



Fire Flow Calculations

LRL File No.	220224
Date	September 8, 2022
Method	Fire Underwriters Survey (FUS)
Prepared by	Tamara Harb

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
			Structural Framing Material					
			Wood Frame	1.5				
	Choose frame used for	Coefficient C Ordinary Construction 1.0						
1	building	related to the type of construction	Non-combustible construction	0.8	Non-combustible construction	0.8		
			Fire resistive construction <2 hrs	0.7				
			Fire resistive construction >2 hrs	0.6				
			Floor Space Area (A)					
2			Total area			6,961	m ²	
3	3 Obtain fire flow before reductions Required fire flow (rounded to nearest 1,000 L/min) Fire Flow = 220 x C x A ^{0.5}			L/min	15,000			
	:		Reductions or surcharge due to factors aff	fecting burning]			
			Non-combustible	-25%				
	Choose combustibility	ibility Occupancy hazard reduction or surcharge	Limited combustible	-15%				
4	of contents		Combustible	0%	Limited combustible	-15%	L/min	12,750
			Free burning	15%				
			Rapid burning	25%				
			Full automatic sprinklers	-30%	True	-30%		
5	Choose reduction for sprinklers	Sprinkler reduction	Water supply is standard for both the system and fire department hose lines	-10%	True	-10%	L/min	7,650
			Fully supervised system	-10%	False	0%		
			North side	>30m	0%			
6	Choose separation	Exposure distance between units	West side	0 to 3m	25%		L/min	13,388
			East side	20.1 to 30m	10%		L/11111	13,300
			South side	20.1 to 30m	10%	45%		
			Net required fire flow					
	Obtain fire flow,			Minimum	required fire flow rate (rounded to n	,		13,000
7	duration, and volume				Minimum required		L/s	216.7
					Required duration	on of fire flow	hr	2.75

APPENDIX C

Wastewater Collection Calculations



		LRL File No Project: Location: Date:		220224 CIV 7 Store 424 Church September	ill Avenue	•	ent			Light Indu Heavy Ind Maximum	ustrial Flow dustrial Flow n Resident	w = 35000 ow = 5500 tial Peak f	low = 2800) L/ha/day)0 L/ha/da Factor = 4 eak Facto	00 L/ha y .0	-	sign Para	Average Daily Flov Industrial	w for Plac Peak Fac	•	oloyment = er Append	= 75L/p/day dix 4-B = 7			Minin		ity = 0.60 n n = 0.013
LOC	CATION			RESIDENT	IAL AREA		JLATION		COMME	ERCIAL	IN	IDUSTRI	AL	0	FICE	C+I+I	INF	FILTRATI	ON	TOTAL			F	PIPE		
STREET FF	ROM	то	AREA (Ha)	POP.	CUMM AREA (Ha)	ULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	POP	ACCU. POP	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (I/s)	TOTAL FLOW (I/s)	LENGT H (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (FULL) (I/s)	VEL. (FULL) (m/s)
Churchill E Ave	Bldg	PROP SAN MH01	0.101	85.4	0.101	85.4	3.6	1.00	0.017	0.017	0.00	0.00	7.0	3.0	3.0	0.01	0.101	0.101	0.03	1.04	13.1	150	2.00%	PVC	21.54	1.22
NOTES Existin	ing inverts	and slopes a	re estima	ted. They are	e to be cor	nfirmed on-si	ite.]		Desigr Check Dwg. I	ТН	•	File Ref.:		·	•		torey Cor LOC	OJECT: ndo Rede CATION: rchil Aver	evelopment		Shee

APPENDIX D

Stormwater Management Calculations Watts Roof Drain Specification

	LRL File No.	220224
	Project:	CIV 7-Storey Condo Building
	Location:	424 Churchill Avenue
	Date:	April 9, 2023
	Designed:	Tamara Harb
ENGINEERING INGÉNIERIE	Drawing Reference:	C701/C702

Pre-Development Catchments

WATERSHED	C = 0.2	C=0.7	C = 0.90	Total Area (m ²)	Total Area (ha)	Combined C
EWS-01	119.4	0.0	893.0	1012.4	0.101	0.82
TOTAL	119.4	0.0	893.0	1012.4	0.101	0.82

Post-Development Catchments

WATERSHED	C = 0.20	C = 0.70	C = 0.90	Total Area (m ²)	Total Area (ha)	Combined C
WS-01(ROOF)	0.00	0.00	116.29	116.29	0.012	0.90
WS-02 (ROOF)	0.00	0.00	141.44	141.44	0.014	0.90
WS-03 (ROOF)	0.00	0.00	248.09	248.09	0.025	0.90
WS-04 (ROOF)	0.00	0.00	62.07	62.07	0.006	0.90
WS-05 (ROOF)	0.00	0.00	130.54	130.54	0.013	0.90
WS-06(UN-CONTROLLED)	0.00	0.00	313.97	313.97	0.031	0.90
TOTAL	0.0	0.0	1012.4	1012.4	0.101	0.90



LRL File No. Project: Location: Date: 220224 CIV 7-Storey Condo Building 424 Churchilll Ave April 9, 2023 Tamara Harb C601 Date: Designed: Drawing Ref.:

Stormwater Management Design Sheet-100 Year

Runoff Equation

- Q = 2.78CIA (L/s) C = Runoff coefficient I = Rainfall intensity (mm/hr) A = Area (ha) = A / (Td + C)^B
- T_c = Time of concentration (min)

Pre-development Stormwater Management - 2 Year Storm

2 year storm	= 732.95 / (Td	+ 6.199) ^{0.81} a = 732.951 b = 0.810 C = 6.199
C	= 0.50	max of 0.5 as per City of Ottawa
	= 76.8	mm/hr
То	= 10	min
Total Area	= 0.101	ha

Allowable Release Rate= 10.81 L/s

Post-development Stormwater Management

					∑R _{2&5}	∑R ₁₀₀
	Total Site Area =	0.070	ha	∑R=		
	WS-01(ROOF)	0.012	ha	R=	0.90	1.00
	WS-02 (ROOF)	0.014	ha	R=	0.90	1.00
Controlled	WS-03 (ROOF)	0.025	ha	R=	0.90	1.00
Controlled	WS-04 (ROOF)	0.006	ha	R=	0.90	1.00
	WS-05 (ROOF)	0.013	ha	R=	0.90	1.00
	Total Controlled	0.070	ha	∑R=	0.90	1.00
Un-controlled	WS-06 (UNCONTROLLED)	0.031	ha	R=	0.90	1.00
Un-controlled	Total Un-Controlled =	0.031	ha	∑R=	0.90	1.00

			Pos	st-development Stormwa	ter Management (Uncon	rolled Catchment W	<u>/S-06)</u>	
100 Year Storm Event:								
	I ₁₀₀ = 1735.6	88 / (Tc	i + 6.014) ^{0.820}		a =	1735.688	b = 0.820	C = 6.014
	Inter	nsity	Uncontrolled	Controlled Release Rate				
Time (min)	(mm	ı/hr)	Runoff (L/s)	Constant (L/s)	Total Release Rate (L/s)			
10	178	8.6	15.59	0.00	15.59			
				•				



LRL File No. 2202 Project: CIV Location: 424 Date: April Designed: Tam Drawing Ref.: C60

220224 CIV 7-Storey Condo Building 424 Churchilli Ave April 9, 2023 Tamara Harb C601

Ir	735.688 / (To Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9	L + 6.014) ^{0.820} Controlled Runoff (L/s)		a =	1735.688	h =	0.820	0 - 0 044
Time (min) (10 10 15 20 25 30 35 40 45 50 60 70 80 60	(mm/hr) 178.6 142.9 120.0 103.8				1755.000	D -	0.820	C = 6.014
Time (min) (10 10 15 20 25 30 35 40 45 50 60 70 80 60	(mm/hr) 178.6 142.9 120.0 103.8		Storage Required	d Controlled Release Rate		Total Dalassa	7	
15 20 25 30 35 40 45 50 60 70 80	142.9 120.0 103.8		Storage Volume (m ³)	Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)		
20 25 30 35 40 45 50 60 70 80	120.0 103.8	5.77	2.71	1.26	0.00	1.26	-	
25 30 35 40 45 50 60 70 80	103.8	4.62	3.02	1.26	0.00	1.26		
30 35 40 45 50 60 70 80		3.88	3.14	1.26	0.00	1.26	-	
35 40 45 50 60 70 80		3.36 2.97	<u>3.15</u> 3.08	1.26 1.26	0.00	1.26 1.26		
40 45 50 60 70 80	82.6	2.97	2.96	1.20	0.00	1.20	-	
50 60 70 80	75.1	2.43	2.81	1.26	0.00	1.26		
60 70 80	69.1	2.23	2.63	1.26	0.00	1.26		
70 80	64.0	2.07	2.42	1.26	0.00	1.26		
80	55.9	1.81	1.97	1.26	0.00	1.26	_	
	49.8 45.0	1.61 1.45	1.47 0.93	1.26 1.26	0.00	1.26	4	
	45.0	1.45	0.93	1.20	0.00	1.26	1	
100	37.9	1.23	0.00	1.26	0.00	1.26	1	
110	35.2	1.14	0.00	1.26	0.00	1.26]	
120	32.9	1.06	0.00	1.26	0.00	1.26		
Maximum Require	ired Roof Sto	Summary of Root prage (100 Year) = Proposed Head = pontrol Flow/Drain =	3.15 150 0.63	m ³ mm L/s	*An Emergency over	flow scupper is prov	ided above this height.	
		er of Roof Drains =	2					
		from Roof Drain =	1.26	L/s				
		ble Roof Surface =	116.28	m ²				
	R	oof Drain Model =	WATTS adjustable roof dra	in w/ weir opening-closed				
	Total St	orage Required =	3.15	m³				
	Availab	e Roof Storage =	6.03	m ³	refer to LRL Plan C6	01		
ar Storm Event:								
	735.688 / (Td	l + 6.014) ^{0.820}		a =	1735.688	b =	0.820	C = 6.014
I ₁₀₀ = 173			Storage Required	d	Ţ		0.820	C = 6.014
I ₁₀₀ = 173	735.688 / (Td Intensity (mm/hr)	l + 6.014) ^{0.820} Controlled Runoff (L/s)	Storage Required		1735.688 Uncontrolled Runoff (L/s)	b = Total Release Rate (L/s)	0.820	C = 6.014
I ₁₀₀ = 173 Time (min) (10	Intensity (mm/hr) 178.6	Controlled Runoff (L/s) 7.02	Storage Volume (m ³) 3.46	d Controlled Release Rate Constant (L/s) 1.26	Uncontrolled Runoff (L/s) 0.00	Total Release Rate (L/s) 1.26	0.820	C = 6.014
I ₁₀₀ = 173 Time (min) (10 15	Intensity (mm/hr) 178.6 142.9	Controlled Runoff (L/s) 7.02 5.62	Storage Volume (m ³) 3.46 3.92	d Controlled Release Rate Constant (L/s) 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00	Total Release Rate (L/s) 1.26 1.26	0.820	C = 6.014
I ₁₀₀ = 173 Time (min) (10 15 20	Intensity (mm/hr) 178.6 142.9 120.0	Controlled Runoff (L/s) 7.02 5.62 4.72	Storage Volume (m ³) 3.46 3.92 4.15	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00	Total Release Rate (L/s) 1.26 1.26 1.26	0.820	C = 6.014
I ₁₀₀ = 173 Time (min) (10 15 20 25	Intensity (mm/hr) 178.6 142.9 120.0 103.8	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08	Storage Volume (m ³) 3.46 3.92 4.15 4.23	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00	Total Release Rate (L/s) 1.26 1.26 1.26 1.26	0.820	C = 6.014
I ₁₀₀ = 173	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61	Storage Volume (m³) 3.46 3.92 4.15 4.23	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
I ₁₀₀ = 173 Time (min) (10 15 20 25	Intensity (mm/hr) 178.6 142.9 120.0 103.8	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08	Storage Volume (m ³) 3.46 3.92 4.15 4.23	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00	Total Release Rate (L/s) 1.26 1.26 1.26 1.26	0.820	C = 6.014
I ₁₀₀ = 173	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25	Storage Volume (m ³) 3.46 3.92 4.15 4.23 4.23 4.17	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
I ₁₀₀ = 173	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6 75.1 69.1 64.0	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25 2.95 2.72 2.51	Storage Volume (m³) 3.46 3.92 4.15 4.23 4.23 4.17 4.07 3.93 3.76	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
I ₁₀₀ = 173	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6 75.1 69.1 69.1 64.0 55.9	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25 2.95 2.72 2.72 2.51 2.20	Storage Volume (m ³) 3.46 3.92 4.15 4.23 4.23 4.17 4.07 3.93 3.76 3.38	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
Item Irent 10 (1) 15 (2) 20 (2) 30 (3) 35 (4) 40 (4) 50 (6) 70 (1)	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6 75.1 69.1 64.0 55.9 49.8	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25 2.95 2.72 2.51 2.25 2.20 1.96	Storage Volume (m ³) 3.46 3.92 4.15 4.23 4.23 4.17 4.07 3.93 3.76 3.38 2.93	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
L ₁₀₀ = 173	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6 75.1 69.1 64.0 55.9 49.8 45.0	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25 2.95 2.75 2.77 2.51 2.20 1.96 1.77	Storage Volume (m ³) 3.46 3.92 4.15 4.23 4.23 4.17 4.07 3.93 3.76 3.38 2.93 2.44	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
Interference Interference 10 10 15 20 25 25 30 35 40 45 50 60 70 80 90 90	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6 75.1 69.1 64.0 55.9 49.8 45.0 41.1	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25 2.95 2.72 2.51 2.20 1.96 1.77 1.62	Storage Volume (m ³) 3.46 3.92 4.15 4.23 4.23 4.23 4.17 4.07 3.93 3.76 3.38 2.93 2.44 1.93	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
L ₁₀₀ = 173	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6 75.1 69.1 64.0 55.9 49.8 45.0	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25 2.95 2.75 2.77 2.51 2.20 1.96 1.77	Storage Volume (m ³) 3.46 3.92 4.15 4.23 4.23 4.17 4.07 3.93 3.76 3.38 2.93 2.44	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014
Time (min) Ir 10 (1) 15 (2) 20 (2) 30 (2) 35 (2) 40 (2) 45 (2) 50 (2) 60 (2)	Intensity (mm/hr) 178.6 142.9 120.0 103.8 91.9 82.6 75.1 69.1 64.0 55.9 49.8	Controlled Runoff (L/s) 7.02 5.62 4.72 4.08 3.61 3.25 2.95 2.72 2.51 2.25 2.20 1.96	Storage Volume (m ³) 3.46 3.92 4.15 4.23 4.23 4.17 4.07 3.93 3.76 3.38 2.93	d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.820	C = 6.014



LRL File No. 2 Project: C Location: 4 Date: A Designed: T Drawing Ref.: C

220224 CIV 7-Storey Condo Building 424 Churchilli Ave April 9, 2023 Tamara Harb C601

Post-development Stormwater Management (WS-03 ROOF)

Stormwater Management Design Sheet-100 Year

		l + 6.014) ^{0.820}		a =	1735.688	b = 0.820	C = 6.014
	ŕ				т		
	Intensity	Controlled	Storage Require	Controlled Release Rate	Uncontrolled	Total Release	
Time (min)	(mm/hr)	Runoff (L/s)	Storage Volume (m ³)	Constant (L/s)	Runoff (L/s)	Rate (L/s)	
10	178.6	12.32	6.63	1.26	0.00	1.26	
15	142.9	9.86	7.74	1.26	0.00	1.26	
20	120.0	8.27	8.42	1.26	0.00	1.26	
25	103.8	7.16	8.85	1.26	0.00	1.26	
30	91.9	6.34	9.14	1.26	0.00	1.26	
35	82.6	5.70	9.31	1.26	0.00	1.26	
40	75.1	5.18	9.41	1.26	0.00	1.26	
45	69.1	4.76	9.46	1.26	0.00	1.26	
50	64.0	4.41	9.45	1.26	0.00	1.26	
60	55.9	3.86	9.34	1.26	0.00	1.26	
70	49.8	3.43	9.13	1.26	0.00	1.26	
80	45.0	3.10	8.85	1.26	0.00	1.26	
90	41.1	2.84	8.51	1.26	0.00	1.26	
100	37.9	2.61	8.13	1.26	0.00	1.26	
110	35.2	2.43	7.71	1.26	0.00	1.26	
120	32.9	2.27	7.26	1.26	0.00	1.26	
Maximum	Required Roof Sto	<u>Summary of Roof</u> prage (100 Year) = Proposed Head =	9.46	m ³	*An Emergency cycr	flow scupper is provided abo	ave this height
		ntrol Flow/Drain =		L/s	, at Emergency over	souppor is provided abt	ste alle height.
		r of Roof Drains =		L-0			
		from Roof Drain =		L/s			
		ble Roof Surface =		m ²			
				ain w/ weir opening-closed			
	Total St	orage Required =	9.46	m ³			
		le Roof Storage =	13.17	m ³	refer to LRL Plan C6	01	

I ₁	₀₀ = 1735.688 / (To	d + 6.014) ^{0.820}		a = 1735.688			b = 0.820	
			Storage Require	d	ſ			
	Intensity	Controlled		Controlled Release Rate	Uncontrolled	Total Release		
Time (min)	(mm/hr)	Runoff (L/s)	Storage Volume (m ³)	Constant (L/s)	Runoff (L/s)	Rate (L/s)		
10	178.6	3.08	1.09	1.26	0.00	1.26		
15	142.9	2.47	1.09	1.26	0.00	1.26		
20	120.0	2.07	0.97	1.26	0.00	1.26		
25	103.8	1.79	0.80	1.26	0.00	1.26		
30	91.9	1.59	0.59	1.26	0.00	1.26		
35	82.6	1.42	0.35	1.26	0.00	1.26		
40	75.1	1.30	0.09	1.26	0.00	1.26		
45	69.1	1.19	0.00	1.26	0.00	1.26		
50	64.0	1.10	0.00	1.26	0.00	1.26		
60	55.9	0.96	0.00	1.26	0.00	1.26		
70	49.8	0.86	0.00	1.26	0.00	1.26		
80	45.0	0.78	0.00	1.26	0.00	1.26		
90	41.1	0.71	0.00	1.26	0.00	1.26		
100	37.9	0.65	0.00	1.26	0.00	1.26		
110	35.2	0.61	0.00	1.26	0.00	1.26		
120	32.9	0.57	0.00	1.26	0.00	1.26		
		Summary of Roo	f Storage					
Maximum	Required Roof Ste	orage (100 Year) =	1.09	m ³				
		Proposed Head =	150	mm	*An Emergency over	rflow scupper is provid	ded above this height	
		ontrol Flow/Drain =	0.63	L/s				
		er of Roof Drains =	2					
	Total Flow	from Roof Drain =	1.26	L/s				
	Availal	ble Roof Surface =	62.07	m ²				



LRL File No. Project: Location: Date: Designed: Drawing Ref.:

220224 CIV 7-Storey Condo Building 424 Churchilli Ave April 9, 2023 Tamara Harb C601

Post-development Stormwater Management (WS-05 ROOF)

Stormwater Management Design Sheet-100 Year

I ₁	₁₀₀ = 1735.688 / (To	d + 6.014) ^{0.820}		a =	= 1735.688	b =	0.820	C = 6.014
			Storage Require	d	Т			
	Intensity	Controlled		Controlled Release Rate	Uncontrolled	Total Release		
Time (min)	(mm/hr)	Runoff (L/s)	Storage Volume (m ³)	Constant (L/s)	Runoff (L/s)	Rate (L/s)		
10	178.6	6.48	3.13	1.26	0.00	1.26		
15	142.9	5.19	3.53	1.26	0.00	1.26		
20	120.0	4.35	3.71	1.26	0.00	1.26		
25	103.8	3.77	3.76	1.26	0.00	1.26		
30	91.9	3.33	3.73	1.26	0.00	1.26		
35	82.6	3.00	3.65	1.26	0.00	1.26		
40	75.1	2.73	3.52	1.26	0.00	1.26		
45	69.1	2.51	3.36	1.26	0.00	1.26		
50	64.0	2.32	3.18	1.26	0.00	1.26		
60	55.9	2.03	2.77	1.26	0.00	1.26		
70	49.8	1.81	2.30	1.26	0.00	1.26		
80	45.0	1.63	1.79	1.26	0.00	1.26		
90	41.1	1.49	1.25	1.26	0.00	1.26		
100	37.9	1.38	0.69	1.26	0.00	1.26		
110	35.2	1.28	0.12	1.26	0.00	1.26		
120	32.9	1.19	0.00	1.26	0.00	1.26		
Maximum		Summary of Roof	<u>Storage</u> 3.76	m³				
IVIAXIIIIUII	r required roor ou	Proposed Head =	150	mm	*An Emergency over	flow scupper is provid	ded above this heid	ht
	C	ontrol Flow/Drain =	0.63	L/s	An Emergency over		aca above tills neigi	
		er of Roof Drains =	2					
		from Roof Drain =	1.26	L/s				
		ble Roof Surface =	131	m ²				
				ain w/ weir opening-closed				
		Roof Drain Model =	WATTS adjustable root dra					
		Roof Drain Model =	WATTS adjustable root dra					
	F	Roof Drain Model =	3.76	m ³ m ³				

CATCHMENT AREAS	DRAINAGE AREAS (ha)	100-YEAR RELEASE RATE	100-YEAR REQUIRED STORAGE (m3)	TOTAL AVAILABLE STORAGE (m3)
WS-01(ROOF)	0.012	1.26	3.15	6.03
WS-02 (ROOF)	0.014	1.26	4.23	4.55
WS-03 (ROOF)	0.025	1.26	9.46	13.17
WS-04 (ROOF)	0.006	1.26	1.09	3.14
WS-05 (ROOF)	0.013	1.26	3.76	6.64
TOTAL CONTROLLED	0.070	6.30	21.69	33.53
WS-06 (UNCONTROLLED)	0.031	15.59	0	0
TOTAL UNCONTROLLED	0.031	15.59	0.00	0.00
TOTAL	0.101	21.89	21.69	33.53



Runoff Equation

 LRL File No.
 220224

 Project:
 CIV 7-Storey Condo Building

 Location:
 424 Churchill Ave

 Date:
 April 9, 2023

 Designed:
 Tamara Harb

 Drawing Ref.:
 C601

Stormwater Management Design Sheet 5-YR

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Q = 2.78CIA (L/s) C = Runoff coefficient I = Rainfall intensity (mm/hr) = A / (Td + C)^B A = Area (ha) T_c = Time of concentration (min) Pre-development Stormwater Management - 2 Year Storm

2 year storm	12 = 7	32.95 / (Td ·	+ 6.199) ^{0.81} a	a = 732.951	b = 0.810	C =	6.199
	C =	0.50	max of 0.5 as per City of Ottawa				
	=	76.8	mm/hr				
	Tc =	10	min				
Total	Area =	0.101	ha				

Allowable Release Rate= 10.81 L/s

Post-development Stormwater Management

					∑R _{2&5}
	Total Site Area =	0.070	ha	∑R=	
	WS-01(ROOF)	0.012	ha	R=	0.90
	WS-02 (ROOF)	0.014	ha	R=	0.90
Controlled	WS-03 (ROOF)	0.025	ha	R=	0.90
Controlled	WS-04 (ROOF)	0.006	ha	R=	0.90
	WS-05 (ROOF)	0.013	ha	R=	0.90
	Total Controlled	0.070	ha	∑R=	0.90
Un-controlled	WS-06 (UNCONTROLLED)	0.031	ha	R=	0.90
Un-controlled	Total Un-Controlled =	0.031	ha	∑R=	0.90

		Pos	st-development Stormwa	Post-development Stormwater Management (Uncontrolled Catchment WS-06)												
5 Year Storm Event:																
	ls = 998.071/ (Td -	+ 6.053) ^{0.814}		a =	998.071	b = 0.814	C =	6.053								
	Intensity	Uncontrolled	Controlled Release Rate		1											
Time (min)	(mm/hr)	Runoff (L/s)	Constant (L/s)	Total Release Rate (L/s)												
10	104.2	8.18	0.00	8.18	1											



LRL File No.220Project:CIVLocation:42Date:ApDesigned:TaiDrawing Ref.:C6

220224 CIV 7-Storey Condo Building 424 Churchilli Ave April 9, 2023 Tamara Harb C601

			Post-developmen	t Stormwater Managemei	nt (WS-01 ROOF)				
ear Storm Event:									
ls	= 998.071/ (Td +	6.053) ^{0.814}		a =	998.071	b =	0.814	C =	6.053
			Storage Require	d	T				
Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m ³)	Controlled Release Rate	Uncontrolled	Total Release			
Time (min) 10	104.2	3.03	Storage Volume (m ³) 1.06	Constant (L/s) 1.26	Runoff (L/s) 0.00	Rate (L/s) 1.26			
15	83.6	2.43	1.05	1.26	0.00	1.26			
20	70.3	2.04	0.94	1.26	0.00	1.26			
25	60.9	1.77	0.77	1.26	0.00	1.26			
30 35	53.9 48.5	1.57 1.41	0.56	1.26 1.26	0.00	1.26 1.26			
40	44.2	1.29	0.06	1.26	0.00	1.26			
45	40.6	1.18	0.00	1.26	0.00	1.26			
50	37.7	1.10	0.00	1.26	0.00	1.26			
60 70	32.9 29.4	0.96	0.00	1.26	0.00	1.26 1.26			
80	26.6	0.03	0.00	1.20	0.00	1.20			
90	24.3	0.71	0.00	1.26	0.00	1.26			
100	22.4	0.65	0.00	1.26	0.00	1.26			
110	20.8	0.61	0.00	1.26	0.00	1.26			
120	19.5	0.57	0.00	1.26	0.00	1.26			
Maximum F	Co Numbe	Summary of Roof prage (100 Year) = Proposed Head = portrol Flow/Drain = er of Roof Drains = from Roof Drain =	Storage 1.06 150 0.63 2 1.26	m ³ mm L/s	*An Emergency over	flow scupper is provid	ded above this height.		
		ble Roof Surface =	116.28	m ²					
	Availai	Je Roor Sunace -							
			WATTS adjustable roof dra	ain w/ weir opening-closed					
	F		WATTS adjustable roof dra 1.06	m ³					
	F Total St	Roof Drain Model =			refer to LRL Plan C6	01			
	F Total St	coof Drain Model =	1.06 6.03	m ³		01			_
ear Storm Event:	F Total St	coof Drain Model =	1.06 6.03	m ³ m ³		01		_	_
	F Total St	koof Drain Model = orage Required = le Roof Storage =	1.06 6.03	m ³ m ³ t Stormwater Managemen			0.814	C =	6.053
	F Total St Availab	koof Drain Model = orage Required = le Roof Storage =	1.06 6.03 Post-developmen	m ³ m ³ <u>t Stormwater Managemen</u> a =	nt (WS-02 ROOF)		0.814	C =	6.053
ls	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814}	1.06 6.03 Post-developmen Storage Require	m ³ m ³ t Stormwater Managemen a = d Controlled Release Rate	nt (WS-02 ROOF) 998.071 Uncontrolled	b = Total Release	0.814	C =	6.053
ls Time (min)	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s)	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³)	m ³ m ³ <u>t Stormwater Managemen</u> a = d <u>Controlled Release Rate</u> Constant (L/s)	nt (WS-02 ROOF) 998.071 Uncontrolled Runoff (L/s)	b = Total Release Rate (L/s)	0.814	C =	6.053
Is Time (min) 10	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s) 3.69	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46	m ³ m ³ t Stormwater Managemen a = d Controlled Release Rate Constant (L/s) 1.26	nt (WS-02 ROOF) 998.071 Uncontrolled	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
ls Time (min)	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s)	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³)	m ³ m ³ <u>t Stormwater Managemen</u> a = d <u>Controlled Release Rate</u> Constant (L/s)	998.071 Uncontrolled Runoff (L/s) 0.00	b = Total Release Rate (L/s)	0.814	C =	6.053
Is Time (min) 10 15 20 25	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.16	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34	m ³ m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26	998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00	b = Total Release Rate (L/s) 1.26 1.26 1.26 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.16 1.91	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17	m ³ m ³ t Stormwater Managemen a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00	b = Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = - 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.96 2.49 2.16 1.91 1.72	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96	m ³ m ³ t Stormwater Managemen a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00	b = Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.49 2.16 1.91 1.72 1.56	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73	m ³ m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	b = Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = - 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.96 2.49 2.16 1.91 1.72	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96	m ³ m ³ t Stormwater Managemen a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00	b = Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = b 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.49 2.16 1.91 1.72 1.56 1.44 1.33 1.17	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00	m ³ m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	b = Total Release Rate (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.16 1.91 1.72 1.56 1.44 1.33 1.17 1.04	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.00	m ³ m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.2	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = le Roof Storage = controlled Runoff (L/s) 3.69 2.96 2.96 2.96 2.96 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.00	m ³ m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	998.071 Uncontrolled Runoff (L/s) 0.00	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = be 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.49 2.16 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94 0.86	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.00 0.00 0.00	m ³ m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = + 6.053) ^{0.814} Controlled Runoff (L/s) 3.669 2.96 2.49 2.16 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94 0.86 0.79	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.00 0.00 0.00 0.00	m ³ m ³ t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = be 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.49 2.16 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94 0.86	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.00 0.00 0.00	m ³ m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110	F Total St Availab = 998.071/ (Td - Intensity (mm/hr) 104.2 83.6 70.3 60.9 53.9 53.9 53.9 53.9 48.5 44.2 40.6 37.7 32.9 48.5 44.2 40.6 37.7 32.9 48.5 44.2 40.6 37.7 32.9 4 8.5 40.6 2.0 8	koof Drain Model = orage Required = le Roof Storage = le Roof Storage = controlled Runoff (L/s) 3.69 2.96 2.96 2.96 2.96 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94 0.86 0.79 0.74	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.00 0.00 0.00 0.00 0.00 0.00	m³ m3 t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.	(WS-02 ROOF) (WS-02 ROOF) (Uncontrolled Runoff (L/s) 0.00	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = le Roof Storage = controlled Runoff (L/s) 3.69 2.96 2.96 2.96 2.96 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94 0.86 0.79 0.74	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	m³ m3 t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.	(WS-02 ROOF) (WS-02 ROOF) (Uncontrolled Runoff (L/s) 0.00	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = be 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.49 2.49 1.62 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94 0.86 0.79 0.74 0.69 Summary of Roof	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.0	m³ m³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.	(WS-02 ROOF) (WS-02 ROOF) (Uncontrolled Runoff (L/s) 0.00	b = Total Release Rate (L/s) 1.26	0.814	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120	F Total St Availab	koof Drain Model = orage Required = le Roof Storage = - 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.16 1.91 1.56 1.44 1.33 1.17 1.04 0.94 0.86 0.79 0.74 0.69 Summary of Roof orage (100 Year) =	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.0	m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.2	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26		C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120	F Total St Availab = 998.071/ (Td - Intensity (mm/hr) 104.2 83.6 70.3 60.9 53.9 48.5 44.2 40.6 37.7 32.9 29.4 20.4 20.4 20.4 20.8 19.5 Required Roof St	koof Drain Model = orage Required = le Roof Storage = be 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.49 2.49 2.49 1.62 1.91 1.72 1.56 1.44 1.33 1.17 1.04 0.94 0.86 0.79 0.74 0.69 Summary of Roof	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.0	m³ m³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26	0.814 ded above this height.	C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120	F Total St Availab a 998.071/ (Td - Intensity (mm/hr) 104.2 83.6 70.3 60.9 53.9 53.9 53.9 48.5 44.2 40.6 37.7 32.9 48.5 44.2 40.6 22.4 20.8 19.5 Required Roof Str Ca Numbr	toof Drain Model = orage Required = le Roof Storage = le Roof Storage = - 6.053) ^{0.814} Controlled Runoff (L/s) 3.69 2.96 2.96 2.16 1.91 1.56 1.44 1.33 1.17 1.04 0.94 0.669 0.74 0.69 Summary of Roof portor Flow/Drain = of Orajan =	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.03 0.05 0.03 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.0	m ³ m ³ t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.26 1.26 1.26 1.26 1.26 1.26 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26		C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120	F Total St Availab = 998.071/ (Td - 104.2 83.6 70.3 60.9 53.9 48.5 44.2 40.6 37.7 32.9 48.5 44.5 44.5 40.6 20.4 20.4 20.4 20.4 20.4 20.8 19.5 Required Roof Sta CC Number Total Flow	toof Drain Model = orage Required = le Roof Storage = le Roof Storage = controlled Runoff (L/s) 3.69 2.96 2.96 2.96 2.96 1.91 1.72 1.56 1.44 0.33 1.17 0.66 0.79 0.74 0.69 Summary of Roof orage (100 Year) = Proposed Head = of Orains = roof Roof Drains =	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.0	m ³ t Stormwater Managemen t Stormwater Managemen a = d Controlled Release Rate Constant (L/s) 1.26 1.25 1.26	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26		C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120	F Total St Availab = 998.071/ (Td - Intensity (mm/hr) 104.2 83.6 70.3 60.9 53.9 44.5 44.2 40.6 70.3 60.9 53.9 44.5 44.2 40.6 24.3 22.4 20.8 19.5 Required Roof Str Numbe Total Flow Availab	koof Drain Model = orage Required = le Roof Storage = le Roof Storage = controlled Runoff (L/s) 3.69 2.96 2.49 2.16 1.91 1.72 1.56 1.44 0.94 0.86 0.74 0.69 Summary of Roof proposed Heag = ontrol Flow/Drain = ro Roof Drains = le Roof Surface =	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.03 0.05 0.03 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.0	m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.2	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26		C =	6.053
Is Time (min) 10 15 20 25 30 35 40 45 50 60 70 80 90 100 110 120	F Total St Availab = 998.071/ (Td - Intensity (mm/hr) 104.2 83.6 70.3 60.9 53.9 53.9 53.9 53.9 48.5 44.2 40.6 37.7 32.9 48.5 44.5 44.2 40.6 37.7 32.9 48.5 44.5 40.6 20.8 19.5 Required Roof Sta CC Number Total Flow Availab	koof Drain Model = orage Required = le Roof Storage = le Roof Storage = controlled Runoff (L/s) 3.69 2.96 2.49 2.16 1.91 1.72 1.56 1.44 0.94 0.86 0.74 0.69 Summary of Roof proposed Heag = ontrol Flow/Drain = ro Roof Drains = le Roof Surface =	1.06 6.03 Post-developmen Storage Require Storage Volume (m ³) 1.46 1.53 1.47 1.34 1.17 0.96 0.73 0.48 0.22 0.00 0.63 2 1.26 141	m ³ t Stormwater Management t Stormwater Management a = d Controlled Release Rate Constant (L/s) 1.26 1.2	998.071 998.071 Uncontrolled Runoff (L/s) 0.00 0.	b = Total Release Rate (L/s) 1.26		C =	6.053



LRL File No. Project: Location: Date: Designed: Drawing Ref.:

220224 CIV 7-Storey Condo Building 424 Churchilli Ave April 9, 2023 Tamara Harb C601

Post-development Stormwater Management (WS-03 ROOF)

	l₅ = 998.071/ (Td +	6.053) ^{0.814}		a =	998.071	b = 0	.814	C =	6.0
]		Storage Require	d	T				
	Intensity	Controlled		Controlled Release Rate	Uncontrolled	Total Release			
Time (min)	(mm/hr)	Runoff (L/s)	Storage Volume (m ³)	Constant (L/s)	Runoff (L/s)	Rate (L/s)			
10	104.2	6.47	3.12	1.26	0.00	1.26			
15	83.6	5.19	3.53	1.26	0.00	1.26			
20	70.3	4.36	3.72	1.26	0.00	1.26			
25	60.9	3.78	3.78	1.26	0.00	1.26			
30	53.9	3.35	3.76	1.26	0.00	1.26			
35	48.5	3.01	3.68	1.26	0.00	1.26			
40	44.2	2.74	3.56	1.26	0.00	1.26			
45	40.6	2.52	3.41	1.26	0.00	1.26			
50	37.7	2.34	3.23	1.26	0.00	1.26			
60	32.9	2.04	2.83	1.26	0.00	1.26			
70	29.4	1.82	2.37	1.26	0.00	1.26			
80	26.6	1.65	1.87	1.26	0.00	1.26			
90	24.3	1.51	1.34	1.26	0.00	1.26			
100	22.4	1.39	0.79	1.26	0.00	1.26			
110	20.8	1.29	0.21	1.26	0.00	1.26			
120	19.5	1.21	0.00	1.26	0.00	1.26			
		Summary of Roo	f Storage						
	Required Roof Sto	orage (100 Year) =	3.78	m ³					
Maximum				mm	*An Emergency over	flow scupper is provide	ed above this he	eight.	
Maximum		Proposed Head =	150	11011	An Emergency over				
Maximum		Proposed Head = ontrol Flow/Drain =	0.63	L/s	An Emergency over				
Maximum	Co								
Maximum	Co	ntrol Flow/Drain =	0.63	L/s L/s	An Emergency over				
Maximum	Co Numbe Total Flow	ntrol Flow/Drain = r of Roof Drains =	0.63 2	L/s	, an Emergency over				
Maximum	Cc Numbe Total Flow Availab	ntrol Flow/Drain = r of Roof Drains = from Roof Drain = le Roof Surface =	0.63 2 1.26	L/s m ²	The Emergency over				
Maximum	Cc Numbe Total Flow Availab R	ntrol Flow/Drain = r of Roof Drains = from Roof Drain = le Roof Surface =	0.63 2 1.26 248	L/s m ²	fur Energency over				

			Post-developmer	t Stormwater Managemen	t (WS-04 ROOF)				
r Storm Event:									
l	5 = 998.071/ (Td +	6.053) ^{0.814}		a =	998.071	b =	0.814	C =	6.053
			Storage Require	d	r				
	Intensity	Controlled		Controlled Release Rate	Uncontrolled	Total Release]		
Time (min)	(mm/hr)	Runoff (L/s)	Storage Volume (m ³)	Constant (L/s)	Runoff (L/s)	Rate (L/s)	-		
10	104.2	1.62	0.21	1.26	0.00	1.26	-		
15	83.6	1.30	0.03	1.26	0.00	1.26	-		
20	70.3	1.09	0.00	1.26	0.00	1.26	4		
25	60.9	0.95	0.00	1.26	0.00	1.26	-		
30	53.9	0.84	0.00	1.26	0.00	1.26	-		
35	48.5	0.75	0.00	1.26	0.00	1.26			
40	44.2	0.69	0.00	1.26	0.00	1.26			
45	40.6	0.63	0.00	1.26	0.00	1.26			
50	37.7	0.58	0.00	1.26	0.00	1.26			
60	32.9	0.51	0.00	1.26	0.00	1.26			
70	29.4	0.46	0.00	1.26	0.00	1.26			
80	26.6	0.41	0.00	1.26	0.00	1.26			
90	24.3	0.38	0.00	1.26	0.00	1.26			
100	22.4	0.35	0.00	1.26	0.00	1.26			
110	20.8	0.32	0.00	1.26	0.00	1.26			
120	19.5	0.30	0.00	1.26	0.00	1.26			
		Summary of Roo		m³					
Maximum I		orage (100 Year) =							
		Proposed Head =			An Emergency over	rflow scupper is provi	ded above this heigh	nt.	
		ontrol Flow/Drain =		L/s					
		er of Roof Drains =							
		from Roof Drain =		L/s					
		ole Roof Surface = Roof Drain Model =	62.07 WATTS adjustable roof dra	m ² ain w/ weir opening-closed					
	Total St	orage Required =	0.21	m ³					
		le Roof Storage =			refer to LRL Plan C6				

Stormwater Management Design Sheet 5-YR



LRL File No. Project: Location: Date: Designed: Drawing Ref.:

220224 CIV 7-Storey Condo Building 424 Churchilli Ave April 9, 2023 Tamara Harb C601

Post-development Stormwater Management (WS-05 ROOF)

Stormwater Management Design Sheet 5-YR

	ls = 998.071/ (Td ·	+ 6.053) ^{0.814}		a =	998.071	b =	0.814	C =	6.
			Storage Require	d	ĺ		Total Release Rate (L/s) 1.26		
Time (min)	Intensity	Controlled		Controlled Release Rate	Uncontrolled				
Time (min) 10	(mm/hr) 104.2	Runoff (L/s) 3.40	Storage Volume (m ³) 1.29	Constant (L/s) 1.26	Runoff (L/s) 0.00				
10	83.6	2.73	1.32	1.26	0.00				
20	70.3	2.73	1.24	1.26	0.00				
20	60.9	1.99	1.09	1.26	0.00				
30	53.9	1.99	0.90	1.20	0.00				
35	48.5	1.58	0.90	1.20	0.00				
40	40.5	1.44	0.00	1.26	0.00				
45	40.6	1.33	0.44	1.26	0.00				
50	37.7	1.23	0.00	1.26	0.00				
60	32.9	1.08	0.00	1.26	0.00				
70	29.4	0.96	0.00	1.26	0.00				
80	26.6	0.87	0.00	1.26	0.00				
90	24.3	0.79	0.00	1.26	0.00				
100	22.4	0.73	0.00	1.26	0.00				
110	20.8	0.68	0.00	1.26	0.00				
120	19.5	0.64	0.00	1.26	0.00	1.26			
		Summary of Roo	f Storage						
Maximum	Required Roof St	orage (100 Year) =	1.32	m ³					
		Proposed Head =		mm	*An Emergency ove	orflow scupper is provid	ded above this he	ight.	
	C	ontrol Flow/Drain =	0.63	L/s					
	Numbe	er of Roof Drains =	2						
	Total Flow	from Roof Drain =	1.26	L/s					
	TOLAT FIOW		131	m ²					
		ble Roof Surface =							
	Availa		WATTS adjustable roof dra	in w/ weir opening-closed					
	Availa F		WATTS adjustable roof dra	in w/ weir opening-closed m ³					

SUN	IMARY OF R	ELEASE RATES	AND STORAGE VOLUME	ES
CATCHMENT AREAS	DRAINAGE AREAS (ha)	5-YEAR RELEASE RATE	5-YEAR REQUIRED STORAGE (m3)	TOTAL AVAILABLE STORAGE (m3)
WS-01(ROOF)	0.012	1.26	1.06	6.03
WS-02 (ROOF)	0.014	1.26	1.53	4.55
WS-03 (ROOF)	0.025	1.26	3.78	13.17
WS-04 (ROOF)	0.006	1.26	0.21	3.14
WS-05 (ROOF)	0.013	1.26	1.32	6.64
TOTAL CONTROLLED	0.070	6.30	7.91	33.53
WS-06 (UNCONTROLLED)	0.031	8.18	0	0
TOTAL UNCONTROLLED	0.031	8.18	0.00	0.00
TOTAL	0.101	14.48	7.91	33.53

LRL Associates Ltd. Storm Design Sheet



 LRL File No.
 220224

 Project:
 CIV 7-Storey Condo Building

 Location:
 424 Churchill Avenue

 Date:
 April 9, 2023

 Designed:
 Tamara Harb

 Drawing Reference:
 C.401

	Storm Design P	rs
Rational Method Q = 2.78CIA		Ottawa Macdonald-Cartier International Airport IDF curve
		equation (10 year event, intensity in mm/hr)
Q = Peak flow in litres per second (L/s)	Runoff Coefficient (C)	l100 = 1735.688 / (Td + 6.014)0.820
A = Drainage area in hectares (ha)	Grass 0.2	Min. velocity = 0.80 m/s
C = Runoff coefficient	Gravel 0.7	Manning's "n" = 0.013
I = Rainfall intensity (mm/hr)	Asphalt / rooftop 0.9	

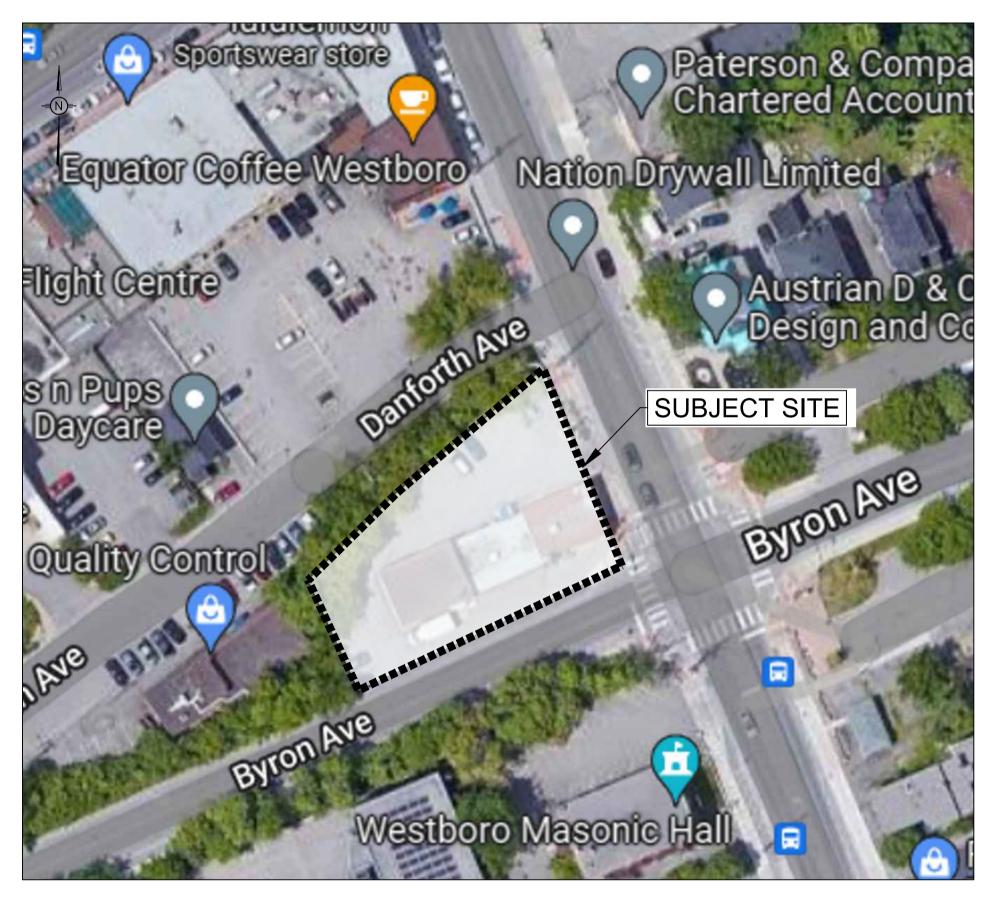
LO	CATION			AREA (ha)	ha) FLOW							ç	STORM S	EWER					
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.70	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Controlled Flow Q (L/s)	Pipe Diameter (mm)	Туре	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q _{FULL})
WS-01 to WS-05	Building	PROP STM MH01	0.000	0.000	0.070	0.175	0.175	10.00	178.6	31.28	6.30	250	PVC	2.00%	11.6	84.1	1.71	0.11	0.37

APPENDIX E

Civil Engineering Drawings

PROPOSED 7 STOREY CONDO REDEVELOPMENT 424 CHURCHILL AVE, OTTAWA ON

REVISION 3



KEY PLAN (N.T.S.)

DRAWING INDEX

TITLE PAGE

SEDIMENT AND EROSION CONTROL PLAN

DEMOLITION PLAN

GRADING AND DRAINAGE PLAN

SERVICING PLAN

STORMWATER MANAGEMENT PLAN

PRE-DEVELOPMENT WATERSHED PLAN

POST-DEVELOPMENT WATERSHED PLAN

CONSTRUCTION DETAIL PLAN



ENGINEERING | INGÉNIERIE

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C101	
C102	
C301	
C401	
C601	
C701	
C702	
C901	



GENERAL NOTES

- 1. ALL WORKS MATERIALS SHALL CONFIRM TO THE LAST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
- 2. THE CONTRACTORS SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTORS SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
- 3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION, ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTORS TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT CONTRACTORS EXPENSE.
- 4. ANY AREA BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE RELOCATING OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DETECTED BY THE ENGINEER AT THE EXPENSE OF DEVELOPERS
- 5. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS'. THE GENERAL CONTRACTORS SHALL BE DEEMED TO BE THE 'CONTRACTOR' AS DEFINED IN THE ACT. 6. ALL THE CONSTRUCTION SIGNAGE MUST CONFIRM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC
- CONTROL DEVICES PER LATEST AMENDMENT 7. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THE CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
- 8. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
- 9. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
- 10. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT. 11. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT
- 12. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL
- INSTRUMENT PRIOR TO BACKFILLING. 13. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME. 14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS
- SPECIFIED BY OPSD IS EXCEEDED.
- 15. ALL PIPE/CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS. 16. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
- 17. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR, REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING/REMOVAL. 18. DRAWINGS SHALL BE READ ON CONJUNCTION WITH ARCHITECTURAL SITE PLAN.
- 19. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ON SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS. 20. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE. 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 ACKNOWLEDGES THAT SURFACE EROSION AND SEDIMENT RUNOFF RESULTING FROM THEIR CONSTRUCTION OPERATIONS HAS POTENTIAL TO CAUSE A DETRIMENTAL IMPACT TO ANY DOWNSTREAM WATERCOURSE OR SEWER. AND THAT ALL CONSTRUCTION OPERATIONS THAT MAY IMPACT UPON WATER QUALITY SHALL BE CARRIED OUT IN MANNER THAT STRICTLY MEETS THE REQUIREMENT OF ALL APPLICABLE LEGISLATION AND REGULATIONS.

AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THEIR OPERATIONS, AND SUPPLYING AND INSTALLING ANY APPROPRIATE CONTROL MEASURES, SO AS TO PREVENT SEDIMENT LADEN RUNOFF ENTERING ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA.

THE CONTRACTOR ACKNOWLEDGES THAT NO ONE MEASURE IS LIKELY TO BE 100% EFFECTIVELY FOR EROSION PROTECTION AND CONTROLLING SEDIMENT RUNOFF AND DISCHARGES FROM THE SITE. THEREFORE, WHERE NECESSARY THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES ARRANGED IN SUCH MANNER AS TO MITIGATE SEDIMENT RELEASE FROM THE CONSTRUCTION OPERATIONS AND ACHIEVE SPECIFIC MAXIMUM PERMITTED CRITERIA WHERE APPLICABLE. SUGGESTED ON-SITE MEASURES MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING METHODS: SEDIMENT PONDS, FILTER BAGS, PUMP FILTERS, SETTLING TANKS, SILT FENCE, STRAW BALES, FILTER CLOTHS, CATCH BASIN FILTERS, CHECK DAMS AND/OR OTHER RECOGNIZED TECHNOLOGIES AND METHOD AVAILABLE AT THE TIME OF CONSTRUCTION. SPECIFIC MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF OPSS 577 WHERE APPROPRIATE. OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

WHERE, IN THE OPINION OF THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, THE INSTALLED CONTROL MEASURES FAIL TO PERFORM ADEQUATELY, THE CONTRACTOR SHALL SUPPLY AND INSTALL ADDITIONAL OR ALTERNATIVE MEASURES AS DIRECTED BY THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY. AS SUCH. THE CONTRACTOR SHALL HAVE ADDITIONAL CONTROL MATERIALS ON SITE AT ALL TIME WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED BY HIM AT THE MOMENT'S NOTICE.

PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR SIX COPIES OF A DETAILED EROSION AND SEDIMENT CONTROL PLAN (ESCP). THE ESCP WILL CONSIST OF WRITTEN DESCRIPTION AND DETAILED DRAWINGS INDICATING THE ON-SITE ACTIVITIES AND MEASURES TO BE USED TO CONTROL EROSION AND SEDIMENT MOVEMENT FOR EACH STEP OF THE WORK.

CONTRACTOR'S RESPONSIBILITIES

THE CONTRACTOR SHALL ENSURE THAT ALL WORKERS, INCLUDING SUB-CONTRACTOR, IN THE WORKING ARE ARE AWARE OF THE IMPORTANCE OF THE EROSION AND SEDIMENT CONTROL MEASURES AND INFORMED OF THE CONSEQUENCES OF THE FAILURE TO COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AGENCIES

THE CONTRACTOR SHALL PERIODICALLY, AND WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENT DEPOSITS AS REQUIRED AT THE SEDIMENT CONTROL DEVICES, INCLUDING THOSE DEPOSITS THAT MAY ORIGINATE FROM OUTSIDE THE CONSTRUCTION AREA. ACCUMULATED SEDIMENT SHALL BE REMOVED IN SUCH A MANNER THAT PREVENTS THE DEPOSITION OF THIS MATERIAL INTO THE SEWER WATERCOURSE AND AVOIDS DAMAGE TO CONTROL MEASURES. THE SEDIMENT SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH REQUIREMENTS FRO EXCESS EARTH MATERIAL, AS SPECIFIED ELSEWHERE IN THE CONTRACT.

THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE CONTRACT ADMINISTRATOR ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO EITHER THE WATERCOURSE OR THE STORM SEWER SYSTEM. FAILURE TO REPORT WILL BE CONSTITUTE A BRACH OF THIS SPECIFICATION AND THE CONTRACTOR MAY ALSO BE SUBJECT TO THE PENALTIES IMPOSED BY THE APPLICABLE REGULATORY AGENCY. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.

THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, THE MEASURE OR MEASURES, IS NO LONGER REQUIRED. NO CONTROL MEASURE MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED IN A MANNER THAT AVOIDS THE ENTRY OF ANY EQUIPMENT, OTHER THAN HAND-HELD EQUIPMENT, INTO ANY WATERCOURSE, AND PREVENTS THE RELEASE OF ANY SEDIMENT OR DEBRIS INTO ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WORKING AREA AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL

WHERE, IN THE OPINION OF EITHER THE CONTRACT ADMINISTRATOR OR A REGULATORY AGENCY, ANY OF THE TERMS SPECIFIED HEREIN HAVE NOT BEEN COMPLIED WITH OR PERFORMED IN A SUITABLE MANNER, OR TAT ALL, THE CONTRACTOR ADMINISTRATOR OR A REGULATORY AGENCY HAS THE RIGHT TO IMMEDIATELY WITHDRAW ITS PERMISSION TO CONTINUE THE WORK BUT MAY RENEW ITS PERMISSION UPON BEING SATISFIED THAT THE DEFAULTS OR DEFICIENCIES IN THE PERFORMANCE OF THIS SPECIFICATION BY THE CONTRACTOR HAVE BEEN REMEDIED.

SPILL CONTROL NOTES

- 1. ALL CONSTRUCTION EQUIPMENT SHALL BE RE-FUELED, MAINTAINED, AND STORED NO LESS THAN 30 METRES FROM WATERCOURSE, STEAMS, CREEKS, WOODLOTS, AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
- 2. THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT
- 3. IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT. THE CONTRACTOR SHALL
- 3.1. IMMEDIATELY NOTIFY APPROPRIATE FEDERAL, PROVINCIAL, AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES, AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, 3.2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST
- ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT 3.3. RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING

MUD MAT NOTES

JURISDICTION

1. THE GRANULAR MATERIAL WILL REQUIRE PERIODIC REPLACEMENT AS IT BECOMES CONTAMINATED BY VEHICLE TRAFFIC.

- 2. SEDIMENT SHALL BE CLEANED FROM PUBLIC ROADS AT THE END OF EACH DAY. 3. SEDIMENT SHALL BE REMOVED FROM PUBLIC ROADS BY SHOVELING OR SWEEPING AND DISPOSED OR PROPERLY IN A CONTROLLED
- SEDIMENT DISPOSAL AREA.

SITE GRADING NOTES

- EROSION CONTROL PLAN
- RECOMMENDATIONS
- OF CONSTRUCTION.
- AND OPSS 310
- 7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 30MM LIFTS.
- REQUIRED BY THE MUNICIPALITY.
- 11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.

- STANDARDS 14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP

ROADWORK SPECIFICATIONS

- STOCK PILLED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

- 1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
- AND AT 60M INTERVALS IN THE SERVICE TRENCHES.
- PROCTOR DENSITY. A MINIMUM OF 300MM AROUND STRUCTURES.
- ADJUSTING UNITS ON THE OUTSIDE ONLY.
- 6. SAFETY PLATFORMS SHALL BE PER OPSD 404.02. 7. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01, IF APPLICABLE.
- SATISFACTION OF THE ENGINEER
- THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.

<u>SANITARY</u>

- STANDARD DRAWINGS (OPSD). AND SPECIFICATIONS (OPSS).
- AMENDMENT, UNLESS SPECIFIED OTHERWISE
- OTHERWISE.
- 14. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.

DRAWING SSP-1.

<u>STORM</u>

- GASKETS AS PER CSA A257.3, OR LATEST AMENDMENT.

- 20. CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010. 21. CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
- 22. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
- 23. ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE
- MADE NECESSARY BY THE WIDENED TRENCH.
- 26. PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE
- APPI ICABI E
- 27. RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.

WATERMAIN

WATERMAIN.

THE SEWER.

BACK FROM STUB.

2.4M.

- 30. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD
- DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
- 31. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
- 32. ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
- AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER. 34. ALL PVC WATERMAINS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF
- OTTAWA STD. W.36 35. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.

36. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.

44. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.

MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.

FINISHED GRADE AT HYDRANT; FIRE HYDRANT LOCATION AS PER STD DWG W18.

37. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.

OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.

49. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

38. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.

2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S

3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT 4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. SC1.1 PROVISION SHALL BE MADE OR CURB DEPRESSIONS AS

INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN O THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT. 5 PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD R10 AND OPSD 509 010

6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 30MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.

8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING. 9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF

10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.

12. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT, ALL JOINTS MUST BE SEALED. 13. SIDEWALKS TO BE 13MM & BEVELED AT 2:1 OR 6MM WITH NO BEVEL REQUIRED BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES

REQUIRED TO BE BARRIER-FREE, UNLESS OTHERWISE NOTED. ALL IN ACCORDANCE WITH OBC 3.8.1.3 & OTTAWA ACCESSIBILITY DESIGN

DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

15. ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT, PREPARED BY LRL ASSOCIATES. DATED NOVEMBER 2020.

16. AL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND

17. THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.

18. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.

19. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).

2. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING S8. THE SEALS SHOULD BE AT LEAST 1.5M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPATIBLE BROWN SILTY CLAY

PLACED IN MAXIMUM 225MM LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES

3. SERVICES TO BUILDING TO BE TERMINATED 1.0M FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED. 4. ALL MAINTENANCE STRUCTURE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD

5. "MODULOC" OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE

8. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2)

VIDEO RECORDING IN A FORMAT ACCEPTABLE TO ENGINEER. ALL SEWER ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS AND NECESSARY REPAIRS HAVE BEEN COMPLETED TO THE

9. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL SEWERS, A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO

10. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL

11. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX 'RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST

12. EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE. 13. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED

16. 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON

17. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2, OR LATEST AMENDMENT. ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1, OR LATEST AMENDMENT. PIPE SHALL BE JOINED WITH STD. RUBBER

18. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' UNLESS OTHERWISE

SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER. 19. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.

24. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS

EXCEEDED, THE CONTRACTOR IS REQUIRED TO PROVIDE AND SHALL BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS

25. ALL ROAD AND PARKING LOT CATCH BASINS TO BE INSTALLED WITH ORTHOGONALLY PLACED SUBDRAINS IN ACCORDANCE WITH DETAIL.

PERFORATED SUBDRAIN FOR ROAD AND PARKING LOT CATCH BASIN SHALL BE INSTALLED PER CITY STD R1 UNLESS OTHERWISE NOTED.

28. ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.

29. ALL STORM MANHOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

39. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE

40. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25,2 AND W25, RESPECTIVELY.

42. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS,

45. FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED

47. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS

48. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL

46. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M

CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE

CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT ENVIRONMENT. IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL

43. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.

ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF

WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM

41. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN

33. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE. BEDDING

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THI CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. T CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO T NNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

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IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BI

UNAUTHORIZED CHANGES

ADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTH CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOU RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY IABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW O INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES. LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES

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03	RE-ISSUED FOR APPROVAL	S.V.	03 MAY 2024
02	RE-ISSUED FOR APPROVAL	Т.Н.	14 APR 2023
01	ISSUED FOR APPROVAL	Т.Н.	11 OCT 2022
No.	REVISIONS	BY	DATE



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GSI PROPERTIES

APPROVED BY Т.Н. V.J. Т.Н.

PROPOSED 7-STOREY CONDO **RE-DEVELOPMENT** 424 CHURCHILL AVE OTTAWA, ON

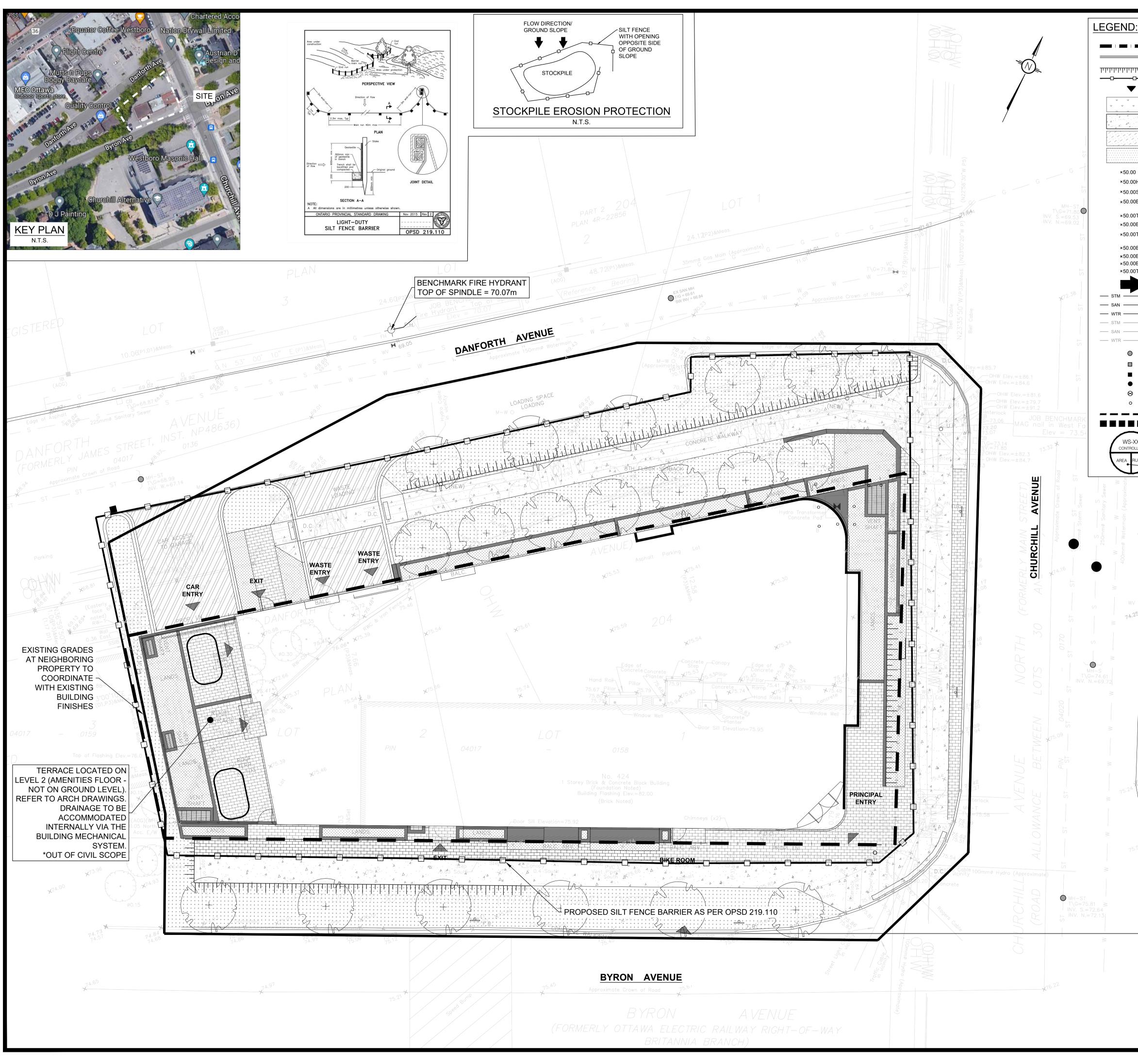
DRAWING TITLE

PROJECT

GENERAL NOTES

220224

APRIL, 2023



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THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF PROPOSED DOOR ENTRANCE/EXIT WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS SERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. PROPOSED GRASS AREA $\psi = \psi$ (100mm TOP SOIL & SOD) AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT PROPOSED CONCRETE FEATURES/SLAB TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. HANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER. UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A PROPOSED HEAVY DUTY ASPHALT CONSTRUCTION DOCUMENT. THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT PROPOSED LIGHT DUTY ASPHALT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED ×50.00 PROPOSED ELEVATION CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF ×50.00HP PROPOSED HIGH POINT ELEVATION THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES ×50.00S PROPOSED SWALE ELEVATION DUE TO THESE CONDITIONS WILL BE FORTHCOMING. ×50.00BC PROPOSED BOTTOM OF CURB UNAUTHORIZED CHANGES: / ASPHALT ELEVATION IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ×50.00TC PROPOSED TOP OF CURB ELEVATION ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER ×50.00BW PROPOSED EXPOSED BOTTOM OF CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT RETAINING WALL OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT ×50.00TW PROPOSED TOP OF RETAINING WALL AGREES TO WAIVE ANY CLAIM AGAINST LIL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED ×50.00EX MATCH INTO EXISTING ELEVATION CHANGES. ×50.00EX BC MATCH INTO EXISTING BOTTOM OF CURB IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, ×50.00EX TC MATCH INTO EXISTING TOP OF CURB TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING ×50.00TPW PROPOSED TOP OF PLANTER WALL FROM SUCH CHANGES PROPOSED OVERLAND MAJOR FLOW ROUTE IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO - STM - STM - PROPOSED STORM SEWER INDEMNIFY BOTH LRL AND THAT FORMER REQUIRES THE CONTRACTOR TO FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION. 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No REVISIONS NOT AUTHENTIC UNLESS SIGNED AND DATED

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ISSUED FOR APPROVAL T.H. 11 OCT 2022

10

V. JOHNSON 100510576

BY

DATE

GSI PROPERTIES

DRAWN B APPROVED BY: DESIGNED B Т.Н. V.J. T.H.

PROJECT PROPOSED 7-STOREY CONDO **RE-DEVELOPMENT** 424 CHURCHILL AVE OTTAWA, ON

DRAWING TITLE

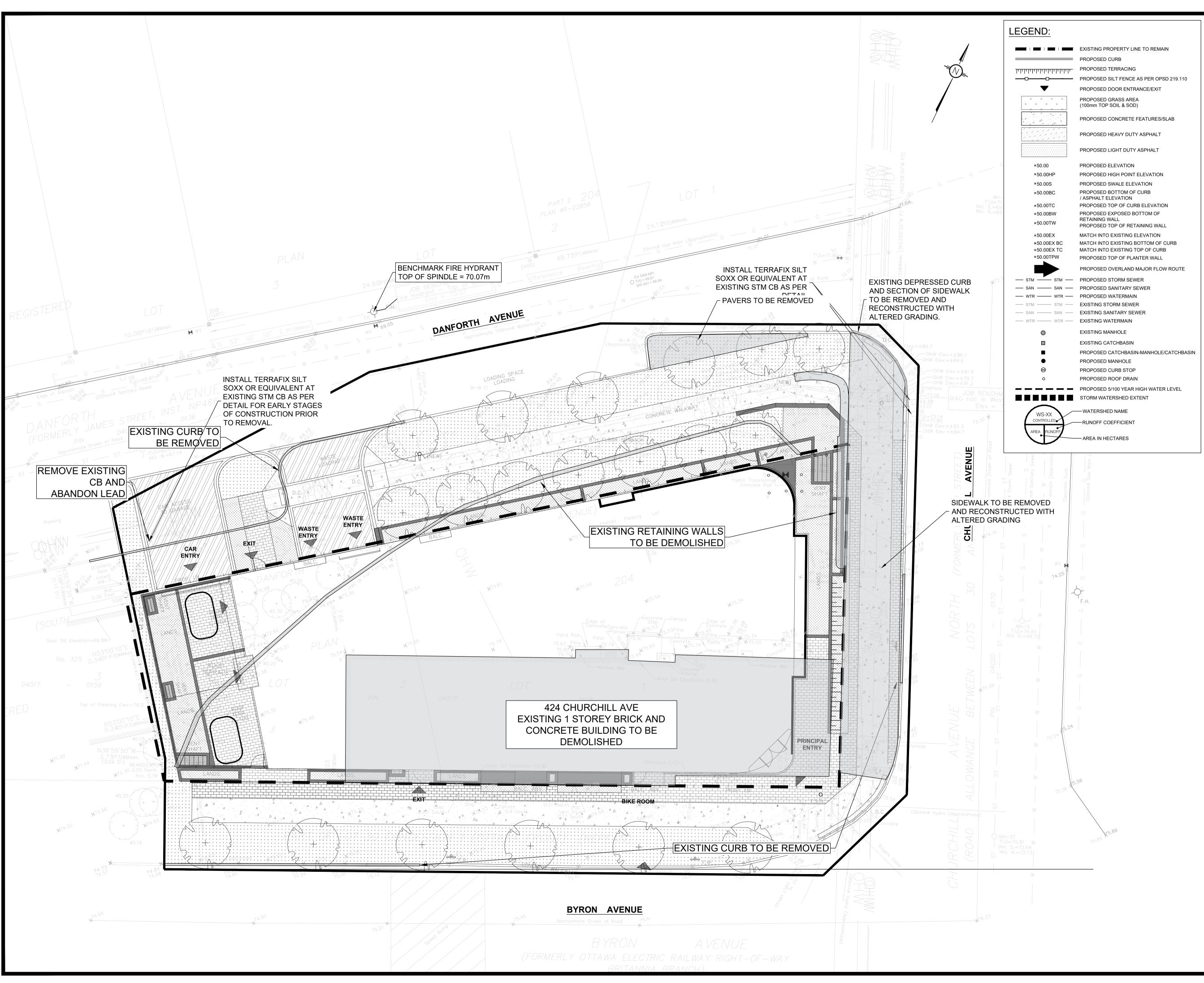
DATE

EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO. 220224

APRIL, 2023

C101



USE AND INTERPRETATION OF DRAWINGS GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. T CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO TH WNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, T SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IE REQUIRED BY ALL WORK WHAT IS REQUIRED BY ANY ONE SHALL DE DINDING AS IF REQUIRED BY ALL. WANN NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS. BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS SERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT. INCLUDING REPEATS OF THE PROJECT. HANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER. UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT. THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING. UNAUTHORIZED CHANGES: IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES. IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES. IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THAT FORMER REQUIRES THE CONTRACTOR TO FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION. GENERAL NOTES: EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK. CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION. THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS. SCALE: 1:125 RE-ISSUED FOR APPROVAL S.V. 03 MAY 2024 03 RE-ISSUED FOR APPROVAL T.H. 14 APR 2023 02 ISSUED FOR APPROVAL T.H. 11 OCT 2022 01 DATE No REVISIONS BY V. JOHNSON 100510576 5-03-20 NOT AUTHENTIC UNLESS SIGNED AND DATE ENGINEERING | INGÉNIERIE 5430 Canotek Road I Ottawa, ON, K1J 9G2 www.lrl.ca I (613) 842-3434

GSI PROPERTIES

APPROVED BY: DESIGNED B DRAWN B Т.Н. V.J. T.H. PROJECT PROPOSED 7-STOREY CONDO

RE-DEVELOPMENT 424 CHURCHILL AVE OTTAWA, ON

DRAWING TITLE

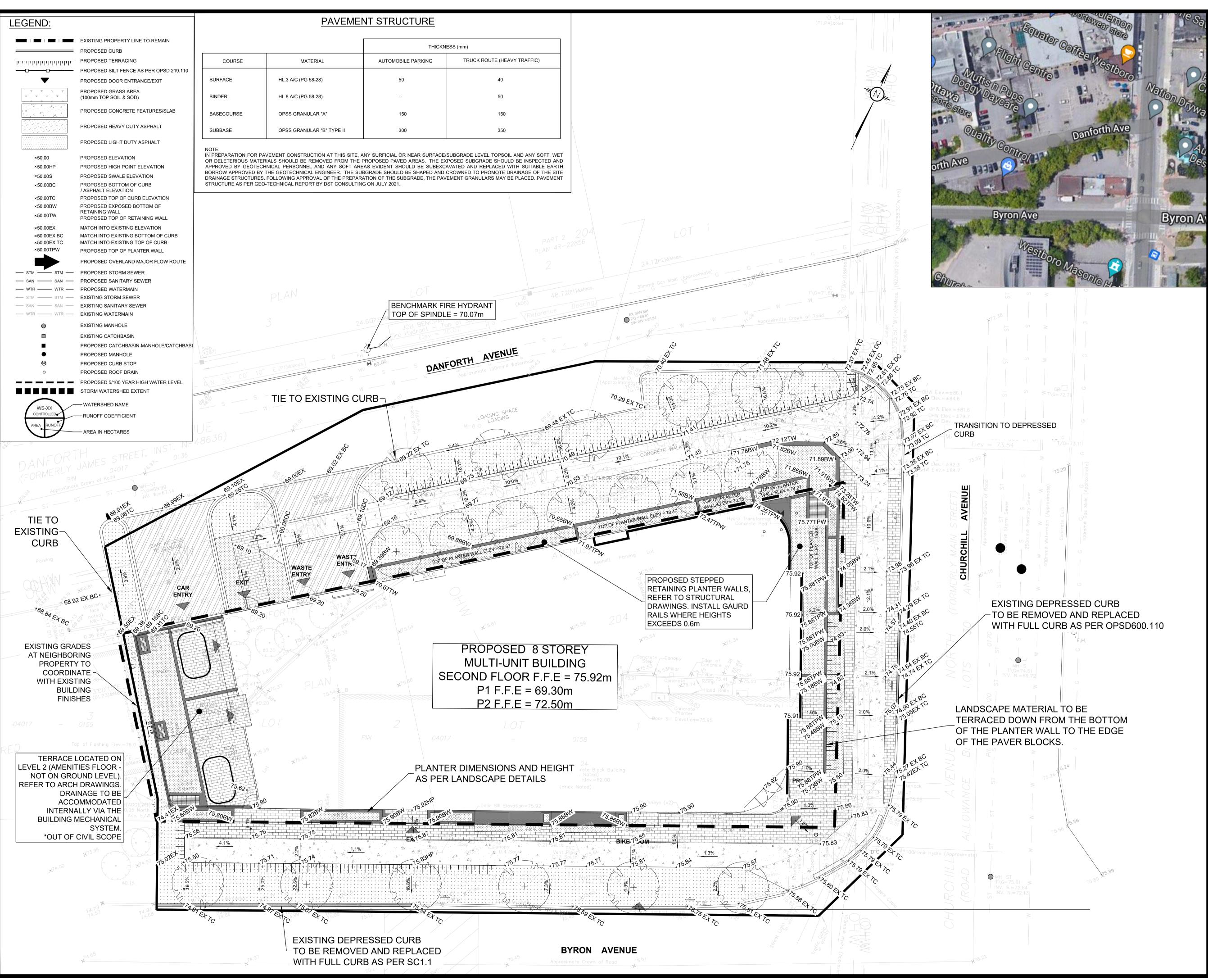
DATE

APRIL, 2023

DEMOLITION PLAN

PROJECT NO. 220224





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GENERAL NOTES:

SCALE: 1:125

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5430 Canotek Road I Ottawa, ON, K1J 9G2 www.lrl.ca I (613) 842-3434

GSI PROPERTIES

PPROVED BY: T.H. V.J. Т.Н.

PROJECT PROPOSED 7-STOREY CONDO

> **RE-DEVELOPMENT** 424 CHURCHILL AVE OTTAWA, ON

DRAWING TITLE

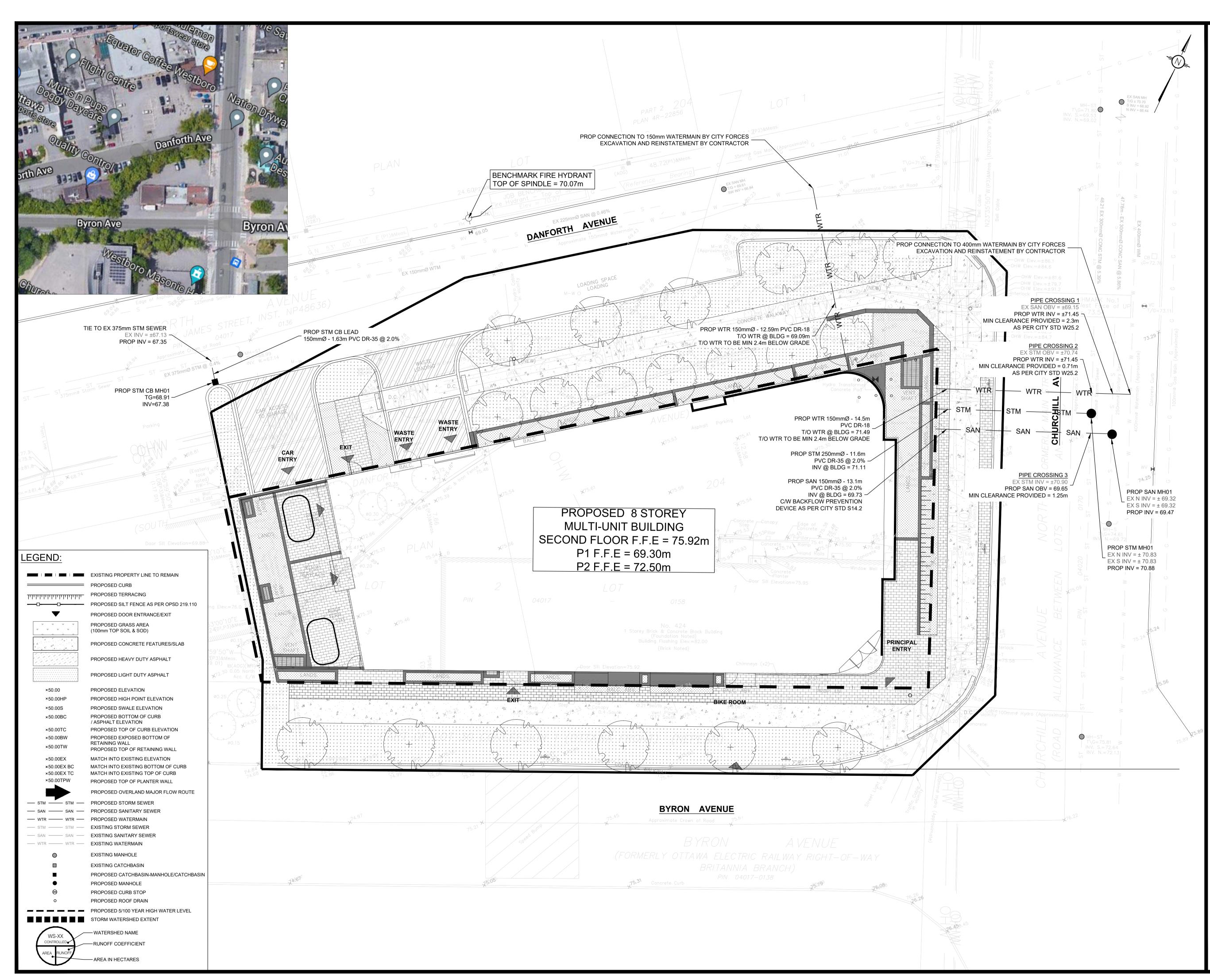
PROJECT NO. 220224

APRIL, 2023

GRADING AND DRAINAGE PLAN

C301

#16789



USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR

UNAUTHORIZED CHANGES:

ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION. <u>GENERAL NOTES:</u>

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

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02	RE-ISSUED FOR APPROVAL	Т.Н.	14 APR 2023
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DESIGNED BY: DRAWN BY: APPROVED BY: T.H. T.H. V.J. PROJECT PROPOSED 7-STOREY CONDO RE-DEVELOPMENT 424 CHURCHILL AVE OTTAWA, ON

DRAWING TITLE

PROJECT NO.

220224

APRIL, 2023

DATE

CLIENT

SERVICING PLAN

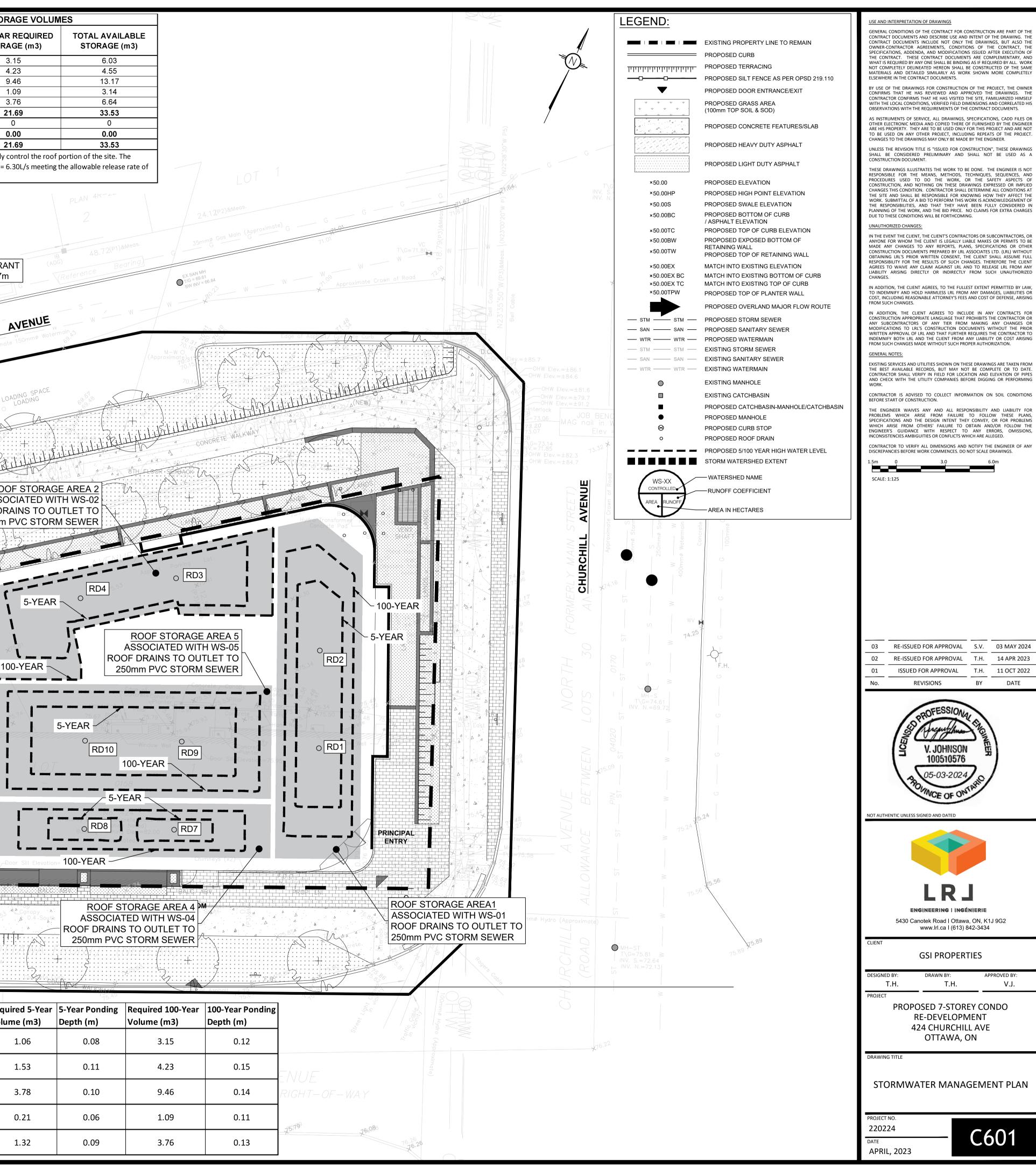
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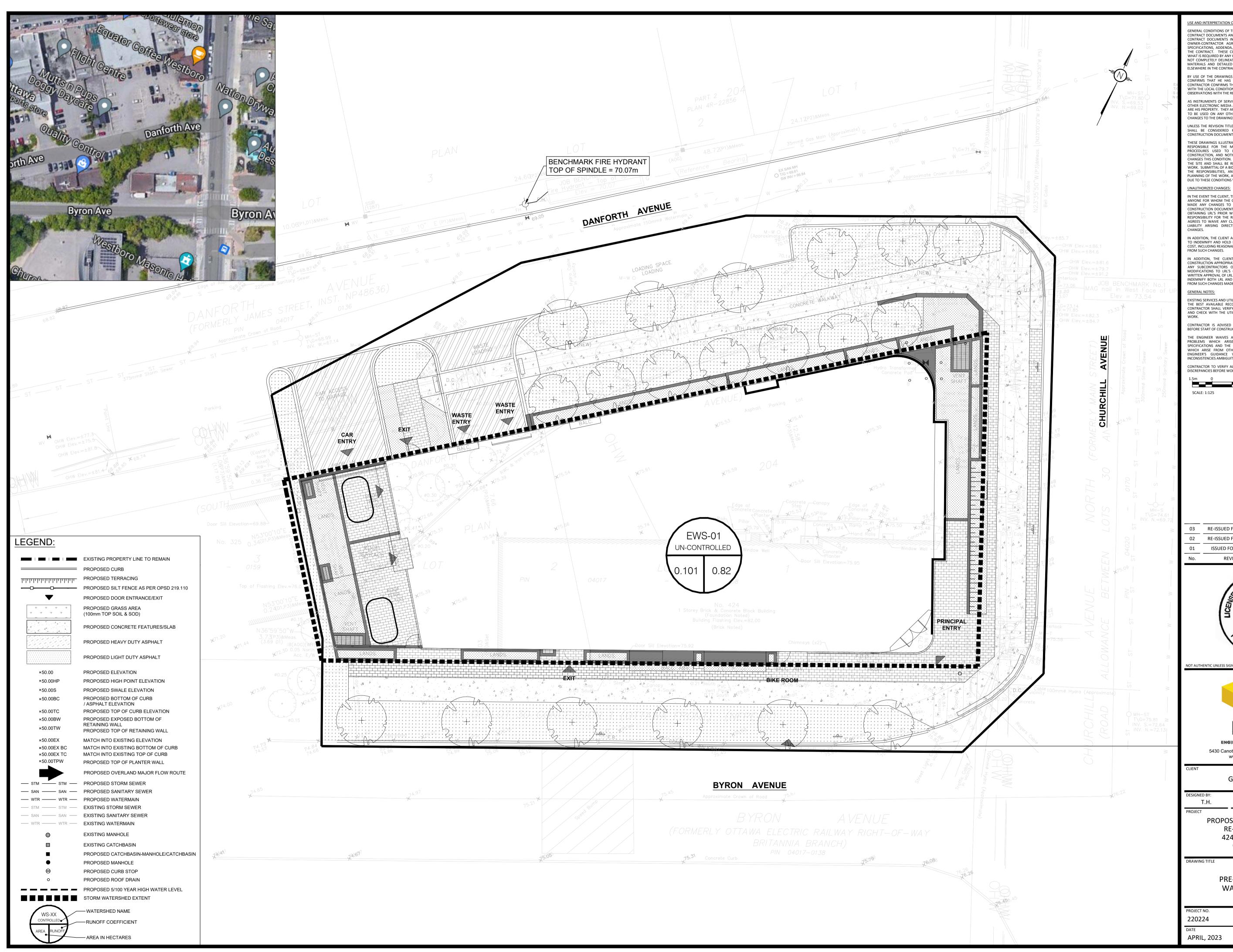


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Watershed	Associated	Drain Type	Weir Opening	-	nilable Storage		
WS-01	Roof Drains	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	(L/s) V 0.63	olume (m3) 6.03	Depth(m 0.15) Volumo 1

Watershed		Drain Type	Weir Opening				1
watersnea	Roof Drains	Diamitype		(L/s)	Volume (m3)	Depth(m)	Volum
WS-01	1	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	6.03	0.15	
2	2	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	0.05	0.15	
	3	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63		0.15	
WS-02	4	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	4.55 d 0.63		0.15	
WS-03	5	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	13.17	0.15	
VVS-03	6	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	13.17		
WS-04	7	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	2.14	0.15	
VV3-04	8	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	3.14	0.15	
	9	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63		0.15	
WS-05	10	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	6.64	0.15	





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SCALE: 1:125 03 RE-ISSUED FOR APPROVAL S.V. 03 MAY 2024 RE-ISSUED FOR APPROVAL T.H. 14 APR 2023 02 ISSUED FOR APPROVAL T.H. 11 OCT 2022 01 No. REVISIONS BY DATE



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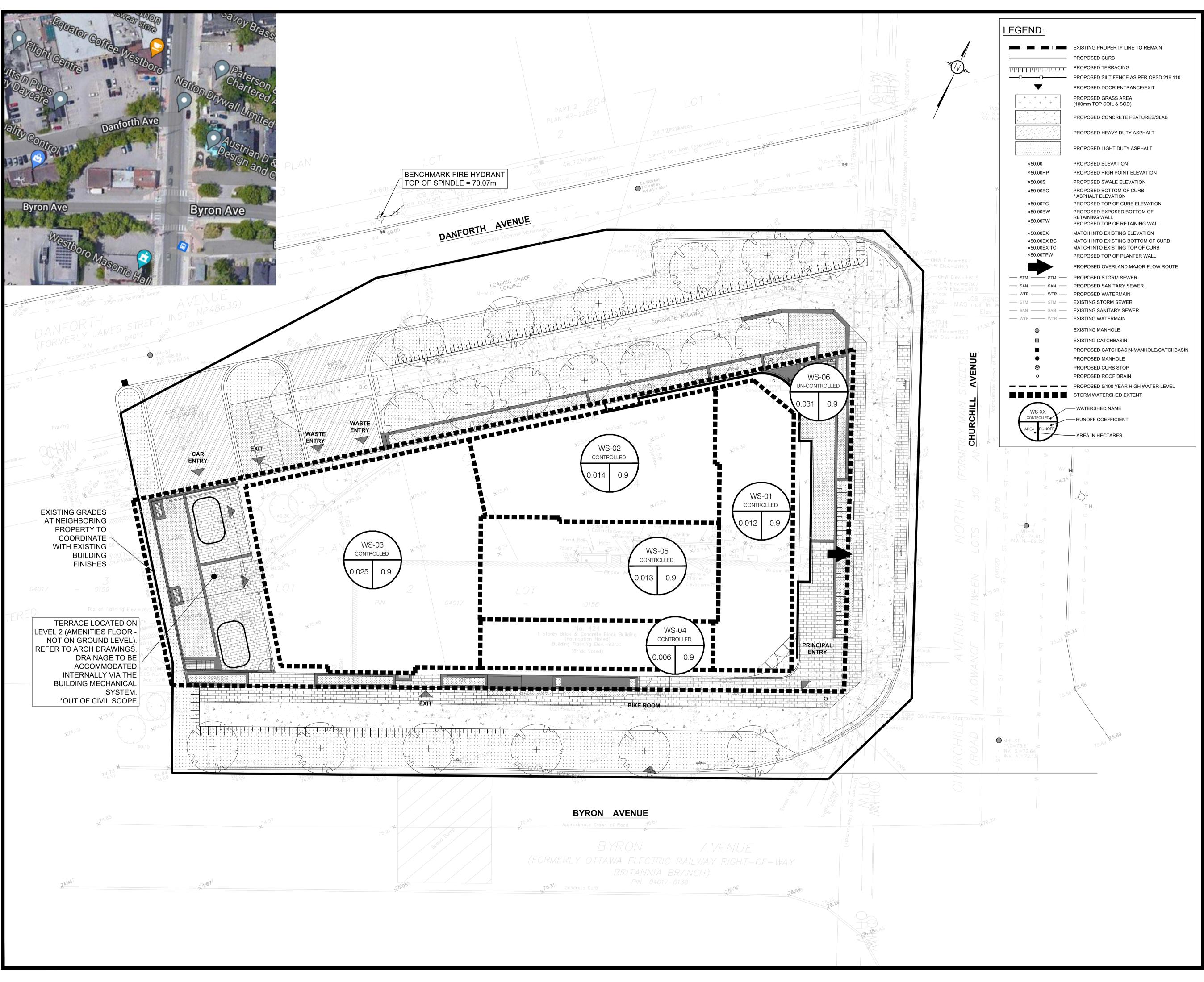
5430 Canotek Road | Ottawa, ON, K1J 9G2 www.lrl.ca | (613) 842-3434

GSI PROPERTIES

DESIGNED B DRAWN B APPROVED BY: Т.Н. V.J. Т.Н. PROJECT PROPOSED 7-STOREY CONDO **RE-DEVELOPMENT** 424 CHURCHILL AVE OTTAWA, ON DRAWING TITLE

PRE-DEVELOPMENT WATERSHED PLAN

C701



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USE AND INTERPRETATION OF DRAWINGS

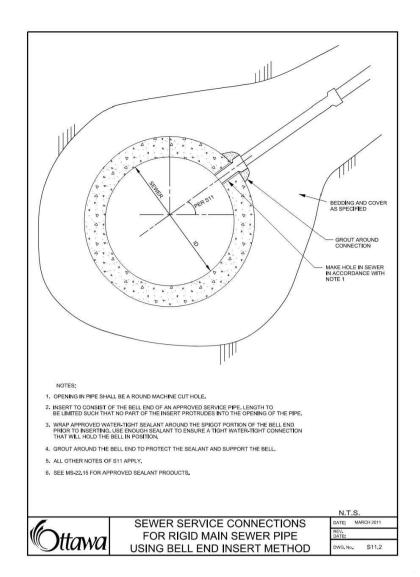
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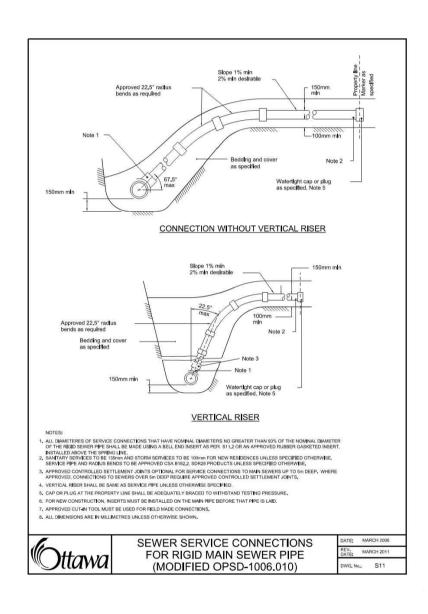
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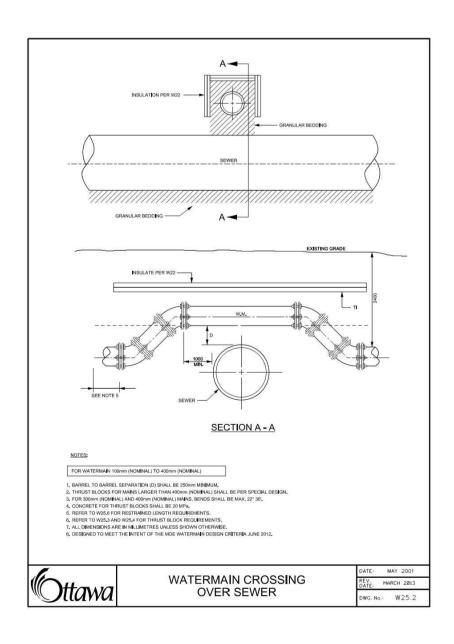
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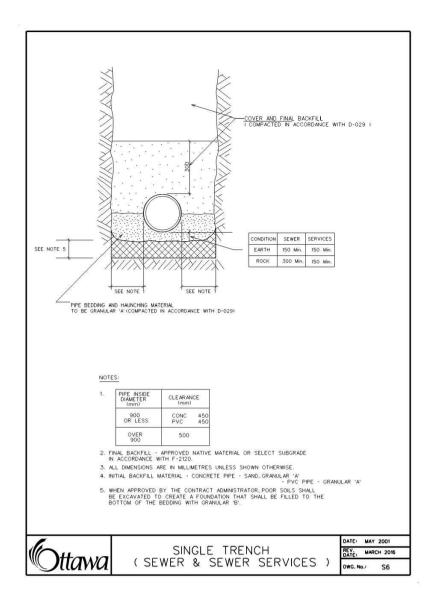
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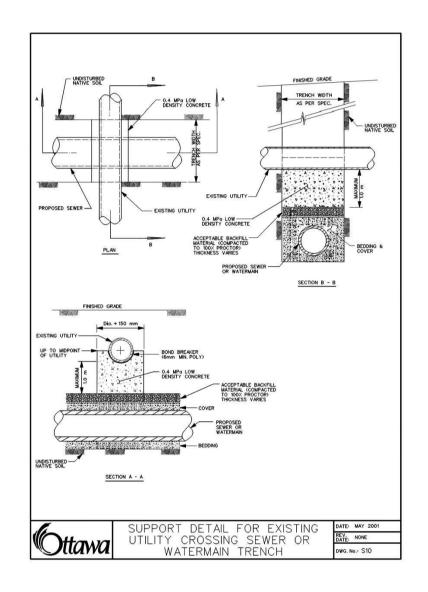
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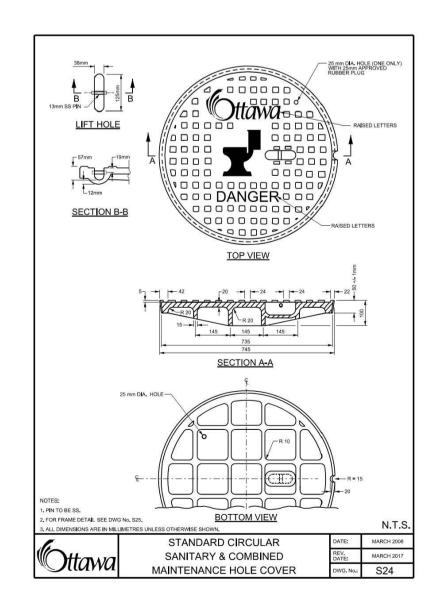


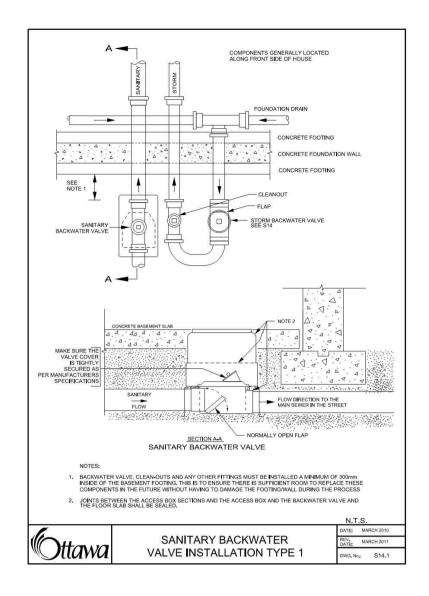


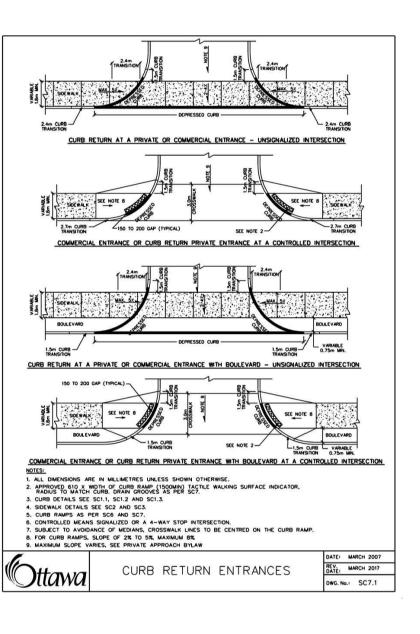


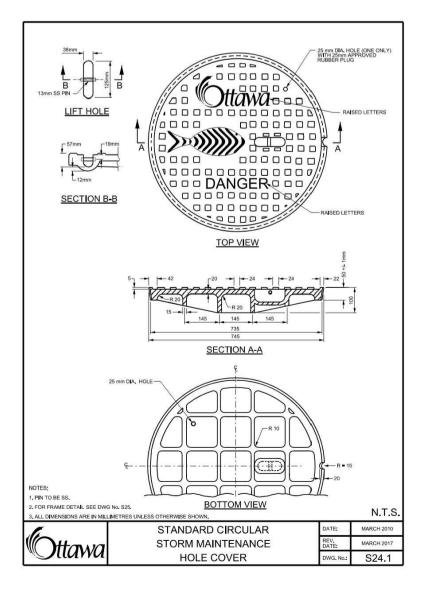


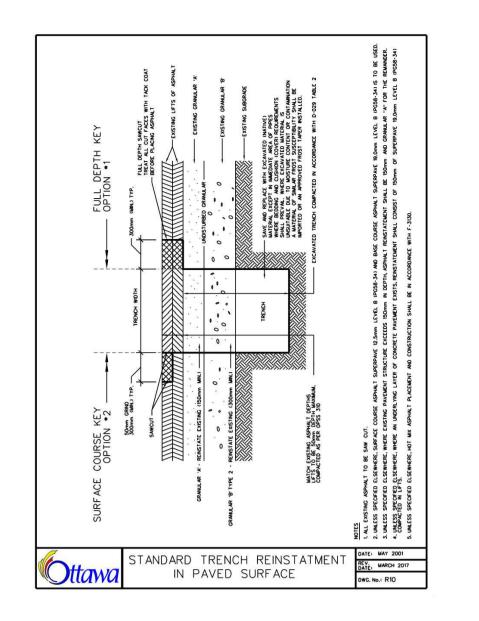


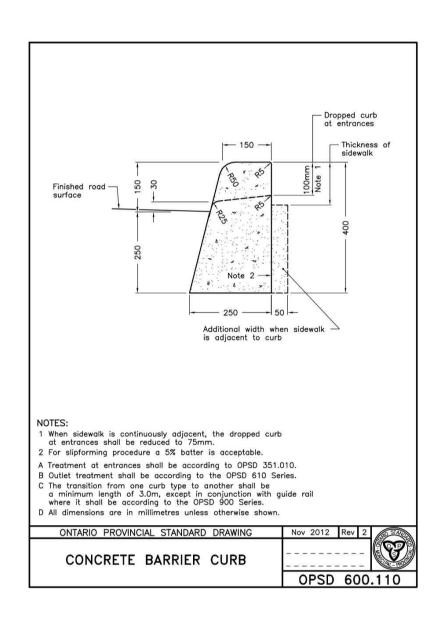


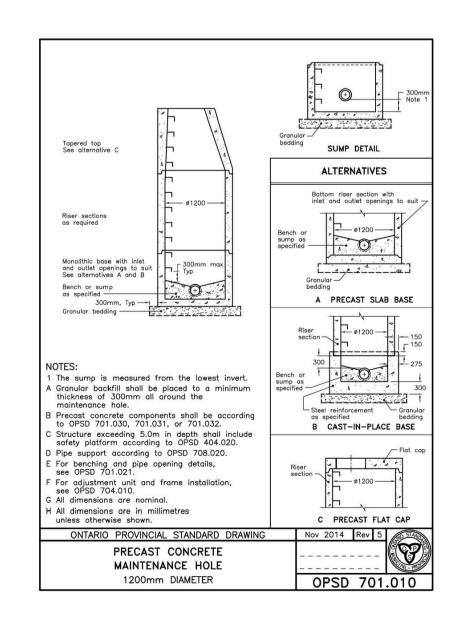


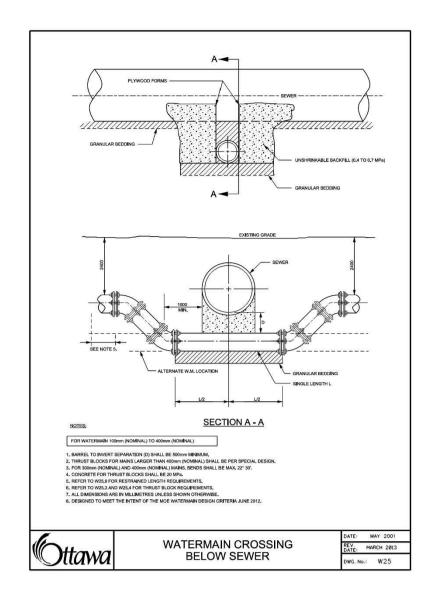


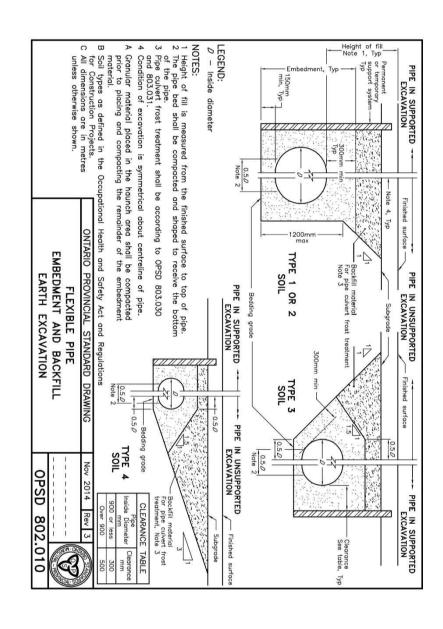












USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING. UNAUTHORIZED CHANGES:

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE

ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION. <u>GENERAL NOTES:</u>

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEER'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED. CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

03	RE-ISSUED FOR APPROVAL	S.V.	03 MAY 2024
02	RE-ISSUED FOR APPROVAL	Т.Н.	14 APR 2023
01	ISSUED FOR APPROVAL	Т.Н.	11 OCT 2022
No.	REVISIONS	BY	DATE



NOT AUTHENTIC UNLESS SIGNED AND DATED



5430 Canotek Road I Ottawa, ON, K1J 9G2 www.lrl.ca I (613) 842-3434

GSI PROPERTIES

DESIGNED BY: DRAWN BY: APPROVED BY: T.H. T.H. V.J.

PROPOSED 7-STOREY CONDO RE-DEVELOPMENT 424 CHURCHILL AVE

OTTAWA, ON

CONSTRUCTION DETAIL PLAN

C901

APRIL, 2023

DRAWING TITLE

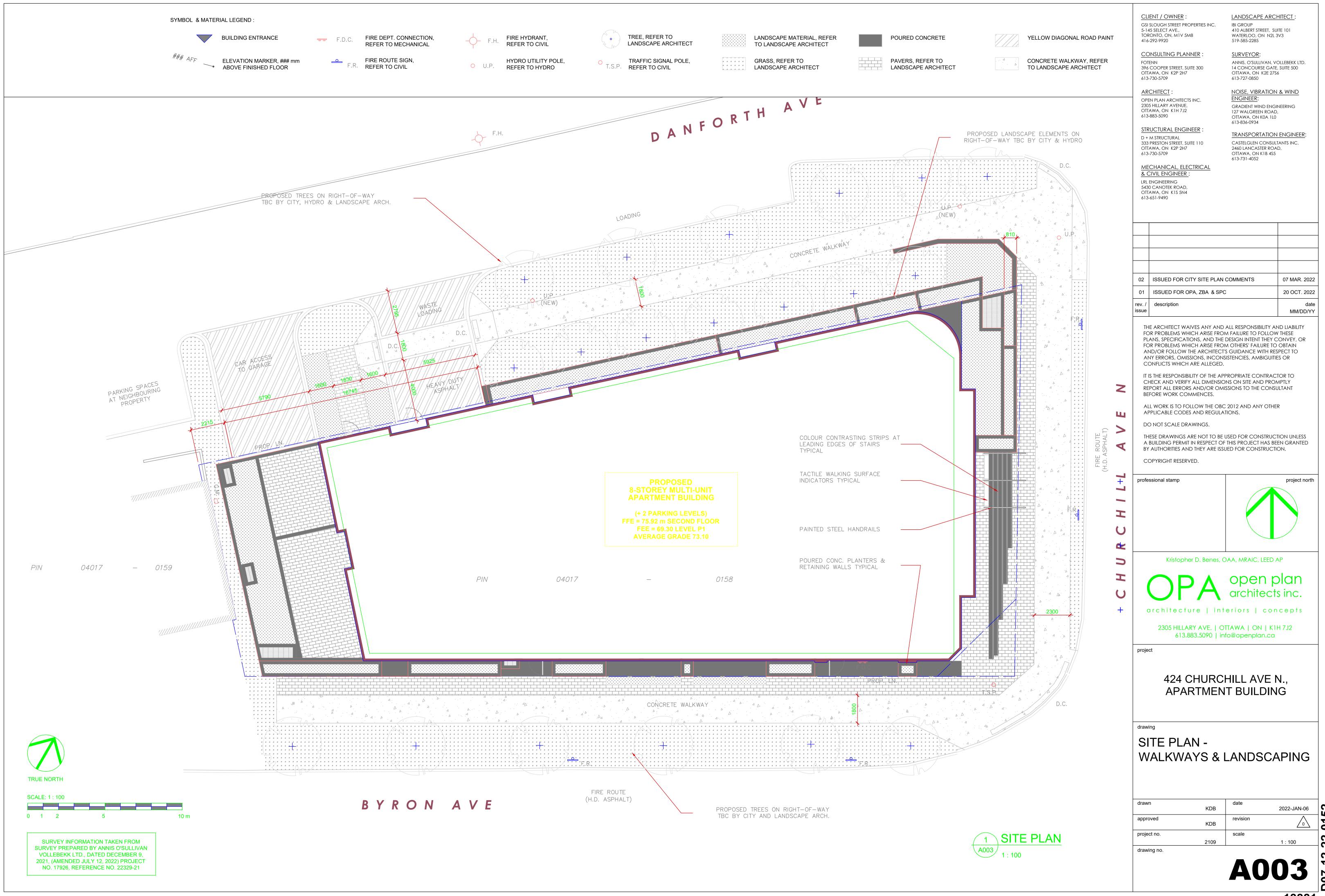
PROJECT NO. 220224

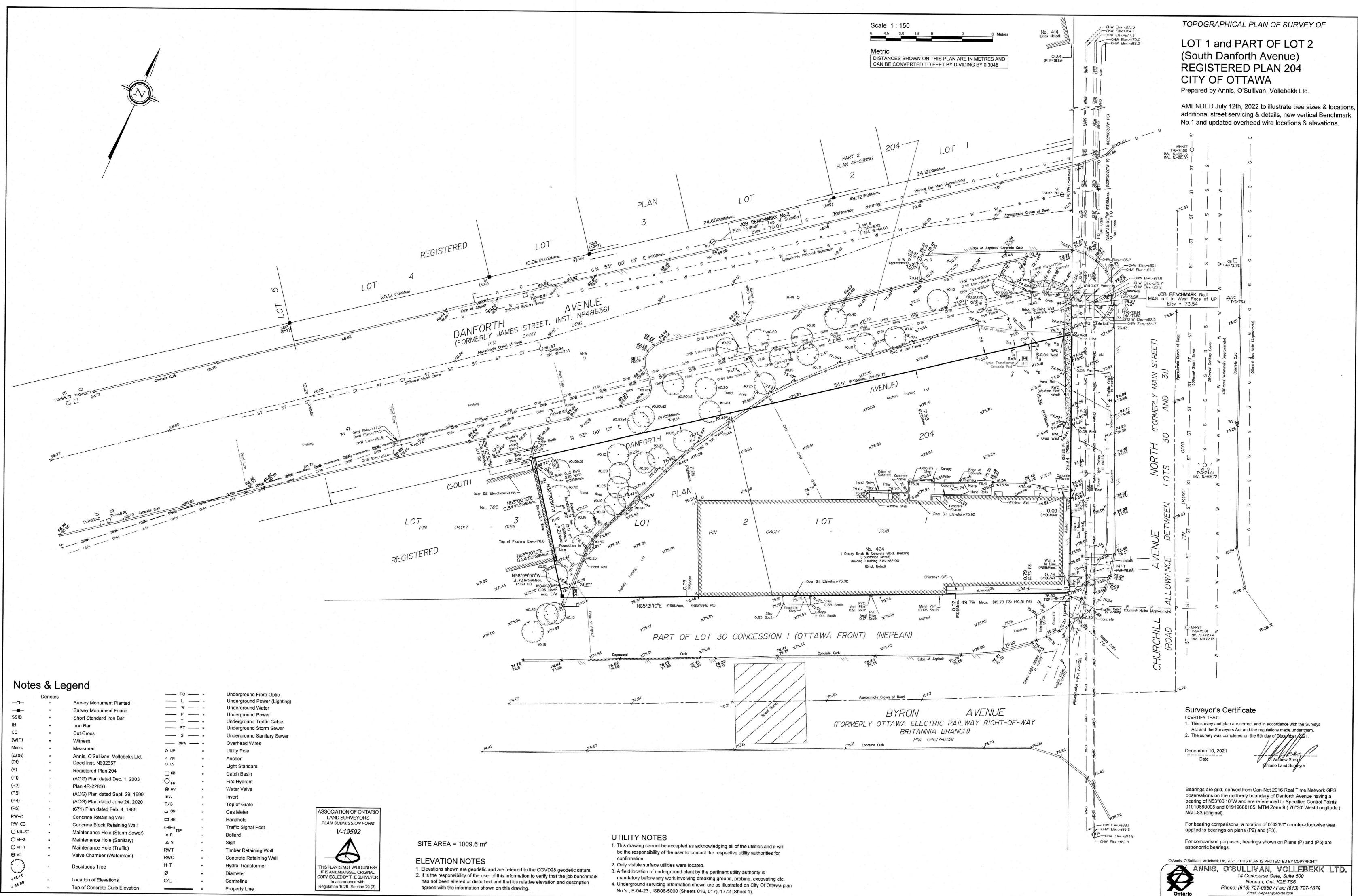
CLIENT

07-16-08-0022

APPENDIX F

Proposed Site Plan Legal Survey As-builts



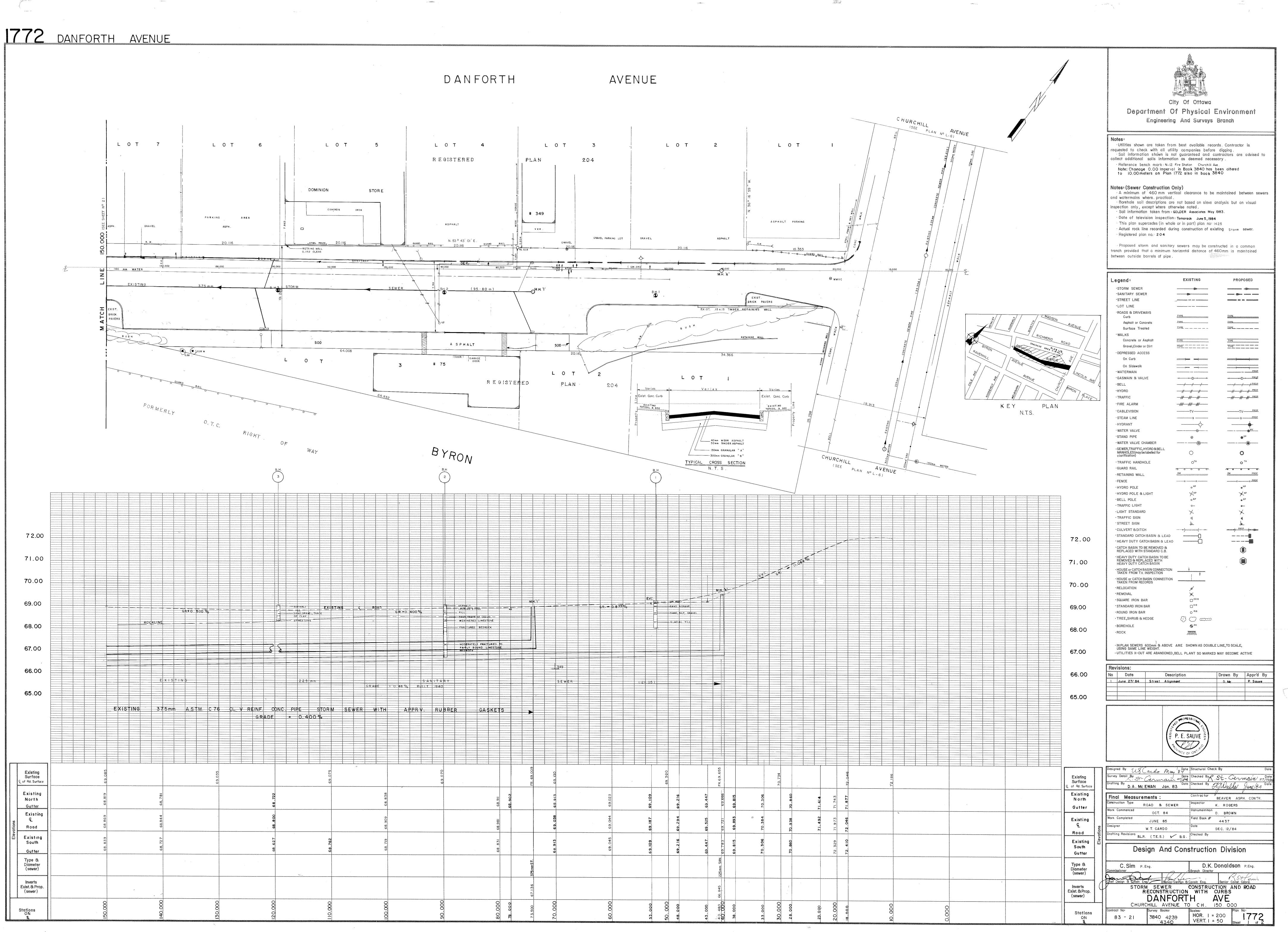


	Denotes		—— F0 —	n	Underground F
	n	Survey Monument Planted	— L —	— · · · ·	Underground F
· · · · ·	н	Survey Monument Found	— w —	<u> </u>	Underground V
SSIB		Short Standard Iron Bar	—— P —		Underground F
IB		Iron Bar	— T —		Underground T
CC	u	Cut Cross	ST	- "	Underground S
(WIT)		Witness	S	- "	Underground S
Meas.		Measured	OHW	- "	Overhead Wire
 (AOG)	U.		O UP	0	Utility Pole
(DI)	u	Annis, O'Sullivan, Vollebekk Ltd. Deed Inst. N632657	• AN	н 2	Anchor
(D)			O LS	н	Light Standard
		Registered Plan 204	СВ		Catch Basin
(PI)		(AOG) Plan dated Dec. 1, 2003	OFH	a	Fire Hydrant
(P2)	н	Plan 4R-22856	€9 WV	u .	Water Valve
(P3)	н	(AOG) Plan dated Sept. 29, 1999	Inv.		Invert
(P4)	U.	(AOG) Plan dated June 24, 2020	T/G		Top of Grate
(P5)	y	(671) Plan dated Feb. 4, 1986	GM	u	Gas Meter
RW-C	Ü.	Concrete Retaining Wall	— — нн		Handhole
RW-CB		Concrete Block Retaining Wall			
O MH-ST		Maintenance Hole (Storm Sewer)	Den TSP		Traffic Signal P
O MH-S	ü	Maintenance Hole (Sanitary)	оB	u.	Bollard
Омн-т		Maintenance Hole (Traffic)	Δs		Sign
⊖ vc			RWT	н	Timber Retainir
		Valve Chamber (Watermain)	RWC		Concrete Retai
$\left\{\cdot\right\}$	н	Deciduous Tree	H-T	н	Hydro Transfor
X.			Ø		Diameter
+ 65.00	н	Location of Elevations	C/L	н	Centreline
+ 6 ^{5.00}		Top of Concrete Curb Elevation	-	n	Property Line

- No.'s ; E-04-23 , ISB08-5000 (Sheets 016, 017), 1772 (Sheet 1).

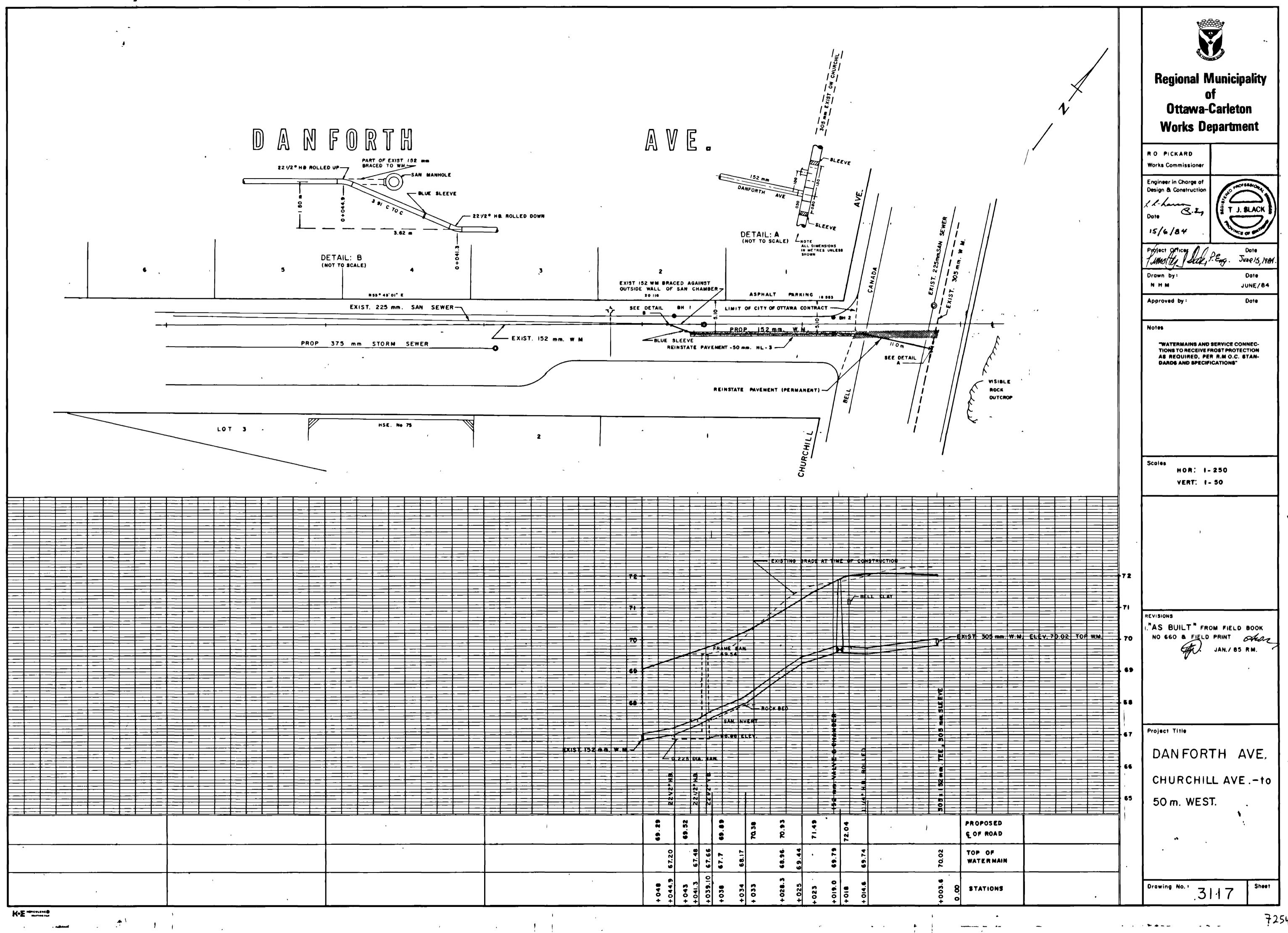
Land Surveyors Job No. 22329-21 (Amend) GSI Properties Pt. Lts 1,2 Pl.204 T F2 ns

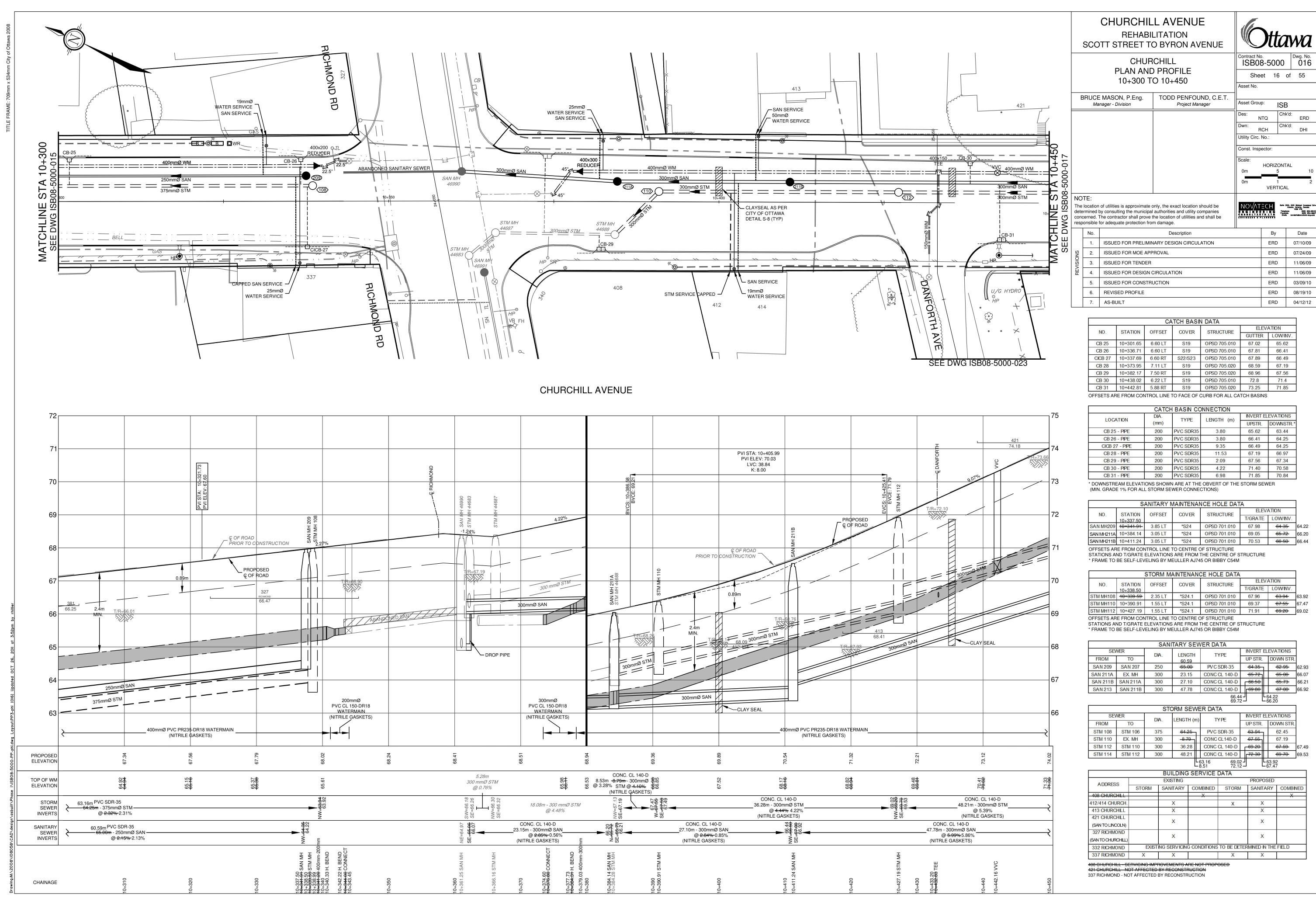




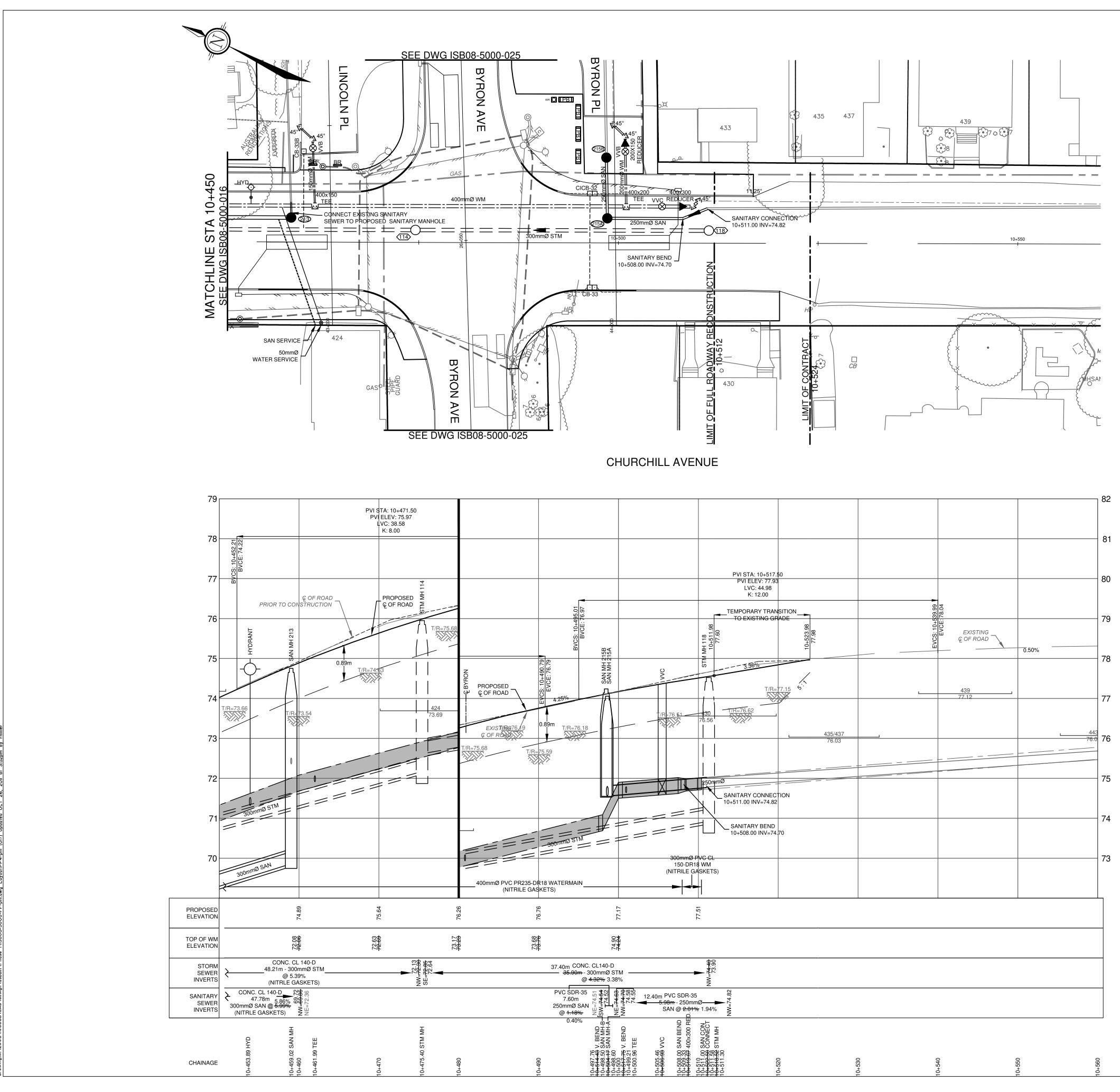
Existing Surface ६ of Rd. Surface	69 085		t 		
Existing North Gutter	68.81 9	68, 781		68 722	
Existing (L Road Existing	68,869	68.844		C B B B B B B B B B B B B B B B B B B B	•
Existing South Gutter	68.839	68,727		68 627	
Type & Diameter (sewer)					~~~
Inverts Exist.& Prop. (sewer)					
Stations ON S.	150.000	140.000			

. I A Martine





			408	STM SERVICE CAPPED 412	414	- ())))))))))))))))))		ANFORTH AVE SEE DWG
		CHURCHILL	AVENUE					
	7.19	4.22%	STM MH 211A STM MH 211A STM MH 211A BVCS: 10+386.58 BVCS: 10+386.58 BVCS: 10+386.58 BVCS: 6921		0.0		POSED ROAD 413 68.41 7.93 300mm0 SAN	HLHOJINE G
68.41	68.51	PVC CL 150-DR18 WATERMAIN (NITRILE GASKETS)	99:39	69.89	CLAY SEAL 400n	nmØ PVC PR235-DR18 WATE (NITRILE GASKETS)		
300	5.28m mmØ STM 0.0.76% VM=999 SE=999 SE=999 SE=999	877 18.08m - 300 mmØ STM @ 4.48% CONC. CL 140-D 5m - 300mmØ SAN @ 2.85% -0.56%	CONC. CL 140-D 8.53m 0.79m-300mmØ 858 @ 3.28% STM @ 4.10% (NITRLE GASKETS) (NITRLE GASKETS) (NITRLE GASKETS) (NITRLE GASKETS) (NITRLE GASKETS) (NITRLE GASKETS)	67.52	CONC. CL 14 36.28m - 300mm @ 4.44% (NITRLE GASK	0-D Ø STM		
10+360 10+361.25 SAN MH	10+366.16 STM MH 10+370	60 8 6 CONNECT 73 73 1. BEND 03 400mm-3007	10+384.14 SAN MH 10+384.28 STM MH 10+390 10+390 10+390 10+390 10+390 10+390			10+411.24 SAN MH	10+427.19 STM MH	20 8 0 TEE



	SCO		L AVENUE LITATION D BYRON AVENUE	Contract No		iwa
	CHURCHILL PLAN AND PROFILE 10+450 TO 10+600				8-5000	of 55
E		MASON, P.Eng. nager - Division	TODD PENFOUND, C.E.T. Project Manager	Asset Grou	^{p:} ISE	3
				Dwn:	ITQ ICH Ch No.:	10 2
dete conc	location rmined l	by consulting the municipal	only, the exact location should be authorities and utility companies he location of utilities and shall be n damage.		ECH Suite RING Teach TSLIR End	200, 240 Michael Couplend Drive Kamela, Onterle, Canade KAM Park, Canade KAM 201, 224-0403 mile (1613) 224-0407 Mia nevalnt@Envystech-eng.com
	No.		Description		Ву	Date
S	1.	ISSUED FOR PRELIMIN	IARY DESIGN CIRCULATION		ERD	07/10/09
REVISIONS	2.	ISSUED FOR MOE APP	ROVAL		ERD	07/24/09
EVIS	3.	ISSUED FOR TENDER			ERD	11/06/09
ш	4.	ISSUED FOR DESIGN (CIRCULATION		ERD	11/06/09
	5.	ISSUED FOR CONSTRI	JCTION		ERD	03/09/10
	6.	AS-BUILT			ERD	04/12/12

	CATCH BASIN DATA										
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEV	ATION					
10.	STATION	UTIOLI	00101	UNCOTONE	GUTTER	LOW/INV.					
CICB 32	10+496.72	5.88 LT	S22/S23	OPSD 705.020	76.93	75.53					
CB 33	10+496.72	5.88 RT	S19	OPSD 705.020	76.93	75.53					

OFFSETS ARE FROM CONTROL LINE TO FACE OF CURB FOR ALL CATCH BASINS

CATCH BASIN CONNECTION								
LOCATION	DIA.	TYPE	LENGTH (m)	INVERT EL	EVATIONS			
LUCATION	(mm)	THE		UPSTR.	DOWNSTR.*			
CICB 32 - PIPE	200	PVC SDR35	4.70	75.53	73.92			
CB 33 - PIPE	200	PVC SDR35	7.00	75.53	73.92			

* DOWNSTREAM ELEVATIONS SHOWN ARE AT THE OBVERT OF THE STORM SEWER (MIN. GRADE 1% FOR ALL STORM SEWER CONNECTIONS)

							_
	SA	NITARY M	AINTENAN	ICE HOLE DATA	٨		
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEV	ATION	1
NO.	STATION	ULISEI	COVER	SIRUCIURE	T/GRATE	LOW/INV.	
SAN MH213	10+459.02	3.05 LT	*S24	OPSD 701.010	74.75	69.86	69.72
SAN MH215B	10+498.47	10.67 LT	*S24	OPSD 701.010	77.24	74.51	1
SAN MH215A	10+504.17	3.07 LT	*S24	OPSD 701.010	77.27	74.63	74.5
SAN MILT-A	10+515.65	3.07 LT	*S24	OPSD 701.010	77.72#	74.82	1
SAN MH T-B	10+521.49	4.38 LT	*\$24	OPSD 701.010	77.88#	74.90	1

L 10+498.50 - 10+498.60

OFFSETS ARE FROM CONTROL LINE TO CENTRE OF STRUCTURE STATIONS AND T/GRATE ELEVATIONS ARE FROM THE CENTRE OF STRUCTURE * FRAME TO BE SELF-LEVELING BY MEULLER AJ745 OR BIBBY C54M # T/GRATE ELEVATION TO BE SET IN FEILD TO MATCH SURFACE ELEVATION IN TEMPORARY TRANSITION AREA

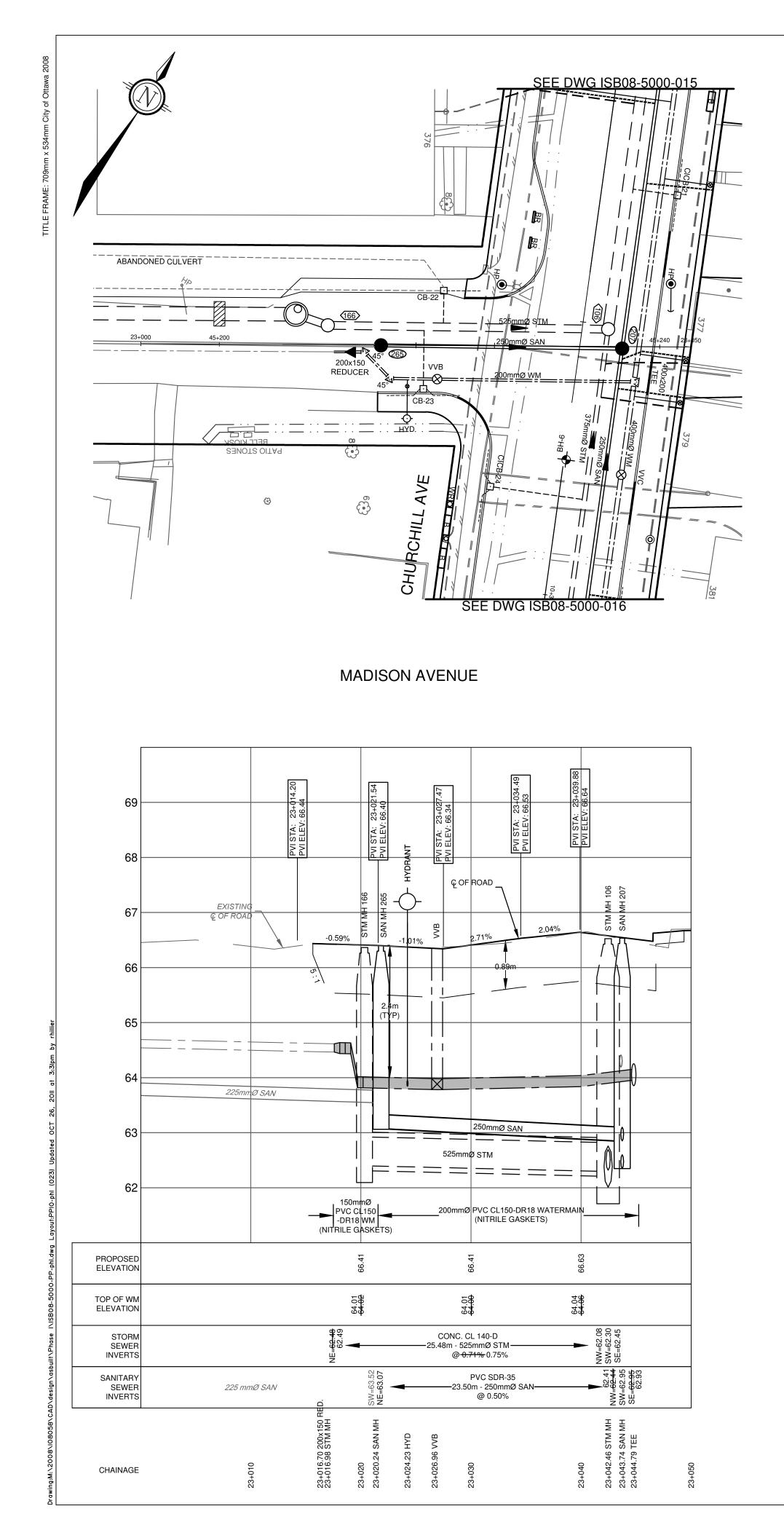
STORM MAINTENANCE HOLE DATA							
NO	STATION	OFFSET	COVER	STRUCTURE	ELEV		
NO.	JIATION	OTTOLI	COVEN	SINCOLORE	T/GRATE	LOW/INV.	
STM MH114	10+475.40	1.55 LT	*S24.1	OPSD 701.010	75.95	72.30	72.12
STM MH118	10+518.52	1.57 LT	*S24.1	OPSD 701.010	77.71#	74.40	73.90
	10.511.20						-

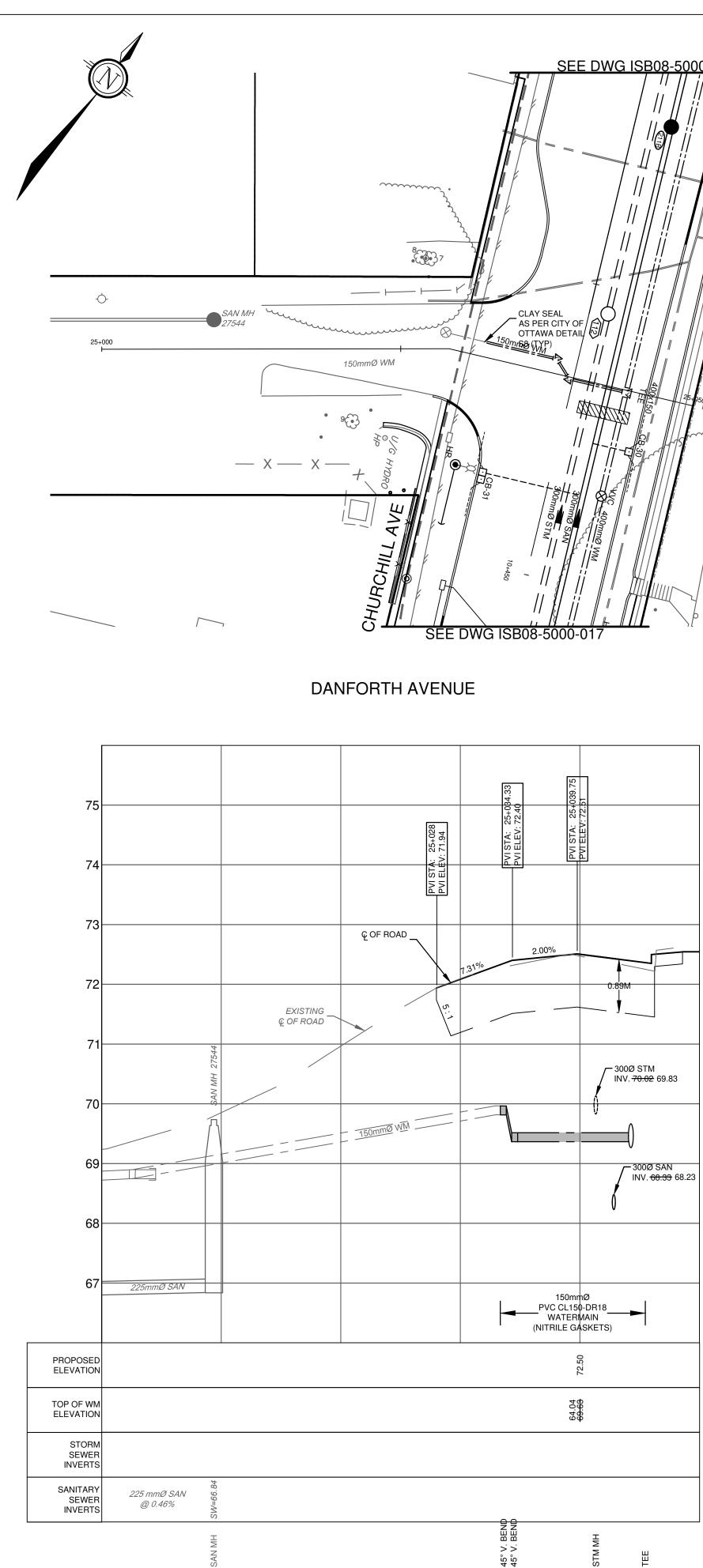
10+511.30 OFFSETS ARE FROM CONTROL LINE TO CENTRE OF STRUCTURE STATIONS AND T/GRATE ELEVATIONS ARE FROM THE CENTRE OF STRUCTURE * FRAME TO BE SELF-LEVELING BY MEULLER AJ745 OR BIBBY C54M # T/GRATE ELEVATION TO BE SET IN FEILD TO MATCH SURFACE ELEVATION IN TEMPORARY TRANSITION AREA

		SAN	TARY SEW	/ER DATA]
SEV	VER	DIA.	LENGTH	TYPE	INVERT EL	EVATIONS	
FROM	TO	DVI.	LENGIN	THE	UP STR.	DOWN STR.	
SAN 213	SAN 211B	300	47.78	CONC CL 140-D	69.86	67.00	66.92
-SAN 215A	SAN 215B	250	<u>9.50</u>	PVC SDR-35	74.63	74.54	
TEMP SAN A	SAN 215A	250	<mark>11.48</mark>	PVC SDR-35	74.82	74.66	74.58
TEMP SAN B		250	<u>5.99</u>	PVC SDR-35	74.90	74.83	
		12.40	⁰ 1		L	69.72	-

		ST	ORM SEWE	ER DATA			1
SEV	WER	DA.	LENGTH (m)	TYPE	INVERT EL	EVATIONS	
FROM	TO	DA.		ITTL	UP STR.	DOWN STR.	
STM 114	STM 112	300	48.21	CONC CL 140-D	72.30	69.70	69.5
STM 118	STM 114	300	43.12	CONC CL 140-D	74.40	72.85	72.6
			37.40		73.90 L	72.12	_

		BUILDING		DATA		
ADDRESS		EXISTING			PROPOSED	
ADDITEOU	STORM	SANITARY	COMBINED	STORM	SANITARY	COMBINED
424 CHURCHILL		Х			Х	
430 CHURCHILL		X			X	





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CHAINAGE

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5g 	

	SCO	REHABI	L AVENUE LITATION O BYRON AVENUE	C) tta	twa
) PROFILE 000 TO 23+050	Contract No ISB08). 8-5000	Dwg. No. 023
			+000 TO 25+050	Shee	et 23	of 55
E		MASON, P.Eng.	TODD PENFOUND, C.E.T. Project Manager	Asset Ro.	^{p:} IS	:D
				Des:		hk'd:
				Dwn:		ERD
				R	CH	DHI
				Utility Circ.		
				Const. Insp	ector:	
				Scale:	HORIZON 5	NTAL 10
					VERTIC	_
The dete cond	ermined I cerned.	by consulting the municipal	only, the exact location should be authorities and utility companies the location of utilities and shall be m damage.		ECH RING TSLTR LANNERS	le 200, 240 Michael Couyland Driv Kanete, Onteria, Canede Kähl På (2013) Jaho (2013) Kanete (2013) Inda naveinfettioverlech-ang.com
	No.		Description		Ву	Date
S	1.	ISSUED FOR PRELIMIN	IARY DESIGN CIRCULATION		ERD	07/10/09
SNOISIVE	2.	ISSUED FOR MOE APP	PROVAL		ERD	07/24/09
SIV18	3.	ISSUED FOR TENDER			ERD	11/06/09
ш	4.	ISSUED FOR DESIGN (CIRCULATION		ERD	11/06/09
	5.	ISSUED FOR CONSTRI	JCTION		ERD	03/09/10
	6.	ADDED CB23 / REVISE	D PROFILE		ERD	08/19/10
	7.	AS-BUILT			ERD	04/12/12

		CA	TCH BASI	N DATA		
NO	STATION	OFFSET	COVER	STRUCTURE	ELEV	ATION
NO.	JIAHON	OTTOLI	FFSEI COVER	STRUCTURE	GUTTER	LOW/INV.
CB 22	23+027.50	5.00 LT	S19	OPSD 705.010	66.20	64.8
CB 23	23+025.71	4.25 RT	S19	OPSD 705.010	66.47	65.07
OFFSET IS F	ROM CONTR	OL LINE TO C	ENTRE OF C	ATCHBASIN		

	CATCH	BASIN CO	NNECTION		
LOCATION	DIA.	TYPE	LENGTH (m)	INVERT EL	EVATIONS
LOGATION	(mm)	1111		UPSTR.	DOWNSTR.*
CICB 22 - PIPE	200	PVC SDR35	3.20	64.94	62.95
CICB 23 - PIPE	200	PVC SDR35	5.65	65.21	62.93
* DOWNSTREAM ELEVAT				STORM SEW	VER

(MIN. GRADE 1% FOR ALL STORM SEWER CONNECTIONS)

	S	ANITARY N	MAINTENA	NCE HOLE DAT	A	
NO.	STATION	OFESET	COVER	STRUCTURF	ELEV	ATION
NO.	OWNER	OFFOL	00101	ONCOTORE	T/GRATE	LOW/INV.
SAN MH265	23+020.24	0.01 RT	*S24	OPSD 701.010	66.41	63.07
		-				

STATIONS AND T/GRATE ELEVATIONS ARE FROM THE CENTRE OF STRUCTURE * FRAME TO BE SELF-LEVELING BY MEULLER AJ745 OR BIBBY C54M

	STORM MAINTENANCE HOLE DATA					
NO.	STATION	OFESET	COVER	STRUCTURE	ELEV	ATION
NO.	JIATION	OFFOLI		STRUCTURE	T/GRATE	LOW/INV.
STM MH166	23+016.98	1.77 LT	*S24.1	OPSD 701.010	66.39	62.48
		-		OF STRUCTURE		

STATIONS AND T/GRATE ELEVATIONS ARE FROM THE CENTRE OF STRUCTURE * FRAME TO BE SELF-LEVELING BY MEULLER AJ745 OR BIBBY C54M

DIA LENGTH TYPE	FRT ELEVATIONS
FROM TO UP	STR. DOWN STR
SAN 265 SAN 207 250 23.50 PV C SDR-35 63	3.07 62.95

STORM SEWER DATA						
SEWER		DIA.	LENGTH (m)	TYPE	INVERT ELEVATIONS	
FROM	TO	DIA.		ITE	UP STR.	DOWN STR.
STM 166	STM 106	525	25.48	CONC CL 140-D	62.48	62.30

APPENDIX G

Fire Hydrant Coverage

