



## **Stormwater Management Report and Servicing Brief**

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

Prepared for:

Halo Car Wash Inc.  
18 Adelaide Street  
Maxville, ON  
K0C 1T0

Attention: Mr. Brad Moore

LRL File No.: 200100  
Site Plan Control No.:

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## 1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Halo Car Wash Inc. to complete a Stormwater Management Analysis and Servicing Brief for the construction of multi-use commercial development located at 6111 Hazeldean Road, Stittsville (Ottawa), Ontario. 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 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). The site will be accessible from (i) a 9.5 m wide RI/RO entrance located off of Hazeldean Rd, (ii) a new 9.3m wide signalized entrance located off of the proposed access road to be constructed along the east of the site, extending north from Hazeldean Road (herein referred to as 'main access', and (iii) a new 9.0m wide entrance located off main access. 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 new development. Should there be any changes in the design features, which may relate to the stormwater considerations, LRL Associates Ltd. should be advised to review the report recommendations.

## 2 EXISTING SITE AND DRAINAGE DESCRIPTION

The subject site measures approximately 1.85 ha and is currently undeveloped, consisting of grassed area and an asphalt driveway near the southeast end. Elevations of existing site range between 113.95 near the northeast corner to 117.34 at the southwest corner of the site.

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

### Ch. Hazeldean Rd

- 762 mm diameter STC watermain
- 375 mm diameter PVC storm sewer

Existing 600 mm diameter storm stub and 200 mm diameter sanitary stub has been provided to service the site at the northwest corner. For water servicing, a 200 mm diameter stub has been provided at Hazeldean Rd. near the southwest corner of the site. In addition, a private water main is available within the City parcel at the north east corner of the site.

## 3 SCOPE OF WORK

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

### Stormwater management

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

### Water services

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

### Sanitary services

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



## **4 REGULATORY APPROVALS**

An MECP Environmental Compliance Approval (ECA) is expected to be required for installation of the proposed storm and sanitary sewers within the site. A Permit to Take Water is not anticipated to be required for pumping requirements for sewer installation. The 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. In addition, there is 200 mm dia. private watermain available near the northeast corner of subject property along the City parcel.

### **5.2 Water Supply Servicing Design**

The subject property is proposed to be serviced via a 200 mm dia. service main to be connected to the 200 mm dia. watermain stub located within Hazeldean Rd. at the southwest corner of the site. To provide redundant supply, a second connection is proposed to be connected with a private main (in the City parcel) at the northeast corner of the subject site. 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 & industrial 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 = 0.64 L/s
- Maximum Day Demand = 0.96 L/s
- Peak Hour Demand = 1.73 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.



**Table 2: Summary of Boundary Conditions**

Demand Scenario	Anticipated Demand (L/s)	Connection-1 (Hazeldean Rd)		Connection-2 (Bandelier Way)	
		Head (m)	Pressure <sup>1</sup> (psi)	Head (m)	Pressure <sup>2</sup> (psi)
Maximum HGL	0.64	159.9	59.6	160.0	63.5
Peak Hour	1.73	156.6	55.0	156.5	58.6
Max Day plus Fire 1	0.96+75	157.6	56.3	155.8	57.7
Max Day plus Fire 2	0.96+53.33	157.7	56.4	156.7	58.9
Max Day plus Fire 3	0.96+88.33	157.5	56.2	155.2	56.7
Max Day plus Fire 4	0.96+78.33	157.6	56.3	155.7	57.4

<sup>1</sup> Ground Elevation = 118.0 m

<sup>2</sup> Ground Elevation = 115.3 m

As indicated in Table 2, pressures in all scenarios meet the required pressure range stated in Table 1 as per City of Ottawa Design Guidelines. Refer to Appendix B for correspondence and Boundary Conditions.

The estimated fire flow for the proposed buildings was determined in accordance with Fire Underwriters Survey (FUS) using the formula:

$$F = 220C\sqrt{A}$$

where,

F = The required fire flow (L/min)

C = Coefficient related to the type of construction

A = The total floor area (m<sup>2</sup>)

The estimated fire flow demand was ranged from 3200 to 5300 L/min, see Appendix B for calculation details.

Three (3) new fire hydrants are proposed to install on-site. Refer to Site Servicing Plan C401 for fire hydrant locations.

Table 3 summarizes the aggregate fire flow of the contributing hydrants based on Table 18.5.4.3 of ISTB-2018-02.

**Table 3: Fire Protection Summary Table**

<b>Building</b>	<b>Fire Flow Demand (L/min)</b>	<b>Fire Hydrants(s) within 75m</b>	<b>Available Combined Fire Flow (L/min)</b>
Proposed Commercial Bldg #1	4500	2	11356
Proposed Commercial Building #2	3200	1	5678
Proposed Halo Car Wash	5300	1	5678
Proposed Mr Lube	4700	1	5678

From Table 3, it is evident that the available combined fire flow is greater than fire flow demands. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

## **6 SANITARY SERVICE**

### **6.1 Existing Sanitary Sewer Services**

There is an existing 200 mm dia. sanitary sewer service stub extending to the property line from Bandelier Street at the northwest corner of the subject site.

### **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 northwest corner. Refer to LRL drawing C401 for the proposed sanitary servicing layout. Table 4 summarizes the City of Ottawa Design Guidelines design parameters used in the estimation of wastewater flow.



**Table 4: 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, and the information received/assumed for car wash wastewater calculation, the anticipated post-development peak design wastewater flow was calculated to be 2.11 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). A peak design wastewater flow of 2.13 L/s was contemplated for this site (see Appendix C).

## **7 STORMWATER MANAGEMENT**

### **7.1 Existing Stormwater Infrastructure**

There is an existing 600 mm diameter storm sewer stub extending to the property line at the northwest corner of the site from the drainage easement which connects the subject property to Bandelier Way. The storm sewer flows easterly and northerly to the Jackson Trails Stormwater Management Facility (Wet Pond).

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



## 7.2 Design Criteria

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

### 7.2.1 Water Quality

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

A Stormceptor model EF08 Oil/Grit Separator (OGS) is proposed downstream of STM MH24 which will provide the required 80% TSS removal as required by MVCA. Refer to Appendix D for details on OGS.

### 7.2.2 Water Quantity

The allowable release rate for the site has been contemplated in the Potter's Key Subdivision Report and was determined to be **70 L/s/ha**. Refer to *Stormwater Criteria for Future Development Commercial Area* included in Appendix D. Based on this pre-determined release rate, the allowable release rate of the subject site is calculated and is summarized in Table 5.

**Table 5: Allowable Release Rate**

Site	Area	Allowable Release Rate	
	(ha)	(L/s/ha)	(L/s)
Proposed Development	1.34	70	94.14
Future Development (Phase 2)	0.51	70	35.70
<b>Total</b>	<b>1.85</b>	<b>70</b>	<b>129.84</b>



### 7.3 Method of Analysis

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

$$Q = 2.78CIA$$

Where,

Q = Flow (L/s)

C = Runoff Coefficient

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

A = Area (ha)

Refer to Appendix D for storage calculations.

### 7.4 Proposed Stormwater Quantity Controls

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

A network of storm sewers is proposed to service the site and outlet to the existing 600 mm diameter storm sewer stub at the northwest corner of the site. The proposed site storm sewers and stormwater management system are shown on Site Servicing Plan C401 and detailed calculations including the design sheet can be found in Appendix D.

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

The site has been analyzed and post-development watersheds have been allocated. A few watersheds (WS-07 and WS-25 in Halo Car Wash area, and WS-08, WS-10 and WS-15 in Mr Lube area) consisting of grass and asphalt area will flow un-controlled off the site. Refer to Post-development Watershed Plan C702 included in Appendix E.

Overland flow in Halo Car Wash area within watersheds WS-01, WS-02, WS-03, WS-04, WS-05, WS-06 and WS-18 (Total 0.42 ha) will be captured by six CBMHs (CBMH01-CBMH06). An ICD, Hydrovex Vortex Flow Regulator 100VHV-1 or approved equivalent, is proposed at CBMH06 to

restrict the collected runoff and control the release rate at 14.70 L/s (H=2.42m). For additional details on select ICD, refer to Appendix D.

Likewise, overland flow in Mr Lube area within watersheds WS-09, WS-11, WS-12, WS-13, WS-14, WS-16 and WS-17 (Total 0.40 ha) will be captured by four CBMHs (CBMH09-CBMH12). An ICD, Hydrovex Vortex Flow Regulator 125VHV-2 or approved equivalent, is proposed at CBMH12 to restrict the collected runoff and control the release rate at 20.34 L/s (H=2.35m).

Finally, overland flow from the commercial area within the watersheds WS-19, WS-20, WS-21, WS-22, WS-23 and WS-24 (Total 0.41 ha) will be captured by six CBMHs (CBMH17-CBMH22). An ICD, Hydrovex Vortex Flow Regulator 125VHV-2 or approved equivalent, is proposed at CBMH22 to restrict the runoff and control release rate at 28.89 L/s (H=3.12m).

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 ultimately be conveyed, via underground storm sewers, to the City storm sewer running along Bandelier Way at a maximum release rate of 63.92 L/s from the proposed development.

Table 6 summarizes post-development drainage areas. Additional details and calculations can be found in Appendix D.

**Table 6: Drainage Areas and Runoff Coefficients**

Site	Watersheds	Area (ha)	Weighted Runoff Coefficient	100-Year Weighted Runoff Coefficient (25% increase)
Halo Car Wash	WS-01 (controlled)	0.094	0.56	0.70
	WS-02 (controlled)	0.091	0.90	1.00
	WS-03 (controlled)	0.076	0.90	1.00
	WS-04 (controlled)	0.041	0.80	1.00
	WS-05 (controlled)	0.044	0.90	1.00
	WS-06 (controlled)	0.023	0.85	1.00
	WS-18 (controlled)	0.050	0.65	0.81
	WS-25 (un-controlled)	0.045	0.25	0.31
	WS-07 (un-controlled)	0.032	0.67	0.83
Mr Lube	WS-09 (controlled)	0.035	0.20	0.25

	WS-11 (controlled)	0.047	0.90	1.00
	WS-12 (controlled)	0.060	0.79	0.99
	WS-13 (controlled)	0.052	0.79	0.99
	WS-14 (controlled)	0.029	0.80	1.00
	WS-16 (controlled)	0.068	0.90	1.00
	WS-17 (controlled)	0.106	0.61	0.76
	WS-08 (un-controlled)	0.008	0.20	0.25
	WS-10 (un-controlled)	0.005	0.90	1.00
	WS-15 (un-controlled)	0.027	0.37	0.47
Commercial Area	WS-19 (controlled)	0.154	0.79	0.98
	WS-20 (controlled)	0.063	0.80	1.00
	WS-21 (controlled)	0.086	0.62	0.78
	WS-22 (controlled)	0.043	0.90	1.00
	WS-23 (controlled)	0.034	0.90	1.00
	WS-24 (controlled)	0.033	0.87	1.00
	<b>Total</b>	<b>1.345</b>	<b>0.73</b>	<b>0.92</b>

Table 7 summarizes the release rates from the proposed site.

**Table 7: Summary of Proposed Development Stormwater Release Rates**

Site Description	Controlled Release Rate	Un-controlled Release Rate	Total
	(L/s)	(L/s)	(L/s)
Halo Car Wash	14.70	20.03	34.73
Mr Lube	20.34	10.18	30.52
Commercial Area	28.89	0.00	28.89
<b>Total</b>	<b>63.92</b>	<b>30.21</b>	<b>94.14</b>

Table 8 summarizes the storage volumes required to meet the allowable release rate at 100-year storm event and the storage provided.



**Table 8: Summary of Storage Volume (100-Year)**

Site Description	Storage Required (m <sup>3</sup> )	Storage Provided (m <sup>3</sup> )			
		Surface Storage	Underground Storage		Total (m <sup>3</sup> )
			Oversized Pipe	CB/CBMH	
Halo Car Wash	217.63	139.70	61.59	29.30	230.59
Mr Lube	173.50	55.73	88.40	33.26	177.39
Commercial Area	133.85	140.47	0	0	140.47
<b>Total</b>	<b>524.97</b>	<b>335.90</b>	<b>149.98</b>	<b>62.56</b>	<b>548.44</b>

The runoff exceeding the allowable release rate will be stored on-site via surficial ponding and underground storage. It is calculated that a total of 524.97 m<sup>3</sup> of storage will be required to attenuate flows to the allowable release rate of 63.92 L/s. The total storage provided is 548.44 m<sup>3</sup>. Refer to Appendix D for details on runoff and storage calculations. The 100-year maximum ponding elevation and depths can be found on Stormwater Management Plan C601 in Appendix E.

## 8 EROSION AND SEDIMENT CONTROL

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

## 9 CONCLUSION

This Stormwater Management and Servicing Report for the proposed 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 maximum hour demand of the proposed development is 1.73 L/s.

- The maximum required fire flows were calculated at 75 and 53.33 L/s for two commercial buildings, 88.33 L/s for Halo Car Wash and 78.33 L/s for Mr Lube. The fire flow water demands were calculated using the FUS method.
- Three (3) on-site fire hydrants are proposed to service the proposed development.
- The new development and future expansion will be serviced with a new 200 mm $\Phi$  watermain to be connected to the existing 200 mm $\Phi$  watermain stub at Ch. Hazeldean Rd and a proposed second connection to a private main on City parcel at the Northeast corner of the subject site.

### **Sanitary Service**

- The anticipated sanitary flow from the proposed development is 2.11 L/s.
- The proposed development will be serviced by a network of 200 mm dia. sanitary sewers that connect to the existing 200mm dia. sanitary stub extended into the site at the Northwest corner.

### **Stormwater Management**

- Stormwater quality control requirements of 80% TSS removal will be met via the use of an Oil/Grit Separator (Stormceptor model EF08 or approved equivalent).
- The storm water release rates from the proposed development will meet contemplated allowable release rate of 94.14 L/s (63.92 L/s controlled and 30.21 L/s un-controlled).
- Stormwater quantity control objectives will be met through on-site stormwater surface storage in the parking lots and underground storage in oversized pipes and CBMH.

## **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**



## Mohan Basnet

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**From:** Philippe Paquette  
**Sent:** November 10, 2020 12:34 PM  
**To:** Mohan Basnet; Maxime Longtin  
**Subject:** FW: Pre-consult Follow Up - 6111 Hazeldean  
**Attachments:** Pre-con Applicant's Study and Plan Identification List.pdf; MFP4003520200306105007\_6B40C942.pdf

Hello guys,  
might be a good thing if you go thru these before going further.  
regards  
Philippe

---

**From:** Shen, Stream <Stream.Shen@ottawa.ca>  
**Sent:** March 6, 2020 3:56 PM  
**To:** Philippe Paquette <ppaquette@lrl.ca>  
**Cc:** Ren, Jeffrey <jeffrey.ren@ottawa.ca>; Turkington, Seana <Seana.Turkington@ottawa.ca>; Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>; Gervais, Josiane <josiane.gervais@ottawa.ca>  
**Subject:** Pre-consult Follow Up - 6111 Hazeldean

Hi Philippe,

Please find below the Pre-Application Consultation Meeting notes for the meeting held on March 4, 2020 for the property at 6111 Hazeldean Road. The proposal requires a Site Plan Control (Complex) and a Lifting Holding By-law applications in order to allow the development of car wash by Halo Car Wash. Information on process, timeline and fees for the different applications can be found [here](#). I have also attached the required Plans & Study List for application submission.

### **Attendees:**

Stream Shen – Planner, City of Ottawa  
Seana Turkington – Planner (Committee of Adjustment), City of Ottawa  
Santhosh Kuruvilla – Project Manager (Infrastructure), City of Ottawa  
Joisane Gervais – Project Manager (Transportation), City of Ottawa  
Jeffrey Ren – Co-op Student, City of Ottawa  
Philippe Paquette – LRL Associates Ltd.  
Brad Lookwood – Halo Car Wash  
Brad Moore – Halo Car Wash

Below are staff's preliminary comments based on the information available at the time of pre-con meeting:

### **Planning**

- The site is zoned AM9[1699]h according to the City's Zoning By-law.
- The holding symbol indicates that the following conditions must be satisfied prior to removal of the holding symbol:
  - (a) 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
  - (b) it must be demonstrated that sufficient capacity downstream of the Jackson Trails pumping station is available for the development at 6111 Hazeldean Road.

- For 2 or more planning applications submitted at the same time and for the same lands, each planning fee will be reduced by 10%.
- 50% of lot width within 3 metres of the front lot line must be occupied by building. There is an exception if the hydro line in front of the site is a high voltage line.
- Please contact Hydro Ottawa to confirm the required setback from the overhead line.
- Please confirm if there is an existing access easement to utilize the signalized intersection and driveway on the adjacent lot.
- Please note that area falls within the Feedermill Creek Rehabilitation Area. Area specific development charges for creek restoration exist for the subject site and can be found as item 9 in the link below.  
<http://app05.ottawa.ca/sirepub/mtgviewer.aspx?meetid=7868&doctype=AGENDA>
- Please note that the subject site is within an area of high archaeological potential. Minto may have conducted archaeological assessments as part of a previous subdivision application, please contact Minto to confirm if an archaeological assessment has already been conducted.
- Parkland dedication or cash-in-lieu of parkland may be required as part of this development and will be based on the City's Parkland Dedication By-law. It may be possible that Minto has already paid cash-in-lieu of parkland as part of a previous subdivision application; if this has been previously paid, please provide evidence of payment or dedication.
- You are encouraged to contact the Ward Councillor, Councillor Glen Gower, at [glen.gower@ottawa.ca](mailto:glen.gower@ottawa.ca) about the proposal.
- If a parcel is severed but continues to be developed and owned by one entity, the 2 parcels may qualify as one lot for the purpose of zoning. If the lots no longer qualify as one lot for the purpose of zoning, additional landscaped buffers for parking areas may be required.

### **Committee of Adjustment**

- No major issues with severances. The Planning Department is a commenting agency for Committee of Adjustment files, however the final approval rests with the Committee.
- Please note that Committee of Adjustment applications are typically submitted after first round comments for Site Plan Control have been received.
- If a parcel is severed and the newly created parcels share services, there may be additional requirements such as easements. Easement may be established through consent process.
- The consent process may introduce additional conditions with 1 year to clear conditions or the severance may lapse.
- It is recommended that the applicant notifies the file lead for site plan control (Stream) prior to applying for a severance.
- An informal pre-consultation for a severance with a Committee of Adjustment planner is also suggested.

Feel free to contact Planner (Committee of Adjustment), Seana Turkington, at [seana.turkington@ottawa.ca](mailto:seana.turkington@ottawa.ca), for follow-up questions.

### **Planning Forester**

- a Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City; an approved TCR is a requirement of Site Plan or Plan of Subdivision approval
- any removal of privately-owned trees 10cm or larger in diameter requires a tree permit issued under the Urban Tree Conservation Bylaw; the permit is based on the approved TCR
- any removal of City-owned trees will require the permission of Forestry Services who will also review the submitted TCR
- the TCR must list all trees on site by species, diameter and health condition – separate stands of trees may be combined using averages
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they can not be retained – please provide a plan showing retained and removed treed areas
- The TCR may be combined with the LP
- Please ensure newly planted trees have an adequate soil volume for their size at maturity

For more information on the process or help with tree retention options, feel free to contact Forester, Mark Richardson, at [mark.richardson@ottawa.ca](mailto:mark.richardson@ottawa.ca).

## **Engineering**

- The Servicing Study Guidelines for Development Applications are available at the following link: <https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans>
- Record drawings & reports and utility plans are available for purchase from the City's Information Centre. Contact the City's Information Centre by email at [informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca) or by phone at (613) 580-2424 x44455
- Stormwater quantity control criteria – be consistent with the stormwater criteria specified in the Design Brief of Potter's Key Subdivision (City file # D07-16-14-0013).
- Existing sanitary and storm sewer stubs are located on the north-west corner of the subject site for service connections.
- Existing watermain stub is located at south-west of this parcel, fronting the property on the west.
- Stormwater quality control – Consult with the Conservation Authority (MVCA) for their requirements. Include the correspondence with MVCA in the stormwater/site servicing report.
- MECP ECA (Environmental Compliance Approval) is required due to proposed use (industrial sewage works) of the building (car wash) and potential servicing (stormwater) of more than one parcel. ECA application will be direct submission to MECP (MOE).
- Clearly show and label the property lines on all sides of the property.
- Clearly show and label all the easements (if any) on the property, on all plans.
- When calculating the post development composite runoff coefficient (C), please provide a drawing showing the individual drainage area and its runoff coefficient.
- When using the modified rational method to calculate the storage requirements for the site, the underground storage should not be included in the overall available storage. The modified rational method assumes that the restricted flow rate is constant throughout the storm which, in this case, underestimates the storage requirement prior to the 1:100 year head elevation being reached. Alternately, if you wish to include the underground storage, you may use an assumed average release rate equal to 50% of the peak allowable rate. Otherwise, disregard the underground storage as available storage or provide modeling to support the design.
- Engineering plans are to be submitted on standard A1 size (594mm x 841mm) sheets.
- Phase 1 ESA and Phase 2 ESA must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
- Provide the following information for water main boundary conditions:
  1. Location map with water service connection location
  2. Average daily demand (l/s)
  3. Maximum daily demand (l/s)
  4. Maximum hourly demand (l/s)
  5. Fire flow demand (provide detailed fire flow calculations based on the fire underwriters survey method)
- If you are proposing any exterior light fixtures, all must be included and approved as part of the site plan approval. Therefore, the lights must be clearly identified by make, model and part number. All external light fixtures must meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the applicant must provide certification from an acceptable professional engineer. The location of all exterior fixtures, a table showing the fixture types (including make, model, part number), and the mounting heights must be included on a plan.

Feel free to contact Infrastructure Project Manager, Santhosh Kuruvilla, at [santhosh.kuruvilla@ottawa.ca](mailto:santhosh.kuruvilla@ottawa.ca), for follow-up questions.

## **Transportation**

- Follow Traffic Impact Assessment Guidelines

- Screening form was reviewed. A TIA is required.
- Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
- Request base mapping asap if RMA is required. Contact Engineering Services (<https://ottawa.ca/en/city-hall/planning-and-development/engineering-services>)
- Sight triangle as per Zoning by-law is 6 m x 6 m measure on the curb line.
- Access on Hazeldean would be limited to right-in/right-out.
- On site plan:
  - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
  - Show dimensions of drive-through queuing spaces on site plan.
  - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
  - Turning movement diagrams required for internal movements (loading areas, garbage).
  - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible.
  - Show lane/aisle widths.
  - Sidewalk is to be continuous across access on Hazeldean as per City Specification 7.1.
  - Pedestrian pathway (along main access, east of property boundary) should be on subject property. Preference would be to see the internal pedestrian pathway connecting north to ped cut-through to Bandelier Way.
  - Grey out any area that will not be impacted by this application.
- AODA legislation is in effect for all organizations, please ensure that the design conforms to these standards.
- Noise Impact Study (as per City of Ottawa Environmental Noise Control Guidelines) required for the following:
  - Stationary due to the proximity to neighbouring noise sensitive land uses.
- Feel free to contact Transportation Project Manager, Josiane Gervais, at [josiane.gervais@ottawa.ca](mailto:josiane.gervais@ottawa.ca), for follow-up questions.

Please refer to the links to “[Guide to preparing studies and plans](#)” and [fees](#) for further information. Additional information is available related to [building permits](#), [development charges](#), and the [Accessibility Design Standards](#). Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting [informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca).

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

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

### **Stream Shen MCIP RPP**

Planner II | Urbaniste II

Development Review | Examen des projets d'aménagement

110 Laurier Avenue West, 4<sup>th</sup> Floor  
Ottawa, ON K1P 1J1  
613.580.2424 ext. 24488  
[stream.shen@ottawa.ca](mailto:stream.shen@ottawa.ca)

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'

## Mohan Basnet

---

**From:** Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>  
**Sent:** March 23, 2020 6:02 PM  
**To:** Philippe Paquette  
**Cc:** Brad Moore; Brad Lockwood  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Confirmed. Please use the stormwater criteria that you specified below for the subject application.

**Santhosh**

---

**From:** Philippe Paquette <ppaquette@lrl.ca>  
**Sent:** March 23, 2020 3:01 PM  
**To:** Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>  
**Cc:** Brad Moore <b.moore@macewen.ca>; Brad Lockwood <b.lockwood@macewen.ca>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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Santhosh,  
Please refer to Page 3 & 4 of the report section 3.2 & 3.4  
Pls confirm  
Thanks  
Philippe

---

**From:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>  
**Sent:** March 23, 2020 2:57 PM  
**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Hi Philippe,

Since I am not very familiar with the Potter's Key report, could you please let me know, on what page you found this stormwater criteria that you specified below in your email (**highlighted in green**)? As long as you follow the criteria that specified in the report for the subject application, the City is ok with it. Please copy and include this criteria in the appendix of your site servicing report for reference.

Thanks,

**Santhosh Kuruvilla, P.E., P.Eng.**

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Sent:** March 23, 2020 2:22 PM  
**To:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>  
**Subject:** FW: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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As per the attached Atrcl SWM report, can you confirm that the maximum allowable release rate for this property is 70l/s/ha? All storm sewers needs to be designed for a 2 year event and Tc of 10 min?

Regards

**Philippe Paquette, C.E.T. and Project Manager**  
Certified Engineering Technologist



**LRL Associates Ltd.**

5430 Canotek Road  
Ottawa, Ontario K1J 9G2

**T** (613) 842-3434 or (877) 632-5664 ext 209

**C** (613) 880-9793

**F** (613) 842-4338

**E** [ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)

**W** [www.lrl.ca](http://www.lrl.ca)

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*We will continue to be reachable by cell phone or by calling LRL at 613-842-3434 which will prompt you to enter the extension of the person you are trying to reach.*

*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*



---

**From:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>  
**Sent:** March 10, 2020 11:35 AM  
**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Subject:** 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Good morning Philippe,

Attached is the plan of the easement, report and work order for the location requested.

*The City of Ottawa's Financial Services Branch will send out an invoice at the end of the month.*  
**Please retain the attached work order for your records. A copy will not be included with the invoice sent at the end of the month.**

If you have any concerns regarding this information, please refer to the contact information below.

Thank you.

Kindest regards,

Brenda Testa  
Technical Records Clerk  
Information Centre Unit

For further information, please contact;

Geospatial Analytics Technology & Solutions Branch - Information Centre Unit

Phone: 613-580-2424 x 44455

Email: [informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>

**Sent:** March 10, 2020 8:28 AM

**To:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>

**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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For now just send us the SWM report, servicing brief and sewer as built (plan and profiles) at the servicing easements (connection points). Our client wishes to develop the property attached. We want to know what are the sewer restrictions for this property.

Many thanks

Regards

**Philippe Paquette, C.E.T. and Project Manager**  
Certified Engineering Technologist



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**W** [www.lrl.ca](http://www.lrl.ca)

*We care deeply, so let us know how we did by completing our [Customer Satisfaction Survey](#).*



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**From:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>

**Sent:** March 9, 2020 3:17 PM

**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>

**Subject:** 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Good afternoon Phillipe,

Thank you for your request for Infrastructure Information.

**Will you need the entire contract of plan D07-16-14-0013, our city file reference number 17314?**

***Please provide the Project Manager's name if this is a City of Ottawa / Ville d'Ottawa project.***

***If this is not a City of Ottawa / Ville d'Ottawa project, the following fee schedule is applicable:***

Item	Fee*
Administration Fee	\$78.00
Engineering Plans - pdf	\$16.00
UCC Central Registry Utility Plans - pdf	\$45.00
UCC MicroStation or AutoCad 1:250 (187m x 125m)	\$143.00
Water/Sewer Distribution Plans	\$45.00
Report fee	\$31.00

\*HST is applicable on all fees

If you require a cost estimate please let us know within 24 hours of receiving this reply.

For further information, please contact:

Geospatial Analytics Technology & Solutions Branch - Information Centre Unit

Phone: 613-580-2424 x 44455

Email: [informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>

**Sent:** March 09, 2020 1:44 PM

**To:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>

**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>; Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>

**Subject:** Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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We would like to get copies of the following documents for the Potter's Key Subdivision in Stittsville Ont. (City of Ottawa file: D07-16-14-0013)

- Servicing study.
- SWM report.
- As-builts engineering dwgs.

Call me on my cell if you have questions or comments

Regards

**Philippe Paquette, C.E.T. and Project Manager**

Certified Engineering Technologist



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## Mohan Basnet

---

**From:** Philippe Paquette  
**Sent:** April 2, 2020 8:58 PM  
**To:** Brad Moore  
**Cc:** Kuruvilla, Santhosh; Shen, Stream; Maxime Longtin  
**Subject:** FW: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)  
**Attachments:** IMG\_20200402\_2026016.jpg; Tech-bulletin-ISTB-2018-01-Sewer.pdf; Ottawa Design Guidelines - Sewer October 2012.pdf; figure 4B.PNG

Brad,  
find attached all the documents Santhosh is referring to in his email bellow + preliminary sanitary peak flows calculations for the entire property (1.85 ha.). Call me tomorrow to discuss.

Santosh, I would really appreciate if you check quickly my calculations to make sure all meets the city of Ottawa requirements.

Call me both if you have questions or comments.  
Regards

---

**From:** Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>  
**Sent:** April 2, 2020 5:57 PM  
**To:** Philippe Paquette <ppaquette@lrl.ca>  
**Cc:** Brad Moore <b.moore@macewen.ca>; Shen, Stream <Stream.Shen@ottawa.ca>; Maxime Longtin <mlongtin@lrl.ca>  
**Subject:** Re: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Hello Philippe,

What you are proposing on the subject site is a car wash and it is considered an industrial use. In order to estimate the allowable sanitary release rate for this site, please refer to the latest City of Ottawa Sewer Design Guideline, section 4 and the Technical Bulletin ISTB-2018-01. The sanitary release rate for this site must be less than or equal to the allowable release rate.

Based on my understanding, there was a recent upgrade done to the Jackson Trails pump station (JTPS) and it has a current capacity of 120 L/s. In order to confirm the current capacity, I sent an email today to our waste water collection branch and the consultant who designed the upgrade of JTPS. So far I haven't received a reply from either of them. Once I get a reply, I will confirm the current pumping capacity.

Please adhere to the City of Ottawa Guidelines and Technical Bulletins..

Thanks,

Santhosh

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Sent:** Thursday, April 2, 2020 1:41 PM  
**To:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>; Shen, Stream <[Stream.Shen@ottawa.ca](mailto:Stream.Shen@ottawa.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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Based on our discussion of this morning can you confirmed that our property of 1.85 Ha. will be allowed to discharge 92,500L/day (1.85 ha.x50,000 l/d/ha) as per section 5.2 & 5.4 of the Atrél report that was used to design the Potter's Key subdivision. Also, since we are using accurate water meter flow counts for the car wash and no theoretical volumes, the 1.5 peaking factor for commercial use doesn't apply.

Please confirm the above plus the pumping station capacity upgrades ASAP.

Many thanks

**Philippe Paquette, C.E.T. and Project Manager**  
Certified Engineering Technologist



**LRL Associates Ltd.**

5430 Canotek Road  
Ottawa, Ontario K1J 9G2

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*We will continue to be reachable by cell phone or by calling LRL at 613-842-3434 which will prompt you to enter the extension of the person you are trying to reach.*

*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*



---

**From:** Philippe Paquette  
**Sent:** April 1, 2020 6:53 PM  
**To:** 'Kuruvilla, Santhosh' <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>; Shen, Stream <[Stream.Shen@ottawa.ca](mailto:Stream.Shen@ottawa.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Ok thanks!

---

**From:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>  
**Sent:** April 1, 2020 6:02 PM  
**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>; Shen, Stream <[Stream.Shen@ottawa.ca](mailto:Stream.Shen@ottawa.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Hi Philippe,

In order to provide you an answer, I will have to check with our Asset Management Group. I am not sure if I can give you an answer prior to April 3, 2020. I will do my best to give you an answer as soon as possible.

Based on my understanding, recently, there was an upgrade done to this pumping station and it has adequate capacity to receive flow from its full catchment area. As I indicated above, I will check with our Asset Management Group and get back to you.

Thanks,

**Santhosh**

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Sent:** April 01, 2020 3:17 PM  
**To:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>; Shen, Stream <[Stream.Shen@ottawa.ca](mailto:Stream.Shen@ottawa.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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Quick question for you? When we read the Atrél report (see attached) it says that The Hazeldean pumping station (owned and operated by the City of Ottawa) has a maximum capacity of 120 l/s. It also says in the report that no upgrades are required to the pumping station if the incoming flows are less than 10 l/s. Past 10 l/s minor upgrades are required. Considering that our car wash will have peak flows of 14.80 l/s or 9.90 l/s if water is being reclaimed (see attached water demand table) is there a way that the City of Ottawa can confirm the actual working capacity of the lift station and if there's some room left below the 10 l/s limit? If upgrades are required based on our new development peak flows, who will be responsible to upgrade the station? The report says Minto, but Minto says its the city responsibility? Who shall we believe?

Can you please send some clarification ASAP as this property deal will be closing April 3<sup>rd</sup>.  
Regards

**Philippe Paquette, C.E.T. and Project Manager**  
Certified Engineering Technologist



**LRL Associates Ltd.**

5430 Canotek Road  
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*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*



---

**From:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>  
**Sent:** March 23, 2020 6:02 PM  
**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Confirmed. Please use the stormwater criteria that you specified below for the subject application.

**Santhosh**

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Sent:** March 23, 2020 3:01 PM  
**To:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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Please refer to Page 3 & 4 of the report section 3.2 & 3.4

Pls confirm

Thanks

Philippe

---

**From:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>  
**Sent:** March 23, 2020 2:57 PM  
**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Hi Philippe,

Since I am not very familiar with the Potter's Key report, could you please let me know, on what page you found this stormwater criteria that you specified below in your email (**highlighted in green**)? As long as you follow the criteria that specified in the report for the subject application, the City is ok with it. Please copy and include this criteria in the appendix of your site servicing report for reference.

Thanks,

**Santhosh Kuruvilla, P.E., P.Eng.**

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Sent:** March 23, 2020 2:22 PM  
**To:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>  
**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>  
**Subject:** FW: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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As per the attached Atriel SWM report, can you confirm that the maximum allowable release rate for this property is **70l/s/ha? All storm sewers needs to be designed for a 2 year event and Tc of 10 min?**

Regards

**Philippe Paquette, C.E.T. and Project Manager**  
Certified Engineering Technologist



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*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*



---

**From:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>  
**Sent:** March 10, 2020 11:35 AM  
**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Subject:** 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Good morning Philippe,  
Attached is the plan of the easement, report and work order for the location requested.  
*The City of Ottawa's Financial Services Branch will send out an invoice at the end of the month.*  
**Please retain the attached work order for your records. A copy will not be included with the invoice sent at the end of the month.**  
If you have any concerns regarding this information, please refer to the contact information below.  
Thank you.

Kindest regards,

Brenda Testa  
Technical Records Clerk  
Information Centre Unit

For further information, please contact;

Geospatial Analytics Technology & Solutions Branch - Information Centre Unit

Phone: 613-580-2424 x 44455  
Email: [informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Sent:** March 10, 2020 8:28 AM  
**To:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>  
**Subject:** RE: 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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

For now just send us the SWM report, servicing brief and sewer as built (plan and profiles) at the servicing easements (connection points). Our client wishes to develop the property attached. We want to know what are the sewer restrictions for this property.

Many thanks

Regards

**Philippe Paquette, C.E.T. and Project Manager**

Certified Engineering Technologist



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---

**From:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>

**Sent:** March 9, 2020 3:17 PM

**To:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>

**Subject:** 20-0272 - RE: Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

Good afternoon Phillipe,

Thank you for your request for Infrastructure Information.

**Will you need the entire contract of plan D07-16-14-0013, our city file reference number 17314?**

***Please provide the Project Manager's name if this is a City of Ottawa / Ville d'Ottawa project.***

***If this is not a City of Ottawa / Ville d'Ottawa project, the following fee schedule is applicable:***

Item	Fee*
Administration Fee	\$78.00
Engineering Plans - pdf	\$16.00
UCC Central Registry Utility Plans - pdf	\$45.00
UCC MicroStation or AutoCad 1:250 (187m x 125m)	\$143.00

Water/Sewer Distribution Plans	\$45.00
Report fee	\$31.00

\*HST is applicable on all fees

If you require a cost estimate please let us know within 24 hours of receiving this reply.

For further information, please contact:

Geospatial Analytics Technology & Solutions Branch - Information Centre Unit

Phone: 613-580-2424 x 44455

Email: [informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)

---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>

**Sent:** March 09, 2020 1:44 PM

**To:** ISD Information Centre / Centre Information <[informationcentre@ottawa.ca](mailto:informationcentre@ottawa.ca)>

**Cc:** Brad Moore <[b.moore@macewen.ca](mailto:b.moore@macewen.ca)>; Brad Lockwood <[b.lockwood@macewen.ca](mailto:b.lockwood@macewen.ca)>; Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>

**Subject:** Potential new development - 6111 Hazeldean Ottawa (LRL#200100)

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We would like to get copies of the following documents for the Potter's Key Subdivision in Stittsville Ont. (City of Ottawa file: D07-16-14-0013)

- Servicing study.
- SWM report.
- As-builts engineering dwgs.

Call me on my cell if you have questions or comments

Regards

**Philippe Paquette, C.E.T. and Project Manager**  
 Certified Engineering Technologist



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'

## Mohan Basnet

---

**From:** Erica Ogden <eogden@mvc.on.ca>  
**Sent:** November 13, 2020 3:41 PM  
**To:** Philippe Paquette  
**Cc:** Planning  
**Subject:** RE: New Commercial development Halo Car Wash, 6111 Hazeldean road Stittsville ON. (LRL#200100)

Hello Philippe,

Thank you for your e-mail. The site is located within the Feedmill Creek watershed, and is within the area of the Carp River Watershed Subwatershed Study (CRWSS) (Robinson Consultants, December 2004). The Feedmill Creek Stormwater Management Criteria Study (JFSA, April 20, 2018) is also applicable to the subject property.

As noted in the City's pre-consultation comments, the stormwater quantity control for the subject property must be consistent with the criteria noted in the Design Brief of the Potter's Key Subdivision.

As per the CRWSS, an enhanced level of protection (80% Total Suspended Solids removal) is required for water quality. Feedmill Creek supports a cold water fish community and therefore temperature controls are also important. The site is within a moderate groundwater recharge area which has an infiltration target of 104 mm/yr.

If you have any questions, please feel free to contact me.

Thank you,

**Erica C. Ogden, MCIP, RPP | Environmental Planner | Mississippi Valley Conservation Authority**

10970 Highway 7, Carleton Place, ON K7C 3P1

[www.mvc.on.ca](http://www.mvc.on.ca) | c. 613 451 0463 | o. 613 253 0006 ext. 229 | [eogden@mvc.on.ca](mailto:eogden@mvc.on.ca)



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---

**From:** Philippe Paquette <[ppaquette@lrl.ca](mailto:ppaquette@lrl.ca)>  
**Sent:** November 10, 2020 3:36 PM  
**To:** Planning <[planning@mvc.on.ca](mailto:planning@mvc.on.ca)>  
**Cc:** Maxime Longtin <[mlongtin@lrl.ca](mailto:mlongtin@lrl.ca)>; Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>; [bmoore@macewen.ca](mailto:bmoore@macewen.ca); Bill Holzman <[b.holzman@holzmanconsultants.com](mailto:b.holzman@holzmanconsultants.com)>  
**Subject:** New Commercial development Halo Car Wash, 6111 Hazeldean road Stittsville ON. (LRL#200100)

Hello Mike,

As mentioned in the pre-consultation meeting notes attached (see bullet #6 under Engineering) for the above mentioned project, we are asking the MVCA to pre-consult with us and advise us on what are the requirements for storm water management quality. As per the attached plan, an OSG structure will be installed downstream of the proposed storm sewer network and be controlling 80% TSS removal for the entire site.

Have a look at the attached documents and let us know if our proposal make any sense.

Many Thanks

**Philippe Paquette, C.E.T.**

Certified Engineering Technologist



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*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*

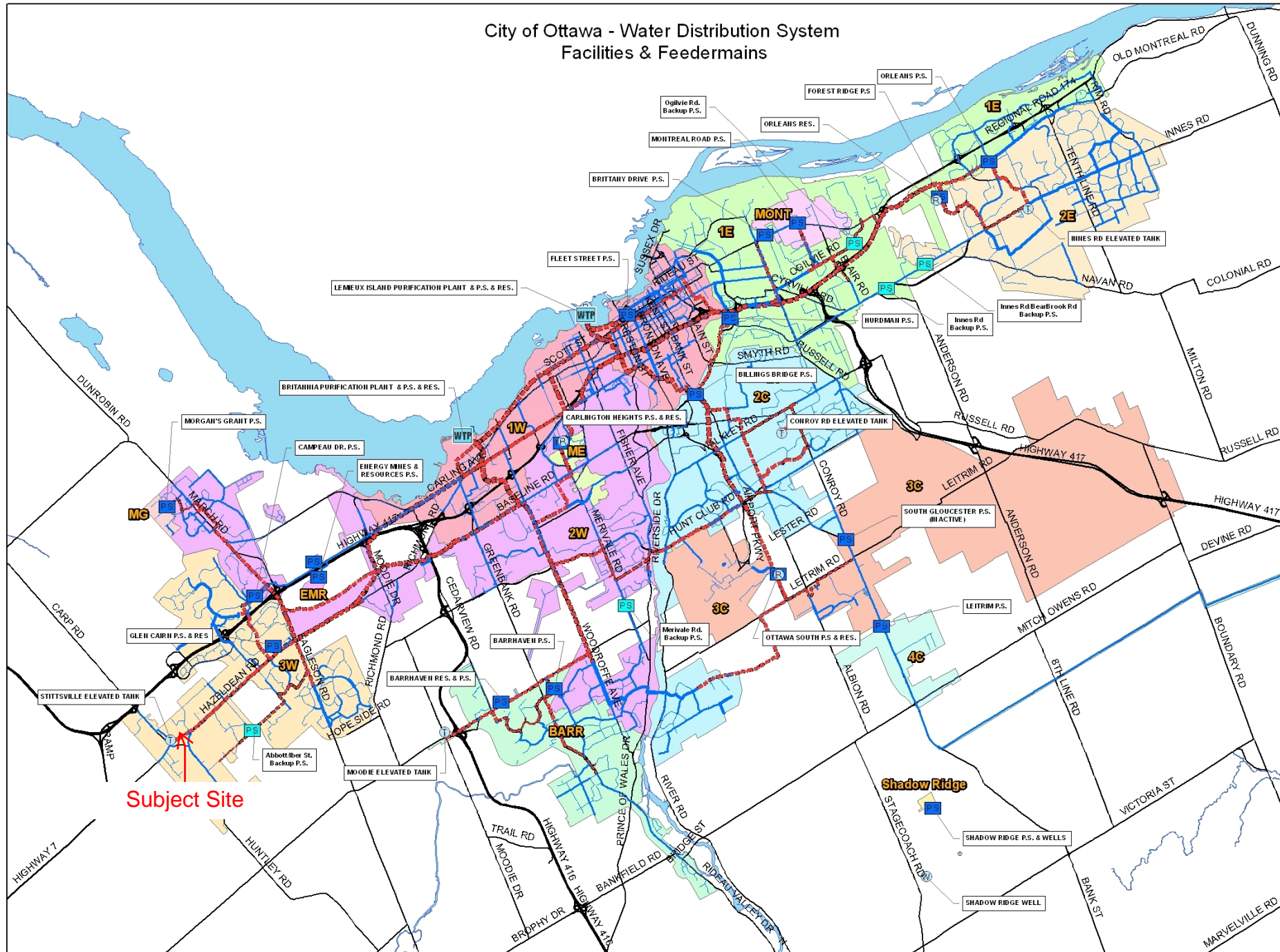


## **APPENDIX B**

### **Water Supply Calculations**



# City of Ottawa - Water Distribution System Facilities & Feeder mains



**Legend**

**Water System Structure**

- Pump Station
- Backup Pump Station
- Water Treatment Plant
- Well
- Elevated Tank
- Reservoir

**WATERMANS**  
**Priority, Internal Diameter**

- Backbone 1524mm - 1981mm
- Backbone 1067mm - 1372mm
- Backbone 810mm - 914mm
- Backbone 406mm - 508mm
- Backbone 152mm - 305mm
- Distribution 1676mm - 1981mm
- Distribution 1067mm - 1372mm
- Distribution 810mm - 914mm
- Distribution 406mm - 508mm
- Distribution 305mm - 381mm

**PRESSURE ZONES**

- 1E
- 1W
- 2C
- 2E
- 2W
- 3C
- 3W
- 4C
- BARR
- EMR
- ME
- MS
- MONT
- SHAD

Infrastructure Services & Community Sustainability  
Infrastructure Services

**FIGURE 5.1**  
DRAWN BY: D. WESG      DATE: 10/14/2013



## Water Service Calculations

LRL File No. : 200100  
 Project : 6111 Hazeldean Rd  
 Date : November 25, 2020  
 Designed by : Mohan Basnet

### Water Demand

#### 1. Commerical Area (except Car Wash Area)

Site area = 1.34 ha

Average Day Demand:

$$Q_{average} = 28 \text{ m}^3 / \text{ha} \cdot \text{day}$$

$$Q_{average} = 37 \text{ m}^3 / \text{day}$$

$$Q_{average} = 37397 \text{ L / day}$$

$$Q_{average} = 0.43 \text{ L / s}$$

(as per Table 4.2 of Ottawa Design Guidelines-Water Distribution)

Maximum daily peak factor: 1.5  
**Maximum daily demand** = 56095 L / day  
 = 0.65 L / s

Maximum hour peak factor: 1.8  
**Maximum hour demand** = 100971 L / day  
 = 1.17 L / s

#### 2. Light Industrial Area (Car Wash Area)

Site area = 0.51 ha

Average Day Demand:

$$Q_{average} = 35 \text{ m}^3 / \text{ha} \cdot \text{day}$$

$$Q_{average} = 18 \text{ m}^3 / \text{day}$$

$$Q_{average} = 17969 \text{ L / day}$$

$$Q_{average} = 0.21 \text{ L / s}$$

(as per Table 4.2 of Ottawa Design Guidelines-Water Distribution)

Maximum daily peak factor: 1.5  
**Maximum daily demand** = 26954 L / day  
 = 0.31 L / s

Maximum hour peak factor: 1.8  
**Maximum hour demand** = 48516 L / day  
 = 0.56 L / s

#### Total Water Demand

**Average Day Demand** = 0.64 L / s  
**Maximum daily demand** = 0.96 L / s  
**Maximum hour demand** = 1.73 L / s



## Fire Flow Calculations - Proposed Commercial Bldg including Starbucks

LRL File No. 200100  
 Date November 23, 2020  
 Method Fire Underwriters Survey (FUS)  
 Prepared by Mohan Basnet

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow	
Structural Framing Material									
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Ordinary Construction	1			
			Ordinary Construction	1.0					
			Non-combustible construction	0.8					
			Fire resistive construction <2 hrs	0.7					
			Fire resistive construction >2 hrs	0.6					
Floor Space Area (A)									
2	Total area					321	m <sup>2</sup>		
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x A <sup>0.5</sup>					L/min	3,942
Reductions or surcharge due to factors affecting burning									
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Combustible	0%	L/min	3,942	
			Limited combustible	-15%					
			Combustible	0%					
			Free burning	15%					
			Rapid burning	25%					
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	False	0%	L/min	3,942	
			Water supply is standard for both the system and fire department hose lines	-10%	False	0%			
			Fully supervised system	-10%	False	0%			
6	Choose separation	Exposure distance between units	North side	>45m	0%		L/min	4,533	
			East side	20.1 to 30m	10%				
			South side	>45m	0%				
			West side	30.1 to 45m	5%				15%
Net required fire flow									
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 100)					L/min	4,500	
		Minimum required fire flow rate					L/s	75.0	
		Required duration of fire flow					hr	1.75	



## Fire Flow Calculations - Proposed Commercial bldg

LRL File No. 200100  
 Date November 23, 2020  
 Method Fire Underwriters Survey (FUS)  
 Prepared by Mohan Basnet

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow	
Structural Framing Material									
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Ordinary Construction	1			
			Ordinary Construction	1.0					
			Non-combustible construction	0.8					
			Fire resistive construction <2 hrs	0.7					
			Fire resistive construction >2 hrs	0.6					
Floor Space Area (A)									
2	Total area					190	m <sup>2</sup>		
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x A <sup>0.5</sup>					L/min	3,032
Reductions or surcharge due to factors affecting burning									
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Combustible	0%	L/min	3,032	
			Limited combustible	-15%					
			Combustible	0%					
			Free burning	15%					
			Rapid burning	25%					
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	False	0%	L/min	3,032	
			Water supply is standard for both the system and fire department hose lines	-10%	False	0%			
			Fully supervised system	-10%	False	0%			
6	Choose separation	Exposure distance between units	North side	>45m	0%		L/min	3,184	
			East side	30.1 to 45m	5%				
			South side	>45m	0%				
			West side	>45m	0%				5%
Net required fire flow									
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 100)					L/min	3,200	
		Minimum required fire flow rate					L/s	53.3	
		Required duration of fire flow					hr	1.25	



## Fire Flow Calculations - NEW HALO CAR WASH

LRL File No. 200100  
 Date November 23, 2020  
 Method Fire Underwriters Survey (FUS)  
 Prepared by Mohan Basnet

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow	
Structural Framing Material									
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Ordinary Construction	1			
			Ordinary Construction	1.0					
			Non-combustible construction	0.8					
			Fire resistive construction <2 hrs	0.7					
			Fire resistive construction >2 hrs	0.6					
Floor Space Area (A)									
2	Total area					485	m <sup>2</sup>		
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x A <sup>0.5</sup>					L/min	4,845
Reductions or surcharge due to factors affecting burning									
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Combustible	0%	L/min	4,845	
			Limited combustible	-15%					
			Combustible	0%					
			Free burning	15%					
			Rapid burning	25%					
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	False	0%	L/min	4,845	
			Water supply is standard for both the system and fire department hose lines	-10%	False	0%			
			Fully supervised system	-10%	False	0%			
6	Choose separation	Exposure distance between units	North side	>45m	0%		L/min	5,329	
			East side	>45m	0%				
			South side	>45m	0%				
			West side	20.1 to 30m	10%				
Net required fire flow									
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 100)					L/min	5,300	
		Minimum required fire flow rate					L/s	88.3	
		Required duration of fire flow					hr	1.75	



## Fire Flow Calculations - PROPOSED MR LUBE

LRL File No. 200100  
 Date November 23, 2020  
 Method Fire Underwriters Survey (FUS)  
 Prepared by Mohan Basnet

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow	
Structural Framing Material									
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Ordinary Construction	1			
			Ordinary Construction	1.0					
			Non-combustible construction	0.8					
			Fire resistive construction <2 hrs	0.7					
			Fire resistive construction >2 hrs	0.6					
Floor Space Area (A)									
2	Total area					221	m <sup>2</sup>		
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x A <sup>0.5</sup>					L/min	3,271
Reductions or surcharge due to factors affecting burning									
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Rapid burning	25%	L/min	4,088	
			Limited combustible	-15%					
			Combustible	0%					
			Free burning	15%					
			Rapid burning	25%					
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	False	0%	L/min	4,088	
			Water supply is standard for both the system and fire department hose lines	-10%	False	0%			
			Fully supervised system	-10%	False	0%			
6	Choose separation	Exposure distance between units	North side	30.1 to 45m	5%		L/min	4,701	
			East side	20.1 to 30m	10%				
			South side	>45m	0%				
			West side	>45m	0%	15%			
Net required fire flow									
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 100)					L/min	4,700	
		Minimum required fire flow rate					L/s	78.3	
		Required duration of fire flow					hr	1.75	

## Boundary Conditions 6111 Hazeldean Road

### Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	38	0.64
Maximum Daily Demand	58	0.96
Peak Hour	104	1.73
Fire Flow Demand #1	4,500	75.00
Fire Flow Demand #2	3,200	53.33
Fire Flow Demand #3	5,300	88.33
Fire Flow Demand #4	4,700	78.33

### Location



## **Results**

### **Connection 1 – Hazeldean Rd.**

<b>Demand Scenario</b>	<b>Head (m)</b>	<b>Pressure<sup>1</sup> (psi)</b>
Maximum HGL	159.9	59.6
Peak Hour	156.6	55.0
Max Day plus Fire 1	157.6	56.3
Max Day plus Fire 2	157.7	56.4
Max Day plus Fire 3	157.5	56.2
Max Day plus Fire 4	157.6	56.3

<sup>1</sup> Ground Elevation = 118.0 m

### **Connection 2 – Bandelier Way**

<b>Demand Scenario</b>	<b>Head (m)</b>	<b>Pressure<sup>1</sup> (psi)</b>
Maximum HGL	160.0	63.5
Peak Hour	156.5	58.6
Max Day plus Fire 1	155.8	57.7
Max Day plus Fire 2	156.7	58.9
Max Day plus Fire 3	155.2	56.7
Max Day plus Fire 4	155.7	57.4

<sup>1</sup> Ground Elevation = 115.3 m

## **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.*

## Mohan Basnet

---

**From:** Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>  
**Sent:** January 13, 2021 2:09 PM  
**To:** Mohan Basnet  
**Subject:** FW: 200100-6111 Hazeldean Boundary Conditions  
**Attachments:** RE: 6111 Hazeldean Road Boundary Conditions

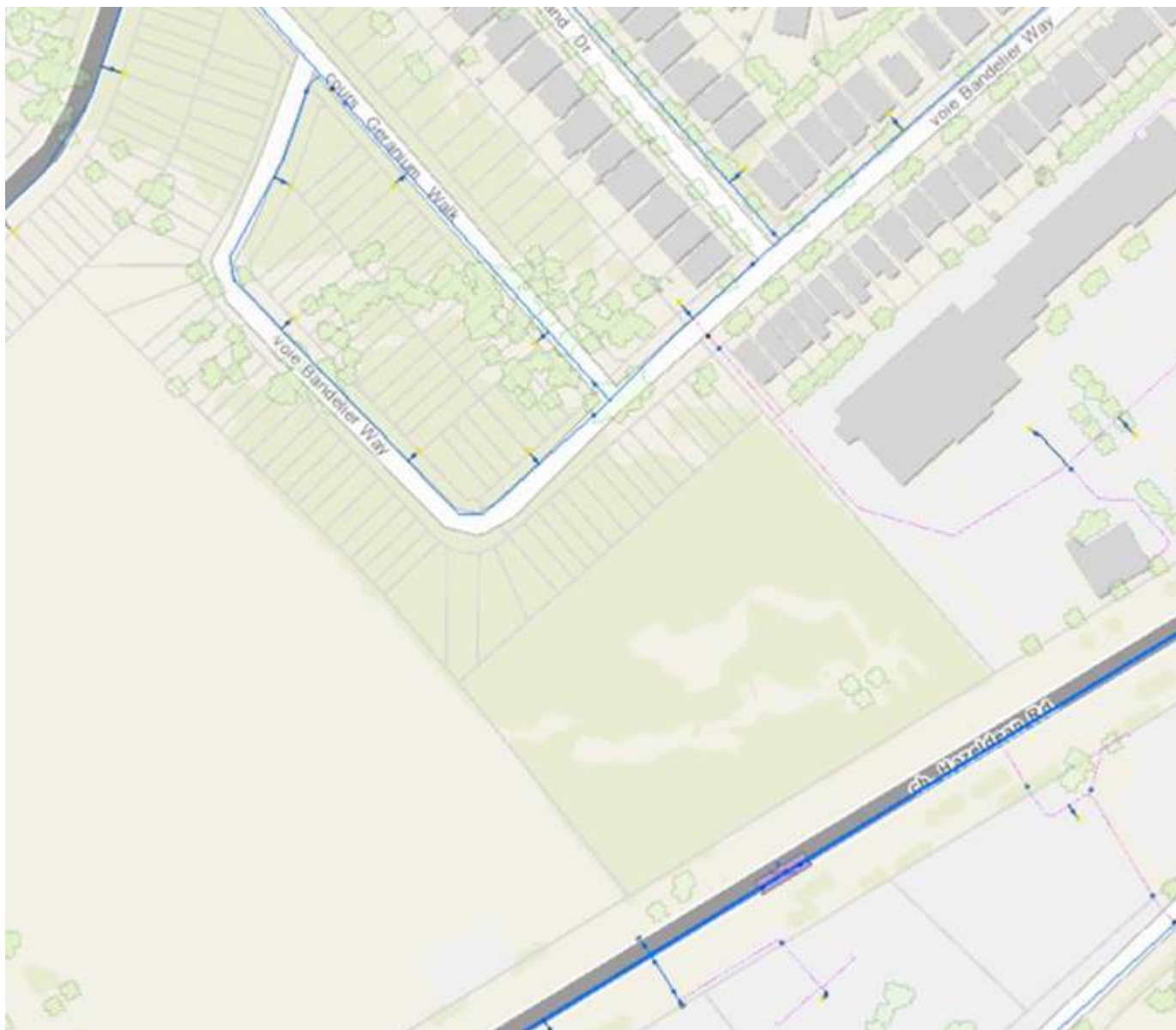
Hi Mohan,

Per your email I sent your request to our Infrastructure Planning for the boundary condition at the connection 2. See their response below.

Thanks,  
Hi Santosh,

### Infrastructure Planning Response

We only provide BC from public mains. Please refer back to the consultant that their connection 2 location is at a private main where the City does not provide a BC from. As such we took connection 2 to the nearest public main. They should be able to extract HGL from the BC provided already provided.



---

**From:** Kuruvilla, Santhosh  
**Sent:** January 11, 2021 4:40 PM  
**To:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>  
**Subject:** RE: 200100-6111 Hazeldean Boundary Conditions

Hi Mohan,

I will look into it and get back to you.

**Santhosh**

---

**From:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>  
**Sent:** January 11, 2021 4:13 PM

**To:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>

**Subject:** RE: 200100-6111 Hazeldean Boundary Conditions

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

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

Hi Santhosh,

Thank you for this.

As we discussed previously, I thought the proposed 2<sup>nd</sup> connection will be at the City Parcel (northeast corner of the subject site as shown in the schematic below).

Could you please advise?

Thanks,

Mohan

### Mohan Basnet, P.Eng.



Civil Engineering Services

**LRL Associates Ltd.**

5430 Canotek Road

Ottawa, Ontario K1J 9G2

**T** (613) 842-3434 or (877) 632-5664 ext 213

**F** (613) 842-4338

**E** [mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)

**W** [www.lrl.ca](http://www.lrl.ca)

*Given the current COVID-19 situation, please be aware that LRL has implemented alternative working conditions for our team. Many of us have now transitioned to working from home; however, communication and workability remains one of our top priorities.*

*We will continue to be reachable by cell phone or by calling LRL at 613-842-3434 which will prompt you to enter the extension of the person you are trying to reach.*

*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*

---

**From:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>

**Sent:** January 11, 2021 4:07 PM

**To:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>

**Subject:** RE: 200100-6111 Hazeldean Boundary Conditions

Hi Mohan,

Please find attached the water boundary conditions for the subject application.

Thanks,

## Santhosh

**From:** Mohan Basnet <[mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)>

**Sent:** December 07, 2020 2:12 PM

**To:** Kuruvilla, Santhosh <[Santhosh.Kuruvilla@ottawa.ca](mailto:Santhosh.Kuruvilla@ottawa.ca)>

**Subject:** 200100-6111 Hazeldean Boundary Conditions

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

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

Hi Santhosh,

Please find below & attached the required information for the water boundary conditions. As discussed, the proposed connections are shown below.

**Type of Development:** Multi-use Commercial Development

**No. of Units:** 5

**Site Address:** 6111 Hazeldean Road, Stittsville (Ottawa), Ontario

Type of Demands	(L/min)	(L/s)	Remarks
Average Day Demand	38.5	0.64	
Maximum Daily Demand	57.8	0.96	
Maximum Hour Demand	104	1.73	
Fire Flow Demand #1	4,500	75.00	Proposed Commercial Bldg #1 including Starbucks (±321
Fire Flow Demand #2	3,200	53.33	Proposed Commercial Bldg #2 (±190 sqm)
Fire Flow Demand #3	5,300	88.33	Proposed Halo Car Wash (±485 sqm)
Fire Flow Demand #4	4,700	78.33	Proposed Mr Lube (±221 sqm)

**Proposed Connection -1** @ Hazeldean Road (existing stub)

**Proposed Connection-2** @ City Parcel (northeast corner of the subject site)



**FUS Calculations** – Attached

**Hydrant Coverage Plan** – Attached. Please note that three (3) on-site Fire Hydrants are being considered to meet the RFF.

Please let me know if you have any questions.

Thank you,

**Mohan Basnet, P.Eng.**

Civil Engineering Services

**LRL Associates Ltd.**

5430 Canotek Road  
Ottawa, Ontario K1J 9G2

**T** (613) 842-3434 or (877) 632-5664 ext 213

**F** (613) 842-4338

**E** [mbasnet@lrl.ca](mailto:mbasnet@lrl.ca)

**W** [www.lrl.ca](http://www.lrl.ca)



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*Many of us have now transitioned to working from home; however, communication and workability remains one of our top priorities.*

*We will continue to be reachable by cell phone or by calling LRL at 613-842-3434 which will prompt you to enter the extension of the person you are trying to reach.*

*In addition, we will continue to have access to all e-mail correspondence and do our best to return all inquiries in a timely manner.*

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,

## **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 SEWER COMPUTATION FORM										PROJECT: POTTER'S KEY SUBDIVISION										Table 20												
DATE: February 2017					CLIENT: Minto Communities Inc.					PROJECT #: 131003					BY: ATREL ENGINEERING LTD					q= 350 l/cap.day					Single dwelling= 3.4 person/unit							
DESIGNED BY: VLL					PROJECT #: 131003					BY: ATREL ENGINEERING LTD					PVC/CONC N= 0.013					I= 0.28 l/ha.s					Townhouse= 2.7 person/unit							
CHECKED BY: AGS					PROJECT #: 131003					BY: ATREL ENGINEERING LTD					OTHER N= 0.024																	
STREET NAMES	LOCATION				RESIDENTIAL						COMMERCIAL , INSTITUTIONAL						PEAK EXT.FLOW Q(i) (L/S)	PEAK DES. Q(d) (L/S)	SEWER DATA								UpStream		DwnStream			
	FROM (Up)		TO (Down)		AREA (ha.)	POP.	AREA (ha.)	POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	AREA (ha.)	POP.	AREA (ha.)	POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)			PEAKING FACTOR M	FLOW Q(p) (L/S)	TYPE PIPE	DIA. (NOM) (mm)	(ACT) (MM)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	Obv. (M)	Inv. (M)	Obv. (M)	Inv. (M)
Eaglehead Crescent	MH	150	MH	151	0.56	41.0	0.56	41	4.00	0.66									0.16	0.82	PVC	200	201.2	0.85	72.5	30.71	97%	0.97	115.06	114.86	114.44	114.24
Eaglehead Crescent	MH	151	MH	152	0.21	7.0	0.77	48	4.00	0.78									0.22	0.99	PVC	200	201.2	0.85	11.0	30.71	97%	0.97	114.41	114.21	114.32	114.12
Eaglehead Crescent	MH	152	MH	154	0.80	38.0	1.57	86	4.00	1.39									0.44	1.83	PVC	200	201.2	0.85	108.5	30.71	94%	0.97	114.14	113.94	113.22	113.02
Park 2	MH	153	MH	154	0.37		0.37												0.10	0.10	PVC	200	201.2	1.00	11.0	33.31	100%	1.05	114.13	113.93	114.02	113.82
Eaglehead Crescent	MH	154	MH	155	0.16	7.0	2.10	93	4.00	1.51									0.59	2.09	PVC	200	201.2	0.85	36.0	30.71	93%	0.97	113.22	113.02	112.91	112.71
Eaglehead Crescent	MH	155	MH	156	0.30	14.0	2.40	107	4.00	1.73									0.67	2.41	PVC	200	201.2	0.50	39.5	23.55	90%	0.74	112.88	112.68	112.68	112.48
Eaglehead Crescent	MH	156	MH	157			2.40	107	4.00	1.73									0.67	2.41	PVC	200	201.2	0.50	11.0	23.55	90%	0.74	112.65	112.45	112.59	112.39
Eaglehead Crescent	MH	157	MH	165	0.38	17.0	2.78	124	4.00	2.01									0.78	2.79	PVC	200	201.2	1.24	73.5	37.09	92%	1.17	112.56	112.36	111.65	111.45
Bandelier Way	MH	160	MH	162	0.17	14.0	0.17	14	4.00	0.23									0.05	0.27	PVC	200	201.2	0.65	40.0	26.86	99%	0.84	114.18	113.98	113.92	113.72
Geranium Walk	MH	161	MH	162	0.40	34.0	0.40	34	4.00	0.55									0.11	0.66	PVC	200	201.2	0.65	63.0	26.86	98%	0.84	114.28	114.08	113.87	113.67
Geranium Walk	MH	162	MH	163	0.23	17.0	0.80	65	4.00	1.05									0.22	1.28	PVC	200	201.2	0.50	45.5	23.55	95%	0.74	113.32	113.12	113.09	112.89
Geranium Walk	MH	163	MH	165	0.18	11.0	0.98	76	4.00	1.23									0.27	1.51	PVC	200	201.2	0.50	37.5	23.55	94%	0.74	113.06	112.86	112.87	112.67
Kimpton Drive	MH	165	MH	166	0.07		16.43	1020	3.79	15.68									4.60	20.28	PVC	375	366.4	0.20	41.0	73.72	72%	0.70	111.58	111.21	111.50	111.13
Kimpton Drive	MH	166	CAP	Kimpt. Dr	0.13	4.0	16.56	1024	3.79	15.74									4.64	20.37	CONC	375	381.0	0.20	21.0	81.80	75%	0.72	109.04	108.67	109.00	108.63
Kimpton Drive	CAP	Kimpt. Dr	EX	8 A			16.56	1024	3.79	15.74									4.64	20.37	CONC	375	381.0	0.20	43.0	81.80	75%	0.72	109.00	108.63	108.91	108.54
Bandelier Way	MH	160	MH	170	0.26	19.0	0.26	19	4.00	0.31									0.07	0.38	PVC	200	201.2	0.75	44.5	28.85	99%	0.91	114.05	113.85	113.72	113.52
Bandelier Way	MH	170	MH	171	0.12	6.0	0.38	25	4.00	0.41									0.11	0.51	PVC	200	201.2	0.75	10.0	28.85	98%	0.91	113.69	113.49	113.61	113.41
Bandelier Way	MH	171	MH	172	0.61	57.0	0.99	82	4.00	1.33									0.28	1.61	PVC	200	201.2	0.75	71.0	28.85	94%	0.91	113.58	113.38	113.05	112.85
Bandelier Way	MH	172	MH	173	0.40	36.0	1.39	118	4.00	1.91									0.39	2.30	PVC	200	201.2	0.65	54.0	26.86	91%	0.84	113.05	112.85	112.70	112.50
Bandelier Way	MH	173	MH	175			1.39	118	4.00	1.91									0.39	2.30	PVC	200	201.2	0.65	3.0	26.86	91%	0.84	112.67	112.47	112.65	112.45
Commercial (by others)	STUB	101	MH	174	1.17	70.0	1.17	70	4.00	1.13	9.02	1292.0	9.02	1292	1.50	7.85			2.85	11.84	PVC	300	299.2	0.23	7.5	46.05	74%	0.65	111.32	111.02	111.30	111.00
Commercial (by Minto)	STUB	102	MH	174							1.85	265.0	1.85	265	1.50	1.61			0.52	2.13	PVC	200	201.2	0.35	6.0	19.71	89%	0.62	111.29	111.09	111.27	111.07
Easement	MH	174	MH	175			1.17	70	4.00	1.13			10.87	1557	1.50	9.46			3.37	13.97	PVC	300	299.2	0.23	55.5	46.05	70%	0.65	111.27	110.97	111.14	110.84
Bandelier Way	MH	175	MH	176	0.13	6.0	2.69	194	4.00	3.14			10.87	1557	1.50	9.46			3.80	16.40	PVC	300	299.2	0.23	8.5	46.05	64%	0.65	111.08	110.78	111.06	110.76
Bandelier Way	MH	176	MH	177	0.52	52.0	3.21	246	4.00	3.99			10.87	1557	1.50	9.46			3.94	17.39	PVC	300	299.2	0.23	68.5	46.05	62%	0.65	111.03	110.73	110.87	110.57
Geranium Walk	MH	161	MH	177	0.72	68.0	0.72	68	4.00	1.10									0.20	1.30	PVC	200	201.2	1.50	113.5	40.80	97%	1.28	114.14	113.94	112.44	112.24
Bandelier Way	MH	177	CAP	Bandelier Way	0.17	14.0	4.10	328	4.00	5.31			10.87	1557	1.50	9.46			4.19	18.97	CONC	300	304.8	0.20	38.0	44.55	57%	0.61	110.87	110.57	110.80	110.50
Street No.2	CAP	Bandelier Way	EX	14 A			4.10	328	4.00	5.31			10.87	1557	1.50	9.46			4.19	18.97	CONC	300	304.8	0.20	43.0	45.12	58%	0.62	110.80	110.50	110.71	110.41
Existing Sanitary Sewers																																





## Sanitary Service Calculations

LRL File No. : 200100  
 Project : 6111 Hazeldean Rd  
 Date : January 19, 2021  
 Designed by : Mohan Basnet

### SAN Design Flow

#### 1. Commerical Area including Phase 2 Development (except Car Wash area)

Site area = 1.32 ha  
 $Q_{average} = 28 \text{ m}^3 / \text{ha-day}$  (as per Technical Bulletin ISTB-2018-01)  
 $Q_{average} = 37 \text{ m}^3 / \text{day}$   
 $Q_{average} = 36932 \text{ L / day}$   
 $Q_{average} = 0.43 \text{ L / s}$   
 Peak factor = 1.5  
 Peak Flow = 0.64 L / s  
 Infiltration Allowance = 0.33 L/ha/s  
 0.44 L/s  
 Peak Design Flow = 1.08 L/s

#### 2. Car Wash Area


Site area = 0.53 ha  
 Number of employee = 2 (assumed)  
 Peak Design flow = 300 L/day (Appendix 4-A.3 Ottawa Sewer Design Guidelines w/ Peak Factor of 2)  
 = 0.003 L/s  
Car Wash Wastewater  
 Vol. of water/car wash = 170 L (assumed with reclaiming system and to be verified by manufacturer)  
 Estimated no. of car wash/day = 435 (assumed and to be verified)  
 Maximum car wash wastewater = 73950 L/day  
 = 0.86 L/s (To ensure that the peak car wash wastewater flow does not exceed 0.86 L/s a storage tank (or equilization tank) should be used)  
 Infiltration Allowance = 0.33 L/ha/s  
 0.17 L/s  
 Peak Design Flow = 1.03 L/s

#### Total Site

Peak Design Flow = 2.11 L/s

#### As per Potter's Key Subdivision Report

Peak Design Flow = 2.13 L/s

<div><div><div>LRL File No.</div><div>200100</div><div>Project:</div><div>Halo Car Wash</div><div>Location:</div><div>6111 Hazeldean, Ottawa</div><div>Date:</div><div>February 5, 2021</div></div></div> <div><div>Sanitary Design Parameters</div><div>Average Daily Flow = 280 L/p/day Commercial &amp; 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 &amp; Institutional Peak Factor = 1.5</div><div>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)</div></div> <div><div>Pipe Design Parameters</div><div>Minimum Velocity = 0.60 m/s Manning's n = 0.013</div></div>
--

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						0.14	0.28	0.28	0.09	0.23	3.0	150	2.00%	PVC	21.54	1.22	
	SAN MH01	SAN MH02								0.28						0.14		0.28	0.09	0.23	19.3	150	0.50%	PVC	10.77	0.61	
	SAN MH02	SAN MH03								0.28						0.14		0.28	0.09	0.23	31.1	200	0.50%	PVC	23.19	0.74	
Halo Car Wash	SAN MH04	SAN MH03									0.53	0.53				0.86	0.53	0.53	0.17	1.03	54.0	150	2.00%	PVC	21.54	1.22	
	SAN MH03	SAN MH05																		1.26	45.5	200	0.50%	PVC	23.19	0.74	
Comm. Area	SAN MH07	SAN MH05							0.53	0.53						0.26	0.53	0.53	0.17	0.43	48.7	200	1.00%	PVC	32.80	1.04	
*Phase 2	STUB	SAN MH05							0.51	0.51						0.25	0.51	0.51	0.17	0.42	6.8	200	1.00%	PVC	32.80	1.04	
	SAN MH05	SAN MH08																		2.11	39.2	200	0.50%	PVC	23.19	0.74	
	SAN MH08	Ex. STUB																		2.11	37.6	200	0.33%	PVC	18.84	0.60	
														Designed: M. B./P.P		PROJECT: Halo Car Wash											
														Checked: M.B.		LOCATION: 6111 Hazeldean, Ottawa											
														Dwg. Reference: C401		File Ref.: 200100				Date: February 5, 2021				Sheet No. 1 of 1			

## **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**

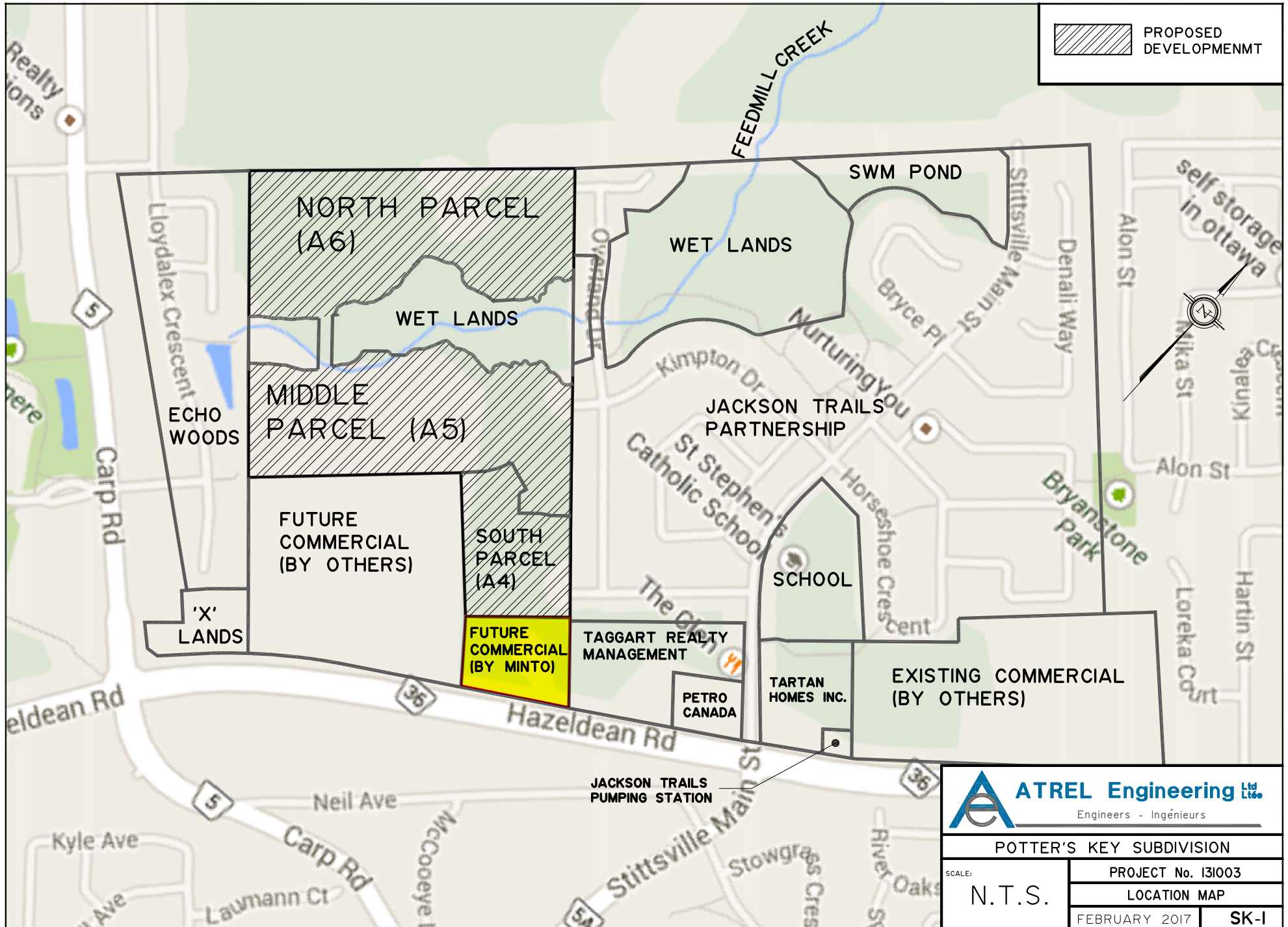
#### **POTTER'S KEY SUBDIVISION**


#### **CITY OF OTTAWA**

**FEBRUARY 2017**



**(Revision 5)**



 <b>ATREL Engineering Ltd.</b> Engineers - Ingénieurs	
POTTER'S KEY SUBDIVISION	
SCALE: N.T.S.	PROJECT No. I3I003
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 ( $\pm 20.07$  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												POTTER'S KEY SUBDIVISION										STORM FREQUENCY : 2 YEAR										Table 1									
DESIGNED BY: VLL CHECKED BY: AGS												Minto Communities Inc. 131003 ATREL ENGINEERING LTD February, 2017										RATIONAL METHOD Q= 2.78 AIR PVC/CONC N= 0.013 CSP N= 0.024 CORR N= 0.021																			
STREET NAMES	LOCATION				AREA (ha.) RUNOFF COEFFICIENT								RATIONAL METHOD		2 YEAR			ACTUAL PIPE FLOW (L/S)	PIPE			SEWER DATA							UpStream		Forced drop (M)	Inv to Inv (M)	DwStream		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)	Obv. (M)			Inv. (M)	Hgl at UP-MH (M)	Hgl Out UP-MH (M)	USF ELEV (M)		HGL FREEBOARD (M)			
Eaglehead Crescent	MH	550	MH	551			0.25		0.33				1.02	1.02	10.00	76.81	78.69	78.69	PVC	375	366.4	0.85	72.5	151.97	48%	1.44	0.84	115.27	114.90		no	114.65	114.28	115.27	115.27	114.65	115.75	0.48			
Eaglehead Crescent	MH	551	MH	552										1.02	10.84	73.73	75.53	75.53	PVC	375	366.4	0.85	11.0	151.97	50%	1.44	0.13	114.62	114.25		no	114.53	114.16	114.63	114.62	114.55	115.43	0.81			
Eaglehead Crescent	MH	552	MH	554			0.72		0.35				1.78	2.81	10.97	73.29	205.68	205.68	CONC	450	457.2	0.85	108.5	274.22	25%	1.67	1.08	114.53	114.08		no	113.61	113.16	114.55	114.53	113.61	115.97	1.44			
Park 2	MH	553	MH	554	0.36								0.20	0.20	10.00	76.81	15.37	15.37	PVC	300	299.2	1.00	11.0	96.02	84%	1.37	0.13	113.72	113.42		no	113.61	113.31	113.72	113.72	113.61	n/a	n/a			
Eaglehead Crescent	MH	554	MH	555										3.01	12.05	69.74	209.68	209.68	CONC	450	457.2	0.85	36.0	274.22	24%	1.67	0.36	113.61	113.16		no	113.30	112.85	113.61	113.61	113.30	114.44	0.83			
Eaglehead Crescent	MH	555	MH	556					0.26				0.51	3.51	12.41	68.65	241.14	241.14	CONC	525	533.4	0.50	41.0	317.25	24%	1.42	0.48	113.30	112.78		no	113.09	112.57	113.30	113.30	113.09	114.04	0.74			
Eaglehead Crescent	MH	556	MH	557										3.51	12.89	67.25	236.22	236.22	CONC	525	533.4	0.50	11.5	317.25	26%	1.42	0.14	113.06	112.54		no	113.00	112.48	113.08	113.06	113.00	113.97	0.91			
Eaglehead Crescent	MH	557	MH	565			0.22		0.23				0.78	4.30	13.02	66.86	287.26	287.26	CONC	525	533.4	0.50	73.0	317.25	9%	1.42	0.86	112.97	112.45	0.23	no	112.60	112.08	113.00	112.97	112.60	113.73	0.76			
Bandelier Way	MH	560	MH	562						0.08			0.17	0.17	10.00	76.81	12.81	12.81	PVC	300	299.2	0.70	44.5	80.34	84%	1.14	0.65	114.34	114.04		no	114.03	113.73	114.34	114.34	114.03	114.87	0.53			
Geranium Walk	MH	561	MH	562											10.00	76.81			PVC	300	299.2	0.65	68.5	77.42	100%	1.10	1.04	114.48	114.18		no	114.03	113.73	114.48	114.48	114.03	115.27	0.79			
Geranium Walk	MH	562	MH	563			0.24				0.39		1.11	1.28	11.04	73.04	93.51	93.51	PVC	375	366.4	0.90	44.0	156.38	40%	1.48	0.49	114.03	113.66	0.40	no	113.63	113.26	114.03	114.03	113.63	115.25	1.22			
Geranium Walk	MH	563	MH	565					0.10				0.19	1.47	11.53	71.39	105.29	105.29	PVC	375	366.4	0.65	39.0	132.90	21%	1.26	0.52	113.20	112.83	0.58	no	112.95	112.58	113.22	113.20	112.95	114.77	1.57			
Kimpton Drive	MH	565	MH	566					0.17				0.33	13.10	16.33	58.80	770.32	770.32	CONC	1050	1066.8	0.12	39.0	986.85	22%	1.10	0.59	112.37	111.32	0.60	no	112.32	111.27	112.37	112.37	112.32	n/a	n/a			
Kimpton Drive	MH	566	MH	Kimpton Drive			0.43						0.54	13.64	16.92	57.58	785.32	785.32	CONC	1350	1371.6	0.12	22.0	1928.87	59%	1.31	0.28	111.72	110.37		no	111.69	110.34	111.73	111.72	111.69	n/a	n/a			
Kimpton Drive	MH	Kimpton Drive	MH	8										13.64	17.20	57.02	777.68	777.68	CONC	1350	1371.6	0.12	41.5	1928.87	60%	1.31	0.53	111.69	110.34		no	111.64	110.29	111.69	111.69	111.64	n/a	n/a			
Bandelier Way	MH	1560	MH	570					0.26				0.54	0.54	10.00	76.81	41.64	41.64	PVC	300	299.2	0.70	44.0	80.34	48%	1.14	0.64	114.27	113.97		no	113.96	113.66	114.27	114.27	113.96	114.88	0.61			
Bandelier Way	MH	570	MH	571										0.54	10.64	74.43	40.35	40.35	PVC	300	299.2	0.70	9.5	80.34	50%	1.14	0.14	113.93	113.63		no	113.86	113.56	113.94	113.93	113.87	114.51	0.58			
Bandelier Way	MH	571	MH	572			0.46						0.58	1.12	10.78	73.93	82.62	82.62	PVC	375	366.4	0.70	71.0	138.31	40%	1.31	0.90	113.86	113.49		no	113.36	112.99	113.87	113.86	113.36	114.51	0.65			
Bandelier Way	MH	572	MH	575			0.22			0.40			1.11	2.23	11.68	70.90	157.88	157.88	CONC	450	457.2	0.65	57.5	239.80	34%	1.46	0.66	113.36	112.91	0.04	no	112.99	112.54	113.36	113.36	113.19	114.07	0.71			
Commercial (by others)	MH	501	MH	574				1.18		8.86			20.38	20.38	15.00	61.77	1258.61	1258.61	CONC	1050	1066.8	0.27	6.0	1480.28	15%	1.66	0.06	113.22	112.17		no	113.20	112.15	113.39	113.39	113.38	n/a	n/a			
Commercial (by Minto)	MH	502	MH	574						1.81			3.77	3.77	10.11	76.39	288.28	288.28	CONC	600	609.6	0.27	9.0	332.84	13%	1.14	0.13	113.20	112.60	0.01	no	113.18	112.58	113.40	113.40	113.38	n/a	n/a			
Easement	MH	574	MH	575										24.15	15.06	61.63	1488.34	1488.34	CONC	1050	1066.8	0.30	53.0	1560.35	5%	1.75	0.51	113.17	112.12		no	113.01	111.96	113.38	113.33	113.19	n/a	n/a			
Bandelier Way	MH	575	MH	576										26.38	15.57	60.46	1594.71	1594.71	CONC	1050	1066.8	0.45	12.0	1911.03	17%	2.14	0.09	112.95	111.90		no	112.90	111.85	113.19	112.99	112.95	113.77	0.78			
Bandelier Way	MH	576	MH	577			0.19			0.33			0.93	27.30	15.66	60.25	1644.95	1644.95	CONC	1200	1219.2	0.27	72.5	2113.43	22%	1.81	0.67	112.90	111.70		no	112.70	111.50	112.95	112.90	112.70	113.77	0.87			
Geranium Walk	MH	10561	MH	577			0.62			0.49			1.80	1.80	10.00	76.81	138.05	138.05	PVC	375	366.4	1.50	113.0	201.88	32%	1.91	0.98	114.40	114.03		no	112.70	112.33	114.40	114.40	112.70	115.15	0.75			
Bandelier Way	MH	577	MH	Bandelier Way			0.36			0.25			0.97	30.07	16.33	58.80	1768.17	1768.17	CONC	1350	1371.6	0.20	36.5	2490.17	29%	1.69	0.36	112.70	111.35		no	112.63	111.28	112.70	112.70	112.63	113.93	1.23			
Bandelier Way	MH	Bandelier Way	MH	14						0.14			0.24	30.31	16.69	58.05	1759.40	1759.40	CONC	1350	1371.6	0.20	41.5	2490.17	29%	1.69	0.41	112.63	111.28		no	112.55	111.20	112.63	112.55	112.55	n/a	n/a			
Existing Storm Sewer																																									



# LRL Associates Ltd.

## Storm Watershed Summary



**LRL File No.** 200100

**Project:** Proposed Development

**Location:** 6111 Hazeldean Rd (Stittsville, ON)

**Date:** February 5, 2021

**Designed:** M. Longtin

**Checked:** M. Basnet

**Dwg Reference:** C701, C702

### Pre-Development Catchments

Watershed	C = 0.20	C = 0.80	C = 0.90	Total Area (ha)	Combined C
EWS-01 (un-controlled)	0.511	0.000	0.000	0.511	0.20
EWS-02 (un-controlled)	1.284	0.000	0.054	1.338	0.23
<b>Total</b>	<b>1.795</b>	<b>0.000</b>	<b>0.054</b>	<b>1.849</b>	<b>0.22</b>

### Post-Development Catchments

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
WS-01 (controlled)	0.045	0.000	0.049	0.094	0.56
WS-02 (controlled)	0.000	0.000	0.091	0.091	0.90
WS-03 (controlled)	0.000	0.000	0.076	0.076	0.90
WS-04 (controlled)	0.006	0.000	0.035	0.041	0.80
WS-05 (controlled)	0.000	0.000	0.044	0.044	0.90
WS-06 (controlled)	0.002	0.000	0.021	0.023	0.85
WS-18 (controlled)	0.018	0.000	0.032	0.050	0.65
WS-25 (un-controlled)	0.042	0.000	0.003	0.045	0.25
WS-07 (un-controlled)	0.011	0.000	0.021	0.032	0.67
WS-09 (controlled)	0.035	0.000	0.000	0.035	0.20
WS-11 (controlled)	0.000	0.000	0.047	0.047	0.90
WS-12 (controlled)	0.009	0.000	0.050	0.060	0.79
WS-13 (controlled)	0.008	0.000	0.022	0.030	0.71
WS-14 (controlled)	0.004	0.000	0.047	0.051	0.84
WS-16 (controlled)	0.000	0.000	0.068	0.068	0.90
WS-17 (controlled)	0.030	0.000	0.076	0.106	0.70
WS-08 (un-controlled)	0.008	0.000	0.000	0.008	0.20
WS-10 (un-controlled)	0.000	0.000	0.005	0.005	0.90
WS-15 (un-controlled)	0.021	0.000	0.007	0.027	0.37
WS-19 (controlled)	0.025	0.000	0.129	0.154	0.79
WS-20 (controlled)	0.009	0.000	0.054	0.063	0.80
WS-21 (controlled)	0.034	0.000	0.052	0.086	0.62
WS-22 (controlled)	0.000	0.000	0.043	0.043	0.90
WS-23 (controlled)	0.000	0.000	0.034	0.034	0.90
WS-24 (controlled)	0.001	0.000	0.032	0.033	0.87
<b>Total</b>	<b>0.307</b>	<b>0.000</b>	<b>1.038</b>	<b>1.345</b>	<b>0.74</b>



**LRL File No.** 200100  
**Project:** Proposed Development  
**Location:** 6111 Hazeldean Rd (Stittsville, ON)  
**Date:** February 5, 2021  
**Designed:** M. Basnet  
**Drawing Ref.:** C601

**Stormwater Management**

**STORM - 100 YEAR**

**Runoff Equation**

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

**Pre-Development Catchments within Development Area**

	<b>Total Area =</b>	<b>1.849</b>	<b>ha</b>	<b><math>\sum R =</math></b>	<b>0.22</b>
Un-Controlled	EWS-01 (Future Development)	0.51	ha	R =	0.20
	EWS-02 (Proposed Development)	1.34	ha	R =	0.23
	<b>Total Un-controlled =</b>	<b>1.85</b>	<b>ha</b>	<b><math>\sum R =</math></b>	<b>0.22</b>

**Pre-Development Release Rate**

**IDF Curve Equations**

100-Year,  $I_{100} = 1735.688 / (Td + 6.014)^{0.820}$       A = 1735.688      B = 0.820      C = 6.014  
 5-Year,  $I_5 = 998.071 / (Td + 6.053)^{0.814}$       A = 998.071      B = 0.814      C = 6.053  
 2-Year,  $I_2 = 732.951 / (Td + 6.199)^{0.810}$       A = 732.951      B = 0.810      C = 6.199

C = 0.23  
 $I_{100} = 178.6$  mm/hr  
 $I_5 = 104.2$  mm/hr  
 $I_2 = 76.8$  mm/hr  
 Td = 10 min  
 A = 1.35 ha  
 100-year Release Rate = 152.40 L/s  
 5-year Release Rate = 88.93 L/s  
 2-year Release Rate = 65.55 L/s  
**Allowable Release Rate = 70 L/ha/s**

*(as determined for Potter's Key Subdivision Report by Atriel Engineering (Rev 5) dated February 2017)*

**Proposed Development Allowable Release Rate = 94.16 L/s**  
**Future Development Allowable Release Rate = 35.70 L/s**  
**Total = 129.86 L/s**

(Proposed development, A=1.34 ha)  
 (Future development, A=0.51 ha)



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**Stormwater Management**

**Post-development Stormwater Management**

					$\sum R_{25.5}$	$\sum R_{100}$
	<b>Total Site Area =</b>	<b>1.345</b>	<b>ha</b>	<b><math>\sum R =</math></b>	<b>0.74</b>	<b>0.93</b>
Halo Car Wash	WS-01 (controlled)	0.094	ha	R =	0.56	0.70
	WS-02 (controlled)	0.091	ha	R =	0.90	1.00
	WS-03 (controlled)	0.076	ha	R =	0.90	1.00
	WS-04 (controlled)	0.041	ha	R =	0.80	1.00
	WS-05 (controlled)	0.044	ha	R =	0.90	1.00
	WS-06 (controlled)	0.023	ha	R =	0.85	1.00
	WS-18 (controlled)	0.050	ha	R =	0.65	0.81
	<b>Total (Controlled)</b>	<b>0.42</b>	<b>ha</b>	<b>R =</b>	<b>0.78</b>	<b>0.98</b>
	WS-25 (un-controlled)	0.045	ha	R =	0.25	0.31
	WS-07 (un-controlled)	0.032	ha	R =	0.67	0.83
	<b>Total (Un-controlled)</b>	<b>0.08</b>	<b>ha</b>	<b>R =</b>	<b>0.42</b>	<b>0.53</b>
	<b>(Controlled+Un-controlled)</b>	<b>0.50</b>	<b>ha</b>	<b>R =</b>	<b>0.73</b>	<b>0.91</b>
Mr Lube	WS-09 (controlled)	0.035	ha	R =	0.20	0.25
	WS-11 (controlled)	0.047	ha	R =	0.90	1.00
	WS-12 (controlled)	0.060	ha	R =	0.79	0.99
	WS-13 (controlled)	0.030	ha	R =	0.71	0.89
	WS-14 (controlled)	0.051	ha	R =	0.84	1.00
	WS-16 (controlled)	0.068	ha	R =	0.90	1.00
	WS-17 (controlled)	0.106	ha	R =	0.70	0.88
	<b>Total (Controlled)</b>	<b>0.40</b>	<b>ha</b>	<b>R =</b>	<b>0.75</b>	<b>0.93</b>
	WS-08 (un-controlled)	0.008	ha	R =	0.20	0.25
	WS-10 (un-controlled)	0.005	ha	R =	0.90	1.00
	WS-15 (un-controlled)	0.027	ha	R =	0.37	0.47
	<b>Total (Un-controlled)</b>	<b>0.04</b>	<b>ha</b>	<b>R =</b>	<b>0.41</b>	<b>0.51</b>
	<b>(Controlled+Un-controlled)</b>	<b>0.44</b>	<b>ha</b>	<b>R =</b>	<b>0.72</b>	<b>0.90</b>
Commercial Area	WS-19 (controlled)	0.154	ha	R =	0.79	0.98
	WS-20 (controlled)	0.063	ha	R =	0.80	1.00
	WS-21 (controlled)	0.086	ha	R =	0.62	0.78
	WS-22 (controlled)	0.043	ha	R =	0.90	1.00
	WS-23 (controlled)	0.034	ha	R =	0.90	1.00
	WS-24 (controlled)	0.033	ha	R =	0.87	1.00
	<b>Total (Controlled)</b>	<b>0.41</b>	<b>ha</b>	<b>R =</b>	<b>0.78</b>	<b>0.98</b>
	<b>Total (Un-controlled)</b>	<b>0.00</b>	<b>ha</b>	<b>R =</b>	<b>0.00</b>	<b>0.00</b>
	<b>(Controlled+Un-controlled)</b>	<b>0.41</b>	<b>ha</b>	<b>R =</b>	<b>0.78</b>	<b>0.98</b>



LRL File No. 200100  
**Project:** Proposed Development  
**Location:** 6111 Hazeldean Rd (Stittsville, ON)  
**Date:** February 5, 2021  
**Designed:** M. Basnet  
**Drawing Ref.:** C601

**Stormwater Management**

**1) 100 Year Post-development Stormwater Management (Halo Car Wash)**

**Un-controlled Runoff**

C = 0.53  
 $I_{100}$  = 178.6 mm/hr  
 $T_d$  = 10 min  
A = 0.08 ha  
**Un-controlled Release Rate = 20.03 L/s**  
**Allowable Release Rate = 34.73 L/s**  
**Controlled Release Rate = 14.70 L/s**

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m <sup>3</sup> )	*Controlled Release Rate (L/s)	Un-controlled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	203.68	117.80	7.35	20.03	27.38
15	142.89	162.99	140.08	7.35	16.03	23.38
20	119.95	136.82	155.37	7.35	13.46	20.80
25	103.85	118.46	166.66	7.35	11.65	19.00
30	91.87	104.79	175.40	7.35	10.31	17.65
35	82.58	94.19	182.38	7.35	9.26	16.61
40	75.15	85.72	188.08	7.35	8.43	15.78
45	69.05	78.76	192.82	7.35	7.75	15.09
50	63.95	72.95	196.81	7.35	7.17	14.52
55	59.62	68.01	200.19	7.35	6.69	14.04
60	55.89	63.76	203.07	7.35	6.27	13.62
65	52.65	60.05	205.54	7.35	5.91	13.25
70	49.79	56.79	207.67	7.35	5.59	12.93
75	47.26	53.90	209.49	7.35	5.30	12.65
80	44.99	51.32	211.06	7.35	5.05	12.40
85	42.95	49.00	212.40	7.35	4.82	12.17
90	41.11	46.89	213.54	7.35	4.61	11.96
95	39.43	44.98	214.51	7.35	4.42	11.77
100	37.90	43.23	215.32	7.35	4.25	11.60
105	36.50	41.63	215.98	7.35	4.09	11.44
110	35.20	40.15	216.52	7.35	3.95	11.30
115	34.01	38.79	216.94	7.35	3.81	11.16
120	32.89	37.52	217.25	7.35	3.69	11.04
125	31.86	36.34	217.46	7.35	3.57	10.92
130	30.90	35.24	217.59	7.35	3.47	10.81
135	30.00	34.22	217.63	7.35	3.36	10.71
140	29.15	33.25	217.59	7.35	3.27	10.62
145	28.36	32.35	217.49	7.35	3.18	10.53
150	27.61	31.49	217.31	7.35	3.10	10.45
155	26.91	30.69	217.08	7.35	3.02	10.37
160	26.24	29.93	216.78	7.35	2.94	10.29
165	25.61	29.21	216.44	7.35	2.87	10.22
170	25.01	28.53	216.04	7.35	2.81	10.15
175	24.44	27.88	215.59	7.35	2.74	10.09
180	23.90	27.26	215.09	7.35	2.68	10.03
185	23.39	26.68	214.56	7.35	2.62	9.97
190	22.90	26.12	213.98	7.35	2.57	9.92
195	22.43	25.59	213.36	7.35	2.52	9.86
200	21.98	25.07	212.71	7.35	2.47	9.81
205	21.55	24.59	212.02	7.35	2.42	9.77
210	21.14	24.12	211.30	7.35	2.37	9.72

\* 50% of allowable controlled release rate as the underground storage is being considered

**On-site Stormwater Retention**

**Total Storage Required = 217.63 m<sup>3</sup>**

**Storage Provided**

**Underground Pipe Storage**

Length = 139.4 m  
Pipe Dia. = 0.75 m  
Storage = **61.59 m<sup>3</sup>**

**Surface Storage    Underground MH Storage**

CBMH01	32.59	4.27	m <sup>3</sup>
CBMH02	26.55	4.58	m <sup>3</sup>
CBMH03	17.11	4.86	m <sup>3</sup>
CBMH04	11.23	5.16	m <sup>3</sup>
CBMH05	37.98	5.04	m <sup>3</sup>
CBMH06	14.24	5.39	m <sup>3</sup>
Total =	<b>139.70</b>	<b>29.30</b>	<b>m<sup>3</sup></b>

**Total Storage Provided = 230.59 m<sup>3</sup>**



LRL File No. 200100  
**Project:** Proposed Development  
**Location:** 6111 Hazeldean Rd (Stittsville, ON)  
**Date:** February 5, 2021  
**Designed:** M. Basnet  
**Drawing Ref.:** C601

**Stormwater Management**

**2) 100 Year Post-development Stormwater Management (Mr Lube)**

**Un-controlled Runoff**

C = 0.51  
 $I_{100}$  = 178.6 mm/hr  
 $T_d$  = 10 min  
A = 0.04 ha  
**Un-controlled Release Rate = 10.18 L/s**  
**Allowable Release Rate = 30.54 L/s**  
**Controlled Release Rate = 20.36 L/s**

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m <sup>3</sup> )	*Controlled Release Rate (L/s)	Un-controlled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	183.73	104.13	10.18	10.18	20.36
15	142.89	147.04	123.17	10.18	8.15	18.33
20	119.95	123.43	135.90	10.18	6.84	17.02
25	103.85	106.86	145.02	10.18	5.92	16.10
30	91.87	94.53	151.83	10.18	5.24	15.42
35	82.58	84.97	157.06	10.18	4.71	14.89
40	75.15	77.32	161.15	10.18	4.29	14.46
45	69.05	71.05	164.36	10.18	3.94	14.12
50	63.95	65.81	166.88	10.18	3.65	13.83
55	59.62	61.35	168.87	10.18	3.40	13.58
60	55.89	57.51	170.41	10.18	3.19	13.37
65	52.65	54.17	171.57	10.18	3.00	13.18
70	49.79	51.23	172.42	10.18	2.84	13.02
75	47.26	48.63	173.01	10.18	2.69	12.87
80	44.99	46.29	173.35	10.18	2.57	12.74
85	42.95	44.20	173.50	10.18	2.45	12.63
90	41.11	42.30	173.46	10.18	2.34	12.52
95	39.43	40.58	173.27	10.18	2.25	12.43
100	37.90	39.00	172.93	10.18	2.16	12.34
105	36.50	37.56	172.47	10.18	2.08	12.26
110	35.20	36.22	171.89	10.18	2.01	12.19
115	34.01	34.99	171.20	10.18	1.94	12.12
120	32.89	33.85	170.42	10.18	1.88	12.06
125	31.86	32.79	169.54	10.18	1.82	12.00
130	30.90	31.79	168.59	10.18	1.76	11.94
135	30.00	30.87	167.56	10.18	1.71	11.89
140	29.15	30.00	166.47	10.18	1.66	11.84
145	28.36	29.18	165.31	10.18	1.62	11.80
150	27.61	28.41	164.08	10.18	1.57	11.75
155	26.91	27.69	162.81	10.18	1.53	11.71
160	26.24	27.00	161.48	10.18	1.50	11.68
165	25.61	26.35	160.10	10.18	1.46	11.64
170	25.01	25.74	158.67	10.18	1.43	11.61
175	24.44	25.15	157.20	10.18	1.39	11.57
180	23.90	24.60	155.69	10.18	1.36	11.54
185	23.39	24.07	154.14	10.18	1.33	11.51
190	22.90	23.56	152.56	10.18	1.31	11.49

\* 50% of allowable controlled release rate as the underground storage is being considered

**On-site Stormwater Retention**

**Total Storage Required = 173.50 m<sup>3</sup>**

**Storage Provided**

**Underground Pipe Storage**

Length = 81.10 9.6 87.6 m  
Pipe Dia. = 1.05 0.75 0.45 m  
Storage = **70.22 4.24 13.93 m<sup>3</sup>**

**Surface Storage Underground Storage**

CBMH09 4.38 9.13 m<sup>3</sup>  
CBMH10 30.33 9.27 m<sup>3</sup>  
CBMH11 13.20 4.91 m<sup>3</sup>  
CBMH12 7.82 9.95 m<sup>3</sup>  
Total = **55.73 33.26 m<sup>3</sup>**

**Total Storage Provided = 177.39 m<sup>3</sup>**



LRL File No. 200100  
**Project:** Proposed Development  
**Location:** 6111 Hazeldean Rd (Stittsville, ON)  
**Date:** February 5, 2021  
**Designed:** M. Basnet  
**Drawing Ref.:** C601

**Stormwater Management**

**3) 100 Year Post-development Stormwater Management (Commercial Area)**

**Un-controlled Runoff**

C = 0.00  
 $I_{100}$  = 175.4 mm/hr  
 $T_d$  = 10 min  
A = 0.00 ha  
**Un-controlled Release Rate = 0.00 L/s**  
**Allowable Release Rate = 28.89 L/s**  
**Controlled Release Rate = 28.89 L/s**

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m <sup>3</sup> )	Controlled Release Rate (L/s)	Un-controlled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	200.28	102.84	28.89	0.00	28.89
15	142.89	160.28	118.25	28.89	0.00	28.89
20	119.95	134.54	126.79	28.89	0.00	28.89
25	103.85	116.48	131.39	28.89	0.00	28.89
30	91.87	103.04	133.48	28.89	0.00	28.89
35	82.58	92.63	133.85	28.89	0.00	28.89
40	75.15	84.29	132.96	28.89	0.00	28.89
45	69.05	77.45	131.12	28.89	0.00	28.89
50	63.95	71.73	128.54	28.89	0.00	28.89
55	59.62	66.88	125.36	28.89	0.00	28.89
60	55.89	62.69	121.70	28.89	0.00	28.89
65	52.65	59.05	117.63	28.89	0.00	28.89
70	49.79	55.85	113.22	28.89	0.00	28.89
75	47.26	53.00	108.52	28.89	0.00	28.89
80	44.99	50.46	103.56	28.89	0.00	28.89
85	42.95	48.18	98.38	28.89	0.00	28.89
90	41.11	46.11	93.01	28.89	0.00	28.89
95	39.43	44.23	87.46	28.89	0.00	28.89
100	37.90	42.51	81.75	28.89	0.00	28.89
105	36.50	40.94	75.91	28.89	0.00	28.89
110	35.20	39.49	69.94	28.89	0.00	28.89
115	34.01	38.14	63.85	28.89	0.00	28.89
120	32.89	36.90	57.66	28.89	0.00	28.89

**On-site Stormwater Retention**

**Total Storage Required = 133.85 m<sup>3</sup>**

**Storage Provided**

Surface Storage (refer to LRL Plan C602)

CBMH17 13.65 m<sup>3</sup>  
CBMH18 39.25 m<sup>3</sup>  
CBMH19 55.27 m<sup>3</sup>  
CBMH20 8.07 m<sup>3</sup>  
CBMH21 7.72 m<sup>3</sup>  
CBMH22 16.51 m<sup>3</sup>

**Total Surface Storage = 140.47 m<sup>3</sup>**

**Total Storage Provided = 140.47 m<sup>3</sup>**

**Summary of Release Rate**

Site Description	Controlled Release Rate (L/s)	Un-controlled Release Rate (L/s)	Total (L/s)
Halo Car Wash	14.70	20.03	34.73
Mr Lube	20.36	10.18	30.54
Commercial Area	28.89	0.00	28.89
<b>Total</b>	<b>63.95</b>	<b>30.21</b>	<b>94.16</b>

**Summary of On-site Storage**

Site Description	Storage Required (m <sup>3</sup> )	Storage Provided (m <sup>3</sup> )			
		Surface Storage	Underground Storage		Total (m <sup>3</sup> )
			Oversized Pipe	CBMH	
Halo Car Wash	217.63	139.70	61.59	29.30	230.59
Mr Lube	173.50	55.73	88.40	33.26	177.39
Commercial Area	133.85	140.47	0	0	140.47
<b>Total</b>	<b>524.97</b>	<b>335.90</b>	<b>149.98</b>	<b>62.56</b>	<b>548.44</b>



**LRL File No.** 200100

**Project:** Proposed Development

**Location:** 6111 Hazeldean Rd (Stittsville, ON)

**Date:** February 5, 2020

**Designed:** M. Basnet

**Dwg. Reference:** C401,C702

**Rational Method**

Q = 2.78CIA

Q = Peak flow (L/s)

A = Drainage area (ha)

C = Runoff coefficient

I = Rainfall intensity (mm/hr)

**Runoff coefficient (C)**

Grass = 0.2

Gravel = 0.8

Asphalt / rooftop = 0.9

**IDF curve**

Ottawa Macdonald-Cartier International Airport

Storm event: 2 Years

**Intensity equation:**

$$I_2 = 732.951 / (Td + 6.199)^{0.810} \text{ (mm/hr)}$$

**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 <sub>FULL</sub> )	Velocity Full	Time of Flow	Ratio Q / Q <sub>FULL</sub>
								(min)	(mm/hr)	(L/s)	(L/s)	(mm)		(%)	(m)	(L/s)	(m/s)	(min)	
WS-18	CB01	CBMH01	0.018	0.000	0.032	0.09	0.09	10.00	76.81	6.94		750	PVC	1.00%	37.3	1113.28	2.52	0.25	0.01
WS-01	CBMH01	CBMH02	0.045	0.000	0.049	0.15	0.24	10.25	75.87	18.08		750	PVC	0.35%	24.6	658.62	1.49	0.28	0.03
WS-02	CBMH02	CBMH03	0.000	0.000	0.091	0.23	0.47	10.52	74.86	34.93		750	PVC	0.35%	23.2	658.62	1.49	0.26	0.05
WS-03	CBMH03	CBMH04	0.000	0.000	0.076	0.19	0.66	10.78	73.93	48.62		750	PVC	0.35%	16.1	658.62	1.49	0.18	0.07
WS-04	CBMH04	CBMH06	0.006	0.000	0.035	0.09	0.75	10.96	73.30	54.83		750	PVC	0.35%	15.9	658.62	1.49	0.18	0.08
WS-05	CBMH05	CBMH06	0.000	0.000	0.044	0.11	0.86	10.00	76.81	65.98		750	PVC	0.35%	22.3	658.62	1.49	0.25	0.10
WS-06	*CBMH06	MH07	0.002	0.000	0.021	0.05	0.91	11.14	72.69	66.33	14.70	300	PVC	0.50%	16.9	68.38	0.97	0.29	0.97
	MH07	MH16	0.000	0.000	0.000	0.00	0.91	11.43	71.72	65.45	14.70	300	PVC	0.50%	32.1	68.38	0.97	0.55	0.96
WS-09	CB08	CBMH09	0.035	0.000	0.000	0.02	0.02	10.00	76.81	1.49		750	PVC	0.25%	9.6	556.64	1.26	0.13	0.00
WS-11	CBMH09	CBMH10	0.000	0.000	0.047	0.12	0.14	10.13	76.32	10.45		1050	Concrete	0.25%	28.30	1365.36	1.58	0.30	0.01
WS-12	CBMH10	CBMH12	0.009	0.000	0.050	0.13	0.27	10.43	75.21	20.16		1050	Concrete	0.25%	26.80	1365.36	1.58	0.28	0.01
WS-13	CBMH11	CBMH12	0.008	0.000	0.022	0.06	0.33	10.00	76.81	25.17		1050	Concrete	0.25%	26.00	1365.36	1.58	0.27	0.02
WS-16			0.000	0.000	0.068	0.17	0.50	10.00	76.81	38.23									
WS-17	CB100	CBMH12	0.030	0.000	0.076	0.21	0.70	10.00	76.81	54.12		450	PVC	5.00%	14.00	637.52	4.01	0.06	0.08
WS-14	*CBMH12	MH16	0.004	0.000	0.047	0.12	0.82	10.71	74.18	61.07	20.34	300	PVC	0.50%	7.10	68.38	0.97	0.12	0.89
	MH16	MH23	0.000	0.000	0.000	0.00	1.74	11.98	69.95	121.41	35.04	450	PVC	0.30%	74.10	156.16	0.98	1.26	0.78
WS-20	CB18	CBMH19	0.009	0.000	0.054	0.14	0.14	10.00	76.81	10.80		300	PVC	1.00%	17.1	96.70	1.37	0.21	0.11
WS-21	CBMH19	CBMH22	0.034	0.000	0.052	0.15	0.29	10.21	76.01	21.97		300	PVC	1.00%	20.80	96.70	1.37	0.25	0.23
WS-19	CB17	CBMH22	0.025	0.000	0.129	0.34	0.63	10.00	76.81	48.09		300	PVC	1.00%	20.10	96.70	1.37	0.24	0.50
WS-22	CB20	CBMH21	0.000	0.000	0.043	0.11	0.73	10.00	76.81	56.26		300	PVC	1.00%	6.90	96.70	1.37	0.08	0.58
WS-23	CBMH21	CBMH22	0.000	0.000	0.034	0.09	0.82	10.08	76.48	62.55		300	PVC	1.00%	21.50	96.70	1.37	0.26	0.65
WS-24	*CBMH22	MH23	0.001	0.000	0.032	0.08	0.90	10.46	75.08	67.37	28.89	300	PVC	1.00%	17.40	96.70	1.37	0.21	0.70
**Phase 2						1.07	1.07	10.11	76.39	81.37	TBD	300	PVC	1.00%	5.30	96.70	1.37	0.06	0.84
	MH23	MH24	0.00	0.00	0.00	0.00	3.70	13.24	66.26	245.04	63.93	600	PVC	0.30%	40.40	336.31	1.19	0.57	0.73
	MH24	OGS	0.00	0.00	0.00	0.00	3.70	13.81	64.73	239.41	63.93	600	PVC	0.30%	6.80	336.31	1.19	0.10	0.71
	OGS	Ext. STUB	0.00	0.00	0.00	0.00	3.70	13.90	64.49	238.49	63.93	600	PVC	0.38%	28.00	378.50	1.34	0.35	0.63

\* CBMH with an inlet control device (ICD)

\*\* C value assumed as 0.75 as per Potter's Key Subdivision Report

# Stormceptor®EF Sizing Report

<b>STORMCEPTOR®</b> <b>ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION</b>		01/08/2021	
Province:	Ontario	Project Name:	6111 Hazeldean Rd.
City:	Stittsville	Project Number:	200100
Nearest Rainfall Station:	OTTAWA MACDONALD-CARTIER INT'L AP	Designer Name:	Brandon O'Leary
NCDC Rainfall Station Id:	6000	Designer Company:	Forterra
Years of Rainfall Data:	37	Designer Email:	brandon.oleary@forterrabp.com
Site Name:	6111 Hazeldean Rd.	Designer Phone:	905-630-0359
Drainage Area (ha):	1.345	EOR Name:	Mohan Basnet
Runoff Coefficient 'c':	0.73	EOR Company:	LRL Associates Ltd.
Particle Size Distribution:	Fine	EOR Email:	mbasnet@lrl.ca
Target TSS Removal (%):	80.0	EOR Phone:	
Required Water Quality Runoff Volume Capture (%):	90.0		
Estimated Water Quality Flow Rate (L/s):	35.48	<b>Net Annual Sediment (TSS) Load Reduction Sizing Summary</b>	
Oil / Fuel Spill Risk Site?	Yes	Stormceptor Model	TSS Removal Provided (%)
Upstream Flow Control?	No	EFO4	67
Peak Conveyance (maximum) Flow Rate (L/s):		EFO6	77
		<b>EFO8</b>	<b>83</b>
		EFO10	86
		EFO12	88
<b>Recommended Stormceptor EFO Model:</b>		<b>EFO8</b>	
<b>Estimated Net Annual Sediment (TSS) Load Reduction (%):</b>		<b>83</b>	
<b>Water Quality Runoff Volume Capture (%):</b>		<b>&gt; 90</b>	

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<sup>®</sup>EF Sizing Report

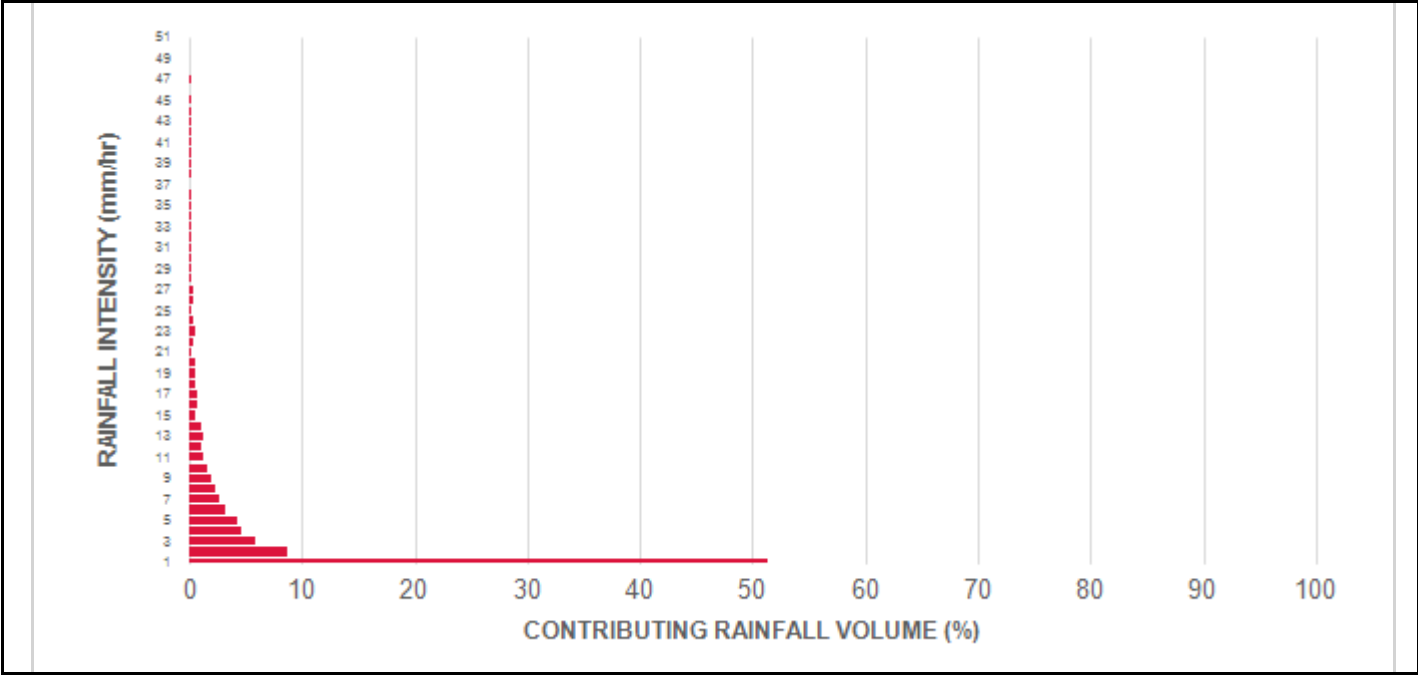
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m <sup>2</sup> )	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	51.3	51.3	2.73	164.0	35.0	93	47.7	47.7
2	8.7	60.0	5.46	328.0	70.0	90	7.8	55.5
3	5.8	65.8	8.19	491.0	105.0	87	5.0	60.6
4	4.6	70.4	10.92	655.0	139.0	83	3.8	64.4
5	4.2	74.6	13.65	819.0	174.0	79	3.3	67.7
6	3.2	77.8	16.38	983.0	209.0	75	2.4	70.1
7	2.6	80.4	19.11	1146.0	244.0	72	1.9	72.0
8	2.4	82.8	21.84	1310.0	279.0	70	1.7	73.7
9	1.9	84.7	24.57	1474.0	314.0	66	1.3	74.9
10	1.6	86.3	27.30	1638.0	348.0	63	1.0	75.9
11	1.3	87.6	30.02	1801.0	383.0	60	0.8	76.7
12	1.1	88.7	32.75	1965.0	418.0	58	0.6	77.3
13	1.3	90.0	35.48	2129.0	453.0	57	0.7	78.1
14	1.1	91.1	38.21	2293.0	488.0	56	0.6	78.7
15	0.6	91.7	40.94	2457.0	523.0	54	0.3	79.0
16	0.8	92.5	43.67	2620.0	558.0	54	0.4	79.4
17	0.7	93.2	46.40	2784.0	592.0	52	0.4	79.8
18	0.5	93.7	49.13	2948.0	627.0	52	0.3	80.1
19	0.6	94.3	51.86	3112.0	662.0	52	0.3	80.4
20	0.5	94.8	54.59	3275.0	697.0	52	0.3	80.6
21	0.2	95.0	57.32	3439.0	732.0	51	0.1	80.7
22	0.4	95.4	60.05	3603.0	767.0	51	0.2	80.9
23	0.5	95.9	62.78	3767.0	801.0	51	0.3	81.2
24	0.4	96.3	65.51	3931.0	836.0	51	0.2	81.4
25	0.1	96.4	68.24	4094.0	871.0	51	0.1	81.5

## Stormceptor<sup>®</sup>EF Sizing Report

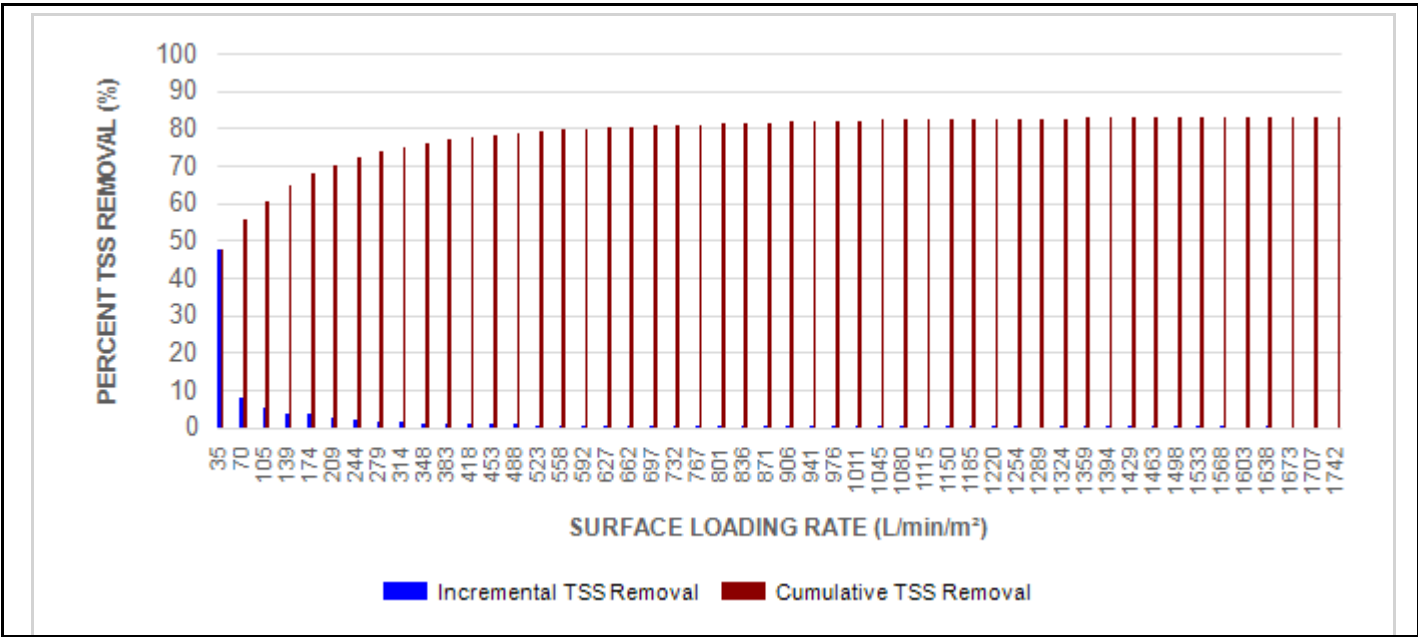
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m <sup>2</sup> )	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.3	96.7	70.97	4258.0	906.0	51	0.2	81.6
27	0.4	97.1	73.70	4422.0	941.0	50	0.2	81.8
28	0.2	97.3	76.43	4586.0	976.0	50	0.1	81.9
29	0.2	97.5	79.16	4749.0	1011.0	50	0.1	82.0
30	0.2	97.7	81.89	4913.0	1045.0	50	0.1	82.1
31	0.1	97.8	84.62	5077.0	1080.0	49	0.0	82.2
32	0.2	98.0	87.35	5241.0	1115.0	49	0.1	82.2
33	0.1	98.1	90.07	5404.0	1150.0	49	0.0	82.3
34	0.1	98.2	92.80	5568.0	1185.0	48	0.0	82.3
35	0.1	98.3	95.53	5732.0	1220.0	48	0.0	82.4
36	0.2	98.5	98.26	5896.0	1254.0	48	0.1	82.5
37	0.0	98.5	100.99	6060.0	1289.0	47	0.0	82.5
38	0.1	98.6	103.72	6223.0	1324.0	47	0.0	82.5
39	0.1	98.7	106.45	6387.0	1359.0	47	0.0	82.6
40	0.1	98.8	109.18	6551.0	1394.0	46	0.0	82.6
41	0.1	98.9	111.91	6715.0	1429.0	45	0.0	82.7
42	0.1	99.0	114.64	6878.0	1463.0	44	0.0	82.7
43	0.2	99.2	117.37	7042.0	1498.0	43	0.1	82.8
44	0.1	99.3	120.10	7206.0	1533.0	42	0.0	82.8
45	0.1	99.4	122.83	7370.0	1568.0	41	0.0	82.9
46	0.0	99.4	125.56	7534.0	1603.0	40	0.0	82.9
47	0.1	99.5	128.29	7697.0	1638.0	40	0.0	82.9
48	0.0	99.5	131.02	7861.0	1673.0	39	0.0	82.9
49	0.0	99.5	133.75	8025.0	1707.0	38	0.0	82.9
50	0.0	99.5	136.48	8189.0	1742.0	37	0.0	82.9
Estimated Net Annual Sediment (TSS) Load Reduction =								83 %

Stormceptor®EF Sizing Report

RAINFALL DATA FROM OTTAWA MACDONALD-CARTIER INT'L AP 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
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

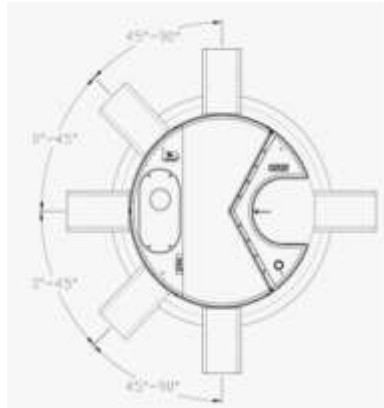
► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle,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

### STANDARD STORMCEPTOR EF/EFO SPECIFICATION

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

## Stormceptor<sup>®</sup> EF Sizing Report

# 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 <sup>3</sup> sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m <sup>3</sup> sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m <sup>3</sup> sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m <sup>3</sup> sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m <sup>3</sup> sediment / 2,476 L oil

## Stormceptor<sup>®</sup>EF Sizing Report

### PART 3 – PERFORMANCE & DESIGN

#### 3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

#### 3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

#### 3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m<sup>2</sup>.

#### 3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m<sup>2</sup> to 2600 L/min/m<sup>2</sup>) 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.

\\NIMBRIUM\PRODUCTS\STORMCEPTOR EF40 DRAWINGS & DETAILS\STANDARD DETAILS\EFO8-DETAIL.DWG 10/19/2018 9:54 AM



- ## INSTALLATION NOTES

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

OUTLET RISER & MAINTENANCE ACCESS

OUTLET RISER VANE

DROP PIPE

SINGLE OR MULTIPLE INLET PIPES  
25mm [1"] DIFFERENCE BETWEEN  
INLET INVERT AND OUTLET INVERT

FRAME AND COVER  
MIN.  $\text{ø}755$  [22"]  
TO BE LOCATED OVER  
DROP PIPE.

FRAME AND COVER  
MIN.  $\text{ø}710$  [28"]  
TO BE LOCATED OVER  
MAINTENANCE ACCESS,  
OIL INSPECTION PORT.

WEIR

OUTLET PLATFORM

OIL INSPECTION PORT

INLET

OUTLET

PLAN VIEW (STANDARD)

OUTLET RISER & MAINTENANCE ACCESS

OUTLET RISER VANE

DROP PIPE

SINGLE OR MULTIPLE INLET PIPES  
25mm [1"] DIFFERENCE BETWEEN  
INLET INVERT AND OUTLET INVERT

INLET FRAME AND GRATE  
MIN. 610x610 mm [24"x24"]  
TO BE LOCATED OVER  
DROP PIPE.

FRAME AND COVER  
MIN.  $\text{ø}710$  [28"]  
TO BE LOCATED OVER  
MAINTENANCE ACCESS,  
OIL INSPECTION PORT.

WEIR

OUTLET PLATFORM

OIL INSPECTION PORT

INLET

OUTLET

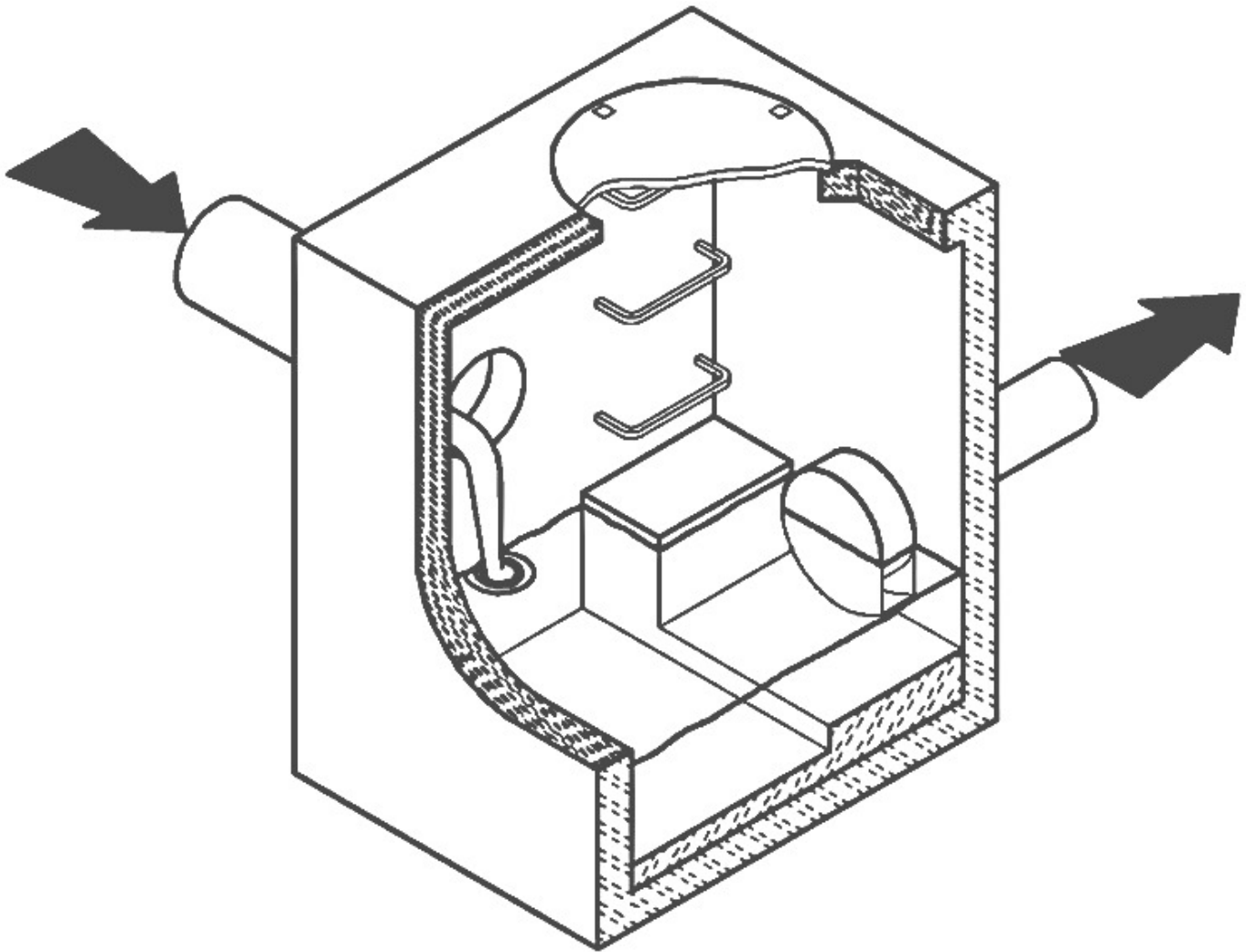
PLAN VIEW (INLET TOP)

<b><u>SITE SPECIFIC DATA REQUIREMENTS</u></b>					
<b>STORMCEPTOR MODEL</b>			<b>EFO8</b>		
<b>STRUCTURE ID</b>					<b>*</b>
<b>HYDROCARBON STORAGE REQ'D (L)</b>					<b>*</b>
<b>WATER QUALITY FLOW RATE (L/s)</b>					<b>*</b>
<b>PEAK FLOW RATE (L/s)</b>					<b>*</b>
<b>RETURN PERIOD OF PEAK FLOW (yrs)</b>					<b>*</b>
<b>DRAINAGE AREA (HA)</b>					<b>*</b>
<b>DRAINAGE AREA IMPERVIOUSNESS (%)</b>					<b>*</b>
<b>PIPE DATA:</b>	<b>I.E.</b>	<b>MAT'L</b>	<b>DIA</b>	<b>SLOPE %</b>	<b>HGL</b>
<b>INLET #1</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>
<b>INLET #2</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>
<b>OUTLET</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>
<b>* PER ENGINEER OF RECORD</b>					

[illegible]



## HYDROVEX<sup>®</sup> VHV / SVHV Vertical Vortex Flow Regulator



**JOHN MEUNIER**

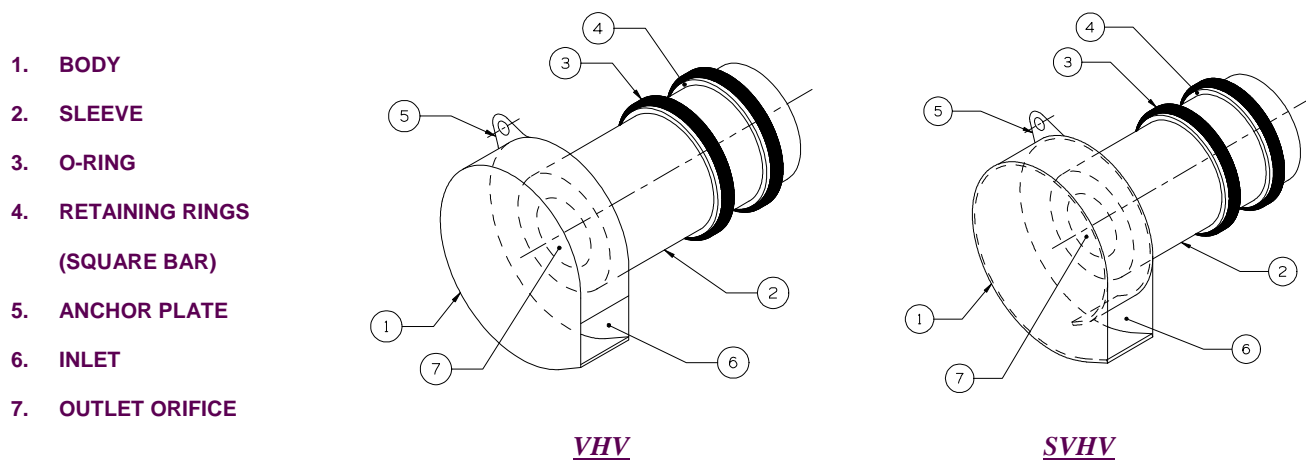
## APPLICATIONS

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

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

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

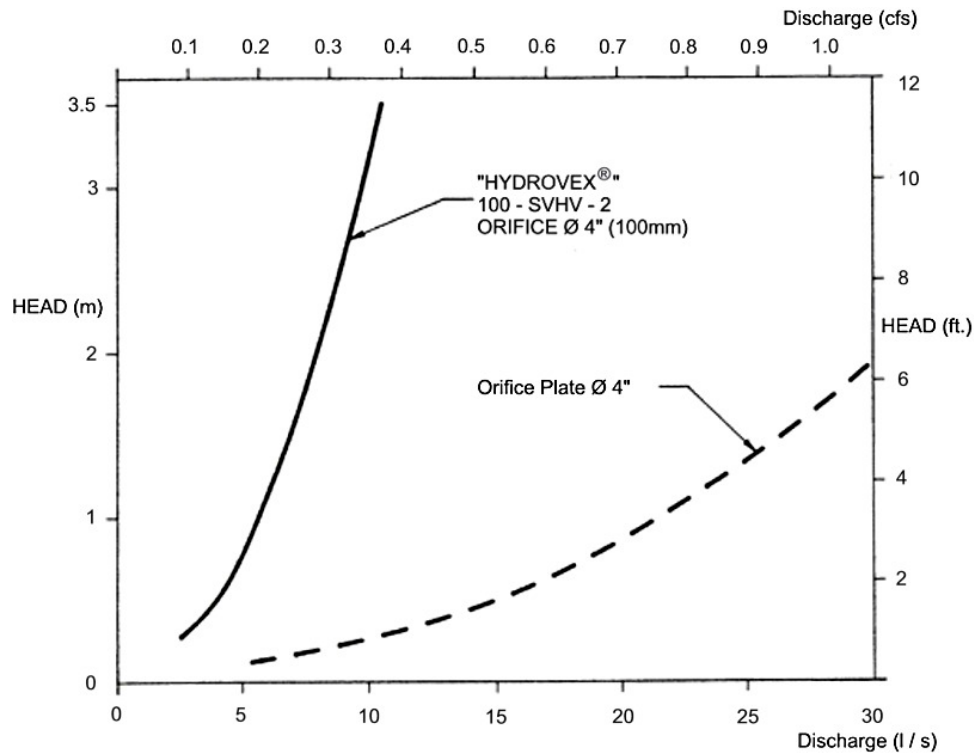
The **HYDROVEX® VHV / SVHV** Vertical Vortex Flow Regulators (refer to **Figure 1**) are manufactured entirely of stainless steel, and consist of a hollow body (1) (in which flow control takes place) and an outlet orifice (7). Two rubber "O" rings (3) seal and retain the unit inside the outlet pipe.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



**FIGURE 1: HYDROVEX® VHV-SVHV VERTICAL VORTEX FLOW REGULATORS**

## ADVANTAGES

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



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

## SELECTION

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

### Example:

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

## INSTALLATION REQUIREMENTS

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

## SPECIFICATIONS

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

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

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

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

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



*Typical VHV model in factory*

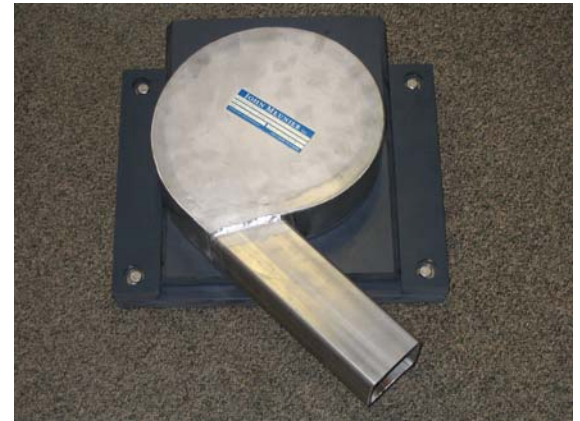
## OPTIONS



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



*FV – SVHV (mounted on sliding plate)*



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



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



*VHV with air vent for minimal slopes*



# VHV Vertical Vortex Flow Regulator

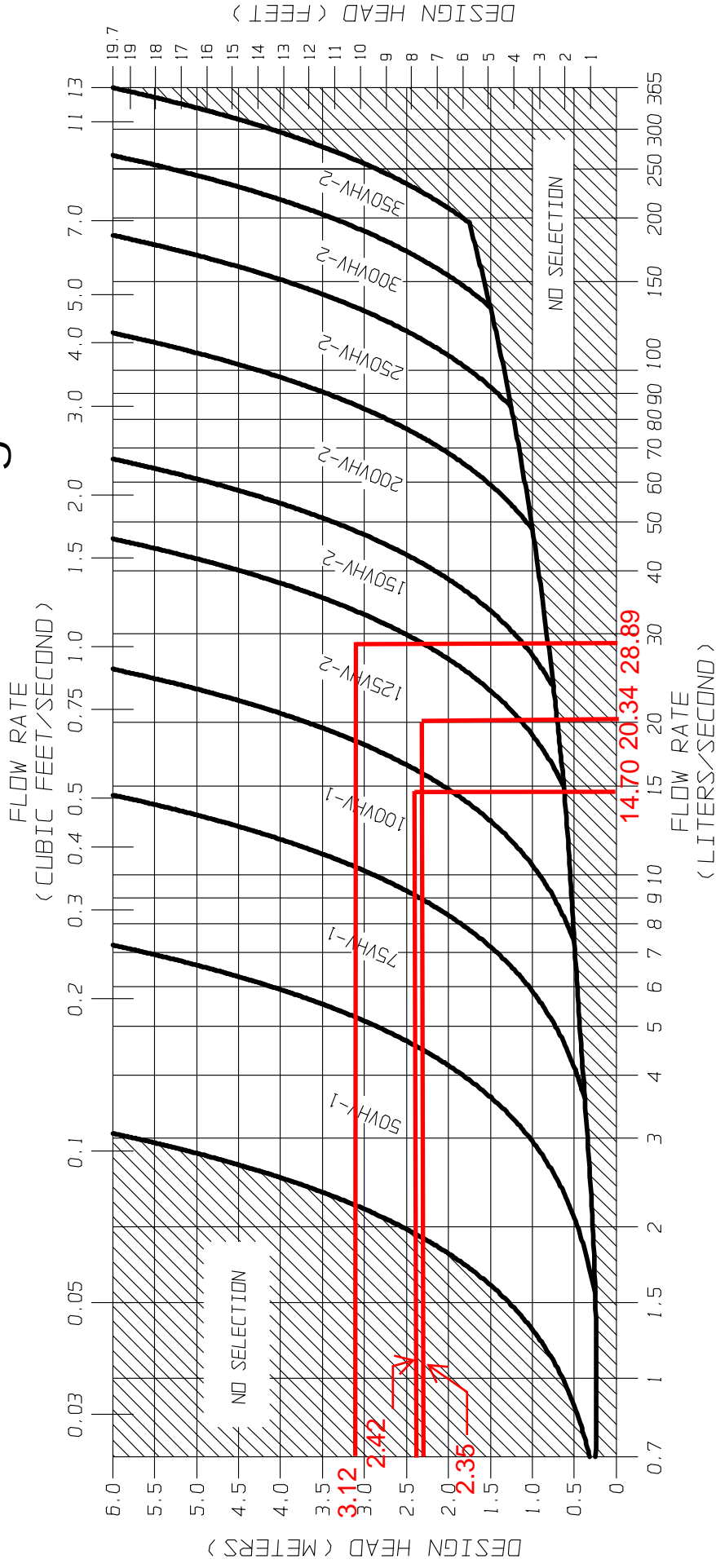
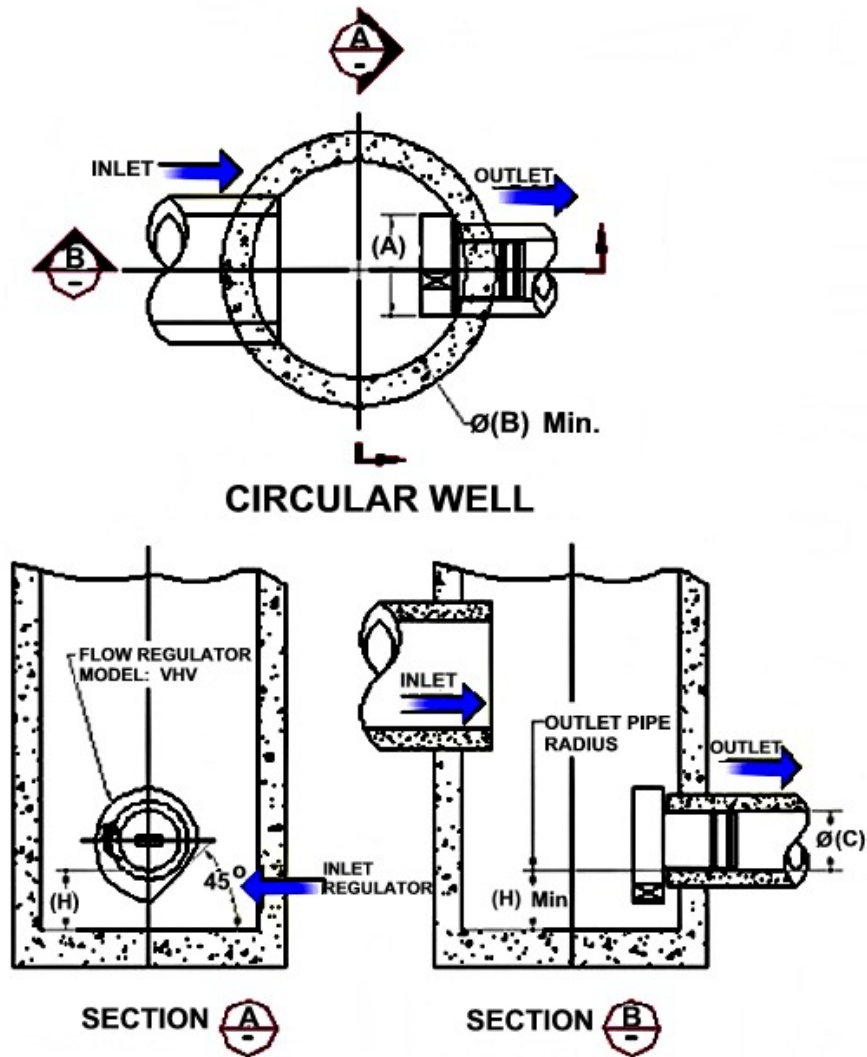


FIGURE 3 - VHV

JOHN MEUNIER

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

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



## INSTALLATION

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

## MAINTENANCE

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

## GUARANTY

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

### John Meunier Inc.

ISO 9001 : 2008

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## **APPENDIX E**

### **Civil Engineering Drawings**



# PROPOSED DEVELOPMENT 6111 HAZELDEAN RD STITTSVILLE, ON

## REVISION 01



KEY PLAN (N.T.S.)

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PROPOSED DEVELOPMENT  
6111 HAZELDEAN ROAD  
REV.01 - ISSUED FOR APPROVAL - FEBRUARY 5TH, 2021  
LRL PROJECT no: 200100



NOT AUTHENTIC UNLESS SIGNED AND DATED

GENERAL NOTES

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

EROSION AND SEDIMENT CONTROL MEASURES

GENERAL

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

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

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

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

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

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

CONTRACTOR'S RESPONSIBILITIES

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

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

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

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

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

SPILL CONTROL NOTES

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

MUD MAT NOTES

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

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. SC1.1 PROVISION SHALL BE MADE OR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN O THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSB 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 30MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 30MM LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
12. REFER JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
13. SIDEWALKS TO BE 13MM & BEVELED AT 2:1 OR 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.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

ROADWORK SPECIFICATIONS

15. ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT, PREPARED BY LRL ASSOCIATES. DATED NOVEMBER 2020.
16. AL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK PILLED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
17. THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
18. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 30MM LIFTS.
19. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
2. CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING S8. THE SEALS SHOULD BE AT LEAST 1.5M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPATIBLE BROWN SILTY CLAY PLACED IN MAXIMUM 225MM LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT 60M INTERVALS IN THE SERVICE TRENCHES.
3. SERVICES TO BUILDING TO BE TERMINATED 1.0M FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
4. ALL MAINTENANCE STRUCTURE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY, A MINIMUM OF 300MM AROUND STRUCTURES.
5. "MODULOC" OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.
6. SAFETY PLATFORMS SHALL BE PER OPSD 404.02.
7. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01, IF APPLICABLE.
8. THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO RECORDING IN A FORMAT ACCEPTABLE TO ENGINEER. ALL SEWER ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS AND NECESSARY REPAIRS HAVE BEEN COMPLETED TO THE SATISFACTION OF THE ENGINEER.
9. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.

SANITARY

10. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), AND SPECIFICATIONS (OPSS).
11. ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX RING-TITE" (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
12. EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
13. SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
14. SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
15. SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.
16. 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING SSP-1.

STORM

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

WATERMAIN

30. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
31. ALL PVC WATERMAINS SHALL BE AWMA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
32. ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
33. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
34. ALL PVC WATERMAINS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
35. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
36. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
37. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
38. THRUST BLOKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
39. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
40. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25.2 AND W25, RESPECTIVELY.
41. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
42. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
43. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
44. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
45. FIRE HYDRANT INSTALLATION SHALL BE ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED FINISHED GRADE AT HYDRANT. FIRE HYDRANT LOCATION AS PER STD DWG W18.
46. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
47. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
48. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT ENVIRONMENT. IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
49. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.
50. ALL WATERMAIN AND WATER SERVICES ARE TO BE INSTALLED 2.4m BELOW GROUND SURFACE. REFER TO CROSSING TABLE FOR CR-XX CROSSINGS ON C401

USE AND INTERPRETATION OF DRAWINGS

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

CLIENT			
HALO CAR WASH			
DESIGNED BY:	DRAWN BY:	APPROVED BY:	
M.B. / P.P.	M.L.	M.B.	

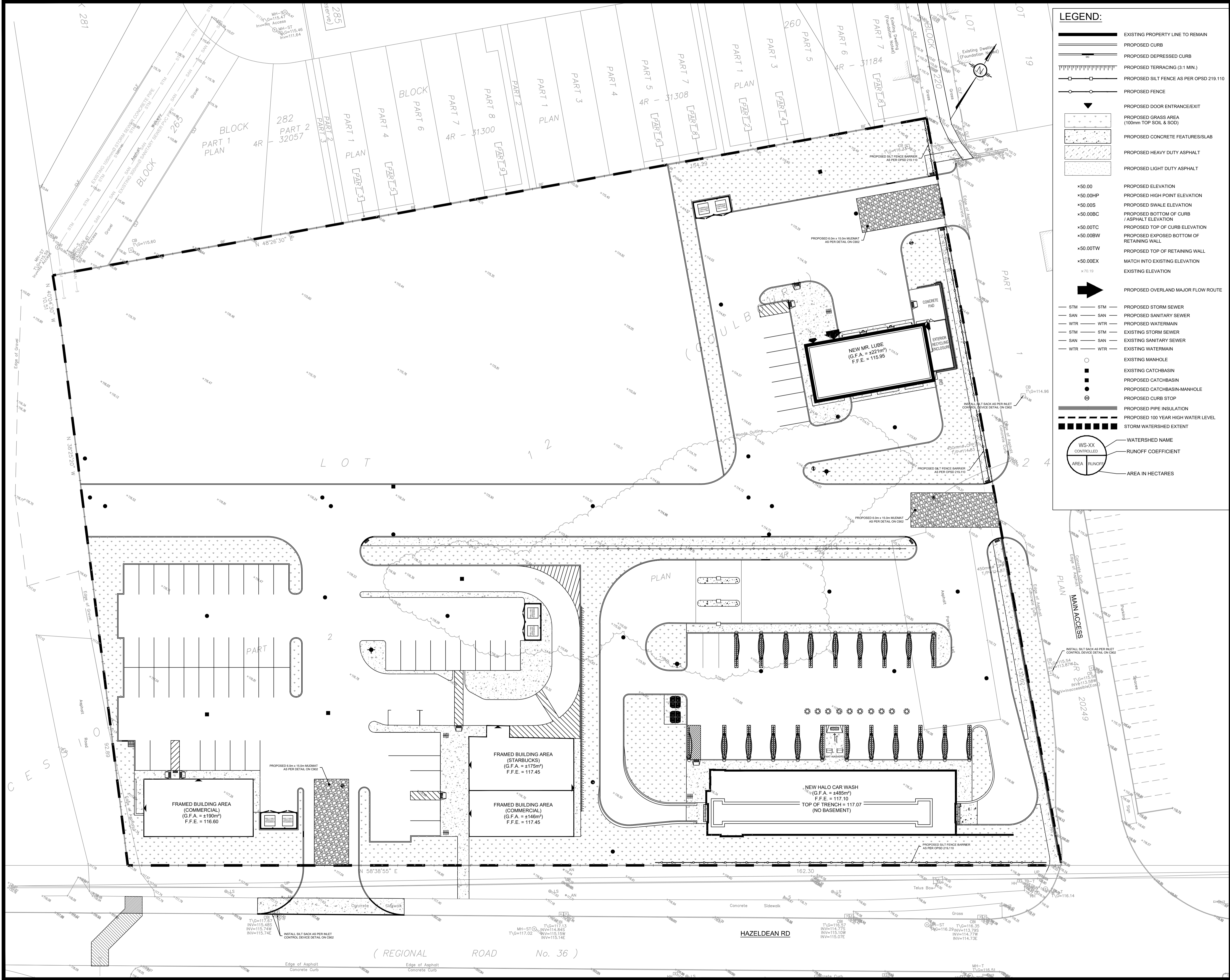
PROJECT

PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTSVILLE, ON

DRAWING TITLE

GENERAL NOTES PLAN

PROJECT NO. 200100	C001
DATE APRIL 2020	



**LEGEND:**

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- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED FENCE
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01 ISSUED FOR APPROVAL P.P. 05 FEB 2021  
No. REVISIONS BY DATE

**PROFESSIONAL ENGINEER**  
M. BASNET  
100501996  
2021/02/05  
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

**LRL**  
ENGINEERING | INGENIERIE  
5430 Canotek Road | Ottawa, ON, K1J 9G2  
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CLIENT: HALO CAR WASH

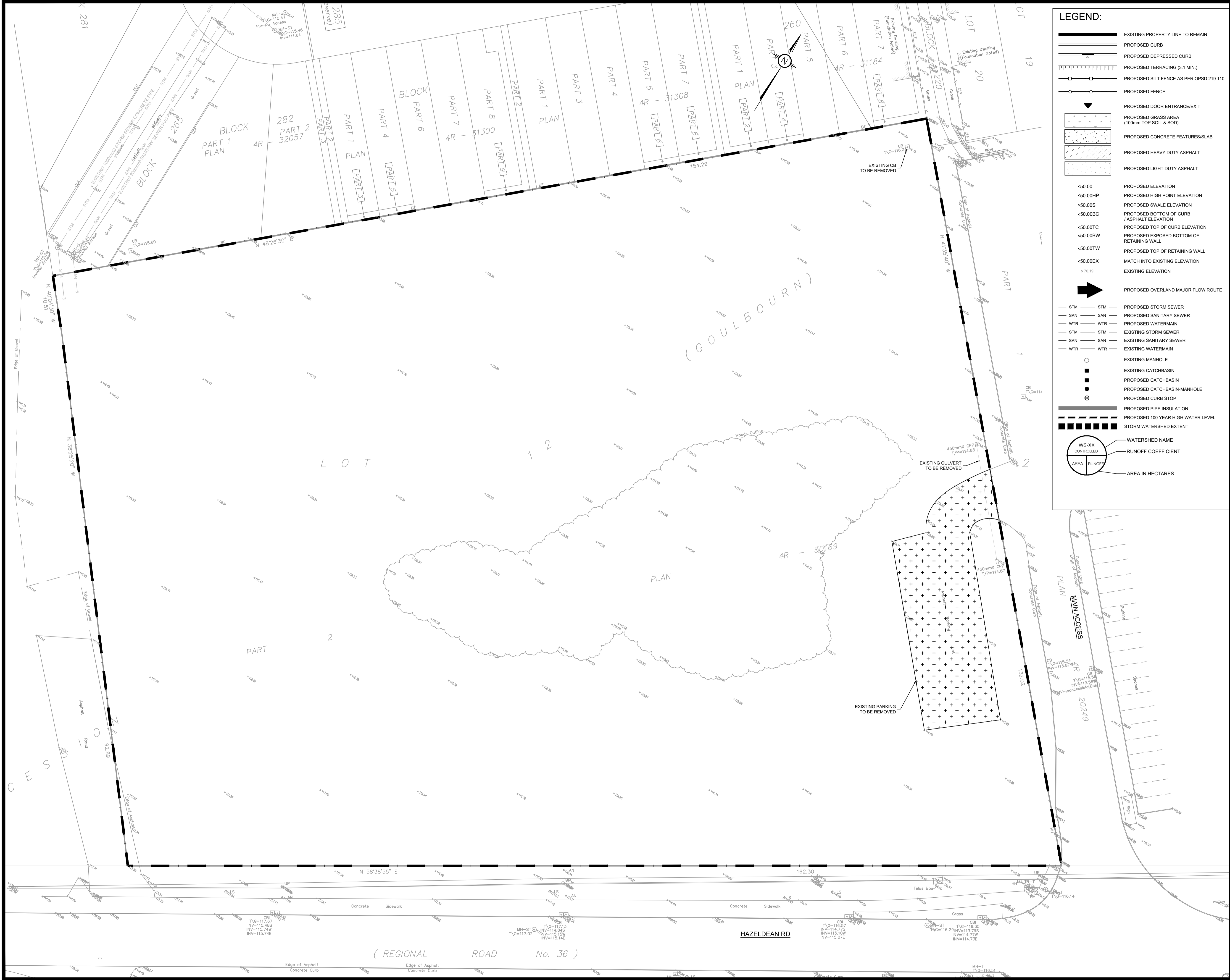
DESIGNED BY: M.B. / P.P. DRAWN BY: M.L. APPROVED BY: M.B.

PROJECT: PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTVILLE, ON

DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO. 200100  
DATE: APRIL 2020

**C101**



**LEGEND:**

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- PROPOSED DEPRESSED CURB
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www.lrl.ca | (613) 842-3434

CLIENT: HALO CAR WASH

DESIGNED BY: M.B. / P.P. DRAWN BY: M.L. APPROVED BY: M.B.

PROJECT: PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTVILLE, ON

DRAWING TITLE: DEMOLITION PLAN

PROJECT NO.: 200100  
DATE: APRIL 2020

**C102**



KEY PLAN  
N.T.S.

DETAILS OF DEVELOPMENT			
DATA		REQUIRED	PROVIDED
ZONING		AM9 (1699)-h - AREA C	
SETBACKS	FY	5.0m	5.0m
	RY	10.0m	35.1m
	INT.SY	N/A	3.0m
	EXT.SY	N/A	
NET LOT AREA ( sqm )		18,490sqm	
BUILDING COVERAGE		N/A	6.6 %
BUILDING HEIGHT		20.0m (MAX)	8.0m (CARWASH)
GROSS FLOOR AREA		1,217 sqm	
No. of UNITS		5	
LOADING SPACES		N/A	2
PARKING:		32 + 4 HC	75 + 6 HC
CAR WASH : NONE		0	
AUTOMOBILE SERVICE STATION : 2 PER SERVICE BAY		6	
RESTAURANT - FAST FOOD : 10 PER 100sqm		18	
RETAIL : 3.4 PER 100sqm		5	
RETAIL : 3.4 PER 100sqm		7	
No. OF STOREYS		1	
OTHER:			

PHASE 2 - FUTURE DEVELOPMENT  
AREA = 0.51 ha.

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01	ISSUED FOR APPROVAL	P.P.	05 FEB 2021
No.	REVISIONS	BY	DATE



NOT AUTHENTIC UNLESS SIGNED AND DATED



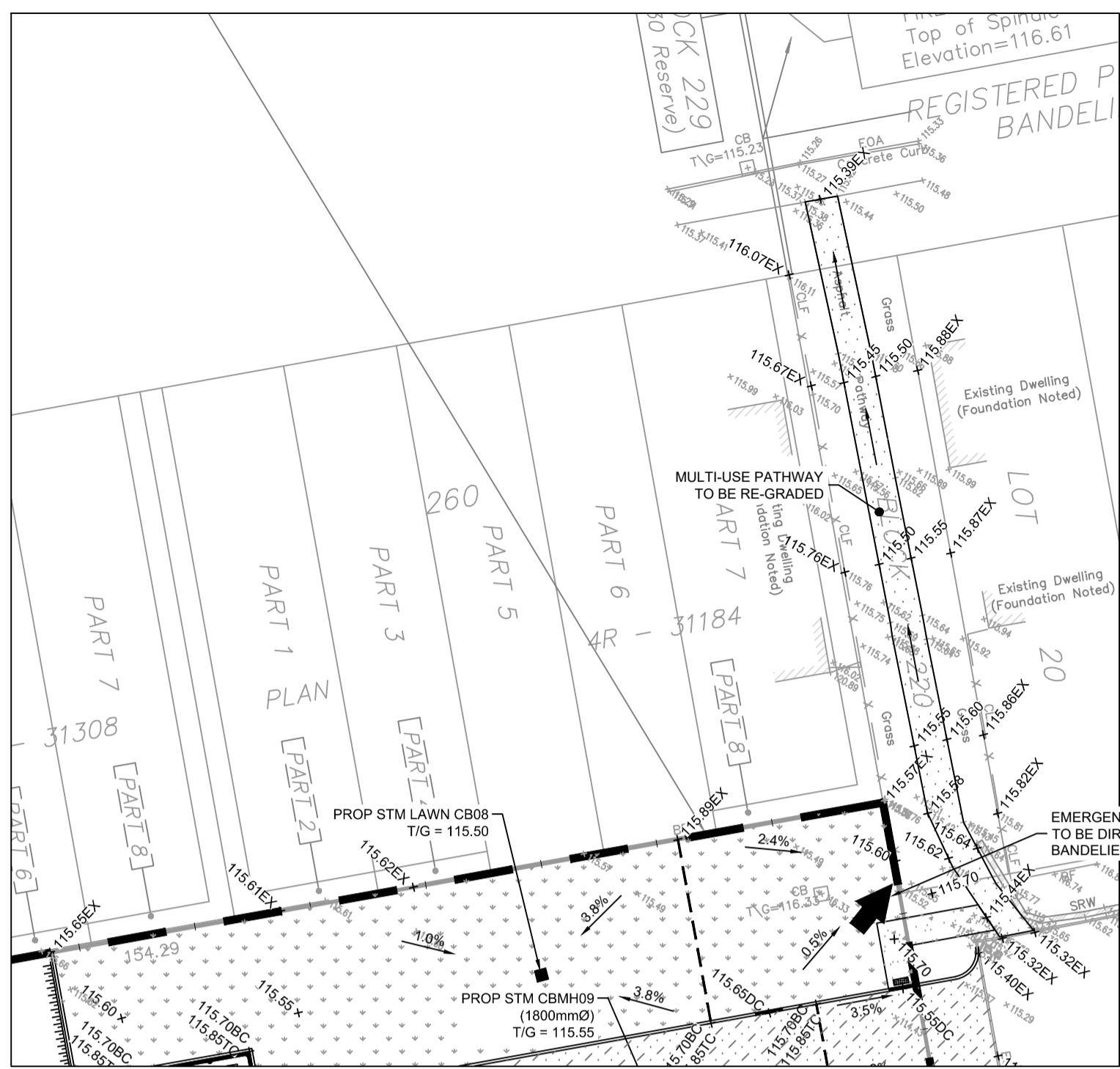
CLIENT  
HALO CAR WASH

DESIGNED BY: M.B. / P.P. DRAWN BY: M.L. APPROVED BY: M.B.

PROJECT  
PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTVILLE, ON

DRAWING TITLE  
SITE DEVELOPMENT PLAN

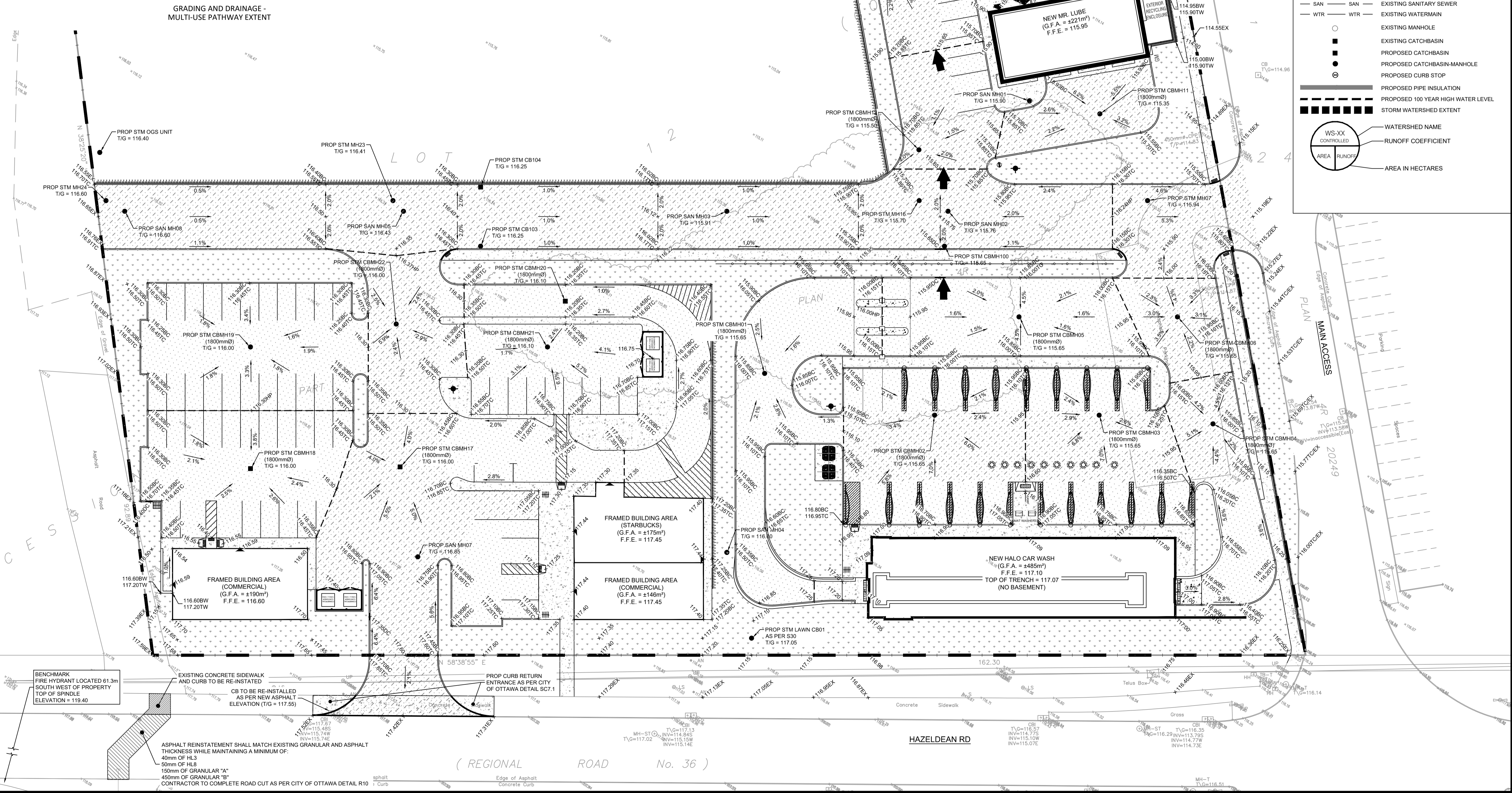
PROJECT NO.  
200100  
DATE  
APRIL 2020  
C201



PAVEMENT STRUCTURE			
COURSE	MATERIAL	THICKNESS (mm)	
		AUTOMOBILE PARKING	TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL3/SP12.5	50	40
BINDER	HL8/SP19.0	-	50
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	300	400

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

PAVEMENT STRUCTURE AS PER GEOTECHNICAL REPORT PREPARED BY LRL DATED SEPTEMBER 30th, 2020.



**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 FENCE
- 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 SLOPE ELEVATION
- PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- 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
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX - WATERSHED NAME
- CONTROLLED - RUNOFF COEFFICIENT
- AREA - AREA IN HECTARES

**USE AND INTERPRETATION OF DRAWINGS**

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

5m 2 5 10m  
SCALE: 1:300

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

CLIENT: **HALO CAR WASH**

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B. / P.P.	M.L.	M.B.

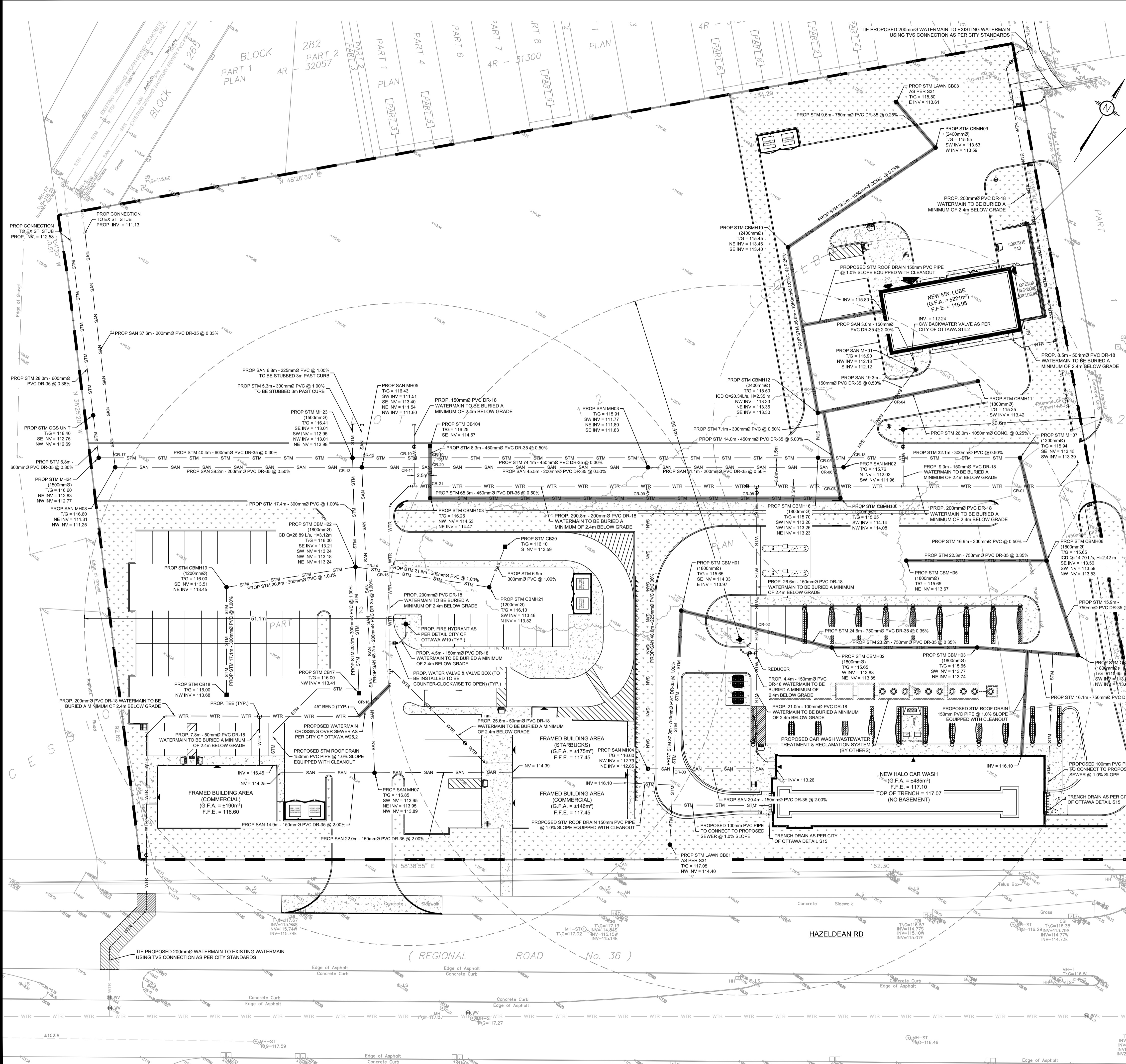
PROJECT: **PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTVILLE, ON**

DRAWING TITLE: **GRADING AND DRAINAGE PLAN**

PROJECT NO.: **200100**

DATE: **APRIL 2020**

**C301**



**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
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- PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
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- PROPOSED FENCE
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- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE
- PROPOSED CURB STOP
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- Watershed Name: WS-XX
- Runoff Coefficient: CONTROLLED
- Area in Hectares: AREA

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No.	REVISIONS	BY	DATE

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

Crossing #	WM	STM	SAN	Depth Separation (m)
CR-01	113.17 (obv.)	113.47 (inv.)	N/A	0.30
CR-02	113.55 (obv.)	113.92 (inv.)	N/A	0.37
CR-03	N/A	114.28 (inv.)	113.08 (obv.)	1.20
CR-04	N/A	113.39 (inv.)	112.24 (obv.)	1.15
CR-05*	N/A	113.75 (inv.)	113.54 (obv.) (STM Lead)	0.21
CR-06	N/A	113.82 (inv.)	112.15 (obv.)	1.67
CR-07	113.60 (obv.)	113.97 (inv.)	N/A	0.37
CR-08	113.70 (obv.)	114.15 (inv.)	N/A	0.45
CR-09	N/A	113.35 (inv.)	112.15 (obv.)	1.20
CR-10	113.75 (inv.)	113.45 (obv.)	N/A	0.30
CR-11	113.80 (inv.)	N/A	111.70 (obv.)	2.10
CR-12	N/A	112.98 (obv.)	111.65 (inv.)	1.33
CR-13	N/A	112.10 (obv.)	113.02 (inv.)	0.92
CR-14	N/A	113.26 (inv.)	111.96 (obv.)	1.30
CR-15	113.00 (obv.)	113.30 (inv.)	N/A	0.30
CR-16	114.48 (inv.)	N/A	114.18 (obv.)	0.30
CR-17	N/A	112.84 (inv.)	111.45 (obv.)	1.39
CR-18	N/A	113.26 (inv.)	112.18 (obv.)	1.08
CR-19	N/A	114.56 (inv.)	113.47 (obv.) (Street STM)	1.09
CR-20	N/A	114.55 (inv.)	111.77 (obv.) (STM Lead)	2.78
CR-21	113.90 (obv.)	114.55 (inv.)	N/A	0.65

\*Unshrinkable backfill as per opps 1359 is to be used where a minimum of 0.3m can't be achieved

CLIENT: **HALO CAR WASH**

DESIGNED BY: **M.B. / P.P.** DRAWN BY: **M.L.** APPROVED BY: **M.B.**

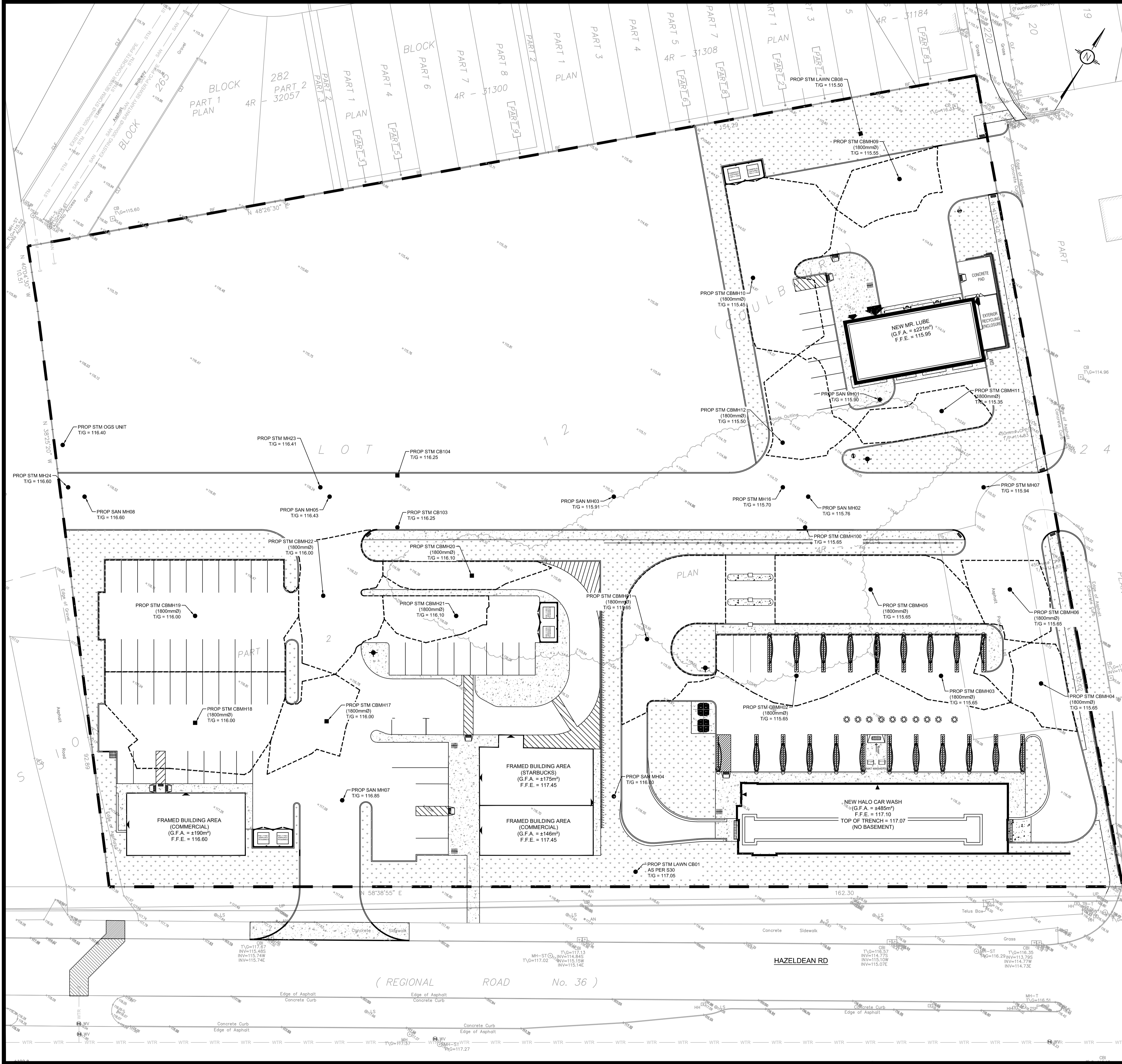
PROJECT: **PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTVILLE, ON**

DRAWING TITLE: **SERVICING PLAN**

PROJECT NO: **200100**

DATE: **APRIL 2020**

**C401**



**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 FENCE  
PROPOSED DOOR ENTRANCE/EXIT  
PROPOSED GRASS AREA (100mm TOP SOIL & SOD)  
PROPOSED CONCRETE FEATURES/SLAB  
PROPOSED HEAVY DUTY ASPHALT  
PROPOSED LIGHT DUTY ASPHALT  
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PROPOSED HIGH POINT ELEVATION  
PROPOSED SWALE ELEVATION  
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PROPOSED TOP OF RETAINING WALL  
MATCH INTO EXISTING ELEVATION  
EXISTING ELEVATION  
PROPOSED OVERLAND MAJOR FLOW ROUTE  
STM  
SAN  
WTR  
STM  
STM  
SAN  
WTR  
EXISTING MANHOLE  
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PROPOSED CATCHBASIN  
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PROPOSED 100 YEAR HIGH WATER LEVEL  
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WS-XX CONTROLLED  
AREA  
RUNOFF  
AREA IN HECTARES

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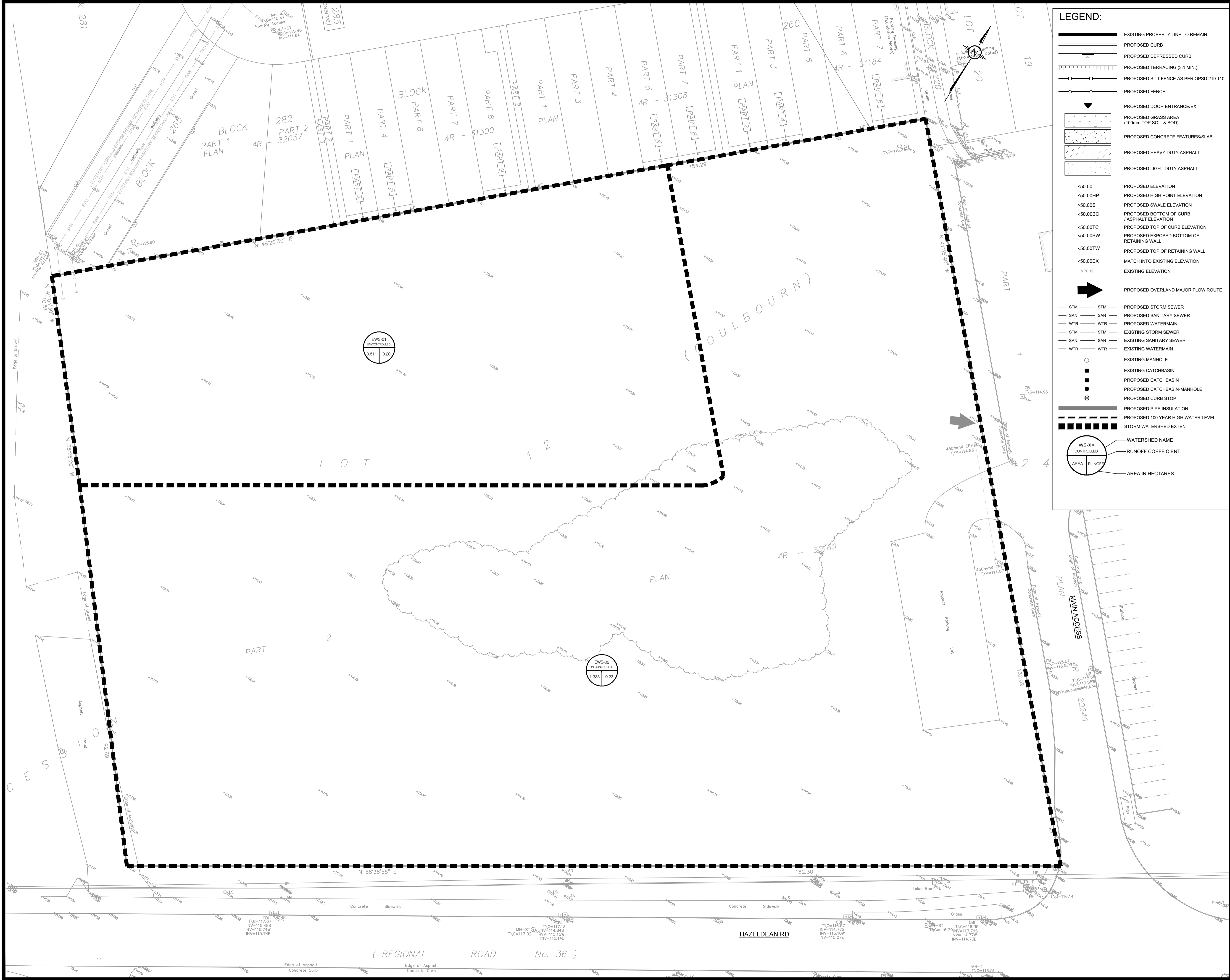
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01 ISSUED FOR APPROVAL P.P. 05 FEB 2021  
No. REVISIONS BY DATE  
M.B. / P.P. M.L. M.B.  
DESIGNED BY: DRAWN BY: APPROVED BY:  
PROJECT: 6111 HAZELDEAN RD STITTVILLE, ON  
DRAWING TITLE: STORMWATER MANAGEMENT PLAN  
PROJECT NO. 200100  
DATE: APRIL 2020

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

**PROPOSED DEVELOPMENT**  
6111 HAZELDEAN RD  
STITTVILLE, ON

Structure	T/G	HWL (100yr event)	Ponding Depth (100yr event) (m)	Storage (100yr event) (m³)
CBMH01	115.65	115.95	0.30	32.59
CBMH02	115.65	115.95	0.30	26.55
CBMH03	115.65	115.95	0.30	17.11
CBMH04	115.65	115.95	0.30	11.23
CBMH05	115.65	115.95	0.30	37.98
CBMH06	115.65	115.95	0.30	14.24
CBMH09	115.55	115.65	0.10	4.38
CBMH10	115.45	115.65	0.20	30.33
CBMH11	115.35	115.65	0.30	13.2
CBMH12	115.50	115.65	0.15	7.82
CBMH17	116.00	116.30	0.30	13.65
CBMH18	116.00	116.30	0.30	39.25
CBMH19	116.00	116.30	0.30	55.27
CBMH20	116.10	116.30	0.20	8.07
CBMH21	116.10	116.30	0.20	7.72
CBMH22	116.00	116.30	0.30	16.51



**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 FENCE  
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PROPOSED TOP OF RETAINING WALL  
MATCH INTO EXISTING ELEVATION  
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PROPOSED OVERLAND MAJOR FLOW ROUTE  
PROPOSED STORM SEWER  
PROPOSED SANITARY SEWER  
PROPOSED WATERMAIN  
EXISTING STORM SEWER  
EXISTING SANITARY SEWER  
EXISTING WATERMAIN  
EXISTING MANHOLE  
EXISTING CATCHBASIN  
PROPOSED CATCHBASIN  
PROPOSED CATCHBASIN-MANHOLE  
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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5m 2 0 5 10m  
SCALE: 1:300

01	ISSUED FOR APPROVAL	P.P.	05 FEB 2021
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  
**HALO CAR WASH**

DESIGNED BY: M.B. / P.P. DRAWN BY: M.L. APPROVED BY: M.B.

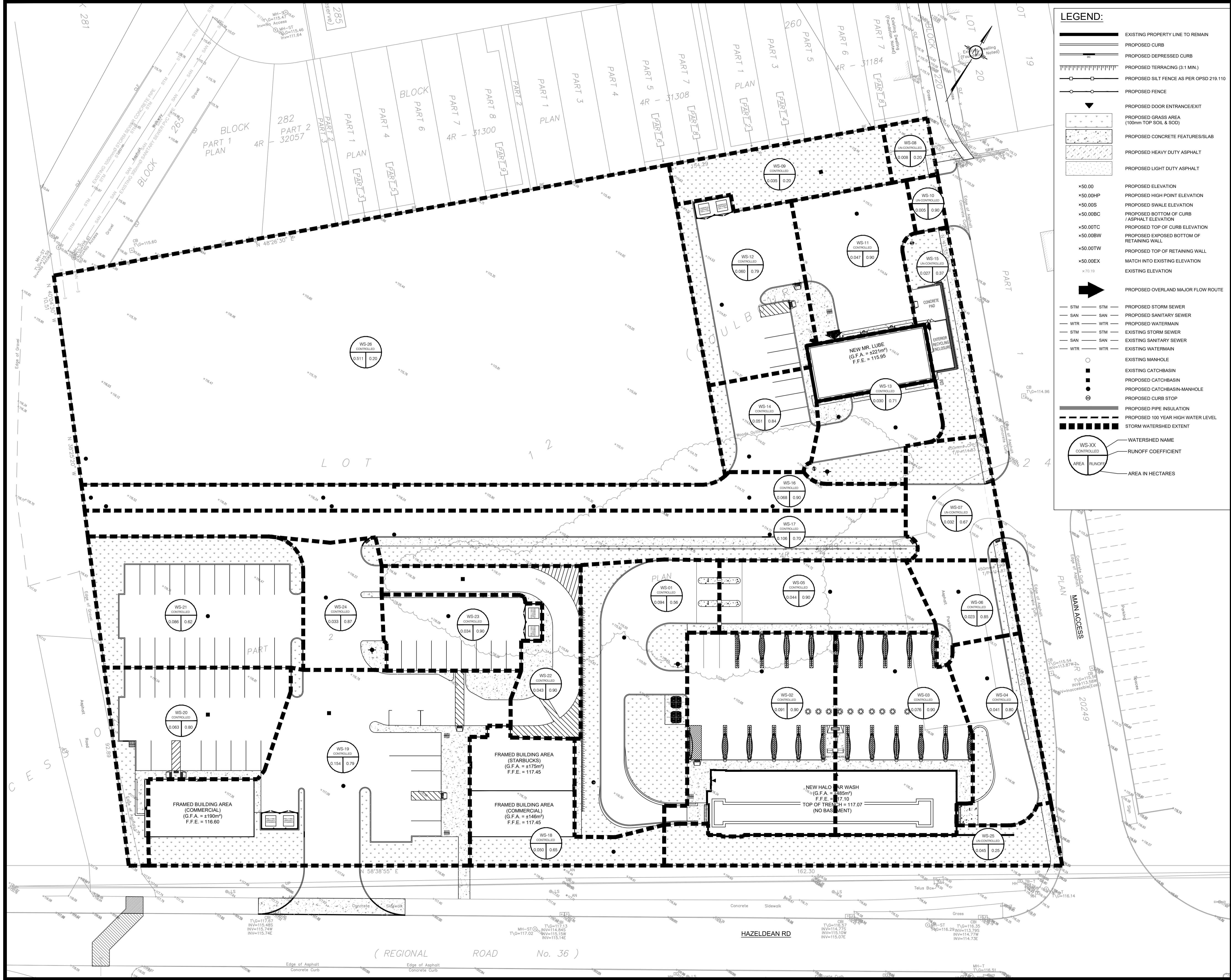
PROJECT  
**PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTVILLE, ON**

DRAWING TITLE  
**PRE-DEVELOPMENT  
WATERSHED PLAN**

PROJECT NO.  
**200100**

DATE  
**APRIL 2020**

**C701**



**LEGEND:**

EXISTING PROPERTY LINE TO REMAIN  
PROPOSED CURB  
PROPOSED DEPRESSED CURB  
PROPOSED TERRACING (3:1 MIN.)  
PROPOSED SILT FENCE AS PER OPSD 219.110  
PROPOSED FENCE  
PROPOSED DOOR ENTRANCE/EXIT  
PROPOSED GRASS AREA (100mm TOP SOIL & SOD)  
PROPOSED CONCRETE FEATURES/SLAB  
PROPOSED HEAVY DUTY ASPHALT  
PROPOSED LIGHT DUTY ASPHALT  
PROPOSED ELEVATION  
PROPOSED HIGH POINT ELEVATION  
PROPOSED SWALE ELEVATION  
PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION  
PROPOSED TOP OF CURB ELEVATION  
PROPOSED EXPOSED BOTTOM OF RETAINING WALL  
PROPOSED TOP OF RETAINING WALL  
MATCH INTO EXISTING ELEVATION  
EXISTING ELEVATION  
PROPOSED OVERLAND MAJOR FLOW ROUTE  
PROPOSED STORM SEWER  
PROPOSED SANITARY SEWER  
PROPOSED WATERMAIN  
EXISTING STORM SEWER  
EXISTING SANITARY SEWER  
EXISTING WATERMAIN  
EXISTING MANHOLE  
EXISTING CATCHBASIN  
PROPOSED CATCHBASIN  
PROPOSED CATCHBASIN-MANHOLE  
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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5m 3 0 5 10m  
SCALE: 1:300

01	ISSUED FOR APPROVAL	P.P.	05 FEB 2021
No.	REVISIONS	BY	DATE

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT: HALO CAR WASH

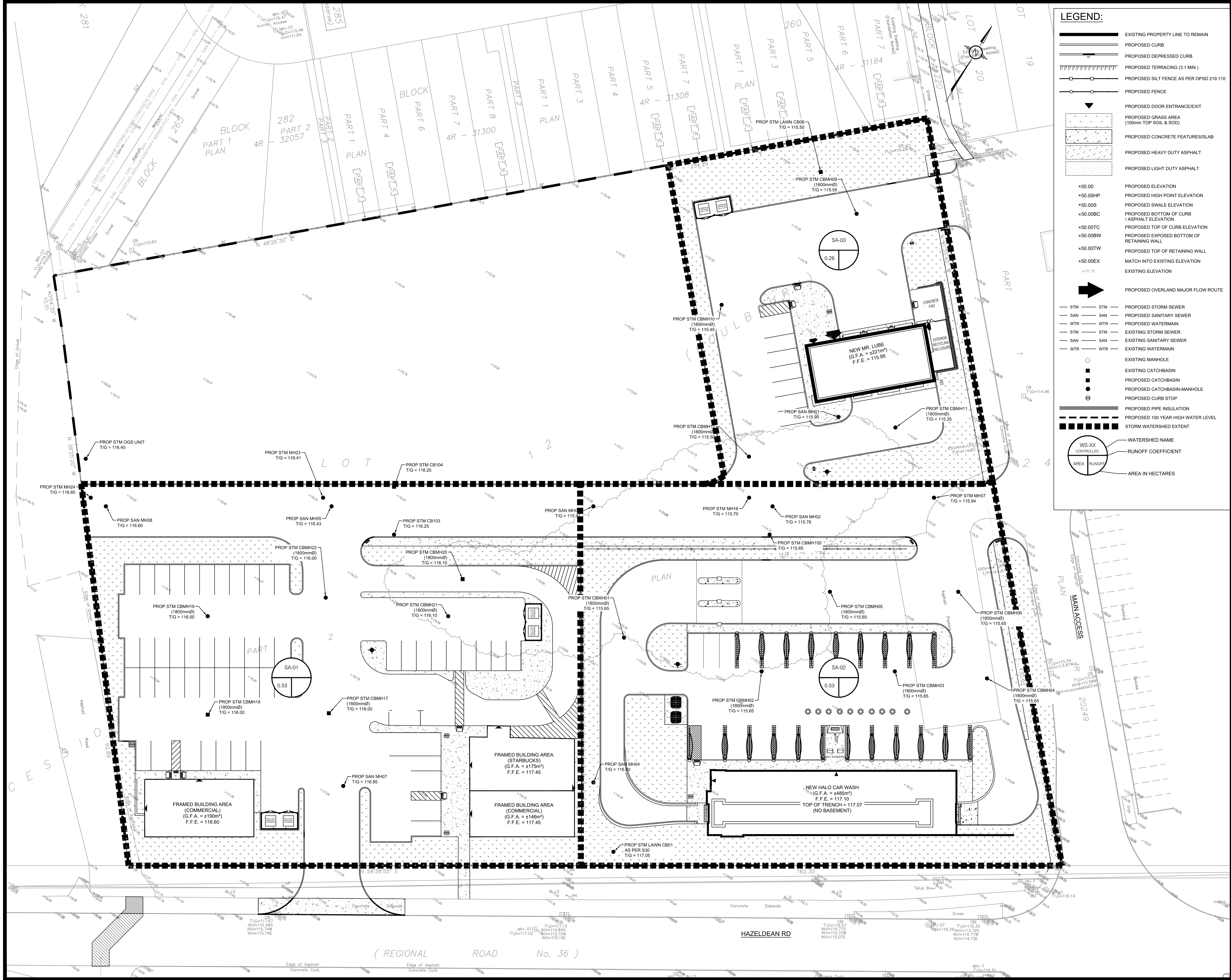
DESIGNED BY: M.B. / P.P. DRAWN BY: M.L. APPROVED BY: M.B.

PROJECT: PROPOSED DEVELOPMENT  
6111 HAZELDEAN RD  
STITTVILLE, ON

DRAWING TITLE: POST-DEVELOPMENT  
WATERSHED PLAN

PROJECT NO.: 200100  
DATE: APRIL 2020

**C702**



**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 FENCE
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED ELEVATION
- PROPOSED HIGH POINT ELEVATION
- PROPOSED SWALE ELEVATION
- PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
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- PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- PROPOSED TOP OF RETAINING WALL
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- STM
- SAN
- WTR
- STM
- STM
- SAN
- WTR
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE
- PROPOSED CURB STOP
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- PROPOSED 100 YEAR HIGH WATER LEVEL
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No.	REVISIONS	BY	DATE



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**LRJ**

ENGINEERING | INGENIERIE

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

CLIENT

**HALO CAR WASH**

DESIGNED BY: M.B. / P.P. DRAWN BY: M.L. APPROVED BY: M.B.

PROJECT

**PROPOSED DEVELOPMENT**  
6111 HAZELDEAN RD  
STITTVILLE, ON

DRAWING TITLE

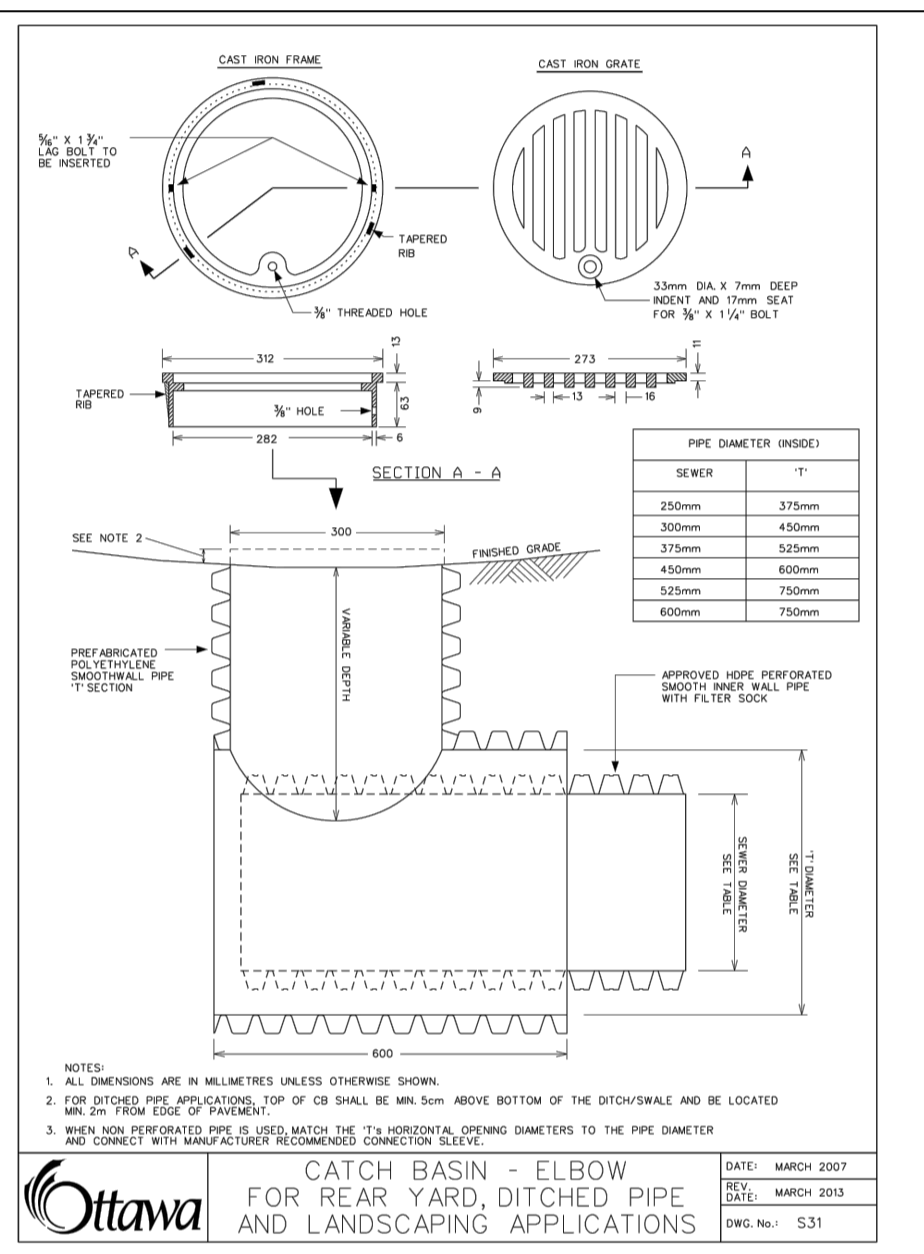
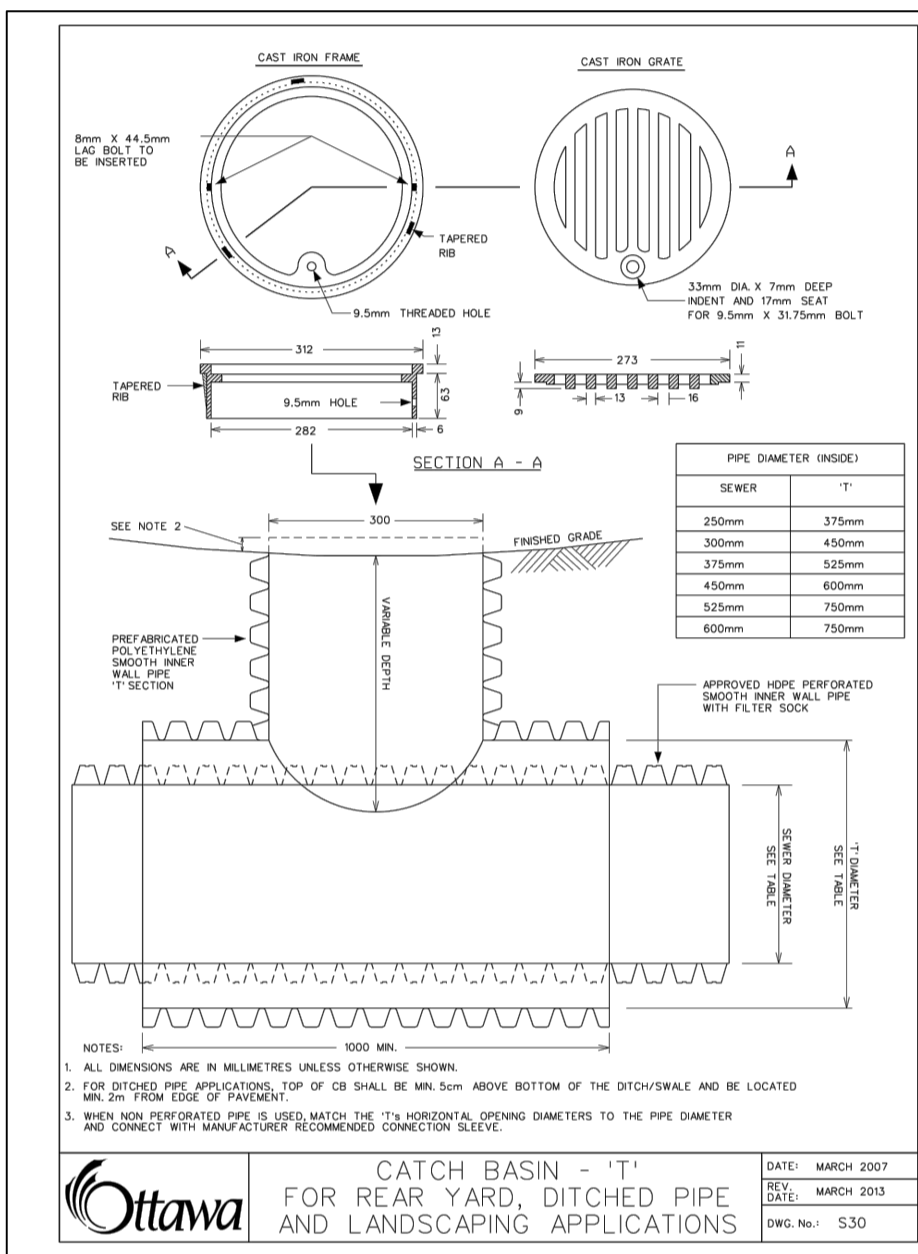
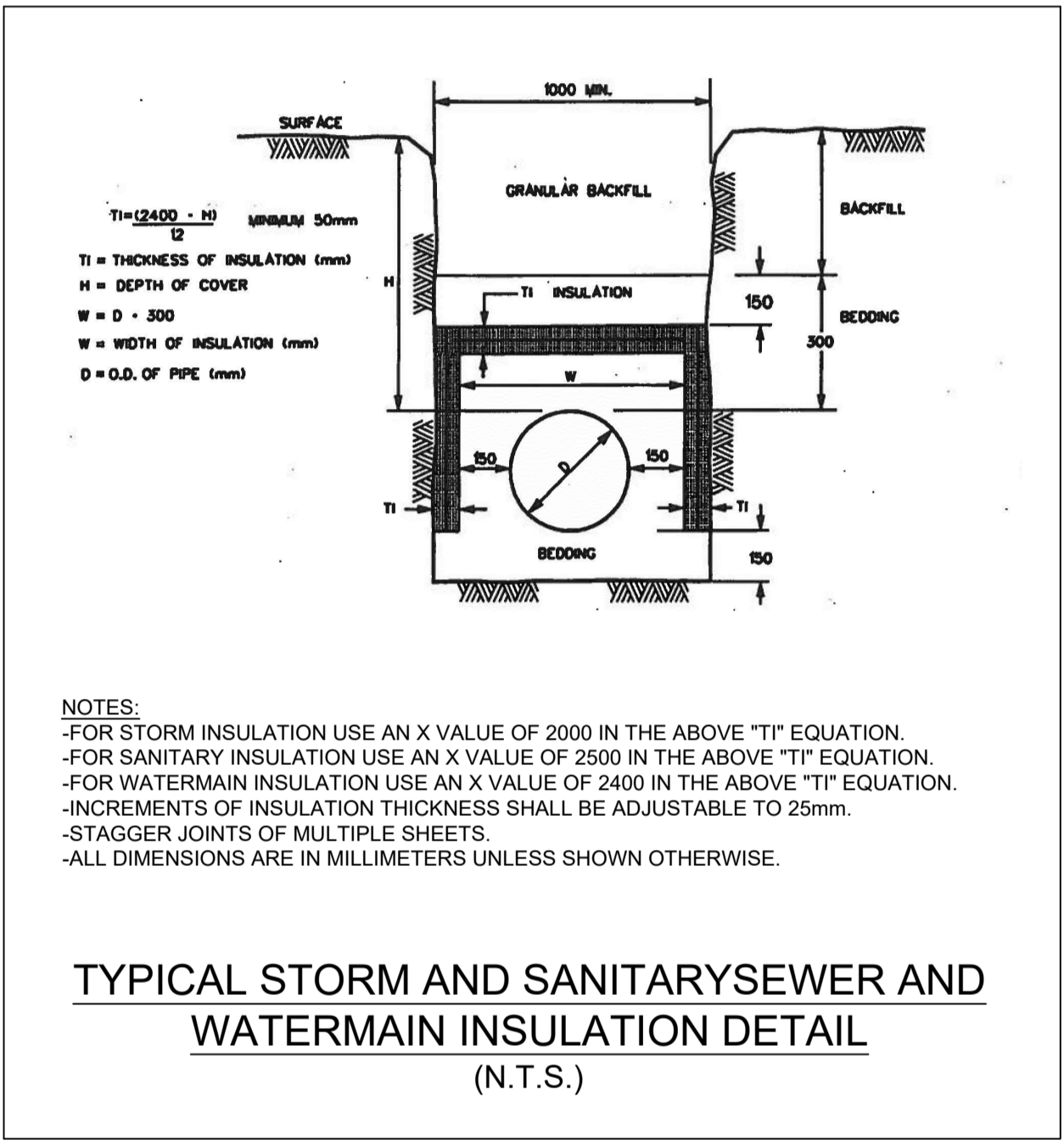
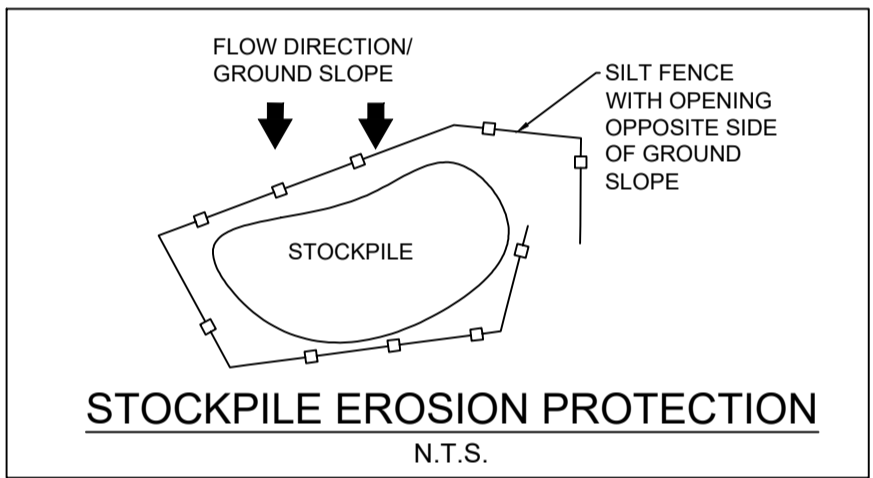
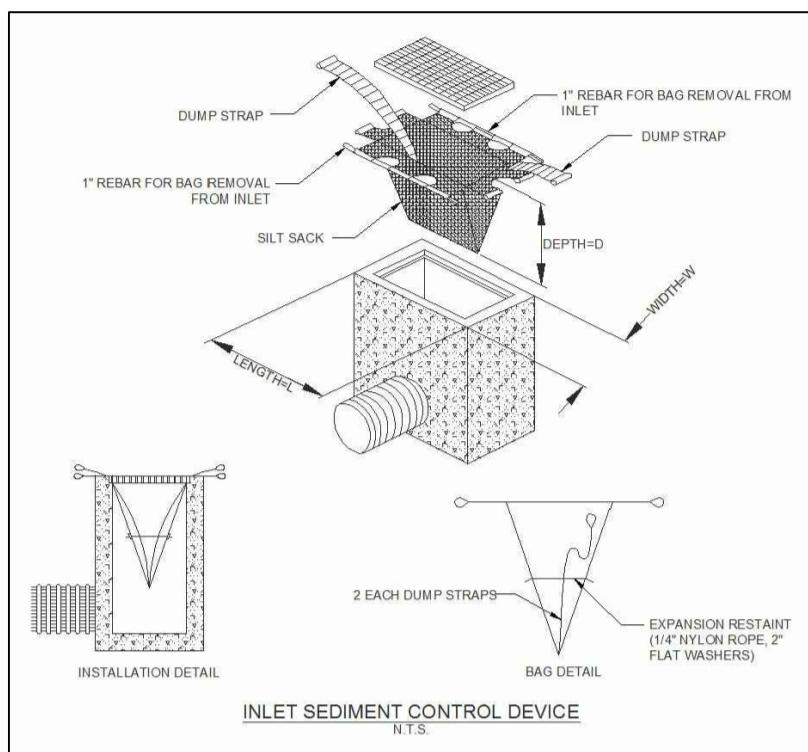
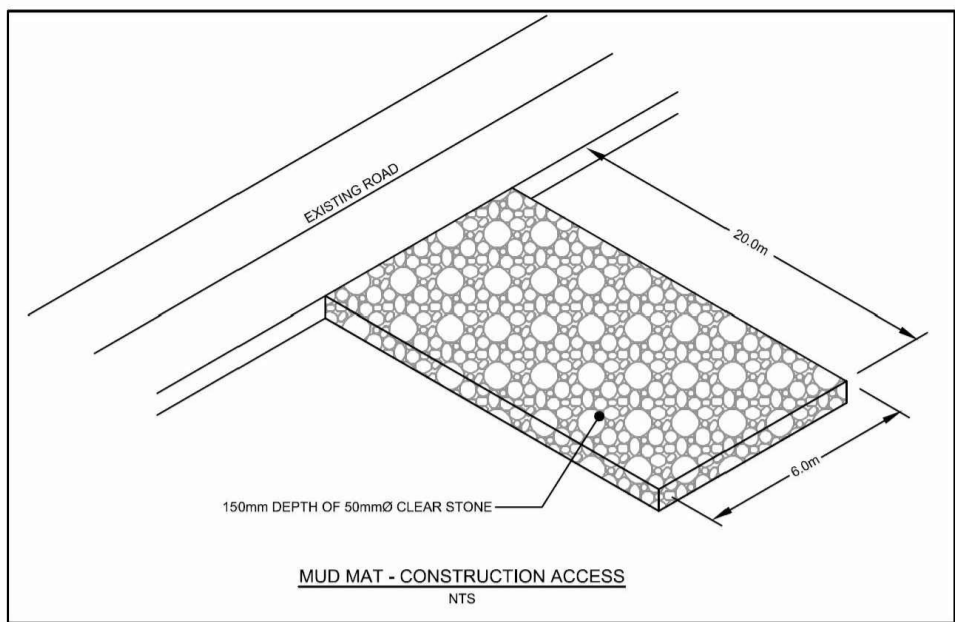
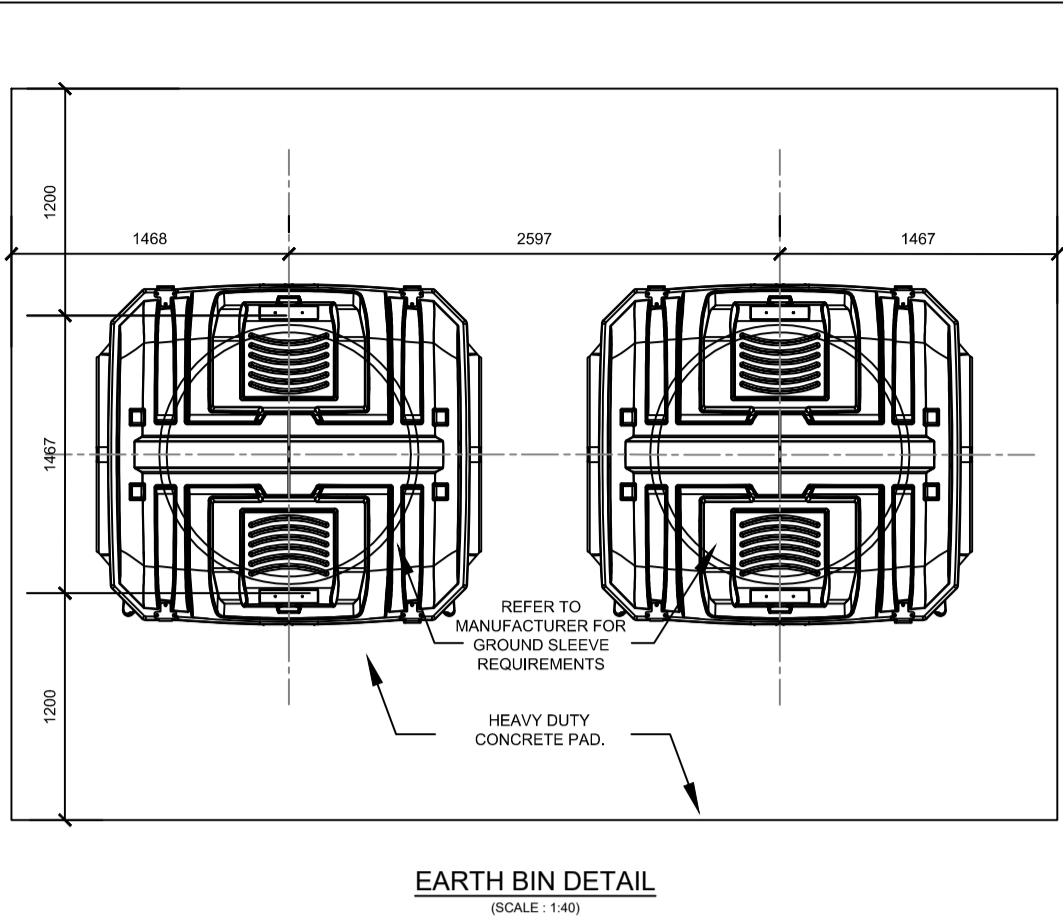
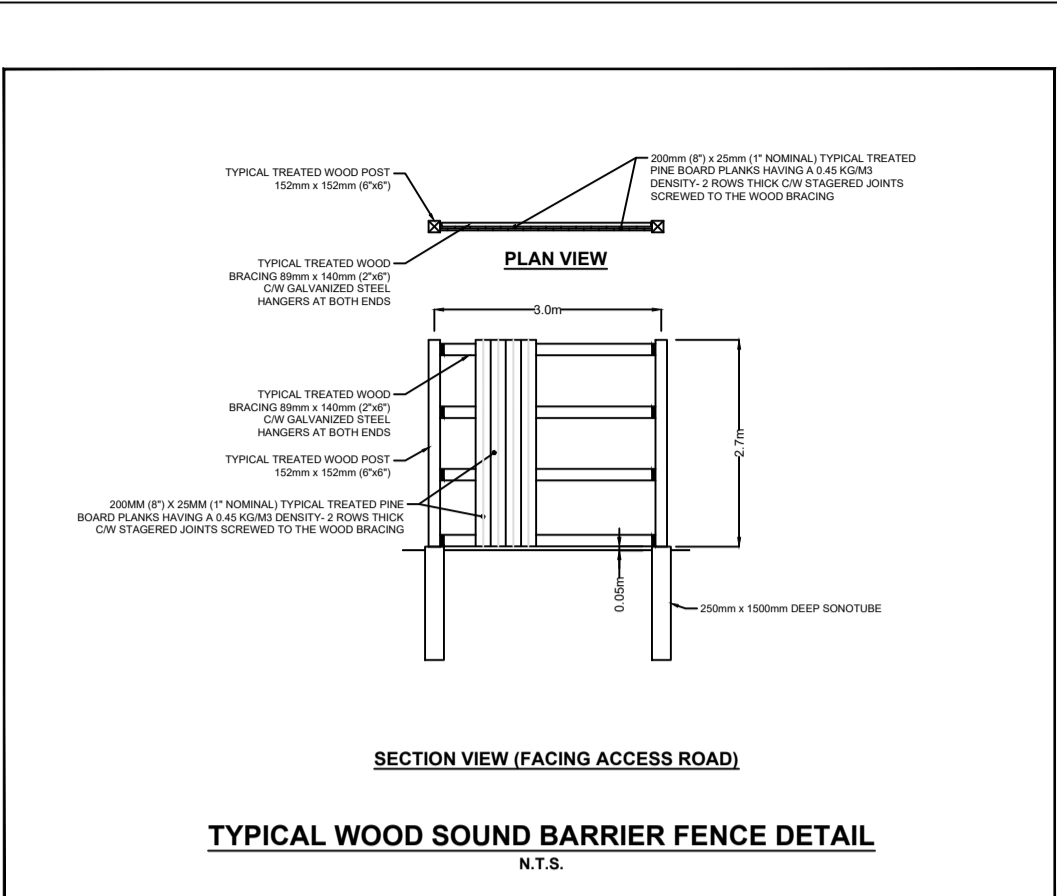
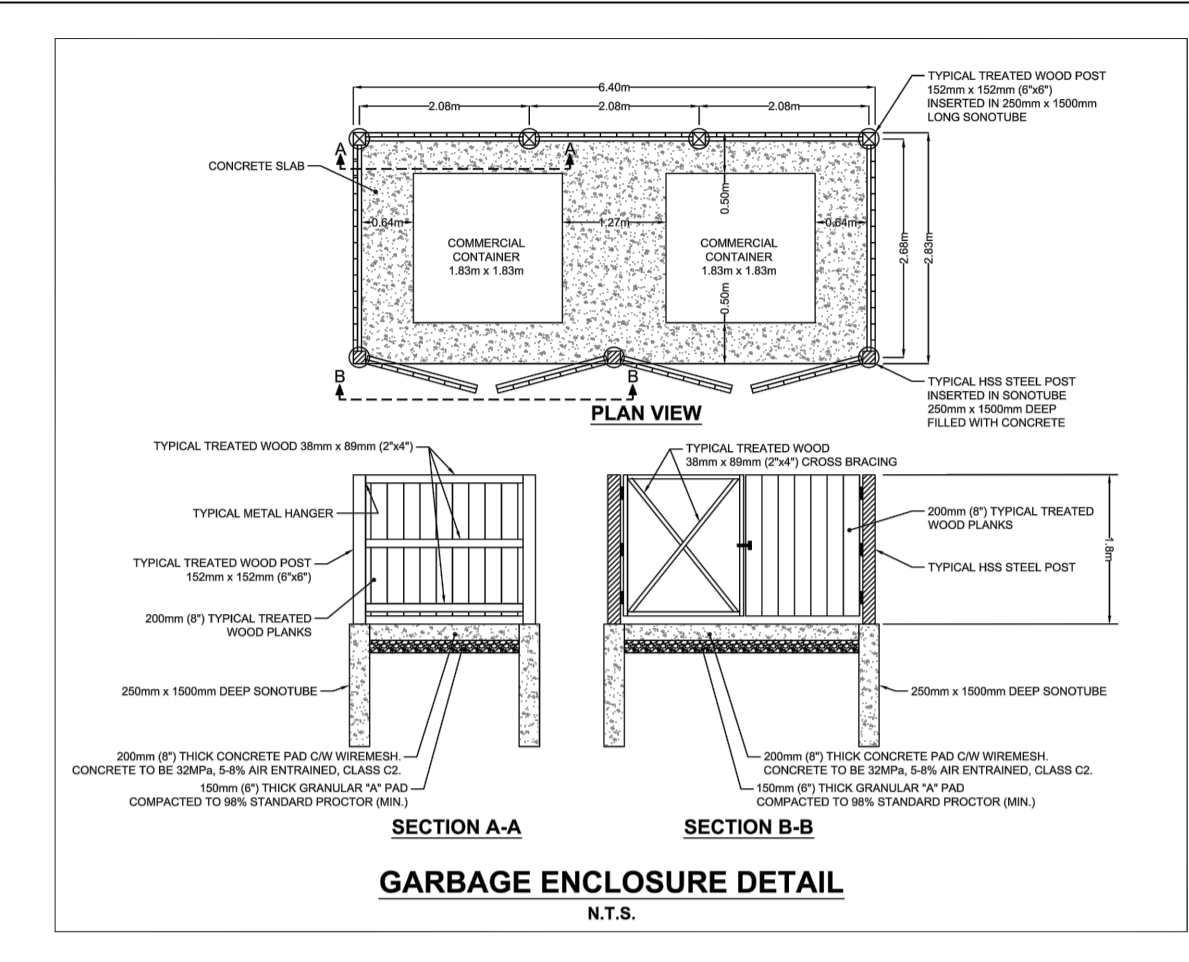
**SANITARY WATERSHED PLAN**

PROJECT NO.  
200100

DATE  
APRIL 2020

**C703**





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

CLIENT		
HALO CAR WASH		
DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.B. / P.P.	M.L.	M.B.
PROJECT		

DRAWING TITLE  
**CONSTRUCTION DETAIL PLAN**

PROJECT NO.  
200100  
DATE  
APRIL 2020

**C902**

## **APPENDIX F**

### **Survey, As-Built, Architectural Drawings**



TOPOGRAPHICAL SKETCH OF

6111 HAZELDEAN ROAD  
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebakk Ltd.  
Field Work Completed September 21, 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	Maintenance Hole (Unidentified)
○ VC	Valve Chamber (Watermain)
— OHW	Overhead Wires
□ CB	Catch Basin
□ CBI	Catch Basin Inlet
— CPP	Corrugated Plastic Pipe
T/P	Top of Pipe
T/G	Top of Grate
□ TB-T	Traffic Terminal Box
— TSP	Traffic Signal Post
△ S	Sign
BF	Board Fence
CLF	Chain Link Fence
INV	Invert
Ø	Diameter
○ UP	Utility Pole
• AN	Anchor
□ H	Handhole
○ LS	Light Standard
+ 65.00	Location of Elevations
+ 65.00	Top of Concrete Curb 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 m<sup>2</sup>

BOUNDARY INFORMATION COMPILED FROM PLAN 4R-30619.

ELEVATION NOTES

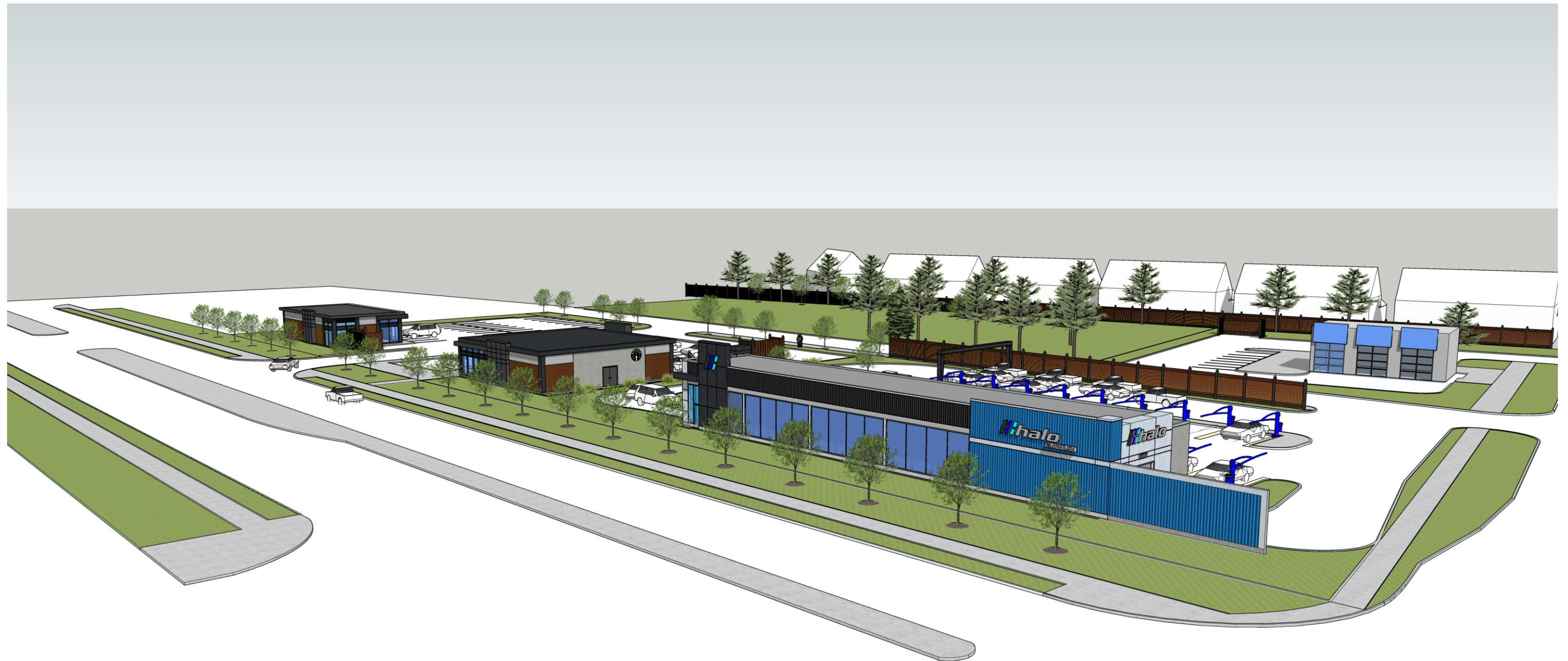
- Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
- It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that its relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

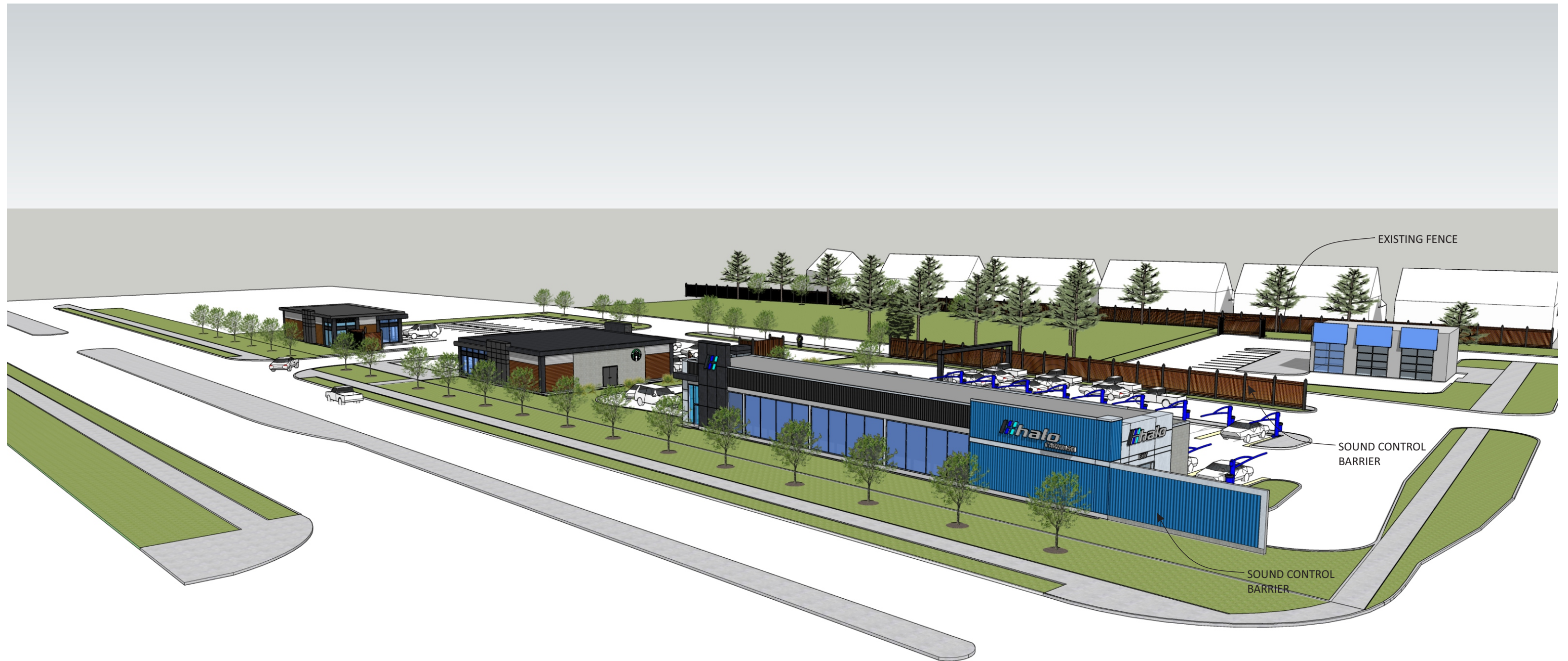
- This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
- Only visible surface utilities were located.
- A field location of underground plant by the pertinent utility authority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







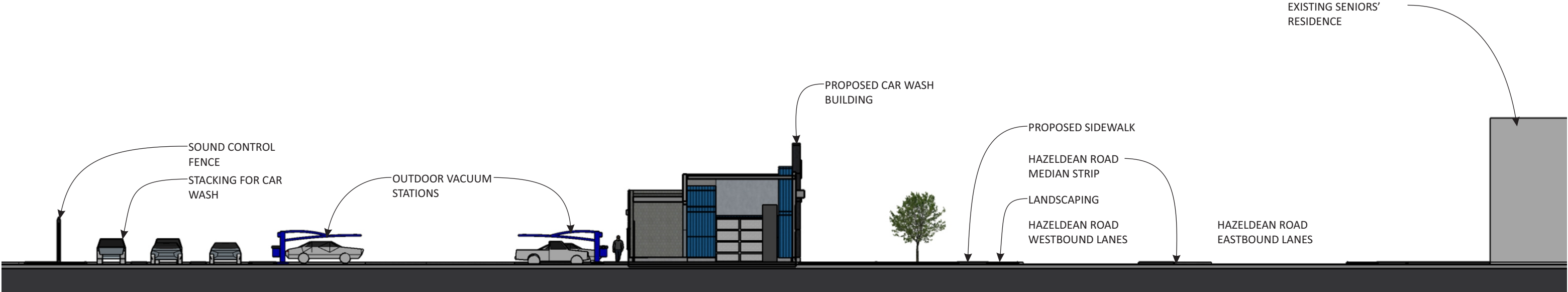
**6111 Hazeldean Road**  
**Site Overview**  
**04 February 2021**



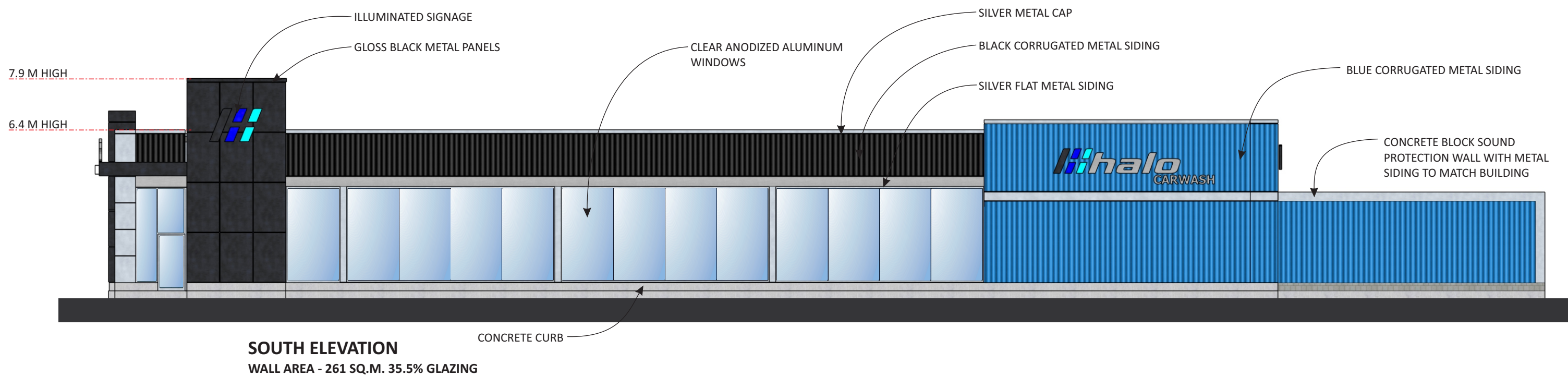
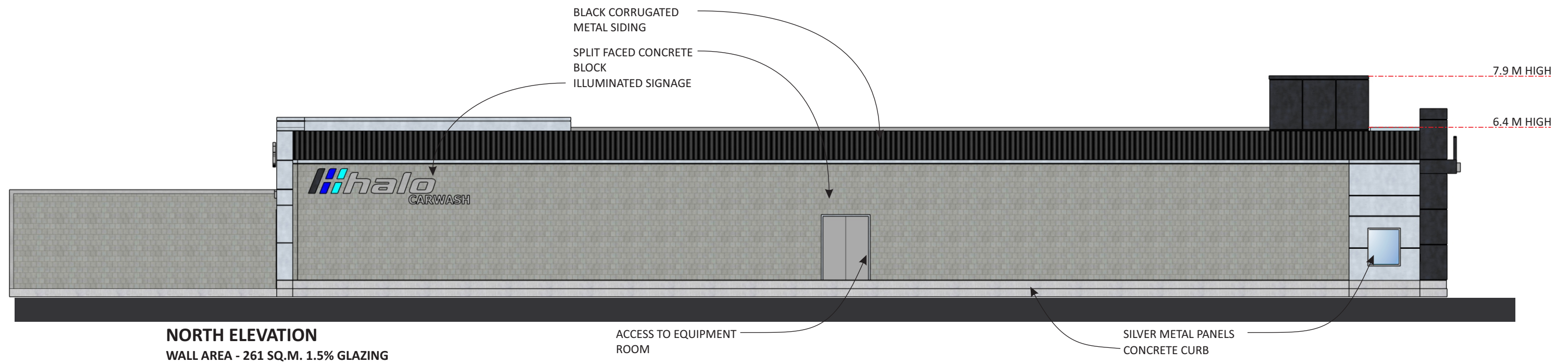
**6111 Hazeldean Road**  
**Site Overview**  
**04 February 2021**



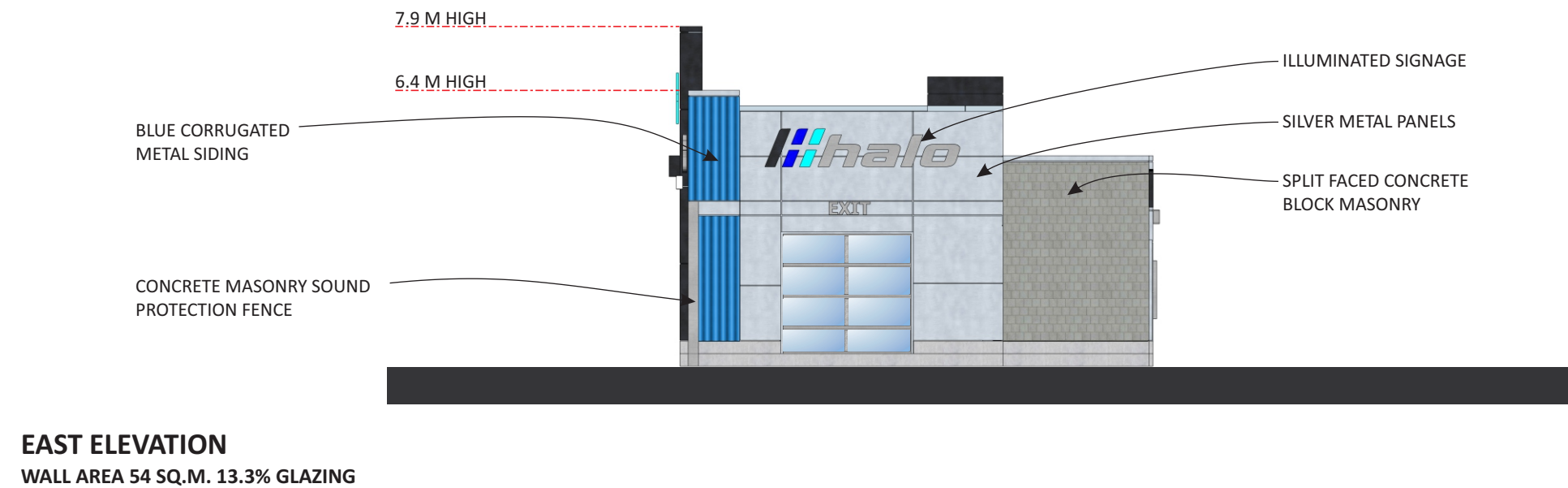
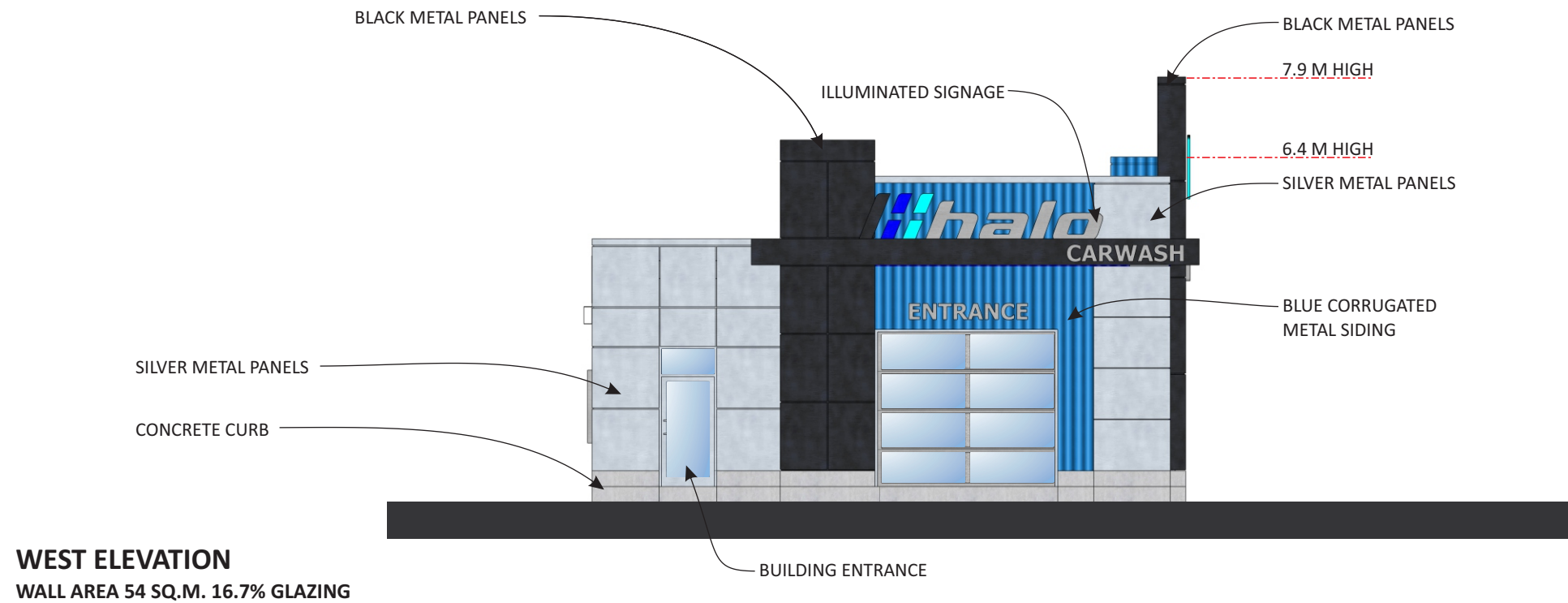
**6111 Hazeldean Road**  
**Site Overview**  
**04 February 2021**



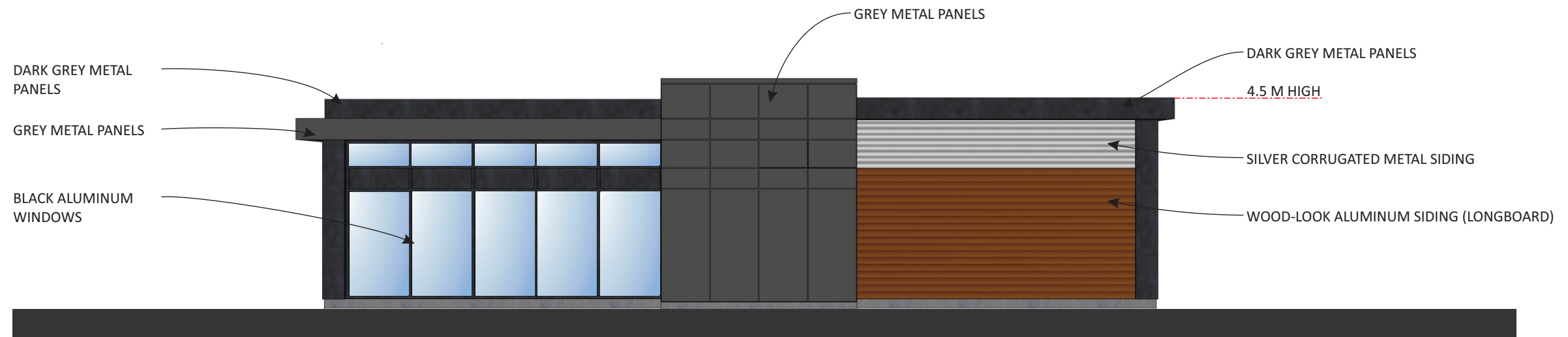
**6111 Hazeldean Road**  
**Streetscape Section**  
**04 February 2021**



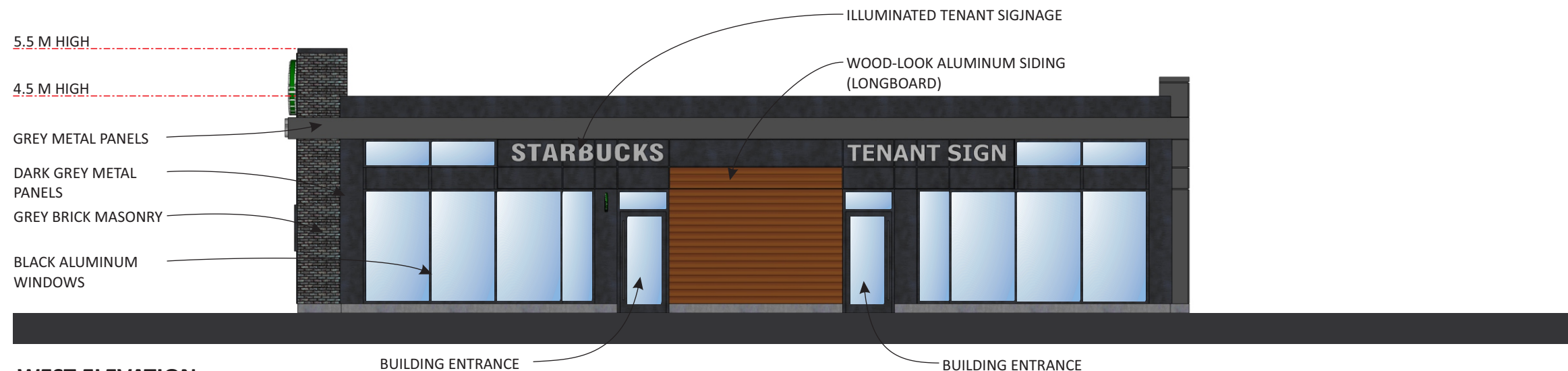
**6111 Hazeldean Road**  
**ELEVATION STUDY - Halo Car Wash**  
**04 February 2021**



**6111 Hazeldean Road**  
**ELEVATION STUDY - Halo Car Wash**  
**04 February 2021**



**SOUTH ELEVATION**  
WALL AREA 83 SQ.M. 18% GLAZING

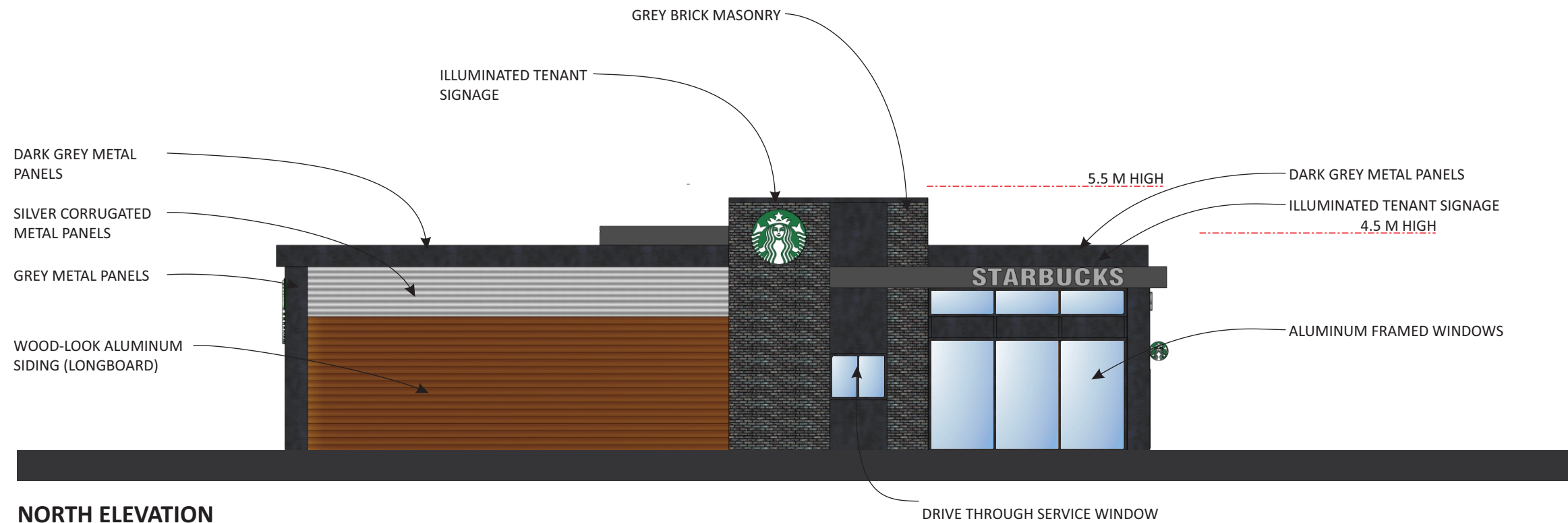


**WEST ELEVATION**  
WALL AREA 81 SQ.M. 26% GLAZING

**6111 Hazeldean Road**  
**ELEVATION STUDY - Multi-Tenant Building 1**  
**04 February 2021**

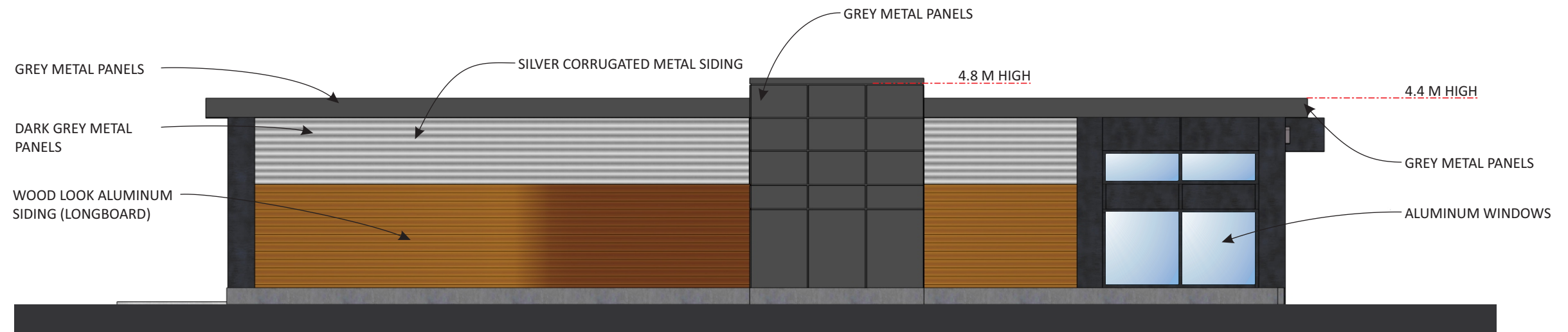


**EAST ELEVATION**  
WALL AREA 81 SQ.M. - 0% GLAZING

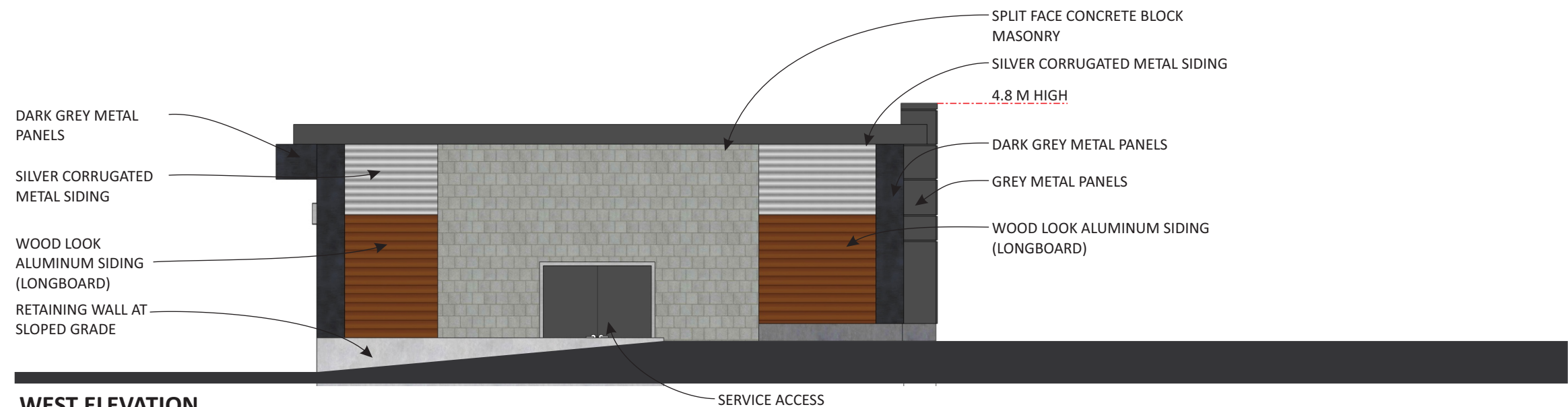


**NORTH ELEVATION**  
WALL AREA 83 SQ.M. 12% GLAZING

**6111 Hazeldean Road**  
**ELEVATION STUDY - Multi-Tenant Building 1**  
**04 February 2021**



**SOUTH ELEVATION**  
WALL AREA 72 SQ.M. 6% GLAZING



**WEST ELEVATION**  
WALL AREA 44 SQ.M. 15% GLAZING

**6111 Hazeldean Road**  
**ELEVATION STUDY - Multi-Tenant Building 2**  
**04 February 2021**



### EAST ELEVATION

WALL AREA 44 SQ.M. 15% GLAZING



### NORTH ELEVATION

WALL AREA 84 SQ.M. 22% GLAZING

## 6111 Hazeldean Road

### ELEVATION STUDY - Multi-Tenant Building 2

04 February 2021