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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
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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 m². 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 Atriel 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 from the Phase 1 development. In pre-development conditions, the stormwater runoff flows uncontrolled overland to the low-lying area towards the northwest and northeast corner of the subject site. Refer to Pre-development Watershed Plan C701 in Appendix E and calculations in Appendix D.



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.

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. Refer to the pre-consultation meeting note included in Appendix A.

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

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 to achieve quantity control will be provided through surface storage within the parking lot and landscape area at the rear of the site. In addition, underground storage will be incorporated via a storage gallery in the rear yard, as well as within the storm sewer pipes and storm structures.

A network of storm sewers is proposed to service the site which will outlet to the existing 300 mm diameter storm sewer stub located at the south property line of the subject site. The proposed storm sewers and stormwater management system are shown on Site Servicing Plan C401 and detailed design calculations can be found in Appendix D.

The existing site is delineated by catchments ECA-01 and ECA-02 which currently drain uncontrolled towards the low-lying area along the northwest and northeast 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 landscape area and site entrance 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, 85 mm diameter orifice is proposed at MH08 to restrict the collected runoff and control the release rate at 24.45 L/s (H=2.63 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)	0.075	0.83	1.00
CA-09 (uncontrolled)	0.032	0.33	0.41
CA-10 (uncontrolled)	0.016	0.45	0.56
Total	0.537	0.72	0.90

Table 6 summarizes the release rates from the proposed site.

Table 6: Summary of Proposed Development Stormwater Release Rates (100-Year)

Site Description	Controlled Release Rate	Uncontrolled Release Rate	Total
	(L/s)	(L/s)	(L/s)
Proposed Development (Phase 2)	24.45	10.89	35.34

Table 7 summarizes the 2-, 5- and 100-yr required storage and available on-site surface and underground storage.

Table 7: Summary of Storage Volume

Site Description	Storage Required (m ³)			Storage Provided (m ³)		
	100-yr	5-yr	2-yr	Surface	Underground	Total
Proposed Development (Phase 2)	216.97	78.86	51.55	181.89	57.58	239.47

The runoff exceeding the allowable release rate will be stored on-site via surficial ponding and underground storage. For 100-yr storm event, it is calculated that a total of 216.97 m³ of storage will be required to attenuate flows to the allowable release rate of 24.45 L/s (controlled release). The total storage provided is 239.47 m³, thus exceeds the required storage. From Table 7, it is evident that the required 2-yr storage will be accommodated underground (i.e. no surface storage).



Refer to Appendix D for details on runoff and storage calculations. The 5- and 100-year maximum ponding elevation and depths can be found on Stormwater Management Plan C601 in Appendix E.

7.5 Infiltration Target

The site is located within the Carp River Subwatershed Study area, where a target infiltration rate of 104 mm/hr has been established. However, based on Geotechnical Investigation prepared by LRL (March 2026), bedrock was encountered at depths ranging from 0.25m to 1.2m below grade with estimated infiltration rates in the range of 0.01-1 mm/hr. Therefore, infiltration-based stormwater management practices are not considered feasible for this site.

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. A mud mat will be installed at the proposed construction entrance. 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 located south of the site, which will eventually connect to watermain within Hazeldean Rd.



Sanitary Service

- The anticipated sanitary design flow from the proposed development is 0.44 L/s.
- The proposed development will be serviced by 200 mm dia. sanitary sewers that connect to the existing 200 mm dia. sanitary stub extended into the site 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 35.34 L/s (24.45 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, as well as underground storage in storage gallery, storm pipes and structures.

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.



Mohan Basnet, P. Eng.
Civil Engineer



APPENDIX A

Pre-consultation / Correspondance



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 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input checked="" type="checkbox"/>	5 <input type="checkbox"/>
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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 satisfied 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 patterns or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

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 (m²)

Q = flow rate (L/s)

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

$$\begin{aligned} \text{Minimum pipe diameter (d)} &= (4Q/\pi V)^{1/2} \\ &= 0.018 \quad \text{m} \\ &= 18 \quad \text{mm} \end{aligned}$$

$$\begin{aligned} \text{Proposed pipe diameter (d)} &= 100 \quad \text{mm} \\ &= 4 \quad \text{Inches} \end{aligned} \quad \text{(to be confirmed with hydraulic pressure analysis)}$$



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 (m³)

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 m²

Prop. Bldg Height = 7.00 m

V = 8575 m³

Q = 265825 L

Required Minimum Water Supply Flow Rate = 6300
105

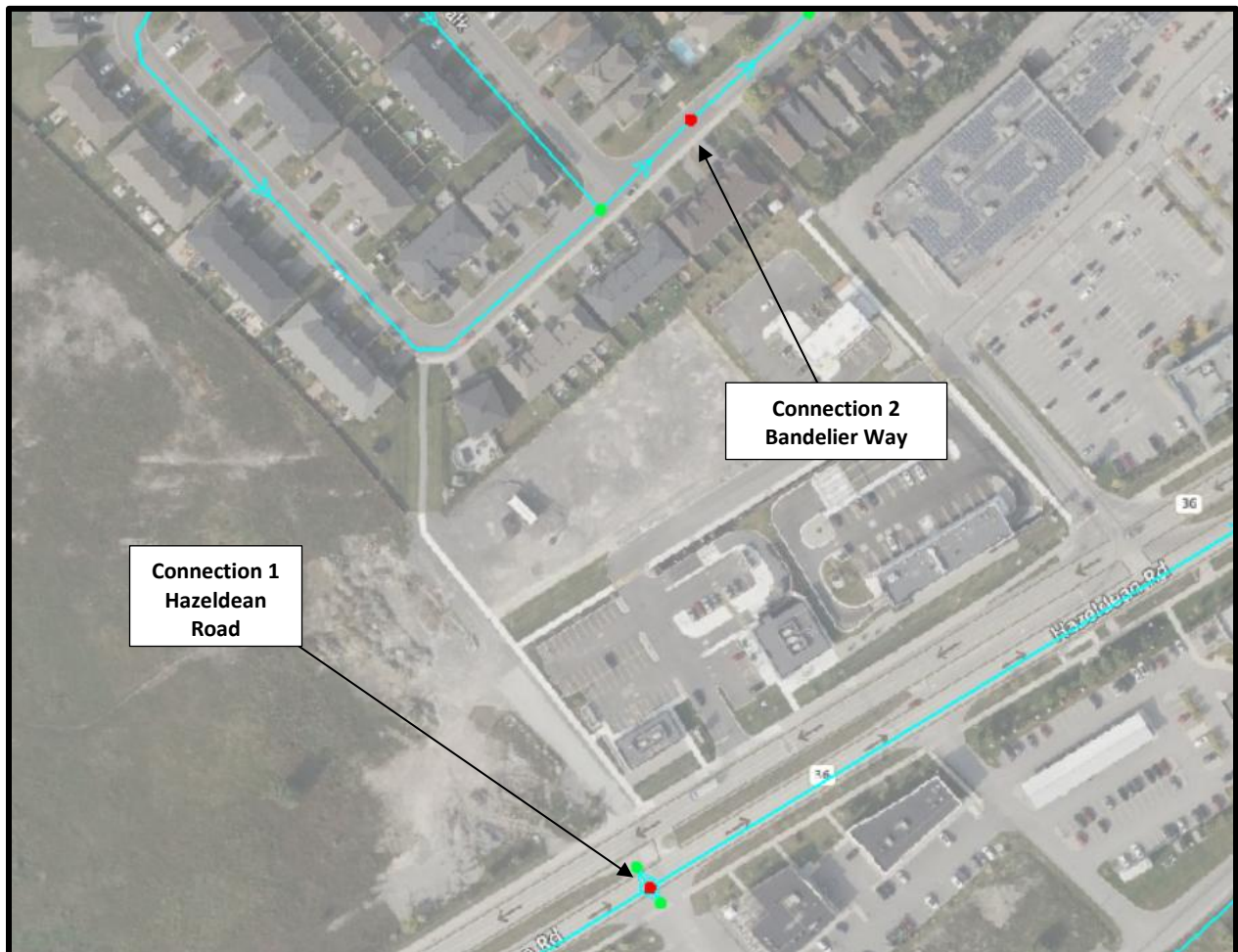
L / min (Table 2 of A-3.2.5.7)
L/s

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)	Pressure¹ (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)	Pressure¹ (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

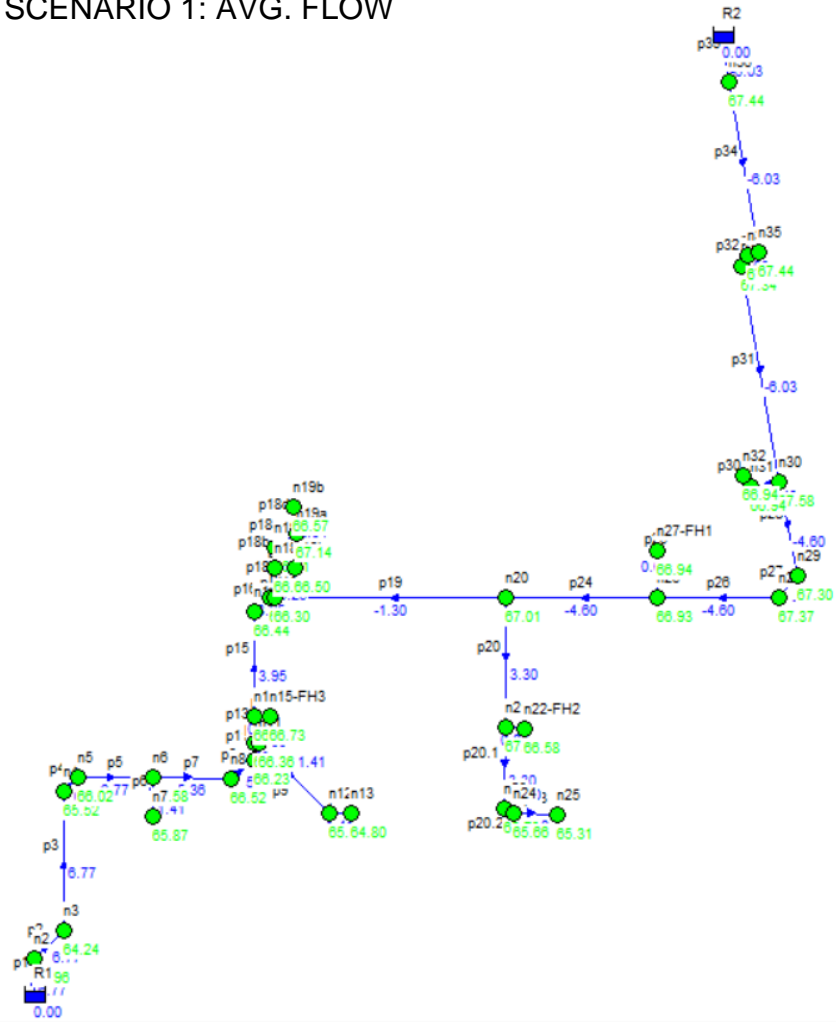
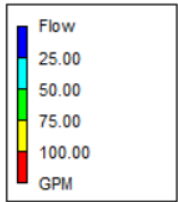
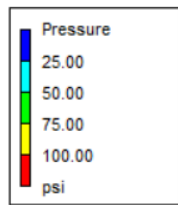
1. The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update.
2. Demands for proposed Connection 1 at existing private water main were split and assigned to upstream 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



```

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

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

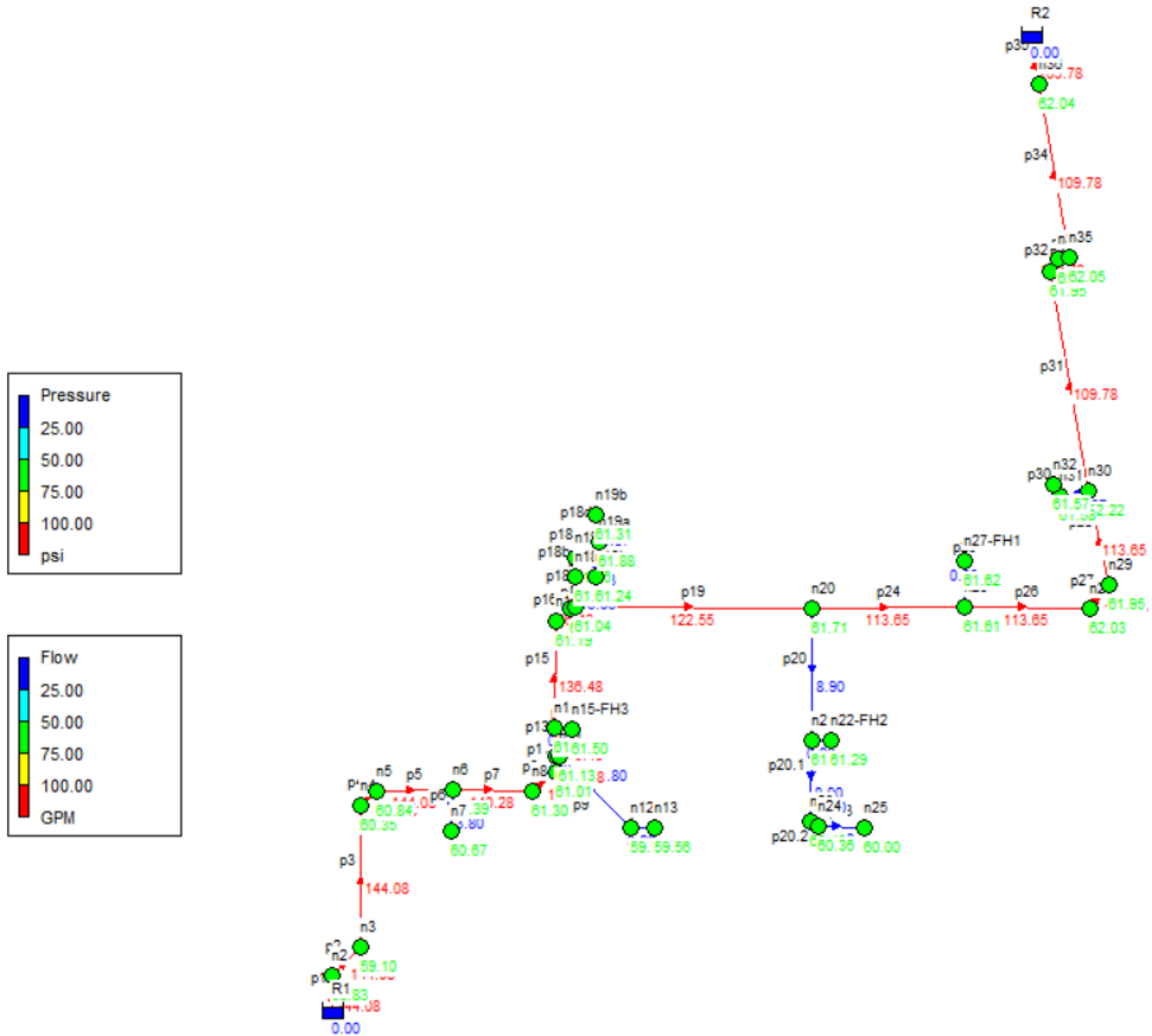
Link Results:

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



```

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

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
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	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

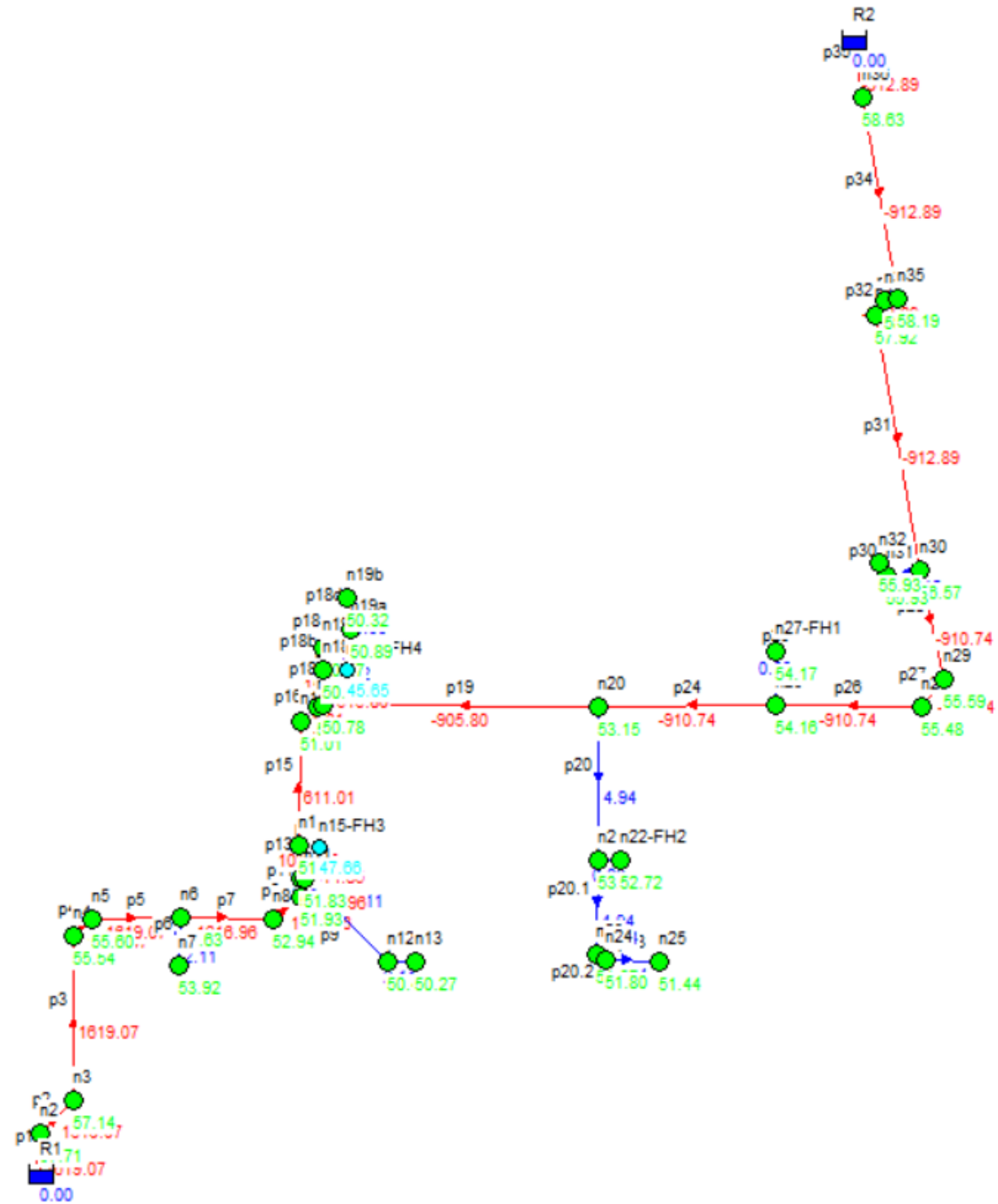
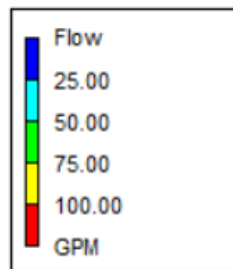
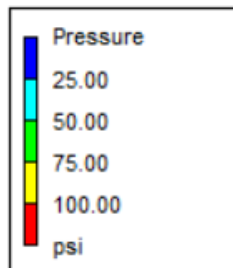
Link Results:

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



```
*****
*                               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

Page 4

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



(Revision 5)



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 Bulletin 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 FLOW	PIPE					
STREET/SITE	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)
					AREA (Ha)	POP.																				
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
Comm. Area		SAN MH03	SAN MH05																	1.32	31.6	200	0.50%	PVC	23.19	0.74
	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
*Phase 2		SAN MH07	SAN MH05																	0.26	48.6	200	3.00%	PVC	56.81	1.81
	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)	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**

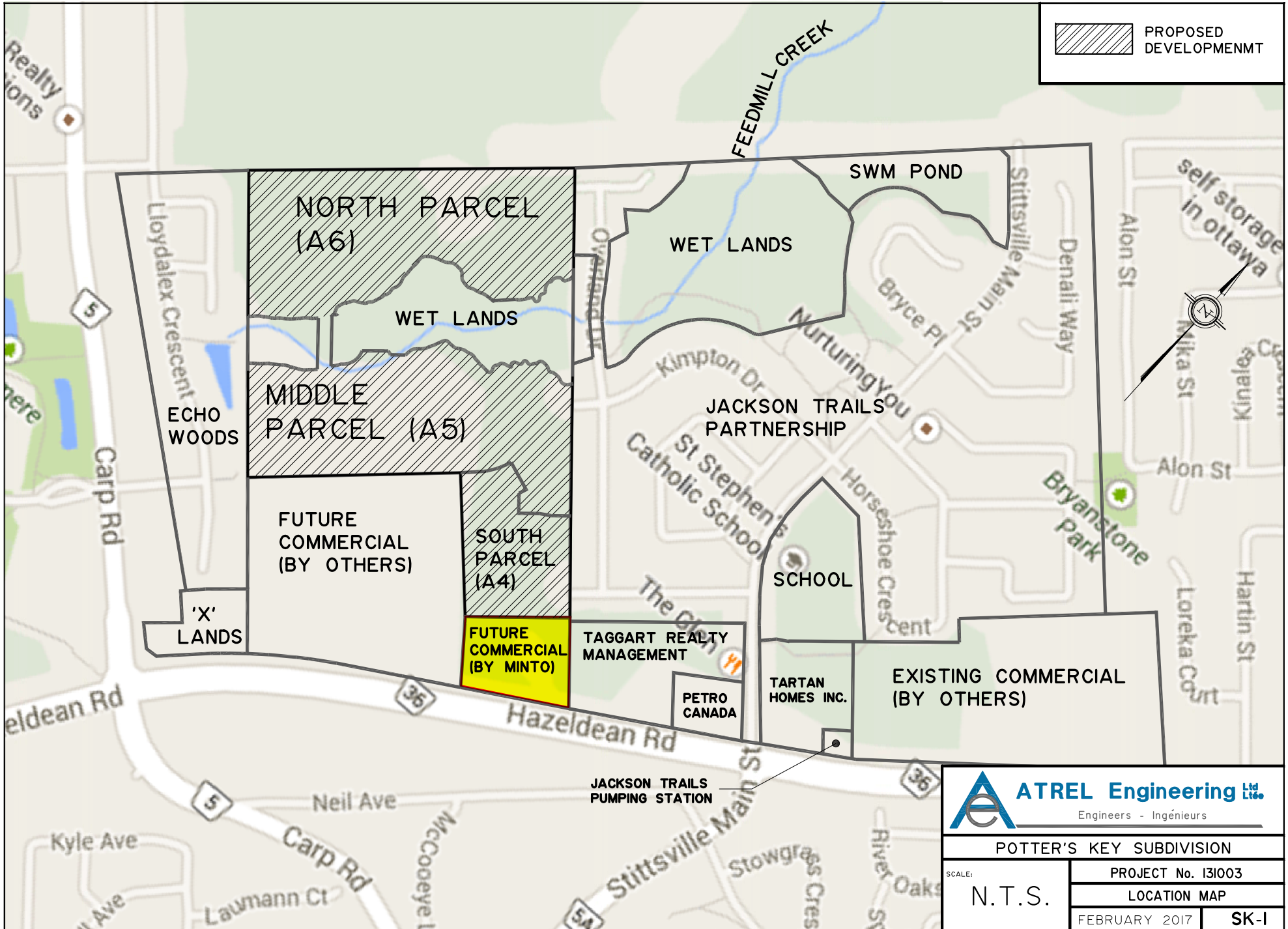
POTTER'S KEY SUBDIVISION

CITY OF OTTAWA

FEBRUARY 2017



(Revision 5)



ATREL Engineering Ltd.
 Engineers - Ingénieurs

POTTER'S KEY SUBDIVISION

SCALE: PROJECT No. I31003

N.T.S. LOCATION MAP

FEBRUARY 2017 SK-I

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				AREA (ha.) RUNOFF COEFFICIENT								RATIONAL METHOD		2 YEAR			ACTUAL PIPE FLOW (L/S)	PIPE			SEWER DATA					UpStream		Down MH Hgl (M)	UpStream						
	FROM (Up)	TO (Down)	0.20	0.45	0.55	0.58	0.70	0.75	0.61	0.87	INDIV. 2.78AR	ACCUM. 2.78AR	TIME CONC. (MIN)	RAINF. INTENS. (MM/HR)	FLOW (L/S)	TYPE	DIA. (NOM) (mm)		(ACT)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	Obv. (M)	Inv. (M)	Forced drop (M)		Inv to Inv (M)	Obv. (M)	Inv. (M)	UpStream		USF ELEV (M)	HGL FREEBOARD (M)
																																	Hgl at UP-MH (M)	Hgl Out UP-MH (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	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	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				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									0.24	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	112.55	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: April 7, 2026

Designed: M.Longtin

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	0.290	0.290	0.90
ECA-02 (uncontrolled)	0.000	0.000	0.218	0.218	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)	0.007	0.000	0.068	0.075	0.83
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	0.141	0.000	0.396	0.537	0.72



LRL File No. 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: April 7, 2026
Designed: M.Longtin
Checked: M. Basnet
Drawing Ref.: C601

**Stormwater Management
 Design Sheet**

STORM - 100 YEAR

Runoff Equation

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

Pre-Development Release Rate

IDF Curve Equations

$I_{100} = 1735.688 / (T_d + 6.014)^{0.820}$ 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 Atriel Engineering (Rev 5) dated February 2017)
35.60 L/s
 Allowable Controlled Release Rate = 24.71 L/s
 Actual Controlled Release Rate = 24.45 L/s

Post-development Stormwater Management

				$\sum R_{2&5}$	$\sum R_{100}$
Total Site Area =	0.537	ha	$\sum R =$	0.72	0.90
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)	0.075	ha	R =	0.83	1.00
Total (controlled)	0.489	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	0.537	ha	R =	0.72	0.90

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	227.62	129.23	12.23	10.89	23.11
15	142.89	182.15	152.93	12.23	8.71	20.94
20	119.95	152.90	168.82	12.23	7.32	19.54
25	103.85	132.38	180.23	12.23	6.33	18.56
30	91.87	117.11	188.79	12.23	5.60	17.83
35	82.58	105.27	195.39	12.23	5.04	17.26
40	75.15	95.79	200.56	12.23	4.58	16.81
45	69.05	88.02	204.65	12.23	4.21	16.44
50	63.95	81.52	207.90	12.23	3.90	16.13
55	59.62	76.00	210.47	12.23	3.64	15.86
60	55.89	71.25	212.49	12.23	3.41	15.63
65	52.65	67.11	214.05	12.23	3.21	15.44
70	49.79	63.47	215.22	12.23	3.04	15.26
75	47.26	60.24	216.06	12.23	2.88	15.11
80	44.99	57.35	216.61	12.23	2.74	14.97
85	42.95	54.75	216.90	12.23	2.62	14.84
90	41.11	52.41	216.97	12.23	2.51	14.73
95	39.43	50.27	216.85	12.23	2.40	14.63
100	37.90	48.32	216.55	12.23	2.31	14.54
105	36.50	46.52	216.09	12.23	2.23	14.45
110	35.20	44.87	215.48	12.23	2.15	14.37
115	34.01	43.35	214.75	12.23	2.07	14.30
120	32.89	41.93	213.89	12.23	2.01	14.23

Note: *50% of maximum controlled release rate for underground storage calculation

On-site stormwater detention

Storage required = 216.97 m³
 Surface storage provided = 181.89 m³ (Refer to DWG C601)
 Underground storage provided = 57.58 m³ (Refer to DWG C401)
Total storage provided = 239.47 m³



LRL File No. 250030
 Project: Proposed Development- Phase 2
 Location: 6111 Hazeldean Rd (Stittsville, ON)
 Date: April 7, 2026
 Designed: M.Longtin
 Checked: M. Basnet
 Drawing Ref.: C601

Stormwater Management
 Design Sheet

STORM - 5 YEAR

Runoff Equation

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

Pre-Development Release Rate

IDF Curve Equations

$I_5 = 998.071 / (T_d + 6.053)^{0.814}$ 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 = 0.509 ha
 5 Year Release Rate = 73.65 L/s

Post-development Stormwater Management

				$\sum R_{2\&5}$
Total Site Area =	0.537	ha	$\sum R =$	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)	0.075	ha	R =	0.83
Total (controlled)	0.489	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	0.537	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	104.19	106.25	56.42	12.23	4.08	16.30
15	83.56	85.21	65.69	12.23	3.43	15.65
20	70.25	71.64	71.30	12.23	2.97	15.20
25	60.90	62.10	74.81	12.23	2.63	14.86
30	53.93	54.99	76.99	12.23	2.37	14.59
35	48.52	49.48	78.23	12.23	2.16	14.38
40	44.18	45.06	78.80	12.23	1.98	14.21
45	40.63	41.43	78.86	12.23	1.84	14.06
50	37.65	38.40	78.52	12.23	1.71	13.94
55	35.12	35.82	77.86	12.23	1.61	13.83
60	32.94	33.60	76.93	12.23	1.51	13.74
65	31.04	31.66	75.79	12.23	1.43	13.66
70	29.37	29.95	74.46	12.23	1.36	13.59
75	27.89	28.44	72.97	12.23	1.30	13.52
80	26.56	27.09	71.34	12.23	1.24	13.46
85	25.37	25.87	69.59	12.23	1.19	13.41
90	24.29	24.77	67.74	12.23	1.14	13.36
95	23.31	23.77	65.79	12.23	1.09	13.32
100	22.41	22.85	63.75	12.23	1.05	13.28
105	21.58	22.01	61.64	12.23	1.02	13.24
110	20.82	21.23	59.46	12.23	0.98	13.21
115	20.12	20.52	57.22	12.23	0.95	13.17
120	19.47	19.85	54.92	12.23	0.00	12.23

Note: *50% of maximum controlled release rate for underground storage calculation

On-site stormwater detention

Storage required = 78.86 m³



LRL File No. 250030
 Project: Proposed Development- Phase 2
 Location: 6111 Hazeldean Rd (Stittsville, ON)
 Date: April 7, 2026
 Designed: M.Longtin
 Checked: M. Basnet
 Drawing Ref.: C601

Stormwater Management
Design Sheet

STORM - 2 YEAR

Runoff Equation

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

Pre-Development Release Rate

IDF Curve Equations

$I_2 = 732.951 / (T_d + 6.199)^{0.810}$ A = 732.951 B = 0.810 C = 6.199

C = 0.50 (max of 0.5 as per City Guidelines)
 $I_2 = 76.8$ mm/hr
 $T_d = 10$ min
 A = 0.509 ha
 2 Year Release Rate = 54.29 L/s

Post-development Stormwater Management

				$\Sigma R_{2\&5}$
Total Site Area =	0.537	ha	$\Sigma R =$	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)	0.075	ha	R =	0.83
Total (controlled)	0.489	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	0.537	ha	R =	0.72

2 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	76.81	78.32	39.66	12.23	3.75	15.97
15	61.77	62.99	45.69	12.23	3.01	15.24
20	52.03	53.06	49.00	12.23	2.54	14.76
25	45.17	46.06	50.75	12.23	2.20	14.43
30	40.04	40.84	51.50	12.23	1.95	14.18
35	36.06	36.77	51.55	12.23	1.76	13.98
40	32.86	33.51	51.09	12.23	1.60	13.83
45	30.24	30.84	50.25	12.23	1.48	13.70
50	28.04	28.60	49.11	12.23	1.37	13.59
55	26.17	26.69	47.73	12.23	1.28	13.50
60	24.56	25.04	46.15	12.23	1.20	13.42
65	23.15	23.61	44.40	12.23	1.13	13.35
70	21.91	22.35	42.51	12.23	1.07	13.29
75	20.81	21.23	40.50	12.23	1.02	13.24
80	19.83	20.22	38.39	12.23	0.97	13.19
85	18.94	19.32	36.18	12.23	0.92	13.15
90	18.14	18.50	33.90	12.23	0.89	13.11
95	17.41	17.76	31.54	12.23	0.85	13.07
100	16.75	17.08	29.12	12.23	0.82	13.04
105	16.13	16.45	26.64	12.23	0.79	13.01
110	15.57	15.88	24.10	12.23	0.76	12.98
115	15.05	15.34	21.52	12.23	0.73	12.96
120	14.56	14.85	18.90	12.23	0.71	12.94

Note: *50% of maximum controlled release rate for underground storage calculation

On-site stormwater detention

Storage required = 51.55 m³
 Underground storage provided = 57.58 m³



LRL File No. 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: April 7, 2026
Designed: M.Longtin
Checked: M. Basnet
Drawing Ref.: C601

**Stormwater Management
Design Sheet**

STORM - 2 YEAR

Pipe Storage

Length (m)	Length (m)	dia. (m)	Storage (m ³)
CB01-CB02	30.80	0.25	1.51
CB02-CB03	30.80	0.25	1.51
CB03-CBMH04	15.30	0.25	0.75
CBMH04-CBMH05	19.10	0.25	0.94
CBMH05-MH08	18.60	0.25	0.91
CB06-CBMH07	48.20	0.25	2.37
CBMH07-MH08	19.90	0.375	2.20
Total			10.19

MH/CBMH Storage

CB/CBMH	Depth (m)	dia. (m)	Storage (m ³)
CBMH04	1.79	1.20	2.03
CBMH05	1.94	1.20	2.19
CB06	1.29	1.20	1.46
CBMH07	1.53	1.20	1.73
MH08	2.37	1.20	2.68
Total			10.09

Underground Storage Gallery

Perforated Pipe Dia.	0.25	m
Perforated Pipe Length	61.6	m
Pipe Storage Volume	3.02	m³
Storage Gallery Width	1.20	m
Avg. Height	1.20	m
Pipe Area	0.05	m ²
Net Storage Area	1.39	m ²
Length	61.6	m
Storage Volume (40% Porosity)	34.27	m³

LRL Associates Ltd.
Storm Sewer Design Sheet



LRL File No. 250030
Project: Proposed Development- Phase 2
Location: 6111 Hazeldean Rd (Stittsville, ON)
Date: April 7, 2026
Designed: M.Longtin
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

WATERSHED / STREET	LOCATION		AREA (ha)			FLOW						STORM SEWER							
	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	HDPE	0.45%	30.8	39.89	0.81	0.63	0.07
CA-02	Lawn CB02	Lawn CB03	0.026	0.000	0.004	0.02	0.05	10.63	100.97	5.18		250	HDPE	0.45%	30.8	39.89	0.81	0.63	0.13
CA-03	Lawn CB03	CBMH04	0.024	0.000	0.002	0.02	0.07	11.26	97.96	6.84		250	PVC	0.45%	15.3	39.89	0.81	0.31	0.17
CA-04	CBMH04	CBMH05	0.003	0.000	0.044	0.11	0.18	11.58	96.54	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	94.83	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%	6.8	46.38	1.48	0.08	0.69
CA-08	CBMH07	MH08	0.007	0.000	0.068	0.17	0.72	10.99	99.25	71.01		375	PVC	0.50%	19.9	123.98	1.12	0.30	0.57
	MH08	OGS					1.02	12.35	93.23	95.07	24.45	300	PVC	1.15%	2.6	103.70	1.47	0.03	0.24

Phase 1: Storm Design Sheet



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
 $Q = 2.78CIA$
 $Q = \text{Peak flow (L/s)}$
 $A = \text{Drainage area (ha)}$
 $C = \text{Runoff coefficient}$
 $I = \text{Rainfall intensity (mm/hr)}$
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}
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																	
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																	
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																	
WS-12	MH100	STM/ CBMH12	0.004	0.000	0.025	0.06	0.64	10.89	73.56	23.38		450	PVC	0.50%	2.60	201.60	1.27	0.03	0.12
	*CBMH12	MH16																	
	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																	
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	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



LRL File No. 250030
Project: Proposed Development-Phase 2
Location: 6147 Hazeldean Rd
Date: April 6, 2026
Designed: M Basnet
Drawing Ref.: C401

Orifice Equation

$$Q = C_d A \sqrt{2gH}$$

Where:

Q = discharge (m^3/s)

C_d = coefficient of discharge

A = area of orifice (m^2)

g = acceleration due to gravity ($= 9.81 \text{ m/s}^2$)

H = head above centreline of orifice

Design Flow (Q) =	24.71	L/s
Design Head (H) =	2.63	m
C_d =	0.6	
g =	9.81	m/s^2
A =	0.00574	m^2
Calculated Orifice Dia (d) =	85.46	mm
Proposed Orifice Dia (d) =	85	mm
A =	0.00567	m^2
Actual Q =	24.45	L/s

TEMPEST Product Submittal Package R1



Date: April 6, 2026

Customer: LRL Engineering

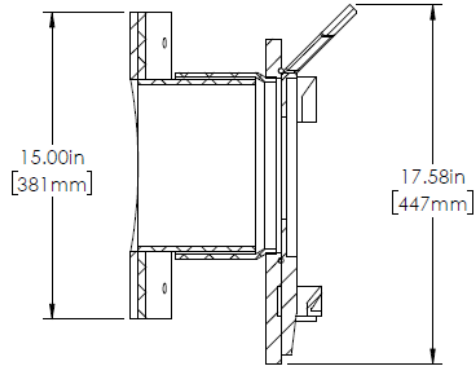
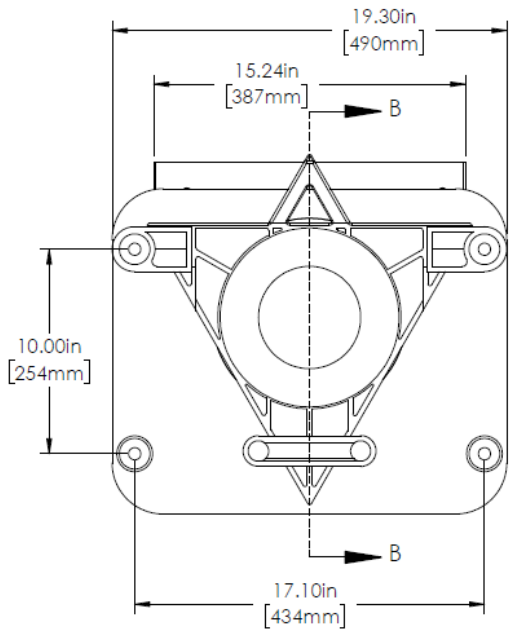
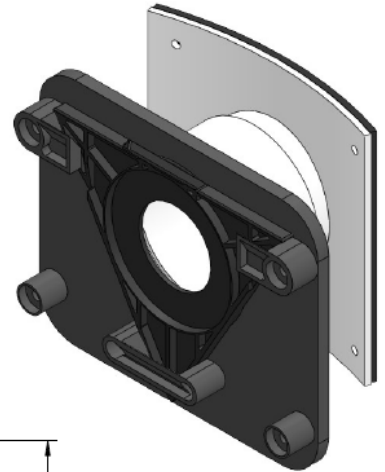
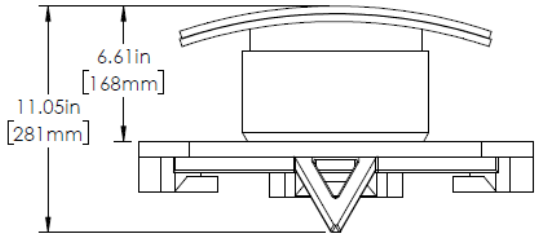
Contact: Mohan Basnet

Location: Stittsville

Project Name: 6147 Hazeldean Rd



Tempest MHF ICD Rd Shop Drawing

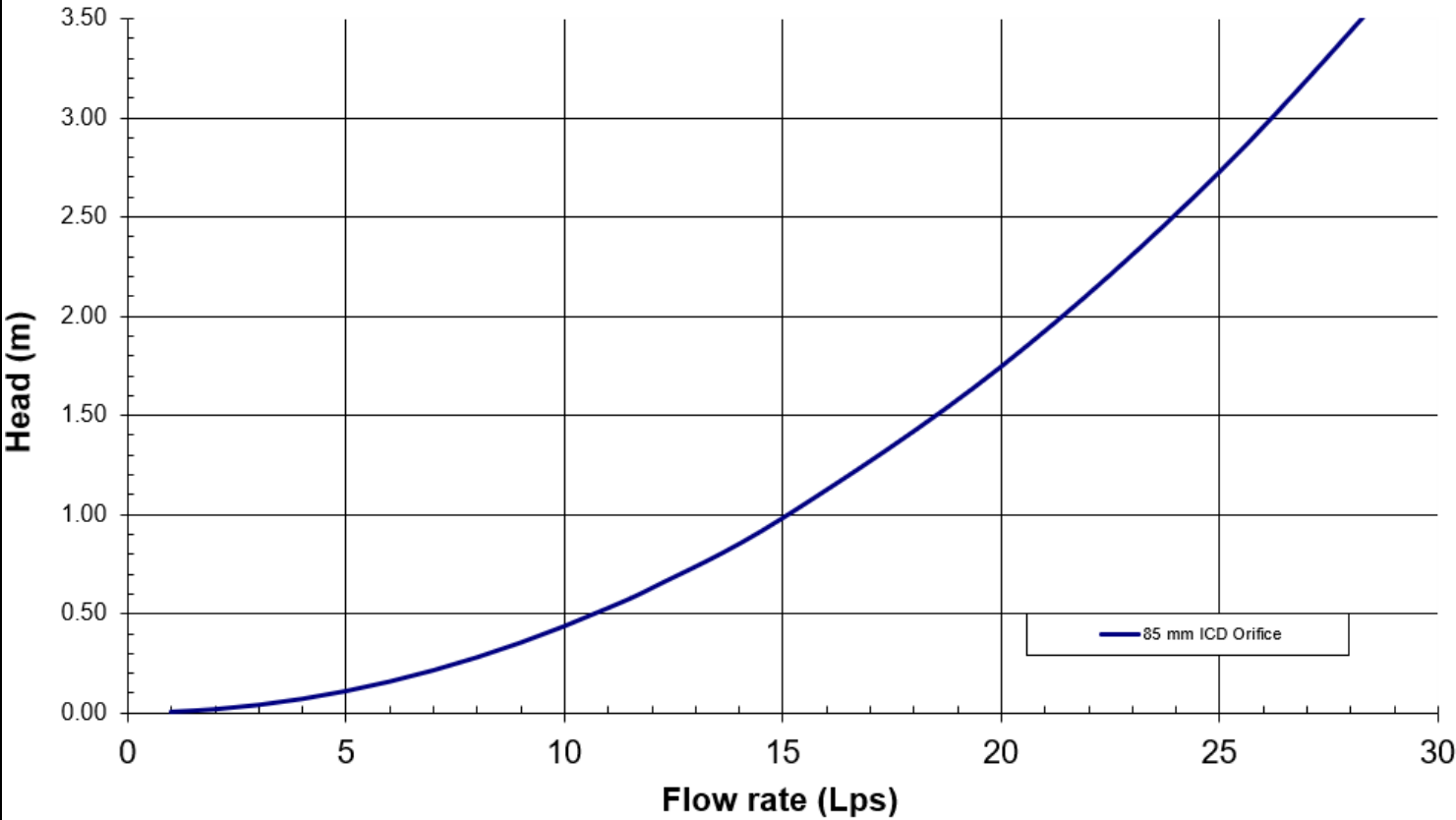


SECTION B-B
SCALE 1 : 7

0	FOR REVIEW	DATE	REVISION	CHK	The Information Contained Herein Is Proprietary To IPEX And May Not Be Used, Reproduced Or Disclosed To Others Except As Specifically Permitted In Writing By IPEX. The Recipient Of This Document, By Its Retention And Use, Agrees To Protect The Same And The Information Contained Therein From Loss Or Theft.	INVADER BRANCH				
						IPEX by olixix PH: (905) 670-7676 FAX: (905) 6705296	MHF ROUND CB ASSEMBLY			
CUSTOMER										
DATE	DRAWN BY	CHECKED BY	SCALE	DWG. NO.						
4/15/2024	J.B.		N.T.S	N/A						

Tempest MHF ICD Flow Curve

Flow: 24.45 L/s
Head: 2.63 m
MH



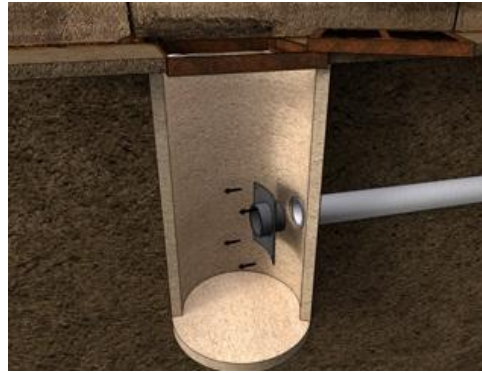
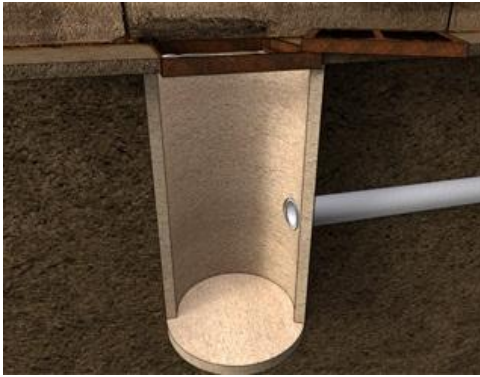
Square CB Installation Notes:

1. Materials and tooling verification:
 - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
 - Material: (4) concrete anchor 3/8x3-1/2, (4) washers, (4) nuts
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Put the nuts on the top of the anchors to protect the threads when you will hit the anchors with the hammer. Remove the nuts on the ends of the anchors
5. Install the wall mounting plate on the anchors and screw the nut in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From ground above using a reach bar, lower the device by hooking the end of the reach bar to the handle of the LMF device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the wall mounting plate and has created a seal.



Round CB Installation Notes: (Refer to square install notes above for steps 1 , 3, & 4)

2. Use spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lb-ft). There should be no gap between the CB spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate and the spigot of the spigot CB wall plate. Slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered into the mounting plate and has created a seal.



CAUTION/WARNING/DISCLAIM:

- Verify that the inlet(s) pipe(s) is not protruding into the catch basin. If it is, cut it back so that the inlet pipe is flush with the catch basin wall.
- Any required cement in the installation must be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Please refer to the IPEX solvent cement guide to confirm required curing times or attend the IPEX [Online Solvent Cement Training Course](#).
- Call your IPEX representative for more information or if you have any questions about our products.

IPEX TEMPEST Inlet Control Devices Technical Specification

General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control where specified. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's must have no moving parts.

Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.



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

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

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

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**



Stormceptor® EF Sizing Report

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

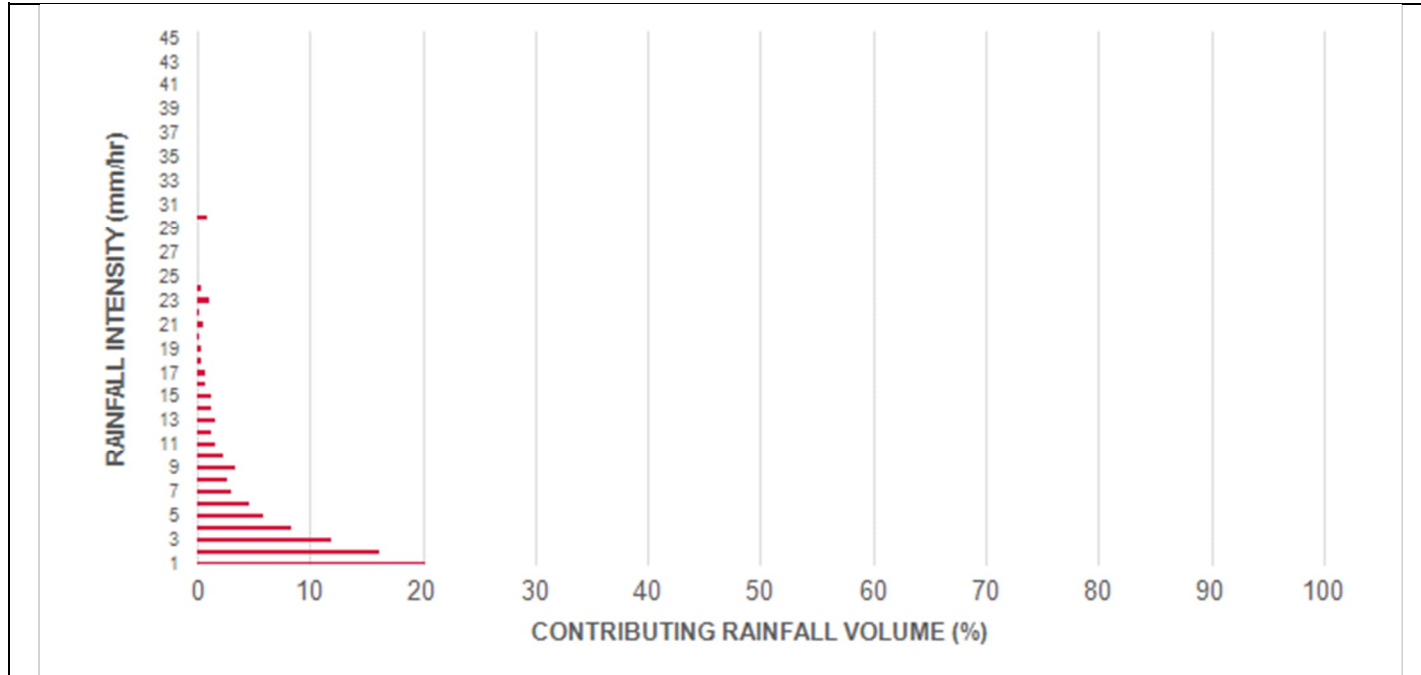
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	0.49	29.0	25.0	100	8.6	8.6
1.00	20.3	29.0	0.98	59.0	49.0	100	20.3	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

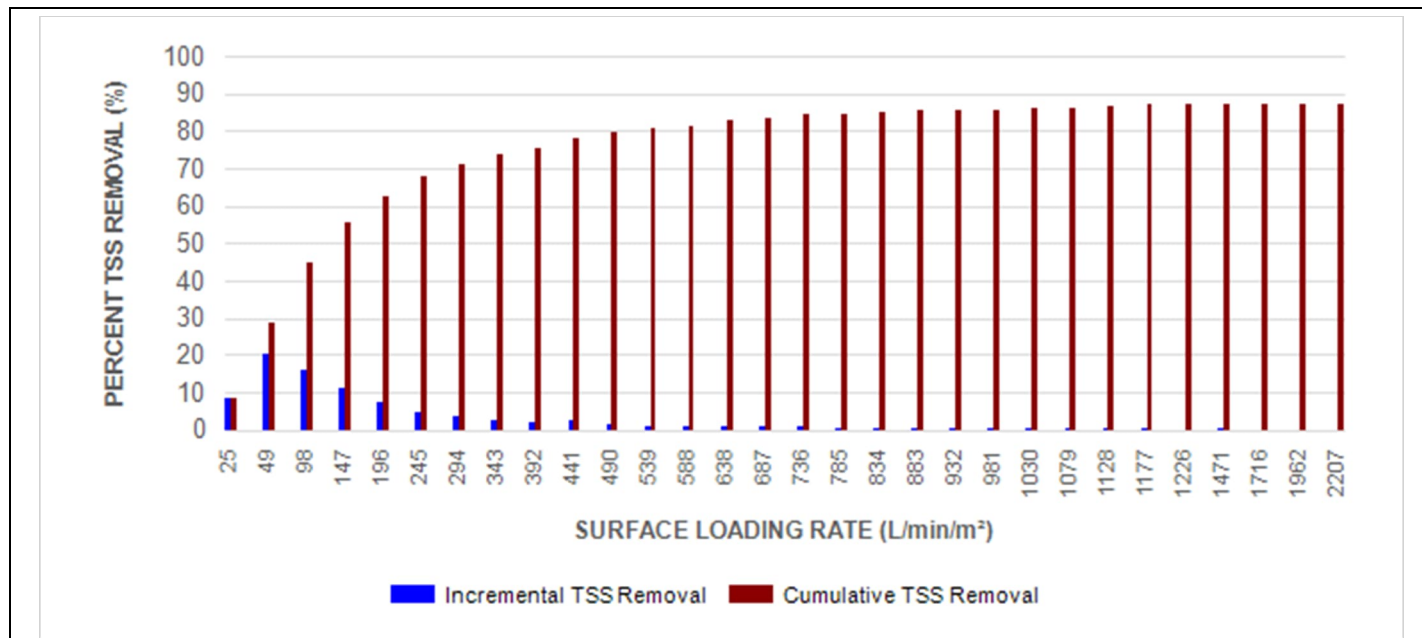


Stormceptor®EF Sizing Report

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

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

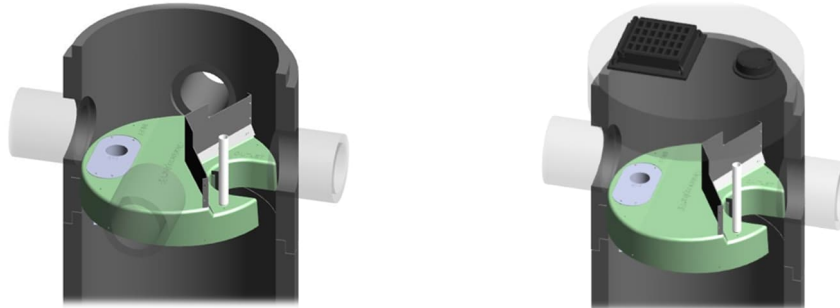
► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance 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

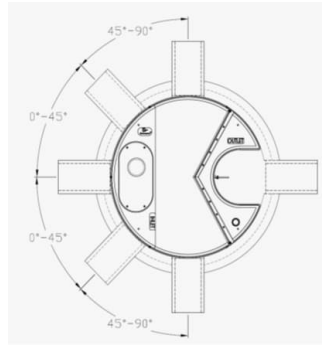
► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle,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



Stormceptor®EF Sizing Report



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)	(ft³)	(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/ft³)

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](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](http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef)

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT 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

Stormceptor® EF Sizing Report

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/m² to 1400 L/min/m², 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/m² and 1400 L/min/m² 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/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² 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/m².

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/m².

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.

Stormceptor®EF Sizing Report

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/m² to 2600 L/min/m²) 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.

APPENDIX E
Civil Engineering Drawings

PROPOSED DEVELOPMENT - PHASE 2

6111 HAZELDEAN RD

STITTSVILLE, ON

REVISION 04



KEY PLAN (N.T.S.)

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SITE DEVELOPMENT PLAN	C201
SITE DEVELOPMENT PLAN - NO UNDERLAY	C202
GRADING AND DRAINAGE PLAN	C301
PRELIMINARY CONSTRUCTION MANAGEMENT PLAN	C302
SERVICING PLAN	C401
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901



LRL

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

PROPOSED DEVELOPMENT - PHASE 2
6111 HAZELDEAN RD, STITTSVILLE, ON
REV.04 - ISSUED FOR APPROVAL - APRIL 7th, 2026
LRL PROJECT no: 250030



NOT AUTHENTIC UNLESS SIGNED AND DATED

007-12-25-0123

19437

GENERAL NOTES

- ALL WORKS MATERIALS SHALL CONFORM 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.
- 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.
- 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.
- 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 CONTRACTORS 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.
- 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.
- ALL THE CONSTRUCTION SIGNAGE MUST CONFIRM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
- 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.
- ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
- THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
- ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
- FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
- ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
- ALL PIPE/CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
- 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.
- 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.
- DRAWINGS SHALL BE READ ON CONJUNCTION WITH ARCHITECTURAL SITE PLAN.
- THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ON SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
- 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 OPS5 577 WHERE APPROPRIATE, OR IN ACCORDANCE WITH MANUFACTURERS 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 MOMENTS 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 CONTRACTORS 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 CONTRACTORS 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 CONTRACTORS 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

- 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.
- 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.
- 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:
 - 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.
 - TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
 - RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

MUD MAT NOTES

- THE GRANULAR MATERIAL WILL REQUIRE PERIODIC REPLACEMENT AS IT BECOMES CONTAMINATED BY VEHICLE TRAFFIC.
- SEDIMENT SHALL BE CLEANED FROM PUBLIC ROADS AT THE END OF EACH DAY.
- SEDIMENT SHALL BE REMOVED FROM PUBLIC ROADS BY SHOVELING OR SWEEPING AND DISPOSED OR PROPERLY IN A CONTROLLED SEDIMENT DISPOSAL AREA.

SITE GRADING NOTES

- PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
- ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
- ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- 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 ON THIS DRAWING ARE TO BE PRICED IN SITE WORKS PORTION OF THE CONTRACT.
- 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.
- GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 300MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
- SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300MM LIFTS.
- ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
- CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
- 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.
- REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
- STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
- SIDEWALKS TO BE 150M & BEVELED AT 2:1 OR 8MM 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.
- 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

- ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT, PREPARED BY LRL ASSOCIATES, DATED NOVEMBER 2020.
- AL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK PILED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
- THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
- SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.
- ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).
- CONCRETE RAMP C&V TACTILE WALKING SURFACE INDICATORS COLOR AS PER OPSD 310.039. TACTILE WALKING SURFACE INDICATORS TO BE INSTALLED AT ALL RAMPS. MATERIAL TO BE POLYMER COMPOSITE, COMPACT GREY.

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

- LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
- CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWINGS 88. THE SEALS SHOULD BE AT LEAST 1.0M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FRONT 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.
- SERVICES TO BUILDING TO BE TERMINATED 1.0M FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
- 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.
- '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.
- SAFETY PLATFORMS SHALL BE PER OPSD 404.02.
- DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01, IF APPLICABLE.
- 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.
- CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPS5 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

- 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).
- 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.
- EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
- SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
- SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
- SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.
- 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING SSP-1.

STORM

- 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.
- 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.
- ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
- CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
- CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
- ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
- ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
- 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.
- 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.
- PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE APPLICABLE.
- RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.
- ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
- ALL STORM MANHOLES WITH PIPE LESS THAN 300MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

WATERMAIN

- ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
- ALL PVC WATERMANS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
- ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
- 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.
- ALL PVC WATERMANS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWC OR RWJ TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
- CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
- VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
- WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
- THRUST BLOCKING OF WATERMANS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
- THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
- WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25.2 AND W25, RESPECTIVELY.
- WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
- 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.
- ALL WATERMANS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
- GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
- 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.
- 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.
- ALL WATERMANS 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.
- WATER SERVICES ARE TO BE DISCHARGED AND PRE-TREATED 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.
- ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

DEWATERING NOTES

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

CLOSE-OUT REQUIREMENTS

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

USE AND INTERPRETATION OF DRAWINGS

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

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

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

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

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

UNAUTHORIZED CHANGES

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

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

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

GENERAL NOTES

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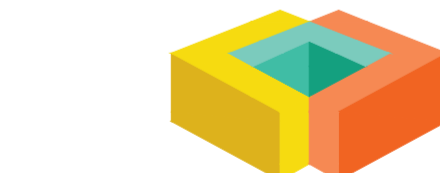
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04	ISSUED FOR APPROVAL	M.L.	07 APR 2026
03	ISSUED FOR APPROVAL	M.L.	11 FEB 2026
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

No.	REVISIONS	BY	DATE
-----	-----------	----	------



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

PROJECT

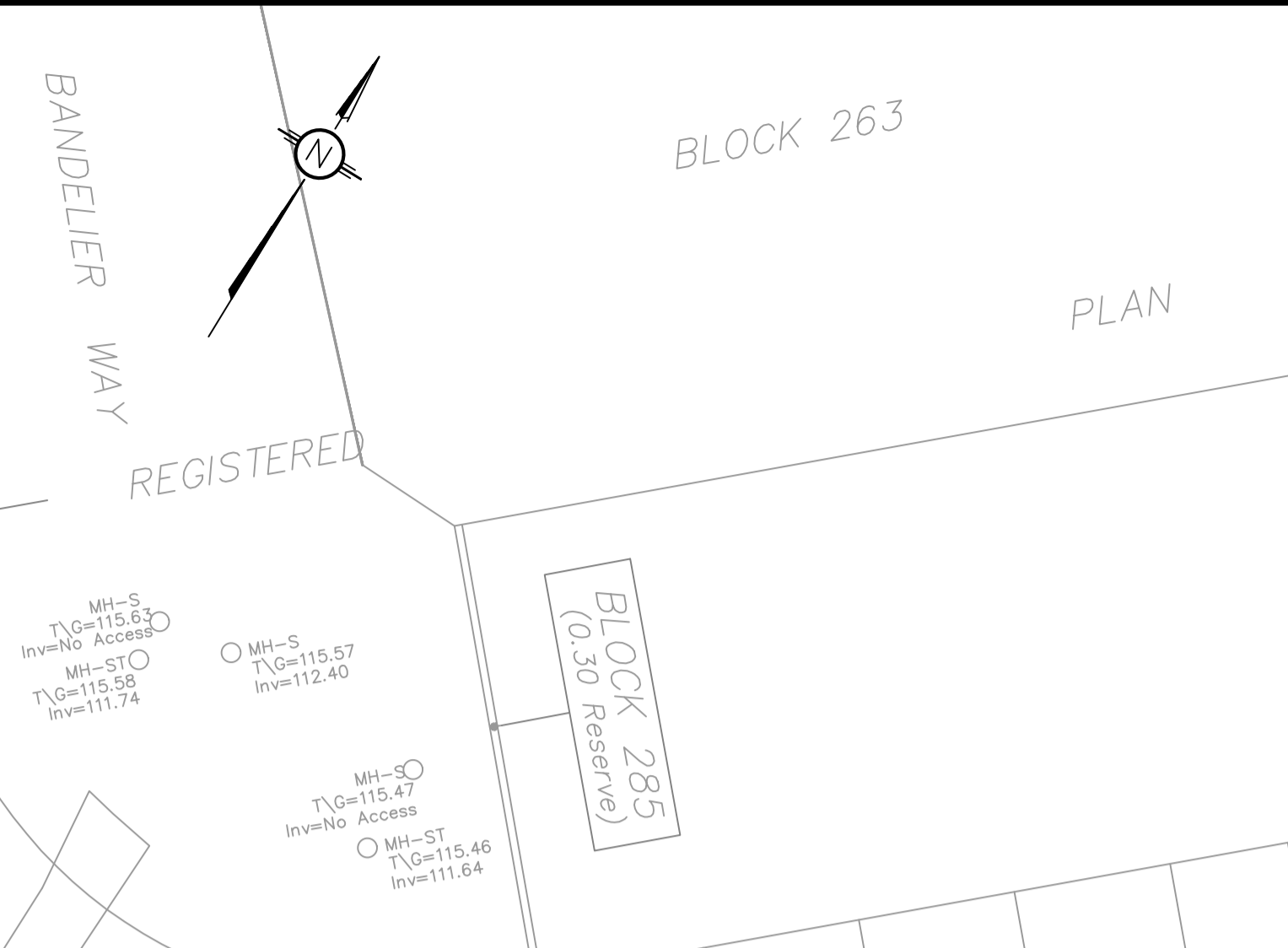
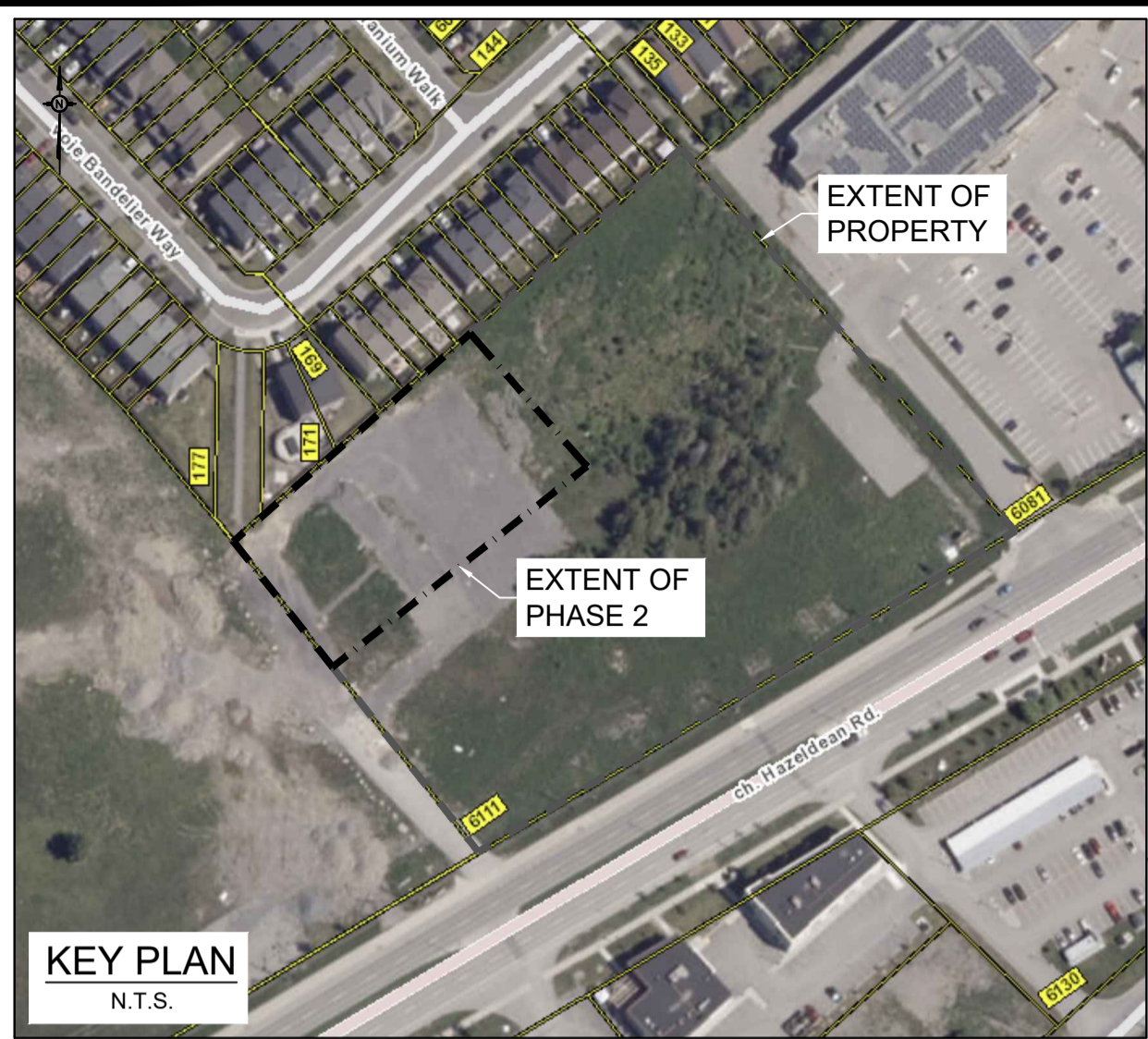
PROPOSED DEVELOPMENT - PHASE 2
6147 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE

GENERAL NOTES

PROJECT NO.

250030 C001



DETAILS OF DEVELOPMENT PHASE 2

DATA	REQUIRED	PROVIDED
ZONING	AMS (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 3.8/100sqm	57 + 1 HC	60 + 2 HC
RESTAURANT (FAST-FOOD) 10/100sqm	35	23
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)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED ELEVATION
- PROPOSED HIGH POINT ELEVATION
- PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- 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
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

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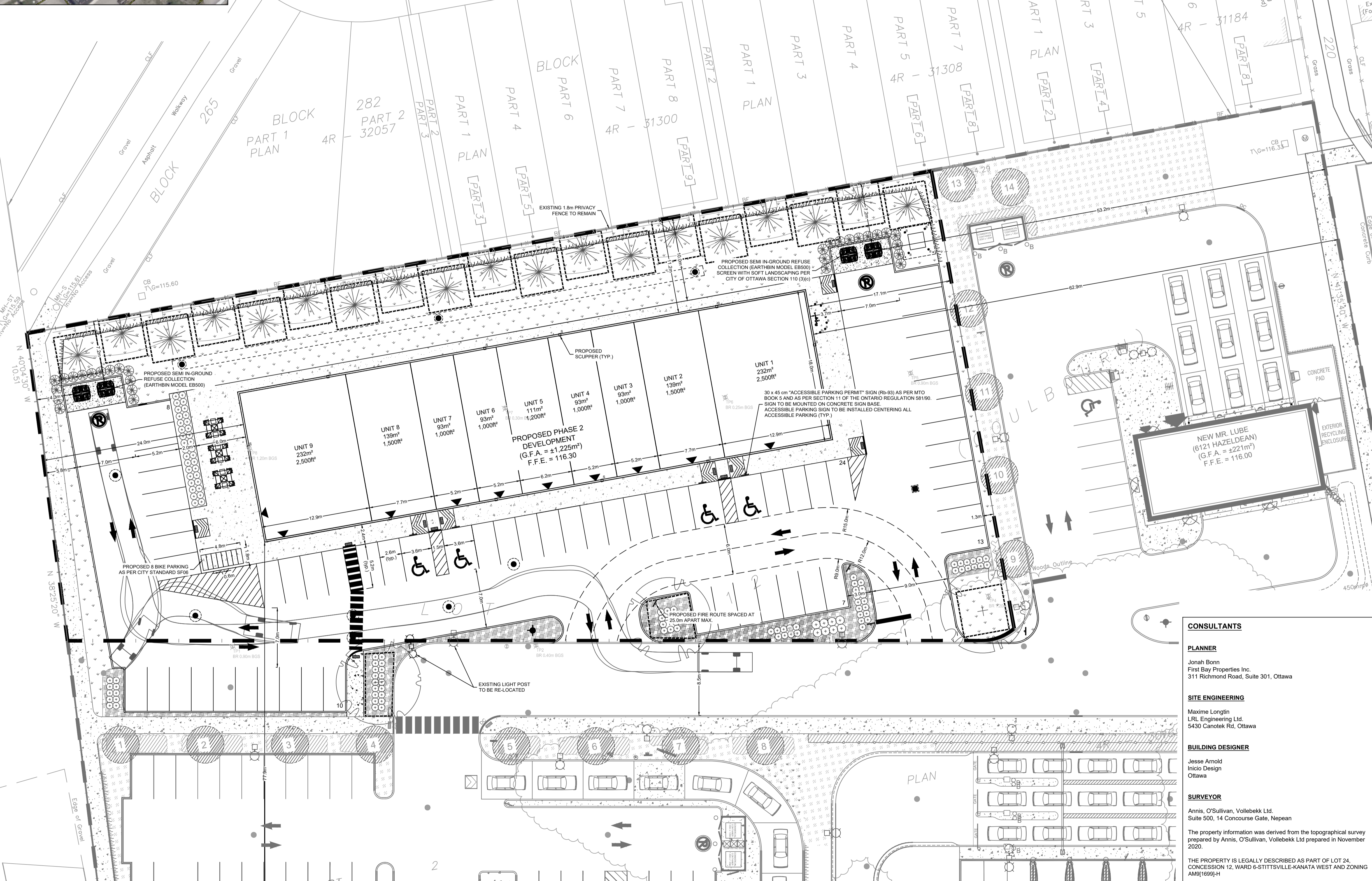
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Scale: 1:250

5m 0 5 10m



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01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

NEW MR. LUBE
(6121 HAZELDEAN)
(G.F.A. = 4221m²)
F.F.E. = 116.00

EXTERIOR RECYCLING ENCLOSURE

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT: GRANT CASTLE CORP.

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

PROJECT: PROPOSED DEVELOPMENT - PHASE 2
6147 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE: SITE DEVELOPMENT PLAN

PROJECT NO.: 250030 C201

CONSULTANTS

PLANNER
Jonah Born
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, Vollebek Ltd.
Suite 500, 14 Concourse Gate, Nepean

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

THE PROPERTY IS LEGALLY DESCRIBED AS PART OF LOT 24, CONCESSION 12, WARD 6-STITTSVILLE-KANATA WEST AND ZONING AMS(1699)-H

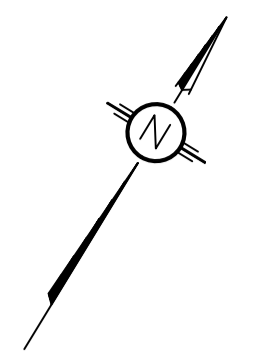
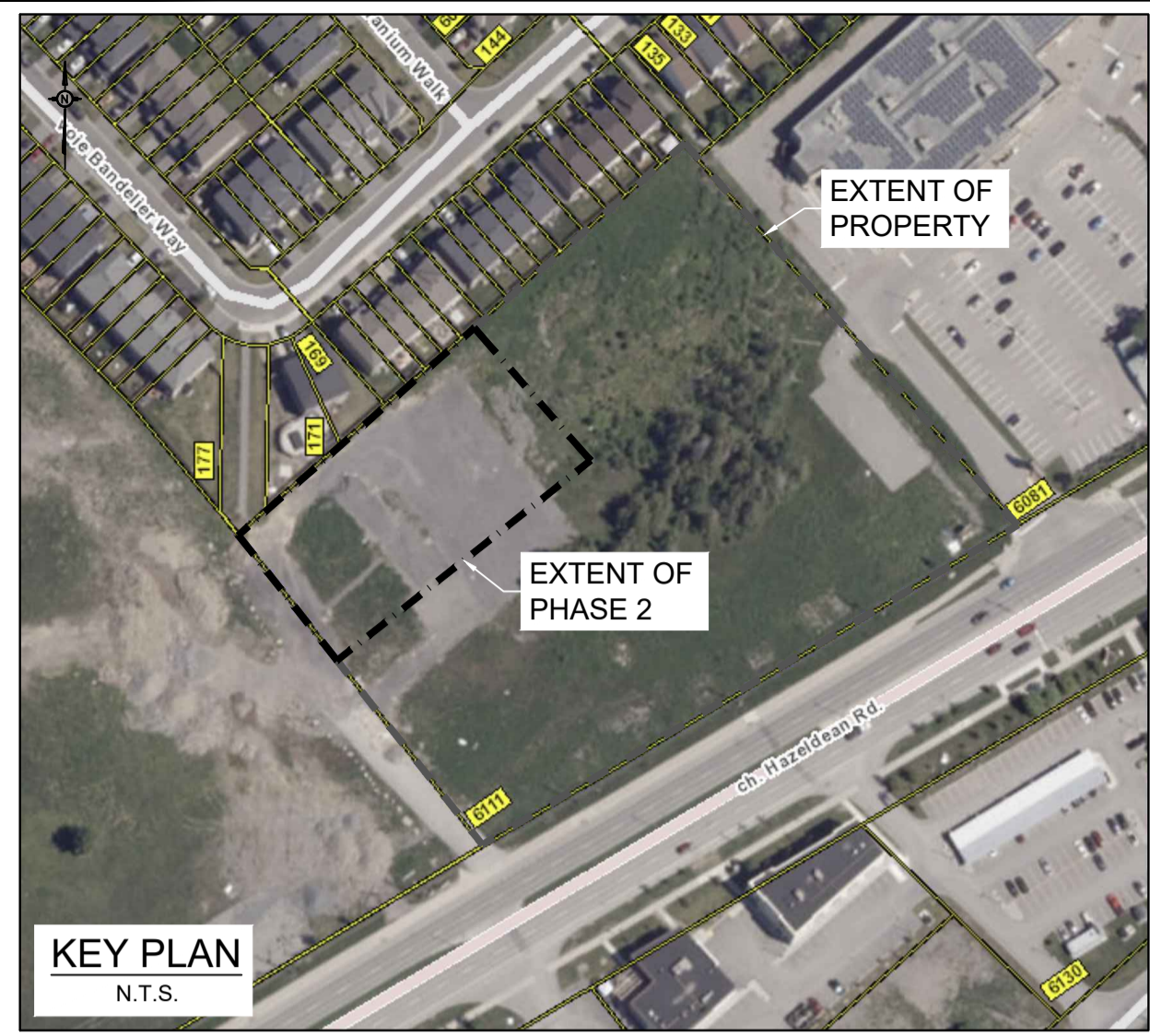
PLAN

2 3

4R - 23045

007-12-25-0123

19437



DETAILS OF DEVELOPMENT PHASE 2

DATA	REQUIRED	PROVIDED
ZONING	AMS (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 (3.8/100sqm)	57 + 1 HC	60 + 2 HC
RESTAURANT (FAST-FOOD) (10/100sqm)	35	
	23	
No. OF STOREYS		1
OTHER:		

LEGEND:

	EXISTING PROPERTY LINE TO REMAIN		PROPOSED OVERLAND MAJOR FLOW ROUTE
	PROPOSED CURB		PROPOSED STORM SEWER
	PROPOSED DEPRESSED CURB		PROPOSED SANITARY SEWER
	PROPOSED TERRACING (3:1 MIN.)		PROPOSED WATERMAIN
	PROPOSED SILT FENCE AS PER OPSD 219.110		EXISTING STORM SEWER
	PROPOSED DOOR ENTRANCE/EXIT		EXISTING SANITARY SEWER
	PROPOSED GRASS AREA (100mm TOP SOIL & SOD)		EXISTING WATERMAIN
	PROPOSED CONCRETE FEATURES/SLAB		EXISTING GAS LINE
	PROPOSED HEAVY DUTY ASPHALT		EXISTING MANHOLE
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	PROPOSED TOP OF CURB ELEVATION		PROPOSED 100 YEAR HIGH WATER LEVEL
	MATCH INTO EXISTING ELEVATION		STORM WATERSHED EXTENT
	EXISTING ELEVATION		WATERSHED NAME
	50.00HP		RUNOFF COEFFICIENT
	50.00BC		AREA IN HECTARES
	50.00TC		
	50.00EX		
	50.19		

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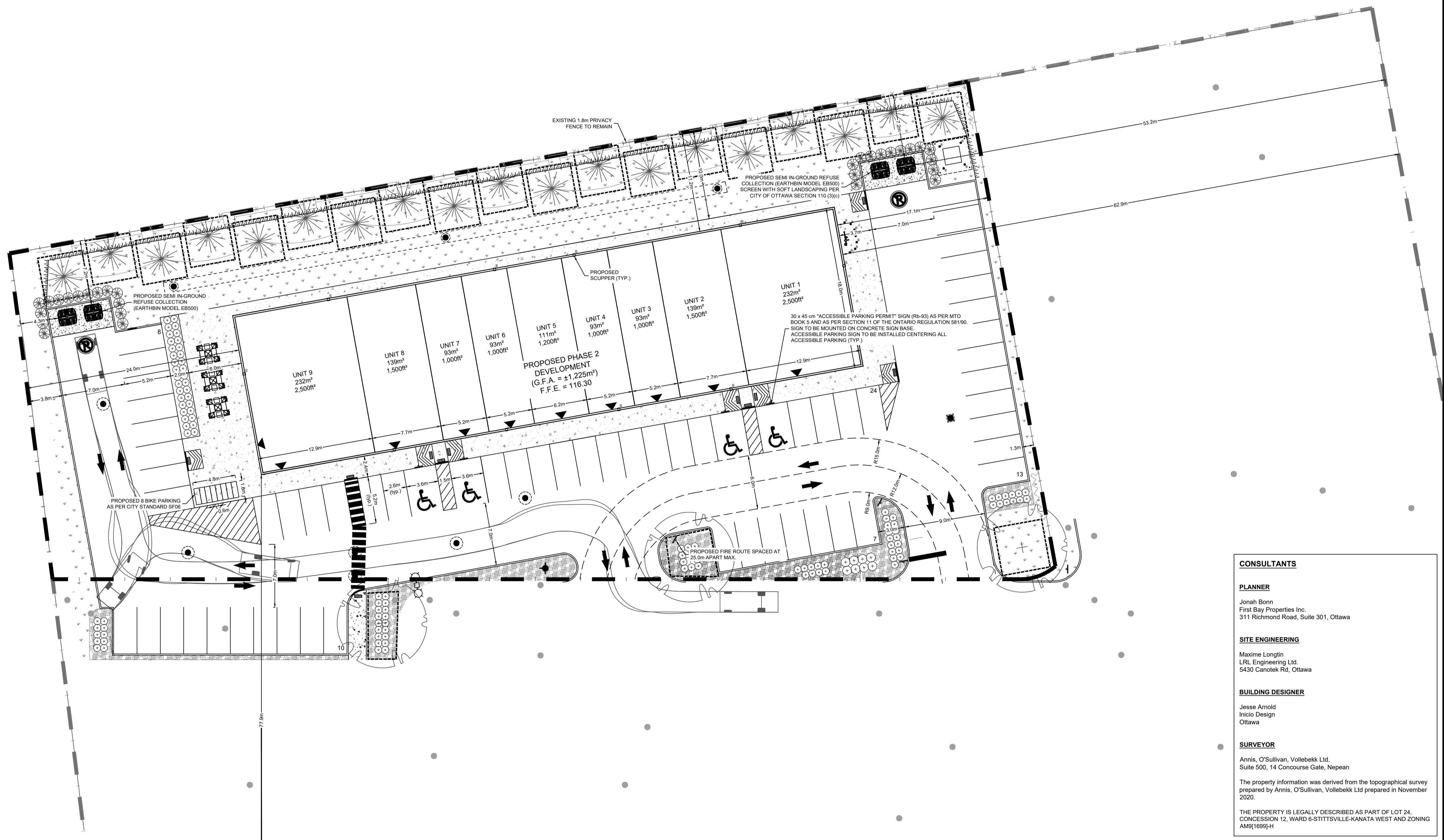
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04 ISSUED FOR APPROVAL M.L. 07 APR 2026
 03 ISSUED FOR APPROVAL M.L. 11 FEB 2026
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No. REVISIONS BY DATE

SCALE: 1:250

5m 0 5 10m

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CONSULTANTS

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

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

BUILDING DESIGNER
 Jesse Arnold
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 Ottawa

SURVEYOR
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LRL
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CLIENT: GRANT CASTLE CORP.

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

PROJECT: PROPOSED DEVELOPMENT - PHASE 2
 6147 HAZELDEAN RD
 STITTSVILLE, ON

DRAWING TITLE: SITE DEVELOPMENT PLAN (NO UNDERLAY)

PROJECT NO. 250030 C202



DETAILS OF DEVELOPMENT PHASE 2

DATA	REQUIRED	PROVIDED
ZONING	AMS (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:		
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RESTAURANT (FAST+FOOD) (10/100sqm)	35	23
No. OF STOREYS		1
OTHER:		

LEGEND:

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Scale: 1:400

No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	M.L.	07 APR 2026
03	ISSUED FOR APPROVAL	M.L.	11 FEB 2026
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

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
Inico Design
Ottawa

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

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

THE PROPERTY IS LEGALLY DESCRIBED AS PART OF LOT 24, CONCESSION 12, WARD 6-STITTSVILLE-KANATA WEST AND ZONING AMS(1699)-H

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

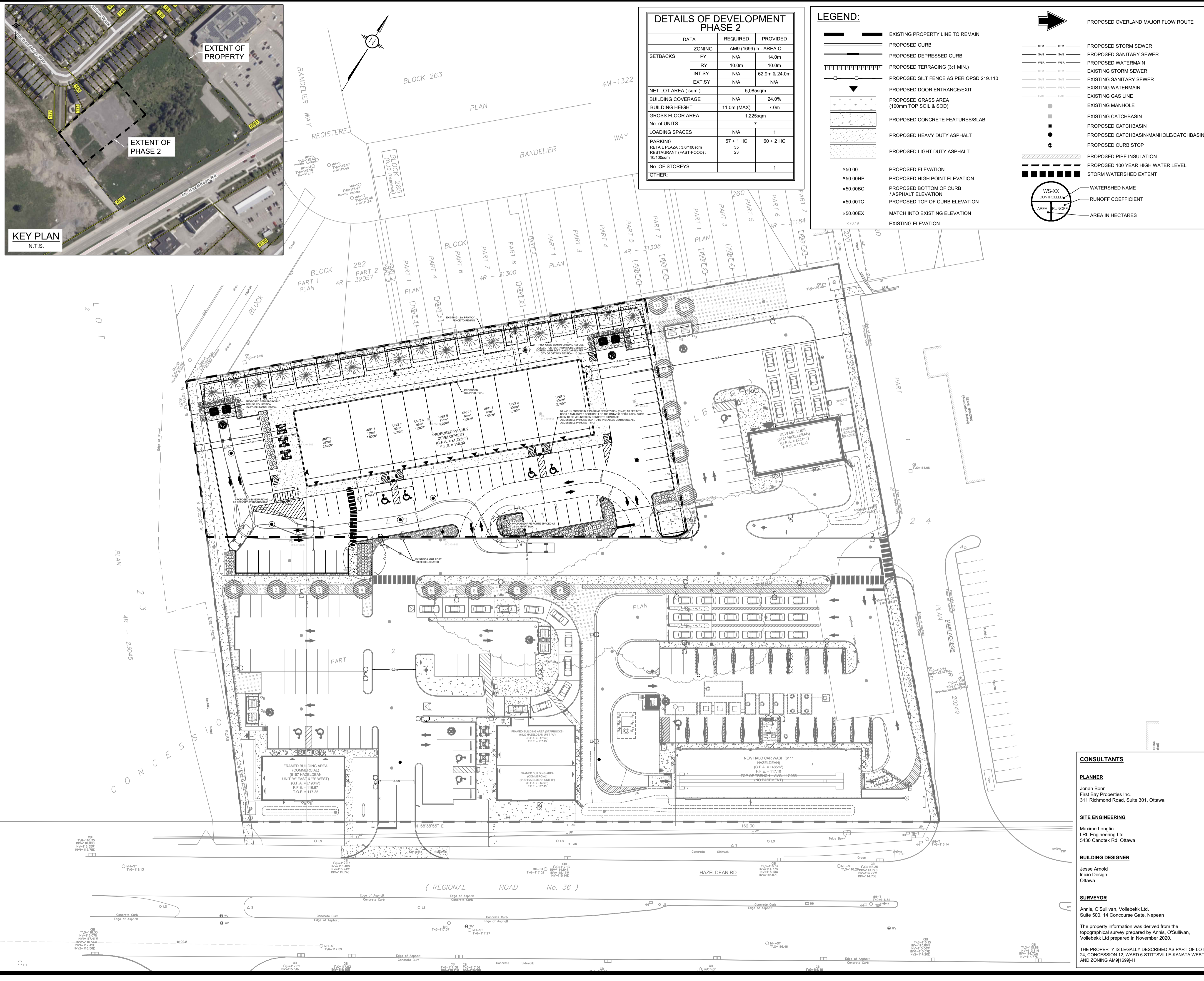
CLIENT: GRANT CASTLE CORP.

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

PROJECT: PROPOSED DEVELOPMENT - PHASE 2
6147 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE: SITE DEVELOPMENT PLAN (OVERALL VIEW)

PROJECT NO.: 250030 C203



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

NOTE:
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PAVEMENT STRUCTURE AS PER GEOTECHNICAL REPORT PREPARED BY LRL, DATED MAY 2021.

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/EXIST
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED ELEVATION
- PROPOSED HIGH POINT ELEVATION
- PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- 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
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

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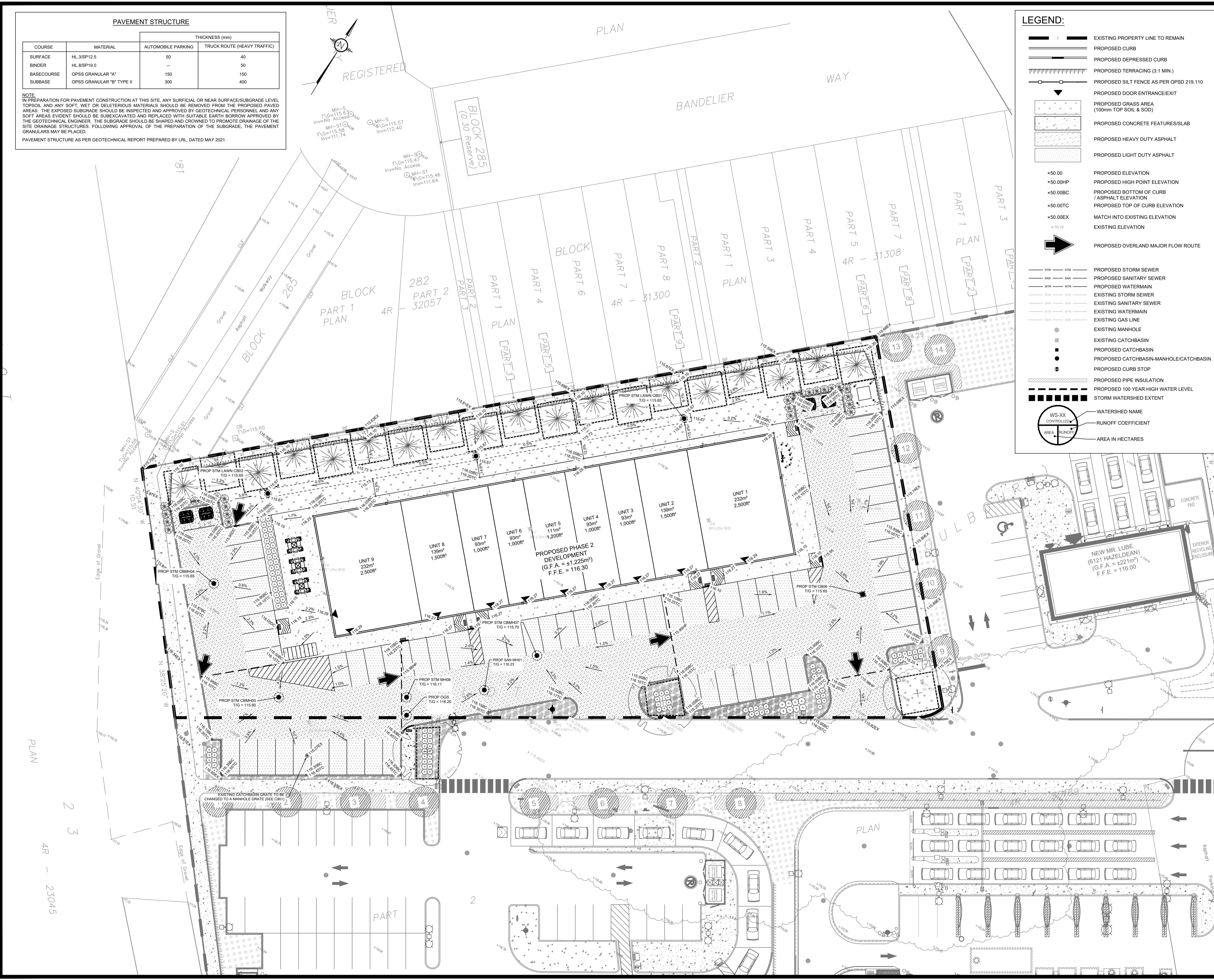
CLIENT: GRANT CASTLE CORP.

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

PROJECT: PROPOSED DEVELOPMENT - PHASE 2
6147 HAZELDEAN RD
STITTSVILLE, ON

DRAWING TITLE: GRADING AND DRAINAGE PLAN

PROJECT NO.: 250030 C301



PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm)	
		AUTOMOBILE PARKING	TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL3SP12.5	40	40
BINDER	HL&SP19.0	50	50
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	300	400

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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)

LEGEND:

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- ||||| 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
- ×50.00P 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 WATERSHED NAME
- AREA RUNOFF RUNOFF COEFFICIENT
- AREA RUNOFF AREA IN HECTARES

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No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	M.L.	07 APR 2026
03	ISSUED FOR APPROVAL	M.L.	11 FEB 2026
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

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

EXTERIOR RECYCLING ENCLOSURE

WOODS OUTLINGS

CONCRETE PAD

SCALE: 1:250

5m 0 5 10m

NOT AUTHENTIC UNLESS SIGNED AND DATED

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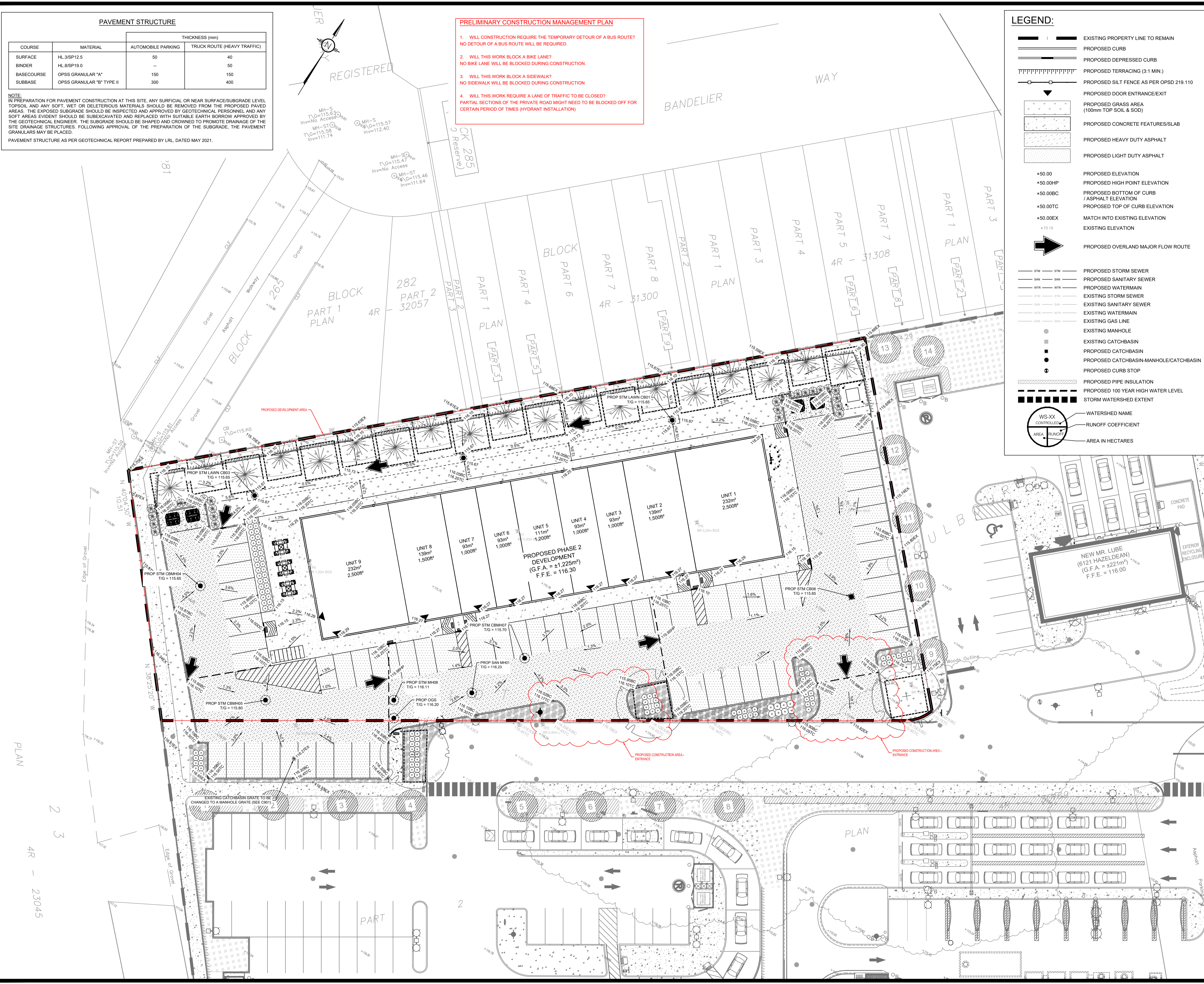
CLIENT: GRANT CASTLE CORP.

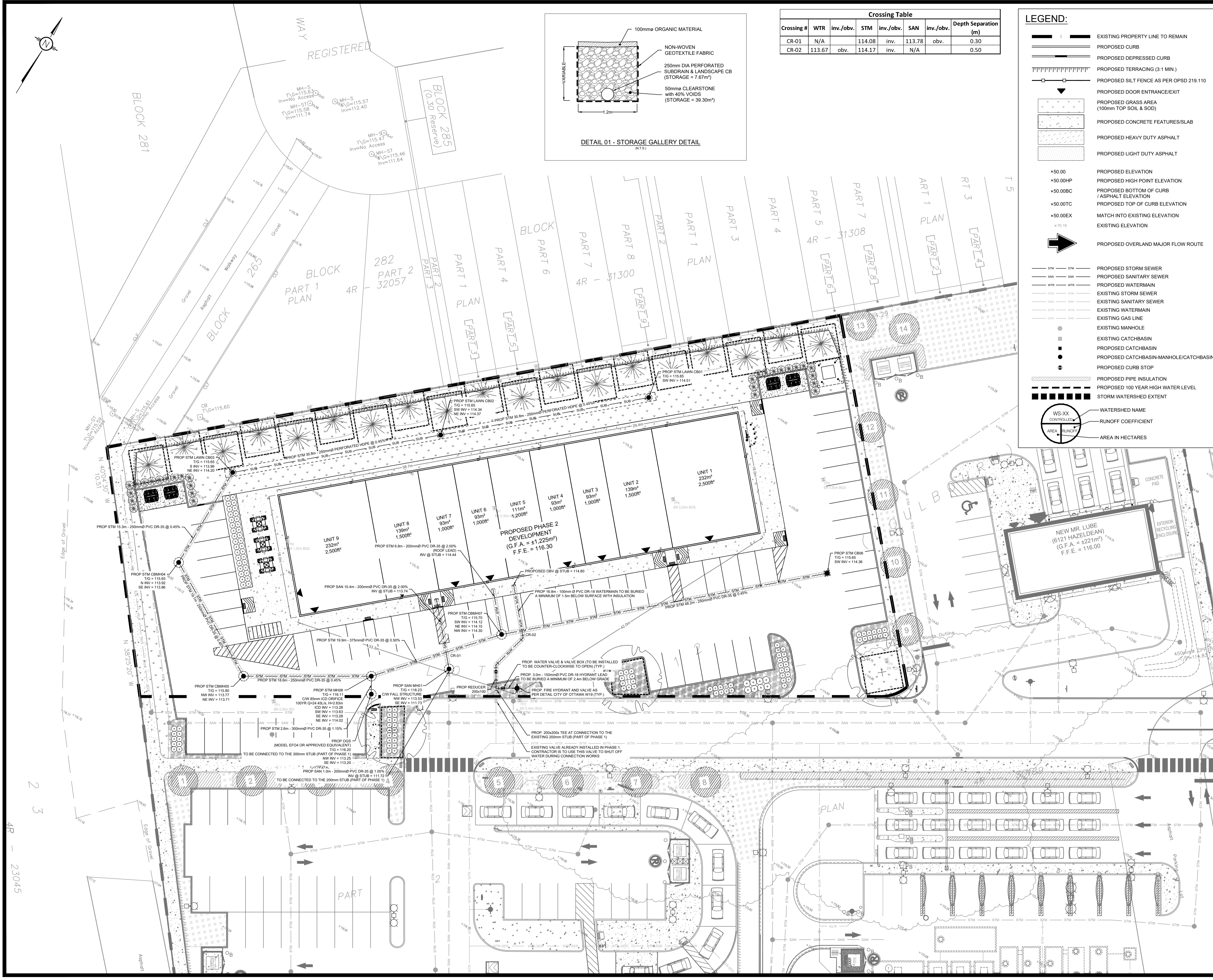
DESIGNED BY: S.V./M.L. DRAWN BY: S.V./M.L. APPROVED BY: M.B.

PROJECT: PROPOSED DEVELOPMENT - PHASE 2
6147 HAZELDEAN RD
STITTSVILLE, ON

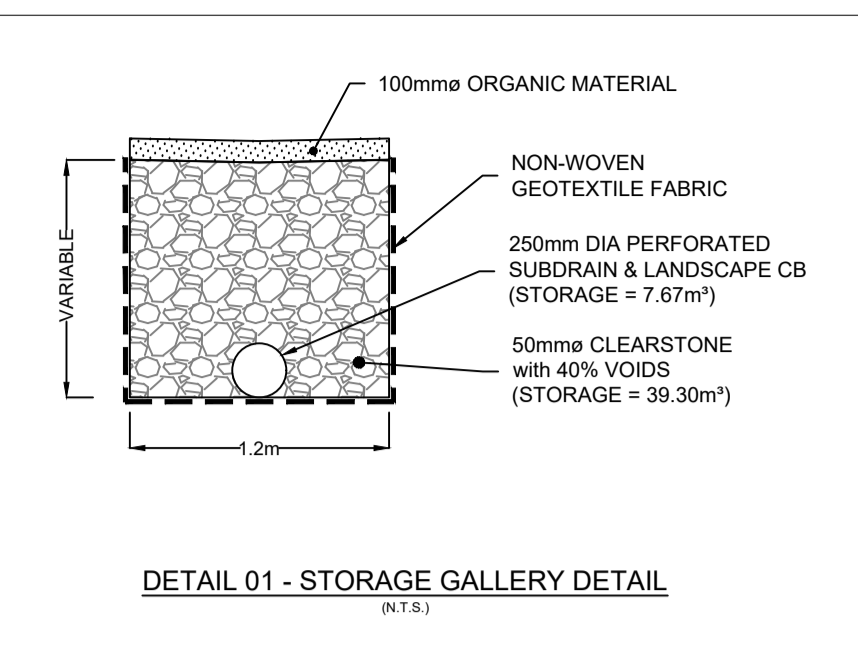
DRAWING TITLE: PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

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



LEGEND:

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- PROPOSED TOP OF CURB ELEVATION
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
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- PROPOSED WATERMAIN
- EXISTING STORM SEWER
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CLIENT
 GRANT CASTLE CORP.

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

PROJECT
 PROPOSED DEVELOPMENT - PHASE 2
 6147 HAZELDEAN RD
 STITTSVILLE, ON

DRAWING TITLE
 SERVICING PLAN

PROJECT NO.
 250030 **C401**

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

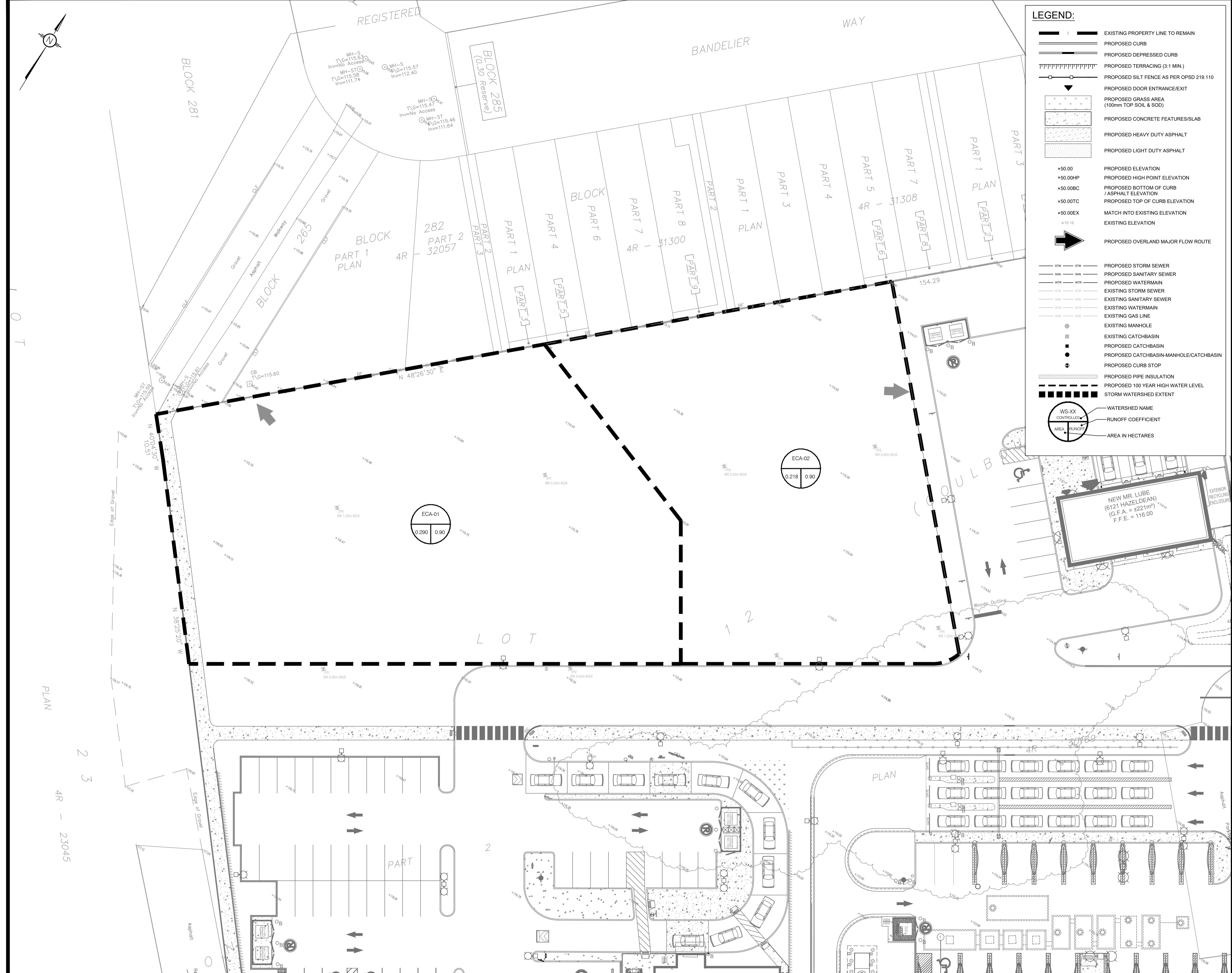
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LEGEND:

- 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/EXIST
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED ELEVATION
- PROPOSED HIGH POINT ELEVATION
- PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- 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
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

USE AND INTERPRETATION OF DRAWINGS

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

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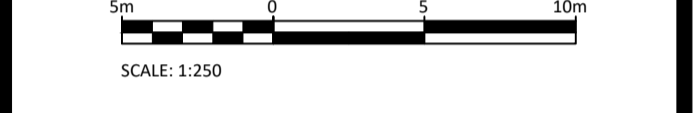
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No.	REVISIONS	BY	DATE
04	ISSUED FOR APPROVAL	M.L.	07 APR 2026
03	ISSUED FOR APPROVAL	M.L.	11 FEB 2026
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025



NOT AUTHENTIC UNLESS SIGNED AND DATED

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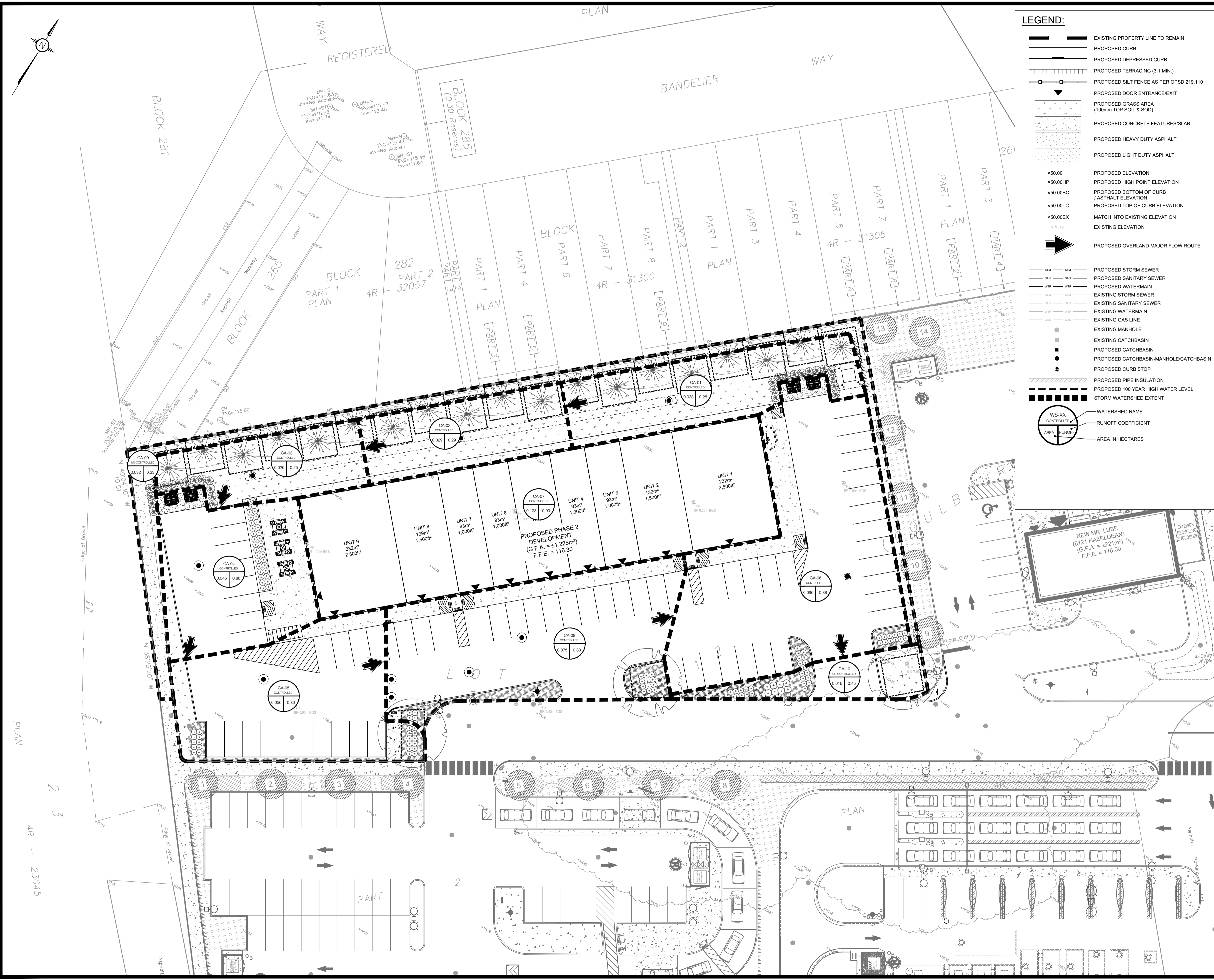
CLIENT: GRANT CASTLE CORP.

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

PROJECT: PROPOSED DEVELOPMENT - PHASE 2
6147 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
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03	ISSUED FOR APPROVAL	M.L.	11 FEB 2026
02	ISSUED FOR APPROVAL	M.L.	14 NOV 2025
01	ISSUED FOR APPROVAL	M.L.	08 SEP 2025

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

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

PROPOSED UNIT 1 232m² 2,500m²

PROPOSED UNIT 2 139m² 1,500m²

PROPOSED UNIT 3 93m² 1,000m²

PROPOSED UNIT 4 93m² 1,000m²

PROPOSED UNIT 5 93m² 1,000m²

PROPOSED UNIT 6 93m² 1,000m²

PROPOSED UNIT 7 93m² 1,000m²

PROPOSED UNIT 8 139m² 1,500m²

PROPOSED UNIT 9 232m² 2,500m²

NOT AUTHENTIC UNLESS SIGNED AND DATED

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CLIENT: GRANT CASTLE CORP.

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

PROJECT: PROPOSED DEVELOPMENT - PHASE 2
6147 HAZELDEAN RD
STITTSVILLE, ON

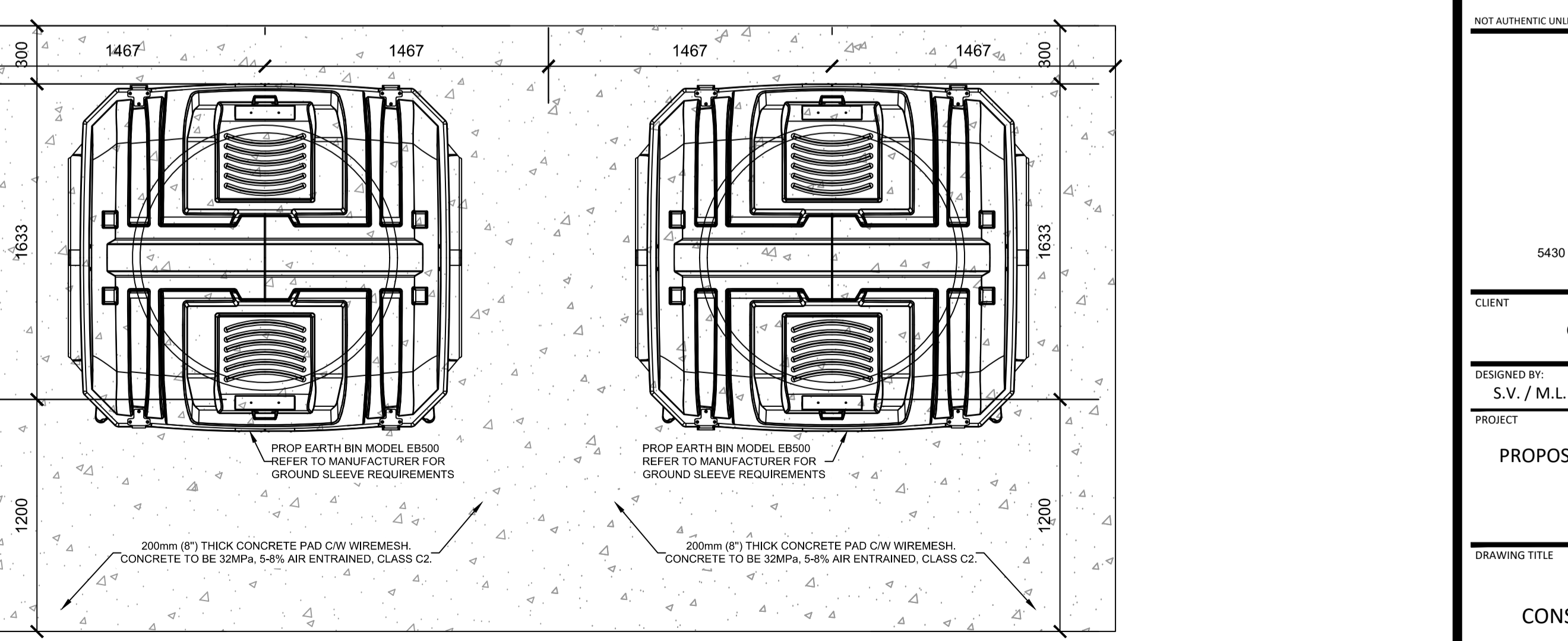
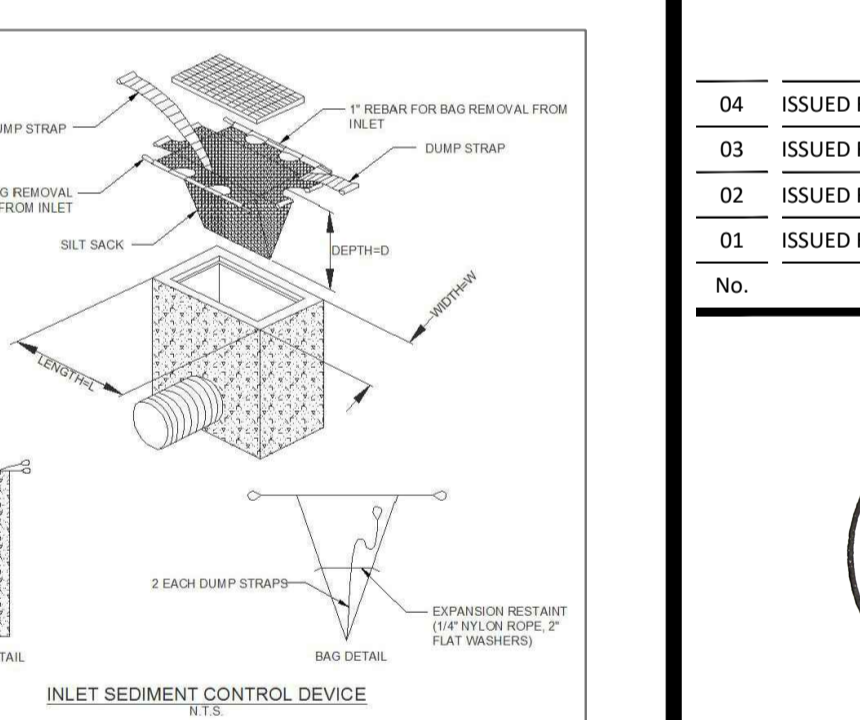
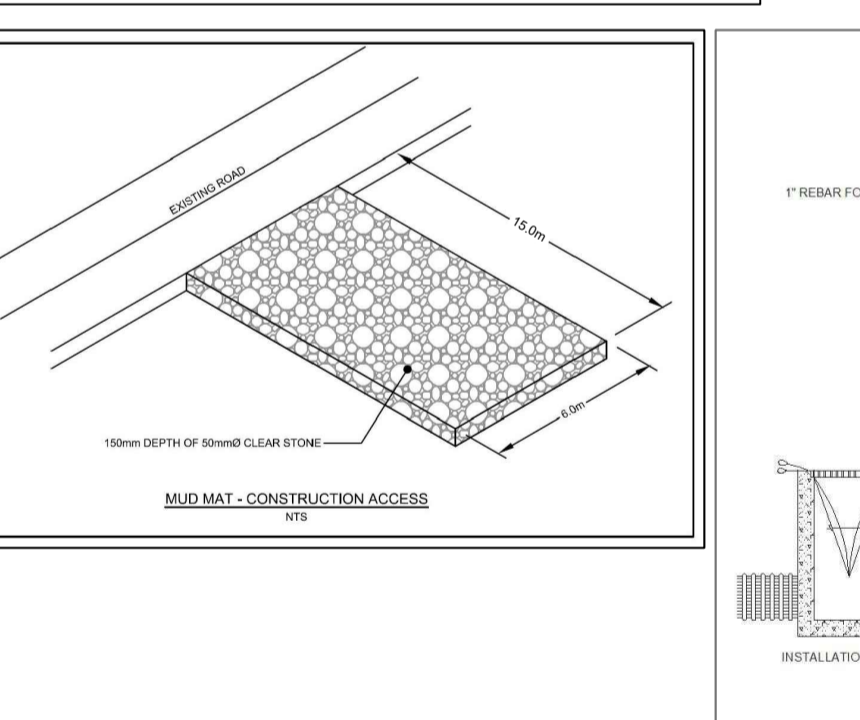
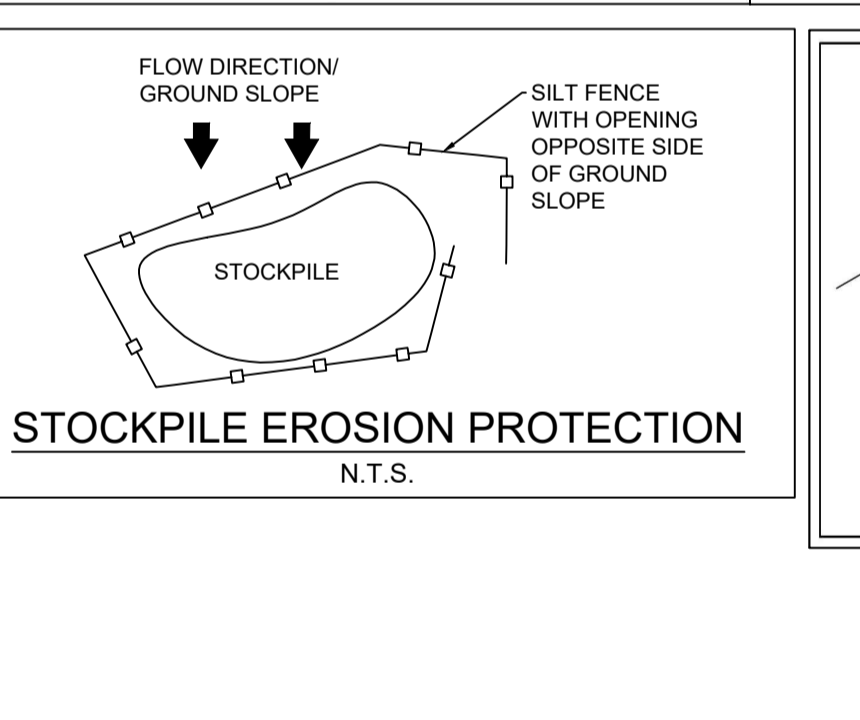
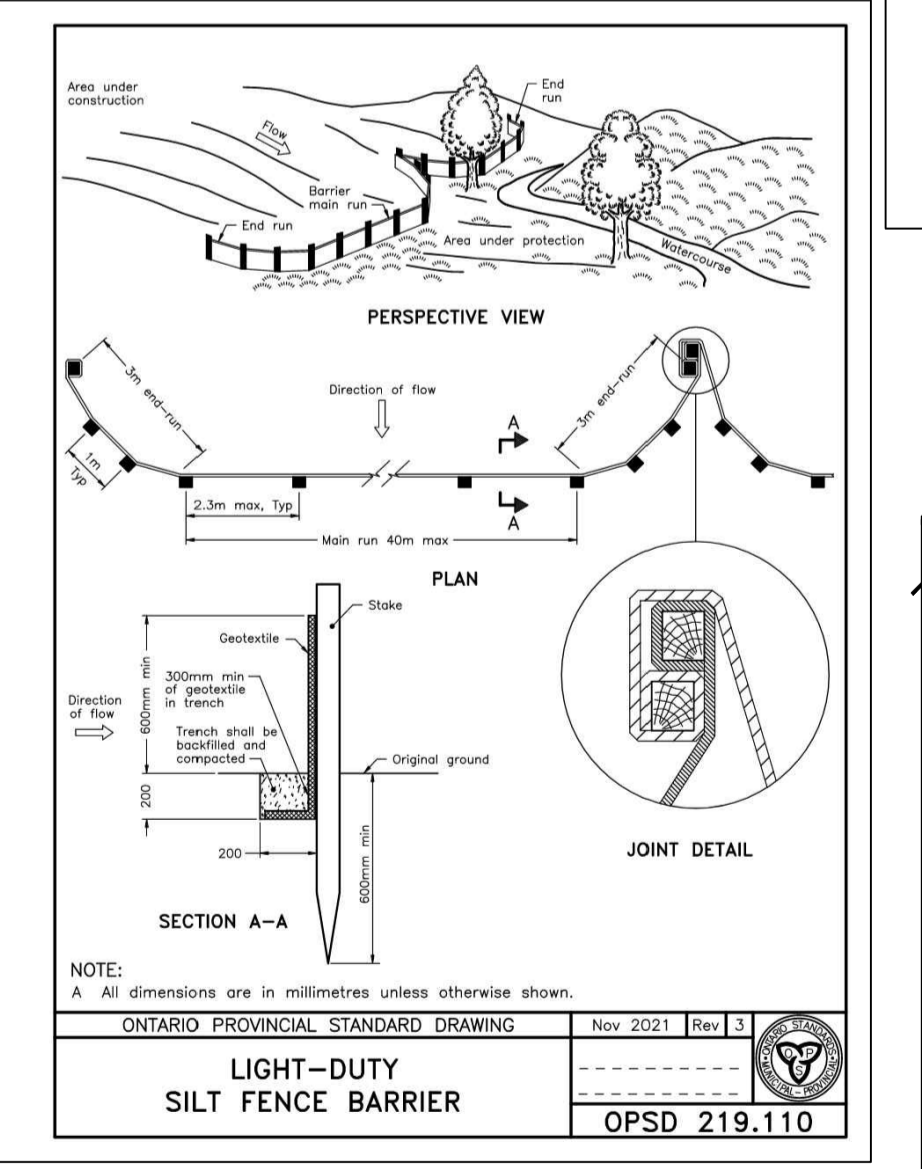
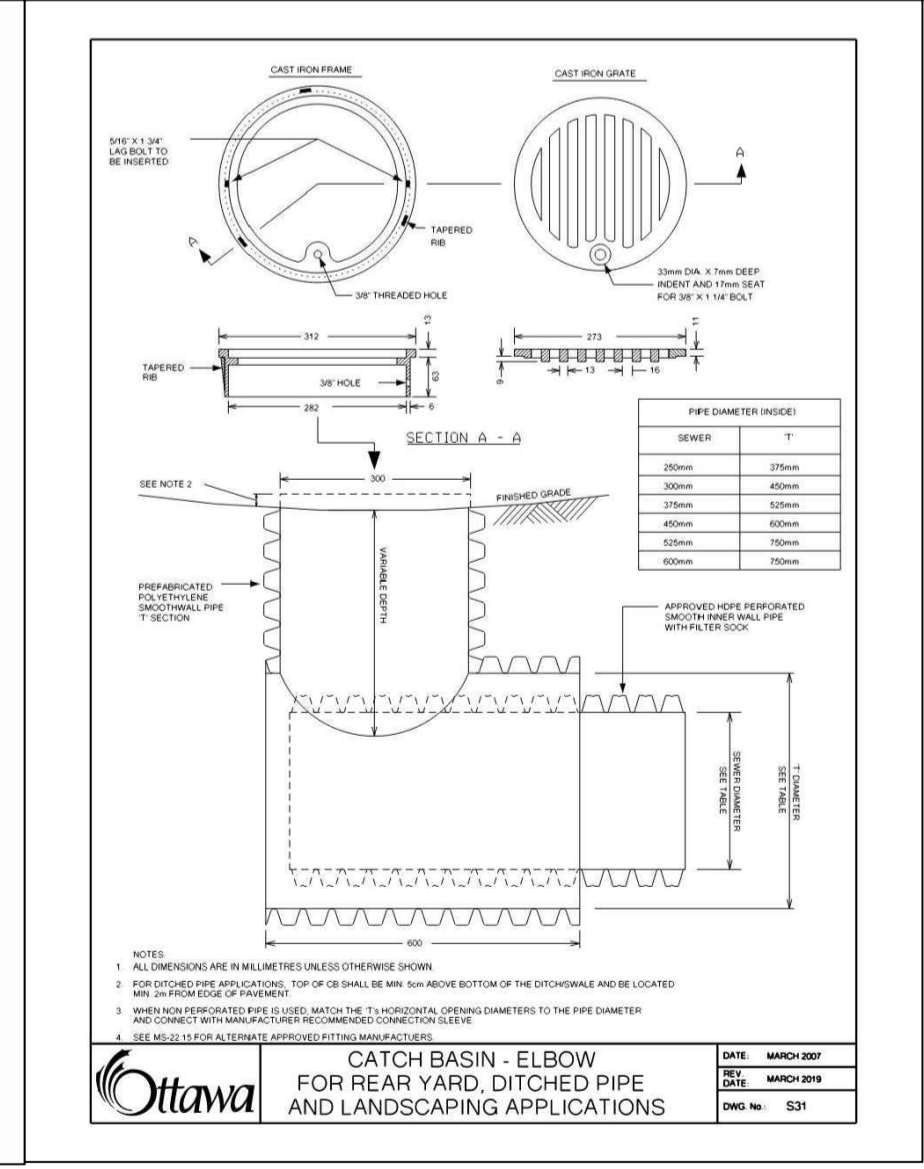
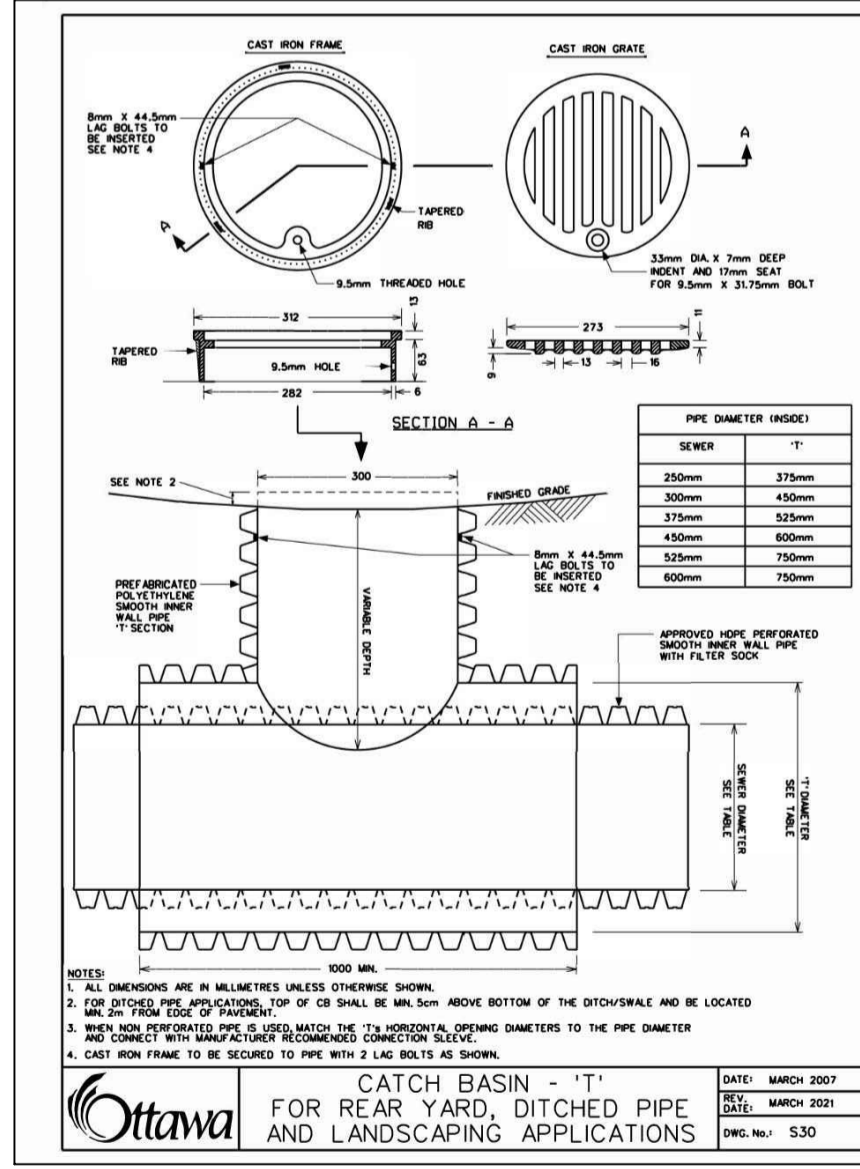
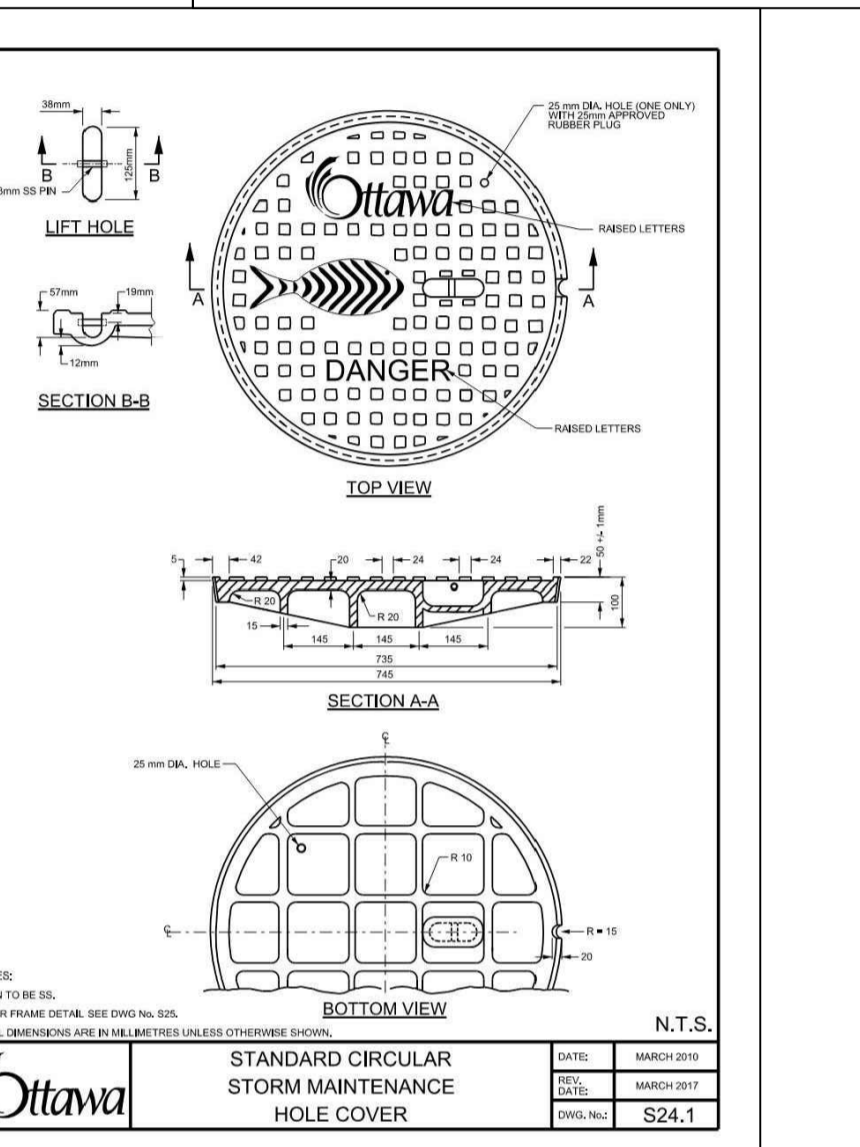
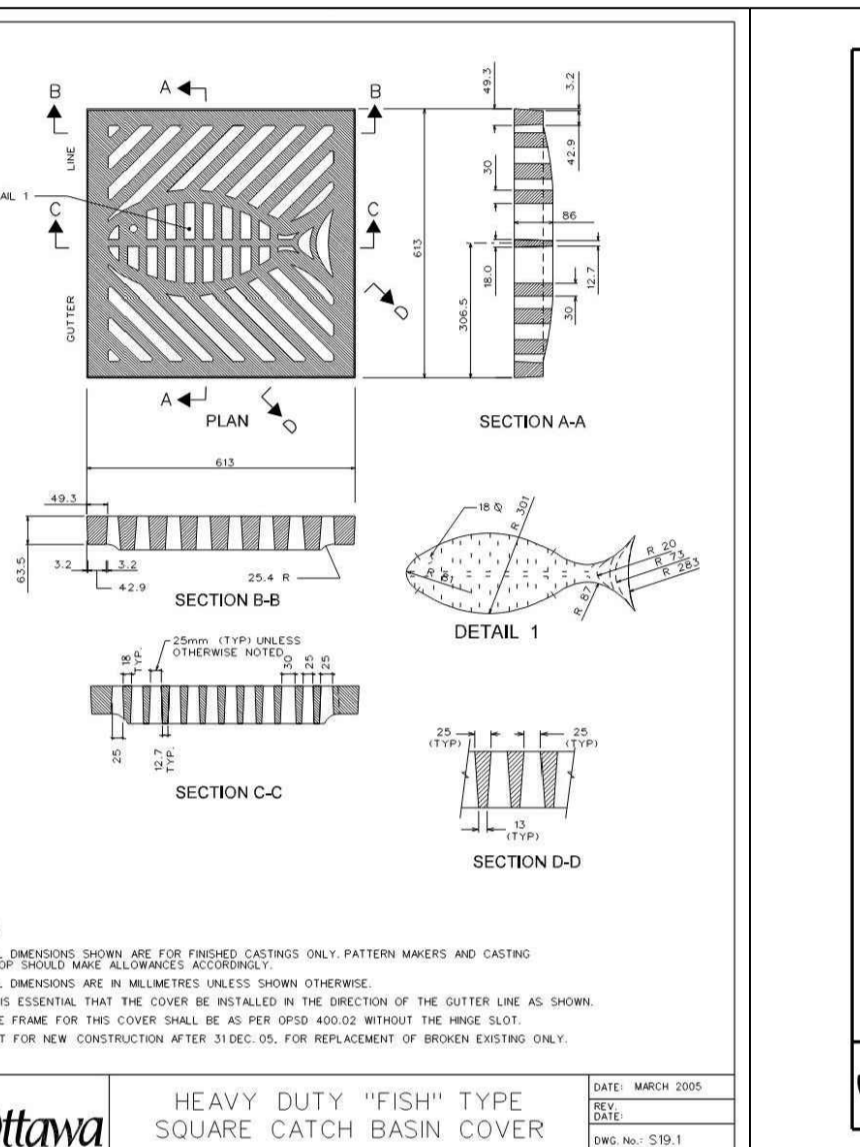
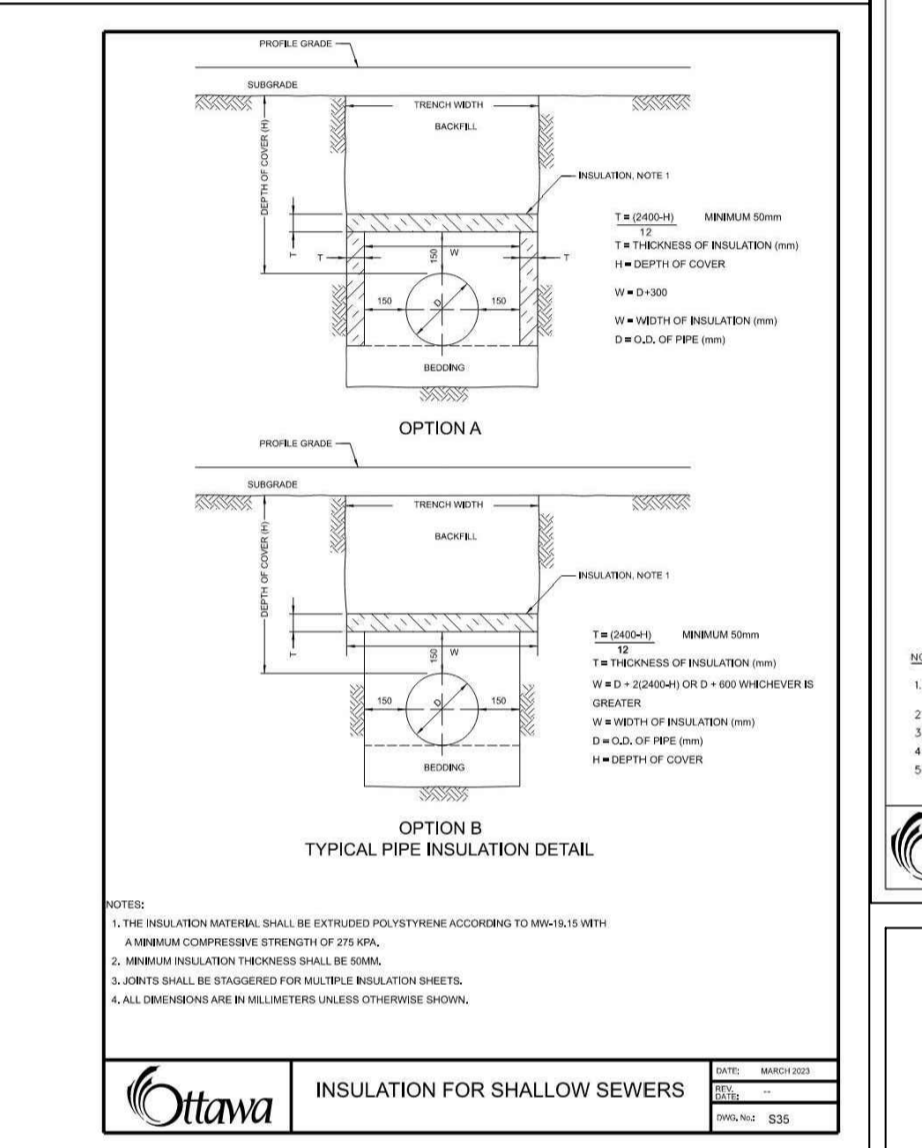
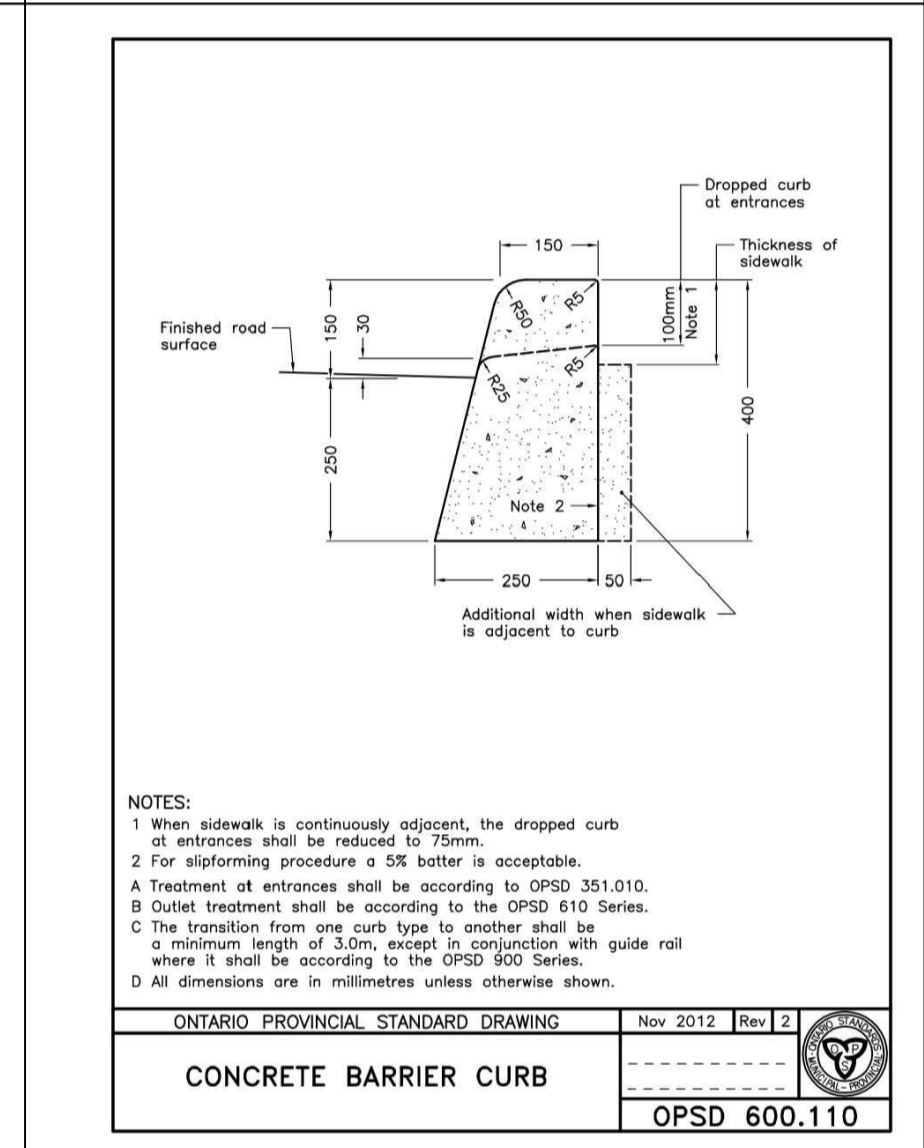
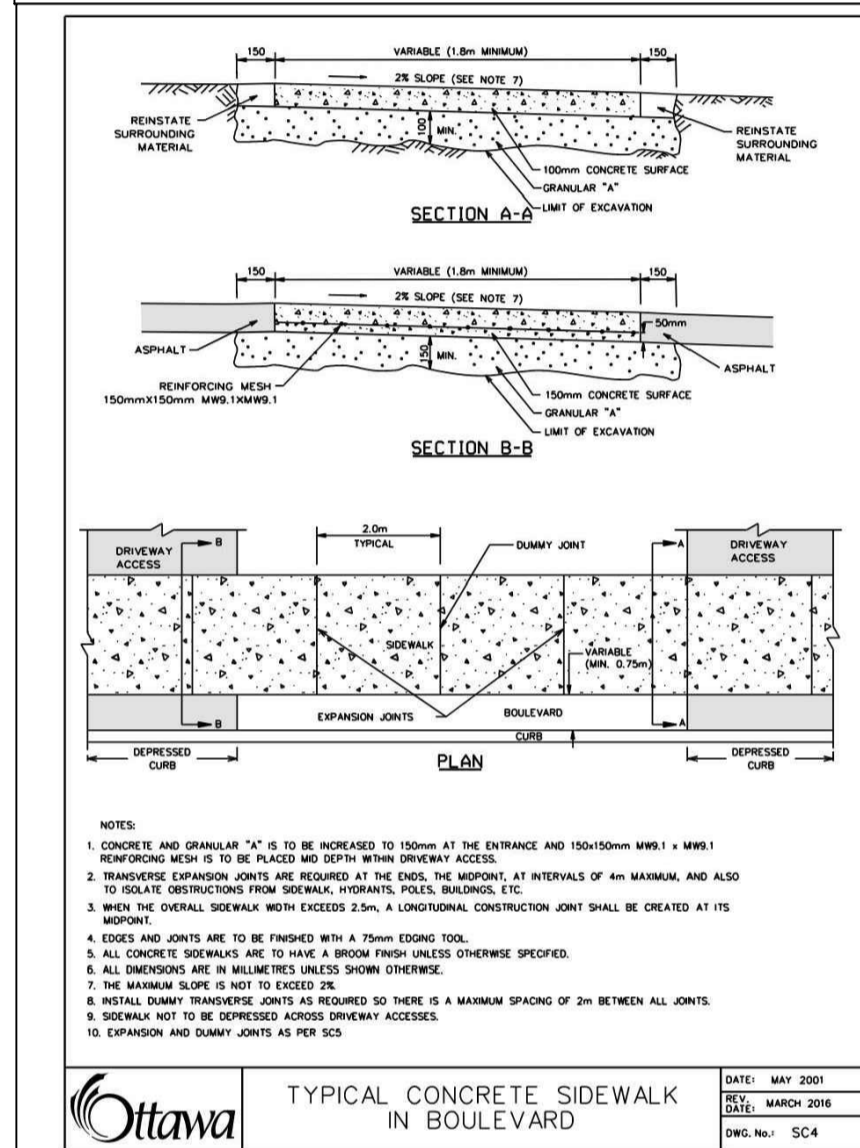
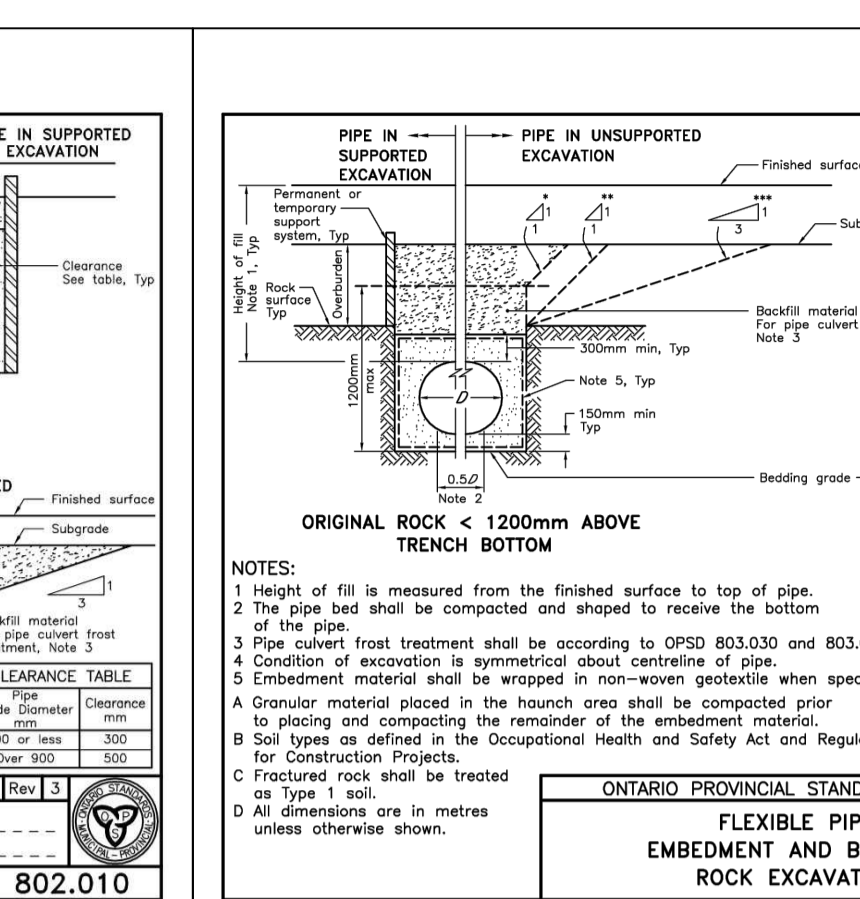
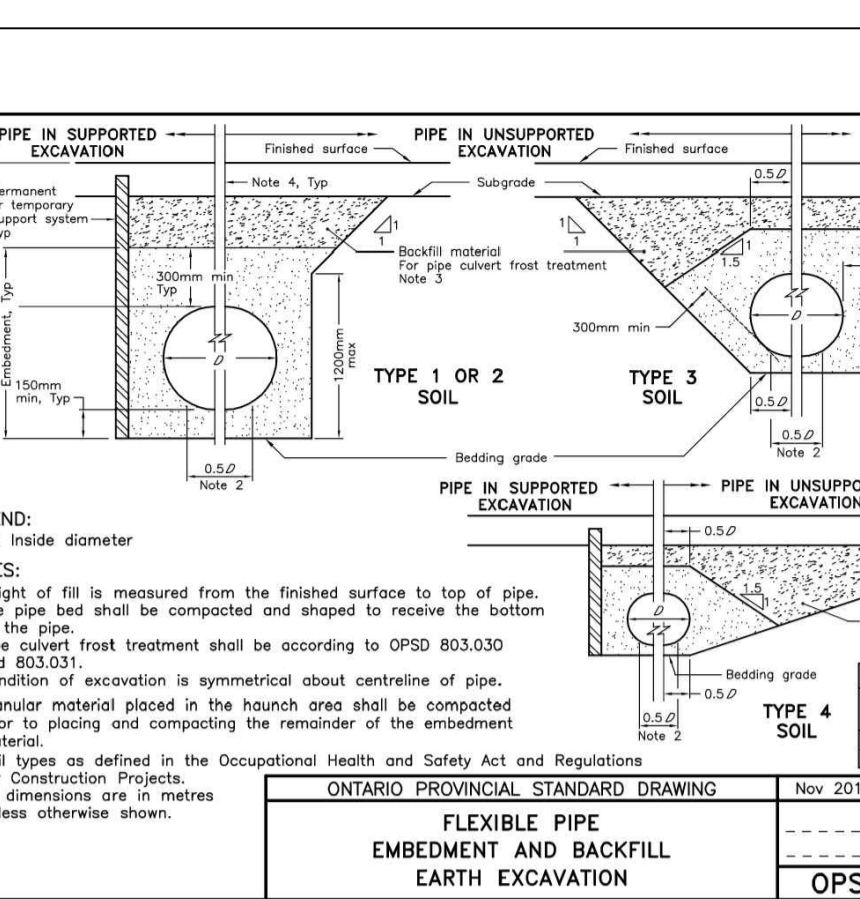
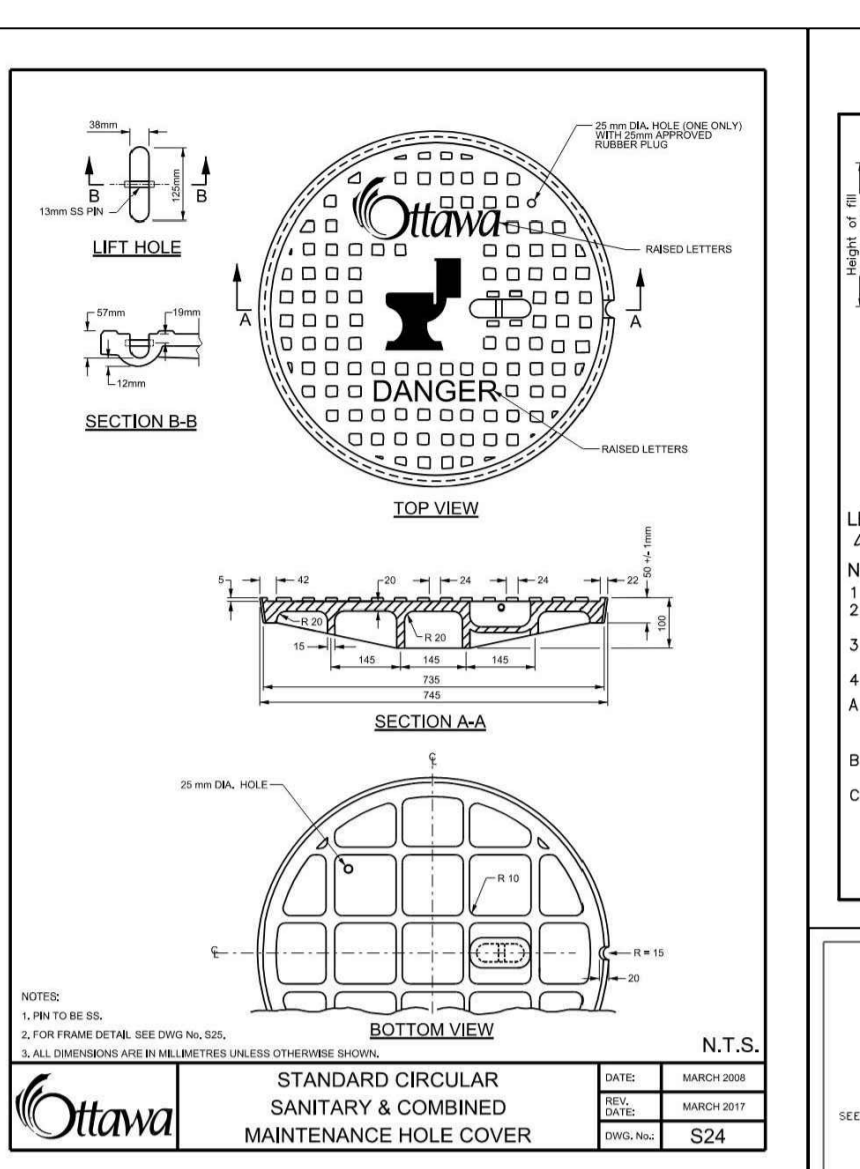
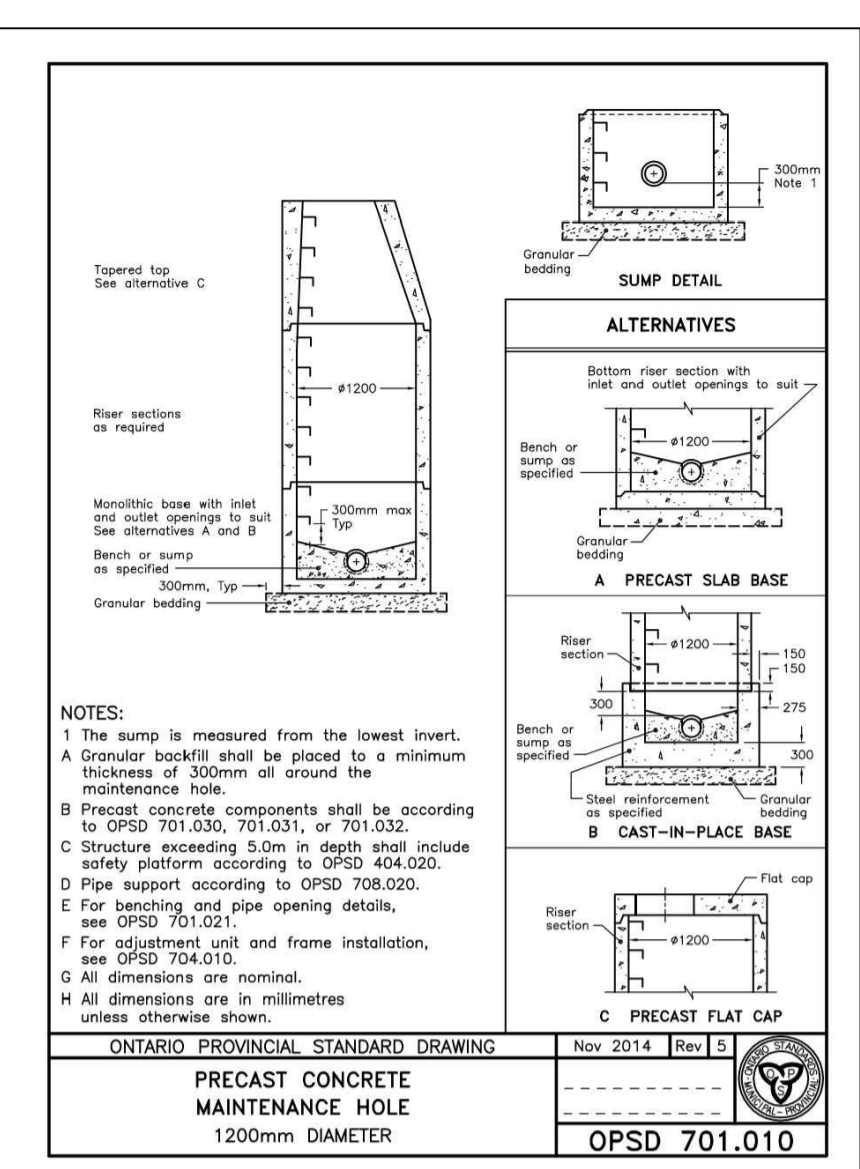
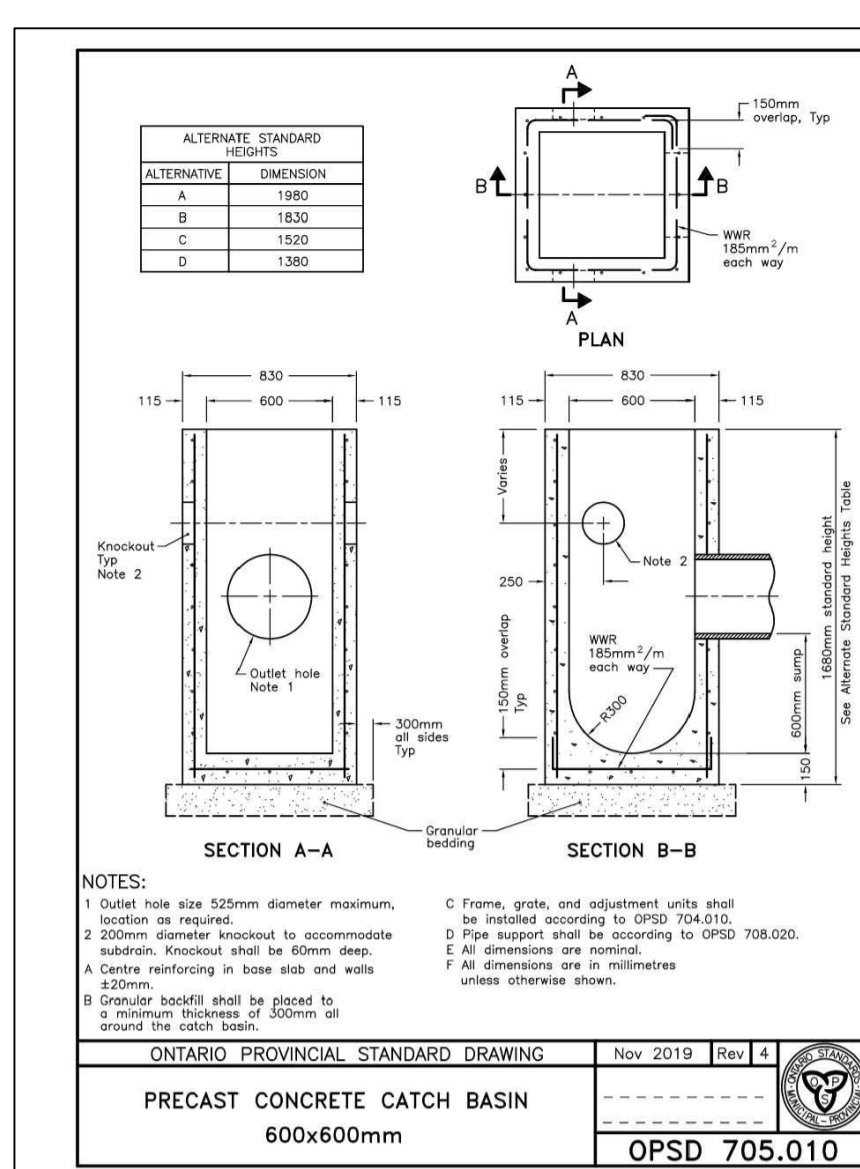
DRAWING TITLE: POST-DEVELOPMENT WATERSHED PLAN

PROJECT NO.: 250030 **C702**

PLAN

4R - 23045

2 3



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

CLIENT: **GRANT CASTLE CORP.**

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

PROJECT: **PROPOSED DEVELOPMENT - PHASE 2 6147 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, Vollebakk Ltd.
Field Work Completed November 10, 2020.

Scale 1 : 300



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, Vollebakk 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-U	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
□ TP	Traffic Signal Post
△ S	Sign
BF	Board Fence
CLF	Chain Link Fence
INV	Invert
EOA	Edge of Asphalt
SRW	Stone Retaining Wall
○	Diameter
○ UP	Utility Pole
○ AN	Anchor
□ HS	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

- Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
- It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that its relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

- 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.
- Only visible surface utilities were located.
- A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

