



Stormwater Management Report and Servicing Brief

Proposed 8- Storey Multi-Unit Building
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

Rev. Jul 03, 2025
Oct 18, 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).

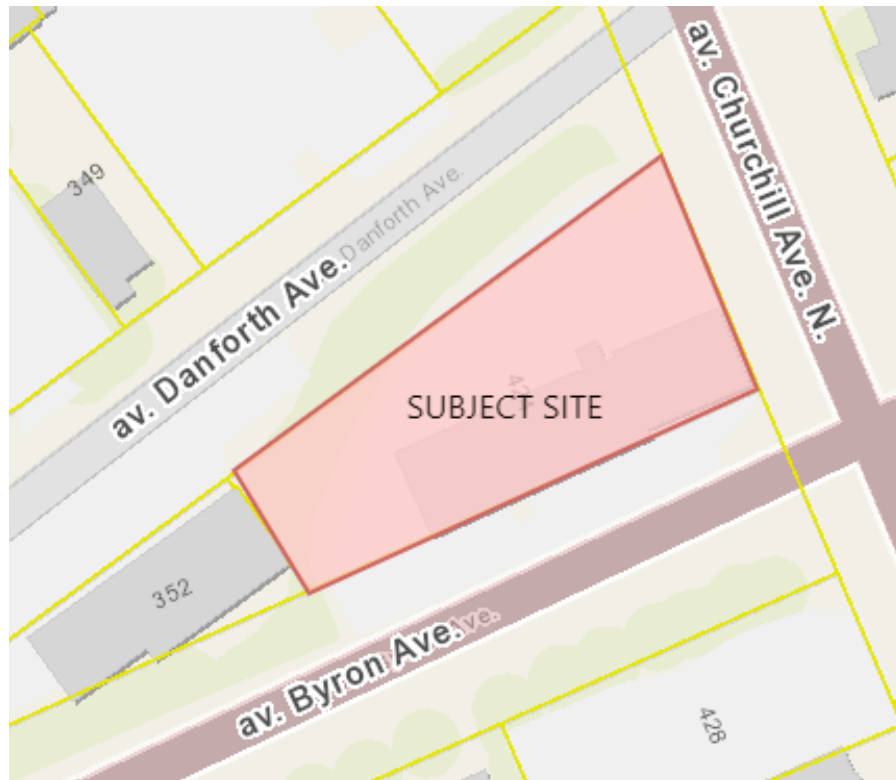


Figure 1: Aerial View of Subject Lands

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 8-storey 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 m²**, **58** residential units, **1,670 m²** 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:

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



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 **56** one-bedroom units and **14** two-bedroom units. Based on the City of Ottawa Design guidelines for population projection, this translates to approximately **107.8** 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*.

Table 1: Development Residential Population Estimate

Proposed Unit Type	Persons Per Unit	Number of Units	Total Population
1 Bedroom	1.4	56	78.4
2 Bedroom	2.1	14	29.4
Total		70	107.8

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 **0.35** L/s,
- Maximum daily demand is **2.53** L/s, and
- Maximum hourly demand is **3.80** 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.

Table 2: Institutional/ Commercial Demands

Property Type	Unit	Rate	Units	Demand (L/d)
Office/ Commercial	28,000	L/p/d	0.0215 ha	602.0
Amenity Space	28,000	L/ha/d	0.0314 ha	879.2



Using the peak factors, the anticipated institutional and commercial demands were calculated as follows:

- Average daily domestic water demand is **0.017 L/s**,
- Maximum daily demand is **0.026 L/s**, and
- Maximum hourly demand is **0.046 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 **0.37 L/s**,
- Maximum daily demand is **2.55 L/s**, and
- Maximum hourly demand is **3.85 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.

Table 3: Summary of Boundary Conditions

Design Parameter	Anticipated Demand (L/s)	Boundary Conditions @ Churchill Ave & Danforth Ave	
		Connection 1* (m H ₂ O / kPa)	Connection 2** (m H ₂ O / kPa)
Average Daily Demand	0.37	40.81 / 400.10	43.64 / 427.85
Max Day + Max Fire Flow (per FUS)	2.55 + 133.33	35.41 / 345.30	16.24 / 159.21
Peak Hour	3.85	34.91 / 342.26	37.74 / 370.00
*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 **8,000 L/min**, see **Appendix B** for details.



There are two (2) existing fire hydrants in proximity to the proposed buildings that are available to provide the required fire flow demands of 8,000 L/min. Refer to **Appendix G** for fire hydrant locations. The proposed development has been reviewed in the context of the location of the surrounding fire hydrants. Given the surrounding layout of the fire hydrants, these hydrants are accessible to fight fire at the subject property. 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*.

Table 4: Fire Protection Summary Table

	Max. Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Available Combined Fire Flow (L/min)
Contemplated Development	8,000	2	(2 x 5678) = 11,356

The total available fire flow from contributing hydrants is equal to **11,356 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 300mm 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 200 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 residential population of 107.8, commercial area of 0.053ha, the total anticipated wet wastewater flow was estimated to be **1.32 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 pre-development 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 pre-development 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 250mm diameter PVC storm sewer pipe will outlet stormwater flows from the site to the existing 300mm PVC storm sewer located within Churchill Avenue N. An additional 150mm diameter PVC storm sewer is proposed to outlet stormwater flows from the foundation drain directly to the existing 300mm PVC storm sewer located within Churchill Avenue N. The foundation drain outlet will have a backflow prevention device at the connection to the building and will be equipped with a sump pump as well as a backup pump and backup power source to ensure flow from the foundation level reaches elevation at the city sewer. Pumping details are to be designed by the mechanical engineer and provided at the Building permit stage. 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**.

Table 5: Post-Development Estimated Areas & Runoff Coefficients

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

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.

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

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

To attenuate flows to the allowable release rate of **10.81 L/s**, it is calculated that a total of **19.53 m³** 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 m³** 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 **8,000 L/min** using the FUS method.
- There are two (2) existing fire hydrants available to service the proposed development. They will provide a combined fire flow of **11,356 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 **1.32 L/s**.
- The proposed development will discharge to the existing 300 mm PVC sanitary sewer within Churchill Avenue N via a proposed 200mm 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 pre-development 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.

Sarthak Vora

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Civil E.I.T



Virginia Johnson, P. Eng.
Civil Engineer



APPENDIX A

Pre-consultation / Correspondance



From: [Bakhit, Reza](#)
To: [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 InformationCentre@ottawa.ca 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 post-development runoff from the subject site, up to and including the **100-year storm event**, to a **2-year pre-development level**. The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than 0.5. **[If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5]**. The time of concentration (T_c) used to determine the pre-development condition should be calculated. *T_c should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; T_c of 10 minutes shall be used for all post-development calculations*].
- Any storm events greater than the established **2-year allowable** release rate, up to and including the **100-year storm event**, shall be detained on-site. The SWM measures required to avoid impact on downstream sewer system will be subject to review.
- Please note that foundation drainage is to be independently connected to 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]

Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used.

Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire 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 patterns or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

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 [Guide to Preparing Studies and Plans](#) 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/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety>

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:

1. 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 TMconstruction@ottawa.ca early in the Site Plan process to determine the ability to construct site and copy File Lead Steve.Gauthier@ottawa.ca on this request.

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

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

Regards,

Reza Bakhit, 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 - Central 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
Date 6/6/2025
Prepared by Sarthak Vora

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

Domestic Demand			
Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom Apartment	1.4	56	78.4
2 Bedroom Apartment	2.1	14	29.4
	Total	70	107.8

*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	30,184 L/d	0.35 L/s	
Maximum Day Factor	7.2	Table (3-3) MOE Peaking Factors	
Maximum Daily Demand	218,263 L/d	2.53 L/s	
Peak Hour Factor	10.9	Table (3-3) MOE Peaking Factors	
Maximum Hour Demand	328,215 L/d	3.80 L/s	

Institutional / Commercial / Industrial Demand			
Property Type	Unit Rate	Units	Demand (L/d)
Office/ Commercial	28000 L/ha/d	0.0215 ha	602.0
Amenities	28000 L/ha/d	0.0314 ha	879.2

Average Day Demand	1,481 L/d	0.017 L/s	
Maximum Day Factor	1.5	(Design Guidelines-Water Distribution Table 4.2)	
Maximum Daily Demand	2,222 L/d	0.026 L/s	
Peak Hour Factor	1.8	(Design Guidelines-Water Distribution Table 4.2)	
Maximum Hour Demand	3,999 L/d	0.046 L/s	

TOTAL DEMAND			
Average Day Demand	31,665 L/d	0.37 L/s	
Maximum Daily Demand	220,485 L/d	2.55 L/s	
Maximum Hour Demand	332,214 L/d	3.85 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:

$$\begin{aligned} \text{Minimum pipe diameter (d)} &= (4Q/\pi V)^{1/2} \\ &= 0.052 \text{ m} \\ &= 52 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{Proposed pipe diameter (d)} &= 150 \text{ mm} \\ &= 6 \text{ Inches} \end{aligned}$$



Fire Flow Calculations

LRL File No.

220224

Date

June 19, 2025

Method

Fire Underwriters Survey (FUS)

Prepared by

Sarthak Vora

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow	
Structural Framing Material									
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Non-combustible construction	0.8			
			Ordinary Construction	1.0					
			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					3,900	m ²		
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	11,000
Reductions or surcharge due to factors affecting burning									
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Limited combustible	-15%	L/min	9,350	
			Limited combustible	-15%					
			Combustible	0%					
			Free burning	15%					
			Rapid burning	25%					
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	True	-30%	L/min	5,610	
			Water supply is standard for both the system and fire department hose lines	-10%	True	-10%			
			Fully supervised system	-10%	False	0%			
6	Choose separation	Exposure distance between units	Northwest side	>30m	0%		L/min	7,948	
			Southwest side	10.1 to 20m	15%				
			Northeast side	20.1 to 30m	10%				
			Southeast side	>30m	0%	25%			
Net required fire flow									
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 1000)					L/min	8,000	
		Minimum required fire flow rate					L/s	133.3	
		Required duration of fire flow					hr	2	

Sarthak Vora

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Wednesday, June 25, 2025 10:35 AM
To: Sarthak Vora
Cc: Virginia Johnson
Subject: RE: 424 Churchill Avenue_Updated BC (LRL 220224)
Attachments: 424 Churchill Avenue June 2025.pdf

Categories: Blue Category

Hello Sarthak

Further to your request, Water Resources Dept. has no issue with the proposed sanitary flow of 1.32 L/s to the 250 mm on Churchill Ave.

In addition, the following BC was provided by Water Dept.:

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

-
Both Connections:

Minimum HGL: 108.6 m

Maximum HGL: 114.5 m

Connection 1 (Danforth):

Max Day + Fire Flow (200 L/s): 87.1 m

Connection 2 (Churchill):

Max Day + Fire Flow (200 L/s): 109.1 m

These are for current conditions and are based on computer model simulation.

Disclaimer:

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji

Pronouns: he/him | Pronom: il

Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1

(613) 580 2424 Ext. | Poste 33017

Int. Mail Code | Code de Courrier Interne 01-14

shawn.wessel@ottawa.ca



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Vacation Alert : June 28 - July 2 (inclusive)



Une Ville, deux la
One City, two lang

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Sarthak Vora <svora@lrl.ca>

Sent: Monday, June 23, 2025 2:12 PM

To: Wessel, Shawn <shawn.wessel@ottawa.ca>

Cc: Virginia Johnson <vjohanson@lrl.ca>

Subject: RE: 424 Churchill Avenue_Updated BC (LRL 220224)

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Hi Shawn,

With the revised building statistics, the fire flow demand has been reduced to below 200 L/s. Could you please provide the Max Day HGL for Danforth Avenue?

Thanks,

Sarthak Vora, Civil E.I.T



LRL ENGINEERING | INGÉNIERIE

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Thursday, June 19, 2025 9:36 AM
To: Sarthak Vora <svora@lrl.ca>
Cc: Virginia Johnson <vjohnson@lrl.ca>
Subject: RE: 424 Churchill Avenue_Updated BC (LRL 220224)

Good morning Sarthak

As per your request, please see the following comments:

The max available fire flow from Danforth is 210 L/s. Please reduce FF demand to the available fire flow capacity.

We can provide a Multi-hydrant analysis to check if 216.7 L/s fire flow can be met. In order to do this please identify the hydrants and distance to the entrance of the building, accordingly. City's Tech bulletin 2018-02 restricts hydrants from the opposite side to be used if there's a median or traffic volume over 30,000/day. If hydrants from opposite side of a busy road are identified then you will need to request traffic count data.

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

- Requested Fire flow (216.7 L/s) is not available for Danforth Connection

Both Connections:

Minimum HGL: 108.6 m

Maximum HGL: 114.5 m

Connection 1 (Danforth):

Max available **Fire flow at 20 psi: 210 L/s**, assumed ground elevation for Danforth connection is 70.9 m.

Connection 2 (Churchill):

Max Day + Fire Flow (216.7 L/s) : 108.9 m

These are for current conditions and are based on computer model simulation.

Disclaimer:

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the

watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

"The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update."

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji

Pronouns: he/him | Pronom: il

Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d’infrastructures

Development Review Central Branch | Direction de l’examen des projets d’aménagement, Centrale

Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l’aménagement et du bâtiment (DGSPAB)

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shawn.wessel@ottawa.ca



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Vacation Alert : June 28 - July 2 (inclusive)



Une Ville, deux la
One City, two lang

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Sarthak Vora <svora@lrl.ca>

Sent: Wednesday, June 11, 2025 9:52 AM

To: Wessel, Shawn <shawn.wessel@ottawa.ca>

Cc: Virginia Johnson <vjohnson@lrl.ca>

Subject: RE: 424 Churchill Avenue_Updated BC (LRL 220224)

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Thankyou Shawn,

Could you please try to expedite the request? We're hoping to re-submit as soon as possible, and this is the only item currently holding things up. Appreciate your help!

Sarthak Vora, Civil E.I.T



LRL ENGINEERING | INGÉNIERIE

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www.lrl.ca

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Wessel, Shawn <shawn.wessel@ottawa.ca>

Sent: Friday, June 6, 2025 1:16 PM

To: Sarthak Vora <svora@lrl.ca>

Cc: Virginia Johnson <vjohnson@lrl.ca>

Subject: RE: 424 Churchill Avenue_Updated BC (LRL 220224)

Thank you Sarthak

Request sent to Water Dept.

Have a nice weekend!

Regards,

Shawn Wessel, A.Sc.T.,rcji

Pronouns: he/him | Pronom: il

Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d’infrastructures

Development Review Central Branch | Direction de l’examen des projets d’aménagement, Centrale

Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l’aménagement et du bâtiment (DGSPAB)

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(613) 580 2424 Ext. | Poste 33017

Int. Mail Code | Code de Courrier Interne 01-14

shawn.wessel@ottawa.ca



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Une Ville, deux la
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From: Sarthak Vora <svora@lrl.ca>
Sent: Friday, June 6, 2025 12:58 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Virginia Johnson <vjohnson@lrl.ca>
Subject: Re: 424 Churchill Avenue_Updated BC (LRL 220224)

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Hello Shawn,

Since the last submission, please note that there has been a revision to the unit counts and commercial/amenity areas for the proposed development.

Boundary Conditions Request:

We are requesting updated boundary conditions based on the revised building statistics. The proposed development consists of an 8-storey building, accommodating a total of 70 residential units, 215m² of commercial space and 314m² of Amenity spaces. We are proposing two (2) 150mmØ water service connection to the existing 400mmØ municipal watermain in Churchill Avenue and the existing 150mmØ municipal watermain in Danforth Avenue.

Could you please provide the updated boundary conditions based on the following revised water demand figures:

	Demand (L/s)
Avg. Daily	0.37
Max. Day + FUS	2.55 + 216.7
Peak Hour	3.85

Sanitary Sewer Capacity confirmation:

We would also appreciate confirmation of capacity within the existing 250mmØ sanitary sewer in Churchill Avenue to accommodate the revised discharge flow of **1.32L/s** from the proposed development.

Please find the updated calculation sheets attached for your reference.

Regards,

Sarthak Vora, Civil E.I.T

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Boundary Condition for 424 Churchill Avenue



Connection 1

Connection 2

358

349

408

412

325

321

421

424

352

428

433

152mm

av. Danforth Ave.

152mm

400mm

203mm

av. Byron Ave.

av. Byron

th Ave.

av. C

Legend

Ownership

Private


Public

City of Ottawa

APPENDIX C

Wastewater Collection Calculations



<div><div><div>LRL File No.</div><div>220224</div><div>Project:</div><div>CIV 8-Storey Condo Redevelopment</div><div>Location:</div><div>424 Churchill Avenue, Ottawa ON</div><div>Date:</div><div>June 6, 2025</div></div></div>	<div>Sanitary Design Parameters</div> <div><div>Average Daily Flow = 280 L/p/day</div><div>Commercial & Institutional Flow = 50000 L/ha/day</div><div>Light Industrial Flow = 35000 L/ha/day</div><div>Heavy Industrial Flow = 55000 L/ha/day</div><div>Maximum Residential Peak Factor = 4.0</div><div>Commercial & Institutional Peak Factor = 1.5</div></div> <div><div>Correction Factor=0.8</div><div>Industrial Peak Factor = as per Appendix 4-B = 7</div><div>Extraneous Flow = 0.33L/s/gross ha</div></div>	<div>Pipe Design Parameters</div> <div><div>Minimum Velocity = 0.60 m/s</div><div>Manning's n = 0.013</div></div>
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LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE					
STREET	FROM	TO MH	AREA (Ha)	POP.	CUMMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)		LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)
					AREA (Ha)	POP.																				
Churchill Ave N	Bldg	PROP SAN MH01		107.8	0.00	107.8	3.6	1.25	0.053	0.053	0.00	0.00	1.0	0.0	0.0	0.05	0.053	0.053	0.02	1.32	13.1	200	2.00%	PVC	46.38	1.48

NOTES	Existing inverts and slopes are estimated. They are to be confirmed on-site.	Designed:	PROJECT:	
		S.V	CIV 8-Storey Condo Redevelopment	
		Checked:	LOCATION:	
		V.J	424 Churchill Avenue North, Ottawa ON	
Dwg. Reference:		Project:		Sheet No.
C.401		220224		1 of 1

APPENDIX D
Stormwater Management Calculations
Watts Roof Drain Specification



LRL Associates Ltd.
Storm Watershed Summary



LRL File No. 220224
Project: CIV 7-Storey Condo Building
Location: 424 Churchill Avenue
Date: April 9, 2023
Designed: Tamara Harb
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. 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-100 Year

Runoff Equation

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

Pre-development Stormwater Management - 2 Year Storm

2 year storm

$$I_2 = 732.95 / (T_d + 6.199)^{0.81}$$

$$a = 732.951$$

$$b = 0.810$$

$$C = 6.199$$

C = 0.50 max of 0.5 as per City of Ottawa
I = 76.8 mm/hr
T_c = 10 min
Total Area = 0.101 ha

Allowable Release Rate = 10.81 L/s

Post-development Stormwater Management

					$\sum R_{24h}$	$\sum R_{100}$
Controlled	Total Site Area =	0.070	ha	$\sum R =$		
	WS-01 (ROOF)	0.012	ha	R =	0.90	1.00
	WS-02 (ROOF)	0.014	ha	R =	0.90	1.00
	WS-03 (ROOF)	0.025	ha	R =	0.90	1.00
	WS-04 (ROOF)	0.006	ha	R =	0.90	1.00
	WS-05 (ROOF)	0.013	ha	R =	0.90	1.00
Un-controlled	Total Controlled	0.070	ha	$\sum R =$	0.90	1.00
	WS-06 (UNCONTROLLED)	0.031	ha	R =	0.90	1.00
	Total Un-Controlled =	0.031	ha	$\sum R =$	0.90	1.00

Post-development Stormwater Management (Uncontrolled Catchment WS-06)

100 Year Storm Event:

$$I_{100} = 1735.688 / (T_d + 6.014)^{0.820}$$

$$a = 1735.688$$

$$b = 0.820$$

$$C = 6.014$$

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
10	178.6	15.59	0.00	15.59



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-100 Year

Post-development Stormwater Management (WS-01 ROOF)

100 Year Storm Event:

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

$$a = 1735.688$$

$$b = 0.820$$

$$C = 6.014$$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
10	178.6	5.77	2.71	1.26	0.00	1.26
15	142.9	4.62	3.02	1.26	0.00	1.26
20	120.0	3.88	3.14	1.26	0.00	1.26
25	103.8	3.36	3.15	1.26	0.00	1.26
30	91.9	2.97	3.08	1.26	0.00	1.26
35	82.6	2.67	2.96	1.26	0.00	1.26
40	75.1	2.43	2.81	1.26	0.00	1.26
45	69.1	2.23	2.63	1.26	0.00	1.26
50	64.0	2.07	2.42	1.26	0.00	1.26
60	55.9	1.81	1.97	1.26	0.00	1.26
70	49.8	1.61	1.47	1.26	0.00	1.26
80	45.0	1.45	0.93	1.26	0.00	1.26
90	41.1	1.33	0.37	1.26	0.00	1.26
100	37.9	1.23	0.00	1.26	0.00	1.26
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

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) = 3.15 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 116.28 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 3.15 m³
Available Roof Storage = 6.03 m³
refer to LRL Plan C601

Post-development Stormwater Management (WS-02 ROOF)

100 Year Storm Event:

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

$$a = 1735.688$$

$$b = 0.820$$

$$C = 6.014$$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
10	178.6	7.02	3.46	1.26	0.00	1.26
15	142.9	5.62	3.92	1.26	0.00	1.26
20	120.0	4.72	4.15	1.26	0.00	1.26
25	103.8	4.08	4.23	1.26	0.00	1.26
30	91.9	3.61	4.23	1.26	0.00	1.26
35	82.6	3.25	4.17	1.26	0.00	1.26
40	75.1	2.95	4.07	1.26	0.00	1.26
45	69.1	2.72	3.93	1.26	0.00	1.26
50	64.0	2.51	3.76	1.26	0.00	1.26
60	55.9	2.20	3.38	1.26	0.00	1.26
70	49.8	1.96	2.93	1.26	0.00	1.26
80	45.0	1.77	2.44	1.26	0.00	1.26
90	41.1	1.62	1.93	1.26	0.00	1.26
100	37.9	1.49	1.38	1.26	0.00	1.26
110	35.2	1.38	0.82	1.26	0.00	1.26
120	32.9	1.29	0.24	1.26	0.00	1.26

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) = 4.23 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 141 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 4.23 m³
Available Roof Storage = 4.55 m³
refer to LRL Plan C601



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-100 Year

Post-development Stormwater Management (WS-03 ROOF)

100 Year Storm Event:

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

a = 1735.688

b = 0.820

C = 6.014

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
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

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) = 9.46 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 248 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 9.46 m³
Available Roof Storage = 13.17 m³
refer to LRL Plan C601

Post-development Stormwater Management (WS-04 ROOF)

100 Year Storm Event:

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

a = 1735.688

b = 0.820

C = 6.014

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
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 Roof Storage

Maximum Required Roof Storage (100 Year) = 1.09 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 62.07 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 1.09 m³
Available Roof Storage = 3.14 m³
refer to LRL Plan C601



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-100 Year

Post-development Stormwater Management (WS-05 ROOF)

100 Year Storm Event:

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

a = 1735.688

b = 0.820

C = 6.014

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
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

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) = 3.76 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 131 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 3.76 m³
Available Roof Storage = 6.64 m³

refer to LRL Plan C.601

SUMMARY OF RELEASE RATES AND STORAGE VOLUMES

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

* Allowable Release Rate = 10.81L/s. As per City comments it's acceptable to only control the roof portion of the site. The remainder can be uncontrolled if it flows to the City ROW. Total controlled flow = 6.30L/s meeting the allowable release rate of 10.81L/s.



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**

Runoff Equation

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

Pre-development Stormwater Management - 2 Year Storm

2 year storm

$$I_2 = 732.95 / (T_d + 6.199)^{0.81}$$

$$a = 732.951$$

$$b = 0.810$$

$$C = 6.199$$

C = 0.50 max of 0.5 as per City of Ottawa
I = 76.8 mm/hr
T_c = 10 min
Total Area = 0.101 ha

Allowable Release Rate = 10.81 L/s

Post-development Stormwater Management

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

Post-development Stormwater Management (Uncontrolled Catchment WS-06)

5 Year Storm Event:

$$I_5 = 998.071 / (T_d + 6.053)^{0.814}$$

$$a = 998.071$$

$$b = 0.814$$

$$C = 6.053$$

Time (min)	Intensity (mm/hr)	Uncontrolled Runoff (L/s)	Controlled Release Rate Constant (L/s)	Total Release Rate (L/s)
10	104.2	8.18	0.00	8.18



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

Post-development Stormwater Management (WS-01 ROOF)

5 Year Storm Event:

$$I_s = 998.071 / (T_d + 6.053)^{0.814}$$

$$a = 998.071$$

$$b = 0.814$$

$$C = 6.053$$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
10	104.2	3.03	1.06	1.26	0.00	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	53.9	1.57	0.56	1.26	0.00	1.26
35	48.5	1.41	0.32	1.26	0.00	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	32.9	0.96	0.00	1.26	0.00	1.26
70	29.4	0.85	0.00	1.26	0.00	1.26
80	26.6	0.77	0.00	1.26	0.00	1.26
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

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) = 1.06 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 116.28 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 1.06 m³
Available Roof Storage = 6.03 m³ refer to LRL Plan C601

Post-development Stormwater Management (WS-02 ROOF)

5 Year Storm Event:

$$I_s = 998.071 / (T_d + 6.053)^{0.814}$$

$$a = 998.071$$

$$b = 0.814$$

$$C = 6.053$$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
10	104.2	3.69	1.46	1.26	0.00	1.26
15	83.6	2.96	1.53	1.26	0.00	1.26
20	70.3	2.49	1.47	1.26	0.00	1.26
25	60.9	2.16	1.34	1.26	0.00	1.26
30	53.9	1.91	1.17	1.26	0.00	1.26
35	48.5	1.72	0.96	1.26	0.00	1.26
40	44.2	1.56	0.73	1.26	0.00	1.26
45	40.6	1.44	0.48	1.26	0.00	1.26
50	37.7	1.33	0.22	1.26	0.00	1.26
60	32.9	1.17	0.00	1.26	0.00	1.26
70	29.4	1.04	0.00	1.26	0.00	1.26
80	26.6	0.94	0.00	1.26	0.00	1.26
90	24.3	0.86	0.00	1.26	0.00	1.26
100	22.4	0.79	0.00	1.26	0.00	1.26
110	20.8	0.74	0.00	1.26	0.00	1.26
120	19.5	0.69	0.00	1.26	0.00	1.26

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) = 1.53 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 141 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 1.53 m³
Available Roof Storage = 4.55 m³ refer to LRL Plan C601



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

Post-development Stormwater Management (WS-03 ROOF)

5 Year Storm Event:

$$I_s = 998.071 / (T_d + 6.053)^{0.814}$$

$$a = 998.071$$

$$b = 0.814$$

$$C = 6.053$$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
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 Roof Storage

Maximum Required Roof Storage (100 Year) = 3.78 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 248 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 3.78 m³
Available Roof Storage = 13.17 m³
refer to LRL Plan C601

Post-development Stormwater Management (WS-04 ROOF)

5 Year Storm Event:

$$I_s = 998.071 / (T_d + 6.053)^{0.814}$$

$$a = 998.071$$

$$b = 0.814$$

$$C = 6.053$$

Time (min)	Intensity (mm/hr)	Storage Required		Controlled Release Rate Constant (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)			
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
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 Roof Storage

Maximum Required Roof Storage (100 Year) = 0.21 m³
Proposed Head = 150 mm
Control Flow/Drain = 0.63 L/s
Number of Roof Drains = 2
Total Flow from Roof Drain = 1.26 L/s
Available Roof Surface = 62.07 m²
Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 0.21 m³
Available Roof Storage = 3.14 m³
refer to LRL Plan C601



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

Post-development Stormwater Management (WS-05 ROOF)

5 Year Storm Event:

$$I_s = 998.071 / (T_d + 6.053)^{0.814}$$

a = 998.071

b = 0.814

C = 6.053

Time (min)	Intensity (mm/hr)	Storage Required			Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
		Controlled Runoff (L/s)	Storage Volume (m ³)	Controlled Release Rate Constant (L/s)		
10	104.2	3.40	1.29	1.26	0.00	1.26
15	83.6	2.73	1.32	1.26	0.00	1.26
20	70.3	2.29	1.24	1.26	0.00	1.26
25	60.9	1.99	1.09	1.26	0.00	1.26
30	53.9	1.76	0.90	1.26	0.00	1.26
35	48.5	1.58	0.68	1.26	0.00	1.26
40	44.2	1.44	0.44	1.26	0.00	1.26
45	40.6	1.33	0.18	1.26	0.00	1.26
50	37.7	1.23	0.00	1.26	0.00	1.26
60	32.9	1.08	0.00	1.26	0.00	1.26
70	29.4	0.96	0.00	1.26	0.00	1.26
80	26.6	0.87	0.00	1.26	0.00	1.26
90	24.3	0.79	0.00	1.26	0.00	1.26
100	22.4	0.73	0.00	1.26	0.00	1.26
110	20.8	0.68	0.00	1.26	0.00	1.26
120	19.5	0.64	0.00	1.26	0.00	1.26

Summary of Roof Storage

Maximum Required Roof Storage (100 Year) = 1.32 m³
 Proposed Head = 150 mm
 Control Flow/Drain = 0.63 L/s
 Number of Roof Drains = 2
 Total Flow from Roof Drain = 1.26 L/s
 Available Roof Surface = 131 m²
 Roof Drain Model = WATTS adjustable roof drain w/ weir opening-closed

*An Emergency overflow scupper is provided above this height.

Total Storage Required = 1.32 m³
 Available Roof Storage = 6.64 m³

refer to LRL Plan C.601

SUMMARY OF RELEASE RATES AND STORAGE VOLUMES

CATCHMENT AREAS	DRAINAGE AREAS (ha)	5-YEAR RELEASE RATE	5-YEAR REQUIRED STORAGE (m ³)	TOTAL AVAILABLE STORAGE (m ³)
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 Parameters

Rational Method $Q = 2.78CIA$

Q = Peak flow in litres per second (L/s)
A = Drainage area in hectares (ha)
C = Runoff coefficient
I = Rainfall intensity (mm/hr)

Runoff Coefficient (C)	
Grass	0.20
Gravel	0.70
Asphalt / rooftop	0.90

Ottawa Macdonald-Cartier International Airport IDF curve equation (10 year event, intensity in mm/hr)

$$I_{100} = 1735.688 / (T_d + 6.014)^{0.820}$$

Min. velocity = 0.80 m/s
Manning's "n" = 0.013

[illegible]

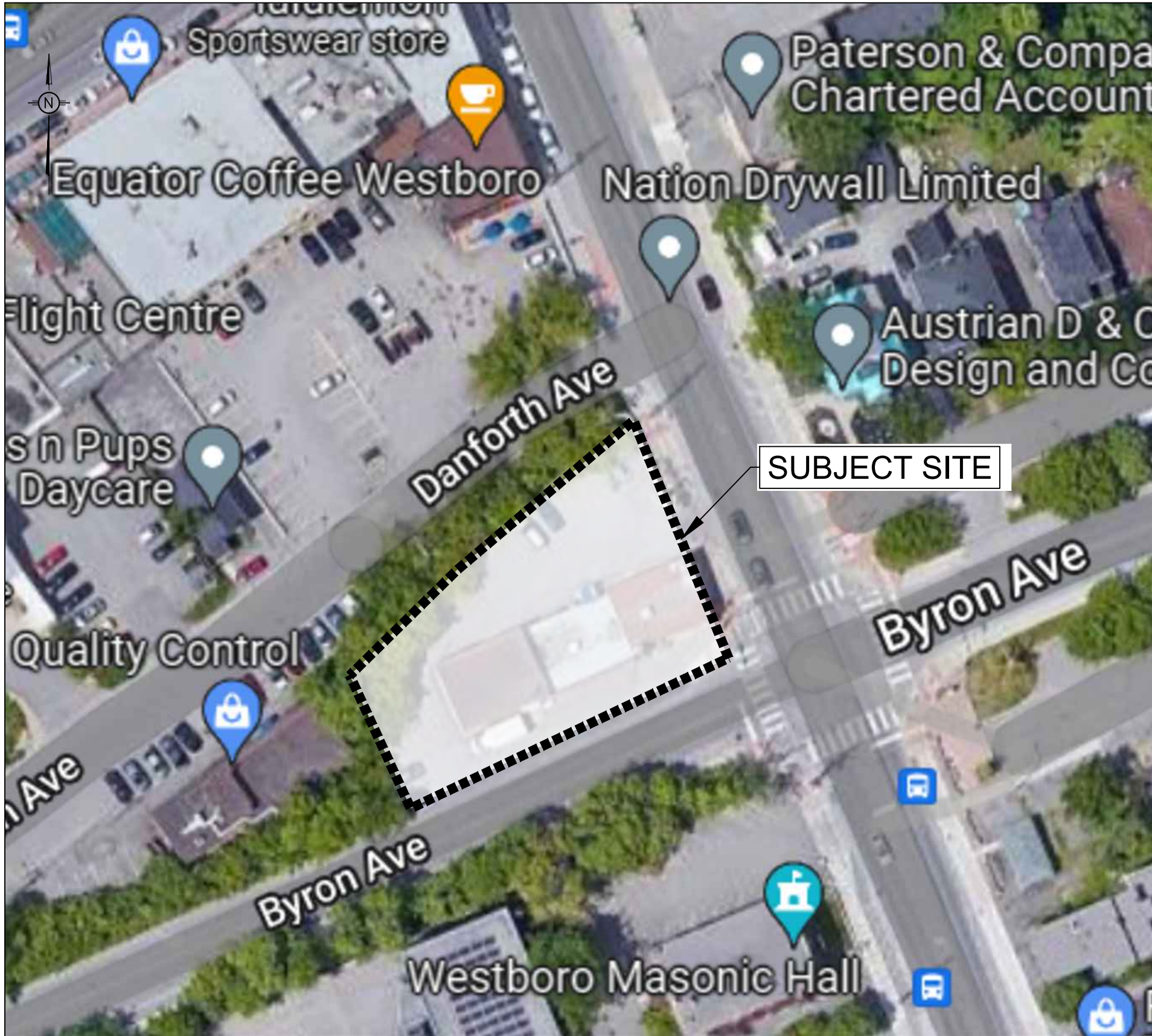
APPENDIX E

Civil Engineering Drawings



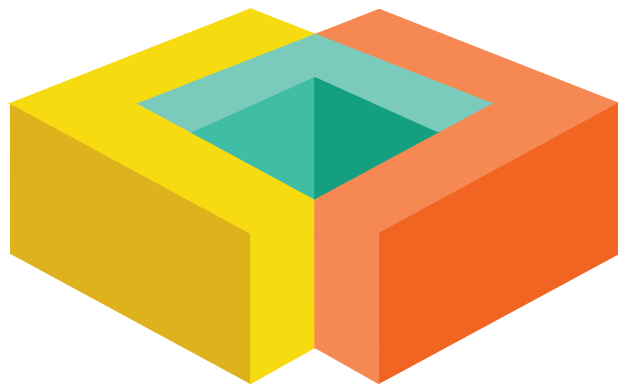
PROPOSED 8 STOREY MULTI-UNIT BUILDING 424 CHURCHILL AVE, OTTAWA ON

REVISION 06



KEY PLAN (N.T.S.)

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STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901



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PROPOSED 8 STOREY MULTI-UNIT BUILDING
424 CHURCHILL AVE, OTTAWA ON
RE-ISSUED FOR APPROVAL - JULY, 2025
LRL PROJECT no: 220224



NOT AUTHENTIC UNLESS SIGNED AND DATED

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 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 SERVICES 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: FILTER BAGS, PUMP FILTERS, SILT FENCE, FILTER CLOTHS, CATCH BASIN FILTERS, AND/OR OTHER RECOGNIZED TECHNOLOGIES AND METHOD AVAILABLE AT THE TIME OF CONSTRUCTION. SPECIFIC MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF OPSS 805 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, ETC.
 - 3.2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIROMENT.
 - 3.3. RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

MUD MAT NOTES

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

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. SC1.1 OR OPSD 600.110. 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.
5. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN ON THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT.
6. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSD 310.
7. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 300MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
8. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300MM LIFTS.
9. 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 REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTINGS AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
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 STANDARDS.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP 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.
16. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK FILLED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
17. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
2. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING S6. 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 96% SPMD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT 60M INTERVALS IN THE SERVICE TRENCHES.
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 PROCTOR DENSITY. A MINIMUM OF 300MM AROUND STRUCTURES.
5. 'MODULOC' OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE 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.
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 SATISFACTION OF THE ENGINEER.
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 THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.
10. FOLLOWING INSTALLATION CONNECTION OF SERVICES WITHIN THE CITY OF OTTAWA, THE CONTRACTOR MUST ENSURE AND REPAVE THE ENTIRE WIDTH OF THE CITY'S ROAD SURFACE, CURB TO CURB, ENSURING A MIN. 50mm ASPHALT OVERLAY TO MEET CITY STANDARDS.

SANITARY

11. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
12. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
13. EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
14. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
15. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
16. SANITARY MAINTENANCE STRUCTURES SHALL HAVE ADDITIONAL BEDDING TO BE BENCHED PER OPSD 701.
17. 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING SSP-1.

STORM

18. 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 GASKETS AS PER CSA A257.3, OR LATEST AMENDMENT.
19. 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.
20. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
21. CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
22. CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
23. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
24. ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
25. 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 MADE NECESSARY BY THE WIDENED TRENCH.
26. 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.
27. PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE APPLICABLE.
28. RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.
29. ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
30. ALL STORM MAN-HOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

WATERMAIN

31. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
32. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
33. ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
34. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17, UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
35. 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.
36. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD 25.5 AND W25.6.
37. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
38. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD 25.5 AND W25.6.
39. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
40. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
41. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25.2 AND W25, RESPECTIVELY.
42. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
43. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS, 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 THE SEWER.
44. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
45. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG W20.
46. FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED FINISHED GRADE AT HYDRANT; FIRE HYDRANT LOCATION AS PER STD DWG W18.
47. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
48. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR PRESSURE LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
49. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL 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 MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
50. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

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 INSTALLED UNLESS AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

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UNAUTHORIZED CHANGES

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02	RE-ISSUED FOR APPROVAL	T.H.	14 APR 2023
01	ISSUED FOR APPROVAL	T.H.	11 OCT 2022

No.	REVISIONS	BY	DATE
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LRL
ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

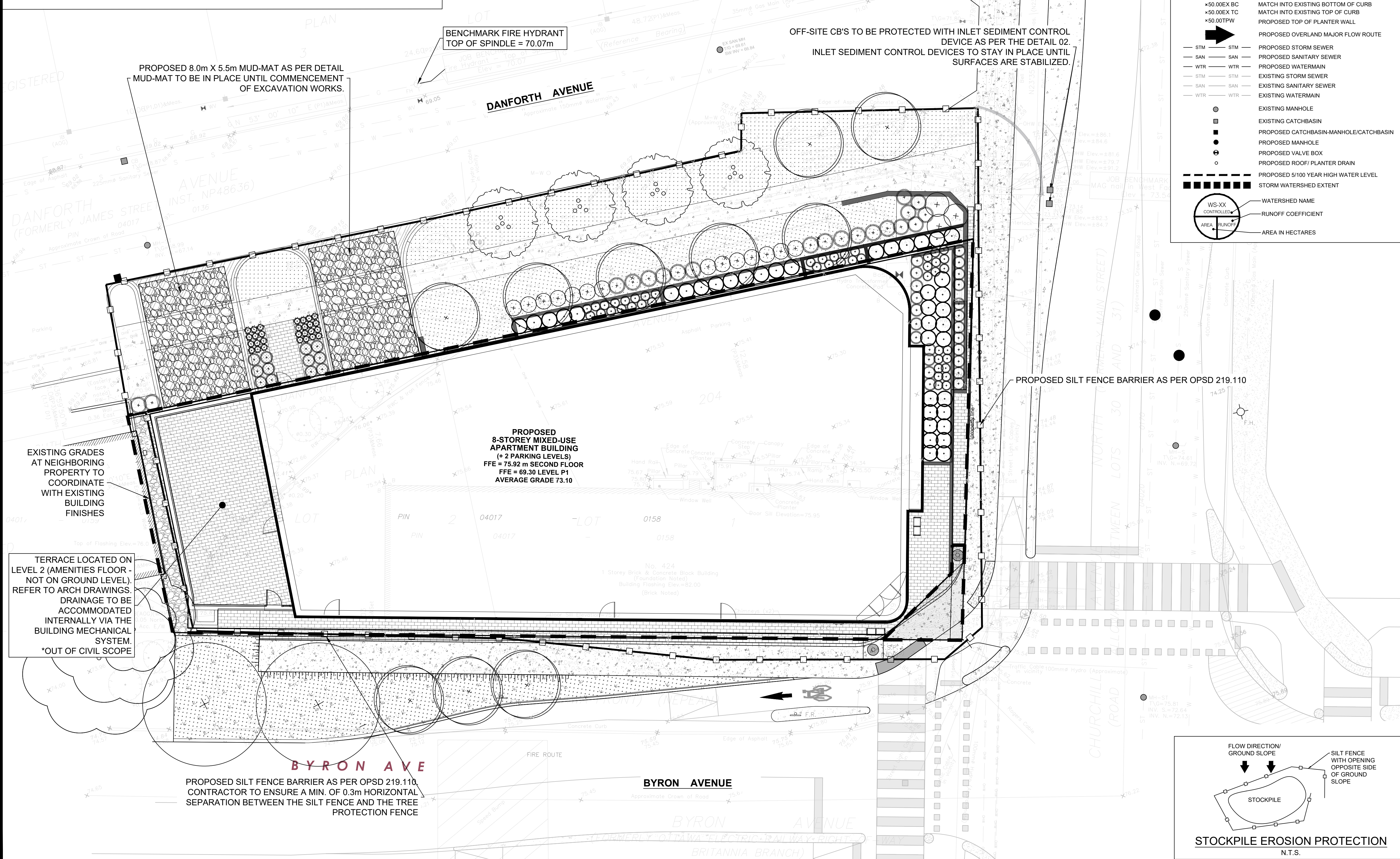
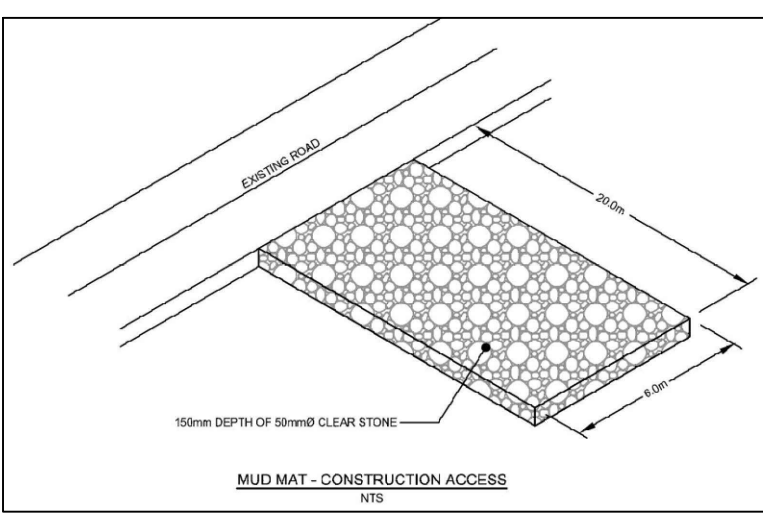
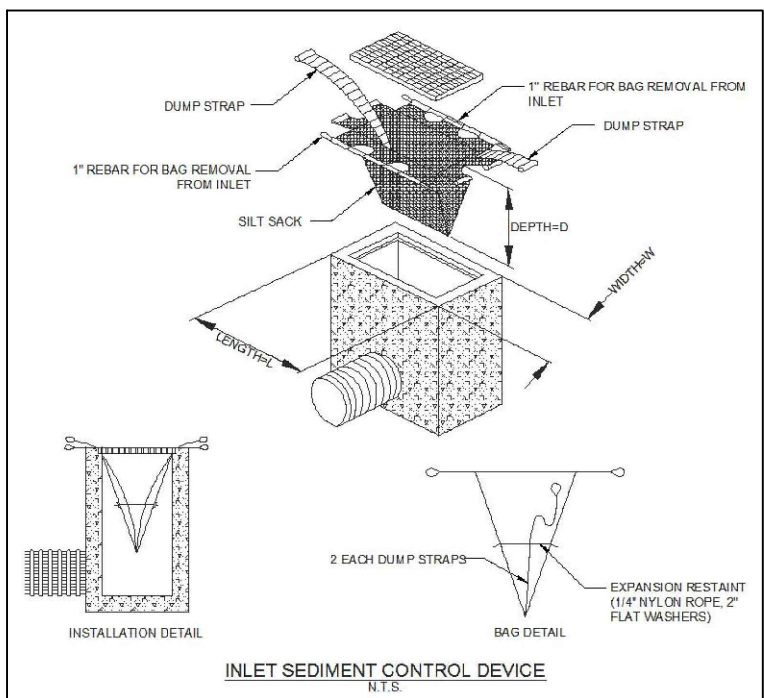
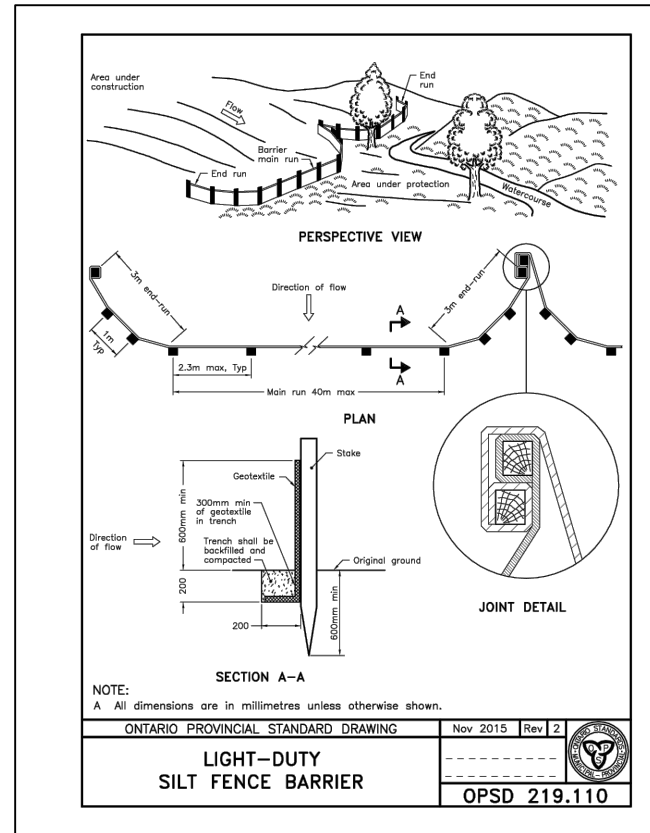
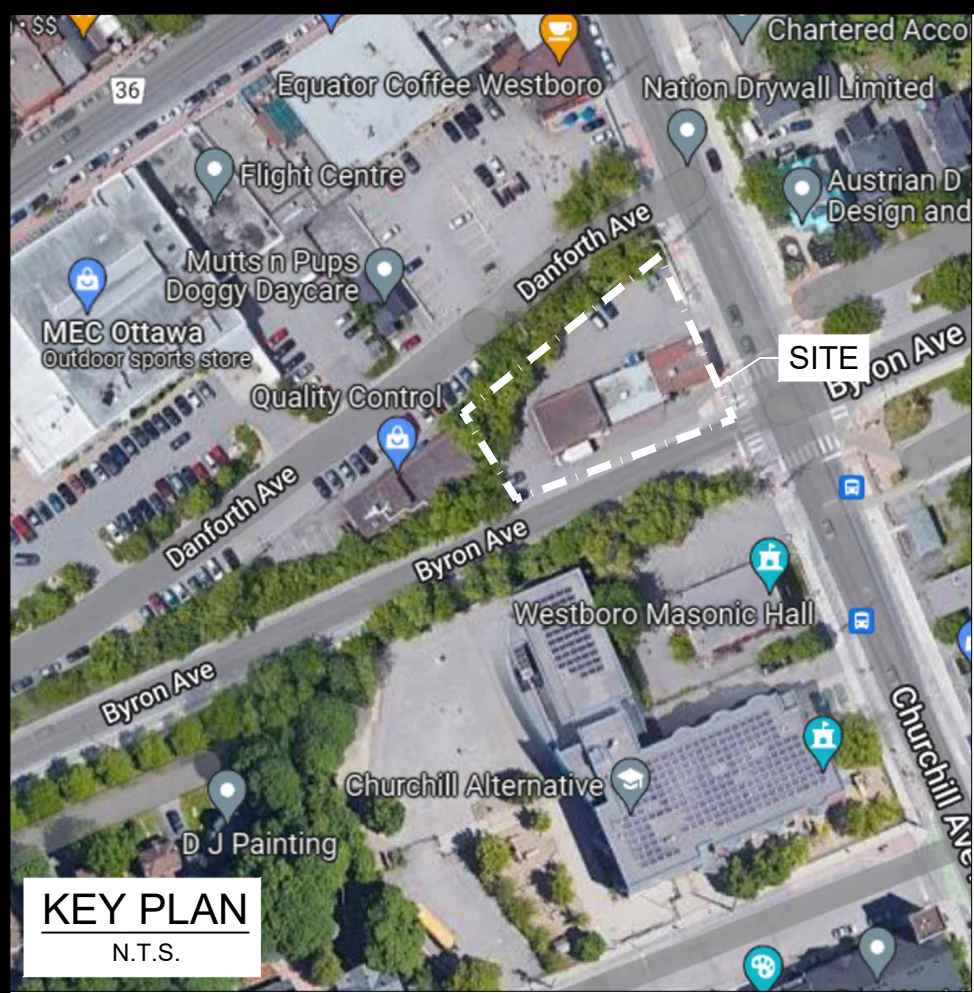
CLIENT		
GSI PROPERTIES		
DESIGNED BY:	DRAWN BY:	APPROVED BY:
T.H.	T.H.	V.J.

PROJECT		
PROPOSED 8-STOREY MULTI-UNIT BUILDING 424 CHURCHILL AVE OTTAWA, ON		

DRAWING TITLE

GENERAL NOTES

PROJECT NO. 220224	
DATE APRIL, 2023	



LEGEND:

- PROPERTY LINE
- PROPOSED CURB
- PROPOSED TERRACING
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED ELEVATION
- PROPOSED HIGH POINT ELEVATION
- PROPOSED SWALE ELEVATION
- PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- PROPOSED TOP OF RETAINING WALL
- MATCH INTO EXISTING ELEVATION
- MATCH INTO EXISTING BOTTOM OF CURB
- MATCH INTO EXISTING TOP OF CURB
- PROPOSED TOP OF PLANTER WALL
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING MANHOLE
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- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED VALVE BOX
- PROPOSED ROOF/PLANTER DRAIN
- PROPOSED 5/100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED AREA RUNOFF
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

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1:5m 0 3.0 6.0m
SCALE: 1:125

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01	ISSUED FOR APPROVAL	T.H.	11 OCT 2022

No.	REVISIONS	BY	DATE
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PROFESSIONAL ENGINEER
V. JOHNSON
100510576
07-03-2025
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRJ
ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lri.ca | (613) 842-3434

CLIENT: **GSI PROPERTIES**

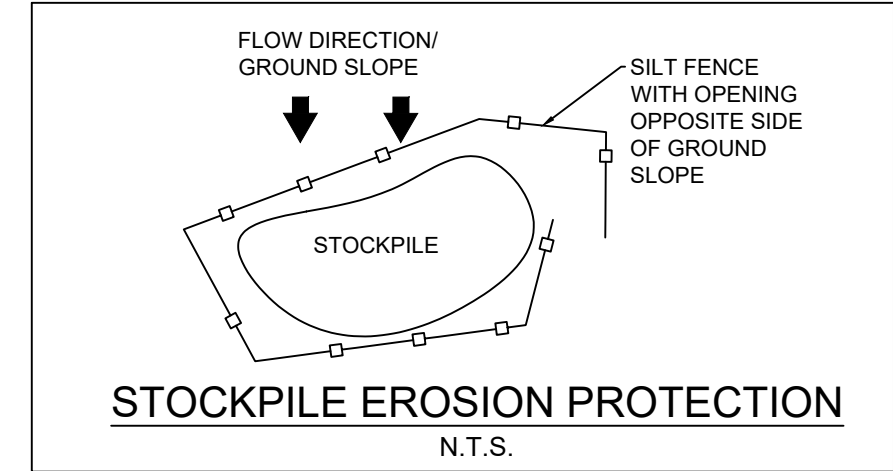
DESIGNED BY: T.H. DRAWN BY: T.H. APPROVED BY: V.J.

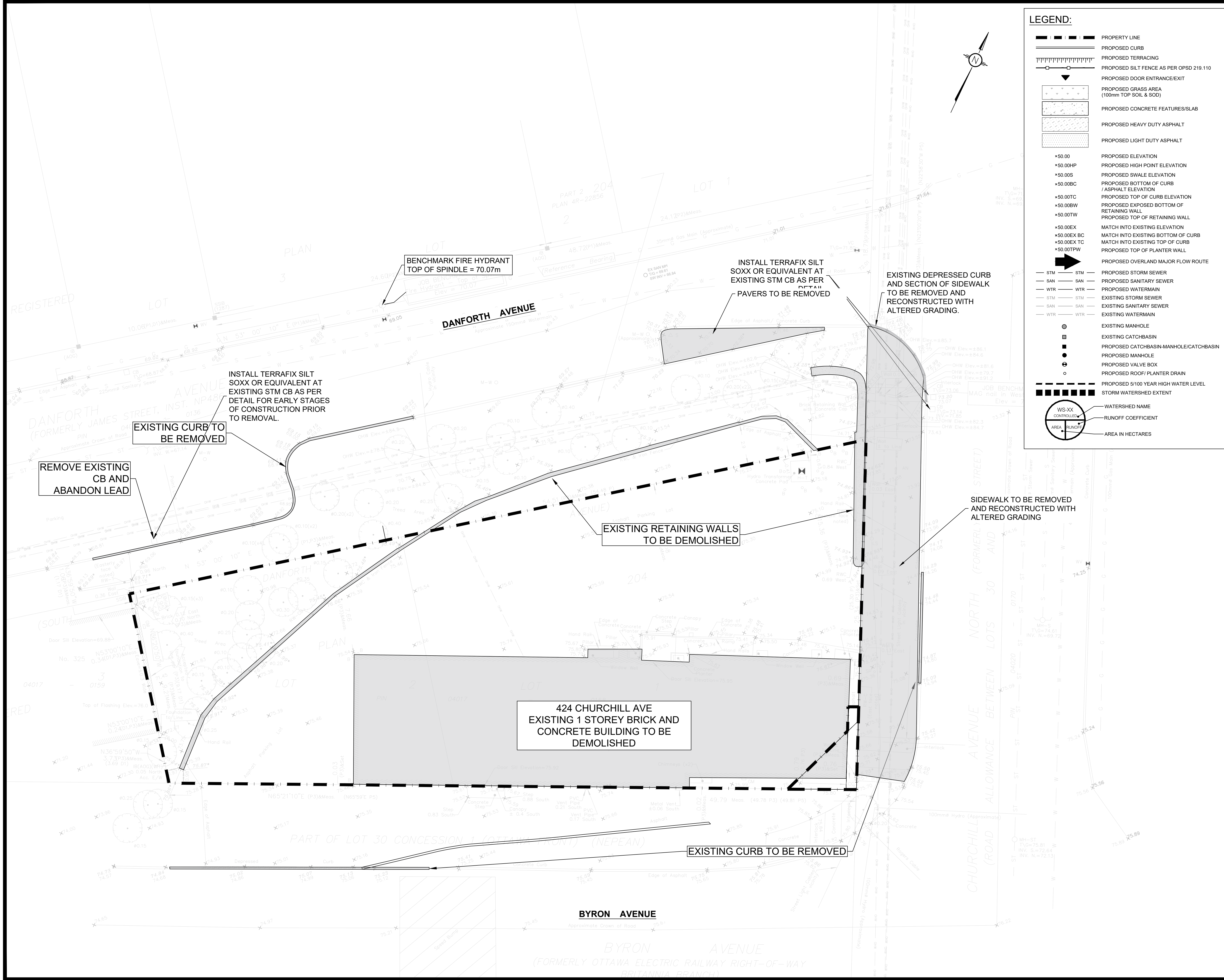
PROJECT: **PROPOSED 8-STOREY MULTI-UNIT BUILDING
424 CHURCHILL AVE
OTTAWA, ON**

DRAWING TITLE: **EROSION AND SEDIMENT CONTROL PLAN**

PROJECT NO.: 220224
DATE: APRIL, 2023

C101





LEGEND:

- PROPERTY LINE
- PROPOSED CURB
- PROPOSED TERRACING
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
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- PROPOSED SWALE ELEVATION
- PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- PROPOSED TOP OF RETAINING WALL
- MATCH INTO EXISTING ELEVATION
- MATCH INTO EXISTING BOTTOM OF CURB
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- PROPOSED TOP OF PLANTER WALL
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED STORM SEWER
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- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
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- PROPOSED 5/100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

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1.5m 0 3.0 6.0m
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PROFESSIONAL ENGINEER
V. JOHNSON
100510576
07-03-2025
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRJ
ENGINEERING | INGENIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lri.ca | (613) 842-3434

CLIENT: GSI PROPERTIES

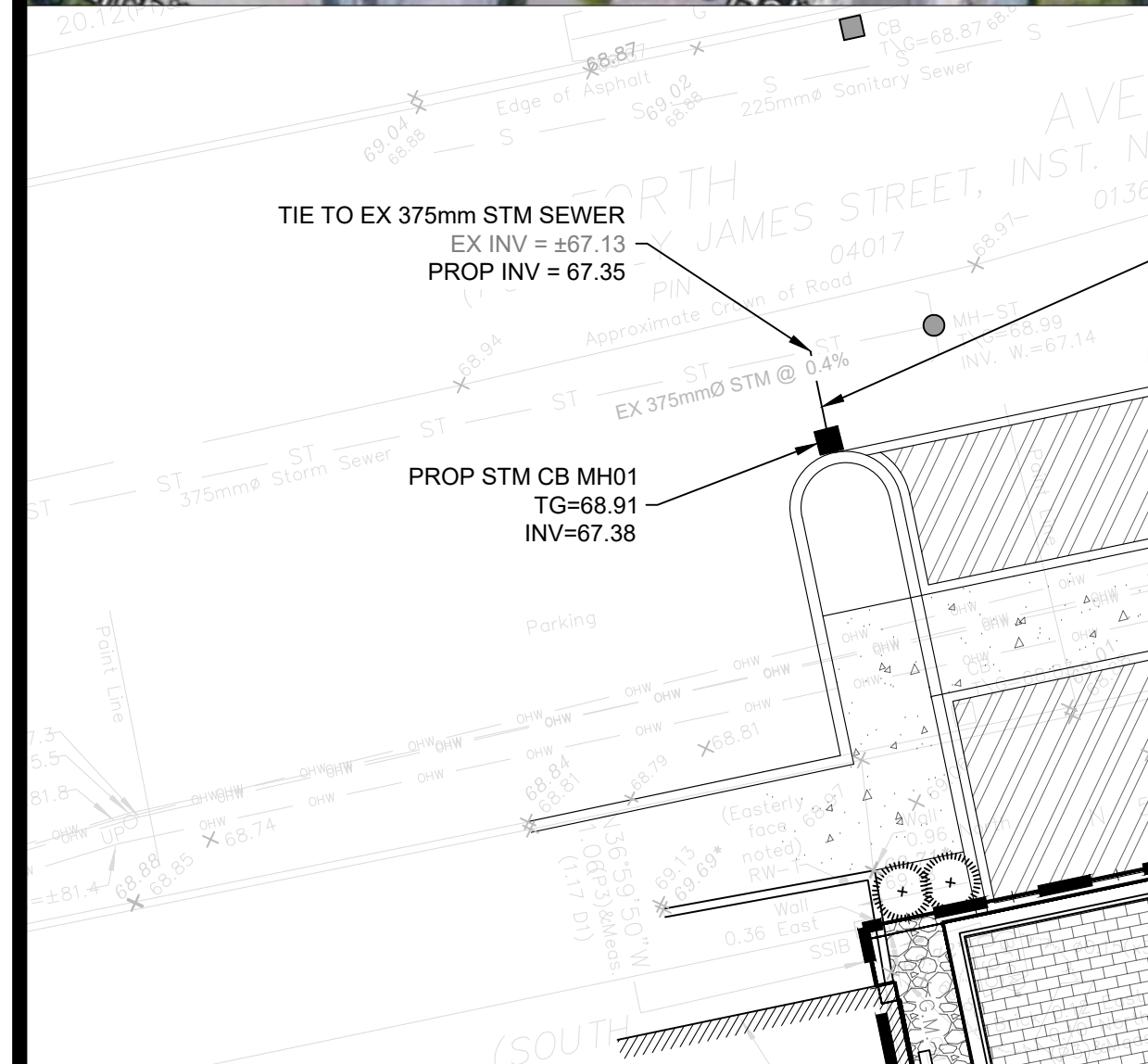
DESIGNED BY:	DRAWN BY:	APPROVED BY:
T.H.	T.H.	V.J.

PROJECT: PROPOSED 8-STORY MULTI-UNIT BUILDING
424 CHURCHILL AVE
OTTAWA, ON

DRAWING TITLE: DEMOLITION PLAN

PROJECT NO.: 220224
DATE: APRIL, 2023

C102



#1888

SUMMARY OF RELEASE RATES AND STORAGE VOLUMES				
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

* Allowable Release Rate = 10.81L/s. As per City comments it's acceptable to only control the roof portion of the site. The remainder can be uncontrolled if it flows to the City ROW. Total controlled flow = 6.30L/s meeting the allowable release rate of 10.81L/s.

LEGEND:

PROPERTY LINE

PROPOSED CURB

PROPOSED TERRACING

PROPOSED SILT FENCE AS PER OPSD 219.110

PROPOSED DOOR ENTRANCE/EXIT

PROPOSED GRASS AREA (100mm TOP SOIL & SOD)

PROPOSED CONCRETE FEATURES/SLAB

PROPOSED HEAVY DUTY ASPHALT

PROPOSED LIGHT DUTY ASPHALT

PROPOSED ELEVATION

PROPOSED HIGH POINT ELEVATION

PROPOSED SWALE ELEVATION

PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION

PROPOSED TOP OF CURB ELEVATION

PROPOSED EXPOSED BOTTOM OF RETAINING WALL

PROPOSED TOP OF RETAINING WALL

MATCH INTO EXISTING ELEVATION

MATCH INTO EXISTING BOTTOM OF CURB

MATCH INTO EXISTING TOP OF CURB

PROPOSED TOP OF PLANTER WALL

PROPOSED OVERLAND MAJOR FLOW ROUTE

PROPOSED STORM SEWER

PROPOSED SANITARY SEWER

PROPOSED WATERMAIN

EXISTING STORM SEWER

EXISTING SANITARY SEWER

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EXISTING CATCHBASIN

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1:125

SCALE: 1:125

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www.lri.ca | (613) 842-3434

CLIENT: GSI PROPERTIES

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

PROJECT: PROPOSED 8-STORY MULTI-UNIT BUILDING
424 CHURCHILL AVE
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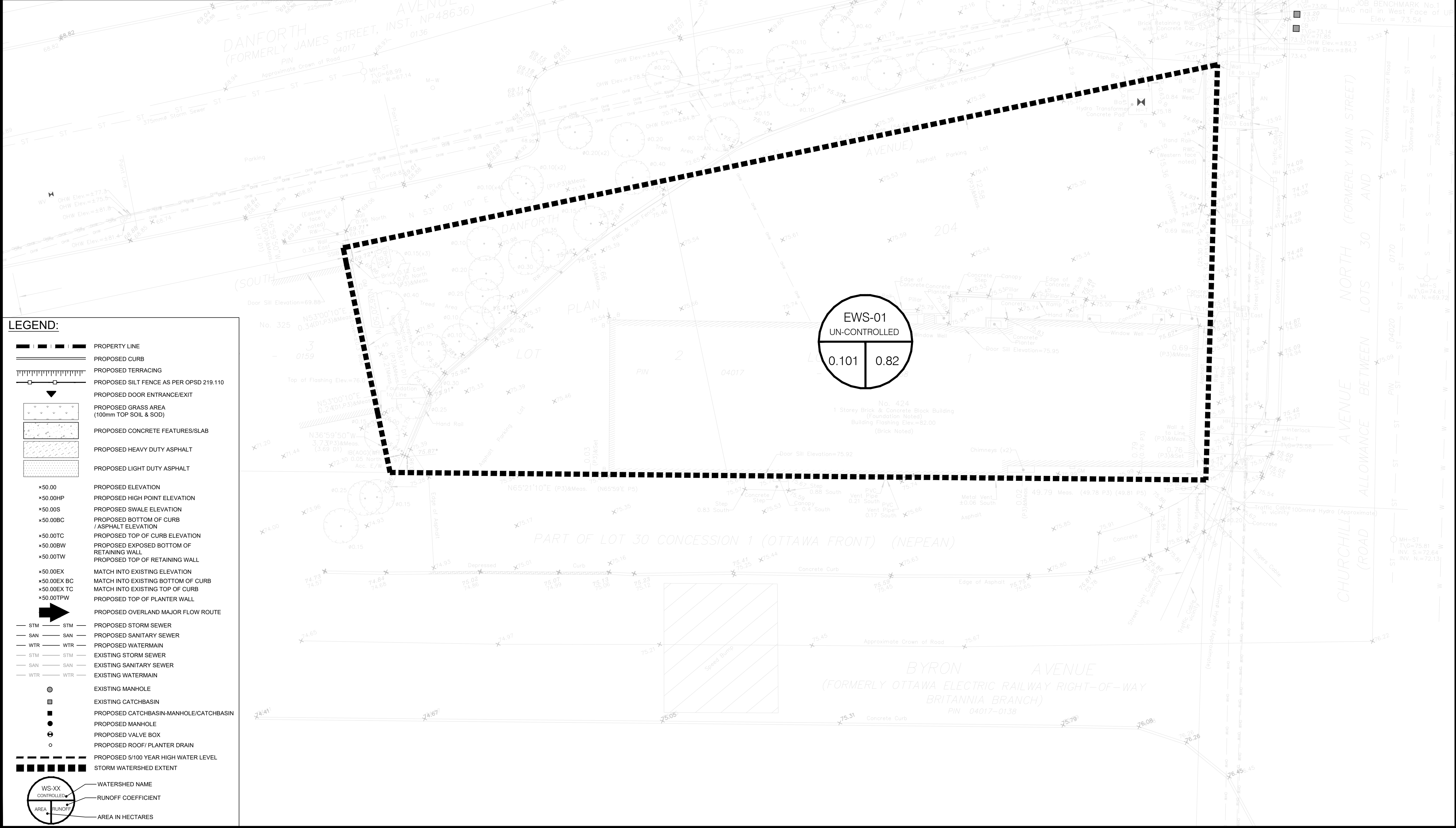
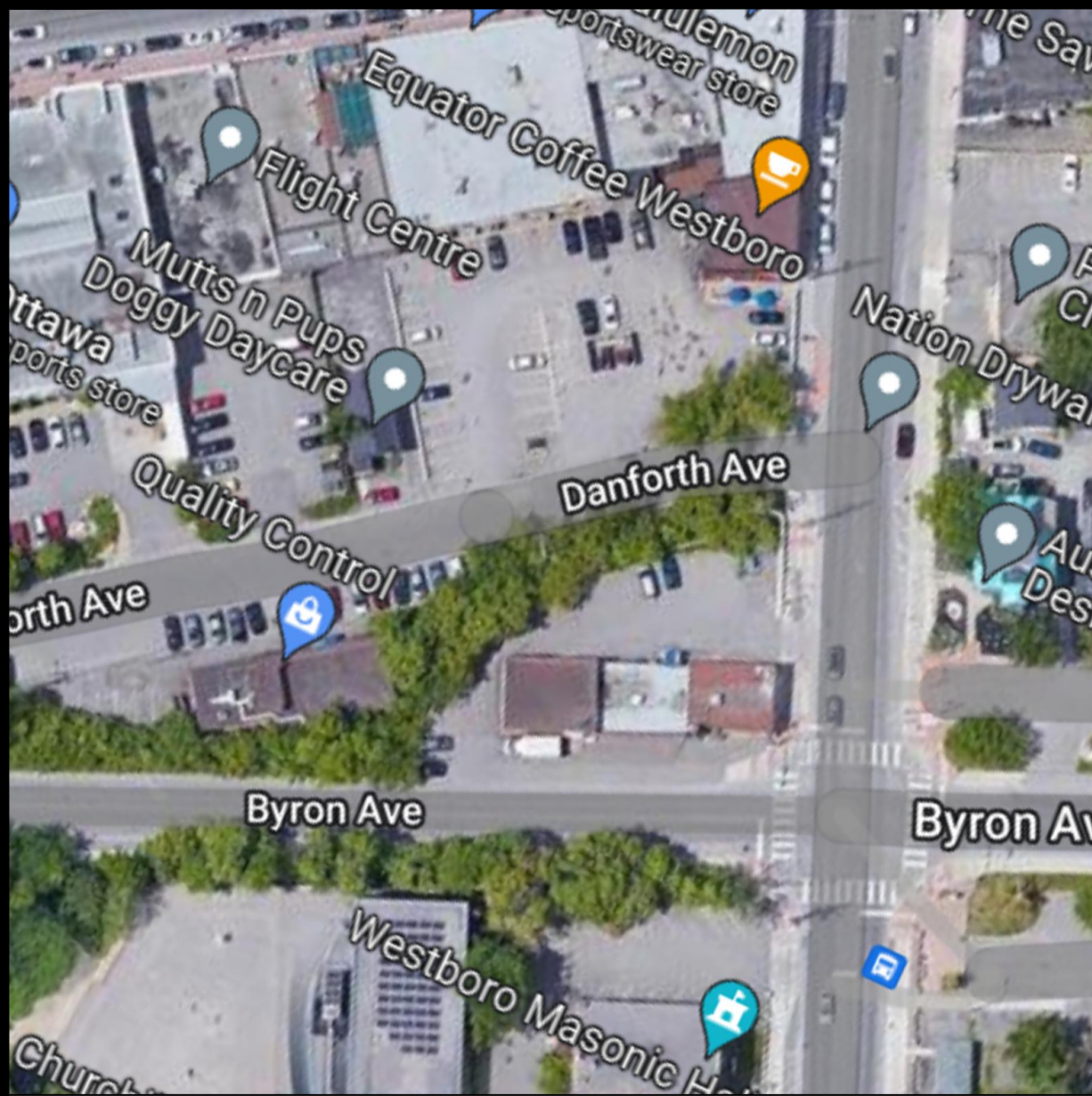
DRAWING TITLE: STORMWATER MANAGEMENT PLAN

PROJECT NO: 220224

DATE: APRIL, 2023

C601

Watershed	Associated Roof Drains	Drain Type	Weir Opening	Flow/Drain (L/s)	Available Storage Volume (m3)	Maximum Ponding Depth(m)	Required 5-Year Volume (m3)	5-Year Ponding Depth (m)	Required 100-Year Volume (m3)	100-Year Ponding Depth (m)
WS-01	1	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	6.03	0.15	1.06	0.08	3.15	0.12
	2	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63						
	3	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63						
WS-02	4	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	4.55	0.15	1.53	0.11	4.23	0.15
	5	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63						
WS-03	6	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	13.17	0.15	3.78	0.10	9.46	0.14
	7	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63						
WS-04	8	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	3.14	0.15	0.21	0.06	1.09	0.11
	9	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63						
WS-05	10	WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63	6.64	0.15	1.32	0.09	3.76	0.13
		WATTS ADJUSTABLE ACCUTROL RD-100-A1	Fully Closed	0.63						



LEGEND:

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- PROPOSED SILT FENCE AS PER OPSD 219.110
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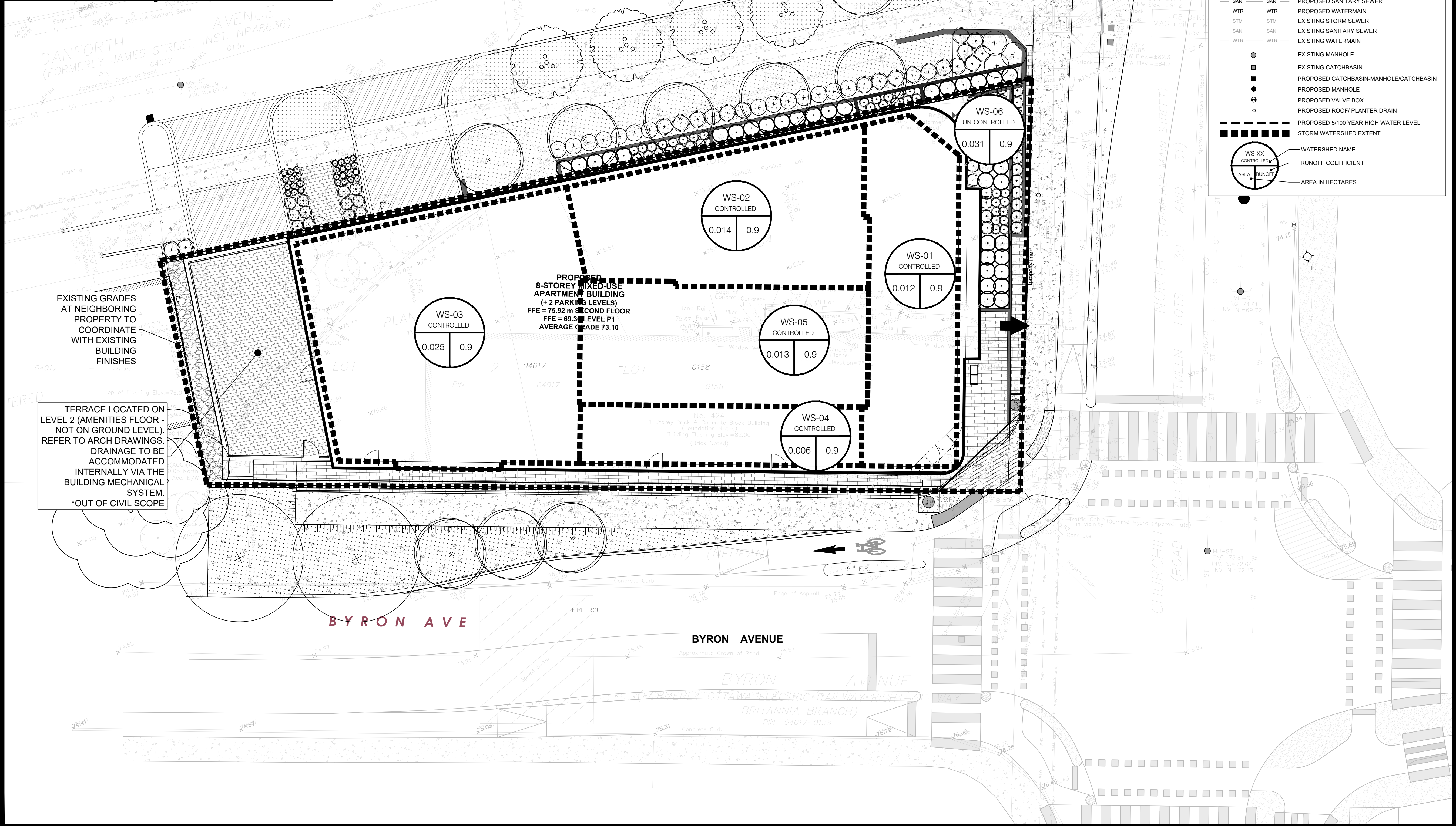
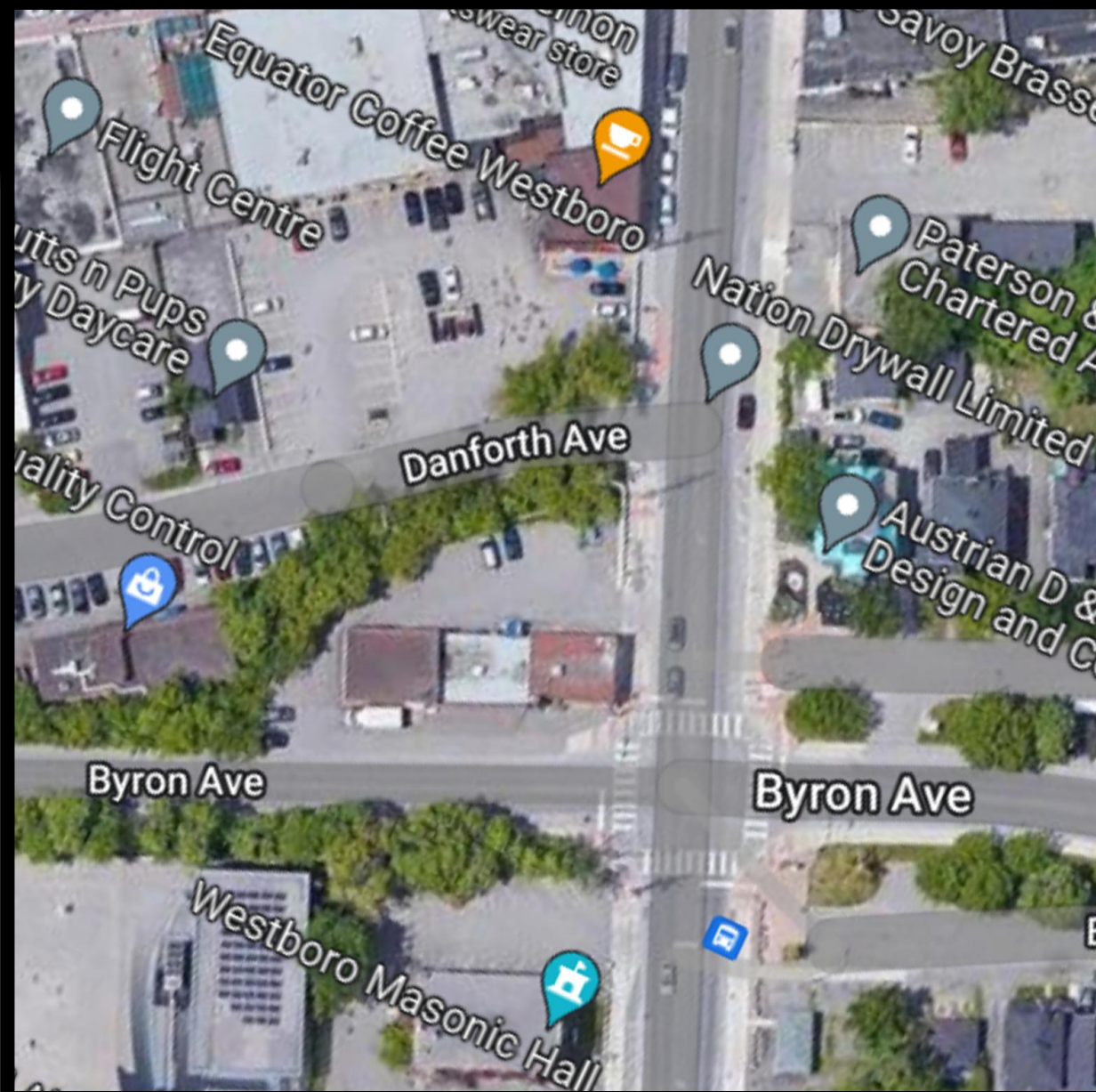
CLIENT
GSI PROPERTIES

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

PROJECT
PROPOSED 8-STORY MULTI-UNIT BUILDING
424 CHURCHILL AVE
OTTAWA, ON

DRAWING TITLE
PRE-DEVELOPMENT WATERSHED PLAN

PROJECT NO. 220224 **DATE** APRIL, 2023 **C701**



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THESE DRAWINGS ILLUSTRATE 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 A KNOWLEDGE 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 LRI ASSOCIATES LTD. (LRI) WITHOUT OBTAINING LRI'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 LRI AND TO RELEASE LRI 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 LRI 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 LRI'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRI AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRI AND THE CLIENT FROM ANY LIABILITY OR COST ARISING 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 VISIT 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.

No.	REVISIONS	BY	DATE
06	RE-ISSUED FOR APPROVAL	S.V.	03 JULY 2025
05	RE-ISSUED FOR APPROVAL	S.V.	18 OCT 2024
04	RE-ISSUED FOR APPROVAL	S.V.	16 JULY 2024
03	RE-ISSUED FOR APPROVAL	S.V.	03 MAY 2024
02	RE-ISSUED FOR APPROVAL	T.H.	14 APR 2023
01	ISSUED FOR APPROVAL	T.H.	11 OCT 2022

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

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

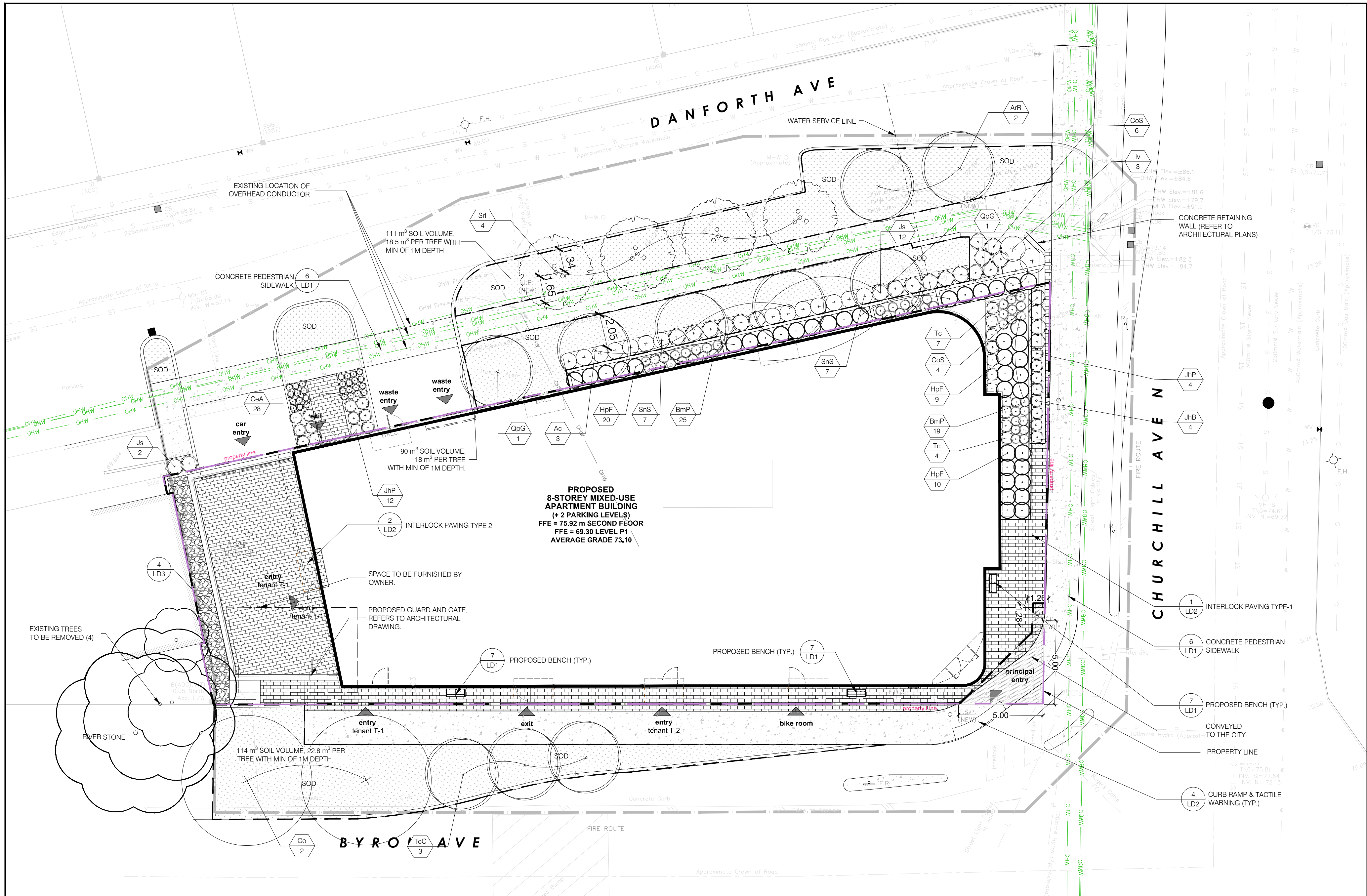
PROJECT
PROPOSED 8-STOREY MULTI-UNIT BUILDING
424 CHURCHILL AVE
OTTAWA, ON

DRAWING TITLE
POST-DEVELOPMENT WATERSHED PLAN

PROJECT NO. 220224 **DATE** APRIL, 2023 **C702**

APPENDIX F
Proposed Site Plan
Legal Survey
As-builts





PLANTING SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	CALIPER (mm)	SIZE (cm)	CONDITION/ FORM	MIN. O.C. SPACING (m)	SPECIES %
DECIDUOUS TREES								
Ac	3	<i>Amelanchier canadensis</i>	Serviceberry	50		W.B.	10	19%
ArR	2	<i>Acer rubrum</i> 'Red Rocket'	Red Rocket Maple	50		W.B.	10	13%
Co	2	<i>Celtis occidentalis</i>	Hackberry	50		W.B.	10	13%
QpG	2	<i>Quercus palustris</i> 'Green Pillar'	Green Pillar Oak	50		W.B.	10	13%
Srl	4	<i>Syringa reticulata</i> 'Ivory Silk'	Ivory Silk Tree Lilac	50		W.B.	10	25%
TcC	3	<i>Tilia cordata</i> 'Corinthian'	Corinthian Linden	50		W.B.	10	19%
TOTAL:	16							100%
SHRUBS								
BnP	47	<i>Buxus microphylla</i> 'Pincushion'	Pincushion Boxwood	50	3 Gal.		1	30%
CoS	10	<i>Chamaecyparis obtusa</i> 'Spiralis'	Spiral Hinoki cypress	50	3 Gal.		1	6%
HpF	39	<i>Hydrangea paniculata</i> 'Fire Light Tidbit'	Fire Light Tidbit Hydrangea	50	3 Gal.		1	25%
Iv	3	<i>Ilex verticillata</i>	Winterberry	50	3 Gal.		1	2%
SnS	14	<i>Spiraea nipponica</i> 'Snowmound'	Snowmound Spiraea					9%
Js	14	<i>Juniperus sabina</i>	Juniperus sabina	50	3 Gal.		1	9%
JhB	4	<i>Juniperus horizontalis</i> 'Blue Chip'	Creeping Juniper	50	3 Gal.		1	3%
JhP	16	<i>Juniperus horizontalis</i> 'Plumosa Compacta'	Compact Andorra Juniper	50	3 Gal.		1	10%
Tc	11	<i>Taxus canadensis</i>	Canada Yew	50	3 Gal.		1	7%
TOTAL:	158							100%
GRASSES								
CeA	28	<i>Carex elata</i> 'Aurea'	Bowles Golden Sedge			1 Gal.	0.3	100%
TOTAL:	28							100%

LANDSCAPE NOTES:

- ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH BY-LAWS AND CODES HAVING JURISDICTION OVER SITE LOCATION.
- COMPLETE ALL WORK TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT.
- REPORT ANY CHANGES, DISCREPANCIES OR SUBSTITUTIONS TO THE LANDSCAPE ARCHITECT FOR REVIEW. OBTAIN APPROVAL FROM THE LANDSCAPE ARCHITECT BEFORE PROCEEDING.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE EXISTING SERVICE LOCATIONS.
- EXACT LOCATIONS OF PLANT MATERIAL WILL BE DETERMINED BY PLACEMENT OF SITE SERVICES SUCH AS HYDRO VAULTS, METERS, UTILITIES ROOF RAIN WATER LEADERS, DRIVEWAYS, LIGHT STANDARDS, ETC.
- ALL PLANT MATERIAL LOCATIONS TO BE STAKED OR MARKED OUT AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- SUPPLY ALL PLANT MATERIAL IN ACCORDANCE WITH THE CANADIAN STANDARDS FOR NURSERY STOCK (8th Ed.).
- INSTALL PLANT MATERIAL ACCORDING TO DETAILS SHOWN.
- DISTURBED SOIL AREAS AROUND TREES AND SHRUBS ARE TO BE COVERED WITH SHREDDED CONIFER BARK MULCH SUCH AS 'CANADA RED' OR 'GRO-BARK' SPM MULCH, OR APPROVED EQUIVALENT. ALTERNATIVE MULCHES MUST BE APPROVED BY THE LANDSCAPE ARCHITECT.
- CONTRACTOR TO UTILIZE LAYOUT DIMENSIONS WHERE PROVIDED.
- PROVIDE PLANTING BED AREA AS NOTED ON THE DRAWING OR TO ACCOMMODATE MATURE SIZE OF PLANT MATERIAL.
- ALL SUPPORT SYSTEMS MUST BE REMOVED BY THE CONTRACTOR AT TIME OF FINAL ACCEPTANCE. NO EXTRAS WILL BE PAID TO COMPLETE THIS WORK.
- SUPPLY AND PLACE TOPSOIL IN ACCORDANCE WITH OPSS 570 TO A MINIMUM DEPTH OF 150MM UNLESS OTHERWISE SPECIFIED.
- SUPPLY AND PLACE SOD IN ACCORDANCE WITH OPSS 571 UNLESS OTHERWISE SPECIFIED.
- SUPPLY AND PLACE SEED IN ACCORDANCE WITH OPSS 572 UNLESS OTHERWISE SPECIFIED. ALL 5:1 OR GREATER SLOPES TO BE SEEDED WITH TACKIFIER. CONTRACTOR TO PROVIDE NECESSARY EROSION CONTROL PROTECTION AS REQUIRED TO ENSURE SOIL STABILIZATION AND PROPER SEED GERMINATION.
- ALL DIMENSIONS IN METRES UNLESS OTHERWISE NOTED.
- IF DISCREPANCIES ARISE BETWEEN PLANT MATERIAL COUNT SHOWN ON DRAWING AND PLANT LIST, THE DRAWING SHALL BE CONSIDERED CORRECT.
- CONTRACTOR TO PROVIDE MINIMUM TWO (2) YEAR WARRANTY FROM DATE ACCEPTED ON ALL WORK UNLESS OTHERWISE SPECIFIED.
- ANY SITE PLAN OR GRADING AND SERVICING SHOWN IS FOR INFORMATION ONLY. REFER TO APPROVED DRAWINGS.
- NOT FOR CONSTRUCTION UNLESS STAMPED, SIGNED AND DATED BY LANDSCAPE ARCHITECT.
- DRAWINGS NOT TO BE REPRODUCED WITHOUT WRITTEN CONSENT FROM LANDSCAPE ARCHITECT.
- APPROVAL OF LANDSCAPE PLAN TO BE OBTAINED FROM MUNICIPALITY.
- FOR GRADING AND SERVICING INFORMATION REFER TO THE CONSULTING ENGINEER'S DRAWINGS.
- FOR LIGHTING INFORMATION AND POWER DISTRIBUTION REFER TO THE ELECTRICAL CONSULTANT'S DRAWINGS.

PLANTING NOTES

- THE CONTRACTOR MUST NOTIFY THE LANDSCAPE ARCHITECT PRIOR TO THE COMMENCEMENT OF ANY PLANTING. THE CONTRACTOR SHALL SUPPLY ALL PLANTS AND MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THIS DRAWING. ANY DISCREPANCIES BETWEEN QUANTITIES SHALL BE REPORTED TO THE LANDSCAPE ARCHITECT.
- ALL LANDSCAPE WORKS WILL BE WARRANTIED FOR A PERIOD OF TWO YEARS FOLLOWING INSPECTION AND WRITTEN NOTICE OF START OF WARRANTY PERIOD AS DETERMINED AND PROVIDED BY THE LANDSCAPE ARCHITECT. PLANT MATERIAL, WHICH IS NOT IN A HEALTHY, VIGOROUS GROWING CONDITION AT THE END OF THE WARRANTY PERIOD, SHALL BE REPLACED TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT / OWNER.
- THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO EXTEND CONTRACTOR'S WARRANTY RESPONSIBILITIES FOR AN ADDITIONAL YEAR IF, AT THE END OF INITIAL WARRANTY PERIOD, LEAF DEVELOPMENT AND GROWTH IS NOT SUFFICIENT TO ENSURE FUTURE SURVIVAL AS DETERMINED BY THE LANDSCAPE ARCHITECT.
- THE CONTRACTOR IS TO IDENTIFY WITH LANDSCAPE ARCHITECT/OWNER ANY MAINTENANCE REQUIREMENTS NECESSARY FOR WARRANTY PURPOSES.
- PLANT MATERIALS SPECIFIED FOR THIS PROJECT WILL CONFORM TO THE CANADIAN NURSERY LANDSCAPE ASSOCIATION (C.N.L.A.) FOR SIZE, VARIETY AND CONDITION AS INDICATED ON THE PLANT SCHEDULE SHOWN ON THESE DRAWINGS. ANY PLANT MATERIALS WHICH DO NOT CONFORM WILL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.
- THE LANDSCAPE ARCHITECT IS TO BE CONTACTED FOR INSPECTION AND WRITTEN APPROVAL PRIOR TO PLANT MATERIAL ARRIVING ON SITE. THE LANDSCAPE ARCHITECT RESERVED THE RIGHT TO REJECT ANY PLANT MATERIALS THAT HAVE NOT BEEN INSPECTED AND APPROVED.
- THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REFUSE ACCEPTANCE OF ANY PLANT DISPLAYING POOR GROWTH HABITS, INJURY OR DISEASE. ANY PLANT MATERIAL THAT IS REJECTED BY THE LANDSCAPE ARCHITECT WILL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF ACCEPTABLE QUALITY AT NO ADDITIONAL CHARGE TO THE PROJECT.
- PLANT MATERIALS COLLECTED FROM WILD SOURCES WILL NOT BE ACCEPTED WITHOUT WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REQUIRE THAT SUPPLIER INVOICES BE SUBMITTED FOR INSPECTION AND APPROVAL PRIOR TO ACCEPTANCE.
- ON-SITE LAYOUT OF THE PLANT MATERIALS TO BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. MINOR FIELD ADJUSTMENTS TO PLANT MATERIAL LOCATIONS MAY BE NECESSARY TO RESPOND TO THE LOCATIONS OF EXISTING PLANTS AND SITE CONDITIONS. THE CONTRACTOR TO REVIEW WITH LANDSCAPE ARCHITECT WHERE RELOCATIONS ARE NECESSARY. THE CONTRACTOR MUST RECEIVE APPROVAL FROM LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- PLANTS ARE NOT TO BE INSTALLED DURING EXTREME HEAT, DROUGHT, OR OTHER UNDESIRABLE CONDITIONS. THOROUGHLY WATER ALL PLANTS IMMEDIATELY AFTER INSTALLATION. THE CONTRACTOR SHALL REGULARLY MONITOR SITE CONDITIONS AND WATER AS REQUIRED TO ENSURE HEALTHY GROWTH CONDITIONS THROUGHOUT THE DURATION OF THE WARRANTY PERIOD.
- DO NOT PLANT DIRECTLY IN CENTERLINE OF DRAINAGE SWALES OR DEPRESSION AREAS. WHERE PROPOSED PLANTING LOCATIONS CONFLICT WITH CONSTRUCTED SWALES OR LOW-LYING WET AREAS, CONTACT LANDSCAPE ARCHITECT FOR DIRECTION.
- ALL PLANTS ARE TO BE PLANTED IN ACCORDANCE WITH THE PLANTING DETAILS SHOWN ON THIS DRAWING. ALL PLANTS ARE TO BE INSTALLED VERTICAL AND PLUMB, REGARDLESS OF GROUND SLOPE.
- SUPPLY AND PLACE TOPSOIL IN ACCORDANCE WITH OPSS 802 TO A MINIMUM DEPTH OF 150MM IN SEED/SOD AREAS AND 600MM IN PLANTING BEDS UNLESS OTHERWISE SPECIFIED. EACH SOURCE OF TOPSOIL, IMPORTED OR NATIVE TO BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO USE. SUBMIT TOPSOIL ANALYSIS/TEST RESULTS TO LANDSCAPE ARCHITECT PRIOR TO ORDER OR DELIVERY TO SITE. TESTING TO BE IN ACCORDANCE WITH CONTRACT SPECIFICATIONS. PREPARED TOPSOIL SHALL BE 4 PARTS TOPSOIL TO ONE PART WELL-ROTTED COMPOST.
- MULCH: TO BE SPREAD UNIFORMLY AROUND THE BASE OF TREES AND SHRUBS TO A MINIMUM DEPTH OF 100 MM. DO NOT PLACE MULCH IN DIRECT CONTACT WITH TRUNK OR STEM(S). ALLOW A 100 MM MULCH FREE ZONE AT TRUNK/STEMS. SHRUBS TO BE IN CONTINUOUSLY MULCHED PLANTING BEDS UNLESS OTHERWISE SPECIFIED.
- SUPPLY AND PLACE SEED IN ACCORDANCE WITH OPSS 804 UNLESS OTHERWISE SPECIFIED. ALL 5:1 OR GREATER SLOPES TO BE SEEDED WITH TACKIFIER. ALL SLOPES GREATER THAN 3:1 SHALL BE MATTED WITH AN EROSION CONTROL BLANKET. SUPPLY AND PLACE SOD IN ACCORDANCE WITH OPSS 803 UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR IS TO REMOVE DEAD OR DAMAGED BRANCHES ON TREES OR SHRUBS. ALL PRUNING SHALL BE PERFORMED IN ACCORDANCE WITH STANDARD HORTICULTURAL PRACTICES AND APPROPRIATE TIMING FOR EACH SPECIES.
- ALL STAKES AND ASSOCIATED TIES ARE TO BE REMOVED AFTER THE FIRST FULL GROWING SEASON. RODENT GUARDS ARE TO BE REMOVED AT THE CONCLUSION OF THE WARRANTY PERIOD. IF UTILIZED, GATORBAGS ARE TO BE REMOVED FOR WINTER MONTHS.

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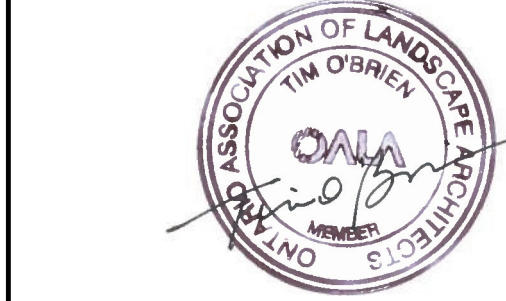
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2	ISSUED FOR ZBA & SPA REVIEW	2023-03-24
3	ISSUED FOR ZBA & SPA REVIEW	2024-08-12
4	ISSUED FOR ZBA & SPA REVIEW	2024-10-24
5	ISSUED FOR SPA	2025-06-26



LEGEND

- TOPSOIL AND SOD AS SPECIFIED MINIMUM 150mm TOPSOIL DEPTH
- CONCRETE PAVING
- UNIT PAVERS
- SOIL VOLUME
- PROPOSED DECIDUOUS SHADE TREE
- PROPOSED DECIDUOUS MULTISTEM TREE
- PROPOSED DECIDUOUS ORNAMENTAL TREE
- PROPOSED SHRUBS
- PROPOSED ANNUALS
- PROPERTY BOUNDARY

SEAL



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www.arcadis.com

PROJECT

424 Churchill Ave

CITY OF OTTAWA

PROJECT NO:
139413

DRAWN BY:
E.I.

CHECKED BY:
E.I.

PROJECT MGR:
M.P.

APPROVED BY:
T.O.

SHEET TITLE

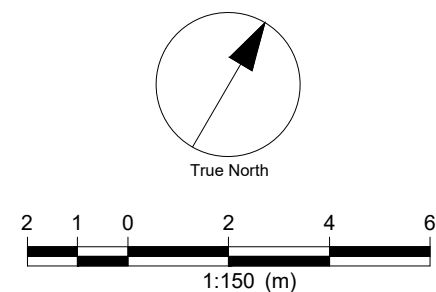
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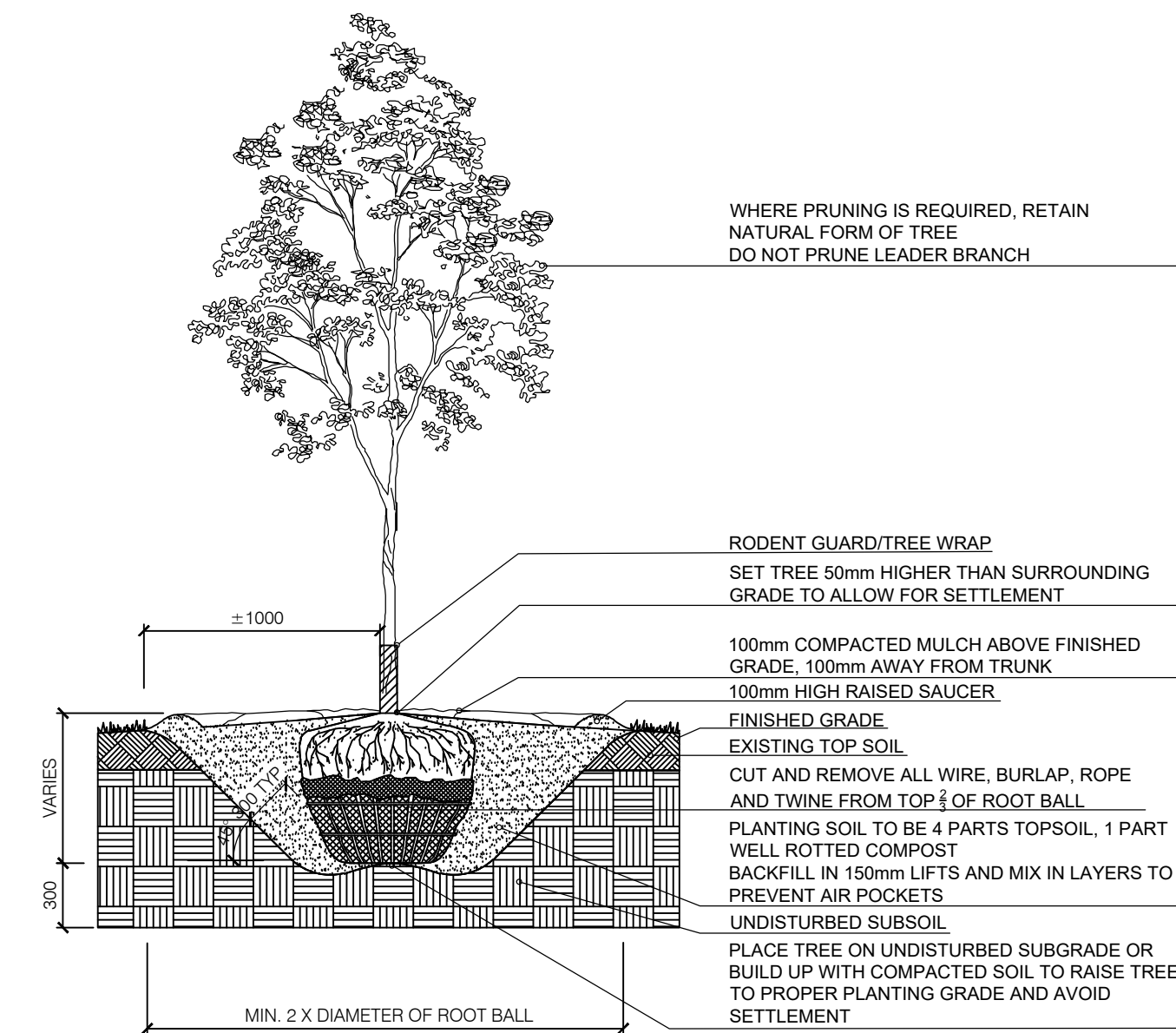
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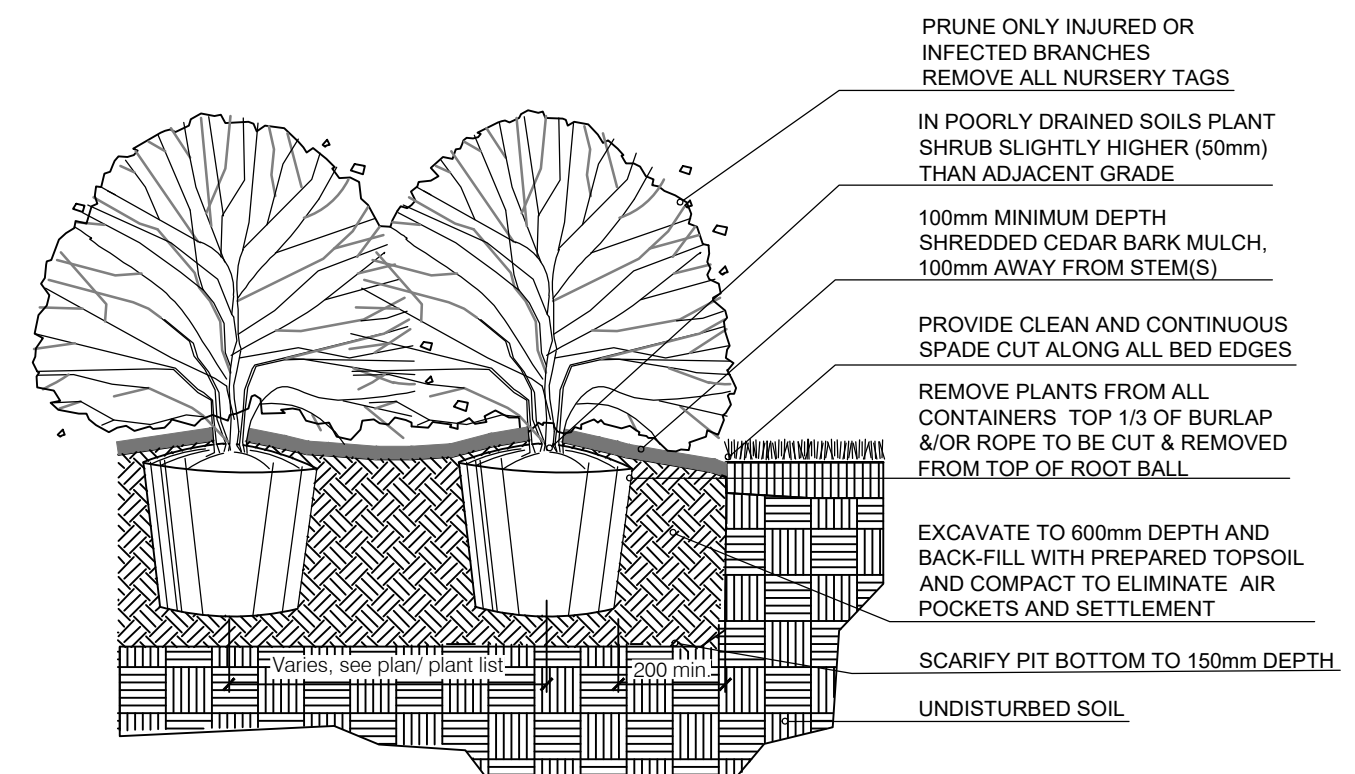
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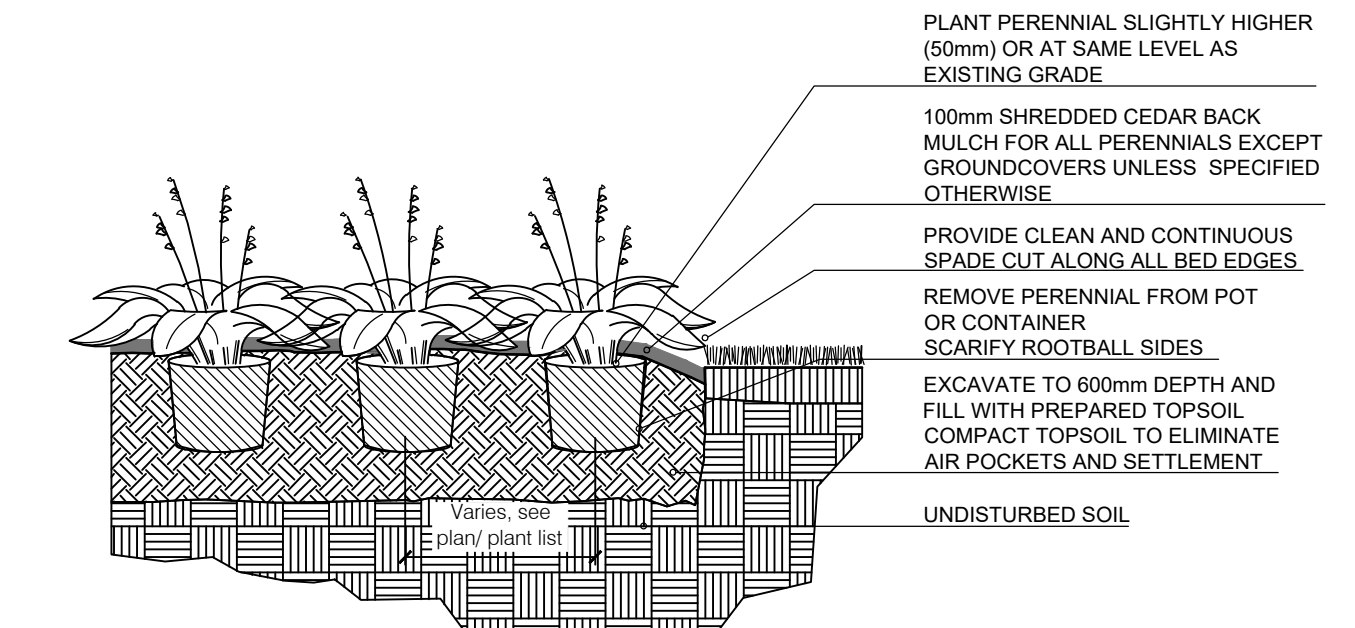




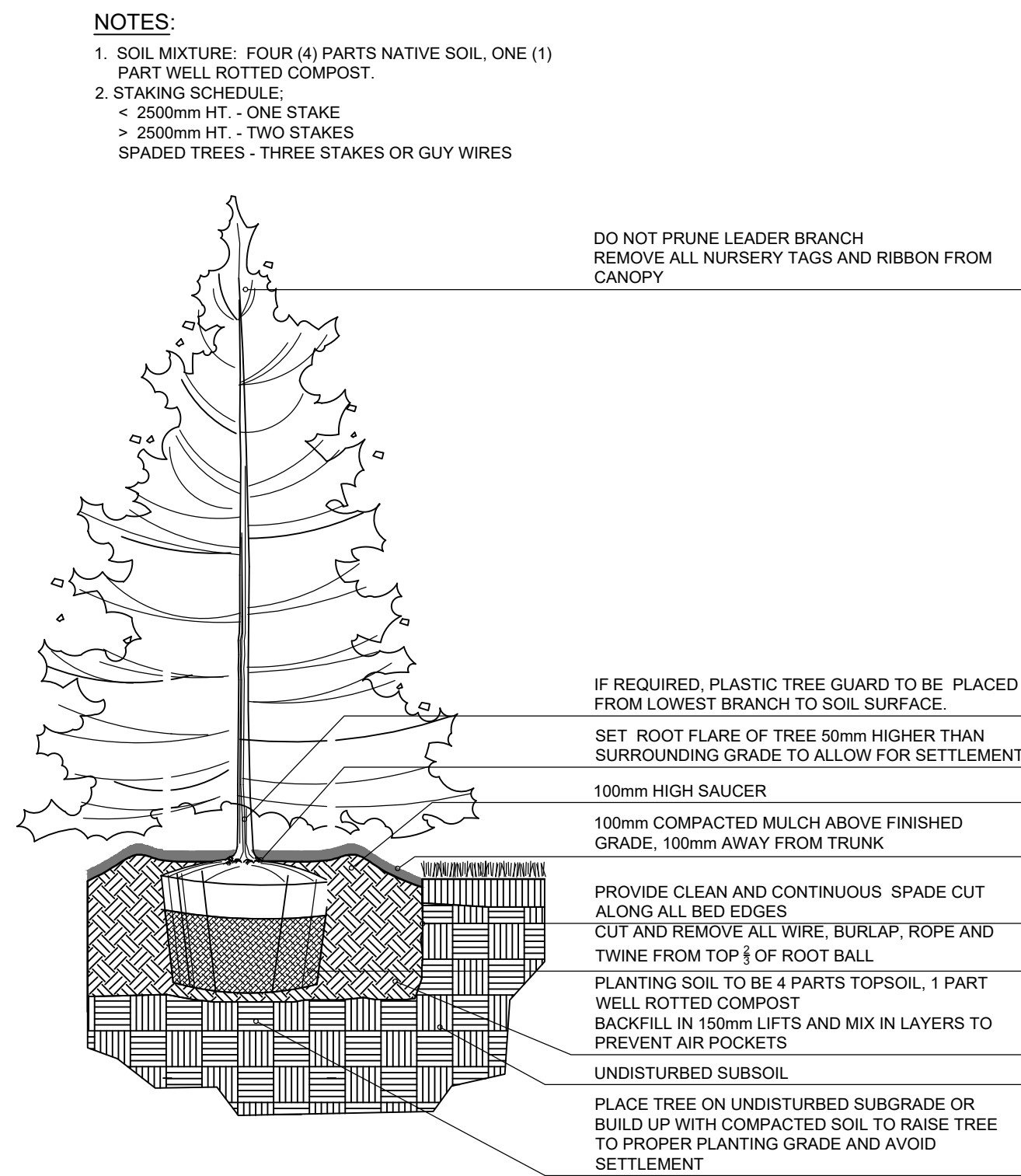
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LD-1 N.T.S.



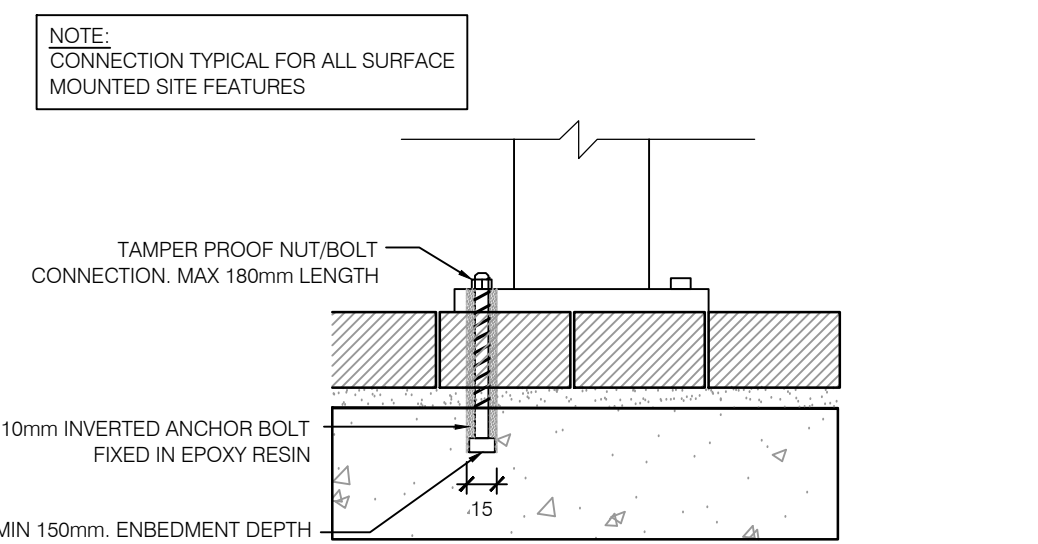
2 BALLED AND BURLAPPED/POTTED SHRUB
LD-1 N.T.S.



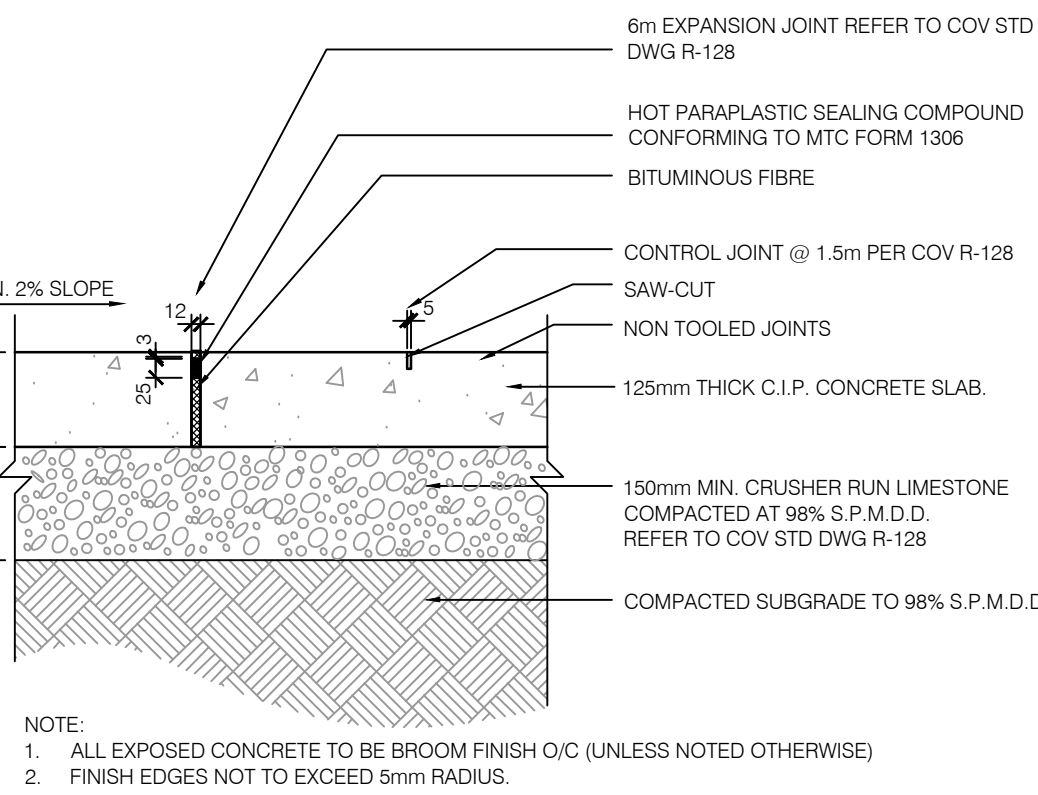
3 CONTAINER GROWN PERENNIAL/GRASS
LD-1 N.T.S.



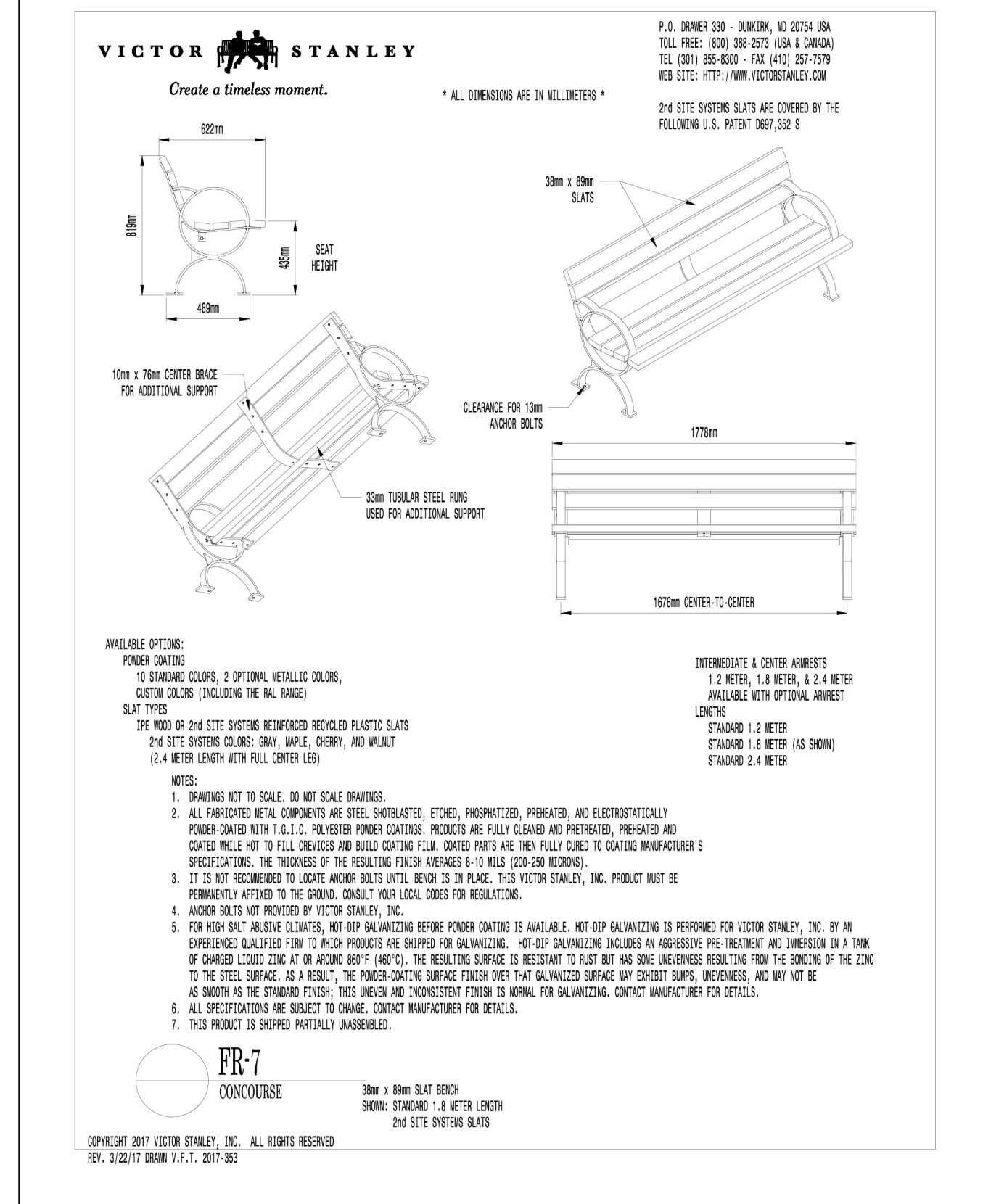
4 BALLED & BURLAPPED/WIRE BASKET CONIFEROUS TREE
LD-1 N.T.S.



5 FURNITURE SURFACE MOUNT (TYP.)
LD-1 N.T.S.



6 CONCRETE SIDEWALK
LD-1 N.T.S.



7 BENCH
LD-1 N.T.S.

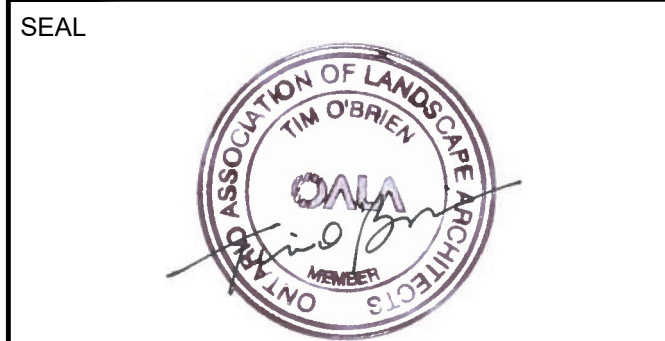
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5	ISSUED FOR SPA	2025-06-26



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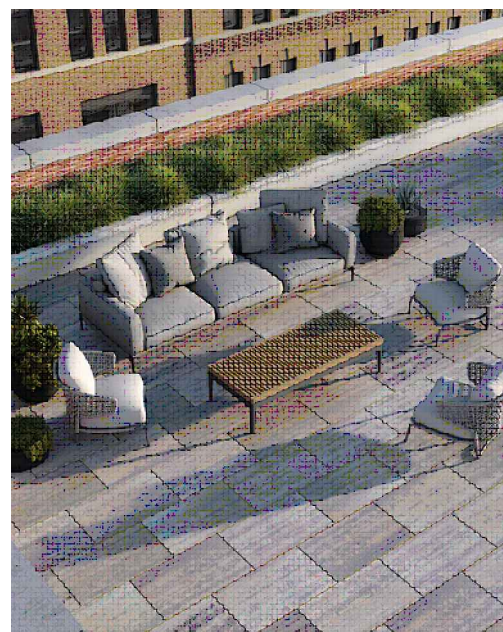
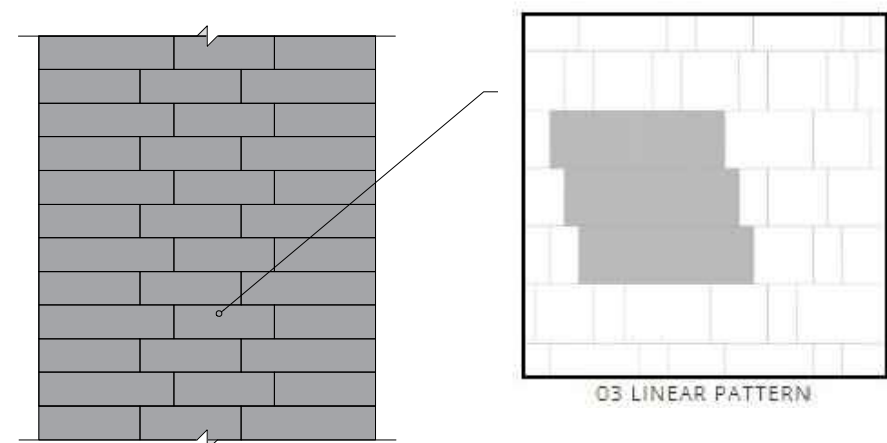
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139413

DRAWN BY: E.L.	CHECKED BY: E.L.
PROJECT MGR: M.P.	APPROVED BY: T.O.

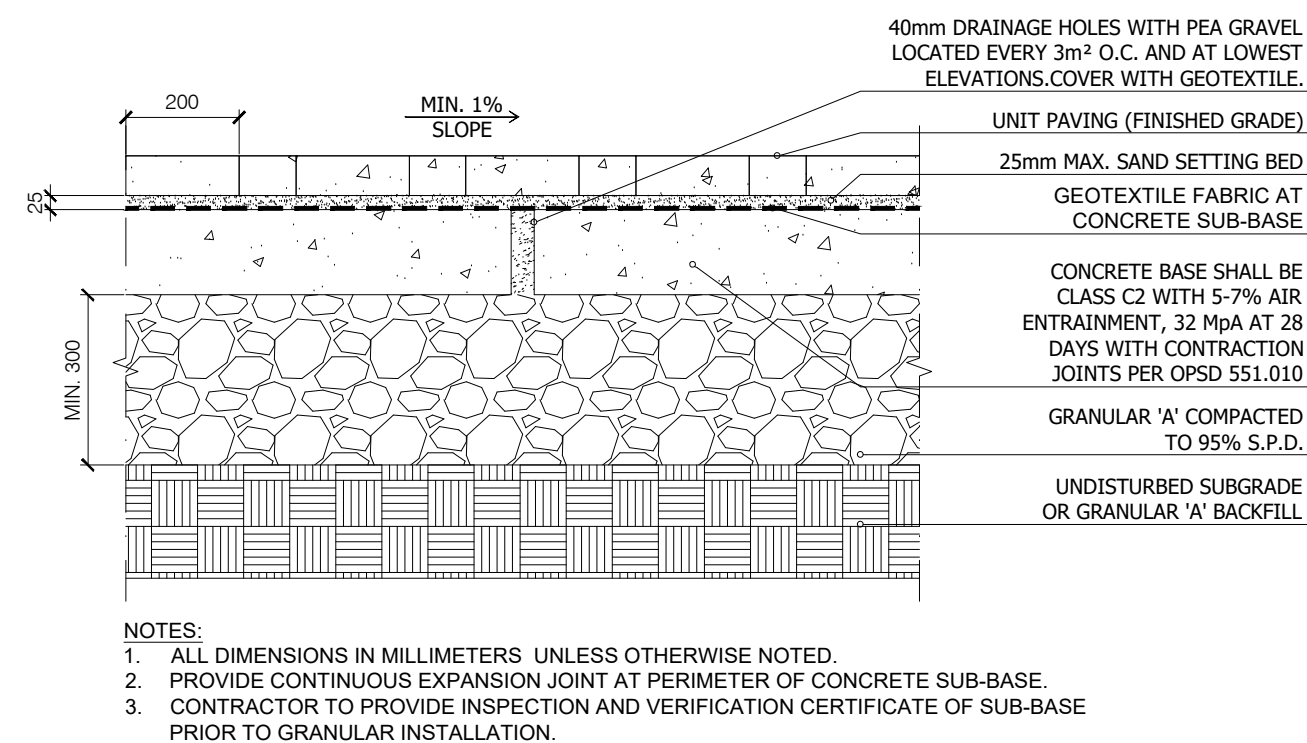
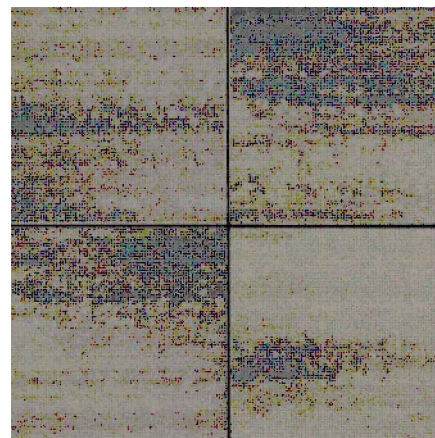
SHEET TITLE
LANDSCAPE DETAILS

SHEET NUMBER LD-1	ISSUE 5
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LAYOUT POSSIBILITIES: 03 LINEAR PATTERN



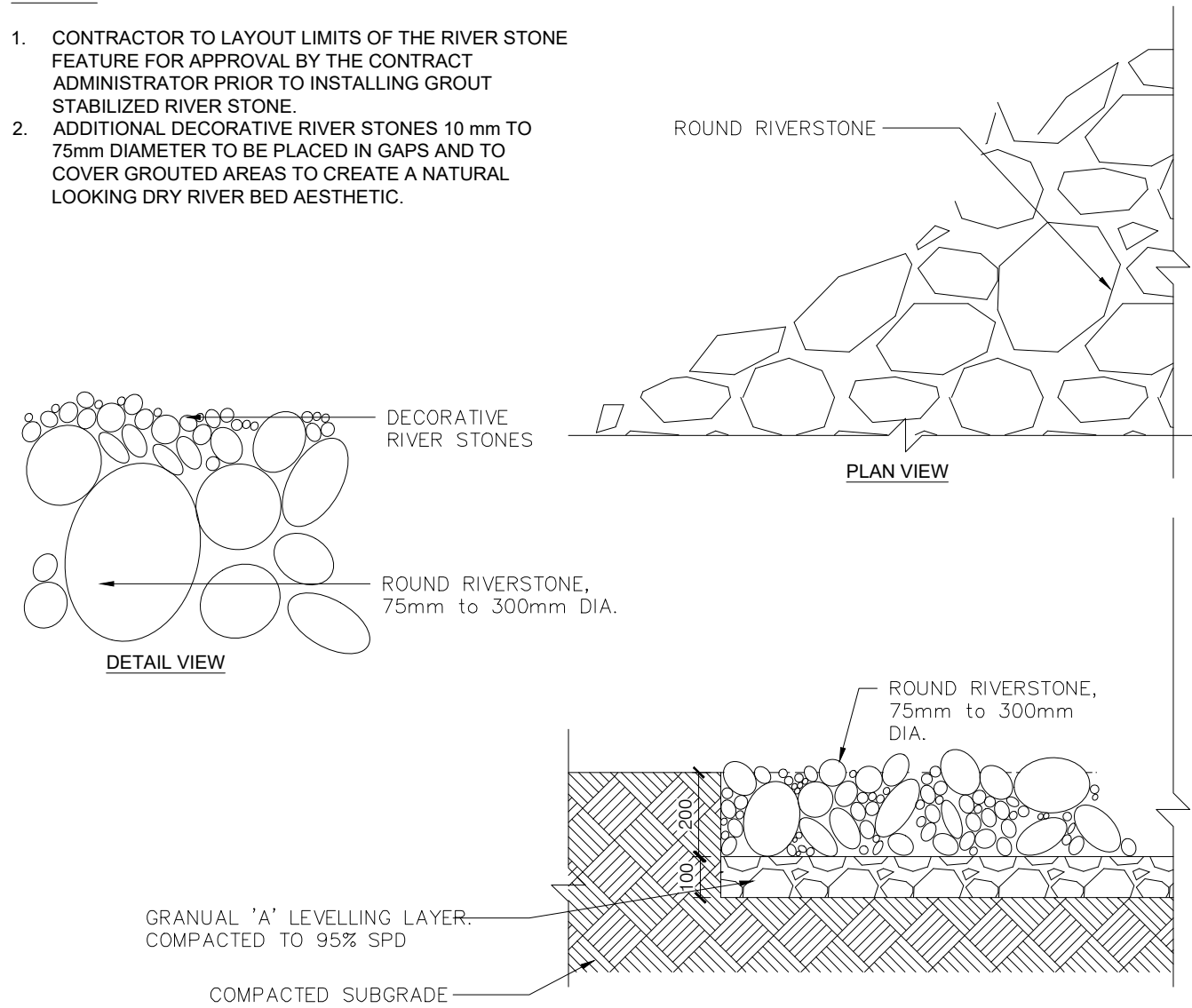
COLOUR: SHALE GREY



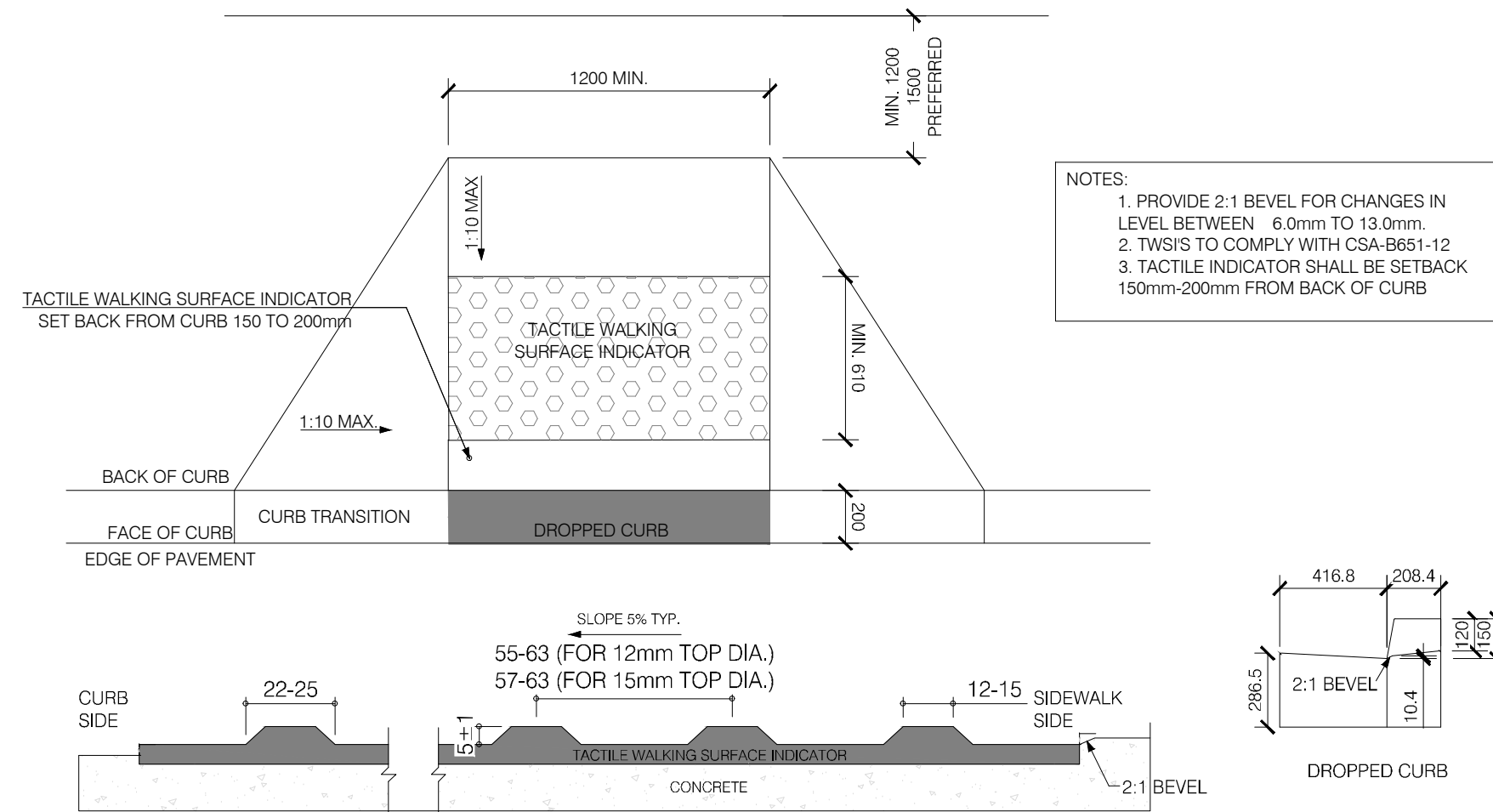
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LD-2	N.T.S.

2	UNIT PAVING WITH CONCRETE BASE
LD-2	N.T.S.

1. CONTRACTOR TO LAYOUT LIMITS OF THE RIVER STONE FEATURE FOR APPROVAL BY THE CONTRACT ADMINISTRATOR PRIOR TO INSTALLING GROUT STABILIZED RIVER STONE.
2. ADDITIONAL DECORATIVE RIVER STONES 10 mm TO 75mm DIAMETER TO BE PLACED IN GAPS AND TO COVER GROUTED AREAS TO CREATE A NATURAL LOOKING DRY RIVER BED AESTHETIC.



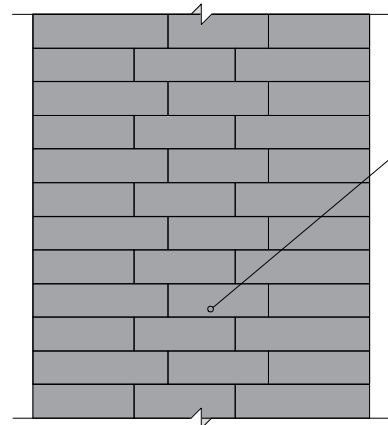
3	RIVER STONE
LD-2	N.T.S.



4 MINIMUM STANDARDS FOR ACCESSIBLE CURB RAMP & TACTILE WARNING STRIP
ID-2 N.T.S.

SHAPE AND SIZE: BLU 80 SMOOTH - 80 MM HD²
SIZES INCLUDED
3 1/8 X 13 X 6 1/2
3 1/8 X 13 X 13
3 1/8 X 13 X 19 1/2

COLOUR: CHAMPLAIN GREY



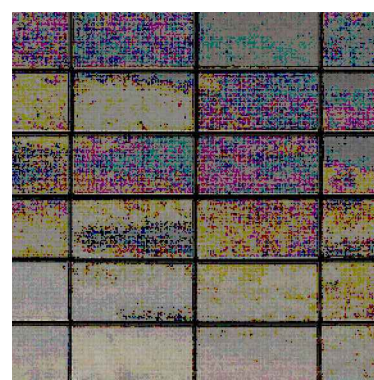
Blu 80 Smooth - 80 MM HD²

SIZES INCLUDED

3 1/8 x 13 x 6 1/2

3 1/8 x 13 x 13

3 1/8 x 13 x 19 1/2



5	UNIT PAVING PATTERN TYPE 2 - SUPPLIED BY TECO-BLOC
D-2	N.T.S.

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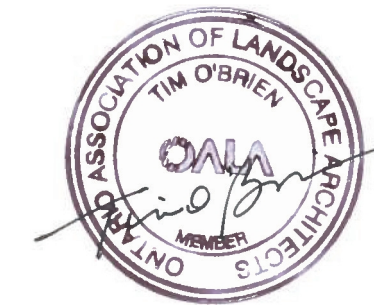
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ISSUES		
No.	DESCRIPTION	DATE
1	ISSUED FOR ZBA & SPA REVIEW	2022-10-21
2	ISSUED FOR ZBA & SPA REVIEW	2023-03-24
3	ISSUED FOR ZBA & SPA REVIEW	2024-08-12
4	ISSUED FOR ZBA & SPA REVIEW	2024-10-24
5	ISSUED FOR SPA	2025-06-26



SEAL



PRIME CONSULTANT



410 Albert Street - Suite 101
Waterloo ON N2L 3V3 Canada
tel 519 585 2255
www.arcadis.com

PROJECT 424 Churchill Ave

CITY OF OTTAWA

PROJECT NO:
139413

DRAWN BY:
E.L

PROJECT MGR
M.P

SHEET TITLE
LAN

SHEET NUMBER

LD-2

ISSUE

5

**LOT 1 and PART OF LOT 2
(South Danforth Avenue)
REGISTERED PLAN 204
CITY OF OTTAWA**

Prepared by Annis, O'Sullivan, Vollebakk Ltd.

AMENDED July 12th, 2022 to illustrate tree sizes & locations,
additional street servicing & details, new vertical Benchmark
No. 1 and updated overhead wire locations & elevations.

Scale 1:150

0 4.5 9 13.5 18 22.5 27 31.5 36 40.5 45 49.5 54 58.5 63 67.5 72 76.5 81 85.5 90 94.5 99 103.5 108 112.5 117 121.5 126 130.5 135 139.5 144 148.5 153 157.5 162 166.5 171 175.5 180 184.5 189 193.5 198 202.5 207 211.5 216 220.5 225 229.5 234 238.5 243 247.5 252 256.5 261 265.5 270 274.5 279 283.5 288 292.5 297 301.5 306 310.5 315 319.5 324 328.5 333 337.5 342 346.5 351 355.5 360 364.5 369 373.5 378 382.5 387 391.5 396 400.5 405 409.5 414 418.5 423 427.5 432 436.5 441 445.5 450 454.5 459 463.5 468 472.5 477 481.5 486 490.5 495 499.5 504 508.5 513 517.5 522 526.5 531 535.5 540 544.5 549 553.5 558 562.5 567 571.5 576 580.5 585 589.5 594 598.5 603 607.5 612 616.5 621 625.5 630 634.5 639 643.5 648 652.5 657 661.5 666 670.5 675 679.5 684 688.5 693 697.5 702 706.5 711 715.5 720 724.5 729 733.5 738 742.5 747 751.5 756 760.5 765 769.5 774 778.5 783 787.5 792 796.5 801 805.5 810 814.5 819 823.5 828 832.5 837 841.5 846 850.5 855 859.5 864 868.5 873 877.5 882 886.5 891 895.5 900 904.5 909 913.5 918 922.5 927 931.5 936 940.5 945 949.5 954 958.5 963 967.5 972 976.5 981 985.5 990 994.5 999 1003.5 1008 1012.5 1017 1021.5 1026 1030.5 1035 1039.5 1044 1048.5 1053 1057.5 1062 1066.5 1071 1075.5 1080 1084.5 1089 1093.5 1098 1102.5 1107 1111.5 1116 1120.5 1125 1129.5 1134 1138.5 1143 1147.5 1152 1156.5 1161 1165.5 1170 1174.5 1179 1183.5 1188 1192.5 1197 1201.5 1206 1210.5 1215 1219.5 1224 1228.5 1233 1237.5 1242 1246.5 1251 1255.5 1260 1264.5 1269 1273.5 1278 1282.5 1287 1291.5 1296 1300.5 1305 1309.5 1314 1318.5 1323 1327.5 1332 1336.5 1341 1345.5 1350 1354.5 1359 1363.5 1368 1372.5 1377 1381.5 1386 1390.5 1395 1399.5 1404 1408.5 1413 1417.5 1422 1426.5 1431 1435.5 1440 1444.5 1449 1453.5 1458 1462.5 1467 1471.5 1476 1480.5 1485 1489.5 1494 1498.5 1503 1507.5 1512 1516.5 1521 1525.5 1530 1534.5 1539 1543.5 1548 1552.5 1557 1561.5 1566 1570.5 1575 1579.5 1584 1588.5 1593 1597.5 1602 1606.5 1611 1615.5 1620 1624.5 1629 1633.5 1638 1642.5 1647 1651.5 1656 1660.5 1665 1669.5 1674 1678.5 1683 1687.5 1692 1696.5 1701 1705.5 1710 1714.5 1719 1723.5 1728 1732.5 1737 1741.5 1746 1750.5 1755 1759.5 1764 1768.5 1773 1777.5 1782 1786.5 1791 1795.5 1800 1804.5 1809 1813.5 1818 1822.5 1827 1831.5 1836 1840.5 1845 1849.5 1854 1858.5 1863 1867.5 1872 1876.5 1881 1885.5 1890 1894.5 1899 1903.5 1908 1912.5 1917 1921.5 1926 1930.5 1935 1939.5 1944 1948.5 1953 1957.5 1962 1966.5 1971 1975.5 1980 1984.5 1989 1993.5 1998 2002.5 2007 2011.5 2016 2020.5 2025 2029.5 2034 2038.5 2043 2047.5 2052 2056.5 2061 2065.5 2070 2074.5 2079 2083.5 2088 2092.5 2097 2101.5 2106 2110.5 2115 2119.5 2124 2128.5 2133 2137.5 2142 2146.5 2151 2155.5 2160 2164.5 2169 2173.5 2178 2182.5 2187 2191.5 2196 2200.5 2205 2209.5 2214 2218.5 2223 2227.5 2232 2236.5 2241 2245.5 2250 2254.5 2259 2263.5 2268 2272.5 2277 2281.5 2286 2290.5 2295 2299.5 2304 2308.5 2313 2317.5 2322 2326.5 2331 2335.5 2340 2344.5 2349 2353.5 2358 2362.5 2367 2371.5 2376 2380.5 2385 2389.5 2394 2398.5 2403 2407.5 2412 2416.5 2421 2425.5 2430 2434.5 2439 2443.5 2448 2452.5 2457 2461.5 2466 2470.5 2475 2479.5 2484 2488.5 2493 2497.5 2502 2506.5 2511 2515.5 2520 2524.5 2529 2533.5 2538 2542.5 2547 2551.5 2556 2560.5 2565 2569.5 2574 2578.5 2583 2587.5 2592 2596.5 2601 2605.5 2610 2614.5 2619 2623.5 2628 2632.5 2637 2641.5 2646 2650.5 2655 2659.5 2664 2668.5 2673 2677.5 2682 2686.5 2691 2695.5 2700 2704.5 2709 2713.5 2718 2722.5 2727 2731.5 2736 2740.5 2745 2749.5 2754 2758.5 2763 2767.5 2772 2776.5 2781 2785.5 2790 2794.5 2799 2803.5 2808 2812.5 2817 2821.5 2826 2830.5 2835 2839.5 2844 2848.5 2853 2857.5 2862 2866.5 2871 2875.5 2880 2884.5 2889 2893.5 2898 2902.5 2907 2911.5 2916 2920.5 2925 2929.5 2934 2938.5 2943 2947.5 2952 2956.5 2961 2965.5 2970 2974.5 2979 2983.5 2988 2992.5 2997 3001.5 3006 3010.5 3015 3019.5 3024 3028.5 3033 3037.5 3042 3046.5 3051 3055.5 3060 3064.5 3069 3073.5 3078 3082.5 3087 3091.5 3096 3100.5 3105 3109.5 3114 3118.5 3123 3127.5 3132 3136.5 3141 3145.5 3150 3154.5 3159 3163.5 3168 3172.5 3177 3181.5 3186 3190.5 3195 3199.5 3204 3208.5 3213 3217.5 3222 3226.5 3231 3235.5 3240 3244.5 3249 3253.5 3258 3262.5 3267 3271.5 3276 3280.5 3285 3289.5 3294 3298.5 3303 3307.5 3312 3316.5 3321 3325.5 3330 3334.5 3339 3343.5 3348 3352.5 3357 3361.5 3366 3370.5 3375 3379.5 3384 3388.5 3393 3397.5 3402 3406.5 3411 3415.5 3420 3424.5 3429 3433.5 3438 3442.5 3447 3451.5 3456 3460.5 3465 3469.5 3474 3478.5 3483 3487.5 3492 3496.5 3501 3505.5 3510 3514.5 3519 3523.5 3528 3532.5 3537 3541.5 3546 3550.5 3555 3559.5 3564 3568.5 3573 3577.5 3582 3586.5 3591 3595.5 3600 3604.5 3609 3613.5 3618 3622.5 3627 3631.5 3636 3640.5 3645 3649.5 3654 3658.5 3663 3667.5 3672 3676.5 3681 3685.5 3690 3694.5 3699 3703.5 3708 3712.5 3717 3721.5 3726 3730.5 3735 3739.5 3744 3748.5 3753 3757.5 3762 3766.5 3771 3775.5 3780 3784.5 3789 3793.5 3798 3802.5 3807 3811.5 3816 3820.5 3825 3829.5 3834 3838.5 3843 3847.5 3852 3856.5 3861 3865.5 3870 3874.5 3879 3883.5 3888 3892.5 3897 3901.5 3906 3910.5 3915 3919.5 3924 3928.5 3933 3937.5 3942 3946.5 3951 3955.5 3960 3964.5 3969 3973.5 3978 3982.5 3987 3991.5 3996 4000.5 4005 4009.5 4014 4018.5 4023 4027.5 4032 4036.5 4041 4045.5 4050 4054.5 4059 4063.5 4068 4072.5 4077 4081.5 4086 4090.5 4095 4099.5 4104 4108.5 4113 4117.5 4122 4126.5 4131 4135.5 4140 4144.5 4149 4153.5 4158 4162.5 4167 4171.5 4176 4180.5 4185 4189.5 4194 4198.5 4203 4207.5 4212 4216.5 4221 4225.5 4230 4234.5 4239 4243.5 4248 4252.5 4257 4261.5 4266 4270.5 4275 4279.5 4284 4288.5 4293 4297.5 4302 4306.5 4311 4315.5 4320 4324.5 4329 4333.5 4338 4342.5 4347 4351.5 4356 4360.5 4365 4369.5 4374 4378.5 4383 4387.5 4392 4396.5 4401 4405.5 4410 4414.5 4419 4423.5 4428 4432.5 4437 4441.5 4446 4450.5 4455 4459.5 4464 4468.5 4473 4477.5 4482 4486.5 4491 4495.5 4500 4504.5 4509 4513.5 4518 4522.5 4527 4531.5 4536 4540.5 4545 4549.5 4554 4558.5 4563 4567.5 4572 4576.5 4581 4585.5 4590 4594.5 4599 4603.5 4608 4612.5 4617 4621.5 4626 4630.5 4635 4639.5 4644 4648.5 4653 4657.5 4662 4666.5 4671 4675.5 4680 4684.5 4689 4693.5 4698 4702.5 4707 4711.5 4716 4720.5 4725 4729.5 4734 4738.5 4743 4747.5 4752 4756.5 4761 4765.5 4770 4774.5 4779 4783.5 4788 4792.5 4797 4801.5 4806 4810.5 4815 4819.5 4824 4828.5 4833 4837.5 4842 4846.5 4851 4855.5 4860 4864.5 4869 4873.5 4878 4882.5 4887 4891.5 4896 4900.5 4905 4909.5 4914 4918.5 4923 4927.5 4932 4936.5 4941 4945.5 4950 4954.5 4959 4963.5 4968 4972.5 4977 4981.5 4986 4990.5 4995 4999.5 5004 5008.5 5013 5017.5 5022 5026.5 5031 5035.5 5040 5044.5 5049 5053.5 5058 5062.5 5067 5071.5 5076 5080.5 5085 5089.5 5094 5098.5 5103 5107.5 5112 5116.5 5121 5125.5 5130 5134.5 5139 5143.5 5148 5152.5 5157 5161.5 5166 5170.5 5175 5179.5 5184 5188.5 5193 5197.5 5202 5206.5 5211 5215.5 5220 5224.5 5229 5233.5 5238 5242.5 5247 5251.5 5256 5260.5 5265 5269.5 5274 5278.5 5283 5287.5 5292 5296.5 5301 5305.5 5310 5314.5 5319 5323.5 5328 5332.5 5337 5341.5 5346 5350.5 5355 5359.5 5364 5368.5 5373 5377.5 5382 5386.5 5391 5395.5 5400 5404.5 5409 5413.5 5418 5422.5 5427 5431.5 5436 5440.5 5445 5449.5 5454 5458.5 5463 5467.5 5472 5476.5 5481 5485.5 5490 5494.5 5499 5503.5 5508 5512.5 5517 5521.5 5526 5530.5 5535 5539.5 5544 5548.5 5553 5557.5 5562 5566.5 5571 5575.5 5580 5584.5 5589 5593.5 5598 5602.5 5607 5611.5 5616 5620.5 5625 5629.5 5634 5638.5 5643 5647.5 5652 5656.5 5661 5665.5 5670 5674.5 5679 5683.5 5688 5692.5 5697 5701.5 5706 5710.5 5715 5719.5 5724 5728.5 5733 5737.5 5742 5746.5 5751 5755.5 5760 5764.5 5769 5773.5 5778 5782.5 5787 5791.5 5796 5800.5 5805 5809.5 5814 5818.5 5823 5827.5 5832 5836.5 5841 5845.5 5850 5854.5 5859 5863.5 5868 5872.5 5877 5881.5 5886 5890.5 5895 5899.5 5904 5908.5 5913 5917.5 5922 5926.5 5931 5935.5 5940 5944.5 5949 5953.5 5958 5962.5 5967 5971.5 5976 5980.5 5985 5989.5 5994 5998.5 6003 6007.5 6012 6016.5 6021 6025.5 6030 6034.5 6039 6043.5 6048 6052.5 6057 6061.5 6066 6070.5 6075 6079.5 6084 6088.5 6093 6097.5 6102 6106.5 6111 6115.5 6120 6124.5 6129 6133.5 6138 6142.5 6147 6151.5 6156 6160.5 6165 6169.5 6174 6178.5 6183 6187.5 6192 6196.5 6201 6205.5 6210 6214.5 6219 6223.5 6228 6232.5 6237 6241.5 6246 6250.5 6255 6259.5 6264 6268.5 6273 6277.5 6282 6286.5 6291 6295.5 6300 6304.5 6309 6313.5 6318 6322.5 6327 6331.5 6336 6340.5 6345 6349.5 6354 6358.5 6363 6367.5 6372 6376.5 6381 6385.5 6390 6394.5 6399 6403.5 6408 6412.5 6417 6421.5 6426 6430.5 6435 6439.5 6444 6448.5 6453 6457.5 6462 6466.5 6471 6475.5 6480 6484.5 6489 6493.5 6498 6502.5 6507 6511.5 6516 6520.5 6525 6529.5 6534 6538.5 6543 6547.5 6552 6556.5 6561 6565.5 6570 6574.5 6579 6583.5 6588 6592.5 6597 6601.5 6606 6610.5 6615 6619.5 6624 6628.5 6633 6637.5 6642 6646.5 6651 6655.5 6660 6664.5 6669 6673.5 6678 6682.5 6687 6691.5 6696 6700.5 6705 6709.5 6714 6718.5 6723 6727.5 6732 6736.5 6741 6745.5 6750 6754.5 6759 6763.5 6768 6772.5 6777 6781.5 6786 6790.5 6795 6799.5 6804 6808.5 6813 6817.5 6822 6826.5 6831 6835.5 6840 6844.5 6849 6853.5 6858 6862.5 6867 6871.5 6876 6880.5 6885 6889.5 6894 6898.5 6903 6907.5 6912 6916.5 6921 6925.5 6930 6934.5 6939 6943.5 6948 6952.5 6957 6961.5 6966 6970.5 6975 6979.5 6984 6988.5 6993 6997.5 7002 7006.5 7011 7015.5 7020 7024.5 7029 7033.5 7038 7042.5 7047 7051.5 7056 7060.5 7065 7069.5 7074 7078.5 7083 7087.5 7092 7096.5 7101 7105.5 7110 7114.5 7119 7123.5 7128 7132.5 7137 7141.5 7146 7150.5 7155 7159.5 7164 7168.5 7173 7177.5 7182 7186.5 7191 7195.5 7200 7204.5 7209 7213.5 7218 7222.5 7227 7231.5 7236 7240.5 7245 7249.5 7254 7258.5 7263 7267.5 7272 7276.5 7281 7285.5 7290 7294.5 7299 7303.5 7308 7312.5 7317 7321.5 7326 7330.5 7335 7339.5 7344 7348.5 7353 7357.5 7362 7366.5 7371 7375.5 7380 7384.5 7389 7393.5 7398 7402.5 7407 7411.5 7416 7420.5 7425 7429.5 7434 7438.5 7443 7447.5 7452 7456.5 7461 7465.5 7470 7474.5 7479 7483.5 7488 7492.5 7497 7501.5 7506 7510.5 7515 7519.5 7524 7528.5 7533 7537.5 7542 7546.5 7551 7555.5 7560 7564.5 7569 7573.5 7578 7582.5 7587 7591.5 7596 7600.5 7605 7609.5 7614 7618.5 7623 7627.5 7632 7636.5 7641 7645.5 7650 7654.5 7659 7663.5 7668 7672.5 7677 7681.5 7686 7690.5 7695 7699.5 7704 7708.5 7713 7717.5 7722 7726.5 7731 7735.5 7740 7744.5 7749 7753.5 7758 7762.5 7767 7771.5 7776 7780.5 7785 7789.5 7794 7798.5 7803 7807.5 7812 7816.5 7821 7825.5 7830 7834.5 7839 7843.5 7848 7852.5 7857 7861.5 7866 7870.5 7875 7879.5 7884 7888.5 7893 7897.5 7902 7906.5 7911 7915.5 7920 7924.5 7929 7933.5 7938 7942.5 7947 7951.5 7956 7960.5 7965 7969.5 7974 7978.5 7983 7987.5 7992 7996.5 8001 8005.5 8010 8014.5 8019 8023.5 8028 8032.5 8037 8041.5 8046 8050.5 8055 8059.5 8064 8068.5 8073 8077.5 8082 8086.5 8091 8095.5 8100 8104.5 8109 8113.5 8118 8122.5 8127 8131.5 8136 8140.5 8145 8149.5 8154 8158.5 8163 8167.5 8172 8176.5 8181 8185.5 8190 8194.5 8199 8203.5 8208 8212.5 8217 8221.5 8226 8230.5 8235 8239.5 8244 8248.5 8253 8257.5 8262 8266.5 8271 8275.5 8280 8284.5 8289 8293.5 8298 8302.5 8307 8311.5 8316 8320.5 8325 8329.5 8334 8338.5 8343 8347.5 8352 8356.5 8361 8365.5 8370 8374.5 8379 8383.5 8388 8392.5 8397 8401.5 8406 8410.5 8415 8419.5 8424 8428.5 8433 8437.5 8442 8446.5 8451 8455.5 8460 8464.5 8469 8473.5 8478 8482.5 8487 8491.5 8496 8500.5 8505 8509.5 8514 8518.5 8523 8527.5 8532 8536.5 8541 8545.5 8550 8554.5 8559 8563.5 8568 8572.5 8577 8581.5 8586 8590.5 8595 8599.5 8604 8608.5 8613 8617.5 8622 8626.5 8631 8635.5 8640 8644.5 8649 8653.5 8658 8662.5 8667 8671.5 8676 8680.5 8685 8689.5 8694 8698.5 8703 8707.5 8712 8716.5 8721 8725.5 8730 8734.5 8739 8743.5 8748 8752.5 8757 8761.5 8766 8770.5 8775 8779.5 8784 8788.5 8793 8797.5 8802 8806.5 8811 8815.5 8820 8824.5 8829 8833.5 8838 8842.5 8847 8851.5 8856 8860.5 8865 8869.5 8874 8878.5 8883 8887.5 8892 8896.5 8901 8905.5 8910 8914.5 8919 8923.5 8928 8932.5 8937 8941.5 8946 8950.5 8955 8959.5 8964 8968.5 8973 8977.5 8982 8986.5 8991 8995.5 9000 9004.5 9009 9013.5 9018 9022.5 9027 9031.5 9036 9040.5 9045 9049.5 9054 9058.5 9063 9067.5 9072 9076.5 9081 9085.5 9090 9094.5 9099 9103.5 9108 9112.5 9117 9121.5 9126 9130.5 9135 9139.5 9144 9148.5 9153 9157.5 9162 9166.5 9171 9175.5 9180 9184.5 9189 9193.5 9198 9202.5 9207 9211.5 9216 9220.5 9

DANFORTH AVENUE



City Of Ottawa
Department Of Physical Environment
Engineering And Surveys Branch

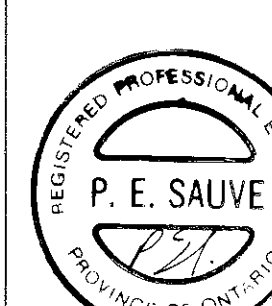
Notes:
- Utilities shown are taken from best available records. Contractor is requested to check with all utility companies before digging.
- Soil information shown is not guaranteed and contractors are advised to collect additional soil information as deemed necessary.
- Reference bench mark: N-12 Fire Station Church Ave.
- Note: Change 0.00 Imperial in Book 3840 has been altered to 10.00 meters on Plan 1772 also in book 3840.

Notes (Sewer Construction Only)
- A minimum of 460 mm vertical clearance to be maintained between sewers and watermain where practical.
- Borehole soil descriptions are not based on sieve analysis but on visual inspection only, except where otherwise noted.
- Soil information taken from: GOLDER Associates May 1993.
- Date of television inspection: Toronto June 5, 1994.
- This plan supersedes (in whole or in part) plan 1772.
- Actual rock line recorded during construction of existing storm sewer.
- Registered plan no. 204.

- Proposed storm and sanitary sewers may be constructed in a common trench provided that a minimum horizontal distance of 460 mm is maintained between outside barrels of pipe.

Legend	EXISTING	PROPOSED
STORM SEWER		
SANITARY SEWER		
STREET LINE		
LOT LINE		
ROADS & DRIVEWAYS		
WALKS		
WATERMAIN		
GASMAIN & VALVE		
BELL		
HYDRANT		
WATER VALVE		
STAND PIPE		
WATER VALVE CHAMBER		
SEWER TRAFFIC HYDRO & BELL MANHOLES (TO BE REMOVED)		
TRAFFIC HANDHOLE		
GUARD RAIL		
RETAINING WALL		
FENCE		
HYDRO POLE		
HYDRO POLE & LIGHT		
BELL POLE		
TRAFFIC LIGHT		
LIGHT STANDARD		
TRAFFIC SIGN		
STREET SIGN		
CULVERT & DITCH		
STANDARD CATCH BASIN & LEAD		
HEAVY DUTY CATCH BASIN & LEAD		
CATCH BASIN TO BE REMOVED & REPLACED WITH STANDARD C.B.		
HEAVY DUTY CATCH BASIN TO BE REMOVED & REPLACED WITH HEAVY DUTY CATCH BASIN		
HOUSE or CATCH BASIN CONNECTION TAKEN FROM T.V. INSPECTION		
HOUSE or CATCH BASIN CONNECTION TAKEN FROM RECORDS		
RELOCATION		
SQUARE IRON BAR		
STANDARD IRON BAR		
ROUND IRON BAR		
TREE, SHRUB & HEDGE		
BOREHOLE		
ROCK		

Revisions:	No	Date	Description	Drawn By	App'd By
	1	June 27/84	Street Alignment	D.M.	P. Sauve



Designed By: *W. G. M. M. M.* Date: *10/1/84* Structural Check By: *R. St. Germain* Date: *10/1/84*
Survey Detail By: *W. G. M. M. M.* Date: *10/1/84* Checked By: *R. St. Germain* Date: *10/1/84*
Drawing By: *D. A. McEwan* Date: *10/1/84* Checked By: *R. St. Germain* Date: *10/1/84*

Final Measurements:	Contractor	Inspector	Instrumentman	Field Book #
Construction Type	ROAD & SEWER	K. ROBERTS	D. BROWN	4437
Work Commenced	OCT. 84			
Work Completed	JUNE 85			
Designer	W. T. CARDO			
Drafting Revisions	BLR, (T.E.S.)	✓		

Design And Construction Division

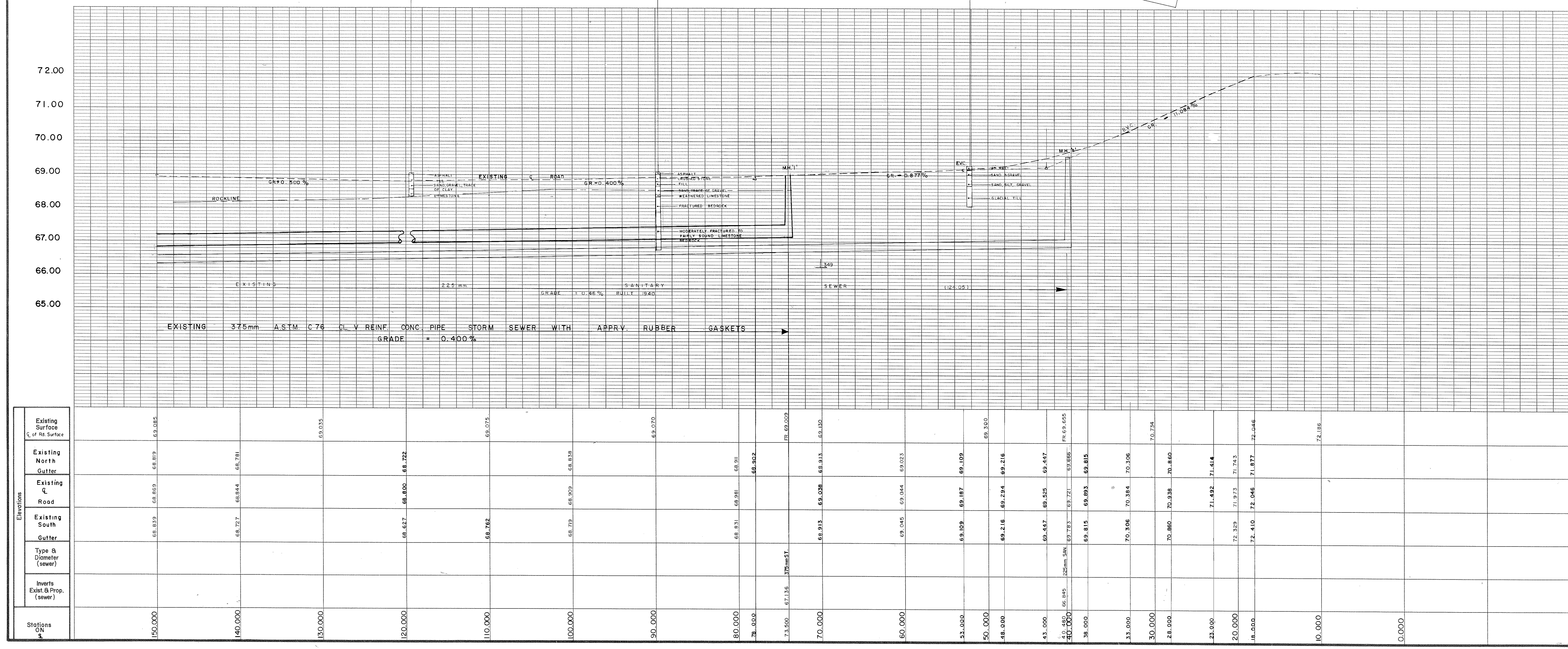
C. Sim P. Eng. D.K. Donaldson P. Eng.

STORM SEWER CONSTRUCTION AND ROAD RECONSTRUCTION WITH CURBS

DANFORTH AVE

CHURCHILL AVENUE TO CH. 150.000

Contract No: 83-21 Survey Book: 3840-4239 Scale: HORIZ. 1" = 200' VERT. 1" = 50' Plan No: 1772 Sheet: 1 of 2



Stationing	Existing Surface Elevation	Existing North Gutter	Existing Road	Existing South Gutter	Type & Diameter (sewer)	Inverts (sewer)
150.000	65.005	65.019	65.019	65.019	375mm	65.019
140.000	65.019	65.033	65.033	65.033	375mm	65.033
130.000	65.033	65.047	65.047	65.047	375mm	65.047
120.000	65.047	65.061	65.061	65.061	375mm	65.061
110.000	65.061	65.075	65.075	65.075	375mm	65.075
100.000	65.075	65.089	65.089	65.089	375mm	65.089
90.000	65.089	65.103	65.103	65.103	375mm	65.103
80.000	65.103	65.117	65.117	65.117	375mm	65.117
70.000	65.117	65.131	65.131	65.131	375mm	65.131
60.000	65.131	65.145	65.145	65.145	375mm	65.145
50.000	65.145	65.159	65.159	65.159	375mm	65.159
40.000	65.159	65.173	65.173	65.173	375mm	65.173
30.000	65.173	65.187	65.187	65.187	375mm	65.187
20.000	65.187	65.201	65.201	65.201	375mm	65.201
10.000	65.201	65.215	65.215	65.215	375mm	65.215
0.000	65.215	65.229	65.229	65.229	375mm	65.229



Regional Municipality
of
Ottawa-Carleton
Works Department

R.O. PICKARD
Works Commissioner

Engineer in Charge of
Design & Construction
T. J. Slack
Date
15/6/84



Project Office
Timothy Slack, P. Eng.
Date
June 15, 1984

Drawn by:
N.H.M.
Date
JUNE/84

Approved by: _____
Date _____

Notes
"WATERMAINS AND SERVICE CONNECTIONS TO RECEIVE FROST PROTECTION AS REQUIRED, PER R.M.O.C. STANDARDS AND SPECIFICATIONS"

Scales
HOR: 1 - 250
VERT: 1 - 50

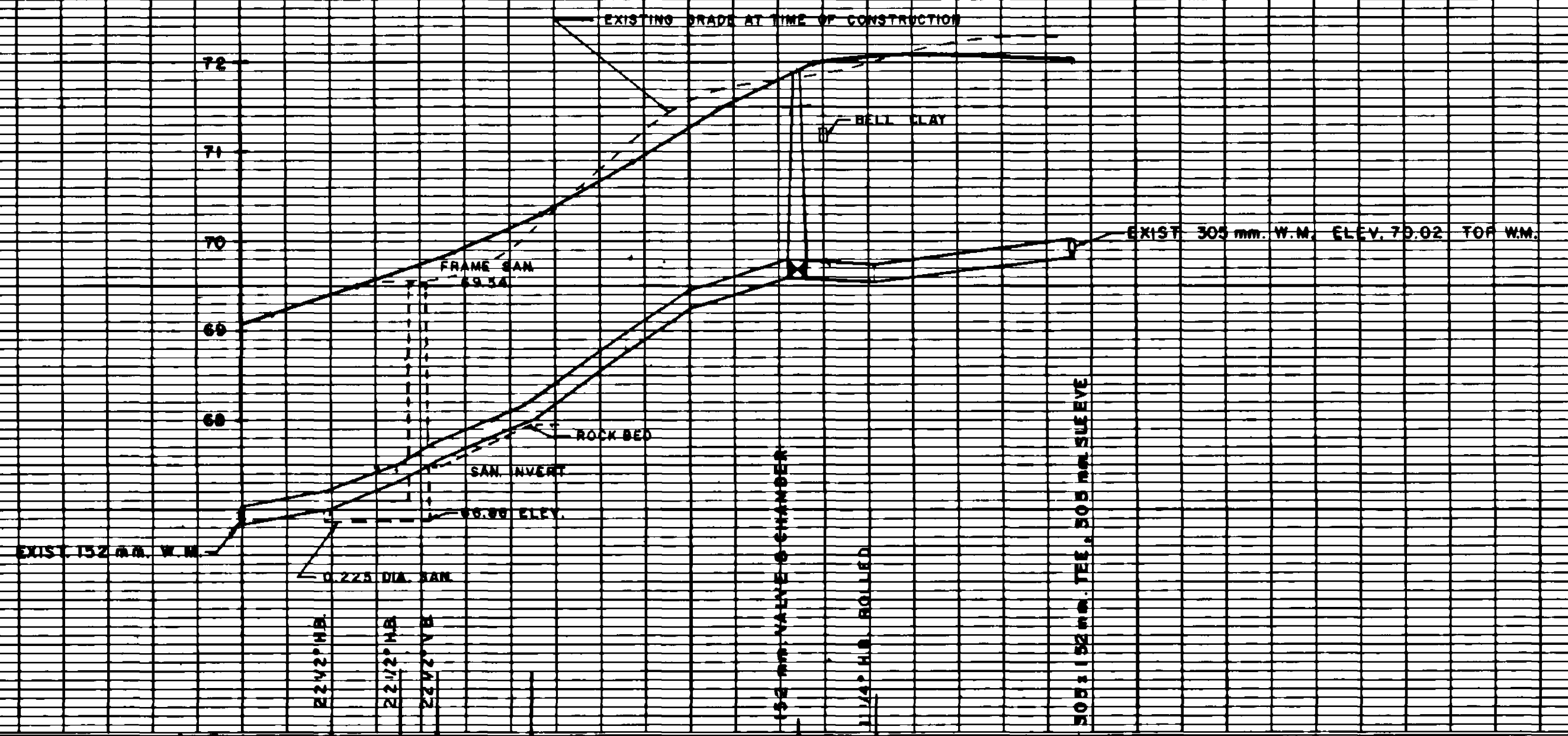
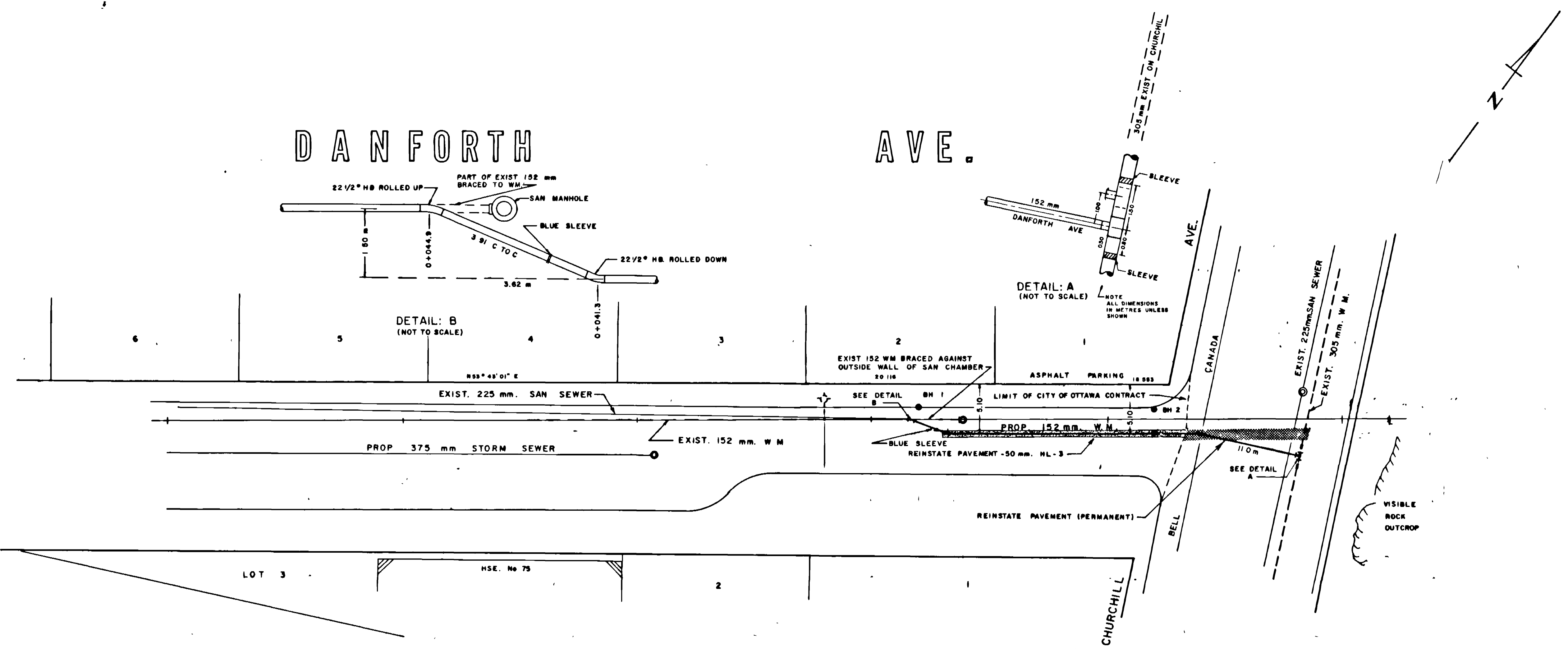
REVISIONS
1. "AS BUILT" FROM FIELD BOOK NO 660 & FIELD PRINT
afp JAN. / 85 R.M.

Project Title
DANFORTH AVE.
CHURCHILL AVE. - to
50 m. WEST.

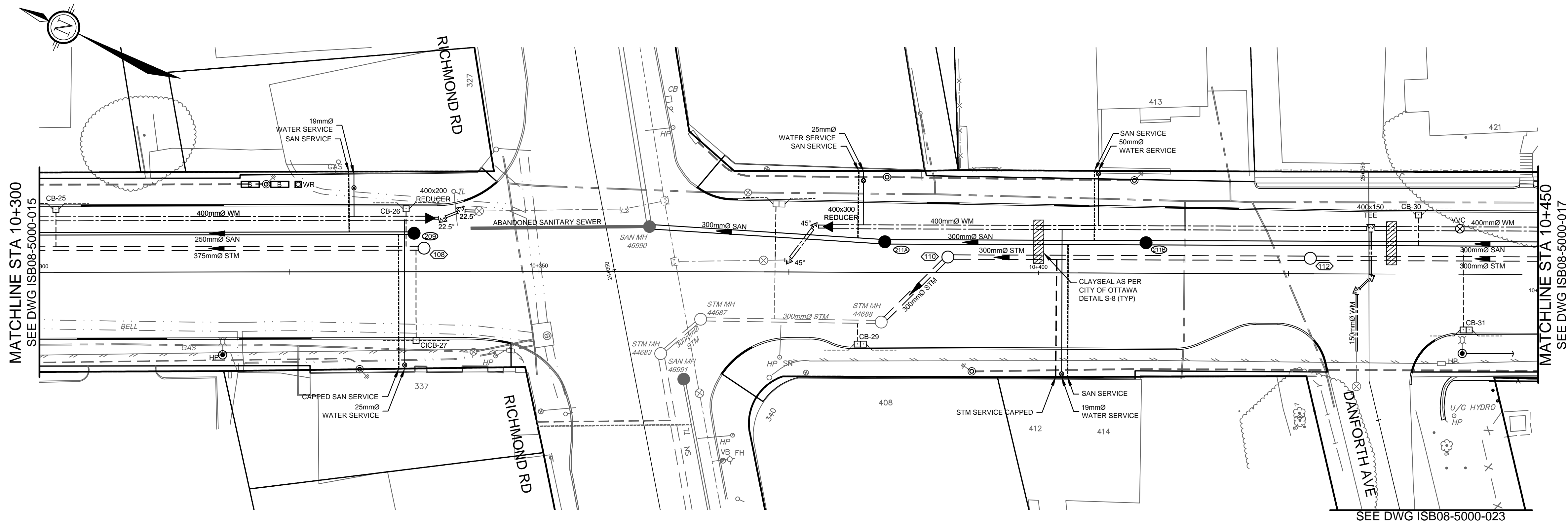
Drawing No. 3117
Sheet




DANFORTH

AVE.



				69.29	69.32	69.39	70.38	70.93	71.49	72.04	PROPOSED E OF ROAD	
				+048	+044.9	+043	+039.10	+038	+034	+033	TOP OF WATERMAIN	
				67.20	67.48	67.66	67.7	68.17	68.96	69.44	STATIONS	
				0+00	0+04.3	0+04.3	0+04.3	0+04.3	0+04.3	0+04.3		



<h1 style="text-align: center;">CHURCHILL AVENUE</h1> <h2 style="text-align: center;">REHABILITATION</h2> <h3 style="text-align: center;">SCOTT STREET TO BYRON AVENUE</h3>				
<h2 style="text-align: center;">CHURCHILL PLAN AND PROFILE</h2> <h3 style="text-align: center;">10+300 TO 10+450</h3>			Contract No. ISB08-5000	Dwg. No. 016
			Sheet 16 of 55	
			Asset No.	
			Asset Group: ISB	
BRUCE MASON, P.Eng. <i>Manager - Division</i>	TODD PENFOUND, C.E.T. <i>Project Manager</i>	Des: NTQ	Chk'd: ERD	
		Dwn: RCH	Chk'd: DHI	
		Utility Circ. No.:		
		Const. Inspector:		
		Scale: <div style="text-align: center;"> HORIZONTAL 0m 5 10  0m 1 2 VERTICAL </div>		
NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.				

No.	Description	By	Date
1.	ISSUED FOR PRELIMINARY DESIGN CIRCULATION	ERD	07/10/09
2.	ISSUED FOR MOE APPROVAL	ERD	07/24/09
3.	ISSUED FOR TENDER	ERD	11/06/09
4.	ISSUED FOR DESIGN CIRCULATION	ERD	11/06/09
5.	ISSUED FOR CONSTRUCTION	ERD	03/09/10
6.	REVISED PROFILE	ERD	08/19/10
7.	AS-BUILT	ERD	04/12/12

CATCH BASIN DATA						
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION	
					GUTTER	LOW/INV.
CB 25	10+301.65	6.60 LT	S19	OPSD 705.010	67.02	65.62
CB 26	10+336.71	6.60 LT	S19	OPSD 705.010	67.81	66.41
OCB 27	10+337.69	6.60 RT	S22/S23	OPSD 705.010	67.89	66.49
CB 28	10+373.95	7.11 LT	S19	OPSD 705.020	68.59	67.19
CB 29	10+382.17	7.50 RT	S19	OPSD 705.020	68.96	67.56
CB 30	10+438.02	6.22 LT	S19	OPSD 705.010	72.8	71.4
CB 31	10+442.81	5.88 RT	S19	OPSD 705.020	73.25	71.85

CATCH BASIN CONNECTION					
LOCATION	DIA. (mm)	TYPE	LENGTH (m)	INVERT ELEVATIONS	
				UPSTR.	DOWNSTR. *
CB 25 - PIPE	200	PVC SDR35	3.80	65.62	63.44
CB 26 - PIPE	200	PVC SDR35	3.80	66.41	64.25
CIQB 27 - PIPE	200	PVC SDR35	9.35	66.49	64.25
CB 28 - PIPE	200	PVC SDR35	11.53	67.19	66.97
CB 29 - PIPE	200	PVC SDR35	2.09	67.56	67.34
CB 30 - PIPE	200	PVC SDR35	4.22	71.40	70.58
CB 31 - PIPE	200	PVC SDR35	6.98	71.85	70.84

SANITARY MAINTENANCE HOLE DATA							
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION		
					T/GRATE	LOW/INV.	
SAN MH209	10+337.50	3.85 LT	"S24	OPSD 701.010	67.98	64.22	
SAN MH211A	10+384.14	3.05 LT	"S24	OPSD 701.010	69.05	66.20	
SAN MH211B	10+411.24	3.05 LT	"S24	OPSD 701.010	70.53	66.44	

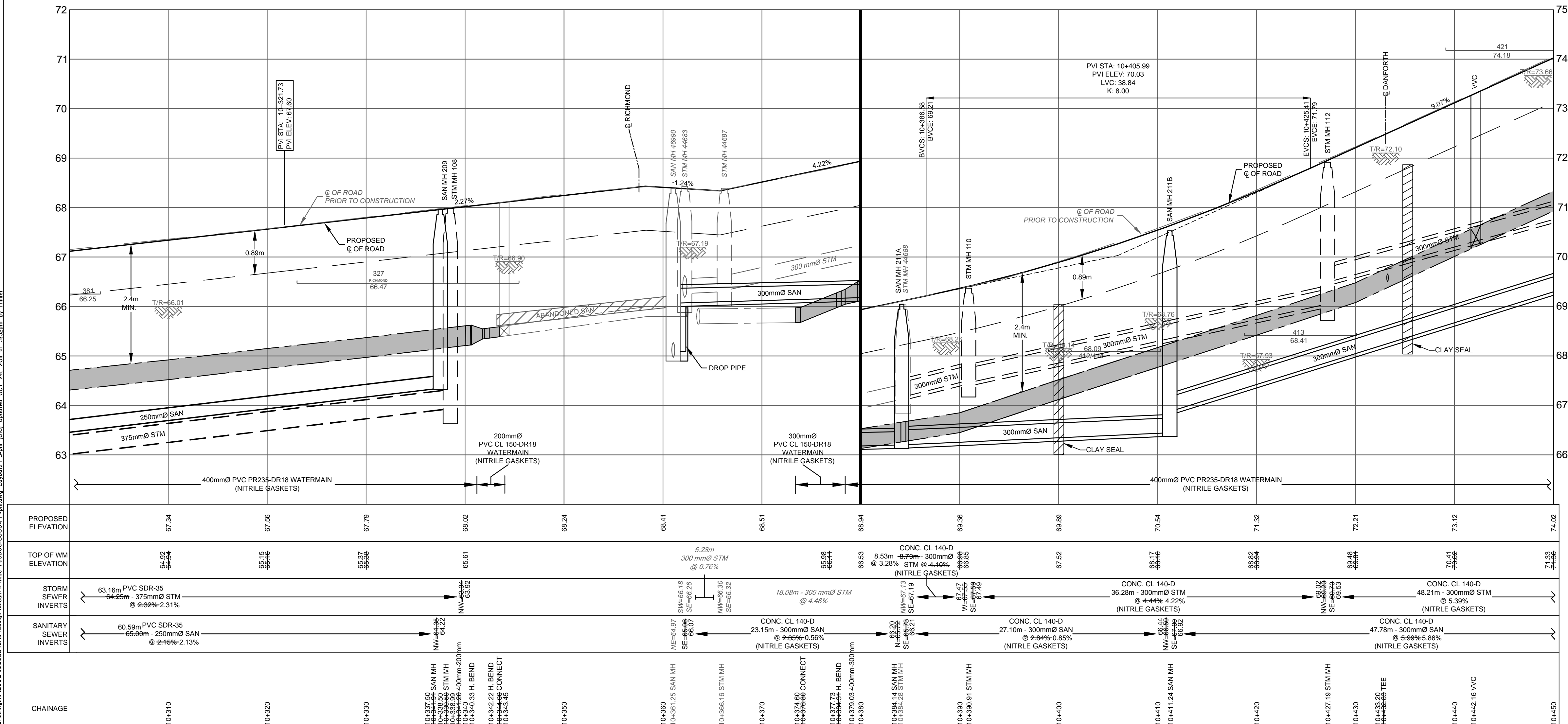
STORM MAINTENANCE HOLE DATA							
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION		
					T/GRADE	LOW/INV	
STM MH108	10+338.50	2.35 LT	"S24"	OPSD 701 010	67.96	69.24	63.92
STM MH110	10+390.91	1.55 LT	"S24"	OPSD 701 010	69.37	67.55	67.47
STM MH112	10+427.19	1.55 LT	"S24"	OPSD 701 010	71.91	69.50	69.02

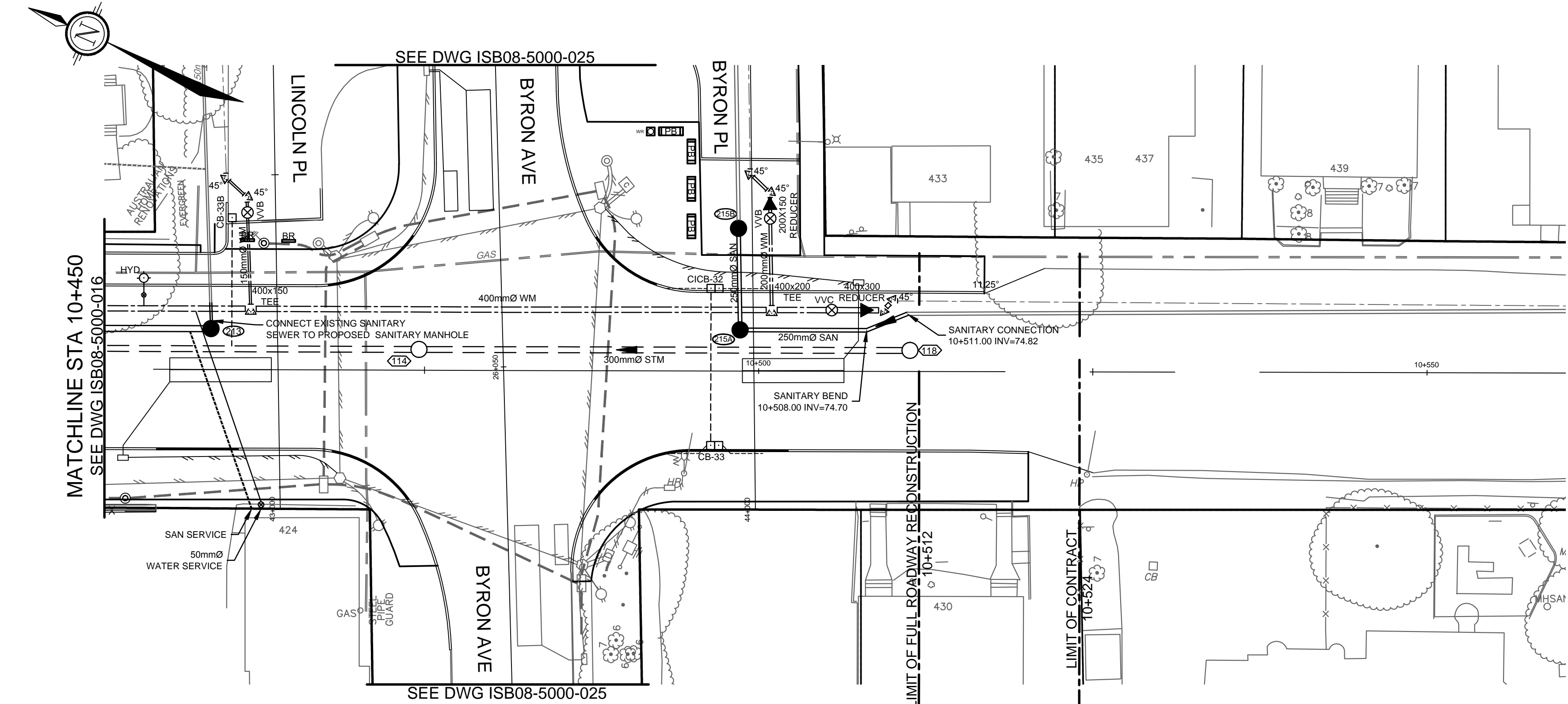
OFFSETS ARE FROM CONTROL LINE TO CENTRE OF STRUCTURE
T/GRADE = ELEVATION OF STATION TO TOP OF STRUCTURE
* FRAME TO BE SELF-LEVELING BY MEULLER AJ74S OR RIBBY C54M

SANITARY SEWER DATA							
SEWER		DIA.	LENGTH	TYPE	INVERT ELEVATIONS		
FROM	TO				UP STR.	DOWN STR.	
SAN 209	SAN 207	250	66.59	PVC SDR-35	64.36	62.56	62.93
SAN 211A	EX. MH	300	23.15	CONC CL 140-D	65.72	65.06	66.07
SAN 211B	SAN 211A	300	27.10	CONC CL 140-D	65.50	65.73	66.21
SAN 213	SAN 211B	300	47.78	CONC CL 140-D	67.00	67.00	66.92

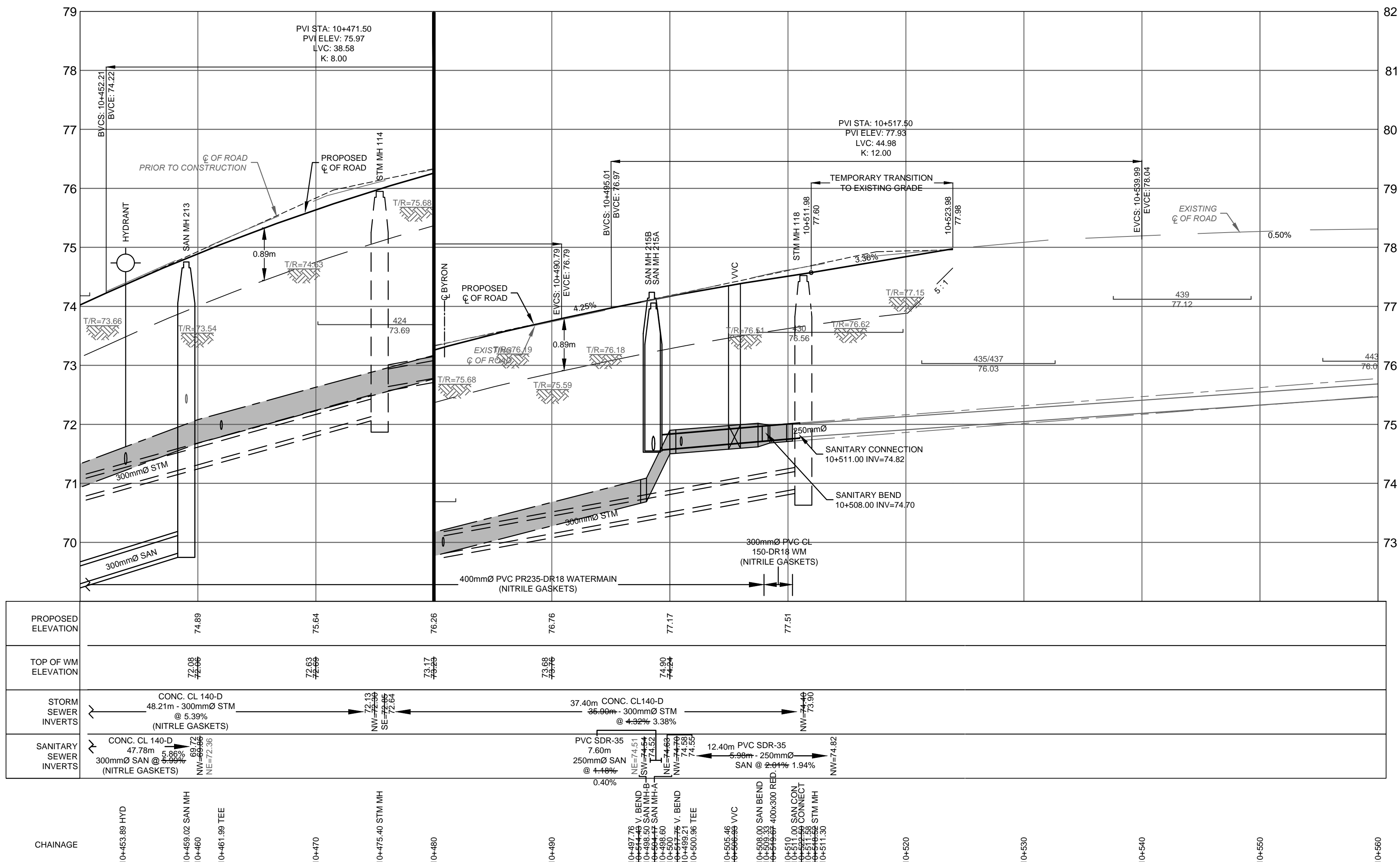
STORM SEWER DATA						
SEWER		DIA.	LENGTH (m)	TYPE	INVERT ELEVATIONS	
FROM	TO				UP STR.	DOWN STR.
STM 108	STM 106	375	<u>44.26</u>	PVC SDR-35	<u>43.40</u>	62.45
STM 110	EX. MH	300	<u>8.79</u>	CONC CL 140-D	<u>47.66</u>	67.19
STM 112	STM 110	300	36.28	CONC CL 140-D	<u>47.70</u>	67.60
STM 114	STM 112	300	48.21	CONC CL 140-D	<u>47.30</u>	69.70

BUILDING SERVICE DATA						
ADDRESS	EXISTING			PROPOSED		
	STORM	SANITARY	COMBINED	STORM	SANITARY	COMBINED
408 CHURCHILL			X			X
412/414 CHURCH		X		X	X	
413 CHURCHILL		X			X	
421 CHURCHILL (SANTO LINCOLN)		X			X	
327 RICHMOND (SANTO CHURCHILL)		X			X	
332 RICHMOND	EXISTING SERVICING CONDITIONS TO BE DETERMINED IN THE FIELD					
337 RICHMOND	X	X		X	X	





CHURCHILL AVENUE



CHURCHILL AVENUE

REHABILITATION

SCOTT STREET TO BYRON AVENUE

CHURCHILL

PLAN AND PROFILE

10+450 TO 10+600

BRUCE MASON, P.Eng.

Manager - Division

TODD PENFOUND, C.E.T.

Project Manager

Contract No.

ISB08-5000

Dwg. No.

017

Sheet

17

of

55

Asset No.

Asset Group:

ISB

Des:

NTQ

Chkd:

ERD

Dwn:

RCH

Chkd:

DHI

Utility Circ. No.:

Const. Inspector:

Scale:

HORIZONTAL

0m

5

10

0m

1

2

VERTICAL

NOTE:

The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

NOVATECH

CONSULTANTS

INCORPORATED

8400 Hwy. 104, Mississauga, Ontario L4V 1V9

Tel: (905) 270-8866 Fax: (905) 270-8867

E-mail: info@novatech.ca

Website: www.novatech.ca

CATCH BASIN DATA						
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION	
					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

CATCH BASIN CONNECTION					
LOCATION	DIA. (mm)	TYPE	LENGTH (m)	INVERT ELEVATIONS	
				UPSTR.	DOWNSTR.
CIB 32 - PIPE	200	PVC SDR35	4.70	75.53	73.92
CB 33 - PIPE	200	PVC SDR35	7.00	75.53	73.92

SANITARY MAINTENANCE HOLE DATA						
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION	
					T/GRATE	LOW IN
SAN MH213	10+459.02	3.05 LT	"S24	OPSD 701.010	74.75	74.98
SAN MH215B	10+504.47	10.67 LT	"S24	OPSD 701.010	77.24	74.51
SAN MH215A	10+504.47	3.07 LT	"S24	OPSD 701.010	77.27	74.63
SAN MH21A	10+515.88	3.07 LT	"S24	OPSD 701.010	77.72	74.92
SAN MH21B	10+521.49	4.38 LT	"S24	OPSD 701.010	77.88	74.96

STORM MAINTENANCE HOLE DATA						
NO.	STATION	OFFSET	COVER	STRUCTURE	ELEVATION	
					T/GRATE	LOW/INV.
STM MH114	10+475.40	1.55 LT	*S24.1	OPSD 701.010	75.95	72.30
STM MH118	10+510.52	1.57 LT	*S24.1	OPSD 701.010	77.71#	74.40

SANITARY SEWER DATA						
SEWER		DIA.	LENGTH	TYPE	INVERT ELEVATIONS	
FROM	TO				UP STR.	DOWN STR.
SAN 213	SAN 211B	300	47.78	CONC CL 140-D	<u>69.96</u>	<u>67.06</u>
SAN 215A	SAN 215B	250	9.50	PVC SDR-35	74.63	74.54
TEMP SAN A	SAN 215A	250	11.40	PVC SDR-35	74.82	74.66
TEMP SAN B	SAN A	250	5.99	PVC SDR-35	74.80	74.03

STORM SEWER DATA						
SEWER		DIA.	LENGTH (m)	TYPE	INVERT ELEVATIONS	
FROM	TO				UP STR	DOWN STR
STM 114	STM 112	300	48.21	CONC CL 140-D	72.30	69.70
STM 118	STM 114	300	49.12	CONC CL 140-D	72.46	72.85
			37.40		73.90	L 72.12

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

APPENDIX G


Fire Hydrant Coverage



FIRE HYDRANT FIGURE



LEGEND

 Hydrants within 75m


 Hydrants within 150m

Table 18.5.4.3 Maximum Fire Hydrant Fire Flow Capacity

Distance to Building ^a		Maximum Capacity ^b	
(ft)	(m)	(gpm)	(L/min)
≤ 250	≤ 76	1500	5678
> 250 and ≤ 500	> 76 and ≤ 152	1000	3785
> 500 and ≤ 1000	> 152 and ≤ 305	750	2839

^aMeasured in accordance with 18.5.1.4 and 18.5.1.5.
^bMinimum 20 psi (139.9 kPa) residual pressure.