Servicing Memo

Proposed Halo Car Wash
3095 Palladium Drive
Kanata, Ontario

Prepared for:

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

Attention: Mr. Jordan Lupovici

LRL File No.: 230273

Revised March 04, 2024
June 16, 2023

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1 Introduction and Site Description

LRL Associates Ltd. was retained by Halo Car Wash Inc. to complete a Site Servicing Memo for the construction of a Car Wash development located at 3095 Palladium Drive, Kanata, ON. The location of the proposed site can be viewed in Figure 1.

Figure 1: Aerial View of Proposed Development

The proposed development will consist of a Halo Tunnel Car Wash which will be accessible from a 9 m wide entrance located off Kanata West Centre Dr. Additional detail of the proposed development can be found on Site Plan (C201) included in Appendix E. The subject site measures approx. **0.536 ha** and is currently undeveloped, consisting of mostly grassed area. The existing site is relatively flat with the elevation ranging from 105.01 (northwest corner) to 104.62 (southwest corner). The infrastructures located within the adjacent right-of-way includes (i) 250 mm dia. Watermain, (ii) 200 mm dia. Sanitary sewer, and (iii) 825 mm dia. Storm sewer.

2 Water Supply

The subject site is proposed to be serviced via 100 mm dia. water servicing to be connected with the existing 250 mm dia. watermain located along the existing road in south end of the site. Estimated water demand for the subject site is calculated based on the City of Ottawa Design guidelines and anticipated water use by Car Wash, as follows.

- Average Day Demand = **1.30 L/s**
- Maximum Day Demand = **2.29 L/s**
- Peak Hour Demand = **6.72 L/s**

The estimated fire flow of the proposed building is calculated **85 L/s** in accordance with Fire Underwriters Survey (FUS) method. Refer to Appendix B for calculation details.

Based on the hydraulic analysis performed by Robinson Consultant Inc., the maximum pressure simulation exceeds 80 psi, therefore, a pressure reducing valve (PRV) is required at the service entry of Halo Building.

3 SANITARY SERVICE

The subject site is proposed to be serviced with 150 mm dia. sanitary sewer to be connected with the existing 200 mm dia. sanitary sewer located along the existing road in the south end of the proposed site. The parameters used to calculate the anticipated sanitary flows were adopted from the City of Ottawa design parameters as well as anticipated car wash water uses. The total anticipated sanitary flow is estimated **6.32 L/s**. Refer to Appendix C for sanitary sewer design sheet.

4 STORMWATER MANAGEMENT

The subject site is proposed to be serviced with 375 mm dia. storm sewer to be connected with the existing 825 mm dia. storm sewer along the existing road in the south end of the subject site. The design criteria for this development is based on 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. The allowable release for the subject site is **105.00 L/s** as determined by Robinson Consultants Inc.

Post-development storm events up to and including 100-yr storm events will be controlled by using an Inlet Control Device (ICD)-John Meunier 250VHV-2 (or approved equivalent). Storage required, as a result of quantity control, will be achieved through parking lot storage. Table 1 shows summary of release rates, required storage and available on-site storage, calculations can be found in Appendix D. For the proposed controlled/uncontrolled areas, refer to Post-development Watershed Plan C702 in Appendix E.

Table 1: Summary of Release Rates and Storage

Catchments	Area (ha)	Release Rate (L/s)		Storage Required (m^3)		Storage Provided (m^3)
		100-yr	5-yr	100-yr	5-yr	
Controlled (WS-01 to WS-06)	0.445	78.51	78.51	67.25	6.28	74.97
Uncontrolled (WS-07 to WS-10)	0.090	26.49	12.37	N/A	N/A	N/A
Total	**0.536**	**105.00**	**90.88**	**67.25**	**6.28**	**74.97**

The runoff exceeding the allowable release rate will be stored on-site via surficial ponding and underground storage. For 100-yr storm event, it is calculated that a total of **67.25 m^3** of storage will be required to attenuate flows to the allowable release rate of **78.51 L/s** (controlled release). The total surface storage provided is **74.97 m^3**, thus exceeds the required storage.

The required storage of **15.80 m^3** for 2-yr storm will be accommodated underground (i.e. no ponding) in oversized pipe and CB/CBMH structures which will provide a total available storage of **21.10 m^3**. It is important to note that an average release rate of **39.26 L/s** (50% of maximum controlled release rate) was used in underground storage calculation for 2-yr storm (Appendix D). Storm events greater than 100-yr will flow overland towards Right-of-Way. The maximum ponding elevation and depths can be found on Stormwater Management Plan C601 (Appendix E).
Based on pre-consultation meeting notes, the stormwater quality control will be achieved in the downstream stormwater management facility, a storm pond (Pond 6 West).

5 REPORT CONDITIONS AND LIMITATIONS

The memo 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.

Maxime Longtin

Civil Engineering Technologist

Mohan Basnet, P.Eng.

Civil Engineer

APPENDIX A

Pre-consultation / Correspondance

Pre-Application Consultation Meeting Notes

Property Address: 3095 Palladium Drive
PC2023-0026
February 9, 2023 – Teams Meeting

Attendees:

Dave Melkie, Quaestus
Barry Godfrey, Quaestus
Tim Eisner, JFSA
Jocelyn Chandler, JFSA
Allan Stone, Architect
Andrew Harte, CGH Transportation
Derek Howe, Taggart
Dave Meikle, DBM Consulting
Chris Collins, EXP Engineering
Molly Smith, Planner II
Alex Gatien, Planner I
Selma Hassan, Urban Design
Laura Hagerman, Parks Planning
Kimberley Baldwin, Parks Planning
Mark Elliot, Environmental Planning
Shika Rathnasooriya, Infrastructure Project Manager
Josiane Gervais, Transportation Project Manager

Regrets: Nancy Young, Forestry

Subject: 3095 Palladium Retail Development.

Meeting notes:

Overview of Proposal

- The proposal is for a multi-tenant shopping centre on roughly the northern two thirds of the site with a car wash on the southern portion of the site. The site is located at the southwest corner of the intersection of Palladium Drive and Campeau Drive.

- The development will require a site plan control application and plan of condominium. Zoning By-law Amendment to permit a car wash is being contemplated.

- The intention is to apply for an ZBA and SPC concurrently. Current OP policies may make the introduction of a car wash difficult to support.

- The intention is to apply for SPC for the neighbouring site to the west (3075 Palladium) at roughly the same time. The neighbouring site is under different ownership but same consulting team.

- Site is part of a previous plan of subdivision and site plan control application (D07-12-15-0016 and D07-12-16-0122). Conditions on page 40 of the subdivision agreement relate to the left turning lane on Palladium Drive, relevant to the application.

Preliminary comments and questions from staff and agencies, including follow-up actions:

- **Planning**

  - The site is designated as Neighbourhood in the Suburban West Transect of the Official Plan.
  - The language in the official plan requires applications to meet the full intention and policies of Section 6.3 – Neighbourhoods. This designation has strict requirements for what kind of non-residential uses are permitted and the design. <u>All policies</u> that speak to non-residential uses must be met due to the language of 'shall' instead of 'should'
    - Specifically policies for non-residential uses:
      - 6.3.1
      - 6.3.2
      - 6.3.3
    - The applicant is encouraged to discuss with staff if the car wash is viable after a redesign to address OP policies. The current design of the car wash would not be supported.
  - With the current concept plan, can't comments on any zoning deficiencies. Please include a full zoning statistics table on the site plan upon submission.
  - Ensure sidewalk connections exist, especially to nearby transit stops.
  - Maximize tree planting and landscaping. Ensure that there is adequate tree planting space, especially along the perimeter of the site and within parking lot islands.
  - Please keep in mind that once Bill 109 is enacted (July 1st 2023), multiple planning applications cannot be filed at the same time. Ex. Rezoning and Site Plan Control – a rezoning would need to complete the appeal period before a site plan application can be filed.

- **Urban Design**

  - A Design Brief is required. A Terms of Reference for the Brief is attached. All elements highlighted in yellow must be addressed in written and graphic format.
  - The City's Urban Design Guidelines for Large Format Retail apply to this site. The Design Brief is to address these guidelines and, in particular, focus on a response to the guidelines related to building orientation and interface with the public realm, treatment of blank walls and service areas, and landscaping. Please note that the quoted recommended soil volume for trees may be out of date and Forestry's current standards are to apply.
  - As noted in the guidelines, such plazas are to address the street as much as possible through:
    - Entrances on the street
    - Real windows on the street
    - Corner units with glazing that wraps the unit and faces the street
    - Use of architectural elements and colour to animate the street
    - Landscaping

    These elements are to be addressed in the submitted drawings and Design Brief.

  - Should the applicant pursue the carwash, the City's Urban Design Guidelines for Drive-throughs must also be addressed in the Design Brief.

- Older retail plazas in the City are undergoing redevelopment and intensification. All new plazas are to be designed considering the logical evolution of the site (as note in the Design Guidelines). If the applicant does not pursue the car wash and the entire site develops as a large format retail, the applicant is asked to provide alternate layouts that considers the site as a whole, shows how the two parcels would work together now and with future redevelopment / intensification.
- The submitted Site and Landscape Plans are to clearly show the location and width of pedestrian walkways within the site, as well as walkway connections to the public sidewalks around the site.
- The submitted Site and Landscape Plan are to show the locations of all primary and exit doors.
- Site landscaping will be important. The applicant's landscape architect is to include robust tree planting within and surrounding the site. The submitted drawings must indicate the soil volumes provided and show planting details for hard and soft surface conditions. The selected species must be successful in urban conditions (salt, drought, compaction).
- If the car wash is pursued, the applicant is asked to provide alternate layouts that would internalize the cueing lanes and provide built form parallel and adjacent to the ROW.

- **Engineering**

  - The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications

  - Servicing and site works shall be in accordance with the following documents:
    - Ottawa Sewer Design Guidelines (October 2012)
    - Ottawa Design Guidelines – Water Distribution (2010)
    - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
    - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
    - City of Ottawa Environmental Noise Control Guidelines (January 2016)
    - City of Ottawa Park and Pathway Development Manual (2012)
    - City of Ottawa Accessibility Design Standards (2012)
    - Ottawa Standard Tender Documents (latest version)
    - Ontario Provincial Standards for Roads & Public Works (2013)

  - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).

  - Watermain Infrastructure:
    a) There are available 200mm and 250mm diameter private PVC watermains located the subdivision. A water boundary condition request is needed for the proposed water connection to the City main.

    b) As per Section 4.4.7.2 of the Ottawa Design Guidelines – Water Distribution, a DMA (District Metering Area) chamber will be required for private developments serviced by a connection 150mm or larger.

    c) Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide an email to Shika Rathnasooriya (Thakshika.Rathnasooriya@ottawa.ca) with the following information:

i. Location of service
ii. Type of development and the amount of fire flow required (as per FUS, 1999 – See technical bulletin ISTB 2021-03).
iii. Average daily demand: ___ l/s.
iv. Maximum daily demand: ___l/s.
v. Maximum hourly daily demand: ___ l/s.

- Sanitary / Storm Infrastructure:
  a) There are available 200mm and 300mm diameter PVC and concrete sanitary sewers located southeast and southwest of the proposed site.
  b) All services (STM, SAN, WTR) should be grouped in a common trench to minimize the number of road cuts.
  c) Sewer connections to be made above the springline of the sewermain as per:
     i. Std Dwg S11.1 for flexible main sewers.
     ii. Std Dwg S11 (For rigid main sewers).
     iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method).
     iv. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.
- The Stormwater Management Criteria, for the subject site, is to be based on the following:
  a) The 5-yr and 100-yr post development peak flows for the development area are to be controlled to a release rate identified in the 'Design Brief , Kanata West Retail Centre 3015, 3075 and 3095 Palladium Drive' dated 2016. Onsite storage is to be provided for storm events up to and including the 100-yr storm event.
  b) There should be no stormwater ponding in parking areas or drive aisles during the 2-year storm event.
  c) Quality control to be provided by Pond 6 West.
  d) Infiltration targets maybe required for the site.
  e) The design of the storm sewers in the area are based on a 5-yr storm. If discharging to a storm sewer, the SWM criteria is to be based on the following for the development area:
     i. The 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
     ii. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less.
     iii. A calculated time of concentration (Cannot be less than 10 minutes).
     iv. Flows to the storm sewer in excess of the 5-yr storm release rate, up to and including the 100-year storm event, must be detained on site.
- MECP ECA Requirements:

An MECP Environmental Compliance Approval (Private Sewage Works) will be required for the proposed development due to the proposed car wash.

- Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

- **Transportation**

  - Follow Transportation Impact Assessment Guidelines:
    - A TIA is required. Please submit the Scoping report to Josiane.gervais@ottawa.ca at your earliest convenience.
    - 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)
    - As discussed, please ensure the TIA addresses the operations at the NB-LT lane on Palladium and how the operations relate to the subdivision condition to close the left-turn lane.
    - A joint TIA study for both 3095 and 3075 Palladium could be considered by the City provided that the timelines of both applications align. Separate title pages/introductions would be required for the individual applications. The iterative steps of the TIA must be followed. Any costs/delays resulting from providing both studies together would be the applicant's responsibility.
  - TMP shows future LRT station at Huntmar Drive (Ultimate Concept).
  - As the proposed site is commercial and for general public use, AODA legislation applies.
    - Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.
    - Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).
    - Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements. https://ottawa.ca/en/city-hall/creating-equal-inclusive-and-diverse-city/accessibility-services/accessibility-design-standards-features#accessibility-design-standards
  - On site plan:
    - Ensure site access meets the City's Private Approach Bylaw.
    - Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.
    - 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 and fall within TAC guidelines (Figure 8.5.1).
    - Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)
    - Parking stalls at the end of dead-end parking aisles require adequate turning around space

- **Environmental**

  - Already had a comprehensive environmental review for the subdivision. Should include a note that they will be followed.
  - Bird-Safe Design Guidelines should be incorporated into the design of the buildings to help reduce bird mortality in the presence of what will likely be substantial amounts of window coverage.
  - Urban Heat Island
    - There is a lot of impermeable surface on the proposed plans, which would contribute to the urban heat island effect and extreme heat events. Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building differently.
  - Within the Carp river watershed, so there are runoff controls. Infrastructure comments address controls.
  - ESA will need to be updated. Must be within 18 months of submission.

- **Forestry**

  - A Tree Conservation Report and Landscape Plan are required, in accordance with the requirements below.
  - There are trees planted around the perimeter of the property which must be retained and protected through the planning and development of the site. Appropriate setbacks and tree protection fencing locations must be shown on the TCR.
  - The Landscape Plan must show where replacement and additional trees will be planted, with a priority of planting large-growing native species, to work towards 40% canopy cover.

  <u>Tree Conservation Report requirements:</u>

  1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
     a. an approved TCR is a requirement of Site Plan approval.
     b. The TCR may be combined with the LP provided all information is supplied
  2. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
  3. Compensation may be required for the removal of city owned trees.
  4. The TCR must contain 2 separate plans:
     a. Plan/Map 1 - show existing conditions with tree cover information
     b. Plan/Map 2 - show proposed development with tree cover information
     c. Please ensure retained trees are shown on the landscape plan
  5. The TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, with information on the species, diameter and health condition
  6. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
  7. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
  8. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at <u>Tree Protection Specification</u> or by searching Ottawa.ca
     a. the location of tree protection fencing must be shown on the plan

b. show the critical root zone of the retained trees

9. The new Official Plan places a strong priority on retention of existing trees. All opportunities to retain protected trees must be considered in the design of plans to maintain and improve the existing canopy cover of the site.
10. For more information on the process or help with tree retention options, contact Nancy Young nancy.young@ottawa.ca or on City of Ottawa

Tree planting requirements:

The Official Plan requires that "On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect;"

The Landscape Plan (LP) must account for the following:

Minimum Setbacks

- 1.5m from sidewalks, MUP/cycle tracks, and water service laterals
- 2.5m from curb
- Conifers: 4.5m setback from curb, sidewalk or MUP/cycle track/pathway
- Street Trees: 7.5m between large growing trees, 4m between small growing trees

- Park or open space planting: 10m spacing between trees, except where otherwise approved in naturalization / afforestation areas
- Adhere to the relevant Hydro Ottawa or Hydro One planting guidelines (species and setbacks) in proximity to above and below-ground hydro

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification and will include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant a diversity of native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please document on the LP that adequate soil volumes can be met:

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

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

- **Parks**

  - CIL at the rate of 2% will be required unless proof of CIL payment during the subdivision registration is provided.

- **City Surveyor**
  - The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
  - Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

  Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

Submission requirements and fees

- Additional information regarding fees related to planning applications can be found here.
- Plans are to be standard A1 size (594 mm x 841 mm) or Arch D size (609.6 mm x 914.4 mm) sheets, dimensioned in metric and utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- All PDF submitted documents are to be unlocked and flattened.

Next steps

- Please reach out to Councillor Curry to discuss the proposal when ready.
- It is anticipated that, as a result of the *More Homes for Everyone Act, 2022*, for applications for site plan approval and zoning by-law amendments, new processes in respect of pre-application consultation will be in place as of January 1, 2023. The new processes are anticipated to require a multiple phase pre-application consultation approach before an application will be deemed complete. Applicants who have not filed a complete application by the effective date may be required to undertake further pre-application consultation(s) consistent with the provincial changes. The by-laws to be amended include By-law 2009-320, the Pre-Consultation By-law, By-law 2022-239, the planning fees by-law and By-law 2022-254, the Information and Materials for Planning Application By-law. The revisions are

anticipated to be before Council in the period after the new Council takes office and the end of the year.

APPENDIX B

Water Supply Calculations

Water Service Calculations

LRL File No. : 230273
Project : Proposed Development - Halo Car Wash
Location : Palladium Drive, Kar
Date : May 17, 2023
Prepared by : M. Basnet

Water Demand

Site area = 0.536 ha (Halo Car Wash)

Average day demand = *35000* *L / ha·day* (based on Table 4.2 of Ottawa Design Guidelines-Water Distribution)
= 18750 L / day
= **0.22** **L / s**

Maximum daily peak factor = 1.5
Maximum daily demand = **0.33** **L / s**

Maximum hour peak factor = 1.8
Maximum hour demand = **0.59** **L / s**

Adjustment - Car Wash

Estimated vol. of water/car wash = 170 L

Average day demand = 93151 L / day (assuming 200000 car wash/year)
1.08 **L / s**

Maximum daily demand = **1.97** **L / s** (assuming 1000 car wash/day)

Maximum hour demand = **6.14** **L / s** (assuming 130 car wash/hour)

Total Anticipated Water Demand

Average day demand = **1.30** **L/s**
Maximum daily demand = **2.29** **L/s**
Maximum hour demand = **6.72** **L/s**

Fire Flow Calculations

LRL File No. 230273
Project: Proposed Development-Halo Car Wash
Location: Palladium Drive, Kanata, ON
Date: May 17, 2023
Method: Fire Underwriters Survey (FUS)
Prepared by: M. 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	Non-combustible Construction	**0.8**		
			Ordinary Construction	1.0				
			Non-combustible construction	0.8				
			Fire resistive construction <2 hrs	0.7				
			Fire resistive construction >2 hrs	0.6				
Floor Space Area (A)								
2	Total area					**533**	m^2	
3	Obtain fire flow before reductions	Required fire flow	Fire Flow = 220 x C x $A^{0.5}$				L/min	**4,063**
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	**4,063**
			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	**4,063**
			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	0 to 3m	25%	**25%**	L/min	**5,079**
			East side	>45m	0%			
			South side	>45m	0%			
			West side	>45m	0%			
Net required fire flow								
7	Obtain fire flow, duration, and volume				Minimum required fire flow rate (rounded to nearest 100)		L/min	**5,100**
					Minimum required fire flow rate		L/s	**85.0**
					Required duration of fire flow		hr	**2**

APPENDIX C

Wastewater Calculations

LRL File No. 230273
Project: Proposed Development-Halo Car Wash
Location: 3095 Palladium Drive, Kanata (ON)
Date: February 15, 2024

Sanitary Design Parameters

Average Daily Flow = 280 L/p/day
Commercial & Institutional Flow = 28000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Heavy Industrial Flow = 55000 L/ha/day
Maximum Residential Peak Factor = 4.0
Commercial & Institutional Peak Factor = 1.5
Industrial Peak Factor = as per Appendix 4-B
Extraneous Flow = 0.33 L/s/gross ha
(as Per Tech Bulletin ISTB-2018-01)

Pipe Design Parameters

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

LOCATION			RESIDENTIAL AREA AND POPULATION						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL	PIPE					
STREET/ SITE	FROM MH	TO MH	AREA (Ha)	POP.	CUMMULATIVE AREA (Ha)	CUMMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	ACCU. AREA (Ha)	AREA (Ha)	ACCU. AREA (Ha)	PEAK FACT.	AREA (Ha)	ACCU. AREA (Ha)	*PEAK FLOW (l/s)	TOTAL AREA (Ha)	ACCU. AREA (Ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	MATERIAL	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)
	BLDG.	SAN MH03																		0.003	10.8	150	3.00%	PVC	26.38	1.49
	SAN MH03	SAN MH04																		0.003	9.1	150	3.00%	PVC	26.38	1.49
	SAN MH01	SAN MH02									0.536					6.139	0.536	0.536	0.177	6.316	34.9	150	1.50%	PVC	18.65	1.06
	SAN MH02	SAN MH04																		6.318	13.5	150	1.50%	PVC	18.65	1.06
	SAN MH04	SAN MH05																		6.318	23.3	150	1.50%	PVC	18.65	1.06
	SAN MH05	Ex. SAN																		6.318	10.9	150	2.93%	PVC	26.07	1.48

Designed: M. B./M.L.	PROJECT: Proposed Halo Car Wash		
Checked: M.B.	LOCATION: 3095 Palladium Drive, Kanata (ON)		
Dwg. Reference: C401	File Ref.: 230273	Date: February 15, 2024	Sheet No. 1 of 1

Note:
**Peak flow including anticipated waste water from Halo Car Wash (6.141 L/s), see below

Site Description	Qty	L/Qty	Total	
			L/day	L/s
Halo Car Wash				
Anticipated Employees	2	75	150	0.002
Total x Peak Factor (1.5)				**0.003**
Estimated Car Wash/Hour (based on info by Halo Car Wash)	130	170		**6.139**
Total Anticipated Peak Design Flow (dry weather flow)				**6.141**

APPENDIX D

Stormwater Management Calculations

LRL Associates Ltd.

Storm Watershed Summary

LRL File No. 230273

Project: Proposed Development-Halo Car Wash

Location: 3095 Palladium Drive, Kanata

Date: February 12, 2024

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 (uncontrolled)	0.503	0.000	0.033	0.536	0.24
Total	**0.503**	**0.000**	**0.033**	**0.536**	**0.24**

Post-Development Catchments

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
WS-01 (controlled)	0.013	0.000	0.082	0.095	0.81
WS-02 (controlled)	0.000	0.000	0.062	0.062	0.90
WS-03 (controlled)	0.013	0.000	0.028	0.042	0.68
WS-04 (controlled)	0.088	0.000	0.085	0.172	0.54
WS-05 (controlled)	0.010	0.000	0.055	0.064	0.79
WS-06 (controlled)	0.012	0.000	0.000	0.012	0.20
WS-07 (uncontrolled)	0.008	0.000	0.014	0.022	0.65
WS-08 (uncontrolled)	0.008	0.000	0.006	0.015	0.50
WS-09 (uncontrolled)	0.022	0.000	0.014	0.037	0.48
WS-10 (uncontrolled)	0.016	0.000	0.001	0.017	0.22
Total	**0.190**	**0.000**	**0.347**	**0.536**	**0.65**

LRL File No. 230273
Project: Proposed Development-Halo Car Wash
Location: 3095 Palladium Drive, Kanata
Date: February 13, 2024
Designed: M. Longtin
Checked: M. Basnet
Drawing Ref.: C701, C702

Stormwater Management Design Sheet

STORM - 100 YEAR

Runoff Equation

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

Pre-development Catchment within Development Area

	Total Area =	**0.536**	ha	**∑R=**	**0.24**
Uncontrolled	EWS-01	0.536	ha	R=	0.24
	Total Uncontrolled =	**0.536**	**ha**	**∑R=**	**0.24**

Allowable Release Rate = 105.00 L/s *(As determined by Robinsons Consultants Inc.)*

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.536**	ha	**∑R=**	**0.65**	**0.82**
Controlled	WS-01	0.095	ha	R=	0.81	1.00
	WS-02	0.062	ha	R=	0.90	1.00
	WS-03	0.042	ha	R=	0.68	0.85
	WS-04	0.172	ha	R=	0.54	0.68
	WS-05	0.064	ha	R=	0.79	0.99
	WS-06	0.012	ha	R=	0.20	0.25
	Total Contolled =	**0.446**	**ha**	**∑R=**	**0.69**	**0.86**
Uncontrolled	WS-07	0.022	ha	R=	0.65	0.81
	WS-08	0.015	ha	R=	0.50	0.62
	WS-09	0.037	ha	R=	0.48	0.59
	WS-10	0.017	ha	R=	0.22	0.28
	Total Uncontolled =	**0.090**	**ha**	**∑R=**	**0.47**	**0.59**

Post-development Stormwater Management (100-Yr)

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

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	190.60	67.25	78.51	26.49	105.00
15	142.89	152.53	66.61	78.51	21.20	99.71
20	119.95	128.04	59.43	78.51	17.79	96.31
25	103.85	110.85	48.51	78.51	15.41	93.92
30	91.87	98.06	35.19	78.51	13.63	92.14
35	82.58	88.15	20.23	78.51	12.25	90.76
40	75.15	80.21	4.08	78.51	11.15	89.66
45	69.05	73.71	0.00	78.51	10.24	88.75
50	63.95	68.27	0.00	78.51	9.49	88.00
55	59.62	63.64	0.00	78.51	8.85	87.36
60	55.89	59.66	0.00	78.51	8.29	86.80
65	52.65	56.20	0.00	78.51	7.81	86.32
70	49.79	53.15	0.00	78.51	7.39	85.90
75	47.26	50.44	0.00	78.51	7.01	85.52
80	44.99	48.02	0.00	78.51	6.67	85.19
85	42.95	45.85	0.00	78.51	6.37	84.88
90	41.11	43.88	0.00	78.51	6.10	84.61
95	39.43	42.09	0.00	78.51	5.85	84.36
100	37.90	40.46	0.00	78.51	5.62	84.13
105	36.50	38.96	0.00	78.51	5.41	83.93
110	35.20	37.58	0.00	78.51	5.22	83.73
115	34.01	36.30	0.00	78.51	5.04	83.56
120	32.89	35.11	0.00	78.51	4.88	83.39

On-site stormwater detention

Storage required = 67.25 m^3
Surface storage provided = 74.97 m^3 (See Dwg C601)

LRL File No. 230273
Project: Proposed Development-Halo Car Wash
Location: 3095 Palladium Drive, Kanata
Date: February 13, 2024
Designed: M. Longtin
Checked: M. Basnet
Drawing Ref.: C701, C702

Stormwater Management Design Sheet

STORM - 5 YEAR

Runoff Equation

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

Pre-development Catchment within Development Area

	Total Area =	**0.536**	ha	**∑R=**	**0.24**
Uncontrolled	EWS-01	0.536	ha	R=	0.24
	Total Uncontrolled =	**0.536**	**ha**	**∑R=**	**0.24**

Allowable Release Rate = 105.00 L/s *(As determined by Robinsons Consultants Inc.)*

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.536**	ha	**∑R=**	**0.65**	**0.82**
Controlled	WS-01	0.095	ha	R=	0.81	1.00
	WS-02	0.062	ha	R=	0.90	1.00
	WS-03	0.042	ha	R=	0.68	0.85
	WS-04	0.172	ha	R=	0.54	0.68
	WS-05	0.064	ha	R=	0.79	0.99
	WS-06	0.012	ha	R=	0.20	0.25
	Total Contolled =	**0.446**	**ha**	**∑R=**	**0.69**	**0.86**
Uncontrolled	WS-07	0.022	ha	R=	0.65	0.81
	WS-08	0.015	ha	R=	0.50	0.62
	WS-09	0.037	ha	R=	0.48	0.59
	WS-10	0.017	ha	R=	0.22	0.28
	Total Uncontolled =	**0.090**	**ha**	**∑R=**	**0.47**	**0.59**

Post-development Stormwater Management (5-Yr)

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

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	104.19	88.97	6.28	78.51	12.37	90.88
15	83.56	71.35	0.00	78.51	9.92	88.43
20	70.25	59.99	0.00	78.51	8.34	86.85
25	60.90	52.00	0.00	78.51	7.23	85.74
30	53.93	46.05	0.00	78.51	6.40	84.91
35	48.52	41.43	0.00	78.51	5.76	84.27
40	44.18	37.73	0.00	78.51	5.24	83.75
45	40.63	34.69	0.00	78.51	4.82	83.33
50	37.65	32.15	0.00	78.51	4.47	82.98
55	35.12	29.99	0.00	78.51	4.17	82.68
60	32.94	28.13	0.00	78.51	3.91	82.42
65	31.04	26.51	0.00	78.51	3.68	82.20
70	29.37	25.08	0.00	78.51	3.49	82.00
75	27.89	23.81	0.00	78.51	3.31	81.82
80	26.56	22.68	0.00	78.51	3.15	81.66
85	25.37	21.66	0.00	78.51	3.01	81.52
90	24.29	20.74	0.00	78.51	2.88	81.39
95	23.31	19.90	0.00	78.51	2.77	81.28
100	22.41	19.13	0.00	78.51	2.66	81.17
105	21.58	18.43	0.00	78.51	2.56	81.07
110	20.82	17.78	0.00	78.51	2.47	80.98
115	20.12	17.18	0.00	78.51	2.39	80.90
120	19.47	16.62	0.00	78.51	2.31	80.82

On-site stormwater detention

Storage required = 6.28 m^3

LRL File No. 230273
Project: Proposed Development-Halo Car Wash
Location: 3095 Palladium Drive, Kanata
Date: February 13, 2024
Designed: M. Longtin
Checked: M. Basnet
Drawing Ref.: C701, C702

Stormwater Management Design Sheet

STORM - 2 YEAR

Runoff Equation

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

Pre-development Catchment within Development Area

	Total Area =	**0.536**	ha	**∑R=**	**0.24**
Uncontrolled	EWS-01	0.536	ha	R=	0.24
	Total Uncontrolled =	**0.536**	**ha**	**∑R=**	**0.24**

Allowable Release Rate = 105.00 L/s *(As determined by Robinsons Consultants Inc.)*

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.536**	ha	**∑R=**	**0.65**	**0.82**
Controlled	WS-01	0.095	ha	R=	0.81	1.00
	WS-02	0.062	ha	R=	0.90	1.00
	WS-03	0.042	ha	R=	0.68	0.85
	WS-04	0.172	ha	R=	0.54	0.68
	WS-05	0.064	ha	R=	0.79	0.99
	WS-06	0.012	ha	R=	0.20	0.25
	Total Contolled =	**0.446**	**ha**	**∑R=**	**0.69**	**0.86**
Uncontrolled	WS-07	0.022	ha	R=	0.65	0.81
	WS-08	0.015	ha	R=	0.50	0.62
	WS-09	0.037	ha	R=	0.48	0.59
	WS-10	0.017	ha	R=	0.22	0.28
	Total Uncontrolled =	**0.090**	**ha**	**∑R=**	**0.47**	**0.59**

Post-development Stormwater Management (2-Yr)

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

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m^3)	*Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	76.81	65.59	15.80	39.26	9.12	48.37
15	61.77	52.75	12.14	39.26	7.33	46.59
20	52.03	44.43	6.21	39.26	6.17	45.43
25	45.17	38.57	0.00	39.26	5.36	44.62
30	40.04	34.19	0.00	39.26	4.75	44.01
35	36.06	30.79	0.00	39.26	4.28	43.54
40	32.86	28.06	0.00	39.26	3.90	43.16
45	30.24	25.82	0.00	39.26	3.59	42.84
50	28.04	23.95	0.00	39.26	3.33	42.58
55	26.17	22.35	0.00	39.26	3.11	42.36
60	24.56	20.97	0.00	39.26	2.91	42.17
65	23.15	19.77	0.00	39.26	2.75	42.00
70	21.91	18.71	0.00	39.26	2.60	41.86
75	20.81	17.77	0.00	39.26	2.47	41.73
80	19.83	16.93	0.00	39.26	2.35	41.61
85	18.94	16.18	0.00	39.26	2.25	41.50
90	18.14	15.49	0.00	39.26	2.15	41.41
95	17.41	14.87	0.00	39.26	2.07	41.32
100	16.75	14.30	0.00	39.26	1.99	41.24
105	16.13	13.78	0.00	39.26	1.91	41.17
110	15.57	13.29	0.00	39.26	1.85	41.10
115	15.05	12.85	0.00	39.26	1.79	41.04
120	14.56	12.43	0.00	39.26	1.73	40.98

*Average release rate taken as 50% of max. allowable controlled release rate for an underground storage calculation

On-site stormwater detention

Storage required = 15.80 m^3
Underground storage provided = **21.10** m^3 (oversized pipe storage & CB/CBMH storage)

Pipe Storage

Length (m)	dia. (m)	Storage (m^3)
39.30	0.250	1.93
23.30	0.375	2.57
29.00	0.450	4.61
32.50	0.250	1.60
7.70	0.450	1.23
	Total	**11.94**

CB/CBMH Storage

CB/CBMH	Depth (m)	dia. (m)	Storage (m^3)
CB01	1.36	0.6*0.6	0.49
CBMH02	1.59	1.20	1.80
CBMH03	1.72	1.20	1.95
CB04	1.68	0.6*0.6	0.60
CBMH05	1.87	1.20	2.12
CBMH06	1.95	1.20	2.21
	Total		**9.16**

LRL Associates Ltd.
Storm Design Sheet

LRL File No.	230273
Project:	Proposed Development-Halo Car Wash
Location:	3095 Palladium Drive, Kanata
Date:	February 15, 2024
Designed:	M. Longtin
Checked:	M. Basnet
Drawing Reference:	C702, C401

Storm Design Parameters

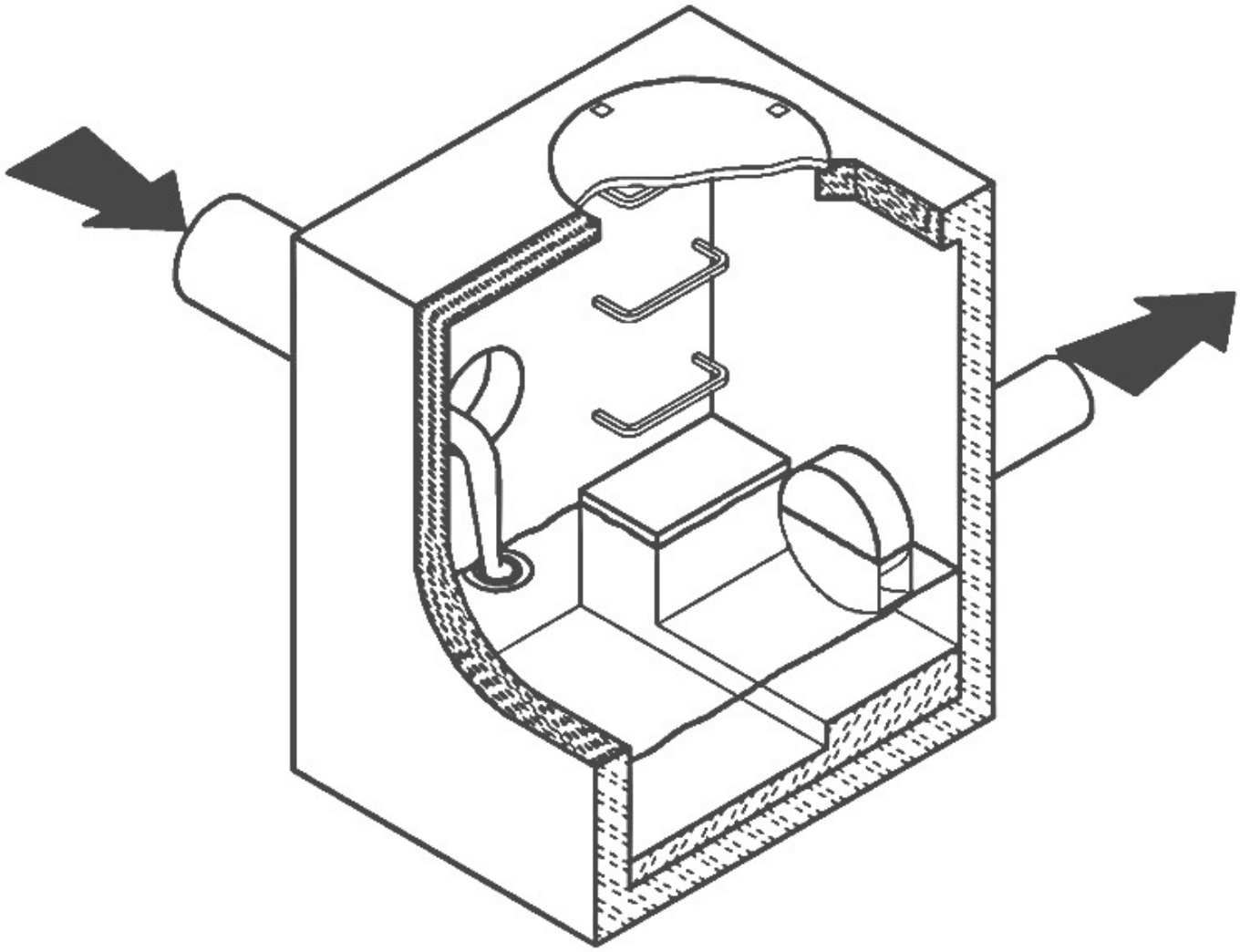
Rational Method	Runoff Coefficient (C)		City of Ottawa IDF curve equation
Q = 2.78CIA	Grass	0.20	(5 year event, intensity in mm/hr)
Q = Peak flow (L/s)	Gravel	0.80	$I_5 = 998.071 / (Td + 6.053)^{0.814}$
A = Drainage area (ha)	Asphalt / rooftop	0.90	Min. velocity = 0.80 m/s
C = Runoff coefficient			Manning's "n" = 0.013
I = Rainfall intensity (mm/hr)			

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. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Controlled Flow Q (L/s)	Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full (L/s)	Velocity Full (m/s)	Time of Flow (min.)	Ratio (Q/Q_{FULL})
WS-01	CB01	CBMH02	0.013	0.000	0.082	0.21	0.21	10.00	104.19	22.04		250	PVC	0.50%	39.3	42.0	0.86	0.76	0.52
WS-02	CBMH02	CBMH03	0.000	0.000	0.062	0.16	0.37	10.76	100.32	36.81		375	PVC	0.30%	23.3	96.0	0.87	0.45	0.38
WS-03	CBMH03	CBMH05	0.013	0.000	0.028	0.08	0.45	11.21	98.20	43.71		450	PVC	0.30%	29.0	156.2	0.98	0.49	0.28
WS-04	CB04	CBMH05	0.088	0.000	0.085	0.26	0.26	10.00	104.19	27.16		250	PVC	0.50%	32.5	42.0	0.86	0.63	0.65
WS-05	CBMH05	CBMH06	0.010	0.000	0.055	0.14	0.85	11.70	95.98	81.35		450	PVC	0.30%	8.8	156.2	0.98	0.15	0.52
WS-06	CBMH06	EX. Sewer	0.012	0.000	0.000	0.01	0.85	11.85	95.33	81.40	78.51	375	PVC	0.26%	15.4	89.4	0.81	0.32	0.88

CSO/STORMWATER MANAGEMENT

HYDROVEX® VHV / SVHV

Vertical Vortex Flow Regulator



JOHN MEUNIER

APPLICATIONS

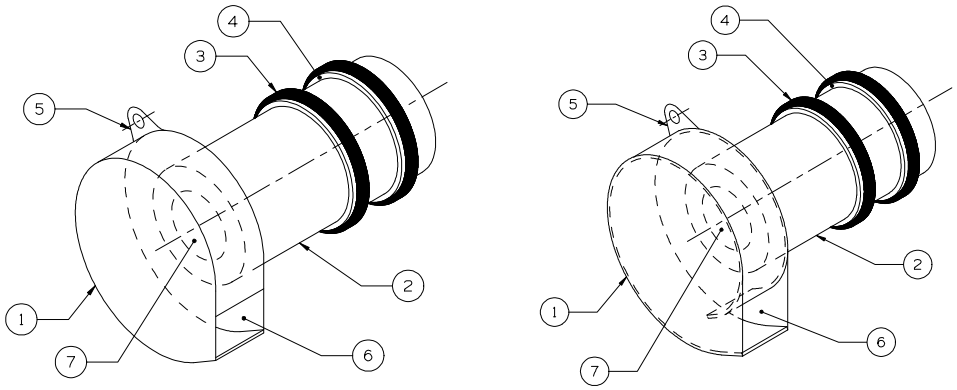
One of the major problems of urban wet weather flow management is the runoff generated after a heavy rainfall. During a storm, uncontrolled flows may overload the drainage system and cause flooding. Due to increased velocities, sewer pipe wear is increased dramatically and results in network deterioration.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

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

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

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

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



VHV ***SVHV***

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

ADVANTAGES

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

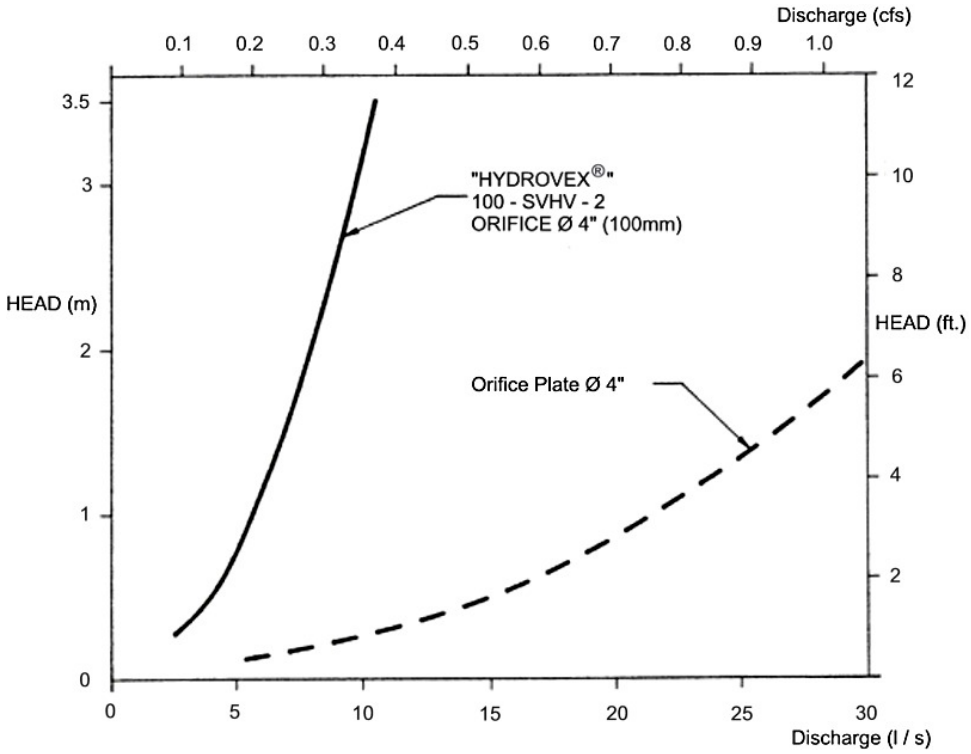


FIGURE 2: DISCHARGE CURVE SHOWING A HYDROVEX® FLOW REGULATOR VS AN ORIFICE PLATE

SELECTION

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

Example:

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

INSTALLATION REQUIREMENTS

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

SPECIFICATIONS

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

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

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

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

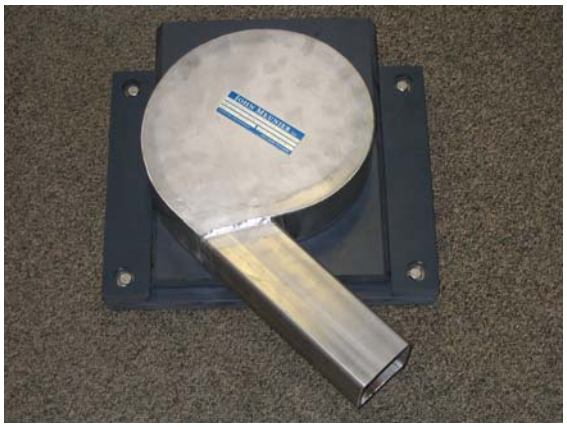
- ***project design flow rate***
- ***pressure head***
- ***chamber's outlet pipe diameter and type***

Typical VHV model in factory

OPTIONS

FV – SVHV (mounted on sliding plate)

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



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

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

VHV with air vent for minimal slopes

HYDROVEX®

VHV Vertical Vortex Flow Regulator

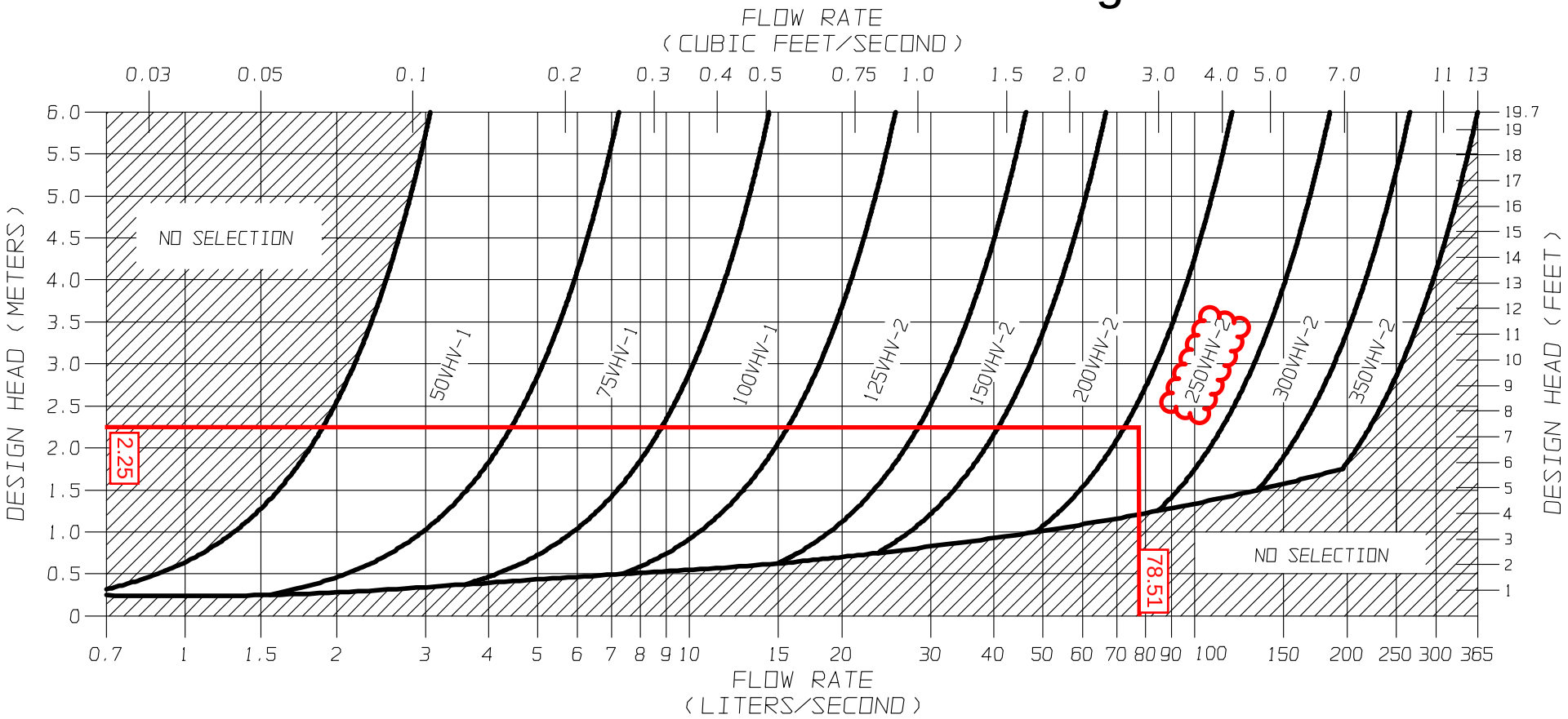
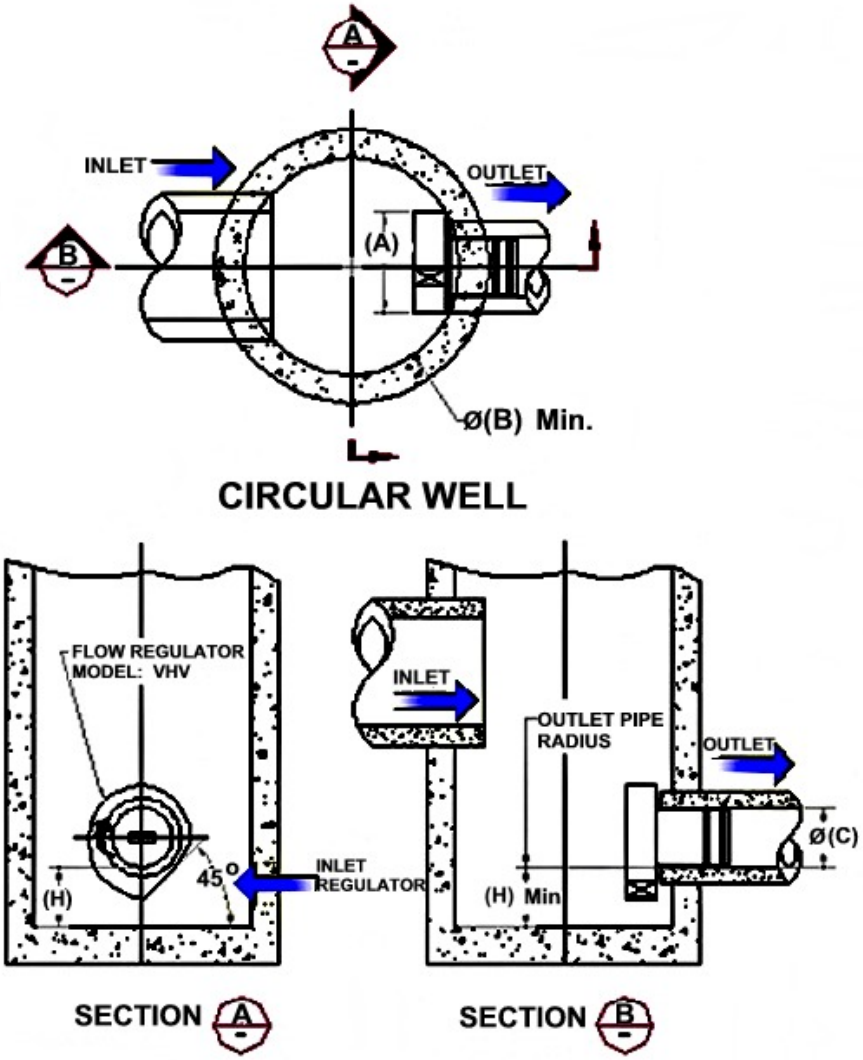


FIGURE 3 - VHV

JOHN MEUNIER

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

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



INSTALLATION

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

MAINTENANCE

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

GUARANTY

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

John Meunier Inc.
ISO 9001 : 2008

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Revised: 2011-05-03

APPENDIX E

Civil Engineering Drawings

PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

REVISION 04

KEY PLAN (N.T.S.)

DRAWING INDEX	
TITLE PAGE	
GENERAL NOTES	C001
SEDIMENT AND EROSION CONTROL PLAN	C101
SITE DEVELOPMENT PLAN	C201
GRADING AND DRAINAGE PLAN	C301
SERVICING PLAN	C401
SERVICING PLAN - RECLAIM TANKS	C402
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAIL PLAN	C901

LRL
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PROPOSED DEVELOPMENT - HALO CAR WASH
3095 PALLADIUM DRIVE, KANATA (ON)
REV.04 - RE-ISSUED FOR APPROVAL - MARCH 4th, 2024
LRL PROJECT no: 230273

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2024/03/04
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

GENERAL NOTES

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

EROSION AND SEDIMENT CONTROL NOTES

GENERAL

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

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

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

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

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

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

CONTRACTOR'S RESPONSIBILITIES

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

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

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

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

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

SPILL CONTROL NOTES

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

MUD MAT NOTES

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

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. SC1.1 PROVISION SHALL BE MADE OR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN O THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSS 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 30MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 30MM LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
12. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
13. SIDEWALKS TO BE 13MM & BEVELED AT 2:1 OR 6MM WITH NO BEVEL REQUIRED BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES REQUIRED TO BE BARRIER-FREE, UNLESS OTHERWISE NOTED. ALL IN ACCORDANCE WITH OBC 3.8.1.3 & OTTAWA ACCESSIBILITY DESIGN STANDARDS.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

ROADWORK SPECIFICATIONS

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

SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

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

SANITARY

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

STORM

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

WATERMAIN

30. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
31. ALL PVC WATERMAINS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
32. ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
33. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
34. ALL PVC WATERMAINS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
35. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
36. VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD W24.
37. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
38. THRUST BLOCKING OF WATERMAINS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
39. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
40. WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25,2 AND W25, RESPECTIVELY.
41. WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
42. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MOE GUIDELINES. FOR CROSSING UNDER SEWERS, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
43. ALL WATERMAINS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
44. GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
45. FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED FINISHED GRADE AT HYDRANT; FIRE HYDRANT LOCATION AS PER STD DWG W18.
46. BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
47. ALL WATERMAINS SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES UNLESS OTHERWISE DIRECTED. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED.
48. ALL WATERMAINS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRETREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT ENVIRONMENT. IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
49. ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

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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

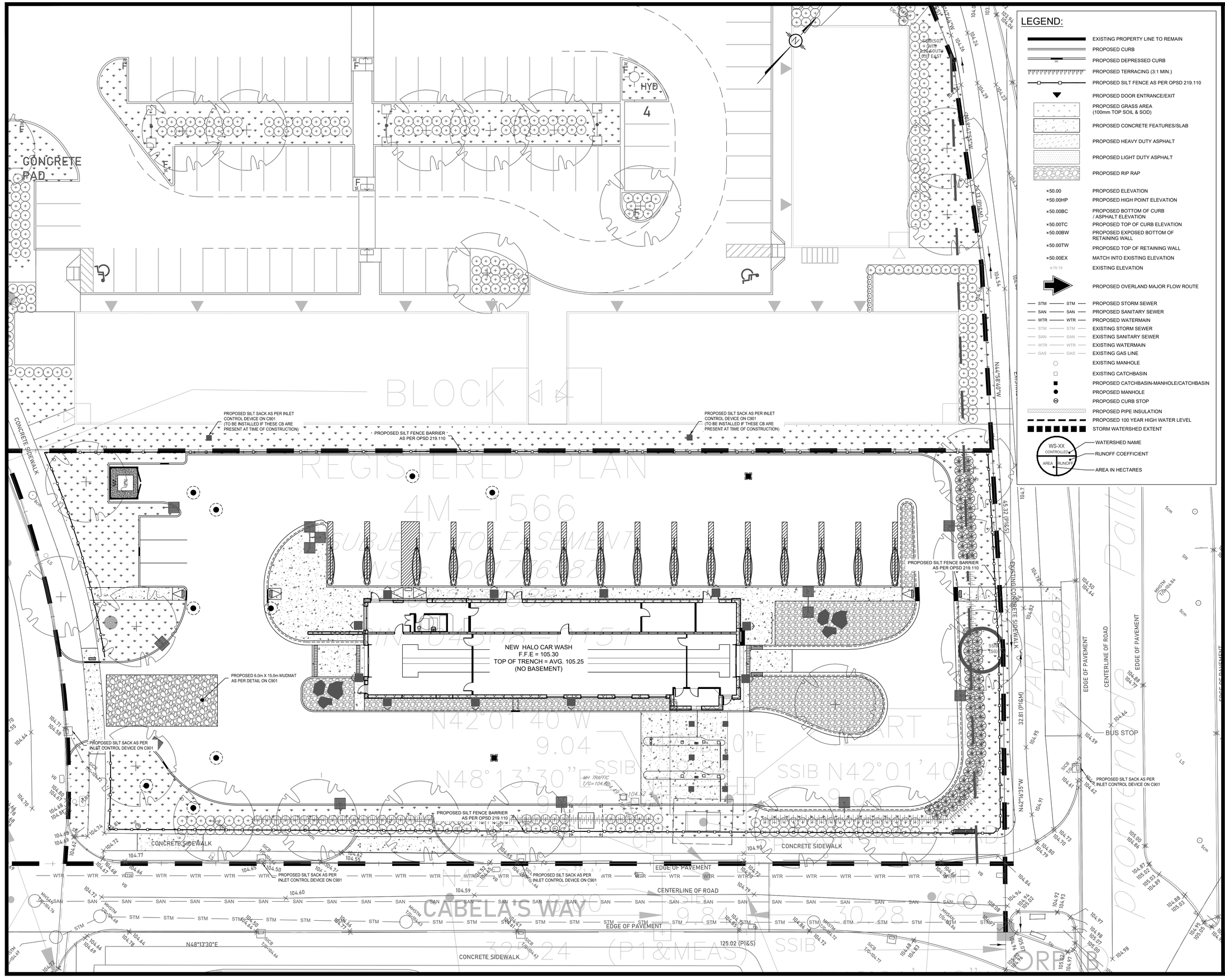
DESIGNED BY: M.L. | DRAWN BY: M.L. | APPROVED BY: M.B.

PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
GENERAL NOTES

PROJECT NO. 230273
DATE MAY 2023

C001



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SCALE: 1:200

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LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2024/03/04
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
HALO CAR WASH

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

PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
230273

DATE
MAY 2023

C101

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LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2024/03/04
PROVINCE OF ONTARIO

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CLIENT
HALO CAR WASH

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

PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
SITE DEVELOPMENT PLAN

PROJECT NO.
230273

DATE
MAY 2023

C201

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm) AUTOMOBILE PARKING	THICKNESS (mm) TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3 A/C (PG 58-34)	50	40
BINDER	HL.8 A/C (PG 58-34)	--	60
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	300	450

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

REFER TO LATEST GEOTECHNICAL REPORT BY GEMTEC DATED JUNE 20, 2023.

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- STM / SAN / WTR / GAS EXISTING STORM SEWER, SANITARY SEWER, WATERMAIN, GAS LINE
- EXISTING MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/CATCHBASIN
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5m 2 0 5m
SCALE: 1:200

No.	REVISIONS	BY	DATE
04	RE-ISSUED FOR APPROVAL	M.L.	MAR 04 2024
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LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2024/03/04
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CLIENT
HALO CAR WASH

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

PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
230273
DATE
MAY 2023

C301

Crossing Table							
Crossing #	WM	(Inv. / Obv.)	STM	(Inv. / Obv.)	SAN	(Inv. / Obv.)	Depth Separation (m)
CR-01	102.06	Obv.	102.56	Inv.	N/A		0.50
CR-02	N/A		102.57	Inv.	101.55	Obv.	1.02
CR-03	102.24	Inv.	N/A		101.74	Obv.	0.50
CR-04	102.18	Obv.	102.68	Inv.	N/A		0.50
CR-05	N/A		102.69	Inv.	101.98	Obv.	0.71
CR-06	102.65	Inv.	N/A		102.10	Obv.	0.55
CR-07	N/A		102.83	Inv.	102.33	Obv.	0.50
WM crossing above sewer per City STD W25.2 WM crossing below sewer per City STD W25							

Structure Table						
Structure	Network	Cover	Structure	Northing	Easting	T/G Elevation
CB01	STM	400.010	705.010	5017523.951	348565.647	104.85
CBMH02	STM	S28.1	701.010	5017497.792	348536.390	104.85
CBMH03	STM	S28.1	701.010	5017479.594	348521.894	104.60
CB04	STM	400.010	705.010	5017479.613	348565.441	104.50
CBMH05	STM	S28.1	701.010	5017457.969	348541.212	104.45
CBMH06	STM	S28.1	701.010	5017451.004	348537.831	104.65
MH01	SAN	401.030	701.010	5017502.586	348544.631	105.14
MH02	SAN	401.030	701.010	5017479.312	348518.577	104.76
MH03	SAN	401.030	701.010	5017475.273	348534.345	104.86
MH04	SAN	401.030	701.010	5017469.240	348527.574	104.77
MH05	SAN	401.030	701.010	5017449.956	348544.800	104.77
MH06	SAN	401.030	701.010	5017443.692	348550.387	104.66

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HALO CAR WASH

DESIGNED BY:	DRAWN BY:	APPROVED BY:
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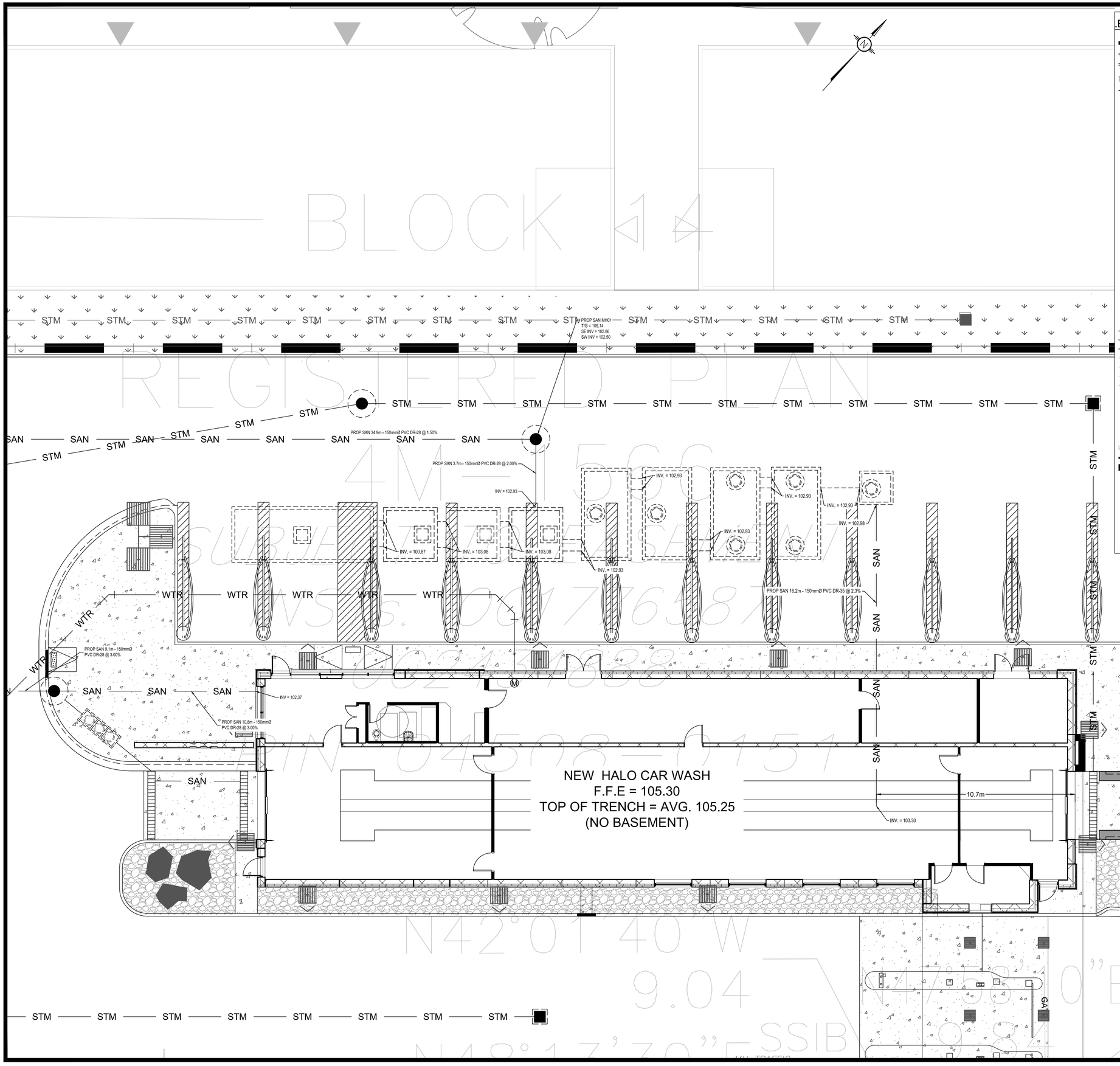
PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
SERVICING PLAN

PROJECT NO.
230273

DATE
MAY 2023

C401



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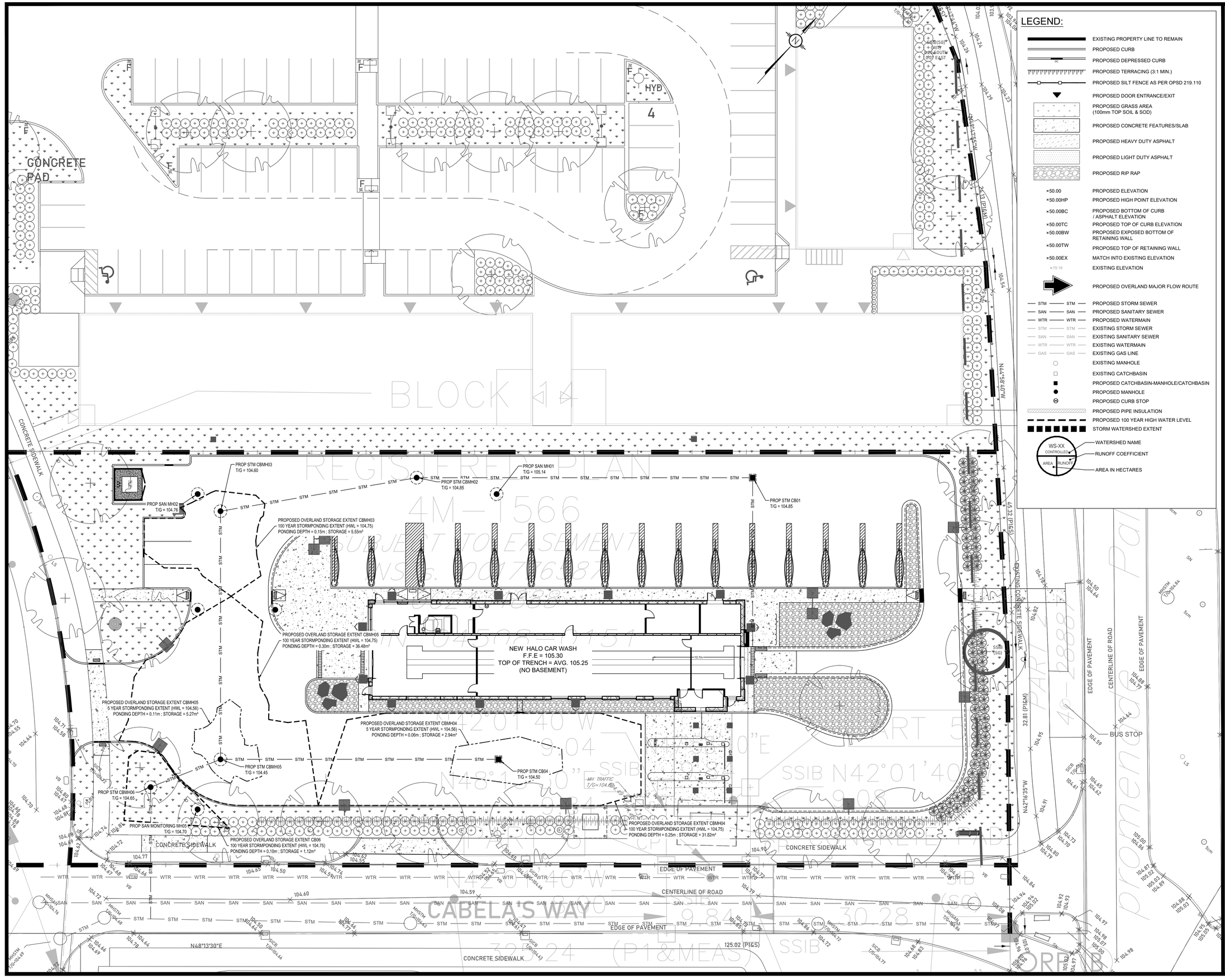
C402



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5m 2 0 5m
SCALE: 1:200

No.	REVISIONS	BY	DATE
04	RE-ISSUED FOR APPROVAL	M.L.	MAR 04 2024
03	RE-ISSUED FOR APPROVAL	M.L.	FEB 15 2024
02	RE-ISSUED FOR APPROVAL	M.L.	NOV 13 2023
01	ISSUED FOR APPROVAL	M.L.	JUNE 16 2023

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2024/03/04
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
HALO CAR WASH

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

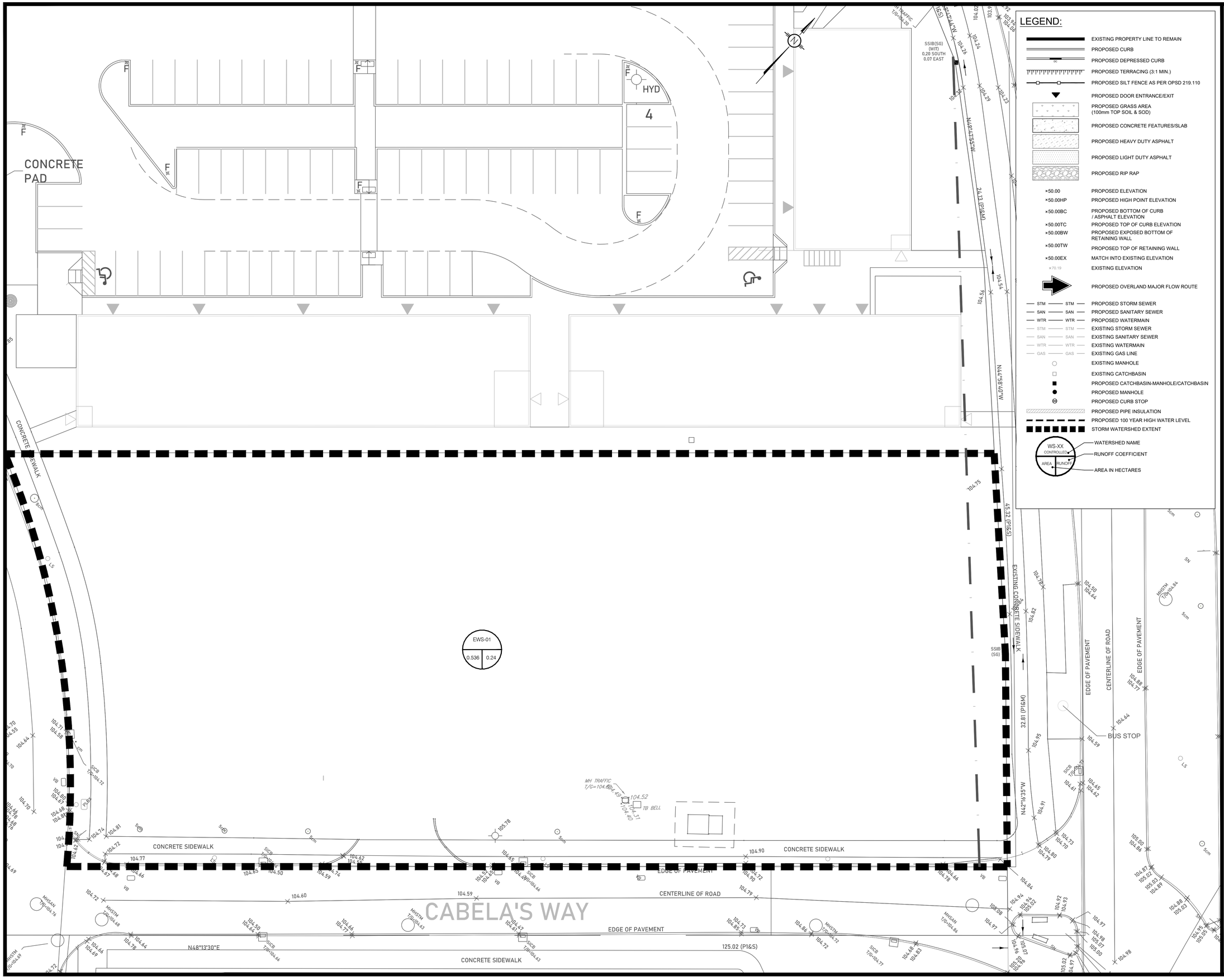
PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
STORMWATER MANAGEMENT PLAN

PROJECT NO.
230273

DATE
MAY 2023

C601



LEGEND:

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

PROJECT
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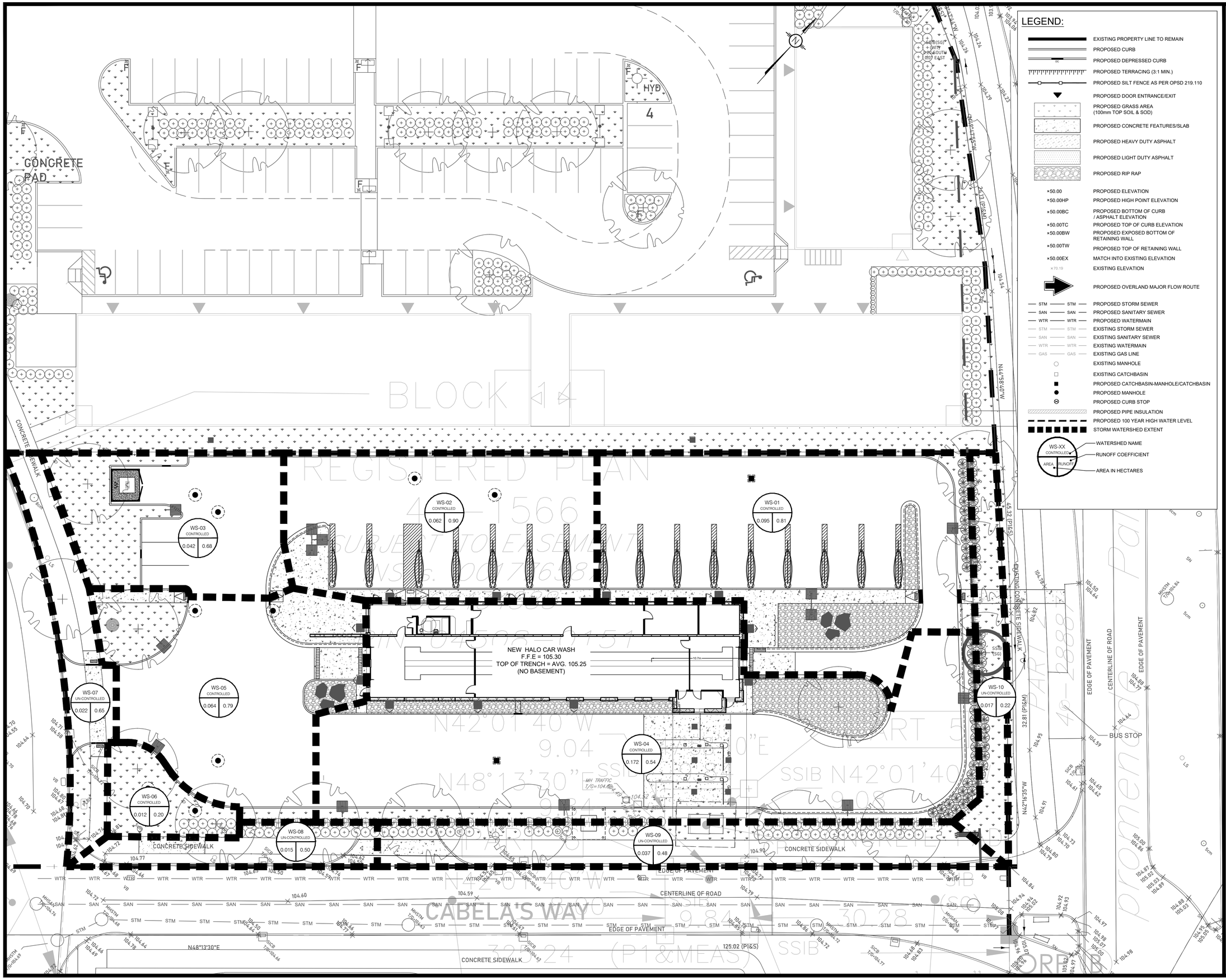
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
230273
DATE
MAY 2023

C701



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LICENSED PROFESSIONAL ENGINEER
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CLIENT
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DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.L.	M.L.	M.B.

PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
POST-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
230273

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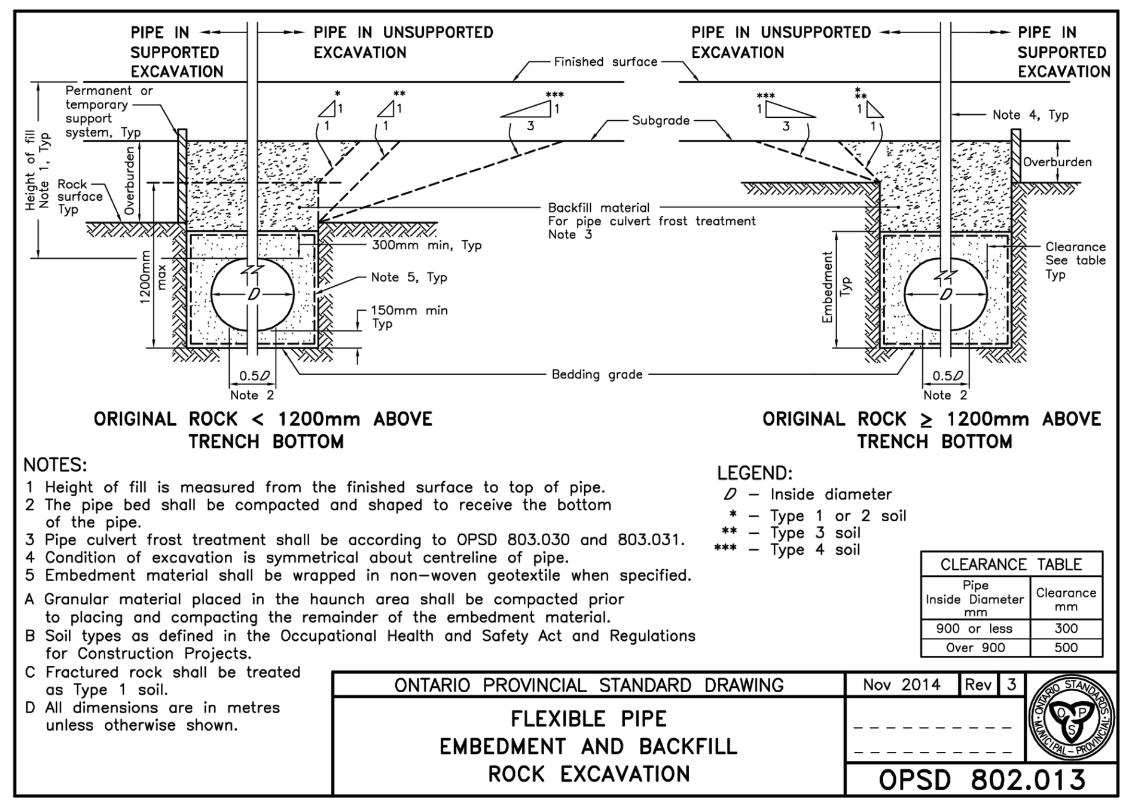
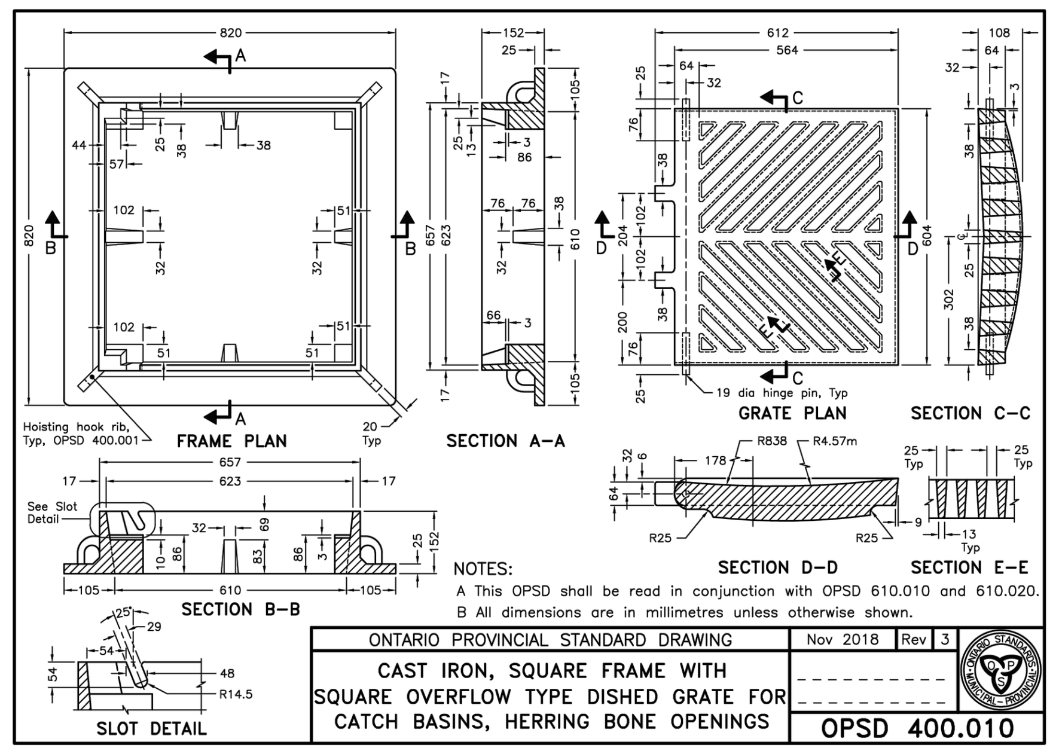
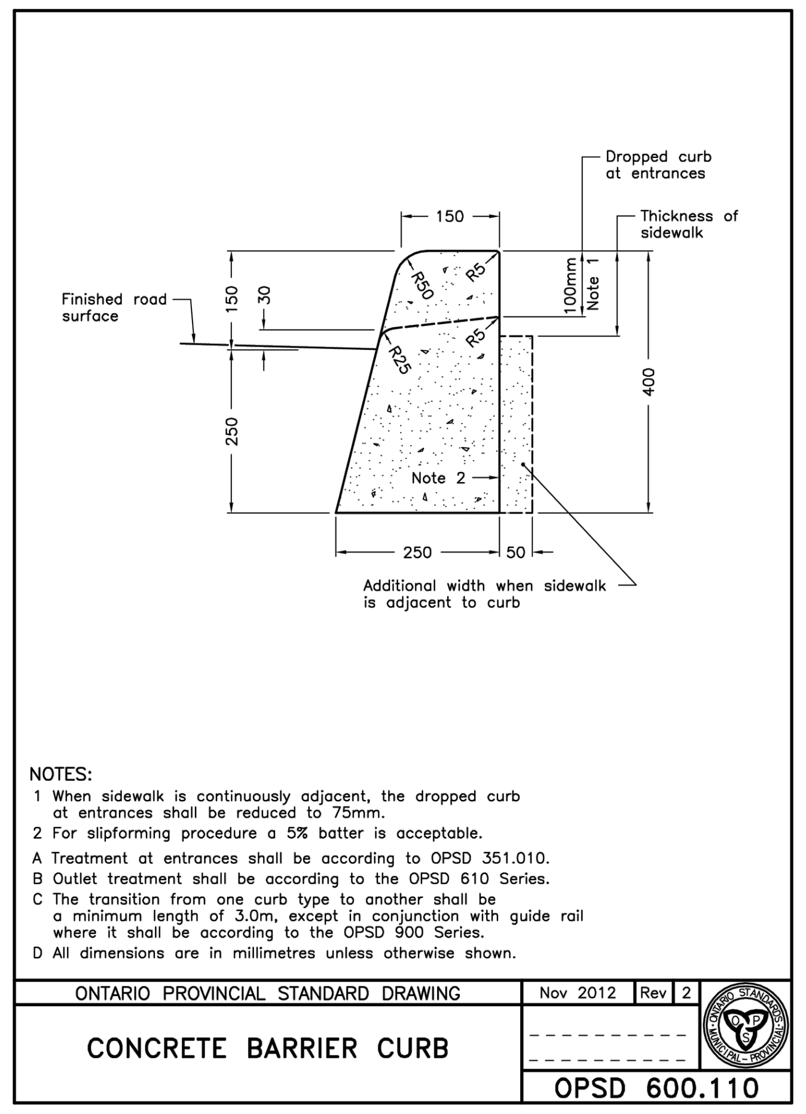
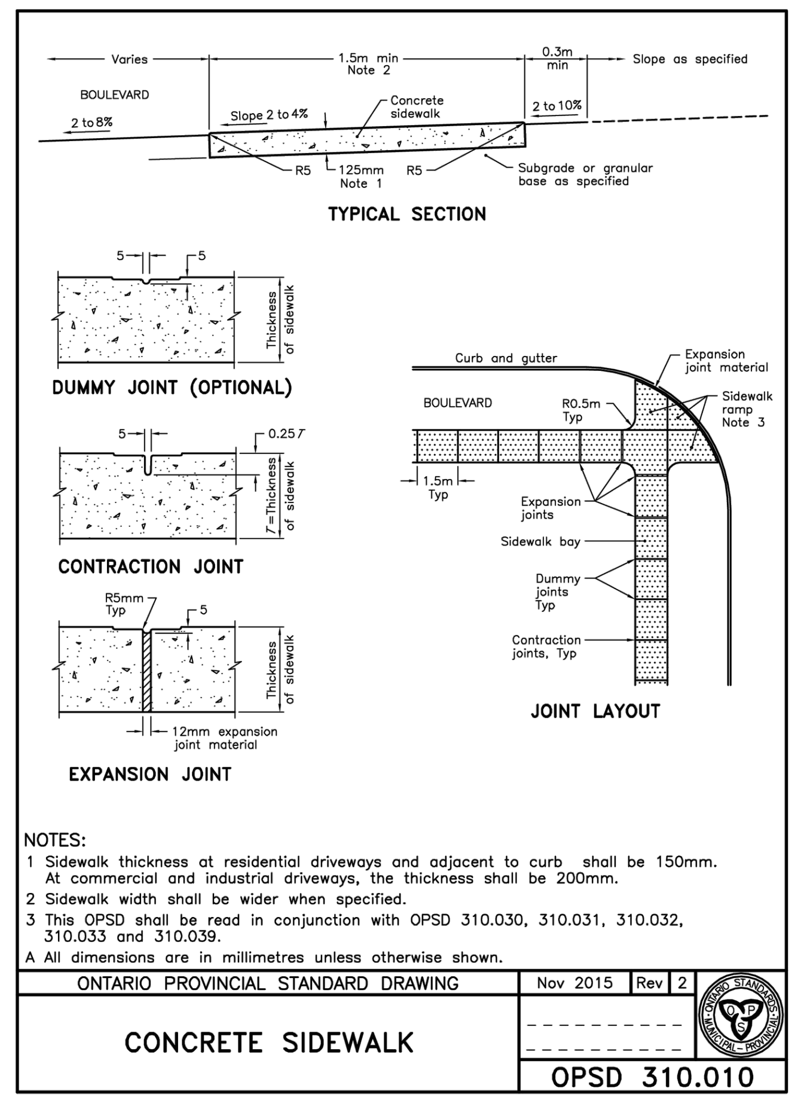
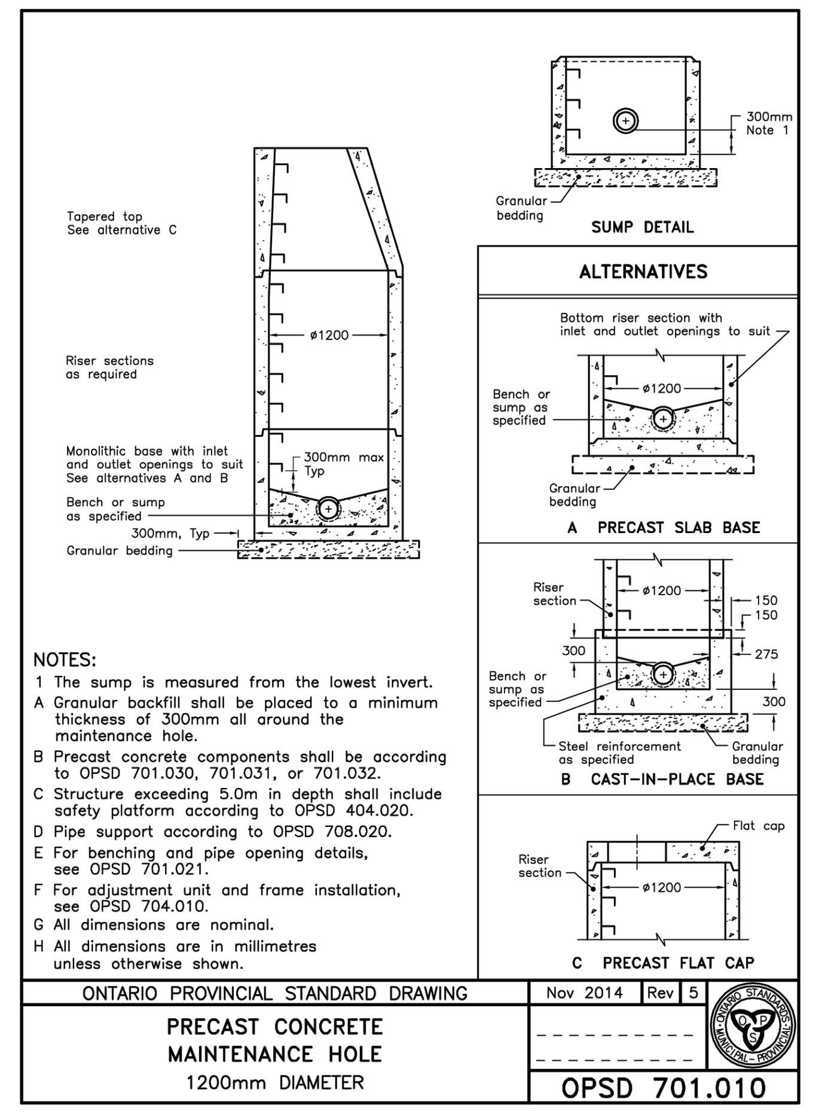
C702

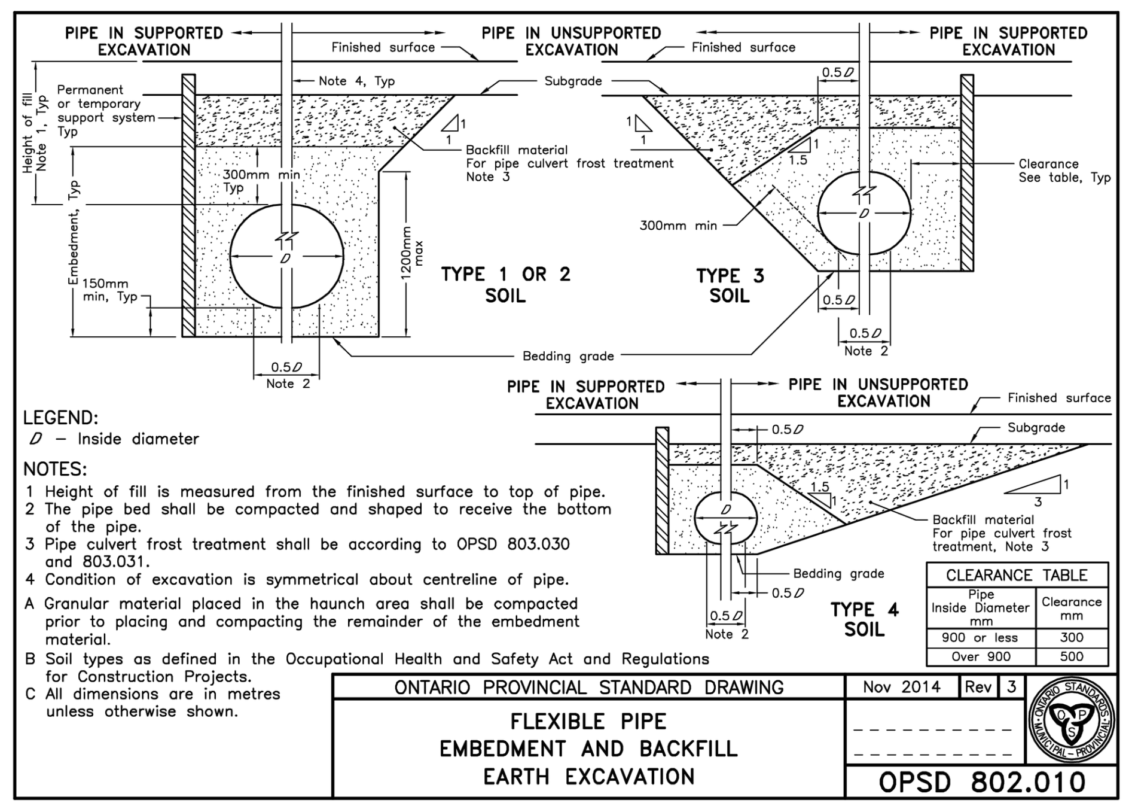


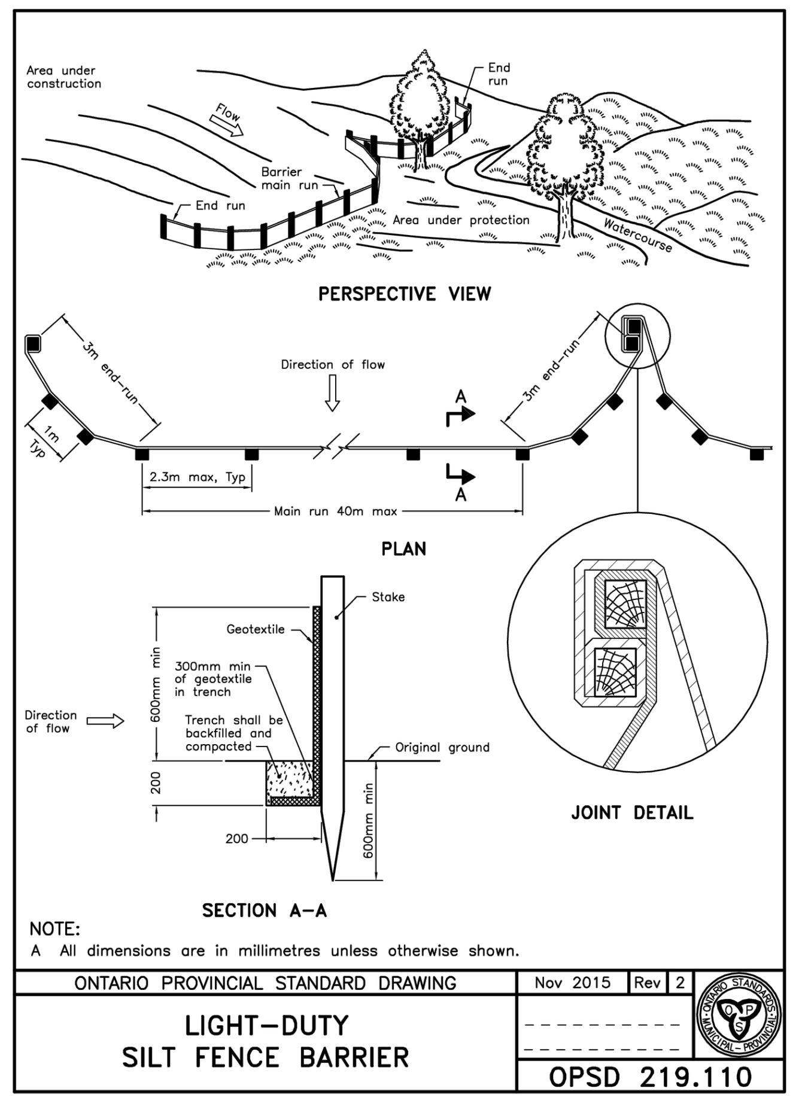


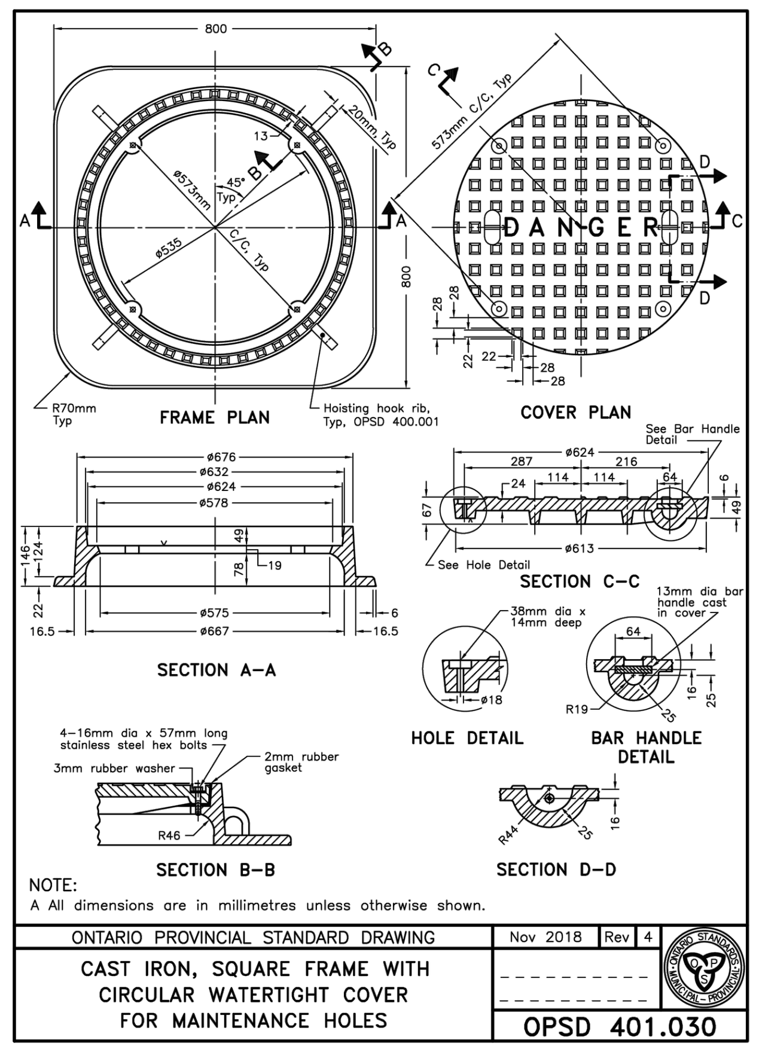


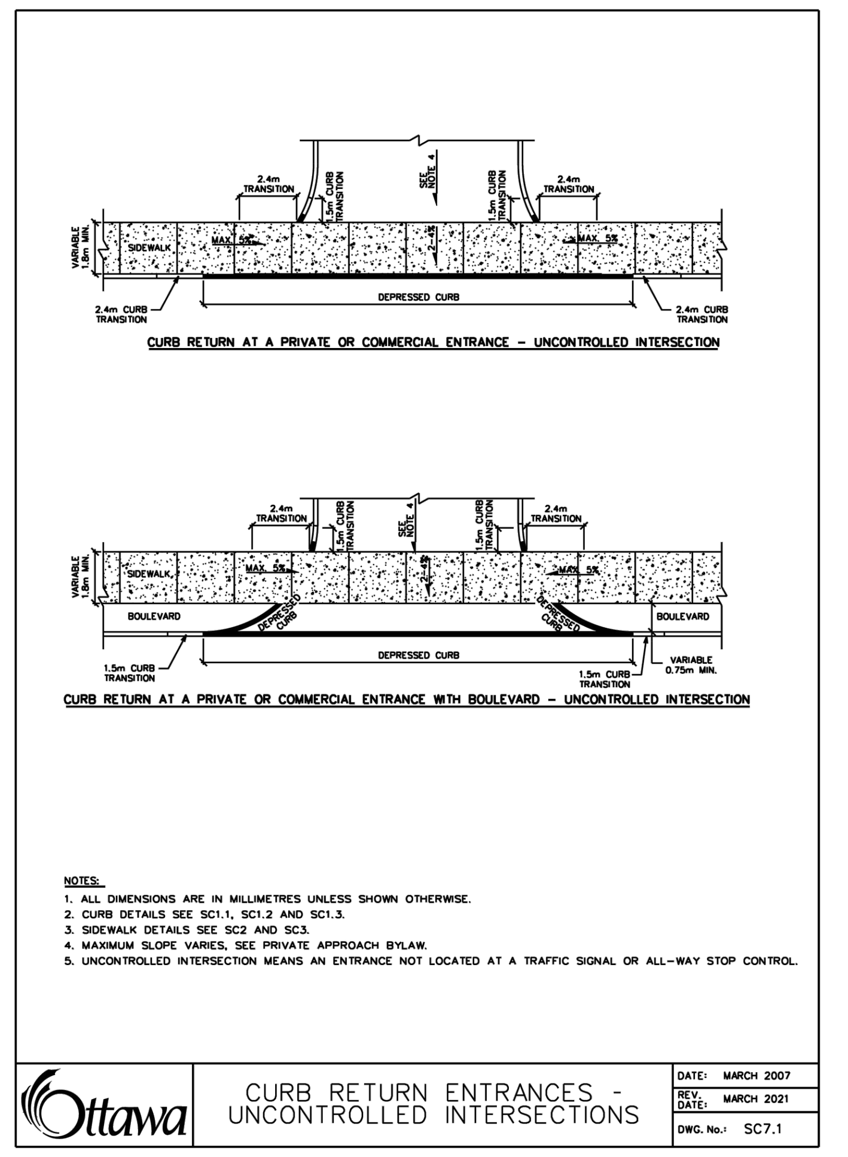


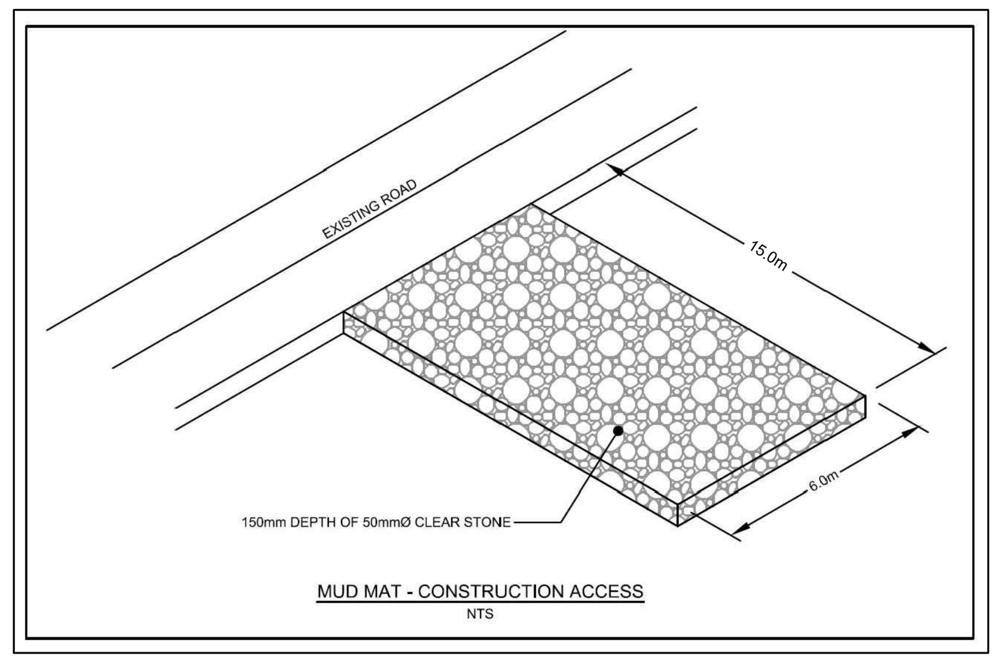


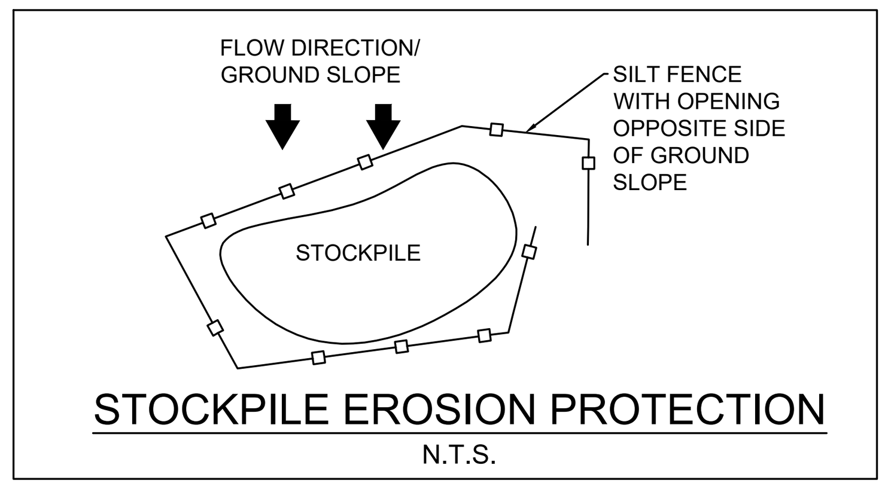


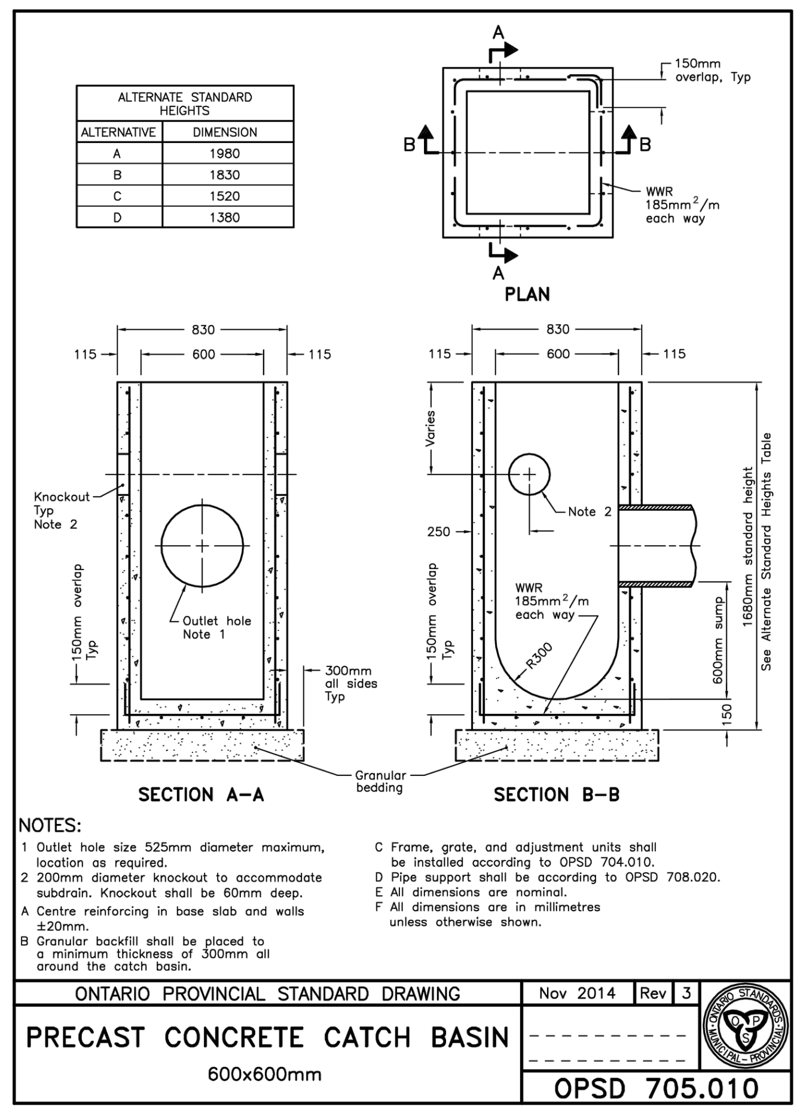


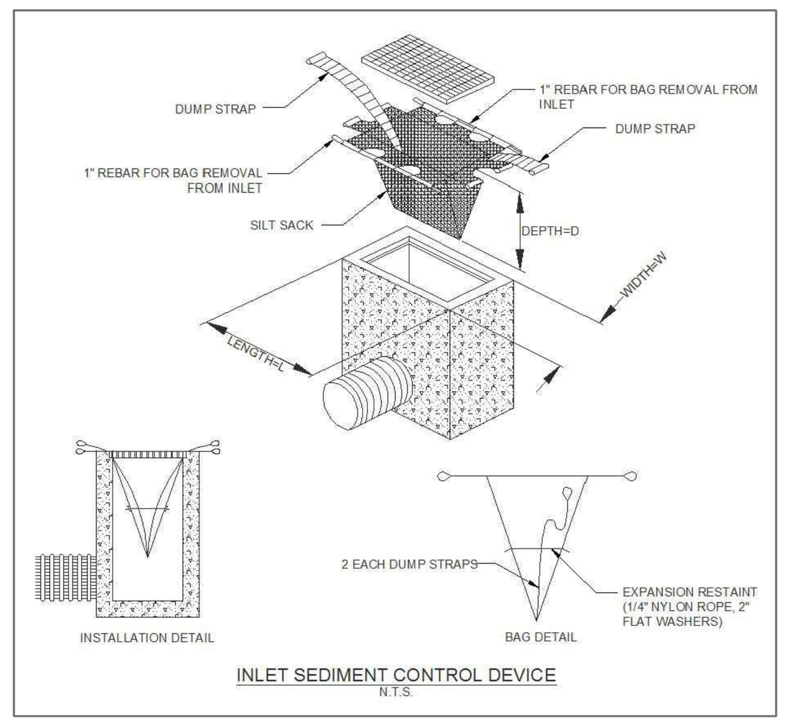


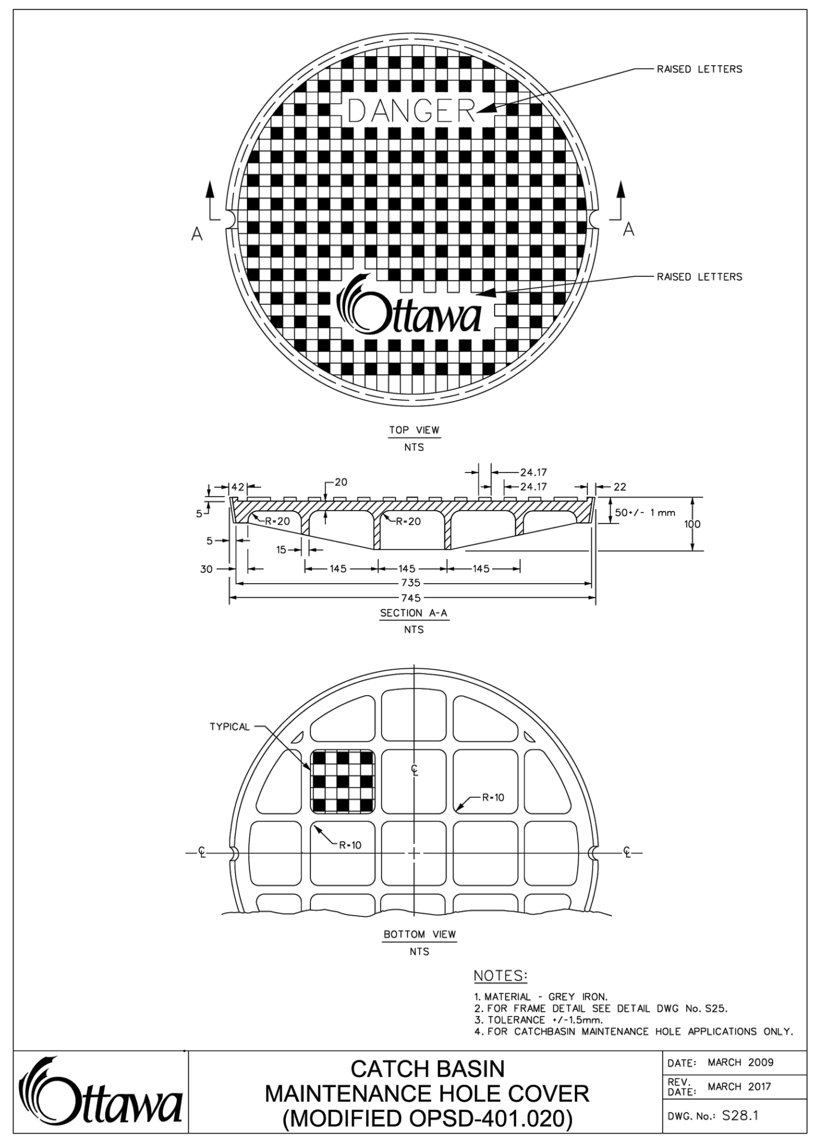


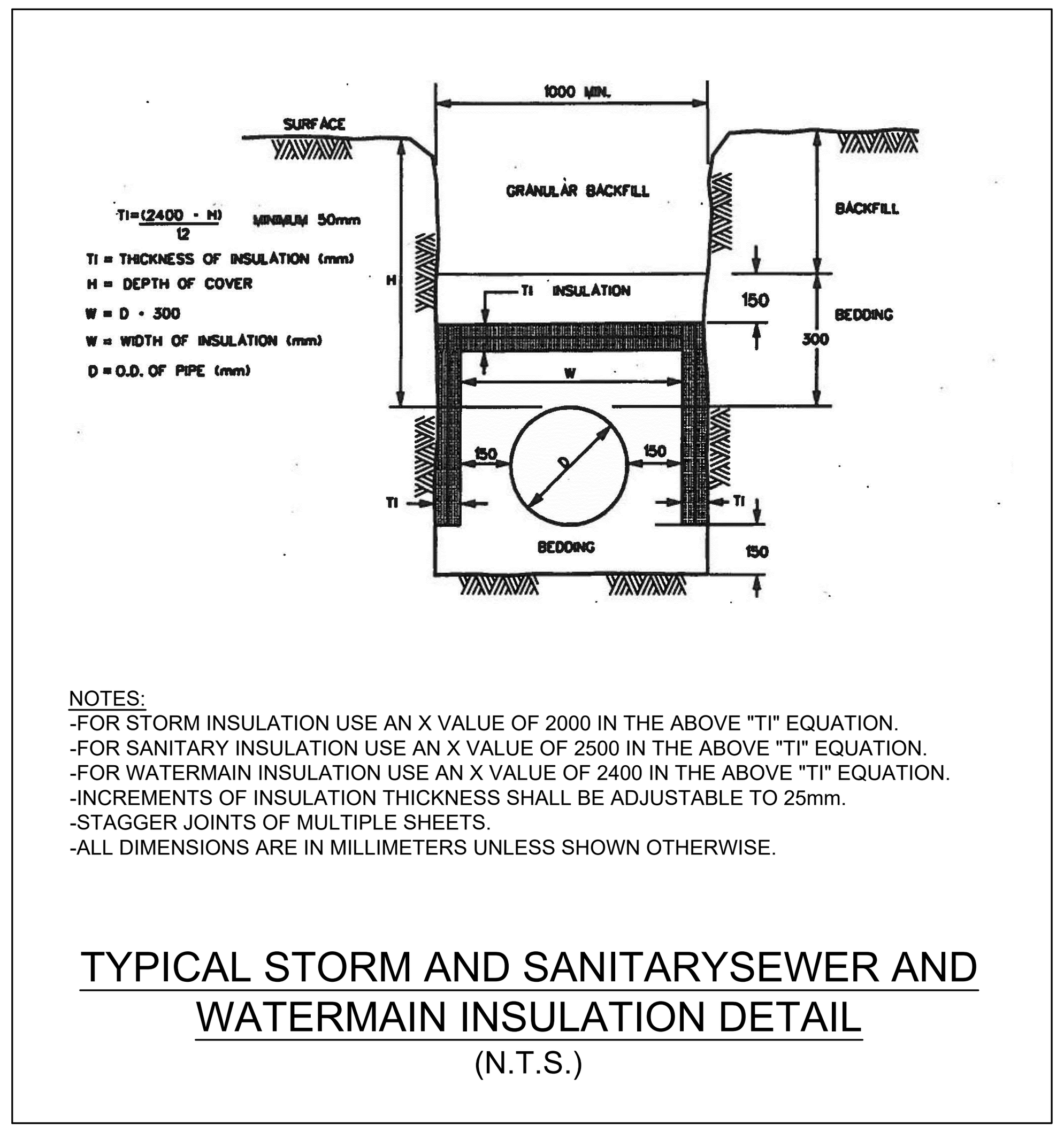


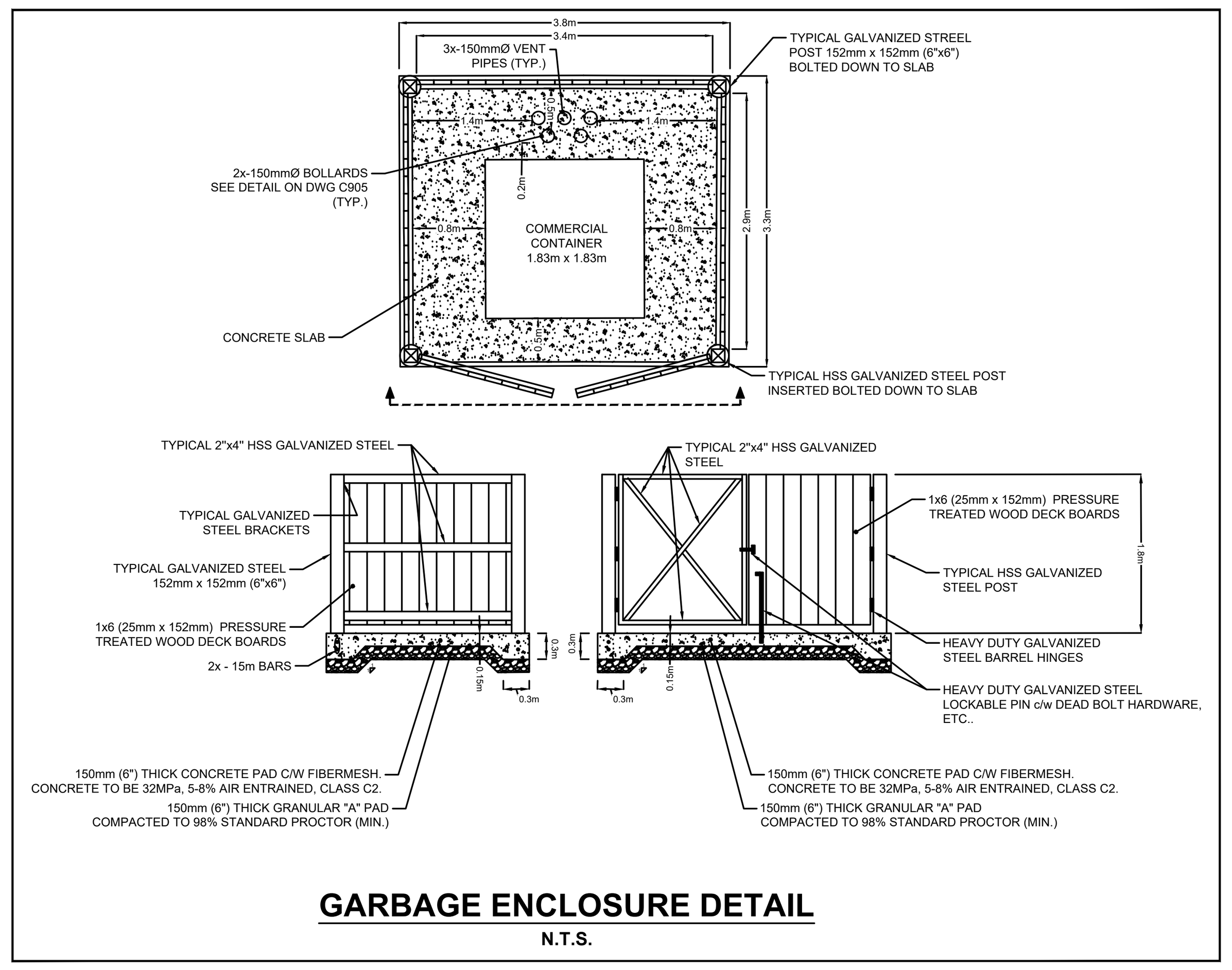












USE AND INTERPRETATION OF DRAWINGS

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

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

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

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

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

UNAUTHORIZED CHANGES:

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

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

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

GENERAL NOTES:

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

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

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

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

04	RE-ISSUED FOR APPROVAL	M.L.	MAR 04 2024
03	RE-ISSUED FOR APPROVAL	M.L.	FEB 15 2024
02	RE-ISSUED FOR APPROVAL	M.L.	NOV 13 2023
01	ISSUED FOR APPROVAL	M.L.	JUNE 16 2023
No.	REVISIONS	BY	DATE

LICENSED PROFESSIONAL ENGINEER
M. BASNET
100501996
2024/03/04
PROVINCE OF ONTARIO

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
HALO CAR WASH

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

PROJECT
PROPOSED DEVELOPMENT
HALO CAR WASH
3095 PALLADIUM DRIVE
KANATA, ON

DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
230273

DATE
MAY 2023

C901