Stormwater Management Report and Servicing Brief

Proposed New Commercial Development
Phase 2
6111 Hazeldean Rd
Stittsville (Ottawa), Ontario

Prepared for:

Grant Castle Corp.
18 Adelaide Street
Maxville, ON
K0C 1T0

Attention: Mr. Jordan Lupovici

LRL File No.: 250030

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1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Grant Castl Corp. to complete a Stormwater Management Analysis and Servicing Brief for the construction of a multi-use commercial buildings located at 6111 Hazeldean Road, Stittsville (Ottawa), Ontario. The proposed development is classified as Phase 2 development for the subject site. The remainder of the site classified as Phase 1 development (Application no.- D07-12-20-113) has received Site Plan Control approval on September 9th, 2022. The property is legally described as Part of Lot 24, Concession 12, Ward 6-Stittsville-Kanata West and Zoning AM9[1699]-h. The location of the proposed development can be viewed in Figure 1.

Figure 1: Aerial View of Proposed Development

The development proposes construction of nine (9) unit multi-use commercial development with the ground floor area of 1225 m^2. The site will be accessible from two (2) 9-12m wide RI/RO entrance located North of Phase 1 Development. For additional details of the proposed development, refer to Site Plan C201 included in Appendix E.

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

2 EXISTING SITE AND DRAINAGE DESCRIPTION

The subject site measures approximately 0.51 ha and is currently undeveloped, consisting of gravel/asphalt area and asphalt driveway along the south boundary developed as part of Phase 1 development. Phase 1 development is a multi-use commercial development including Halo Tunnel Car Wash (485 sqm), Mr Lube Automotive Maintenance Facility (221 sqm), a Starbucks restaurant (175 sqm), and two additional commercial buildings (146 sqm and 190 sqm in sizes).

Phase 1 is accessible from an 8.5 m wide RI/RO entrance located off Hazeldean Rd. Elevations of the existing site range between 115.66 near the northeast corner to 116.65 at the southwest corner of the site.

Existing utility stubs for storm sewer, sanitary sewer, and water service were provided at the southwest corner of the site as part of the Phase 1 development. These connection points will be utilized to service the proposed development under Phase 2.

Existing service includes

- 300 mm diameter PVC Storm sewer lateral
- 200 mm diameter PVC Sanitary sewer lateral
- 200 mm diameter PVC Water service lateral.

3 SCOPE OF WORK

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

Stormwater management

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

Water services

- Calculate the expected water supply demand at average and peak conditions.
- Calculate the required fire flow.
- Confirm the adequacy of water supply and pressure during peak flow and fire flow.
- Describe the proposed water distribution network and connection to the existing system.

Sanitary services

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

4 REGULATORY APPROVALS

An Environmental Activity and Sector Registry (EASR) is expected to be required for installation of the proposed storm sewers within the site. A Permit to Take Water is not anticipated to be required for pumping requirements for sewer installation. The Mississippi Valley Conservation Authority (MVCA) will need to be consulted in order to obtain municipal approval for site development. No other approval requirements from other regulatory agencies are anticipated.

5 WATER SUPPLY AND FIRE PROTECTION

5.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 3W water distribution network pressure zone. The subject property is located to the north of an existing 762 mm dia. watermain along Hazeldean Rd. A 200 mm dia. water service stub is available near the southwest corner of the property, provided as a part of the Phase 1 development.

5.2 Water Supply Servicing Design

The subject property is proposed to be serviced via a 100 mm dia. service main to be connected to the 200 mm dia. watermain stub located at the southwest corner of the site. The watermain stub was provided during the Phase 1 development, and it is connected to two watermain sources:

- Connection 1: Within Hazeldean Rd, southwest of the site
- Connection 2: Within Bandelier Way, northeast of the site.

This site will not require a redundant supply, and so a second connection is not proposed. For servicing layout, refer to Site Servicing Plan C401 in Appendix E.

Table 1 summarizes the City of Ottawa Design Guidelines design parameters employed in the preparation of the water demand estimate.

Table 1: City of Ottawa Water Servicing Design Parameters

Design Parameters	Value
Average Day Demand - Commercial	28,000 L/gross ha/day
Average Day Demand - Light Industrial	35,000 L/gross ha/day
Maximum Day Demand-Commercial/Industrial	1.5 × Average Day Demand
Maximum Hour Demand-Commercial/Industrial	1.8 × Maximum Day Demand
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Desired operating pressure during Maximum Day Flow	345 kPa (50 psi) to 552 kPa (80 psi)
Minimum allowable pressure during Peak Hour Flow	275 kPa (40 psi)
Minimum allowable pressure during Fire Flow Conditions	140 kPa (20 psi)

The required water supply requirements for the proposed commercial development, calculated by using the parameters in Table 1 are included in Appendix B.

Below is the summary of anticipated water demands

- Average Day Demand = 0.16 L/s
- Maximum Day Demand = 0.25 L/s
- Peak Hour Demand = 0.44 L/s

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated domestic water demand and fire flow demand. Table 2 summarizes the boundary conditions of the proposed development. Refer to Appendix B for correspondence and Boundary Conditions.

Table 2: Summary of Boundary Conditions

Demand Scenario	Connection-1 (Hazeldean Rd)		Connection-2 (Bandelier Way)	
	Head (m)	Pressure[1] (psi)	Head (m)	Pressure[2] (psi)
Maximum HGL	160.6	60.6	160.6	64.4
Peak Hour	157.0	55.5	156.8	59.0
Max Day plus Fire Flow	157.0	55.5	154.5	55.7

[1] Ground Elevation = 118.0 m
[2] Ground Elevation = 115.4 m

5.3 Hydraulic Analysis of Water Distribution Network

To determine operating pressures under different flow scenarios, the proposed water distribution network was modeled and analyzed using EPANET (Version 2.2). The hydraulic model uses two supply reservoirs with HGL provided by City Boundary Conditions at different flow scenarios. The first connection is represented by Reservoir R1 at Hazeldean Rd whereas the second connection is represented by Reservoir R2 at Bandelier Way. The EPANET model expands on the previously developed Phase 1 system. Three (3) different flow scenarios were analyzed as described below. Refer to Appendix B for the modeling results.

- **Scenario 1 (Avg Day):** Avg demand of 10 L/min (2.64 GPM) was applied at the service entry node (n19b). The residual pressure ranged from 63.96 to 67.58 psi, remaining within the acceptable 50-80 psi pressure range (Table 1)

- **Scenario 2 (Peak Hour):** Peak hour demand of 26 L/min (6.87 GPM) was applied at the service entry node (n19b) which resulted residual pressure of 58.83 to 62.22 psi, exceeding the minimum pressure requirements of 40 psi.

- **Scenario 3 (Max Day + Fire Flow)**: For the maximum day plus fire flow condition, fire flow from Phase 2 onsite fire hydrant (node n18b) and Phase 2 nearby fire hydrant (node n15-FH3) was capped at 5700 L/min (1505.78 GPM) and 3800 L/min (1003.85 GPM), respectively with a maximum day demand of 15 L/min (3.96 GPM) applied. The residual pressure under this condition ranged from 45.65 to 58.63 psi, exceeding the minimum pressure requirement of 20 psi.

5.4 Fire Flow Calculations

The fire flow rate was calculated using the Ontario Building Code (OBC) method. The following parameters were considered for OBC calculation.

- The Water Supply Coefficient (K) value: 31
- The proposed building height: 7.0m

The minimum required fire flow was calculated to be 6,300 L/min (105 L/s). Refer to Appendix B for calculation details.

According to Technical Bulletin ISTC 2025-05 issued by the City of Ottawa, when fire flow calculated using the OBC method exceeds 9,000 L/min, the FUS method must be applied. However, in this case, the fire demand calculated using the OBC method is less than 9,000 L/min; therefore, the OBC method is used.

One (1) new fire hydrant is proposed in front of the building to service the development. For the hydrant location, refer to Site Servicing Plan C401. In addition, three (3) fire hydrants were previously installed on-site during the Phase 1 development.

Based on Table 18.5.4.3 of ISTB-2018-02 and considering only the proposed new (Phase 1) fire hydrant together with the additional (Phase 2) hydrant located to the south, the available fire flow is determined to be 9,463 L/min, which exceeds the required fire flow of 6,300 L/min.

6 SANITARY SERVICE

6.1 Existing Sanitary Sewer Services

There is an existing 200 mm dia. sanitary sewer service at the southwest corner of the subject site, extending from the Phase 1 development.

6.2 Sanitary Sewer Servicing Design

The proposed development will be serviced via 200 mm dia. sanitary sewers which will connect to the existing 200mm dia. sanitary service stub extending to the subject site's property line at the southwest corner. Refer to LRL drawing C401 for the proposed sanitary servicing layout. Table 3

summarizes the City of Ottawa Design Guidelines design parameters used in the estimation of wastewater flow.

Table 3: City of Ottawa Wastewater Design Parameters

Design Parameters	Value
Commercial Average Flow	28,000 L/gross ha/day
Average Light Industrial Flow	35,000 L/gross ha/day
Commercial Peak Factor	1.5
Infiltration Allowance (Dry Weather)	0.05 L/s/gross ha
Infiltration Allowance (Wet Weather)	0.28 L/s/gross ha
Total Infiltration Allowance	0.33 L/s/gross ha

Based on these parameters (Table 3), the anticipated post-development peak design wastewater flow was calculated to be 0.27 L/s. Refer to Appendix C for further information on wastewater flow calculations and the sewer design sheet.

Anticipated wastewater flows from the existing site was reported in the *Stormwater Management, Watermain, Storm Sewer and Sanitary Sewer Design Brief (Potter's Key Subdivision Report)* prepared by Atrel Engineering, dated February 2017 (Revision 5). The report identified a peak design wastewater flow of 2.13 L/s for the entire site.

During Phase 1 development, the projected wastewater flows were determined as follows:

- Phase 1: 1.578 L/s
- Phase 2: 0.416 L/s

The Phase 2 allocation of 0.416 L/s was originally based on an anticipated development area of 0.51 ha. However, the actual Phase 2 area has increased to 0.54 ha, resulting in a revised calculated sanitary flow of 0.44 L/s. Consequently, the total calculated peak design wastewater flow for the entire site is now 2.02 L/s. The revised total flow remains conservative and within the approved capacity limits established in the original servicing design.

7 STORMWATER MANAGEMENT

7.1 Existing Stormwater Infrastructure

There is an existing 300 mm diameter storm sewer stub extending to the property line at the southwest corner of the site from the Phase 1 development which connects the subject property to Bandelier Way. The storm sewer flows easterly and northerly to the Jackson Trails Stormwater Management Facility (Wet Pond).

In pre-development conditions, the stormwater runoff flows uncontrolled overland to the low-lying area towards the northwest of the subject site. Refer to Appendix D for pre- and post-development watershed information.

7.2 Design Criteria

The stormwater management criteria for this development is based on Potter's Key Design Brief, the City of Ottawa Sewer Design Guidelines, 2012 (City standards), as well as the Ministry of the Environment's Stormwater Management, Planning and Design Manual, 2003 (SWMPD Manual).

7.2.1 Water Quality

The subject property is located within the Feedmill Creek Watershed and is within the area of the Carp River Watershed Subwatershed Study (CRWSS) and is subjected to review by the Mississippi Valley Conservation Authority (MVCA). It was determined that an enhanced level of protection, 80% Total Suspended Solids (TSS) removal, would be required for all contaminated stormwater runoff from the proposed development. Correspondence with MVCA is included in Appendix A.

A Stormceptor model EF04 Oil/Grit Separator (OGS) is proposed downstream of STM MH08 which will exceed the required 80% TSS removal as required by MVCA. Refer to Appendix D for details on OGS.

7.2.2 Water Quantity

The allowable release rate for the site has been contemplated in the Potter's Key Subdivision Report and was determined to be **70 L/s/ha**. Refer to *Stormwater Criteria for Future Development Commercial Area* included in Appendix D. Based on this pre-determined release rate, the allowable release rate of the subject site is calculated and is summarized in Table 4.

Table 4: Allowable Release Rate

Site	Area	Allowable Release Rate	
	(ha)	(L/s/ha)	(L/s)
Proposed Development	0.509	70	35.60

7.3 Method of Analysis

The Rational Method has been used to calculate the peak flow rate from the proposed site and to quantify the storage required for quantity control for the proposed development.

$$Q = 2.78CIA$$

Where,

Q = Flow (L/s)

C = Runoff Coefficient

I = Rainfall Intensity (mm/hr), determined from the City of Ottawa IDF curves

A = Area (ha)

Refer to Appendix D for storage calculations.

7.4 Proposed Stormwater Quantity Controls

The proposed stormwater management quantity control for this development will be accomplished using an Inlet Control Device (ICD) in the storm sewer. Ponding required as a result of quantity control will be accomplished through surface storage in the parking lot and landscape area at the rear of the site.

A network of storm sewers is proposed to service the site and outlet to the existing 300 mm diameter storm sewer stub at the southwest corner of the site. The proposed site storm sewers and stormwater management system are shown on Site Servicing Plan C401 and detailed calculations including the design sheet can be found in Appendix D.

The existing site is delineated by catchments EWS-01 which currently drains un-controlled towards the low-lying area along the northwest boundary. Refer to Pre-development Watershed Plan C701 included in Appendix E.

The site has been analyzed, and post-development watersheds have been allocated. Two (2) catchments (CA-09 & CA-10) consisting primarily of grass area and a concrete sidewalk will flow uncontrolled off the site. For additional details, refer to Post-development Watershed Plan C702 included in Appendix E.

Overland flow within catchments CA-01 to CA-08 will be captured by several CBMHs and CB structures. Catchment CA-05 includes the southern portion of the parking lot that was originally incorporated as part of the Phase 1 development. Since this area now drains to CBMH05, it is considered part of the Phase 2 development for the purpose of stormwater management and servicing design.

An ICD, Hydrovex Vortex Flow Regulator 125VHV-1 or approved equivalent, is proposed at CBMH1 to restrict the collected runoff and control the release rate at 24.71 L/s (H=2.67 m). For additional details on select ICD, refer to Appendix D.

Proposed grading will control the flow of stormwater and provide positive overland drainage towards catch basins and manholes for a controlled release. Refer to Grading Plan C301 in Appendix E. All overland stormwater captured will outlet to the existing 300 mm diameter storm sewer stub and will ultimately be conveyed, via underground storm sewers, to the City storm sewer running along Bandelier Way.

Table 5 summarizes post-development drainage areas. Additional details and calculations can be found in Appendix D.

Table 5: Drainage Areas and Runoff Coefficients

Catchments	Area (ha)	Weighted Runoff Coefficient	100-Year Weighted Runoff Coefficient (25% increase)
CA-01 (controlled)	0.038	0.26	0.33
CA-02 (controlled)	0.029	0.29	0.36
CA-03 (controlled)	0.026	0.25	0.32
CA-04 (controlled)	0.046	0.86	1.00
CA-05 (controlled)	0.056	0.80	1.00
CA-06 (controlled)	0.096	0.88	1.00
CA-07 (controlled)	0.123	0.90	1.00
CA-08 (controlled)	0.078	0.82	1.00
CA-09 (uncontrolled)	0.032	0.33	0.41
CA-10 (uncontrolled)	0.016	0.45	0.56
Total	**0.540**	**0.72**	**0.89**

Table 6 summarizes the release rates from the proposed site.

Table 6: Summary of Proposed Development Stormwater Release Rates

Site Description	Controlled Release Rate	Uncontrolled Release Rate	Total
	(L/s)	(L/s)	(L/s)
Proposed Development	24.71	10.89	35.60
Total	**24.71**	**10.89**	**35.60**

Table 7 summarizes the storage volumes required to meet the allowable release rate at 100-year storm event and the storage provided.

Table 7: Summary of Storage Volume (100-Year)

Site	Storage Required (m^3)		Storage Provided(m^3)
	100-yr	5-yr	
Proposed development	172.40	126.04	179.83
Total	**172.40**	**126.04**	**179.83**

The runoff exceeding the allowable release rate will be stored on-site via surficial ponding. For 100-yr storm event, it is calculated that a total of 172.40 m^3 of storage will be required to attenuate flows to the allowable release rate of 24.71 L/s (controlled release). The total storage provided is 179.83 m^3, thus exceeds the required storage.

Refer to Appendix D for details on runoff and storage calculations. The 100-year maximum ponding elevation and depths can be found on Stormwater Management Plan C601 in Appendix E.

8 EROSION AND SEDIMENT CONTROL

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

9 CONCLUSION

This Stormwater Management and Servicing Report for the proposed Phase 2 development at 6111 Hazeldean Rd presents the rationale and details for the servicing requirements for the subject property. In accordance with the report objectives, the servicing requirements for the development are summarized below.

Water Service

- The anticipated peak hour demand of the proposed development is 0.44 L/s.
- The maximum required fire flows were calculated at 105 L/s for the commercial development. The fire flow water demand was calculated using the OBC method.
- One (1) fire hydrant will be installed in front of the proposed building which will service the proposed development.
- The new development will be serviced with a new 100 mm dia. watermain to be connected to the existing 200 mm dia. watermain stub at the southwest corner of the site which will eventually connect to watermain within Hazeldean Rd.

Sanitary Service

- The anticipated sanitary flow from the proposed development is 0.27 L/s.
- The proposed development will be serviced by a network of 200 mm dia. sanitary sewers that connect to the existing 200 mm dia. sanitary stub extended into the site at the southwest corner from the Phase 1 development.

Stormwater Management

- Stormwater quality control requirements of 80% TSS removal will be met via the use of an Oil/Grit Separator (Stormceptor model EF04 or approved equivalent).

- The storm water release rates from the proposed development will meet the calculated allowable release rate of 35.60 L/s (24.71 L/s controlled and 10.89 L/s uncontrolled).
- Stormwater quantity control objectives will be met through on-site stormwater surface storage in the parking lots and rear yard surface storage.

10 REPORT CONDITIONS AND LIMITATIONS

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

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

Prepared by:

LRL Associates Ltd.

Sarthak Vora

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Civil E.I.T

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Civil Engineer

APPENDIX A

Pre-consultation / Correspondance

File No.: PC2025-0122

May 15, 2025

Jonah Bonn
Landscape Ltd.
Via email: jbonn@firstbay.ca

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 6111 Hazeldean Road

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on May 5, 2025.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please provide your next submission together with the necessary Forms, studies and/or plans to planningcirculations@ottawa.ca, copy to: Nishant Dave and John Bernier.

2. In your subsequent submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed is requested with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

3. Please note, if your development proposal changes significantly in scope, design, or density it is recommended that a subsequent pre-consultation application be submitted.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. The following Official Plan policies apply to the site:

    a. The subject site is designated as Mainstreet Corridor on Schedule B5 – Suburban Urban Transect

    b. Sutherland Street is identified as Arterial – Existing on Schedule C4 – Urban Road Network

2. Staff generally have no concerns with the proposed development as it aligns with Section 6.2.2., policy 1 – Mainstreet Corridor Designation – of the Official Plan.

3. Zoning Provisions

    a. Please note that Drive-Through Operations that abut residential zones and located within 3 metres or more require an opaque screen with a minimum height of 1.5 metres, per Section 112, policy 4 of the Zoning By-law.

        i. Consider providing an opaque screen with a height of two metres to remain consistent with screening requirements for waste enclosures, per Section 110, policy 3 of the Zoning By-law

        ii. Consider Crime Prevention Through Environmental Design (CPTED) principles when designing the opaque screen to ensure there is natural surveillance to the rear, and mitigating opportunities for entrapment areas. In addition, explore opportunities to provide lighting at the rear to illuminate the space, balancing safety and light spillage onto the residential area.

    b. Please note that Drive-Through Operations with a restaurant use require seven queuing spaces prior to the menu board and a total of 11 queuing spaces, per Section 112, Table 112 of the Zoning By-law.

4. Design Guidelines

a. As you continue to develop the design of the proposed development, please consider Drive-Through Operation and Arterial Mainstreet Design Guidelines. Please see the following:

   i. DriveThrough.qxd

   ii. ArterialMainstreet.qxd

5. Site Plan

   a. Explore opportunities to provide additional landscaping elements at the rear, and throughout the proposed surface parking lot through landscaped islands, medians, etc. This will aid in mitigating urban heat-island effects per Section 10, policy 10.3 of the Official Plan.

6. Stationary Noise Assessment Submission Requirement

   a. A Stationary Noise Assessment will be requested for the Drive-Through Operation to assess the noise impact onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.

Development Application:

7. To permit this development, the following applications will be required:

   a. It has been noted during the pre-consultation that the applicant is requesting Phase Two of the development be tied to the Site Plan Agreement (SPA) for Phase One. As the original SPA was registered in 2021—over four years ago—Staff have determined that the proposed development will require a **new** Site Plan Control – Complex application. That said, with recent changes to the City of Ottawa's planning process under Bill 109, Site Plan Control applications are now subject to a streamlined 60-day approval timeline, helping to accelerate the development review process and approvals.

   b. Lifting of Holding Symbol Application – the following conditions need to be satifised to be able lift the holding symbol on site, per Urban Exception 1699:

      i. It must be demonstrated that the Jackson Trails pumping station has sufficient capacity to accept flows from the development at 6111 Hazeldean Road to the satisfaction of the City, and;

      ii. It must be demonstrated that sufficient capacity downstream of the Jackson Trails pumping station is available for the development at 6111 Hazeldean Road.

Feel free to contact Nishant Dave (nishant.dave@ottawa.ca), Planner I, for follow-up questions.

Urban Design

Comments:

8. Please provide a short Design Brief as per the attached terms of reference to provide an overview of the project and provide a rationale of how the proposal has addressed the Large Format Retail Guidelines and Drive-Through Guidelines.

9. Provide significant screening planting between the proposed development and existing residents to the rear. This should include coniferous tree plantings

10. Please ensure that parking islands are large enough for tree planting.

Submission Requirements:

11. Site Plan

12. Landscape Plan

13. Elevations

14. Design Brief

Feel free to contact Lisa Stern (lisa.stern@ottawa.ca), Urban Designer, for follow-up questions.

Engineering

Comments:

15. The Stormwater Management Criteria, for the subject site, is to be based on the following:

    a. **Water Quantity Control:** The site is tributary to the Jackson Trails Stormwater Management Facility. The allowable release rate will need to follow the approved rate set out in the **Potter's Key Subdivision Report**. The approved Stormwater Management and Servicing Report for the Phase 1 development should be referenced to ensure overall site approved rates are being met.

    b. **Water Quality Control:** The subject property is located within the Feedmill Creek Watershed and is within the area of the Carp River Watershed Subwatershed Study (CRWSS). An enhanced level of protection, 80% Total Suspended Solids (TSS) removal is required.

Furthermore, as per the CRWSS, the site is located within a moderate groundwater recharge area which has an infiltration target of 104 mm/yr.

16. An MECP Environmental Compliance Approval may be required for the proposed development if the property will be severed, i.e. Phase 1 property is to be severed from Phase 2 property.

17. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

    a. Location of service

    b. Type of development and the amount of fire flow required (as per FUS).

    c. Average daily demand: ___ l/s.

    d. Maximum daily demand: ___l/s.

    e. Maximum hourly daily demand: ___ l/s.

18. Water

    a. Water Supply Redundancy: Residential buildings with a basic day demand greater than 50m3/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration. The basic day demand for this site not expected to exceed 50m3/day.

    b. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal. Two or more public hydrants are anticipated to be required to handle fire flow.

19. Sewer (sanitary and storm)

    a. A storm sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices.

    b. Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices.

c. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.

d. Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.

e. Please provide a Pre-Development Drainage Area Plan to define the pre-development drainage areas/patterns. Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution.

f. Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A topographical plan of survey shall be provided as part of the submission and a note provided on the plans.

g. There must be at least 15cm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

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

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

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

k. Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 2- and 100-year event storage requirements.

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

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

n. If rooftop control and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a Roof Drain Plan as part of the submission.

o. Street catch basins are not to be located at any proposed entrances.

20. Phase One Environmental Site Assessment

a. The previous Phase One Environmental Site Assessment (ESA) completed for the Phase 1 development can be submitted but will need to be updated. The Phase One ESA will need to be updated in a letter format (i.e. not a full report) due to the report being published more than 18 months ago. The update shall review all the information re a potential for occurrence of contamination impacting the site since the original phase one ESA was done. The phase one ESA shall be updated as per the requirements of Section 28 of the O. Reg. 153/04.

21. Servicing and Stormwater Management Brief

a. A Servicing and Stormwater Management Brief can be submitted in lieu of a study/report. The brief will need demonstrate that the proposed servicing demands do not exceed the limits approved in the Phase 1 Servicing and Stormwater Management Report. The brief should also demonstrate that there is adequate water supply for domestic and fire fighting needs through updated boundary conditions. For further questions or

clarifications as to what information is required, please contact the assigned Project Manager.

22. Background Studies and/or Subwatershed Studies

    a. Carp River Watershed Study

    b. Potter's Key Subdivision Report

    c. 6111 Hazeldean Phase 1 Servicing and Stormwater Management Report

23. Snow Storage

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

24. Gas Pressure Regulating Station

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

25. General Comments

    a. It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.

    b. Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided, and all easements shall be shown on the engineering plans.

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

Feel free to contact Mohammed Fawzi (mohammed.fawzi@ottawa.ca), Senior Project Manager, for follow-up questions.

Noise

Comments:

26. Please see Stationary Noise Assessment request above in planning comments.

Transportation

Comments:

27. Follow Transportation Impact Assessment Guidelines:

    a. A Transportation Impact Assessment is required. Please submit the Scoping report to rochelle.fortier@ottawa.ca at your earliest convenience. The applicant is responsible to submit the Scoping Report and must allow for a 14 day circulation period and sign-off prior to the Strategy Report submission.

    b. The Strategy Report must be submitted for review at the latest with the formal submission package. The applicant is still encouraged to submit the Strategy Report to the TMP before submission and allow for a 14 day circulation period.

    c. If an RMA is required to support the proposed development, the functional plan and/or RMA plans must be submitted with the formal submission to deem complete, per the TIA Guidelines. Request base mapping asap if RMA is required. Contact Engineering Services.

28. Ensure that the development proposal complies with the Right-of-Way protection requirements - See Schedule C16 of the Official Plan.
    a. ROW must be unincumbered and conveyed at no cost to the City. Note that conveyance of the ROW/corner triangle will be required prior to registration of the SP agreement. Additional information on the conveyance process can be provided upon request.

    b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management. The applicant shall submit support evidence and rationale to support any relief to Transportation Planning satisfaction.

29. As the proposed site is commercial and for general public use, AODA legislation applies.
    a. Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.

b. Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).

c. Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements.

30. On site plan:
    a. Ensure site accesses meet the City's Private Approach Bylaw and all driveways/aisles meet the requirements outlined in Section 107 of the Zoning By-law.

    b. Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.

    c. Turning movement diagrams required for internal movements (loading areas, garbage).

    d. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).

    e. Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)

    f. Parking stalls at the end of dead-end parking aisles require adequate turning around space

    g. Grey out any area that will not be impacted by this application.

Feel free to contact Rochelle Fortier-Lesage (rochelle.fortier@ottawa.ca), Transportation Project Manager, for follow-up questions.

Environment

Comments:

31. There are no triggers for an Environmental Impact Study.

32. Bird-Safe Design Guidelines - Please review and incorporate bird safe design elements where relevant. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf

33. Please consider if there are features that can be added reduce the urban heat island effect (see OP 10.3.3). For example, this impact can be reduced by adding

large canopy trees, green roofs or vegetation walls, or incorporating building with low heat absorbing materials.

Feel free to contact Matthew Hayley (matthew.hayley@ottawa.ca), Environmental Planner, for follow-up questions.

Forestry

Comments:

34. Future Trees - tree planting requirements for the landscape plan
    a. Minimum Setbacks
        i. Maintain 1.5m from sidewalk, MUP/cycle track, water service laterals.
        ii. Maintain 2.5m from curb.
        iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
35. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
36. Tree specifications
    a. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    b. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
    c. Please consider transplant trees – they can provide effective, and immediate screening
37. No root barriers, dead-man anchor systems, or planters are permitted.
38. No tree stakes unless necessary
39. Hard surface planting
    a. If there are hard surface plantings, a planting detail must be provided.
    b. Curb style planters are highly recommended.
    c. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

d. Trees are to be planted at grade.

40. Soil Volume - Please demonstrate as per the *Landscape Plan Terms of Reference* that the available soil volumes for new plantings will meet or exceed the following:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	5

41. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years.

42. Page 7 of the Landscape Plan Terms of Reference requires applicants to submit a digital, georeferenced CAD or GIS file of the final approved LP. Please follow this link to review the submission requirements: https://documents.ottawa.ca/sites/documents/files/landscape_tor_en.pdf . The file can be sent to the Planning Forester or Planning File Lead.

Feel free to contact Mark Richardson (mark.richardson@ottawa.ca), Forester, for follow-up questions.

Parkland

Comments:

This is a phased site plan development. Cash in lieu of parkland was taken for the entire area of the site at the time of the Phase 1 site plan. File D07-12-21-0020. The amount of parkland owing was calculated as 2% of the gross land area of 18,493 sq meters equating to 369.86 sq meters of parkland. The amount of CIL owing was $87,585.

Please provide proof of payment for CIL funds taken at Phase 1 site plan or additional CIL will have to be calculated for phase 2.

Feel free to contact Diane Emmerson (diane.emmerson@ottawa.ca), Parks Planner, for follow-up questions.

Other

43. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.

    a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. The timing of an updated report to Committee is unknown at this time, and updates will be shared when they are available.

    b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

Submission Requirements and Fees

1. Site Plan Control – Complex
    a. Additional information regarding fees related to planning applications can be found here.
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Nishant Dave

Encl. List of Plans and Studies and List of Technical Agencies

c.c. John Bernier, Planner II
Lisa Stern, Urban Designer
Mohammed Fawzi, Senior Project Manager
Rochelle Fortier, Transportation Project Manager
Mark Richardson, Planning Forestry
Matthew Hayley, Environmental Planner
Diane Emmerson, Parks Planner

APPENDIX B

Water Supply Calculations
Fire Flow Calculations

Water Supply Calculations

LRL File No. : 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazealden Rd, Stittsville, ON
Date: 8/27/2025
Designed: S Vora
Checked: M Basnet
Dwg Reference: C401

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

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate (L/ha/d)	Area (ha)	Demand (L/d)
Commercial	**28000**	**0.508**	**14224**

Average Day Demand	**14,224**	**L/d**	**0.165**	**L/s**
Maximum Day Factor	1.5		(Design Guidelines-Water Distribution Table 4.2)	
Maximum Daily Demand	**21,336**	**L/d**	**0.247**	**L/s**
Peak Hour Factor	1.8		(Design Guidelines-Water Distribution Table 4.2)	
Maximum Hour Demand	**38,405**	**L/d**	**0.445**	**L/s**

TOTAL DEMAND				
Average Day Demand	**14,224**	**L/d**	**0.16**	**L/s**
Maximum Daily Demand	**21,336**	**L/d**	**0.25**	**L/s**
Maximum Hour Demand	**38,405**	**L/d**	**0.44**	**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) =	$(4Q/\pi V)^{1/2}$		
=	0.018	m	
=	18	mm	
Proposed pipe diameter (d) =	**100**	mm	(to be confirmed with hydraulic pressure analysis)
=	**4**	Inches	

Fire Flow Calculations as per Ontario Building Code (OBC)

LRL File No. : 250030
Project : Proposed Development- Phase 2
Location : 6111 Hazealden Rd, Stittsville, ON
Date : August 27, 2025
Prepared by: S Vora

Fire Protection Water Supply Calculations

$Q = KVS_{Tot}$ (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 = 31 (Group E)

Building Information based on Architectural Drawing

Floor Area = 1225 m^2
Prop. Bldg Height = 7.00 m
V = 8575 **m^3**

Q = 265825 **L**

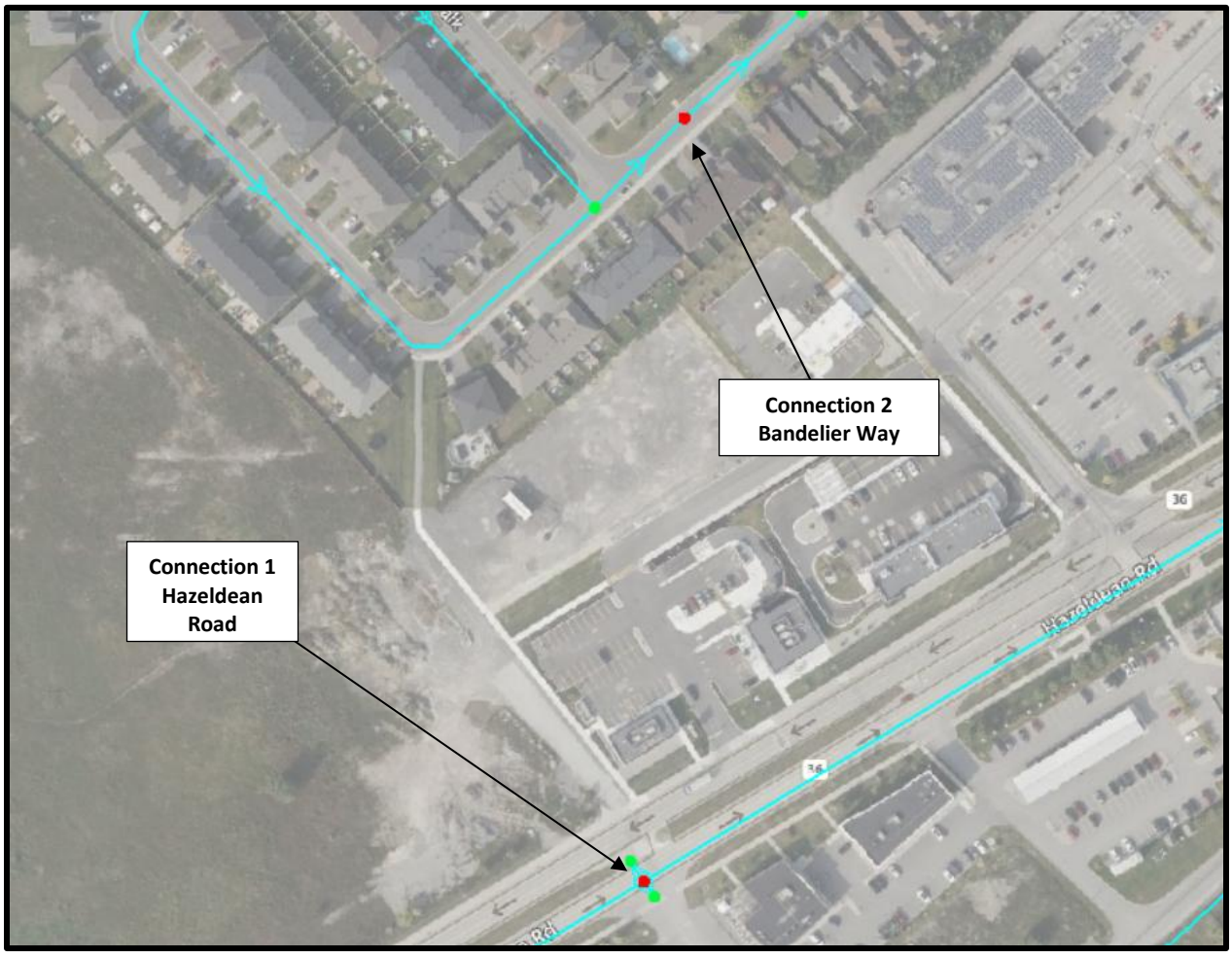
Required Minimum Water Supply Flow Rate = 6300 **L / min** (Table 2 of A-3.2.5.7)
105 L/s

Boundary Conditions
6111 Hazeldean Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	10	0.16
Maximum Daily Demand	15	0.25
Peak Hour	26	0.44
Fire Flow Demand #1	6,300	105.00

Location



Results

Connection 1 – Hazeldean Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.6	60.6
Peak Hour	157.0	55.5
Max Day plus Fire Flow #1	157.0	55.5

[1] Ground Elevation = 118.0 m

Connection 2 – Bandelier Way

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.6	64.4
Maximum HGL	156.8	59.0
Max Day plus Fire Flow #1	154.5	55.7

[1] Ground Elevation = 115.4 m

Notes

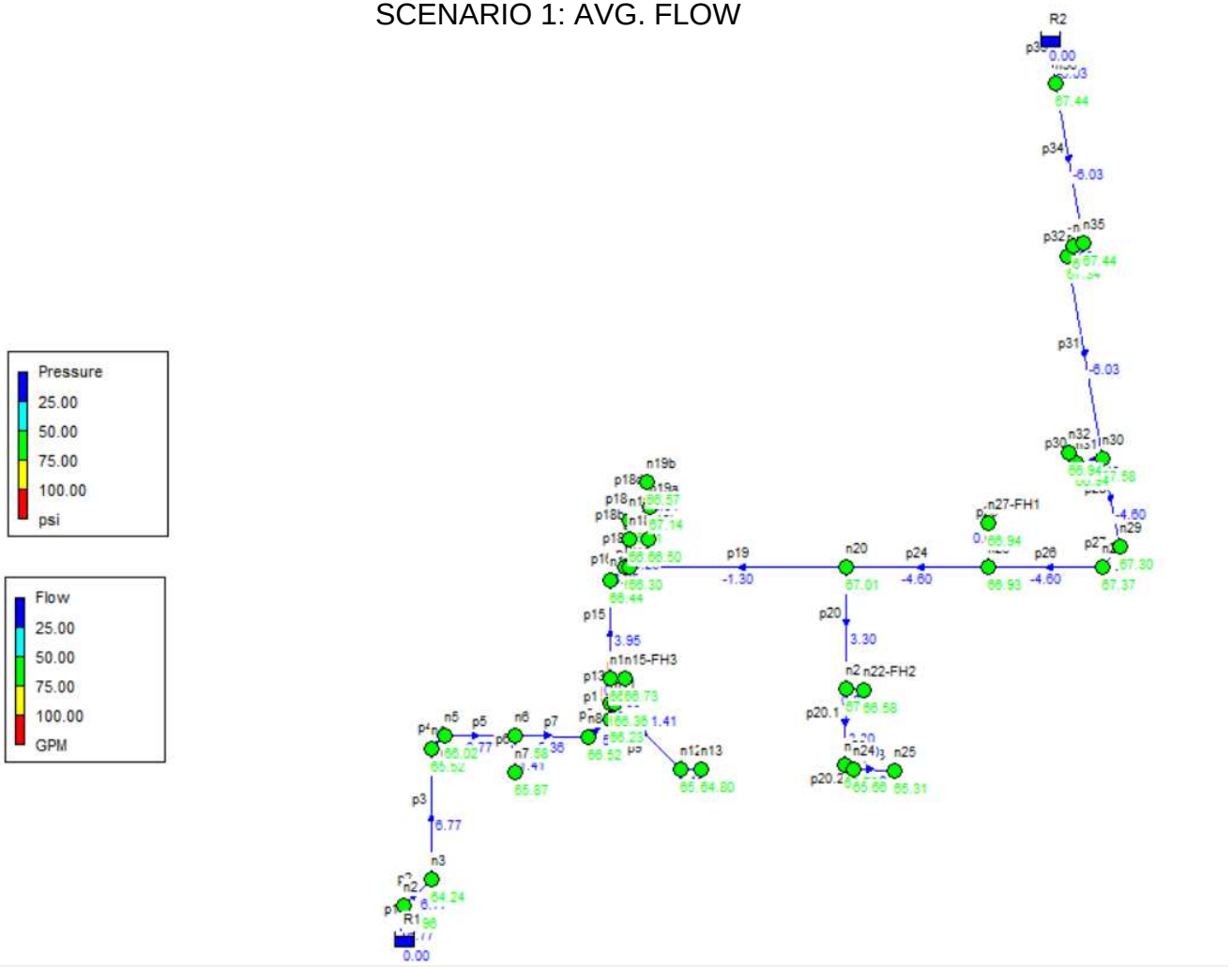
1. The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update.
2. Demands for proposed Connection 1 at existing private water main were split and assigned to upstream junctions at Hazeldean Road & Bandelier Way off the public looped watermains. The engineer must calculate headloss off the public looped watermains.

Disclaimer

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

Water Distribution Network Hydraulic Analysis using EPANET

SCENARIO 1: AVG. FLOW



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*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
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Input File: 250030_Avg Day.net

Link - Node Table:

Link ID	Start Node	End Node	Length ft	Diameter in
p1	R1	n2	35.88	8
p2	n2	n3	27.16	8
p3	n3	n4	91.91	8
p4	n4	n5	13.91	8
p5	n5	n6	48.77	8
p6	n6	n7	25.66	2
p7	n6	n8	51.79	8
p8	n8	n9	23.16	8
p9	n11	n12	67.44	2
p10	n12	n13	14.39	2
p11	n9	n10	7.12	8
p12	n10	n11	1.81	2
p13	n10	n14	17.48	8
p14	n14	n15-FH3	10.04	6
p15	n14	n16	69.37	8
p16	n16	n17	13.91	8
p17	n17	n18	2.82	8
p18b	n18a	n19	11.15	4
p19	n18	n20	154.42	8
p20	n20	n21	88.17	6
p21	n21	n22-FH2	19.35	6
p23	n24	n25	29.22	4
p24	n20	n26	100.73	8
p25	n26	n27-FH1	29.52	6
p26	n26	n28	81.64	8
p27	n28	n29	17.06	8
p28	n29	n30	63.96	8
p29	n30	n31	19.68	2
p30	n31	n32	9.84	2
p31	n30	n33	146.19	8
p32	n33	n34	8.66	8
p33	n34	n35	6.95	8
p34	n35	n36	119.72	10
p20.1	n21	n23	52.09	4
p20.2	n23	n24	6.56	4
p35	n36	R2	27.88	8
p18a	n18a	n18b	10.17	6

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length ft	Diameter in
p18c	n19	n19a	18.37	4
p18d	n19a	n19b	25.58	4
p18	n18	n18a	26.24	8

Node Results:

Node ID	Demand GPM	Head ft	Pressure psi	Quality
n2	0.00	526.77	63.96	0.00
n3	0.00	526.77	64.24	0.00
n4	0.00	526.77	65.52	0.00
n5	0.00	526.77	66.02	0.00
n6	0.00	526.77	66.58	0.00
n7	1.41	526.77	65.87	0.00
n8	0.00	526.77	66.52	0.00
n9	0.00	526.77	66.23	0.00
n10	0.00	526.77	66.36	0.00
n11	0.00	526.77	66.36	0.00
n12	0.00	526.76	65.02	0.00
n13	1.41	526.76	64.80	0.00
n14	0.00	526.77	66.30	0.00
n15-FH3	0.00	526.77	66.73	0.00
n16	0.00	526.77	66.44	0.00
n17	0.00	526.77	66.30	0.00
n18	0.00	526.77	66.30	0.00
n19	2.61	526.77	66.71	0.00
n20	0.00	526.77	67.01	0.00
n21	0.00	526.77	67.01	0.00
n22-FH2	0.00	526.77	66.58	0.00
n23	0.00	526.77	65.73	0.00
n24	0.00	526.77	65.66	0.00
n25	3.30	526.77	65.31	0.00
n26	0.00	526.77	66.93	0.00
n27-FH1	0.00	526.77	66.94	0.00
n28	0.00	526.77	67.37	0.00
n29	0.00	526.77	67.30	0.00
n30	0.00	526.77	67.58	0.00
n31	0.00	526.77	66.94	0.00
n32	1.43	526.77	66.94	0.00
n33	0.00	526.77	67.34	0.00
n34	0.00	526.77	67.40	0.00
n35	0.00	526.77	67.44	0.00
n36	0.00	526.77	67.44	0.00
n18a	0.00	526.77	66.50	0.00
n18b	0.00	526.77	66.50	0.00
n19a	0.00	526.77	67.14	0.00

Node Results: (continued)

Node ID	Demand GPM	Head ft	Pressure psi	Quality	
n19b	2.64	526.77	66.57	0.00	
R1	-6.77	526.77	0.00	0.00	Reservoir
R2	-6.03	526.77	0.00	0.00	Reservoir

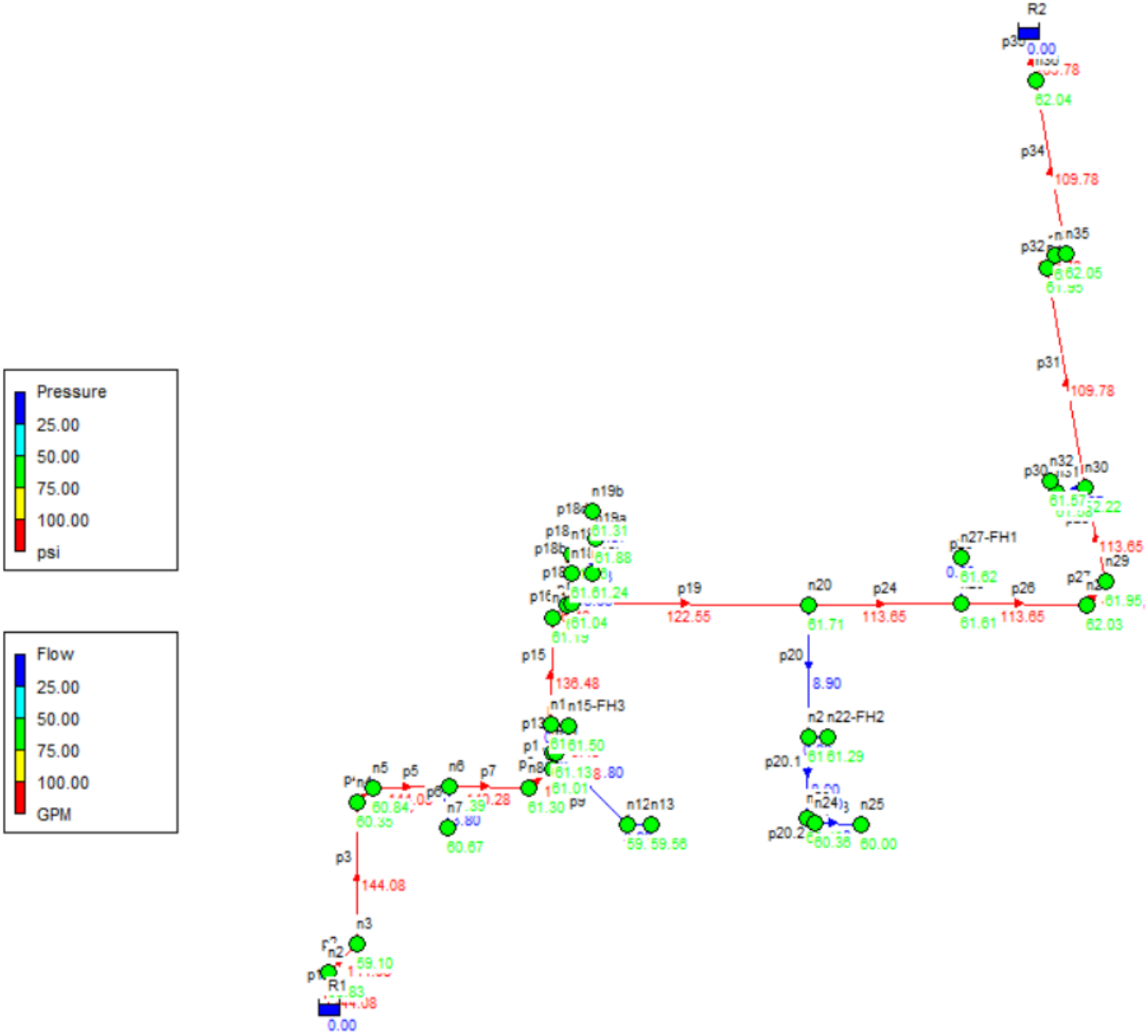
Link Results:

Link ID	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
p1	6.77	0.04	0.00	Open
p2	6.77	0.04	0.00	Open
p3	6.77	0.04	0.00	Open
p4	6.77	0.04	0.00	Open
p5	6.77	0.04	0.00	Open
p6	1.41	0.14	0.14	Open
p7	5.36	0.03	0.00	Open
p8	5.36	0.03	0.00	Open
p9	1.41	0.14	0.13	Open
p10	1.41	0.14	0.13	Open
p11	5.36	0.03	0.00	Open
p12	1.41	0.14	0.13	Open
p13	3.95	0.03	0.00	Open
p14	0.00	0.00	0.00	Open
p15	3.95	0.03	0.00	Open
p16	3.95	0.03	0.00	Open
p17	3.95	0.03	0.00	Open
p18b	5.25	0.13	0.05	Open
p19	-1.30	0.01	0.00	Open
p20	3.30	0.04	0.00	Open
p21	0.00	0.00	0.00	Open
p23	3.30	0.08	0.02	Open
p24	-4.60	0.03	0.00	Open
p25	0.00	0.00	0.00	Open
p26	-4.60	0.03	0.00	Open
p27	-4.60	0.03	0.00	Open
p28	-4.60	0.03	0.00	Open
p29	1.43	0.15	0.14	Open
p30	1.43	0.15	0.14	Open
p31	-6.03	0.04	0.00	Open
p32	-6.03	0.04	0.00	Open
p33	-6.03	0.04	0.01	Open
p34	-6.03	0.02	0.00	Open
p20.1	3.30	0.08	0.02	Open
p20.2	3.30	0.08	0.02	Open
p35	-6.03	0.04	0.00	Open
p18a	0.00	0.00	0.00	Open
p18c	2.64	0.07	0.01	Open

Link Results: (continued)

Link ID	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
p18d	2.64	0.07	0.02	Open
p18	5.25	0.03	0.00	Open

SCENARIO 2: PEAK HOUR



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*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
*********************************************************************
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Input File: 250030_Peak Hour.net

Link - Node Table:

Link ID	Start Node	End Node	Length ft	Diameter in
p1	R1	n2	35.88	8
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p3	n3	n4	91.91	8
p4	n4	n5	13.91	8
p5	n5	n6	48.77	8
p6	n6	n7	25.66	2
p7	n6	n8	51.79	8
p8	n8	n9	23.16	8
p9	n11	n12	67.44	2
p10	n12	n13	14.39	2
p11	n9	n10	7.12	8
p12	n10	n11	1.81	2
p13	n10	n14	17.48	8
p14	n14	n15-FH3	10.04	6
p15	n14	n16	69.37	8
p16	n16	n17	13.91	8
p17	n17	n18	2.82	8
p18b	n18a	n19	11.15	4
p19	n18	n20	154.42	8
p20	n20	n21	88.17	6
p21	n21	n22-FH2	19.35	6
p23	n24	n25	29.22	4
p24	n20	n26	100.73	8
p25	n26	n27-FH1	29.52	6
p26	n26	n28	81.64	8
p27	n28	n29	17.06	8
p28	n29	n30	63.96	8
p29	n30	n31	19.68	2
p30	n31	n32	9.84	2
p31	n30	n33	146.19	8
p32	n33	n34	8.66	8
p33	n34	n35	6.95	8
p34	n35	n36	119.72	10
p20.1	n21	n23	52.09	4
p20.2	n23	n24	6.56	4
p35	n36	R2	27.88	8
p18a	n18a	n18b	10.17	6

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length ft	Diameter in
p18c	n19	n19a	18.37	4
p18d	n19a	n19b	25.58	4
p18	n18	n18a	26.24	8

Node Results:

Node ID	Demand GPM	Head ft	Pressure psi	Quality
n2	0.00	514.93	58.83	0.00
n3	0.00	514.91	59.10	0.00
n4	0.00	514.83	60.35	0.00
n5	0.00	514.82	60.84	0.00
n6	0.00	514.78	61.39	0.00
n7	3.80	514.76	60.67	0.00
n8	0.00	514.74	61.30	0.00
n9	0.00	514.72	61.01	0.00
n10	0.00	514.72	61.13	0.00
n11	0.00	514.72	61.13	0.00
n12	0.00	514.66	59.77	0.00
n13	3.80	514.65	59.56	0.00
n14	0.00	514.70	61.07	0.00
n15-FH3	0.00	514.70	61.50	0.00
n16	0.00	514.65	61.19	0.00
n17	0.00	514.64	61.04	0.00
n18	0.00	514.64	61.04	0.00
n19	7.06	514.64	61.46	0.00
n20	0.00	514.55	61.71	0.00
n21	0.00	514.54	61.71	0.00
n22-FH2	0.00	514.54	61.29	0.00
n23	0.00	514.54	60.43	0.00
n24	0.00	514.54	60.36	0.00
n25	8.90	514.53	60.00	0.00
n26	0.00	514.49	61.61	0.00
n27-FH1	0.00	514.49	61.62	0.00
n28	0.00	514.45	62.03	0.00
n29	0.00	514.44	61.95	0.00
n30	0.00	514.41	62.22	0.00
n31	0.00	514.39	61.58	0.00
n32	3.87	514.38	61.57	0.00
n33	0.00	514.33	61.95	0.00
n34	0.00	514.33	62.01	0.00
n35	0.00	514.33	62.05	0.00
n36	0.00	514.31	62.04	0.00
n18a	0.00	514.64	61.24	0.00
n18b	0.00	514.64	61.24	0.00
n19a	0.00	514.63	61.88	0.00

Node Results: (continued)

Node ID	Demand GPM	Head ft	Pressure psi	Quality	
n19b	6.87	514.63	61.31	0.00	
R1	-144.08	514.96	0.00	0.00	Reservoir
R2	109.78	514.30	0.00	0.00	Reservoir

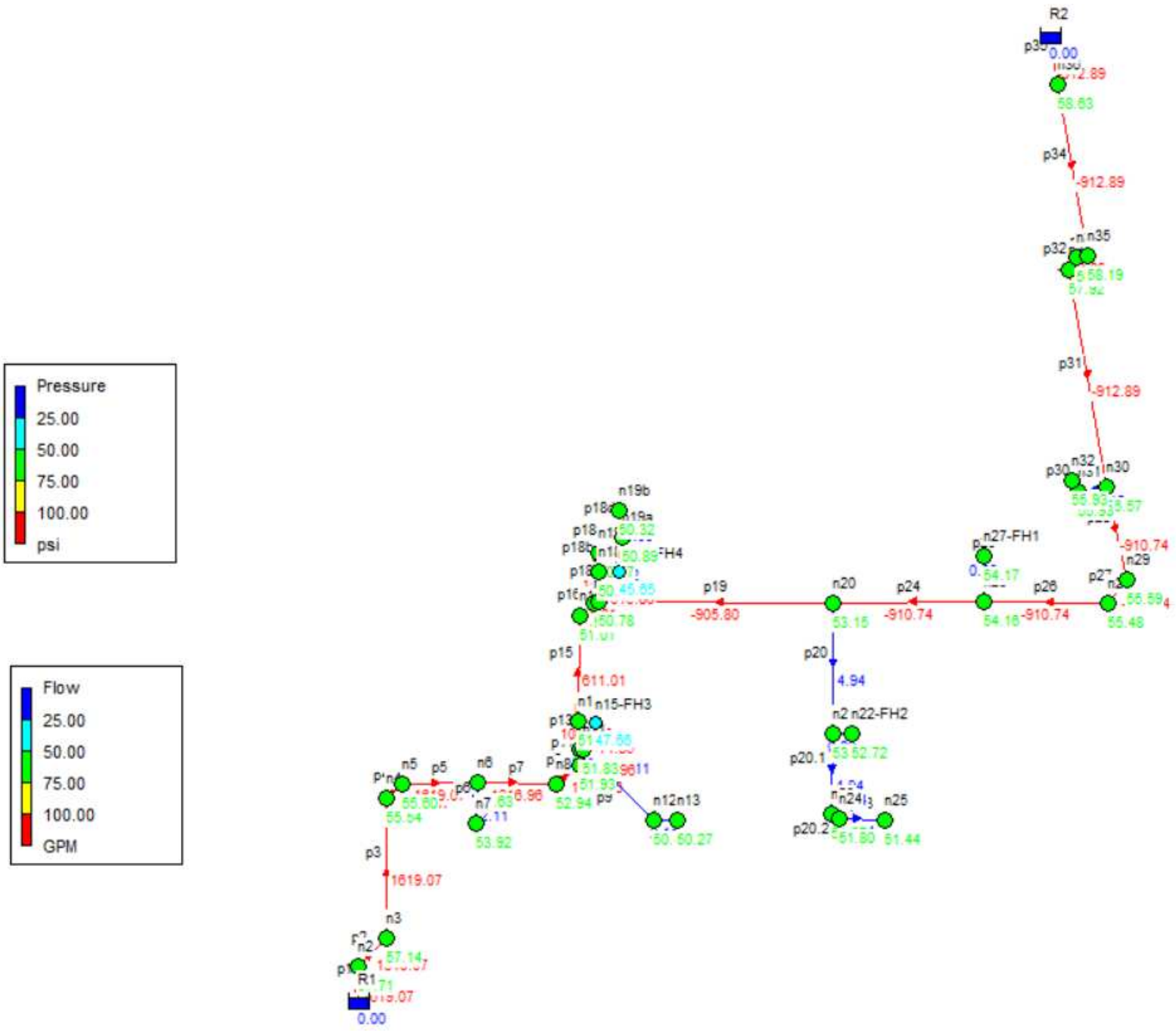
Link Results:

Link ID	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
p1	144.08	0.92	0.82	Open
p2	144.08	0.92	0.82	Open
p3	144.08	0.92	0.82	Open
p4	144.08	0.92	0.82	Open
p5	144.08	0.92	0.82	Open
p6	3.80	0.39	0.84	Open
p7	140.28	0.90	0.78	Open
p8	140.28	0.90	0.78	Open
p9	3.80	0.39	0.84	Open
p10	3.80	0.39	0.84	Open
p11	140.28	0.90	0.78	Open
p12	3.80	0.39	0.84	Open
p13	136.48	0.87	0.74	Open
p14	0.00	0.00	0.00	Open
p15	136.48	0.87	0.74	Open
p16	136.48	0.87	0.74	Open
p17	136.48	0.87	0.76	Open
p18b	13.93	0.36	0.32	Open
p19	122.55	0.78	0.61	Open
p20	8.90	0.10	0.02	Open
p21	0.00	0.00	0.00	Open
p23	8.90	0.23	0.14	Open
p24	113.65	0.73	0.53	Open
p25	0.00	0.00	0.00	Open
p26	113.65	0.73	0.53	Open
p27	113.65	0.73	0.53	Open
p28	113.65	0.73	0.53	Open
p29	3.87	0.40	0.87	Open
p30	3.87	0.40	0.87	Open
p31	109.78	0.70	0.50	Open
p32	109.78	0.70	0.49	Open
p33	109.78	0.70	0.49	Open
p34	109.78	0.45	0.17	Open
p20.1	8.90	0.23	0.14	Open
p20.2	8.90	0.23	0.14	Open
p35	109.78	0.70	0.23	Open
p18a	0.00	0.00	0.00	Open
p18c	6.87	0.18	0.09	Open

Link Results: (continued)

Link ID	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
p18d	6.87	0.18	0.09	Open
p18	13.93	0.09	0.01	Open

SCENARIO 3: MAX. DAY + FIRE FLOW



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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
*********************************************************************
```

Input File: 250030_Max Day + Fire Flow.net

Link - Node Table:

Link ID	Start Node	End Node	Length ft	Diameter in
p1	R1	n2	35.88	8
p2	n2	n3	27.16	8
p3	n3	n4	91.91	8
p4	n4	n5	13.91	8
p5	n5	n6	48.77	8
p6	n6	n7	25.66	2
p7	n6	n8	51.79	8
p8	n8	n9	23.16	8
p9	n11	n12	67.44	2
p10	n12	n13	14.39	2
p11	n9	n10	7.12	8
p12	n10	n11	1.81	2
p13	n10	n14	17.48	8
p14	n14	n15-FH3	10.04	6
p15	n14	n16	69.37	8
p16	n16	n17	13.91	8
p17	n17	n18	2.82	8
p18b	n18a	n19	11.15	4
p19	n18	n20	154.42	8
p20	n20	n21	88.17	6
p21	n21	n22-FH2	19.35	6
p23	n24	n25	29.22	4
p24	n20	n26	100.73	8
p25	n26	n27-FH1	29.52	6
p26	n26	n28	81.64	8
p27	n28	n29	17.06	8
p28	n29	n30	63.96	8
p29	n30	n31	19.68	2
p30	n31	n32	9.84	2
p31	n30	n33	146.19	8
p32	n33	n34	8.66	8
p33	n34	n35	6.95	8
p34	n35	n36	119.72	10
p20.1	n21	n23	52.09	4
p20.2	n23	n24	6.56	4
p35	n36	R2	27.88	8
p18a	n18a	n18b-FH4	10.17	6

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length ft	Diameter in
p18c	n19	n19a	18.37	4
p18d	n19a	n19b	25.58	4
p18	n18	n18a	26.24	8

Node Results:

Node ID	Demand GPM	Head ft	Pressure psi	Quality
n2	0.00	512.36	57.71	0.00
n3	0.00	510.39	57.14	0.00
n4	0.00	503.73	55.54	0.00
n5	0.00	502.72	55.60	0.00
n6	0.00	499.19	54.63	0.00
n7	2.11	499.18	53.92	0.00
n8	0.00	495.44	52.94	0.00
n9	0.00	493.77	51.93	0.00
n10	0.00	493.25	51.83	0.00
n11	0.00	493.25	51.83	0.00
n12	0.00	493.23	50.49	0.00
n13	2.11	493.23	50.27	0.00
n14	0.00	491.99	51.23	0.00
n15-FH3	1003.85	490.77	47.66	0.00
n16	0.00	491.16	51.01	0.00
n17	0.00	491.00	50.80	0.00
n18	0.00	490.96	50.78	0.00
n19	7.06	489.28	50.47	0.00
n20	0.00	494.78	53.15	0.00
n21	0.00	494.78	53.15	0.00
n22-FH2	0.00	494.78	52.72	0.00
n23	0.00	494.78	51.87	0.00
n24	0.00	494.78	51.80	0.00
n25	4.94	494.78	51.44	0.00
n26	0.00	497.30	54.16	0.00
n27-FH1	0.00	497.30	54.17	0.00
n28	0.00	499.34	55.48	0.00
n29	0.00	499.76	55.59	0.00
n30	0.00	501.36	56.57	0.00
n31	0.00	501.35	55.93	0.00
n32	2.15	501.35	55.93	0.00
n33	0.00	505.03	57.92	0.00
n34	0.00	505.24	58.07	0.00
n35	0.00	505.42	58.19	0.00
n36	0.00	506.43	58.63	0.00
n18a	0.00	489.28	50.25	0.00
n18b-FH4	1505.78	486.66	45.65	0.00
n19a	0.00	489.28	50.89	0.00

Node Results: (continued)

Node ID	Demand GPM	Head ft	Pressure psi	Quality	
n19b	3.96	489.27	50.32	0.00	
R1	-1619.07	514.96	0.00	0.00	Reservoir
R2	-912.89	506.76	0.00	0.00	Reservoir

Link Results:

Link ID	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
p1	1619.07	10.33	72.48	Open
p2	1619.07	10.33	72.48	Open
p3	1619.07	10.33	72.48	Open
p4	1619.07	10.33	72.48	Open
p5	1619.07	10.33	72.48	Open
p6	2.11	0.22	0.28	Open
p7	1616.96	10.32	72.31	Open
p8	1616.96	10.32	72.31	Open
p9	2.11	0.22	0.28	Open
p10	2.11	0.22	0.28	Open
p11	1616.96	10.32	72.31	Open
p12	2.11	0.22	0.29	Open
p13	1614.85	10.31	72.13	Open
p14	1003.85	11.39	121.43	Open
p15	611.01	3.90	11.92	Open
p16	611.01	3.90	11.92	Open
p17	611.01	3.90	11.93	Open
p18b	11.02	0.28	0.21	Open
p19	-905.80	5.78	24.72	Open
p20	4.94	0.06	0.01	Open
p21	0.00	0.00	0.00	Open
p23	4.94	0.13	0.05	Open
p24	-910.74	5.81	24.97	Open
p25	0.00	0.00	0.00	Open
p26	-910.74	5.81	24.97	Open
p27	-910.74	5.81	24.97	Open
p28	-910.74	5.81	24.97	Open
p29	2.15	0.22	0.29	Open
p30	2.15	0.22	0.29	Open
p31	-912.89	5.83	25.08	Open
p32	-912.89	5.83	25.08	Open
p33	-912.89	5.83	25.08	Open
p34	-912.89	3.73	8.46	Open
p20.1	4.94	0.13	0.05	Open
p20.2	4.94	0.13	0.05	Open
p35	-912.89	5.83	11.84	Open
p18a	1505.78	17.09	257.31	Open
p18c	3.96	0.10	0.03	Open

Link Results: (continued)

Link ID	Flow GPM	Velocity fps	Unit Headloss ft/Kft	Status
p18d	3.96	0.10	0.03	Open
p18	1516.80	9.68	64.23	Open

APPENDIX C

Wastewater Calculations

MINTO COMMUNITIES INC.

STORMWATER MANAGEMENT, WATERMAIN, STORM SEWER AND SANITARY SEWER

DESIGN BRIEF

PART OF LOT 23 AND 24
CONCESSION 12

POTTER'S KEY SUBDIVISION

CITY OF OTTAWA

FEBRUARY 2017

ATREL Engineering Ltd Ltée
Engineers - Ingénieurs

(Revision 5)

SANITARY SEWER COMPUTATION FORM

DATE: **February 2017**
DESIGNED BY: VLL
CHECKED BY: AGS

PROJECT: **POTTER'S KEY SUBDIVISION**
CLIENT: Minto Communities Inc.
PROJECT #: 131003
BY: ATREL ENGINEERING LTD

q= 350 l/cap.day
I= 0.28 l/ha.s
PVC/CONC N= 0.013
OTHER N= 0.024

Table 20
Single dwelling= 3.4 person/unit
Townhouse= 2.7 person/unit

STREET NAMES	LOCATION FROM (Up)		LOCATION TO (Down)		RESIDENTIAL INDIVIDUAL AREA (ha.)	RESIDENTIAL INDIVIDUAL POP.	RESIDENTIAL CUMULATIVE AREA (ha.)	RESIDENTIAL CUMULATIVE POP.	RESIDENTIAL PEAKING FACTOR M	RESIDENTIAL FLOW Q(p) (L/S)	COMMERCIAL , INSTITUTIONAL INDIVIDUAL AREA (ha.)	COMMERCIAL , INSTITUTIONAL INDIVIDUAL POP.	COMMERCIAL , INSTITUTIONAL CUMULATIVE AREA (ha.)	COMMERCIAL , INSTITUTIONAL CUMULATIVE POP.	COMMERCIAL , INSTITUTIONAL PEAKING FACTOR M	COMMERCIAL , INSTITUTIONAL FLOW Q(p) (L/S)	PEAKING FACTOR M	FLOW Q(p) (L/S)	PEAK EXT.FLOW Q(i) (L/S)	PEAK DES. Q(d) (L/S)	SEWER DATA TYPE PIPE	DIA. (N0M) (mm)	DIA. (ACT) (MM)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	UpStream Obv. (M)	UpStream Inv. (M)	DwnStream Obv. (M)	DwnStream Inv. (M)
Eaglehead Crescent	MH	150	MH	151	0.56	41.0	0.56	41	4.00	0.66									0.16	0.82	PVC	200	201.2	0.85	72.5	30.71	97%	0.97	115.06	114.86	114.44	114.24
Eaglehead Crescent	MH	151	MH	152	0.21	7.0	0.77	48	4.00	0.78									0.22	0.99	PVC	200	201.2	0.85	11.0	30.71	97%	0.97	114.41	114.21	114.32	114.12
Eaglehead Crescent	MH	152	MH	154	0.80	38.0	1.57	86	4.00	1.39									0.44	1.83	PVC	200	201.2	0.85	108.5	30.71	94%	0.97	114.14	113.94	113.22	113.02
Park 2	MH	153	MH	154	0.37		0.37												0.10	0.10	PVC	200	201.2	1.00	11.0	33.31	100%	1.05	114.13	113.93	114.02	113.82
Eaglehead Crescent	MH	154	MH	155	0.16	7.0	2.10	93	4.00	1.51									0.59	2.09	PVC	200	201.2	0.85	36.0	30.71	93%	0.97	113.22	113.02	112.91	112.71
Eaglehead Crescent	MH	155	MH	156	0.30	14.0	2.40	107	4.00	1.73									0.67	2.41	PVC	200	201.2	0.50	39.5	23.55	90%	0.74	112.88	112.68	112.68	112.48
Eaglehead Crescent	MH	156	MH	157			2.40	107	4.00	1.73									0.67	2.41	PVC	200	201.2	0.50	11.0	23.55	90%	0.74	112.65	112.45	112.59	112.39
Eaglehead Crescent	MH	157	MH	165	0.38	17.0	2.78	124	4.00	2.01									0.78	2.79	PVC	200	201.2	1.24	73.5	37.09	92%	1.17	112.56	112.36	111.65	111.45
Bandelier Way	MH	160	MH	162	0.17	14.0	0.17	14	4.00	0.23									0.05	0.27	PVC	200	201.2	0.65	40.0	26.86	99%	0.84	114.18	113.98	113.92	113.72
Geranium Walk	MH	161	MH	162	0.40	34.0	0.40	34	4.00	0.55									0.11	0.66	PVC	200	201.2	0.65	63.0	26.86	98%	0.84	114.28	114.08	113.87	113.67
Geranium Walk	MH	162	MH	163	0.23	17.0	0.80	65	4.00	1.05									0.22	1.28	PVC	200	201.2	0.50	45.5	23.55	95%	0.74	113.32	113.12	113.09	112.89
Geranium Walk	MH	163	MH	165	0.18	11.0	0.98	76	4.00	1.23									0.27	1.51	PVC	200	201.2	0.50	37.5	23.55	94%	0.74	113.06	112.86	112.87	112.67
Kimpton Drive	MH	165	MH	166	0.07		16.43	1020	3.79	15.68									4.60	20.28	PVC	375	366.4	0.20	41.0	73.72	72%	0.70	111.58	111.21	111.50	111.13
Kimpton Drive	MH	166	CAP	Kimpt. Dr	0.13	4.0	16.56	1024	3.79	15.74									4.64	20.37	CONC	375	381.0	0.20	21.0	81.80	75%	0.72	109.04	108.67	109.00	108.63
Kimpton Drive	CAP	Kimpt. Dr	EX	8 A			16.56	1024	3.79	15.74									4.64	20.37	CONC	375	381.0	0.20	43.0	81.80	75%	0.72	109.00	108.63	108.91	108.54
Bandelier Way	MH	160	MH	170	0.26	19.0	0.26	19	4.00	0.31									0.07	0.38	PVC	200	201.2	0.75	44.5	28.85	99%	0.91	114.05	113.85	113.72	113.52
Bandelier Way	MH	170	MH	171	0.12	6.0	0.38	25	4.00	0.41									0.11	0.51	PVC	200	201.2	0.75	10.0	28.85	98%	0.91	113.69	113.49	113.61	113.41
Bandelier Way	MH	171	MH	172	0.61	57.0	0.99	82	4.00	1.33									0.28	1.61	PVC	200	201.2	0.75	71.0	28.85	94%	0.91	113.58	113.38	113.05	112.85
Bandelier Way	MH	172	MH	173	0.40	36.0	1.39	118	4.00	1.91									0.39	2.30	PVC	200	201.2	0.65	54.0	26.86	91%	0.84	113.05	112.85	112.70	112.50
Bandelier Way	MH	173	MH	175			1.39	118	4.00	1.91									0.39	2.30	PVC	200	201.2	0.65	3.0	26.86	91%	0.84	112.67	112.47	112.65	112.45
Commercial (by others)	STUB	101	MH	174	1.17	70.0	1.17	70	4.00	1.13	9.02	1292.0	9.02	1292	1.50	7.85			2.85	11.84	PVC	300	299.2	0.23	7.5	46.05	74%	0.65	111.32	111.02	111.30	111.00
Commercial (by Minto)	STUB	102	MH	174							1.85	265.0	1.85	265	1.50	1.61			0.52	2.13	PVC	200	201.2	0.35	6.0	19.71	89%	0.62	111.29	111.09	111.27	111.07
Easement	MH	174	MH	175			1.17	70	4.00	1.13			10.87	1557	1.50	9.46			3.37	13.97	PVC	300	299.2	0.23	55.5	46.05	70%	0.65	111.27	110.97	111.14	110.84
Bandelier Way	MH	175	MH	176	0.13	6.0	2.69	194	4.00	3.14			10.87	1557	1.50	9.46			3.80	16.40	PVC	300	299.2	0.23	8.5	46.05	64%	0.65	111.08	110.78	111.06	110.76
Bandelier Way	MH	176	MH	177	0.52	52.0	3.21	246	4.00	3.99			10.87	1557	1.50	9.46			3.94	17.39	PVC	300	299.2	0.23	68.5	46.05	62%	0.65	111.03	110.73	110.87	110.57
Geranium Walk	MH	161	MH	177	0.72	68.0	0.72	68	4.00	1.10									0.20	1.30	PVC	200	201.2	1.50	113.5	40.80	97%	1.28	114.14	113.94	112.44	112.24
Bandelier Way	MH	177	CAP	Bandelier Way	0.17	14.0	4.10	328	4.00	5.31			10.87	1557	1.50	9.46			4.19	18.97	CONC	300	304.8	0.20	38.0	44.55	57%	0.61	110.87	110.57	110.80	110.50
Street No.2	CAP	Bandelier Way	EX	14 A			4.10	328	4.00	5.31			10.87	1557	1.50	9.46			4.19	18.97	CONC	300	304.8	0.20	43.0	45.12	58%	0.62	110.80	110.50	110.71	110.41

Existing Sanitary Sewers

LICENSED PROFESSIONAL ENGINEER
A. G. Y. SAUVE
100142393
Feb. 24, 2017
PROVINCE OF ONTARIO

Sanitary Service Calculations

LRL File No. : 200100
Project : Halo Car Wash
Address 6111 Hazeldean Rd, Stittsville, ON
Date : June 11, 2021
Designed by : Mohan Basnet

SAN Design Flow

Site Description	Qty	L/Qty	Total	
			L/day	L/s
Halo Car Wash				
Employees	2	75	150	0.002
Total x Peak Factor (1.5)				0.003
*Anticipated cars per day	655	132	86460	1.001
				1.003
Mr. Lube				
Floor drains	2	375	750	0.009
Anticipated cars per day	50	40	2000	0.023
Total x Peak Factor (1.5)				**0.048**
Starbucks				
Seats	25	125	3125	0.036
Total x Peak Factor (1.5)				**0.054**
Commercial 1 (next to Starbucks)				
Floor area 146m^2	146	5	730	0.008
Parking spots	5	6	30	0.000
Total x Peak Factor (1.5)				**0.013**
Commercial 2 (stand alone building)				
Floor area 190m^2	190	5	950	0.011
Parking spots	7	6	42	0.000
Total x Peak Factor (1.5)				**0.017**
Total excluding infiltration allowances				1.136
Infiltration 0.33 L/s/ha	1.34			0.442
Total including infiltration allowances				**1.578**
Future Development				
Area (ha)	0.51	28000	14280	0.165
Total x Peak Factor (1.5)				0.248
Infiltration 0.33 L/s/ha				0.168
Total including infiltration allowances				**0.416**
Grand Total				**1.994**
Permitted (Per Potter's Key Subdivision Report)				**2.130**

Note

*Fresh water consumption per car is 132 L with water reclaim system (info by Halo Car Wash)
SAN release rate from Halo Car Wash will be controlled at 1 L/s (see Drawing C401)

LRL File No. 200100
Project: Halo Car Wash
Location: 6111 Hazeldean Rd, Stittsville, ON
Date: June 10, 2021

Sanitary Design Parameters

Average Daily Flow = 280 L/p/day
Commercial & Institutional Flow = 28000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Heavy Industrial Flow = 55000 L/ha/day
Maximum Residential Peak Factor = 4.0
Commercial & Institutional Peak Factor = 1.5

Industrial Peak Factor = as per Appendix 4-B = 7.4
Extraneous Flow = 0.33 L/s/gross ha
(as Per Tech Bulleting ISTB-2018-01)

Pipe Design Parameters

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

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL	PIPE					
STREET/ SITE	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE AREA (Ha)	CUMMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)	FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)
Mr Lube	Bldg.	SAN MH01							0.28	0.28						0.048	0.28	0.28	0.09	0.14	3.0	150	2.00%	PVC	21.54	1.22
	SAN MH01	SAN MH02																		0.14	19.3	150	0.50%	PVC	10.77	0.61
	SAN MH02	SAN MH03																		0.14	31.1	200	0.50%	PVC	23.19	0.74
Halo Car Wash	Bldg.	SAN MH04									0.53	0.53				0.003	0.53	0.53	0.17	0.18	20.4	150	2.00%	PVC	21.54	1.22
	SAN MH04	SAN MH10																		0.18	16.4	200	2.00%	PVC	46.38	1.48
	**Forcemain	SAN MH10																		1.00	14.7	75				
	SAN MH10	SAN MH03																		1.18	31.6	200	2.00%	PVC	46.38	1.48
	SAN MH03	SAN MH05																		1.32	31.6	200	0.50%	PVC	23.19	0.74
Comm. Area	Starbucks	SAN MH07							0.27	0.27						0.067	0.27	0.27	0.09	0.15	22.5	150	2.00%	PVC	21.54	1.22
	Comm Bldg	SAN MH07							0.27	0.27						0.017	0.27	0.27	0.09	0.10	13.0	150	2.00%	PVC	21.54	1.22
	SAN MH07	SAN MH05																		0.26	48.6	200	3.00%	PVC	56.81	1.81
*Phase 2	STUB	SAN MH05							0.51	0.51						0.248	0.51	0.51	0.17	0.42	6.8	200	1.00%	PVC	32.80	1.04
	SAN MH05	SAN MH08																		1.99	40.7	200	0.50%	PVC	23.19	0.74
	SAN MH08	Ex. STUB																		1.99	37.6	200	0.50%	PVC	23.19	0.74

Designed: M. B./P.P	PROJECT: Halo Car Wash		
Checked: M.B.	LOCATION: 6111 Hazeldean, Ottawa		
Dwg. Reference: C401	File Ref.: 200100	Date: 2021-06-10	Sheet No. 1 of 1

LRL File No. 250030
Project: Halo Hazeldean-Phase 2
Location: 6111 Hazeldean Rd, Stittsville, ON
Date: November 13, 2025
Designed: S.V.
Checked: M.B.

Sanitary Design Parameters

Commercial Flow = 28000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Commercial Peak Factor = 1.5
Industrial Peak Factor = as per Appendix 4-B
Extraneous Flow = 0.33L/s/gross ha

Pipe Design Parameters

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

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW, Q (l/s)	PIPE						
STREET	FROM	TO MH	AREA (Ha)	POP.	CUMMULATIVE AREA (Ha)	CUMMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)		LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (Q_{FULL}) (l/s)	VEL. (FULL) (m/s)	Q/Q_{FULL}
	STUB	PROP. SAN MH01							0.540	0.540						0.26	0.540	0.540	0.18	0.44	10.4	200	2.00%	PVC	46.38	1.48	0.01
	PROP SAN MH01	EX. SAN MH05																		0.44	7.8	200	1.00%	PVC	32.80	1.04	0.01

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

APPENDIX D

Stormwater Management Calculations

MINTO COMMUNITIES INC.

STORMWATER MANAGEMENT, WATERMAIN, STORM SEWER AND SANITARY SEWER

DESIGN BRIEF

PART OF LOT 23 AND 24
CONCESSION 12

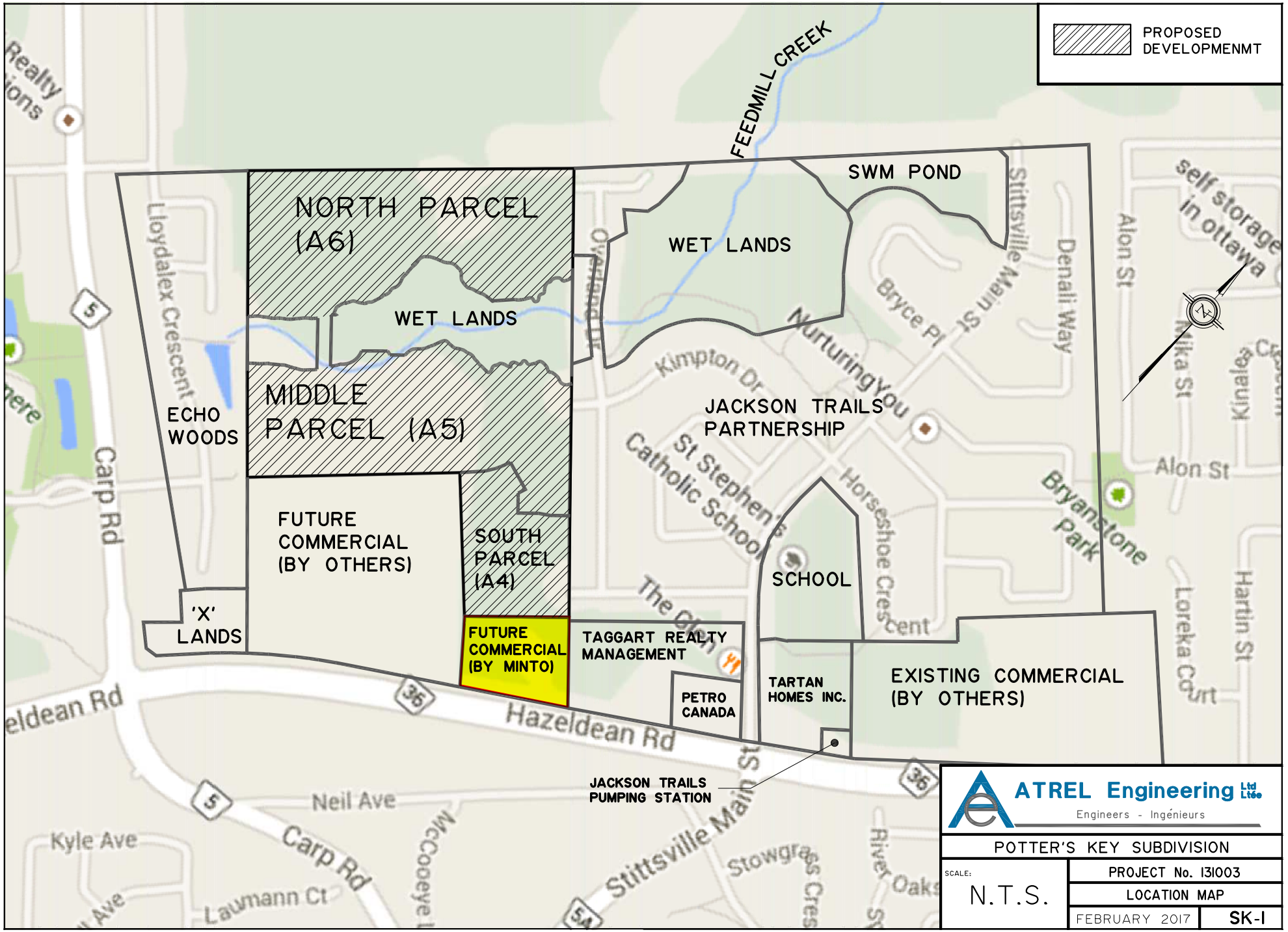
POTTER'S KEY SUBDIVISION

CITY OF OTTAWA

FEBRUARY 2017

ATREL Engineering Ltd Ltée
Engineers - Ingénieurs

(Revision 5)



ATREL Engineering Ltd Ltée
Engineers - Ingénieurs

POTTER'S KEY SUBDIVISION

SCALE:	PROJECT No. 131003
N.T.S.	LOCATION MAP
	FEBRUARY 2017 | SK-1

b) Major System

i. Grading design is to be based on split lot drainage.
ii. On street routing must be provided and illustrated on the grade control plan to carry flows exceeding the minor system capacity towards the wetland. This routing must incorporate a maximum 0.30m grade difference between any high points and the adjacent upstream low point. An overall positive slope of at least 0.10% will be required across consecutive high points for routing purposes.

c) Water Quality

As per the "Jackson Trails Stormwater Management Design Brief" dated June 2006, an Enhanced Level of Protection (80 % removal of Total Suspended Solids) will be achieved in the stormwater management wet pond. The Best Management Practices should also be implemented within the subdivision design and during construction.

3.3 Tributary Area

The proposed development of Potter's Key Subdivision (± 20.07 ha.) is adjacent to a future residential land parcel (1.17 ha.), two future commercial areas of 9.02 ha. (owned by others) and 1.85 ha.(owned by Minto), all of which are included in this analysis. The storm drainage area is divided in several sub-basin areas in order to assess the flow to each pipes (see plan 131003-STM1 and 131003-STM2). A runoff coefficient was calculated for each area using 0.20 for grass and 0.90 for asphalt and roofs.

3.4 Theoretical Flows

The storm flows are calculated using the 2 year Intensity Duration Frequency (IDF) curve from the City of Ottawa. In addition, the inflow into the proposed storm sewers shall be restricted to 70 L/s/ha via inlet control devices and catch basin interconnections as per Jackson Trails – Stormwater Management Design Brief. A "Flow Restrictors and Catchbasin Table" can be found on plan 131003-TD1 showing J.F.S.A's calculate 100 year ponding elevation for each individual catchbasin as well as their inverts, type of flow restrictor and top of grates. Furthermore, the table shows the head on the flow restrictor calculated with J.F.S.A's 100 year ponding elevation. The table serves as a verification that no more than 70 l/s/ha. will be released into the minor system during the 100 year storm event.

STORM SEWER COMPUTATION FORM

DESIGNED BY: VLL
CHECKED BY: AGS

POTTER'S KEY SUBDIVISION
Minto Communities Inc.
131003
ATREL ENGINEERING LTD
February, 2017

STORM FREQUENCY : 2 YEAR
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 1

STREET NAMES	LOCATION FROM (Up)		LOCATION TO (Down)		AREA (ha.) RUNOFF COEFFICIENT 0.20	0.45	0.55	0.58	0.70	0.75	0.61	0.87	RATIONAL METHOD INDIV. 2.78AR	ACCUM. 2.78AR	2 YEAR TIME CONC. (MIN)	RAINF. INTENS. (MM/HR)	FLOW (L/S)	ACTUAL PIPE FLOW (L/S)	PIPE TYPE	DIA. (N0M) (mm)	(ACT)	SLOPE (%)	LENGTH (M)	SEWER DATA CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	UpStream Obv. (M)	Inv. (M)	Forced drop (M)	Inv to Inv (M)	DwStream Obv. (M)	Inv. (M)	UpStream Hgl at UP-MH (M)	Hgl Out UP-MH (M)	Down MH Hgl (M)	UpStream USF ELEV (M)	HGL FREEBOARD (M)
Eaglehead Crescent	MH	550	MH	551			0.25		0.33				1.02	1.02	10.00	76.81	78.69	78.69	PVC	375	366.4	0.85	72.5	151.97	48%	1.44	0.84	115.27	114.90		no	114.65	114.28	115.27	115.27	114.65	115.75	0.48
Eaglehead Crescent	MH	551	MH	552										1.02	10.84	73.73	75.53	75.53	PVC	375	366.4	0.85	11.0	151.97	50%	1.44	0.13	114.62	114.25		no	114.53	114.16	114.63	114.62	114.55	115.43	0.81
Eaglehead Crescent	MH	552	MH	554			0.72		0.35				1.78	2.81	10.97	73.29	205.68	205.68	CONC	450	457.2	0.85	108.5	274.22	25%	1.67	1.08	114.53	114.08		no	113.61	113.16	114.55	114.53	113.61	115.97	1.44
Park 2	MH	553	MH	554	0.36								0.20	0.20	10.00	76.81	15.37	15.37	PVC	300	299.2	1.00	11.0	96.02	84%	1.37	0.13	113.72	113.42		no	113.61	113.31	113.72	113.72	113.61	n/a	n/a
Eaglehead Crescent	MH	554	MH	555										3.01	12.05	69.74	209.68	209.68	CONC	450	457.2	0.85	36.0	274.22	24%	1.67	0.36	113.61	113.16		no	113.30	112.85	113.61	113.61	113.30	114.44	0.83
Eaglehead Crescent	MH	555	MH	556					0.26				0.51	3.51	12.41	68.65	241.14	241.14	CONC	525	533.4	0.50	41.0	317.25	24%	1.42	0.48	113.30	112.78		no	113.09	112.57	113.30	113.30	113.09	114.04	0.74
Eaglehead Crescent	MH	556	MH	557										3.51	12.89	67.25	236.22	236.22	CONC	525	533.4	0.50	11.5	317.25	26%	1.42	0.14	113.06	112.54		no	113.00	112.48	113.08	113.06	113.00	113.97	0.91
Eaglehead Crescent	MH	557	MH	565			0.22		0.23				0.78	4.30	13.02	66.86	287.26	287.26	CONC	525	533.4	0.50	73.0	317.25	9%	1.42	0.86	112.97	112.45	0.23	no	112.60	112.08	113.00	112.97	112.60	113.73	0.76
Bandelier Way	MH	560	MH	562						0.08			0.17	0.17	10.00	76.81	12.81	12.81	PVC	300	299.2	0.70	44.5	80.34	84%	1.14	0.65	114.34	114.04		no	114.03	113.73	114.34	114.34	114.03	114.87	0.53
Geranium Walk	MH	561	MH	562											10.00	76.81			PVC	300	299.2	0.65	68.5	77.42	100%	1.10	1.04	114.48	114.18		no	114.03	113.73	114.48	114.48	114.03	115.27	0.79
Geranium Walk	MH	562	MH	563		0.24				0.39			1.11	1.28	11.04	73.04	93.51	93.51	PVC	375	366.4	0.90	44.0	156.38	40%	1.48	0.49	114.03	113.66	0.40	no	113.63	113.26	114.03	114.03	113.63	115.25	1.22
Geranium Walk	MH	563	MH	565					0.10				0.19	1.47	11.53	71.39	105.29	105.29	PVC	375	366.4	0.65	39.0	132.90	21%	1.26	0.52	113.20	112.83	0.58	no	112.95	112.58	113.22	113.20	112.95	114.77	1.57
Kimpton Drive	MH	565	MH	566					0.17				0.33	13.10	16.33	58.80	770.32	770.32	CONC	1050	1066.8	0.12	39.0	986.85	22%	1.10	0.59	112.37	111.32	0.60	no	112.32	111.27	112.37	112.37	112.32	n/a	n/a
Kimpton Drive	MH	566	MH	Kimpton Drive		0.43							0.54	13.64	16.92	57.58	785.32	785.32	CONC	1350	1371.6	0.12	22.0	1928.87	59%	1.31	0.28	111.72	110.37		no	111.69	110.34	111.73	111.72	111.69	n/a	n/a
Kimpton Drive	MH	Kimpton Drive	MH	8										13.64	17.20	57.02	777.68	777.68	CONC	1350	1371.6	0.12	41.5	1928.87	60%	1.31	0.53	111.69	110.34		no	111.64	110.29	111.69	111.69	111.64	n/a	n/a
Bandelier Way	MH	1560	MH	570						0.26			0.54	0.54	10.00	76.81	41.64	41.64	PVC	300	299.2	0.70	44.0	80.34	48%	1.14	0.64	114.27	113.97		no	113.96	113.66	114.27	114.27	113.96	114.88	0.61
Bandelier Way	MH	570	MH	571										0.54	10.64	74.43	40.35	40.35	PVC	300	299.2	0.70	9.5	80.34	50%	1.14	0.14	113.93	113.63		no	113.86	113.56	113.94	113.93	113.87	114.51	0.58
Bandelier Way	MH	571	MH	572		0.46							0.58	1.12	10.78	73.93	82.62	82.62	PVC	375	366.4	0.70	71.0	138.31	40%	1.31	0.90	113.86	113.49		no	113.36	112.99	113.87	113.86	113.36	114.51	0.65
Bandelier Way	MH	572	MH	575		0.22				0.40			1.11	2.23	11.68	70.90	157.88	157.88	CONC	450	457.2	0.65	57.5	239.80	34%	1.46	0.66	113.36	112.91	0.04	no	112.99	112.54	113.36	113.36	113.19	114.07	0.71
Commercial (by others)	MH	501	MH	574				1.18		8.86			20.38	20.38	15.00	61.77	1258.61	1258.61	CONC	1050	1066.8	0.27	6.0	1480.28	15%	1.66	0.06	113.22	112.17		no	113.20	112.15	113.39	113.39	113.38	n/a	n/a
Commercial (by Minto)	MH	502	MH	574						1.81			3.77	3.77	10.11	76.39	288.28	288.28	CONC	600	609.6	0.27	9.0	332.84	13%	1.14	0.13	113.20	112.60	0.01	no	113.18	112.58	113.40	113.40	113.38	n/a	n/a
Easement	MH	574	MH	575										24.15	15.06	61.63	1488.34	1488.34	CONC	1050	1066.8	0.30	53.0	1560.35	5%	1.75	0.51	113.17	112.12		no	113.01	111.96	113.38	113.33	113.19	n/a	n/a
Bandelier Way	MH	575	MH	576										26.38	15.57	60.46	1594.71	1594.71	CONC	1050	1066.8	0.45	12.0	1911.03	17%	2.14	0.09	112.95	111.90		no	112.90	111.85	113.19	112.99	112.95	113.77	0.78
Bandelier Way	MH	576	MH	577		0.19				0.33			0.93	27.30	15.66	60.25	1644.95	1644.95	CONC	1200	1219.2	0.27	72.5	2113.43	22%	1.81	0.67	112.90	111.70		no	112.70	111.50	112.95	112.90	112.70	113.77	0.87
Geranium Walk	MH	10561	MH	577		0.62				0.49			1.80	1.80	10.00	76.81	138.05	138.05	PVC	375	366.4	1.50	113.0	201.88	32%	1.91	0.98	114.40	114.03		no	112.70	112.33	114.40	114.40	112.70	115.15	0.75
Bandelier Way	MH	577	MH	Bandelier Way		0.36				0.25			0.97	30.07	16.33	58.80	1768.17	1768.17	CONC	1350	1371.6	0.20	36.5	2490.17	29%	1.69	0.36	112.70	111.35		no	112.63	111.28	112.70	112.70	112.63	113.93	1.23
Bandelier Way	MH	Bandelier Way	MH	14							0.14		0.24	30.31	16.69	58.05	1759.40	1759.40	CONC	1350	1371.6	0.20	41.5	2490.17	29%	1.69	0.41	112.63	111.28		no	112.55	111.20	112.63	112.63	112.55	n/a	n/a

Existing Storm Sewer

LRL Associates Ltd.

Storm Watershed Summary

LRL File No. 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: November 13, 2025
Designed: S.Vora
Checked: M. Basnet
Dwg Reference: C701, C702

Pre-Development Catchments

Catchment	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
ECA-01 (uncontrolled)	0.000	0.000	0.509	0.509	0.90
Total	**0.000**	**0.000**	**0.509**	**0.509**	**0.90**

Post-Development Catchments

Catchment	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
CA-01 (controlled)	0.035	0.000	0.004	0.038	0.26
CA-02 (controlled)	0.026	0.000	0.004	0.029	0.29
CA-03 (controlled)	0.024	0.000	0.002	0.026	0.25
CA-04 (controlled)	0.003	0.000	0.044	0.046	0.86
CA-05 (controlled)	0.008	0.000	0.048	0.056	0.80
CA-06 (controlled)	0.003	0.000	0.094	0.096	0.88
CA-07 (controlled)	0.000	0.000	0.123	0.123	0.90
CA-08 (controlled)	0.009	0.000	0.070	0.078	0.82
CA-09 (uncontrolled)	0.026	0.000	0.006	0.032	0.33
CA-10 (uncontrolled)	0.010	0.000	0.006	0.016	0.45
Total	**0.143**	**0.000**	**0.398**	**0.540**	**0.72**

LRL File No. 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: 45974
Designed: S.Vora
Checked: M. Basnet
Drawing Ref.: C601

Stormwater Management Design Sheet

STORM - 100 YEAR

Runoff Equation

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

Pre-Development Release Rate

IDF Curve Equations

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

C =	0.50	(max of 0.5 as per City Guidelines)	
I_{100} =	178.6	mm/hr	
T_d =	10	min	
A =	0.509	ha	
100 Year Release Rate =	126.21	L/s	
Allowable Release Rate =	**70.00**	**L/ha/s**	*(as determined for Potter's Key Subdivision Report by Atrel Engineering (Rev 5) dated February 2017)*
	35.60	**L/s**	

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.540**	**ha**	**∑R =**	**0.72**	**0.89**
	CA-01 (controlled)	0.038	ha	R =	0.26	0.33
	CA-02 (controlled)	0.029	ha	R =	0.29	0.36
	CA-03 (controlled)	0.026	ha	R =	0.25	0.32
	CA-04 (controlled)	0.046	ha	R =	0.86	1.00
	CA-05 (controlled)	0.056	ha	R =	0.80	1.00
	CA-06 (controlled)	0.096	ha	R =	0.88	1.00
	CA-07 (controlled)	0.123	ha	R =	0.90	1.00
	CA-08 (controlled)	0.078	ha	R =	0.82	1.00
	Total (controlled)	**0.493**	**ha**	**R =**	**0.75**	**0.94**
	CA-09 (uncontrolled)	0.032	ha	R =	0.33	0.41
	CA-10 (uncontrolled)	0.016	ha	R =	0.45	0.56
	Total (uncontrolled)	**0.048**	**ha**	**R =**	**0.37**	**0.46**
	Total	**0.540**	**ha**	**R =**	**0.72**	**0.89**

100 Year Post-development Stormwater Management

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	229.00	122.58	24.71	10.89	35.60
15	142.89	183.26	142.70	24.71	8.71	33.42
20	119.95	153.83	154.95	24.71	7.32	32.02
25	103.85	133.18	162.72	24.71	6.33	31.04
30	91.87	117.82	167.61	24.71	5.60	30.31
35	82.58	105.91	170.52	24.71	5.04	29.74
40	75.15	96.37	172.00	24.71	4.58	29.29
45	69.05	88.56	172.40	24.71	4.21	28.92
50	63.95	82.02	171.94	24.71	3.90	28.61
55	59.62	76.47	170.81	24.71	3.64	28.34
60	55.89	71.68	169.12	24.71	3.41	28.11
65	52.65	67.52	166.97	24.71	3.21	27.92
70	49.79	63.85	164.43	24.71	3.04	27.74
75	47.26	60.60	161.55	24.71	2.88	27.59
80	44.99	57.70	158.37	24.71	2.74	27.45
85	42.95	55.09	154.95	24.71	2.62	27.32
90	41.11	52.72	151.30	24.71	2.51	27.21
95	39.43	50.57	147.45	24.71	2.40	27.11
100	37.90	48.61	143.43	24.71	2.31	27.02
105	36.50	46.81	139.24	24.71	2.23	26.93
110	35.20	45.15	134.91	24.71	2.15	26.85
115	34.01	43.61	130.45	24.71	2.07	26.78
120	32.89	42.19	125.87	24.71	2.01	26.71

On-site stormwater detention

Storage required =	**172.40**	**m^3**	
Storage provided =	**179.83**	**m^3**	(Refer to DWG C601)

LRL File No. 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: 45974
Designed: S.Vora
Checked: M. Basnet
Drawing Ref.: C601

Stormwater Management Design Sheet

STORM - 5 YEAR

Runoff Equation

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

Pre-Development Release Rate

IDF Curve Equations

$I_5 = 998.071 / (Td + 6.053)^{0.814}$ A = 998.071 B = 0.814 C = 6.053

C =	0.50	(max of 0.5 as per City Guidelines)
I_5 =	104.2	mm/hr
T_d =	10	min
A =	0.51	ha
5 Year Release Rate =	73.65	L/s

Post-development Stormwater Management

					$\sum R_{2\&5}$
	Total Site Area =	**0.540**	**ha**	**∑R =**	**0.72**
	CA-01 (controlled)	0.038	ha	R =	0.26
	CA-02 (controlled)	0.029	ha	R =	0.29
	CA-03 (controlled)	0.026	ha	R =	0.25
	CA-04 (controlled)	0.046	ha	R =	0.86
	CA-05 (controlled)	0.056	ha	R =	0.80
	CA-06 (controlled)	0.096	ha	R =	0.88
	CA-07 (controlled)	0.123	ha	R =	0.90
	CA-08 (controlled)	0.078	ha	R =	0.82
	Total (controlled)	**0.493**	**ha**	**R =**	**0.75**
	CA-09 (uncontrolled)	0.032	ha	R =	0.33
	CA-10 (uncontrolled)	0.016	ha	R =	0.45
	Total (uncontrolled)	**0.048**	**ha**	**R =**	**0.37**
	Total	**0.540**	**ha**	**R =**	**0.72**

5 Year Post-development Stormwater Management

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	183.20	95.10	24.71	6.97	31.68
15	142.89	146.61	109.71	24.71	5.85	30.56
20	119.95	123.07	118.03	24.71	5.07	29.77
25	103.85	106.55	122.76	24.71	4.48	29.19
30	91.87	94.26	125.19	24.71	4.03	28.73
35	82.58	84.72	126.04	24.71	3.67	28.37
40	75.15	77.10	125.74	24.71	3.37	28.07
45	69.05	70.84	124.58	24.71	3.12	27.83
50	63.95	65.62	122.73	24.71	2.91	27.61
55	59.62	61.17	120.34	24.71	2.73	27.43
60	55.89	57.35	117.51	24.71	2.57	27.27
65	52.65	54.01	114.31	24.71	2.43	27.13
70	49.79	51.08	110.79	24.71	2.31	27.01
75	47.26	48.48	107.00	24.71	2.20	26.90
80	44.99	46.16	102.98	24.71	2.10	26.80
85	42.95	44.07	98.76	24.71	2.01	26.71
90	41.11	42.18	94.36	24.71	1.92	26.63
95	39.43	40.46	89.80	24.71	1.85	26.55
100	37.90	38.89	85.10	24.71	1.78	26.49
105	36.50	37.45	80.27	24.71	1.72	26.42
110	35.20	36.12	75.32	24.71	1.66	26.36
115	34.01	34.89	70.27	24.71	1.60	26.31
120	32.89	33.75	65.12	24.71	0.00	24.71

On-site stormwater detention

Storage required = 126.04 m^3

LRL Associates Ltd.

Storm Sewer Design Sheet

LRL File No. 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: November 13, 2025
Designed: S.Vora
Checked: M. Basnet
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-01	Lawn CB01	Lawn CB02	0.035	0.000	0.004	0.03	0.03	10.00	104.19	2.93		250	PVC	0.45%	30.0	39.89	0.81	0.62	0.07
CA-02	Lawn CB02	Lawn CB03	0.026	0.000	0.004	0.02	0.05	10.62	101.05	5.19		250	PVC	0.45%	31.5	39.89	0.81	0.65	0.13
CA-03	Lawn CB03	CBMH04	0.024	0.000	0.002	0.02	0.07	11.26	97.97	6.84		250	PVC	0.46%	15.7	40.33	0.82	0.32	0.17
CA-04	CBMH04	CBMH05	0.003	0.000	0.044	0.11	0.18	11.58	96.53	17.40		250	PVC	0.45%	19.1	39.89	0.81	0.39	0.44
CA-05	CBMH05	MH08	0.008	0.000	0.048	0.12	0.30	11.97	94.82	28.86		250	PVC	0.45%	18.6	39.89	0.81	0.38	0.72
CA-06	CB06	CBMH07	0.003	0.000	0.094	0.24	0.24	10.00	104.19	24.58		250	PVC	0.45%	48.2	39.89	0.81	0.99	0.62
CA-07	Building	CBMH07	0.000	0.000	0.123	0.31	0.31	10.00	104.19	31.96		200	PVC	2.00%	7.3	46.38	1.48	0.08	0.69
CA-08	CBMH07	MH08	0.009	0.000	0.070	0.18	0.72	10.99	99.25	71.62		375	PVC	0.50%	19.9	123.98	1.12	0.30	0.58
	MH08	OGS					1.03	12.35	93.22	95.64	24.71	250	PVC	1.15%	2.6	63.77	1.30	0.03	0.39

LRL File No. 200100
Project: Proposed Development
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: November 11, 2021
Designed: M. Basnet
Dwg. Reference: 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: 2 Years
Intensity equation:
$I_2 = 732.951 / (Td + 6.199)^{0.810}$ (mm/hr)

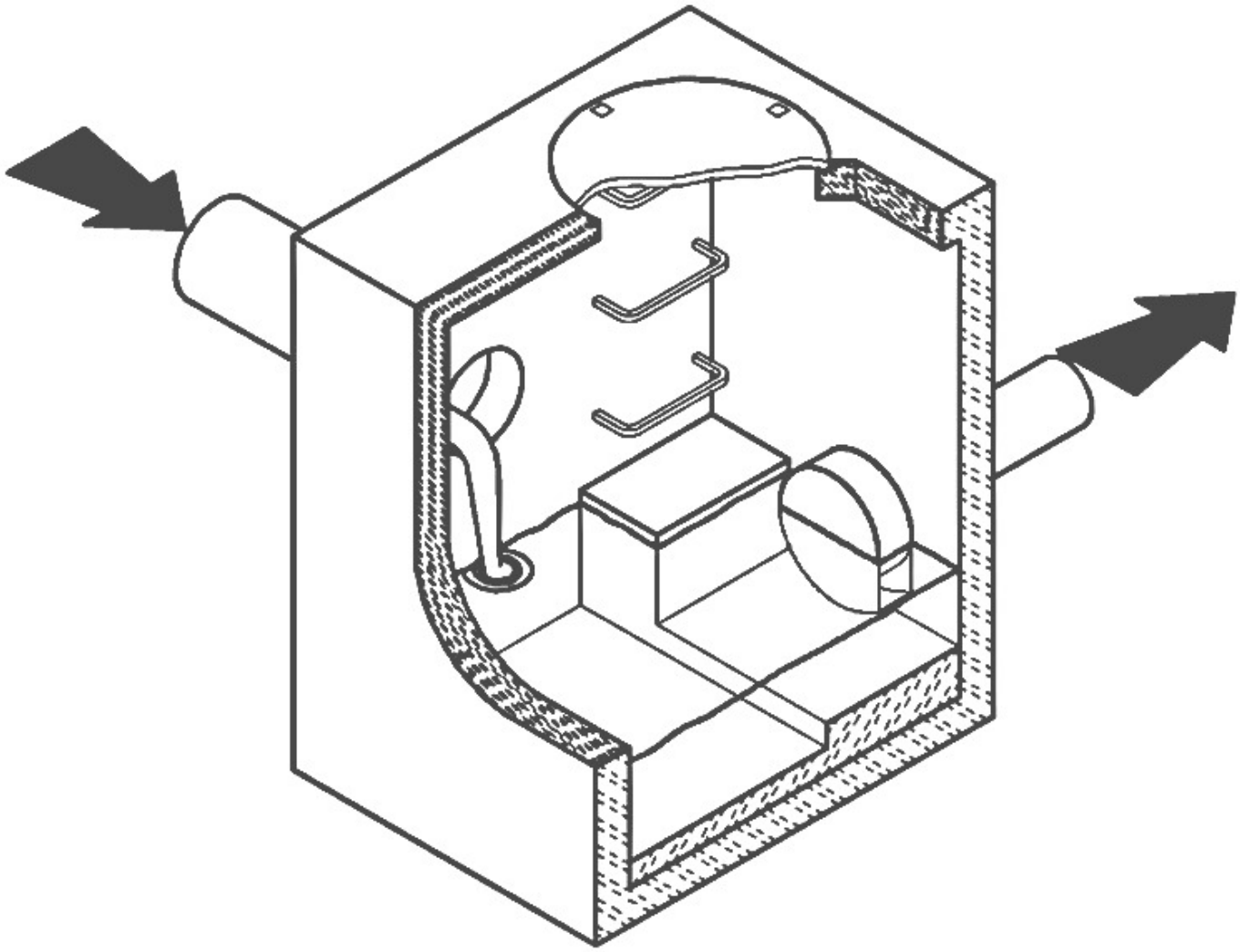
Pipe Design Parameters
Minimum velocity = 0.80 m/s
Manning's "n" = 0.013

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)	
WS-16	CB01	CBMH01	0.049	0.000	0.081	0.23	0.23	10.00	76.81	17.58		750	Concrete	1.60%	37.3	1408.20	3.19	0.20	0.01
WS-01	CBMH01	MH106	0.034	0.000	0.065	0.18	0.41	10.20	76.06	31.23		750	Concrete	0.35%	9.9	658.62	1.49	0.11	0.05
	MH106	CBMH05					0.41	10.31	75.65	31.06		750	Concrete	0.35%	29.9	658.62	1.49	0.33	0.05
WS-05	CBMH05	CBMH06	0.000	0.000	0.044	0.11	0.52	10.64	74.43	38.83		750	Concrete	0.35%	24.3	658.62	1.49	0.27	0.06
WS-02	CBMH02	CBMH03	0.000	0.000	0.065	0.16	0.16	10.00	76.81	12.51		750	Concrete	0.35%	23.2	658.62	1.49	0.26	0.02
WS-03	CBMH03	CBMH04	0.000	0.000	0.050	0.13	0.29	10.26	75.82	21.85		750	Concrete	0.34%	12.1	649.15	1.47	0.14	0.03
WS-04	CBMH04	CBMH06	0.005	0.000	0.038	0.10	0.38	10.40	75.31	28.97		750	Concrete	0.35%	14.8	658.62	1.49	0.17	0.04
WS-06	*CBMH06	MH07	0.001	0.000	0.022	0.06	0.91	10.91	73.47	66.59	19.96	300	PVC	0.50%	16.4	68.38	0.97	0.28	0.97
	MH07	MH16					0.91	11.19	72.50	65.71	19.96	300	PVC	0.50%	38.4	68.38	0.97	0.66	0.96
WS-08	CB08	CBMH09	0.029	0.000	0.000	0.02	0.02	10.00	76.81	1.25		750	PVC	0.25%	9.3	556.64	1.26	0.12	0.00
WS-09	CBMH09	CBMH10	0.000	0.000	0.044	0.11	0.13	10.12	76.34	9.57		975	Concrete	0.25%	28.30	1120.53	1.50	0.31	0.01
WS-10	CBMH10	CBMH12	0.009	0.000	0.051	0.13	0.26	10.44	75.17	19.30		975	Concrete	0.25%	26.80	1120.53	1.50	0.30	0.02
WS-11.1	CB11	CBMH11	0.014	0.000	0.022	0.06	0.06	10.73	74.09	4.70		975	Concrete	1.00%	10.10	2241.05	3.00	0.06	0.00
WS-11	CBMH11	CBMH12	0.009	0.000	0.023	0.06	0.06	10.00	76.81	4.76		975	Concrete	0.25%	26.00	1120.53	1.50	0.29	0.00
WS-15	CBMH103	CBMH104	0.012	0.000	0.076	0.20	0.20	10.00	76.81	15.09		450	PVC	0.50%	8.30	201.60	1.27	0.11	0.07
WS-14	CBMH104	CBMH105	0.000	0.000	0.049	0.12	0.32	10.77	73.97	23.51		450	PVC	0.50%	58.50	201.60	1.27	0.77	0.12
WS-15	CB101	CBMH105	0.012	0.000	0.076	0.20	0.20	10.00	76.81	15.09		450	PVC	0.50%	9.90	201.60	1.27	0.13	0.07
	CBMH105	MH100					0.32	10.85	73.68	23.42		450	PVC	0.50%	6.40	201.60	1.27	0.08	0.12
	MH100	STM/ CBMH12					0.32	10.89	73.56	23.38		450	PVC	0.50%	2.60	201.60	1.27	0.03	0.12
WS-12	*CBMH12	MH16	0.004	0.000	0.025	0.06	0.64	10.73	74.09	47.16	14.81	300	PVC	0.50%	7.10	68.38	0.97	0.12	0.69
	MH16	MH23					1.54	11.86	70.35	108.53	34.77	450	PVC	0.30%	74.10	156.16	0.98	1.26	0.69
WS-18	CBMH18	CBMH19	0.011	0.000	0.064	0.17	0.17	10.00	76.81	12.69		675	PVC	0.50%	17.1	594.39	1.66	0.17	0.02
WS-19	CBMH19	CBMH22	0.054	0.000	0.061	0.18	0.35	10.17	76.15	26.41		675	PVC	0.50%	20.80	594.39	1.66	0.21	0.04
WS-17.1	CB108	MH107	0.010	0.000	0.019	0.05	0.05	10.00	76.81	4.06		200	PVC	0.93%	16.70	31.63	1.01	0.28	0.13
	MH107	CBMH17					0.05	10.28	75.76	4.00		200	PVC	1.00%	14.00	32.80	1.04	0.22	0.12
WS-17	CBMH17	CBMH22	0.018	0.000	0.099	0.26	0.26	10.00	76.81	19.74		675	PVC	0.50%	20.10	594.39	1.66	0.20	0.03
WS-20	CBMH20	CBMH21	0.002	0.000	0.038	0.10	0.10	10.00	76.81	7.33		675	PVC	2.00%	6.90	1188.77	3.32	0.03	0.01
WS-21	CBMH21	CBMH22	0.000	0.000	0.034	0.08	0.18	10.03	76.67	13.82		675	PVC	2.00%	21.50	1188.77	3.32	0.11	0.01
WS-22	*CBMH22	MH23					0.78	10.38	75.37	59.10	31.58	300	PVC	1.00%	17.40	96.70	1.37	0.21	0.61
	MH23	OGS					2.33	13.11	66.61	155.00	66.35	600	PVC	0.30%	3.90	336.31	1.19	0.05	0.46
**Phase 2						1.07	1.07	10.11	76.39	81.37	TBD	300	PVC	1.00%	5.30	96.70	1.37	0.06	0.84
	OGS	MH24					3.39	13.17	66.46	225.43	66.35	600	PVC	0.30%	36.50	336.31	1.19	0.51	0.67
	MH24	Ext. STUB					3.39	13.68	65.07	220.72	66.35	600	PVC	0.38%	28.00	378.50	1.34	0.35	0.58

* CBMH with an inlet control device (ICD)
** C value assumed as 0.75 as per Potter's Key Subdivision Report

CSO/STORMWATER MANAGEMENT

HYDROVEX® VHV / SVHV
Vertical Vortex Flow Regulator



JOHN MEUNIER

APPLICATIONS

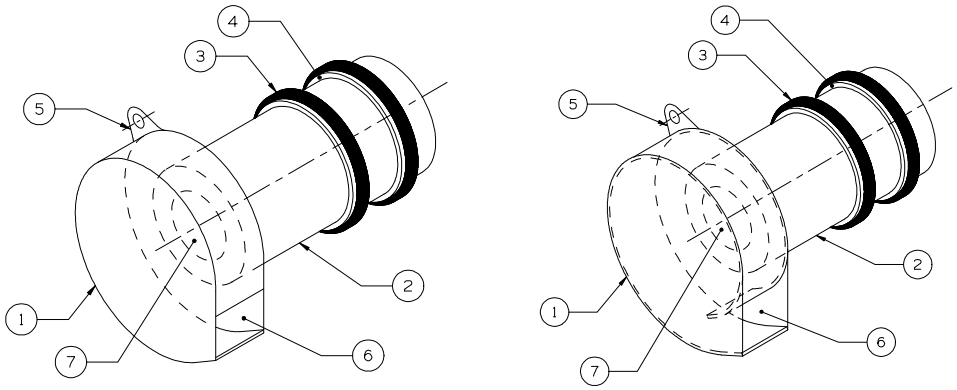
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration. In a combined sewer system, the wastewater treatment plant may also experience significant increases in flows during storms, thereby losing its treatment efficiency.

A simple means of controlling excessive water runoff is by controlling excessive flows at their origin (manholes). **John Meunier Inc.** manufactures the **HYDROVEX® VHV / SVHV** line of vortex flow regulators to control stormwater flows in sewer networks, as well as manholes.

The vortex flow regulator design is based on the fluid mechanics principle of the forced vortex. This grants flow regulation without any moving parts, thus reducing maintenance. The operation of the regulator, depending on the upstream head and discharge, switches between orifice flow (gravity flow) and vortex flow. Although the concept is quite simple, over 12 years of research have been carried out in order to get a high performance.

The **HYDROVEX® VHV / SVHV** Vertical Vortex Flow Regulators **(refer to Figure 1)** are manufactured entirely of stainless steel, and consist of a hollow body (**1**) (in which flow control takes place) and an outlet orifice (**7**). Two rubber "O" rings (**3**) seal and retain the unit inside the outlet pipe. Two stainless steel retaining rings (**4**) are welded on the outlet sleeve to ensure that there is no shifting of the "O" rings during installation and use.

1. **BODY**
2. **SLEEVE**
3. **O-RING**
4. **RETAINING RINGS (SQUARE BAR)**
5. **ANCHOR PLATE**
6. **INLET**
7. **OUTLET ORIFICE**



VHV ***SVHV***

FIGURE 1: HYDROVEX® VHV-SVHV VERTICAL VORTREX FLOW REGULATORS

ADVANTAGES

- The **HYDROVEX® VHV / SVHV** line of flow regulators are manufactured entirely of stainless steel, making them durable and corrosion resistant.
- Having no moving parts, they require minimal maintenance.
- The geometry of the **HYDROVEX® VHV / SVHV** flow regulators allows a control equal to an orifice plate, having a cross section area 4 to 6 times smaller. This decreases the chance of blockage of the regulator, due to sediments and debris found in stormwater flows. **Figure 2** illustrates the comparison between a regulator model 100 SVHV-2 and an equivalent orifice plate. One can see that for the same height of water, the regulator controls a flow approximately four times smaller than an equivalent orifice plate.
- Installation of the **HYDROVEX® VHV / SVHV** flow regulators is quick and straightforward and is performed after all civil works are completed.
- Installation requires no special tools or equipment and may be carried out by any contractor.
- Installation may be carried out in existing structures.

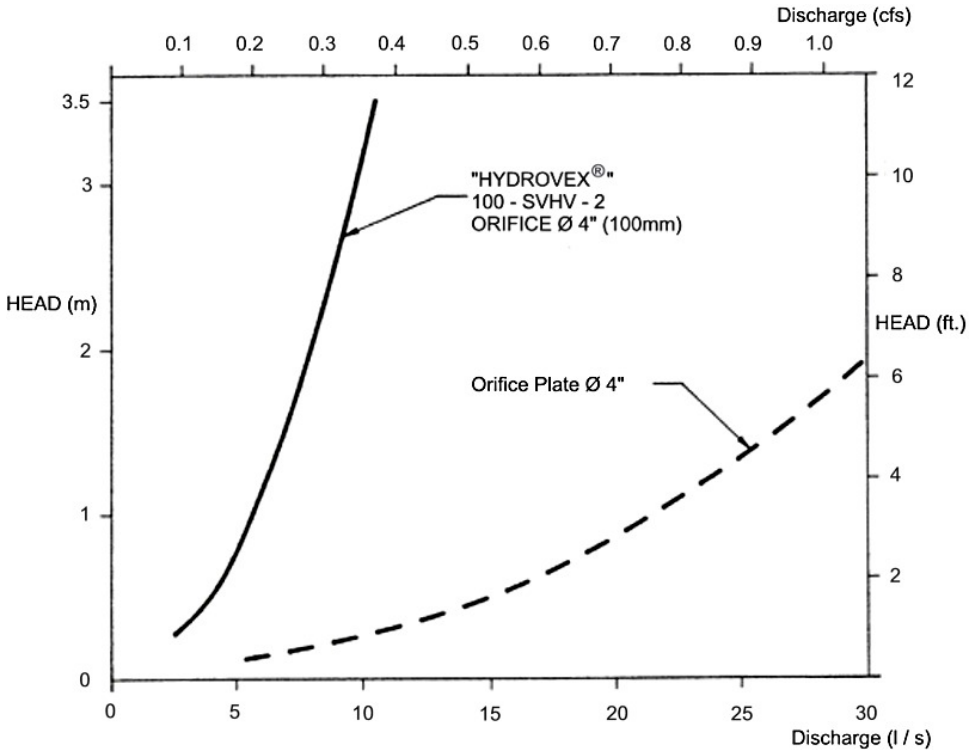


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

SELECTION

Selection of a **VHV or SVHV** regulator can be easily made using the selection charts found at the back of this brochure (see **Figure 3**). These charts are a graphical representation of the maximum upstream water pressure (head) and the maximum discharge at the manhole outlet. The maximum design head is the difference between the maximum upstream water level and the invert of the outlet pipe. All selections should be verified by John Meunier Inc. personnel prior to fabrication.

Example:

✓ Maximum design head	2m (6.56 ft.)
✓ Maximum discharge	6 L/s (0.2 cfs)
✓ Using **Figure 3** - VHV	model required is a **75 VHV-1**

INSTALLATION REQUIREMENTS

All **HYDROVEX® VHV / SVHV** flow regulators can be installed in circular or square manholes. **Figure 4** gives the various minimum dimensions required for a given regulator. ***It is imperative to respect the minimum clearances shown to ensure easy installation and proper functioning of the regulator.***

SPECIFICATIONS

In order to specify a **HYDROVEX®** regulator, the following parameters must be defined:

- The model number (ex: 75-VHV-1)
- The diameter and type of outlet pipe (ex: 6" diam. SDR 35)
- The desired discharge (ex: 6 l/s or 0.21 CFS)
- The upstream head (ex: 2 m or 6.56 ft.) *
- The manhole diameter (ex: 36" diam.)
- The minimum clearance "H" (ex: 10 inches)
- The material type (ex: 304 s/s, 11 Ga. standard)

* ***Upstream head is defined as the difference in elevation between the maximum upstream water level and the invert of the outlet pipe where the HYDROVEX® flow regulator is to be installed.***

PLEASE NOTE THAT WHEN REQUESTING A PROPOSAL, WE SIMPLY REQUIRE THAT YOU PROVIDE US WITH THE FOLLOWING:

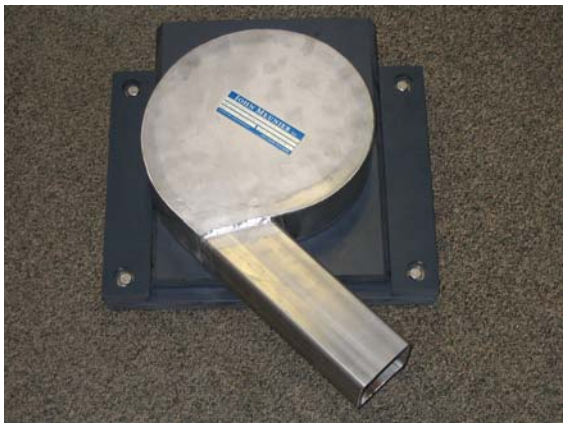
- ***project design flow rate***
- ***pressure head***
- ***chamber's outlet pipe diameter and type***

Typical VHV model in factory

OPTIONS

FV – SVHV (mounted on sliding plate)

VHV-1-O (standard model with odour control inlet)



FV – VHV-O (mounted on sliding plate with odour control inlet)

VHV with Gooseneck assembly in existing chamber without minimum release at the bottom

VHV with air vent for minimal slopes

HYDROVEX®

VHV Vertical Vortex Flow Regulator

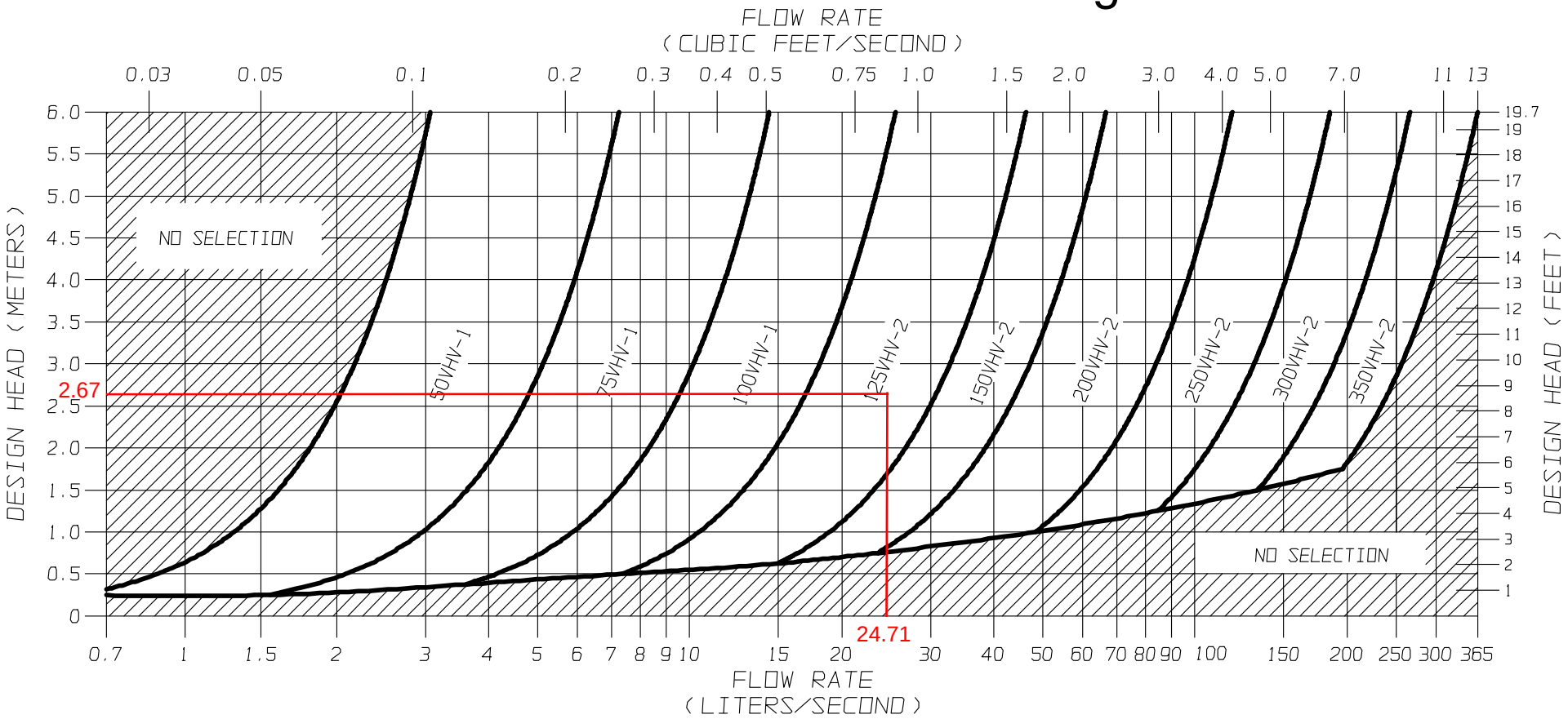
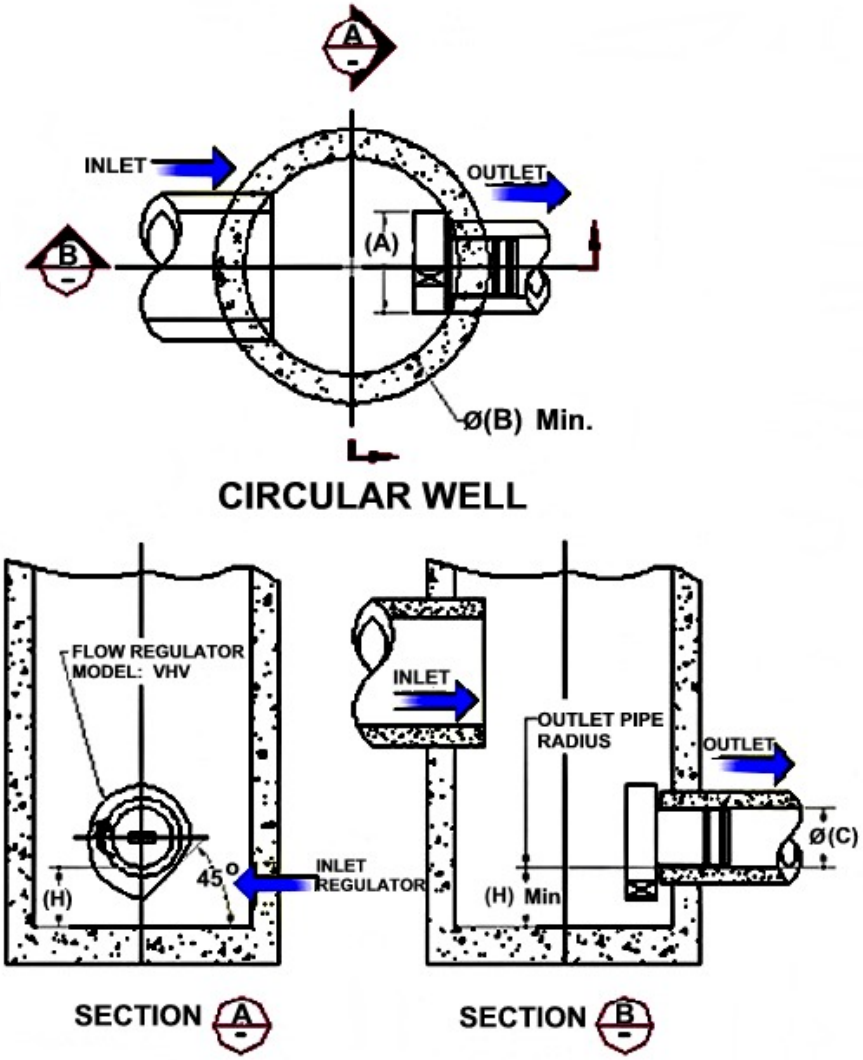


FIGURE 3 - VHV

JOHN MEUNIER

FLOW REGULATOR TYPICAL INSTALLATION IN CIRCULAR MANHOLE
FIGURE 4 (MODEL VHV)

Model Number	Regulator Diameter		Minimum Manhole Diameter		Minimum Outlet Pipe Diameter		Minimum Clearance	
	A (mm)	**A** (in.)	**B** (mm)	**B** (in.)	**C** (mm)	**C** (in.)	**H** (mm)	**H** (in.)
50VHV-1	150	6	600	24	150	6	150	6
75VHV-1	250	10	600	24	150	6	150	6
100VHV-1	325	13	900	36	150	6	200	8
125VHV-2	275	11	900	36	150	6	200	8
150VHV-2	350	14	900	36	150	6	225	9
200VHV-2	450	18	1200	48	200	8	300	12
250VHV-2	575	23	1200	48	250	10	350	14
300VHV-2	675	27	1600	64	250	10	400	16
350VHV-2	800	32	1800	72	300	12	500	20



INSTALLATION

The installation of a **HYDROVEX®** regulator may be undertaken once the manhole and piping is in place. Installation consists of simply fitting the regulator into the outlet pipe of the manhole. **John Meunier Inc.** recommends the use of a lubricant on the outlet pipe, in order to facilitate the insertion and orientation of the flow controller.

MAINTENANCE

HYDROVEX® regulators are manufactured in such a way as to be maintenance free; however, a periodic inspection (every 3-6 months) is suggested in order to ensure that neither the inlet nor the outlet has become blocked with debris. The manhole should undergo periodically, particularly after major storms, inspection and cleaning as established by the municipality

GUARANTY

The **HYDROVEX®** line of **VHV / SVHV** regulators are guaranteed against both design and manufacturing defects for a period of 5 years. Should a unit be defective, **John Meunier Inc.** is solely responsible for either modification or replacement of the unit.

John Meunier Inc.
ISO 9001 : 2008

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Revised: 2011-05-03

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

09/05/2025

Province:	Ontario
City:	Stittsville
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	OGS

Drainage Area (ha):	0.49
Runoff Coefficient 'c':	0.72

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	11.39
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	24.71
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	406
Estimated Average Annual Sediment Volume (L/yr):	330

Project Name:	6111 Hazeldean Phase 2
Project Number:	250030
Designer Name:	Jessica Steffler
Designer Company:	Forterra Pipe & Precast
Designer Email:	jessica.steffler@RinkerPipe.com
Designer Phone:	519-239-6958
EOR Name:	Maxime Longtin
EOR Company:	LRL Engineering
EOR Email:	mlongtin@lrl.ca
EOR Phone:	613-842-3434

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	87
EFO5	92
EFO6	94
EFO8	98
EFO10	99
EFO12	100

Recommended Stormceptor EFO Model:	EFO4
Estimated Net Annual Sediment (TSS) Load Reduction (%):	87
Water Quality Runoff Volume Capture (%):	> 90

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THIRD-PARTY TESTING AND VERIFICATION

► Stormceptor® EF and Stormceptor® EFO are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators and performance has been third-party verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol.

PERFORMANCE

► Stormceptor® EF and EFO remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The Canadian ETV PSD shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

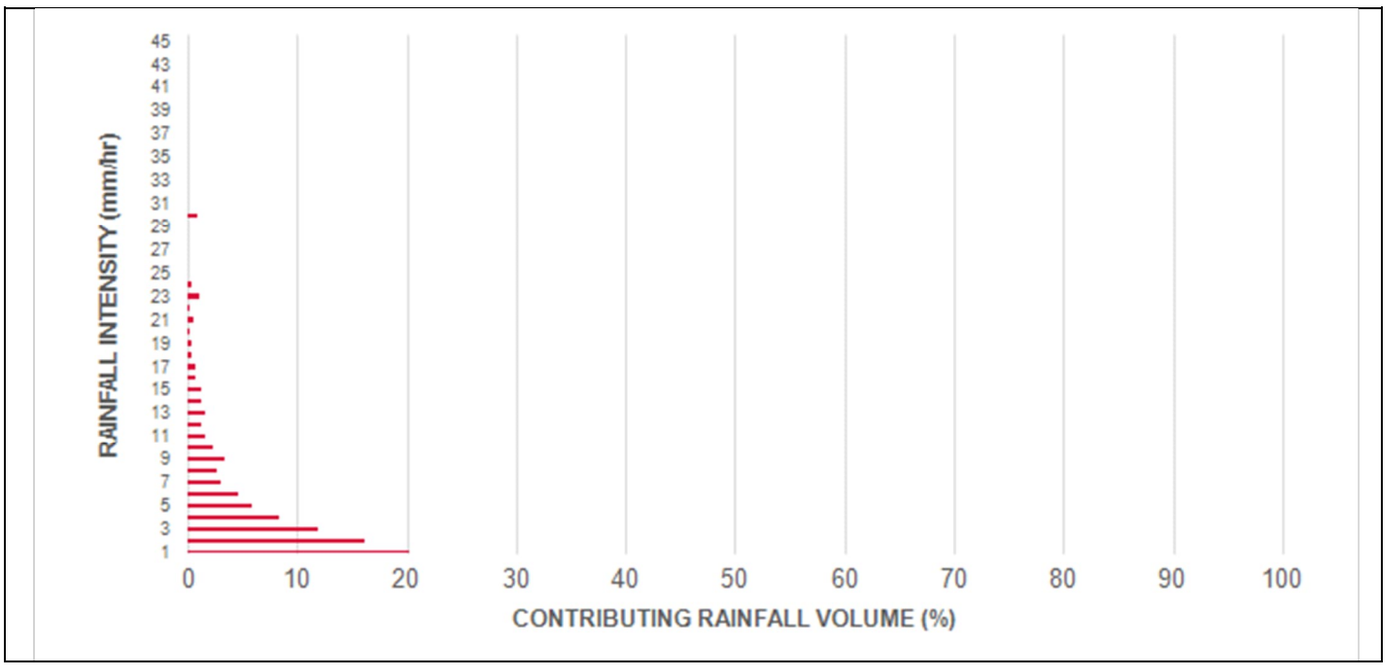
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

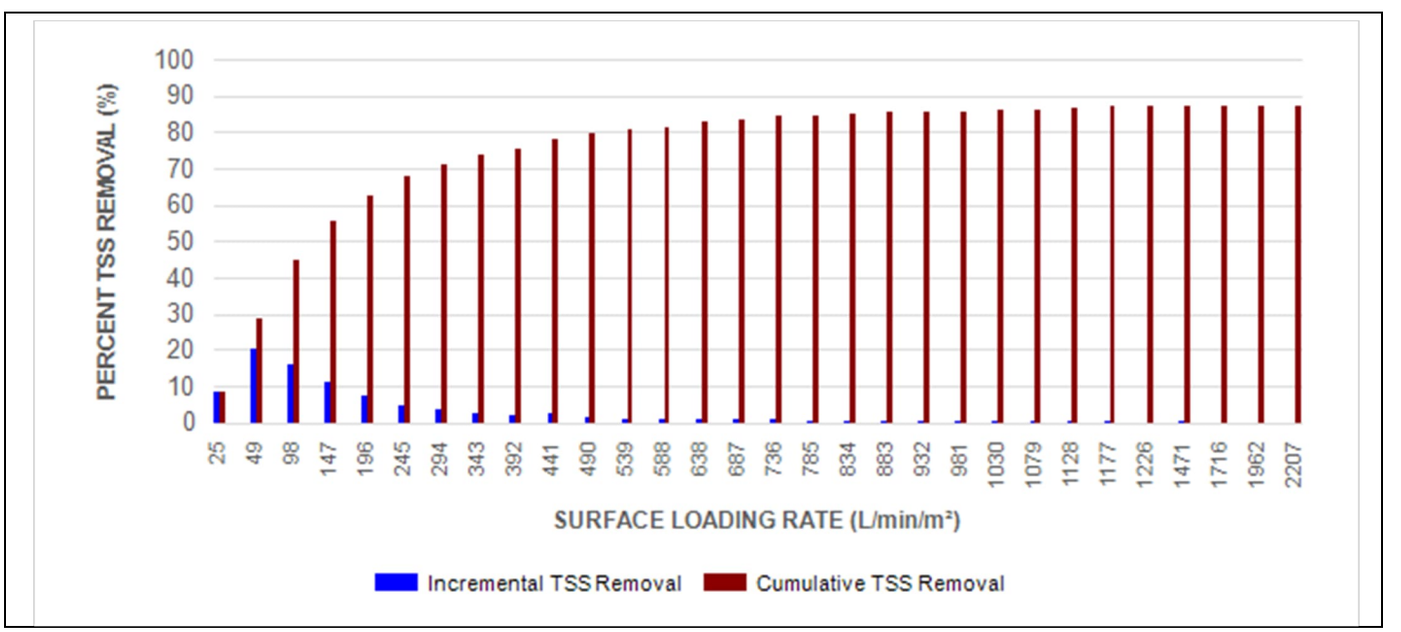
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	0.49	29.0	25.0	100	8.6	8.6
1.00	20.3	29.0	0.98	59.0	49.0	100	20.3	29.0
2.00	16.2	45.2	1.96	118.0	98.0	97	15.8	44.7
3.00	12.0	57.2	2.94	177.0	147.0	91	10.9	55.6
4.00	8.4	65.6	3.92	235.0	196.0	84	7.1	62.7
5.00	5.9	71.6	4.90	294.0	245.0	81	4.8	67.6
6.00	4.6	76.2	5.88	353.0	294.0	79	3.7	71.2
7.00	3.1	79.3	6.87	412.0	343.0	77	2.3	73.6
8.00	2.7	82.0	7.85	471.0	392.0	74	2.0	75.6
9.00	3.3	85.3	8.83	530.0	441.0	72	2.4	78.0
10.00	2.3	87.6	9.81	588.0	490.0	70	1.6	79.6
11.00	1.6	89.2	10.79	647.0	539.0	67	1.1	80.7
12.00	1.3	90.5	11.77	706.0	588.0	66	0.9	81.5
13.00	1.7	92.2	12.75	765.0	638.0	64	1.1	82.6
14.00	1.2	93.5	13.73	824.0	687.0	64	0.8	83.4
15.00	1.2	94.6	14.71	883.0	736.0	64	0.7	84.2
16.00	0.7	95.3	15.69	942.0	785.0	63	0.4	84.6
17.00	0.7	96.1	16.67	1000.0	834.0	63	0.5	85.1
18.00	0.4	96.5	17.65	1059.0	883.0	62	0.2	85.3
19.00	0.4	96.9	18.63	1118.0	932.0	62	0.3	85.6
20.00	0.2	97.1	19.62	1177.0	981.0	62	0.1	85.7
21.00	0.5	97.5	20.60	1236.0	1030.0	61	0.3	86.0
22.00	0.2	97.8	21.58	1295.0	1079.0	60	0.1	86.1
23.00	1.0	98.8	22.56	1353.0	1128.0	59	0.6	86.7
24.00	0.3	99.1	23.54	1412.0	1177.0	58	0.2	86.9
25.00	0.0	99.1	24.52	1471.0	1226.0	56	0.0	86.9
30.00	0.9	100.0	29.42	1765.0	1471.0	50	0.5	87.3
35.00	0.0	100.0	34.33	2060.0	1716.0	43	0.0	87.3
40.00	0.0	100.0	39.23	2354.0	1962.0	37	0.0	87.3
45.00	0.0	100.0	44.14	2648.0	2207.0	33	0.0	87.3
Estimated Net Annual Sediment (TSS) Load Reduction =								87 %

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



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Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

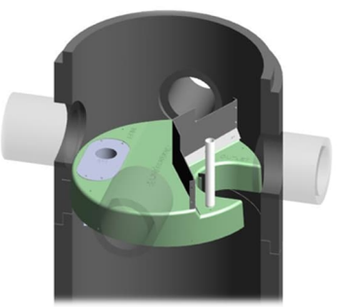
► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

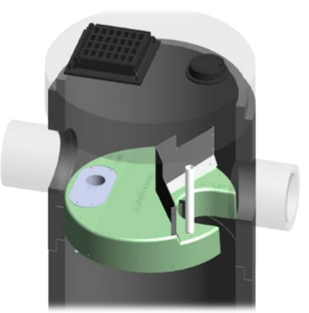
DESIGN FLEXIBILITY

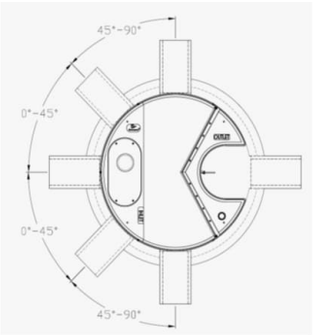
► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, Stormceptor® EFO has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

* Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/ EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/ EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

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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	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L 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 of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

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

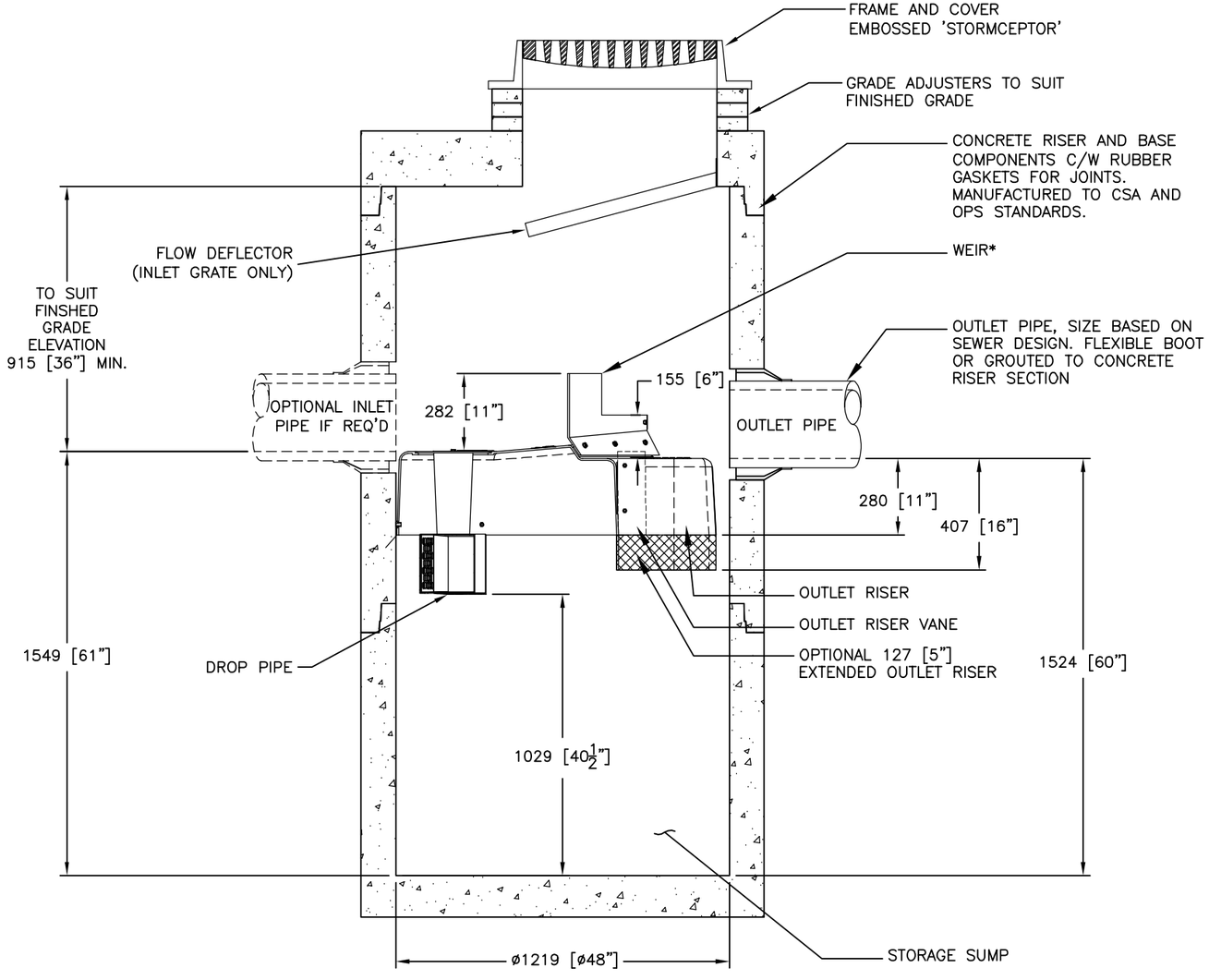
The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

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.

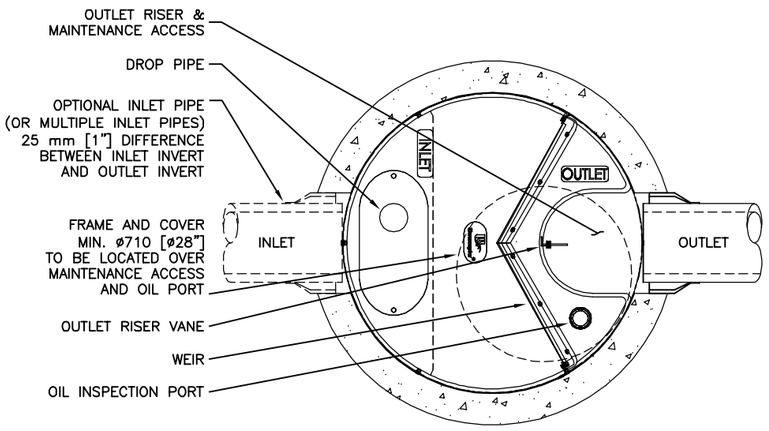
3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

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.

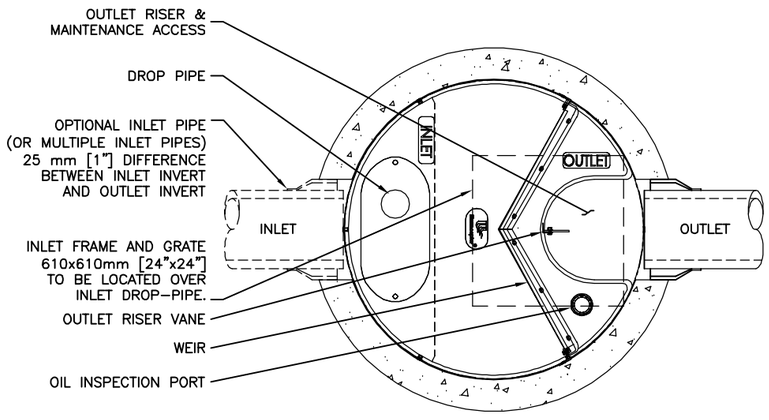
3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five 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.



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF4 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO4 (OIL CAPTURE CONFIGURATION). WEIR HEIGHT IS 150 mm (6 INCH) FOR EF04.

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EFO4				
STRUCTURE ID					*
HYDROCARBON STORAGE REQ'D (L)					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

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PROJECT No.:	SEQUENCE No.:
EFO4	*

SHEET: 1 OF 1

APPENDIX E

Civil Engineering Drawings

PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

REVISION 02

KEY PLAN (N.T.S.)

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PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD, STITTSVILLE, ON
REV.02 - ISSUED FOR APPROVAL - NOVEMBER 14th, 2025
LRL PROJECT no: 250030

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, PREPARED BY LRL ASSOCIATES, DATED NOVEMBER 2020.
16. AL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND 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 WATERMAINS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER 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.

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No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2025/11/14
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

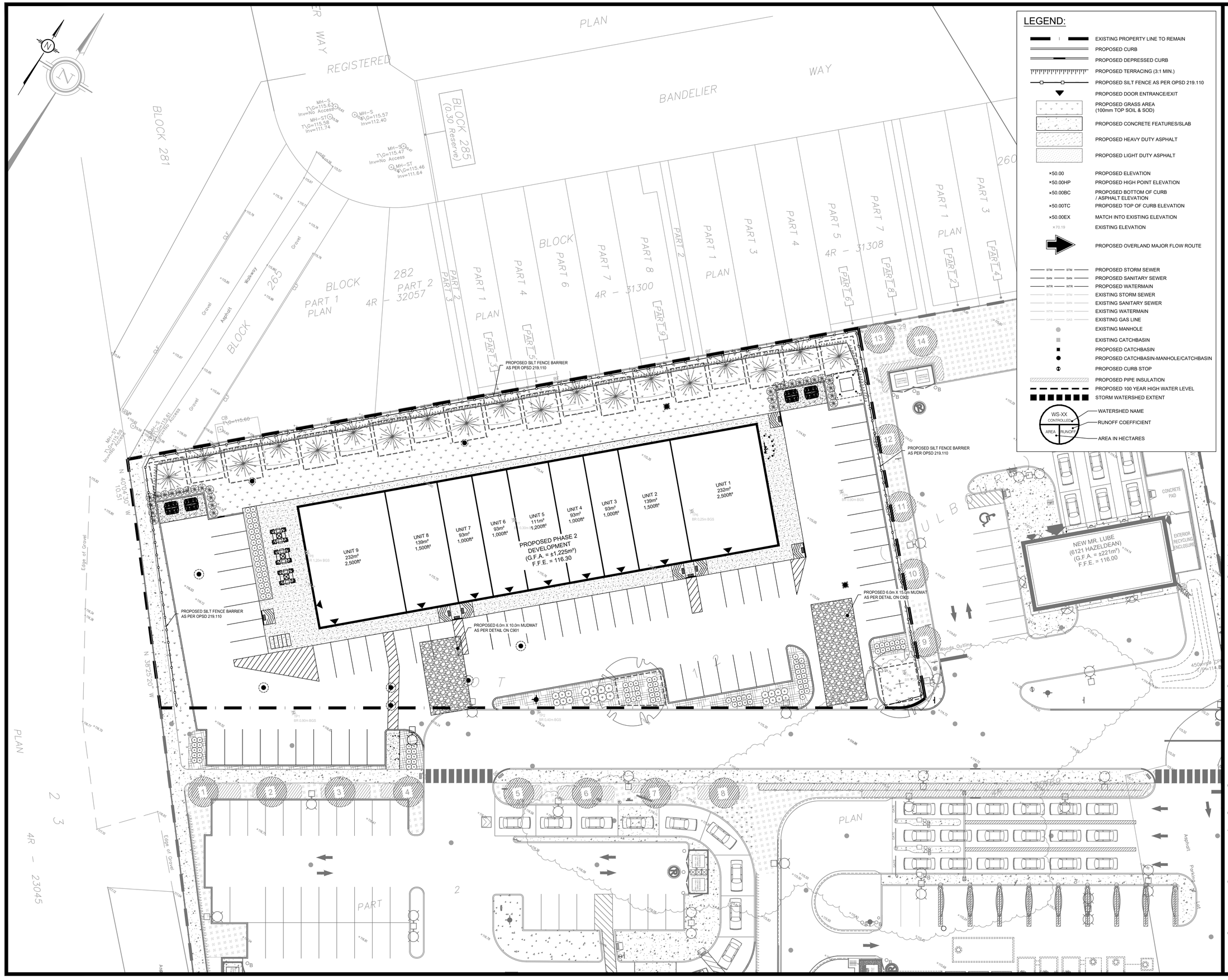
CLIENT
GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE
GENERAL NOTES

PROJECT NO.
250030
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 DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
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- PROPOSED LIGHT DUTY ASPHALT
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- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- STM STM PROPOSED STORM SEWER
- SAN SAN PROPOSED SANITARY SEWER
- WTR WTR PROPOSED WATERMAIN
- STM STM EXISTING STORM SEWER
- SAN SAN EXISTING SANITARY SEWER
- WTR WTR EXISTING WATERMAIN
- GAS GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX WATERSHED NAME
- CONTROLLED RUNOFF COEFFICIENT
- AREA / RUNOFF AREA IN HECTARES

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5m 0 5 10m

SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
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CLIENT

GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT

PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE

EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.

250030 C101

LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
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- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- STM — STM PROPOSED STORM SEWER
- SAN — SAN PROPOSED SANITARY SEWER
- WTR — WTR PROPOSED WATERMAIN
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- WTR — WTR EXISTING WATERMAIN
- GAS — GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED — WATERSHED NAME
- AREA | RUNOFF — RUNOFF COEFFICIENT
- AREA IN HECTARES

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5m 0 5 10m

SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER
M. BASHET
100501996
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT

GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT

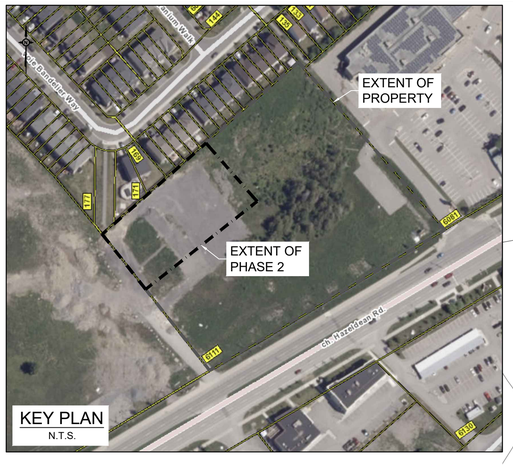
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE

DEMOLITION PLAN

PROJECT NO.

250030 C102



DETAILS OF DEVELOPMENT PHASE 2			
DATA		REQUIRED	PROVIDED
ZONING		AM9 (1699)-h - AREA C	
SETBACKS	FY	N/A	14.0m
	RY	10.0m	10.0m
	INT.SY	N/A	62.9m & 24.0m
	EXT.SY	N/A	N/A
NET LOT AREA (sqm)		5,085sqm	
BUILDING COVERAGE		N/A	24.0%
BUILDING HEIGHT		11.0m (MAX)	7.0m
GROSS FLOOR AREA		1,225sqm	
No. of UNITS		7	
LOADING SPACES		N/A	1
PARKING: RETAIL PLAZA : 3.6/100sqm RESTAURANT (FAST-FOOD) : 10/100sqm		57 + 1 HC 35 23	60 + 2 HC
No. OF STOREYS			1
OTHER:			

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 DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
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- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
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- AREA IN HECTARES

PROPOSED SEMI IN-GROUND REFUSE COLLECTION (EARTHBIN MODEL EB500)

PROPOSED SEMI IN-GROUND REFUSE COLLECTION (EARTHBIN MODEL EB500)

PROPOSED PHASE 2 DEVELOPMENT (G.F.A. = ±1,225m²) F.F.E. = 116.30

UNIT 1 232m² 2,500ft²
UNIT 2 139m² 1,500ft²
UNIT 3 93m² 1,000ft²
UNIT 4 93m² 1,000ft²
UNIT 5 111m² 1,200ft²
UNIT 6 93m² 1,000ft²
UNIT 7 93m² 1,000ft²
UNIT 8 139m² 1,500ft²
UNIT 9 232m² 2,500ft²

NEW MR. LUBE (6121 HAZELDEAN) (G.F.A. = ±221m²) F.F.E. = 116.00

30 x 45 cm "ACCESSIBLE PARKING PERMIT" SIGN (Rb-93) AS PER MTO BOOK 5 AND AS PER SECTION 11 OF THE ONTARIO REGULATION 581/90. SIGN TO BE MOUNTED ON CONCRETE SIGN BASE. ACCESSIBLE PARKING SIGN TO BE INSTALLED CENTERING ALL ACCESSIBLE PARKING (TYP.)

PROPOSED 5 BIKE PARKING AS PER CITY STANDARD SF06

PROPOSED FIRE ROUTE SPACED AT 25.0m APART MAX.

EXISTING LIGHT POST TO BE RELOCATED

BANDELIER WAY
REGISTERED PLAN
BLOCK 263
BLOCK 285 (0.30 Reserve)
BLOCK 265
BLOCK 282
PART 2 32057
PART 1 4R – 31308
PART 1 4R – 31184
PART 1 4R – 31300
PART 1 4R – 23045
PART 2 4R – 23045
Edge of Gravel
Edge of Asphalt
Concrete Curb
Asphalt
Gravel
Grass
Woods Outline
Existing Dwelling (Demolition noted)
CONCRETE PAD
EXTERIOR RECYCLING ENCLOSURE

USE AND INTERPRETATION OF DRAWINGS

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5m 0 5 10m
SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER M. BASNET 100501996 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
GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE
SITE DEVELOPMENT PLAN

PROJECT NO.
250030

C201

CONSULTANTS

PLANNER
Jonah Bonn
First Bay Properties Inc.
311 Richmond Road, Suite 301, Ottawa

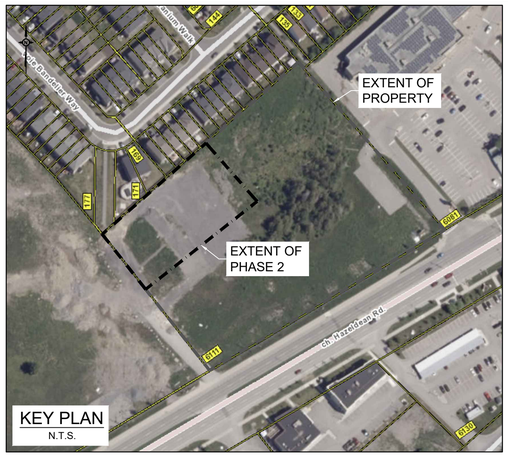
SITE ENGINEERING
Maxime Longtin
LRL Engineering Ltd.
5430 Canotek Rd, Ottawa

BUILDING DESIGNER
Jesse Arnold
Inicio Design
Ottawa

SURVEYOR
Annis, O'Sullivan, Vollebekk Ltd.
Suite 500, 14 Concourse Gate, Nepean

The property information was derived from the topographical survey prepared by Annis, O'Sullivan, Vollebekk Ltd prepared in November 2020.

THE PROPERTY IS LEGALLY DESCRIBED AS PART OF LOT 24, CONCESSION 12, WARD 6-STITTSVILLE-KANATA WEST AND ZONING AM9[1699]-H



DETAILS OF DEVELOPMENT PHASE 2

DATA		REQUIRED	PROVIDED
ZONING		AM9 (1699)-h - AREA C	
SETBACKS	FY	N/A	14.0m
	RY	10.0m	10.0m
	INT.SY	N/A	62.9m & 24.0m
	EXT.SY	N/A	N/A
NET LOT AREA (sqm)		5,085sqm	
BUILDING COVERAGE		N/A	24.0%
BUILDING HEIGHT		11.0m (MAX)	7.0m
GROSS FLOOR AREA		1,225sqm	
No. of UNITS		7	
LOADING SPACES		N/A	1
PARKING: RETAIL PLAZA : 3.6/100sqm RESTAURANT (FAST-FOOD) : 10/100sqm		57 + 1 HC 35 23	60 + 2 HC
No. OF STOREYS			1
OTHER:			

LEGEND:

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- PROPOSED CURB
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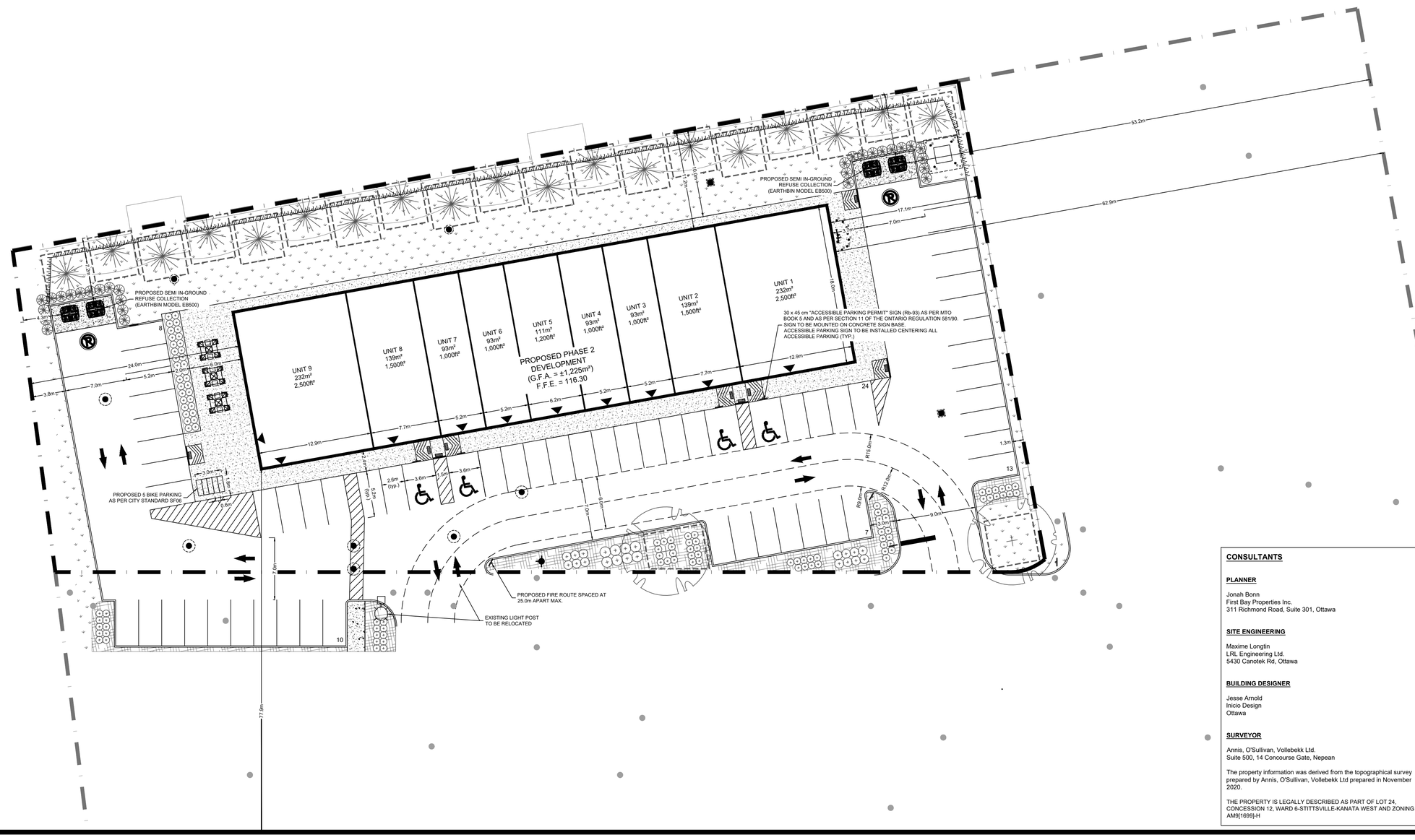

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No.	REVISIONS	BY	DATE
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01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER M. BASNET 100501996 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT
GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE
SITE DEVELOPMENT PLAN
(NO UNDERLAY)

PROJECT NO.
250030

C202

CONSULTANTS

PLANNER
Jonah Bonn
First Bay Properties Inc.
311 Richmond Road, Suite 301, Ottawa

SITE ENGINEERING
Maxime Longtin
LRL Engineering Ltd.
5430 Canotek Rd, Ottawa

BUILDING DESIGNER
Jesse Arnold
Inicio Design
Ottawa

SURVEYOR
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PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm)	
		AUTOMOBILE PARKING	TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3/SP12.5	50	40
BINDER	HL.8/SP19.0	--	50
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	300	400

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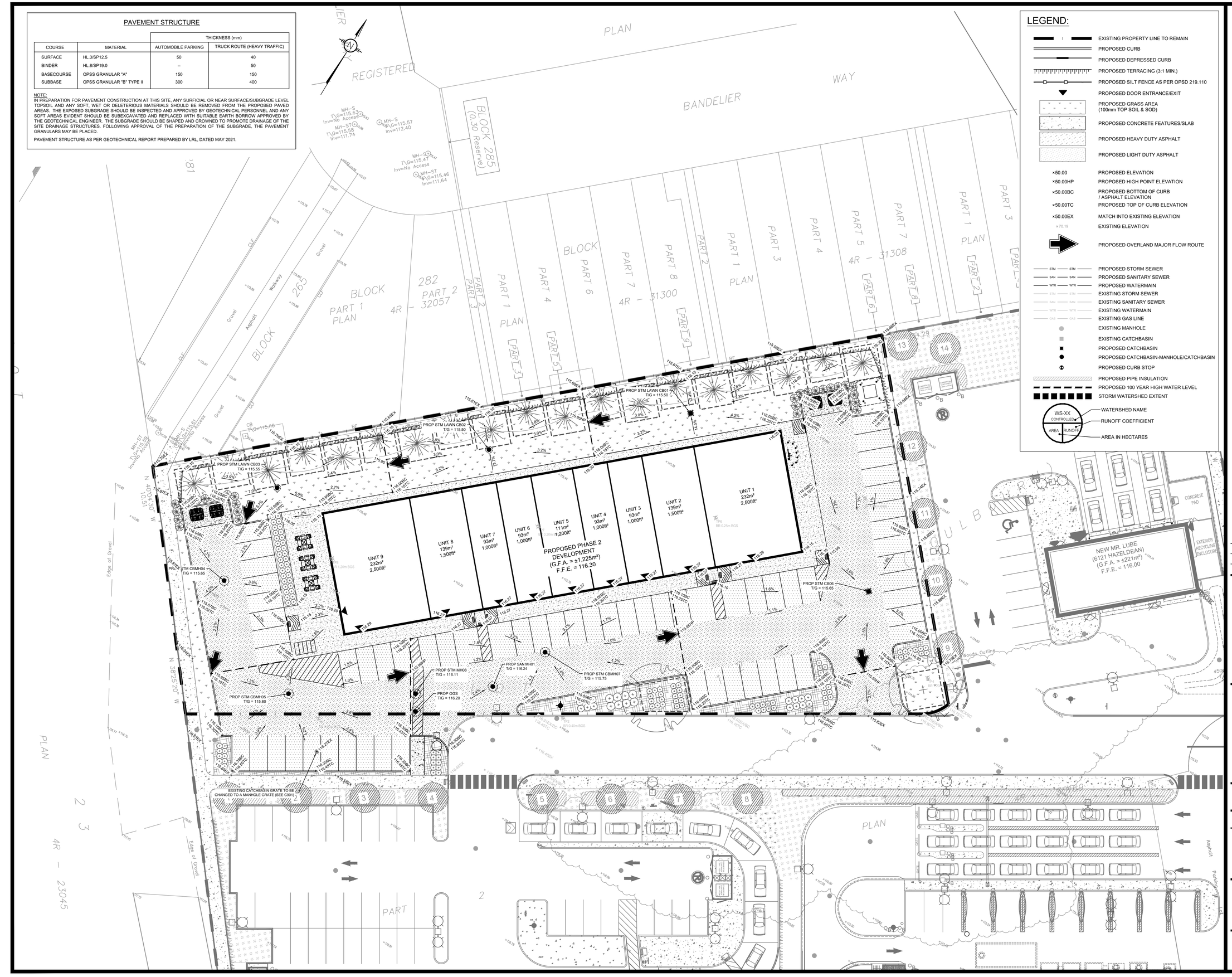

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LICENSED PROFESSIONAL ENGINEER — M. BASNET — 100501996 — PROVINCE OF ONTARIO

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DESIGNED BY:	DRAWN BY:	APPROVED BY:
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PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
250030

C301

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) AUTOMOBILE PARKING	THICKNESS (mm) TRUCK ROUTE (HEAVY TRAFFIC)
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PAVEMENT STRUCTURE AS PER GEOTECHNICAL REPORT PREPARED BY LRL, DATED MAY 2021.

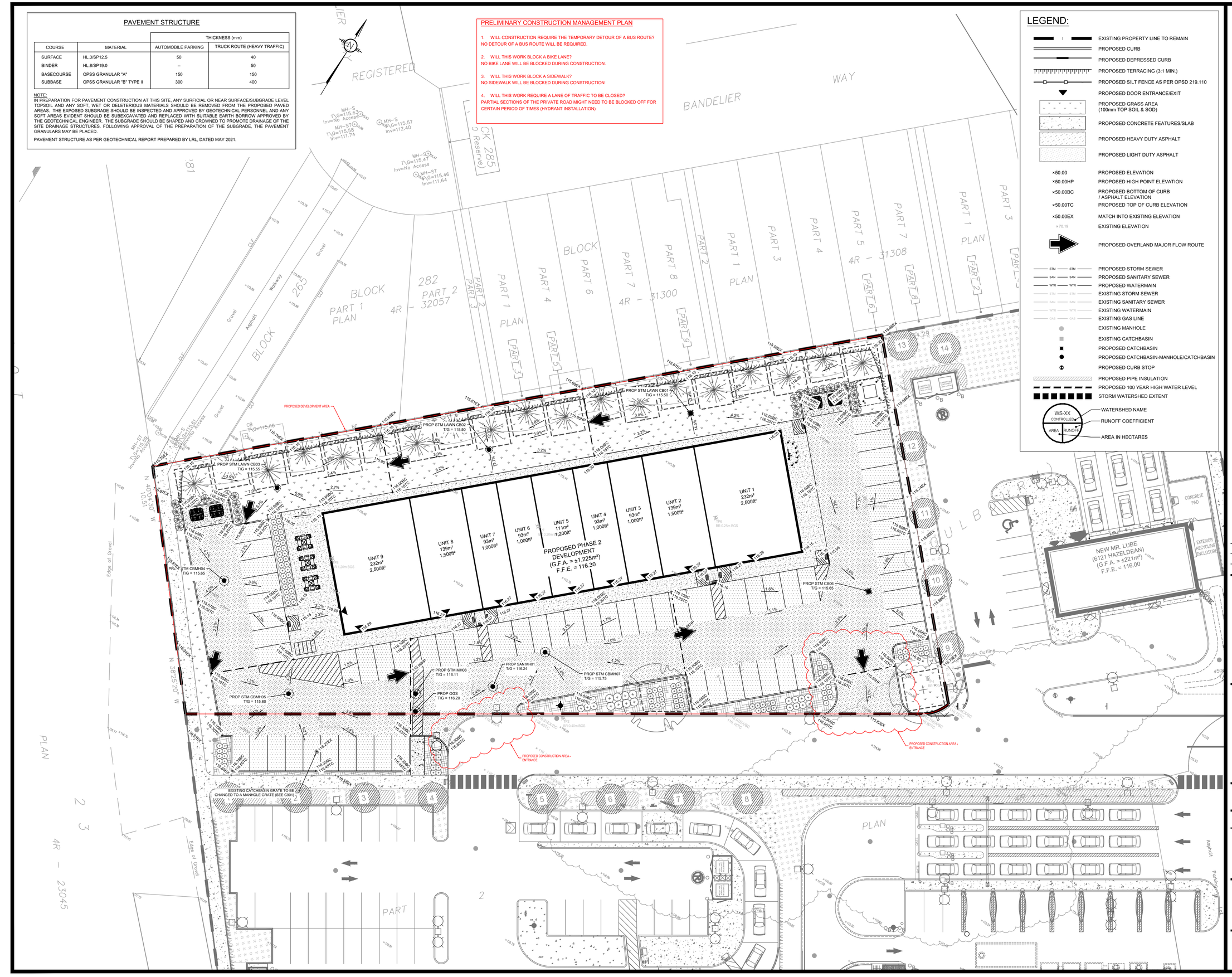
PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

1. WILL CONSTRUCTION REQUIRE THE TEMPORARY DETOUR OF A BUS ROUTE?
NO DETOUR OF A BUS ROUTE WILL BE REQUIRED.

2. WILL THIS WORK BLOCK A BIKE LANE?
NO BIKE LANE WILL BE BLOCKED DURING CONSTRUCTION.

3. WILL THIS WORK BLOCK A SIDEWALK?
NO SIDEWALK WILL BE BLOCKED DURING CONSTRUCTION

4. WILL THIS WORK REQUIRE A LANE OF TRAFFIC TO BE CLOSED?
PARTIAL SECTIONS OF THE PRIVATE ROAD MIGHT NEED TO BE BLOCKED OFF FOR CERTAIN PERIOD OF TIMES (HYDRANT INSTALLATION)



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- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
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- PROPOSED HEAVY DUTY ASPHALT
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5m 0 5 10m
SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER — M. BASNET — 100501996 — 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
GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE
PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

PROJECT NO.
250030 C302

Crossing Table

Crossing #	WTR	inv./obv.	STM	inv./obv.	SAN	inv./obv.	Depth Separation (m)
CR-01	N/A		114.08	inv.	113.78	obv.	0.30
CR-02	113.67	obv.	114.17	inv.	N/A		0.50

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5m 0 5 10m

SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER — M. BASNET — 100501996 — PROVINCE OF ONTARIO

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CLIENT

GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT

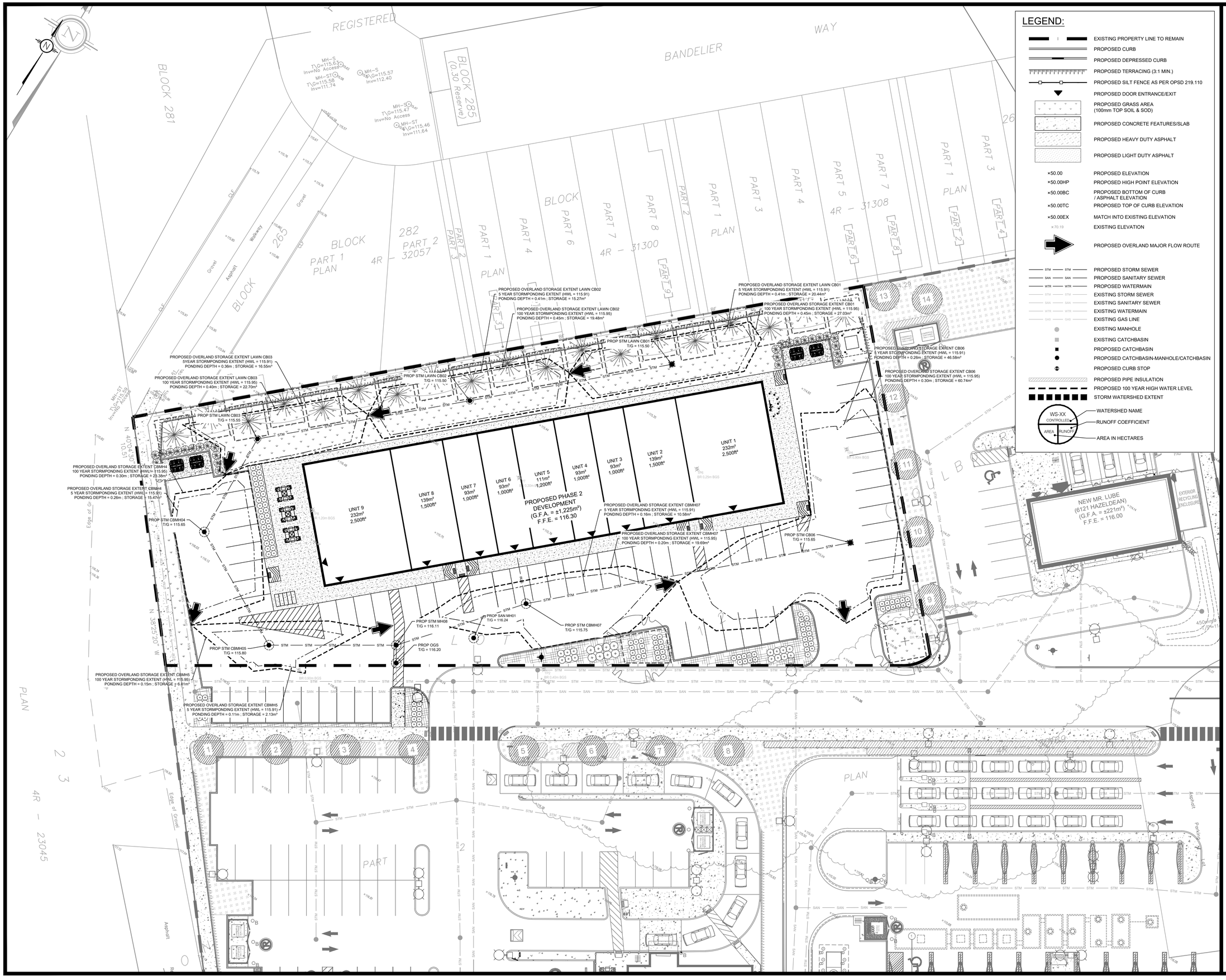
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE

SERVICING PLAN

PROJECT NO.

250030 C401



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5m 0 5 10m

SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT
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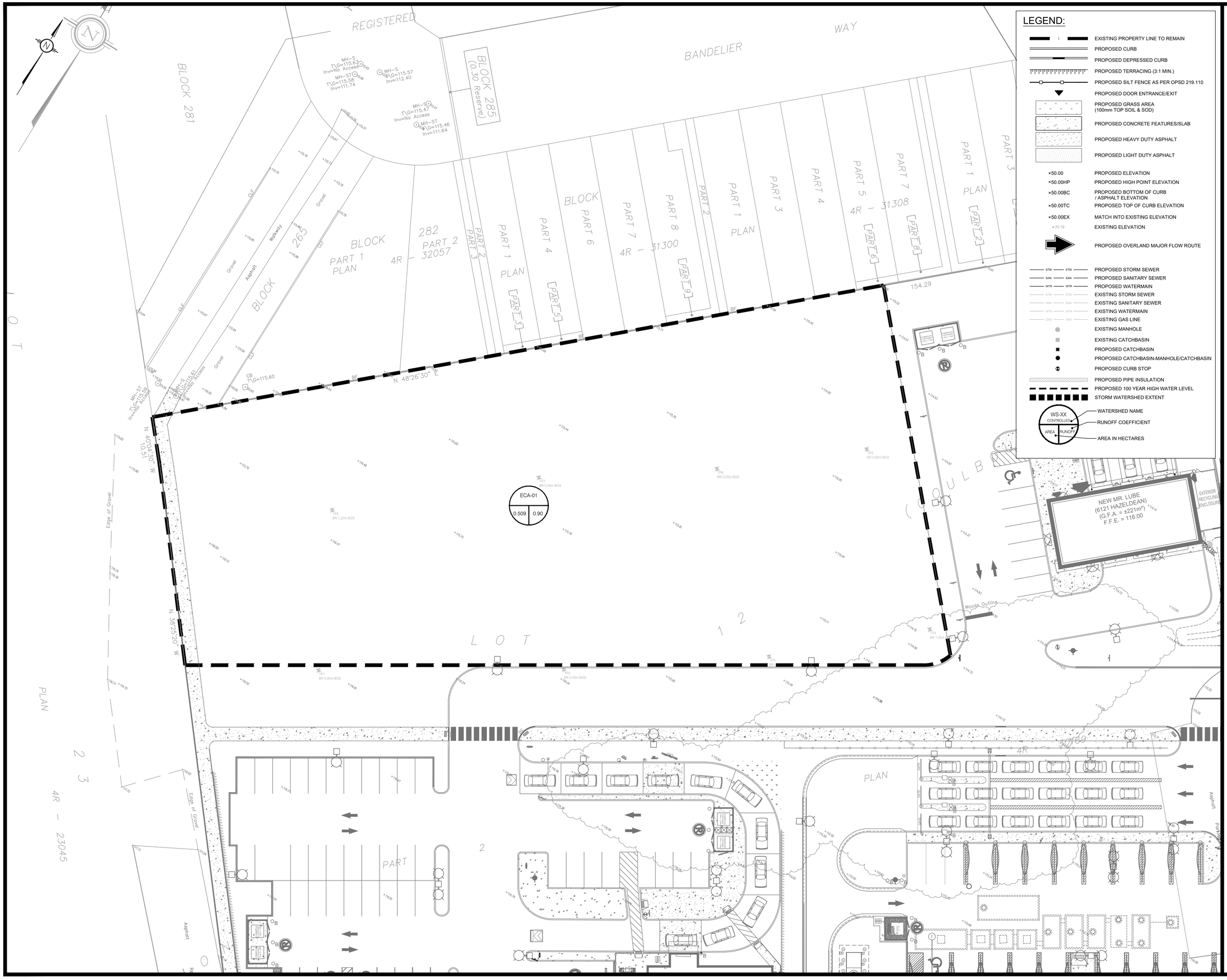
DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE
STORMWATER MANAGEMENT PLAN

PROJECT NO.
250030

C601



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5m 0 5 10m

SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

LRL
ENGINEERING | INGÉNIERIE
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www.lrl.ca | (613) 842-3434

CLIENT

GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

PROJECT

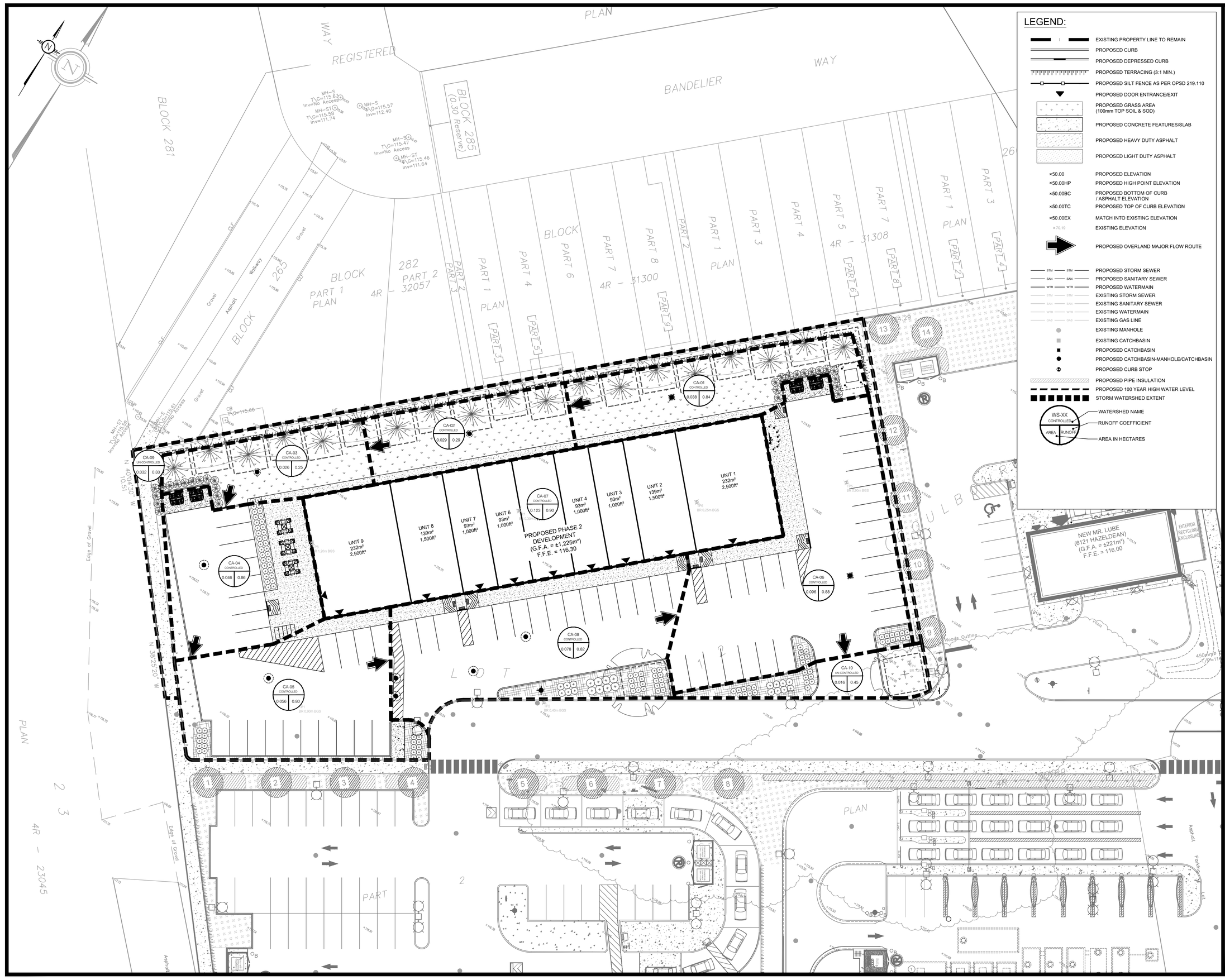
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE

PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.

250030 C701



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 DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- STM — STM PROPOSED STORM SEWER
- SAN — SAN PROPOSED SANITARY SEWER
- WTR — WTR PROPOSED WATERMAIN
- STM — STM EXISTING STORM SEWER
- SAN — SAN EXISTING SANITARY SEWER
- WTR — WTR EXISTING WATERMAIN
- GAS — GAS EXISTING GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED / UNCONTROLLED — AREA / RUNOFF — WATERSHED NAME / RUNOFF COEFFICIENT / AREA IN HECTARES

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5m 0 5 10m
SCALE: 1:250

No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER — M. BASNET — 100501996 — PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT
GRANT CASTLE CORP.

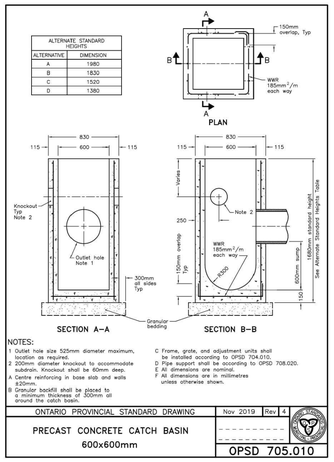
DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

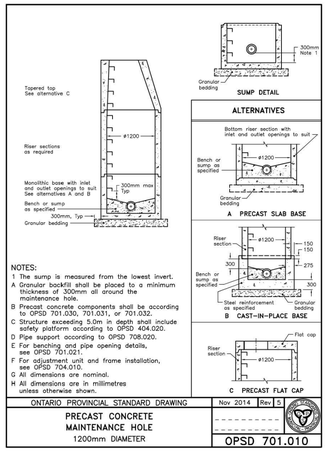
PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

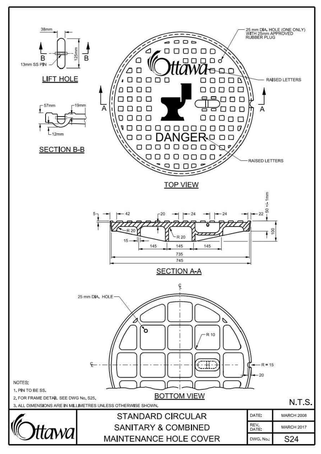
DRAWING TITLE
POST-DEVELOPMENT
WATERSHED PLAN

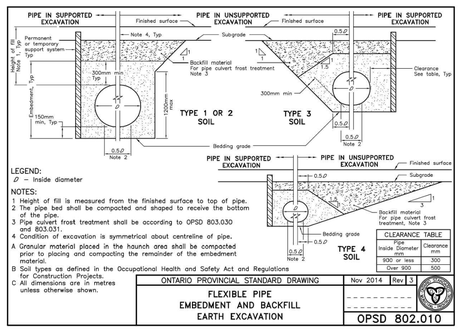
PROJECT NO.
250030

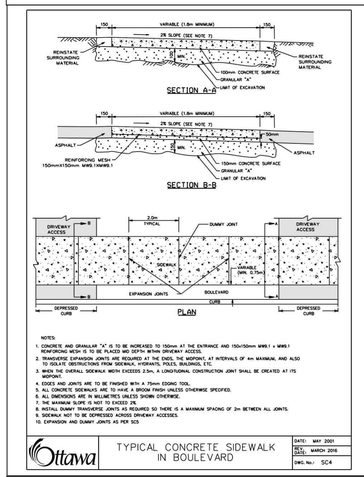
C702

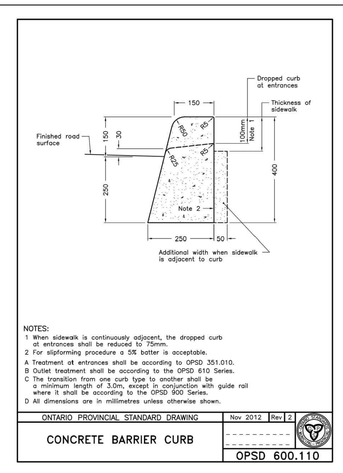


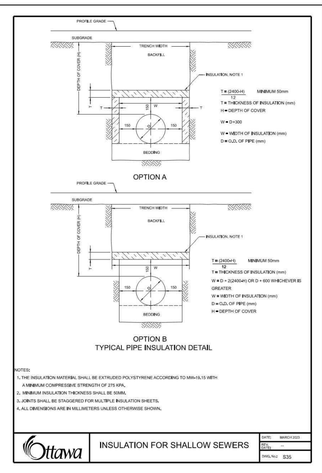


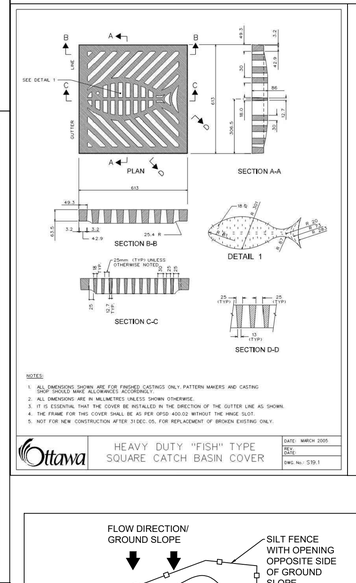


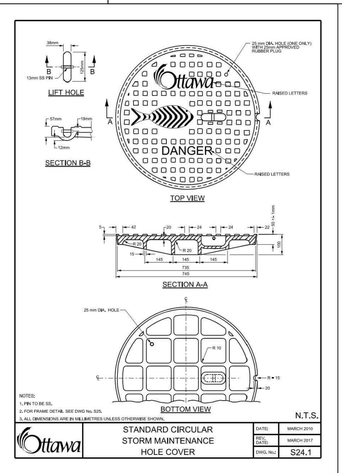


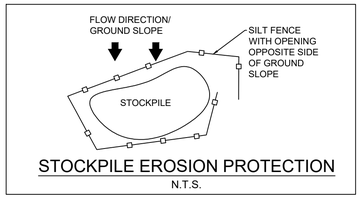


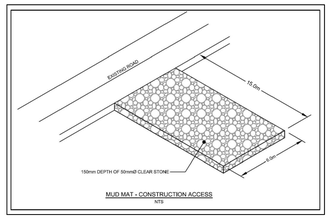


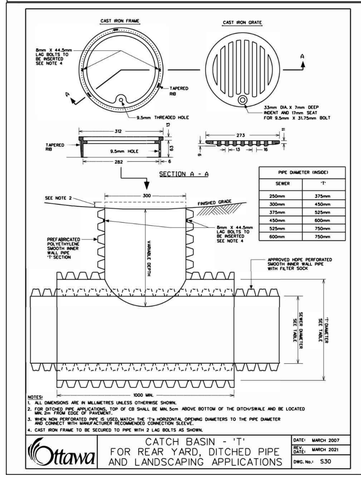


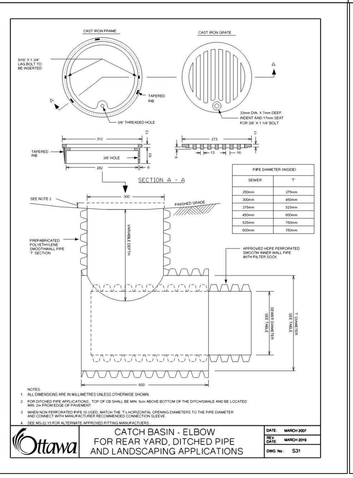


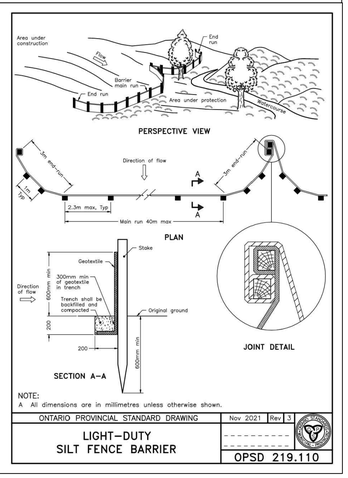


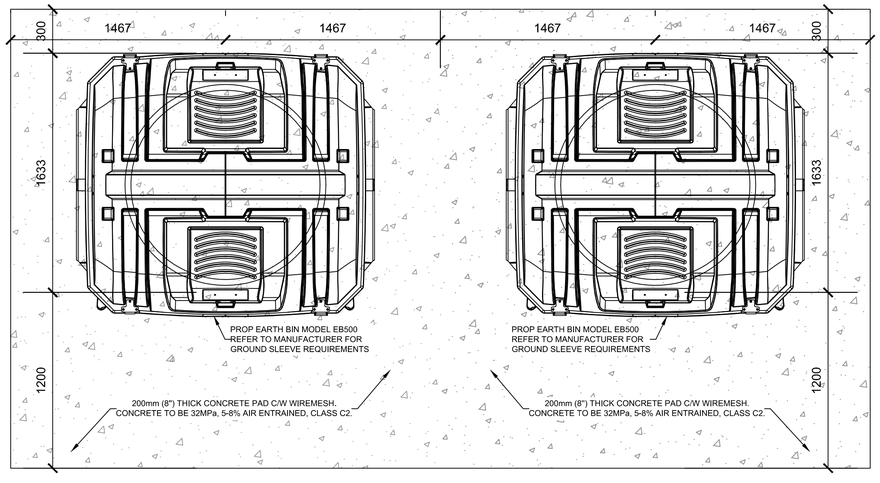












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No.	REVISIONS	BY	DATE
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

LICENSED PROFESSIONAL ENGINEER M. BASNET 100501996 PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT
GRANT CASTLE CORP.

DESIGNED BY:	DRAWN BY:	APPROVED BY:
S.V. / M.L.	S.V. / M.L.	M.B.

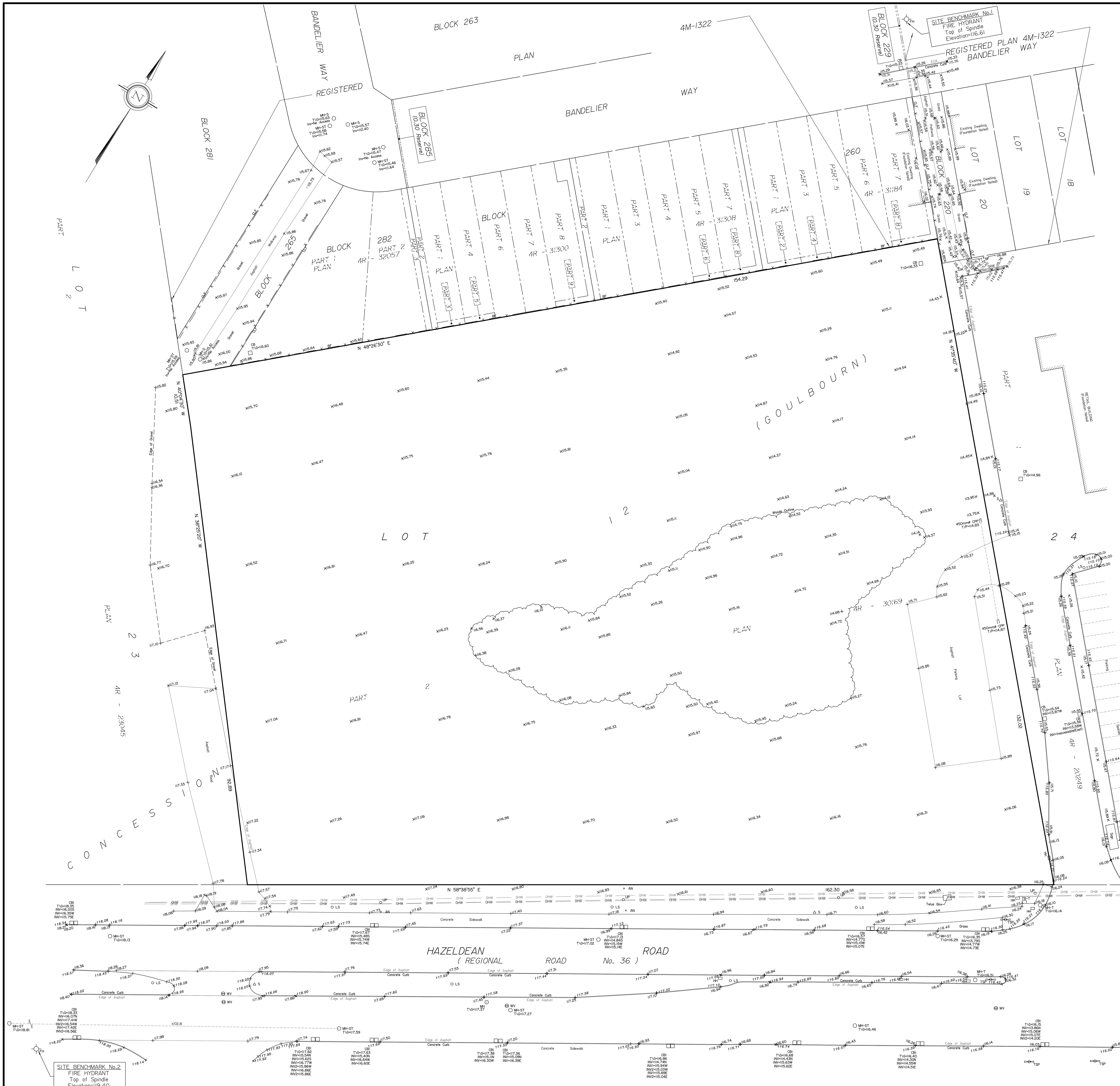
PROJECT
PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
250030

C901

APPENDIX F
Survey, As-Builts



TOPOGRAPHICAL SKETCH OF

6111 HAZELDEAN ROAD
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.
Field Work Completed November 10, 2020.

Scale 1 : 300

12 9 6 3 0 6 12 Metres

Metric

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

Notes & Legend

	Denotes	
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
FH	"	Fire Hydrant
WV	"	Water Valve
SP	"	Water Stand Post
MH-S	"	Maintenance Hole (Sanitary)
MH-ST	"	Maintenance Hole (Storm Sewer)
MH-T	"	Maintenance Hole (Traffic)
MH-H	"	Maintenance Hole (Hydro)
MH	"	Maintenance Hole (Unidentified)
VC	"	Valve Chamber (Watermain)
OHW	"	Overhead Wires
CB	"	Catch Basin
CBI	"	Catch Basin Inlet
CPP	"	Corrugated Plastic Pipe
T/P	"	Top of Pipe
T/G	"	Top of Grate
TB-T	"	Traffic Terminal Box
TSP	"	Traffic Signal Post
S	"	Sign
BF	"	Board Fence
CLF	"	Chain Link Fence
INV	"	Invert
EOA	"	Edge of Asphalt
SRW	"	Stone Retaining Wall
Ø	"	Diameter
UP	"	Utility Pole
AN	"	Anchor
HH	"	Handhole
LS	"	Light Standard
+ 65.00	"	Location of Elevations
+ 65.00	"	Top of Concrete Curb Elevation
+ 65.00	"	Top of Wall Elevation
———	"	Property Line

Bearings are grid, and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

SITE AREA = 18494.4 m²

BOUNDARY INFORMATION COMPILED FROM PLAN 4R-30619.

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
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.

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.

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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. 20881-20 6111HazeldeanRd PrtLt24Con12 T F | DG