Stormwater Management Report and Servicing Brief

National Capital Business Park
Site 3 - Building A1 and A3
4055 Russell Road
Ottawa, ON

Prepared for:

Avenue 31 Capital Inc.
801-250 City Centre
Ottawa, ON
K1R6K7

Attention: Matt Blasioli

LRL File No.: 230778

December 19th, 2025

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1 INTRODUCTION AND SITE DESCRIPTION

The development at 4055 Russell Road – Site 3 received City of Ottawa Site Plan Approval in 2022. The approved development included three buildings: A1, A2, and B. Building A2 and B have been constructed along with the Logistics Private roadway. In addition, all sewer, road and utility infrastructure has been constructed within Logistics Private Road, providing servicing and access to Building A2 and B from Russell Road. Avenue 31 Capital Inc. is proposing an alternative design for Building A1, which will be reviewed as part of this submission.

LRL Associates Ltd. was retained by Avenue 31 Capital Inc. to complete a Stormwater Management Analysis and Servicing Brief for the changes to Building A1. The original design of A1 was a single multistory building with a footprint of 59,232.1 m^2. The new design includes two single story buildings (A1 & A3) with footprints of 19,190m^2 and 25,237m^2, respectively.

The subject property is legally described as Part 5, Part of Lot 3, Concession 6 (Rideau Front) in the geographic township of Gloucester in the City of Ottawa. The subject lot is zoned IH (Heavy Industrial Zone). The site area is approximately **13.32 Ha** of the total Site 3 area 24 Ha.

Figure 1: Arial View of Proposed Development

The proposed development consists of two (2) industrial buildings with associated surface parking. Industrial Building A1, located on the north side of the site, has a proposed floor area of approximately 19,190 m², while Industrial Building A3, situated on the south side, has a proposed floor area of approximately 25,327 m². For further details, refer to the Site Plan included in ***Appendix E.***

This report has been prepared as an amendment to the approved Site Servicing and Stormwater Management Report for National Capital Business Park – 4055 Russell Road, Site 3, prepared by David Schaeffer Engineering Ltd., dated February 2022 (Rev. 3). This document is included in Appendix G and is hereafter referenced as SPA-FEB-2022.

The intent of this submission is to maintain consistency with the original stormwater management and servicing design criteria established in SPA-FEB-2022, while updating relevant elements to reflect the current development layout.

This report has also 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 BACKGROUND STUDIES AND GUIDELINES

The following guidelines were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**
  City of Ottawa, SDG002, October 2012
    - Technical Bulleting ISDTB-2014-01
      City of Ottawa, February 5, 2014
    - Technical Bulleting PIEDTB-2016-01
      City of Ottawa, September 6, 2016
    - Technical Bulleting ISTB-2018-01
      City of Ottawa, March 21, 2018
    - Technical Bulleting ISTB-2018-04
      City of Ottawa, June 27, 2018
    - Technical Bulleting ISTB-2019-02
      City of Ottawa, July 8, 2019
- **City of Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, WDG001, July 2010
    - Technical Bulleting ISD-2010-2
      City of Ottawa, December 15, 2010
    - Technical Bulleting ISDTB-2014-02
      City of Ottawa, May 27, 2014
    - Technical Bulleting ISDTB-2018-02
      City of Ottawa, March 21, 2018
    - Technical Bulleting ISDTB-2021-03
      City of Ottawa, August 18, 2021

  - Technical Bulleting IWSTB-2024-05
    City of Ottawa, November 18, 2024

- DSEL – Site Servicing and Stormwater Management for Nation Capital Business Park, 4055 Russell Road – Site 3, dated February 2022 – Rev3.

- 4120 & 4055 Russell Road – Erosion Threshold and Exceedance Analysis Geo Morphix, May 25, 2021.

- Response to RVCA comments regarding 4120 & 4055 Russell Road – Erosion Threshold and Exceedance Analysis Mather Award Drain, McEwan Creek, and Ramsey Creek Ottawa, Geo Morphix, dated February 8, 2022.

- Geotechnical Investigation, National Capital Business Park, Site 3, 4055 Russell Road, Ottawa, Paterson Group, (PG4854-3 rev 2) dated December 10, 2025.

3 EXISTING INFRASTRUCTURE AND DRAINAGE DESCRIPTION

This report is submitted as an amendment to the approved Site Plan Control application. As such, the existing site conditions and drainage patterns are assumed to be consistent with those presented in the approved Site Servicing and Stormwater Management Report. For full design details, refer to the approved report titled *SPA-FEB-2022*.

Under current conditions, Buildings A2 and B have been constructed, along with Logistics Private and all associated underground infrastructure, including water, sanitary, and storm sewer services within the roadway. Additionally, all three stormwater management quantity control ponds P1, P2, and P3 have been constructed and are functioning as intended.

As-built information indicates the following existing infrastructure located within the existing site:

Logistics Private (*private infrastructure*):

- 200mm diameter PVC watermain - The 200mm diameter water loop has been constructed looping from the existing 400mm diameter watermain located at Russell Road and Logistics Private, up Logistics Private and through the bldg. A1/A3 Site and back to Russell Road.
- 900mm, 975mm and 1500mm diameter Storm Sewer *(directing site runoff to the site stormwater quantity ponds*)
- Three (3) storm service connections extending onto the site (900mm diameter, 450mm diameter, 1350mm diameter).
- One (1) 250mm diameter sanitary sewer service extending to the site from a 250mm diameter sanitary sewer.

Logistics Private (*municipal infrastructure*):

- Existing 1350mm diameter Green Creek Collector South Trunk sanitary sewer.

Watermain mapping, along with as-built information indicate the following existing infrastructure located within the adjacent right-of-way, Russell Road:

Russell Road:

- 400mm diameter capped watermain at the Russell Road and Logistic Private intersection.
- 400mm diameter capped watermain in proximity to the north property line of 4055 Russell Road.

There are no storm or sanitary sewers located within Russell Road.

4 CONSULTATION AND REGULATORY APPROVALS

A pre-consultation meeting for the proposed development was held on September 10, 2025.

An MECP Environmental Compliance Approval has been issued. Number 4328-CGHM5P, Issue Date, August 3, 2022. Technical Review Memorandum, Rideau Valley Conservation Authority, Review of Water Balance for Site 3 (JFSA, February 4,2022), dated May 25, 2022.

A Permit to Take Water is not anticipated to be required for pumping requirements for sewer installation. No other approval requirements from other regulatory agencies are anticipated.

Regulatory approvals are included in ***Appendix A.***

5 GEOTECHNICAL CONSIDERATIONS

A revised geotechnical investigation was completed by Paterson Group Inc. (Report No. PG4854-3, Revision 2), dated December 10, 2025.

Subsurface conditions generally consist of a thin layer of topsoil underlain by silty sand and/or stiff to hard silty clay. Compact to dense glacial till was encountered at depths ranging from approximately 1.4 m to 9.0 m below existing grade, with practical refusal observed at depths between 2.2 m and 4.9 m in most test locations.

Groundwater conditions varied, with levels ranging from dry to approximately 3.9 m below grade at the time of investigation. Long-term groundwater levels are anticipated to stabilize between 2.0 m and 3.0 m below grade, subject to seasonal fluctuations.

The geotechnical assessment identified permissible grade raise constraints across the site. In particular, grade raises in the vicinity of Buildings A1 and A3 are generally limited from up to 1.5 m to as much as 3.0 m, increasing from west to east, as detailed in the Permissible Grade Raise Plan included in the report.

The geotechnical report also provides design recommendations for excavation, trenching, pipe bedding and backfill, groundwater control, slope stability, and grade raise limits. These recommendations will be implemented during detailed design and construction.

6 SCOPE OF WORK

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

Stormwater management

- Adhering to the calculated post-development stormwater peak flow to the existing storm service connections extending into the site, *SPA-FEB-2022*.

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, *SPA-FEB-2022*.
- 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 network and connection to the existing sanitary sewer.
- Review impact of increased sanitary flow on downstream sanitary sewer, *SPA-FEB-2022*.

7 WATER SUPPLY AND FIRE PROTECTION

7.1 Existing Water Supply Services and Fire Hydrant Coverage

The subject property is located within the City of Ottawa's 2W2C water distribution pressure zone.

Water servicing for the site has already been constructed. Two service connections to the existing 406 mm capped watermains along Russell Road provide water supply to the site. Buildings A1 and A3 will be serviced through the internal watermain loop that has been installed. No changes are proposed to the existing connections on Russell Road.

Buildings A1 and A3 are being proposed in place of the originally approved Building A1. The original EPANet water distribution model, completed in 2022, remains applicable and is summarized in Table 1 below.

Table 1: 2022 Model Simulation Demand Summary (N6-BLDG A1)

Design Parameter	Demands (L/s)
Average Daily Demand	152.1
Max Day + Fire Flow (per FUS)	228.1
Water demand calculation per DSEL – Site Servicing and Stormwater Management for Nation Capital Business Park, 4055 Russell Road – Site 3, dated February 2022 – Rev3.	

7.2 Water Supply Servicing Design

A 200 mm diameter private watermain was previously extended from Russell Road, continuing northeast and north along Logistics Private. At approximately 235 m, a tee connection was installed to extend a 200 mm diameter watermain westward into the A1 & A3 development site. This watermain continues approximately 370 m north to the property line, then angles southwest and loops back to Russell Road.

It is proposed that two industrial buildings (A1 and A3) will be constructed on the subject site. Since the average day demand for each building exceeds 50m3/d, each building will be serviced by two (2) 200 mm diameter water service connections, separated by a valve, connected to the private watermain loop. These connections will tie into the existing 200 mm diameter watermain from Russell Road. Refer to *Site Servicing Plan C.401* in ***Appendix E*** for the servicing layout and connection details.

It should be noted that approximately 370m of the 200 mm diameter watermain loop within the A1 & A3 site will need to be realigned due to a conflict with the footprint of the proposed Building A1.

Table 2 below summarizes the City of Ottawa Design Guidelines design parameters employed in the preparation of the water demand estimate.

Table 2: City of Ottawa Design Guidelines Design Parameters

Average Day Demand	
Residential	280 L/c/d
Industrial - Light	35,000 L/gross ha/d
Industrial - Heavy	55,000 L/gross ha/d
Commercial Office Space	75 L/9.3m2/d
Maximum Daily Demand	
Residential	2.5 x avg. day
Industrial	1.5 x avg. day
Commercial	1.5 x avg. day
Institutional	1.5 x avg. day
Maximum Hour Demand	
Residential	2.2 x max. day
Industrial	1.8 x max. day
Commercial	1.8 x max. day
Institutional	1.8 x max. day

The proposed gross area of each industrial building is approximately 19,190m^2 building A1 and approximately 25,327m^2 for building A3. It is assumed that 5% of each building will be dedicated to office space, 959.5m^2 for A1 and 1,266m^2 for building A3. Based on the *City of Ottawa Design Guidelines for Consumption Rates*, the building's use was considered *Industrial-Light* with a consumption rate of 35,000 L/gross ha/day and the office space with a consumption rate of 75 L/9.3m2/day.

The required water supply for the industrial buildings has been calculated using the following formula:

$$\boldsymbol{Q = (q \times A \times M)}$$

Where,
q = average water consumption (L/gross ha/day for industrial space and 75L/9.3m^2/d for office space)
A = area (ha for industrial space and m^2 for office space)
M = Peak factor

The following factors were used in calculations as per Table 4.2 in the City of Ottawa Design Guidelines;

- Maximum Daily Demand Factor = **1.5**
- Peak Hour Demand Factor = **1.8**

Using the above-mentioned factors and design parameters listed in Table 1, total anticipated demands were calculated as follows:

Building A1

- Average daily domestic water demand is **0.83** L/s,
- Maximum daily demand is **1.24** L/s, and
- Maximum hourly is **2.24** L/s.

Building A3

- Average daily domestic water demand is **0.97** L/s,
- Maximum daily demand is **1.46** L/s, and
- Maximum hourly is **2.63** L/s.

Table 3 below summarizes anticipated demands. Refer to ***Appendix B*** for water demand calculations.

Table 3: Summary of Anticipated Demands

Design Parameter	**Anticipated Demands (L/s)**	
	Building A1	**Building A3**
Average Daily Demand	0.83	0.97
Max Daily Demand	1.24	1.46
Required Fire Flow (FUS)	133.3	150.0
Peak Hour	2.24	2.63
Water demand calculation per City of Ottawa Water Design guidelines. ***See Appendix B*** *for details.*		

New boundary conditions were not requested from the City of Ottawa. As per *SPA-FEB-2022,* the approved water demand for Building A1 was as follows:

- Average daily domestic water demand is **2.53** L/s,

- Maximum daily demand is **3.80** L/s, and
- Maximum hourly is **6.83** L/s.

The revised average day and peak daily and hourly water demands are below and remain consistent with the previously approved servicing design. The updated demands are within the parameters established in the *SPA-FEB-2022* report and continue to conform to the City's water demand and hydraulic performance criteria.

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 – Fire Resistive Construction (Type I);
- Occupancy type – Limited Combustible; and
- Sprinkler Protection – Automatic Sprinkler System.

The estimated fire flow demand was estimated to be **8,000 L/min**, for Building A1 and **9,000 L/min** for Building A3. There are five (5) existing and four (4) proposed fire hydrants located in proximity to the proposed buildings that are available to provide the required fire flow demands. Refer to ***Appendix B*** for fire flow calculations and *Site Servicing Plan C.401* in ***Appendix E*** for fire hydrant locations.

Table 3 below summarizes the aggregate fire flow of the contributing hydrants in proximity to the proposed buildings based on Table 18.5.4.3 of *ISTB-2018-02*.

Table 4: Fire Protection Summary Table

Industrial Building	Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Available Combined Fire Flow (L/min)
A1	8000	4	22000
A3	9000	3	16500

The total available fire flow from the contributing hydrants is equal to **22,000 L/min** and **16,500 L/min** for buildings A1 and A3 respectively, 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.

8 SANITARY SERVICE

8.1 Existing Sanitary Sewer Services

The site is within the Green Creek Collector south trunk sewer catchment area. The 1350mm diameter trunk sewer extends through the site within Logistics Private from west to east. As per the approved drawings, a new 250mm diameter sanitary sewer was constructed within Logistics Private to convey the site flows to the trunk sewer, and a 250mm sanitary service was extended into the A1 & A3 site for servicing.

8.2 Sanitary Sewer Servicing Design

The sanitary flows from industrial buildings A1 and A3 will connect as per the approved design. The site will outlet to the private gravity sewer network designed in accordance with the City of Ottawa design criteria and outlets to the Green Creek Collector South Sewer via the already constructed sanitary maintenance structure SAN1.

Refer to LRL drawing *Site Servicing Plan C.401*, included in ***Appendix E*****,** for the proposed sanitary servicing.

The total post-development wet flow for the site was calculated to be **12.14 L/s;** 5.54 L/s from building A1 and 6.60 L/s from building A3. The parameters used to calculate the anticipated flows for the industrial portions of the building were an Average Light Industrial Flow of 35,000 L/ha/day as per the City of Ottawa Design Guidelines, an infiltration allowance of 0.33 L/ha/s, an industrial peak factor of 4.4, and a commercial office flow of 75 L/9.3m2/d.

As per *SPA-FEB-2022,* the approved sanitary design flow was calculated to be 16.21L/s. Therefore, the revised design flow of 12.33L/s remains below and consistent with the approved sanitary flow.

Refer to ***Appendix C*** for further information on the calculated sanitary flows.

9 STORMWATER MANAGEMENT

9.1 Existing Stormwater Infrastructure

Stormwater runoff from the subject property is within the Ramsay Creek watershed and has been reviewed and approved by the City of Ottawa and the Rideau Valley Conservation Authority (RVCA).

Existing stormwater services are detailed within *SPA-FEB-2022.*

9.2 Design Criteria

The stormwater management criteria included pre-consultation with City of Ottawa officials, RVCA, 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).

9.2.1 Water Quality & Quantity

Stormwater quality and quantity controls for the site are consistent with the previously approved *SPA-FEB-2022* design.

An enhanced level of water quality treatment, providing 80% total suspended solids (TSS) removal, is achieved through the EFO10 Oil Grit Separator (OGS) installed at the outlet of the existing Pond P1. This unit is located downstream of structures STM101 and DICB100, which are equipped with inlet control devices (ICDs). Consistent with the original design, this OGS installation remains the sole quality control measure for the development, and the revised design maintains this approach without modification.

Stormwater quantity control for the site will be provided within Pond 1 (P1), consistent with the design approach outlined in the approved *SPA-FEB-2022* report. Under the revised development plan, site drainage will be directed to the existing storm maintenance holes STM303, STM312 & STM315, as originally intended. From there, flows are conveyed to Pond 1, where outlet control is maintained through two ICD orifice plates: an 83 mm plate at STM101 for the 2-year storm event, and a 450 mm plate at DICB100 for the 100-year storm event. No on-site quantity control was proposed within the development boundary as per *SPA-FEB-2022* report, and the revised design criteria remain consistent.
Site Servicing Plan C.401 in ***Appendix E***

9.2.2 Erosion Assessment and Water Balance

An erosion assessment has been completed, and the approved design adheres to maximum allowable release rate for the 25mm design storm.

A water balance was completed, and details can be found within the approved *SPA-FEB-2022.*

9.3 Proposed Stormwater Management Design

The site will adhere to the *SPA-FEB-2022* stormwater management design.

9.3.1 Pre-development

Pre-development drainage and flows are per the approved *SPA-FEB-2022.*

9.3.2 Post-development

The post-development drainage has been designed to match the *SPA-FEB-2022* post-development drainage areas A304 through A310, A312 & A313, and A317 through A321.

Table 5 below summarizes post-development drainage areas refer to LRL drawing C.702 in ***Appendix E*** for details. Calculations can be found in ***Appendix D.***

Table 5: *Drainage Areas*

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
CA-01 (controlled)	0.002	0.000	0.098	0.10	0.88

CA-02 (controlled)	0.000	0.000	0.071	0.07	0.90
CA-03 (controlled)	0.000	0.000	0.087	0.09	0.90
CA-04 (controlled)	0.002	0.000	0.085	0.09	0.89
CA-05 (controlled)	0.000	0.000	0.080	0.08	0.90
CA-06 (controlled)	0.038	0.000	0.070	0.11	0.65
CA-07A (controlled)	0.210	0.000	0.000	0.21	0.20
CA-07B (controlled)	0.110	0.000	0.010	0.12	0.26
CA-08 (controlled)	0.050	0.000	0.456	0.51	0.83
CA-09 (controlled)	0.000	0.000	0.360	0.36	0.90
CA-10 (controlled)	0.000	0.000	1.910	1.91	0.90
CA-11 (controlled)	0.024	0.000	0.534	0.56	0.87
CA-12 (controlled)	0.132	0.000	0.235	0.37	0.65
CA-13 (controlled)	0.000	0.000	0.414	0.41	0.90
CA-14 (controlled)	0.000	0.000	0.480	0.48	0.90
CA-15 (controlled)	0.000	0.000	0.470	0.47	0.90
CA-16 (controlled)	0.000	0.000	0.470	0.47	0.90
CA-17 (controlled)	0.000	0.000	0.468	0.47	0.90
CA-18 (controlled)	0.000	0.000	0.394	0.39	0.90
CA-19 (controlled)	0.002	0.000	0.194	0.20	0.89
CA-20 (controlled)	0.038	0.000	0.055	0.09	0.61
CA-21 (controlled)	0.036	0.000	0.061	0.10	0.64
CA-22 (controlled)	0.090	0.000	0.410	0.50	0.77
CA-23 (controlled)	0.058	0.000	0.662	0.72	0.84
CA-24 (controlled)	0.000	0.000	2.530	2.53	0.90
CA-25 (controlled)	0.013	0.000	0.305	0.32	0.87
CA-26 (controlled)	0.170	0.000	0.032	0.20	0.31
CA-27 (controlled)	0.075	0.000	0.143	0.22	0.66
CA-28 (controlled)	0.068	0.000	0.108	0.18	0.63
CA-29 (controlled)	0.110	0.000	0.110	0.22	0.55
CA-30 (controlled)	0.087	0.000	0.114	0.20	0.60
CA-31 (controlled)	0.045	0.000	0.110	0.16	0.70

CA-32 (controlled)	0.020	0.000	0.082	0.10	0.76
CA-33 (controlled)	0.034	0.000	0.062	0.10	0.65
CA-34 (controlled)	0.108	0.000	0.044	0.15	0.40
CA-35 (UN-controlled)	0.040	0.000	0.044	0.08	0.57
Total	**1.562**	**0.000**	**11.758**	**13.32**	**0.82**

As discussed earlier, Stormwater quantity management for the site remains consistent with the design principles outlined in the approved *SPA-FEB-2022* report. Under the revised development plan, storm runoff will be discharged to three designated storm maintenance holes: STM303, STM312, and STM315. These MHs are connected to existing infrastructure within the Logistics Private right-of-way and ultimately outlet to Pond 1 (P1), which provides site-level stormwater detention.

Pond 1 Outlets and Design Control:
Flow regulation from constructed Pond 1 will be achieved through:

- An existing 83 mm ICD orifice plate at STM101, controlling the 2-year storm event.
- An existing 450 mm ICD orifice plate at DICB100, designed for the 100-year storm event.

No additional on-site quantity control measures were proposed within the development boundary, as per the original *SPA-FEB-2022* design. The revised design maintains this approach while ensuring that post-development flows to each outlet location do not exceed the originally approved peak flow rates, thereby confirming that the existing downstream infrastructure within the Logistics Private corridor can accommodate the revised flow distribution without adverse impact.

As per the approved *SPA-FEB-2022* design, the site accommodates temporary overland ponding to manage short-term surcharge events due to the detained stormwater backing up within the storm sewer system. In the revised layout, any detained runoff that backs up within the system will temporarily pond above the storm structures in the Parking lot areas, Landscape zones and Drive aisles and pavement zones. The maximum ponding depth is limited to 0.3 m above the structure rim elevations. Each catchment area is designed with a dedicated spillover point to route excess runoff safely, should the ponding volume exceed storage limits.

Refer to Drawings C601 and C702 in ***Appendix E*** for detailed layouts of Ponding extents, Spillover elevations, and Overland flow routing.

Moreover, three designated emergency overflow outlets for extreme events have been determined.

- Three spillover points discharge to the east, flowing onto the Logistics Private right-of-way.

Refer to Drawing C301 in ***Appendix E*** for the location of the emergency overflow point.

10 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. Refer to LRL Associates drawing C.101 in ***Appendix E*** for erosion and sediment control details.

11 CONCLUSION

This Stormwater Management and Servicing Report for the alteration in the development at Site 3 of the National Capital Business Park presents the rationale and details per the approved servicing requirements for the subject property.

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

Water Service

- The required fire flow remained the same, as per the approved *SPA-FEB-2022* design.
- The required fire flow was calculated to be **8,000 L/min & 9,000 L/min** using the FUS method for building A1 and A3.
- Each building will be serviced via two 200 mm diameter. water service connection to be connected to the existing 200mm diameter watermain loop extend through the site from Logistics Private.

Sanitary Service

- The calculated wet wastewater flow remained as designed, per the approved *SPA-FEB-2022* design.
- The total calculated wet wastewater flow from the proposed development is **12.14 L/s;** 5.54 L/s from building A1 and 6.60 L/s from building A3**.**
- The proposed development will be serviced via the constructed network within Logistics Private.

Stormwater Management

- The stormwater management design of the site will remain as per the approved *SPA-FEB-2022* design.
- The site has been analyzed, and post-development watersheds have been allocated.
- Quantity and quality controls will remain as per the approved *SPA-FEB-2022* design. No new quantity and quality controls are being designed for the site.

12 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

Sarthak Vora
Civil Designer

Kelly Paradis, PMP, P.Eng.
Civil Engineer

APPENDIX A

Correspondance

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 4328-CGHM5P
Issue Date: August 3, 2022

National Capital Business Park Inc.
250 City Centre Avenue, Unit 801
Ottawa, Ontario
K1R 6K7

Site Location: National Capital Business Park - Site 3
4055 Russell Road
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the establishment of wastewater infrastructure Works located in the City of Ottawa, Ontario, consisting of the following:

- **sanitary sewers** on Easement INST. CT212893 (from approximately 200 metres east of Russel Road to approximately 50 metres west of Highway 417), discharging to existing sewers located the same easement;

- **storm sewers** within the subject site to the storm outlets and headwalls (from approximately 150 metres east of Russell Road in the south to approximately 400 metres east of Russel Road in the north), discharging to existing ditches, tributary to McEwen Creek and Ramsey Creek, located approximately 300 metres east of the north storm outlet;

the establishment of stormwater management Works to serve the proposed industrial area, located in the City of Ottawa, Ontario, consisting of the following:

- **oil and grit separator (catchment area 18.34 hectares):** one (1) oil and grit separator, Stormceptor EF010 or Equivalent Equipment, located at the north end of the site, providing Enhanced Level of protection, having a sediment storage capacity of 17,790 litres, an oil storage capacity of 1,670 litres, a total storage volume of approximately 23,700 litres, and a maximum treatment rate of 65 litres per second, receiving inflow from the storm sewer located around buildings A1 and A2 at the north end of the site as controlled by the 83 millimetre inlet control device, discharging via a 600 millimetre diameter outlet pipe to the ditch adjacent to Highway 417 and tributary to the Ramsey Creek;

- **oil and grit separator (catchment area 3.47 hectares):** one (1) oil and grit separator, Stormceptor EF06 or Equivalent Equipment, located at the south end of the site, providing Enhanced Level of protection, having a sediment storage capacity of 3,470 litres, an oil storage capacity of 610 litres, a total storage volume of approximately 5,070 litres, and a maximum treatment rate of 23.4 litres per second, receiving inflow from the storm sewer located around building B in the south end of the site as regulated by a Tempest LMF 50 Inlet Control Device, discharging via a 975 millimetre diameter outlet pipe to the Mather Award Drain near Russel Road;

the establishment of stormwater management Works to serve the industrial area, located in the City of Ottawa, Ontario, for the collection, transmission, treatment and disposal of stormwater runoff from a total catchment area of 22.7 hectares, to provide Enhanced Level water quality protection and erosion control, and to attenuate post-development peak flows to pre-development peak flows for all storm events up to and including the 100-year storm event, discharging to the Ramsey Creek and the Mather Award Drain, consisting of the following:

- **stormwater management facility (catchment area 18.34 hectares):** one (1) surface ponding, located at the north end of the property, having a maximum available storage volume of 10,957 cubic metres and a maximum depth of 2.15 metres, complete with one (1) inlet structure, and one (1) outlet structure headwall, consisting of a 300 millimetre diameter storm outlet pipe equipped with a 83 millimetre diameter within STM101, allowing a maximum discharge of 404.07 litres per second under the 100-year storm event to existing ditch and ultimately Ramsey Creek located Adjacent to Highway 417; and

- **stormwater management facility (catchment area 3.47 hectares):** one (1) surface ponding, located at the south end of the property, having a maximum available storage volume of 2,567 cubic metres and a maximum depth of 2.3 metres, complete with one (1) outlet structure catchbasin, consisting of a 300 millimetre diameter storm outlet pipe equipped with a downstream 375 millimetre diameter storm outlet pipe equipped with a downstream 375 millimetre diameter orifice and a Tempest LMF 50 orifice or Equivalent Equipment within STM401, allowing a maximum discharge of 107.6 litres per second under the 100-year storm event to existing Mather Award Drain located south of the subject site;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

3. "District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

4. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;

5. "Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of the approved named equipment.

6. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

7. "Owner" means National Capital Business Park Inc., and includes its successors and assignees;

8. "OWRA" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40* , as amended;

9. "Works" means the sewage Works described in the Owner's application, and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of Owner;

    b. change of address of the Owner;

    c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

    d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act,* R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

2. The Owner shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the Works do not constitute a safety or health hazard to the general public.

3. The Owner shall undertake an inspection of the condition of the Works, at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the Works to prevent the excessive build-up of sediment, oil/grit, debris and/or decaying vegetation, to avoid reduction of the capacity and/or permeability of the Works, as applicable. The Owner shall also regularly inspect and clean out the inlet to and outlet from the Works to ensure that these are not obstructed.

4. The Owner shall construct, operate and maintain the Works with the objective that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discoloration on the receiving waters.

5. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's administrative office for inspection by the Ministry. The logbook shall include the following:

    a. the name of the Works; and

    b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the Works.

6. The Owner shall prepare an operations manual prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:

    a. operating and maintenance procedures for routine operation of the Works;

b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

d. contingency plans and procedures for dealing with potential spills and any other abnormal situations and for notifying the District Manager; and

e. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

7. The Owner shall maintain the operations manual current and retain a copy at the Owner's administrative office for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

5. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

6. REPORTING

1. One (1) week prior to the start-up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start-up date.

2. The Owner shall, upon request, make all reports, manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare a performance report within ninety (90) days following the end of the period being reported upon, and submit the report(s) to the District Manager when requested. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be prepared to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

a. a description of any operating problems encountered and corrective actions taken;

b. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;

c. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

d. a summary of all spill or abnormal discharge events; and

e. any other information the District Manager requires from time to time.

7. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

Schedule "A"

1. Application for Environmental Compliance Approval, dated June 17, 2022, received on July 11, 2022, submitted by National Capital Business Park Inc.;

2. Transfer of Review Letter of Recommendation, dated July 11, 2022 and signed by Jeff Shillington, P.Eng., Senior Project Manager, Development Review, South Branch, City of Ottawa, including the following supporting documents:

    a. Final Plans and Specifications prepared by David Schaeffer Engineering Ltd.

    b. Pipe Data Form - Watermain, Storm Sewer, Sanitary Sewer, and Forcemain Design Supplement to Application for Approval for Water and Sewage Works.

    c. Hydraulic Design Sheets prepared by David Schaeffer Engineering Ltd.

    d. Stormwater Management Report prepared by David Schaeffer Engineering Ltd.

    e. Design brief, calculations and specifications prepared by David Schaeffer Engineering Ltd.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from the Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. The Condition also ensures that adequate storage is maintained in the Works at all times as required by the design. Furthermore, this Condition is included to ensure that the Works are operated and maintained to function as designed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

6. Condition 6 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me and the Ontario Land Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

The Director appointed for the purposes of
Part II.1 of the *Environmental Protection Act*
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act.*

DATED AT TORONTO this 3rd day of August, 2022

Fariha Pannu.

Fariha Pannu, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

AJ/

c: District Manager, MECP Ottawa District Office
City Clerk, City of Ottawa (File No. D07-12-21-0069)
Jeff Shillington, P.Eng., City of Ottawa
Alex Tourigny, David Schaeffer Engineering Ltd.
Laurence Coulson, David Schaeffer Engineering Ltd.

APPENDIX B

Water Supply Calculations

Water Supply Calculations

LRL File No. : 230778
Project: Proposed Development
Location: 4055 Russell Rd, Ottawa
Date: 12/18/2025
Designed: S.V
Checked: K.P
Dwg Reference: C401

BUILDING -A1

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

Industrial Demand

Property Type	Unit Rate	Area (ha)	Demand (L/d)
Office Space (L/9.3m2/d)	75	0.096	7737.6
Light Industrial Demand (L/ha/d)	35000	1.824	63840

Average Day Demand	**71,578**	**L/d**		**0.828**	**L/s**
Maximum Day Factor	1.5		(Design Guidelines-Water Distribution Table 4.2)		
Maximum Daily Demand	**107,366**	**L/d**		**1.243**	**L/s**
Peak Hour Factor	1.8		(Design Guidelines-Water Distribution Table 4.2)		
Maximum Hour Demand	**193,260**	**L/d**		**2.237**	**L/s**

TOTAL DEMAND				
Average Day Demand	**71,578**	**L/d**	**0.83**	**L/s**
Maximum Daily Demand	**107,366**	**L/d**	**1.24**	**L/s**
Maximum Hour Demand	**193,260**	**L/d**	**2.24**	**L/s**

Water Service Pipe Sizing

Q = VA

Where: V = velocity (m/s)
A = area of pipe (m^2)
Q = flow rate (L/s)

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

Minimum pipe diameter (d) =	$(4Q/\pi V)^{1/2}$		
=	0.040	m	
=	40	mm	
Proposed pipe diameter (d) =	**200**	mm	(to be confirmed with hydraulic pressure analysis)
=	**8**	Inches	

Water Supply Calculations

LRL File No. : 230778
Project: Proposed Development
Location: 4055 Russell Rd, Ottawa
Date: 12/18/2025
Designed: S.V
Checked: K.P
Dwg Reference: C401

BUILDING -A3

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

Industrial Demand

Property Type	Unit Rate	Area (ha)	Demand (L/d)
Office Space (L/9.3m2/d)	75	0.1265	10195.9
Light Industrial Demand (L/ha/d)	35000	2.4035	84122.5

Average Day Demand	**84,123**	**L/d**	**0.974**	**L/s**
Maximum Day Factor	1.5		(Design Guidelines-Water Distribution Table 4.2)	
Maximum Daily Demand	**126,184**	**L/d**	**1.460**	**L/s**
Peak Hour Factor	1.8		(Design Guidelines-Water Distribution Table 4.2)	
Maximum Hour Demand	**227,131**	**L/d**	**2.629**	**L/s**

TOTAL DEMAND

Average Day Demand	**84,123**	**L/d**	**0.97**	**L/s**
Maximum Daily Demand	**126,184**	**L/d**	**1.46**	**L/s**
Maximum Hour Demand	**227,131**	**L/d**	**2.63**	**L/s**

Water Service Pipe Sizing

Q = VA

Where: V = velocity (m/s)
A = area of pipe (m^2)
Q = flow rate (L/s)

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

Minimum pipe diameter (d) =	$(4Q/\pi V)^{1/2}$		
=	0.043	m	
=	43	mm	
Proposed pipe diameter (d) =	**200**	mm	(to be confirmed with hydraulic pressure analysis)
=	**8**	Inches	

Fire Flow Calculations

LRL File No. 230778
Project: Proposed Development
Location: 4055 Russell Rd, Ottawa
Date: December 18, 2025
Method: Fire Underwriter's Survey (FUS)
Prepared by: S,V

BUILDING - A1

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Construction Coefficient (C)								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame Construction (Type V)	1.5	Fire Resistive Construction (Type I)	**0.6**		
			Mass Timber Construction (Type IV-A)	0.8				
			Mass Timber Construction (Type IV-B)	0.9				
			Mass Timber Construction (Type IV-C)	1.0				
			Mass Timber Construction (Type IV-D)	1.5				
			Ordinary Construction (Type III)	1.0				
			Noncombustible Construction (Type II)	0.8				
			Fire Resistive Construction (Type I)	0.6				
Floor Area (A)								
2	Total Effective Floor Area					**19,190**	m^2	
3	Obtain fire flow before reductions	Required fire flow (rounded to nearest 1000)	Fire Flow = 220 x C x $A^{0.5}$				L/min	**19,000**
Occupancy and Contents Adjustment								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Noncombustible	-25%	Limited combustible	**-15%**	L/min	**16,150**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
Sprinkler Protection								
5	Choose reduction for sprinklers	Sprinkler reduction	Automatic sprinkler protection designed & installed in accordance with NFPA 13	-30%	True	**-30%**	L/min	**8,075**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
Exposure Adjustment								
6	Choose separation	Exposure distance	North side	>30m	0%	**0%**	L/min	**8,075**
			East side	>30m	0%			
			South side	>30m	0%			
			West side	>30m	0%			
Net Required Fire Flow								
7	Obtain fire flow and duration	Minimum required fire flow (rounded to nearest 1000)					L/min	**8,000**
		Minimum required fire flow					L/s	**133.3**
		Required duration of fire flow					hr	**2**

Fire Flow Calculations

LRL File No. 230778
Project: Proposed Development
Location: 4055 Russell Rd, Ottawa
Date: December 18, 2025
Method: Fire Underwriter's Survey (FUS)
Prepared by: S,V

BUILDING - A3

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow
Construction Coefficient (C)								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame Construction (Type V)	1.5	Fire Resistive Construction (Type I)	**0.6**		
			Mass Timber Construction (Type IV-A)	0.8				
			Mass Timber Construction (Type IV-B)	0.9				
			Mass Timber Construction (Type IV-C)	1.0				
			Mass Timber Construction (Type IV-D)	1.5				
			Ordinary Construction (Type III)	1.0				
			Noncombustible Construction (Type II)	0.8				
			Fire Resistive Construction (Type I)	0.6				
Floor Area (A)								
2	Total Effective Floor Area					**25,327**	m^2	
3	Obtain fire flow before reductions	Required fire flow (rounded to nearest 1000)	Fire Flow = 220 x C x $A^{0.5}$				L/min	**22,000**
Occupancy and Contents Adjustment								
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Noncombustible	-25%	Limited combustible	**-15%**	L/min	**18,700**
			Limited combustible	-15%				
			Combustible	0%				
			Free burning	15%				
			Rapid burning	25%				
Sprinkler Protection								
5	Choose reduction for sprinklers	Sprinkler reduction	Automatic sprinkler protection designed & installed in accordance with NFPA 13	-30%	True	**-30%**	L/min	**9,350**
			Water supply is standard for both the system and fire department hose lines	-10%	True	**-10%**		
			Fully supervised system	-10%	True	**-10%**		
Exposure Adjustment								
6	Choose separation	Exposure distance	North side	>30m	0%	**0%**	L/min	**9,350**
			East side	>30m	0%			
			South side	>30m	0%			
			West side	>30m	0%			
Net Required Fire Flow								
7	Obtain fire flow and duration	Minimum required fire flow (rounded to nearest 1000)					L/min	**9,000**
		Minimum required fire flow					L/s	**150.0**
		Required duration of fire flow					hr	**2**

Fire Flow Calculations as per Ontario Building Code (OBC)

LRL File No. : 230778
Project : Proposed Development
Location : 4055 Russell Rd, Ottawa
Date : December 18, 2025
Prepared by: SV

Fire Protection Water Supply Calculations- Building A1

$Q = KVS_{Tot}$ (OBC Appendix A-3.2.5.7)

where

Q = minimum supply of water (L)
K = water supply coefficient from Table 1 of A-3.2.5.7
V = total building volume (m^3)
S_{Tot} = total of spatial coefficient values from property line exposures on all sides from Figure 1 of A-3.2.5.7

$S_{Tot} = 1.0 + (S_{side1} + S_{side2} + S_{side3} + S_{side4})$

		Exposure Distance (m)	
S_{Side1} =	0.00	>10	(North)
S_{Side2} =	0.00	>10	(East)
S_{Side3} =	0.00	>10	(South)
S_{Side4} =	0.00	>10	(West)
S_{Tot} =	**1.00**		

K = 17 (Group F-2, non-combustible construction with fire resistance ratings)

Building Information based on Architectural Drawing

Floor Area = 19190 m^2
Prop. Bldg Height = 12.19 m
V = 233926 m^3

Q = 3976744 L

Required Minimum Water Supply Flow Rate = 9000 L / min (Table 2 of A-3.2.5.7)
150 L/s

Fire Flow Calculations as per Ontario Building Code (OBC)

LRL File No. : 230778
Project : Proposed Development
Location : 4055 Russell Rd, Ottawa
Date : December 18, 2025
Prepared by: SV

Fire Protection Water Supply Calculations- Building A3

$Q = KVS_{Tot}$ (OBC Appendix A-3.2.5.7)

where

Q = minimum supply of water (L)
K = water supply coefficient from Table 1 of A-3.2.5.7
V = total building volume (m^3)
S_{Tot} = total of spatial coefficient values from property line exposures on all sides from Figure 1 of A-3.2.5.7

$S_{Tot} = 1.0 + (S_{side1} + S_{side2} + S_{side3} + S_{side4})$

		Exposure Distance (m)	
S_{Side1} =	0.00	>10	(North)
S_{Side2} =	0.00	>10	(East)
S_{Side3} =	0.00	>10	(South)
S_{Side4} =	0.00	>10	(West)
S_{Tot} =	**1.00**		

K = 17 (Group F-2, non-combustible construction with fire resistance ratings)

Building Information based on Architectural Drawing

Floor Area = 25327 m^2
Prop. Bldg Height = 12.19 m
V = 308736 m^3

Q = 5248514 L

Required Minimum Water Supply Flow Rate = 9000 L / min (Table 2 of A-3.2.5.7)
150 L/s

APPENDIX C

Wastewater Collection Calculations

LRL Associates Ltd.
Sanitary Sewer Design Sheet

LRL File No.: 230778
Project: Proposed Development
Location: 4055 Russell Rd, Ottawa
Designed: S.V
Checked: K.P
Date: December 18, 2025
DWG. Reference: C401

Sanitary Design Parameters

Commercial & Institutional Flow = 28000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Heavy Industrial Flow = 55000 L/ha/day
Office Space = 75L/9.3m2/d
Commercial & Institutional Peak Factor = 1.5
Average Daily Flow = 280 L/p/day
Industrial Peak Factor = as per Appendix 4-B
Extraneous Flow = 0.33 L/s/ha

Pipe Design Parameters

Maximum Velocity = 3.00 m/s
Minimum Velocity = 0.60 m/s
Manning's n = 0.013

LOCATION			RESIDENTIAL						COMMERCIAL/ OFFICE		LIGHT-INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW, Q	PIPE						
STREET	FROM	TO	AREA	POP.	ACCU. AREA	ACCU. POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FACT.	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW		LENGTH	DIA.	SLOPE	MATERIAL	CAP. Q(FULL)	VEL. V(FULL)	RATIO Q /QFULL
			(Ha)		(Ha)			(L/s)	(Ha)	(Ha)		(Ha)		(Ha)	(Ha)	(L/s)	(Ha)	(Ha)	(L/s)	(L/s)	(m)	(mm)	(%)		(L/s)	(m/s)	
	BLDG A1	MH201							0.096	0.096	1.82	1.82	4.4			3.34	6.660	6.660	2.20	5.54	33.9	250	0.51%	PVC	42.47	0.87	0.13
	BLDG A2	MH201							0.127	0.127	2.40	2.40	4.4			4.40	6.660	6.660	2.20	6.60	133.2	250	0.51%	PVC	42.47	0.87	0.16
	MH201	EX SAN8																		**12.14**	45.5	250	0.51%	PVC	42.47	0.87	0.29

Notes: Existing inverts and slopes are estimated. They are to be confirmed on-site.

APPENDIX D

Stormwater Management Calculations

LRL Associates Ltd.

Storm Watershed Summary

LRL File No. 230778
Project: Proposed A1/A3 Development
Location: 4055 Russell Rd, Ottawa
Date: December 18, 2025
Designed: SV
Checked: KP
Dwg Reference: C701, C702

Pre-Development Catchments

Watershed	Total Area (ha)
ECA-01 (controlled)	13.320
Total	**13.320**

AS PER SPA-FEB-2022, STORMWATER FROM THE ENTIRE DEVELOPMENT PARCEL IS PROPOSED TO BE CONVEYED TO EXISTING POND P1, LOCATED AT THE NORTHEAST CORNER OF THE SITE. STORMWATER WILL FURTHER DISCHARGE TO THE NORTHEAST TOWARD RAMSEY CREEK, IDENTIFIED AS OUTLET 'A'. NO STORMWATER QUANTITY CONTROLS WERE PROPOSED WITHIN THE DEVELOPMENT BOUNDARY AND QUANTITY CONTROL MEASURES ARE IMPLEMENTED AT THE OUTLET OF POND P1.

Post-Development Catchments

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
CA-01 (controlled)	0.002	0.000	0.098	0.10	0.88
CA-02 (controlled)	0.000	0.000	0.071	0.07	0.90
CA-03 (controlled)	0.000	0.000	0.087	0.09	0.90
CA-04 (controlled)	0.002	0.000	0.085	0.09	0.89
CA-05 (controlled)	0.000	0.000	0.080	0.08	0.90
CA-06 (controlled)	0.038	0.000	0.070	0.11	0.65
CA-07A (controlled)	0.210	0.000	0.000	0.21	0.20
CA-07B (controlled)	0.110	0.000	0.010	0.12	0.26
CA-08 (controlled)	0.050	0.000	0.456	0.51	0.83
CA-09 (controlled)	0.000	0.000	0.360	0.36	0.90
CA-10 (controlled)	0.000	0.000	1.910	1.91	0.90
CA-11 (controlled)	0.024	0.000	0.534	0.56	0.87
CA-12 (controlled)	0.132	0.000	0.235	0.37	0.65
CA-13 (controlled)	0.000	0.000	0.414	0.41	0.90
CA-14 (controlled)	0.000	0.000	0.480	0.48	0.90
CA-15 (controlled)	0.000	0.000	0.470	0.47	0.90
CA-16 (controlled)	0.000	0.000	0.470	0.47	0.90
CA-17 (controlled)	0.000	0.000	0.468	0.47	0.90
CA-18 (controlled)	0.000	0.000	0.394	0.39	0.90
CA-19 (controlled)	0.002	0.000	0.194	0.20	0.89
CA-20 (controlled)	0.038	0.000	0.055	0.09	0.61
CA-21 (controlled)	0.036	0.000	0.061	0.10	0.64
CA-22 (controlled)	0.090	0.000	0.410	0.50	0.77

LRL Associates Ltd.

Storm Watershed Summary

CA-23 (controlled)	0.058	0.000	0.662	0.72	0.84
CA-24 (controlled)	0.000	0.000	2.530	2.53	0.90
CA-25 (controlled)	0.013	0.000	0.305	0.32	0.87
CA-26 (controlled)	0.170	0.000	0.032	0.20	0.31
CA-27 (controlled)	0.075	0.000	0.143	0.22	0.66
CA-28 (controlled)	0.068	0.000	0.108	0.18	0.63
CA-29 (controlled)	0.110	0.000	0.110	0.22	0.55
CA-30 (controlled)	0.087	0.000	0.114	0.20	0.60
CA-31 (controlled)	0.045	0.000	0.110	0.16	0.70
CA-32 (controlled)	0.020	0.000	0.082	0.10	0.76
CA-33 (controlled)	0.034	0.000	0.062	0.10	0.65
CA-34 (controlled)	0.108	0.000	0.044	0.15	0.40
CA-35 (UN-controlled)	0.040	0.000	0.044	0.08	0.57
Total	**1.562**	**0.000**	**11.758**	**13.32**	**0.82**

LRL Associates Ltd.

Storm Sewer Design Sheet

LRL File No. 230778
Project: Proposed A1/A3 Development
Location: 4055 Russell Rd, Ottawa
Date: December 18, 2025
Designed: SV
Checked: KP
Dwg. Ref.: C401,C702

Rational Method

Q = 2.78CIA
Q = Peak flow (L/s)
A = Drainage area (ha)
C = Runoff coefficient
I = Rainfall intensity (mm/hr)

Runoff coefficient (C)

Grass = 0.2
Gravel = 0.8
Asphalt / rooftop = 0.9

IDF curve

Ottawa Macdonald-Cartier International Airport
Storm event: 5 Years

Intensity equation:

$I_5 = 998.071 / (Td + 6.053)^{0.814}$ (mm/hr)

Pipe Design Parameters

Minimum velocity = 0.80 m/s
Manning's "n" = 0.013

LOCATION			AREA (ha)			FLOW						STORM SEWER							
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.80	C = 0.90	Indiv. 2.78AC	Accum. 2.78AC	Time of Conc.	Rainfall Intensity	Peak Flow (Q)	Controlled Flow (Q)	Pipe Dia.	Type	Slope	Length	Capacity Full (Q_{FULL})	Velocity Full	Time of Flow	Ratio Q/Q_{FULL}
								(min)	(mm/hr)	(L/s)	(L/s)	(mm)		(%)	(m)	(L/s)	(m/s)	(min)	
CA-11	CBMH107	CBMH106	0.024	0.000	0.514	1.30	1.30	10.00	104.19	135.39		600	PVC	0.13%	63.1	223.08	0.79	1.33	0.61
CA-01	CBMH106	CBMH105	0.002	0.000	0.119	0.30	1.60	11.33	97.64	156.07		600	PVC	0.13%	61.1	223.08	0.79	1.29	0.70
CA-02	CBMH105	CBMH104	0.000	0.000	0.072	0.18	1.78	12.62	92.11	163.83		600	PVC	0.13%	59.0	223.08	0.79	1.25	0.73
CA-03	CBMH104	CBMH103	0.000	0.000	0.082	0.21	1.98	13.87	87.40	173.37		600	PVC	0.13%	58.8	223.08	0.79	1.24	0.78
CA-04	CBMH103	CBMH102	0.002	0.000	0.083	0.21	2.19	15.11	83.20	182.39		675	PVC	0.11%	57.6	278.79	0.78	1.23	0.65
CA-05	CBMH102	CBMH101	0.000	0.000	0.081	0.20	2.39	16.34	79.45	190.28		675	PVC	0.11%	82.2	282.57	0.79	1.73	0.67
CA-06	CBMH101	MH01	0.038	0.000	0.072	0.20	2.60	18.08	74.77	194.12		675	PVC	0.11%	18.5	282.57	0.79	0.39	0.69
CA-12	CB209	CB208	0.128	0.000	0.235	0.66	0.66	10.00	104.19	68.68		450	PVC	0.20%	69.5	125.90	0.79	1.46	0.55
CA-13	CB208	CBMH207	0.000	0.000	0.414	1.04	1.69	11.46	97.05	164.50		600	PVC	0.13%	59.2	223.08	0.79	1.25	0.74
CA-14	CBMH207	CBMH206	0.000	0.000	0.479	1.20	2.89	12.71	91.75	265.48		750	PVC	0.10%	58.3	352.05	0.80	1.22	0.75
CA-15	CBMH206	CBMH205	0.000	0.000	0.471	1.18	4.07	13.93	87.17	354.94		900	PVC	0.10%	58.0	572.47	0.90	1.07	0.62
CA-16	CBMH205	CBMH204	0.000	0.000	0.470	1.18	5.25	15.01	83.53	438.37		900	PVC	0.10%	58.4	572.47	0.90	1.08	0.77
CA-17	CBMH204	CBMH203	0.000	0.000	0.472	1.18	6.43	16.09	80.20	515.56		1050	PVC	0.10%	54.9	863.53	1.00	0.92	0.60
CA-24	BUILDING A3	CBMH203	0.000	0.000	2.522	6.31	6.31	10.00	104.19	657.46		1050	PVC	0.10%	42.7	863.53	1.00	0.71	0.76
CA-18	CBMH203	CBMH202	0.000	0.000	0.399	1.00	13.74	17.01	77.59	1065.85		1350	PVC	0.10%	47.3	1687.83	1.18	0.67	0.63
CA-19	CBMH202	CBMH201	0.004	0.000	0.200	0.50	14.24	17.68	75.80	1079.44		1350	PVC	0.10%	33.1	1687.83	1.18	0.47	0.64
CA-10	BUILDING A1	CBMH201	0.000	0.000	1.910	4.78	4.78	10.00	104.19	497.92		1050	PVC	0.10%	33.1	863.53	1.00	0.55	0.58
CA-09	CBMH201	MH01	0.017	0.000	0.352	0.89	19.91	18.14	74.61	1485.38		1350	PVC	0.10%	39.2	1687.83	1.18	0.55	0.88
	MH01	EXMH303	0.000	0.000	0.000	0.00	22.50	18.70	73.25	1648.42		1350	PVC	0.10%	36.0	1687.83	1.18	0.51	0.98
CA-20	CBMH403	CBMH402	0.038	0.000	0.055	0.16	0.16	10.00	104.19	16.54		300	PVC	0.35%	40.7	57.21	0.81	0.84	0.29
CA-21	CBMH402	EXMH312	0.036	0.000	0.061	0.17	0.33	10.84	99.96	33.13		300	PVC	0.35%	42.2	57.21	0.81	0.87	0.58
CA-08	CBMH401	EX MH312	0.050	0.000	0.452	1.16	1.16	10.00	104.19	120.73		525	PVC	0.20%	43.0	192.33	0.89	0.81	0.63

LRL Associates Ltd.
Storm Sewer Design Sheet

CA-25	CBMH311-B	CBMH311-A	0.013	0.000	0.305	0.77	0.77	10.00	104.19	80.26		450	PVC	0.21%	38.3	130.65	0.82	0.78	0.61
CA-26	CBMH311-A	CBMH310	0.160	0.000	0.032	0.17	0.94	10.78	100.26	94.18		450	PVC	0.20%	37.6	127.50	0.80	0.78	0.74
CA-27	CBMH310	CBMH309	0.075	0.000	0.143	0.40	1.34	11.56	96.62	129.36		525	PVC	0.16%	61.0	172.02	0.79	1.28	0.75
CA-28	CBMH309	CBMH308	0.068	0.000	0.108	0.31	1.65	12.84	91.26	150.30		600	PVC	0.13%	60.0	221.39	0.78	1.28	0.68
CA-29	CBMH308	CBMH307	0.093	0.000	0.110	0.33	1.97	14.12	86.53	170.79		600	PVC	0.13%	60.2	221.39	0.78	1.28	0.77
CA-30	CBMH307	CBMH306	0.048	0.000	0.114	0.31	2.29	15.40	82.30	188.11		600	PVC	0.13%	57.5	221.39	0.78	1.22	0.85
CA-31	CBMH306	CBMH305	0.032	0.000	0.110	0.29	2.58	16.62	78.66	202.85		675	PVC	0.11%	68.4	278.79	0.78	1.46	0.73
CA-32	CBMH305	CBMH304	0.020	0.000	0.082	0.22	2.80	18.08	74.76	208.95		675	PVC	0.11%	74.2	278.79	0.78	1.59	0.75
CA-33	CBMH304	CBMH303	0.034	0.000	0.062	0.17	2.97	19.67	70.98	210.75		675	PVC	0.11%	47.8	278.79	0.78	1.02	0.76
CA-23	CBMH303	CBMH301	0.058	0.000	0.683	1.74	4.71	20.69	68.76	323.89		750	PVC	0.10%	71.5	352.05	0.80	1.50	0.92
CA-34	CBMH302	CBMH301	0.108	0.000	0.044	0.17	0.17	10.00	104.19	17.73		250	PVC	0.46%	21.8	40.33	0.82	0.44	0.44
CA-22	CBMH301	EX MH315	0.090	0.000	0.420	1.10	5.98	22.19	65.79	393.47		900	PVC	0.11%	47.6	600.41	0.94	0.84	0.66

APPENDIX E

Civil Engineering Drawings

BUILDING A1 AND A3
4055 RUSSELL ROAD, OTTAWA

REVISION 01

KEY PLAN (N.T.S.)

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STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
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CONSTRUCTION DETAIL PLAN	C901
CONSTRUCTION DETAIL PLAN	C902

LRL
ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
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BUILDING A1 AND A3
4055 RUSSELL ROAD, OTTAWA
REV.01 - ISSUED FOR APPROVAL - DECEMBER 2025
LRL PROJECT no: 230778

LICENSED PROFESSIONAL ENGINEER
R.L. PARADIS
100049152
PROVINCE OF ONTARIO
2025/12/19

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

EROSION AND SEDIMENT CONTROL NOTES

GENERAL

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

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

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

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

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

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

CONTRACTOR'S RESPONSIBILITIES

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

THE CONTRACTOR SHALL PERIODICALLY (WEEKLY), 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 WATERCOURSE AND AVOIDS DAMAGE TO EXISTING SITE FEATURES. 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 IS REQUIRED TO IMPLEMENT SEDIMENT AND EROSION CONTROL MEASURES AT LEAST ONE WEEK BEFORE THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. THESE MEASURES SHOULD BE THOROUGHLY INSTALLED TO EFFECTIVELY MANAGE SOIL EROSION AND SEDIMENT RUNOFF. FOLLOWING INSTALLATION, THE CONTRACTOR MUST CONDUCT INSPECTIONS OF THESE CONTROL MEASURES ON A WEEKLY BASIS TO ENSURE THEIR ONGOING EFFECTIVENESS AND FUNCTIONALITY.

IN ADDITION TO THE REGULAR WEEKLY INSPECTIONS, THE CONTRACTOR MUST ALSO CARRY OUT ADDITIONAL INSPECTIONS IN THE AFTERMATH OF ANY MAJOR RAINFALL EVENTS. THIS WILL HELP ASSESS THE PERFORMANCE OF THE EROSION CONTROL MEASURES UNDER INCREASED WATER FLOW CONDITIONS. ANY DEFICIENCIES OR DAMAGES IDENTIFIED DURING THESE INSPECTIONS MUST BE PROMPTLY REPAIRED TO MAINTAIN COMPLIANCE AND ENSURE THE INTEGRITY OF THE CONSTRUCTION SITE.

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 ENVIRONMENT.
   - 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 PROVISION SHALL BE MADE OR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN O THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSS 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 30MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 30MM LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
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.

ROADWORK SPECIFICATIONS

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 PILLED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
17. THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
18. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.
19. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).
20. CONCRETE RAMP C/W TACTILE WALKING SURFACE INDICATORS COMPONENT AS PER OPSD 310.039. TACTILE WALKING SURFACE INDICATORS TO BE INSTALLED AT ALL RAMPS. MATERIAL TO BE POLYMER COMPOSITE, COLOR GREY.

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 S8. THE SEALS SHOULD BE AT LEAST 1.5M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPATIBLE BROWN SILTY CLAY PLACED IN MAXIMUM 225MM LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES 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.

SANITARY

10. 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).
11. 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.
12. EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
13. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
14. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
15. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.
16. 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING SSP-1.

STORM

17. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2, OR LATEST AMENDMENT. ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1, OR LATEST AMENDMENT. PIPE SHALL BE JOINED WITH STD. RUBBER GASKETS AS PER CSA A257.3, OR LATEST AMENDMENT.
18. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
19. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
20. CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
21. CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
22. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
23. ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
24. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED , THE CONTRACTOR IS REQUIRED TO PROVIDE AND SHALL BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
25. ALL ROAD AND PARKING LOT CATCH BASINS TO BE INSTALLED WITH ORTHOGONALLY PLACED SUBDRAINS IN ACCORDANCE WITH DETAIL. PERFORATED SUBDRAIN FOR ROAD AND PARKING LOT CATCH BASIN SHALL BE INSTALLED PER CITY STD R1 UNLESS OTHERWISE NOTED.
26. PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE APPLICABLE.
27. RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.
28. ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
29. ALL STORM MANHOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

WATERMAIN

30. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
31. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
32. ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
33. 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.
34. ALL PVC WATERMAINS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
35. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
36. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
37. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
38. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
39. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
40. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25,2 AND W25, RESPECTIVELY.
41. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
42. 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.
43. ALL BURIED WATER INFRASTRUCTURE, INCLUDING WATERMAINS, PRIVATE FIRE PROTECTION LINES, AND SERVICE CONNECTIONS, SHALL HAVE A MINIMUM COVER OF 2.4 M. WHERE MINIMUM COVER CANNOT BE ACHIEVED, THERMAL INSULATION SHALL BE PROVIDED IN ACCORDANCE WITH STD DWG W22.
44. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
45. 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.
46. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
47. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
48. 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.
49. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

DEWATERING NOTES

1. PROVIDE ALL “EASR” DOCUMENT TO LRL ENV. STAFF FOR REVIEW BEFORE REGISTERING ONLINE WITH THE MECP.
2. ADVISE MECP AND LRL STAFF BEFORE EXCAVATION STARTS.
3. RECORD DAILY WATER PUMPING RATES AND DATA AND PROVIDE TO LRL.
4. RECORD DAILY WEATHER CONDITIONS DURING PUMPING AND PROVIDE TO LRL.
5. SAMPLE 2-3 TIMES A WEEK WATER BEING PUMPED TO ENSURE THEY FULFILL QUALITY RELEASE RATES AS PER LOCAL MUNICIPAL GUIDELINES. SEND WATER RESULTS TO LRL FOR REVIEW.
6. CLOSE/TERMINATE “EASR” ON THE MECP WEBSITE 30 DAYS OR LESS FROM THE END OF PUMPING. ADVISE LRL WHEN THIS HAS BEEN DONE.

CLOSE-OUT REQUIREMENTS

1. WRITTEN CERTIFICATION AND AS-BUILT DRAWINGS CONFIRMING THAT THE STORM WATER MANAGEMENT MEASURES HAVE BEEN IMPLEMENTED AS PER APPROVED DESIGN.
2. STREET CLEANING - MAINTAIN ALL STREETS WITHIN THE AREA IN ORDER TO ENSURE THEY ARE CLEAR OF MUD, DUST & OTHER MATERIAL RESULTING FROM VEHICLES INVOLVED IN DEVELOPMENTS.
3. WRITTEN CERTIFICATION THAT THE PLUMBING AND LATERAL SERVICES HAVE RECEIVED AND PASSED A DYE TEST INSPECTION.
4. SUBMIT WRITTEN CERTIFICATION THAT ALL SANITARY SEWERS, MANHOLES, EXCEPT PRIVATE BUILDING SANITARY SEWER CONNECTIONS, HAVE PASSED LEAKAGE TESTING. THE VERIFICATION WILL INCLUDED CERTIFIED TEST RESULTS FOR ALL SECTIONS OF SANITARY SEWERS CONSTRUCTED.
5. VIDEO EXAMINATION OF STORM AND SANITARY SEWERS 200MM OR LARGER IN DIAMETER SHALL BE REQUIRED.
6. MAINTAIN AND POST SIGNS DESIGNATING FIRE LANES AND PARKING FOR PHYSICALLY DISABLED IN CONFORMITY WITH CITY BY-LAWS AND KEPT FREE AND CLEAR OF VEHICLES AND THAT PARKING SPACES FOR THE DISABLED ARE NOT ILLEGALLY OCCUPIED.
7. LANDSCAPING - MAINTENANCE OF PLANT MATERIAL SHALL BEGIN IMMEDIATELY AFTER INSTALLATION - WATERING, WEEDING & RODENT PEST AND DISEASE CONTROL IN ACCORDANCE WITH GENERALLY ACCEPTED HORTICULTURAL PRACTICES.
8. SNOW STORAGE SHALL BE SHOWN ON THE APPROVED SITE PLAN OR APPROVED BY THE GM, PLANNING, REAL ESTATE & ECONOMIC DEVELOPMENT.
9. EXTERIOR LIGHTING BE INSTALLED ONLY IN THE LOCATIONS AND IN ACCORDANCE WITH SPECIFICATIONS SHOWN ON THE APPROVED PLANS.
10. REPLACE ANY DAMAGED OR DESTROYED TREES DURING THE DEVELOPMENT.
11. SUBMIT A CERTIFIED SURVEYOR'S REAL PROPERTY REPORT, INCLUDING FOUNDATION ELEVATIONS, UPON COMPLETION OF THE FOUNDATION
12. SUPPLY ONE SET OF MYLAR OR PLASTIC FILM AS-CONSTRUCTED ROAD, GRADING AND SERVICE DRAWINGS INCLUDING THE LOCATION OF ALL WORKS. PROVIDE THE AS-BUILT DRAWINGS AND THE ATTRIBUTE DATA FOR THE WORKS.
13. BARRIER CURBS - PARKING AREAS AND ENTRANCES HAVE BARRIER CURBS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DRAWING.
14. REINSTATEMENT OF CITY PROPERTY INCLUDING BUT NOT LIMITED TO SIDEWALKS, CURBS AND BOULEVARDS, WHICH MIGHT HAVE BEEN DAMAGED DURING THE DEVELOPMENT.
15. EXTEND INTERNAL WALKWAYS BEYOND THE LIMITS OF THE SUBJECT LANDS TO CONNECT TO EXISTING PUBLIC SIDEWALKS.
16. CERTIFICATION LETTER THAT CERTIFIES ACOUSTICAL COMPLIANCE WITH ALL REQUIREMENTS OF THE APPLICABLE CONDITIONS IN THE AGREEMENT.
17. PROVIDE CONFIRMATION BY THE GEOTECHNICAL ENGINEER THAT THE OWNER COMPLIED WITH ALL RECOMMENDATIONS AND PROVISIONS OF THE REPORT, PRIOR TO CONSTRUCTION OF THE FOUNDATION AND AT THE COMPLETION OF THE WORKS.
18. OBTAIN A VIDEO INSPECTION OF THE CITY SEWER SYSTEM TO DETERMINE IF THE CITY SEWER SYSTEM SUSTAINED ANY DAMAGES AS A RESULT OF CONSTRUCTION.
19. INSTALL AND MAINTAIN IN GOOD WORKING ORDER THE REQUIRED IN-GROUND STROMWATER INLET CONTROL DEVICES AS RECOMMENDED IN THE APPROVED STORMWATER MANAGEMENT REPORT.
20. STORMWATER WORKS CERTIFICATION - PROVIDE CERTIFICATES OF COMPLIANCE CONFIRMING THAT ALL RECOMMENDATIONS AND PROVISIONS HAVE BEEN IMPLEMENTED IN ACCORDANCE WITH THE APPROVED PLANS.
21. CERTIFICATE OF CONFORMANCE AND AS-BUILT DRAWINGS CERTIFYING THAT ALL REQUIRED INLET CONTROL DEVICES HAVE BEEN PROPERLY INSTALLED AND THAT THE STORM SEWER SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED DRAWINGS.
22. PROVIDE CERTIFICATION THAT THE SITE LIGHTING HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED DESIGN PLAN.

GENERAL NOTES:

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

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

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

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

SCALE : #####

NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
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CLIENT: AVENUE 31

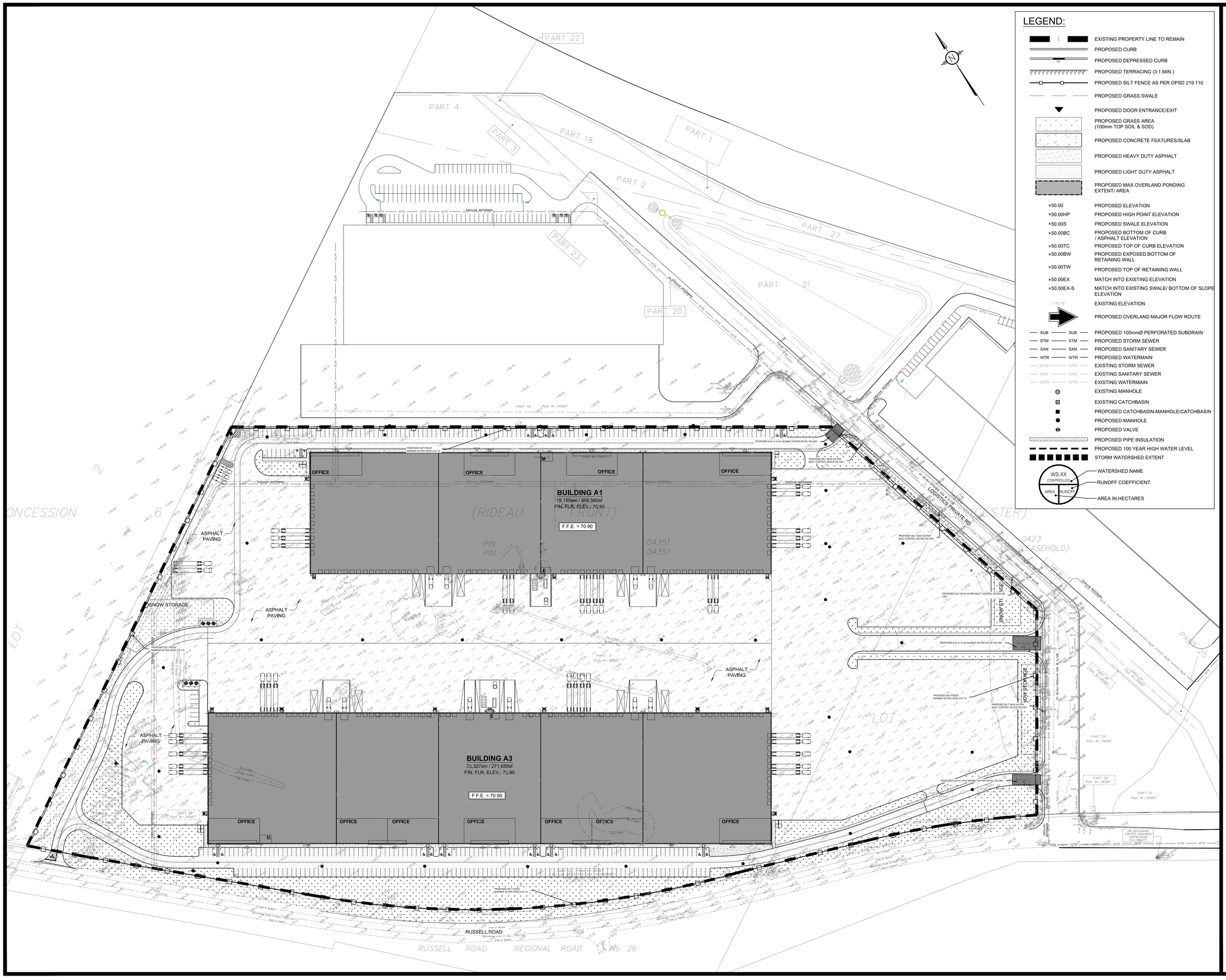
DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT: BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

DRAWING TITLE: GENERAL NOTES

PROJECT NO. 230778

C001



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED GRASS SWALE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED MAX OVERLAND PONDING EXTENT/ AREA
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00S PROPOSED SWALE ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00BW PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- ×50.00TW PROPOSED TOP OF RETAINING WALL
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×50.00EX-S MATCH INTO EXISTING SWALE/ BOTTOM OF SLOPE ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM PROPOSED STORM SEWER
- SAN PROPOSED SANITARY SEWER
- WTR PROPOSED WATERMAIN
- STM EXISTING STORM SEWER
- SAN EXISTING SANITARY SEWER
- WTR EXISTING WATERMAIN
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED VALVE
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED — WATERSHED NAME
- AREA — RUNOFF — RUNOFF COEFFICIENT
- AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

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20m 10 0 20 40m

SCALE: 1:1000

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No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER
K. L. PARADIS
100045162
2025/12/19
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
AVENUE 31

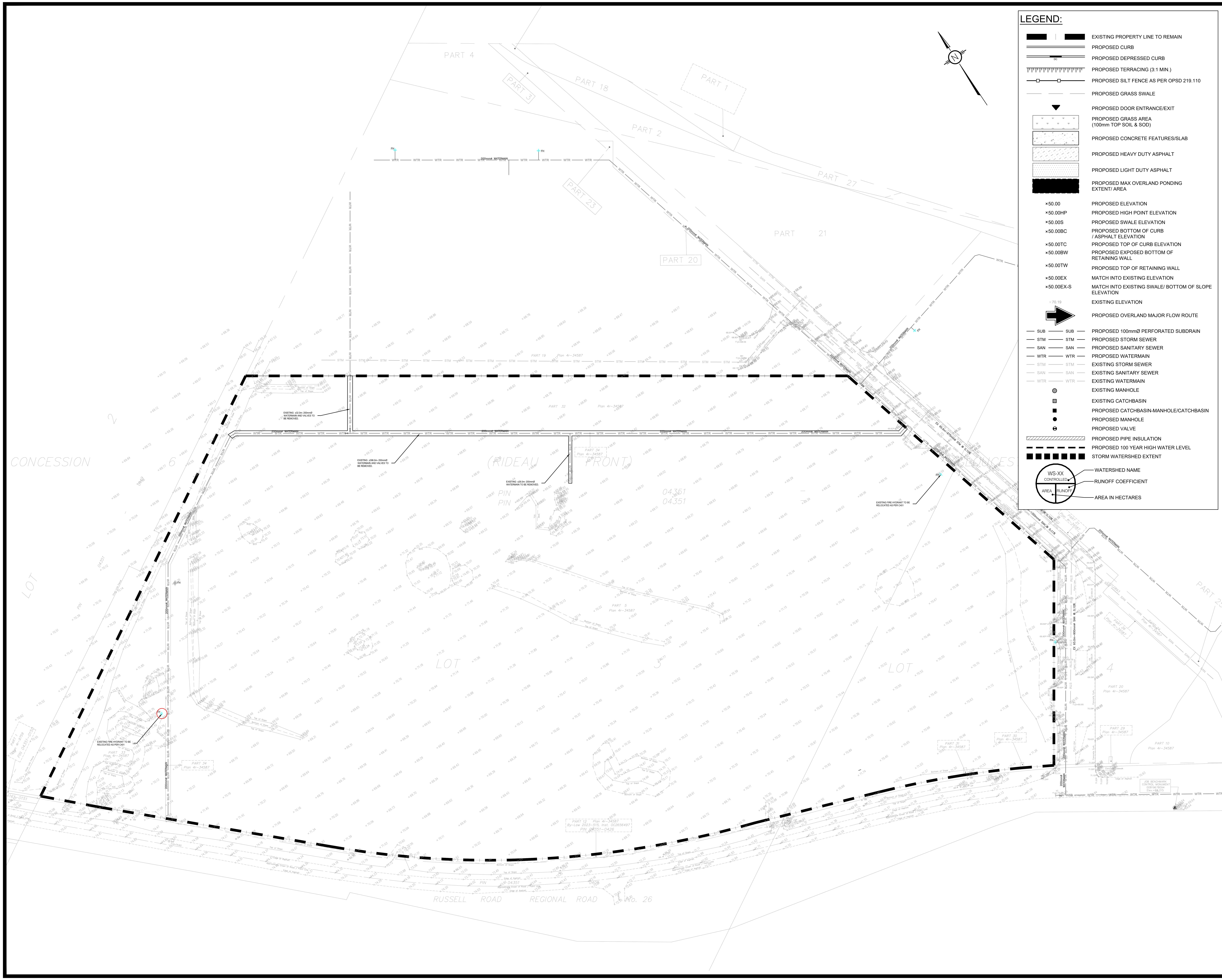
DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT
BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
230778

C101



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01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER K. L. PARADIS 100045152 2025/12/19 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT

AVENUE 31

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT

BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

DRAWING TITLE

DEMOLITION PLAN

PROJECT NO.

230778 C102

TOPOGRAPHIC SURVEY PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. JOB NO. 24257-23 4055 RUSSELL RD T D1, DATED JANUARY 08, 2024

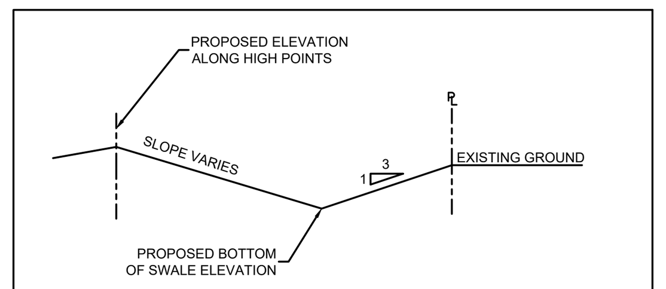
ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum and are referred to Control Monument 0011962U3456 having an elevation of 73.746 metres and Control Monument 00819678094 having an elevation of 69.215 metres.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

- COORDINATE SYSTEM IS MTM ZONE 9 NAD83 (ORIGINAL)

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.



SWALE - TYPICAL SECTION

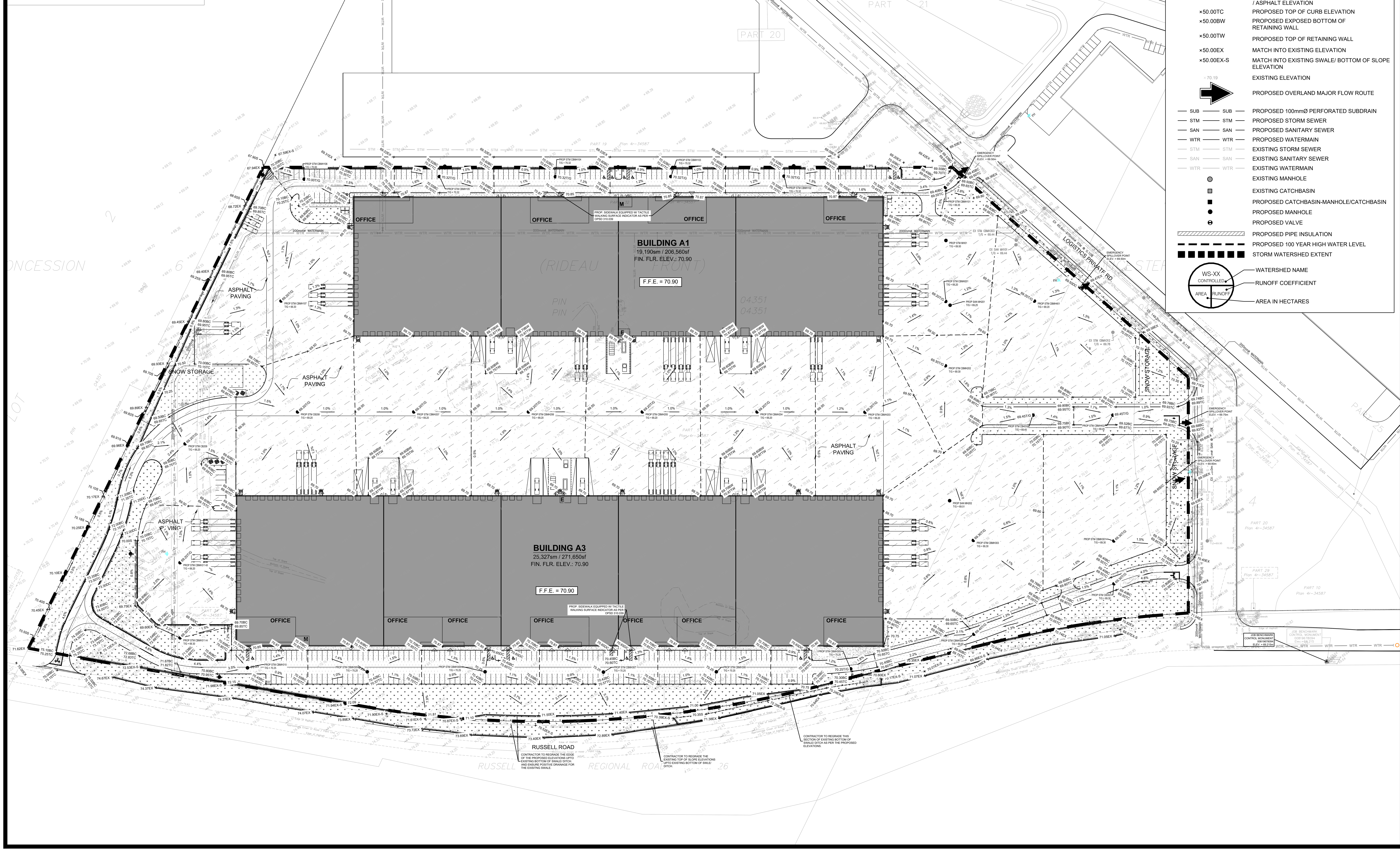
(N.T.S.)

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) AUTOMOBILE PARKING	THICKNESS (mm) TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3 A/C (PG 58-34)	50	40
BINDER	HL.8 A/C (PG 58-34)	--	50
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	300	350

NOTE:
IN PREPARATION FOR PAVEMENT CONSTRUCTION AT THIS SITE, ANY SURFICIAL OR NEAR SURFACE/SUBGRADE LEVEL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIALS SHOULD BE REMOVED FROM THE PROPOSED PAVED AREAS. THE EXPOSED SUBGRADE SHOULD BE INSPECTED AND APPROVED BY GEOTECHNICAL PERSONNEL AND ANY SOFT AREAS EVIDENT SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE EARTH BORROW APPROVED BY THE GEOTECHNICAL ENGINEER. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE SITE DRAINAGE STRUCTURES. FOLLOWING APPROVAL OF THE PREPARATION OF THE SUBGRADE, THE PAVEMENT GRANULARS MAY BE PLACED.

PAVEMENT STRUCTURE AS PER GEOTECHNICAL INVESTIGATION REPORT PG4854-3 PREPARED BY PATERSON GROUP DATED NOVEMBER 26, 2021.



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PROJECT
BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

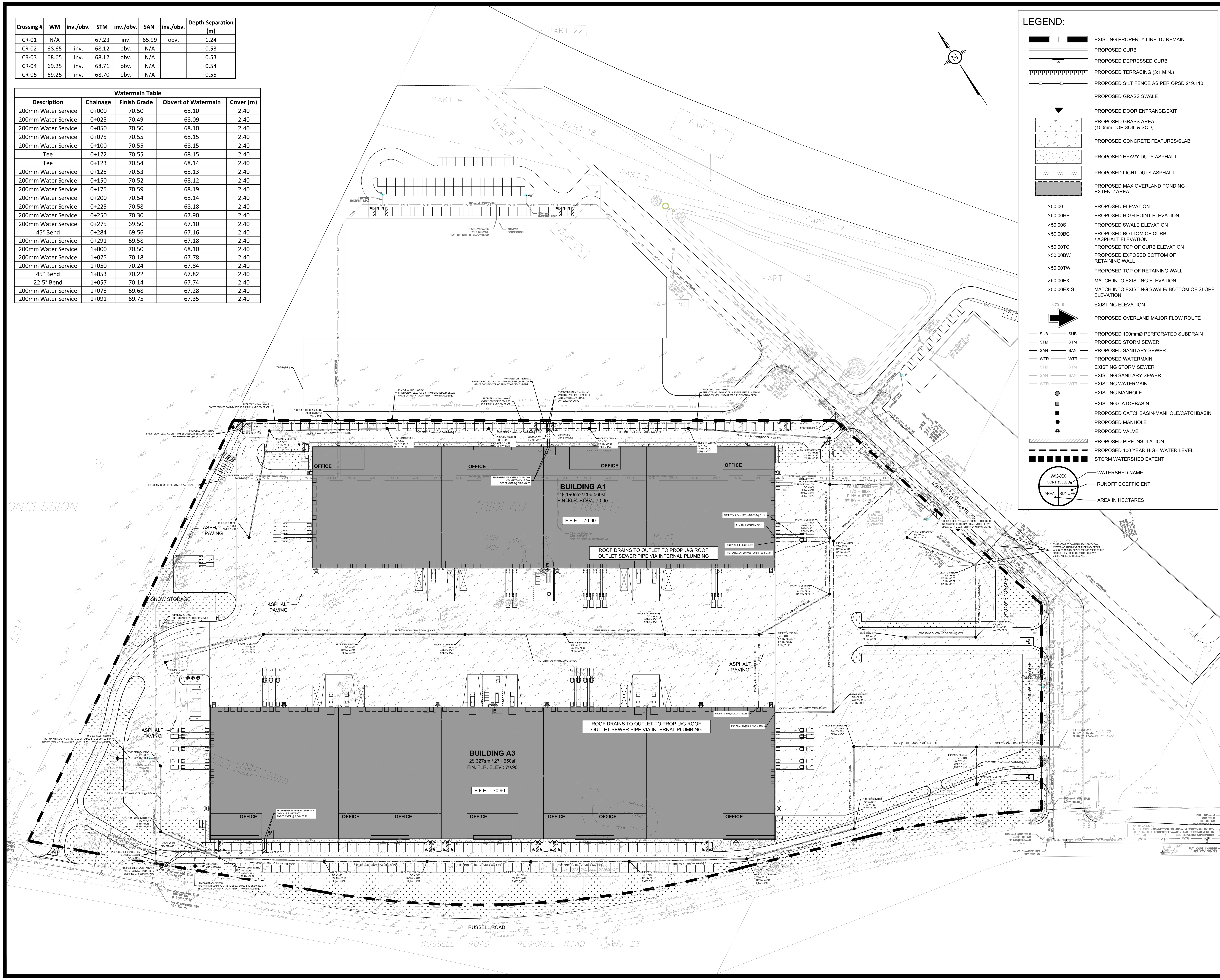
DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
230778 C301

Crossing #	WM	inv./obv.	STM	inv./obv.	SAN	inv./obv.	Depth Separation (m)
CR-01	N/A		67.23	inv.	65.99	obv.	1.24
CR-02	68.65	inv.	68.12	obv.	N/A		0.53
CR-03	68.65	inv.	68.12	obv.	N/A		0.53
CR-04	69.25	inv.	68.71	obv.	N/A		0.54
CR-05	69.25	inv.	68.70	obv.	N/A		0.55

Watermain Table

Description	Chainage	Finish Grade	Obvert of Watermain	Cover (m)
200mm Water Service	0+000	70.50	68.10	2.40
200mm Water Service	0+025	70.49	68.09	2.40
200mm Water Service	0+050	70.50	68.10	2.40
200mm Water Service	0+075	70.55	68.15	2.40
200mm Water Service	0+100	70.55	68.15	2.40
Tee	0+122	70.55	68.15	2.40
Tee	0+123	70.54	68.14	2.40
200mm Water Service	0+125	70.53	68.13	2.40
200mm Water Service	0+150	70.52	68.12	2.40
200mm Water Service	0+175	70.59	68.19	2.40
200mm Water Service	0+200	70.54	68.14	2.40
200mm Water Service	0+225	70.58	68.18	2.40
200mm Water Service	0+250	70.30	67.90	2.40
200mm Water Service	0+275	69.50	67.10	2.40
45° Bend	0+284	69.56	67.16	2.40
200mm Water Service	0+291	69.58	67.18	2.40
200mm Water Service	1+000	70.50	68.10	2.40
200mm Water Service	1+025	70.18	67.78	2.40
200mm Water Service	1+050	70.24	67.84	2.40
45° Bend	1+053	70.22	67.82	2.40
22.5° Bend	1+057	70.14	67.74	2.40
200mm Water Service	1+075	69.68	67.28	2.40
200mm Water Service	1+091	69.75	67.35	2.40



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- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×50.00EX-S MATCH INTO EXISTING SWALE/ BOTTOM OF SLOPE ELEVATION
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- PROPOSED OVERLAND MAJOR FLOW ROUTE
- SUB — SUB PROPOSED 100mmØ PERFORATED SUBDRAIN
- STM — STM PROPOSED STORM SEWER
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- WTR — WTR PROPOSED WATERMAIN
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- EXISTING CATCHBASIN
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- PROPOSED MANHOLE
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- PROPOSED PIPE INSULATION
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20m 10 0 20 40m

SCALE: 1:1000

NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER K.T. PARASIS 100505165 2025/12/19 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

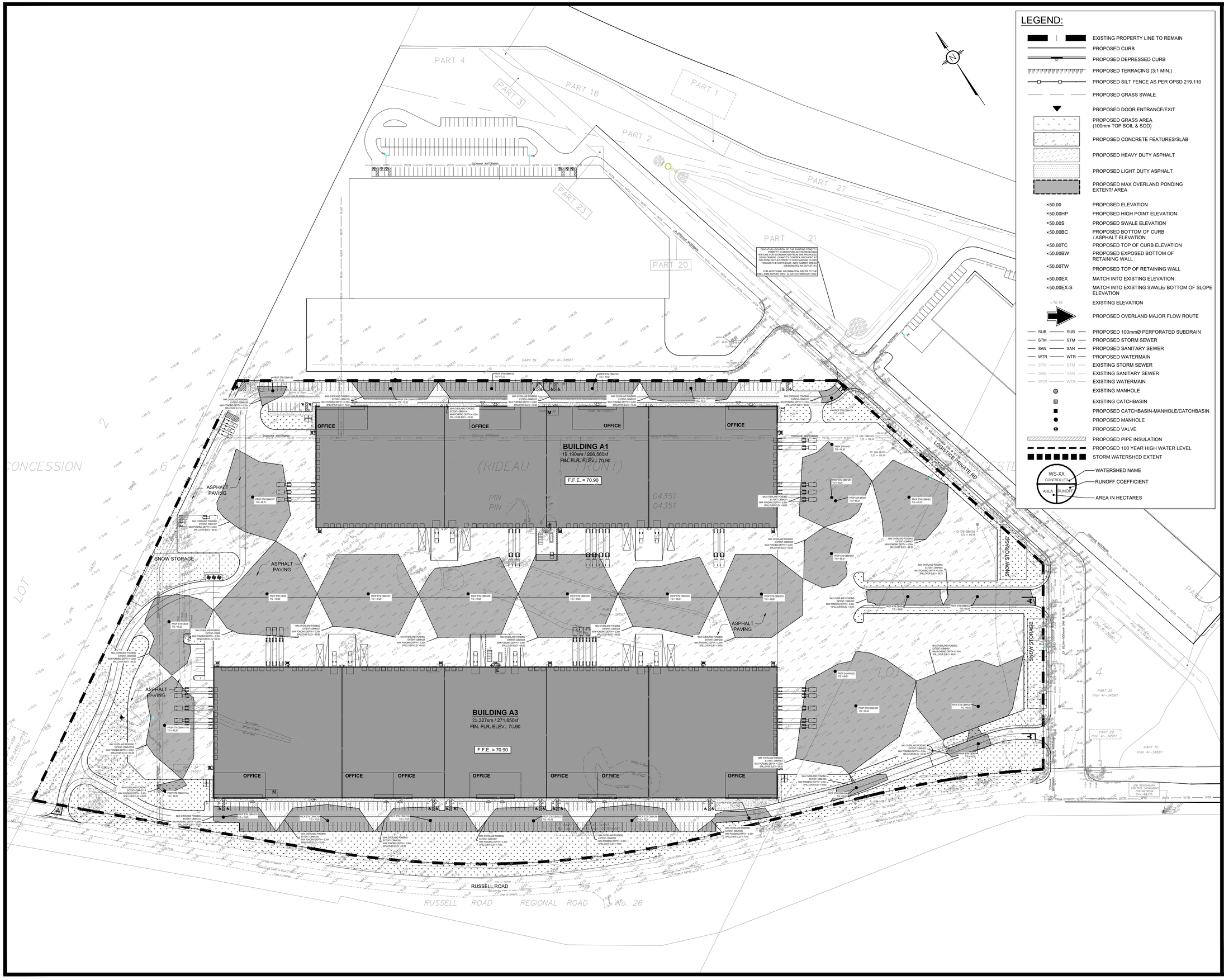
CLIENT
AVENUE 31

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT
BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

DRAWING TITLE
SERVICING PLAN

PROJECT NO.
230778 C401



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20m 10 0 20 40m

SCALE: 1:1000

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No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER — K.L. PARADIS — 100145152 — 2025-12-19 — PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT

AVENUE 31

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT

BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

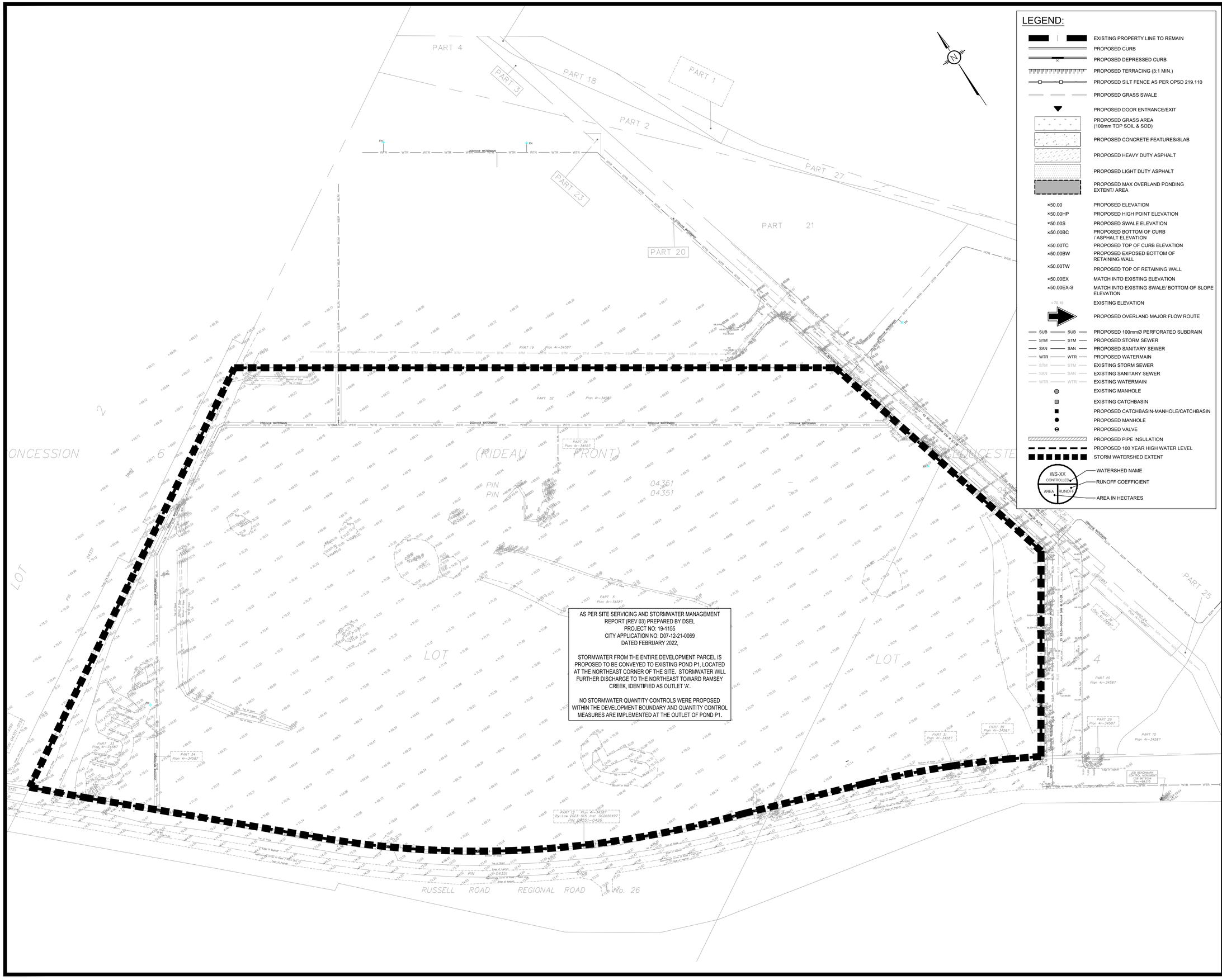
DRAWING TITLE

STORMWATER MANAGEMENT PLAN

PROJECT NO.

230778

C601



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20m 10 0 20 40m
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No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER
K. L. PARADIS
100045162
2025/12/19
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT
AVENUE 31

DESIGNED BY:	DRAWN BY:	APPROVED BY:
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PROJECT
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4055 RUSSELL ROAD
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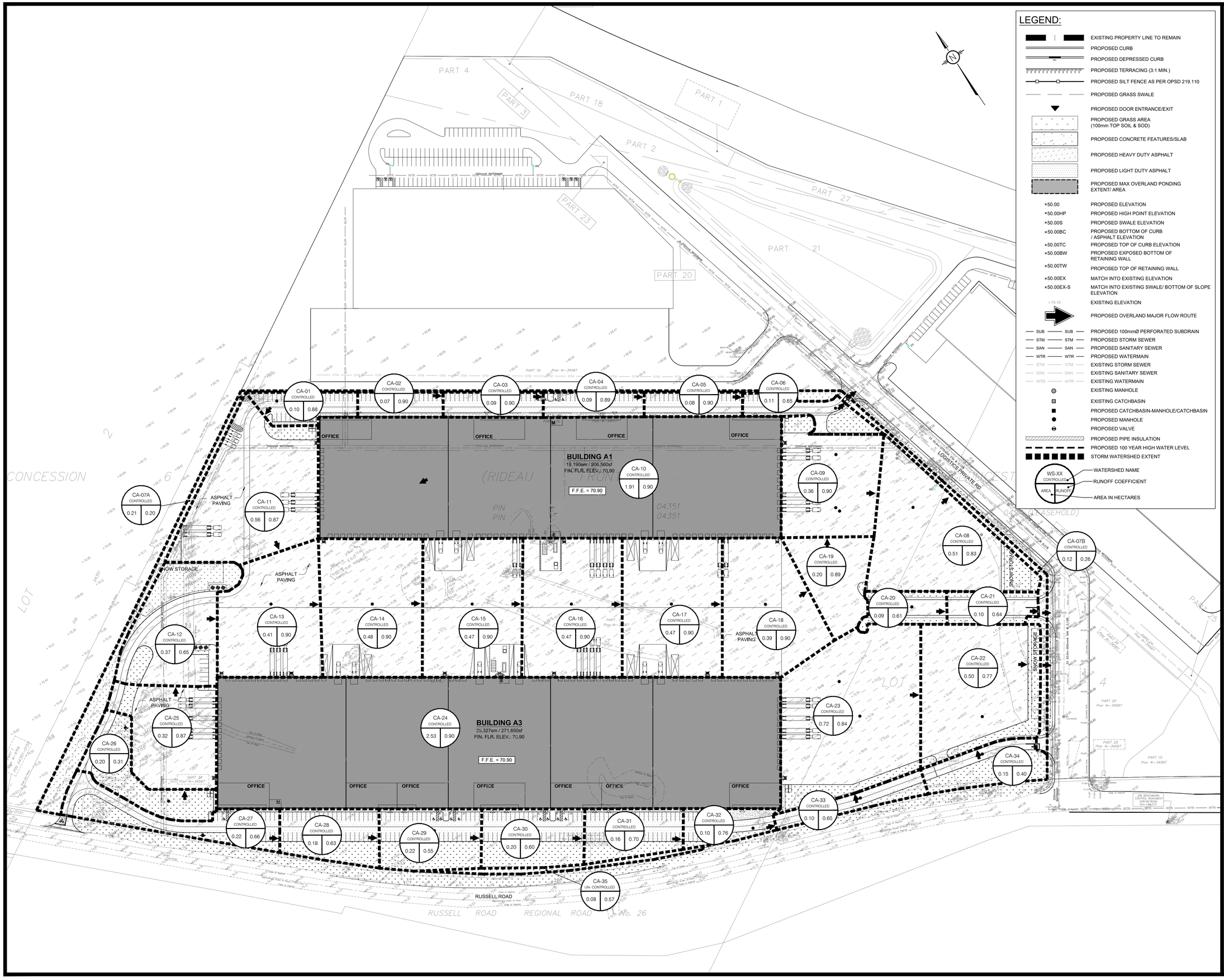
DRAWING TITLE
PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
230778 C701



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GENERAL NOTES:

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CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

20m 10 0 20 40m

SCALE: 1:1000

NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER K.L. PARAMIS 100045152 2025/12/19 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT

AVENUE 31

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT

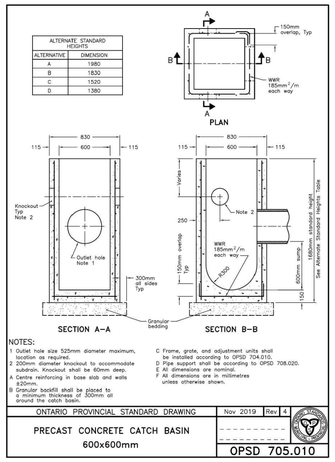
BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

DRAWING TITLE

POST-DEVELOPMENT WATERSHED PLAN

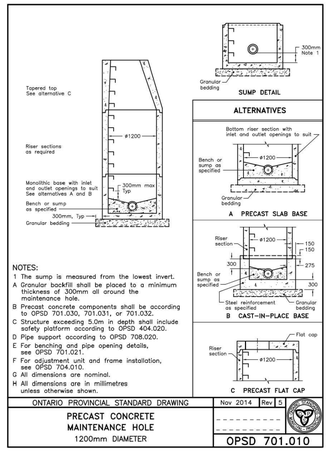
PROJECT NO.

230778 C702



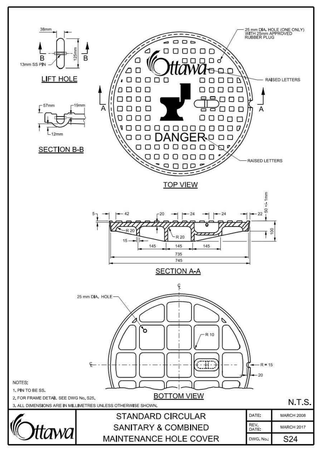
NOTES:
1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
A Centre reinforcing in base slab and walls @30mm.
B Granular backfill shall be placed to a minimum distance of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE CATCH BASIN 600x600mm		OPSD 705.010

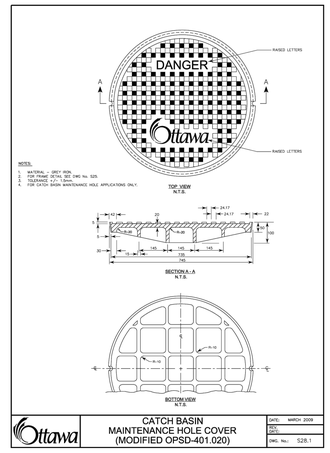


NOTES:
1 The sump is measured from the lowest invert.
A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.
B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
D Pipe support according to OPSD 708.020.
E For benching and pipe opening details, see OPSD 701.021.
F For adjustment unit and frame installation, see OPSD 704.010.
G All dimensions are nominal.
H All dimensions are in millimetres unless otherwise shown.

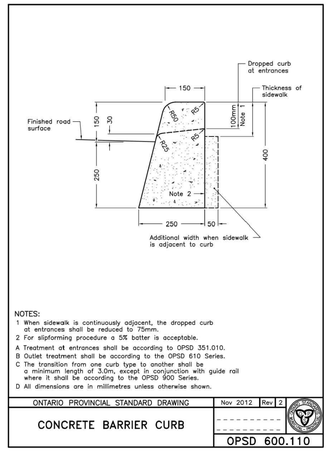
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010



STANDARD CIRCULAR SANITARY & COMBINED MAINTENANCE HOLE COVER	DATE:	MARCH 2008
	REV. DATE:	MARCH 2017
	DWG. No.:	S24

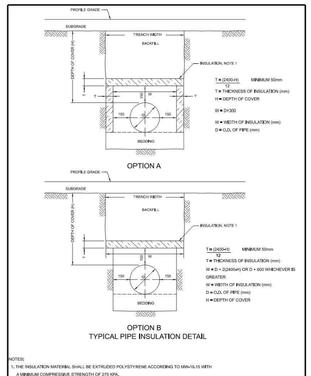


CATCH BASIN MAINTENANCE HOLE COVER (MODIFIED OPSD-401.020)	DATE:	MARCH 2009
	REV. DATE:	
	DWG. No.:	S28.1



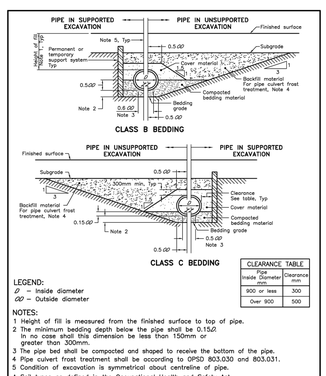
NOTES:
1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
2 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		OPSD 600.110



NOTES:
1. THE INSULATION MATERIAL SHALL BE EXTRUDED POLYSTYRENE ACCORDING TO MMAH/S WITH:
A MINIMUM COMPRESSIVE STRENGTH OF 275 KPA,
2. MINIMUM INSULATION THICKNESS SHALL BE 50MM,
3. JOINTS SHALL BE STAGGERED FOR MULTIPLE INSULATION SHEETS.
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

INSULATION FOR SHALLOW SEWERS	DATE:	MARCH 2023
	SUPV. DATE:	
	DWG. No.:	S35

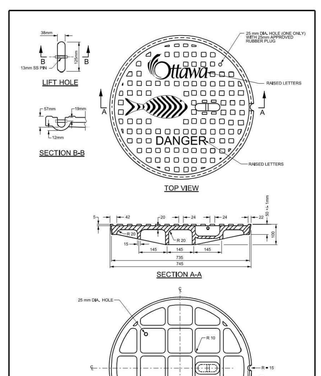


CLEARANCE TABLE	
Pipe Diameter mm	Clearance mm
Inside Diameter	
900 or less	300
Over 900	500

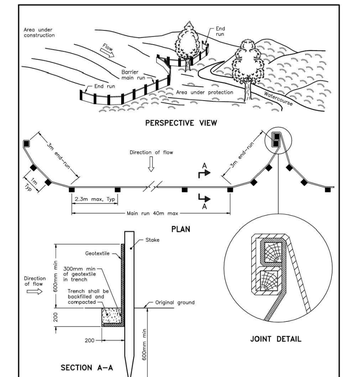
LEGEND:
ID = Inside diameter
OD = Outside diameter

NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The minimum bedding depth below the pipe shall be 0.15∅ in no case shall this dimension be less than 150mm or greater than 300mm.
3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
5 Condition of excavation is symmetrical about centreline of pipe.
A Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
B All dimensions are in metres unless otherwise shown.

RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 4 SOIL – EARTH EXCAVATION	ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 3
			OPSD 802.032

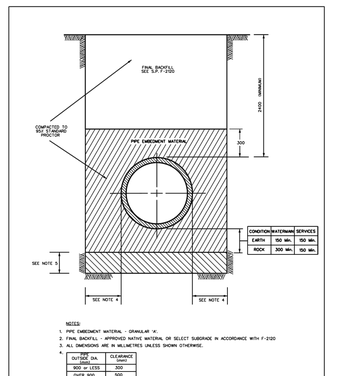


STANDARD CIRCULAR STORM MAINTENANCE HOLE COVER	DATE:	MARCH 2019
	REV. DATE:	MARCH 2017
	DWG. No.:	S24.1



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3
LIGHT–DUTY SILT FENCE BARRIER		OPSD 219.110



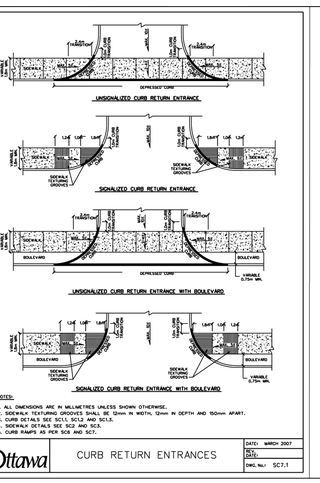
CONDITION	WATERMAIN	SERVICES
EARTH	150 MIN.	150 MIN.
ROCK	300 MIN.	150 MIN.

NOTES:
1. PIPE EMBEDMENT MATERIAL – GRANULAR 'A'.
2. FINAL BACKFILL – APPROVED NATIVE MATERIAL OR SELECT SUBGRADE IN ACCORDANCE WITH F-220
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
4.

OUTSIDE DIA.	CLEARANCE (each)
900 or LESS	300
OVER 900	500

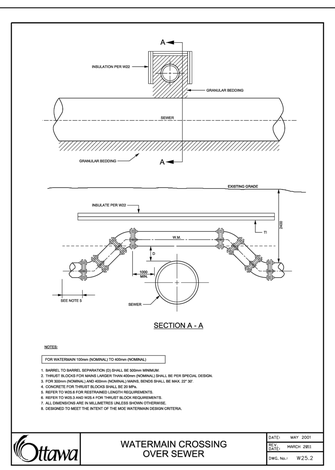
5. WHEN APPROVED BY THE CONTRACT ADMINISTRATOR POOR SOILS SHALL BE EXCAVATED TO CREATE A FOUNDATION THAT SHALL BE FILLED TO THE BEDDING WITH GRANULAR 'B'.

STANDARD TRENCH DETAIL	DATE:	MAY 2001
	REV. DATE:	MARCH 2006
	DWG. No.:	W17



NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
2. SIDEWALK TEXTURING GROOVES SHALL BE 12mm IN WIDTH, 12mm IN DEPTH AND 150mm APART.
3. CURB DETAILS SEE SC1, SC1.2 AND SC1.3.
4. SIDEWALK DETAILS SEE SC2 AND SC3.
5. CURB RAMPS AS PER SC6 AND SC7.

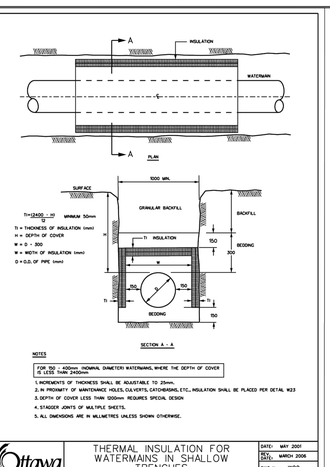
CURB RETURN ENTRANCES	DATE:	MARCH 2007
	SUPV. DATE:	
	DWG. No.:	SC7.1



NOTES:
FOR WATERMAIN 100mm (NOMINAL) TO 400mm (NOMINAL)

1. BARREL TO MARRIL DEFINITION (D) SHALL BE 50mm MINIMUM.
2. THRUST BLOCKS FOR MAINS LARGER THAN 400mm (NOMINAL) SHALL BE PER SPECIAL DESIGN.
3. FOR 500mm (NOMINAL) AND 450mm (NOMINAL) MAINS, BENDS SHALL BE MAX. 22° 30'.
4. CONCRETE FOR THRUST BLOCKS SHALL BE 20 MPa.
5. ALL BOLTS, NUTS AND WASHERS SHALL BE STAINLESS STEEL.
6. REFER TO W25.3 AND W25.4 FOR THRUST BLOCK REQUIREMENTS.
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.
8. DESIGNED TO MEET THE INTENT OF THE MOE WATERMAIN DESIGN CRITERIA.

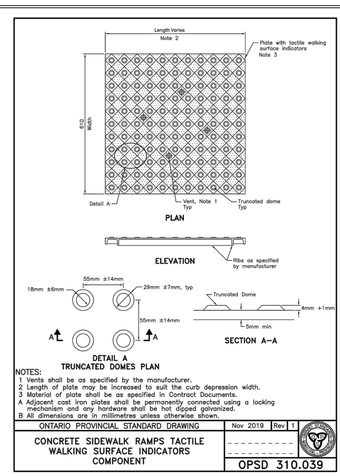
WATERMAIN CROSSING OVER SEWER	DATE:	MAY 2001
	REV. DATE:	MARCH 2011
	DWG. No.:	W25.2



NOTES
FOR ISO – 400mm (NOMINAL DIAMETER) WATERMAINS, WHERE THE DEPTH OF COVER IS LESS THAN 2400mm

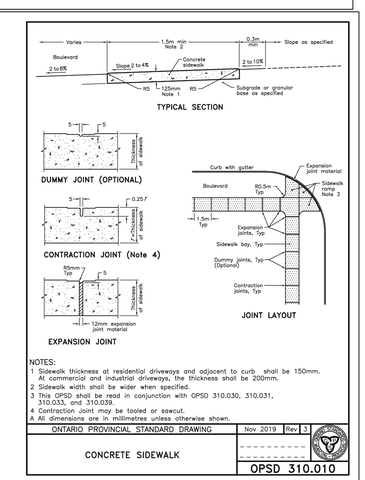
1. INCREMENTS OF THICKNESS SHALL BE ADJUSTABLE TO 25mm.
2. IN PROXIMITY OF MAINTENANCE HOLES, CULVERTS, CATCHBASINS, ETC., INSULATION SHALL BE PLACED PER DETAIL W23
3. DEPTH OF COVER LESS THAN 1200mm REQUIRES SPECIAL DESIGN
4. STAGGER JOINTS OF MULTIPLE SHEETS.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.

THERMAL INSULATION FOR WATERMAINS IN SHALLOW TRENCHES	DATE:	MAY 2001
	REV. DATE:	MARCH 2006
	DWG. No.:	W22



TRUNCATED DOMES PLAN
NOTES:
1 Vents shall be as specified by the manufacturer.
2 Length of plate may be increased to suit the curb depression width.
3 Material of plate shall be as specified in Contract Documents.
A Adjacent cast iron plates shall be permanently connected using a locking mechanism and any hardware shall be hot dipped galvanized.
B All dimensions are in millimetres unless otherwise shown.

CONCRETE SIDEWALK RAMPS TACTILE WALKING SURFACE INDICATORS COMPONENT	ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 1
			OPSD 310.039



NOTES:
1 Sidewalk thickness at residential driveways and adjacent to curb shall be 150mm. At commercial and industrial driveways, the thickness shall be 200mm.
2 Sidewalk width shall be wider when specified.
3 This OPSD shall be read in conjunction with OPSD 310.030, 310.031, 310.033, and 310.039.
4 Contraction joint may be tooled or sawcut.
A All dimensions are in millimetres unless otherwise shown.

CONCRETE SIDEWALK	ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 3
			OPSD 310.010

USE AND INTERPRETATION OF DRAWINGS

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

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

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

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

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NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER K. L. PAPANIS 100945162 2025/12/19 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

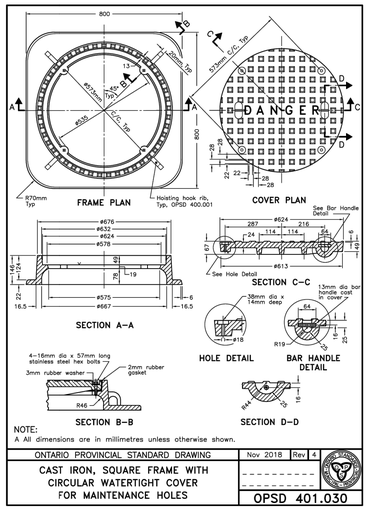
CLIENT
AVENUE 31

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT
BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

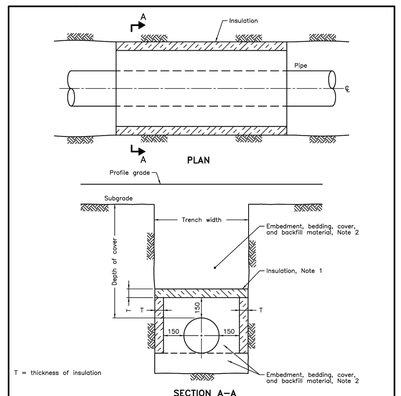
DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
230778 C901



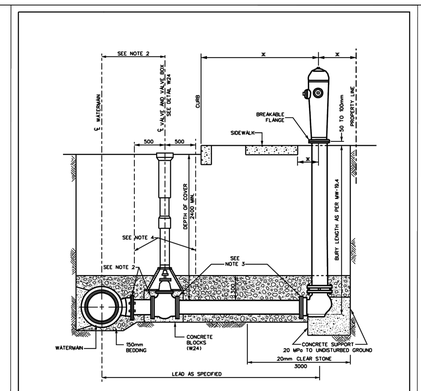
NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CAST IRON, SQUARE FRAME WITH CIRCULAR WATERTIGHT COVER FOR MAINTENANCE HOLES		OPSD 401.030



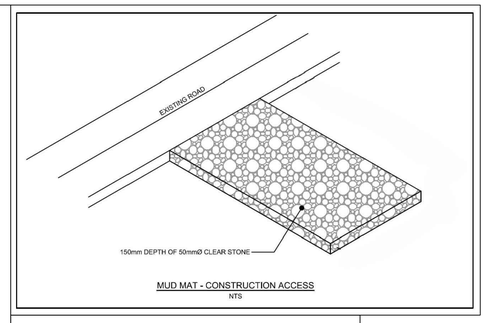
NOTES:
1 The insulation material shall be extruded polystyrene according to OPSS 1605 with a minimum compressive strength of 275 kPa.
2 Pipe embedment or bedding, cover, and backfill shall be according to:
a) Flexible OPSD 802.010, 802.013, 802.020, and 802.023.
b) Rigid — OPSD 802.030, 802.031, 802.032, 802.033, 802.050, 802.051, 802.052, and 802.053.
A Minimum insulation thickness shall be 50mm.
B Joints shall be staggered for multiple insulation sheets.
C This OPSD is to be read in conjunction with OPSD 3090.100 and 3090.101.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2020	Rev 1
INSULATION FOR SEWERS AND WATERMAINS IN SHALLOW TRENCHES		OPSD 1109.030

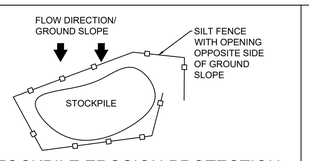


NOTES
FOR ALL WATERMAINS
1. SEE DETAIL W20 FOR HYDRANTS IN DITCH AREAS.
2. FOR WATERMAINS 400mm AND UNDER, LOCATE VALVE WITHIN 1.0m OF CENTRELINE. RETAINING/RESTRAINING DEVICES TO BE UTILIZED. FOR WATERMAINS 600mm AND OVER, BOLT VALVE WITH FLANGED END DIRECTLY TO FLANGED TEE.
3. RETAINING/RESTRAINING DEVICES TO BE UTILIZED.
4. HYDRANT BREAKABLE FLANGE ELEVATION TO BE ESTABLISHED PRIOR TO INSTALLATION. REFER TO MW-19.4 AND F-7013.
5. SEE MW-10.1 FOR BACKFILL REQUIREMENTS IN THIS AREA.
6. = SEE W18 FOR HYDRANT LOCATION REQUIREMENTS.
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.

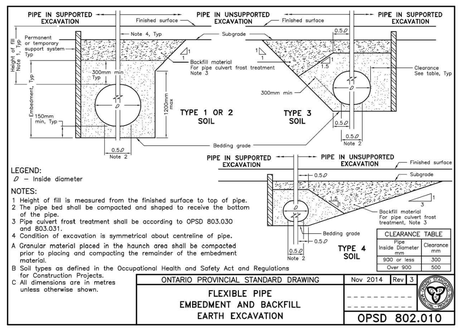
Ottawa	HYDRANT INSTALLATION	DATE: MAY 2001 REV. DATE: MARCH 2006 DWG. NO.: W19



MUD MAT - CONSTRUCTION ACCESS
NTS



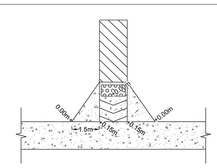
STOCKPILE EROSION PROTECTION
N.T.S.



NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

CLEARANCE TABLE	
Pipe Inside Diameter	Clearance mm
900 or less	300
Over 900	500

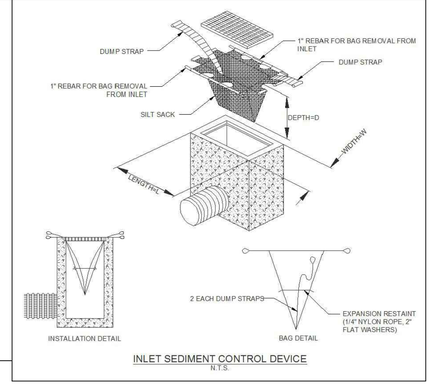
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		OPSD 802.010



THE CURB RAMP SHALL:

1. HAVE A RUNNING SLOPE OF 1:10
2. HAVE A WIDTH OF NOT LESS THAN 1.5m EXCLUSIVE OF FLARED SIDES;
3. HAVE A SURFACE INCLUDING FLARED SIDES THAT SHALL:
   A. BE SLIP-RESISTANT;
   B. HAVE A DETECTABLE WARNING SURFACE THAT IS COLOUR- AND TEXTURE-CONSTRASTED WITH THE ADJACENT SURFACES, AND
   C. HAVE A SMOOTH TRANSITION FROM THE RAMP AND ADJACENT SURFACES, AND
4. HAVE FLARED SIDES WITH A SLOPE OF NOT MORE THAN 1:10 ***WHERE PEDESTRIANS ARE LIKELY TO WALK ACROSS THEM***.

CURB RAMP DETAIL
(N.T.S.)



INLET SEDIMENT CONTROL DEVICE
N.T.S.

USE AND INTERPRETATION OF DRAWINGS

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

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

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

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

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

UNAUTHORIZED CHANGES:

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

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

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND 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 VERIFY IN FIELD FOR LOCATION AND ELEVATION OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

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

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

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
01	ISSUED FOR APPROVAL	S.V.	19 DEC 2025

LICENSED PROFESSIONAL ENGINEER
K. L. PARADIS
100048162
2025/12/19
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
AVENUE 31

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V.	S.V.	K.P.

PROJECT
BUILDING A1 AND A3
4055 RUSSELL ROAD
OTTAWA, ON

DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
230778

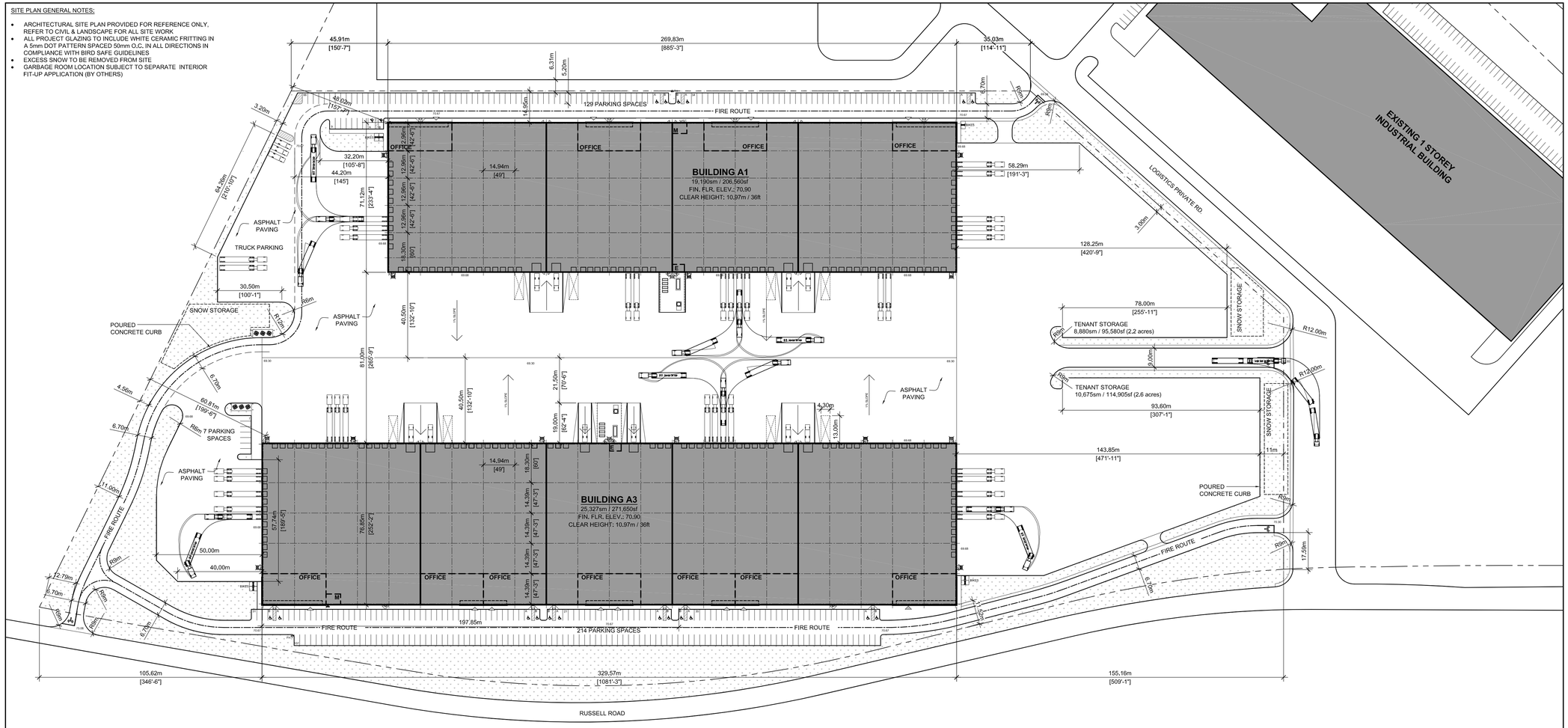
C902

APPENDIX F

Proposed Site Plan
Legal Survey

SITE PLAN GENERAL NOTES:

- ARCHITECTURAL SITE PLAN PROVIDED FOR REFERENCE ONLY, REFER TO CIVIL & LANDSCAPE FOR ALL SITE WORK
- ALL PROJECT GLAZING TO INCLUDE WHITE CERAMIC FRITTING IN A 5mm DOT PATTERN SPACED 50mm O.C. IN ALL DIRECTIONS IN COMPLIANCE WITH BIRD SAFE GUIDELINES
- EXCESS SNOW TO BE REMOVED FROM SITE
- GARBAGE ROOM LOCATION SUBJECT TO SEPARATE INTERIOR FIT-UP APPLICATION (BY OTHERS)



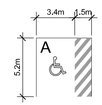
04 SITE PLAN
SPA-01 SCALE: 1:1000

ENTRY / EXIT — TENANT SUITE ENTRANCE / EXIT

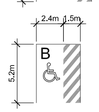
FH — FIRE HYDRANT

SC — SIAMESE CONNECTION

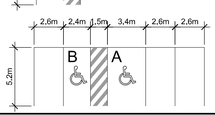
BARRIER-FREE CURB RAMP WITH TACTILE WALKING SURFACE INDICATORS



TYPE A BARRIER-FREE PARKING SPACE WITH PAINTED ACCESSIBLE AISLE



TYPE B BARRIER-FREE PARKING SPACE WITH PAINTED ACCESSIBLE AISLE



TYPE A & TYPE B BARRIER-FREE PARKING SPACES WITH TYPICAL PARKING SPACES

03 DRAWING LEGEND
SPA-01 SCALE:

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION	REQUIRED / PERMITTED	PROVIDED
ZONING: IH HEAVY INDUSTRIAL ZONE	WAREHOUSE HEAVY INDUSTRIAL LIMITED COMMERCIAL TRUCK TRANSPORT GARDEN NURSERY	WAREHOUSE (N95) HEAVY INDUSTRIAL AGRICULTURAL TRUCK TRANSPORT
MINIMUM LOT AREA	0,4HA	13,52HA / 33,41 ACRES
MINIMUM LOT WIDTH	no minimum	IRREGULAR LOT SHAPE
MINIMUM FRONT YARD	7,5m	COMPLIANT WITH ZONING
MINIMUM CORNER SIDE YARD	7,5m	COMPLIANT WITH ZONING
MINIMUM INTERIOR YARD SETBACK	15m (abutting R or I zone) 7,5m	COMPLIANT WITH ZONING
MINIMUM REAR YARD	15m (abutting R or I zone) 7,5m	COMPLIANT WITH ZONING
MAXIMUM FLOOR SPACE INDEX	2	COMPLIANT WITH ZONING
MAXIMUM BUILDING HEIGHT	22m	BUILDING A1: 12,8m BUILDING A3: 12,8m
MINIMUM LANDSCAPE BUFFER WIDTH	7,5m (abutting R or I zone) 3m	COMPLIANT WITH ZONING

ZONING MECHANISM: ZONING BY-LAW 2008-250 CONSOLIDATION		REQUIRED	PROVIDED
PARKING, TYPICAL - SECTION 101 AREA C WAREHOUSE (N95) OR HEAVY INDUSTRIAL USE (N42): 0,8 SPACES PER 100sm FOR FIRST 5,000m2 0,4 SPACES PER 100sm AFTER FIRST 5,000m2 PARKING, BARRIER FREE - SECTION 112 (BYLAW 2017-301)	BUILDING A1: 19,190sm	92 TYPICAL 2 TYPE A ACCESSIBLE 3 TYPE B ACCESSIBLE	121 TYPICAL 4 TYPE A ACCESSIBLE 4 TYPE B ACCESSIBLE
	BUILDING A3: 25,327sm	121 TYPICAL 2 TYPE A ACCESSIBLE 3 TYPE B ACCESSIBLE	209 TYPICAL 6 TYPE A ACCESSIBLE 6 TYPE B ACCESSIBLE
BICYCLE PARKING - SECTION 111 WAREHOUSE / TRUCK TRANSPORT 1 SPACE PER 2000sm	BUILDING A1: 19,190sm	10 TYPICAL	12 TYPICAL LOCATION TBD
	BUILDING A3: 25,327sm	13 TYPICAL	16 TYPICAL LOCATION TBD
LOADING SPACE - SECTION 113 WAREHOUSE / HEAVY INDUSTRIAL	BUILDING A1: 19,190sm	2 SPACES	4 OVERSIZED 13.4m X 4.3m
	BUILDING A3: 25,327sm	3 SPACES	4 OVERSIZED 13.4m X 4.3m

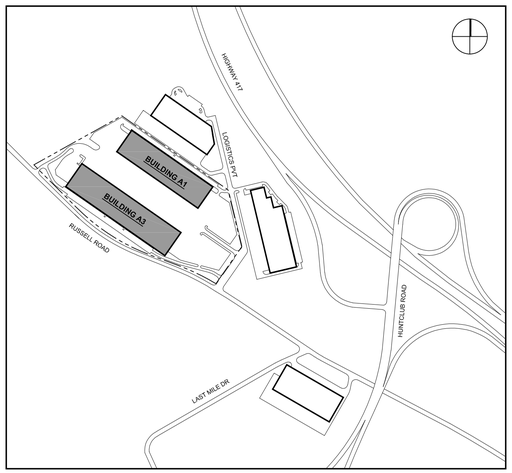
BUILDING CLASSIFICATION:

3.2.2.76 GROUP F, DIVISION 2, ANY HEIGHT, ANY AREA, SPRINKLERED
- NON-COMBUSTIBLE CONSTRUCTION REQUIRED
- FLOOR ASSEMBLIES SHALL HAVE A MIN 2hr FIRE RESISTANCE RATING
- MEZZANINES SHALL HAVE A MIN 1hr FIRE RESISTANCE RATING
- LOAD BEARING WALLS AND COLUMNS SHALL HAVE A FIRE RESISTANCE RATING NOT LESS THAN SUPPORTED ASSEMBLIES

3.2.2.79 SPATIAL SEPARATION - TABLE 3.2.3.1.E
- 15m MINIMUM SPATIAL SEPARATION FOR 100% AREA OF UNPROTECTED OPENINGS (EBF > 200m2)
- 9m SPATIAL SEPARATION FOR 100% AREA OF UNPROTECTED OPENINGS WHEN FACING A STREET

3.4.2.5 LOCATION OF EXITS
- 45m MAXIMUM TRAVEL DISTANCE IF FLOOR AREA IS SPRINKLERED OR
- PERIMETER EXITS SPACED MAX 60m ALONG PERIMETER OF FLOOR AREA

02 SITE DATA AND ZONING INFORMATION
SPA-01 SCALE:



01 LOCATION PLAN
SPA-01 SCALE: NTS

MCROBIE
ARCHITECTS + INTERIOR DESIGNERS

Avenue31

North

Revisions

No.	By	Description	Date
04	ERM	REVISED FOR COORDINATION	2025-11-18
05	ERM	REVISED FOR COORDINATION	2025-11-19
06	ERM	REVISED FOR COORDINATION	2025-11-26
07	ERM	REVISED FOR COORDINATION	2025-11-28
08	ERM	REVISED FOR COORDINATION	2025-12-02
09	ERM	REVISED FOR COORDINATION	2025-12-09
10	ERM	REVISED FOR COORDINATION	2025-12-10

Project

NATIONAL CAPITAL BUSINESS PARK BUILDINGS A1 & A3

4055 RUSSELL RD, OTTAWA

Drawing

LOCATION PLAN, ZONING REVIEW & SITE PLAN

Scale: AS NOTED

Stamp

Drawn: ERM

Checked: ERM

Project No.: 25-199

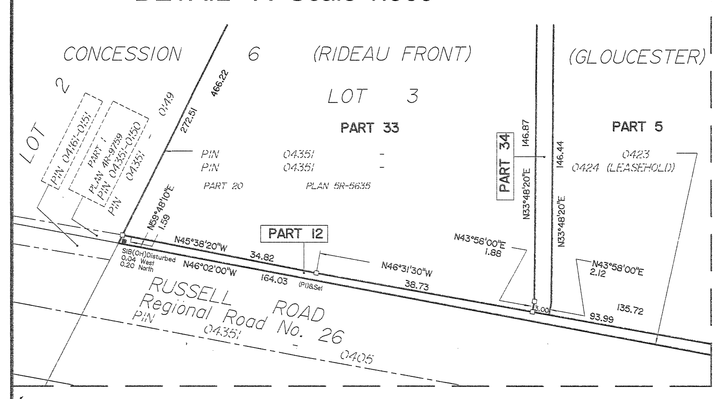
Drawing No.: SPA-01

Date: NOV 2025

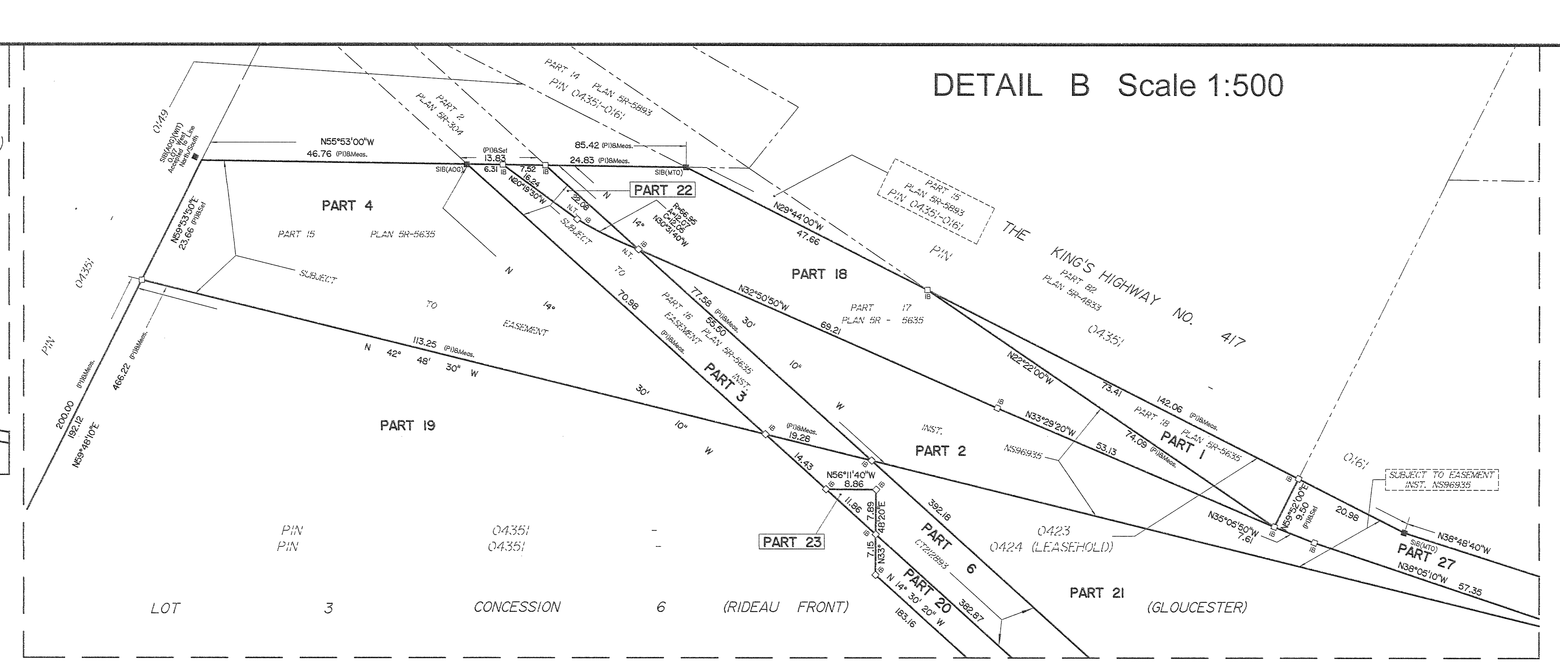
P:\Projects_2025\25-199\3000 Design Documents\3300 Drawings\3350 Drawings\3351 ACAD\NCBP Building A1 & A3 - Site Plan.dwg, 2025-12-10

24 X 36 – PLOT ARCH D

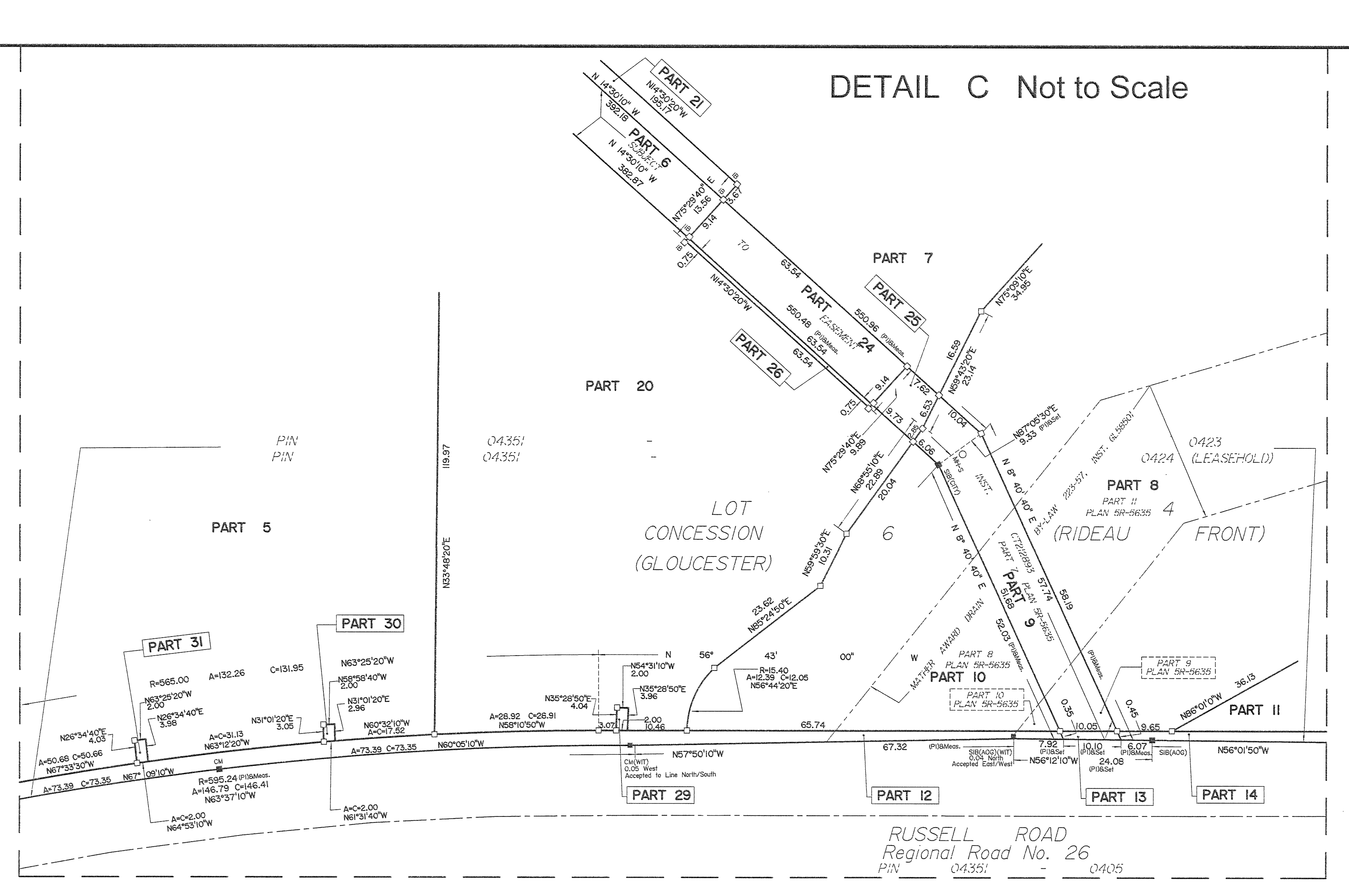
DETAIL A Scale 1:500



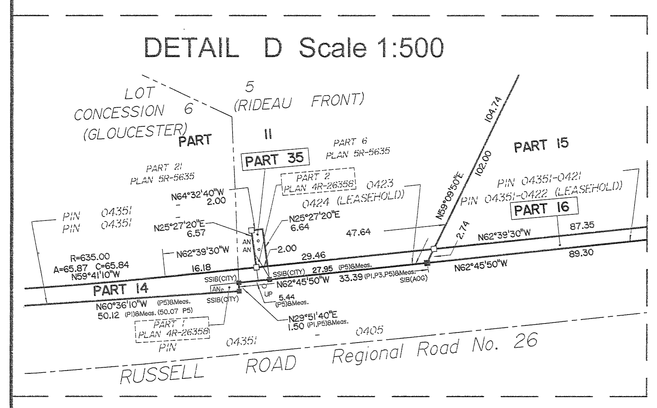
DETAIL B Scale 1:500



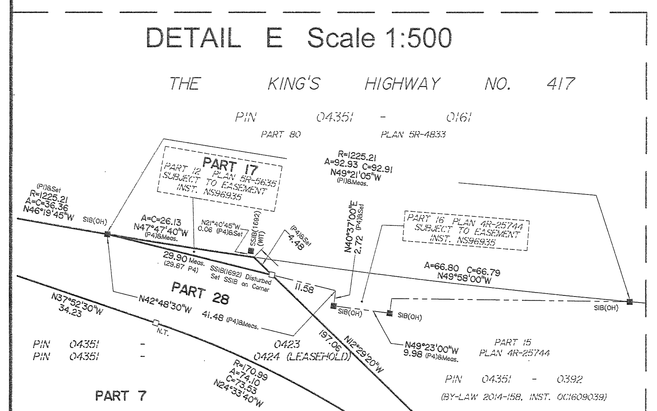
DETAIL C Not to Scale

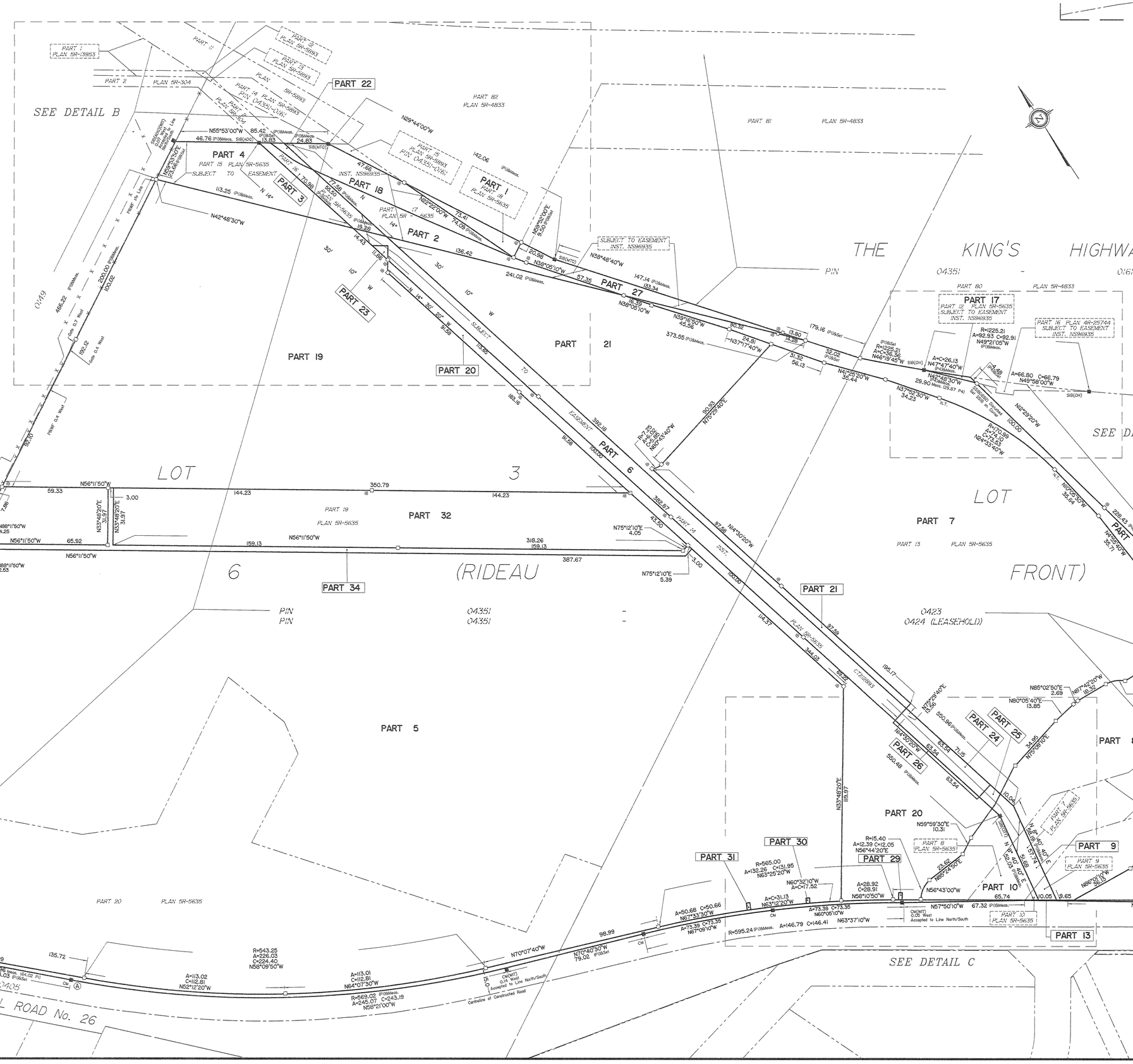


DETAIL D Scale 1:500



DETAIL E Scale 1:500





I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.
DATE: April 28, 2022
A.J. Bingham
ANDREW J. BINGHAM
ONTARIO LAND SURVEYOR

PLAN 4R-34587
RECEIVED AND DEPOSITED
DATE: April 28/2022
REPRESENTATIVE FOR LAND REGISTRAR FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON NO. 4.

SCHEDULE

PART	LOT	CONCESSION	PIN
1			
2	PART OF 3		
3			
4			
5			
6	PART OF 3 & 4		Part of 04351-0423
7			Part of 04351-0424 (LEASEHOLD)
8	PART OF 4 & 5		
9	PART OF 4		
10	PART OF 4 & 5		
11	PART OF 4 & 5		
12	PART OF 3 & 4	6 (RIDEAU FRONT)	
13	PART OF 4		
14	PART OF 4 & 5		
15			All of 04351-0421
16	PART OF 5		All of 04351-0422 (LEASEHOLD)
17	PART OF 4		
18	PART OF 3		
19			
20	PART OF 3 & 4		
21			
22	PART OF 3		Part of 04351-0423
23			Part of 04351-0424 (LEASEHOLD)
24	PART OF 4		
25			
26	PART OF 3		
27	PART OF 3 & 4		
28	PART OF 4		
29			
30	PART OF 3		
31			
32	PART OF 5		

Parts 3, 6, 9, 13, 22, 23, 24, 25 : Subject to easement Inst. CT212863
Parts 2, 3, 4, 17, 18, 22, 27: Subject to easement Inst. NS99035

Parts 1 to 14 (inclusive) and 17 to 26 (inclusive) comprise all of PIN 04351-0423 and PIN 04351-0424 (LEASEHOLD).

PLAN OF SURVEY OF

PART OF LOT 3, 4, and 5 CONCESSION 6 (Rideau Front) Geographic Township of Gloucester CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 1000

0 10 20 30 40 50 60 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 20th day of April, 2022.

April 27, 2022 — Date

A.J. Bingham — Andrew J. Bisham, Ontario Land Surveyor

This plan of survey relates to AOLS Plan Submission Form Number V-25449.

Notes & Legend

—○—	Denotes	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	-	Standard Iron Bar
ESIB	-	Short Standard Iron Bar
IB	-	Iron Bar
CM	-	Concrete Monument
(WIT)	-	Witness
(AOO)	-	Annis, O'Sullivan, Vollebekk Ltd.
Meas.	-	Measured
(P1)	-	Plan 5R-5635
(P2)	-	Plan 4R-24859
(P4)	-	Plan 4R-25744
(P5)	-	Plan 4R-26568
(P6)	-	Plan 4R-29968
CH	-	Chord Line
AN	-	Anchor
PB/WF	-	Post & Wire Fence
N.T.	-	Non-Tangential

All set survey monuments are SIB unless otherwise noted.

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99965.

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations on reference points A and B, shown hereon and are referenced to Specified Control Points 01919680105 and 01919843761, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

Coordinates are derived from Can-Net 2016 Real Time Network GPS observations referenced to Specified Control Points 01919680105 and 01919843761, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

Coordinate values are to urban accuracy in accordance with O. Reg. 216/10.

. 01919680105	Northing	5024015.16	Easting 372971.65
. 01919843761	Northing	5036176.12	Easting 372435.11
. Point A	Northing	5027705.32	Easting 375653.97
. Point B	Northing	5027464.66	Easting 376308.76

Caution: Coordinates cannot, in themselves, be used to re-establish corners or boundaries shown on this plan.

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S4
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: mail@aovltd.com
Ontario Land Surveyors

Station - 0011962U3456 (Page 1 of 2)

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2025-Dec-16

Station: 0011962U3456

AKA Names: 00162U3456, 3456, 62U3456, VANO

Number of Ref Sketches: 1

Networks [usage]: 3336CS [FREE]

Known Status: Existing

Last Reported Visit:

Monument Type: -

Station Type: SPIR

Location Description:

Township: OTTAWA GROUND ROD WITH BRASS CAP, ON SOUTHWEST SIDE OF RUSSELL ROAD, 1.3 KM SOUTHEAST OF WALKLEY ROAD, ABOUT 120 M NORTHWEST OF ST. GEORGES ANGLICAN CHURCH, 5.8 M NORTHWEST OF GATE TO CEMETERY, 13.7 M SOUTHWEST OF CENTRE LINE OF RUSSELL ROAD, 1.8 M NORTHEAST OF CEMETERY FENCE, AT ROAD LEVEL, INSIDE A LENGTH OF FLU LINING SET IN GROUND.

No Photo

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1983:CSRS:CBNV6-2010.0	**Horiz Order:** CSRS Class C	**Ellipsoidal Order:** Third Order
Latitude: N45° 23′ 06.103066″	**Longitude:** W75° 35′ 45.193573″	**Ellipsoidal elev:** 41.071

***UTM Zone:** 18	**E:** E453350.602	**N:** N5025896.331	**C. S. F.:** 0.99962031	**Mrdl Convg:** -0° 25′ 27.1″
***MTM Zone:** 9	**E:** E375600.270	**N:** N5027629.624	**C. S. F.:** 0.99995517	**Mrdl Convg:** 0° 38′ 37.0″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 73.440	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 73.746	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2020-Jan-14	Established by GSC -- MTO established CSRS coordinates April 2018

Station - 0011962U3456 (Page 2 of 2)

Reference Sketches

Sketch 1 of 1

MONUMENT POSITION SKETCH

DATE:	UPDATED:	JOB FILE:
APRIL 2 2018		17-21710
TYPE OF MONUMENT:	**RELATIONSHIP TO GROUND:**	**CONDITION:**
RIB W CAP	10CM BELOW	GOOD

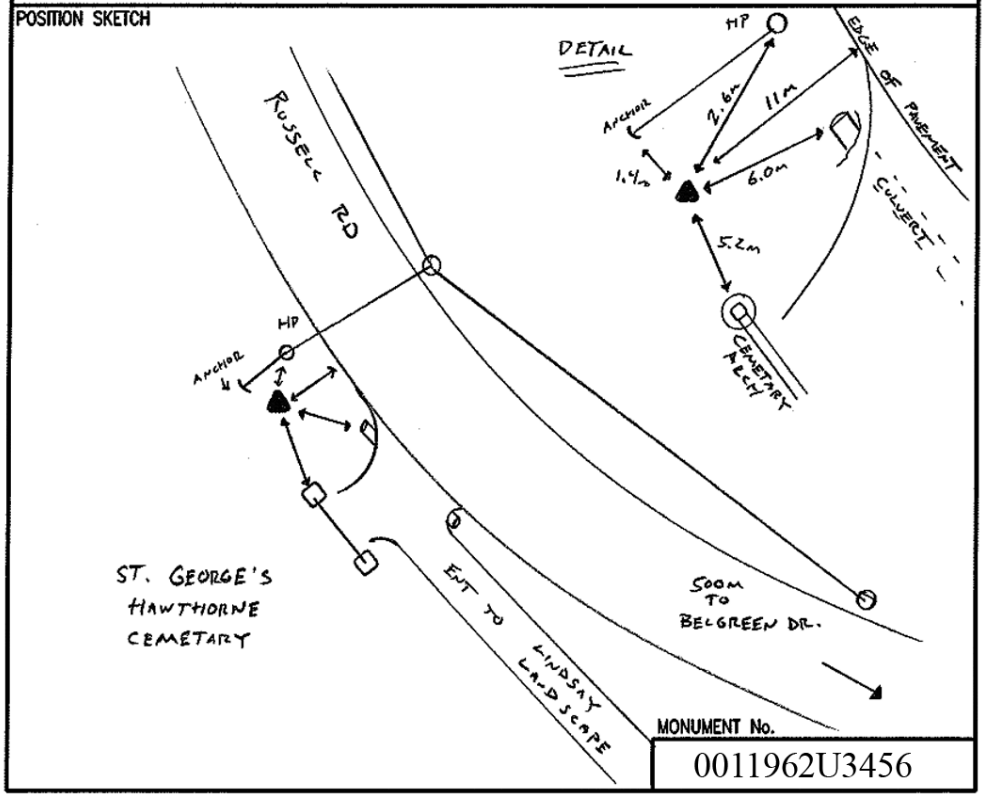
INTERVISIBLE WITH: N/A

LOCATION:

POINT IS LOCATED ON THE WEST SIDE OF RUSSELL RD APPROX 500 M NORTH OF BELGREEN DR. THE POINT IS FRONT OF ST. GEORGE'S HAWTHORNE CEMETARY.

PURPOSE: LOCATE ___ PRECISE REFERENCE ___

POSITION SKETCH



MONUMENT No.

0011962U3456

APPENDIX G

Site Servicing and Stormwater Management report
for National Capital Business Park,
4055 Russell Road – Site 3

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SITE SERVICING AND STORMWATER MANAGEMENT

FOR

NATIONAL CAPITAL BUSINESS PARK
4055 RUSSELL ROAD – SITE 3

CITY OF OTTAWA

PROJECT NO.: 19-1155
CITY APPLICATION NO.: D07-12-21-0069

FEBRUARY 2022 – REV 3

SITE SERVICING AND STORMWATER MANAGEMENT
FOR
4055 RUSSELL ROAD – SITE 3

NATIONAL CAPITAL BUSINESS PARK

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FOR
4055 RUSSELL ROAD – SITE 3
NATIONAL CAPITAL BUSINESS PARK
FEBRUARY 2022 – REV 3

CITY OF OTTAWA
PROJECT NO.: 19-1155

1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by National Capital Business Park to prepare a Site Servicing and Stormwater Management report in support of the application for the Site 3 Site Plan Control (SPC) at 4120 Russell Road.

The subject property is located within the City of Ottawa urban boundary, in the Gloucester-Southgate ward. As illustrated in ***Figure 1***, the subject property is located north of the Russell Road and Hunt Club intersection. Comprised of a single parcel of land, the subject property measures approximately ***24 ha*** and is currently zoned IH-Heavy Industrial.

Figure 1: Site Location

The proposed SPC would allow for the development of three light industrial buildings, with street access and parking from Russell Road. The proposed development would include approximately ***4,490 m²*** of office space and ***8.23 ha*** of industrial space. A copy of the Site Plan is included in ***Drawings/Figures***.

The objective of this report is to provide sufficient detail to demonstrate that the proposed development is supported by existing and proposed municipal servicing infrastructure, and that the site design conforms to current City of Ottawa design standards.

1.1 Existing Conditions

The existing site is mostly undeveloped and consists of grassed and vegetated areas. Existing farm buildings will be removed as part of this development. The elevations range between 66.7 m and 70.2 m with a minimal grade change of approximate 0.6% from the Southwest to the Northeast corner of the property.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist in close proximity to the subject property:

Watermains

- 406 mm capped ductile iron watermain within Russell Road to the north of 4055 Russell Rd;
- 305 mm capped ductile iron watermain within Belgreen Drive at Russell Road; and a
- Future 406 mm capped ductile iron watermain within Russell Road at the Belgreen Drive intersection to be constructed as part of the Site 1 development.

Sanitary Sewers

- 900mm - 1350 mm diameter concrete Green Creek Collector South trunk sewer runs through the subject site and crosses Russell Road.

Storm Sewers

- 375 mm diameter PVC storm sewer within Hunt Club Road.

1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

Ontario Water Resources Act (OWRA) s.53 approval will be required from the Ministry of the Environment and Climate Change (MECP) for sanitary and stormwater and falls under the Direct Submission process. City of Ottawa to confirm whether application would qualify for the Transfer of Review process.

Conservation Authorities Act approval will be required from Rideau Valley Conservation Authority for development within regulatory limits and the release of stormwater runoff to watercourses.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, is located in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002,* October 2012.
  (City Standards)

  - **Technical Bulletin ISDTB-2014-01**
    City of Ottawa, February 5, 2014.
    (*ISDTB-2014-01*)

  - **Technical Bulletin PIEDTB-2016-01**
    City of Ottawa, September 6, 2016.
    (*PIEDTB-2016-01*)

  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-01*)

  - **Technical Bulletin ISTB-2018-04**
    City of Ottawa, June 27, 2018.
    (*ISTB-2018-04*)

  - **Technical Bulletin ISTB-2019-01**
    City of Ottawa, January, 2019.
    (*ISTB-2019-01*)

  - **Technical Bulletin ISTB-2019-02**
    City of Ottawa, July 8, 2019.
    (*ISTB-2019-02*)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

- **Technical Bulletin ISDTB-2018-02**
  City of Ottawa, March 21, 2018.
  (ISDTB-2018-02)

- **Technical Bulletin ISTB-2021-03**
  City of Ottawa, August 18, 2021.
  (ISTB-2021-03)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE* Design Guidelines*)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch, January 1, 2010 Update.
  (OBC)

- **Functional Servicing Report for National Capital Business Park – 4120 & 4055 Russell Road**
  DSEL, March 2020.
  (FSR)

- **Servicing Design Brief for National Capital Business Park – Last Mile Drive**
  DSEL, March 2021.
  (LMD Servicing Report)

- **4120 & 4055 Russell Road – Erosion Threshold and Exceedance Analysis**
  Geo Morphix, May 25, 2021.
  (Geo Morphix Erosion Analysis)

- **Mather Award Drain / Erosion Assessment for Outlets A and B/C**
  JFSA, June 16, 2021.
  (JFSA Erosion Assessment)

- **Geotechnical Investigation**
  Paterson Group, August 13, 2020.
  (Geotech Report)

- **Low Impact Development Stormwater Management Planning and Design Guide**
  Toronto and Region Conservation, Credit Valley Conservation, Lake Simcoe Region Conservation, 2019
  (LID SWMPDG)

- **Hydrogeological Study**
  Paterson Group, July 31, 2020.
  (Hydro-G Report)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies beside the City of Ottawa 2W2C pressure zone, as shown by the Pressure Zone map in ***Appendix B***. The following existing municipal watermains are available to provide service to support development:

- Existing 406 mm capped watermain within Russell Road to the north of 4055 Russell.
- Future 406 mm capped watermain within Russell Road at the Belgreen Road intersection. Design for the watermain has been submitted to the city in support of the Site Servicing design for Site 1 (***Site 1 Servicing Design***) under separate cover. For the purpose of this application, it is assumed that the watermain will be in-service and available at the time of construction.

3.2 Water Supply Servicing Design

It is proposed to service the development by extending the existing 406 mm diameter watermain stub within Russell Road, north of 4055 Russell Road, towards the subject site and by extending with the watermain stub provided by the ***Site 1 Servicing Design*** towards the subject site.

In accordance with City of Ottawa technical bulletin ISDTB-2014-02, redundant service connections will be required due to an estimated design flow of greater than 50 m^3/day. As per drawing ***SSP-0***, a 200 mm diameter watermain network is proposed. Connections to both watermain extensions will provide a redundant connection for the development. In addition, buildings are proposed to be equipped with 200 mm diameter service laterals.

Table 1, below, summarizes the ***Water Supply Guidelines*** employed in the preparation of the preliminary water demand estimate.

Table 1: Water Supply Design Criteria

Design Parameter	Value
Commercial Office	75 L/9.3m^2/d
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Light Industrial Demand	35,000 L/gross ha/d
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa

Table 2, below, summarizes the estimated water supply demand and boundary conditions for the proposed development based on the ***Water Supply Guidelines***.

Table 2
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Estimated Demand[1] (L/min)	Boundary Condition[2] Northern Connection (m H_2O / kPa)	Boundary Condition[2] Southern Connection (m H_2O / kPa)
Average Daily Demand	225.2	130.2 / 541.5	130.2 / 580.8
Max Day + Fire Flow (14,000 L/s)	14,337.8	120.2 / 443.4	119.1 / 471.9
Peak Hour	608.0	123.6 / 476.8	123.6 / 516.0

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 75m and 71m for the northern connection and southern connection, respectively. See ***Appendix B.***

Fire flow requirements are to be determined in accordance with City of Ottawa ***Water Supply Guidelines*** and the Ontario Building Code.

Fire flow requirements were estimated per City of Ottawa Technical Bulletin ***ISTB-2018-02***. The following parameters were assumed:

- Type of construction – Modified Fire Resistive Construction;
- Occupancy type – Limited Combustibility; and
- Sprinkler Protection – Supervised Sprinkler System.

Table 3, below, summarizes the estimated fire flow demands based on the FUS method. Detailed calculations can be found in ***Appendix B***.

Table 3
Fire Flow Demand Estimation

Building	Estimated Demand (L/min)
A1	14,000
A2	6,000
B	7,000

As per Table 3, the maximum fire flow demand estimated for the system is ***14,000 L/min***, noting that actual building materials selected will affect the estimated flow. A certified fire protection system specialist would need to be employed to design the building fire suppression system and confirm the actual fire flow demand.

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***.

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow demand for the demands indicated by the correspondence in ***Appendix B***. As shown by ***Table 2,*** above, the minimum and maximum pressures exceed the pressure range identified by the ***Water Supply Guidelines***.

3.2.1 EPANet Water Modelling

EPANet was utilized to determine pipe sizing and the availability of pressures throughout the system during average day demand, max day plus fire flow, and peak hour demands. The static model determines pressures based on the available head obtained from the boundary conditions provided by the City of Ottawa.

The model utilizes the Hazen-Williams equation to determine pressure drop, while the pipe properties, including friction factors, have been selected in accordance with Table 4.4 of the ***Water Supply Guidelines***. The model was prepared to assess the available pressure at the finished first floor of each building as well as the pressures the watermain provided to fire hydrants during fire flow conditions.

Table 4, below, summarizes the demands applied to nodes throughout the system for each scenario.

Table 4
Model Simulation Demand Summary

Location	Average Day (L/min)	Max Day + Fire Flow (A1) (kPa)	Max Day + Fire Flow (A2) (kPa)	Max Day + Fire Flow (B) (kPa)	Peak Hour (kPa)
N6 - BLDG A1	152.1	228.1	228.1	228.1	410.6
N10 - BLDG A2	31.0	46.5	46.5	46.5	83.6
N19 - BLDG B	42.1	63.2	63.2	63.2	113.8
H1	0.0	5700.0	0.0	0.0	0.0
H2	0.0	2600.0	0.0	0.0	0.0
H3	0.0	0.0	3000.0	0.0	0.0
H4	0.0	0.0	3000.0	0.0	0.0
H5	0.0	5700.0	0.0	0.0	0.0
H8	0.0	0.0	0.0	3500.0	0.0
H9	0.0	0.0	0.0	3500.0	0.0

Table 5 summarizes the output reports for each scenario. Refer to ***Appendix B*** for model schematics and output reports.

Table 5
Model Simulation Output Summary

Location	Average Day (kPa)	Max Day + Fire Flow (A1) (kPa)	Max Day + Fire Flow (A2) (kPa)	Max Day + Fire Flow (B) (kPa)	Peak Hour (kPa)
H1	591.2 †	237.0	474.8	475.8	526.2
H2	609.2 †	367.5	480.5	482.1	544.2
H3	624.5 †	386.8	396.2	461.3	559.2 †
H4	624.3 †	386.7	396.0	457.5	559.0 †
H5	611.1 †	260.1	457.9	439.5	545.7
H6	617.1 †	444.0	485.8	470.1	552.2 †
H7	623.5 †	388.1	464.3	433.9	558.2 †
H8	622.6 †	394.2	467.6	354.3	557.3 †
H9	622.6 †	400.1	471.3	354.3	557.4 †
N1	564.8 †	462.0	466.0	466.1	500.0
N10	620.0 †	382.4	425.9	452.1	554.7 †
N11	625.1 †	387.7	464.8	448.5	559.8 †
N12	624.1 †	385.4	466.5	451.8	558.8 †
N13	621.9 †	381.7	468.7	450.3	556.5 †
N14	620.4 †	408.5	475.4	450.3	555.2 †
N15	618.0 †	444.9	486.7	471.0	553.1 †
N16	605.0 †	493.4	495.2	494.5	540.2
N17	623.2 †	387.8	464.0	433.6	557.9 †
N18	621.2 †	386.6	462.5	425.9	555.8 †
N19	618.0 †	383.5	459.4	422.7	552.6 †
N2	585.9 †	359.1	469.5	470.5	520.9
N20	621.5 †	393.0	466.5	391.8	556.1 †
N21	621.5 †	399.0	470.1	391.8	556.2 †
N3	608.4 †	370.8	479.7	481.3	543.4
N4	616.8 †	379.0	458.1	461.2	551.5
N5	618.7 †	380.1	460.8	448.0	553.3 †
N6	605.2 †	366.6	447.2	434.6	539.6
N7	623.1 †	385.4	425.3	459.9	557.8 †
N8	623.0 †	385.4	425.0	456.3	557.7 †
N9	623.0 †	385.4	428.9	455.2	557.7 †
† indicates pressures exceeded required pressure values as outlined in ***Table 1***					

Initial boundary conditions obtained indicate residual pressures above the recommended pressure range as specified in ***Table 1*** and the ***Water Supply Guidelines***. Results from modelling of the internal watermain indicates pressures will exceed 552 kPa during average day demands. As a result, buildings will need to be equipped with pressure reducing valves.

The model indicates that pressures within the watermain network are within ***City Standards***.

3.3 Water Supply Conclusion

Estimated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions.

The estimated water demand was submitted to the City of Ottawa for establishing boundary conditions. The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow. The minimum and maximum pressures exceed the pressure range identified by the ***Water Supply Guidelines***.

Results from modelling of the internal watermain indicates pressures will exceed 552 kPa during average day demands. As a result, buildings will need to be equipped with pressure reducing valves.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site lies within the Green Creek Collector South Sewer catchment area, as illustrated in the City sewer mapping included in ***Appendix C***. The existing 1350 mm diameter collector sewer runs from west to east, through the subject site. Refer to drawing ***EX-1*** for further details.

4.2 Wastewater Design

It is proposed that the development will be serviced via a network of gravity sewers designed in accordance with the City of Ottawa design criteria and will outlet to the Green Creek Collector South Sewer. As illustrated by ***SSP-3***, the internal 250 mm diameter sanitary sewer system will connect to the Green Creek Collector South sewer via sanitary maintenance structure SAN1. Buildings are proposed to be equipped with 250 mm service laterals, to be confirmed by the mechanical engineer.

Table 6, below***,*** summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 6
Wastewater Design Criteria

Design Parameter	Value
Commercial Office Space	75 L/9.3m^2/d
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28 L/s/ha (Wet Weather) 0.33 L/s/ha (Total)
Industrial - Light	35,000 L/gross ha/d
Industrial Peaking Factor	4.4 per City of Ottawa Sewer Design Guidelines Appendix 4B
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 7, below, demonstrates the estimated peak flow from the proposed development. See ***Appendix C*** for associated calculations.

Table 7
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	9.78
Estimated Peak Dry Weather Flow	31.62
Estimated Peak Wet Weather Flow	37.49

The peak wastewater flow generated from the proposed development to the internal sanitary network and ultimately the Green Creek Collector South sewer has been estimated to be ***37.49 L/s***; detailed calculations are included in ***Appendix C***.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Green Creek Collector South Sewer. It is proposed to discharge wastewater to the existing 1350 mm diameter collector sewer via connection to the existing sanitary maintenance structure located within the site.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

The subject property is within the Ramsay Creek watershed, and is subject to review and approval from the City of Ottawa and Rideau Valley Conservation Authority (RVCA).

4055 Russell Road (Site 3) generally drains to the east towards two outlets. The northern portion of the site currently drains north east towards Ramsey Creek, referred to as ***Outlet A***. The southern portion of the site currently drains south east towards the Mather Award Drain, referred to as ***Outlet B/C***. Refer to the ***Pre-development Drainage Characteristics Figure*** located in ***Appendix D*** for reference.

It is assumed, for the purpose of calculating stormwater management requirements for development, that the existing property currently contains no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized in ***Table 8,*** below:

Table 8
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate Outlet A (L/s)	Estimated Peak Flow Rate Outlet B/C (L/s)
2-year	316.9	138.3
5-year	426.3	186.0
100-year	906.7	395.3

5.2 Post-development Stormwater Management Target

Pre-consultation with City of Ottawa and RVCA staff indicates that the following stormwater management controls will be required for development of the site:

- Maximum peak flow rates must not exceed pre-development values for storms with return periods ranging from 2 to 100 years.
- Enhanced quality level treatment (80% TSS removal) will be required.
- Water budget and potential benefits of LIDs to be evaluated.

Pre-consultation correspondence is included in ***Appendix A.***

As maximum peak flow rates from the development are not to exceed pre-development flow rates, the allowable release rate for ***Site 3*** is equal to the pre-development flows to Outlet A and to Outlet B/C (***Table 8***). Based on the above, the allowable post-development release rate towards Outlet A is ***316.9 L/s*** and ***906.7 L/s*** for the 2-year and 100-year storm events, respectively. The allowable post-development release rate towards Outlet B/C is ***138.3 L/s*** and ***395.3 L/s*** for the 2-year and 100-year storm events, respectively.

In addition to the peak 2 to 100 year runoff flow rate controls, erosion threshold and exceedance analysis has been undertaken for each of the site stormwater outfalls (A and B/C) as presented in ***Geo Morphix Erosion Analysis***.

5.3 Proposed Stormwater Management System

It is proposed that stormwater will outlet to the two drainage outlets for the site; the first towards Outlet A via a swale connecting into the existing 417 roadside ditch, and towards Outlet B/C via a swale connecting into the Mather Award Drain. Refer to drawings ***GP-0***, ***SSP-0***, ***SWM-1*** for further details.

To meet stormwater quantity control targets, the proposed design will consist of surface flow attenuation storage. As illustrated by drawing ***GP-0***, there are three surface storage areas proposed within the subject site. The first, herein referred to as ***P1***, located between Building A2 and B, attenuates and releases stormwater towards Outlet A. The second, herein referred to as ***P2***, located within the loading area in front of Building B, attenuates and releases stormwater towards Outlet B/C. The third, herein referred to as ***P3***, located between Building A1 and B, attenuates and releases stormwater towards Outlet B/C.

Roof controls are anticipated for the Site 3 buildings. To meet stormwater quantity control policies from the MTO, rooftop controls have not been accounted for within the stormwater management calculations, to confirm that the site is not dependent on the rooftop controls.

5.3.1 Proposed Stormwater Management System – Outlet A

As per drawing ***SWM-1***, drainage collected from Building A1, Building A2, the parking areas surrounding Building A1, the parking area surrounding Building A2, the main drive aisle, and a small parking area north of Building B is collected by the internal storm sewer network and conveyed to ***P1*** via headwall HW200 and HW300. The proposed internal storm sewer network will convey drainage to storm maintenance hole STM101, where the flow rate will be attenuated through an ***83 mm ICD*** orifice plate bolted to the outlet side of storm maintenance hole ***STM101***; and DICB100, where the flow rate will be attenuated through a ***450 mm ICD*** orifice plate bolted to the outlet side of the structure. Refer to drawing ***SSP-1*** for the servicing layout and drawing ***DS-2*** for STM101 and ICD details.

Table 9, below, summarizes the post-development flow rates and calculated attenuation storage requirements to attenuate runoff release rates to pre-development values tributary to Outlet A.

Table 9
Stormwater Flow Rate Summary – Outlet A

Control Area	2-Year Release Rate (L/s)	2-Year Required Storage (m^3)	100-Year Release Rate (L/s)	100-Year Required Storage (m^3)	100-Year Available Storage (m^3)
Unattenuated Areas	17.8	0.0	51.3	0.0	0.0
Attenuated Areas	70.5	3645.6	404.1	8434.2	10452.7
Total	**88.3**	**3645.6**	**455.4**	**8434.2**	**10452.7**

It is anticipated that approximately ***8,434 m³*** of storage will be required on site to attenuate flow to the established release rates; storage calculations are contained within ***Appendix D***. As summarized above, the post development release rates are ***88.3 L/s*** and ***455.4 L/s*** during the 2-year and 100-year storm events respectively, meeting the target release rates of ***316.9 L/s*** and ***906.7 L/s***.

Detained water will back-up within the storm sewer and accumulate in the depressed area, ***P1***. The depressed area will provide the opportunity for groundwater infiltration and provide surface detention storage during rainfall events. The depressed area has been sized to provide adequate detention for events greater than the 1:100year storm. A surface storage table presented in Appendix D provides the stage vs. storage relationship. The depressed area is equipped with an emergency spillway should any orifices become obstructed and provides 0.3m freeboard from 1:100year ponding elevations to top of bank. Details for the overflow, pond geometry, ponding levels and outlets are presented in Drawing DS-3. As shown on the drawings, the emergency overflow is located above the 1:100year water levels, providing additional storage and protection for larger storm events. It should be noted that, as per MTO guidelines, rooftop storage was not accounted for when sizing the P1 area for detention. Given the large rooftop areas however, there is expected to be significant opportunities for rooftop storage.

Stormwater quality controls for outlet A will be provided through an EFO10 Oil Grit Separator (OGS) that has been sized to provide 80% Total Suspended Solids (TSS) removal. Refer to ***Appendix D*** for the OGS sizing report.

An erosion assessment has been completed for Outlet A by GEO Morphix, north east of the subject site. The GEO Morphix report establishes the target release rate from the site during the 25 mm design storm event.

JFSA prepared a stormwater assessment (*National Capital Business Park – Erosion Assessment for Site 3*), accounting for the maximum allowable release rate for the 25 mm design storm of ***14 L/s*** consistent with what is presented in the GEO Morphix report. The results of the hydrologic modelling presented in JFSAs report, confirm that adequate storage is provided with the servicing design to control the outflows to the target release rate and that the proposed flow controls are adequately sized accommodate the 25mm maximum allowable release rate.

5.3.2 Proposed Stormwater Management System – Outlet B/C

As per drawing ***SWM-1***, drainage collected near Building B (Area A401-405) and drainage from Building B, is collected by the internal storm sewer network and conveyed to depressed area ***P2*** (loading bay in front of building B) and ***P3*** (depressed grass area). Drainage will be conveyed to ***P2*** via back up from the trench drains alongside building B and overland flow routes. Drainage will be conveyed to ***P3*** via water back up from catch basin CB402A.

The proposed internal storm sewer network will convey drainage to storm maintenance hole STM401, where the flow rate will be attenuated through a ***Tempest LMF50 ICD*** and a ***375 mm ICD*** orifice plate bolted to the outlet side of storm maintenance hole STM401. Refer to drawing ***SSP-2*** for the servicing layout and drawing DS-2 for STM401 and ICD details.

Table 10, below, summarizes the post-development flow rates and calculated attenuation storage requirements to attenuate runoff release rates to pre-development values tributary to Outlet B/C.

Table 10
Stormwater Flow Rate Summary – Outlet B/C

Control Area	2-Year Release Rate (L/s)	2-Year Required Storage (m^3)	100-Year Release Rate (L/s)	100-Year Required Storage (m^3)	100-Year Available Storage (m^3)
External Areas	25.2	0.0	72.6	0.0	0.0
Unattenuated Areas	8.5	0.0	24.6	0.0	0.0
Attenuated Areas	7.4	764.6	107.6	1437.0	3393.6
Total	**41.1**	**764.6**	**204.9**	**1437.0**	**3393.6**

It is anticipated that approximately ***1437 m^3*** of storage will be required on site to attenuate flow to the established release rates; storage calculations are contained within ***Appendix D***. As summarized above, the post development release rates are ***41.1 L/s*** and ***204.9 L/s*** during the 2-year and 100-year storm events respectively, meeting the target release rates of ***138.3 L/s*** and ***395.3 L/s***.

Detained water will back-up within the storm sewer and accumulate in the depressed areas, ***P2*** and ***P3***. The grassed depressed area will provide the opportunity for groundwater infiltration and provide surface detention storage during rainfall events. The depressed ***P3*** area has been sized to provide adequate detention for events greater than the 1:100year storm. A surface storage table presented in ***Appendix D*** provides the stage vs. storage relationship. The depressed area is equipped with an emergency spillway should any orifices become obstructed and provides 0.3m freeboard from 1:100year ponding elevations to top of bank. Details for the overflow, pond geometry, ponding levels and outlets are presented in ***Drawings DS-3 and DS-2***. As shown on the drawings, the

emergency overflow is located above the 1:100year water levels, providing additional storage and protection for larger storm events. It should be noted that, as per MTO guidelines, rooftop storage was not accounted for when sizing the required storage. Given the large rooftop areas however, there is expected to be significant opportunities for rooftop storage.

Stormwater quality controls will be provided through an EFO6 OGS (or an approved equivalent), which is required to be sized to provide 80% Total Suspended Solids (TSS) removal. Refer to ***Appendix D*** for the OGS sizing report. In accordance with the Hydrogeological Study prepared by Paterson Group (***Hydro-G Report***), the OGS unit has been placed near the outlet in order to manage flow velocity and sediment load.

An erosion assessment has been completed by GEO Morphix for Outlet B/C, south east of the subject site during the 25 mm design storm event.

JFSA prepared a preliminary stormwater assessment, accounting for the maximum allowable release rate for the 25 mm design storm of ***3.0 L/s*** consistent with the GEO Morphix report. The results of the hydrologic modelling presented in JFSAs report, confirm that adequate storage is provided with the servicing design to control the outflows to the target release rate.

5.4 Water Budget and Low Impact Development Measures

A hydrogeological study, water budget assessment and groundwater impact assessment was prepared by Paterson Group for the overall National Capital Business Park development area, and is presented in their Hydrogeological Study dated July 31, 2020 (***Hydro-G Report)***.

Soils within the study area generally consist of topsoil overlying a thin layer of silty sand. It is interpreted that the majority of surface water will either flow down-gradient as sheet drainage where silty sand is present, or infiltrate the upper silty sand deposit before being intercepted by the underlying silty clay deposit where it will flow laterally down-gradient as perched water (interflow). Isolated pockets were identified where recharge may be occurring. However, given the intermittent nature of the silty sand deposit being connected to the underlying glacial till, the volume of recharge occurring within the site boundaries is expected to be minimal.

With regards to discharge zones, neither the topographical or geological conditions are suitable for discharge to be occurring on a large scale at the subject site. While the Mather Award Drain, located east of Russell Road, could theoretically be considered a discharge zone, the volume is anticipated to be minimal given the limited reach length present within the boundaries of the study area and limited recharge potential of the surrounding areas.

The post-development water budget analysis presented in the ***Hydro-G Report*** estimates an approximate decrease in overall site infiltration of 51.8% and an increase in runoff of 85.0%, in comparison to pre-development conditions. Although, it is noted that this

estimate does not consider any potential infiltration in development areas with low imperviousness (eg. asphalt or concrete pavement areas), whereas some portion (15 to 30%) of surface water that lands on impervious surfaces either evaporates, infiltrates or is diverted to grassed areas where additional infiltration may occur. As such, the post-development runoff volumes should be considered a conservative estimate, and are not expected to definitively represent future conditions.

With regards to infiltration rates for the soils found on site, these are expected to range from 20 to 50 mm/hr for silty sand.

The proposed stormwater drainage system employs shallow-sloped depressed storage areas to collect and convey surface drainage from parking lot areas, drive aisles, landscaped areas towards either the Mather Award Drain or Ramsey Creek. These depressed areas are designed to promote infiltration of surface runoff, in accordance with the recommendations of the ***Hydro-G Report***.

5.4.1 Site 3 Water Balance

JFSA completed a water balance to assess the annual average runoff from Site 3 to the two stormwater outlets. The results of their analysis are summarized in a document titled – ***National Capital Business Park-Water Balance for Site 3***. A continuous model was prepared to assess the water balance under existing conditions, proposed conditions with no flow controls or LID strategies and to evaluate the proposed servicing design. The following three tables present the water balance results for each respective scenario.

Table 11
Existing Conditions Water Balance

Scenario	Area	Average Annual Runoff	Average Annual Infiltration	Average Annual Initial Abstraction
Outlet A	15.078 ha.	8% 6,633 m3	34% 26,494m3	58% 45,007 m3
Outlet BC	7.637 ha.	6% 2,456 m3	36% 14,327 m3	58% 22,802 m3
Total	**22.715 ha.**	**7%** **9,089m3**	**35%** **40,821m3**	**58%** **67,809 m3**

Table 12
Proposed Conditions (No Flow Controls) Water Balance

Scenario	Area	Average Annual Runoff	Average Annual Infiltration	Average Annual Initial Abstraction
Outlet A	18.951 ha.	61% 59,524 m3	7% 7,138 m3	32% 31,524 m3
Outlet BC	3.764 ha.	58% 11,347 m3	9% 1,639 m3	33% 6,496 m3
Total	**22.715 ha.**	**60%** **70,871 m3**	**8%** **8,777 m3**	**32%** **38,020 m3**

Table 13
Proposed Design (With Flow Controls) Water Balance

Scenario	Area	Average Annual Runoff	Average Annual Infiltration	Average Annual Initial Abstraction
Outlet A	18.951 ha.	35% 34,826 m3	32% 31,836 m3	32% 31,524 m3
Outlet BC	3.764 ha.	39% 7,642 m3	27% 5,344 m3	33% 6,496 m3
Total	**22.715 ha.**	**36%** **42,468 m3**	**32%** **37,180 m3**	**32%** **38,020 m3**

Results presented in the JFSA water balance show that providing flow controls and the implementation of large surface dry ponds for storage increases the annual infiltration and subsequently reduces annual runoff volumes by 24% compared to having a design where no flow controls or LIDs are utilized. The JFSA results also show that the implementation of the large pervious areas that are being proposed allow for the site's infiltration volumes to be within 10% of those under pre-development conditions.

5.5 Stormwater Servicing Conclusions

Drainage from the existing property is directed towards both Ramsey Creek and the Mather Award Drain by flowing overland towards the drainage systems. Stormwater from the proposed development will continue to flow towards the existing site outlets and will be attenuated to meet pre-development conditions.

Post development stormwater runoff release rates will not exceed pre-development values for storms with return periods ranging from 2 to 100 years. The site stormwater management plan incorporates the MTO policy that roof top storage cannot be accounted for in the stormwater retention calculation. It is estimated that ***8434 m^3*** of surface storage will be required to attenuate the proposed site to meet pre-development runoff release rates for Outlet A and ***1,437 m^3*** of surface storage will be required to attenuate the proposed site to meet pre-development runoff release rates for Outlet B/C.

Stormwater runoff from the proposed development will be treated for 80% TSS removal by two OGS units, prior to release into the Mather Award Drain and Ramsey Creek.

The proposed stormwater design conforms to all relevant ***City Standards*** and Policies for approval.

The proposed stormwater design will control the site runoff release rate to those established by GEO Morphix during the 25 mm design storm event to protect against erosion in Ramsey Creek. This will be achieved by attenuating flow through manhole STM101 and ditch inlet catchbasin DICB100 and attenuation within depressed area ***P1***.

The proposed stormwater design will control the site runoff release rate to those established by GEO Morphix during the 25 mm design storm event to protect against erosion in the Mather Award Drain. This will be achieved by attenuating flow through manhole STM 401 and attenuation within depressed areas ***P2*** and ***P3***.

Depressed stormwater storage areas ***P1***, ***P2*** and ***P3*** will retain runoff from the site during frequent rainfall events, and will be landscaped to promote water retention within the soils to improve infiltration and evapotranspiration.

6.0 UTILITIES

Gas and Hydro services currently exist within the Russell Road right-of-way. Utility servicing will be coordinated with the individual utility companies prior to site development.

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. During construction the extent of erosion losses is exaggerated due to the removal of vegetation and the top layer of soil becoming agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fence will be installed around the perimeter of the site and will be cleaned and maintained throughout construction. Silt fence will remain in place until the working areas have been stabilized and re-vegetated.

Catch basins will have SILTSACKs or an approved equivalent installed under the grate during construction to protect from silt entering the storm sewer system.

A mud mat will be installed at the construction access in order to prevent mud tracking onto adjacent roads.

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents:

- Limit extent of exposed soils at any given time;
- Re-vegetate exposed areas as soon as possible;
- Minimize the area to be cleared and grubbed;
- Protect exposed slopes with plastic or synthetic mulches;
- Install silt fence to prevent sediment from entering existing ditches;
- No refueling or cleaning of equipment near existing watercourses;
- Provide sediment traps and basins during dewatering;
- Install filter cloth between catch basins and frames;
- Plan construction at proper time to avoid flooding; and
- Establish material stockpiles away from watercourses, so that barriers and filters may be installed.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers; and
- Clean and change filter cloth at catch basins.

8.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by National Capital Business Park to prepare a Site Servicing and Stormwater Management report in support of the application for a Site Plan Control (SPC) at 4055 Russell Road – Site 3. The preceding report outlines the following:

- Based on boundary conditions provided by the City, pressures within the internal watermain network exceed the City's required pressure range therefore, pressure reducing valves may be required;
- The FUS method and associated City guidelines for estimating fire flow indicated ***14,000 L/min*** is required for the proposed development;
- A connection to the 300mm diameter municipal watermain within Belgreen Drive and a connection to the 406 mm diameter watermain within Russell Road is proposed to provide service to Site 3;
- The proposed development will generate a total peak wet weather wastewater flow rate of approx. ***37.49 L/s*** to be discharged into the Green Creek Collector Sewer;
- Drainage from the existing property is directed to Ramsey Creek and the Mather Award Drain. It is proposed that the stormwater outlet from proposed development will continue to be directed towards the existing outlets;
- Based on City of Ottawa, RVCA and MTO requirements for stormwater quantity control, post development stormwater release rates will be restricted to ***88.3 L/s*** and ***455.4 L/s*** during the 2-year and 100-year storm events for Outlet A and ***41.1 L/s*** and ***204.9 L/s*** during the 2-year and 100-year storm events for Outlet B/C;
- It is proposed that stormwater objectives may be met through stormwater retention via surface storage, and it is anticipated that ***8,434 m^3*** of onsite storage will be required to attenuate flow to the established release rate above for Outlet A;
- It is proposed that stormwater objectives may be met through storm water retention via surface storage, and it is anticipated that ***1,437 m^3*** of onsite storage will be required to attenuate flow to the established release rate above for Outlet B/C;
- Stormwater runoff from the proposed development will be treated for 80% Total Suspended Solids removal by three oil/grit separator units;
- The proposed stormwater design will control the site runoff release rate to 14 L/s for Outlet A and 3 L/s for Outlet B/C during the 25 mm design storm event to protect against erosion; and
- Erosion and sediment control measures will be implemented prior to commencing construction activities onsite, and will be maintained until the site is stabilized.

David Schaeffer Engineering Ltd.

Per: Alexandre Tourigny, P.Eng.

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APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

19-1155 13/05/2021

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Figure 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☒	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	GP-1
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☒	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.4
☒	All preliminary and formal site plan submissions should have the following information: -Metric scale -North arrow (including construction North) -Key plan -Name and contact information of applicant and property owner -Property limits including bearings and dimensions -Existing and proposed structures and parking areas -Easements, road widening and rights-of-way -Adjacent street names	All

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3, 3.4

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 3.2
☒	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Section 3.3
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.3, 3.4
☒	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 3.2, 3.3
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2, 3.3, 3.4
☒	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Appendix B

4.3 Development Servicing Report: Wastewater

☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

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

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☐	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☒	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 7.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other peSrmits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

JenniferKMurray@outlook.com

From:	Gervais, Melanie <Melanie.Gervais@ottawa.ca>
Sent:	November 28, 2019 2:58 PM
To:	mpilon@ave31.com; Jennifer Murray
Cc:	isabel.barrios@ncc-ccn.ca; Barakengera, Martin; gaelle.grangien@ncc-ccn.ca; tiera.zukerman@ncc-ccn.ca; bill.leonard@ncc-ccn.ca; jennifer.halsall@ncc-ccn.ca; Leclerc-Morin, Isabelle; Lee Sheets; Jennifer Luong
Subject:	4055 and 4120 Russell Road - pre-application consultation
Attachments:	McEwanCreekFunctionalDesign2001.pdf; Pre-con Applicant's Study and Plan Identification List.pdf

Hi Michel and Jennifer,

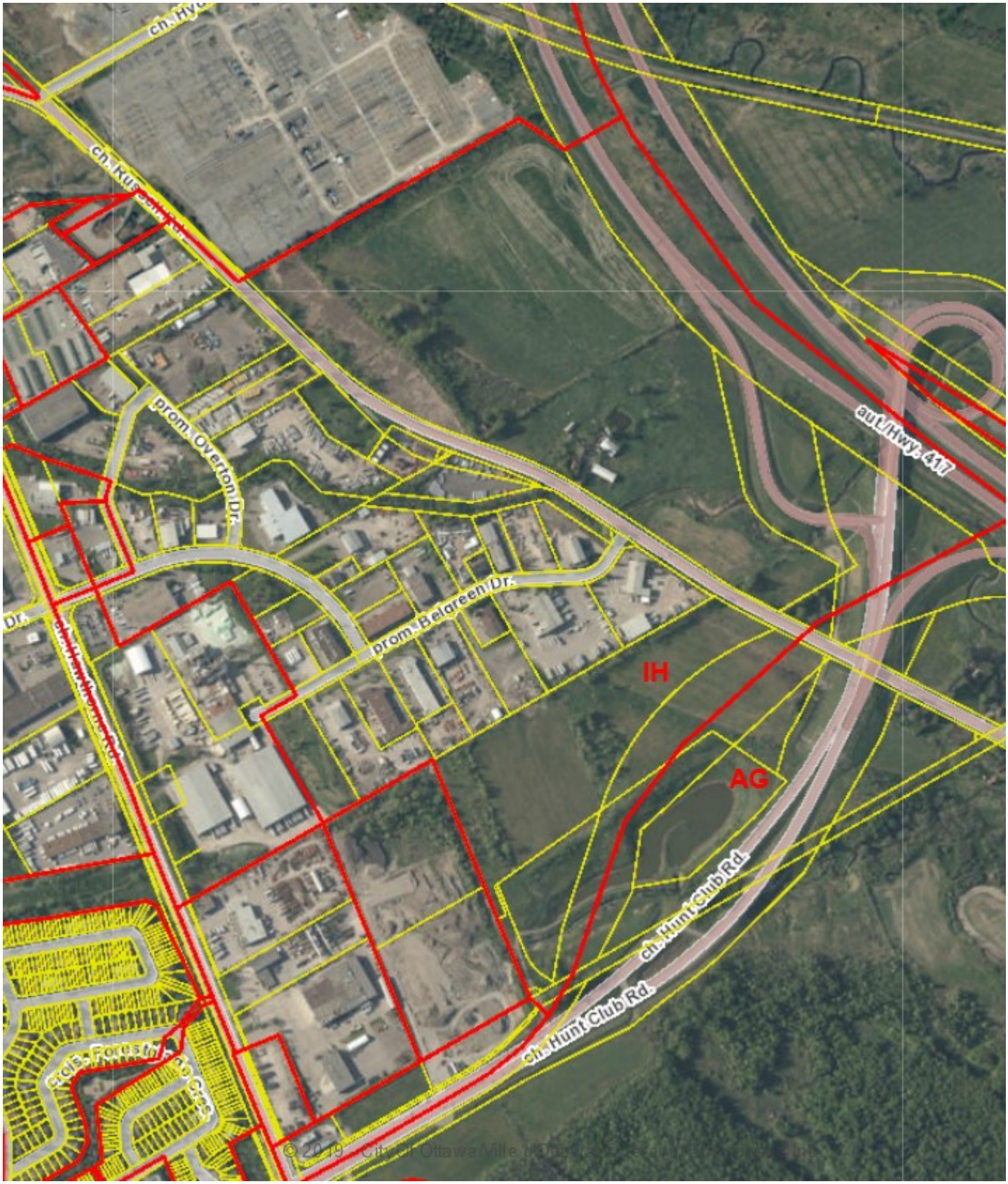
As a follow up to the pre-application consultation meeting held on November 18th, please find below a recap of the meeting.

Planning:

We could approve a Concept Master Site Plan and any other master studies or master plans that would make sense to guide future individual site plans. For example, you could submit a Concept Master Site Plan, transportation study, servicing plan/study and EIS that would be approved for the entire site (2 parcels). Each subsequent building would come forward on the regular (complex) site plan control application basis but would benefit from the master plans/studies approved.

The 2-stage site plan approach is much different, it is rarely used, and is more or less a draft approval of a site plan where we condition the detailed plans and studies after a 'draft approved site plan' draft approved. In order to complete the site plan approval process on a 2-stage site plan application you need to come forward and clear your conditions on your detailed plans/studies. This is most often used for financing where an applicant wants to get 'approval' up front to finance the project.

In this case I think the Master Plan approach is what makes most sense. It is not a separate application, it is the 'complex' site plan control application with certain plans/reports approved for the entire site (two parcels) and the detailed plans/reports approved for the first phase. You would therefore need to submit a New - Complex Site Plan application with a fee of $32,106.89 + engineering review fees + $995 (Conservation Authority fee). Please note that the fees may increase in 2020.



The properties identified as 4055 and 4120 Russell Road are zoned IH (Heavy Industrial Zone). The zoning provisions for Business Park Industrial can be found here and all the provisions for parking lots can be found here. Please note that a small portion of the site is designated Agricultural Resource Area in the Official Plan and zoned AG (Agricultural Zone), these discrepancies resulted

from a small shift in the location of the Hunt Club Road extension and interchange. The City will be correcting these Official Plan and zoning discrepancies which must be in force prior to any Site Plan Control approval.

Proper landscaping will be required on site. This includes the addition of trees within landscape buffers and landscaped islands. Please note that all Landscape Plans need to be stamped by a Landscape Architect.

Schedule I of the Official Plan identifies Highway 417 and Hunt Club Road as Scenic-Entry Routes. The policies of Section 4.6.4 of the Official Plan will have to be respected and the Planning Rationale will have to indicate how the policies are respected.

The Planning Rationale will have to explain the proposal, review the applicable Official Plan and Secondary Plan policies, review the applicable Zoning By-law provisions and review the Accessibility Design Standards. The Planning Rationale should also include a section on the environmental components (key points).

Please see the attached list identifying the submission requirements.

Forestry:

1. a Tree Conservation Report (TCR) must be supplied for review; an approved TCR is a requirement for Site Plan approval. Please try and retain as many trees as possible.
2. any removal of privately-owned trees 10cm or larger in diameter requires a tree permit issued under the Urban Tree Conservation Bylaw; the permit is based on the approved TCR
3. any removal of City-owned trees will require the permission of Forestry Services who will also review the submitted TCR
4. for this site, the TCR may be combined with the Environmental Impact Statement provided all information is clearly displayed
5. the TCR must list all trees on site by species, diameter and health condition – stands of trees may be combined using averages
6. the TCR must address all trees with a critical root zone that extends into the developable area – all trees that could be impacted by the construction that are outside the developable area need to be addressed.
7. trees with a trunk that crosses/touches a property line are considered co-owned by both property owners; permission from the adjoining property owner must be obtained prior to the removal of co-owned trees
8. If trees are to be removed, the TCR must clearly show where they are, and document the reason they can not be retained – please provide a plan showing retained and removed treed areas
9. All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines listed on Ottawa.ca
10. the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
11. Tree removal restrictions to accommodate for nesting birds will be in place from April 1 to August 15
12. Please ensure newly planted trees have an adequate soil volume for their size at maturity
13. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca

Transportation:

Russell Road is designated as an Arterial road within the City's Official Plan with a ROW protection limit of 30.0 metres. The ROW protection limit and the offset distance (15.0 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings.

ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.

The City's policy for the provision of pedestrian facilities as set forth by the Official Plan (OP), the Transportation Master Plan (TMP) and the Pedestrian Plan (OPP) specifically direct pedestrian facilities on City roads that lead to areas of work and employment ("retail/commercial/employment").

The concrete sidewalk is to meet City standards and be 2.0 metres in width and to be continuous along property frontage and depressed through the proposed accesses (please refer to the City's sidewalk and curb standard drawing SC7.1 for unsignalized entrance).

Proposed road modifications and new signals will require the delegated authority approval from the Manager of Design Review, Transportation Engineering Services.

The TIA (Transportation Impact Assessment) Guidelines (2017) were approved by Transportation Committee and City Council on June 14, 2017. The new version of the TIA Guidelines (2017) that are posted on the web are now to be used for the TIA Submission for development applications. The following list highlights the significant changes to the 2006 TIA Guidelines

1. A Screening Test (Step 1) quickly determines if a transportation study is required. Consultants should fill in the form in Appendix B.
2. Should the development generate 60 peak hour person trips, the TIA guidelines Step 2 – Scoping report would be required.
3. Study Scope (Step 2) is site specifically tailored; there are no longer three defined types of TIA reports. Scoping report is required and needs to be signed off by TPM before the consultant moves on to Forecasting volumes.
4. Sign off from City Transportation Project Manager is required at key points in the review process prior to TIA Submission (Step 5). See Figure 1 on page 9 for a good flow chart of the process.
5. Multi Modal Level of Service (MMLOS) and Complete Street analysis is required to assess the impact of all modes of travel rather than just vehicle traffic.
6. There is no longer a requirement for consultant pre-approval. Consultants must now sign and submit the Credentials Form included in the Appendix A with each TIA report.
7. The TIA Submission (report, drawings and/or monitoring plan) is required with the development application.
8. The TIA report is to review the potential for "Short Cutting" through the proposed development (Site #2 & 3).

Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).

- https://ottawa.ca/en/transportation-impact-assessment-guidelines

On site plan:

- Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
- Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
- Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
- Show lane/aisle widths.
- Ensure pedestrian connections are provided on the site.
- Grey out any area that will not be impacted by this application.

AODA legislation (link) is in effect for all organizations, please ensure that the design conforms to these standards, see attached checklist for guidance.

For any transportation questions, please contact Wally Dubyk (Wally.Dubyk@ottawa.ca).

Concerning the access on Hunt Club Rd, the distance between intersections was substandard but the City agreed that we would accept it, as per the *Shared Access Road Term Sheet* dated for reference purposes as of August 17, 2016. The details of the road itself were not discussed at that time and will have to be determine through this Site Plan process (ex. private or public road).

Engineering:

Storm

- When draining to a surface drainage system, the post development peak flow rate must match the pre-development pear flow rate.
- RVCA require 80% TSS removal through on-site treatment prior to outletting to a natural watercourse.

Sanitary

- As an industrial site the peak flow timing will be different than residential, so the impact on the trunk system will be low.
- No direct connections to the trunk sewer would be permitted; they would have to make use of one of the existing MH/shafts on the sewer.

- For 4055, they have the existing chambers on the property.

- For 4120, the preference would either be to either install a sewer in Russel Rd to their property, or to negotiate with the neighbouring properties and the City to allow them access to one of the existing chambers on the south side of the properties that front onto Belgreen Dr. The Hunt Club outlet is only a 250mm sewer and is likely inadequate.

Water

- To be looped via a new watermain along Russell Rd. Please submit a request for boundary conditions.

MECP ECA's would be required for the industrial use (direct submission), any new sewers within the right of way (new sanitary along Russell) (transfer of review) and any storm outlets (transfer of review).

Noise Impact Study will be required if you have any on-site noise sensitive uses (typ. Offices) to analyze the noise levels to ensure the building components mitigate sound levels to acceptable levels at the plane of window.

Urban Design:

Site 3: Building 'A' orientation. Back of house facing street? Main entrance hidden from street front and 417.
Is the volume of parking reflective of zoning or actual demand?
There are opportunities for site sustainability:

- Break up huge expanses of hard surface with soft or permeable paving;
- Tree cover to reduce heat island effect;
- Pedestrian access across the site and through large parking areas;
- Everything seems over-sized probably because the initial design has had a certain level of redundancy applied, however, I think there is room now to apply a more sensitive design and environmental brush to only take what you need and apply a lens of ecological sensitivity and human safety and comfort to the site design;
- Study the primary views (Gateway, street-front, etc.);

Site 1 & 2:

- See sustainable opportunities for creative organization and landscape integration to improve human safety, comfort, accessibility etc.

Environmental

4055 Russell Road:

The watercourse here is called the Mather Award Drain and is part of the McEwan Creek study (approved in 2001). It will require a setback. The setback to the watercourse will be the greater of 30 m from Normal High Water Mark, 15 m from Top Of Bank or geotechnical limit of hazard. Further, the McEwan Creek study had some restoration/improvements plan as per the attached. This will need to be implemented through this application. In addition to the restoration work on the Mather Award Drain, there will be a requirement for an EIS.

4120 Russell Rd:

A watercourse runs along the east side of the Hydro site and is mapped in Schedule L1 of the Official Plan as part of the Natural Heritage System. This watercourse is also in the McEwan Creek study. The development of this parcel will require an EIS.

These watercourses may have status under the drainage act, a by-law may be required under the Drainage Superintendent process. Please contact the drainage superintendent to confirm status.

Endangered and Threatened Species - the EIS for each site will need to address the endangered and threatened species habitat. The database indicates that there are bobolinks, butternuts, barn swallows and bank swallows present in the area however the EIS will need to address all potential species.

RVCA

- Water Quality Control should provide enhanced treatment (80% TSS removal).
- Water course setbacks of 30 metres to be maintained.

- Any alterations to existing watercourses would require a permit from the Conservation Authority (albeit not proposed at the meeting). A small watercourse is identified as draining to the storm pond south of the site, and enclosure of this feature would be considered an alteration to a watercourse.

****

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

These pre-consultation comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change.

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

Regards,

Mélanie Gervais *MCIP, RPP*
Planner / Urbaniste
Development Review /
Examen des demandes d'aménagement
Planning, Infrastructure and Economic Development Department /
Services de la planification, de l'infrastructure et du développement économique
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Mail Code: 01-14

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Amr Salem

From: Brandon Chow
Sent: March 11, 2020 1:37 PM
To: Amr Salem
Subject: FW: 4055/4120 Russell Road
Attachments: p&p05.pdf; p&p06.pdf; details01.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

fyi

Brandon Chow
Project Coordinator / Intermediate Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.532
fax: (613) 836-7183
email: bchow@DSEL.ca

From: Oram, Cody <Cody.Oram@ottawa.ca>
Sent: January 22, 2020 3:21 PM
To: Matt Wingate <MWingate@dsel.ca>
Cc: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>; Gervais, Melanie <Melanie.Gervais@ottawa.ca>; jamie.batchelor@rvca.ca
Subject: RE: 4055/4120 Russell Road

Hi Matt,
Please find the servicing comments below in response to your information requests:

Watermain:

- Request for boundary conditions have been sent. I'll pass along the results when received.

Storm Drainage:

- As confirmed with the RCVA – for stormwater management, the report should be prepared with reference to Section 3.0 of the MOE Stormwater Manual to determine the environmental design criteria required for the site. This includes consideration of the water balance, water quality, erosion control/geomorphology, and water quantity. When it comes to water quantity, the manual itself says that "generally, accepted criteria are that maximum peak flow rates must not exceed pre-development values for storms with return periods ranging from 2 to 100

years". The appropriate water quality criteria for this area is enhanced (80% TSS removal). The Conservation Authority encourages the use of LID technologies where feasible. Given that the outlets will likely be to the Mather Award Ditch portion which meanders and where erosion is likely a concern, the stormwater management plan will have to demonstrate that erosion will not be exacerbated. This will require confirmation that the stormwater will not exceed the erosion threshold for this section of the watercourse.

- The minimum setbacks from any watercourse for this area will be 30 metres from the normal highwater mark, 15 metres from top of bank or that determined by a geotechnical study (whichever is the greater of all the setbacks). The geotechnical report will need to be completed in accordance with the MNR Technical Guides for Natural Hazards and an appropriate Limit of Hazard Lands identified for the site. There will be no encroachment into the setbacks for structures, roads, parking areas etc. The RVCA will be requiring fencing along the perimeter of the site and the setback.
- All five phases of the work described in the McEwen Report have been completed.

Wastewater:

- For 4120, the preference would be either to install a sanitary sewer along Russel Road or to negotiate with the neighbouring property and the City to allow access to one of the existing chambers on the south side of the properties that front onto Belgreen Drive. The Hunt Club outlet is only a 250mm sewer and is likely inadequate.
- For 4055, no direct connections to the trunk sewer are permitted, however, connections to an existing MH/shaft on the trunk sewer is permissible.
- There appears to be an existing 225mm buried drop pipe @ MH13 (MHSA00545 – and should be field verified, refer to attached drawings) which may be a servicing option, especially for 4120 Russel Road if an easement or property issues to the sewer north of the property prove problematic.

Please note, all plans attached are for reference only. It is the Consultant's responsibility to verify the information in the field.

Should you have any questions or concerns, please do not hesitate to contact me.

Regards,
Cody

Cody Oram, P.Eng. Senior Engineer
Development Review, South Services
Planning, Infrastructure and Economic Development Department | Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste **13422**, fax/téléc:613-580-2576, cody.oram@ottawa.ca

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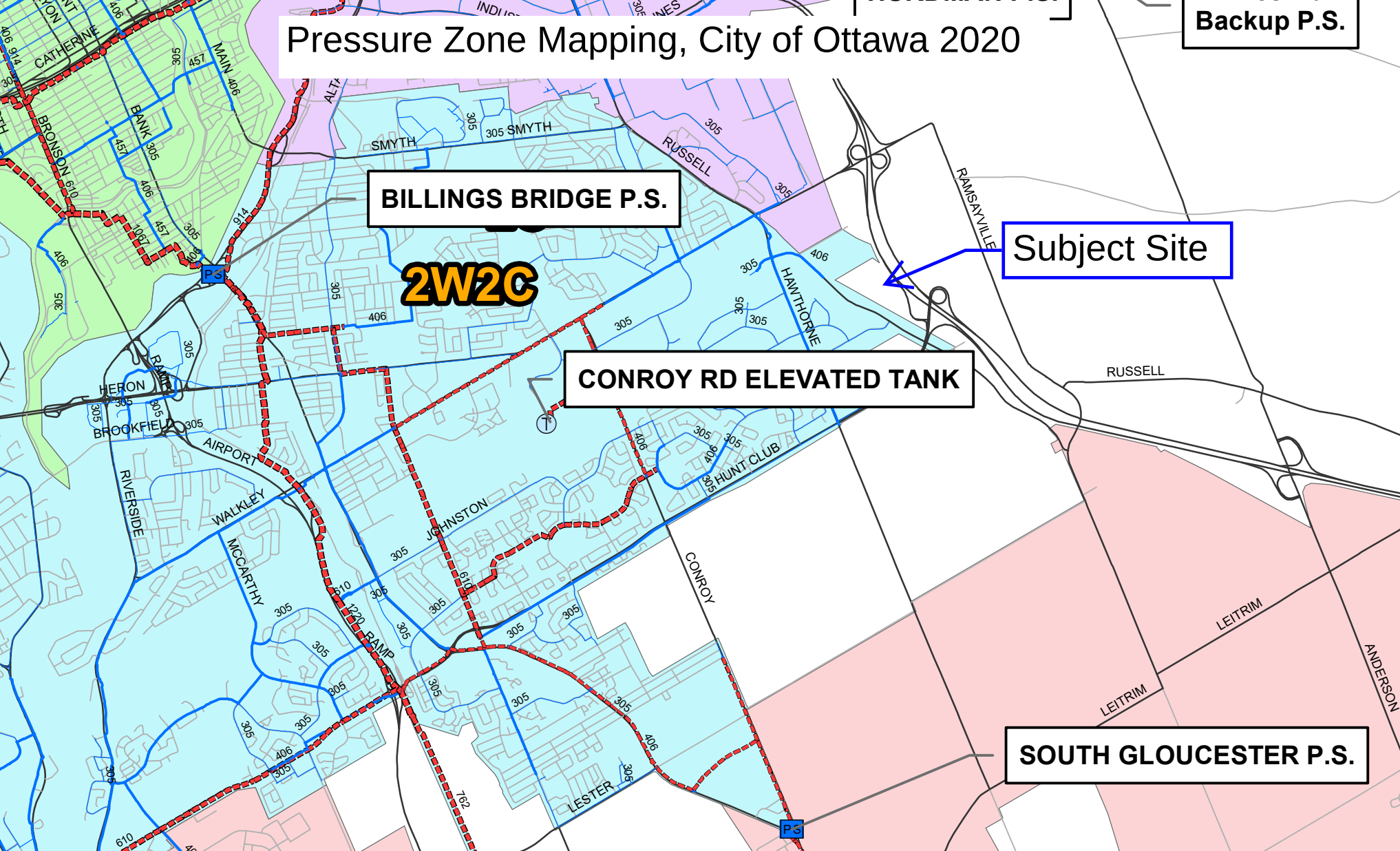
From: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Sent: January 14, 2020 9:04 AM
To: Oram, Cody <Cody.Oram@ottawa.ca>
Subject: FW: 4055/4120 Russell Road

APPENDIX B

Water Supply


Pressure Zone Mapping, City of Ottawa 2020
Backup P.S.
BILLINGS BRIDGE P.S.
2W2C
Subject Site
CONROY RD ELEVATED TANK
SOUTH GLOUCESTER P.S.
SMYTH
RUSSELL
RAMSAYVILLE
HAWTHORNE
HUNT CLUB
CONROY
LEITRIM
ANDERSON
LESTER
JOHNSTON
AIRPORT
WALKLEY
RIVERSIDE
MCCARTHY
HERON
BROOKFIELD
BRONSON
BANK
MAIN
CATHERINE
P3

4055 Russell Road - Site 3
Proposed Site Conditions

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5 $L/m^2/d$	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75 $L/9.3m^2/d$	4,487	36.19	25.1	54.3	37.7	97.7	67.8
Restaurant*	125 L/seat/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d	8.25	288.63	200.4	432.9	300.7	779.3	541.2
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
		Total I/CI Demand	324.8	225.6	487.2	338.4	877.0	609.0
		Total Demand	**324.8**	**225.6**	**487.2**	**338.4**	**877.0**	**609.0**

* Estimated number of seats at 1 seat per $9.3m^2$

4055 Russell Road - Site 3, BLDG A1
Proposed Site Conditions

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5 $L/m^2/d$	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75 $L/9.3m^2/d$	2,412	19.45	13.5	29.2	20.3	52.5	36.5
Restaurant*	125 L/seat/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d	5.69	199.15	138.3	298.7	207.4	537.7	373.4
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
		Total I/CI Demand	218.6	151.8	327.9	227.7	590.2	409.9
		Total Demand	**218.6**	**151.8**	**327.9**	**227.7**	**590.2**	**409.9**

* Estimated number of seats at 1 seat per $9.3m^2$

4055 Russell Road - Site 3, BLDG A2
Proposed Site Conditions

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5 $L/m^2/d$	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75 $L/9.3m^2/d$	786	6.34	4.4	9.5	6.6	17.1	11.9
Restaurant*	125 L/seat/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d	1.14	39.74	27.6	59.6	41.4	107.3	74.5
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
	Total I/CI Demand		46.1	32.0	69.1	48.0	124.4	86.4
	Total Demand		**46.1**	**32.0**	**69.1**	**48.0**	**124.4**	**86.4**

* Estimated number of seats at 1 seat per $9.3m^2$

4055 Russell Road - Site 3, BLDG B
Proposed Site Conditions

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5 $L/m^2/d$	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75 $L/9.3m^2/d$	1,289	10.40	7.2	15.6	10.8	28.1	19.5
Restaurant*	125 L/seat/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d	1.42	49.74	34.5	74.6	51.8	134.3	93.3
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
		Total I/CI Demand	60.1	41.8	90.2	62.6	162.4	112.8
		Total Demand	**60.1**	**41.8**	**90.2**	**62.6**	**162.4**	**112.8**

* Estimated number of seats at 1 seat per $9.3m^2$

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Fire-Resistive Construction **Modified fire resistive per Tech Bulletin ISTB-2018-02*

C	0.6		*Type of Construction Coefficient per FUS Part II, Section 1*
A	59323.1	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	32150.4	L/min
	32000.0	**L/min** *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**27200.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%
Reduction	**-13600 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	>45m	32	2	64	0%	
S	Non-Combustible	>45m	229	0	0	0%	
E	Non-Combustible	>45m	186	0	0	0%	
W	Non-Combustible	>45m	40	0	0	0%	
		% Increase				**0%**	*value not to exceed 75%*

Increase	**0.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	13600.0	L/min *fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section*
	14000.0	**L/min** *rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.
-Calculations based on Fire Underwriters Survey - Part II

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Fire-Resistive Construction **Modified fire resistive per Tech Bulletin ISTB-2018-02*

C	0.6		*Type of Construction Coefficient per FUS Part II, Section 1*
A	12140.9	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	14544.5	L/min	
	15000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**12750.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%
Reduction	**-6375 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	>45m	0	0	0	0%	
S	Non-Combustible	>45m	43	0	0	0%	
E	Non-Combustible	>45m	0	0	0	0%	
W	Non-Combustible	>45m	408	0	0	0%	
		% Increase				**0%**	*value not to exceed 75%*

Increase	**0.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	6375.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	6000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.
-Calculations based on Fire Underwriters Survey - Part II

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Fire-Resistive Construction **Modified fire resistive per Tech Bulletin ISTB-2018-02*

C	0.6		*Type of Construction Coefficient per FUS Part II, Section 1*
A	15500.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	16433.9	L/min	
	16000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**13600.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%
Reduction	**-6800 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	>45m	43	2	86	0%	
S	Non-Combustible	>45m	31	1	31	0%	
E	Non-Combustible	>45m	0	0	0	0%	
W	Non-Combustible	>45m	142	2	284	0%	
		% Increase				**0%**	*value not to exceed 75%*

Increase	**0.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	6800.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	7000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.
-Calculations based on Fire Underwriters Survey - Part II

Boundary Conditions Unit Conversion

Connection 1 (Northern)

Grnd Elev 75

	m H_2O	PSI	kPa	
Avg. Day	**130.2**	78.5	541.5	
Peak Hour	**123.6**	69.1	476.8	
Max Day + FF	**120.2**	64.3	443.4	*FF = 233 L/s*

Connection 1 (Southern)

Grnd Elev 71

	m H_2O	PSI	kPa	
Avg. Day	**130.2**	84.2	580.8	
Peak Hour	**123.6**	74.8	516.0	
Max Day + FF	**119.1**	68.4	471.9	*FF = 233 L/s*

Minor Loss Coefficients

Fitting	Loss Coefficient
Globe valve, fully open	10
Angle valve, fully open	5
Swing check valve, fully open	2.5
Gate valve, fully open	0.2
Short-radius elbow	0.9
Medium-radius elbow	0.8
Long-radius elbow	0.6
45 degree elbow	0.4
Closed return bend	2.2
Standard tee - flow through run	0.6
Standard tee - flow through branch	1.8
Square Entrance	0.5
Exit	1

*Minor loss coefficients based on EPANET 2 USERS MANUAL, dated September 2000

Pipe Diameter vs. "C" Factor

Pipe Diameter (m)	C-Factor
150	100
200 to 250	110
300 to 600	120
Over 600	130

Node Pressures

Kpa	Pressure (kPa)	Pressure (m H20)
Max	552	56.3
Rec Max	480	49.0
Rec Min	350	35.7
Min	275	28.1

Location	Average Day (L/min)	Max Day + Fire Flow BLDG A1 (L/min)	Max Day + Fire Flow BLDG A2 (L/min)	Max Day + Fire Flow BLDG B (L/min)	Peak Hour (L/min)
N6 - BLDG A1	151.8	227.7	227.7	227.7	409.9
N10 - BLDG A2	32.0	48.0	48.0	48.0	86.4
N19 - BLDG B	41.8	62.6	62.6	62.6	112.8
H1	0.0	5700.0	0.0	0.0	0.0
H2	0.0	2600.0	0.0	0.0	0.0
H3	0.0	0.0	3000.0	0.0	0.0
H4	0.0	0.0	3000.0	0.0	0.0
H5	0.0	5700.0	0.0	0.0	0.0
H8	0.0	0.0	0.0	3500.0	0.0
H9	0.0	0.0	0.0	3500.0	0.0

Location	Average Day (kPa)	Max Day + Fire Flow BLDG A1 (L/min)	Max Day + Fire Flow BLDG A2 (L/min)	Max Day + Fire Flow BLDG B (L/min)	Peak Hour (kPa)
H1	591.2	237.0	474.8	475.8	526.2
H2	609.2	367.5	480.5	482.1	544.2
H3	624.5	386.8	396.2	461.3	559.2
H4	624.3	386.7	396.0	457.5	559.0
H5	611.1	260.1	457.9	439.5	545.7
H6	617.1	444.0	485.8	470.1	552.2
H7	623.5	388.1	464.3	433.9	558.2
H8	622.6	394.2	467.6	354.3	557.3
H9	622.6	400.1	471.3	354.3	557.4
N1	564.8	462.0	466.0	466.1	500.0
N10	620.0	382.4	425.9	452.1	554.7
N11	625.1	387.7	464.8	448.5	559.8
N12	624.1	385.4	466.5	451.8	558.8
N13	621.9	381.7	468.7	450.3	556.5
N14	620.4	408.5	475.4	450.3	555.2
N15	618.0	444.9	486.7	471.0	553.1
N16	605.0	493.4	495.2	494.5	540.2
N17	623.2	387.8	464.0	433.6	557.9
N18	621.2	386.6	462.5	425.9	555.8
N19	618.0	383.5	459.4	422.7	552.6
N2	585.9	359.1	469.5	470.5	520.9
N20	621.5	393.0	466.5	391.8	556.1
N21	621.5	399.0	470.1	391.8	556.2
N3	608.4	370.8	479.7	481.3	543.4
N4	616.8	379.0	458.1	461.2	551.5
N5	618.7	380.1	460.8	448.0	553.3
N6	605.2	366.6	447.2	434.6	539.6
N7	623.1	385.4	425.3	459.9	557.8
N8	623.0	385.4	425.0	456.3	557.7
N9	623.0	385.4	428.9	455.2	557.7

Alison Gosling

From: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Sent: May 6, 2021 10:07 AM
To: Alison Gosling
Subject: RE: 4120 Russell Road Site 3 - Boundary condition request
Attachments: 4120 Russel Road May 2021.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Alison,

Please see the attached and below for boundary conditions.

Let me know if you require anything further.

Jeff Shillington, P.Eng.
Senior Project Manager, Development Review, South Branch
Planning, Infrastructure and Economic Development
City of Ottawa
tel: 580-2424 x 16960
email: jeff.shillington@ottawa.ca

The following are boundary conditions, HGL, for hydraulic analysis at 4120 Russell (zone 2W2C) assumed to be looped and connected to the 406mm on Russell Road and 305mm on Belgreen Drive (see attached PDF for location).

Both Connections:

Minimum HGL = 123.6 m

Maximum HGL = 130.2 m

Fire Flow Analysis:

Please note the following analysis assumed the proposed 406mm extension along Russell Road as requested.

Russell Road Connection: Max Day + Fire Flow (233 L/s) = 120.2 m

Belgreen Drive Connection: Max Day + Fire Flow (233 L/s) = 119.1 m

The maximum pressure at the Belgreen connection is estimated to be more than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

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.

From: Alison Gosling <AGosling@dsel.ca>
Sent: April 28, 2021 1:09 PM
To: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Subject: 4120 Russell Road Site 3 - Boundary condition request

Good afternoon Jeff,

We would like to request water boundary conditions for 4120 Russell Road – Site 3 using the following proposed development demands:

1. Location of Service / Street Number: 4120 Russell Road

2. Type of development and the amount of fire flow required for the proposed development:

- The proposed Phased development is mixed use office/industrial. The full build-out proposes 4,487 m^2 of office space and 8.23 ha of industrial space.
- It is anticipated that the development will have a dual connection to be serviced from the existing (and future) 406 mm diameter watermain within Russell Road, as shown by the attached map.
- Fire demand based on Technical Bulletin ISTB-2018-02 has been used to estimate the max fire demand of ***14,000 L/min***. Refer to the attached for detailed calculations.

3.

	L/min	L/s
Avg. Daily	225.2	3.75
Max Day	337.8	5.63
Peak Hour	608.0	10.13

It you have any questions please feel free to contact me.

Thank you,

Alison Gosling, P.Eng.
Junior Project Manager

DSEL

david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

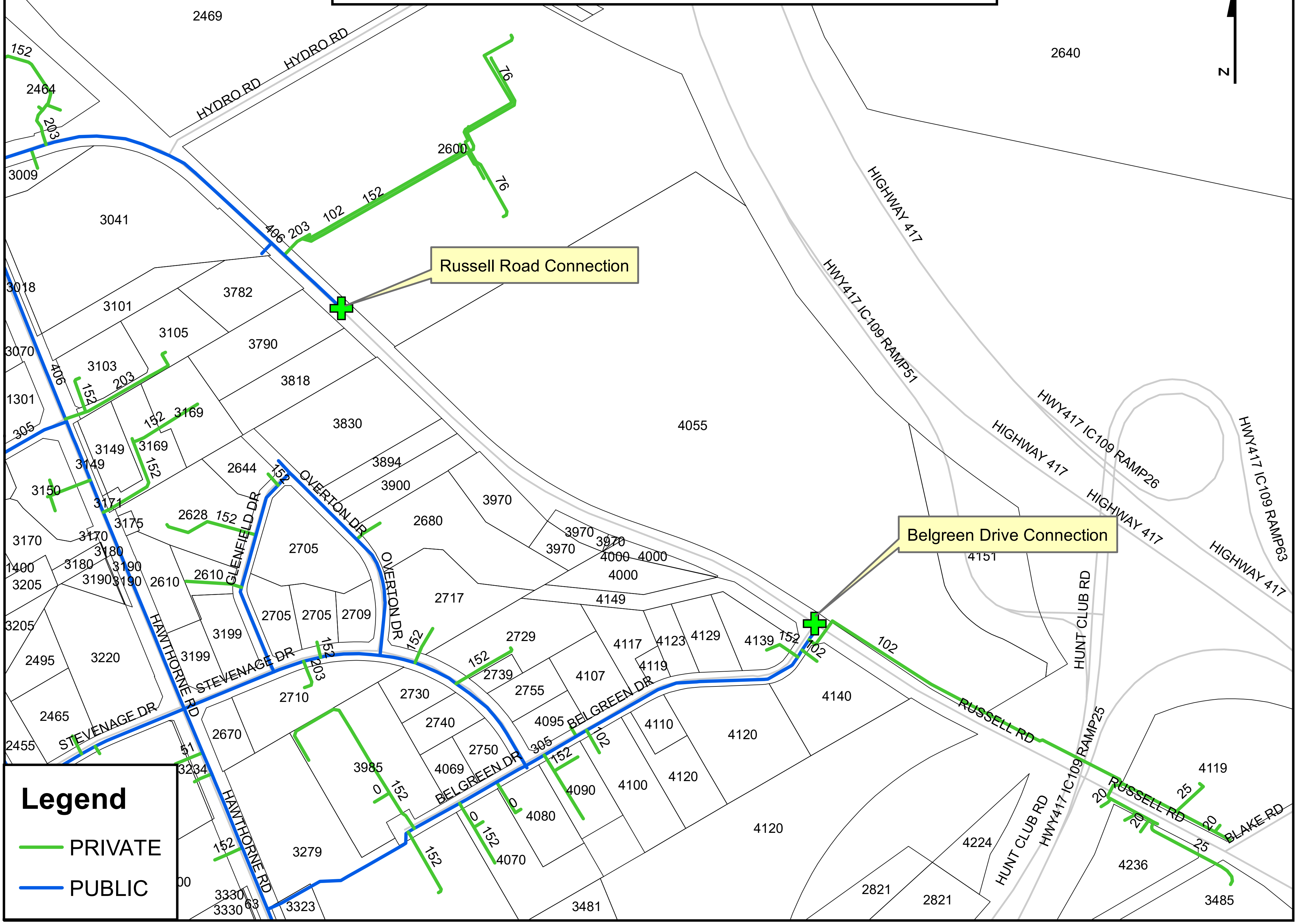
cell: (343) 542-9218
email: agosling@dsel.ca

Please note that I will be working remotely given the current circumstances. Please send me an email should you wish to discuss over the phone and I will return your call as soon as possible.

'

'

Boundary Conditions for 4120 Russell Road



```
[TITLE]


[JUNCTIONS]
;ID                  Elev            Demand          Pattern
 N1                  72.63           0                                ;
 N2                  70.48           0                                ;
 N3                  68.18           0                                ;
 N4                  67.32           0                                ;
 N7                  66.67           0                                ;
 H3                  66.53           0                                ;
 N8                  66.68           0                                ;
 H4                  66.55           0                                ;
 N9                  66.68           0                                ;
 N10                 66.99           31                               ;
 H1                  69.94           0                                ;
 H2                  68.10           0                                ;
 N11                 66.47           0                                ;
 N17                 66.66           0                                ;
 H7                  66.63           0                                ;
 N18                 66.87           0                                ;
 N19                 67.19           42.1                             ;
 N20                 66.84           0                                ;
 H8                  66.72           0                                ;
 N21                 66.84           0                                ;
 H9                  66.72           0                                ;
 N12                 66.57           0                                ;
 N5                  67.12           0                                ;
 N6                  68.49           152.1                            ;
 N13                 66.8            0                                ;
 H5                  67.90           0                                ;
 N14                 66.95           0                                ;
 N15                 67.19           0                                ;
 H6                  67.28           0                                ;
 N16                 68.53           0                                ;

[RESERVOIRS]
;ID                  Head            Pattern
 32                  130.2                           ;
 33                  130.2                           ;

[TANKS]
;ID                  Elevation       InitLevel       MinLevel        MaxLevel
        Diameter        MinVol          VolCurve

[PIPES]
;ID                  Node1                   Node2                   Length
        Diameter        Roughness       MinorLoss       Status
 P2                  N1                      N2                      84
        200             110             2.4             Open    ;
```

```
P4                N2                N3                67.25
      200         110         0.6         Open    ;
P3                H1                N2                15.5
      150         100         5.9         Open    ;
P5                H2                N3                6.5
      150         100         0           Open    ;
P6                N3                N4                166.6
      200         110         1           Open    ;
P10               N4                N7                176.7
      200         110         2.2         Open    ;
P11               H3                N7                8.2
      150         100         5.9         Open    ;
P12               N7                N8                83.6
      200         110         0.6         Open    ;
P13               H4                N8                7.9
      150         100         5.9         Open    ;
P14               N8                N9                23.6
      200         110         0.6         Open    ;
P15               N9                N10               8.6
      200         110         2           Open    ;
P16               N9                N11               221.5
      200         110         1.2         Open    ;
P7                N4                N5                294
      200         110         0.6         Open    ;
P8                N5                N6                28.4
      200         110         2           Open    ;
P9                N5                N12               38
      200         110         1.2         Open    ;
P17               N12               N11               36.2
      200         110         0.8         Open    ;
P25               N11               N17               38.7
      200         110         2.2         Open    ;
P26               H7                N17               2.8
      150         100         5.9         Open    ;
P27               N17               N18               19.7
      200         110         0.6         Open    ;
P28               N18               N19               7.5
      200         110         2           Open    ;
P29               N18               N20               139.5
      200         110         1.4         Open    ;
P30               H8                N20               5.9
      150         100         5.9         Open    ;
P31               N20               N21               143.4
      200         110         0.6         Open    ;
P32               N21               H9                5.9
      150         100         5.9         Open    ;
P18               N12               N13               38.9
      200         110         0.8         Open    ;
P19               H5                N13               9.4
      150         100         5.9         Open    ;
```

```
 P20                    N13                    N14                    75
        200             110             0.6             Open    ;
 P33                    N21                    N14                    237.3
        200             110             3.2             Open    ;
 P24                    32                     N16                    103.5
        400             110             1.8             Open    ;
 P23                    N16                    N15                    89.2
        200             110             2               Open    ;
 P22                    N15                    H6                     6
        150             100             5.9             Open    ;
 P21                    N15                    N14                    56.4
        200             110             1.2             Open    ;
 P1                     33                     N1                     99.6
        400             110             1               Open    ;

[PUMPS]
;ID                    Node1                  Node2                  Parameters

[VALVES]
;ID                    Node1                  Node2                  Diameter
        Type    Setting         MinorLoss

[TAGS]

[DEMANDS]
;Junction              Demand          Pattern                Category

[STATUS]
;ID                    Status/Setting

[PATTERNS]
;ID                    Multipliers

[CURVES]
;ID                    X-Value         Y-Value

[CONTROLS]

[RULES]

[ENERGY]
 Global Efficiency     75
 Global Price          0
 Demand Charge         0

[EMITTERS]
;Junction              Coefficient

[QUALITY]
;Node                  InitQual
```

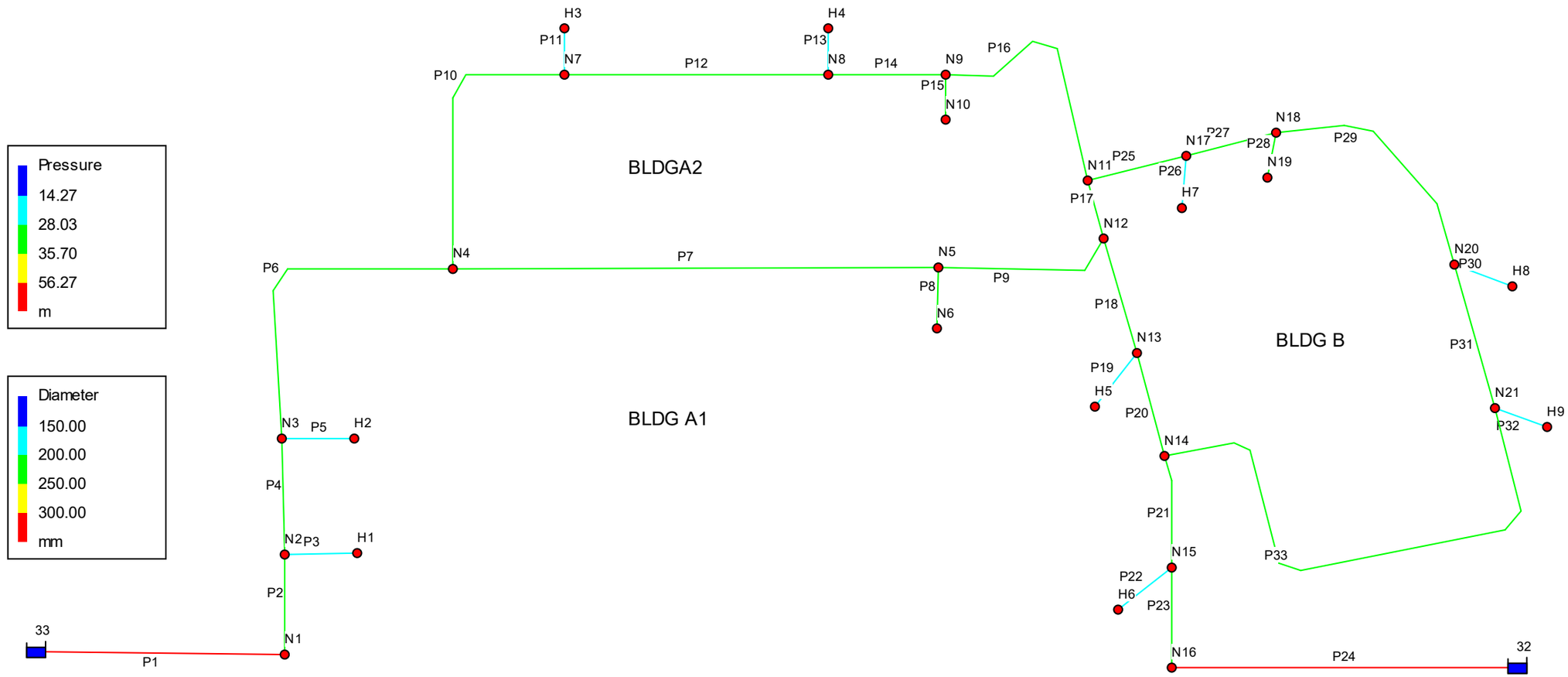
```
[SOURCES]
;Node                   Type            Quality         Pattern

[REACTIONS]
;Type           Pipe/Tank               Coefficient


[REACTIONS]
 Order Bulk             1
 Order Tank             1
 Order Wall             1
 Global Bulk            0
 Global Wall            0
 Limiting Potential     0
 Roughness Correlation  0

[MIXING]
;Tank                   Model

[TIMES]
 Duration               0
 Hydraulic Timestep     1:00
 Quality Timestep       0:05
 Pattern Timestep       1:00
 Pattern Start          0:00
 Report Timestep        1:00
 Report Start           0:00
 Start ClockTime        12 am
 Statistic              None

[REPORT]
 Status                 No
 Summary                No
 Page                   0

[OPTIONS]
 Units                  LPM
 Headloss               H-W
 Specific Gravity       1
 Viscosity              1
 Trials                 40
 Accuracy               0.001
 CHECKFREQ              2
 MAXCHECK               10
 DAMPLIMIT              0
 Unbalanced             Continue 10
 Pattern                1
 Demand Multiplier      1.0
 Emitter Exponent       0.5
```

```
 Quality                 None mg/L
 Diffusivity             1
 Tolerance               0.01

[COORDINATES]
;Node                    X-Coord                 Y-Coord
 N1                      1942.89                 2441.21
 N2                      1942.89                 3505.04
 N3                      1909.29                 4736.84
 N4                      3734.60                 6550.95
 N7                      4921.61                 8622.62
 H3                      4932.81                 9115.34
 N8                      7743.56                 8622.62
 H4                      7743.56                 9126.54
 N9                      8997.76                 8622.62
 N10                     8997.76                 8141.10
 H1                      2717.06                 3516.84
 H2                      2686.77                 4748.39
 N11                     10509.52                7491.60
 N17                     11570.10                7756.61
 H7                      11519.63                7201.40
 N18                     12529.10                8008.98
 N19                     12428.15                7534.53
 N20                     14428.89                6595.74
 H8                      15044.79                6371.78
 N21                     14854.42                5061.59
 H9                      15414.33                4860.02
 N12                     10677.49                6875.70
 N5                      8919.37                 6562.15
 N6                      8905.10                 5919.38
 N13                     11035.83                5655.10
 H5                      10590.92                5081.52
 N14                     11326.99                4557.67
 N15                     11405.38                3359.46
 H6                      10843.28                2911.16
 N16                     11405.38                2295.63
 32                      15100.78                2295.63
 33                      -722.28                 2463.61

[VERTICES]
;Link                    X-Coord                 Y-Coord
 P6                      1808.51                 6326.99
 P6                      1976.48                 6550.95
 P10                     3734.60                 8376.26
 P10                     3880.18                 8622.62
 P16                     9501.68                 8611.42
 P16                     9927.21                 8980.96
 P16                     10184.77                8902.58
 P9                      10487.12                6539.75
 P29                     13253.08                8085.11
```

```
 P29                    13566.63               8029.12
 P29                    14238.52               7245.24
 P33                    15134.38               3975.36
 P33                    14966.41               3773.80
 P33                    12782.75               3325.87
 P33                    12558.79               3404.26
 P33                    12245.24               4613.66
 P33                    12077.27               4692.05
 P21                    11405.38               4288.91

[LABELS]
;X-Coord            Y-Coord          Label & Anchor Node
 -666.29          1959.69          "average day = 130.2m"
 -688.69          1612.54          "max day + fire flow = 120.2m"
 13533.03         1903.70          "average day = 130.2m"
 13477.04         1567.75          "max day + fire flow = 119.1m"
 13477.04         1254.20          "peak hour = 123.6m"
 -677.49          1310.19          "peak hour = 123.6m"
 5604.70          7749.16          "BLDGA2"
 5604.70          5061.59          "BLDG A1"
 12525.20         5901.46          "BLDG B"

[BACKDROP]
 DIMENSIONS             0.00                   0.00                   10000.00
        10000.00
 UNITS                  None
 FILE
 OFFSET                 0.00                   0.00

[END]
```

SITE 3 - AVERAGE DAY DEMAND

Day 1, 12:00



average day = 130.2m

max day + fire flow = 120.2m

peak hour = 123.6m

average day = 130.2m

max day + fire flow = 119.1m

peak hour = 123.6m

```
******************************************************************
*                            E P A N E T                         *
*                     Hydraulic and Water Quality                *
*                     Analysis for Pipe Networks                 *
*                          Version 2.0                           *
******************************************************************

Input File: 2021-05-11_1155_avg.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
P2	N1	N2	84	200
P4	N2	N3	67.25	200
P3	H1	N2	15.5	150
P5	H2	N3	6.5	150
P6	N3	N4	166.6	200
P10	N4	N7	176.7	200
P11	H3	N7	8.2	150
P12	N7	N8	83.6	200
P13	H4	N8	7.9	150
P14	N8	N9	23.6	200
P15	N9	N10	8.6	200
P16	N9	N11	221.5	200
P7	N4	N5	294	200
P8	N5	N6	28.4	200
P9	N5	N12	38	200
P17	N12	N11	36.2	200
P25	N11	N17	38.7	200
P26	H7	N17	2.8	150
P27	N17	N18	19.7	200
P28	N18	N19	7.5	200
P29	N18	N20	139.5	200
P30	H8	N20	5.9	150
P31	N20	N21	143.4	200
P32	N21	H9	5.9	150
P18	N12	N13	38.9	200
P19	H5	N13	9.4	150
P20	N13	N14	75	200
P33	N21	N14	237.3	200
P24	32	N16	103.5	400
P23	N16	N15	89.2	200
P22	N15	H6	6	150
P21	N15	N14	56.4	200
P1	33	N1	99.6	400

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
N1	0.00	130.20	57.57	0.00	
N2	0.00	130.20	59.72	0.00	
N3	0.00	130.20	62.02	0.00	
N4	0.00	130.19	62.87	0.00	
N7	0.00	130.19	63.52	0.00	
H3	0.00	130.19	63.66	0.00	
N8	0.00	130.19	63.51	0.00	
H4	0.00	130.19	63.64	0.00	
N9	0.00	130.19	63.51	0.00	
N10	31.00	130.19	63.20	0.00	
H1	0.00	130.20	60.26	0.00	
H2	0.00	130.20	62.10	0.00	
N11	0.00	130.19	63.72	0.00	
N17	0.00	130.19	63.53	0.00	
H7	0.00	130.19	63.56	0.00	
N18	0.00	130.19	63.32	0.00	
N19	42.10	130.19	63.00	0.00	
N20	0.00	130.19	63.35	0.00	
H8	0.00	130.19	63.47	0.00	
N21	0.00	130.19	63.35	0.00	
H9	0.00	130.19	63.47	0.00	
N12	0.00	130.19	63.62	0.00	
N5	0.00	130.19	63.07	0.00	
N6	152.10	130.18	61.69	0.00	
N13	0.00	130.19	63.39	0.00	
H5	0.00	130.19	62.29	0.00	
N14	0.00	130.19	63.24	0.00	
N15	0.00	130.19	63.00	0.00	
H6	0.00	130.19	62.91	0.00	
N16	0.00	130.20	61.67	0.00	
32	-130.07	130.20	0.00	0.00	Reservoir
33	-95.13	130.20	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
P2	95.13	0.05	0.03	Open
P4	95.13	0.05	0.03	Open
P3	0.00	0.00	0.00	Open

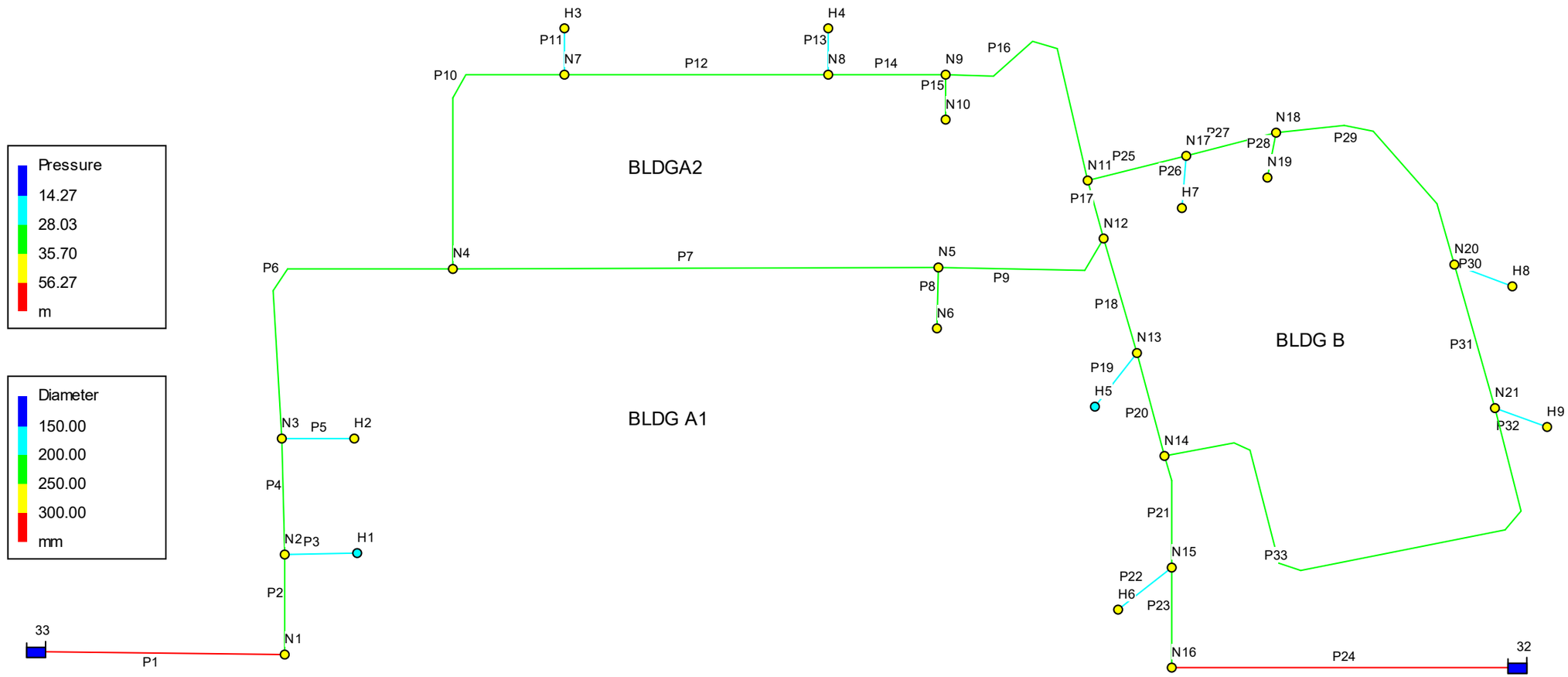
P5	0.00	0.00	0.00	Open
P6	95.13	0.05	0.03	Open
P10	40.02	0.02	0.01	Open
P11	0.00	0.00	0.00	Open
P12	40.02	0.02	0.01	Open
P13	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
P14	40.02	0.02	0.01	Open
P15	31.00	0.02	0.01	Open
P16	9.02	0.00	0.00	Open
P7	55.11	0.03	0.01	Open
P8	152.10	0.08	0.09	Open
P9	-96.99	0.05	0.03	Open
P17	-6.87	0.00	0.00	Open
P25	2.15	0.00	0.00	Open
P26	0.00	0.00	0.00	Open
P27	2.15	0.00	0.00	Open
P28	42.10	0.02	0.01	Open
P29	-39.95	0.02	0.01	Open
P30	0.00	0.00	0.00	Open
P31	-39.95	0.02	0.01	Open
P32	0.00	0.00	0.00	Open
P18	-90.12	0.05	0.03	Open
P19	0.00	0.00	0.00	Open
P20	-90.12	0.05	0.03	Open
P33	-39.95	0.02	0.01	Open
P24	130.07	0.02	0.00	Open
P23	130.07	0.07	0.06	Open
P22	0.00	0.00	0.00	Open
P21	130.07	0.07	0.06	Open
P1	95.13	0.01	0.00	Open

SITE 3, BLDG A1 - MAX DAY + FIRE FLOW DEMAND

Day 1, 12:00



average day = 130.2m

max day + fire flow = 120.2m

peak hour = 123.6m

average day = 130.2m

max day + fire flow = 119.1m

peak hour = 123.6m

```
******************************************************************
*                            E P A N E T                         *
*                     Hydraulic and Water Quality                *
*                     Analysis for Pipe Networks                 *
*                          Version 2.0                           *
******************************************************************

Input File: 2021-05-11_1155_maxA1.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
P2	N1	N2	84	200
P4	N2	N3	67.25	200
P3	H1	N2	15.5	150
P5	H2	N3	6.5	150
P6	N3	N4	166.6	200
P10	N4	N7	176.7	200
P11	H3	N7	8.2	150
P12	N7	N8	83.6	200
P13	H4	N8	7.9	150
P14	N8	N9	23.6	200
P15	N9	N10	8.6	200
P16	N9	N11	221.5	200
P7	N4	N5	294	200
P8	N5	N6	28.4	200
P9	N5	N12	38	200
P17	N12	N11	36.2	200
P25	N11	N17	38.7	200
P26	H7	N17	2.8	150
P27	N17	N18	19.7	200
P28	N18	N19	7.5	200
P29	N18	N20	139.5	200
P30	H8	N20	5.9	150
P31	N20	N21	143.4	200
P32	N21	H9	5.9	150
P18	N12	N13	38.9	200
P19	H5	N13	9.4	150
P20	N13	N14	75	200
P33	N21	N14	237.3	200
P24	32	N16	103.5	400
P23	N16	N15	89.2	200
P22	N15	H6	6	150
P21	N15	N14	56.4	200
P1	33	N1	99.6	400

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
N1	0.00	119.72	47.09	0.00	
N2	0.00	107.09	36.61	0.00	
N3	0.00	105.98	37.80	0.00	
N4	0.00	105.95	38.63	0.00	
N7	0.00	105.96	39.29	0.00	
H3	0.00	105.96	39.43	0.00	
N8	0.00	105.97	39.29	0.00	
H4	0.00	105.97	39.42	0.00	
N9	0.00	105.97	39.29	0.00	
N10	46.50	105.97	38.98	0.00	
H1	5700.00	94.10	24.16	0.00	
H2	2600.00	105.56	37.46	0.00	
N11	0.00	105.99	39.52	0.00	
N17	0.00	106.19	39.53	0.00	
H7	0.00	106.19	39.56	0.00	
N18	0.00	106.28	39.41	0.00	
N19	63.20	106.28	39.09	0.00	
N20	0.00	106.90	40.06	0.00	
H8	0.00	106.90	40.18	0.00	
N21	0.00	107.51	40.67	0.00	
H9	0.00	107.51	40.79	0.00	
N12	0.00	105.86	39.29	0.00	
N5	0.00	105.87	38.75	0.00	
N6	228.10	105.86	37.37	0.00	
N13	0.00	105.71	38.91	0.00	
H5	5700.00	94.41	26.51	0.00	
N14	0.00	108.59	41.64	0.00	
N15	0.00	112.54	45.35	0.00	
H6	0.00	112.54	45.26	0.00	
N16	0.00	118.83	50.30	0.00	
32	-5822.34	119.10	0.00	0.00	Reservoir
33	-8515.46	120.20	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
P2	8515.46	4.52	150.39	Open
P4	2815.46	1.49	16.56	Open
P3	-5700.00	5.38	838.37	Open

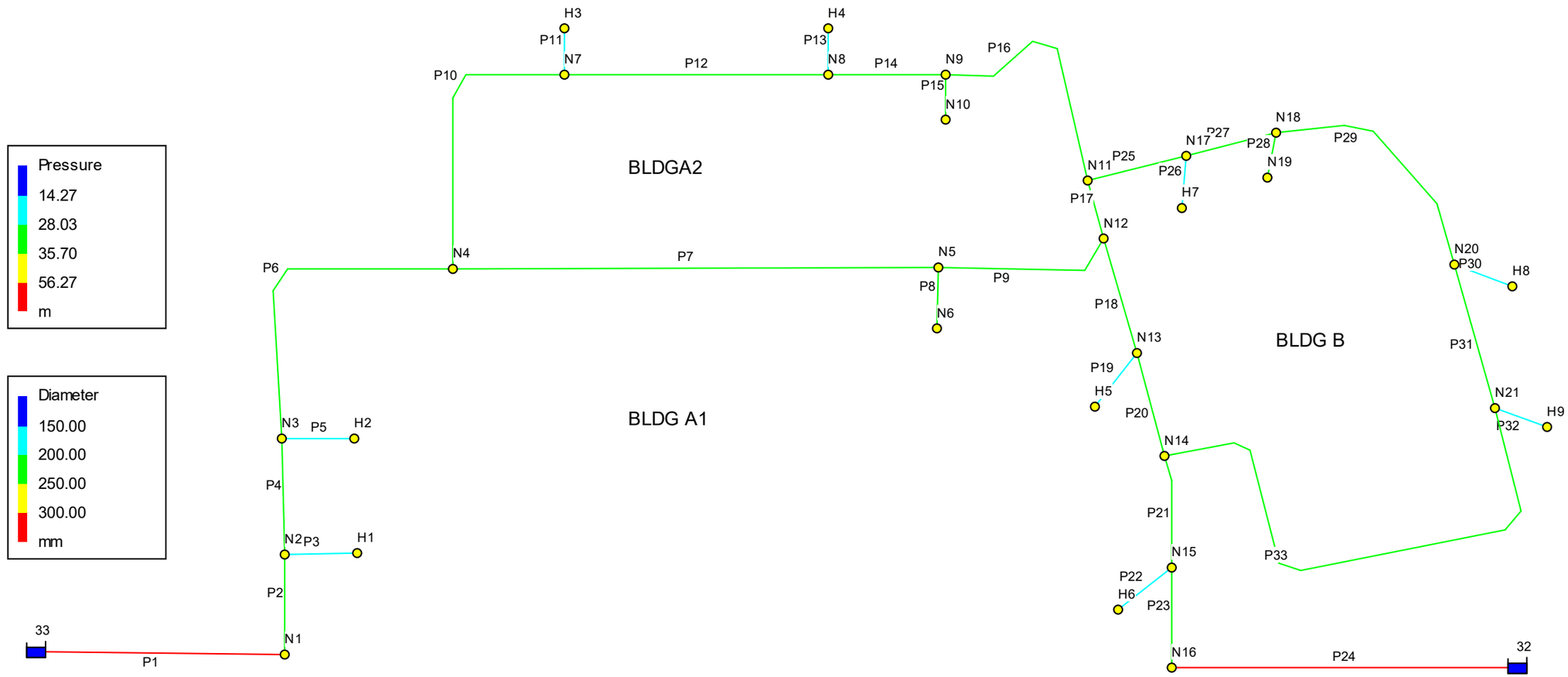
P5	-2600.00	2.45	64.97	Open
P6	215.46	0.11	0.14	Open
P10	-119.31	0.06	0.05	Open
P11	0.00	0.00	0.00	Open
P12	-119.31	0.06	0.05	Open
P13	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status
P14	-119.31	0.06	0.05	Open
P15	46.50	0.02	0.02	Open
P16	-165.81	0.09	0.08	Open
P7	334.77	0.18	0.30	Open
P8	228.10	0.12	0.20	Open
P9	106.67	0.06	0.04	Open
P17	-1153.58	0.61	3.40	Open
P25	-1319.39	0.70	5.24	Open
P26	0.00	0.00	0.00	Open
P27	-1319.39	0.70	4.58	Open
P28	63.20	0.03	0.03	Open
P29	-1382.59	0.73	4.44	Open
P30	0.00	0.00	0.00	Open
P31	-1382.60	0.73	4.28	Open
P32	0.00	0.00	0.00	Open
P18	1260.25	0.67	3.98	Open
P19	-5700.00	5.38	1202.02	Open
P20	-4439.75	2.36	38.39	Open
P33	-1382.60	0.73	4.53	Open
P24	5822.34	0.77	2.57	Open
P23	5822.34	3.09	70.59	Open
P22	0.00	0.00	0.00	Open
P21	5822.34	3.09	70.03	Open
P1	8515.46	1.13	4.78	Open

SITE 3, BLDG A2 - MAX DAY + FIRE FLOW DEMAND

Day 1, 12:00



average day = 130.2m

max day + fire flow = 120.2m

peak hour = 123.6m

average day = 130.2m

max day + fire flow = 119.1m

peak hour = 123.6m

```
******************************************************************
*                            E P A N E T                         *
*                     Hydraulic and Water Quality                *
*                     Analysis for Pipe Networks                 *
*                          Version 2.0                           *
******************************************************************

Input File: 2021-05-11_1155_maxa2.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
P2	N1	N2	84	200
P4	N2	N3	67.25	200
P3	H1	N2	15.5	150
P5	H2	N3	6.5	150
P6	N3	N4	166.6	200
P10	N4	N7	176.7	200
P11	H3	N7	8.2	150
P12	N7	N8	83.6	200
P13	H4	N8	7.9	150
P14	N8	N9	23.6	200
P15	N9	N10	8.6	200
P16	N9	N11	221.5	200
P7	N4	N5	294	200
P8	N5	N6	28.4	200
P9	N5	N12	38	200
P17	N12	N11	36.2	200
P25	N11	N17	38.7	200
P26	H7	N17	2.8	150
P27	N17	N18	19.7	200
P28	N18	N19	7.5	200
P29	N18	N20	139.5	200
P30	H8	N20	5.9	150
P31	N20	N21	143.4	200
P32	N21	H9	5.9	150
P18	N12	N13	38.9	200
P19	H5	N13	9.4	150
P20	N13	N14	75	200
P33	N21	N14	237.3	200
P24	32	N16	103.5	400
P23	N16	N15	89.2	200
P22	N15	H6	6	150
P21	N15	N14	56.4	200
P1	33	N1	99.6	400

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
N1	0.00	120.13	47.50	0.00	
N2	0.00	118.34	47.86	0.00	
N3	0.00	117.08	48.90	0.00	
N4	0.00	114.02	46.70	0.00	
N7	0.00	110.02	43.35	0.00	
H3	3000.00	106.92	40.39	0.00	
N8	0.00	110.00	43.32	0.00	
H4	3000.00	106.92	40.37	0.00	
N9	0.00	110.40	43.72	0.00	
N10	46.50	110.40	43.41	0.00	
H1	0.00	118.34	48.40	0.00	
H2	0.00	117.08	48.98	0.00	
N11	0.00	113.85	47.38	0.00	
N17	0.00	113.96	47.30	0.00	
H7	0.00	113.96	47.33	0.00	
N18	0.00	114.02	47.15	0.00	
N19	63.20	114.02	46.83	0.00	
N20	0.00	114.39	47.55	0.00	
H8	0.00	114.39	47.67	0.00	
N21	0.00	114.76	47.92	0.00	
H9	0.00	114.76	48.04	0.00	
N12	0.00	114.12	47.55	0.00	
N5	0.00	114.09	46.97	0.00	
N6	228.10	114.08	45.59	0.00	
N13	0.00	114.58	47.78	0.00	
H5	0.00	114.58	46.68	0.00	
N14	0.00	115.41	48.46	0.00	
N15	0.00	116.80	49.61	0.00	
H6	0.00	116.80	49.52	0.00	
N16	0.00	119.01	50.48	0.00	
32	-3328.57	119.10	0.00	0.00	Reservoir
33	-3009.23	120.20	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
P2	3009.23	1.60	21.29	Open
P4	3009.23	1.60	18.74	Open
P3	0.00	0.00	0.00	Open

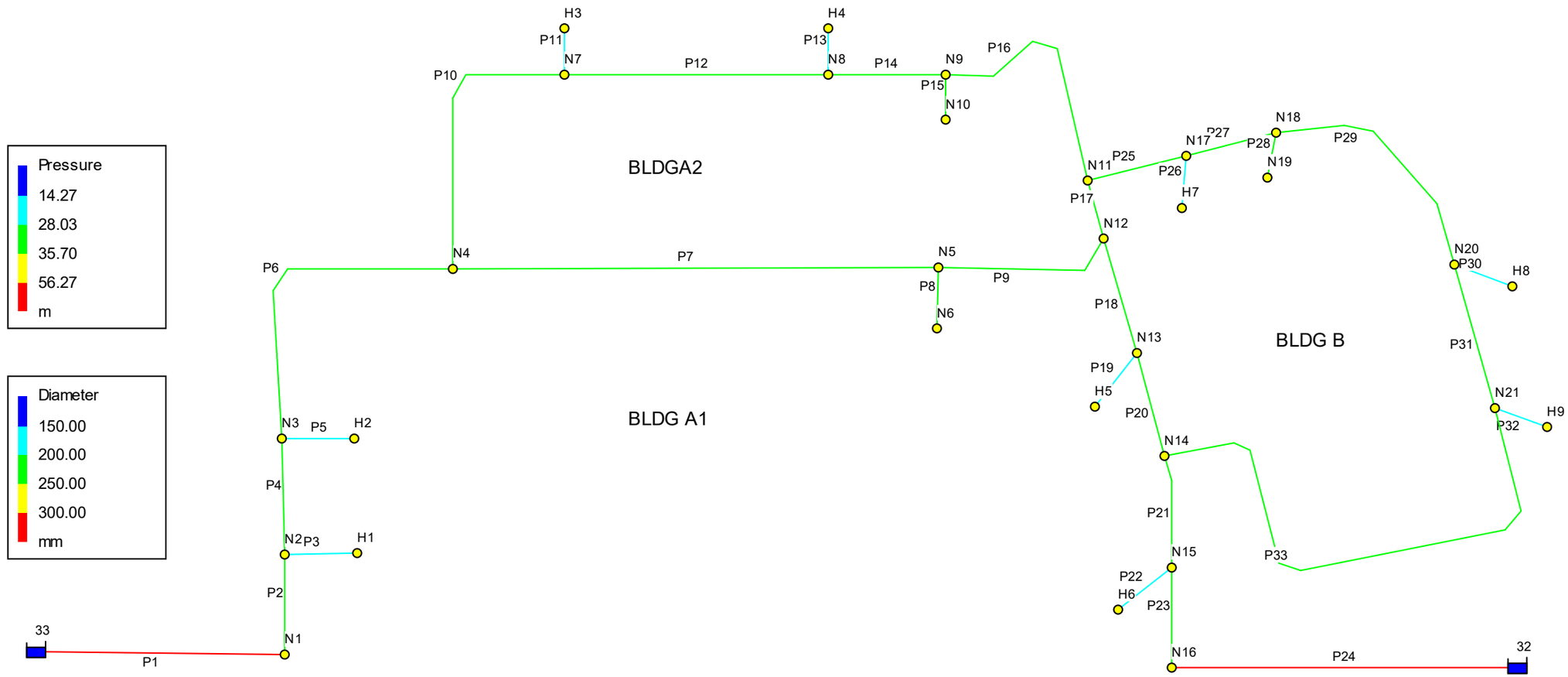
P5	0.00	0.00	0.00	Open
P6	3009.23	1.60	18.36	Open
P10	3289.73	1.75	22.67	Open
P11	-3000.00	2.83	378.10	Open
P12	289.73	0.15	0.24	Open
P13	-3000.00	2.83	389.24	Open

Link Results: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
P14	-2710.27	1.44	17.16	Open
P15	46.50	0.02	0.02	Open
P16	-2756.77	1.46	15.54	Open
P7	-280.51	0.15	0.22	Open
P8	228.10	0.12	0.20	Open
P9	-508.61	0.27	0.77	Open
P17	1764.66	0.94	7.53	Open
P25	-992.10	0.53	3.05	Open
P26	0.00	0.00	0.00	Open
P27	-992.10	0.53	2.68	Open
P28	63.20	0.03	0.03	Open
P29	-1055.30	0.56	2.69	Open
P30	0.00	0.00	0.00	Open
P31	-1055.30	0.56	2.59	Open
P32	0.00	0.00	0.00	Open
P18	-2273.27	1.21	11.98	Open
P19	0.00	0.00	0.00	Open
P20	-2273.27	1.21	11.05	Open
P33	-1055.30	0.56	2.74	Open
P24	3328.57	0.44	0.90	Open
P23	3328.57	1.77	24.75	Open
P22	0.00	0.00	0.00	Open
P21	3328.57	1.77	24.57	Open
P1	3009.23	0.40	0.68	Open

SITE 3, BLDG B - MAX DAY + FIRE FLOW DEMAND

Day 1, 12:00



average day = 130.2m

max day + fire flow = 120.2m

peak hour = 123.6m

average day = 130.2m

max day + fire flow = 119.1m

peak hour = 123.6m

```
******************************************************************
*                            E P A N E T                         *
*                     Hydraulic and Water Quality                *
*                     Analysis for Pipe Networks                 *
*                          Version 2.0                           *
******************************************************************

Input File: 2021-05-11_1155_maxB.net
```

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
P2	N1	N2	84	200
P4	N2	N3	67.25	200
P3	H1	N2	15.5	150
P5	H2	N3	6.5	150
P6	N3	N4	166.6	200
P10	N4	N7	176.7	200
P11	H3	N7	8.2	150
P12	N7	N8	83.6	200
P13	H4	N8	7.9	150
P14	N8	N9	23.6	200
P15	N9	N10	8.6	200
P16	N9	N11	221.5	200
P7	N4	N5	294	200
P8	N5	N6	28.4	200
P9	N5	N12	38	200
P17	N12	N11	36.2	200
P25	N11	N17	38.7	200
P26	H7	N17	2.8	150
P27	N17	N18	19.7	200
P28	N18	N19	7.5	200
P29	N18	N20	139.5	200
P30	H8	N20	5.9	150
P31	N20	N21	143.4	200
P32	N21	H9	5.9	150
P18	N12	N13	38.9	200
P19	H5	N13	9.4	150
P20	N13	N14	75	200
P33	N21	N14	237.3	200
P24	32	N16	103.5	400
P23	N16	N15	89.2	200
P22	N15	H6	6	150
P21	N15	N14	56.4	200
P1	33	N1	99.6	400

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
N1	0.00	120.14	47.51	0.00	
N2	0.00	118.44	47.96	0.00	
N3	0.00	117.24	49.06	0.00	
N4	0.00	114.33	47.01	0.00	
N7	0.00	113.55	46.88	0.00	
H3	0.00	113.55	47.02	0.00	
N8	0.00	113.19	46.51	0.00	
H4	0.00	113.19	46.64	0.00	
N9	0.00	113.08	46.40	0.00	
N10	46.50	113.08	46.09	0.00	
H1	0.00	118.44	48.50	0.00	
H2	0.00	117.24	49.14	0.00	
N11	0.00	112.19	45.72	0.00	
N17	0.00	110.86	44.20	0.00	
H7	0.00	110.86	44.23	0.00	
N18	0.00	110.28	43.41	0.00	
N19	63.20	110.28	43.09	0.00	
N20	0.00	106.78	39.94	0.00	
H8	3500.00	102.84	36.12	0.00	
N21	0.00	106.78	39.94	0.00	
H9	3500.00	102.84	36.12	0.00	
N12	0.00	112.62	46.05	0.00	
N5	0.00	112.79	45.67	0.00	
N6	228.10	112.79	44.30	0.00	
N13	0.00	112.70	45.90	0.00	
H5	0.00	112.70	44.80	0.00	
N14	0.00	112.85	45.90	0.00	
N15	0.00	115.20	48.01	0.00	
H6	0.00	115.20	47.92	0.00	
N16	0.00	118.94	50.41	0.00	
32	-4410.56	119.10	0.00	0.00	Reservoir
33	-2927.24	120.20	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
P2	2927.24	1.55	20.21	Open
P4	2927.24	1.55	17.80	Open
P3	0.00	0.00	0.00	Open

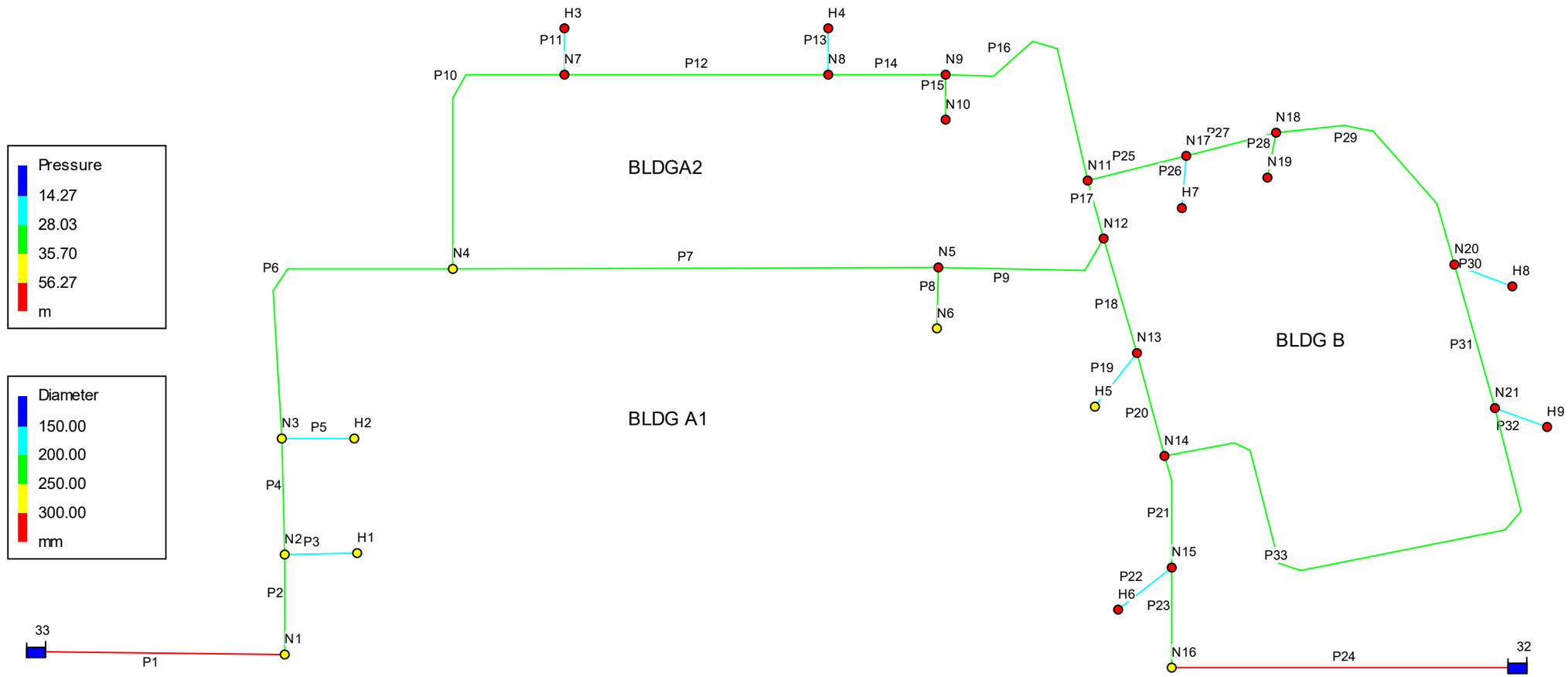
P5	0.00	0.00	0.00	Open
P6	2927.24	1.55	17.44	Open
P10	1373.04	0.73	4.45	Open
P11	0.00	0.00	0.00	Open
P12	1373.04	0.73	4.30	Open
P13	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
P14	1373.04	0.73	4.80	Open
P15	46.50	0.02	0.02	Open
P16	1326.54	0.70	3.99	Open
P7	1554.20	0.82	5.24	Open
P8	228.10	0.12	0.20	Open
P9	1326.10	0.70	4.65	Open
P17	2239.07	1.19	11.76	Open
P25	3565.61	1.89	34.43	Open
P26	0.00	0.00	0.00	Open
P27	3565.61	1.89	29.62	Open
P28	63.20	0.03	0.03	Open
P29	3502.41	1.86	25.05	Open
P30	-3500.00	3.30	667.72	Open
P31	2.41	0.00	0.00	Open
P32	3500.00	3.30	667.73	Open
P18	-912.98	0.48	2.18	Open
P19	0.00	0.00	0.00	Open
P20	-912.98	0.48	2.03	Open
P33	-3497.59	1.86	25.59	Open
P24	4410.56	0.58	1.52	Open
P23	4410.56	2.34	41.94	Open
P22	0.00	0.00	0.00	Open
P21	4410.56	2.34	41.62	Open
P1	2927.24	0.39	0.65	Open

SITE 3 - PEAK HOUR DEMAND

Day 1, 12:00



average day = 130.2m

max day + fire flow = 120.2m

peak hour = 123.6m

average day = 130.2m

max day + fire flow = 119.1m

peak hour = 123.6m

```
******************************************************************
*                            E P A N E T                         *
*                     Hydraulic and Water Quality                *
*                     Analysis for Pipe Networks                 *
*                          Version 2.0                           *
******************************************************************

Input File: 2021-05-11_1155_peak.net
s


Link - Node Table:
------------------------------------------------------------------
Link            Start           End                 Length  Diameter
ID              Node            Node                     m        mm
------------------------------------------------------------------
P2              N1              N2                      84       200
P4              N2              N3                   67.25       200
P3              H1              N2                    15.5       150
P5              H2              N3                     6.5       150
P6              N3              N4                   166.6       200
P10             N4              N7                   176.7       200
P11             H3              N7                     8.2       150
P12             N7              N8                    83.6       200
P13             H4              N8                     7.9       150
P14             N8              N9                    23.6       200
P15             N9              N10                    8.6       200
P16             N9              N11                  221.5       200
P7              N4              N5                     294       200
P8              N5              N6                    28.4       200
P9              N5              N12                     38       200
P17             N12             N11                   36.2       200
P25             N11             N17                   38.7       200
P26             H7              N17                    2.8       150
P27             N17             N18                   19.7       200
P28             N18             N19                    7.5       200
P29             N18             N20                  139.5       200
P30             H8              N20                    5.9       150
P31             N20             N21                  143.4       200
P32             N21             H9                     5.9       150
P18             N12             N13                   38.9       200
P19             H5              N13                    9.4       150
P20             N13             N14                     75       200
P33             N21             N14                  237.3       200
P24             32              N16                  103.5       400
P23             N16             N15                   89.2       200
P22             N15             H6                       6       150
P21             N15             N14                   56.4       200
P1              33              N1                    99.6       400
```

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
N1	0.00	123.60	50.97	0.00	
N2	0.00	123.58	53.10	0.00	
N3	0.00	123.57	55.39	0.00	
N4	0.00	123.54	56.22	0.00	
N7	0.00	123.53	56.86	0.00	
H3	0.00	123.53	57.00	0.00	
N8	0.00	123.53	56.85	0.00	
H4	0.00	123.53	56.98	0.00	
N9	0.00	123.53	56.85	0.00	
N10	83.60	123.53	56.54	0.00	
H1	0.00	123.58	53.64	0.00	
H2	0.00	123.57	55.47	0.00	
N11	0.00	123.53	57.06	0.00	
N17	0.00	123.53	56.87	0.00	
H7	0.00	123.53	56.90	0.00	
N18	0.00	123.53	56.66	0.00	
N19	113.80	123.52	56.33	0.00	
N20	0.00	123.53	56.69	0.00	
H8	0.00	123.53	56.81	0.00	
N21	0.00	123.54	56.70	0.00	
H9	0.00	123.54	56.82	0.00	
N12	0.00	123.53	56.96	0.00	
N5	0.00	123.52	56.40	0.00	
N6	410.60	123.50	55.01	0.00	
N13	0.00	123.53	56.73	0.00	
H5	0.00	123.53	55.63	0.00	
N14	0.00	123.55	56.60	0.00	
N15	0.00	123.57	56.38	0.00	
H6	0.00	123.57	56.29	0.00	
N16	0.00	123.60	55.07	0.00	
32	-350.72	123.60	0.00	0.00	Reservoir
33	-257.28	123.60	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status
P2	257.28	0.14	0.21	Open
P4	257.28	0.14	0.19	Open
P3	0.00	0.00	0.00	Open

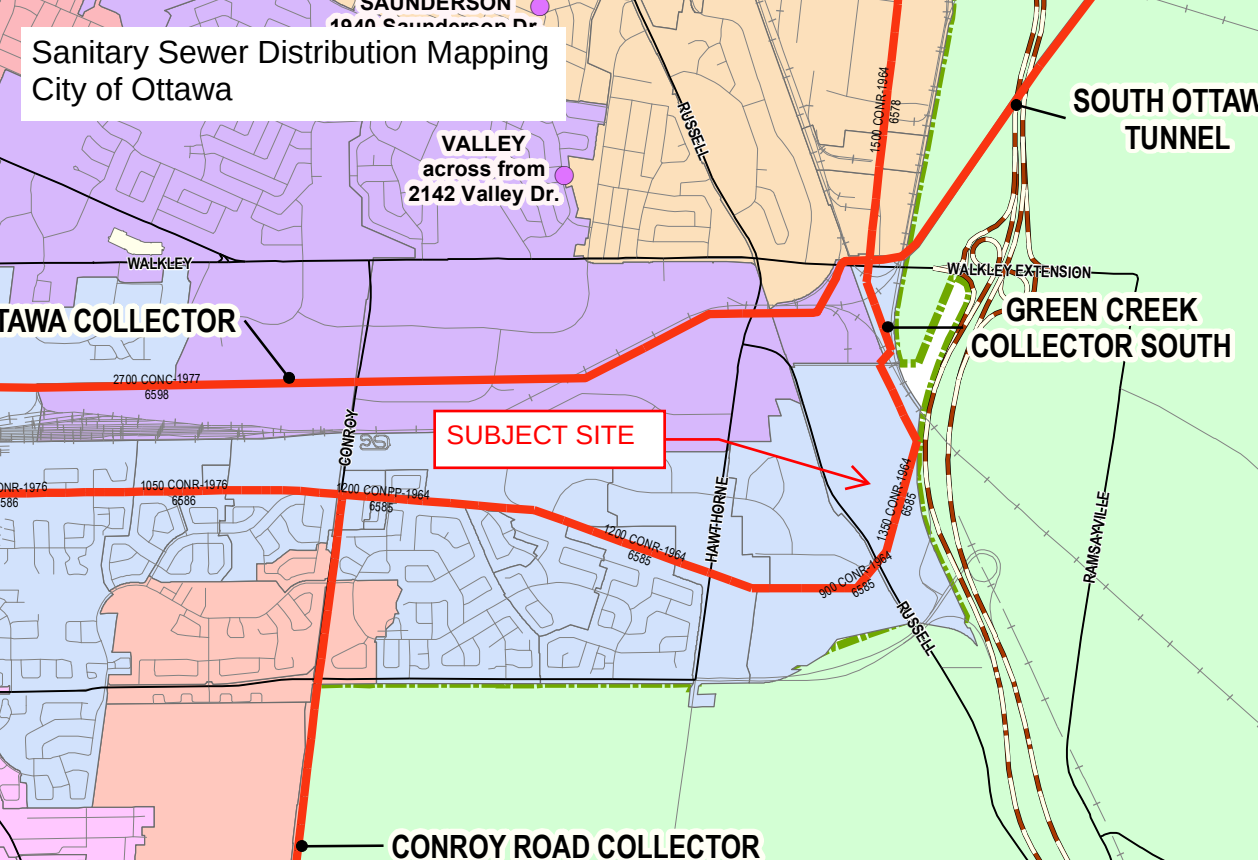
P5	0.00	0.00	0.00	Open
P6	257.28	0.14	0.19	Open
P10	107.91	0.06	0.04	Open
P11	0.00	0.00	0.00	Open
P12	107.91	0.06	0.04	Open
P13	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status
P14	107.90	0.06	0.04	Open
P15	83.60	0.04	0.05	Open
P16	24.30	0.01	0.00	Open
P7	149.37	0.08	0.07	Open
P8	410.60	0.22	0.61	Open
P9	-261.23	0.14	0.22	Open
P17	-18.31	0.01	0.00	Open
P25	5.99	0.00	0.00	Open
P26	0.00	0.00	0.00	Open
P27	5.99	0.00	0.00	Open
P28	113.80	0.06	0.09	Open
P29	-107.81	0.06	0.04	Open
P30	0.00	0.00	0.00	Open
P31	-107.81	0.06	0.04	Open
P32	0.00	0.00	0.00	Open
P18	-242.91	0.13	0.18	Open
P19	0.00	0.00	0.00	Open
P20	-242.91	0.13	0.17	Open
P33	-107.81	0.06	0.04	Open
P24	350.72	0.05	0.01	Open
P23	350.72	0.19	0.37	Open
P22	0.00	0.00	0.00	Open
P21	350.72	0.19	0.37	Open
P1	257.28	0.03	0.01	Open

APPENDIX C

Wastewater Collection


Sanitary Sewer Distribution Mapping
City of Ottawa
SAUNDERSON
1940 Saunderson Dr.
VALLEY
across from
2142 Valley Dr.
WALKLEY
TAWA COLLECTOR
2700 CONC-1977
6598
CONROY
SUBJECT SITE
1050 CONR-1976
6586
1200 CONPP-1964
6585
1200 CONR-1964
6585
HAWTHORNE
900 CONR-1964
6585
1350 CONR-1964
6585
RUSSELL
1500 CONR-1964
6578
SOUTH OTTAW
TUNNEL
WALKLEY EXTENSION
GREEN CREEK
COLLECTOR SOUTH
RAMSAYVILLE
CONROY ROAD COLLECTOR

4055 Russell Rd - Site 3
Proposed Site Conditions

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 21 **ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**1.05**	**L/s**
Infiltration / Inflow (Wet)	**5.87**	**L/s**
Infiltration / Inflow (Total)	**6.92**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Commercial floor space	5	$L/m^2/d$		0.00
Office	75	$L/9.3m^2/d$	4,487	0.42
School	70	L/student/d		0.00
Industrial - Light**	35,000	L/gross ha/d	20.53	8.32
Industrial - Heavy**	55,000	L/gross ha/d		0.00
			Average I/C/I Flow	**8.74**
			Peak Institutional / Commercial Flow	0.63
			Peak Industrial Flow**	29.94 **Peaking Factor of 3.6*
			Peak I/C/I Flow	**30.57**

*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**9.78 L/s**
Total Estimated Peak Dry Weather Flow Rate	**31.62 L/s**
Total Estimated Peak Wet Weather Flow Rate	**37.49 L/s**

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION				RESIDENTIAL AREA AND POPULATION								INDUST		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	AREA ID	FROM M.H.	TO M.H.	AREA (ha)	UNITS	UNITS Singles	UNITS Townhouse	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
EASEMENT																														
	BLDG A2	BLDG A2	SAN2						0.00	0			1.139	1.14	0.079	0.08		0.00	1.75	1.22	1.22	0.40	2.15	15.1	250	1.00	59.47	0.04	1.21	0.57
	2	SAN2	SAN1						0.00	0			2.173	3.31		0.08		0.00	4.92	2.17	3.39	1.12	6.04	111.2	250	0.50	42.05	0.14	0.86	0.61
To Pipe SAN1 - EX. SAN									0.00	0				3.31		0.08		0.00			3.39									
	BLDG A1	BLDG A1	SAN9						0.00	0			5.702	5.70	0.241	0.24		0.00	8.60	5.94	5.94	1.96	10.56	22.4	250	1.00	59.47	0.18	1.21	0.91
	10	SAN10	SAN9						0.00	0			2.574	2.57		0.00		0.00	3.75	2.57	2.57	0.85	4.60	80.5	250	0.30	32.57	0.14	0.66	0.46
	9	SAN9	SAN8						0.00	0			0.526	8.80		0.24		0.00	13.12	0.53	9.04	2.98	16.10	100.0	250	0.30	32.57	0.49	0.66	0.66
	8	SAN8	SAN7						0.00	0			0.060	8.86		0.24		0.00	13.21	0.06	9.10	3.00	16.21	19.7	250	0.30	32.57	0.50	0.66	0.66
	7B								0.00	0			4.577	4.58		0.00		0.00	6.67	4.58	4.58	1.51	8.19							
	7A	SAN7	SAN5						0.00	0			0.190	13.63		0.24		0.00	20.16	0.19	13.87	4.58	24.73	44.6	250	0.30	32.57	0.76	0.66	0.73
Contribution From Pipe SAN6 - SAN5									0.00	0.00				3.21		0.13		0.00		3.33	3.33									
		SAN5	SAN1						0.00	0				16.83		0.37		0.00	24.98	0.00	17.20	5.68	30.66	31.5	250	0.35	35.18	0.87	0.72	0.81
To Pipe SAN1 - EX. SAN									0.00	0				16.83		0.37		0.00			17.20									
	BLDGB	BLDG B	SAN6						0.00	0			1.372	1.37	0.129	0.13		0.00	2.15	1.50	1.50	0.50	2.65	10.5	250	1.00	59.47	0.04	1.21	0.60
	6A								0.00	0			0.124	0.12		0.00		0.00	0.18	0.12	0.12	0.04	0.22							
	6B	SAN6	SAN5						0.00	0			1.709	3.21		0.13		0.00	4.82	1.71	3.33	1.10	5.92	55.7	250	0.50	42.05	0.14	0.86	0.60
To Pipe SAN5 - SAN1									0.00	0				3.21		0.13		0.00			3.33									
DROP PIPE TO EXISTING SAN MH																														
Contribution From Pipe SAN2 - SAN1									0.00	0.00				3.31		0.08		0.00		3.39	3.39									
Contribution From Pipe SAN5 - SAN1									0.00	0.00				16.83		0.37		0.00		17.20	17.20									
	1	SAN1	EX SAN						0.00	0.00			0.111	20.26		0.45		0.00	30.06	0.11	20.71	6.83	36.90	1.5	250	0.50	42.05	0.88	0.86	0.97

DESIGN PARAMETERS

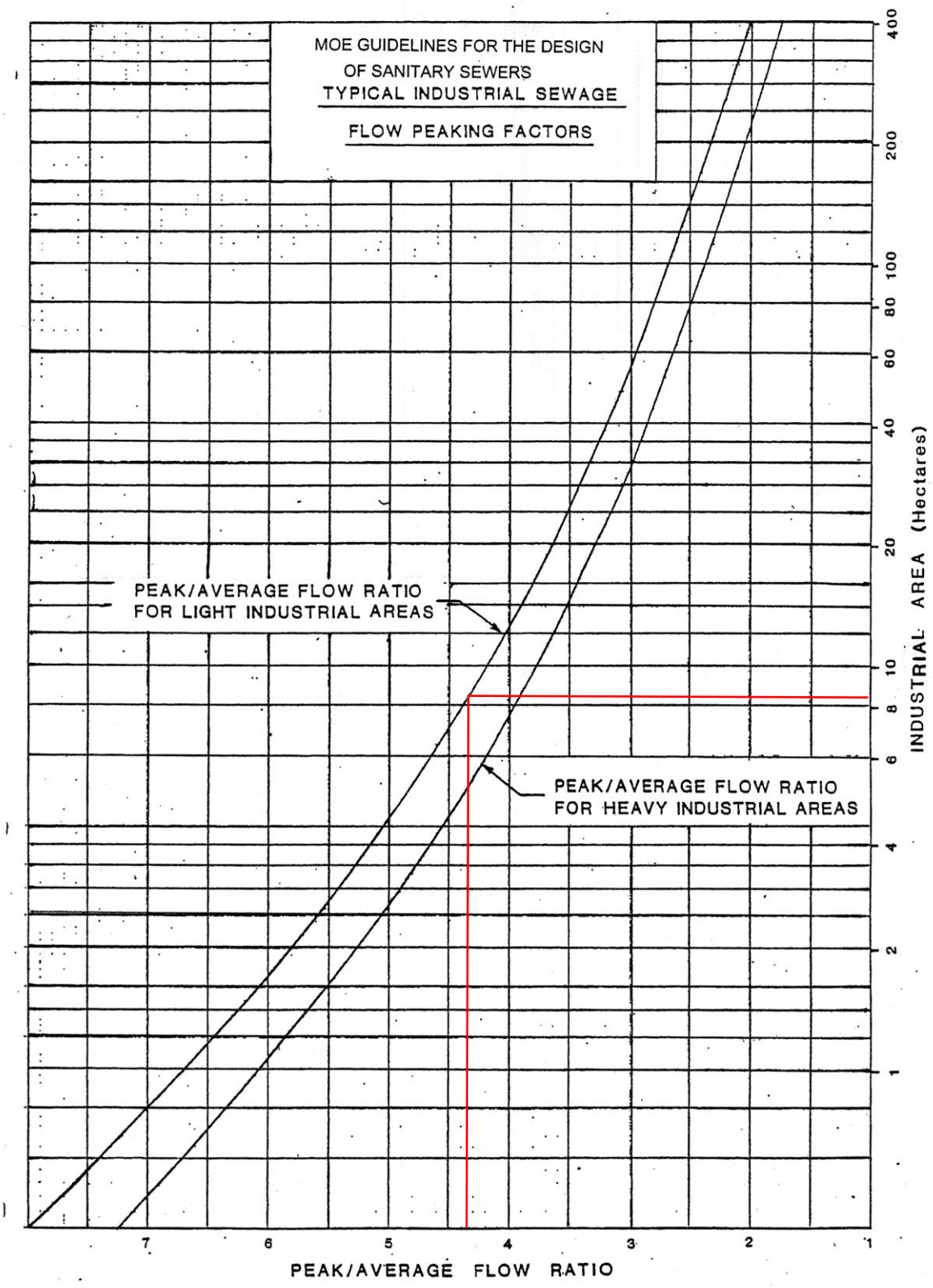
Park Flow =	0	9300	L/ha/da	0.10764	l/s/Ha				
Average Daily Flow =	280	280	l/p/day			Industrial Peak Factor = as per MOE Graph			
Industrial Flow =	0	35000	L/ha/da	0.40509	l/s/Ha	Extraneous Flow =	0.330	L/s/ha	
Comm/Inst Flow =	0	28000	L/ha/da	0.3241	l/s/Ha	Minimum Velocity =	0.600	m/s	
Max Res. Peak Factor =	4.00	4.00				Manning's n = (Conc)	0.013	(Pvc)	0.013
Commercial/Inst./Park Peak Factor =	3.60	3.60				Townhouse coeff=	2.7		
Institutional =	0.32	0.32	l/s/Ha			Single house coeff=	3.4		

Designed:	GGG	PROJECT:	**4055 RUSSELL ROAD - SITE 3**
Checked:	BNC	LOCATION:	**City of Ottawa**
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 14		File Ref: 19-1155	Date: **2022-01-24** Sheet No. 1 of 1

APPENDIX 4-B

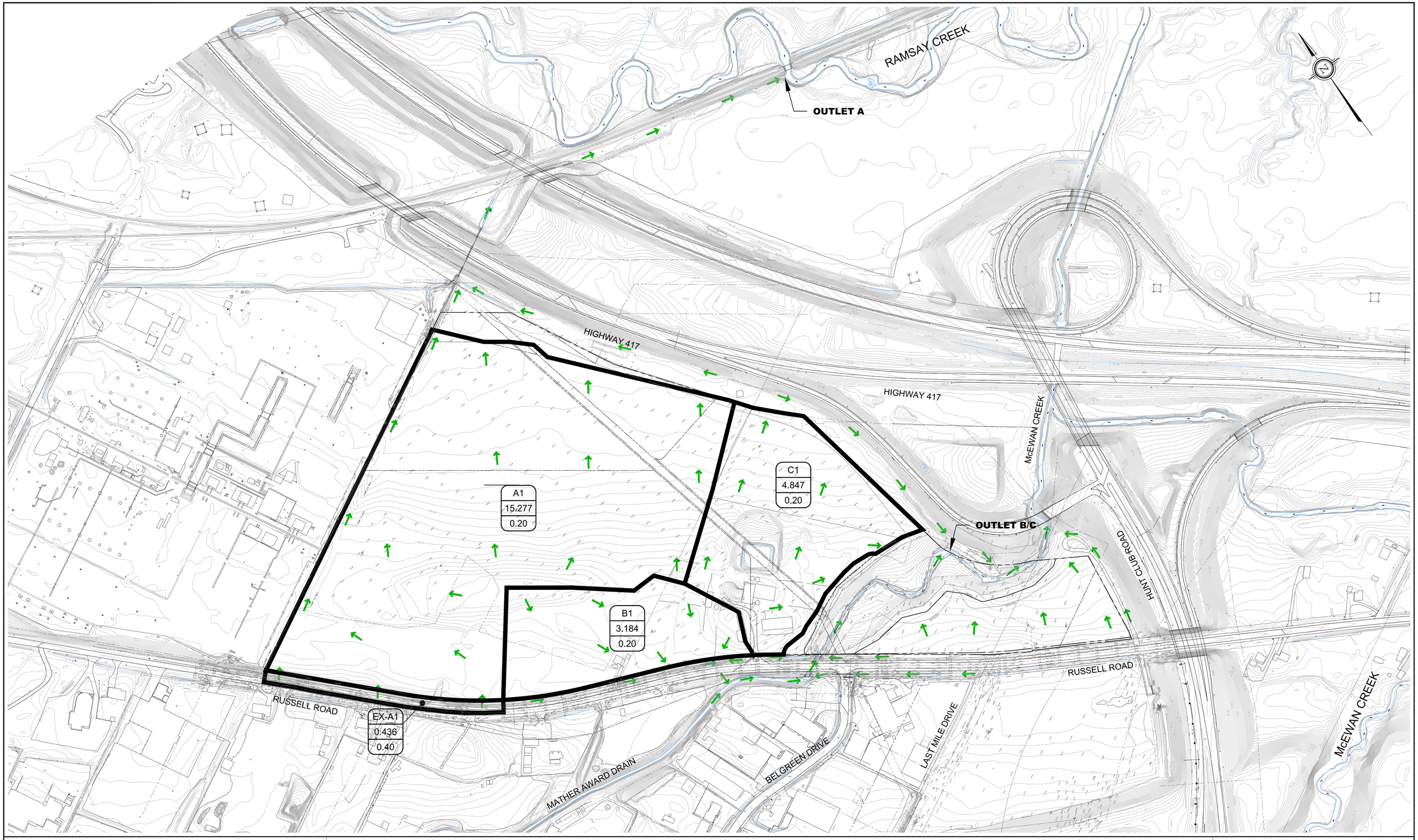
PEAKING FACTOR FOR INDUSTRIAL AREAS

APPENDIX 4-B PEAKING FACTOR FOR INDUSTRIAL AREAS



APPENDIX D

Stormwater Management



DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS™

120 Iber Road Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

4055 RUSSELL RD - SITE 3
PRE-DEVELOPMENT DRAINAGE

PROJECT No. :	19-1155
SCALE:	1:2000
DATE:	MAY 2021
DRAWING No.	1

z:\projects\19-1155_4120-russell-road\b_design\b2_drawings\b2-2_main (dsel)\site-3_spa_sub1\2021-05-13_1155_spa.dwg

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2012

Existing Drainage Charateristics to Outlet A

Area ID	A1, EX-A1	
Area	15.514	ha
C	0.21	Rational Method runoff coefficient
t_c	36.5	min

Estimated Peak Flow

	2-year	5-year	100-year
i	35.0	47.1	80.1
Q	316.9	426.3	906.7

* C value calculated as a composite value based on existing site soil conditions and topography.
value derived using Table 5.7 Runoff Coefficients for Various Soil Conditions from the Ottawa Sewer Design Guidelines,

Drainage Basin Characteristics

Area ID	
A (ha)	15.51
L (m)	285
Up Elev	72.19
Dn Elev	66.67
S (%)	1.9
CN (-)	61
Tc (min)	36.5

**CN value was selected assuming Hydrologic Soil Group B and good conditions (grass covering >75%)*

Time of Concentration per SCS lag equation

$$t_c = \frac{100L^{0.8}\left[\left(\frac{1000}{CN}\right)-9\right]^{0.7}}{1900S^{0.5}}$$

L, length in ft
CN, SCS runoff curve number
S, average watershed slope in (%)

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Existing Drainage to Outlet A

	2-year	100-year	
Q	316.9	906.7	L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID U1
Total Area 0.616 ha
C 0.20 Rational Method runoff coefficient

	2-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
20.0	52.0	17.8	17.8	0.0	0.0	120.0	51.3	51.3	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Area ID BLDG A1, BLDG A2, A101-A321
Available Sub-surface Storage

Total Subsurface Storage (m^3) 0.0

Stage Attenuated Areas Storage Summary

		Surface Storage					
	Stage	**Ponding**	**h_o**	**delta d**	**V***	**V_{acc}****	**$Q_{release}$†**
	(m)	**(m^2)**	**(m)**	**(m)**	**(m^3)**	**(m^3)**	**(L/s)**
ICD 1	66.51		0.00			0.0	0.0
	66.55	0	0.04	0.04		0.0	2.9
	66.75	991	0.24	0.20	67.3	67.3	7.2
	66.95	5,268	0.44	0.20	569.6	636.9	9.7
	67.15	5,480	0.64	0.20	1074.7	1711.7	11.7
	67.35	5,695	0.84	0.20	1117.4	2829.1	13.4
ICD 2	67.45	5,803	0.94	0.10	574.9	3404.0	14.2
	67.55	5,911	1.04	0.10	585.7	3989.7	150.8
	67.75	6,130	1.24	0.20	1204.0	5193.7	251.7
	67.95	6,349	1.44	0.20	1247.8	6441.6	321.4
	68.15	6,572	1.64	0.20	1292.0	7733.6	378.3
	68.35	6,796	1.84	0.20	1336.7	9070.3	427.5
Max ponding	68.55	7,029	2.04	0.20	1382.4	10452.7	471.6

* V=Incremental storage volume
**V_{acc}=Total surface and sub-surface
† $Q_{release}$ = Release rate calculated from orifice equation

Orifice Location **STM101** **ICD 1** 83 mm **DICB100** **ICD 2** 450 mm
Total Area 18.335 ha
C 0.75 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

	2-year					**100-year**				
t_c	**i**	**Q_{actual}‡**	**$Q_{release}$**	**Q_{stored}**	**V_{stored}**	**i**	**Q_{actual}‡**	**$Q_{release}$**	**Q_{stored}**	**V_{stored}**
(min)	**(mm/hr)**	**(L/s)**	**(L/s)**	**(L/s)**	**(m^3)**	**(mm/hr)**	**(L/s)**	**(L/s)**	**(L/s)**	**(m^3)**
10	76.8	2933.8	70.5	2863.3	1718.0	178.6	8525.7	404.1	8121.7	4873.0
20	52.0	1987.5	70.5	1916.9	2300.3	120.0	5727.3	404.1	5323.3	6387.9
30	40.0	1529.6	70.5	1459.0	2626.3	91.9	4386.5	404.1	3982.4	7168.3
40	32.9	1255.3	70.5	1184.8	2843.5	75.1	3588.0	404.1	3183.9	7641.4
50	28.0	1071.1	70.5	1000.6	3001.7	64.0	3053.6	404.1	2649.6	7948.7
60	24.6	938.0	70.5	867.5	3123.0	55.9	2668.8	404.1	2264.8	8153.1
70	21.9	837.0	70.5	766.5	3219.2	49.8	2377.3	404.1	1973.3	8287.7
80	19.8	757.5	70.5	686.9	3297.2	45.0	2148.2	404.1	1744.1	8371.8
90	18.1	693.0	70.5	622.5	3361.4	41.1	1962.9	404.1	1558.9	8417.9
100	16.7	639.7	70.5	569.1	3414.8	37.9	1809.8	404.1	1405.7	8434.2
110	15.6	594.7	70.5	524.2	3459.5	35.2	1680.8	404.1	1276.8	8426.6
120	14.6	556.2	70.5	485.7	3497.0	32.9	1570.6	404.1	1166.6	8399.3
130	13.7	522.9	70.5	452.4	3528.6	30.9	1475.3	404.1	1071.2	8355.7
140	12.9	493.8	70.5	423.2	3555.0	29.2	1391.9	404.1	987.9	8298.0
150	12.3	468.0	70.5	397.5	3577.1	27.6	1318.3	404.1	914.3	8228.4
160	11.7	445.0	70.5	374.5	3595.3	26.2	1252.9	404.1	848.8	8148.4
170	11.1	424.5	70.5	353.9	3610.2	25.0	1194.2	404.1	790.1	8059.2
180	10.6	405.9	70.5	335.4	3622.1	23.9	1141.3	404.1	737.2	7961.9
190	10.2	389.1	70.5	318.5	3631.3	22.9	1093.3	404.1	689.2	7857.4
200	9.8	373.7	70.5	303.2	3638.2	22.0	1049.6	404.1	645.5	7746.4
210	9.4	359.7	70.5	289.1	3642.9	21.1	1009.6	404.1	605.5	7629.6
220	9.1	346.7	70.5	276.2	3645.6	20.4	972.8	404.1	568.7	7507.4

2-year $Q_{attenuated}$ **70.54 L/s** **100-year $Q_{attenuated}$** **404.07 L/s**
2-year Max. Storage Required **3645.6 m^3** **100-year Max. Storage Required** **8434.2 m^3**
Est. 2-year Storage Elevation **67.49 m** **Est. 100-year Storage Elevation** **68.25 m**

Summary of Release Rates and Storage Volumes

Control Area	**2-Year Release Rate (L/s)**	**2-Year Required Storage (m^3)**	**100-Year Release Rate (L/s)**	**100-Year Required Storage (m^3)**	**100-Year Available Storage (m^3)**
Unattenuated Areas	17.8	0.0	51.3	0.0	0.0
Attenuated areas	70.5	3645.6	404.1	8434.2	10452.7
Total	**88.3**	**3645.6**	**455.4**	**8434.2**	**10452.7**

Detailed Stormceptor Sizing Report – OGS A

Project Information & Location			
Project Name	4055 Russell Rd.	**Project Number**	19-1155
City	Ottawa	**State/ Province**	Ontario
Country	Canada	**Date**	12/11/2020
Designer Information		**EOR Information (optional)**	
Name	Brandon O'Leary	**Name**	Brandon Chow
Company	Forterra	**Company**	David Schaeffer Engineering Ltd.
Phone #	905-630-0359	**Phone #**	
Email	brandon.oleary@forterrabp.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	OGS A
Recommended Stormceptor Model	EFO10
TSS Removal (%) Provided	84
Particle Size Distribution (PSD)	Fine Distribution
Rainfall Station	OTTAWA MACDONALD-CARTIER INT'L A

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

EFO Sizing Summary			
EFO Model	**% TSS Removal Provided**	**% Runoff Volume Captured Provided**	**Standard EFO Hydrocarbon Storage Capacity**
EFO4	59	59	265 L (70 gal)
EFO6	71	82	610 L (160 gal)
EFO8	79	93	1070 L (280 gal)
EFO10	84	97	1670 L (440 gal)
EFO12	98	98	2475 L (655 gal)
Parallel Units / MAX	Custom	Custom	Custom

For Stormceptor Specifications and Drawings Please Visit:
http://www.imbriumsystems.com/technical-specifications

OVERVIEW

Stormceptor ® EF is a continuation and evolution of the most globally recognized oil-grit separator (OGS) stormwater treatment technology - **Stormceptor ®.** Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil-grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at higher flow rates as compared to the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF's patent-pending treatment and scour prevention technology and internal bypass ensures sediment is retained during all rainfall events.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Ontario	**Total Number of Rainfall Events**	4093
Rainfall Station Name	OTTAWA MACDONALD-CARTIER INT'L A	**Total Rainfall (mm)**	20978.1
Station ID #	6000	**Average Annual Rainfall (mm)**	567.0
Coordinates	45°19'N, 75°40'W	**Total Evaporation (mm)**	1860.8
Elevation (ft)	370	**Total Infiltration (mm)**	4397.6
Years of Rainfall Data	37	**Total Rainfall that is Runoff (mm)**	14719.7

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

ONLINE APPLICATION

Stormceptor EF's internal bypass and patent-pending scour prevention technology has demonstrated very effective retention of pollutants in third-party testing and verification following the Canadian ETV's **Procedure for Laboratory Testing of Oil-Grit Separators.** Sediment scour prevention demonstrated an effluent concentration of less than 10 mg/L for sediment particles ranging from 1 to 1,000 microns, even during peak influent flow rates associated with infrequent high intensity storm events. While Stormceptor EF will capture oil, only the Stormceptor EFO configuration has been third-party tested and verified to retain greater than 99% of captured oil. Based on these verified performance attributes, the most efficient and widely accepted application of Stormceptor EF is an online configuration, which allows all upstream conveyance flows to enter and exit the unit. The online application eliminates the need for costly additional bypass structures, piping and installation expense.

FLOW ENTRANCE OPTIONS

Single Inlet Pipe – A common design which includes one inlet pipe and one outlet pipe. A 90-degree (maximum) bend is also accepted with this configuration.

Inlet Grate – Allows surface runoff to enter the unit from grade. The inlet grate option can also be used in conjunction with one inlet pipe or multiple inlet pipes. A removable flow deflector is added in the Stormceptor EF4/EFO4.

Maximum Pipe Diameter		
Model	Inlet (in/mm)	Outlet (in/mm)
EF4 / EFO4	24 / 610	24 / 610
EF6 / EFO6	36 / 915	36 / 915
EF8 / EFO8	48 / 1220	48 / 1220
EF10 / EFO10	72 / 1828	72 / 1828
EF12 / EFO12	72 / 1828	72 / 1828

Multiple Inlet Pipe – Allows for multiple inlet pipes of various diameters to enter the unit.

Maximum Pipe Diameter		
Model	Inlet (in/mm)	Outlet (in/mm)
EF4 / EFO4	18 / 457	24 / 610
EF6 / EFO6	30 / 762	36 / 915
EF8 / EFO8	42 / 1067	48 / 1220
EF10 / EFO10	60 / 1524	72 / 1828
EF12 / EFO12	60 / 1524	72 / 1828

Drainage Area	
Total Area (ha)	18.34
Imperviousness %	79

Up Stream Storage	
Storage (ha-m)	Discharge (cms)
0.0000	0.0000
0.0000	0.0000
0.3645	0.0705
0.8435	0.4041

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cms)	

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	90.00
Oil Spill Capture Volume (L)	
Peak Conveyed Flow Rate (L/s)	404.1
Water Quality Flow Rate (L/s)	70.5

Design Details	
Stormceptor Inlet Invert Elev (m)	66.95
Stormceptor Outlet Invert Elev (m)	66.75
Stormceptor Rim Elev (m)	69.20
Normal Water Level Elevation (m)	
Pipe Diameter (mm)	1920
Pipe Material	RCP - concrete
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	OGS A

Site Details

Drainage Area

Total Area (ha)	18.34
Imperviousness %	79
Oil Spill Capture Volume (L)	

Infiltration Parameters

Horton's equation is used to estimate infiltration	
Max. Infiltration Rate (mm/hr)	61.98
Min. Infiltration Rate (mm/hr)	10.16
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Surface Characteristics

Width (m)	857.00
Slope %	2
Impervious Depression Storage (mm)	0.508
Pervious Depression Storage (mm)	5.08
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Evaporation

Daily Evaporation Rate (mm/day)	2.54

Dry Weather Flow

Dry Weather Flow (L/s)	0

Maintenance Frequency

Maintenance Frequency (months) >	12

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	Build Up/ Wash-off

Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	125
Exponential Buildup Power	0.40
Exponential Washoff Exponent	0.20

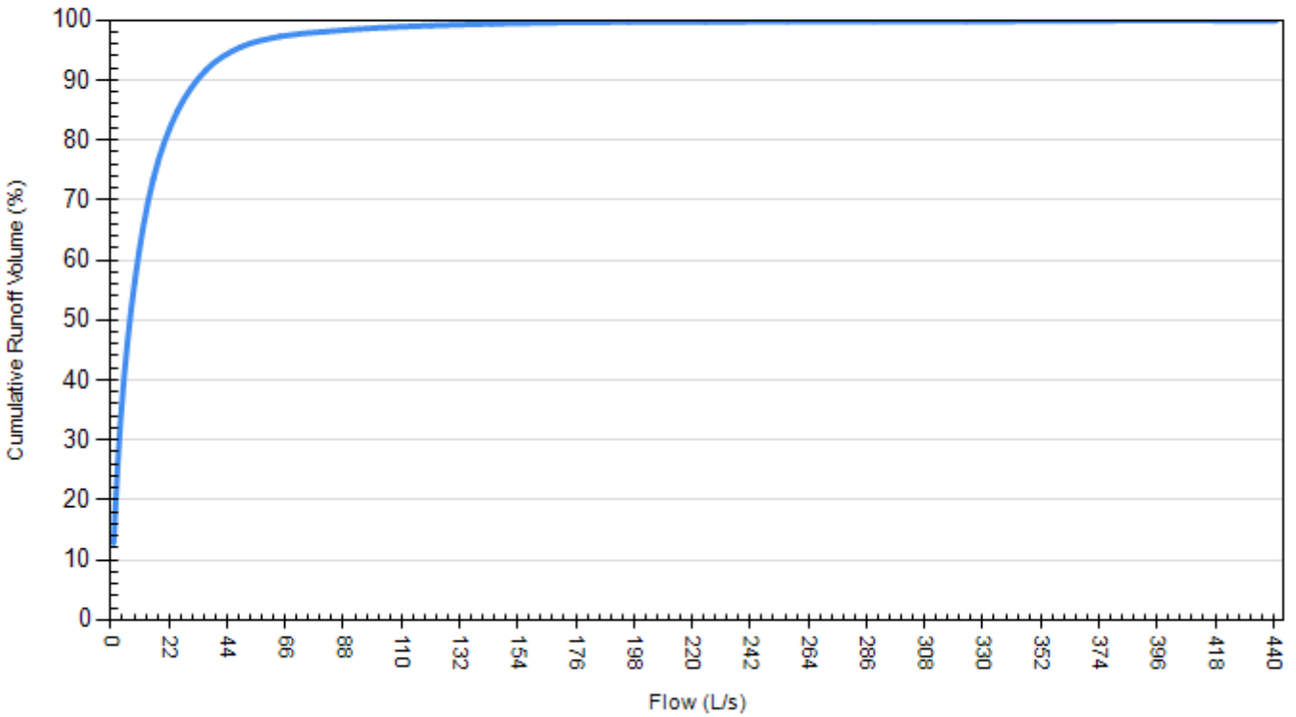
TSS Availability Parameters

Availability Constant A	0.057
Availability Factor B	0.04
Availability Exponent C	1.10
Min. Particle Size Affected by Availability (micron)	400

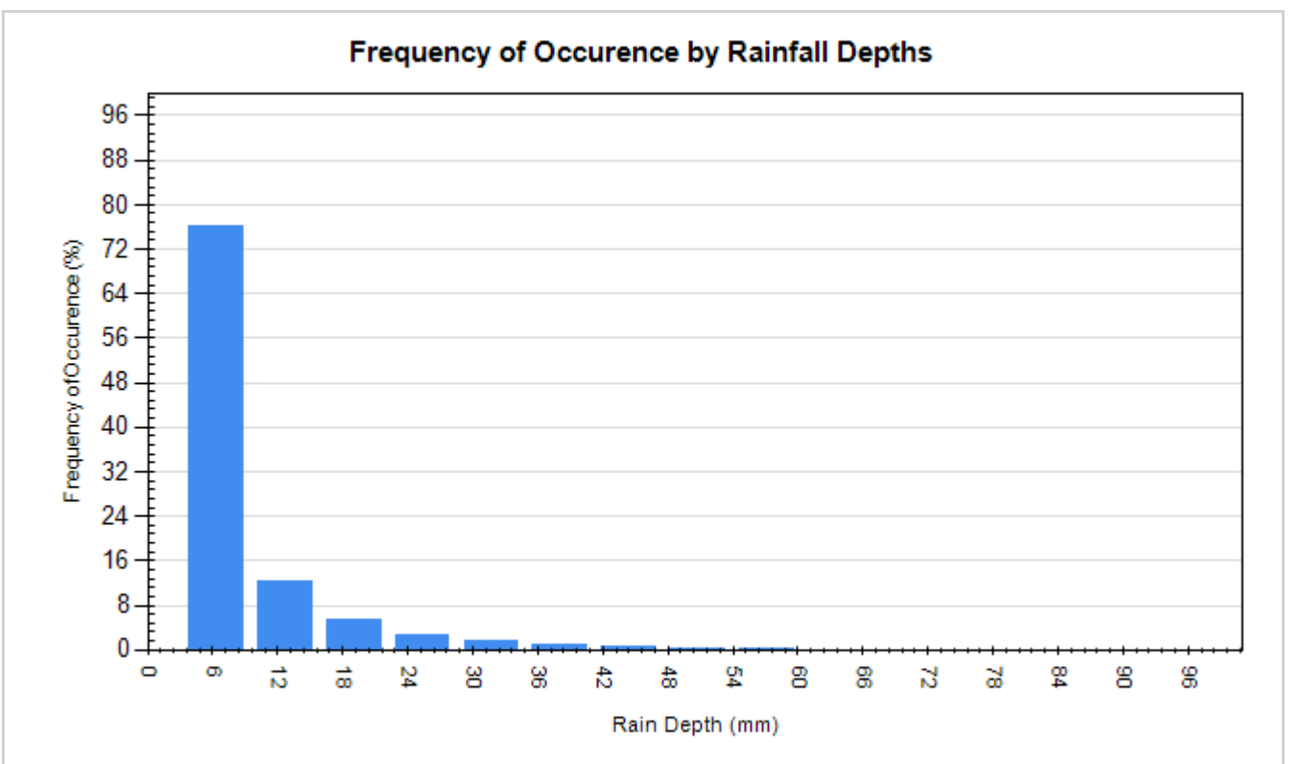
Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (L/s)	**Runoff Volume (m^3)**	**Volume Over (m^3)**	**Cumulative Runoff Volume (%)**
1	346123	2361969	12.8
4	953899	1759729	35.3
9	1524102	1179009	56.4
16	1985171	724264	73.5
25	2289972	415067	84.7
36	2476816	225254	91.7
49	2580546	121968	95.5
64	2629607	72822	97.3
81	2651859	50577	98.1
100	2666899	35383	98.7
121	2677739	24626	99.1
144	2685486	16874	99.4
169	2690399	11911	99.6
196	2693111	9211	99.7
225	2694928	7391	99.7
256	2696258	6056	99.8
289	2697180	5133	99.8
324	2697933	4380	99.8
361	2698549	3756	99.9
400	2699026	3281	99.9
441	2699418	2882	99.9

Cumulative Runoff Volume by Runoff Rate

For area: 18.34(ha), imperviousness: 79.00%, rainfall station: OTTAWA MACDONALD-CARTIER INT'L A



Rainfall Event Analysis				
Rainfall Depth (mm)	**No. of Events**	**Percentage of Total Events (%)**	**Total Volume (mm)**	**Percentage of Annual Volume (%)**
6.35	3113	76.1	5230	24.9
12.70	501	12.2	4497	21.4
19.05	225	5.5	3469	16.5
25.40	105	2.6	2317	11.0
31.75	62	1.5	1765	8.4
38.10	35	0.9	1206	5.8
44.45	28	0.7	1163	5.5
50.80	12	0.3	557	2.7
57.15	7	0.2	378	1.8
63.50	1	0.0	63	0.3
69.85	1	0.0	64	0.3
76.20	1	0.0	76	0.4
82.55	0	0.0	0	0.0
88.90	1	0.0	84	0.4
95.25	0	0.0	0	0.0
101.60	0	0.0	0	0.0



4055 Russell Rd - Site 3
Existing Conditions
Outlet B/C

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2012

Existing Drainage Charateristics to Outlet B/C

Area ID	B1, C1	
Area	7.64	ha
C	0.20	Rational Method runoff coefficient
t_c	40.5	min

Estimated Peak Flow

	2-year	5-year	100-year
i	32.6	43.8	74.5
Q	138.3	186.0	395.3

* C value calculated as a composite value based on existing site soil conditions and topography.
value derived using Table 5.7 Runoff Coefficients for Various Soil Conditions from the Ottawa Sewer Design Guidelines,

Drainage Basin Characteristics

Area ID	
A (ha)	7.64
L (m)	250
Up Elev	71.70
Dn Elev	68.5
S (%)	1.3
CN (-)	61
Tc (min)	40.5

**CN value was selected assuming Hydrologic Soil Group B and good conditions (grass covering >75%)*

Time of Concentration per SCS lag equation

$$t_c = \frac{100L^{0.8}\left[\left(\frac{1000}{CN}\right)-9\right]^{0.7}}{1900S^{0.5}}$$

L, length in ft
CN, SCS runoff curve number
S, average watershed slope in (%)

4055 Russell Rd - Site 3
Proposed Conditions
Outlet B/C

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Existing Drainage to Outlet B/C

	2-year	100-year	
Q	138.3	395.3	L/s

Estimated Post Development Peak Flow from External Areas

Area ID EX-A1
Total Area 0.436 ha
C 0.40 Rational Method runoff coefficient

	2-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
20.0	52.0	25.2	25.2	0.0	0.0	120.0	72.6	72.6	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID U2
Total Area 0.295 ha
C 0.20 Rational Method runoff coefficient

	2-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
20.0	52.0	8.5	8.5	0.0	0.0	120.0	24.6	24.6	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

4055 Russell Rd - Site 3
Proposed Conditions
Outlet B/C

Estimated Post Development Peak Flow from Attenuated Areas

Area ID BLDG B, A401-A408
Available Sub-surface Storage

Total Subsurface Storage (m^3) 0.0

Stage Attenuated Areas Storage Summary

		Surface Storage							
	Stage	Ponding (Pervious)	Ponding (Impervious)	h_o	delta d	V* (Pervious)	V* (Impervious)	V_{acc}**	$Q_{release}$†
	(m)	(m^2)	(m^2)	(m)	(m)	(m^3)	(m^3)	(m^3)	(L/s)
ICD 1	66.76			0.00				0.0	0.0
T/L	68.40	-	-	1.64	1.64			0.0	2.8
	68.45	165	353	1.69	0.05	2.7	5.9	8.6	2.9
	68.65	1,667	1785	1.89	0.20	157.1	195.5	361.2	3.1
ICD 2	68.75	1,717	2514	1.99	0.10	169.2	213.9	744.3	3.2
	68.85	1,767	3251	2.09	0.10	174.2	287.5	1205.9	97.7
Max ponding	69.15	1,931	7985.4	2.39	0.30	554.5	1633.2	3393.6	192.1

* V=Incremental storage volume
**V_{acc}=Total surface and sub-surface
† $Q_{release}$ = Release rate calculated from orifice equation

Orifice Location **STM401** **ICD 1** Tempest LMF 50 **ICD 2** 375 mm
Total Area 3.469 ha
C 0.75 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

	2-year					100-year				
t_c	i	Q_{actual}‡	$Q_{release}$	Q_{stored}	V_{stored}	i	Q_{actual}‡	$Q_{release}$	Q_{stored}	V_{stored}
(min)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)	(mm/hr)	(L/s)	(L/s)	(L/s)	(m^3)
10	76.8	555.1	7.4	547.7	328.6	178.6	1613.1	107.6	1505.4	903.3
20	52.0	376.0	7.4	368.7	442.4	120.0	1083.6	107.6	976.0	1171.2
30	40.0	289.4	7.4	282.0	507.7	91.9	829.9	107.6	722.3	1300.1
40	32.9	237.5	7.4	230.2	552.4	75.1	678.9	107.6	571.2	1370.9
50	28.0	202.7	7.4	195.3	585.9	64.0	577.8	107.6	470.1	1410.3
60	24.6	177.5	7.4	170.1	612.4	55.9	504.9	107.6	397.3	1430.3
70	21.9	158.4	7.4	151.0	634.2	49.8	449.8	107.6	342.1	1437.0
80	19.8	143.3	7.4	135.9	652.6	45.0	406.4	107.6	298.8	1434.2
90	18.1	131.1	7.4	123.8	668.3	41.1	371.4	107.6	263.7	1424.2
100	16.7	121.0	7.4	113.7	682.0	37.9	342.4	107.6	234.8	1408.6
110	15.6	112.5	7.4	105.2	694.0	35.2	318.0	107.6	210.4	1388.4
120	14.6	105.2	7.4	97.9	704.7	32.9	297.2	107.6	189.5	1364.5
130	13.7	98.9	7.4	91.6	714.3	30.9	279.1	107.6	171.5	1337.6
140	12.9	93.4	7.4	86.1	722.9	29.2	263.4	107.6	155.7	1307.9
150	12.3	88.5	7.4	81.2	730.6	27.6	249.4	107.6	141.8	1276.1
160	11.7	84.2	7.4	76.8	737.7	26.2	237.0	107.6	129.4	1242.2
170	11.1	80.3	7.4	72.9	744.1	25.0	225.9	107.6	118.3	1206.6
180	10.6	76.8	7.4	69.4	749.9	23.9	215.9	107.6	108.3	1169.5
190	10.2	73.6	7.4	66.3	755.3	22.9	206.9	107.6	99.2	1131.0
200	9.8	70.7	7.4	63.3	760.1	22.0	198.6	107.6	90.9	1091.3
210	9.4	68.0	7.4	60.7	764.6	21.1	191.0	107.6	83.4	1050.4

2-year $Q_{attenuated}$ **7.36 L/s** **100-year $Q_{attenuated}$** **107.65 L/s**
2-year Max. Storage Required **764.6 m^3** **100-year Max. Storage Required** **1437.0 m^3**
Est. 2-year Storage Elevation **68.75 m** **Est. 100-year Storage Elevation** **68.88 m**

Summary of Release Rates and Storage Volumes

Control Area	2-Year Release Rate (L/s)	2-Year Required Storage (m^3)	100-Year Release Rate (L/s)	100-Year Required Storage (m^3)	100-Year Available Storage (m^3)
External Areas	25.2	0.0	72.6	0.0	0.0
Unattenuated Areas	8.5	0.0	24.6	0.0	0.0
Attenuated areas	7.4	764.6	107.6	1437.0	3393.6
Total	**41.1**	**764.6**	**204.9**	**1437.0**	**3393.6**

Detailed Stormceptor Sizing Report – OGS B

Project Information & Location			
Project Name	4055 Russell Rd.	**Project Number**	19-1155
City	Ottawa	**State/ Province**	Ontario
Country	Canada	**Date**	12/11/2020
Designer Information		**EOR Information (optional)**	
Name	Brandon O'Leary	**Name**	Brandon Chow
Company	Forterra	**Company**	David Schaeffer Engineering Ltd.
Phone #	905-630-0359	**Phone #**	
Email	brandon.oleary@forterrabp.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	OGS B
Recommended Stormceptor Model	EFO6
TSS Removal (%) Provided	89
Particle Size Distribution (PSD)	Fine Distribution
Rainfall Station	OTTAWA MACDONALD-CARTIER INT'L A

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

EFO Sizing Summary			
EFO Model	**% TSS Removal Provided**	**% Runoff Volume Captured Provided**	**Standard EFO Hydrocarbon Storage Capacity**
EFO4	82	96	265 L (70 gal)
EFO6	89	98	610 L (160 gal)
EFO8	99	99	1070 L (280 gal)
EFO10	99	99	1670 L (440 gal)
EFO12	99	99	2475 L (655 gal)
Parallel Units / MAX	Custom	Custom	Custom

For Stormceptor Specifications and Drawings Please Visit:
http://www.imbriumsystems.com/technical-specifications

OVERVIEW

Stormceptor ® EF is a continuation and evolution of the most globally recognized oil-grit separator (OGS) stormwater treatment technology - **Stormceptor ®.** Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil-grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at higher flow rates as compared to the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF's patent-pending treatment and scour prevention technology and internal bypass ensures sediment is retained during all rainfall events.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis
PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station			
State/Province	Ontario	**Total Number of Rainfall Events**	4093
Rainfall Station Name	OTTAWA MACDONALD-CARTIER INT'L A	**Total Rainfall (mm)**	20978.1
Station ID #	6000	**Average Annual Rainfall (mm)**	567.0
Coordinates	45°19'N, 75°40'W	**Total Evaporation (mm)**	1657.5
Elevation (ft)	370	**Total Infiltration (mm)**	4393.5
Years of Rainfall Data	37	**Total Rainfall that is Runoff (mm)**	14927.1

Notes
• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules. • Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed. • For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

ONLINE APPLICATION

Stormceptor EF's internal bypass and patent-pending scour prevention technology has demonstrated very effective retention of pollutants in third-party testing and verification following the Canadian ETV's **Procedure for Laboratory Testing of Oil-Grit Separators.** Sediment scour prevention demonstrated an effluent concentration of less than 10 mg/L for sediment particles ranging from 1 to 1,000 microns, even during peak influent flow rates associated with infrequent high intensity storm events. While Stormceptor EF will capture oil, only the Stormceptor EFO configuration has been third-party tested and verified to retain greater than 99% of captured oil. Based on these verified performance attributes, the most efficient and widely accepted application of Stormceptor EF is an online configuration, which allows all upstream conveyance flows to enter and exit the unit. The online application eliminates the need for costly additional bypass structures, piping and installation expense.

FLOW ENTRANCE OPTIONS

Single Inlet Pipe – A common design which includes one inlet pipe and one outlet pipe. A 90-degree (maximum) bend is also accepted with this configuration.

Inlet Grate – Allows surface runoff to enter the unit from grade. The inlet grate option can also be used in conjunction with one inlet pipe or multiple inlet pipes. A removable flow deflector is added in the Stormceptor EF4/EFO4.

Maximum Pipe Diameter		
Model	Inlet (in/mm)	Outlet (in/mm)
EF4 / EFO4	24 / 610	24 / 610
EF6 / EFO6	36 / 915	36 / 915
EF8 / EFO8	48 / 1220	48 / 1220
EF10 / EFO10	72 / 1828	72 / 1828
EF12 / EFO12	72 / 1828	72 / 1828

Multiple Inlet Pipe – Allows for multiple inlet pipes of various diameters to enter the unit.

Maximum Pipe Diameter		
Model	Inlet (in/mm)	Outlet (in/mm)
EF4 / EFO4	18 / 457	24 / 610
EF6 / EFO6	30 / 762	36 / 915
EF8 / EFO8	42 / 1067	48 / 1220
EF10 / EFO10	60 / 1524	72 / 1828
EF12 / EFO12	60 / 1524	72 / 1828

Drainage Area	
Total Area (ha)	3.47
Imperviousness %	79

Up Stream Storage	
Storage (ha-m)	Discharge (cms)
0.0000	0.00000
0.0000	0.00000
0.0765	0.00731
0.1420	0.11110

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cms)	

Water Quality Objective	
TSS Removal (%)	89.0
Runoff Volume Capture (%)	90.00
Oil Spill Capture Volume (L)	
Peak Conveyed Flow Rate (L/s)	111.10
Water Quality Flow Rate (L/s)	7.31

Design Details	
Stormceptor Inlet Invert Elev (m)	66.75
Stormceptor Outlet Invert Elev (m)	66.72
Stormceptor Rim Elev (m)	69.95
Normal Water Level Elevation (m)	
Pipe Diameter (mm)	975
Pipe Material	RCP - concrete
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

Particle Size Distribution (PSD)

Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name	OGS B

Site Details

Drainage Area

Total Area (ha)	3.47
Imperviousness %	79
Oil Spill Capture Volume (L)	

Infiltration Parameters

Horton's equation is used to estimate infiltration	
Max. Infiltration Rate (mm/hr)	61.98
Min. Infiltration Rate (mm/hr)	10.16
Decay Rate (1/sec)	0.00055
Regeneration Rate (1/sec)	0.01

Surface Characteristics

Width (m)	373.00
Slope %	2
Impervious Depression Storage (mm)	0.508
Pervious Depression Storage (mm)	5.08
Impervious Manning's n	0.015
Pervious Manning's n	0.25

Evaporation

Daily Evaporation Rate (mm/day)	2.54

Dry Weather Flow

Dry Weather Flow (L/s)	0

Maintenance Frequency

Maintenance Frequency (months) >	12

Winter Months

Winter Infiltration	0

TSS Loading Parameters

TSS Loading Function	Build Up/ Wash-off

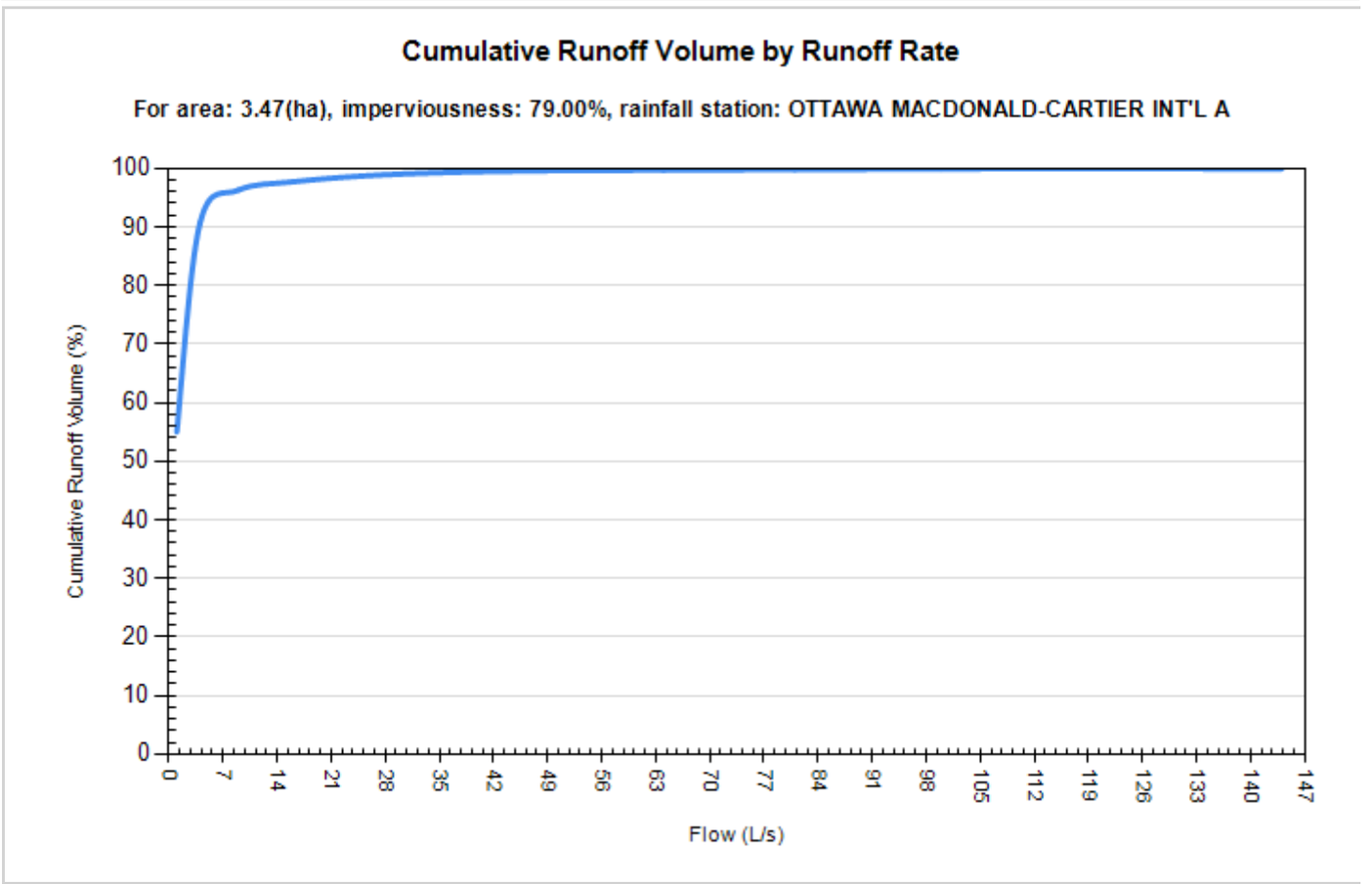
Buildup/Wash-off Parameters

Target Event Mean Conc. (EMC) mg/L	125
Exponential Buildup Power	0.40
Exponential Washoff Exponent	0.20

TSS Availability Parameters

Availability Constant A	0.057
Availability Factor B	0.04
Availability Exponent C	1.10
Min. Particle Size Affected by Availability (micron)	400

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (L/s)	**Runoff Volume (m³)**	**Volume Over (m³)**	**Cumulative Runoff Volume (%)**
1	285782	235153	55.0
4	470513	49336	90.6
9	500183	19170	96.3
16	507654	11715	97.7
25	512663	6694	98.7
36	515589	3774	99.3
49	517185	2171	99.6
64	517971	1387	99.7
81	518322	1035	99.8
100	518613	745	99.9
121	518746	613	99.9
144	518824	535	99.9



Rainfall Event Analysis				
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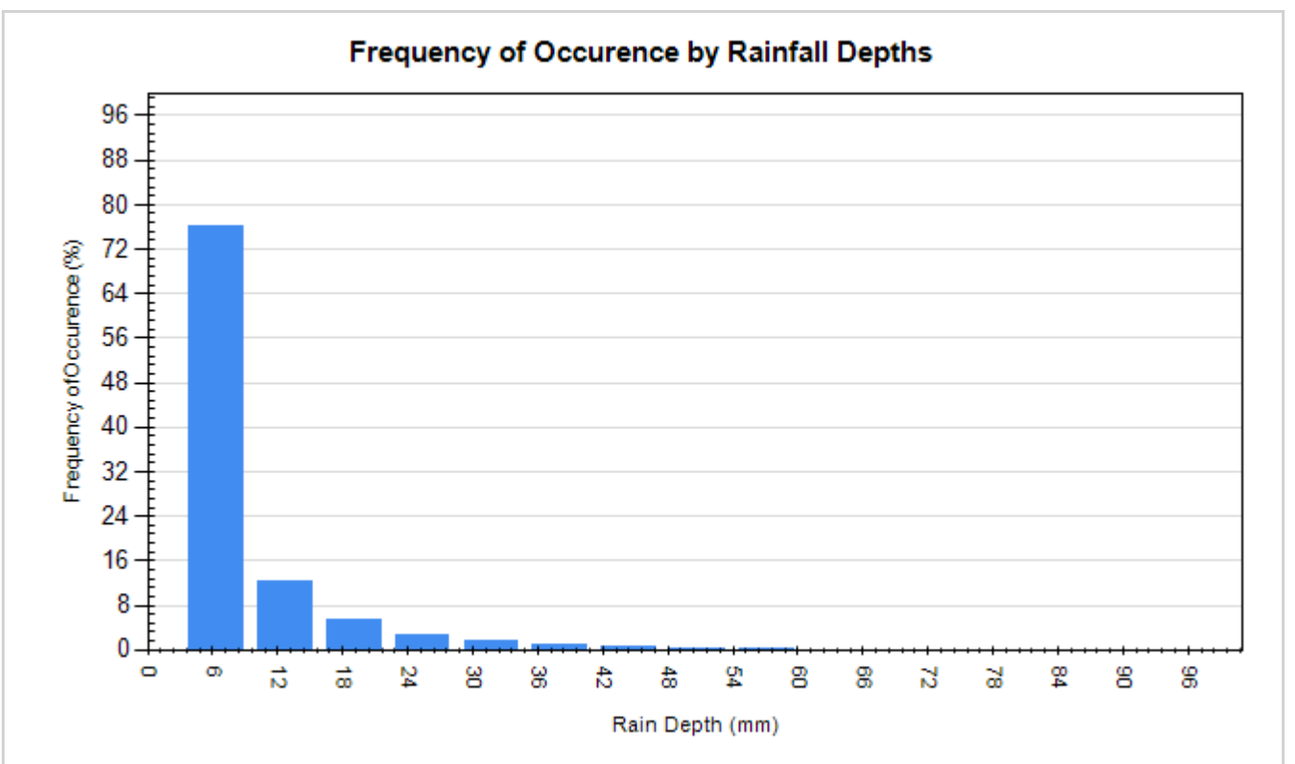
38.10	35	0.9	1206	5.8
44.45	28	0.7	1163	5.5
50.80	12	0.3	557	2.7
57.15	7	0.2	378	1.8
63.50	1	0.0	63	0.3
69.85	1	0.0	64	0.3
76.20	1	0.0	76	0.4
82.55	0	0.0	0	0.0
88.90	1	0.0	84	0.4
95.25	0	0.0	0	0.0
101.60	0	0.0	0	0.0



STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The **minimum** sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1

4ft (1219mm) Diameter OGS Units:	1.19m^3 sediment / 265L oil
6ft (1829mm) Diameter OGS Units:	3.48m^3 sediment / 609Ll oil
8ft (2438mm) Diameter OGS Units:	8.78m^3 sediment / 1,071L oil
10ft (3048mm) Diameter OGS Units:	17.78m^3 sediment / 1,673L oil
12ft (3657mm) Diameter OGS Units:	31.23m^3 sediment / 2,476L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality

treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

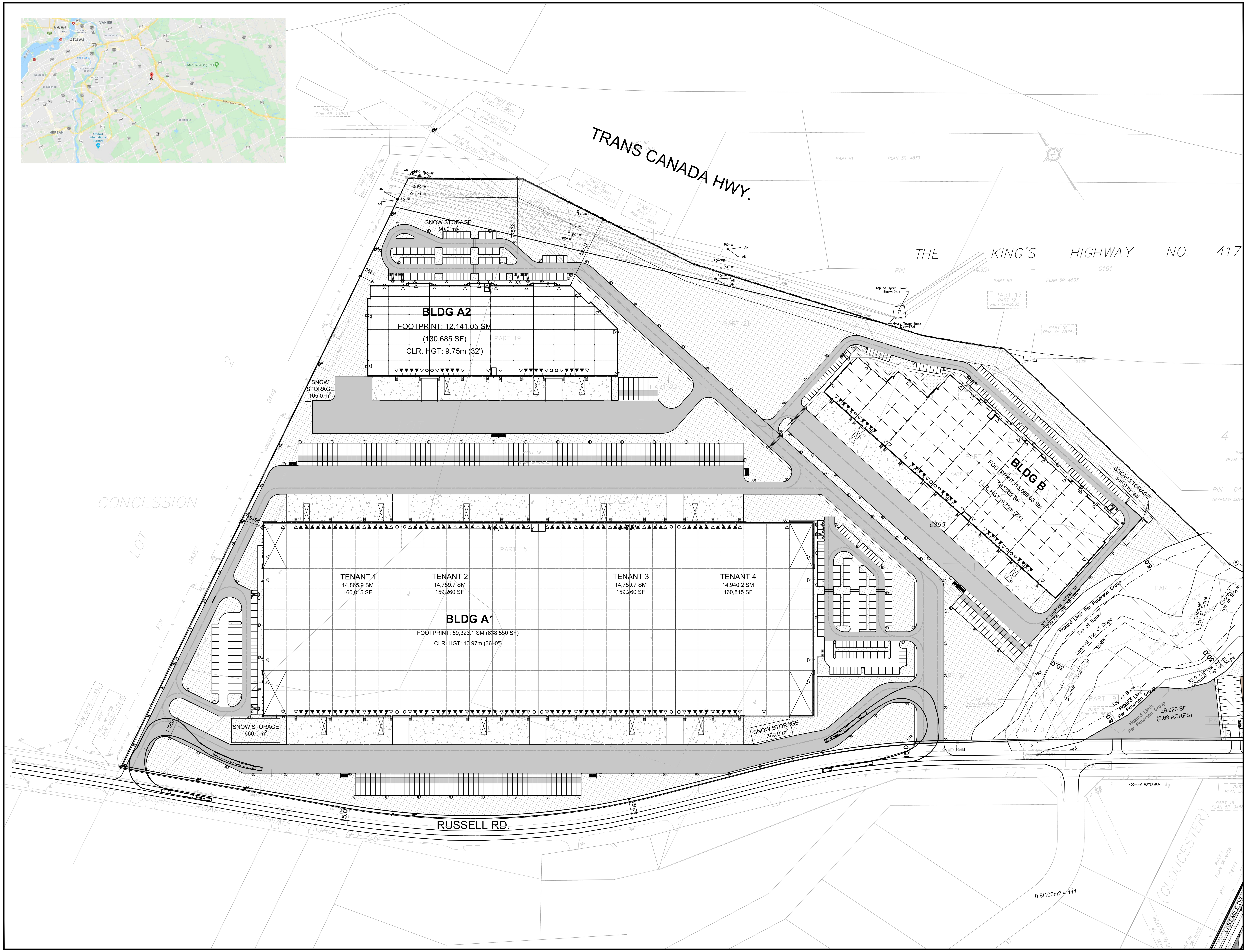
3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

DRAWINGS / FIGURES

CAUTION: IF THIS SHEET IS NOT 24"x36" IT IS A REDUCED PRINT



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NATIONAL CAPTIAL BUILDING A2 4055 RUSSELL RD

OTTAWA, ONTARIO

OVERALL SITE PLAN

	DATE	REMARKS
1	2021-05-13	ISSUED FOR SPA
2	2021-09-27	REISSUED FOR SPA
3	2022-01-14	ISSUED FOR PERMIT

PA / PM:	AS/LN
DRAWN BY:	HW
JOB NO.:	TOR21-0007-00

SHEET

A1.0

FILE NUMBER D07-12-21-0069
PLAN NUMBER 18486

2022-01-14 ISSUED FOR PERMIT

Z:\Projects\19-1155_4120-Russell-Road\B_Design\B2_Drawings\B2_3_Resources\Architect\2022-01-21-Site-3\X0028_SP.dwg

SKETCH SHOWING PROPOSED DEVELOPMENT LIMITS AT

4055 Russell Road

CITY OF OTTAWA

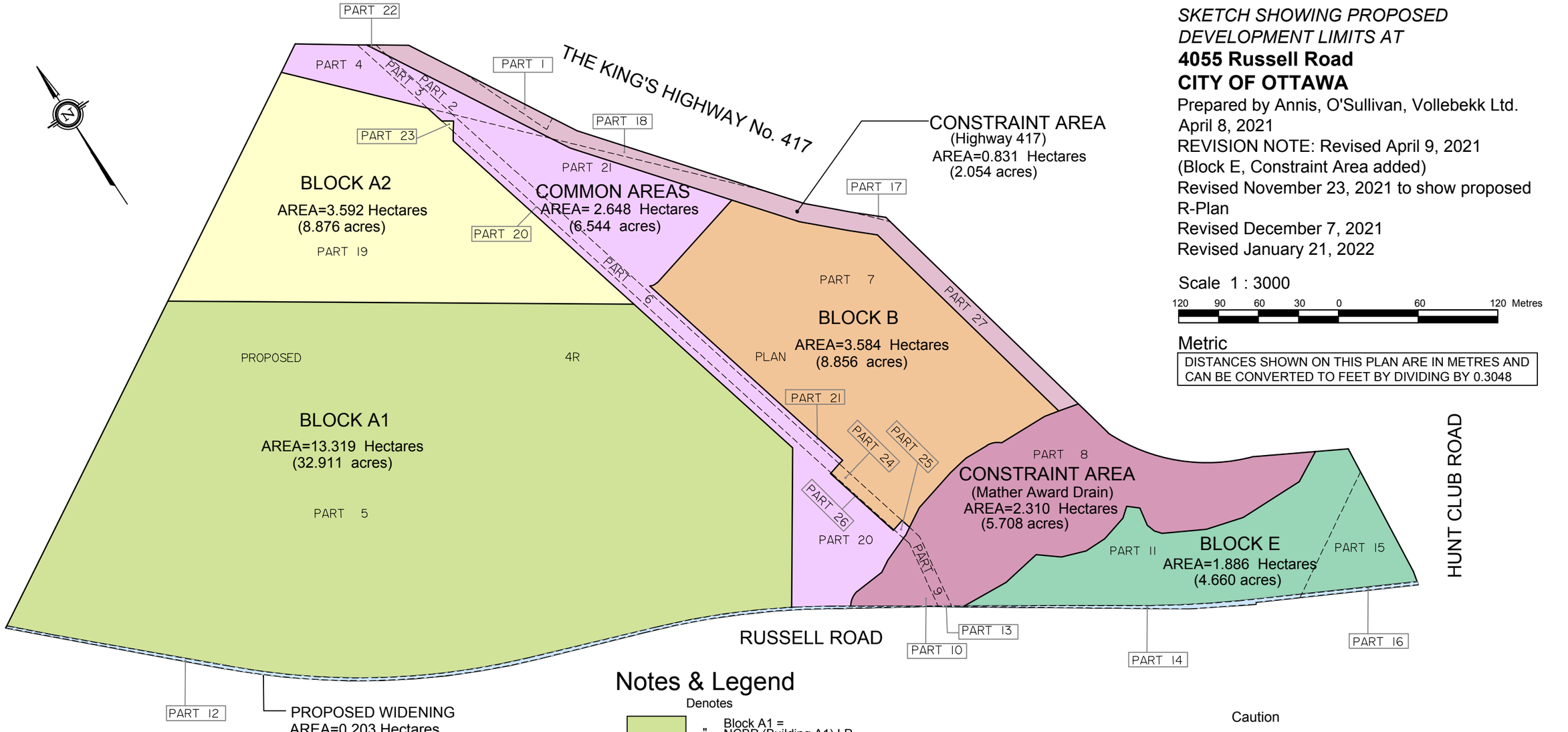
Prepared by Annis, O'Sullivan, Vollebekk Ltd.
April 8, 2021
REVISION NOTE: Revised April 9, 2021
(Block E, Constraint Area added)
Revised November 23, 2021 to show proposed R-Plan
Revised December 7, 2021
Revised January 21, 2022

Scale 1 : 3000

120 90 60 30 0 60 120 Metres

Metric

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



Notes & Legend

Denotes

" Block A1 = NCBP (Building A1) LP

" Block A2 = NCBP (Building A2) LP

" Block B = NCBP (Building B) LP

" Block E = NCBP (Building E) LP

" Constraint Area (Mather Award Drain)

" Constraint Area (Highway 417)

" Common Area/ Storm Water Management Ponds = NCBP LP

" Proposed Widening = City of Ottawa

Caution

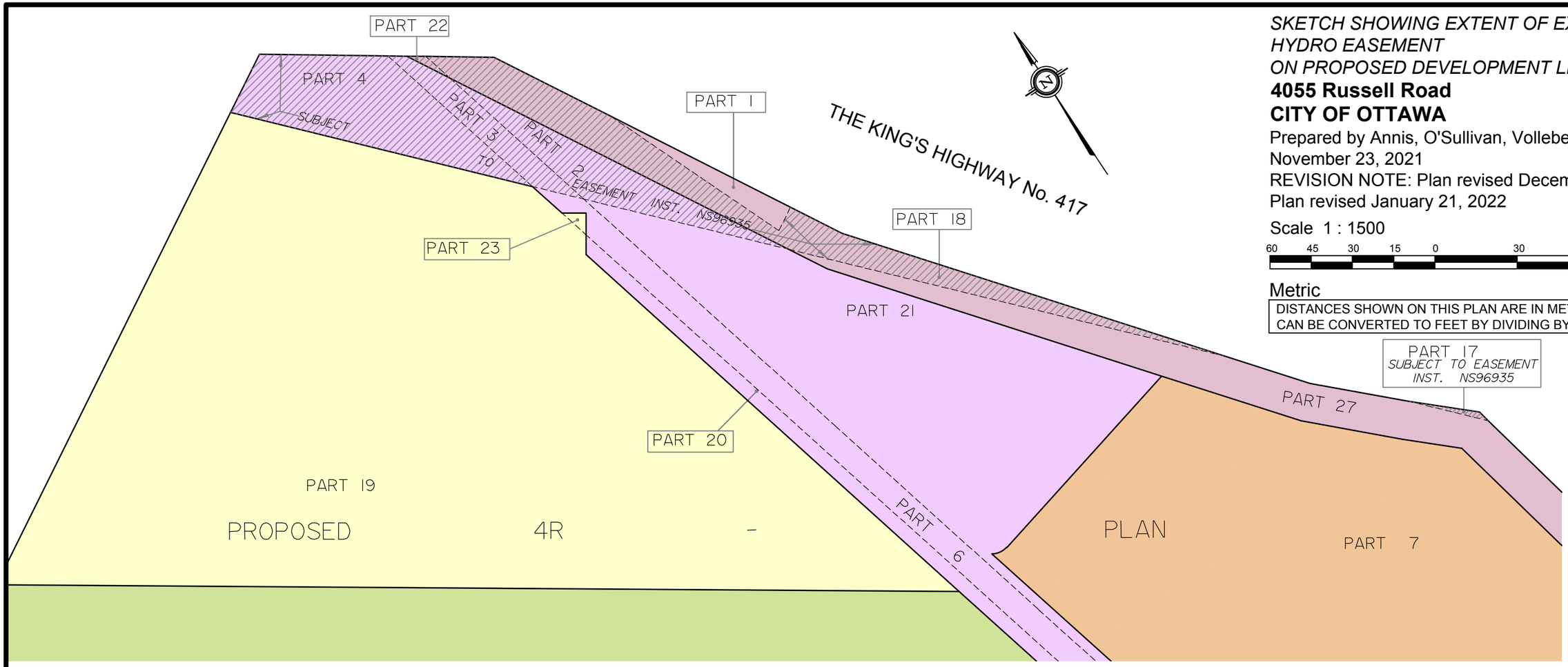
This is NOT a Plan of Survey and shall not be used except for the purpose indicated in the title block.

Boundary information compiled from plans.

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 17730-19 Colour Block Sketch Limits D6

Y:\2019\17730-19\Drawings\17730-19 colour block sketch limits D6.dwg, 1/21/2022 1:40:38 PM



SKETCH SHOWING EXTENT OF EXISTING HYDRO EASEMENT
ON PROPOSED DEVELOPMENT LIMITS AT

4055 Russell Road
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.
November 23, 2021
REVISION NOTE: Plan revised December 7, 2021
Plan revised January 21, 2022

Scale 1 : 1500

60 45 30 15 0 30 60 Metres

Metric

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

Notes & Legend

Denotes

- " Block A1 = NCBP (Building A1) LP
- " Block A2 = NCBP (Building A2) LP
- " Block B = NCBP (Building B) LP
- " Block E = NCBP (Building E) LP
- " Constraint Area (Mather Award Drain)
- " Constraint Area (Highway 417)
- " Common Area/ Storm Water Management Ponds = NCBP LP
- " Proposed Widening = City of Ottawa
- " Extent of Easement Inst. NS96935

Caution

This is NOT a Plan of Survey and shall not be used except for the purpose indicated in the title block.

Boundary information compiled from plans.

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Ontario Land Surveyors

Job No. 17730-19 Colour Hydro Easement D3

Y:\2019\17730-19\Drawings\17730-19 colour Hydro easement D3.dwg, 1/21/2022 1:51:56 PM

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE:_____________

____
ANDREW J. BROXHAM
ONTARIO LAND SURVEYOR

PLAN 4R-

RECEIVED AND DEPOSITED
DATE: _____________

____
REPRESENTATIVE FOR LAND REGISTRAR FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON NO. 4.

SCHEDULE

AREA (Sq.m.)	PART	LOT	CONCESSION	PIN
348.7	1	PART OF 3	6 (RIDEAU FRONT)	Part of 04351-0393
1197.0	2			
652.4	3			
2403.9	4			
133183.9	5	PART OF 3 & 4		
3627.3	6			
35211.7	7			
20790.1	8	PART OF 4 & 5		
570.9	9	PART OF 4		
1743.1	10			
15024.2	11	PART OF 4 & 5		
1309.4	12	PART OF 3 & 4		
3.7	13	PART OF 4		
503.4	14	PART OF 4 & 5		
3836.4	15	PART OF 5		All of 04351-0384
198.0	16			
32.5	17	PART OF 4		Part of 04351-0393
2552.2	18	PART OF 3		
35885.4	19			
8215.5	20	PART OF 3 & 4		
10306.8	21			
26.7	22	PART OF 3		
34.9	23			
580.9	24	PART OF 4		
80.6	25			
47.7	26			
5358.2	27	PART OF 3 & 4		

Parts 3, 6, 9, 13, 22, 23, 24, 25 : Subject to easement Inst. CT212893
Parts 2, 3, 4, 17, 18, 22: Subject to easement Inst. NS96935
Parts 1 to 14 (inclusive) and 17 to 27 (inclusive) comprise all of PIN 04351-0393.

PLAN OF SURVEY OF

PART OF LOT 3, 4, and 5
CONCESSION 6 (Rideau Front)
Geographic Township of Gloucester
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 1000
40 30 20 10 0 20 40 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the ____ day of ________, 2022.

__________ Date

__________________ Andrew J. Broxham
Ontario Land Surveyor

Notes & Legend

—□—	Denotes	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
CM	"	Concrete Monument
(WIT)	"	Witness
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
Meas.	"	Measured
(P1)	"	Plan 5R-5635
(P3)	"	Plan 4R-24959
(P4)	"	Plan 4R-25744
(P5)	"	Plan 4R-26358
(P6)	"	Plan 4R-29568
UP	"	Utility Pole
AN	"	Anchor
P&WF	"	Post & Wire Fence

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99995.

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations on reference points A and B, shown hereon and are referenced to Specified Control Points 01919680105 and 019198434761, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

Coordinates are derived from Can-Net 2016 Real Time Network GPS observations referenced to Specified Control Points 01919680105 and 01918434761, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

Coordinate values are to urban accuracy in accordance with O. Reg. 216/10.

. 01919680105	Northing	5024915.16	Easting	373971.65
. 019198434761	Northing	5036178.12	Easting	372436.11
. Point A	Northing	5027705.32	Easting	375553.97
. Point B	Northing	5027484.66	Easting	376208.76

Caution: Coordinates cannot, in themselves, be used to re-establish corners or boundaries shown on this plan.

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Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 17730-19 Russell Rd PtLts 3 To 5 C6 RF GL R2 D5 | ig