Planning Department Development Application Form

Complete Application

A complete development application consists of the following:

1. A completed, signed, and notarized application form
2. Supporting information adequate to illustrate your proposal as indicated in **Section H** of this application form
3. Written authorization from the registered owner of the subject lands where the applicant is not the owner as per Section N
4. Cash, debit, credit or cheque payable to Norfolk County in the amount set out in the user fees By-Law that will be accepted and deposited once the application has been deemed complete.

Pre-Submission Consultation:

Norfolk County requires a Pre-Consultation Meeting for all applications; however, minor applications may be exempted depending on the nature of the proposal. The purpose of a Pre-Consultation Meeting is to provide the applicant with an opportunity to present the proposed application, discuss potential issues, and for the Norfolk County and Agency staff to identify the application requirements. Application requirements, as detailed in the Pre-Consultation Meeting Comments, are valid for one year after the meeting date.

Development Application Process

Once an application has been deemed complete by a Planner, Norfolk County staff will circulate the application to adjacent landowners, public agencies, and internal departments for comment. The time involved in application processing varies depending on its complexity, acceptability to the other agencies, and statutory Planning Act decision time-frames.

Payment is required once your application is deemed complete. Pre-payments will not be accepted.

Norfolk County collects personal information submitted through this form under the Municipal Freedom of Information and Protection Act's authority. Norfolk County will use this information for the purposes indicated or implied by this form. You can direct questions about collecting personal information to Norfolk GIS Services at NorfolkGIS@norfolkcounty.ca.

Additional studies required for the complete application shall be at the applicant's sole expense. Sometimes, peer reviews may be necessary to review particular studies at the applicant's expense. In these caseds, Norfolk County staff will select the company to complete the peer review.

Norfolk County will refund the original fee if applicants withdraw their applications before circulation. If Norfolk County must recirculate your drawings, there will be an additional fee. If Norfolk County must do more than three reviews of engineering drawings due to revisions by the owner or failure to revise engineering drawings as requested, Norfolk County will charge an additional fee. Full refunds are only available before Norfolk County has circulated the application.

Notification Sign Requirements

For public notification, Norfolk County will provide you with a sign to indicate the intent and purpose of your development application. It is your responsibility to:

1. Post one sign per frontage in a conspicuous location on the subject lands.
2. Ensure one sign is posted at the front of the subject lands at least three feet above ground level and not on a tree.
3. Notify the Planner when the sign is in place.
4. Maintain the sign until the development application is finalized and, after that, remove it.

Contact Us

For additional information or assistance completing this application, please contact a Planner at 519-426-5870 or 519-875-4485 extension 1842 or planning@norfolkcounty.ca. Please submit the completed application and fees to the attention of the Planning Department at 185 Robinson Street, Suite 200, Simcoe, ON N3Y 5L6.

For Office Use Only:

File Number	_____	Public Notice Sign	_____
Related File Number	_____	Application Fee	_____
Pre-consultation Meeting	_____	Conservation Authority Fee	_____
Application Submitted	_____	Well & Septic Info Provided	_____
Complete Application	_____	Planner	_____

Check the type of planning application(s) you are submitting.

- ☐ Official Plan Amendment
- ☐ Zoning By-Law Amendment
- ☐ Temporary Use By-law
- ☐ Draft Plan of Subdivision/Vacant Land Condominium
- ☐ Condominium Exemption
- ☑ Site Plan Application
- ☐ Extension of a Temporary Use By-law
- ☐ Part Lot Control
- ☐ Cash-in-Lieu of Parking
- ☐ Renewable Energy Project or Radio Communication Tower

Please summarize the desired result of this application (for example, a special zoning provision on the subject lands to include additional use(s), changing the zone or official plan designation of the subject lands, creating a certain number of lots, or similar)

This proposal is for the renovation and addition of the existing Robinson Chevrolet, Buick, GMC dealership. It will add floor area to the dealership to expand the showroom, increase the number of offices, provide a larger parts storage, and 5 more service bays. As a result of this addition, we anticipate a reduction of the number of parking spaces by 9 stalls.

Property Assessment Roll Number: 40100131800

A. Applicant Information

Name of Owner 875 Holding Inc. (Contact Name - Ted Kohli)

Address 875 Woodlawn Road West

Town and Postal Code Guelph, ON N1K 1B7

Phone Number 519-821-0520

Cell Number

Email ted@robinsonmc.com

Name of Applicant

Address

Town and Postal Code

Phone Number

Cell Number

Email

Name of Agent Tracey Swift / Rahwa Mohamed

Address 279 King St W Suite 200

Town and Postal Code Kitchener, ON N2G 1B1

Phone Number 519-885-5600

Cell Number 519-500-8948

Email tswift@srmarchitects.ca / rmohamed@srmarchitects.ca

Unless otherwise directed, Norfolk County will forward all correspondence and notices regarding this application to both owner and agent noted above.

☐ Owner ▬ Agent ☐ Applicant

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

CIBC (21 King Street West, 3rd Floor Hamilton Ontario L8P 4W7)

B. Location, Legal Description and Property Information

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):

   SIMCOE RP 37R3585 PART 1 TOWNSEND, CON 14 PT LOT 1, OTHER, 2.02AC 240.92FR D

   Municipal Civic Address: 51 Queensway East, Simcoe

   Present Official Plan Designation(s): RP 37R3585 PART 1

   Present Zoning: Services Commercial Zone - CS

2. Is there a special provision or site specific zone on the subject lands?

   ☐ Yes ☐ No If yes, please specify corresponding number:

3. Present use of the subject lands:

   Car Dealership

4. Please describe **all existing** buildings or structures on the subject lands and whether they will be retained, demolished or removed. If retaining the buildings or structures, please describe the type of buildings or structures, and illustrate the setback, in metric units, from the front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:

   The existing car dealership will be retained. It is a 1 storey building constructed of concrete block, EIFS and a flat roof.
   The existing car dealership and body shop garage will be retained. Its setbacks consists of 31.1m at the front yard, 23.7m at the interior side yard, 31.1m at the exterior side yard and 17.7m at the rear yard. The combined total gross floor area is 1,581.5m2 (870m2 car dealership, 691.5m2 body shop garage), has a 17.2% lot coverage (10.2% car dealership, 7% body shop garage) and are both 1 storey.
   There is also an existing pre-eng steel structure / architectural concrete block building used as a collision center / wash bay.

5. If an addition to an existing building is being proposed, please explain what it will be used for (for example: bedroom, kitchen, or bathroom). If new fixtures are proposed, please describe.

   The dealership will have 2 additions: the north addition will be used as service bays, and the west addition will be an extension of the showroom, larger parts storage as well as new office spaces. New plumbing fixtures are proposed for the washrooms, lunch room, and lounge.
   The dealership will have 2 additions: the north addition will be used as service bays, and the west addition will be an extension of the showroom, larger parts storage as well as new office spaces. **Fixtures??? ex. Plumbing

6. Please describe **all proposed** buildings or structures/additions on the subject lands. Describe the type of buildings or structures/additions, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:

   Not Applicable

7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being architecturally and/or historically significant? Yes ☐ No ☐

   If yes, identify and provide details of the building:

8. If known, the length of time the existing uses have continued on the subject lands:

   40 Years

9. Existing use of abutting properties:

   North - MG (General Industrial Zone), South - R2 (Urban Residential Type 2 Zone) East and West - CS (Service Commercial Zone)

10. Are there any easements or restrictive covenants affecting the subject lands?

    ☐ Yes ■ No If yes, describe the easement or restrictive covenant and its effect:

C. Purpose of Development Application

Note: Please complete all that apply.

1. Please explain what you propose to do on the subject lands/premises which makes this development application necessary:

   Site design is modified to accommodate the additions resulting in a parking reduction.

2. Please explain why it is not possible to comply with the provision(s) of the Zoning By-law/and or Official Plan:

   Not Applicable

3. Does the requested amendment alter all or any part of the boundary of an area of settlement in the municipality or implement a new area of settlement in the municipality? ☐ Yes ■ No If yes, describe its effect:

4. Does the requested amendment remove the subject land from an area of employment? ☐ Yes ■ No If yes, describe its effect:

5. Does the requested amendment alter, replace, or delete a policy of the Official Plan? ☐ Yes ■ No If yes, identify the policy, and also include a proposed text of the policy amendment (if additional space is required, please attach a separate sheet):

_____

_____

_____

6. Description of land intended to be severed in metric units:
   Frontage: Not Applicable
   Depth: _____
   Width: _____
   Lot Area: _____
   Present Use: _____
   Proposed Use: _____
   Proposed final lot size (if boundary adjustment): _____
   If a boundary adjustment, identify the assessment roll number and property owner of the lands to which the parcel will be added: _____

   _____

   Description of land intended to be retained in metric units:
   Frontage: _____
   Depth: _____
   Width: _____
   Lot Area: _____
   Present Use: _____
   Proposed Use: _____
   Buildings on retained land: _____
7. Description of proposed right-of-way/easement:
   Frontage: Not Applicable
   Depth: _____
   Width: _____
   Area: _____
   Proposed use: _____
8. Name of person(s), if known, to whom lands or interest in lands to be transferred, leased or charged (if known): Not Applicable

   _____

9. **Site Information**	**Zoning**	**Proposed**
Please indicate unit of measurement, for example: m, m^2 or %		
Lot frontage	16.5m	
Lot depth	-	95.6m
Lot width	-	95.1m
Lot area	495m2	9798.9m2
Lot coverage	35%	23.5%
Front yard	3m	17.4m
Rear yard	9m	17.7m
Left Interior side yard	3m	N/A
Right Interior side yard	3m	29.7m
Exterior side yard (corner lot)	3m	31.1m
Landscaped open space	-	330m2
Entrance access width	-	
Exit access width	-	
Size of fencing or screening	-	
Type of fencing	-	

10. Building Size

Number of storeys	-	1
Building height	11m	5.1m
Total ground floor area	-	1630m2
Total gross floor area	-	1850m2
Total useable floor area	-	1563m2

11. Off Street Parking and Loading Facilities

Number of off street parking spaces	46	121
Number of visitor parking spaces	-	0
Number of accessible parking spaces	3	3
Number of off street loading facilities	-	0

12. Residential (if applicable) Not Applicable

Number of buildings existing: _____

Number of buildings proposed: _____

Is this a conversion or addition to an existing building? ☐ Yes ☐ No

If yes, describe: _____

Type	Number of Units	Floor Area per Unit in m2
Single Detached	_____	_____
Semi-Detached	_____	_____
Duplex	_____	_____
Triplex	_____	_____
Four-plex	_____	_____
Street Townhouse	_____	_____
Stacked Townhouse	_____	_____
Apartment - Bachelor	_____	_____
Apartment - One bedroom	_____	_____
Apartment - Two bedroom	_____	_____
Apartment - Three bedroom	_____	_____

Other facilities provided (for example: play facilities, underground parking, games room, or swimming pool):

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: 2

Number of buildings proposed: 0

Is this a conversion or addition to an existing building? ■ Yes ☐ No

If yes, describe:

To the dealership, an addition to the showroom, large parts storage and new office spaces

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

Proposed service area is 928m2 and proposed commercial/retail area is 807m2.

Seating Capacity (for assembly halls or similar): Not Applicable

Total number of fixed seats: Not Applicable

Describe the type of business(es) proposed: Car dealership

Total number of staff proposed initially: 26 - dealership

Total number of staff proposed in five years: 28 - dealership

Maximum number of staff on the largest shift: 26 - dealership

Is open storage required: ☐ Yes ☐ No

Is a residential use proposed as part of, or accessory to commercial/industrial use?

☐ Yes ☒ No If yes please describe:

_____

_____

14. Institutional (if applicable) Not Applicable

Describe the type of use proposed: _____

Seating capacity (if applicable): _____

Number of beds (if applicable): _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

_____

_____

_____

15. Describe Recreational or Other Use(s) (if applicable) Not Applicable

_____

_____

_____

_____

_____

D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands? ☒ Yes ☐ No ☐ Unknown
   If yes, specify the uses (for example: gas station or petroleum storage):
   Industrial / Commercial use on adjacent lands. No previous use on property.
2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites?☐ Yes ☐ No ☐ Unknown
3. Provide the information you used to determine the answers to the above questions:
   Phase 1 and 2 ESAs.
4. If you answered yes to any of the above questions in Section D, a previous use inventory showing all known former uses of the subject lands, or if appropriate, the adjacent lands, is needed. Is the previous use inventory attached? ☒ Yes ☐ No

E. Provincial Policy

1. Is the requested amendment consistent with the provincial policy statements issued under subsection 3(1) of the *Planning Act, R.S.O. 1990, c. P. 13*? ☒ Yes ☐ No

   If no, please explain:

2. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the provincial policy statement subsection 2.1.7? ☒ Yes ☐ No

   If no, please explain:

3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection? ☒ Yes ☐ No

   If no, please explain:

   _____

   _____

   Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C please attach relevant information and approved mitigation measures from the Risk Manager Official.

4. Are any of the following uses or features on the subject lands or within 500 metres of the subject lands, unless otherwise specified? Please check boxes, if applicable.

   Livestock facility or stockyard (submit MDS Calculation with application)

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Wooded area

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Municipal Landfill

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Sewage treatment plant or waste stabilization plant

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Provincially significant wetland (class 1, 2 or 3) or other environmental feature

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Floodplain

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Rehabilitated mine site

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Non-operating mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Active mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Industrial or commercial use (specify the use(s))

   ☒ On the subject lands or ☒ within 500 meters – distance _____

   Active railway line

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Seasonal wetness of lands

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Erosion

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Abandoned gas wells

   ☐ On the subject lands or ☐ within 500 meters – distance _____

F. Servicing and Access

1. Indicate what services are available or proposed:

Water Supply

- ☒ Municipal piped water
- ☐ Communal wells
- ☐ Individual wells
- ☐ Other (describe below)

Sewage Treatment

- ☒ Municipal sewers
- ☐ Communal system
- ☐ Septic tank and tile bed in good working order
- ☐ Other (describe below)

Storm Drainage

- ☒ Storm sewers
- ☐ Open ditches
- ☐ Other (describe below)

2. Existing or proposed access to subject lands:

- ☒ Municipal road
- ☐ Provincial highway
- ☐ Unopened road
- ☐ Other (describe below)

Name of road/street: 51 Queensway East, Gilbertson Drive

G. Other Information

1. Does the application involve a local business? ☒ Yes ☐ No

   If yes, how many people are employed on the subject lands?

   26 - Dealership only.

2. Is there any other information that you think may be useful in the review of this application? If so, explain below or attach on a separate page.

   N/A

H. Supporting Material to be submitted by Applicant

In order for your application to be considered complete, **folded** hard copies (number of paper copies as directed by the planner) and an **electronic version (PDF) of the properly named site plan drawings, additional plans, studies and reports** will be required, including but not limited to the following details:

1. Concept/Layout Plan
2. All measurements in metric
3. Key map
4. Scale, legend and north arrow
5. Legal description and municipal address
6. Development name
7. Drawing title, number, original date and revision dates
8. Owner's name, address and telephone number
9. Engineer's name, address and telephone number
10. Professional engineer's stamp
11. Existing and proposed easements and right of ways
12. Zoning compliance table – required versus proposed
13. Parking space totals – required and proposed
14. All entrances to parking areas marked with directional arrows
15. Loading spaces, facilities and routes (for commercial developments)
16. All dimensions of the subject lands
17. Dimensions and setbacks of all buildings and structures
18. Location and setbacks of septic system and well from all existing and proposed lot lines, and all existing and proposed structures
19. Gross, ground and useable floor area
20. Lot coverage
21. Floor area ratio
22. Building entrances, building type, height, grades and extent of overhangs
23. Names, dimensions and location of adjacent streets including daylighting triangles
24. Driveways, curbs, drop curbs, pavement markings, widths, radii and traffic directional signs
25. All exterior stairways and ramps with dimensions and setbacks
26. Retaining walls including materials proposed
27. Fire access and routes
28. Location, dimensions and number of parking spaces (including visitor and accessible) and drive aisles
29. Location of mechanical room, and other building services (e.g. A/C, HRV)
30. Refuse disposal and storage areas including any related screening (if indoors, need notation on site plan)
31. Winter snow storage location

32. Landscape areas with dimensions
33. Natural features, watercourses and trees
34. Fire hydrants and utilities location
35. Fencing, screening and buffering – size, type and location
36. All hard surface materials
37. Light standards and wall mounted lights (plus a note on the site plan that all outdoor lighting is to be dark sky compliant)
38. Business signs (make sure they are not in sight lines)
39. Sidewalks and walkways with dimensions
40. Pedestrian access routes into site and around site
41. Bicycle parking
42. Architectural elevations of all building sides
43. All other requirements as per the pre-consultation meeting

In addition, the following additional plans, studies and reports, including but not limited to, **may** also be required as part of the complete application submission:

☐ Zoning Deficiency Form

☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)

▣ Architectural Plan

▣ Buildings Elevation Plan

☐ Cut and Fill Plan

▣ Erosion and Sediment Control Plan

▣ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)

▣ Landscape Plan

▣ Photometric (Lighting) Plan

☐ Plan and Profile Drawings

▣ Site Servicing Plan

▣ Storm water Management Plan

☐ Street Sign and Traffic Plan

☐ Street Tree Planting Plan

▣ Tree Preservation Plan

☐ Archaeological Assessment

☐ Environmental Impact Study

- ☒ Functional Servicing Report
- ☐ Geotechnical Study / Hydrogeological Review
- ☐ Minimum Distance Separation Schedule
- ☐ Noise or Vibration Study
- ☐ Record of Site Condition
- ☐ Storm water Management Report
- ☒ Traffic Impact Study – please contact the Planner to verify the scope required

Site Plan applications will require the following supporting materials:

1. Two (2) complete sets of the site plan drawings folded to 8½ x 11 and an electronic version in PDF format
2. Letter requesting that the Holding be removed (if applicable)
3. A cost estimate prepared by the applicant's engineer
4. An estimate for Parkland dedication by a certified land appraiser
5. Property Identification Number (PIN) printout

Standard condominium exemptions will require the following supporting materials:

- ☐ Plan of standard condominium (2 paper copies and 1 electronic copy)
- ☐ Draft condominium declaration
- ☐ Property Identification Number (PIN) printout

Your development approval might also be dependent on other relevant federal or provincial legislation, municipal by-laws or other agency approvals.

All final plans must include the owner's signature as well as the engineer's signature and seal.

I. Development Agreements

A development agreement may be required prior to site plan approval, subdivision and condominium applications. Should this be necessary for your development, you will be contacted by the agreement administrator with further details of the requirements including but not limited to insurance coverage, professional liability for your engineer, additional fees and securities.

J. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required, it is their solicitor's responsibility on behalf of the owner, to disclose the registration of all transfer(s) of land and/or easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner for the registration of postponements of any charges in favour of the County.

K. Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

L. Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the ***Planning Act, R.S.O. 1990, c. P. 13*** for the purposes of processing this application.

Owner/Applicant Signature

Dec 19/2023
Date

M. Owner's Authorization

If the applicant/agent is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We 875 Holding Inc. am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize SRM Architects to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

Owner

Dec 19/2023
Date

N. Declaration

I, Sam Hirani of City of Guelph

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act*.

Declared before me at:
in accordance with O. Reg 431/20, Administering Oath of Declaration Remotely. City of Guelph

Owner/Applicant Signature

In the Province of Ontario

This 19th day of December

A.D., 20 23

Kimberly Leslie Haynes, a Commissioner, etc., Province of Ontario, for SRM Architects Inc. Expires June 22, 2024.

A Commissioner, etc.

Pre-Submission Consultation Meeting Minutes

Date: November 9, 2022

Description of Proposal: The applicant proposes an expansion of an existing vehicle dealership

Property Location: 51 Queensway E., Simcoe

Roll Number: 40100131800

As a result of the information shared at the pre-consultation meeting dated November 9, 2022, the following applications and qualified professional documents / reports are required as part of the development review process.

Please note that various fees are associated with each application and there are also costs for qualified professionals retained to complete various documents / reports. All requirements identified are minimum and determined as of the date of the pre-consultation meeting with the information available at that time. As the proposal proceeds and more information is made available, additional applications, studies, reports, etc. may be required.

This summary including checklists, comments and requests are applicable for a period of one (1) year from the date of meeting. If an application is not received within that time frame, a subsequent pre-consultation meeting may be required due to changes in policies and technical requirements.

All applications are required to include information outlined in the Pre-consultation unless otherwise noted.

Before you submit your application, please contact the assigned Planner to confirm submission requirements and the applicable fee.

Please sign receipt of the Pre-consultation and confirm understanding of requirements identified as a complete information, noting that changes in development proposal, legislation or corporate requirements may necessitate additional information as part of a complete application.

Proponent / Agent Name	Signature	Date
Tracey Swift		
Dave Kittel		

Attendance List

Proponent	Tracey Swift (Managing Partner), Dave Kittel (VP Operations and General Manager)
Community Development – Planning and Agreement	Tricia Givens, Director, Planning (Chair) Fabian Serra, Planner Annette Helmig, Agreement and Development Coordinator
Community Development – Building and Zoning	Jonathan Weir, Building Inspector Roxanne Lambrecht, Zoning Administrator Kacie VandenBulck, Zoning Administrator
Environment & Infrastructure Services – Development Engineering	Zeel Joshi, Development Technologist
Community Services – Fire	Katie Ballantyne, Community Safety Officer
Community Development – Economic Development	Chris Garwood, Economic Development Supervisor
Paramedic Services	Stuart Burnett, Deputy Chief
Operations – Forestry	Adam Biddle, Supervisor of Forestry
Operations – Parks and Facilities	Todd Shoemaker, Director, Parks
Corporate Support Services – Realty Services	Kelly Darbishire, Specialist, Realty Services Karen Lambrecht, Corporate Support Generalist
Corporate Support Services – Accessibility	Sam McFarlane, Manager, Accessibility and Special Projects
Haldimand Norfolk Health Unit	Emily Kichler, Community Health Dietician
Long Point Regional Conservation Authority	Leigh-Anne Mauthe, Supervisor of Planning Services Isabel Johnson, Resource Planner
Community Development – Heritage and Culture	Melissa Collver, Director Heritage and Culture
Community Development – Recreation	Nikki Slote, Director Recreation

Table of Contents

Proposal Summary

The applicant proposes a renovation to an existing car dealership that would expand the showroom and allow for additional office space.

Planning Comments

The subject lands are designated Commercial in the Norfolk County Official Plan.

The subject lands are zoned Service Commercial (CS) zone in the Norfolk County Zoning By-Law.

The property is subject to Site Plan Control and thus a Site Plan Application is required. There is not an existing site plan on record. The Site Plan Drawing is to show the existing status of the site and the proposed works to be done.

A vehicular traffic model is to be shown on the site plan. The traffic model is to show the maneuverability and traffic access aisles. Fire access is to be shown on the plan as well.

For this project a zoning by-law amendment may be required to address any lot deficiencies (ex: parking).

The lots on the property must be merged as the site functions all as one. The parking area of 61 Queensway does not county to parking calculation. Once the lots are merged the parking area of 61 Queensway counts towards the parking of 51 Queensway East.

Endangered and threatened species and their habitat are protected under the provinces Endangered Species Act, 2007 (ESA), O. Reg. 242/08 & O. Reg. 830/21. The Act prohibits development or site alteration within areas of significant habitat for endangered or threatened species without demonstrating that no negative impacts will occur. The Ministry of Environment, Conservation and Parks provides the service of responding to species at risk information requests and project screenings. The proponent is responsible for discussing the proposed activity and having their project screened with MECP.

Please be advised that it is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

[see Appendix A for additional comments]

Assigned Planner:

Fabian Serra
Planner
Extension 1834
Fabian.Serra@norfolkcounty.ca

List of Complete Application Requirements

Planning Department

Planning application(s) required to proceed		Required
Official Plan Amendment Application Choose an item.		
Zoning By-law Amendment Application Choose an item.		X (may be required to address deficiencies (parking)
Site Plan Application Choose an item.		x
Draft Plan of Subdivision Application		
Draft Plan of Condominium Application		
Part Lot Control Application		
Consent / Severance Application		
Minor Variance Application		
Removal of Holding Application		
Temporary Use By-Law Application		
Other - Click here to enter text.		
Planning requirements for a complete application The items below are to be submitted as part of the identified Planning Application(s). ** electronic/PDF copies of all plans, studies and reports are required**	**Required at OPA/ Zoning Stage**	**Required at Site Plan Stage**
Proposed Site Plan / Drawing		x
Planning Impact Analysis Report / Justification Report		
Environmental Impact Study Choose an item.		
Neighbourhood Plan (TOR must be approved by the County)		
Agricultural Impact Assessment Report		
Archaeological Assessment		
Heritage Impact Assessment		
Market Impact Analysis		
Dust, Noise and/or Vibration Study		
MOE D-Series Guidelines Analysis		
Landscaping Plan		x
Elevation Plan		x
Photometrics (Lighting) Plan		x

Vehicular Traffic Model (to be shown on site plan)		x
Shadow Analysis Report		
Record of Site Condition		
Contaminated Site Study		
Minimum Distance Separation Schedule		
Parking Assessment		
Hydrogeological Study		
Restricted Land Use Screening Form		
Topographical Survey Drawing		
Additional Planning requirements		**Required**
Development Agreement		x
Parkland Dedication/Cash-in-lieu of Parkland		x

*the list of requirements is based on the information submitted and as presented for this specific pre-consultation meeting. Any changes to a proposal may necessitate changes to Planning Department submission requirements.

*Community Development fees, applications, and helpful resources can be found can be found by visiting https://www.norfolkcounty.ca/government/planning/

Agreements

A recommended condition of your planning application approval will be to enter into a development agreement with the County that will be registered on title to the subject lands, at the Owner's expense.
The additional requirements for a development agreement could include, but are not limited to the following:

- Engineering drawing review
- Engineer's schedule of costs for the works
- Clearance letter and supporting documentation to support condition clearance
- User fees and performance securities
- Current property identification number (PIN printout) (can be obtained by visiting https://help.onland.ca/en/home/)
- Owner's commercial general liability insurance to be obtained and kept in force during the terms of the agreement
- Postponement of interest. If there are mortgagees / charges on your property identifier, your legal representative will be required to obtain a postponement from your bank or financial institution to the terms outlined in your development agreement
- Transfers and / or transfer easements along with registered reference plan

I look forward to assisting you through the agreement stage of your development through to final release of your performance securities.

Annette Helmig

Agreement and Development Coordinator
Extension 8053
Annette.Helmig@norfolkcounty.ca

Development Engineering

Development Engineering – 51 Queensway East, Simcoe (Expansion of existing car dealership

Development Engineering requirements to proceed The below requirements are to be submitted as part of the Formal Development Planning application.	**Required at Site Plan Stage**	**Potentially Required (See Notes Section)**
General Requirements		
Concept Plan	X[5]	
Area Rough Grading Plan		X[16]
Lot Grading Plan	X[6]	
Siltation and Erosion Control Plan	X[6]	
General Plan of Services	X[5,6,9]	
Geotechnical Report		X[17]
Functional Servicing Report	X[5]	
Ministry of Environment, Conservation and Parks Permit		X[18]
Water Servicing Requirements– Section 10.0 Norfolk County Design Criteria and ISMP Section 4.0		
Water Modelling (County Consultant)		X[19]
Backflow Preventer (RPZ)		X[20]
Sanitary Servicing Requirements – Section 9.0 Norfolk County Design Criteria and ISMP Section 4.0		
Sanitary Modelling (County Consultant)		X[19]
Property Line Inspection Maintenance Hole	X[10]	
Storm Water Servicing Requirements – Section 7.0 and Section 8 Norfolk County Design Criteria and ISMP Section 4.0		
Storm Water Management Design Report (including calculations)	X[11]	
Storm Water Drainage Plan	X[12]	

Storm Sewer Design Sheet	X[13]	
Establish/Confirm Legal and Adequate Outlet	X[14]	
Anticipated Flow/Analysis to Receiving Collection System	X[14]	
Oil-Grit Separator		X[21]
Transportation Requirements – Section 6.0 Norfolk County Design Criteria, ISMP Section 5.0, Section 6.0 and Appendix J		
Traffic Impact Study	X[15]	

General Notes:

1. Securities will be required in the form of a schedule. Any works completed within the Municipal Right-of-Way (R.O.W.) are to be shown as 100% security. Any works completed within private property are to be shown as 10% security. This can be submitted at time of Site Plan.
2. All reports and drawings are to be signed and stamped by a Professional Engineer (P. Eng) and adhere to Norfolk County's Design Criteria. A copy of this criteria is available upon request.
3. All Recommendations from all reports (FSR, SWM, TIS) are to be implemented into the design, at the developer's expense
4. All applicable permits and inspections are to be issued by Public Works.

Required at Site Plan Stage:

5. The following reports/studies will be required at time of Site Plan Submission:
    a. Concept Plan;
    b. General Plan of Services;
    c. Functional Servicing Report (per Norfolk County Design Criteria Section 3);
        i. Showing all existing municipal service connections
        ii. All on site services including in-building connections shown through the mechanical drawings
    d. Storm Water Management Report (as per Norfolk County Design Criteria Section 7 and Section 8.);
    e. Traffic Impact Brief (as per ISMP Appendix J – TIS Guidelines);
6. Lot Grading Plan, Siltation and Erosion Control Plan, and the General Plan of Services drawing can be shown on one engineering plan as long as it's legible for review.
7. The Functional Servicing Report shall include information to ensure that the existing water and sanitary is adequate for the new proposal
8. As per Norfolk County records, this property shows two water meters - a 2" water meter and 5/8"x ¾" water meter. A reduced pressure flow assembly will be required on all separate water services.

9. A site plan (general plan of services) that shows all water, sanitary sewer and storm sewers along with the location of gutters in the bay area is required for verification.
10. A sanitary sewer property line inspection manhole is required.
11. Stormwater Management Report is to be completed as per Norfolk County Design Criteria Section 7. The Storm Water Management report must also include information that identifies if the existing sewer has the capacity for this new proposal.
12. A Storm Drainage Area Plan will be required as per Norfolk County Design Criteria and must identify if any external overland flows are tributary to this site. The Plan must also show the location of all major overland flows exiting the site.
13. Storm sewer design sheets will be required to prove adequacy in the existing Storm sewers.
14. The developer will be responsible to confirm anticipated flow to the existing storm system and ensure adequate capacity exists to accept the proposed development. It shall be the developer's responsibility to satisfy themselves that there is an adequate storm collection to the proposed development. All associated costs of construction for upgrades to existing and new infrastructure shall be the responsibility of the owner / applicants of the development.
15. As per Norfolk County's Integrated Sustainable Master Plan (ISMP) – Appendix J: Traffic Impact Study (TIS) Guidelines, a Traffic Impact Study is required.

Potentially Required Notes:

16. Area rough grading may be required if cut and fill proposed is in excess of 0.5m.
17. A Geotechnical Report will be required if infiltration galleries are proposed for the Stormwater Management design.
18. Ministry of Environment, Conservation and Parks Permit may be required depending on the storm water management design proposed.
19. Water modelling and sanitary modelling may be required depending on the functional servicing report.
20. A back flow preventer may be required if the property currently does not have one.
21. An oil and grit separator may be required depending on the location of existing services.

Zeel Joshi
Development Technologist
Extension 8122
Zeel.Joshi@norfolkcounty.ca

County Departmental Comments & Requirements

Corporate Support Services – Realty Services

The County will require a postponement of any charge(s)/mortgage(s) on title to the County's Site Plan Agreement. We recommend that you connect with your lender(s) and/or solicitor as early in the process as possible to avoid any delays.

Kelly Darbishire
Specialist, Realty Services
Extension 8117
Kelly.Darbishire@norfolkcounty.ca

Building

Zoning Administrator:

Property zoned Service Commercial (CS)

- Use permitted in the zone
- For the dealership building with the addition, 41 parking spaces will be required, with 1 Type A and 1 Type B Accessible parking to be provided at the calculation of 1 parking space for every 35 sqm of usable floor area. (1,417sqm /35 =40.48 rounded up to 41). The existing body shop requires 20 spaces with 1 Type A Accessible parking space (690.728sqm /35=19.73 rounded to 20). Out of the 122 provided parking spaces, 61 spaces are to be allotted for staff and costumers, with the other 61 spaces available for cars for sale.
- As per section 4.21 of the Zoning bylaw, all required parking spaces are to be wholly situated on the lot occupied by the buildings or structures that the parking spaces are required for.
- Please refer to Section 4.0 of the Zoning bylaw for parking requirements.
- Final site plan to show a complete zoning table stating zoning requirements and what is being proposed along with a detailed parking layout inclusive of parking dimensions.

4.2 **Location of Parking on a *Lot***

4.2.1 All *parking spaces* shall be wholly provided on the *lot* occupied by the *building, structure* or use for which the *parking spaces* are *required* except where a *lot* has both residential and non-residential *Zones* in which case any *parking spaces* for non-residential use shall not be *permitted* on any portion of the *lot Zoned* residential.

Roxanne Lambrecht
Zoning Administrator
Extension 1839
Roxanne.Lambrecht@norfolkcounty.ca

Building Inspector:

The proposed construction is considered an E Mercantile, D Office and Personal Services and F2 Industrial type occupancies as defined by the Ontario Building Code (OBC). You will need to retain the services of an Architect and a Professional Engineer to complete the design documentation for this application.

The Designer will need to supply an OBC Matrix complete with the occupant load. The Designers OBC review will need to include Section 3.2 Building Fire Safety, Section 3.8 Barrier Free Design and Section 3.3 Safety Within Floor Areas and with attention to Industrial Occupancies.

On site trailers used for sales may require a building permit depending on type of access and size.

Items for Site Plan

Site plan drawings need to have enough detail, to determine compliance with the code references listed.

1. Indicate location of access route and access route design [OBC 3.2.5.4 to 3.2.5.6]
2. Revised fire water pond design and calculations. [OBC 3.2.5.7]
1. Indicate location of existing and new fire department connections. Dimensions between hydrants and building entrances is required.

[OBC 3.2.5.16]

3. Location and specifications of exterior lighting. Lighting to be included in SB-10 report – energy efficiency
4. Indicate barrier free path of travel from parking area to building entrance. Construction of curb cuts and location of tactile attention indicators is required. [OBC 3.8.1.3, & 3.8.3.2]
5. Location of revised septic system (if required)
6. Provide building elevations and cross section, showing building massing, location of proposed entrances and exits, barrier free controls, exterior lighting locations, and exterior signage. [Planning Act 41(4).2]

Items for Building Permit

"-Industrial Commercial Institutional (ICI)" and "Applicable Law Checklist" Step by Step Guide Building Permit Package has been attached to the minutes herein, this contains information on drawing requirements, designers, forms, contact information for Building Department etc.

If you have any questions on the building permit process or plans required, please contact permits@norfolkcounty.ca or 519-426-5870 ext. 6016

Jonathan Weir,
Building Official III
Extension 1832
jonathan.weir@norfolkcounty.ca

Fire Department

Norfolk County Fire has the following comment(s):

- Ensure adequate access for fire department apparatus is maintained during construction and provided once construction is complete

Katie Ballantyne
Community Safety Officer
Extension 2423
Katie.ballantyne@norfolkcounty.ca

Appendix A: Summary of Applicable Planning Legislation, Policy and Zoning

Following is a summary of key items related to the proposal as presented; noting these documents are meant to be read in their entirety with relevant policies to be applied in each situation. This is not an exhaustive list and only in response to the information submitted for the pre-consultation. This feedback is subject to change pending full submission of a development application and any changes or additional information provided therein.

Provincial Policy Statement, 2020

https://www.ontario.ca/page/provincial-policy-statement-2020

Norfolk County Official Plan
https://www.norfolkcounty.ca/government/planning/official-plan/

Section 9.6.1 outlines requirements in relation to requests to amend the Official Plan.

Section 9.6.2 outlines requirements in relation to requests to amend the Zoning By-law.

Section 7.11.1 and Section 7.11.2 outlines the permitted uses and land use policies for properties designated Commercial in the Norfolk County Official Plan.

It is the responsibility of the proponent to review and ensure relevant Official Plan policies are addressed in any future development application.

Norfolk County Zoning By-Law 1-Z-2014

https://www.norfolkcounty.ca/government/planning/new-zoning-by-law/

Section 6.3.1 of the Norfolk County Zoning By-Law outlines the permitted uses within the Service Commercial Zone.

Section 6.3.2 of the Norfolk County Zoning By-Law outlines the zone provisions within the Service Commercial Zone.

The provisions of the Norfolk County Zoning By-Law shall apply to all lands within the boundaries of Norfolk County. No land, building or structure shall be used, erected or altered in whole or in part except in conformity with the provisions of this By-Law. No land, building or structure shall be used or occupied except for uses that are specifically identified in the By-Law as permitted uses by the relevant zoning category.

It is the responsibility of the proponent to review and ensure relevant Zoning By-law provisions are addressed in any future development application

Site Plan Control:

1. Concept/Layout Plan
2. All measurements in metric
3. Key map
4. Scale, legend and north arrow
5. Legal description and municipal address
6. Development name
7. Drawing title, number, original date and revision dates
8. Owner's name, address and telephone number
9. Engineer's name, address and telephone number
10. Professional engineer's stamp
11. Existing and proposed easements and right of ways
12. Zoning compliance table – required versus proposed
13. Parking space totals – required and proposed
14. All entrances to parking areas marked with directional arrows
15. Loading spaces, facilities and routes (for commercial developments)
16. All dimensions of the subject lands
17. Dimensions and setbacks of all buildings and structures
18. Location and setbacks of septic system and well from all existing and proposed lot lines, and all existing and proposed structures
19. Gross, ground and useable floor area
20. Lot coverage
21. Floor area ratio
22. Building entrances, building type, height, grades and extent of overhangs
23. Names, dimensions and location of adjacent streets including daylighting triangles
24. Driveways, curbs, drop curbs, pavement markings, widths, radii and traffic directional signs
25. All exterior stairways and ramps with dimensions and setbacks
26. Retaining walls including materials proposed
27. Fire access and routes
28. Location, dimensions and number of parking spaces (including visitor and accessible) and drive aisles
29. Location of mechanical room, and other building services (e.g. A/C, HRV)
30. Refuse disposal and storage areas including any related screening (if indoors, need notation on site plan)
31. Winter snow storage location
32. Landscape areas with dimensions
33. Natural features, watercourses and trees
34. Fire hydrants and utilities location
35. Fencing, screening and buffering – size, type and location
36. All hard surface materials
37. Light standards and wall mounted lights (plus a note on the site plan that all outdoor lighting is to be dark sky compliant)

38. Business signs (make sure they are not in sight lines)
39. Sidewalks and walkways with dimensions
40. Pedestrian access routes into site and around site
41. Bicycle parking
42. Architectural elevations of all building sides
43. All other requirements as per the pre-consultation meeting

51 Queensway East, Simcoe Commercial Development

Traffic Impact Brief

SRM Architects and Urban Designers

December 12, 2023

→ The Power of Commitment

GHD
140 Allstate Parkway, Suite 210
Markham, Ontario L3R 5Y8, Canada
T +1 905 752 4300 | **F** +1 905 752 4301 | **E** info-northamerica@ghd.com | **ghd.com**

Last saved date	December 12, 2023
File name	\\ghdnet\ghd\CA\Markham\Projects\662\12626883
Author	Nathan Chan, EIT
Project manager	Roland Roovers, P.Eng.
Client name	SRM Architects and Urban Designers
Project name	51 Queensway East
Document title	51 Queensway East, Simcoe Commercial Development | Traffic Impact Brief
Revision version	01
Project number	12626883

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
	01	Nathan Chan, EIT	Roland Roovers, P.Eng.		Roland Roovers, P.Eng.		Dec 12, 2023

© GHD 2023

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorized use of this document in any form whatsoever is prohibited.

Executive summary

- The purpose of this study is to determine the traffic-related impacts on the roadway system from the commercial development located in Simcoe, Ontario, on the north-east corner of Queensway East and Gilbertson Drive.
- Based on the current site plan, the site expansion consists of an increase of 1,110 m^2 GFA to 1,850 m^2 GFA to the dealership building.
- The study intersections for capacity analysis are:
    - Queensway East / Site Access (West)
    - Queensway East / Site Access (East)
    - Gilbertson Drive / Site Access (North)
- Existing 2023 traffic volumes were obtained through traffic data collection in November 2023.
- The study assumes a 5-year study horizon beyond the expected build-out. Due to the size and nature of the proposed development, 2025 is the expected year of full build-out. Therefore, the study horizon will be 2030, 5 years beyond full build-out.
- To be conservative, the study assumed that an annual growth rate of 2.0% which was applied to all movements of the 2023 counts to estimate the background traffic growth for the 2030 study horizon.
- No background developments are identified in the vicinity of the study area.
- The site will generate a total of 23 inbound and 34 outbound vehicle trips during the PM peak hour, and 40 inbound and 40 outbound vehicle trips during the Saturday peak hour.
- The site trips generated by the proposed developments were distributed to the roadway system based on an understanding of recent traffic counts.
- This study concludes that under the future traffic forecasts, the traffic generated by the proposed subject development along with non-site related traffic growth and background developments can be easily accommodated by the existing street system. Traffic generated by the proposed development does not add significant adverse impacts on the study intersections. No additional road improvements are triggered by the proposed development.
- All three site accesses are expected to have good operational characteristics under the future total traffic conditions.

- The Vehicle Circulation Review confirms that the proposed site plan is sufficient to accommodate the circulation requirements of fire trucks, and front-loading garbage trucks.

- There are no sightline issues with the two accesses along Queensway East. There are sightline limitations due to the “S-curve” on Gilbertson Drive for the north access on Gilbertson Drive. GHD recommends that within the “S-curve” of Gilbertson Drive, the posted speed be reduced to 30 km/hr. This speed limit reduction serves the purpose of meeting the sight distance requirements under a 30 km/hr design speed. Additional signage is recommended as a speed reduction and traffic safety measure to achieve 30 km/hr within the “S-curve”.

If you wish to discuss any aspect of the Traffic Impact Study, do not hesitate to contact the undersigned.

Sincerely,

GHD

Roland Roovers, P.Eng.
Senior Manager, Transportation Planning
Roland.Roovers@ghd.com

Nathan Chan
Transportation EIT
Nathan.Chan@ghd.com

Encl.
RR/NC

Contents

Figure index

Table index

Appendices

1. Introduction

1.1 Retainer and objective

GHD was retained by SRM Architects and Urban Designers to prepare a Traffic Impact Brief for the commercial development located at 51 Queensway East in Simcoe, Ontario, on the north-east corner of Queensway East and Gilbertson Drive.

The site plan indicates a site expansion of 740 m^2 from 1,110 m^2 GFA to 1,850 m^2 GFA to the existing dealership. The current plans are attached in **Appendix A**Error! Reference source not found.. The site location is shown in **Figure 1**. **Figure 2** shows the site plan and the access locations of the proposed development.

1.2 Study background

For study purposes, the proposed development is expected to be completed in 2025. Therefore, the study horizon is 2030, five years beyond build-out. The study intersections include three existing accesses: two on Queensway East and one on Gilbertson Drive.

This study establishes the existing traffic volumes and operating conditions for the weekday PM and Saturday peak hour periods, derives and assesses the future background traffic growth, estimates, and assigns new site traffic volumes, and documents the expected site-related impacts on the road network.

Our findings, conclusions and recommendations are contained herein.

1.3 Study Team

The project team members involved in the preparation of this study are:

- Mr. Roland Roovers, P.Eng., Senior Manager, Transportation Planning
- Mr. Nathan Chan, EIT, Transportation Planner

Figure 1 Site location

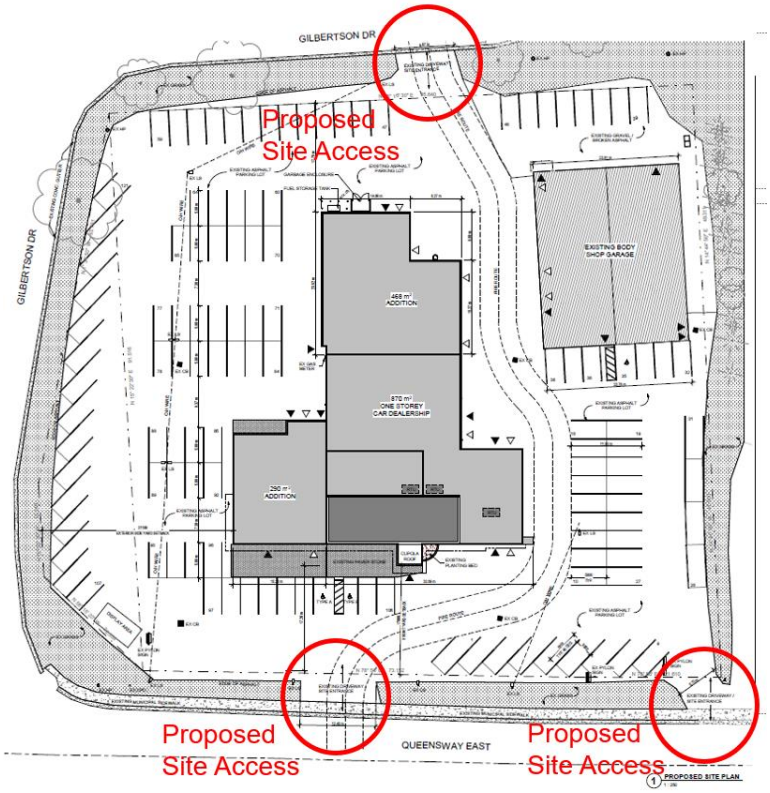


Figure 2 Site Plan

2. Site characteristics

2.1 Site environs

The site development is located in Simcoe, Ontario, on the north-east corner of Queensway East and Gilbertson Drive, with a municipal address known as 51 Queensway East. The location of the subject site is shown in **Figure 1**.

2.2 Study area

The study intersections for capacity analysis are:

- Queensway East / Site Access (West)
- Queensway East / Site Access (East)
- Gilbertson Drive / Site Access (North)

Based on the current site plan, the site expansion consists of an increase of 740 m^2 from 1,110 m^2 GFA to 1,850 m^2 GFA to the dealership building. **Figure 2** shows the proposed development and the site access locations.

3. Existing traffic conditions

3.1 Existing road network

The following describes the existing road infrastructure in the study area. **Figure 3** shows the existing and future lane configurations and traffic controls of the study intersections.

Queensway East

Queensway East is an east-west provincially maintained highway. It has a four-lane cross-section and a posted speed limit of 50 km/hr.

Gilbertson Drive

Gilbertson is a north-south local road. It has a two-lane cross-section and a posted speed limit of 50 km/hr.

3.2 Existing traffic data

Traffic data was obtained from Ontario Traffic Inc. and is contained in Error! Reference source not f ound.. The intersections, control type, and turning movement count (TMC) collection date are listed in **Table 1.**

Table 1 Existing traffic conditions

Intersection	Control Type	TMC Date
Queensway East / Site Access (West)	Two-Way Stop	Thu, Nov 2, 2023, Sat, Nov 4, 2023
Queensway East / Site Access (East)	Two-Way Stop	Thu, Nov 2, 2023, Sat, Nov 4, 2023
Gilbertson Drive / Site Access (North)	Two-Way Stop	Thu, Nov 2, 2023, Sat, Nov 4, 2023

Figure 3 shows the existing 2023 traffic volumes for weekday AM and PM peak hours at the study area intersections.

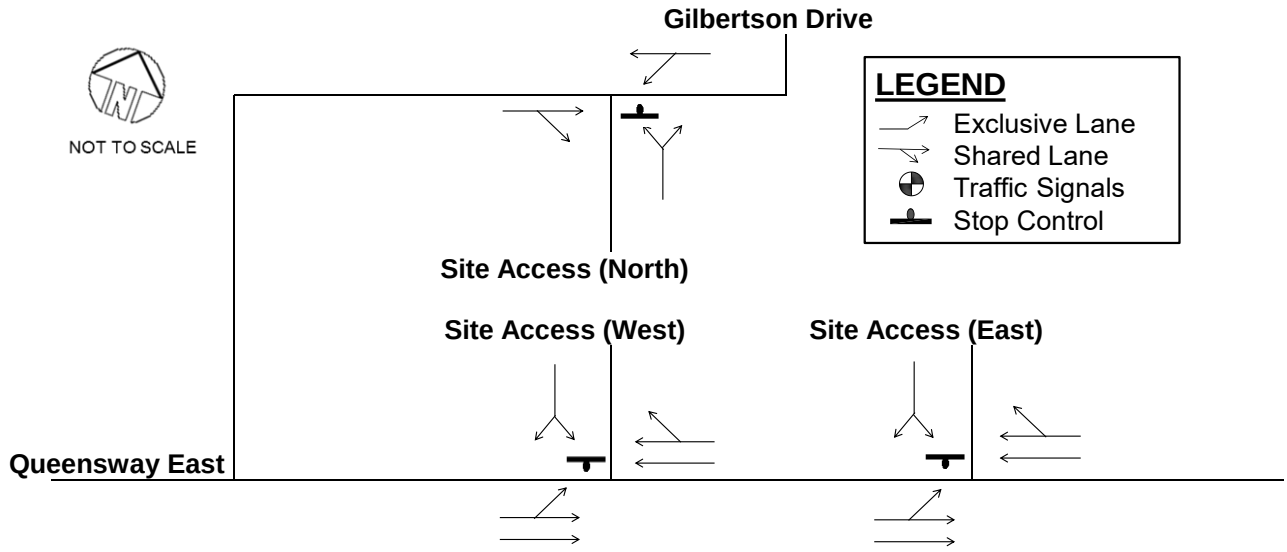


Figure 3 Lane configurations

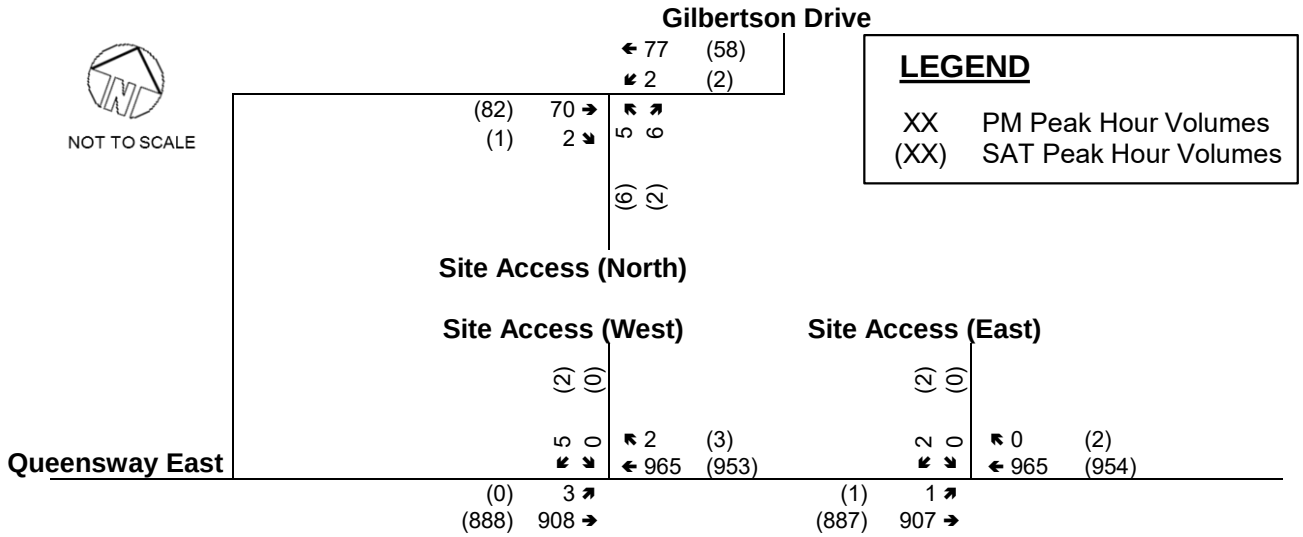


Figure 4 Existing traffic volumes

3.3 Existing traffic conditions

The capacity analysis identifies how well the intersections and driveways are operating. The analyses are based on the methodology contained in the Highway Capacity Manual, which assigns an intersection Level of Service (LOS) based on the average control delay experienced by each vehicle passing through that intersection. Synchro 11 software was utilized to conduct the analysis.

Peak hour factors for the study intersection were from the existing traffic data and used in the Synchro analysis.

For analysis purposes, ‘critical’ intersection movements are defined as traffic movements where:

- Volume to capacity (v/c) ratio of through movement or shared through/turning movement exceeds 0.85; or
- Volume to capacity (v/c) ratio of an exclusive turning movement exceeds 1.0.

Table 2 summarizes the results of the existing intersection capacity analyses. **Appendix C** contains the detailed existing intersection capacity analysis reports.

Table 2 Existing Traffic Conditions

Intersection	Control Type	PM Peak Hour		SAT Peak Hour	
		Critical/ Key Movements v/c(LOS) Delay in Seconds	95th %ile Queues (m)	Critical/ Key Movements v/c(LOS) Delay in Seconds	95th %ile Queues (m)
Queensway East / Site Access (West)	Two-Way Stop Controlled	**Overall: (A) 0** EBTL = 0.01 (B) 10 WBTR = 0.00 (A) 0 SBLR = 0.01 (B) 12	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 0** EBTL = 0.00 (A) 0 WBTR = 0.00 (A) 0 SBLR = 0.00 (B) 12	EBTR = 0 WBTL = 0 NBLR = 0
Queensway East / Site Access (East)	Two-Way Stop Controlled	**Overall: (A) 0** EBTL = 0.00 (B) 10 WBTR = 0.00 (A) 0 SBLR = 0.00 (B) 12	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 0** EBTL = 0.00 (B) 10 WBTR = 0.00 (A) 0 SBLR = 0.00 (B) 12	EBTR = 0 WBTL = 0 NBLR = 0
Gilbertson Drive / Site Access (North)	Two-Way Stop Controlled	**Overall: (A) 1** EBTR = 0.00 (A) 0 WBTL = 0.00 (A) 8 NBLR = 0.02 (A) 9	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 1** EBTR = 0.00 (A) 0 WBTL = 0.00 (A) 7 NBLR = 0.01 (A) 9	EBTR = 0 WBTL = 0 NBLR = 0

Under existing traffic conditions, no critical movements and queue issues are identified. The study intersections have individual movements volume to capacity ratios of 0.02, or lower and LOS ‘B’ or better, all better than acceptable metrics.

4. Background traffic conditions

4.1 Study horizon

The expected build-out and completion of the dealership expansion is 2025. Therefore, the study 5-year horizon beyond build-out is 2030.

4.2 Planned road network

There are no roadway and intersection improvements expected or planned within the study horizon year beyond the addition of the site access.

4.3 Future traffic growth

A background traffic growth rate of 2.0% per year has been selected to be conservative.

4.4 Background Developments

No background developments are identified in the vicinity of the study area.

4.5 Background traffic volumes

With an annual 2.0% traffic growth and with no background development traffic volumes, the future background traffic volumes are presented in **Figure 5**.

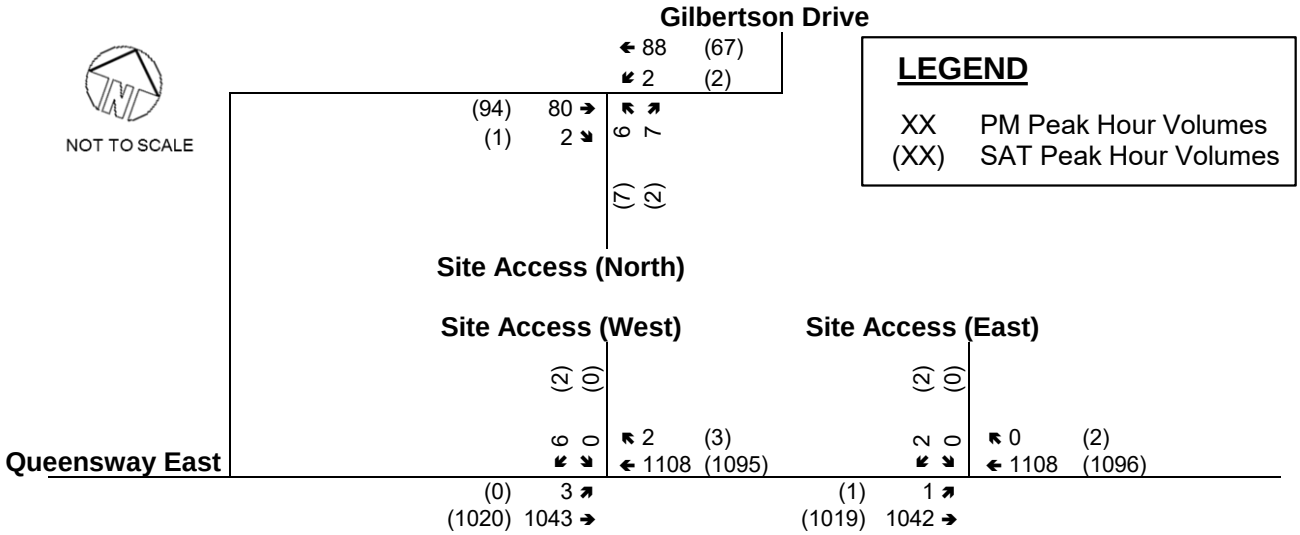


Figure 5 Background traffic volumes

4.6 Background traffic conditions

The future background traffic volumes were subjected to intersection capacity analyses based on the same methodologies and existing lane configurations utilized for the existing conditions.

Peak hour factors for the study intersection were from the existing traffic data and used in the Synchro analysis.

Table 3 summarizes the results of the intersection capacity analysis. **Appendix D** contains the detailed background intersection capacity analysis reports.

Table 3 Background traffic conditions

Intersection	Control Type	PM Peak Hour		SAT Peak Hour	
		Critical/ Key Movements v/c(LOS) Delay in Seconds	95th %ile Queues (m)	Critical/ Key Movements v/c(LOS) Delay in Seconds	95th %ile Queues (m)
Queensway East / Site Access (West)	Two-Way Stop Controlled	**Overall: (A) 0** EBTL = 0.01 (B) 11 WBTR = 0.00 (A) 0 SBLR = 0.01 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 0** EBTL = 0.00 (A) 0 WBTR = 0.00 (A) 0 SBLR = 0.01 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0
Queensway East / Site Access (East)	Two-Way Stop Controlled	**Overall: (A) 0** EBTL = 0.00 (B) 11 WBTR = 0.00 (A) 0 SBLR = 0.00 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 0** EBTL = 0.00 (B) 11 WBTR = 0.00 (A) 0 SBLR = 0.01 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0
Gilbertson Drive / Site Access (North)	Two-Way Stop Controlled	**Overall: (A) 1** EBTR = 0.00 (A) 0 WBTL = 0.00 (A) 7 NBLR = 0.02 (A) 9	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 1** EBTR = 0.00 (A) 0 WBTL = 0.00 (A) 7 NBLR = 0.01 (A) 10	EBTR = 0 WBTL = 0 NBLR = 0

Under background traffic conditions, no critical movements and queue issues are identified. The study intersections have individual movements volume to capacity ratios of 0.02, or lower and LOS ‘B’ or better, all better than acceptable metrics.

5. Proposed site development

5.1 Site traffic generation

Based on the current site plan, the site expansion consists of an increase of 740 m^2 from 1,110 m^2 GFA to 1,850 m^2 GFA to the dealership building.

The number of vehicle trips that will be generated by the proposed site expansion can be estimated using different methodologies.

Methodology 1: Trips are estimated based on the proportional increase GFA of the dealership building. Based on the provided site statistics, the dealership building will increase by a factor of 1.67 (1,850 / 1,110 m^2). The existing site traffic volumes as observed from collected turning movement counts were increased by a factor of 1.67.

Methodology 2: Trips were forecasted for the total GFA of the dealership building using the Institute of Transportation Engineers (ITE) 11th Edition Trip Generation Manual, for the Land Use Codes (LUCs) for Automobile Sales (New) (LUC 840).

Vehicle trips were generated using the two methodologies. In Methodology 2, vehicle trips were generated via an average rate value and a fitted curve equation. The method that produced the highest results for each peak period was selected to be conservative. The estimated future site

trips that were selected are highlighted in **Table 4**. The ITE Trip Generation calculations are provided in **Appendix E**.

Table 4 Site trip generation

Methodology	ITE Land Use	Units	Parameter	PM Peak Hour			SAT Peak Hour		
				In	Out	Total	In	Out	Total
1			Existing Trips	10	18	28	9	12	21
			Future Trips (1.67 x Existing)	17	30	47	15	20	35
2	840 - Automobile Sales (New)	19.9 (1000 sq ft GFA)	New Trips (Avg Rate)	19	29	48	**40**	**40**	**80**
			New Trips (Fitted Rate)	**23**	**34**	**57**	38	37	75

Therefore, to be conservative, the site will generate a total of 23 inbound and 34 outbound vehicle trips during the PM peak hour, and 40 inbound and 40 outbound vehicle trips during the Saturday peak hour.

5.2 Directional distribution and assignment

The site trips generated by the proposed developments were distributed to the roadway system based on the existing traffic patterns. **Table 5** summarizes the trip distribution adopted in the study to assign the site trips to the road network for the weekday PM and Saturday peak hours.

Table 5 Site trip distribution

Trip Orientation (to / from)		PM Peak Hour		SAT Peak Hour	
		In	Out	In	Out
Gilbertson Drive	North	20%	33%	22%	17%
	South	0%	0%	0%	0%
Queensway East	East	20%	28%	56%	50%
	West	60%	39%	22%	33%
Total		100%	100%	100%	100%

The site traffic volumes are illustrated in **Figure 6**.

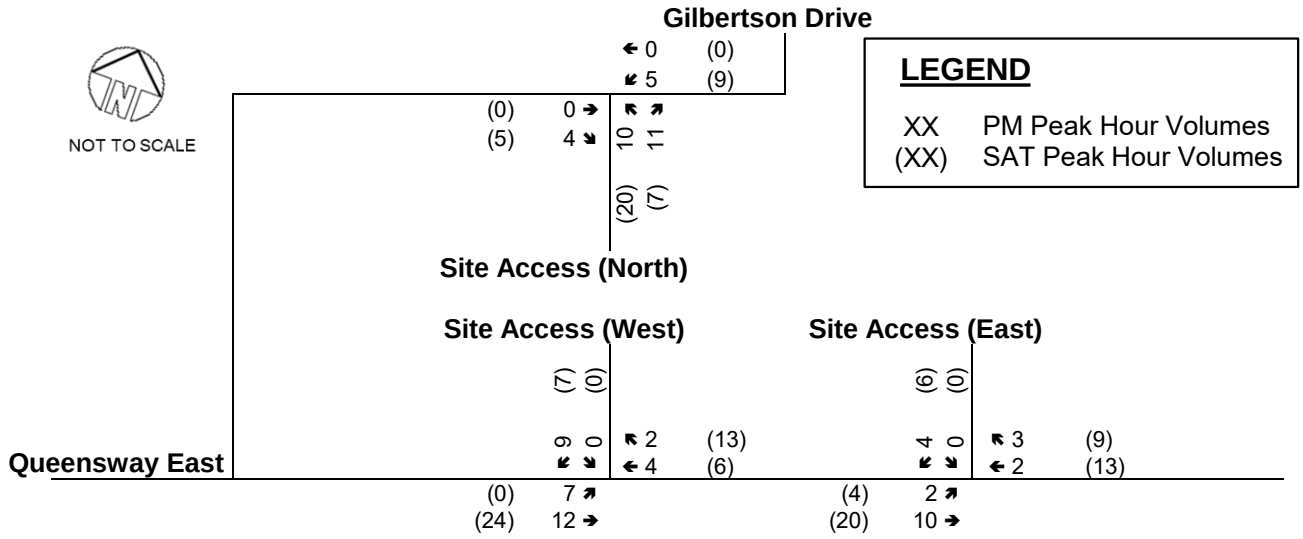


Figure 6 New site trips

6. Total traffic conditions

6.1 Total traffic volumes

To estimate the traffic impacts due to the introduction of new site trips, the background traffic flows (**Figure 5**) were combined with the estimated new site trips **(Figure 6**) to get the estimate of the total traffic during the weekday PM and SAT peak hours as illustrated in **Figure 7**.

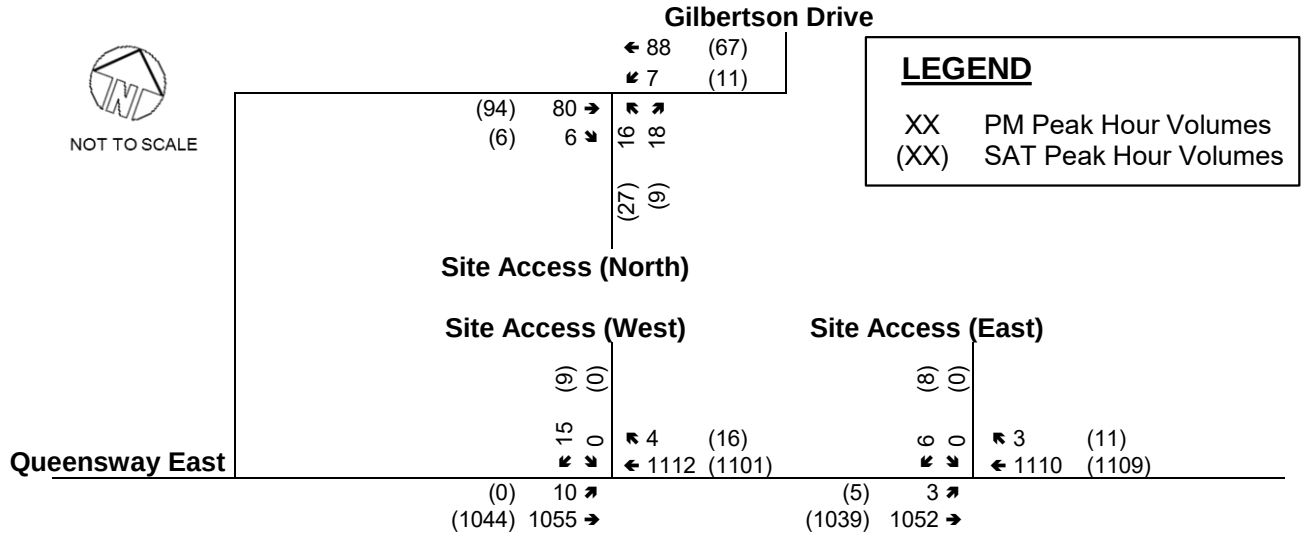


Figure 7 Total traffic volumes

6.2 Total traffic conditions

The future total traffic volumes were subjected to intersection capacity analyses based on the same methodologies utilized for the existing and background conditions. Peak hour factors for the study intersections were from the existing traffic data and used in the Synchro analysis. Peak hour factors for the study intersection were from the existing traffic data and used in the Synchro analysis.

Table 6 summarizes the results of the intersection capacity analysis. **Appendix F** contains the detailed total intersection capacity analysis reports.

Table 6 Total traffic conditions

Intersection	Control Type	PM Peak Hour		SAT Peak Hour	
		Critical/ Key Movements v/c(LOS) Delay in Seconds	95th %ile Queues (m)	Critical/ Key Movements v/c(LOS) Delay in Seconds	95th %ile Queues (m)
Queensway East / Site Access (West)	Two-Way Stop Controlled	**Overall: (A) 0** EBTL = 0.02 (B) 11 WBTR = 0.00 (A) 0 SBLR = 0.03 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 0** EBTL = 0.00 (A) 0 WBTR = 0.00 (A) 0 SBLR = 0.02 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0
Queensway East / Site Access (East)	Two-Way Stop Controlled	**Overall: (A) 0** EBTL = 0.01 (B) 11 WBTR = 0.00 (A) 0 SBLR = 0.01 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 0** EBTL = 0.01 (B) 11 WBTR = 0.00 (A) 0 SBLR = 0.02 (B) 13	EBTR = 0 WBTL = 0 NBLR = 0
Gilbertson Drive / Site Access (North)	Two-Way Stop Controlled	**Overall: (A) 2** EBTR = 0.00 (A) 0 WBTL = 0.01 (A) 7 NBLR = 0.05 (A) 9	EBTR = 0 WBTL = 0 NBLR = 0	**Overall: (A) 2** EBTR = 0.00 (A) 0 WBTL = 0.01 (A) 7 NBLR = 0.05 (A) 10	EBTR = 0 WBTL = 0 NBLR = 0

Under total traffic conditions, no critical movements and queue issues are identified. The study intersections have individual movements volume to capacity ratios of 0.05, or lower and LOS ‘B’ or better, all better than acceptable metrics.

In summary, based on the above capacity analysis, the traffic generated by the proposed development along with non-site related traffic growth can be easily accommodated by the existing street system.

Traffic generated by the proposed development does not add significant adverse impacts on the study intersections. No additional road improvements are triggered by the proposed development. All three site accesses can be expected to have excellent operational characteristics under the future total traffic conditions.

7. Site circulation review

The site plan was reviewed with respect to design vehicle circulation using AutoTURN software.

Based on the analysis, the Vehicle Circulation Review confirms that the proposed site plan is sufficient to accommodate the circulation requirements of fire trucks, front-loading garbage trucks, and passenger vehicles. The AutoTURN diagrams showing the vehicle sweep paths are provided in **Appendix G**.

8. Sightline review

The site has two accesses along Queensway East, and one access on Gilbertson Drive. An assessment of the available sightlines was undertaken in accordance with the Geometric Design Guide for Canadian Roads, 2017 Edition, published by the Transportation Association of Canada (TAC). **Table 7** details the findings of the assessment. Sightline diagrams are illustrated in **Appendix H**.

Table 7 Intersection Sight Distance Requirements

Access (Vehicle - Design Speed) Stopping Sight Distance	Case	Required Intersection Sight Distance (TAC 2017)	Available Intersection Sight Distance	TAC Reference
Queensway East Access (Passenger Car – 60 km/hr Design Speed) SSD: 85 m	B1: Vehicles turning left from stop	130 m	200+ m (*acceptable*)	Table 9.9.4
	B2: Vehicles turning right from stop	110 m	200+ m (*acceptable*)	Table 9.9.6
	F: Left turns from the major road	95 m	200+ m (*acceptable*)	Table 9.9.12
Queensway West Access (Passenger Car – 60 km/hr Design Speed) SSD: 85 m	B1: Vehicles turning left from stop	130 m	200+ m (*acceptable*)	Table 9.9.4
	B2: Vehicles turning right from stop	110 m	200+ m (*acceptable*)	Table 9.9.6
	F: Left turns from the major road	95 m	200+ m (*acceptable*)	Table 9.9.12
Gilbertson Road North Access (Passenger Car – 40 km/hr Design Speed) SSD: 50 m	B1: Vehicles turning left from stop	85 m	65 m	Table 9.9.4
	B2: Vehicles turning right from stop	75 m	55 m	Table 9.9.6
	F: Left turns from the major road	65 m	58 m	Table 9.9.12
Gilbertson Road North Access	B1: Vehicles turning left from stop	65 m	65 m (*acceptable*)	Table 9.9.4

Access (Vehicle - Design Speed) Stopping Sight Distance	Case	Required Intersection Sight Distance (TAC 2017)	Available Intersection Sight Distance	TAC Reference
(Passenger Car – 30 km/hr Design Speed) SSD: 35 m	B2: Vehicles turning right from stop	55 m	55 m (*acceptable*)	Table 9.9.6
	F: Left turns from the major road	50 m	58 m (*acceptable*)	Table 9.9.12

Based on the sightline review, there are no sightline issues with the two accesses along Queensway East.

For the north access on Gilbertson Drive, there are sightline limitations due to the sharp “S-curve” on Gilbertson Drive. Currently, Gilbertson Drive is unposted therefore assumed to be 50 km/hr. However, based on the roadway geometry of the reverse curves, vehicles are expected to decelerate to speeds of around 30 km/hr and maintain the reduced speed along the entirely of the “S-curve” before accelerating back to the higher assumed speed limit.

GHD recommends that within the “S-curve” of Gilbertson Drive, the posted speed be reduced to 30 km/hr. This speed limit reduction serves the purpose of meeting the sight distance requirements under a 30 km/hr design speed. Additional signage is recommended as a speed reduction and traffic safety measure to achieve 30 km/hr within the “S-curve”. In accordance with Ontario Traffic Manual (OTM) Book 6 – Warning Signs, a Sharp Reverse Curve – Right (WA-4) with 30 km/hr Advisory Speed tab (WA-7T) sign is shown in Figure 8**.** Signage is to be placed in advance of the first curve in the northbound and southbound directions.

The site accesses provide sufficient sightlines and sight distances to satisfy the requirements for all cases (**Table 7**) from the 2017 TAC manual under.

Figure 8 Recommended signage

9. Findings, conclusions and recommendations

- The purpose of this study is to determine the traffic-related impacts on the roadway system from the commercial development located in Simcoe, Ontario, on the north-east corner of Queensway East and Gilbertson Drive.
- Based on the current site plan, the site expansion consists of an increase of 1,110 m^2 GFA to 1,850 m^2 GFA to the dealership building.
- The study intersections for capacity analysis are:
    - Queensway East / Site Access (West)
    - Queensway East / Site Access (East)
    - Gilbertson Drive / Site Access (North)
- Existing 2023 traffic volumes were obtained through traffic data collection in November 2023.
- The study assumes a 5-year study horizon beyond the expected build-out. Due to the size and nature of the proposed development, 2025 is the expected year of full build-out. Therefore, the study horizon will be 2030, 5 years beyond full build-out.
- To be conservative, the study assumed that an annual growth rate of 2.0% which was applied to all movements of the 2023 counts to estimate the background traffic growth for the 2030 study horizon.
- No background developments are identified in the vicinity of the study area.
- The site will generate a total of 23 inbound and 34 outbound vehicle trips during the PM peak hour, and 40 inbound and 40 outbound vehicle trips during the Saturday peak hour.
- The site trips generated by the proposed developments were distributed to the roadway system based on an understanding of recent traffic counts.
- This study concludes that under the future traffic forecasts, the traffic generated by the proposed subject development along with non-site related traffic growth and background developments can be easily accommodated by the existing street system. Traffic generated by the proposed development does not add significant adverse impacts on the study intersections. No additional road improvements are triggered by the proposed development.
- All three site accesses are expected to have good operational characteristics under the future total traffic conditions.

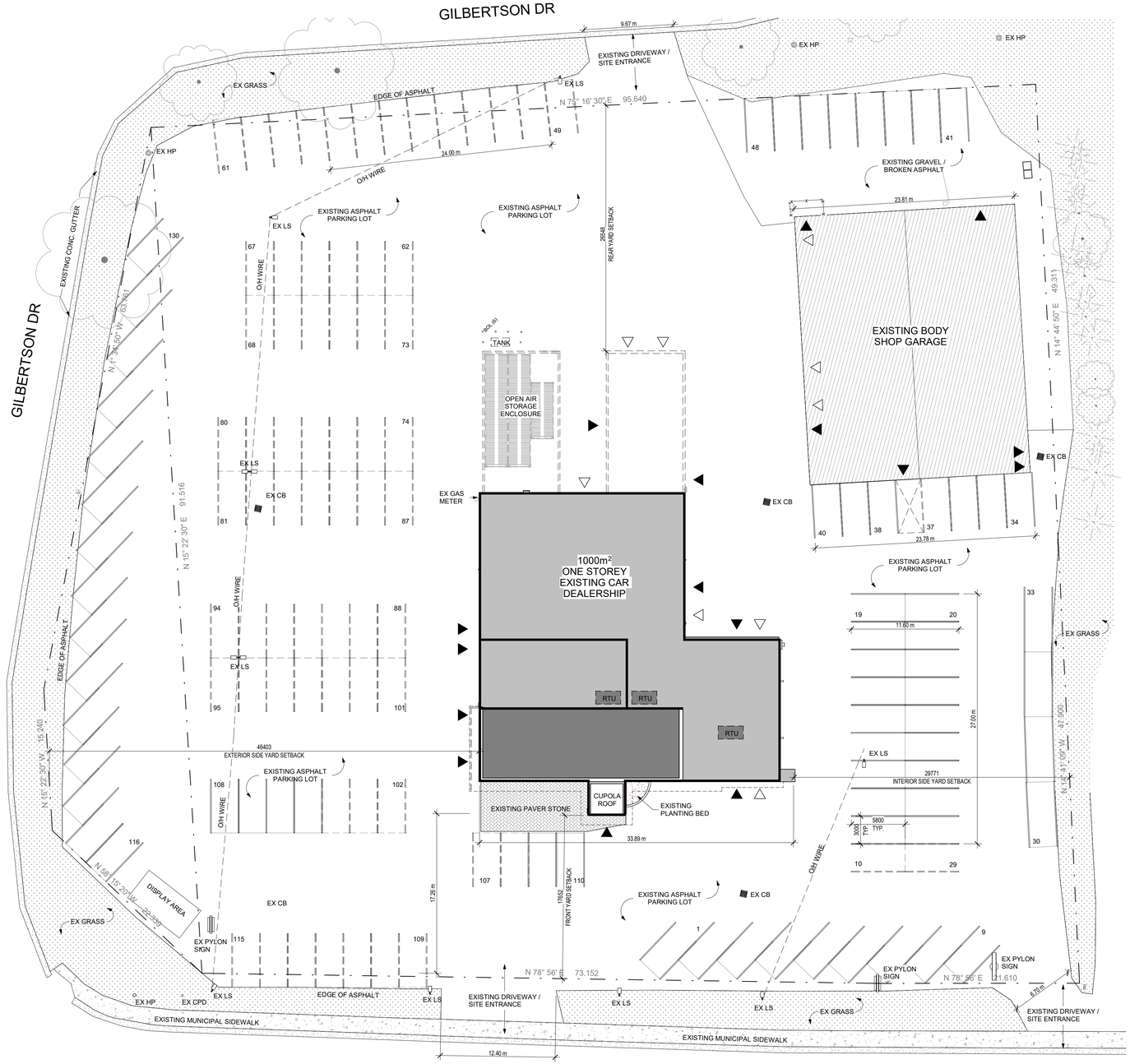
- The Vehicle Circulation Review confirms that the proposed site plan is sufficient to accommodate the circulation requirements of fire trucks, and front-loading garbage trucks.

- There are no sightline issues with the two accesses along Queensway East. There are sightline limitations due to the “S-curve” on Gilbertson Drive for the north access on Gilbertson Drive. GHD recommends that within the “S-curve” of Gilbertson Drive, the posted speed be reduced to 30 km/hr. This speed limit reduction serves the purpose of meeting the sight distance requirements under a 30 km/hr design speed. Additional signage is recommended as a speed reduction and traffic safety measure to achieve 30 km/hr within the “S-curve”.

Appendices

Appendix A

Site Plan



1 EXISTING SITE PLAN
1 : 250

Project North

True North

2 KEY PLAN
1 : 2500

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

EXISTING SITE PLAN

22071
FOR COORDINATION
2023-11-27

SRM↗ architects+ urban×designers

2023-11-28 2:38:20 PM

1 **PROPOSED SITE PLAN**
1 : 250

Project North

True North

BUILDING CODE REVIEW SUMMARY

Firm Name:
SRM Architects Inc.
279 King Street West
Suite 200
Kitchener, Ontario, N2G 1B2
T: 519.885.5600
Certificate of Practice Number: 4273

Name of Project:
Robinson Chevrolet

Location:
51 Queensway East, Simcoe

The Architect noted above has exercised responsible control with respect to design activities. The Architects seal number is the Architect's BCDN.

Item	Ontario Building Code Matrix Parts 3 & 9			OBC Section Reference	
1	Project Description: ■ New Construction ■ Addition ■ Alteration ☐ Change of Use	■ Part 11 11.1 to 11.4		■ Part 3 1.1.2.[A]	☐ Part 9 1.1.2.[A] and 9.10.1.3.
2	Major Occupancy (s) Group D, E & F2			3.1.2.1(1)	9.10.2
3	Building Area (m²) Existing 870 m² New 760 m² Total 1,630 m² Original Existing 1,000.6 m²			1.4.1.2.[A]	1.4.1.2.[A]
4	Gross Area (m²) Original Existing 1,240.6 m² Existing 1,090 m² Demo (incl. mezzanine) 149.6 m² New 760 m² Total 1,850 m²			1.4.1.2.[A]	1.4.1.2.[A]
5	Number of Storeys Above Grade 2 Below Grade N/A			1.4.1.2.[A] & 3.2.1.1.	1.4.1.2.[A] & 9.10.4.
6	Height of Building 5.5 m (finished grade to floor level of top storey)				
7	Number of Streets / Access Routes 3			3.2.2.10 & 3.2.5.	9.10.20
8	Building Classification Group E, up to 2 Storeys, Sprinklered 3.2.2.62			3.2.2.20 - 83	9.10.2
9	Sprinkler System Proposed ■ Entire Building ☐ Basement Only ☐ In lieu of roof rating ☐ Not required ☐ Selected Compartments ☐ Selected Floor Areas			3.2.2.20 - 83 3.2.1.5 3.2.2.17 Index	9.10.8.2. Index
10	Standpipe required ☐ Yes ■ No			3.2.9	N/A
11	Fire Alarm required ☐ Yes ■ No			3.2.4	9.10.18.
12	Water Service Supply is Adequate ■ Yes (hydrant to be located within 90m of building) ☐ No			3.2.5.7	N/A
13	High Building ☐ Yes (refer to High Building Summary) ■ No			3.2.6	N/A
14	Construction Restrictions ☐ Combustible permitted ☐ Non-combustible required ■ Both Actual Construction ☐ Combustible ■ Non-combustible ☐ Both			3.2.2.20 - 83	9.10.6
15	Mezzanine (s) Area (m²) 220 m²			3.2.1.1.(3)-(8)	9.10.4.1
16	Occupant Load Based on ☐ m² / person (Public) ■ Design of building based on WR capacity Level 1 & Level 2 Occupancy F2 & E Load 48 persons			3.1.17	9.9.1.3
17	Barrier Free Design ■ Yes ☐ No (Explain)			3.8	9.5.2
18	Hazardous Substances ■ Yes ☐ No			3.3.1.2. & 3.3.1.19.	9.10.1.3(4)
19	Required Fire Resistance Rating (FRR)	Horizontal Assemblies Fire Resistance Rating (hours)	Listed Design No. or Description (SB-2)	3.2.2.20 - 83 & 3.2.1.4.	9.10.8 & 9.10.9
		Floors 45 minutes Hours	N/A		
		Roof N/A Hours	N/A		
		Mezzanine N/A Hours	N/A		
		Fire Resistance Rating of Supporting Members	Listed Design No. or Description (SB-2)		
		Floors 45 minutes Hours	N/A		
		Roof N/A Hours	N/A		
		Mezzanine N/A Hours	N/A		
20	Washroom Requirements:			3.7.4.	9.31.

Occupancy	Male Public Req'd	Male Public Provided	Male Staff Req'd	Male Staff Provided	Female Public Req'd	Female Public Provided	Female Staff Req'd	Female Staff Provided
E & F2	1	1	4	4	1	1	2	2

21	Exits First Floor: Occupancy F2 & E Exits Required 8 Exits Provided 9 Second Floor: Occupancy F2 & E Exits Required 1 (ex.) Exits Provided 1 (ex.)	3.4.	9.9
22	Fire Separations: Janitor's Room: 0 hr Service Rooms: 1 hr Repair Garage: 2 hr Storage Garage: 1.5 hr Storage Rooms: 45 min	3.3.1.20. 3.6.2. 3.3.5.5. 3.2.1.2., 3.3.5.6. 3.3.4.3	9.10.10. 9.10.9.17. 9.10.4.3., 9.10.9.16 9.10.10.6.
23	Barrier Free Entrances: Number of Entrances required to be Barrier Free = 1 Power Door Operators Required ■ Yes ☐ No	3.8.1.2. 3.8.3.3.	9.5.2
24	Roof Anchors: ☐ Required ■ Not Required	4.4.4	
25	Spatial Separation - Construction of Exterior Walls	3.2.3.	9.10.14.

Wall Face	Area of E.B.F.	Limiting Distance	Ratio L/H to H/L	Permitted Max % of Openings	Proposed Max % of Openings	Required F.R.R. of Wall	Listed Design or Description	Non-Combustible Cladding	Non-Combustible Construction
North	233	17.7	N/A	100%	19%	N/A	N/A	N/A	N/A
South	234	17.8	N/A	100%	31%	N/A	N/A	N/A	N/A
East	304	29.7	N/A	100%	15%	N/A	N/A	N/A	N/A
West	287	31.1	N/A	100%	5%	N/A	N/A	N/A	N/A

2 **KEY PLAN**
1 : 2500

SITE DATA

51 QUEENSWAY EAST, SIMCOE, ONTARIO

DATA - DEALERSHIP		REQUIRED	EXISTING	PROVIDED
ZONING		ZONING - CS		
LOT AREA (m²)		495 (m²) MIN.	9798.9 (m²)	
SETBACKS	FRONT YARD (m)	3 (m)	17.4 (m)	17.4 (m)
	INTERIOR SIDE YARD (m)	3 (m)	29.7 (m)	29.7 (m)
	EXTERIOR SIDE YARD (m)	3 (m)	46.4 (m)	31.1 (m)
	REAR YARD (m)	9 (m)	26.9 (m)	17.7 (m)

BUILDING DATA - DEALERSHIP (MAIN BUILDING)

DATA	REQUIRED	EXISTING	PROPOSED
BUILDING AREA (m²)	N/A	870 (m²)	1,630 (m²)
GROSS FLOOR AREA (m²)	N/A	1,110 (m²)	1,850 (m²)
NUMBER OF STOREYS	N/A	1	1
BUILDING HEIGHT (m)	11 (m) MAX.	5.1 (m)	5.1 (m)
COMMERCIAL/RETAIL AREA (m²)	N/A	389 (m²)	807 (m²)
SERVICE AREA(m²)	N/A	611 (m²)	928 (m²)
LOT COVERAGE (%)	35% MAX.	10.2 (%)	16.5 (%)

BUILDING DATA - GARAGE (BUILDING ON NORTH-EAST CORNER)

DATA	REQUIRED	EXISTING	PROPOSED
BUILDING AREA (m²)	N/A	691.5 (m²)	N/A
GROSS FLOOR AREA (m²)	N/A	691.5 (m²)	N/A
NUMBER OF STOREYS	N/A	1	N/A
BUILDING HEIGHT (m)	11 (m) MAX.	5.1 (m)	N/A
SERVICE AREA(m²)	N/A	691.5 (m²)	N/A
LOT COVERAGE (%)	35% MAX.	7 (%)	N/A

LANDSCAPING DATA

DATA	REQUIRED	EXISTING	PROVIDED
LANDSCAPE AREA (percentage)	N/A	2.3 (%)	3.4 (%)
LANDSCAPE AREA (m²)	N/A	227.5 (m²)	330 (m²)

VEHICLE PARKING DATA

DATA	REQUIRED	EXISTING	PROVIDED
NON-RESIDENTIAL USE PARKING (DEALERSHIP)	1 SPACE/35m² = 46	110	121
NON-RESIDENTIAL USE PARKING (GARAGE)	1 SPACE/35m² = 20	20	121
BARRIER FREE PARKING (DEALERSHIP)	2	0	2
BARRIER FREE PARKING (GARAGE)	1	0	1
TOTAL	1 SPACE/35m² = 46	130	121

BICYCLE PARKING DATA

DATA	REQUIRED	EXISTING	PROVIDED
COMMERCIAL BICYCLE PARKING	N/A	N/A	N/A
	TOTAL	N/A	N/A

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

PROPOSED SITE PLAN

22071
FOR COORDINATION
2023-11-27

SRM architects+ urban designers

2023-11-28 2:38:24 PM

Appendix B

Turning Movement Counts

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #23-354 - GHD

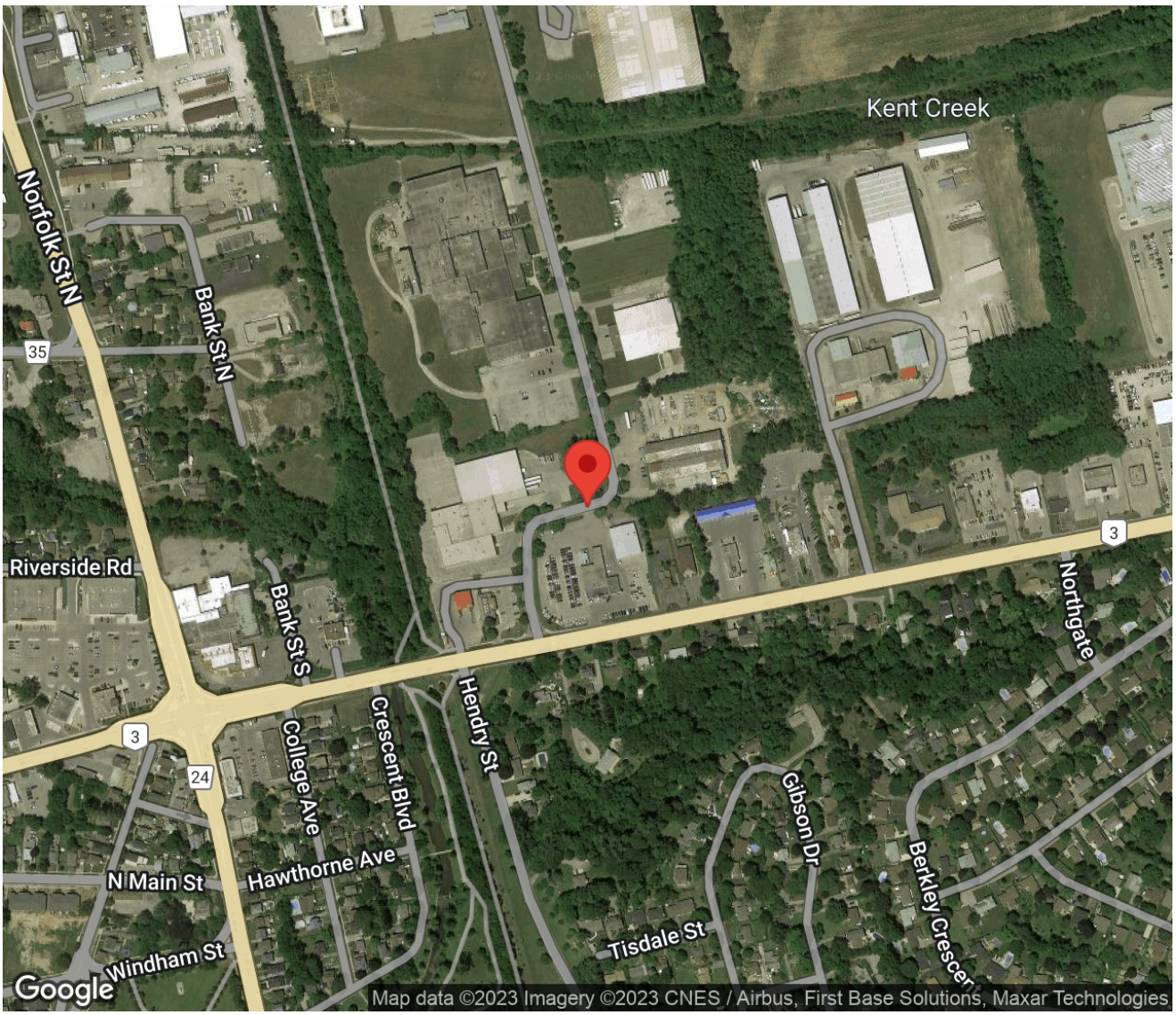
Intersection Count Report

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Municipality:	Simcoe
Count Date:	Thursday, Nov 02, 2023
Site Code:	2335400001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	16:00-18:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code:	2335400001
Municipality:	Simcoe
Count Date:	Nov 02, 2023



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code:	2335400001
Municipality:	Simcoe
Count Date:	Nov 02, 2023

Robinson Chevrolet Buick GMC Simcoe - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
16:00 - 17:00	0	0	0	0	0	0	5	0	6	0	11	0	11
17:00 - 18:00	0	0	0	0	0	0	12	0	5	0	17	1	17
GRAND TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**11**	**0**	**28**	**1**	**28**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code:	2335400001
Municipality:	Simcoe
Count Date:	Nov 02, 2023

Gilbertson Dr - Traffic Summary

Hour	East Approach Totals Includes Cars, Trucks, Bicycles						West Approach Totals Includes Cars, Trucks, Bicycles						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
16:00 - 17:00	2	77	0	0	79	0	0	70	2	0	72	0	151
17:00 - 18:00	0	46	0	0	46	0	0	49	0	0	49	0	95
GRAND TOTAL	**2**	**123**	**0**	**0**	**125**	**0**	**0**	**119**	**2**	**0**	**121**	**0**	**246**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400001
Municipality: Simcoe
Count Date: Nov 02, 2023

South Approach - Robinson Chevrolet Buick GMC Simcoe

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
16:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
16:15	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
16:45	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
17:00	9	0	1	0	10	0	0	0	0	0	0	0	0	0	0	0
17:15	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	1
17:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	2	0	2	0	0	0	0	0	0	0	1	0	1	0
SUBTOTAL	17	0	10	0	27	0	0	0	0	0	0	0	1	0	1	1
GRAND TOTAL	17	0	10	0	27	0	0	0	0	0	0	0	1	0	1	1

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400001
Municipality: Simcoe
Count Date: Nov 02, 2023

East Approach - Gilbertson Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
16:00	0	21	0	0	21	0	1	0	0	1	0	0	0	0	0	0
16:15	0	25	0	0	25	0	0	0	0	0	0	0	0	0	0	0
16:30	1	13	0	0	14	0	0	0	0	0	0	0	0	0	0	0
16:45	1	17	0	0	18	0	0	0	0	0	0	0	0	0	0	0
17:00	0	16	0	0	16	0	0	0	0	0	0	0	0	0	0	0
17:15	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0
17:30	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	0
17:45	0	8	0	0	8	0	0	0	0	0	0	1	0	0	1	0
SUBTOTAL	2	121	0	0	123	0	1	0	0	1	0	1	0	0	1	0
GRAND TOTAL	2	121	0	0	123	0	1	0	0	1	0	1	0	0	1	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400001
Municipality: Simcoe
Count Date: Nov 02, 2023

West Approach - Gilbertson Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
16:00	0	20	0	0	20	0	1	0	0	1	0	0	0	0	0	0
16:15	0	18	2	0	20	0	0	0	0	0	0	0	0	0	0	0
16:30	0	19	0	0	19	0	0	0	0	0	0	0	0	0	0	0
16:45	0	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0
17:00	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	0
17:15	0	16	0	0	16	0	0	0	0	0	0	0	0	0	0	0
17:30	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0
17:45	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	118	2	0	120	0	1	0	0	1	0	0	0	0	0	0
GRAND TOTAL	0	118	2	0	120	0	1	0	0	1	0	0	0	0	0	0

Peak Hour Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:00:00
To: 17:00:00

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400001
Count Date: Nov 02, 2023

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Gilbertson Dr runs E/W

East Approach

	Out	In	Total
Cars	78	75	153
Trucks	1	1	2
Bicycles	0	0	0
	79	**76**	**155**

Peds: 0

Gilbertson Dr

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	1	69	**70**	
0	0	2	**2**	

Peds: 0

Peds: 0

Gilbertson Dr

Totals	Cars	Trucks	Bicycles
0	0	0	0
77	76	1	0
2	2	0	0

West Approach

	Out	In	Total
Cars	71	81	152
Trucks	1	1	2
Bicycles	0	0	0
	72	**82**	**154**

Totals	5	6	0
Cars	5	6	0
Trucks	0	0	0
Bicycles	0	0	0

Robinson Chevrolet Buick GMC Simcoe

South Approach

	Out	In	Total
Cars	11	4	15
Trucks	0	0	0
Bicycles	0	0	0
	11	**4**	**15**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400001
Count Date: Nov 02, 2023
Period: 16:00 - 18:00

Peak Hour Data (16:00 - 17:00)

Start Time	North Approach						South Approach Robinson Chevrolet Buick GMC Simcoe						East Approach Gilbertson Dr						West Approach Gilbertson Dr						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
16:00					0		2		0	0	0	2	0	22		0	0	22		21	0	0	0	21	45
16:15					0		1		3	0	0	4	0	25		0	0	25		18	2	0	0	20	49
16:30					0		0		2	0	0	2	1	13		0	0	14		19	0	0	0	19	35
16:45					0		2		1	0	0	3	1	17		0	0	18		12	0	0	0	12	33
Grand Total					**0**	**0**	**5**		**6**	**0**	**0**	**11**	**2**	**77**		**0**	**0**	**79**		**70**	**2**	**0**	**0**	**72**	**162**
Approach %						-	45.5		54.5	0		-	2.5	97.5		0		-		97.2	2.8	0		-	
Totals %						0	3.1		3.7	0		6.8	1.2	47.5		0		48.8		43.2	1.2	0		44.4	
PHF						**0**	**0.63**		**0.5**	**0**		**0.69**	**0.5**	**0.77**		**0**		**0.79**		**0.83**	**0.25**	**0**		**0.86**	**0.83**
Cars						0	5		6	0		11	2	76		0		78		69	2	0		71	160
% Cars						0	100		100	0		100	100	98.7		0		98.7		98.6	100	0		98.6	98.8
Trucks						0	0		0	0		0	0	1		0		1		1	0	0		1	2
% Trucks						0	0		0	0		0	0	1.3		0		1.3		1.4	0	0		1.4	1.2
Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
% Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #23-354 - GHD

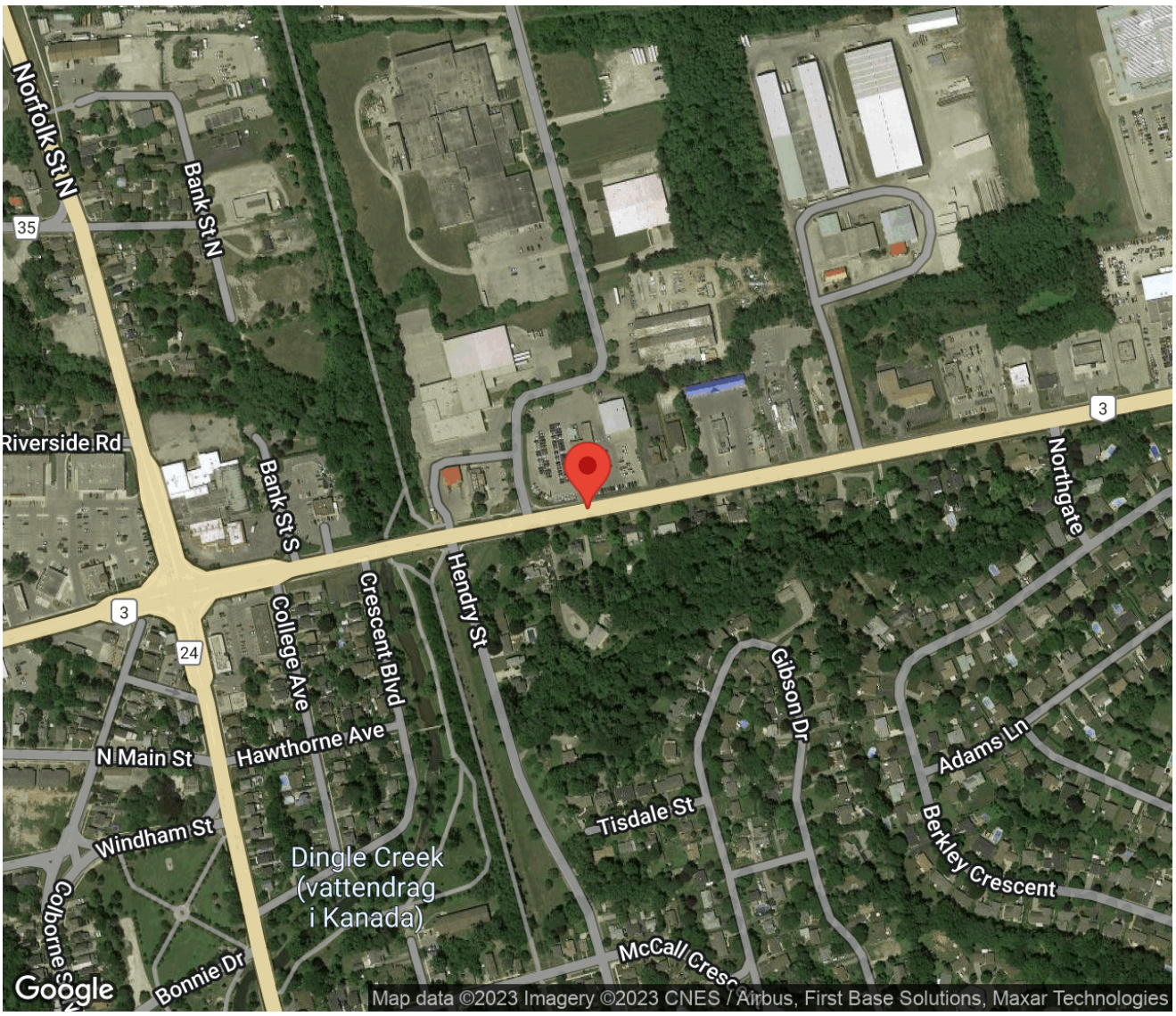
Intersection Count Report

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Municipality:	Simcoe
Count Date:	Thursday, Nov 02, 2023
Site Code:	2335400002
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	16:00-18:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code:	2335400002
Municipality:	Simcoe
Count Date:	Nov 02, 2023



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code:	2335400002
Municipality:	Simcoe
Count Date:	Nov 02, 2023

Robinson Chevrolet Buick GMC Simcoe (west driveway) - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
16:00 - 17:00	1	0	3	0	4	5	0	0	0	0	0	0	4
17:00 - 18:00	0	0	2	0	2	8	0	0	0	0	0	0	2
GRAND TOTAL	**1**	**0**	**5**	**0**	**6**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**6**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code:	2335400002
Municipality:	Simcoe
Count Date:	Nov 02, 2023

Queensway East - Traffic Summary

Hour	East Approach Totals (Includes Cars, Trucks, Bicycles)						West Approach Totals (Includes Cars, Trucks, Bicycles)						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
16:00 - 17:00	0	943	2	0	945	0	3	915	0	0	918	0	1863
17:00 - 18:00	0	899	1	0	900	0	0	794	0	0	794	0	1694
GRAND TOTAL	**0**	**1842**	**3**	**0**	**1845**	**0**	**3**	**1709**	**0**	**0**	**1712**	**0**	**3557**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400002
Municipality: Simcoe
Count Date: Nov 02, 2023

North Approach - Robinson Chevrolet Buick GMC Simcoe (west driveway)

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
16:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
16:45	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2
17:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	3
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
SUBTOTAL	1	0	5	0	6	0	0	0	0	0	0	0	0	0	0	13
GRAND TOTAL	1	0	5	0	6	0	0	0	0	0	0	0	0	0	0	13

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400002
Municipality: Simcoe
Count Date: Nov 02, 2023

East Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
16:00	0	238	1	0	239	0	8	0	0	8	0	0	0	0	0	0
16:15	0	208	0	0	208	0	7	0	0	7	0	0	0	0	0	0
16:30	0	235	0	0	235	0	8	0	0	8	0	0	0	0	0	0
16:45	0	236	1	0	237	0	3	0	0	3	0	0	0	0	0	0
17:00	0	238	1	0	239	0	5	0	0	5	0	0	0	0	0	0
17:15	0	234	0	0	234	0	6	0	0	6	0	0	0	0	0	0
17:30	0	206	0	0	206	0	5	0	0	5	0	0	0	0	0	0
17:45	0	199	0	0	199	0	6	0	0	6	0	0	0	0	0	0
SUBTOTAL	0	1794	3	0	1797	0	48	0	0	48	0	0	0	0	0	0
GRAND TOTAL	**0**	**1794**	**3**	**0**	**1797**	**0**	**48**	**0**	**0**	**48**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400002
Municipality: Simcoe
Count Date: Nov 02, 2023

West Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↩	Total	↰	↑	↱	↩	Total	↰	↑	↱	↩	Total	
16:00	0	223	0	0	223	0	5	0	0	5	0	0	0	0	0	0
16:15	0	203	0	0	203	0	9	0	0	9	0	0	0	0	0	0
16:30	1	226	0	0	227	0	5	0	0	5	0	0	0	0	0	0
16:45	2	242	0	0	244	0	2	0	0	2	0	0	0	0	0	0
17:00	0	225	0	0	225	0	4	0	0	4	0	0	0	0	0	0
17:15	0	201	0	0	201	0	3	0	0	3	0	0	0	0	0	0
17:30	0	193	0	0	193	0	3	0	0	3	0	0	0	0	0	0
17:45	0	162	0	0	162	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	3	1675	0	0	1678	0	34	0	0	34	0	0	0	0	0	0
GRAND TOTAL	3	1675	0	0	1678	0	34	0	0	34	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	16:00:00	From:	16:30:00
To:	18:00:00	To:	17:30:00

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400002
Count Date: Nov 02, 2023

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Queensway East runs E/W

North Approach

	Out	In	Total
Cars	5	5	10
Trucks	0	0	0
Bicycles	0	0	0
	5	**5**	**10**

Robinson Chevrolet Buick GMC Simcoe (west driveway)

Bicycles	0	0	0
Trucks	0	0	0
Cars	5	0	0
Totals	**5**	**0**	**0**

East Approach

	Out	In	Total
Cars	945	894	1839
Trucks	22	14	36
Bicycles	0	0	0
	967	**908**	**1875**

Peds: 8

Queensway East

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	0	3	**3**	
0	14	894	**908**	

Peds: 0

Peds: 0

Queensway East

Totals	Cars	Trucks	Bicycles
0	0	0	0
2	2	0	0
965	943	22	0

Peds: 0

West Approach

	Out	In	Total
Cars	897	948	1845
Trucks	14	22	36
Bicycles	0	0	0
	911	**970**	**1881**

- Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400002
Count Date: Nov 02, 2023
Period: 16:00 - 18:00

Peak Hour Data (16:30 - 17:30)

Start Time	North Approach Robinson Chevrolet Buick GMC Simcoe (west driveway)						South Approach						East Approach Queensway East						West Approach Queensway East						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
16:30	0		1	0	2	1					0			243	0	0	0	243	1	231		0	0	232	476
16:45	0		2	0	2	2					0			239	1	0	0	240	2	244		0	0	246	488
17:00	0		2	0	3	2					0			243	1	0	0	244	0	229		0	0	229	475
17:15	0		0	0	1	0					0			240	0	0	0	240	0	204		0	0	204	444
Grand Total	**0**		**5**	**0**	**8**	**5**					**0**	**0**		**965**	**2**	**0**	**0**	**967**	**3**	**908**		**0**	**0**	**911**	**1883**
Approach %	0		100	0		-						-		99.8	0.2	0		-	0.3	99.7		0		-	
Totals %	0		0.3	0		0.3						0		51.2	0.1	0		51.4	0.2	48.2		0		48.4	
PHF	**0**		**0.63**	**0**		**0.63**						**0**		**0.99**	**0.5**	**0**		**0.99**	**0.38**	**0.93**		**0**		**0.93**	**0.96**
Cars	0		5	0		5						0		943	2	0		945	3	894		0		897	1847
% Cars	0		100	0		100						0		97.7	100	0		97.7	100	98.5		0		98.5	98.1
Trucks	0		0	0		0						0		22	0	0		22	0	14		0		14	36
% Trucks	0		0	0		0						0		2.3	0	0		2.3	0	1.5		0		1.5	1.9
Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
% Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
Peds					8	-					0	-					0	-					0	-	8
% Peds					100	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #23-354 - GHD

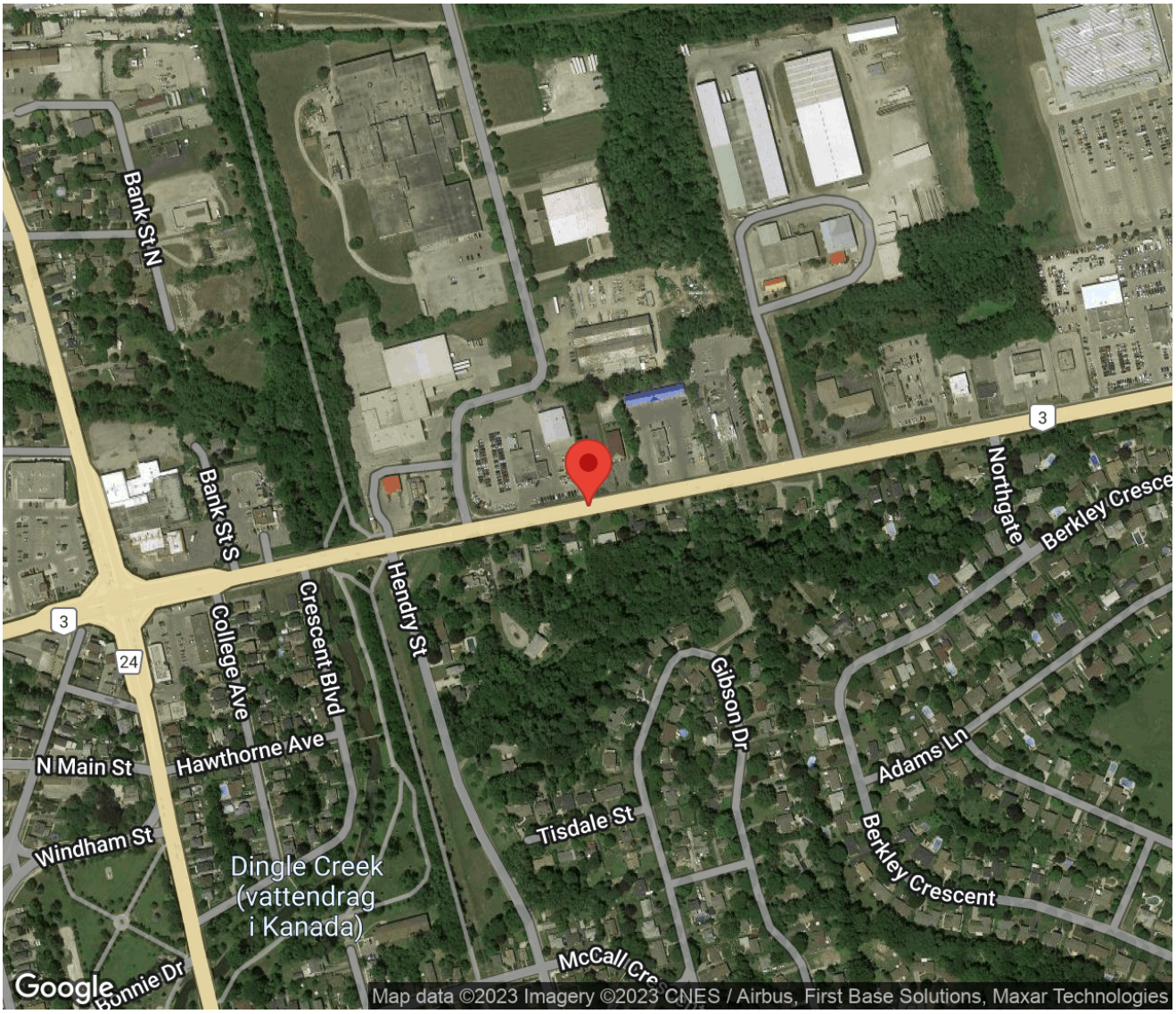
Intersection Count Report

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Municipality:	Simcoe
Count Date:	Thursday, Nov 02, 2023
Site Code:	2335400003
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	16:00-18:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code:	2335400003
Municipality:	Simcoe
Count Date:	Nov 02, 2023



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code:	2335400003
Municipality:	Simcoe
Count Date:	Nov 02, 2023

Robinson Chevrolet Buick GMC Simcoe (east driveway) - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
16:00 - 17:00	0	0	2	0	2	6	0	0	0	0	0	0	2
17:00 - 18:00	0	0	2	0	2	4	0	0	0	0	0	0	2
GRAND TOTAL	**0**	**0**	**4**	**0**	**4**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**4**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code:	2335400003
Municipality:	Simcoe
Count Date:	Nov 02, 2023

Queensway East - Traffic Summary

Hour	East Approach Totals (Includes Cars, Trucks, Bicycles)						West Approach Totals (Includes Cars, Trucks, Bicycles)						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
16:00 - 17:00	0	943	0	0	943	0	0	916	0	0	916	0	1859
17:00 - 18:00	0	898	0	0	898	0	1	793	0	0	794	0	1692
GRAND TOTAL	**0**	**1841**	**0**	**0**	**1841**	**0**	**1**	**1709**	**0**	**0**	**1710**	**0**	**3551**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400003
Municipality: Simcoe
Count Date: Nov 02, 2023

North Approach - Robinson Chevrolet Buick GMC Simcoe (east driveway)

Start Time	Cars					Trucks					Bicycles					Total Peds
					Total					Total					Total	
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:30	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
SUBTOTAL	0	0	3	0	3	0	0	1	0	1	0	0	0	0	0	10
GRAND TOTAL	0	0	3	0	3	0	0	1	0	1	0	0	0	0	0	10

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400003
Municipality: Simcoe
Count Date: Nov 02, 2023

East Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
16:00	0	239	0	0	239	0	8	0	0	8	0	0	0	0	0	0
16:15	0	208	0	0	208	0	7	0	0	7	0	0	0	0	0	0
16:30	0	233	0	0	233	0	8	0	0	8	0	0	0	0	0	0
16:45	0	237	0	0	237	0	3	0	0	3	0	0	0	0	0	0
17:00	0	239	0	0	239	0	5	0	0	5	0	0	0	0	0	0
17:15	0	234	0	0	234	0	6	0	0	6	0	0	0	0	0	0
17:30	0	205	0	0	205	0	4	0	0	4	0	0	0	0	0	0
17:45	0	199	0	0	199	0	6	0	0	6	0	0	0	0	0	0
SUBTOTAL	0	1794	0	0	1794	0	47	0	0	47	0	0	0	0	0	0
GRAND TOTAL	**0**	**1794**	**0**	**0**	**1794**	**0**	**47**	**0**	**0**	**47**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400003
Municipality: Simcoe
Count Date: Nov 02, 2023

West Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
16:00	0	224	0	0	224	0	5	0	0	5	0	0	0	0	0	0
16:15	0	203	0	0	203	0	9	0	0	9	0	0	0	0	0	0
16:30	0	226	0	0	226	0	5	0	0	5	0	0	0	0	0	0
16:45	0	242	0	0	242	0	2	0	0	2	0	0	0	0	0	0
17:00	0	225	0	0	225	0	4	0	0	4	0	0	0	0	0	0
17:15	0	201	0	0	201	1	2	0	0	3	0	0	0	0	0	0
17:30	0	193	0	0	193	0	3	0	0	3	0	0	0	0	0	0
17:45	0	162	0	0	162	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	0	1676	0	0	1676	1	33	0	0	34	0	0	0	0	0	0
GRAND TOTAL	0	1676	0	0	1676	1	33	0	0	34	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	16:00:00	From:	16:30:00
To:	18:00:00	To:	17:30:00

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400003
Count Date: Nov 02, 2023

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Queensway East runs E/W

North Approach

	Out	In	Total
Cars	2	0	2
Trucks	0	1	1
Bicycles	0	0	0
	2	**1**	**3**

Robinson Chevrolet Buick GMC Simcoe (east driveway)

Bicycles	0	0	0
Trucks	0	0	0
Cars	2	0	0
Totals	**2**	**0**	**0**

East Approach

	Out	In	Total
Cars	943	894	1837
Trucks	22	13	35
Bicycles	0	0	0
	965	**907**	**1872**

Peds: 6

Queensway East

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	1	0	**1**	
0	13	894	**907**	

Peds: 0

Peds: 0

Queensway East

Totals	Cars	Trucks	Bicycles	
0	0	0	0	
0	0	0	0	
965	943	22	0	

Peds: 0

West Approach

	Out	In	Total
Cars	894	945	1839
Trucks	14	22	36
Bicycles	0	0	0
	908	**967**	**1875**

- Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400003
Count Date: Nov 02, 2023
Period: 16:00 - 18:00

Peak Hour Data (16:30 - 17:30)

Start Time	North Approach Robinson Chevrolet Buick GMC Simcoe (east driveway)						South Approach						East Approach Queensway East						West Approach Queensway East						Total Vehicles
	↰	↑	↱	↩	Peds	Total	↰	↑	↱	↩	Peds	Total	↰	↑	↱	↩	Peds	Total	↰	↑	↱	↩	Peds	Total	
16:30	0		2	0	0	2					0			241	0	0	0	241	0	231		0	0	231	474
16:45	0		0	0	4	0					0			240	0	0	0	240	0	244		0	0	244	484
17:00	0		0	0	2	0					0			244	0	0	0	244	0	229		0	0	229	473
17:15	0		0	0	0	0					0			240	0	0	0	240	1	203		0	0	204	444
Grand Total	**0**		**2**	**0**	**6**	**2**					**0**	**0**		**965**	**0**	**0**	**0**	**965**	**1**	**907**		**0**	**0**	**908**	**1875**
Approach %	0		100	0		-						-		100	0	0		-	0.1	99.9		0		-	
Totals %	0		0.1	0		0.1						0		51.5	0	0		51.5	0.1	48.4		0		48.4	
PHF	**0**		**0.25**	**0**		**0.25**						**0**		**0.99**	**0**	**0**		**0.99**	**0.25**	**0.93**		**0**		**0.93**	**0.97**
Cars	0		2	0		2						0		943	0	0		943	0	894		0		894	1839
% Cars	0		100	0		100						0		97.7	0	0		97.7	0	98.6		0		98.5	98.1
Trucks	0		0	0		0						0		22	0	0		22	1	13		0		14	36
% Trucks	0		0	0		0						0		2.3	0	0		2.3	100	1.4		0		1.5	1.9
Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
% Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
Peds					6	-					0	-					0	-					0	-	6
% Peds					100	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #23-354 - GHD

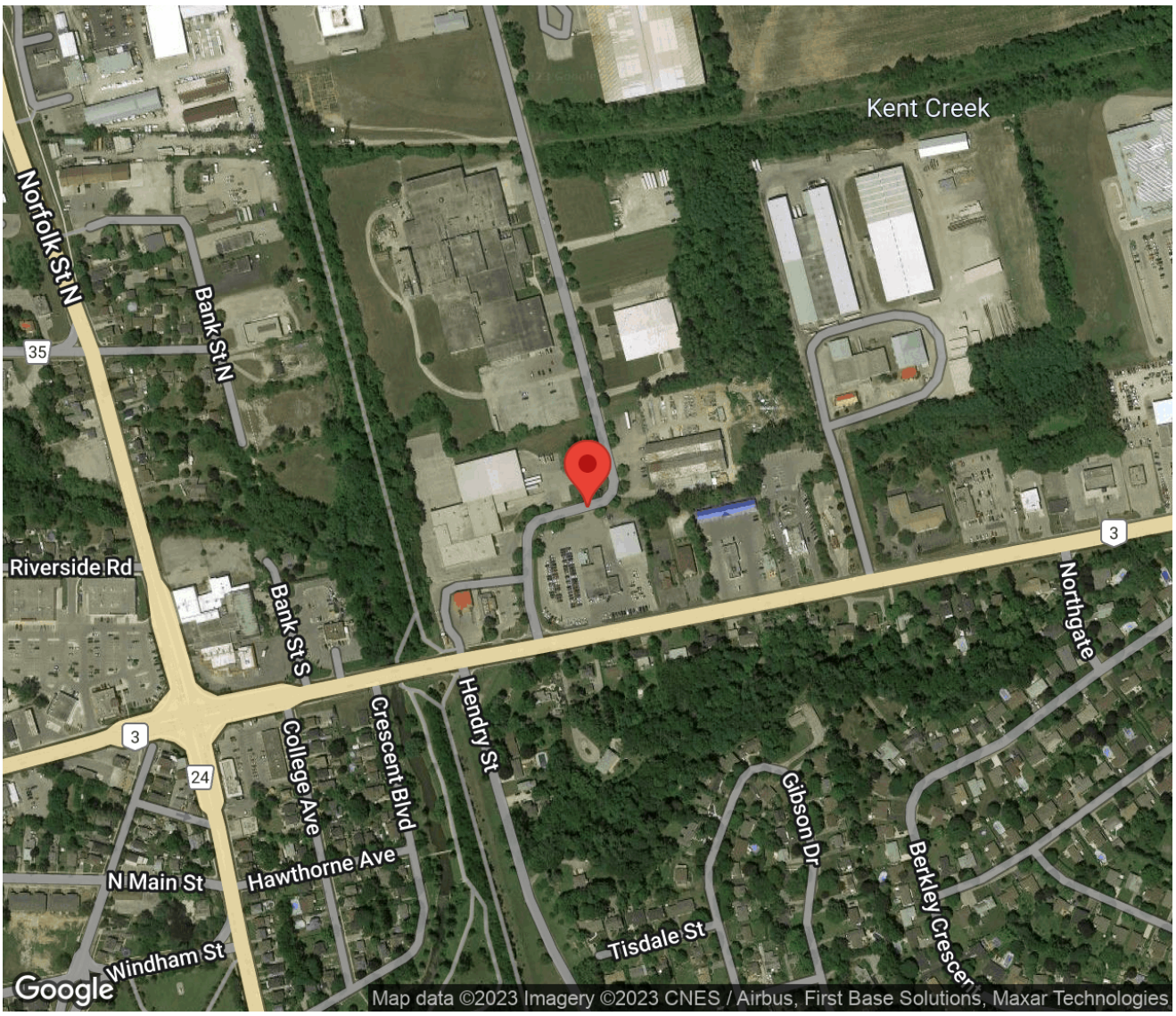
Intersection Count Report

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Municipality:	Simcoe
Count Date:	Saturday, Nov 04, 2023
Site Code:	2335400004
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	12:00-14:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code:	2335400004
Municipality:	Simcoe
Count Date:	Nov 04, 2023



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code:	2335400004
Municipality:	Simcoe
Count Date:	Nov 04, 2023

Robinson Chevrolet Buick GMC Simcoe - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
12:00 - 13:00	0	0	0	0	0	0	5	0	2	0	7	1	7
13:00 - 14:00	0	0	0	0	0	0	1	0	2	0	3	0	3
GRAND TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**4**	**0**	**10**	**1**	**10**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code:	2335400004
Municipality:	Simcoe
Count Date:	Nov 04, 2023

Gilbertson Dr - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
12:00 - 13:00	2	49	0	0	51	0	0	78	0	0	78	0	129
13:00 - 14:00	0	70	0	0	70	0	0	65	4	0	69	0	139
GRAND TOTAL	**2**	**119**	**0**	**0**	**121**	**0**	**0**	**143**	**4**	**0**	**147**	**0**	**268**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400004
Municipality: Simcoe
Count Date: Nov 04, 2023

South Approach - Robinson Chevrolet Buick GMC Simcoe

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
12:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
12:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
12:30	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
12:45	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
13:00	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	5	0	4	0	9	1	0	0	0	1	0	0	0	0	0	1
GRAND TOTAL	5	0	4	0	9	1	0	0	0	1	0	0	0	0	0	1

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400004
Municipality: Simcoe
Count Date: Nov 04, 2023

East Approach - Gilbertson Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
12:00	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0
12:15	0	21	0	0	21	0	0	0	0	0	0	0	0	0	0	0
12:30	2	11	0	0	13	0	1	0	0	1	0	0	0	0	0	0
12:45	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0
13:00	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	0
13:15	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	0
13:30	0	21	0	0	21	0	0	0	0	0	0	0	0	0	0	0
13:45	0	15	0	0	15	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	2	118	0	0	120	0	1	0	0	1	0	0	0	0	0	0
GRAND TOTAL	2	118	0	0	120	0	1	0	0	1	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400004
Municipality: Simcoe
Count Date: Nov 04, 2023

West Approach - Gilbertson Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
12:00	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0
12:15	0	22	0	0	22	0	0	0	0	0	0	0	0	0	0	0
12:30	0	25	0	0	25	0	0	0	0	0	0	0	0	0	0	0
12:45	0	21	0	0	21	0	0	0	0	0	0	0	0	0	0	0
13:00	0	14	1	0	15	0	0	0	0	0	0	0	0	0	0	0
13:15	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0
13:30	0	19	1	0	20	0	0	0	0	0	0	0	0	0	0	0
13:45	0	26	2	0	28	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	143	4	0	147	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	0	143	4	0	147	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	12:00:00	From:	12:15:00
To:	14:00:00	To:	13:15:00

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400004
Count Date: Nov 04, 2023

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Gilbertson Dr runs E/W

East Approach

	Out	In	Total
Cars	59	84	143
Trucks	1	0	1
Bicycles	0	0	0
	60	**84**	**144**

Peds: 0

Gilbertson Dr

			Totals
0	0	0	**0**
0	0	82	**82**
0	0	1	**1**

Peds: 0

Peds: 0

Gilbertson Dr

	Totals			
	0	0	0	0
	58	57	1	0
	2	2	0	0

Peds: 0

West Approach

	Out	In	Total
Cars	83	62	145
Trucks	0	2	2
Bicycles	0	0	0
	83	**64**	**147**

Robinson Chevrolet Buick GMC Simcoe

Totals	6	2	0
Cars	5	2	0
Trucks	1	0	0
Bicycles	0	0	0

South Approach

	Out	In	Total
Cars	7	3	10
Trucks	1	0	1
Bicycles	0	0	0
	8	**3**	**11**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Gilbertson Dr & Robinson Chevrolet Buick GMC Simcoe
Site Code: 2335400004
Count Date: Nov 04, 2023
Period: 12:00 - 14:00

Peak Hour Data (12:15 - 13:15)

Start Time	North Approach						South Approach Robinson Chevrolet Buick GMC Simcoe						East Approach Gilbertson Dr						West Approach Gilbertson Dr						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
12:15					0		1		0	0	0	1	0	21		0	0	21		22	0	0	0	22	44
12:30					0		2		0	0	0	2	2	12		0	0	14		25	0	0	0	25	41
12:45					0		2		1	0	0	3	0	8		0	0	8		21	0	0	0	21	32
13:00					0		1		1	0	0	2	0	17		0	0	17		14	1	0	0	15	34
Grand Total					**0**	**0**	**6**		**2**	**0**	**0**	**8**	**2**	**58**		**0**	**0**	**60**		**82**	**1**	**0**	**0**	**83**	**151**
Approach %						-	75		25	0		-	3.3	96.7		0		-		98.8	1.2	0		-	
Totals %						0	4		1.3	0		5.3	1.3	38.4		0		39.7		54.3	0.7	0		55	
PHF						**0**	**0.75**		**0.5**	**0**		**0.67**	**0.25**	**0.69**		**0**		**0.71**		**0.82**	**0.25**	**0**		**0.83**	**0.86**
Cars						0	5		2	0		7	2	57		0		59		82	1	0		83	149
% Cars						0	83.3		100	0		87.5	100	98.3		0		98.3		100	100	0		100	98.7
Trucks						0	1		0	0		1	0	1		0		1		0	0	0		0	2
% Trucks						0	16.7		0	0		12.5	0	1.7		0		1.7		0	0	0		0	1.3
Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
% Bicycles						0	0		0	0		0	0	0		0		0		0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #23-354 - GHD

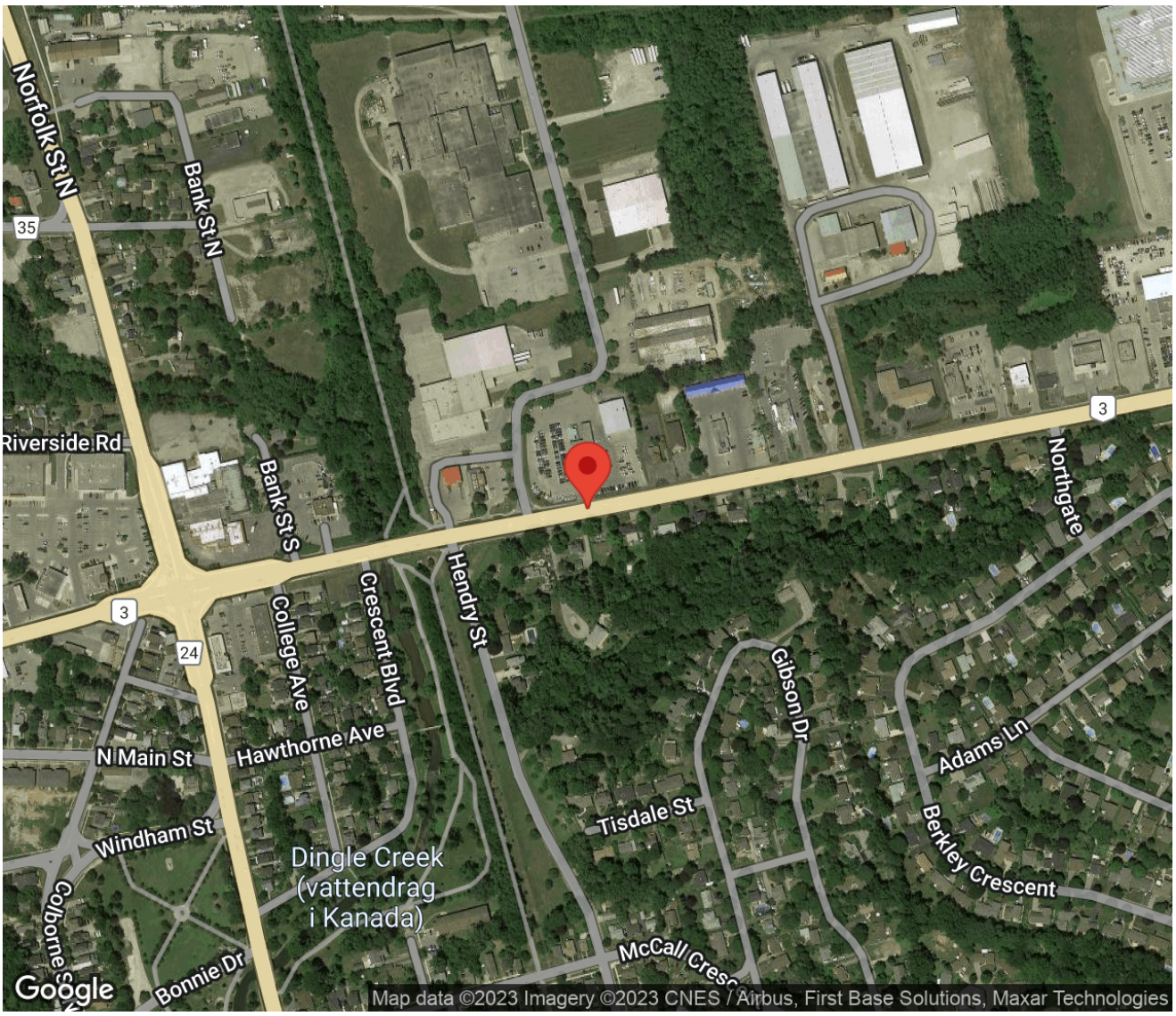
Intersection Count Report

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Municipality:	Simcoe
Count Date:	Saturday, Nov 04, 2023
Site Code:	2335400005
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	12:00-14:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code:	2335400005
Municipality:	Simcoe
Count Date:	Nov 04, 2023



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code:	2335400005
Municipality:	Simcoe
Count Date:	Nov 04, 2023

Robinson Chevrolet Buick GMC Simcoe (west driveway) - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
12:00 - 13:00	0	0	4	0	4	2	0	0	0	0	0	0	4
13:00 - 14:00	2	0	2	0	4	3	0	0	0	0	0	0	4
GRAND TOTAL	**2**	**0**	**6**	**0**	**8**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**8**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code:	2335400005
Municipality:	Simcoe
Count Date:	Nov 04, 2023

Queensway East - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
12:00 - 13:00	0	929	3	0	932	0	0	894	0	0	894	0	1826
13:00 - 14:00	0	870	0	0	870	0	1	874	0	0	875	0	1745
GRAND TOTAL	**0**	**1799**	**3**	**0**	**1802**	**0**	**1**	**1768**	**0**	**0**	**1769**	**0**	**3571**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400005
Municipality: Simcoe
Count Date: Nov 04, 2023

North Approach - Robinson Chevrolet Buick GMC Simcoe (west driveway)

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
12:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
13:30	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1
13:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
SUBTOTAL	2	0	6	0	8	0	0	0	0	0	0	0	0	0	0	5
GRAND TOTAL	2	0	6	0	8	0	0	0	0	0	0	0	0	0	0	5

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400005
Municipality: Simcoe
Count Date: Nov 04, 2023

East Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
12:00	0	202	0	0	202	0	0	0	0	0	0	0	0	0	0	0
12:15	0	242	1	0	243	0	0	0	0	0	0	0	0	0	0	0
12:30	0	249	0	0	249	0	1	0	0	1	0	0	0	0	0	0
12:45	0	233	2	0	235	0	2	0	0	2	0	0	0	0	0	0
13:00	0	226	0	0	226	0	0	0	0	0	0	0	0	0	0	0
13:15	0	210	0	0	210	0	0	0	0	0	0	0	0	0	0	0
13:30	0	204	0	0	204	0	1	0	0	1	0	0	0	0	0	0
13:45	0	227	0	0	227	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	0	1793	3	0	1796	0	6	0	0	6	0	0	0	0	0	0
GRAND TOTAL	0	1793	3	0	1796	0	6	0	0	6	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400005
Municipality: Simcoe
Count Date: Nov 04, 2023

West Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
12:00	0	220	0	0	220	0	0	0	0	0	0	0	0	0	0	0
12:15	0	247	0	0	247	0	3	0	0	3	0	0	0	0	0	0
12:30	0	222	0	0	222	0	4	0	0	4	0	0	0	0	0	0
12:45	0	197	0	0	197	0	1	0	0	1	0	0	0	0	0	0
13:00	0	212	0	0	212	0	2	0	0	2	0	0	0	0	0	0
13:15	0	247	0	0	247	0	2	0	0	2	0	0	0	0	0	0
13:30	1	196	0	0	197	0	2	0	0	2	0	1	0	0	1	0
13:45	0	211	0	0	211	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	1	1752	0	0	1753	0	15	0	0	15	0	1	0	0	1	0
GRAND TOTAL	1	1752	0	0	1753	0	15	0	0	15	0	1	0	0	1	0

Peak Hour Diagram

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Specified Period
From: 12:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400005
Count Date: Nov 04, 2023

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Queensway East runs E/W

North Approach

	Out	In	Total
Cars	2	3	5
Trucks	0	0	0
Bicycles	0	0	0
	2	**3**	**5**

Robinson Chevrolet Buick GMC Simcoe (west driveway)

Bicycles	0	0	0
Trucks	0	0	0
Cars	2	0	0
Totals	**2**	**0**	**0**

East Approach

	Out	In	Total
Cars	953	878	1831
Trucks	3	10	13
Bicycles	0	0	0
	956	**888**	**1844**

Peds: 3

Queensway East

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	0	0	**0**	
0	10	878	**888**	

Peds: 0

Peds: 0

Queensway East

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	3	3	0	0
	953	950	3	0

Peds: 0

West Approach

	Out	In	Total
Cars	878	952	1830
Trucks	10	3	13
Bicycles	0	0	0
	888	**955**	**1843**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (west driveway)
Site Code: 2335400005
Count Date: Nov 04, 2023
Period: 12:00 - 14:00

Peak Hour Data (12:15 - 13:15)

Start Time	North Approach Robinson Chevrolet Buick GMC Simcoe (west driveway)						South Approach						East Approach Queensway East						West Approach Queensway East						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
12:15	0		2	0	2	2					0			242	1	0	0	243	0	250		0	0	250	495
12:30	0		0	0	0	0					0			250	0	0	0	250	0	226		0	0	226	476
12:45	0		0	0	0	0					0			235	2	0	0	237	0	198		0	0	198	435
13:00	0		0	0	1	0					0			226	0	0	0	226	0	214		0	0	214	440
Grand Total	**0**		**2**	**0**	**3**	**2**					**0**	**0**		**953**	**3**	**0**	**0**	**956**	**0**	**888**		**0**	**0**	**888**	**1846**
Approach %	0		100	0		-						-		99.7	0.3	0		-	0	100		0		-	
Totals %	0		0.1	0		0.1						0		51.6	0.2	0		51.8	0	48.1		0		48.1	
PHF	**0**		**0.25**	**0**		**0.25**						**0**		**0.95**	**0.38**	**0**		**0.96**	**0**	**0.89**		**0**		**0.89**	**0.93**
Cars	0		2	0		2						0		950	3	0		953	0	878		0		878	1833
% Cars	0		100	0		100						0		99.7	100	0		99.7	0	98.9		0		98.9	99.3
Trucks	0		0	0		0						0		3	0	0		3	0	10		0		10	13
% Trucks	0		0	0		0						0		0.3	0	0		0.3	0	1.1		0		1.1	0.7
Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
% Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
Peds					3	-					0	-					0	-					0	-	3
% Peds					100	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #23-354 - GHD

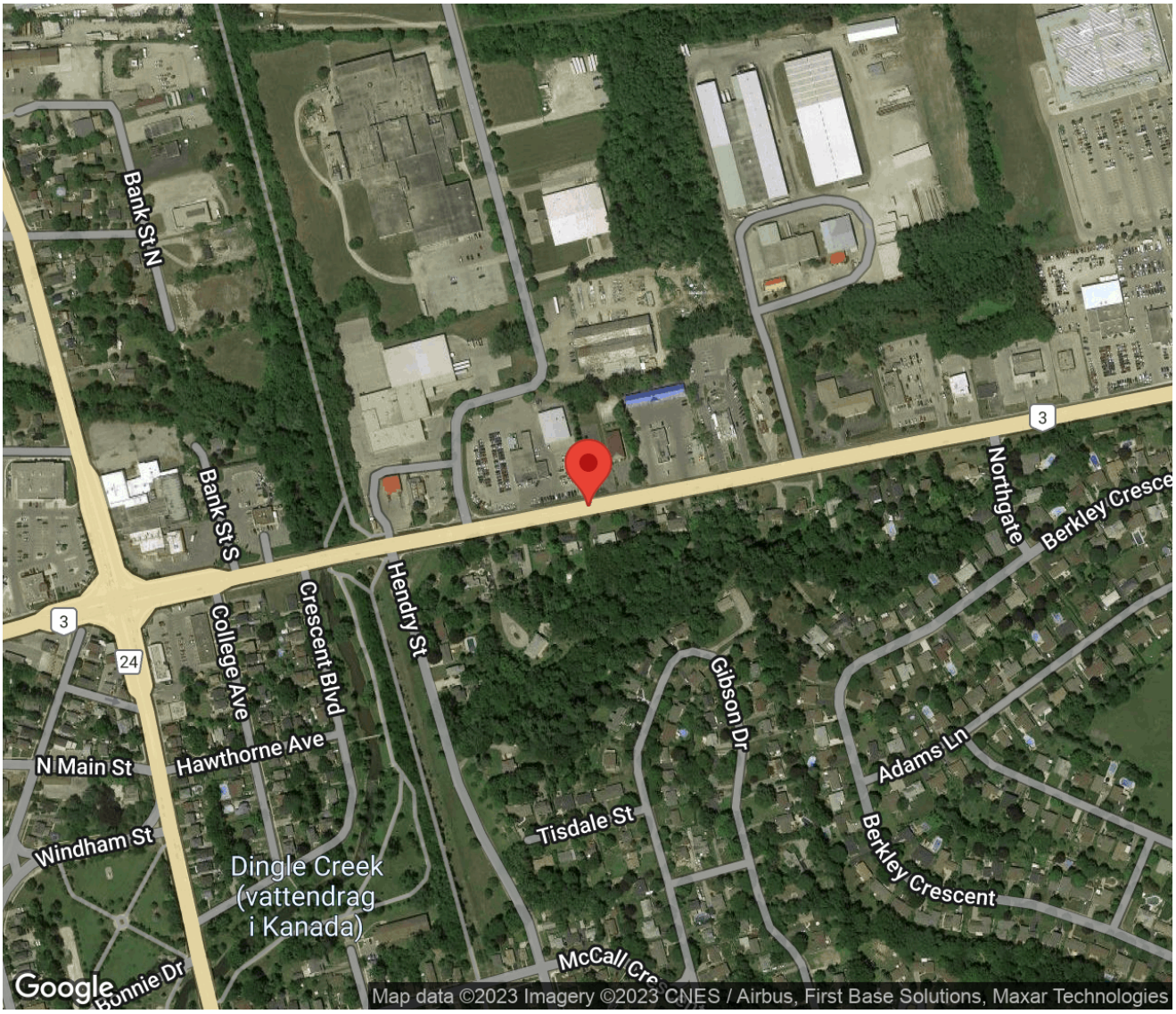
Intersection Count Report

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Municipality:	Simcoe
Count Date:	Saturday, Nov 04, 2023
Site Code:	2335400006
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	12:00-14:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code:	2335400006
Municipality:	Simcoe
Count Date:	Nov 04, 2023



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code:	2335400006
Municipality:	Simcoe
Count Date:	Nov 04, 2023

Robinson Chevrolet Buick GMC Simcoe (east driveway) - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
12:00 - 13:00	0	0	2	0	2	2	0	0	0	0	0	0	2
13:00 - 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	**0**	**0**	**2**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code:	2335400006
Municipality:	Simcoe
Count Date:	Nov 04, 2023

Queensway East - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
12:00 - 13:00	0	930	4	0	934	0	1	893	0	0	894	0	1828
13:00 - 14:00	0	870	0	0	870	0	1	875	0	0	876	0	1746
GRAND TOTAL	**0**	**1800**	**4**	**0**	**1804**	**0**	**2**	**1768**	**0**	**0**	**1770**	**0**	**3574**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400006
Municipality: Simcoe
Count Date: Nov 04, 2023

North Approach - Robinson Chevrolet Buick GMC Simcoe (east driveway)

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2
GRAND TOTAL	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400006
Municipality: Simcoe
Count Date: Nov 04, 2023

East Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
					Total					Total					Total	
12:00	0	202	2	0	204	0	0	0	0	0	0	0	0	0	0	0
12:15	0	243	0	0	243	0	0	1	0	1	0	0	0	0	0	0
12:30	0	247	0	0	247	0	1	0	0	1	0	0	0	0	0	0
12:45	0	235	1	0	236	0	2	0	0	2	0	0	0	0	0	0
13:00	0	226	0	0	226	0	0	0	0	0	0	0	0	0	0	0
13:15	0	210	0	0	210	0	0	0	0	0	0	0	0	0	0	0
13:30	0	204	0	0	204	0	1	0	0	1	0	0	0	0	0	0
13:45	0	227	0	0	227	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	0	1794	3	0	1797	0	6	1	0	7	0	0	0	0	0	0
GRAND TOTAL	**0**	**1794**	**3**	**0**	**1797**	**0**	**6**	**1**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400006
Municipality: Simcoe
Count Date: Nov 04, 2023

West Approach - Queensway East

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
12:00	0	220	0	0	220	0	0	0	0	0	0	0	0	0	0	0
12:15	1	246	0	0	247	0	3	0	0	3	0	0	0	0	0	0
12:30	0	222	0	0	222	0	4	0	0	4	0	0	0	0	0	0
12:45	0	197	0	0	197	0	1	0	0	1	0	0	0	0	0	0
13:00	0	212	0	0	212	0	2	0	0	2	0	0	0	0	0	0
13:15	1	246	0	0	247	0	2	0	0	2	0	0	0	0	0	0
13:30	0	198	0	0	198	0	2	0	0	2	0	1	0	0	1	0
13:45	0	211	0	0	211	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	2	1752	0	0	1754	0	15	0	0	15	0	1	0	0	1	0
GRAND TOTAL	**2**	**1752**	**0**	**0**	**1754**	**0**	**15**	**0**	**0**	**15**	**0**	**1**	**0**	**0**	**1**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	12:00:00	From:	12:15:00
To:	14:00:00	To:	13:15:00

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400006
Count Date: Nov 04, 2023

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Queensway East runs E/W

North Approach

	Out	In	Total
Cars	2	2	4
Trucks	0	1	1
Bicycles	0	0	0
	2	**3**	**5**

Robinson Chevrolet Buick GMC Simcoe (east driveway)

Bicycles	0	0	0
Trucks	0	0	0
Cars	2	0	0
Totals	**2**	**0**	**0**

East Approach

	Out	In	Total
Cars	952	877	1829
Trucks	4	10	14
Bicycles	0	0	0
	956	**887**	**1843**

Peds: 2

Queensway East

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	0	1	**1**	
0	10	877	**887**	

Peds: 0

Peds: 0

Queensway East

Totals	Cars	Trucks	Bicycles	
0	0	0	0	
2	1	1	0	
954	951	3	0	

Peds: 0

West Approach

	Out	In	Total
Cars	878	953	1831
Trucks	10	3	13
Bicycles	0	0	0
	888	**956**	**1844**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Queensway East & Robinson Chevrolet Buick GMC Simcoe (east driveway)
Site Code: 2335400006
Count Date: Nov 04, 2023
Period: 12:00 - 14:00

Peak Hour Data (12:15 - 13:15)

Start Time	North Approach Robinson Chevrolet Buick GMC Simcoe (east driveway)						South Approach						East Approach Queensway East						West Approach Queensway East						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
12:15	0		0	0	2	0					0			243	1	0	0	244	1	249		0	0	250	494
12:30	0		2	0	0	2					0			248	0	0	0	248	0	226		0	0	226	476
12:45	0		0	0	0	0					0			237	1	0	0	238	0	198		0	0	198	436
13:00	0		0	0	0	0					0			226	0	0	0	226	0	214		0	0	214	440
Grand Total	**0**		**2**	**0**	**2**	**2**					**0**	**0**		**954**	**2**	**0**	**0**	**956**	**1**	**887**		**0**	**0**	**888**	**1846**
Approach %	0		100	0		-						-		99.8	0.2	0		-	0.1	99.9		0		-	
Totals %	0		0.1	0		0.1						0		51.7	0.1	0		51.8	0.1	48		0		48.1	
PHF	**0**		**0.25**	**0**		**0.25**						**0**		**0.96**	**0.5**	**0**		**0.96**	**0.25**	**0.89**		**0**		**0.89**	**0.93**
Cars	0		2	0		2						0		951	1	0		952	1	877		0		878	1832
% Cars	0		100	0		100						0		99.7	50	0		99.6	100	98.9		0		98.9	99.2
Trucks	0		0	0		0						0		3	1	0		4	0	10		0		10	14
% Trucks	0		0	0		0						0		0.3	50	0		0.4	0	1.1		0		1.1	0.8
Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
% Bicycles	0		0	0		0						0		0	0	0		0	0	0		0		0	0
Peds					2	-					0	-					0	-					0	-	2
% Peds					100	-					0	-					0	-					0	-	

Appendix C

Synchro Reports – Existing Conditions

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	70	2	2	77	5	6
Future Vol, veh/h	70	2	2	77	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	1	0	1	0	0
Mvmt Flow	84	2	2	93	6	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	86	0	182	85
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	97	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1523	-	812	980
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	932	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1523	-	811	980
Mov Cap-2 Maneuver	-	-	-	-	811	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	931	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	895	-	-	1523	-
HCM Lane V/C Ratio	0.015	-	-	0.002	-
HCM Control Delay (s)	9.1	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	908	965	2	0	5
Future Vol, veh/h	5	908	965	2	0	5
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	5	946	1005	2	0	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1015	0	-	0	1497	512
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	483	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	691	-	-	-	115	512
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	686	-	-	-	112	509
Mov Cap-2 Maneuver	-	-	-	-	112	-
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	686	-	-	-	509
HCM Lane V/C Ratio	0.008	-	-	-	0.01
HCM Control Delay (s)	10.3	0.1	-	-	12.1
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	907	965	0	0	2
Future Vol, veh/h	1	907	965	0	0	2
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	1	935	995	0	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1001	0	-	0	1471	504
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	470	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	700	-	-	-	120	518
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	601	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	696	-	-	-	118	515
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	318	-
Stage 2	-	-	-	-	598	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	696	-	-	-	515
HCM Lane V/C Ratio	0.001	-	-	-	0.004
HCM Control Delay (s)	10.2	0	-	-	12
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	82	1	2	58	6	2
Future Vol, veh/h	82	1	2	58	6	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	2	17	13
Mvmt Flow	95	1	2	67	7	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	96	0	167	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	71	-
Critical Hdwy	-	-	4.1	-	6.57	6.33
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	-	-	2.2	-	3.653	3.417
Pot Cap-1 Maneuver	-	-	1510	-	790	931
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	915	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1510	-	789	931
Mov Cap-2 Maneuver	-	-	-	-	789	-
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	914	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	820	-	-	1510	-
HCM Lane V/C Ratio	0.011	-	-	0.002	-
HCM Control Delay (s)	9.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	888	953	3	0	2
Future Vol, veh/h	0	888	953	3	0	2
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	0	955	1025	3	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1031	0	-	0	1508	517
Stage 1	-	-	-	-	1030	-
Stage 2	-	-	-	-	478	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	682	-	-	-	114	509
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	595	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	680	-	-	-	113	508
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	593	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	680	-	-	-	508
HCM Lane V/C Ratio	-	-	-	-	0.004
HCM Control Delay (s)	0	-	-	-	12.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	887	954	2	0	2
Future Vol, veh/h	1	887	954	2	0	2
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	50	0	0
Mvmt Flow	1	954	1026	2	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1030	0	-	0	1508	516
Stage 1	-	-	-	-	1029	-
Stage 2	-	-	-	-	479	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	682	-	-	-	114	509
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	595	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	681	-	-	-	113	508
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	594	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	681	-	-	-	508
HCM Lane V/C Ratio	0.002	-	-	-	0.004
HCM Control Delay (s)	10.3	0	-	-	12.1
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Appendix D

Synchro Reports – Future Background Conditions

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	80	2	2	88	6	7
Future Vol, veh/h	80	2	2	88	6	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	1	0	1	0	0
Mvmt Flow	96	2	2	106	7	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	98	0	207	97
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	110	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1508	-	786	965
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	920	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1508	-	785	965
Mov Cap-2 Maneuver	-	-	-	-	785	-
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	919	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	873	-	-	1508	-
HCM Lane V/C Ratio	0.018	-	-	0.002	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1043	1108	2	0	6
Future Vol, veh/h	3	1043	1108	2	0	6
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	3	1086	1154	2	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1164	0	-	0	1712	586
Stage 1	-	-	-	-	1163	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	607	-	-	-	83	459
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	603	-	-	-	81	456
Mov Cap-2 Maneuver	-	-	-	-	81	-
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	544	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	603	-	-	-	456
HCM Lane V/C Ratio	0.005	-	-	-	0.014
HCM Control Delay (s)	11	0.1	-	-	13
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1042	1108	0	0	2
Future Vol, veh/h	1	1042	1108	0	0	2
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	1	1074	1142	0	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1148	0	-	0	1687	577
Stage 1	-	-	-	-	1148	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	616	-	-	-	86	465
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	555	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	613	-	-	-	85	463
Mov Cap-2 Maneuver	-	-	-	-	85	-
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	552	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	613	-	-	-	463
HCM Lane V/C Ratio	0.002	-	-	-	0.004
HCM Control Delay (s)	10.9	0	-	-	12.8
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	1	2	67	7	2
Future Vol, veh/h	94	1	2	67	7	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	2	17	13
Mvmt Flow	109	1	2	78	8	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	110	0	192	110
Stage 1	-	-	-	-	110	-
Stage 2	-	-	-	-	82	-
Critical Hdwy	-	-	4.1	-	6.57	6.33
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	-	-	2.2	-	3.653	3.417
Pot Cap-1 Maneuver	-	-	1493	-	764	914
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1493	-	763	914
Mov Cap-2 Maneuver	-	-	-	-	763	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	792	-	-	1493	-
HCM Lane V/C Ratio	0.013	-	-	0.002	-
HCM Control Delay (s)	9.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1020	1095	3	0	2
Future Vol, veh/h	0	1020	1095	3	0	2
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	0	1097	1177	3	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1183	0	-	0	1731	593
Stage 1	-	-	-	-	1182	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	597	-	-	-	81	454
Stage 1	-	-	-	-	258	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	595	-	-	-	81	453
Mov Cap-2 Maneuver	-	-	-	-	81	-
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	595	-	-	-	453
HCM Lane V/C Ratio	-	-	-	-	0.005
HCM Control Delay (s)	0	-	-	-	13
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1019	1096	2	0	2
Future Vol, veh/h	1	1019	1096	2	0	2
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	50	0	0
Mvmt Flow	1	1096	1178	2	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1182	0	-	0	1731	592
Stage 1	-	-	-	-	1181	-
Stage 2	-	-	-	-	550	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	598	-	-	-	81	454
Stage 1	-	-	-	-	258	-
Stage 2	-	-	-	-	547	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	597	-	-	-	80	453
Mov Cap-2 Maneuver	-	-	-	-	80	-
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	597	-	-	-	453
HCM Lane V/C Ratio	0.002	-	-	-	0.005
HCM Control Delay (s)	11	0	-	-	13
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

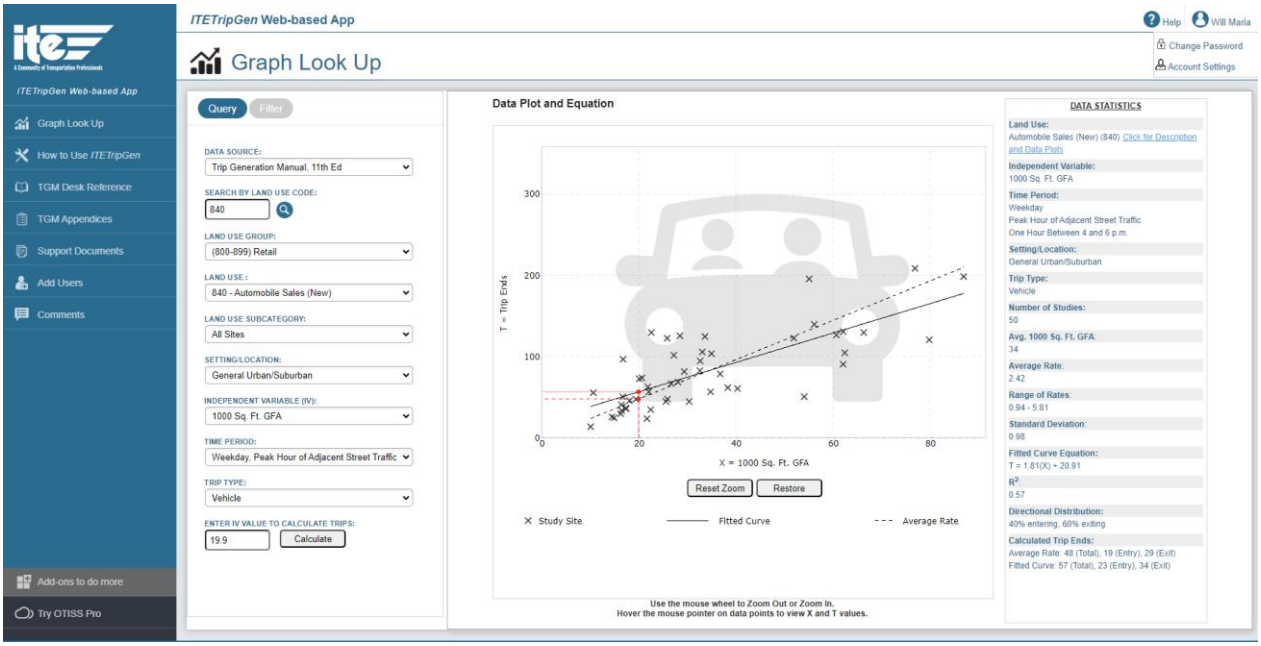
Appendix E

Trip Generation

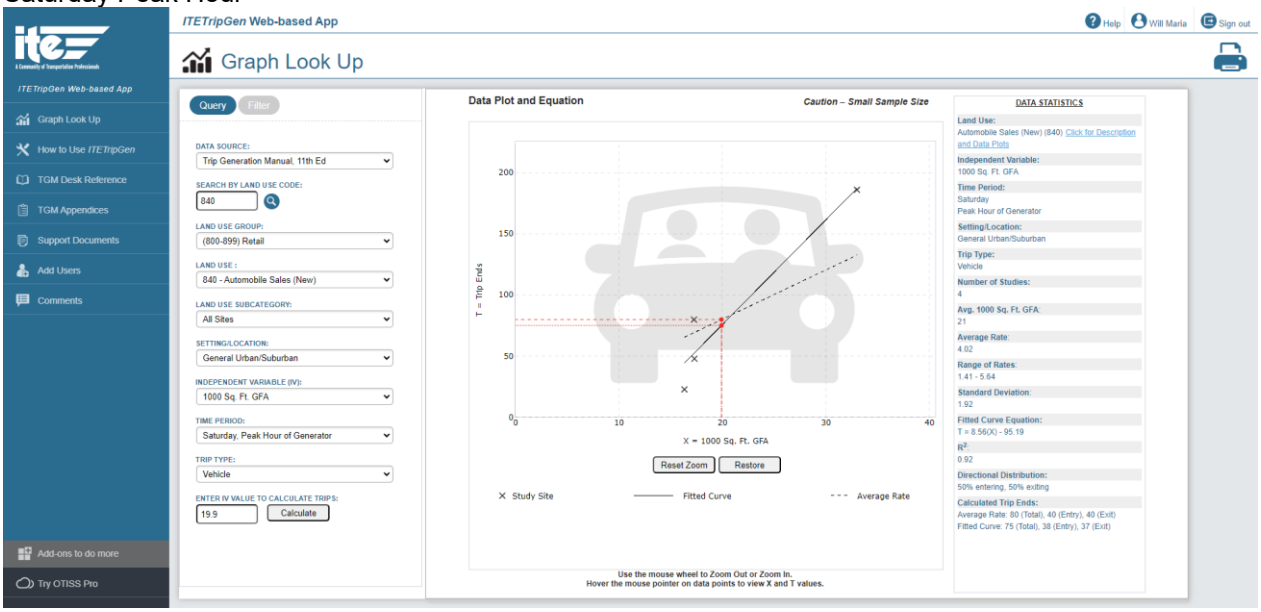
Trip Generation

51 Queensway East, Simcoe Ontario
1,850 m^2 GFA (19,913 sq. ft GFA)

PM Peak Hour



Saturday Peak Hour



Appendix F

Synchro Reports – Future Total Conditions

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	80	6	7	88	16	18
Future Vol, veh/h	80	6	7	88	16	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	1	0	1	0	0
Mvmt Flow	96	7	8	106	19	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	103	0	222	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	122	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1502	-	771	961
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	908	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1502	-	766	961
Mov Cap-2 Maneuver	-	-	-	-	766	-
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	903	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	858	-	-	1502	-
HCM Lane V/C Ratio	0.048	-	-	0.006	-
HCM Control Delay (s)	9.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	1055	1112	4	0	15
Future Vol, veh/h	10	1055	1112	4	0	15
Conflicting Peds, #/hr	8	0	0	8	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	10	1099	1158	4	0	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1170	0	-	0	1738	589
Stage 1	-	-	-	-	1168	-
Stage 2	-	-	-	-	570	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	604	-	-	-	80	457
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	535	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	600	-	-	-	76	454
Mov Cap-2 Maneuver	-	-	-	-	76	-
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	531	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	600	-	-	-	454
HCM Lane V/C Ratio	0.017	-	-	-	0.034
HCM Control Delay (s)	11.1	0.2	-	-	13.2
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1052	1110	3	0	6
Future Vol, veh/h	3	1052	1110	3	0	6
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	3	1085	1144	3	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1153	0	-	0	1701	580
Stage 1	-	-	-	-	1152	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	613	-	-	-	85	463
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	548	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	610	-	-	-	83	461
Mov Cap-2 Maneuver	-	-	-	-	83	-
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	545	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	610	-	-	-	461
HCM Lane V/C Ratio	0.005	-	-	-	0.013
HCM Control Delay (s)	10.9	0.1	-	-	12.9
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	6	11	67	27	9
Future Vol, veh/h	94	6	11	67	27	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	2	17	13
Mvmt Flow	109	7	13	78	31	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	116	0	217	113
Stage 1	-	-	-	-	113	-
Stage 2	-	-	-	-	104	-
Critical Hdwy	-	-	4.1	-	6.57	6.33
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	-	-	2.2	-	3.653	3.417
Pot Cap-1 Maneuver	-	-	1485	-	739	911
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	884	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1485	-	732	911
Mov Cap-2 Maneuver	-	-	-	-	732	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	876	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	770	-	-	1485	-
HCM Lane V/C Ratio	0.054	-	-	0.009	-
HCM Control Delay (s)	9.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1044	1101	16	0	9
Future Vol, veh/h	0	1044	1101	16	0	9
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	0	1123	1184	17	0	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1204	0	-	0	1758	604
Stage 1	-	-	-	-	1196	-
Stage 2	-	-	-	-	562	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	587	-	-	-	78	446
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	540	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	586	-	-	-	78	445
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	252	-
Stage 2	-	-	-	-	538	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	586	-	-	-	445
HCM Lane V/C Ratio	-	-	-	-	0.022
HCM Control Delay (s)	0	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1039	1109	11	0	8
Future Vol, veh/h	5	1039	1109	11	0	8
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	0	50	0	0
Mvmt Flow	5	1117	1192	12	0	9

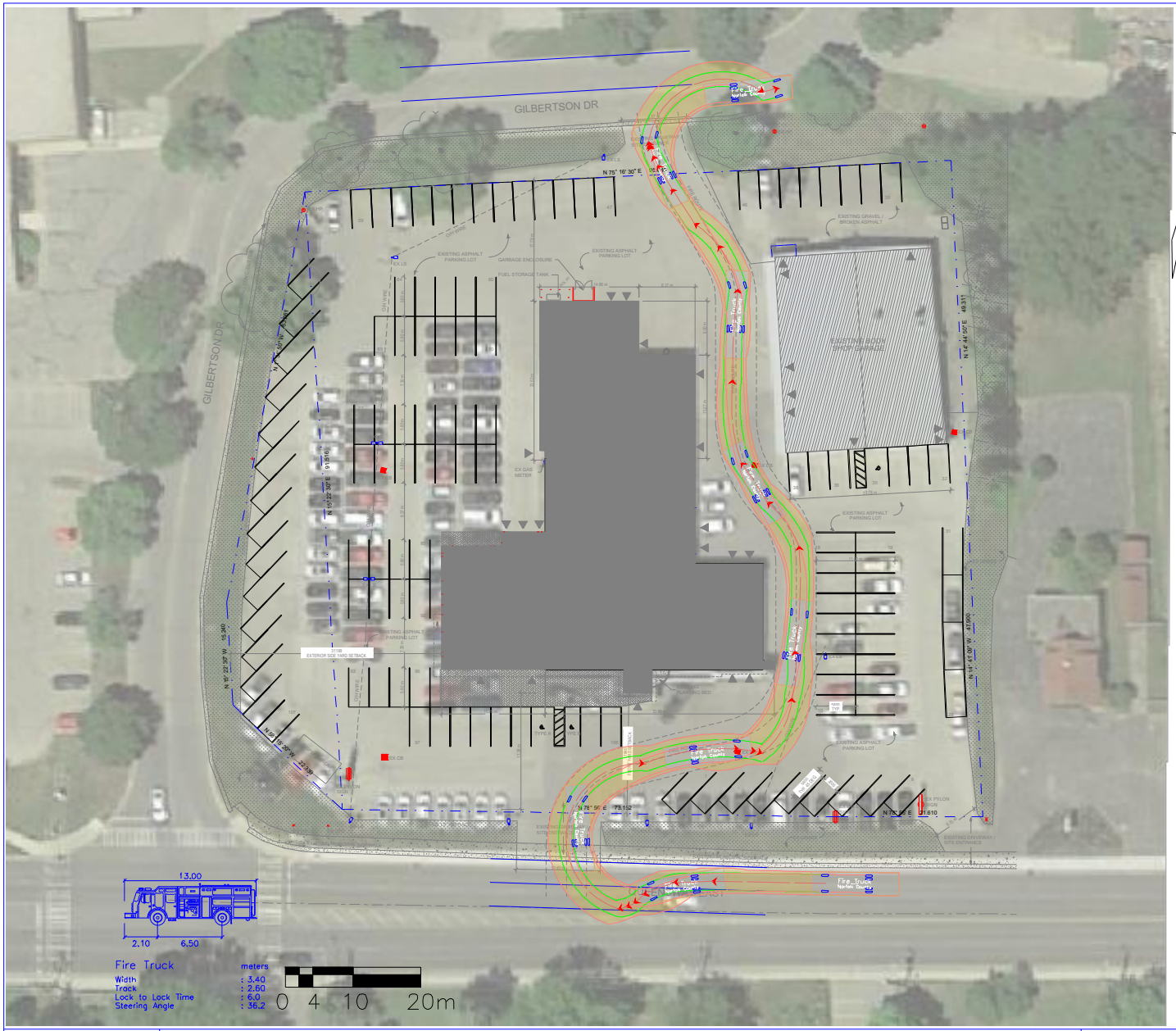
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1206	0	-	0	1769	604
Stage 1	-	-	-	-	1200	-
Stage 2	-	-	-	-	569	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	586	-	-	-	76	446
Stage 1	-	-	-	-	252	-
Stage 2	-	-	-	-	535	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	585	-	-	-	74	445
Mov Cap-2 Maneuver	-	-	-	-	74	-
Stage 1	-	-	-	-	246	-
Stage 2	-	-	-	-	534	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	585	-	-	-	445
HCM Lane V/C Ratio	0.009	-	-	-	0.019
HCM Control Delay (s)	11.2	0.1	-	-	13.2
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Appendix G

AutoTURN Review

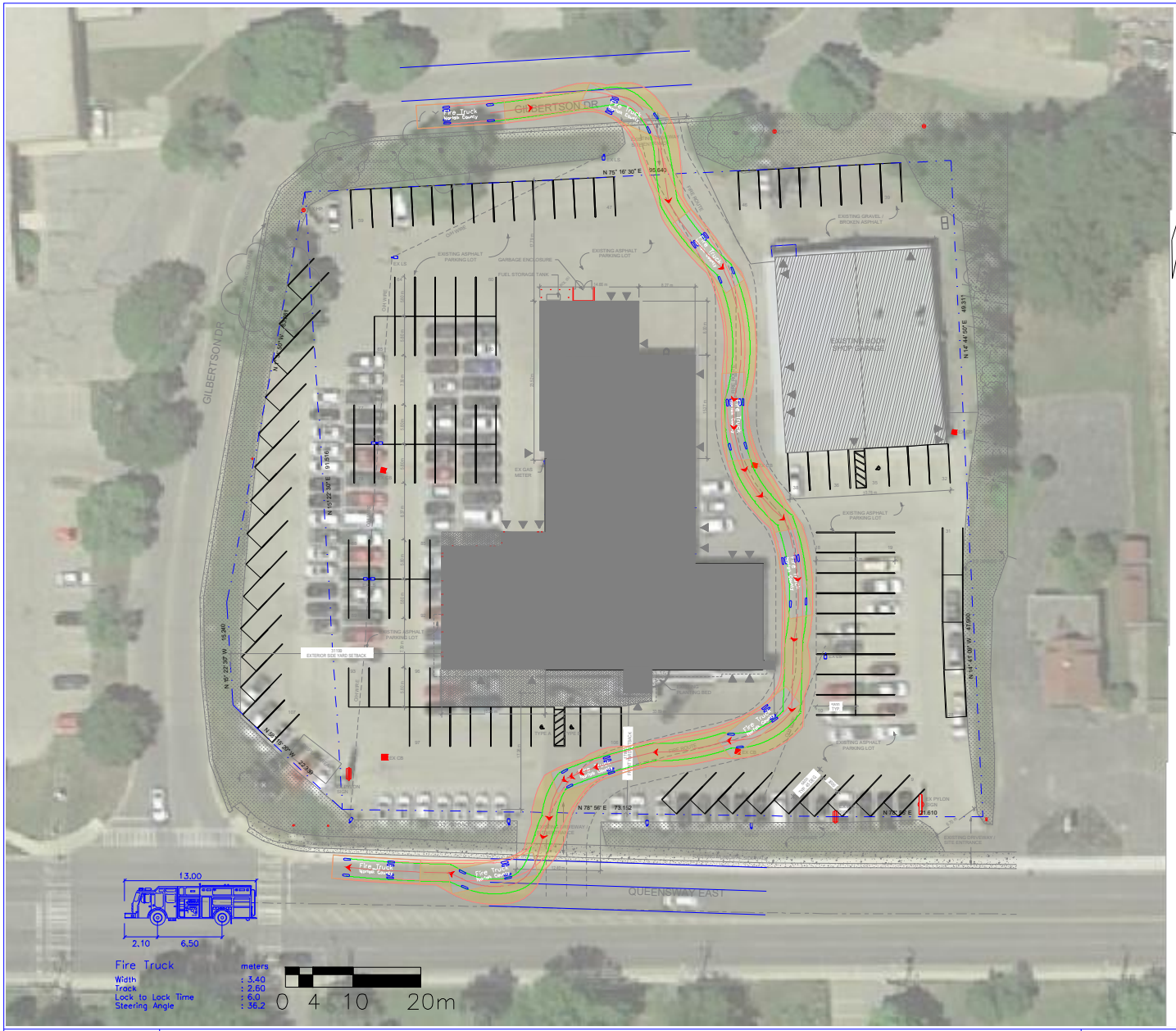


VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
FIRE TRUCK - NORTHBOUND

FIGURE: AT-1

PROJECT NO. 12626883

DATE: DEC 5, 2023

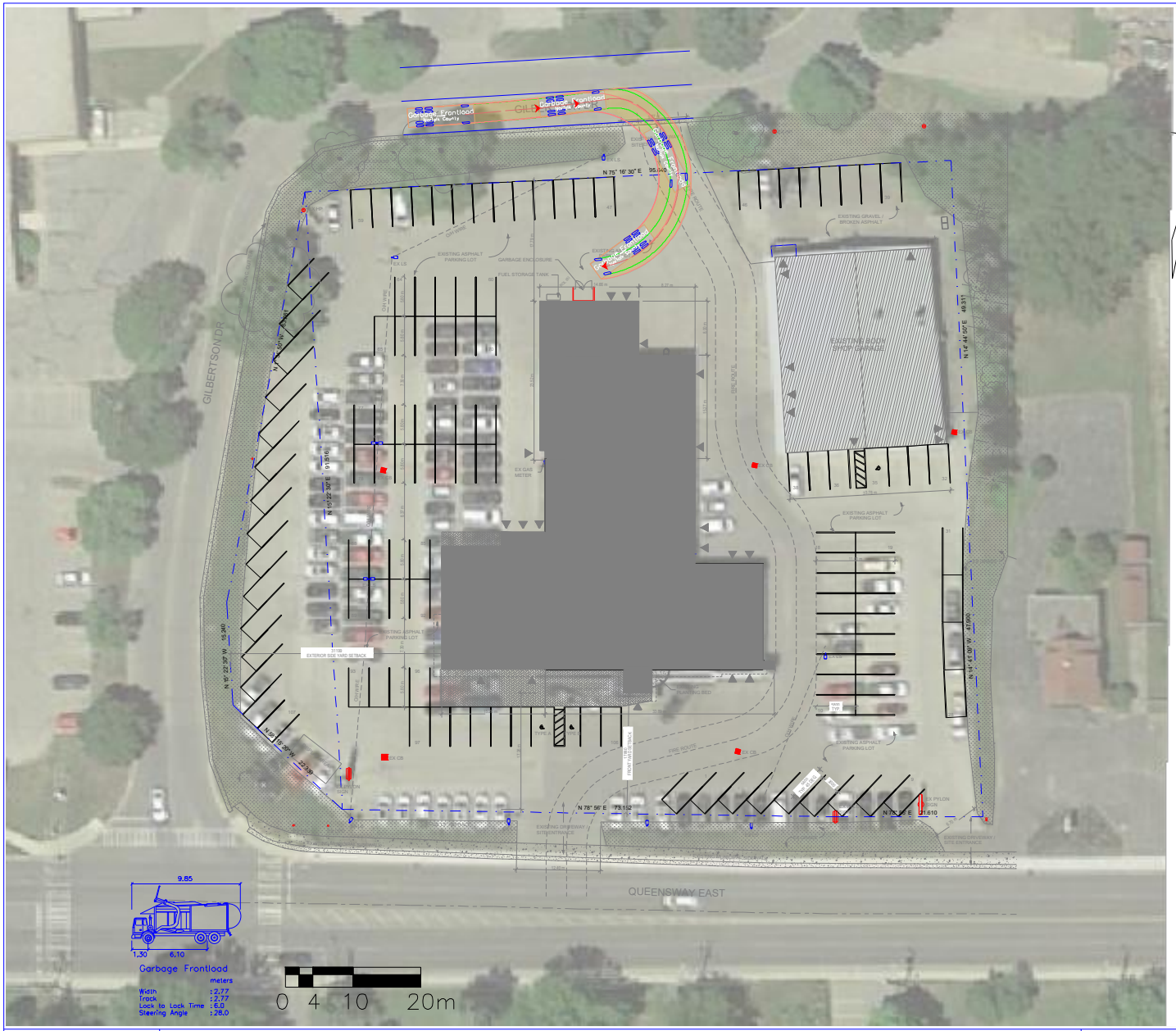


VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
FIRE TRUCK - SOUTHBOUND

FIGURE: AT-2

PROJECT NO. 12626883

DATE: DEC 5, 2023



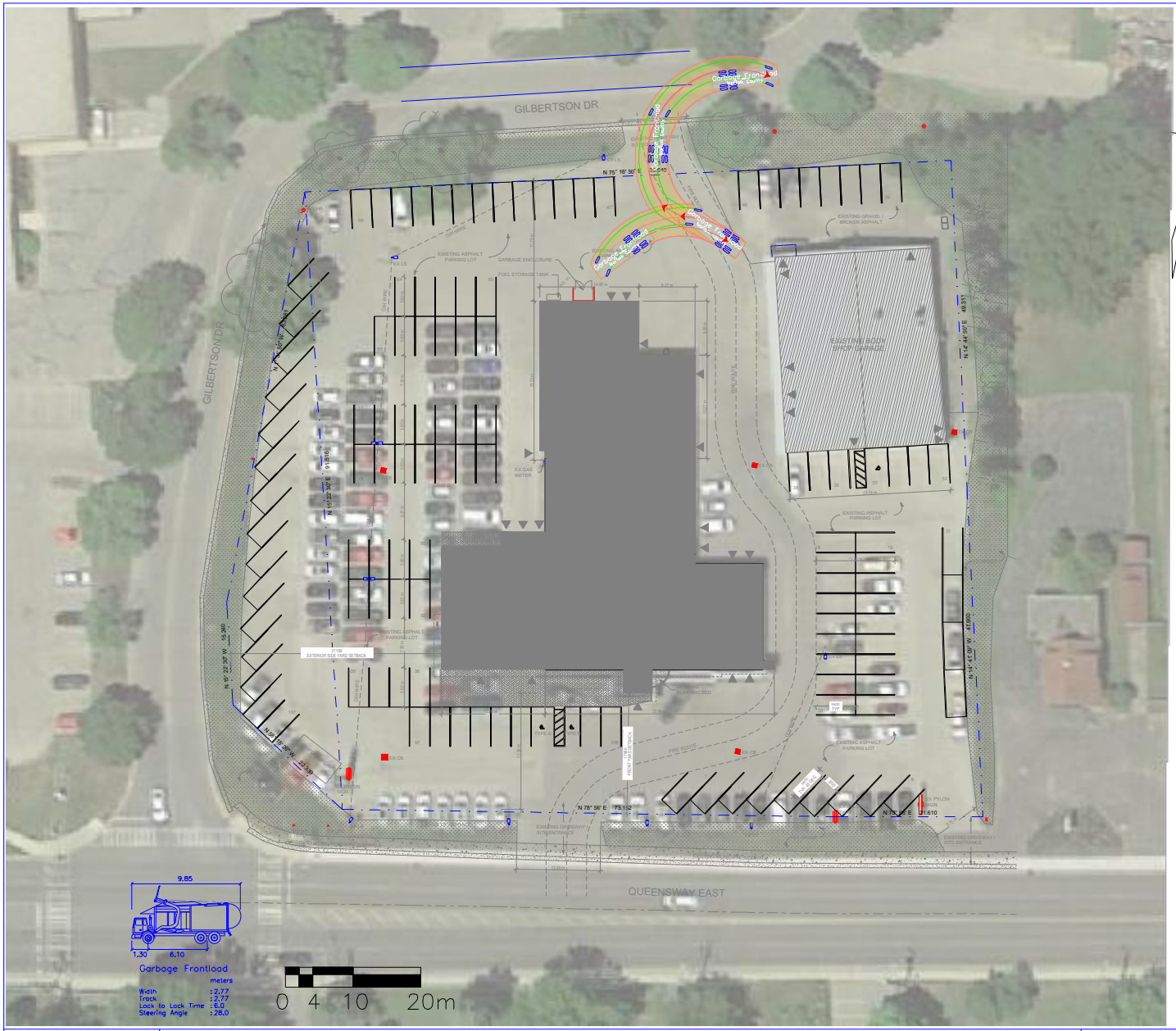
GHD

VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
GARBAGE TRUCK - INBOUND (EASTBOUND)

FIGURE: AT-3

PROJECT NO. 12626883

DATE: DEC 5, 2023



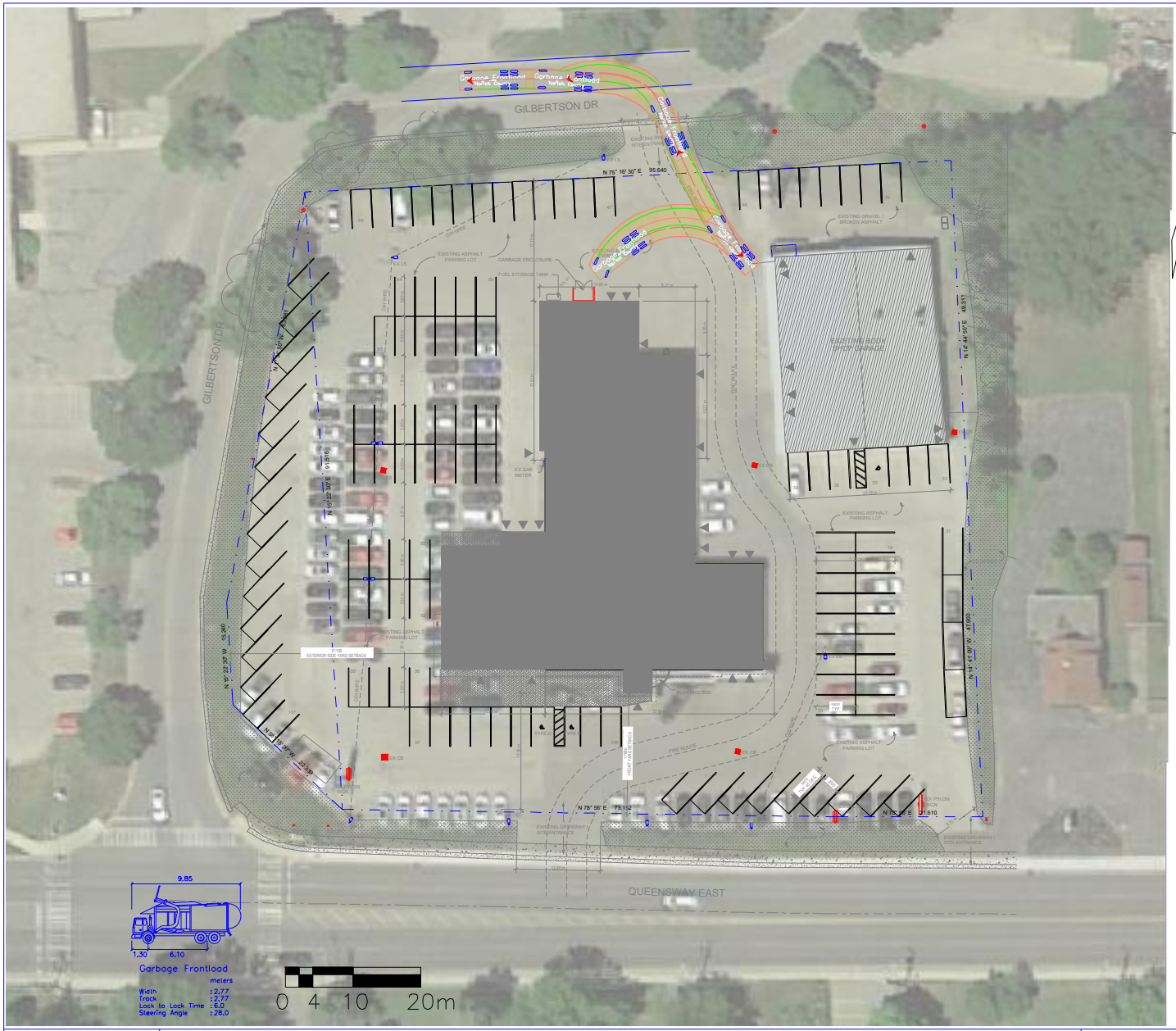
GHD

VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
GARBAGE TRUCK - OUTBOUND (EASTBOUND)

FIGURE: AT-4

PROJECT NO. 12626883

DATE: DEC 5, 2023



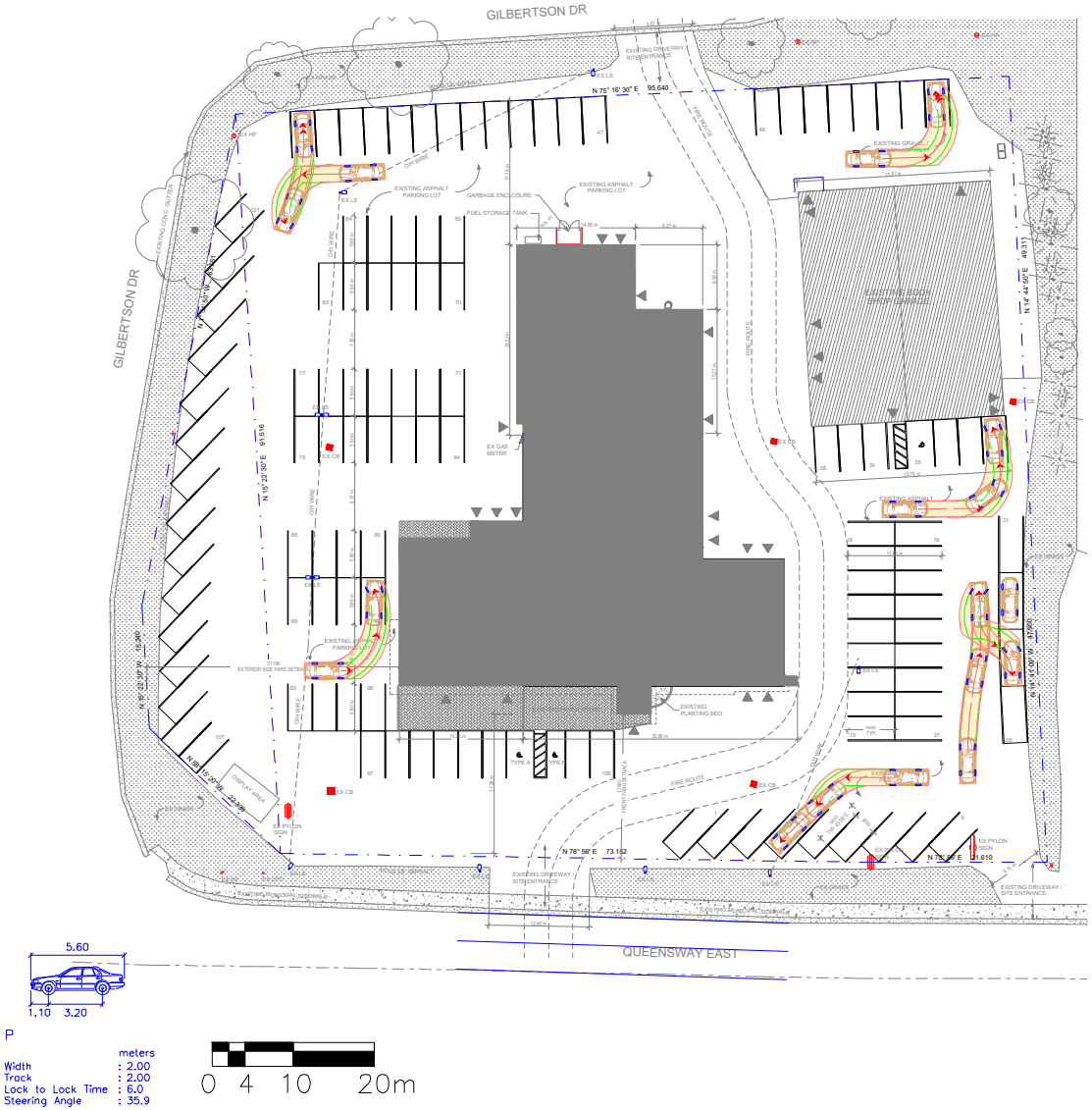
GHD

VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
GARBAGE TRUCK - OUTBOUND (WESTBOUND)

FIGURE: AT-5

PROJECT NO. 12626883

DATE: DEC 5, 2023

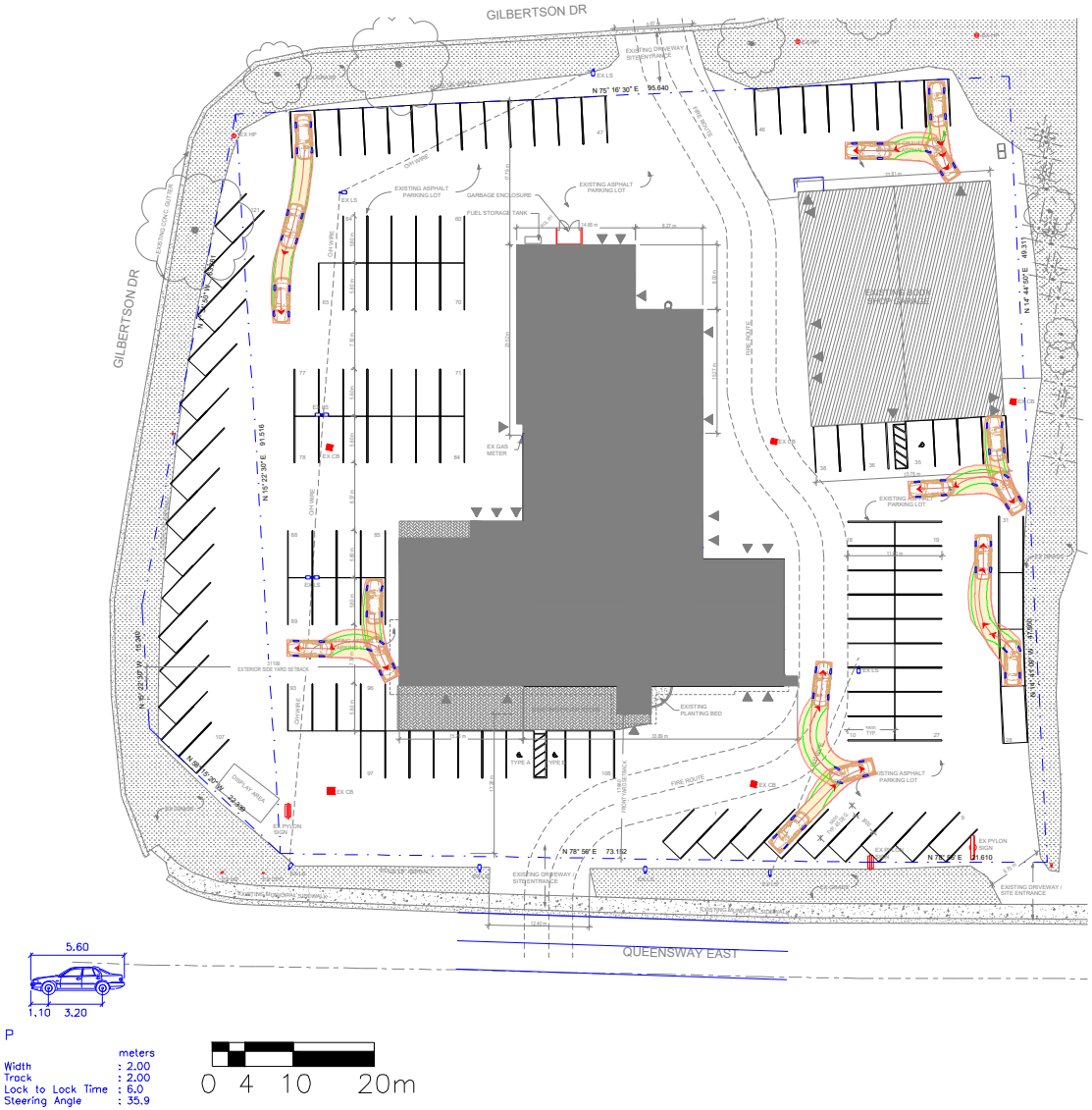


VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
PASSENGER VEHICLE - INBOUND

FIGURE: AT-6

PROJECT NO. 12626883

DATE: DEC 5, 2023

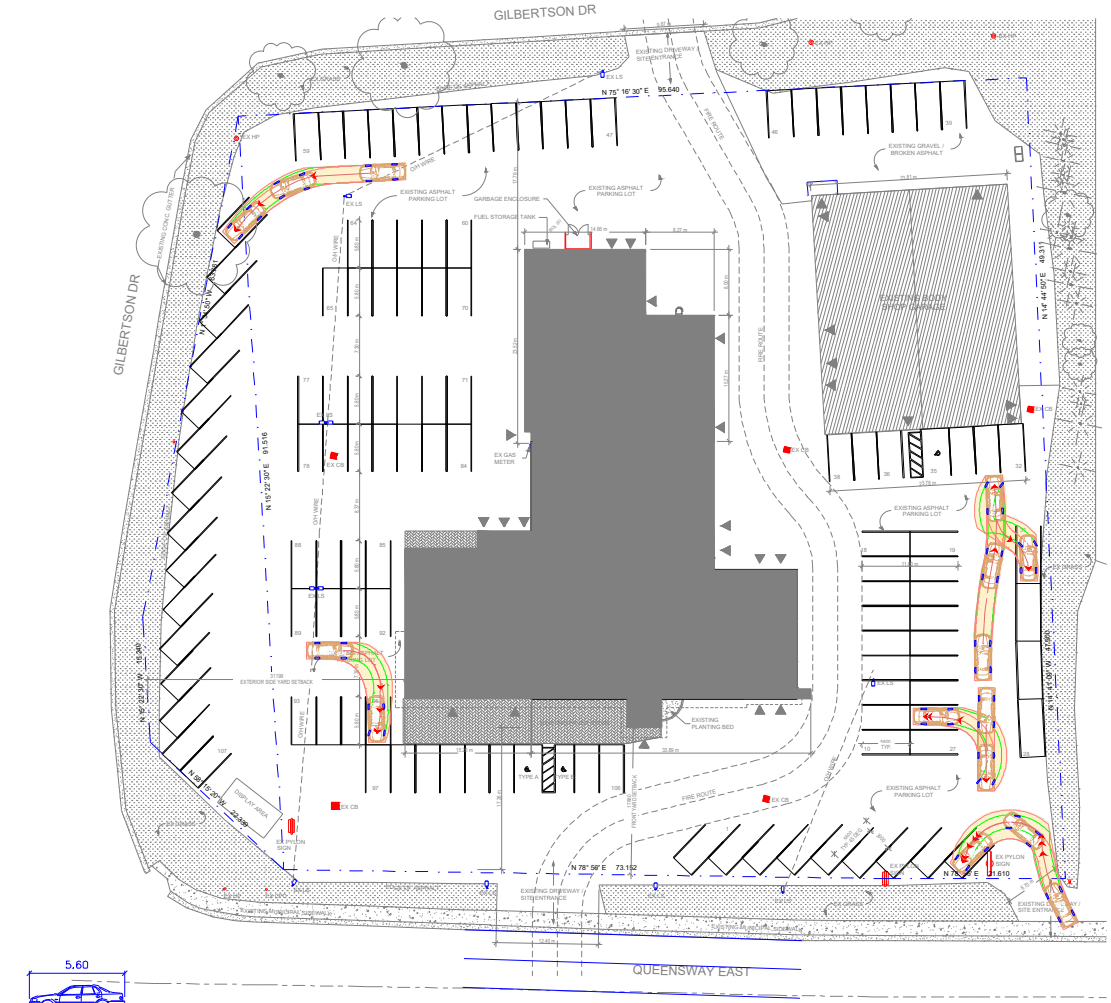


VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
PASSENGER VEHICLE - OUTBOUND

FIGURE: AT-7

PROJECT NO. 12626883

DATE: DEC 5, 2023

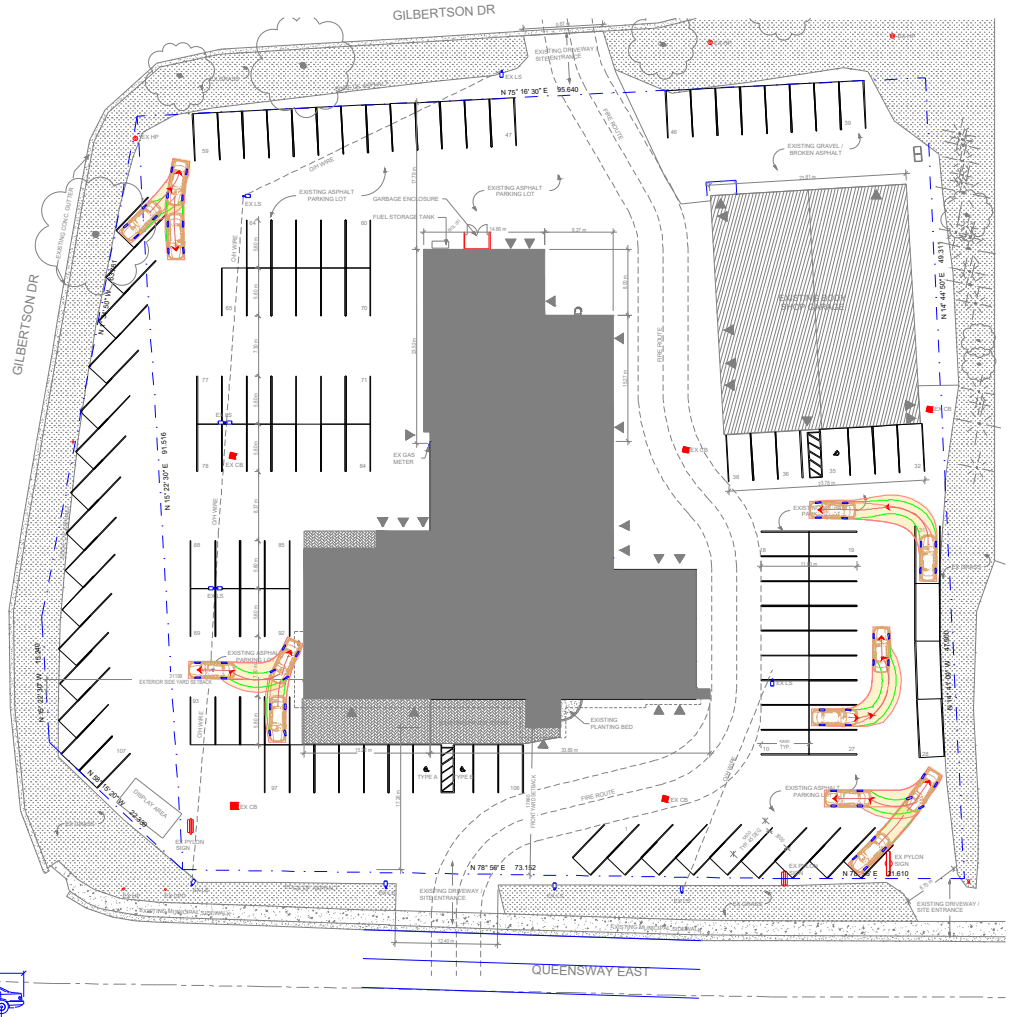


VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
PASSENGER VEHICLE - INBOUND

FIGURE: AT-8

PROJECT NO. 12626883

DATE: DEC 5, 2023



VEHICLE CIRCULATION PLAN - 51 QUEENSWAY EAST, SIMCOE
PASSENGER VEHICLE - OUTBOUND

FIGURE: AT-9

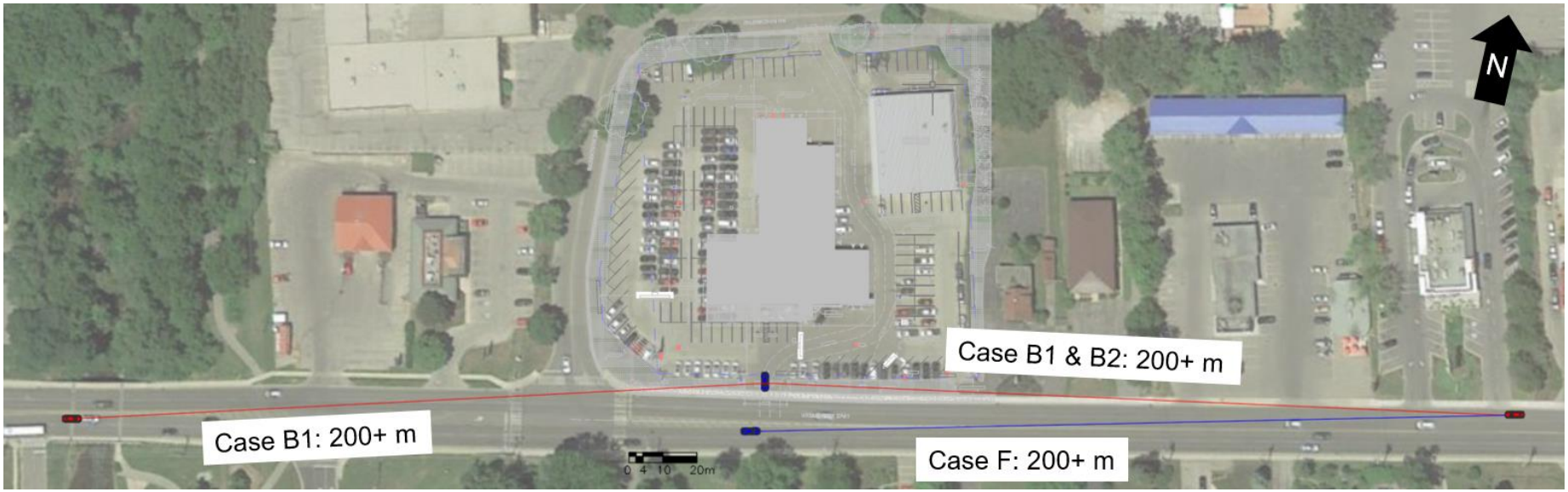
PROJECT NO. 12626883

DATE: DEC 5, 2023

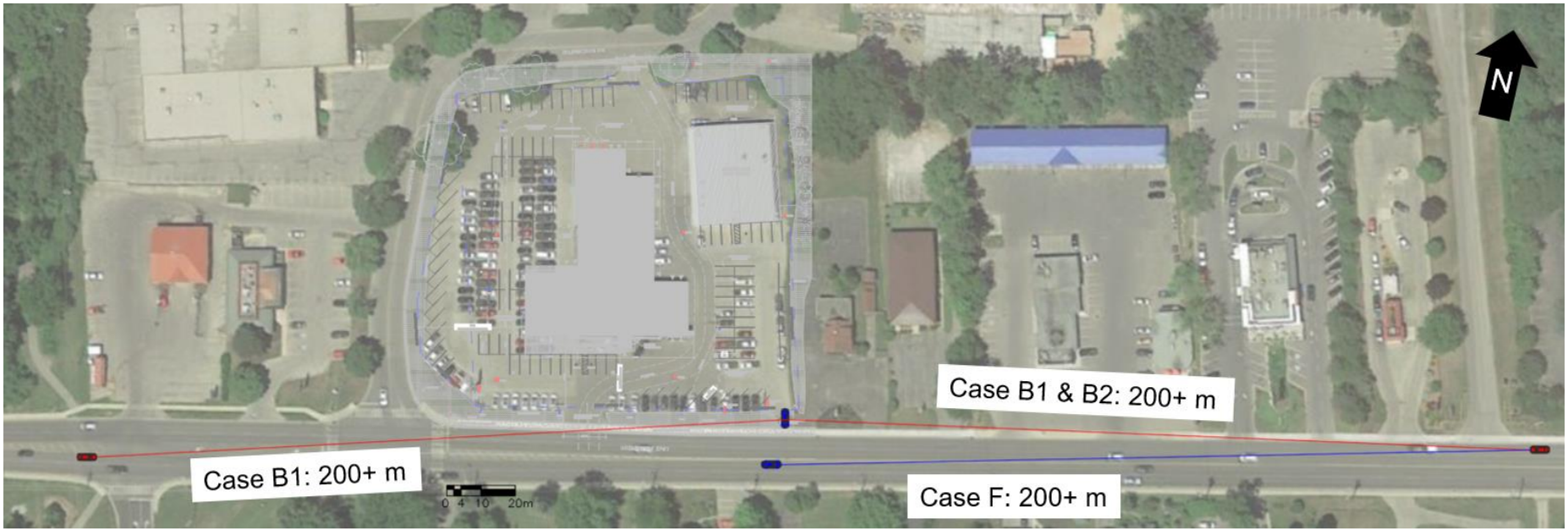
Appendix H

Sightline Diagrams

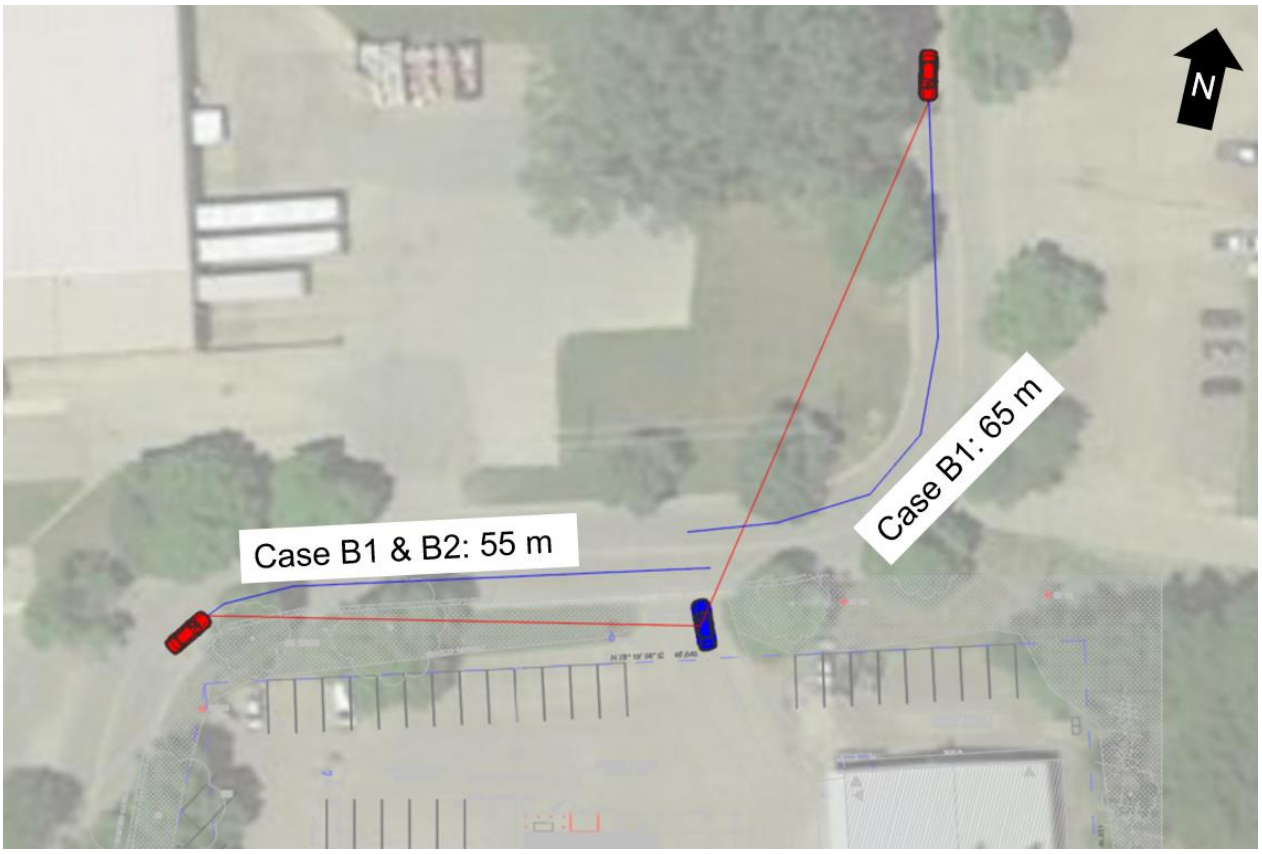
Sightline Diagrams – West Access



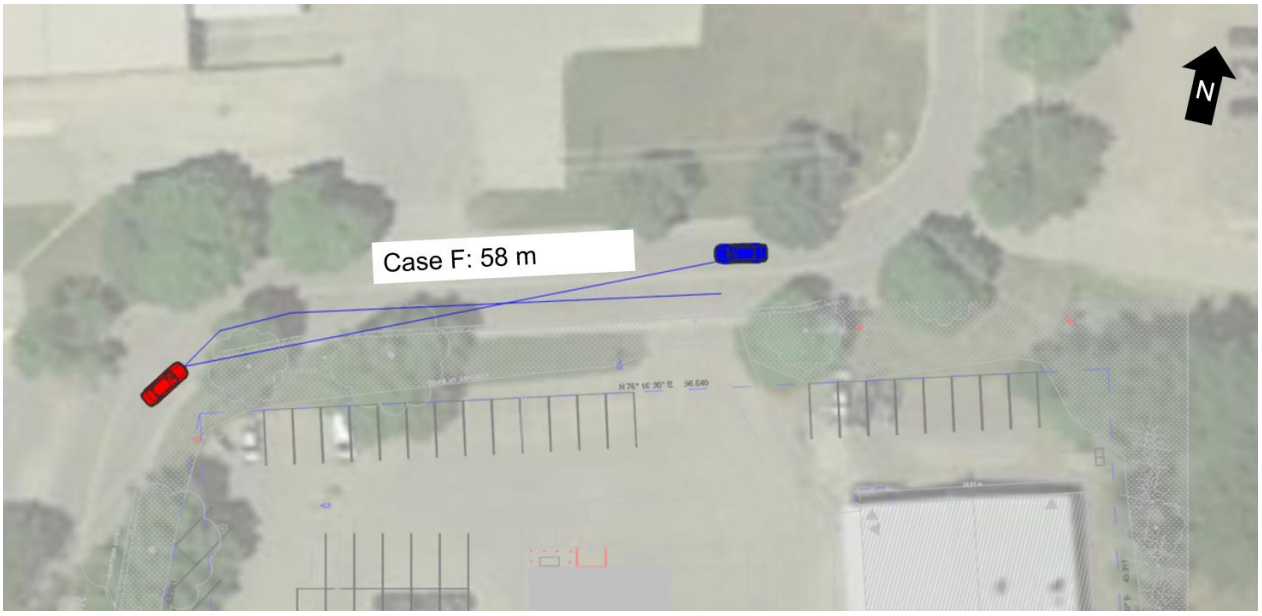
Sightline Diagrams – East Access



Sightline Diagrams – North Access (Case B1 & B2)



Sightline Diagrams – North Access (Case F)



Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads – Chapter 9 Excerpts:

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Table 9.9.12: Intersection Sight Distance – Case F, Left Turn from the Major Road

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance	
		Passenger Cars	
		Calculated (m)	Design (m)
20	20	30.6	35
30	35	45.9	50
40	50	61.2	65
50	65	76.5	80
60	85	91.7	95
70	105	107.0	110
80	130	122.3	125
90	160	137.6	140
100	185	152.9	155
110	220	168.2	170
120	250	183.5	185
130	285	198.8	200

Note: Intersection sight distance shown is for a passenger car making a left turn from an undivided highway. For other conditions and design vehicles, the time gap should be adjusted and the sight distance recalculated.

QUEENSWAY EAST

1 EXISTING SITE PLAN
1 : 250

2 KEY PLAN
1 : 2500

Project North **True North**

GENERAL NOTES

1. **Do not scale drawings.** Written dimensions shall have precedence over scaled dimensions.
2. All work shall comply with the 2012 Ontario Building Code and amendments.
3. Contractors must check and verify all dimensions and specifications and report any discrepancies to the architect before proceeding with the work.
4. All contractors and sub-contractors shall have a set of approved construction documents on site at all times.
5. All documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the consultant for the account of the owner.
6. The material contained herein reflects the consultants best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the contract documents, or any reliance on/or decisions to be made based on them are the responsibility of such third parties.
7. The consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the contract documents.

No.	Date	Revision
2	2023-12-22	Issued for Site Plan Approval
1	2022-09-27	Issued for Pre-Consultation

Client:

Project Name / Address:

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

SRM architects+ urban⋆designers

Project No: 22071
Drawing Date: 2023-11-27
Drawn by: NKS
Checked by: TLS/JLH
Office Location: KITCHENER
Plot Date / Time: 2023-12-22 12:14:35 PM

Drawing Name:

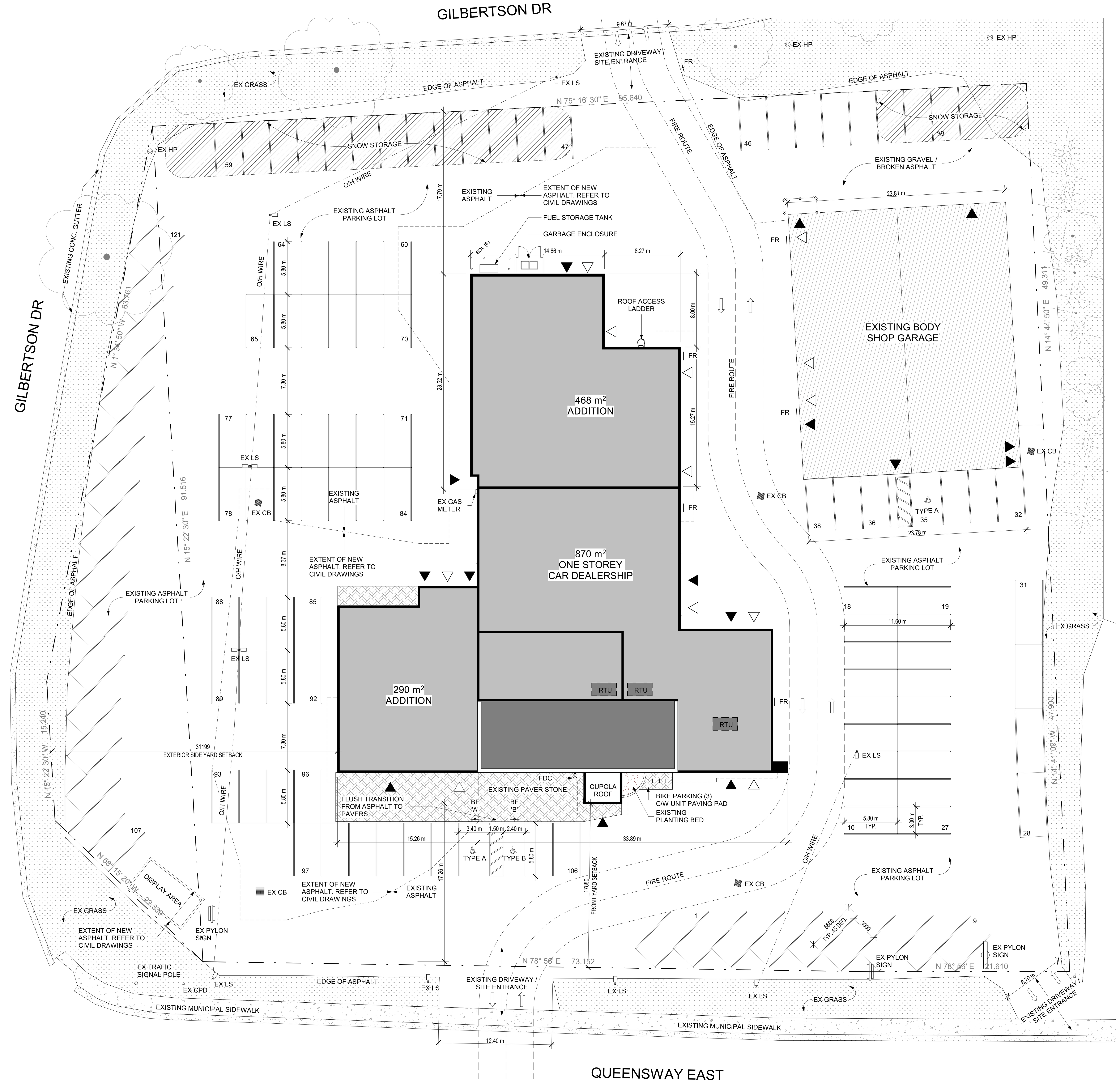
EXISTING SITE PLAN

ONTARIO ASSOCIATION OF ARCHITECTS
JENNIFER HAUBURTON
LICENCE 8158

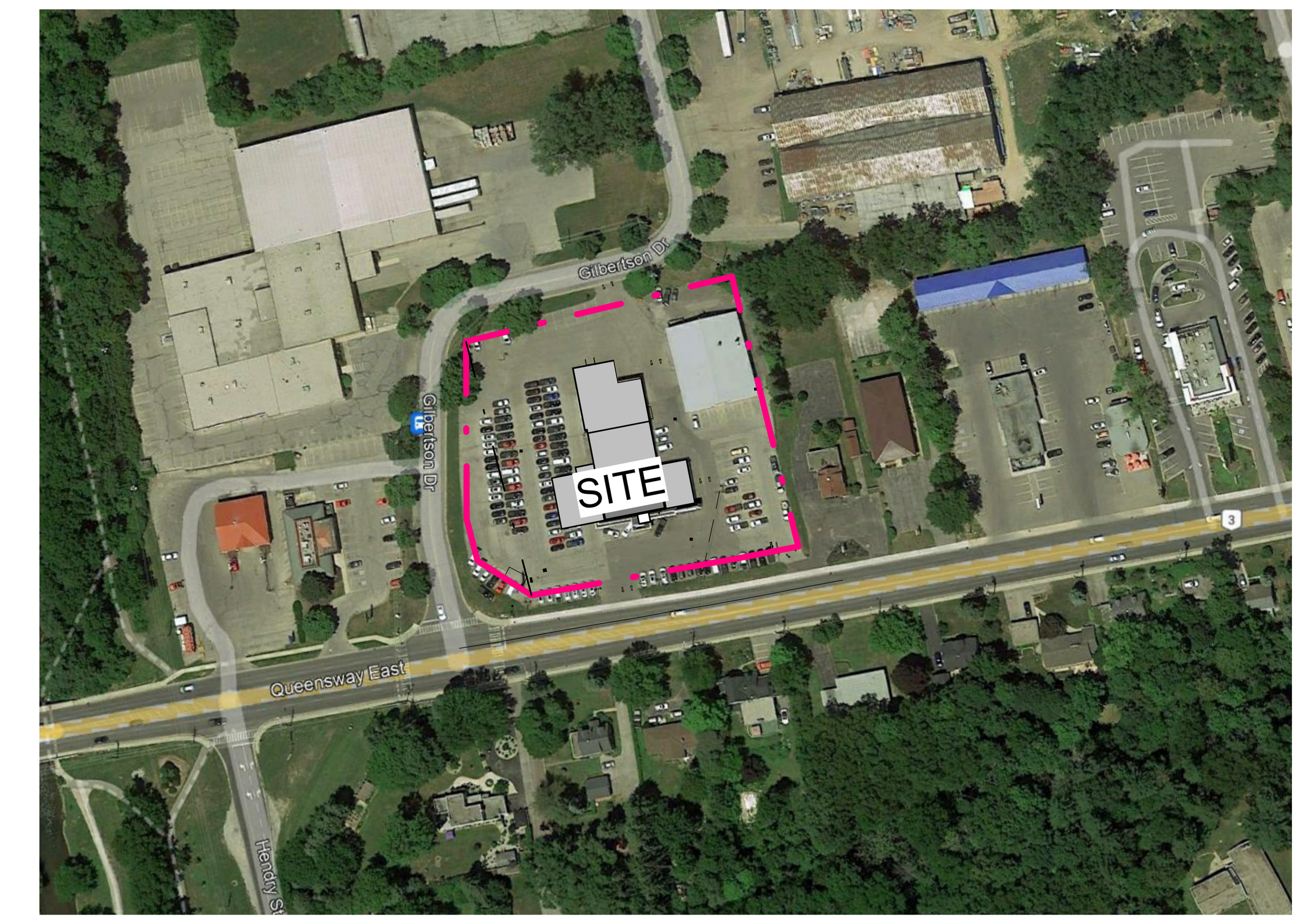
Drawing Scale: As indicated
Status: FOR COORDINATION
Revision No.: r2
Drawing No.: **A1.1**

Do not scale drawings. Contractors must check and verify all dimensions and report any discrepancies to the Architect before proceeding with the work. All documents remain the property of the Architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The Contract Documents were prepared by the Consultant for the account of the Owner.
The material contained herein reflects the Consultants best judgement in light of the information available to him at the time of preparation.Any use which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the Contract Documents.

C:\Users\nciosa\Documents\22071_Robinson Chevy Simcoe_2023-10-02_ndosa31WFR.rvt



1 PROPOSED SITE PLAN
1 : 250



2 KEY PLAN
1 : 2500

Project North

True North

GENERAL NOTES

1. **Do not scale drawings.** Written dimensions shall have precedence over scaled dimensions.
2. All work shall comply with the 2012 Ontario Building Code and amendments.
3. Contractors must check and verify all dimensions and specifications and report any discrepancies to the architect before proceeding with the work.
4. All contractors and sub-contractors shall have a set of approved construction documents on site at all times.
5. All documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the consultant for the account of the owner.
6. The material contained herein reflects the consultants best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the contract documents, or any reliance on/or decisions to be made based on them are the responsibility of such third parties.
7. The consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the contract documents.

SITE DATA

51 QUEENSWAY EAST, SIMCOE, ONTARIO

	DATA - DEALERSHIP	REQUIRED	EXISTING	PROVIDED
	ZONING	ZONING - CS		
	LOT AREA (m²)	495 (m²) MIN.	9798.9 (m²)	
SETBACKS	FRONT YARD (m)	3 (m)	17.4 (m)	17.4 (m)
	INTERIOR SIDE YARD (m)	3 (m)	29.7 (m)	29.7 (m)
	EXTERIOR SIDE YARD (m)	3 (m)	46.4 (m)	31.1 (m)
	REAR YARD (m)	9 (m)	26.9 (m)	17.7 (m)

BUILDING DATA - DEALERSHIP (MAIN BUILDING)

DATA	REQUIRED	EXISTING	PROPOSED
BUILDING AREA (m²)	N/A	870 (m²)	1,630 (m²)
GROSS FLOOR AREA (m²)	N/A	1,110 (m²)	1,850 (m²)
NUMBER OF STOREYS	N/A	1	1
BUILDING HEIGHT (m)	11 (m) MAX.	5.1 (m)	5.1 (m)
COMMERCIAL/RETAIL AREA (m²)	N/A	389 (m²)	807 (m²)
SERVICE AREA(m²)	N/A	611 (m²)	928 (m²)
LOT COVERAGE (%)	35% MAX.	10.2 (%)	16.5 (%)

BUILDING DATA - GARAGE (BUILDING ON NORTH-EAST CORNER)

DATA	REQUIRED	EXISTING	PROPOSED
BUILDING AREA (m²)	N/A	691.5 (m²)	N/A
GROSS FLOOR AREA (m²)	N/A	691.5 (m²)	N/A
NUMBER OF STOREYS	N/A	1	N/A
BUILDING HEIGHT (m)	11 (m) MAX.	5.1 (m)	N/A
SERVICE AREA(m²)	N/A	691.5 (m²)	N/A
LOT COVERAGE (%)	35% MAX.	7 (%)	N/A

LANDSCAPING DATA

DATA	REQUIRED	EXISTING	PROVIDED
LANDSCAPE AREA (percentage)	N/A	2.3 (%)	3.4 (%)
LANDSCAPE AREA (m²)	N/A	227.5 (m²)	330 (m²)

VEHICLE PARKING DATA

DATA	REQUIRED	EXISTING	PROVIDED
NON-RESIDENTIAL USE PARKING (DEALERSHIP)	1 SPACE/35m² = 46	110	121
NON-RESIDENTIAL USE PARKING (GARAGE)	1 SPACE/35m² = 20	20	121
BARRIER FREE PARKING (DEALERSHIP) 1 x 'A' | 1 x 'B'	2	0	2
BARRIER FREE PARKING (GARAGE) 1 x 'A'	1	0	1
TOTAL	1 SPACE/35m² = 46	130	121

BICYCLE PARKING DATA

DATA	REQUIRED	EXISTING	PROVIDED
COMMERCIAL BICYCLE PARKING	N/A	N/A	N/A
	TOTAL	N/A	N/A

SITE PLAN LEGEND

- Property Line
- Building Setback
- Entrance / Exit
- FR - Fire Route Sign
- BF 'A'/'B' - Barrier Free Parking Sign, 'A' Stall type A, 'B' Stall type B
- Pole mounted sign
- EX LS - Light Standard (Existing)
- Painted Directional Arrow
- EX CB - Catch Basin (Existing)
- Fire Department Connection
- EX HP - Existing Hydro Pole
- EX CPD - Existing Cable/Telephone Pedestal
- BOL (#) - 'Bollard' (number of bollards)

No.	Date	Revision
2	2023-12-22	Issued for Site Plan Approval
1	2022-09-27	Issued for Pre-Consultation

Client:

Project Name / Address:

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

SRM architects+ urban*designers

Project No: 22071
Drawing Date: 2023-11-27
Drawn by: NKS
Checked by: TLS/JLH
Office Location: KITCHENER
Plot Date / Time: 2023-12-22 12:14:41 PM

Drawing Name:

PROPOSED SITE PLAN

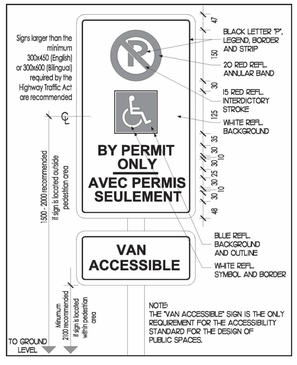
ONTARIO ASSOCIATION OF ARCHITECTS
JENNIFER HALIBURTON
LICENCE
8158

Drawing Scale: As indicated
Status: FOR COORDINATION
Revision No.: r2
Drawing No.: A1.2

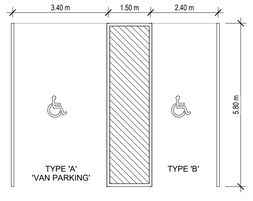
C:\Users\ndosa\Documents\22071_Robinson Chevy Simcoe_2023-10-02_ndosa3TWFR.rvt

1 EXISTING HYDRANT
1 : 1

2 SITE - FIRE ROUTE SIGN
1 : 1



3 SITE - BF PARKING SIGN
1 : 1



4 BARRIER FREE PARKING STALLS
1 : 100

BUILDING CODE REVIEW SUMMARY

Firm Name: SRM Architects Inc.
279 King St W
Kitchener, Ontario, N2G 1B1
T: 519.885.5600

Certificate of Practice Number: 4273

Name of Project: Robinson Chevrolet

Location:
51 Queensway East, Simcoe

Item	Ontario Building Code Matrix Parts 11 - Renovation of Existing Building		OBC Reference
11.1	Existing Building Classification	Describe Existing Use: Office Construction Index: N/A Hazard Index: N/A ■ Not Applicable (no change of major occupancy)	11.2.1 T 11.2.1.1A T 11.2.1.1B to N
11.2	Alteration to Existing Building is:	Basic Renovation ☐ Extensive Renovation ■	11.3.3.1 11.3.3.2
11.3	Reduction in Performance Level:		11.4.2
		Structural: ☐ No ■ Yes	11.4.2.1
		By increase in occupant load: ☐ No ■ Yes	11.4.2.2
		By change of major occupancy: ■ No ☐ Yes	11.4.2.3
		Plumbing: ☐ No ■ Yes	11.4.2.4
		Sewage-system: ■ No ☐ Yes	11.4.2.5
11.4	Compensating Construction:		11.4.3
		Structural: ☐ No ■ Yes (explain)	11.4.3.2
		Existing building is being modified to accept additions and renovations	
		Increase in occupant load: ■ No ☐ Yes (explain)	11.4.3.3
		Additional washrooms allow for an increase in occupant load.	
		Change in major occupancy: ■ No ☐ Yes (explain)	11.4.3.4
		Plumbing: ☐ No ■ Yes (explain)	11.4.3.5
		All washrooms are new. Existing washrooms and plumbing removed.	
		Sewage system: ■ No ☐ Yes (explain)	11.4.3.6
11.5	Compliance Alternatives Proposed:	☐ No ■ Yes (reference #s) F26 - T11.5.1.1. Does not apply, except where a change in major occupancy occurs from a lesser hazard index.	11.5.1
11.6	Alternative Measures Proposed:	■ No ☐ Yes (explain)	11.5.2

BUILDING CODE REVIEW SUMMARY

Firm Name:
SRM Architects Inc.
279 King Street West
Suite 200
Kitchener, Ontario, N2G 1B2
T: 519.885.5600

Certificate of Practice Number: 4273

Name of Project:
Robinson Chevrolet

Location:
51 Queensway East, Simcoe

The Architect noted above has exercised responsible control with respect to design activities. The Architects seal number is the Architect's BCDN.

Item	Ontario Building Code Matrix Parts 3 & 9			OBC Section Reference	
1	Project Description:	☐ New Construction ■ Addition ■ Alteration ☐ Change of Use	■ Part 11 11.1 to 11.4	■ Part 3 1.1.2.[A]	☐ Part 9 1.1.2.[A] and 9.10.1.3.
2	Major Occupancy (s)	Group D, E & F2		3.1.2.1(1)	9.10.2
3	Building Area (m²)	Existing 870 m² New 760 m² Total 1,630 m² Original Existing 1,000.6 m²		1.4.1.2.[A]	1.4.1.2.[A]
4	Gross Area (m²)	Original Existing 1,240.6 m² Existing 1,090 m² Demo (incl. mezzanine) 149.6 m² New 760 m² Total 1,850 m²		1.4.1.2.[A]	1.4.1.2.[A]
5	Number of Storeys	Above Grade 2 Below Grade N/A		1.4.1.2.[A] & 3.2.1.1.	1.4.1.2.[A] & 9.10.4.
6	Height of Building	5.5 m (finished grade to floor level of top storey)			
7	Number of Streets / Access Routes	3		3.2.2.10 & 3.2.5.	9.10.20
8	Building Classification	Group E, up to 2 Storeys, Sprinklered 3.2.2.62 Group F, Division 2, up to 4 Storeys, Sprinklered 3.2.2.70		3.2.2.20 - 83	9.10.2
9	Sprinkler System Proposed	■ Entire Building ☐ Selected Compartments ☐ Basement Only ☐ Selected Floor Areas ☐ In lieu of roof rating ☐ Not required		3.2.2.20 - 83 3.2.1.5 3.2.2.17 Index	9.10.8.2. Index
10	Standpipe required	☐ Yes ■ No		3.2.9	N/A
11	Fire Alarm required	☐ Yes ■ No		3.2.4	9.10.18.
12	Water Service Supply is Adequate	■ Yes (hydrant to be located within 90m of building) ☐ No		3.2.5.7	N/A
13	High Building	☐ Yes (refer to High Building Summary) ■ No		3.2.6	N/A
14	Construction Restrictions Actual Construction	☐ Combustible permitted ☐ Non-combustible required ■ Both ☐ Combustible ■ Non-combustible ☐ Both		3.2.2.20 - 83	9.10.6
15	Mezzanine (s) Area (m²)			3.2.1.1.(3)-(8)	9.10.4.1
16	Occupant Load Based on Level 1 & Level 2 Occupancy F2 & E	☐ m² / person (Public) ■ Design of building based on WR capacity Load 48 persons		3.1.17	9.9.1.3
17	Barrier Free Design	■ Yes ☐ No (Explain)		3.8	9.5.2
18	Hazardous Substances	■ Yes ☐ No		3.3.1.2. & 3.3.1.19.	9.10.1.3(4)
19	Required Fire Resistance Rating (FRR)	Horizontal Assemblies Fire Resistance Rating (hours) / Listed Design No. or Description (SB-2) Floors 45 minutes Hours N/A Roof N/A Hours N/A Mezzanine N/A Hours N/A Fire Resistance Rating of Supporting Members / Listed Design No. or Description (SB-2) Floors 45 minutes Hours N/A Roof N/A Hours N/A Mezzanine N/A Hours N/A		3.2.2.20 - 83 & 3.2.1.4.	9.10.8 & 9.10.9
20	Washroom Requirements:			3.7.4.	9.31.

Occupancy	Male Public Req'd	Male Public Provided	Male Staff Req'd	Male Staff Provided	Female Public Req'd	Female Public Provided	Female Staff Req'd	Female Staff Provided
E & F2	1	1	1	2	1	1	1	1

21	Exits First Floor: Occupancy F2 & E Exits Required 4 Exits Provided 4 Second Floor: Occupancy F2 & E Exits Required 1 (ex.) Exits Provided 1 (ex.)			3.4.	9.9
22	Fire Separations: Janitor's Room: 0 hr Service Rooms: 1 hr Repair Garage: 2 hr Storage Garage: 1.5 hr Storage Rooms: 45 min			3.3.1.20. 3.6.2. 3.3.5.5. 3.2.1.2., 3.3.5.6. 3.3.4.3	 9.10.10. 9.10.9.17. 9.10.4.3., 9.10.9.16 9.10.10.6.
23	Barrier Free Entrances: Number of Entrances required to be Barrier Free = 1 Power Door Operators Required ■ Yes ☐ No			3.8.1.2. 3.8.3.3.	9.5.2
24	Roof Anchors: ☐ Required ■ Not Required			4.4.4	
25	Spatial Separation - Construction of Exterior Walls			3.2.3.	9.10.14.

Wall Face	Area of E.B.F.	Limiting Distance	Ratio L/H to H/L	Permitted Max % of Openings	Proposed Max % of Openings	Required F.R.R. of Wall	Listed Design or Description	Non-Combustible Cladding	Non-Combustible Construction
North	233	17.7	N/A	100%	19%	N/A	N/A	N/A	N/A
South	234	17.8	N/A	100%	31%	N/A	N/A	N/A	N/A
East	304	29.7	N/A	100%	15%	N/A	N/A	N/A	N/A
West	287	31.1	N/A	100%	5%	N/A	N/A	N/A	N/A

GENERAL NOTES

1. **Do not scale drawings.** Written dimensions shall have precedence over scaled dimensions.
2. All work shall comply with the 2012 Ontario Building Code and amendments.
3. Contractors must check and verify all dimensions and specifications and report any discrepancies to the architect before proceeding with the work.
4. All contractors and sub-contractors shall have a set of approved construction documents on site at all times.
5. All documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the consultant for the account of the owner.
6. The material contained herein reflects the consultants best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the contract documents, or any reliance on/or decisions to be made based on them are the responsibility of such third parties.
7. The consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the contract documents.

No.	Date	Revision
2	2023-12-22	Issued for Site Plan Approval
1	2022-09-27	Issued for Pre-Consultation

Client:

Project Name / Address:

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

SRM architects+ urban⋆designers

Project No: 22071
Drawing Date: 12/18/23
Drawn by: NKS
Checked by: TLS/JLH
Office Location: KITCHENER
Plot Date / Time: 2023-12-22 12:14:42 PM

Drawing Name:

OBC MATRIX & SITE DETAILS

ONTARIO ASSOCIATION OF ARCHITECTS
JENNIFER HALIBURTON
LICENCE 8158

Drawing Scale: As indicated
Status: FOR COORDINATION
Revision No.: r2
Drawing No.: **A1.3**

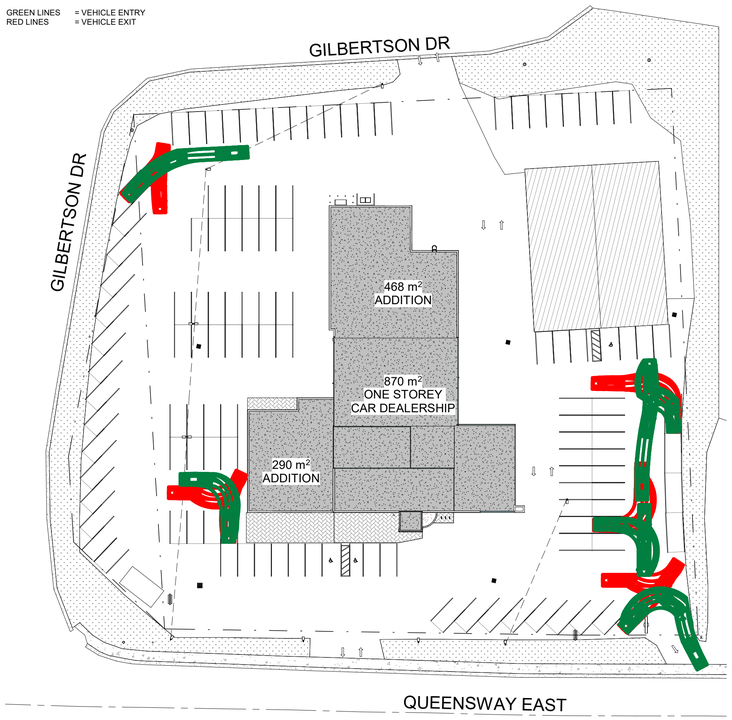
Do not scale drawings. Contractors must check and verify all dimensions and report any discrepancies to the Architect before proceeding with the work. All documents remain the property of the Architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the Consultant for the account of the Owner.
The material contained herein reflects the Consultants best judgement in light of the information available to him at the time of preparation Any use which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the Contract Documents.

C:\Users\nclosa\Documents\22071_Robinson Chevy Simcoe_2023-10-02_nclosa3TWFR.rvt

Do not scale drawings. Contractors must check and verify all dimensions and report any discrepancies to the Architect before proceeding with the work. All documents remain the property of the Architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The Contract Documents were prepared by the Consultant for the account of the Owner.
The material contained herein reflects the Consultants best judgement in light of the information available to him at the time of preparation Any use which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the Contract Documents.

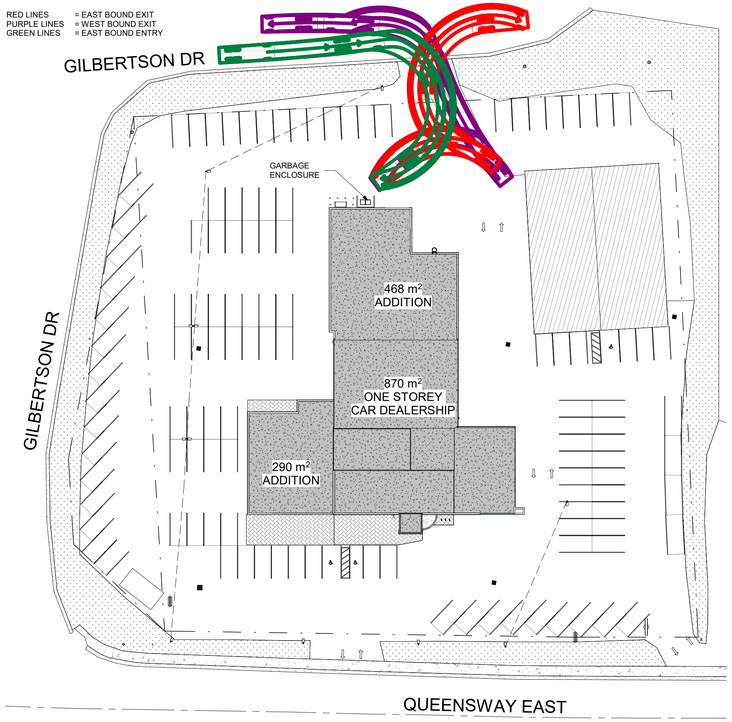
C:\Users\ndosa\Documents\22071_Robinson Chevy Simcoe_2023-10-02_ndosa3TWFR.rvt

GREEN LINES = VEHICLE ENTRY
RED LINES = VEHICLE EXIT



4 PASSENGER VEHICLES
1 : 500

RED LINES = EAST BOUND EXIT
PURPLE LINES = WEST BOUND EXIT
GREEN LINES = EAST BOUND ENTRY

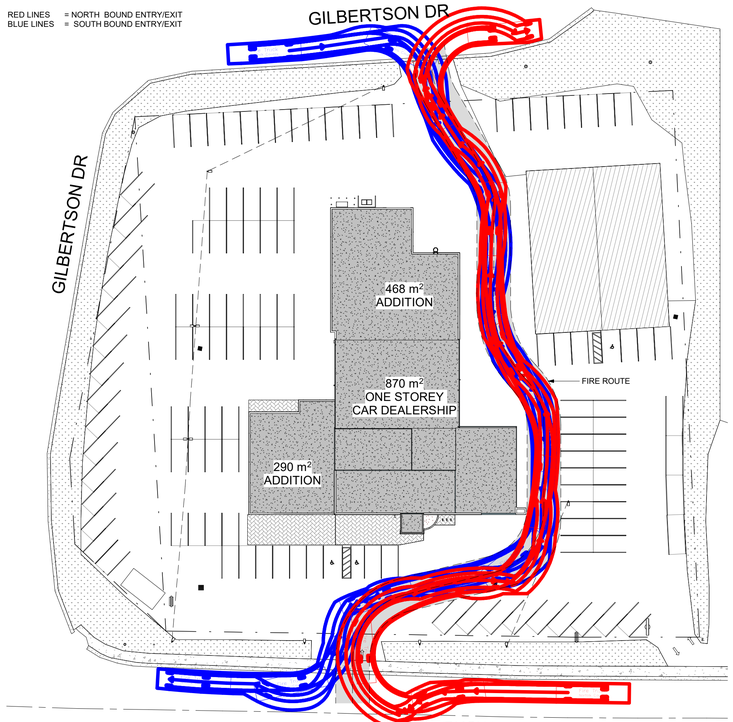


2 GARBAGE TRUCK TURNING
1 : 500

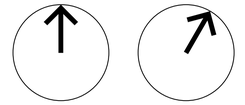
GREEN LINES = VEHICLE ENTRY
RED LINES = VEHICLE EXIT

3 PASSENGER VEHICLES
1 : 500

RED LINES = NORTH BOUND ENTRY/EXIT
BLUE LINES = SOUTH BOUND ENTRY/EXIT



1 FIRE TRUCK TURNING
1 : 500



GENERAL NOTES

1. **Do not scale drawings.** Written dimensions shall have precedence over scaled dimensions.
2. All work shall comply with the 2012 Ontario Building Code and amendments.
3. Contractors must check and verify all dimensions and specifications and report any discrepancies to the architect before proceeding with the work.
4. All contractors and sub-contractors shall have a set of approved construction documents on site at all times.
5. All documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the consultant for the account of the owner.
6. The material contained herein reflects the consultants best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the contract documents, or any reliance on/or decisions to be made based on them are the responsibility of such third parties.
7. The consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the contract documents.

No.	Date	Revision
2	2023-12-22	Issued for Site Plan Approval
1	2022-09-27	Issued for Pre-Consultation

Client:

Project Name / Address:

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

SRM↗ architects+ urban⋆designers

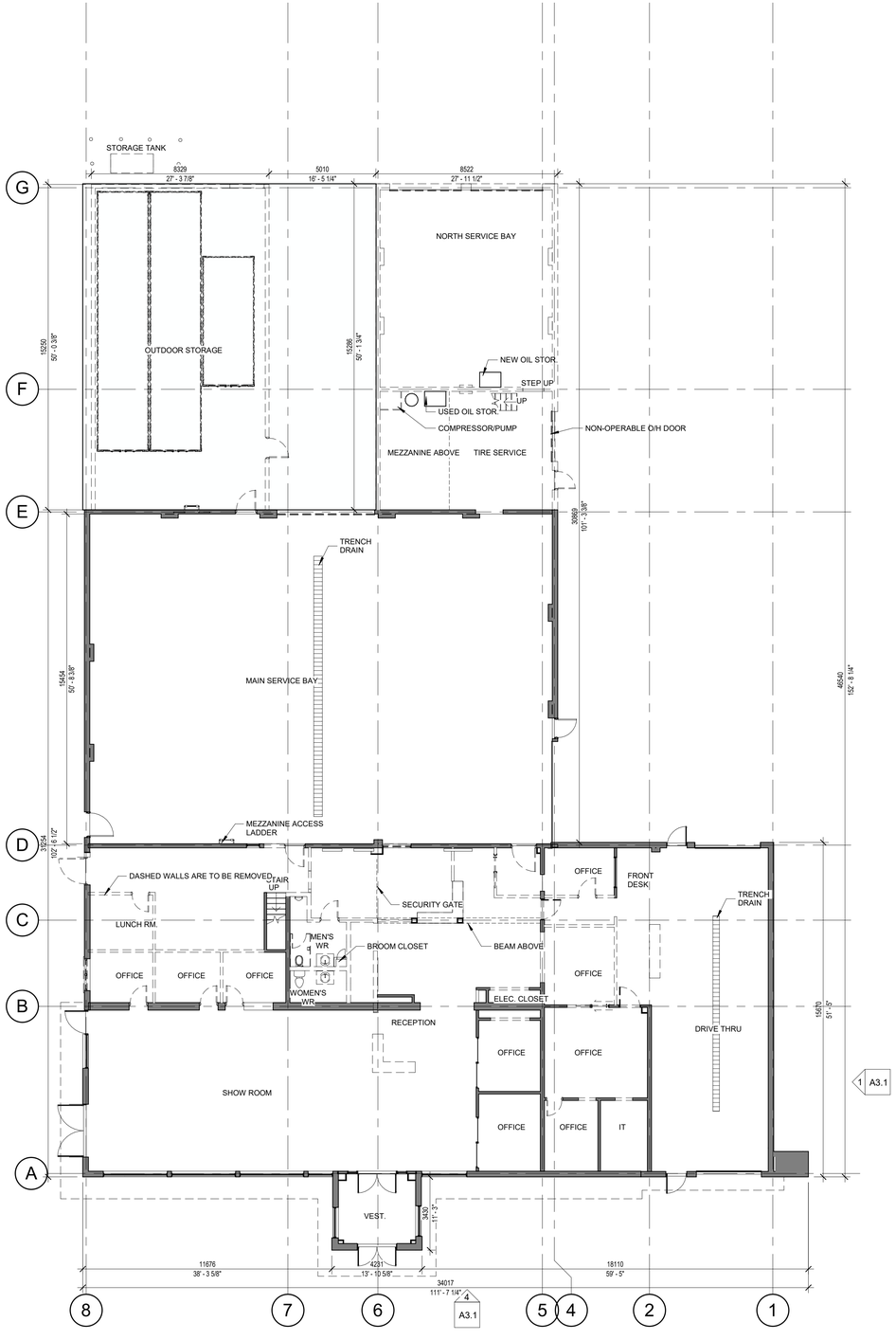
Project No: 22071
Drawing Date: 12/18/23
Drawn by: NKS
Checked by: TLS/JLH
Office Location: KITCHENER
Plot Date / Time: 2023-12-22 12:14:48 PM

Drawing Name:

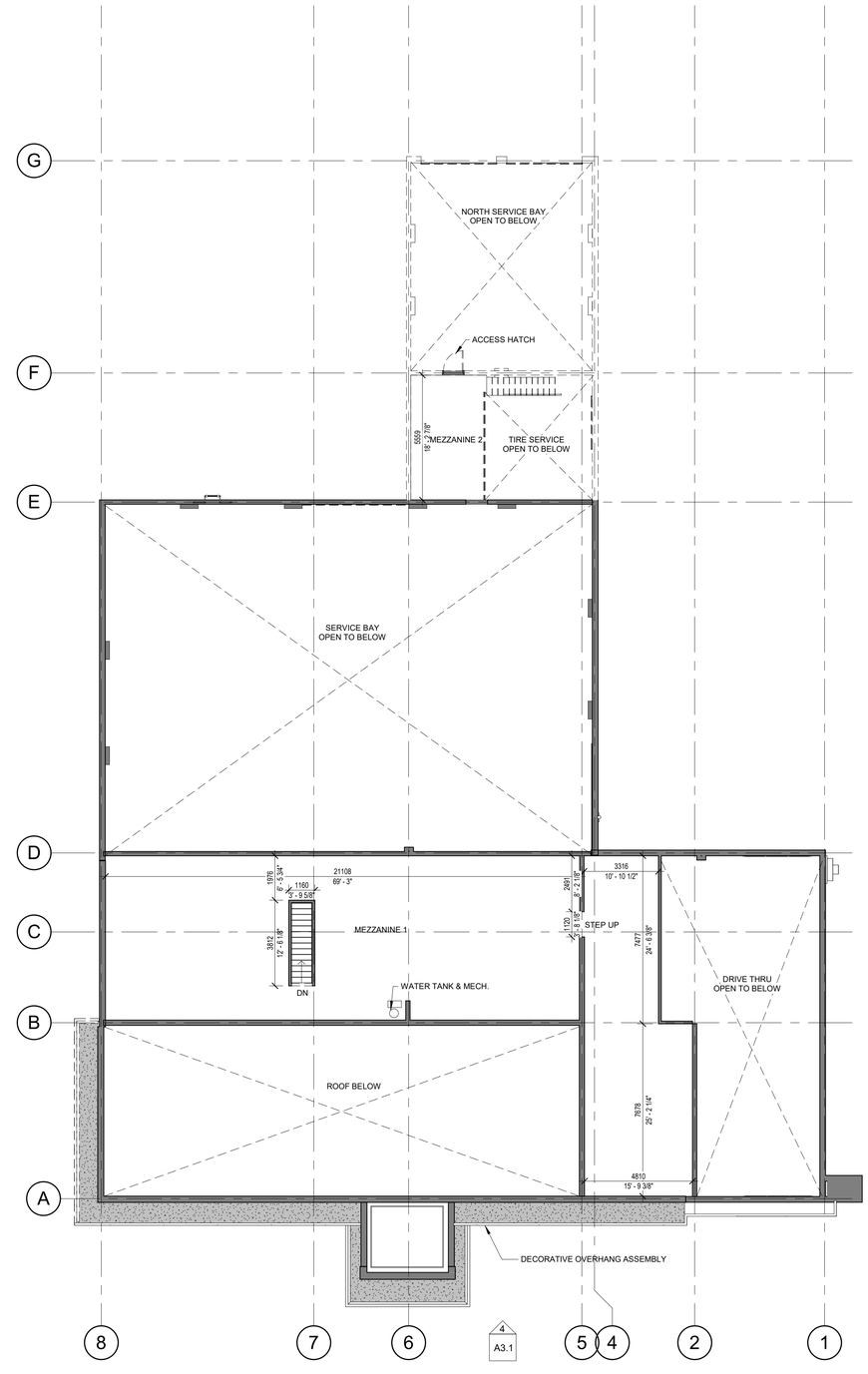
TURNING SIMULATION

ONTARIO ASSOCIATION OF ARCHITECTS
JENNIFER HALIBURTON
LICENCE 8158

Drawing Scale: 1 : 500
Status: FOR COORDINATION
Revision No.: r2
Drawing No.: **A1.4**



1 FLOOR PLAN - LEVEL 1
1 : 125



2 FLOOR PLAN - LEVEL 2
1 : 125

Do not scale drawings. Contractors must check and verify all dimensions and report any discrepancies to the Architect before proceeding with the work. All documents remain the property of the Architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The Contract Documents were prepared by the Consultant for the account of the Owner.
The material contained herein reflects the Consultants best judgement in light of the information available to him at the time of preparation Any use which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the Contract Documents.

C:\Users\nclosa\Documents\22071_Robinson Chevy Simcoe_2023-10-02_nclosa3TWFR.rvt

Project North

True North

GENERAL NOTES

1. **Do not scale drawings.** Written dimensions shall have precedence over scaled dimensions.
2. All work shall comply with the 2012 Ontario Building Code and amendments.
3. Contractors must check and verify all dimensions and specifications and report any discrepancies to the architect before proceeding with the work.
4. All contractors and sub-contractors shall have a set of approved construction documents on site at all times.
5. All documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the consultant for the account of the owner.
6. The material contained herein reflects the consultants best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the contract documents, or any reliance on/or decisions to be made based on them are the responsibility of such third parties.
7. The consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the contract documents.

No.	Date	Revision
2	2023-12-22	Issued for Site Plan Approval
1	2022-09-27	Issued for Pre-Consultation

Client:

Project Name / Address:

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

SRM architects+ urban⋆designers

Project No: 22071
Drawing Date: 2023-11-27
Drawn by: Author
Checked by: Checker
Office Location: KITCHENER
Plot Date / Time: 2023-12-22 12:14:49 PM

Drawing Name:

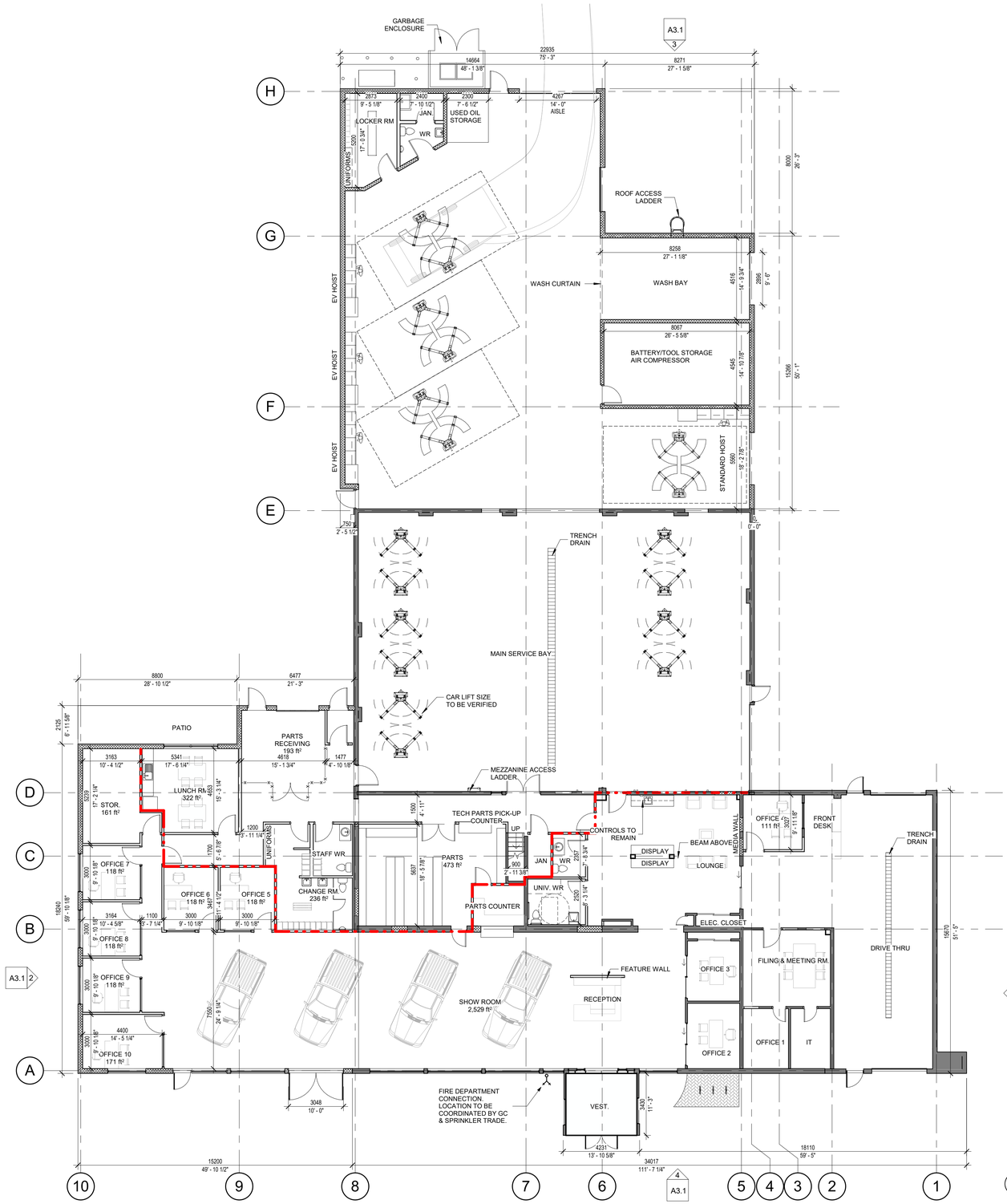
EXISTING CONDITIONS FLOOR PLANS

ONTARIO ASSOCIATION OF ARCHITECTS
JENNIFER HALIBURTON
LICENCE 8158

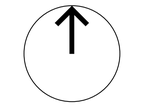
Drawing Scale: 1 : 125
Status: FOR COORDINATION
Revision No.: r2
Drawing No.: **A2.1**

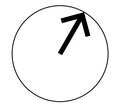
Do not scale drawings. Contractors must check and verify all dimensions and report any discrepancies to the Architect before proceeding with the work. All documents remain the property of the Architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. This Contract Documents were prepared by the Consultant for the account of the Owner.
The material contained herein reflects the Consultants best judgement in light of the information available to him at the time of preparation.Any use which a third party makes of this Contract Documents, or any reliance on or decisions to be made based on them are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the Contract Documents.

C:\Users\ndosa\Documents\22071_Robinson Chevy Simcoe_2023-10-02_ndosa31TWFR.rvt



1 FLOOR PLAN - LEVEL 1
1 : 125





GENERAL NOTES

1. **Do not scale drawings.** Written dimensions shall have precedence over scaled dimensions.
2. All work shall comply with the 2012 Ontario Building Code and amendments.
3. Contractors must check and verify all dimensions and specifications and report any discrepancies to the architect before proceeding with the work.
4. All contractors and sub-contractors shall have a set of approved construction documents on site at all times.
5. All documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the consultant for the account of the owner.
6. The material contained herein reflects the consultants best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the contract documents, or any reliance on/or decisions to be made based on them are the responsibility of such third parties.
7. The consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the contract documents.

No.	Date	Revision
2	2023-12-22	Issued for Site Plan Approval
1	2022-09-27	Issued for Pre-Consultation

Client:

Project Name / Address:

51 QUEENSWAY EAST, SIMCOE ON N3Y 4M5

SRM↗
architects+
urban⋆designers

Project No: 22071
Drawing Date: 2023-11-27
Drawn by: Author
Checked by: Checker
Office Location: KITCHENER
Plot Date / Time: 2023-12-22 12:14:51 PM

Drawing Name:

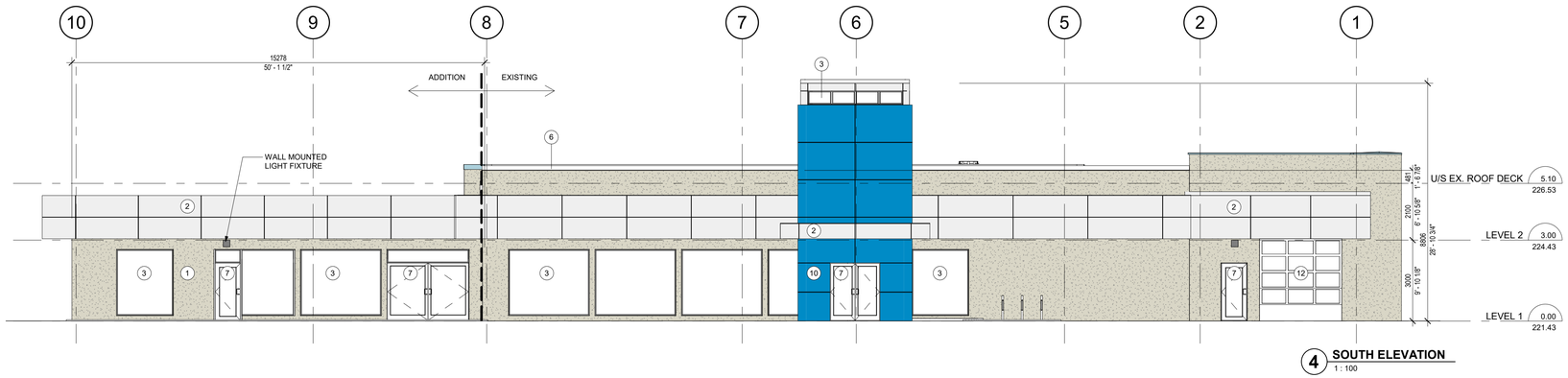
PROPOSED FLOOR PLANS

ONTARIO ASSOCIATION OF ARCHITECTS
JENNIFER HALBURTON
LICENCE 8158

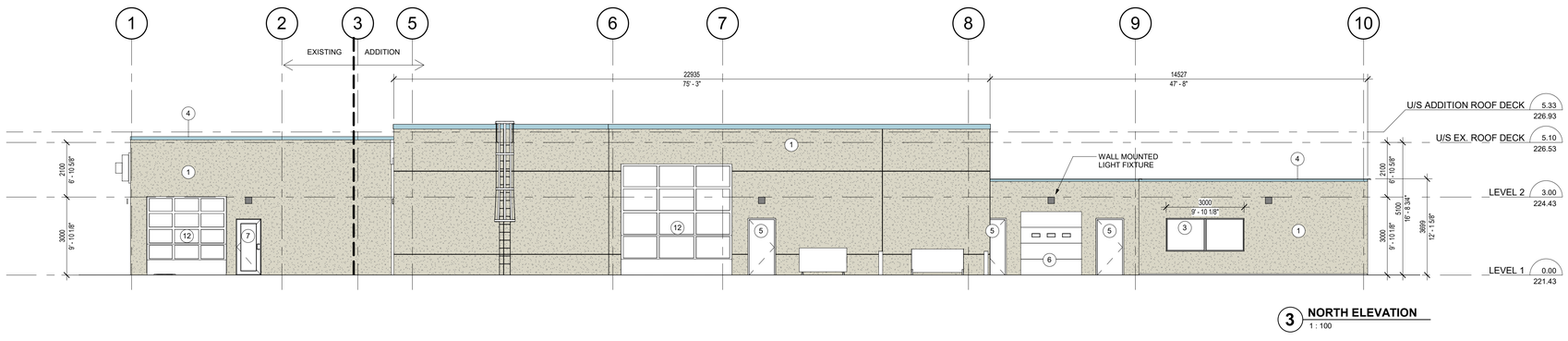
Drawing Scale: 1 : 125
Status: FOR COORDINATION
Revision No.: r2
Drawing No.: **A2.2**

MATERIAL LEGEND

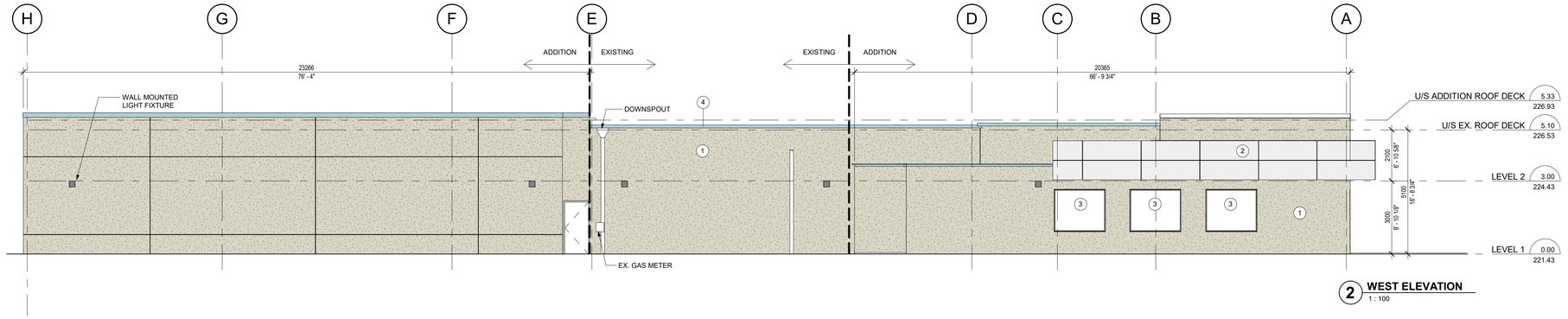
1. STUCCO SIDING
   COLOUR: LIGHT BEIGE
2. ALUMINUM COMPOSITE MATERIAL SIDING
   COLOUR: GREY
3. PREFINISHED ALUMINUM PUNCHED WINDOW
4. PREFINISHED METAL FLASHING: COLOUR TO MATCH EXISTING
5. HOLLOW METAL DOOR & FRAME
6. INSULATED OVERHEAD DOOR
7. ALUMINUM FRAMED EXTERIOR GLASS DOOR & GLAZING SYSTEM
9. CONCRETE MASONRY UNIT
10. ALUMINUM COMPOSITE MATERIAL SIDING
    COLOUR: BLUE
11. BRICK VENEER
    COLOUR: BEIGE
12. GLASS OVERHEAD DOOR



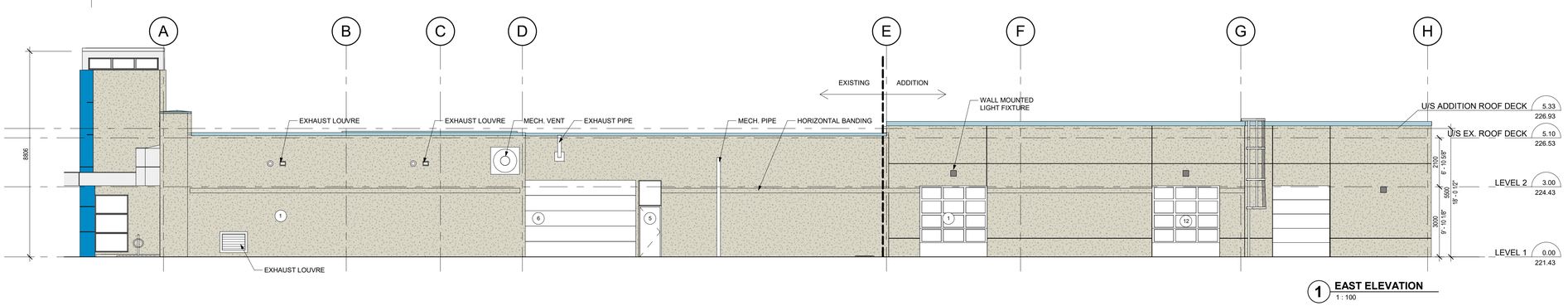
4 SOUTH ELEVATION
1 : 100



3 NORTH ELEVATION
1 : 100



2 WEST ELEVATION
1 : 100



1 EAST ELEVATION
1 : 100

GENERAL NOTES

1. **Do not scale drawings.** Written dimensions shall have precedence over scaled dimensions.
2. All work shall comply with the 2012 Ontario Building Code and amendments.
3. Contractors must check and verify all dimensions and specifications and report any discrepancies to the architect before proceeding with the work.
4. All contractors and sub-contractors shall have a set of approved construction documents on site at all times.
5. All documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. The contract documents were prepared by the consultant for the account of the owner.
6. The material contained herein reflects the consultants best judgement in light of the information available to him at the time of preparation. Any use which a third party makes of the contract documents, or any reliance on/or decisions to be made based on them are the responsibility of such third parties.
7. The consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the contract documents.

No.	Date	Revision
2	2023-12-22	Issued for Site Plan Approval
1	2022-09-27	Issued for Pre-Consultation

Client:

Project Name / Address:

**51 QUEENSWAY EAST,
SIMCOE ON N3Y 4M5**

SRM↗
architects+
urban⋆designers

Project No: 22071
Drawing Date: 2023-11-27
Drawn by: NKS
Checked by: TLS/JLH
Office Location: KITCHENER
Plot Date / Time: 2023-12-22 12:14:54 PM

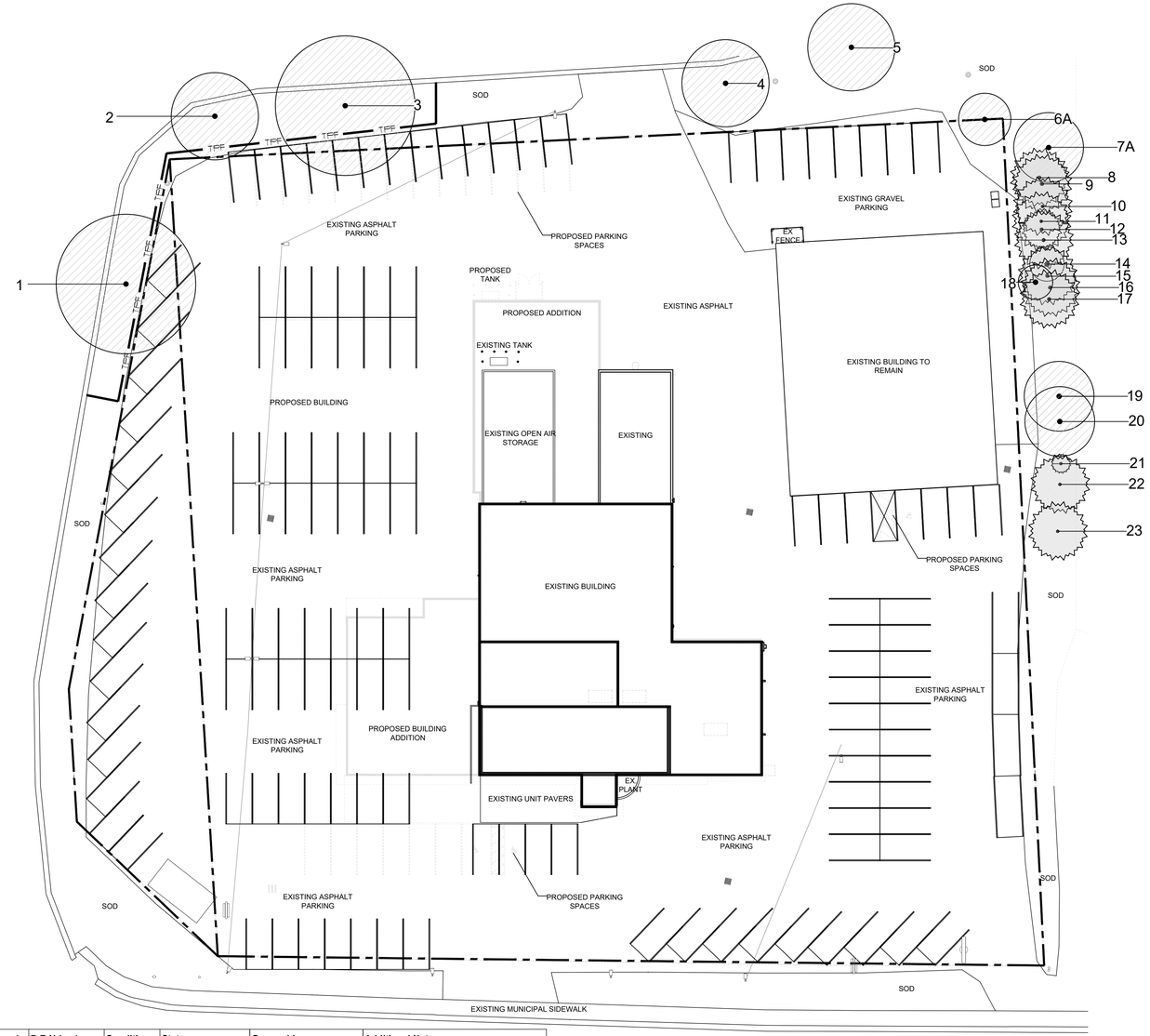
Drawing Name:

ELEVATIONS

ONTARIO ASSOCIATION OF ARCHITECTS
JENNIFER HALIBURTON
LICENCE
8158

Drawing Scale: As indicated
Status: FOR COORDINATION
Revision No.: r2
Drawing No.: **A3.1**

Do not scale drawings. Contractors must check and verify all dimensions and report any discrepancies to the Architect before proceeding with the work. All documents remain the property of the Architect. Unauthorized use, modification, and/or reproduction of these documents is prohibited without written permission. This Contract Documents were prepared by the Consultant for the account of the Owner.
The material contained herein reflects the Consultants best judgement in light of the information available to him at the time of preparation Any use which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the Contract Documents.
C:\Users\nclosa\Documents\22071_Robinson Chevy Simcoe_2023-10-02_nclosa3TWFR.rvt



NOTES:

SITE VISIT DATE: AUGUST 30, 2023

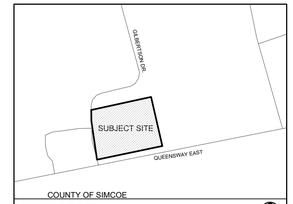
TREE INVENTORY COMPLETED BY ISA CERTIFIED ARBORIST CATHERINE HODGINS #ON-2258A

TREE LOCATIONS AND DRIPLINES BASED ON EXISTING CONDITIONS PLAN PROVIDED BY GM ENGINEERING AND HILL DESIGN STUDIO FIELD SURVEY ON AUGUST 30, 2023.

#A DENOTES APPROXIMATE TREE LOCATION BASED ON HILL DESIGN FIELD SURVEY ON AUGUST 30, 2023 AND AERIAL PHOTOGRAPHY.

LEGEND

	EXISTING INVENTORIED DECIDUOUS TREES TO REMAIN
	EXISTING INVENTORIED CONIFEROUS TREES TO REMAIN
TPF	TREE PROTECTION FENCE



KEY MAP N.T.S.

GENERAL NOTES

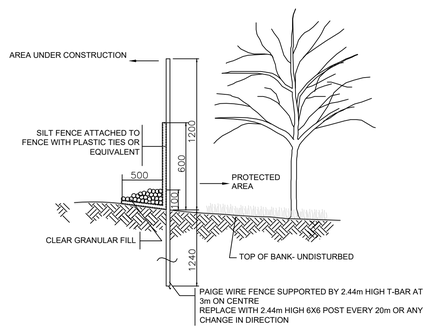
1. CONTRACTOR TO LOCATE ALL UNDERGROUND UTILITIES.
2. SITE PLAN INFORMATION AS PER SRM ARCHITECTS.
3. EXISTING CONDITIONS PLAN AS PER GM BLUE PLAN ENGINEERING.
4. SITE LIGHTING BY OTHERS.

TREE INVENTORY LIST

ID #	Tree Species (Latin)	Tree Species (Common)	D.B.H (cm)	Condition	Status	Ownership	Additional Notes
1	Celtis occidentalis	Common Hackberry	90	Fair	Preserve	Adjacent Property	Hydro pruned, 1 main branch removed, rest overhanging parking.
2	Acer platanoides	Norway Maple	49	Fair	Preserve	Adjacent Property	Hydro pruned, heavy suckering at base.
3	Celtis occidentalis	Common Hackberry	84	Fair	Preserve	Adjacent Property	Hydro pruned, co-dominant stems, overhanging parking
4	Acer platanoides	Norway Maple	44	Fair	Preserve	Adjacent Property	15% Dead branches
5	Acer platanoides	Norway Maple	50	Good	Preserve	Adjacent Property	5% Dead branches
6A	Julgans nigra	Black Walnut	25	Fair	Preserve	Presumed Boundary Tree	Vine choked
7A	Julgans nigra	Black Walnut	25	Fair	Preserve	Adjacent Property	
8	Picea glauca	White Spruce	23	Fair	Preserve	Adjacent Property	Thin crown, vine choked
9	Celtis occidentalis	Common Hackberry	10/10	Fair	Preserve	Adjacent Property	
10	Picea glauca	White Spruce	36	Fair	Preserve	Adjacent Property	Thin crown
11	Celtis occidentalis	Common Hackberry	12	Fair	Preserve	Adjacent Property	
12	Picea glauca	White Spruce	24	Poor	Preserve	Adjacent Property	Thin crown
13	Picea glauca	White Spruce	26/26	Fair	Preserve	Adjacent Property	Thin crown
14	Picea glauca	White Spruce	24	Fair	Preserve	Adjacent Property	Thin crown
15	Picea glauca	White Spruce	26	Fair	Preserve	Adjacent Property	Thin crown
16	Picea glauca	White Spruce	26	Fair	Preserve	Adjacent Property	Thin crown
17	Picea glauca	White Spruce	26	Fair	Preserve	Adjacent Property	Thin crown
18	Acer negundo	Manitoba Maple	10/10/8	Fair	Preserve	Adjacent Property	Suppressed
19	Celtis occidentalis	Common Hackberry	10/12/14	Good	Preserve	Adjacent Property	
20	Celtis occidentalis	Common Hackberry	15	Good	Preserve	Adjacent Property	
21	Picea glauca	White Spruce	13/1	Very Poor	Remove	Adjacent Property	90% Dead, vine choked
22	Picea glauca	White Spruce	38	Fair	Preserve	Adjacent Property	Co-dominant stems with included bark, vine choked, surrounded by poison Ivy.
23	Picea glauca	White Spruce	38	Fair	Preserve	Adjacent Property	Thin crown, vine choked

TREE PROTECTION NOTES

1. AS PART OF ANY TREE REMOVAL OPERATION ALL STEMS, LIMBS AND STUMPS SHOULD BE REMOVED FROM THE SITE.
2. UPON COMPLETION OF ANY TREE REMOVAL OPERATIONS, TREE PROTECTION FENCING SHOULD BE INSTALLED AS ILLUSTRATED. THIS PROTECTION FENCING SHOULD BE MAINTAINED UNTIL ALL EXCAVATION AND BUILDING CONSTRUCTION WORK IS COMPLETED.
3. ANY ROOTS DISTURBED DURING CONSTRUCTION SHOULD BE CUT CLEANLY AND BURIED IMMEDIATELY.
4. NO HEAVY EQUIPMENT OR STOCKING OF MATERIAL SHALL OCCUR WITHIN THE DRIPLINES OF ANY TREES THAT ARE TO BE PRESERVED.
5. TREE PROTECTION MEASURES TO BE INSPECTED BY LANDSCAPE ARCHITECT AND CITY STAFF PRIOR TO START OF CONSTRUCTION.
6. IF CONSTRUCTION OR ANY WORK OCCURS WITHIN THE TREE PRESERVATION ZONE, INSIDE THE LIMITS OF THE TREE PROTECTION FENCE, IT IS NECESSARY TO ONLY USE HAND TOOLS. NO MACHINERY WILL BE PERMITTED IN THIS ZONE.



1 TREE PROTECTION FENCING DETAIL

NTS

REVISIONS

no.	date	description	by
1.	Dec.21.23	Issued for approval	AWH

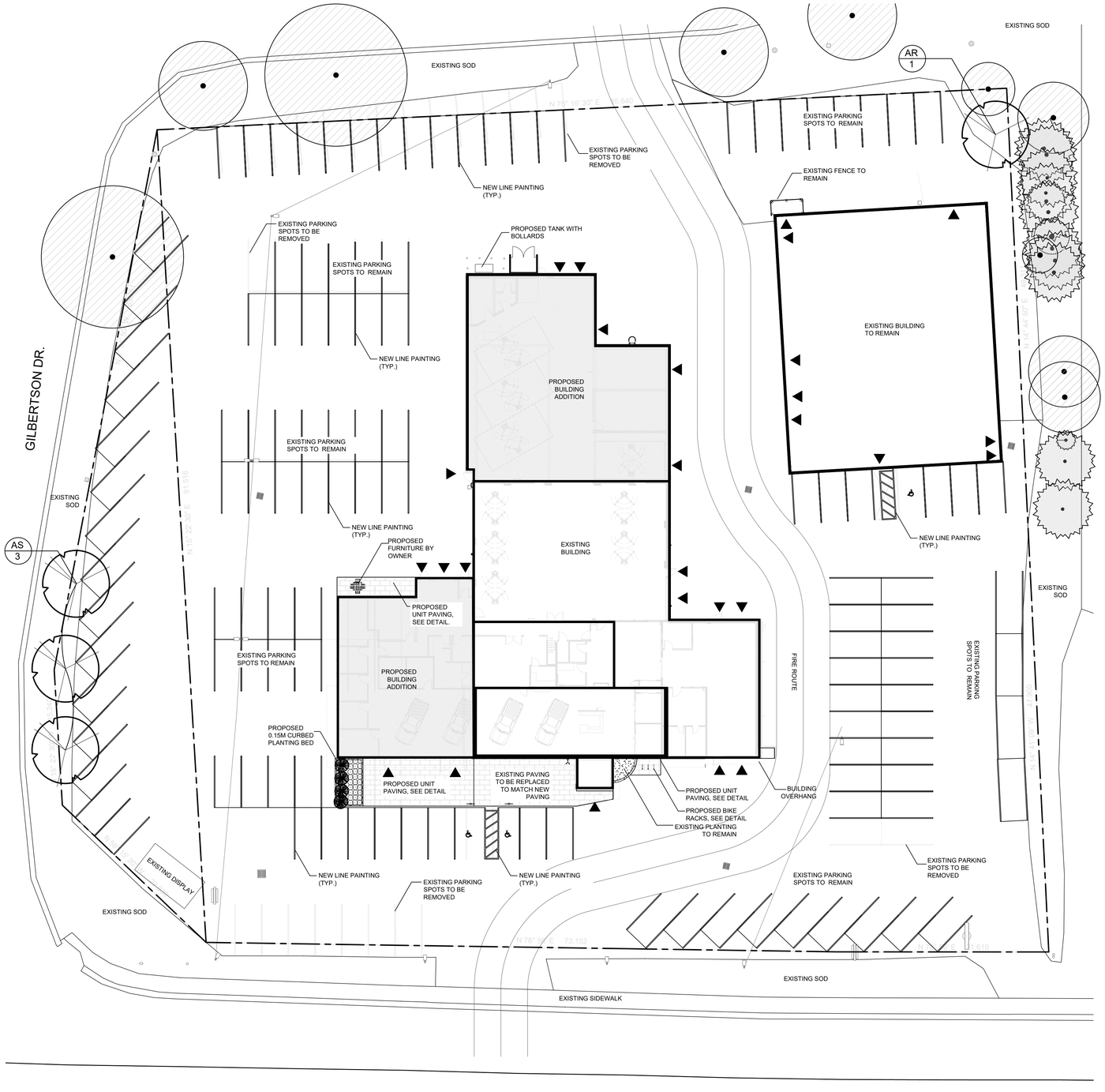
ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
AARON W. HILL
OALA
MEMBER

Robinson Car Dealership Addition
51 Queensway East,
Simcoe, ON

Tree Management Plan

Hill Design Studio Inc.
226-686-0700 www.hilldesign.ca

PROJECT NO.: 2023-72	DRAWN BY: EA
SCALE: 1:300	DESIGNED BY: EA
SHEET: L1	APPROVED BY: AWH
	PLOT DATE: Dec. 21, 2023

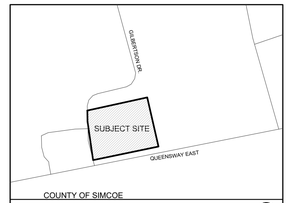


LEGEND

- PROPOSED CONIFEROUS SHRUBS
- PROPOSED DECIDUOUS SHRUBS
- PROPOSED PERRENIALS
- EXISTING INVENTORIED TREES TO REMAIN
- PROPOSED DECIDUOUS TREES

PLANT MATERIAL LIST

KEY	QUANT.	COMMON NAME	BOTANICAL NAME	SIZE	COND.
AS	3	Sugar Maple	Acer saccharum	60mm cal.	W.B.
AR	1	Autumn Spire Maple	Acer rubrum 'Autumn Spire'	60mm cal.	W.B.
Js	4	Savin Juniper	Juniperus sabina	50cm 3 gal.	F.P.
he	27	Little Wine Cup Daylily	Hemerocallis 'Little Wine Cup'	1 gal.	Pot



KEY MAP N.T.S.

GENERAL NOTES

1. ALL WORKMANSHIP WILL BE TO THE STANDARDS OF LANDSCAPE ONTARIO.
2. ALL PLANT MATERIAL TO BE NO.1 GRADE NURSERY GROWN IN ACCORDANCE WITH THE CANADIAN STANDARDS FOR NURSERY STOCK, 6TH EDITION, 1998, BY THE CANADIAN NURSERY TRADES ASSOCIATION.
3. BACKFILL WILL CONSIST OF SOIL NATIVE TO THE SITE OR GENERAL SOIL TYPE/CLASS NATIVE TO THE SITE. TOPSOIL TO BE TESTED FOR NUTRIENT VALUE, AND AMENDED FOR OPTIMAL GROWTH AS PER THE RECOMMENDATIONS OF THE SOIL TEST.
4. CONTRACTOR SHALL MAINTAIN ALL LANDSCAPE AREAS UNTIL OWNER'S ACCEPTANCE OF PROJECT.
5. CONTRACTOR TO LOCATE ALL UNDERGROUND UTILITIES.
6. PLANTING MAY BE ADJUSTED TO SUIT LOCATIONS OF SITE UTILITY STRUCTURES/SERVICES.
7. ALL MATERIALS MUST BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
8. SPREAD MULCH TO A MINIMUM OF 100mm COMPACTED DEPTH ON ALL TREE PITS AND PLANTING BEDS.
9. CHECK AND VERIFY ALL DIMENSIONS AND QUANTITIES PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES ARE TO BE REPORTED IN WRITING TO THE LANDSCAPE ARCHITECT. QUANTITIES NOTED WITHIN THE PLAN SUPERCEDE THOSE IN THE PLANT LIST. ANY SUBSTITUTIONS SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT.
10. SOD AS MARKED WITH NURSERY SOD ON A MINIMUM OF 100mm OF CLEAN TOPSOIL. FINE GRADE AND SOD ALL BOULEVARD AREAS TO MUNICIPAL SPECIFICATIONS AND REPAIR DAMAGE TO ADJACENT PROPERTIES, AS REQUIRED.
11. FINAL INSPECTION AND ACCEPTANCE OF PLANTING WORK SHALL COINCIDE WITH THE FINAL INSPECTION AND ACCEPTANCE OF ALL WORK INCLUDED IN THE CONTRACT.
12. ALL SEEDED SLOPES 3:1 AND GREATER TO RECEIVE EROSION CONTROL MATTING (COIR MAT, OR OTHER WILDLIFE FRIENDLY ALTERNATIVE). PIN SOD ON ALL SLOPES OF 3:1 OR GREATER.
13. SUBMIT A WRITTEN GUARANTEE TO THE EFFECT THAT ALL PLANTS ACCEPTED DURING THE PERIOD OF JANUARY 1st TO JULY 15th SHALL BE GUARANTEED UNTIL JULY 15th THE FOLLOWING YEAR. PLANTS ACCEPTED DURING THE PERIOD OF JULY 15th TO DECEMBER 31st SHALL BE GUARANTEED FOR ONE YEAR FROM THE DATE OF ACCEPTANCE. THE GUARANTEE PERIODS LISTED ABOVE SHALL APPLY TO ALL "NURSERY GROWN" PLANTS.
14. AT THE TIME OF FINAL INSPECTION ALL PLANTS SHALL BE IN A HEALTHY, VIGOUROUS GROWING CONDITION, PLANTED IN FULL ACCORDANCE WITH DRAWINGS AND CONDITIONS.
15. SURVEY PLAN AS PER J.D. BARNES LTD.
16. SITE PLAN INFORMATION AS PER SRM ARCHITECTS INC.
17. SITE GRADING AND SERVICING INFORMATION AS PER OTHERS AND IS FOR INFORMATIONAL PURPOSES ONLY.
18. SITE LIGHTING BY OTHERS.

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
AARON W. HILL
OALA MEMBER

REVISIONS

no.	date	description	by
1.	Dec.21.23	Issued for approval	AWH

Robinson Car Dealership Addition
51 Queensway East,
Simcoe, ON

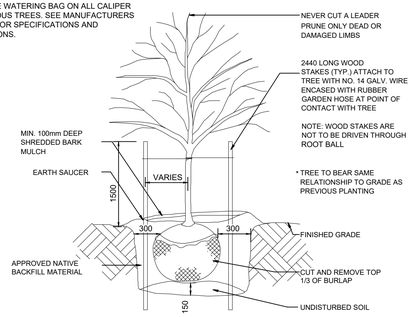
Landscape Plan

Hill Design Studio Inc.
226-686-0700 www.hilldesign.ca

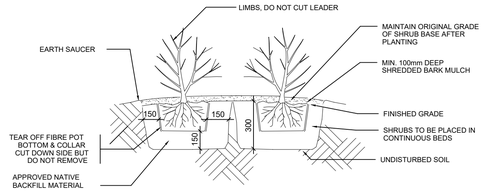
PROJECT NO.: 2023-72	DRAWN BY: EA
SCALE: 1:250	DESIGNED BY: EA
SHEET: L2	APPROVED BY: AWH
	PLOT DATE: Dec. 21, 2023

TREEGATOR:

INSTALL TREEGATOR ORIGINAL SLOW RELEASE WATERING BAG ON ALL CALIPER DECIDUOUS TREES. SEE MANUFACTURERS DETAIL FOR SPECIFICATIONS AND DIRECTIONS.



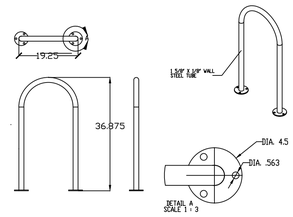
1 DECIDUOUS TREE PLANTING DETAIL
NTS



2 SHRUB PLANTING DETAIL
NTS

BIKE RACK BY MAGLIN
(OR APPROVED EQUAL)
T 1-800-716-5506
F 1-877-260-9393
WWW.MAGLIN.COM
SALES@MAGLIN.COM

SPECIFICATIONS:
MODEL: MBR502
FINISH: BLACK POWDER COAT
OPTIONS: NONE
INSTALLATION: SURFACE MOUNT



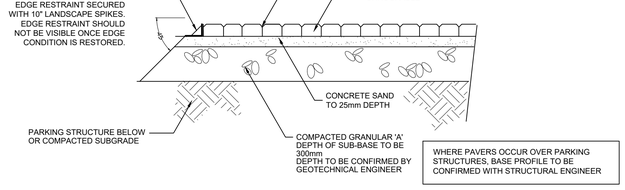
3 BIKE RACK DETAIL
NTS

NOTE:

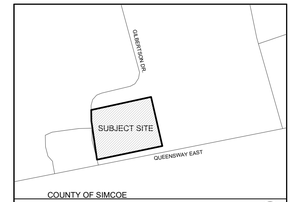
PAVERS TO BE UNILOCK BEACON HILL SMOOTH PAVER OR EQUIVALENT AS APPROVED BY L. A.
COLOUR: OPAL BLEND
PATTERN: LINEAR

WWW.UNILOCK.CA
1-800-265-6124

MAIN ENTRANCE PAVERS TO BE UNILOCK PROMENADE PLANK PAVER OR EQUIVALENT AS APPROVED BY L. A.
COLOUR: OPAL BLEND WITH STEEL GREY BLEND 400mm WIDE SOLDIER COURSE
PATTERN: LINEAR



4 UNIT PAVER DETAIL
NTS



KEY MAP N.T.S.

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
ANDREW W. HILL
OALA
MEMBER

REVISIONS

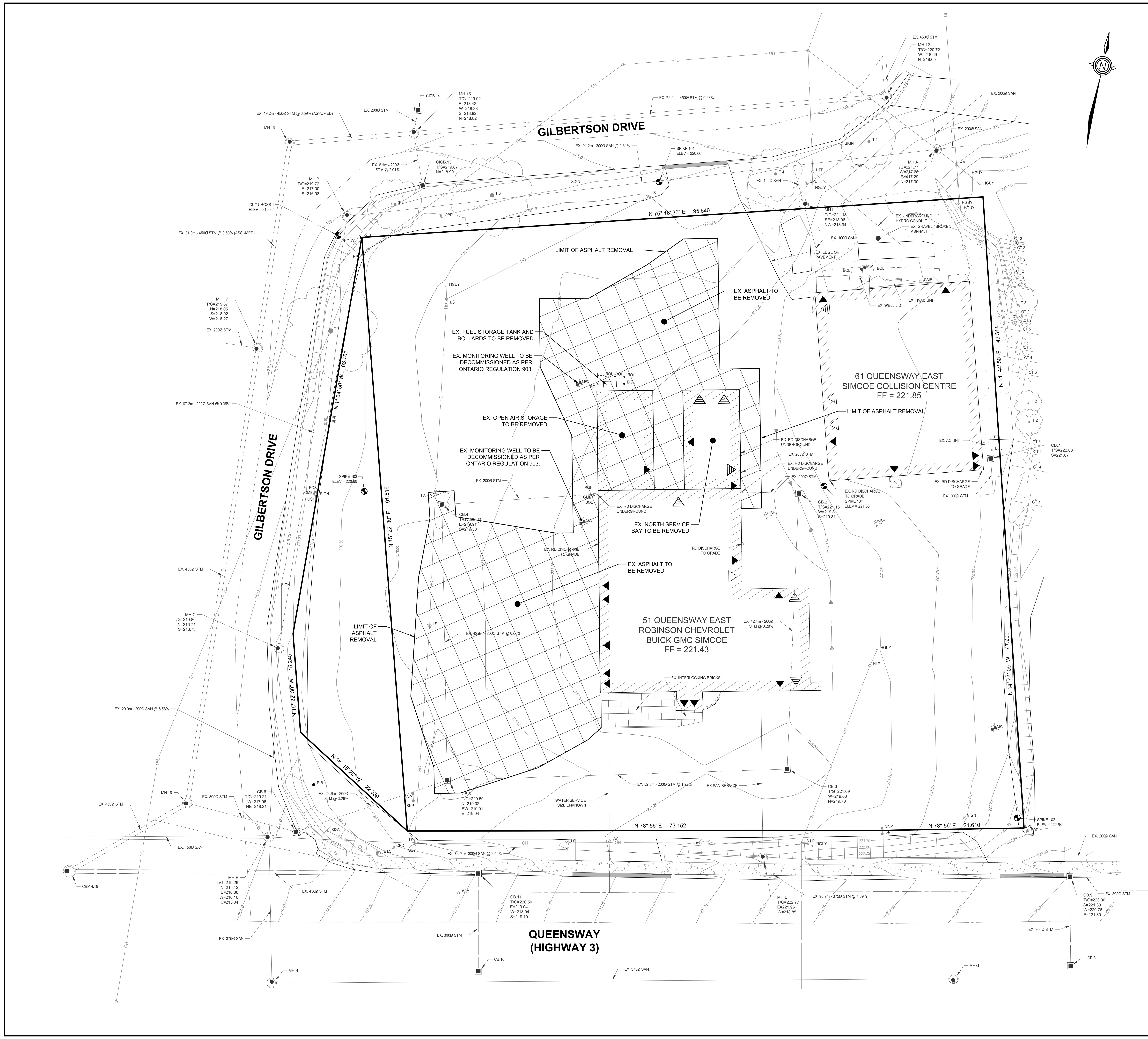
no.	date	description	by
1.	Dec.21.23	Issued for approval	AWH

Robinson Car Dealership Addition
51 Queensway East,
Simcoe, ON

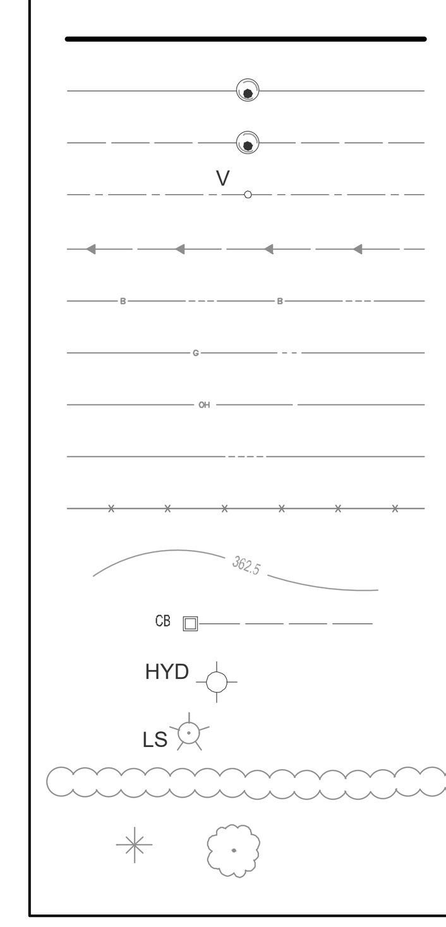
Landscape Details

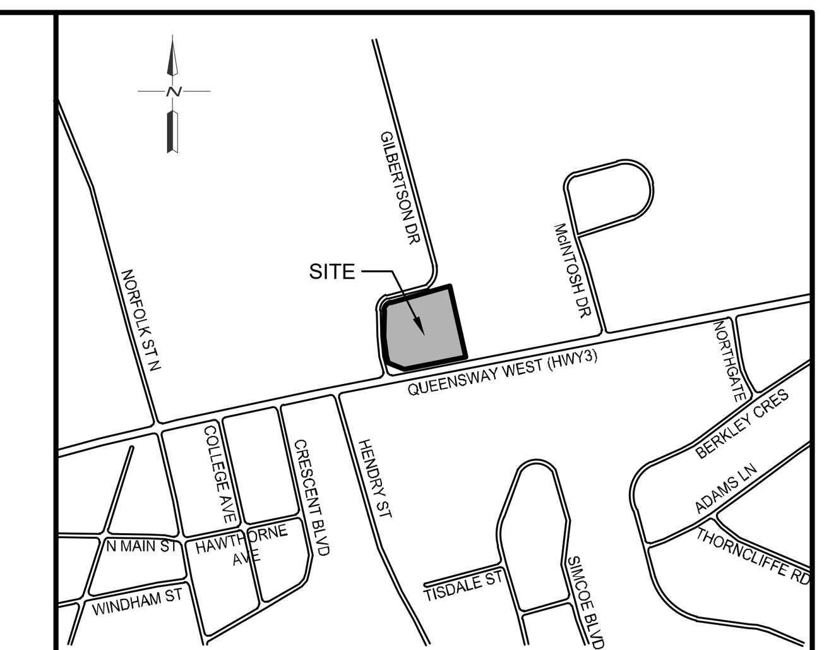
Hill Design Studio Inc
226-686-0700 www.hilldesign.ca

PROJECT NO.: 2023-72
DRAWN BY: EA
SCALE: AS SHOWN
DESIGNED BY: EA
SHEET: L3
APPROVED BY: AWH
PLOT DATE: Dec. 21, 2023



LEGEND





TOWN OF SIMCOE
KEY PLAN
NOT TO SCALE

NOTES :

1. TOPOGRAPHIC AND EXISTING FEATURE SURVEY COMPLETED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
2. EXISTING INFRASTRUCTURE INVERT WHERE SURVEYED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
3. MISSING EXISTING INFRASTRUCTURE INFORMATION WAS TAKEN FROM RECORD DRAWING NUMBER S-380 DATED MAY, 1978 PROVIDED BY NORFOLK COUNTY.
4. PROPOSED SITE PLAN PROVIDED BY SRM ARCHITECTS AND URBAN DESIGNERS DATED DECEMBER 21, 2023.

4 2 0 5 10 15
1:300 (m)

BENCH MARKS :

COSINE BENCHMARK 001972U330

BENCHMARK ELEVATION = 212.380

TOWNSHIP: SIMCOE NORFOLK STREET (HIGHWAY NO. 24) CONCRETE BRIDGE OVER A CREEK, 0.2 KM NORHT OF JUNCTION OF HIGHWAYS NO. 3 AND NO. 24, TABLET IN SOUTHEAST CONCRETE ABUTMENT, 1.31 M BELOW TOP OF CONCRETE END POST AND 63 CM NORTH OF SOUTH END OF BRIDGE.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

LICENSED PROFESSIONAL ENGINEER
Dec.20/23
A.E. KROETSCH
100072069
PROVINCE OF ONTARIO

NO.	DATE	REVISION DESCRIPTION	CH'KD
1.	2023/12/21	ISSUED FOR APPROVAL	A.E.K.

GM BluePlan
ENGINEERING

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
330 TRILLIUM DRIVE, UNIT D, KITCHENER, ON N2E 3J2
TEL: 519-748-1440 www.gmblueplan.ca

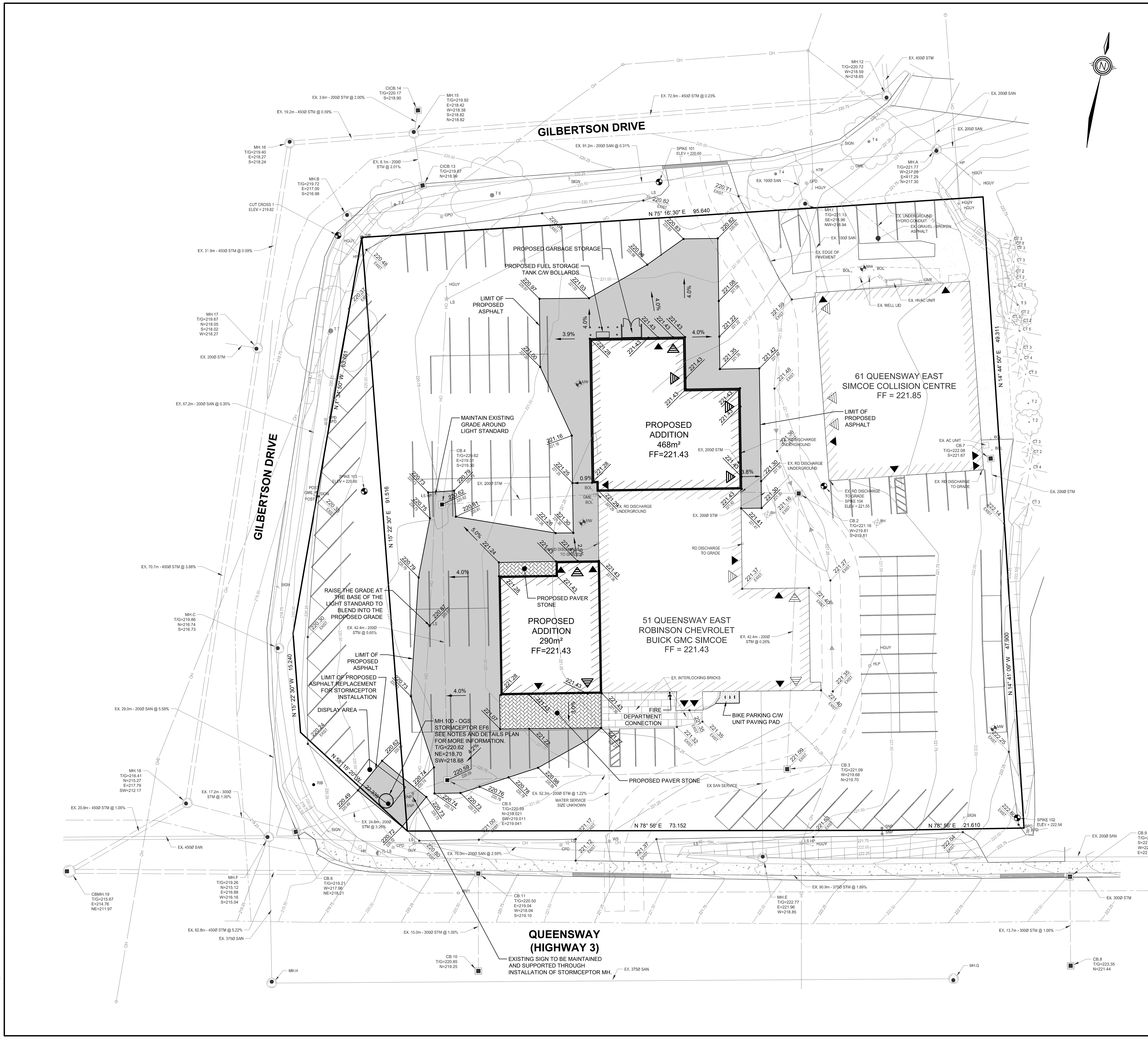
51 QUEENSWAY EAST

SRM ARCHITECTS AND URBAN DESIGNERS

TOWN OF SIMCOE

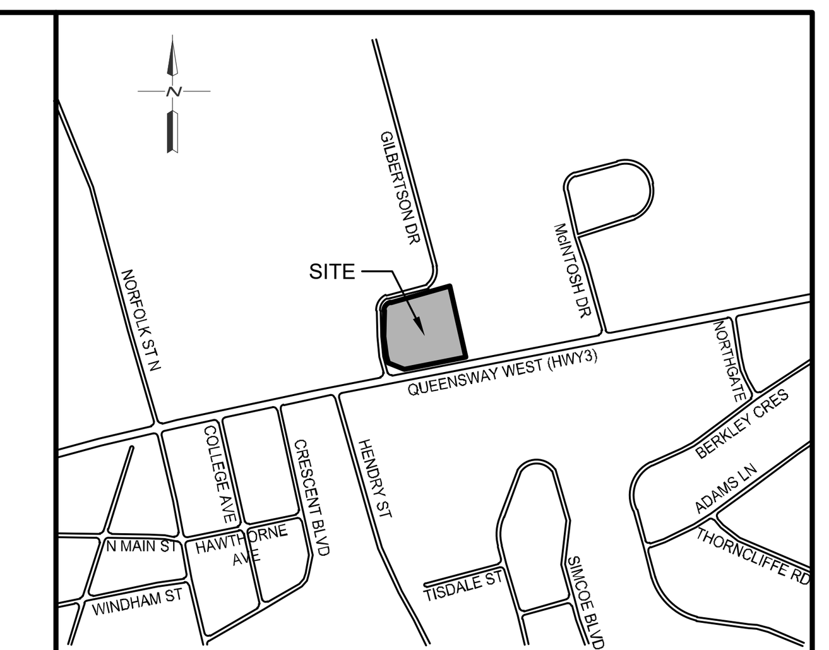
EXISTING CONDITIONS PLAN

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
E.B.	A.E.K.	423025	1
DESIGNED BY :	DATE :	SCALE :	
A.E.K.	DEC 2023	1:300	



LEGEND	
PROPERTY LINE	
EX. SANITARY SEWER	
EX. STORM SEWER	
EX. WATERMAIN	
EX. DITCH	
EX. BELL LINE	
EX. GAS LINE	
EX. FENCE LINE	
EX. CONTOURS	
EX. CATCH BASIN	CB
EX. FIRE HYDRANT	HYD
EX. LIGHT STANDARD	LS
HEDGE	
CONIFEROUS/DECIDUOUS TREES	
PROP. STORM SEWER	
PROP. CATCH BASIN	
PROP. SWALE	
PROPOSED GRADE EXISTING GRADE	
EXISTING GRADE	
TOP OF WALL GRADE	
BOTTOM OF WALL GRADE	
PROPOSED GRADE	
PROP. TOP OF CURB PROP. BOTTOM OF CURB	
PROPOSED SWALE GRADE	

NOTE:
SANITARY AND WATER SERVICES FOR THE PROPOSED BUILDING ADDITIONS TO BE PROVIDED VIA THE EXTENSION OF EXISTING SERVICES WITHIN THE 51 QUEENSWAY EAST BUILDING.



TOWN OF SIMCOE
KEY PLAN
NOT TO SCALE

NOTES :

1. TOPOGRAPHIC AND EXISTING FEATURE SURVEY COMPLETED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
2. EXISTING INFRASTRUCTURE INVERT WHERE SURVEYED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
3. MISSING EXISTING INFRASTRUCTURE INFORMATION WAS TAKEN FROM RECORD DRAWING NUMBER S-380 DATED MAY, 1978 PROVIDED BY NORFOLK COUNTY.
4. PROPOSED SITE PLAN PROVIDED BY SRM ARCHITECTS AND URBAN DESIGNERS DATED DECEMBER 21, 2023.

4 2 0 5 10 15
1:300 (m)

BENCH MARKS :

COSINE BENCHMARK 001972U330

BENCHMARK ELEVATION = 212.380

TOWNSHIP: SIMCOE NORFOLK STREET (HIGHWAY NO. 24) CONCRETE BRIDGE OVER A CREEK, 0.2 KM NORHT OF JUNCTION OF HIGHWAYS NO. 3 AND NO. 24, TABLET IN SOUTHEAST CONCRETE ABUTMENT, 1.31 M BELOW TOP OF CONCRETE END POST AND 63 CM NORTH OF SOUTH END OF BRIDGE.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

LICENSED PROFESSIONAL ENGINEER
Dec. 20/23
A.E. KROETSCH
100072069
PROVINCE OF ONTARIO

NO.	DATE	REVISION DESCRIPTION	CH'KD
1.	2023/12/21	ISSUED FOR APPROVAL	A.E.K.

GM BluePlan ENGINEERING
GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
330 TRILLIUM DRIVE, UNIT D, KITCHENER, ON N2E 3J2
TEL. 519-748-1440 www.gmblueplan.ca

51 QUEENSWAY EAST

SRM ARCHITECTS AND URBAN DESIGNERS

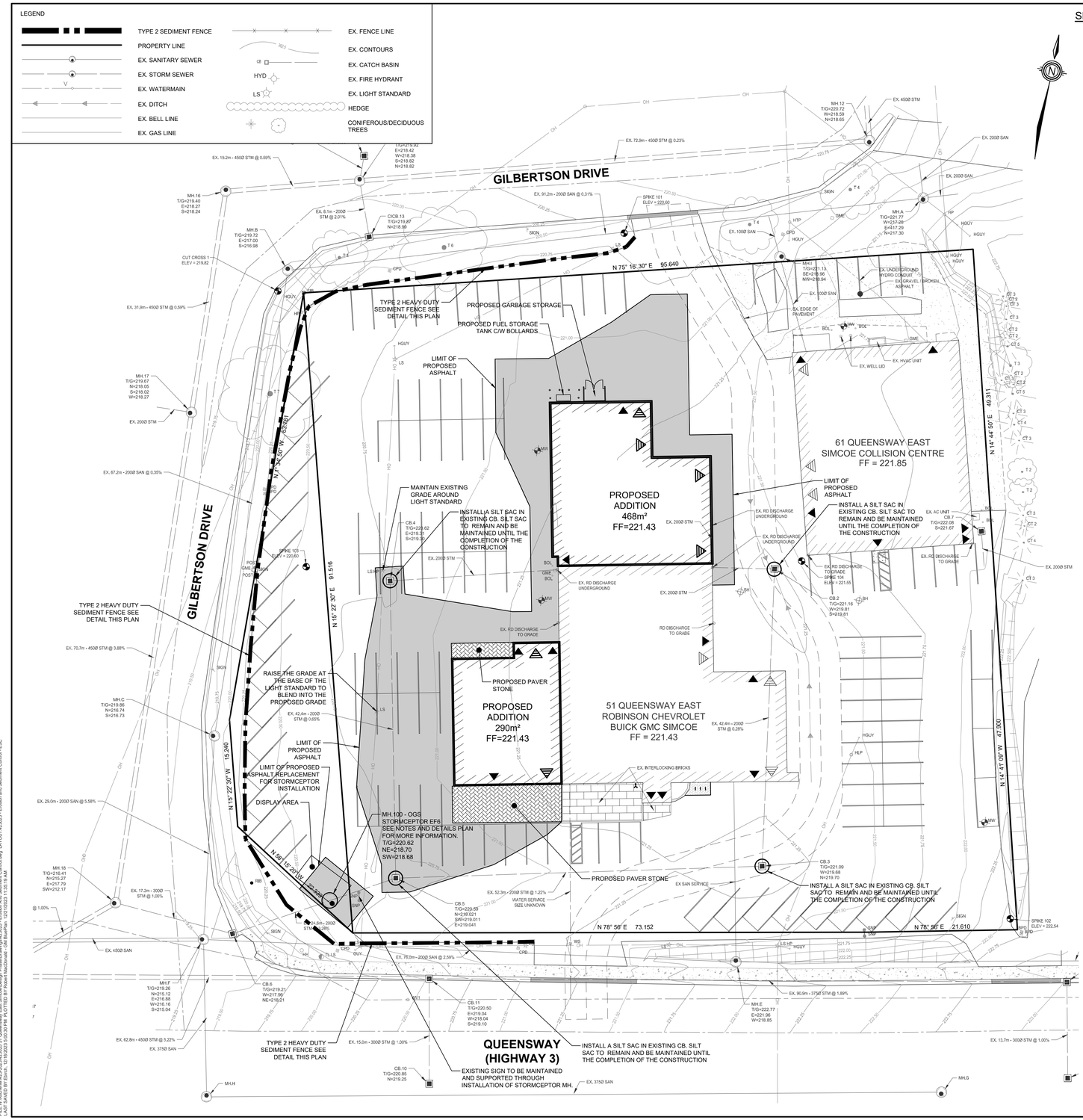
TOWN OF SIMCOE

SITE GRADING AND SERVICING PLAN

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
E.B.	A.E.K.	423025	2
DESIGNED BY :	DATE :	SCALE :	
A.E.K.	DEC 2023	1:300	

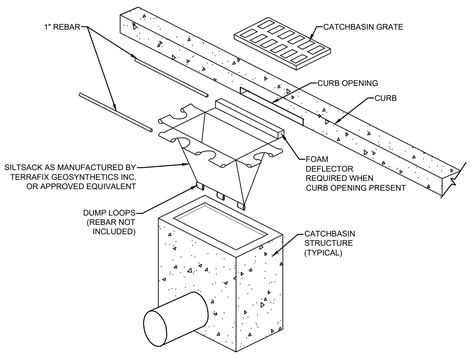
LEGEND

- TYPE 2 SEDIMENT FENCE
- PROPERTY LINE
- EX. SANITARY SEWER
- EX. STORM SEWER
- EX. WATERMAIN
- EX. DITCH
- EX. BELL LINE
- EX. GAS LINE
- EX. FENCE LINE
- EX. CONTOURS
- EX. CATCH BASIN
- EX. FIRE HYDRANT
- EX. LIGHT STANDARD
- HEDGE
- CONIFEROUS/DECIDUOUS TREES



SEDIMENT AND EROSION CONTROL NOTES

1. SITE WORKS ARE TO BE STAGED IN SUCH A MANNER THAT EROSION WILL BE MINIMIZED AND THAT BARRIERS AND SEDIMENTATION FACILITIES WITHIN THE SITE ARE PROVIDED TO CONTROL ANY EROSION THAT DOES OCCUR.
2. PRIOR TO THE ISSUANCE OF A BUILDING PERMIT, A SEDIMENT POND OR STORAGE AREA MUST BE ESTABLISHED TO COLLECT SURFACE DRAINAGE FROM ALL AREAS THAT WILL BE DISTURBED. WATER PUMPED FROM EXCAVATION OR DEWATERING OPERATIONS MUST BE DIRECTED TO THE SEDIMENT POND.
3. ALL SILT FENCING TO BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY GRADING EXCAVATION OR DEMOLITION.
4. CLEARING AND GRUBBING OF THE SITE SHOULD BE KEPT TO A MINIMUM AND VEGETATION REMOVED ONLY IN ADVANCED OF IMMEDIATE CONSTRUCTION.
5. STOCKPILES OF EARTH OR TOPSOIL ARE TO BE LOCATED AND PROTECTED TO MINIMIZE ENVIRONMENTAL INTERFERENCE. STOCKPILES SHOULD NOT BE LOCATED IMMEDIATELY ADJACENT TO DITCHES OR ROAD ALLOWANCES. EROSION CONTROL FENCING IS TO BE INSTALLED AROUND THE BASE OF ALL STOCKPILES. A PERIMETER DITCH LEADING TO A SETTLING AREA OR SEDIMENTATION TRAP SHOULD BE INSTALLED AROUND THE STOCKPILE.
6. EROSION PROTECTION TO BE PROVIDED AROUND ALL STORM AND SANITARY MANHOLES CATCH BASINS, DITCHES SWALES AND WATERCOURSES.
7. ADDITION EROSION CONTROL MEASURES MAY BE REQUIRED AS SITE DEVELOPMENT PROGRESSES. THE CONTRACTOR IS TO PROVIDE ALL ADDITIONAL EROSION CONTROL STRUCTURES.
8. THE DESIGN CONSULTANT IS TO MONITOR EROSION CONTROL STRUCTURES TO ENSURE FENCING IS INSTALLED AND MAINTENANCE IS PERFORMED TO CITY REQUIREMENTS.
9. EROSION CONTROL STRUCTURES ARE TO BE MONITORED REGULARLY AND ANY DAMAGE TO STRUCTURES REPAIRED IMMEDIATELY. SEDIMENTS ARE TO BE REMOVED WHEN ACCUMULATIONS REACH A MAXIMUM OF 50% OF THE FENCE. CLOGGED FILTER MATERIALS SUCH AS CRUSHED STONE, STRAW BALES OR FILTER CLOTH MUST BE REPLACED AS REQUIRED.
10. ALL EROSION CONTROL STRUCTURES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
11. NO ALTERNATIVE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE DESIGN CONSULTANT AND THE TOWNSHIP.
12. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT MUNICIPAL ROADWAYS AND SIDEWALKS AREA CLEANED OF ALL SEDIMENTS FROM VEHICULAR TRACKING ETC. TO AND FROM THE SITE AT THE END OF EACH WORK DAY.
13. ALL DISTURBED AREAS NOT INCLUDED IN CONSTRUCTION TO BE RE-TOPSOILED AND RE-SEEDED IMMEDIATELY AFTER COMPLETION OF AREA GRADING.

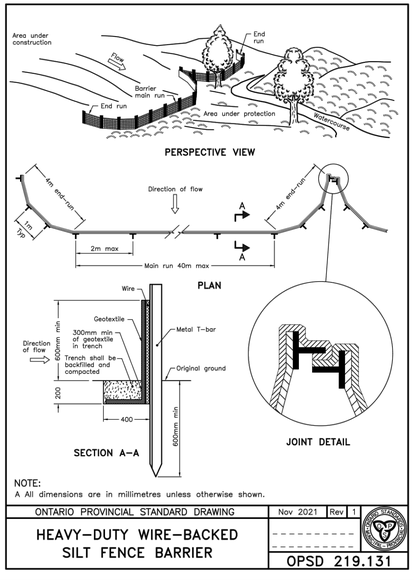


TYPE 'B'

1. REFER TO MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION AND MAINTENANCE PROCEDURES.

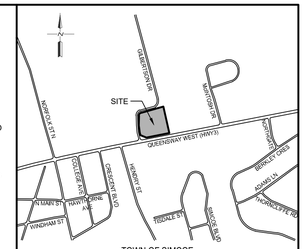
SILTSACK DETAIL

N.T.S.



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

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	1
HEAVY-DUTY WIRE-BACKED SILT FENCE BARRIER	OPSD 219.131		



TOWN OF SIMCOE
KEY PLAN
NOT TO SCALE

NOTES :

1. TOPOGRAPHIC AND EXISTING FEATURE SURVEY COMPLETED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
2. EXISTING INFRASTRUCTURE INVERT WHERE SURVEYED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
3. MISSING EXISTING INFRASTRUCTURE INFORMATION WAS TAKEN FROM RECORD DRAWING NUMBER S-380 DATED MAY, 1978 PROVIDED BY NORFOLK COUNTY.
4. PROPOSED SITE PLAN PROVIDED BY SRM ARCHITECTS AND URBAN DESIGNERS DATED DECEMBER 21, 2023.

4 2 0 5 10 15
1:300 (m)

BENCH MARKS :

COSINE BENCHMARK 001972U330

BENCHMARK ELEVATION = 212.380

TOWNSHIP: SIMCOE NORFOLK STREET (HIGHWAY NO. 24) CONCRETE BRIDGE OVER A CREEK, 0.2 KM NORHT OF JUNCTION OF HIGHWAYS NO. 3 AND NO. 24, TABLET IN SOUTHEAST CONCRETE ABUTMENT, 1.31 M BELOW TOP OF CONCRETE END POST AND 63 CM NORTH OF SOUTH END OF BRIDGE.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

LICENSED PROFESSIONAL ENGINEER
Dec. 20/23
A.E. KROETSCH
100072069
PROVINCE OF ONTARIO

NO.	DATE	REVISION DESCRIPTION	CHKD
1.	2023/12/21	ISSUED FOR APPROVAL	A.E.K.

GM BluePlan ENGINEERING
GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
330 TRILLIUM DRIVE, UNIT D, KITCHENER, ON N2E 3J2
TEL. 519-748-1440
www.gmblueplan.ca

51 QUEENSWAY EAST

SRM ARCHITECTS AND URBAN DESIGNERS

TOWN OF SIMCOE

EROSION AND SEDIMENT CONTROL PLAN

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
E.B.	A.E.K.	423025	3
DESIGNED BY :	DATE :	SCALE :	
A.E.K.	DEC 2023	1:300	

FILE:W:\Kitchener\423-2023\423025 51 Queensway East Simcoe\Design Phase\Drawings\423025 - Erosion And Sediment Control.dwg LAYOUT:423025 - Erosion and Sediment Control - ESC
LAST SAVED BY:Eboon, 12/19/2023 8:00:30 PM PLOTTED BY:Robert MacDonald - GM BluePlan, 12/21/2023 11:26:19 AM

GENERAL NOTES

1. DRAWINGS ARE NOT TO BE SCALED.
2. ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON THE SITE PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER BEFORE PROCEEDING.
3. UNLESS OTHERWISE NOTED ON THE DRAWINGS THE STANDARD TOWNSHIP, REGION (OR COUNTY), MTO AND OPSD DRAWINGS AND OPSS ARE TO CONSTITUTE PART OF THIS CONTRACT AND DRAWINGS.
4. REFER TO O.B.C. - 2012 STANDARDS AND SPECIFICATIONS AND TOWNSHIP SPECIFICATIONS AND STANDARD DRAWINGS FOR LIST OF APPROVED MANUFACTURERS AND MATERIALS.
5. EXISTING STRUCTURES ARE NOT TO BE DISTURBED, NOR ENCROACH ON ADJACENT PROPERTIES UNLESS INSTRUCTED BY THE ENGINEER.
6. THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNERS CONTRACTOR FROM OBTAINING, BUT NOT LIMITED TO THE FOLLOWING PERMITS, ROAD CUTS, SEWER PERMITS, RELOCATION OF SERVICES, ENCROACHMENT AGREEMENTS, APPROACH APPROVAL PERMITS, ETC.
7. PRIOR TO CONSTRUCTION, THE ENGINEER IS TO BE NOTIFIED BY THE OWNER AND THE CONTRACTOR AS TO THE EXTENT OF THE CONSTRUCTION LIMITS THEY PROPOSE. THE TOWNSHIP, BUILDING AND PLUMBING OFFICIALS ARE TO BE NOTIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE SERVICING PLANS, LANDSCAPE PLAN, SITE ELECTRICAL PLANS, AND ANY OTHER PLANS OR DRAWINGS WHICH DEPICT WORKS THAT ARE PROPOSED FOR THIS SITE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS. ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS FOR THE TOWNSHIP AND THE MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR ONTARIO.
10. THE CONTRACTOR SHALL ENDEAVOUR TO PREVENT MUD TRACKING ONTO EXISTING RIGHT-OF-WAYS AND SHALL PROVIDE FOR CLEANUP AT HIS OWN EXPENSE AS DIRECTED BY THE TOWNSHIP. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO CONTROL DUST ON THE PROJECT AND HE SHALL PROVIDE CONTROLLING MEASURES AS DIRECTED BY THE TOWNSHIP.
11. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES PRIOR TO AND DURING CONSTRUCTION. LOCATION OF EXISTING UTILITIES TO BE VERIFIED IN THE FIELD.
12. ALL SERVICES AND/OR UTILITIES LOCATED ON CONCRETE SIDEWALKS OR CURBS TO BE ISOLATED FROM THE SIDEWALK OR CURB AS PER OPSD 310.040.
13. ALL UTILITIES SHALL BE LOCATED, SUPPORTED AND PROTECTED TO THE SATISFACTION OF THE UTILITY COMPANY DURING THE CONSTRUCTION PERIOD.
14. THE CONTRACTOR SHALL RECTIFY ALL DISTURBED AREAS TO ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF THE TOWNSHIP.
15. THE CONTRACTOR IS TO OBTAIN, AND PAY FOR ANY NECESSARY PERMITS FOR ANY MUNICIPAL ROAD CUTS FOR THE INSTALLATION OF SANITARY, STORM, AND WATER SERVICE CONNECTIONS. ROAD CUTS TO BE RESTORED AS PER TOWNSHIP SATISFACTION.
16. BLASTING WILL NOT BE ALLOWED UNLESS AUTHORIZED BY THE TOWNSHIP.
17. ANY UTILITY RELOCATIONS DUE TO THIS DEVELOPMENT TO BE UNDERTAKEN AT THE EXPENSE OF THE OWNER/DEVELOPER.
18. ALL DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF SERVICE AND THE PROPERTY OF THE ENGINEER WHICH MUST BE RETURNED AT THE COMPLETION OF WORK.
19. DRIVEWAYS SHALL BE SETBACK A MINIMUM CLEARANCE OF 1.0m FROM ALL ABOVEGROUND SERVICES OR OTHER OBSTRUCTIONS.
20. ALL CONSTRUCTION WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
21. ANY CONFLICTS WITH EXISTING SERVICES SHALL BE RECTIFIED AT THE OWNER'S EXPENSE.

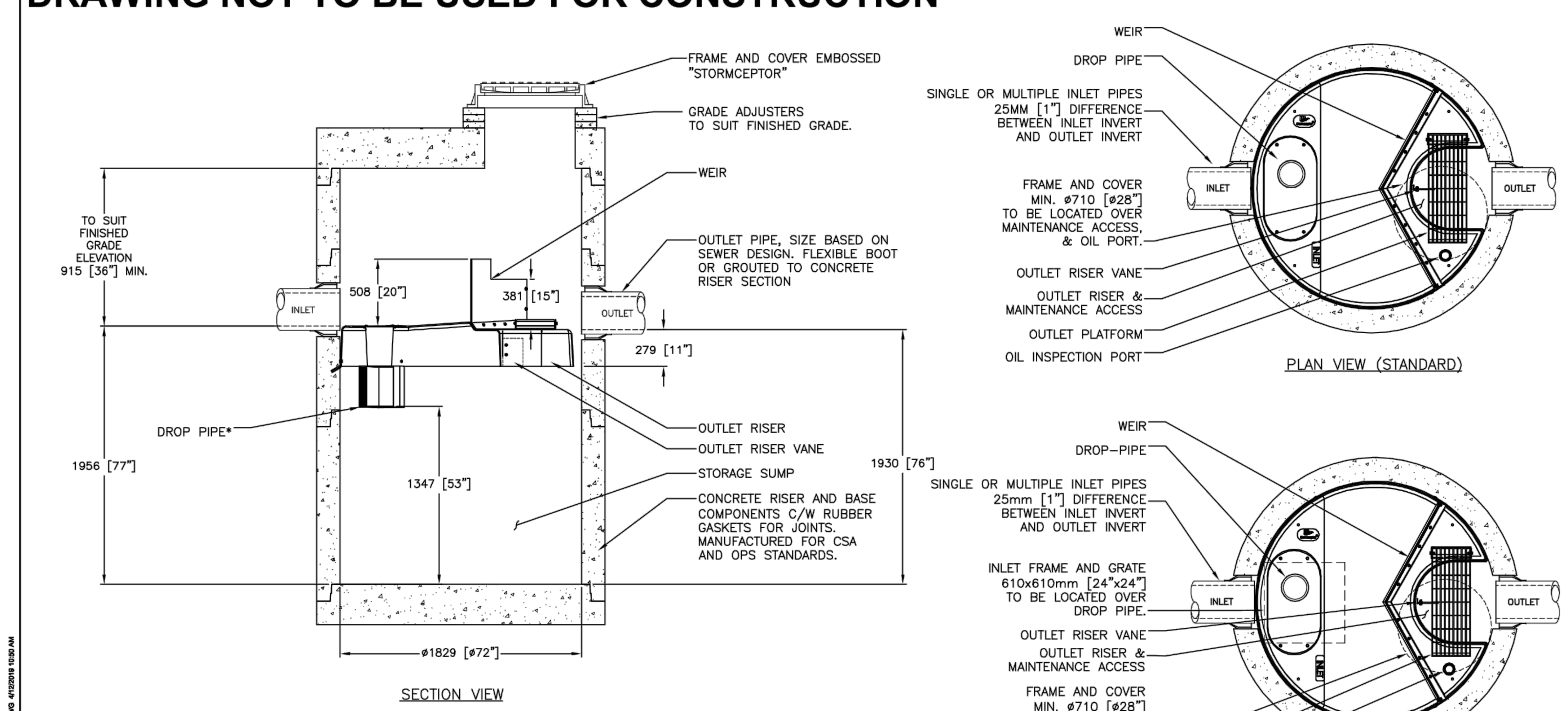
GRADING

1. THE GRADING PLAN IS TO BE READ WITH THE SITE SERVICES DRAWINGS.
2. CONTRACTOR TO RESTORE AREAS ON PUBLIC R.O.W. OR ADJACENT LANDS THAT HAVE BEEN DISTURBED DURING CONSTRUCTION.
3. ALL DRIVEWAY AND GRADING MATERIAL AND CONSTRUCTION METHODS MUST CONFORM TO CURRENT TOWNSHIP STANDARDS AND SPECIFICATIONS.
4. ALL FILL WITHIN THE SITE TO BE COMPACTED TO A MIN. OF 98% Std. PROCTOR DRY DENSITY. ALL FILL WITHIN THE SITE PARKING AREA TO BE COMPACTED TO A MIN. OF 95% SPD. THE SUITABILITY OF ALL FILL MATERIALS ARE TO BE CONFIRMED BY A RECOGNIZED SOILS CONSULTANT TO THE DIRECTOR OF PUBLIC WORKS PRIOR TO INSTALLATION OF ANY ROAD BASE MATERIALS.
5. LANDSCAPING SHALL NOT ENCROACH ON BOULEVARD NOR SHALL BOULEVARD GRADES BE ALTERED.
6. SILT FENCE(S) TO BE INSTALLED AND MAINTAINED TO PREVENT SILT FLOWING ONTO ADJACENT LANDS. SILTATION CONTROL SHALL BE ERECTED PRIOR TO ANY GRADING OR CONSTRUCTION AND SHALL BE IN GOOD REPAIR THROUGHOUT THE CONSTRUCTION AND GRADING PHASES.
7. ANY CHANGES IN GRADES, CATCH BASINS, SERVICES LATERALS, STORM AND SANITARY SEWERS REQUIRE THE APPROVAL OF GM BLUEPLAN ENGINEERING LIMITED.
8. THE CONTRACTOR SHALL RECTIFY ALL DISTURBED AREAS TO ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF GM BLUEPLAN ENGINEERING LIMITED.
9. ALL LANDSCAPING TO BE INSTALLED AS SOON AS POSSIBLE OR PRIOR TO THE END OF THE FIRST GROWING SEASON. LANDSCAPING TO BE MAINTAINED UNTIL IT IS ESTABLISHED.
10. ALL COMPACTION TO BE CERTIFIED BY A GEOTECHNICAL CONSULTANT.
11. ALL CURBS ARE TO BE 150mm ABOVE THE PROPOSED GUTTER LINE (G/L) UNLESS NOTED OTHERWISE.
12. PAVEMENT GRADE SHALL BE MIN. 0.5%, MAX. 8%.
13. DRAINAGE SWALE GRADE SHALL BE MIN. 2%, MAX. 6%.
14. SLOPES IN LANDSCAPE AREAS AND ON BERMS SHALL NOT EXCEED 3 HORIZONTAL TO 1 VERTICAL, UNLESS NOTED OTHERWISE.

GENERAL TESTING AND INSPECTION NOTES

1. TESTING OF ALL SERVICES BY GENERAL CONTRACTOR.
2. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CONTACTING GM BLUEPLAN ENGINEERING LIMITED FOR THE COMPLETION OF ALL REQUIRED SITE INSPECTIONS.
3. ALL STORM SEWERS ARE TO BE MANDREL TESTED PRIOR TO FINAL ACCEPTANCE BY THE ENGINEER. ALL MANDREL TESTING AS PER OPSS 410.
4. ALL STORM REQUIRE FIELD INSPECTION BY THE SITE SERVICING ENGINEERING DURING INSTALLATION INSPECTION SERVICES REQUIRE A MINIMUM OF 4 HOURS NOTICE.

DRAWING NOT TO BE USED FOR CONSTRUCTION



GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF6 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO6 (OIL CAPTURE CONFIGURATION).

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

INSTALLATION NOTES

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

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).

STANDARD DETAIL NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EF6				
STRUCTURE ID					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

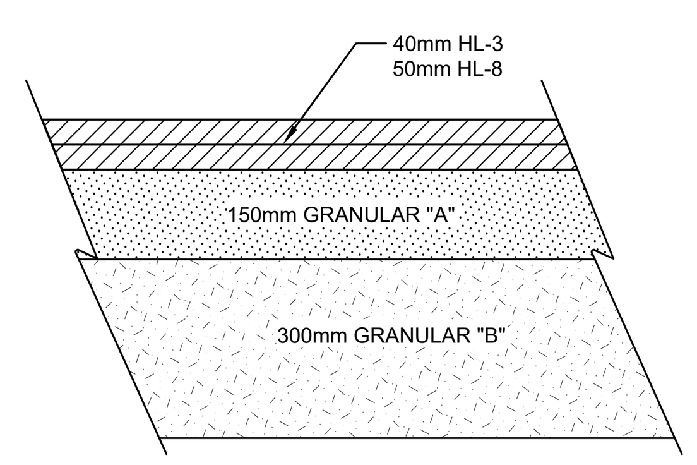
* PER ENGINEER OF RECORD

Stormceptor® EF — SCALE = NTS

imbrium® — 407 FAIRVIEW DRIVE, WHITBY, ON L1N 3A9 — TF 800-565-4801 CA 416-960-9900 INTL +1-416-960-9900

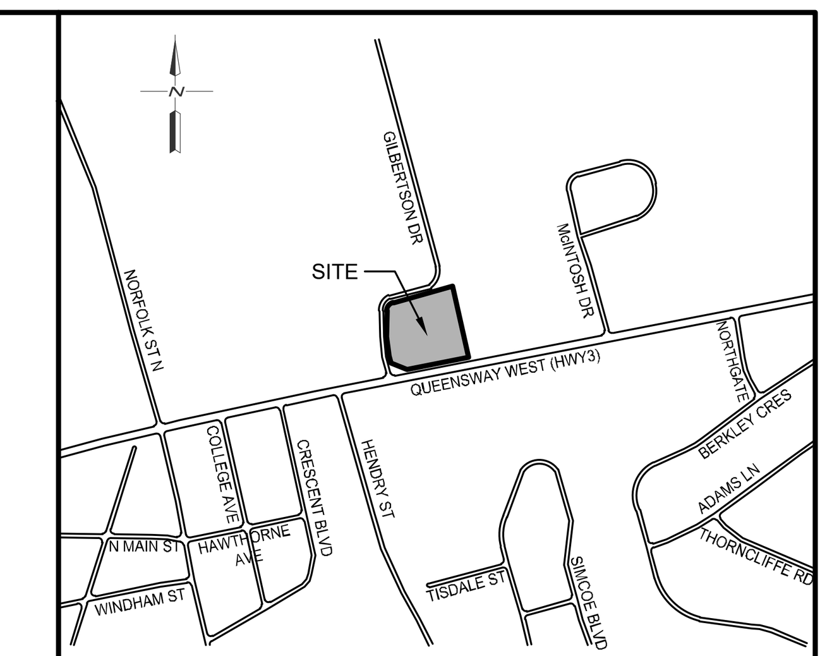
1	6/8/18	OUTLET PLATFORM
0	5/26/17	INITIAL RELEASE
MARK	DATE	REVISION DESCRIPTION

DATE: 5/26/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EF6	SEQUENCE No.: *
SHEET: 1 OF 1	



ASPHALT PAVEMENT (LIGHT DUTY)

N.T.S.



TOWN OF SIMCOE

KEY PLAN

NOT TO SCALE

NOTES :

1. TOPOGRAPHIC AND EXISTING FEATURE SURVEY COMPLETED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
2. EXISTING INFRASTRUCTURE INVERT WHERE SURVEYED BY GM BLUEPLAN ENGINEERING ON MAY 5, 2022.
3. MISSING EXISTING INFRASTRUCTURE INFORMATION WAS TAKEN FROM RECORD DRAWING NUMBER S-380 DATED MAY, 1978 PROVIDED BY NORFOLK COUNTY.
4. PROPOSED SITE PLAN PROVIDED BY SRM ARCHITECTS AND URBAN DESIGNERS DATED DECEMBER 21, 2023.

4 2 0 5 10 15
1:300 (m)

BENCH MARKS :

COSINE BENCHMARK 001972U330

BENCHMARK ELEVATION = 212.380

TOWNSHIP: SIMCOE NORFOLK STREET (HIGHWAY NO. 24) CONCRETE BRIDGE OVER A CREEK, 0.2 KM NORHT OF JUNCTION OF HIGHWAYS NO. 3 AND NO. 24, TABLET IN SOUTHEAST CONCRETE ABUTMENT, 1.31 M BELOW TOP OF CONCRETE END POST AND 63 CM NORTH OF SOUTH END OF BRIDGE.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

LICENSED PROFESSIONAL ENGINEER — Dec. 20/23 — A.E. KROETSCH — 100072069 — PROVINCE OF ONTARIO

NO.	DATE	REVISION DESCRIPTION	CH'KD
1.	2023/12/21	ISSUED FOR APPROVAL	A.E.K.

GM BluePlan ENGINEERING

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
330 TRILLIUM DRIVE, UNIT D, KITCHENER, ON N2E 3J2
TEL: 519-748-1440 www.gmblueplan.ca

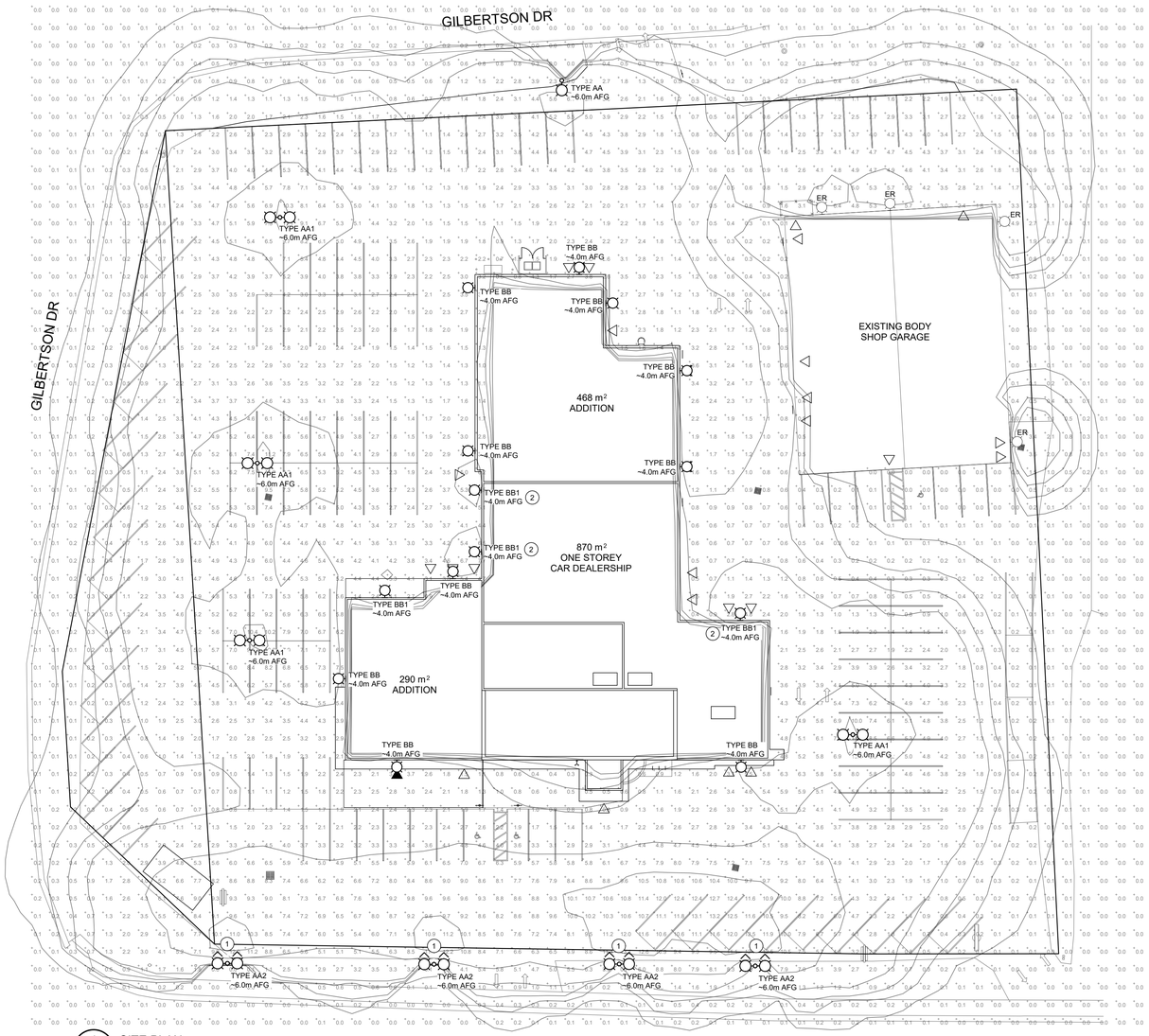
51 QUEENSWAY EAST

SRM ARCHITECTS AND URBAN DESIGNERS

TOWN OF SIMCOE

NOTES AND DETAILS PLAN

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
E.B.	A.E.K.	423025	4
DESIGNED BY :	DATE :	SCALE :	
A.E.K.	DEC 2023	AS NOTED	



1 SLP-1 SITE PLAN
SCALE: 1:300

SITE PLAN NOTES

GENERAL

A. COORDINATE EXACT LOCATIONS OF LIGHT STANDARDS WITH SITE SERVICES, DRIVEWAYS, AND OTHER FEATURES.

B. COORDINATE MOUNTING HEIGHTS WITH FINAL GRADE AND ARCHITECTURAL ELEVATIONS.

C. MOUNTING HEIGHT OF EXTERIOR LIGHT FIXTURES IS FROM CENTRELINE OF EQUIPMENT TO AVERAGE GRADE HEIGHT UNLESS SPECIFIED OR INDICATED OTHERWISE. CONFIRM ALL HEIGHTS AND LOCATIONS WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN.

D. POLE MOUNTED LIGHT FIXTURES TO REPLACE EXISTING POLE MOUNTED LIGHT FIXTURES ON EXISTING POLES. INSTALL FIXTURES AT SAME MOUNTING HEIGHT AND ORIENTATION AS EXISTING FIXTURES.

SPECIFIC

1. ARROW INDICATES DIRECTION OF ROTATED OPTICS. COORDINATE EXACT INSTALLATION LOCATIONS ON SITE.
2. NOTED WALL MOUNTED LIGHT FIXTURE TO REPLACE EXISTING WALL MOUNTED LIGHT FIXTURE. INSTALL FIXTURE AT SAME MOUNTING HEIGHT AND ORIENTATION AS EXISTING FIXTURE.

LEGEND

SYMBOL	DESCRIPTION
X	WALL MOUNTED LIGHT FIXTURE (AS PER SCHEDULE)
X X	POLE MOUNTED LIGHT FIXTURE (AS PER SCHEDULE)

THIS DRAWING INDICATES ALL PROPOSED OUTDOOR LIGHTING FIXTURES FOR THIS DEVELOPMENT. THE PROPOSED LIGHTING DISTRIBUTION PATTERN WILL NOT CAUSE VEILING LUMINANCE (DISABILITY GLARE), THAT THERE WILL BE NO SIGNIFICANT ENCROACHMENT OF LIGHT (0.5 FOOTCANDLES OR GREATER) OR OBJECTIONABLE GLARE UPON ANY ADJACENT PROPERTY AND THAT VISIBILITY OF LIGHT SOURCES FROM ANY RESIDENTIAL SITE HAVE BEEN MINIMIZED WHERE POSSIBLE SO AS NOT TO CREATE A NUISANCE.

SIGNATURE OF DESIGN PROFESSIONAL

LIGHTING FIXTURE SCHEDULE

FIXTURE	MANUFACTURER & CATALOG NO.	LAMPS LAMP COLOUR VOLTAGE/BALLAST	FINISH MOUNTING HEIGHT	FIXTURE DESCRIPTION
AA	LITHONIA CAT.# DSX1-LED-P10-30K-TFTM-MVOLT-HSS	156W 16,116 lm LED 3000°K 120V	TBD POLE ~6.0m AFG	POLE MOUNTED LED LUMINAIRE WITH FORWARD THROW DISTRIBUTION WITH SPILL CONTROL AND EXTERNAL HOUSE SIDE SHIELD. MOUNTED ON EXISTING TO REMAIN POLE IN SAME LOCATION AND HEIGHT AS PREVIOUS LUMINAIRE. ARCHITECT TO SELECT STANDARD FINISHES.
AA1	LITHONIA CAT.# DSX1-LED-P10-30K-TFTM-MVOLT	156W 16,116 lm LED 3000°K 120V	TBD POLE ~6.0m AFG	TWIN HEAD POLE MOUNTED LED LUMINAIRE WITH FORWARD THROW DISTRIBUTION WITH SPILL CONTROL. MOUNTED ON EXISTING TO REMAIN POLE IN SAME LOCATION AND HEIGHT AS PREVIOUS LUMINAIRE. ARCHITECT TO SELECT STANDARD FINISHES.
AA2	LITHONIA CAT.# DSX1-LED-P10-30K-TFTM-MVOLT-HSS-L90	156W 16,116 lm LED 3000°K 120V	TBD POLE ~6.0m AFG	TWIN HEAD POLE MOUNTED LED LUMINAIRE WITH FORWARD THROW DISTRIBUTION WITH SPILL CONTROL, EXTERNAL HOUSE SIDE SHIELD, AND ROTATED OPTICS. MOUNTED ON EXISTING TO REMAIN POLE IN SAME LOCATION AND HEIGHT AS PREVIOUS LUMINAIRE. ARCHITECT TO SELECT STANDARD FINISHES. REFER TO DRAWINGS FOR ORIENTATION OF OPTICS.
BB	LITHONIA CAT.# WDGE2-LED-P4-30K-90CRI-T4M	46W 3,978 lm LED 3000°K 120V	TBD WALL AS NOTED	WALL MOUNTED LED LUMINAIRE WITH TYPE 4 DISTRIBUTION WITH BACK-LIGHT CONTROL. ARCHITECT TO SELECT STANDARD FINISH. COORDINATE MOUNTING HEIGHT AND PLACEMENT WITH ARCHITECTURAL ELEVATIONS.
BB1	LITHONIA CAT.# WDGE1-LED-P1-30K-90CRI	12W 1,529 lm LED 3000°K 120V	TBD WALL AS NOTED	WALL MOUNTED LED LUMINAIRE WITH FORWARD THROW DISTRIBUTION WITH BACK LIGHT CONTROL. ARCHITECT TO SELECT STANDARD FINISH. COORDINATE MOUNTING HEIGHT AND PLACEMENT WITH ARCHITECTURAL ELEVATIONS. NOTED FIXTURES MOUNTED IN SAME LOCATION AND HEIGHT AS PREVIOUS LUMINAIRE.

TYPE AA, AA1, AND AA2 POLE MOUNTED FIXTURES

TYPE BB WALL MOUNTED FIXTURE

TYPE BB1 WALL MOUNTED FIXTURE

NOTE TO CONTRACTORS:

DO NOT SCALE DRAWINGS.

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS. ALL CONDUIT RUNS AND EQUIPMENT LOCATIONS ARE TO BE COORDINATED WITH STRUCTURAL ELEMENTS AND MECHANICAL EQUIPMENT.

THE DRAWINGS ARE TO BE READ AND DESIGNED IN CONJUNCTION WITH THE SPECIFICATIONS.

ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED, REUSED, OR MODIFIED WITHOUT THE ENGINEER'S WRITTEN PERMISSION.

NO.	DATE	REVISION
01	19 DEC 2023	FOR SPA

LICENSED PROFESSIONAL ENGINEER
23.12.19
J. B. ACRI
100057613
PROVINCE OF ONTARIO

PROJECT NORTH
TRUE NORTH

FORTECH ENGINEERING
202-420 Sheldon Dr. P 519-745-2900
Cambridge, ON JAcri@FortechEng.com
N1T 2H9

PROJECT # 16016

PROJECT
ROBINSON CHEVROLET ADDITION
51 Queensway E., Simcoe, ON

DRAWING NAME
SITE LIGHTING PLAN

PLOT DATE	DRAWN BY
19 DEC 2023	N.Drummond
SCALE	CHECKED BY
AS NOTED	J. Acri
JOB NO.	DWG NO.
22071	SLP-1

Rahwa Mohamed

From: Brett Hamm <Brett.Hamm@norfolkcounty.ca>
Sent: Wednesday, March 8, 2023 10:36 AM
To: Rahwa Mohamed
Cc: Tim Dickhout
Subject: RE: 51 Queensway E., Simcoe (Robinson Chevrolet) - Engineering Pre-Con. Comments
Attachments: ISMP Appendix J - TIS Guidelines.pdf

Good morning,

After discussion and reconsideration , Development Engineering has agreed that a full Traffic Impact Study is not required for this application. Instead, a Traffic Impact Brief will be adequate due to the conditions of the site and the consistency of trips to/from the location.

The conditions have been updated accordingly and requirements for a brief are as follows:

As per Norfolk County's ISMP Appendix J - TIS Guidelines, a traffic impact brief will be required. The following sections of the Appendix J - TIS Guidelines will need to be adhered to:

a. Section A1.3 – Existing Conditions;
b. Section A1.4 – Study Area;
c. Section A1.5 – Development Land Use Type & Site Plan;
    i. This should include vehicular turning movements, demonstrating that the entrances are designed to accommodate the anticipated vehicular traffic without causing undue interference with the traffic flow on the street.
    ii. Sightlines;
d. Conclusions and Recommendations.

I can also confirm that the attached document has the correct appendix J included within, however, I have attached a condensed version which may be more convenient.

If there's anything else I can do for you, feel free to reach out.

Thanks,
Brett

Brett Hamm
Junior Development Technologist
Engineering
185 Robinson St., Simcoe, Ontario, N3Y 5L6
519-426-5870 x. 1081

Working together with our community

From: Rahwa Mohamed <rmohamed@srmarchitects.ca>
Sent: Thursday, February 23, 2023 10:57 AM
To: Tim Dickhout <tim.dickhout@norfolkcounty.ca>; Stephen Gradish <stephen.gradish@norfolkcounty.ca>
Cc: Tracey Swift <tswift@srmarchitects.ca>
Subject: FW: 51 Queensway E., Simcoe (Robinson Chevrolet) - Engineering Pre-Con. Comments

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning Tim, Stephen,

With Zeel out of the office, I was wondering if you could assist me with the below request for 51 Queensway E., Simcoe. Zeel provided the following pre-consultation comment, indicating that a Traffic Impact Study is required:

- "As per Norfolk County's Integrated Sustainable Master Plan (ISMP) – Appendix J: Traffic Impact Study (TIS) Guidelines, a Traffic Impact Study is required."

Would either of you be able to indicate what the concern is regarding the site's traffic or narrow down the scope of this comment? In addition, please confirm that this is Norfolk County's Appendix J.

Attached are the pre-consultation comments provided for 51 Queensway E., Simcoe.

Kind Regards,

Rahwa Mohamed

srm Architects Inc.
279 King Street West, Suite 200
Kitchener, Ontario N2G 1B1

t: 519.885.5600 x265

Any documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is strictly prohibited without written permission.

From: Rahwa Mohamed
Sent: February 15, 2023 11:32 AM
To: Zeel.Joshi@norfolkcounty.ca
Cc: Tracey Swift <tswift@srmarchitects.ca>
Subject: 51 Queensway E., Simcoe (Robinson Chevrolet) - Engineering Pre-Con. Comments

Good Morning Zeel,

Regarding 51 Queensway E., Simcoe, you provided the following pre-consultation comment, indicating that a Traffic Impact Study is required:

- "As per Norfolk County's Integrated Sustainable Master Plan (ISMP) – Appendix J: Traffic Impact Study (TIS) Guidelines, a Traffic Impact Study is required."

Would you be able to indicate what your concern is regarding the site's traffic or narrow down the scope of this comment? In addition, please confirm that this is Norfolk County's Appendix J.

Attached are the pre-consultation comments provided for 51 Queensway E., Simcoe.

Kind Regards,

Rahwa Mohamed

srm Architects Inc.
279 King Street West, Suite 200
Kitchener, Ontario N2G 1B1

t: 519.885.5600 x265

Any documents remain the property of the architect. Unauthorized use, modification, and/or reproduction of these documents is strictly prohibited without written permission.

Disclaimer: This e-mail and any attachments may contain personal information or information that is otherwise confidential and it's intended for the exclusive use of the intended recipient. If you are not the intended recipient, any use, disclosure or copying of any part of it is prohibited. Norfolk County accepts no liability for damage caused by any virus transmitted in this message. If this e-mail is received in error, please immediately reply and delete or destroy any copies of it. The transmission of e-mails between an employee or agent of Norfolk County and a third party does not constitute a binding contract without the express written consent of an authorized representative of The Corporation of Norfolk County.

PHASE 2 ENVIRONMENTAL SITE ASSESSMENT

51-61 QUEENSWAY EAST,
SIMCOE, ONTARIO

FOR
ROBINSON BUICK GMC
875 WOODLAWN ROAD WEST,
GUELPH, ON.,
ATTN: MR. TED KOHLI

BY:

BLUEWATER GEOSCIENCE
CONSULTANTS INC.
42 SHADYRIDGE PLACE
KITCHENER, ON

PROJECT NO.: BG-804

JANUARY 2022

BLUEWATER
GEOSCIENCE CONSULTANTS INC

BLUEWATER GEOSCIENCE
CONSULTANTS INC.

42 Shadyridge Place
Kitchener, Ontario
N2N 3J1

Tel: (519) 744-4123
www.bluewatergeoscience.ca
E-mail: blemieux@rogers.com

January 11, 2022

Robinson Buick GMC,
875 Woodlawn Road West,
Guelph, ON.
Attn: Mr. Ted Kohli

Dear Mr. Kohli:

Re: Phase 2 Environmental Site Assessment,
51-61 Queensway East,
Simcoe, Ontario

Bluewater Geoscience Consultants Inc. (Bluewater) was retained by Mr. Ted Kohli of Robinson Buick GMC (the client and potential property purchaser) to complete a Phase 2 Environmental Site Assessment (ESA) for an industrial/commercial property located at 51-61 Queensway East in Simcoe, Ontario. The Client is considering purchasing the property and wishes to determine environmental conditions as part of their pre-purchase due diligence and for financing purposes. The purpose of the Phase 2 ESA was to investigate potential environmental liabilities associated with the current and historic land uses on and around the property as identified in a Phase 1 ESA completed for the site. The Client has related that a Record of Site Condition (RSC) is not required for the property.

The scope of work, observations, analytical test results and our conclusions and recommendations for this investigation are presented in the following report. This report may be relied upon by Robinson Buick GMC. Based on the information determined during this Phase 2 ESA, there was no soil or groundwater impacts identified at concentrations in excess of the applicable Table 2 ICC Site Condition Standard at the subject property. The site is considered suitable for on-going ICC land use.

We trust that this report is complete within our terms of reference and suitable for your present requirements. If you have any questions or require further information, please do not hesitate to contact our office.

Sincerely,
BLUEWATER GEOSCIENCE CONSULTANTS INC.

B. Lemieux

Breton J. Lemieux, M.Sc., P.Geo. QP_{ESA}
President, Senior Geoscientist

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

Bluewater Geoscience Consultants Inc. (Bluewater) was retained by Mr. Ted Kohli of Robinson Buick GMC (the client and potential property purchaser) to complete a Phase 2 Environmental Site Assessment (ESA) for an industrial/commercial property located at 51-61 Queensway East in Simcoe, Ontario. The Client is considering purchasing the property and wishes to determine environmental conditions as part of their pre-purchase due diligence and for financing purposes. The purpose of the Phase 2 ESA was to investigate potential environmental liabilities associated with the current and historic land uses on and around the property as identified in a Phase 1 ESA completed for the site. The Client has related that a Record of Site Condition (RSC) is not required for the property.

This investigation was conducted in general accordance with the Ministry of the Environment, Conservation and Parks (MECP) "Guideline for Use at Contaminated Sites in Ontario" (GUCSO) (September 1998) and relevant portions of Ontario Regulation 153/04 (as amended Ont. Reg. 511/09) requirements and protocols in order to assess the current environmental condition of the subject property with regards to the on-going use of the property. During the current investigation, observations were made concerning the subject property and surrounding areas. The subject property is currently and historically in industrial/commercial land use and no change in land use is being considered. The site is not considered a sensitive environmental site. The Site and surrounding properties obtain their potable water supply from a municipal supply that is derived from groundwater sources. Based on the conditions encountered, the Site Condition Standard (SCS) applicable to this site are industrial/commercial/community (ICC) land use Standards for coarse-textured soil using the full-depth approach in a potable groundwater condition (Table 2, Ont. Reg. 153/04 (as amended) Standards).

The Phase 2 ESA field work was completed between December 13 and 28, 2021 and consisted of advancing six (6) exploratory boreholes at accessible locations around the property. Prior to initiating the borehole drilling, underground services were located through Ontario One Call. The boreholes were advanced utilizing a track-mounted Geoprobe drill rig. Soil sampling was completed continuously with depth in the boreholes which extended up to 10.6 m (35 feet) below grade. Soil vapour screening of the recovered soil samples from the boreholes was completed to identify areas of potential impairment. Significantly-elevated soil vapour concentrations were not identified in any of the boreholes.

Selected soil samples from the boreholes were submitted for laboratory analysis of the VOC (volatile organic compounds) including BTEX (benzene, toluene, ethylbenzene and xylenes), F1 – F4 fraction Petroleum Hydrocarbon (PHC), polycyclic aromatic hydrocarbons (PAH) and Metals parameters. Four of the boreholes were developed as groundwater monitoring wells (BH/MW's 1, 2, 3 and 4) to determine whether shallow groundwater is present and, if so, allow samples of the groundwater to be obtained and submitted for laboratory analysis.

On December 15, 2021 the groundwater monitoring was undertaken. The four newly-installed groundwater monitoring wells were monitored with a Heron Interface Probe (IFP) to determine the depth to groundwater and the potential presence of free phase PHC product. No indications of the presence of free phase PHC product was noted with the IFP. Based on the groundwater level

measurements, the shallow groundwater was determined to be present at depths of between 4.6 m below grade and 9.9 m below grade. Groundwater flow direction determination was not completed as part of this assessment.

Each of the groundwater monitoring wells was developed according the MECP protocols by purging at least three casing volumes of water, or pumping the well dry three times, prior to obtaining the groundwater samples. Monitoring well development and groundwater sampling was completed using LDPE tubing and waterra inertial tips. Groundwater samples were obtained from each of the monitoring wells and selected samples were submitted to an accredited analytical laboratory for analysis of the VOC, PHC and PAH parameters.

The results of the completed soil laboratory analyses were compared to Table 2 Ontario Regulation 153/04 (as amended July 2011) Site Condition Standard for industrial/commercial/community (ICC) land use and coarse-textured soil. The results indicated that none of the soil samples submitted for analyses from the boreholes contained parameter concentrations in excess of the Table 2 SCS.

The results of the completed groundwater laboratory analyses were compared to Table 2 Ontario Regulation 153/04 (as amended July 2011) Site Condition Standards. The results of the groundwater sampling indicated that the groundwater samples analyzed from BH/MW's 2, 3 and 4 during this assessment contained trace concentrations of PAH parameters that were in excess of the Table 2 groundwater SCS. The groundwater analysis for PAH parameters is well known to be affected by trace amounts of sediment in the sample and this was likely the case here. As such, the three wells in questions were re-sampled on December 28, 2021. Prior to sampling the wells were purged dry at least 3 times using the waterra samplers. The wells were then allowed to recover and any silt allowed to settle before re-sampling. The samples were then obtained from the wells with dedicated bailers taking the sample from the top of the water column in an attempt to minimize possible entrained sediment content. The results of the groundwater re-sampling indicated that all three samples met the Table 2 SCS and did not contain detectable concentrations of any PAH parameters.

Based on the information determined during this Phase 2 ESA, there were no soil or groundwater contaminant parameter concentrations identified at concentrations in excess of the Table 2 ICC CSC. The Site appears suitable for the on-going industrial/commercial land use.

The results of this investigation are discussed in greater detail in the text of this report.

2.0 INTRODUCTION

Bluewater Geoscience Consultants Inc. (Bluewater) was retained by Mr. Ted Kohli of Robinson Buick GMC (the client and potential property purchaser) to complete a Phase 2 Environmental Site Assessment (ESA) for an industrial/commercial property located at 51-61 Queensway East in Simcoe, Ontario. The Client is considering purchasing the property and wishes to determine environmental conditions as part of their pre-purchase due diligence and for financing purposes. The purpose of the Phase 2 ESA was to investigate potential environmental liabilities associated with the current and historic land uses on and around the property as identified in a Phase 1 ESA completed for the site. The Client has related that a Record of Site Condition (RSC) is not required for the property.

This investigation was conducted in general accordance with the Ministry of the Environment, Conservation and Parks (MECP) "Guideline for Use at Contaminated Sites in Ontario" (GUCSO) (September 1998) and relevant portions of Ontario Regulation 153/04 (as amended Ont. Reg. 511/09) requirements and protocols in order to assess the current environmental condition of the subject property with regards to the on-going use of the property. During the current investigation, observations were made concerning the subject property and surrounding areas. The subject property is currently and historically in industrial/commercial land use and no change in land use is being considered. The site is not considered a sensitive environmental site. The Site and surrounding properties obtain their potable water supply from a municipal supply that is derived from groundwater sources. Based on the conditions encountered, the Site Condition Standard (SCS) applicable to this site are industrial/commercial/community (ICC) land use Standards for coarse-textured soil using the full-depth approach in a potable groundwater condition (Table 2, Ont. Reg. 153/04 (as amended) Standards).

3.0 SCOPE OF WORK

The scope of work was completed to determine whether there were indications of significant soil and/or groundwater impairment associated with the former on-site and off-site land uses and to determine whether the site was in compliance with the applicable MECP Ont. Reg. 153/04 (as amended July 2011) SCS for soil and groundwater. The scope of work was limited to that agreed upon with the Client and included the following:

- Reviewing the clearing of underground services from representatives of the various utility companies;
- Retaining a private utility locate company to locate on site services and clear the selected borehole locations;
- Supervise a subcontracted drill rig to complete the drilling, soil sampling and groundwater monitoring well installations;
- Advance six (6) boreholes at accessible locations around the property;
- Log the stratigraphy encountered in the boreholes documenting any visual or olfactory evidence of contamination;
- Complete soil vapour screening on soil samples recovered from the boreholes;

- Obtaining representative soil samples from the boreholes and submit them to an accredited analytical laboratory for analysis of the VOC, BTEX, F1 – F4 PHC, PAH and Metals parameters;
- Install four (4) groundwater monitoring wells to determine if shallow groundwater is present and, if so, allow samples of the groundwater to be obtained and submitted for analytical testing and to determine the groundwater flow patterns;
- Obtaining representative groundwater samples from the monitoring wells and submit them to an accredited analytical laboratory for analysis of the VOC, BTEX, F1 – F4 PHC and PAH parameters;
- Re-sample BH/MW's 2, 3 and 4 for PAH parameters;
- Comparing the results of the completed lab analyses of soil and groundwater samples to MECP Ont. Reg. 153/04 (as amended July 2011) Table 2 SCS applicable to the property to determine compliance;
- Preparing this Phase 2 ESA report;

4.0 BACKGROUND

The subject site is located on the north side of Queensway East, east of Gilbertson Drive, in Simcoe, Ontario, as shown in Figure 1, Location Plan of Appendix A. The Site is surrounded by industrial and commercial properties.

The Site is a roughly-rectangular shaped parcel, approximately 1.08 ha (2.37 acres) in total size. The property carries two municipal addresses, 51 and 61 Queensway East, however the 61 address is not used currently. The 51 Queensway East property is legally described as "Registered Plan 37R3585 Part 1, Townsend Concession 14, Part Lot 1, Norfolk County" and the 61 Queensway East property is legally described as "Townsend Conc. 14, Part Lot 1, RP 37R1002, Parts 1 and 2, Norfolk County: The Assessment Roll # for #51 is 401-001-31800-0000 and for #61 is 401-001-32000-0000.

5.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Bluewater completed a Phase 1 ESA for the property dated December 10, 2021. The findings of the Phase 1 are detailed below:

Based on the findings of this Phase One ESA no *actual* environmental concerns were identified at the Site. The assessment did identify *potential* environmental concerns both on and off Site, specifically: the presence of the body shop, the storage of gasoline in an ~2,200 litre aboveground storage tank (AST) and the repair and maintenance of vehicles in the service bays. Further, the former presence of a retail petroleum sales outlet at 71 Queensway East, approximately 70 m east (upgradient) of the site. These potential concerns are detailed below:

1. The presence of the body shop on the northeast part of the Site. *Commercial Autobody Shops* (PCA # 10) is considered to represent a PCA as defined by MECP.

2. The on-site presence of gasoline stored in an AST. *Gasoline and Associated Products Storage in Fixed Tanks* (PCA # 28) is considered to represent a PCA as defined by MECP.

3. The completion of repair and maintenance of vehicles on site. *Storage, maintenance, fuelling and repair of equipment, vehicles, and materials used to maintain transportation systems* (PCA #52) is considered to represent a PCA as defined by MECP.

4. A former, off-site retail petroleum sales outlet (gas station) had been located at 71 Queensway East, ~60 m upgradient of the subject site. *Gasoline and Associated Products Storage in Fixed Tanks* (PCA # 28) is considered to represent a PCA as defined by MECP.

5. Based on the date of construction (1969), there is a potential that 'Designated Substances' such as asbestos and/or lead paint in building materials, PCBs in original lighting, and mercury in thermostats could possibly be present. These items are typical to buildings of this age, and if present in intact operating condition, they generally would not be considered to be a health and safety concern for the occupants, nor would they present a risk of significant environmental liability for the current use of the property. If asbestos, lead paint or other designated substances were actually present, they would be of concern if significant renovation, construction or demolition were to occur that could expose or damage such materials. If necessary, these potential concerns could be addressed at such time as this type of work may take place. Demolition of the structure(s) may require a Designated Substances Survey (DSS) prior to demolition.

6. In addition, if future Site development were to generate excess construction soil requiring movement, re-use or off-Site disposal; sampling and chemical analyses of the excess construction fill may be required to determine the acceptability of such materials for off-site disposal at a proposed receiving site. New regulations regarding the characterization, tracking, use and disposal of excess soil have recently been enacted by the provincial government.

Based on the observations, findings and conclusions of this assessment; further, intrusive investigation (i.e. completion of a Phase Two ESA with soil and groundwater sampling and chemical analyses) is recommended to confirm or refute the potential for adverse impact to the Site in relation to the identified concerns and to assess the current environmental condition of the Site.

6.0 SUBSURFACE INVESTIGATIONS

Underground services were located by personnel from the various utility companies. Bluewater personnel experienced in environmental sampling protocols selected and laid out the test hole locations, inspected and logged the test holes and monitoring well installations, monitored the groundwater monitoring wells, cared for the recovered soil and groundwater samples under standard chain-of-custody protocols, and selected the soil and groundwater samples for laboratory analyses.

6.1 Borehole Drilling

The Phase 2 ESA field work was completed between December 13 and 28, 2021 and consisted of advancing six (6) exploratory boreholes at suspect and accessible locations on the subject property. The boreholes were advanced utilizing a track-mounted Geoprobe drill rig using direct push, soil coring sampling techniques. Soil sampling was completed continuously with depth in the boreholes which extended up to 10.6 m (35 feet) below grade.

6.2 Soil Sampling

Soil sampling was complete using an MC-5 core sampler which produces continuous soil cores of 5 cm diameter with depth. Soil samples were selected for analysis based on the presence of indicators of impairment (odours, sheen, staining etc.), the results of soil screening for volatile vapours, and/or their position in the soil column where potential contaminants may collect. Evidence of potential impairment to soil was not noted during the drilling or sampling of any of the boreholes.

Selected worse-case soil samples from the boreholes were submitted for laboratory analysis of the VOC, BTEX, F1 – F4 fraction PHC, PAH and Metals parameters. These chemical parameters were selected as being representative of potential contaminants associated with the identified sources of concern.

Soil samples from each sampler were subdivided to be used for chemical testing, and/or visual and olfactory observations and headspace screening, respectively. Samples selected for chemical analyses were immediately placed in laboratory-supplied jars, equipped with Teflon lids. All samples were stored in a cooler or refrigerator at temperatures between 5 and 15 degrees Celsius under standard chain of custody protocols, until submission to the testing laboratory on December 13, 2021.

The drilling and sampling equipment was cleaned between sampling locations with a laboratory grade, non-phosphate detergent scrub, followed by a clean water rinse. All hand-sampling equipment contacting the soil samples was cleaned between each sample with a non-phosphate soap and water scrub, followed by a rinse with distilled water.

6.3 Stratigraphy

The boreholes encountered surficial materials consisting of asphalt at BH's 1, 2, 4, 5 and 6 and topsoil at BH-3. Below these surficial materials was noted sand and gravel fill at all locations. Below the fill was encountered native Sand to sandy Silt soils which extended to the maximum depth investigated of 10.6 below grade. Groundwater was noted during the drilling at depths of between 4.6 and 9.5 m below grade in the native Sand soil. Based on visual observation, the native soil at the site did not contain enough fine grained particles to warrant application of the fine to medium-grained soil standards.

Detailed descriptions of the site stratigraphy and observed conditions are contained on the Borehole Logs, included in Appendix B.

6.4 Soil Vapour Screening

Upon retrieval of the soil samples from the boreholes, sub-samples were obtained at regular depth intervals. The sub-samples were placed into Ziploc bags and allowed to equilibrate for several minutes in ambient air conditions. After a period of time the headspace within the bags was analyzed for organic vapour concentration utilizing an Eagle 2 combustible vapour meter with Photo-ionization detector (PID). Elevated soil vapour concentrations were not determined at any of the borehole locations. The borehole logs contained in Appendix B document the determined soil vapour concentrations for the recovered soil samples.

6.5 Groundwater

Free groundwater was noted during the drilling of BH/MW's 1, 2, 3 and 4. Groundwater monitoring wells were installed at four of these locations (BH/MW's 1, 2, 3 and 4). The wells were constructed using new, 38 mm diameter PVC well pipe. Screened sections were placed in the base of the borehole where the groundwater level was anticipated. The screened sections were surrounded with a silica sand pack in the borehole annulus. Bentonite seals were placed in the well annulus above the silica sand pack. The wells were completed at ground surface with new J-plugs and lock with steel monument casings concreted in place.

On December 15, 2021 the groundwater monitoring was undertaken. The four, newly-installed wells were monitored with a Heron Interface Probe (IFP) to determine the depth to groundwater and the potential presence of free phase PHC product. No indications of the presence of free phase PHC product was noted with the IFP. The depth to shallow groundwater was determined to be ~4.6 m below grade at BH/MW-1 and BH/MW-2, 9.9 m below grade at BH/MW-3 and 5.9 m below grade at BH/MW-4. Table 1 in Appendix C provides the groundwater monitoring data. It appears that perched groundwater conditions are present in portions of the Site.

The groundwater monitoring wells were developed according to accepted MECP protocols by purging a minimum of three casing volumes of water from each well. The well development was completed using dedicated polyethylene tubing waterra, inertial foot valves. The wells were noted to recharge relatively quickly and a minimum of five casing volumes was removed from each well. Purge water began as slightly silty with a brownish colour but cleared up as purging continued.

Upon the completion of well development and adequate recharge, the groundwater samples were obtained from the top portion of the water column within the well. The groundwater samples were placed directly into the appropriate, laboratory-supplied sample bottles. VOC, BTEX, PHC and PAH sample bottles contained sodium bisulphate preservative. The groundwater samples were placed into an ice-pack filled cooler and delivered to the lab directly upon completion of field work.

Due to a finding of slightly-elevated PAH parameter concentrations at BH/MS's 2, 3 and 4, these wells were re-sampled on December 28, 2021 using dedicated bailers to attempt to minimize sediment content in the samples.

7.0 APPLICABLE REGULATORY STANDARDS

The Ministry of the Environment, Conservation and Parks document "Guideline for Use at Contaminated Sites in Ontario" (GUCSO revised September 1998) provides the regulatory framework to assess environmental sites. As of October 1, 2004 the document Ont. Reg. 153/04 was introduced by MECP standardizing the soil and groundwater guidelines. As of July 1, 2011, MECP amended the soil and groundwater Standards under Ont. Reg. 511/09.

The analytical results obtained from the laboratory testing were compared to Ont. Reg. 153/04 (as amended July 2011), Table 2: Generic Site Condition Standards for a Potable Ground Water Condition using the industrial/commercial/community (ICC) land use Standards for coarse-textured soil. The following rationale was used to determine the applicable site restoration criteria for use at this site:

Site Sensitivity: There were no sensitive environmental sites identified in the vicinity of the subject site. Based on the information gathered during the investigation, there is greater than 2 m of overburden at the site. There are no permanent surface water bodies within 30 m of the subject site. The pH of the site soils was determined by lab analysis to be 7.91, in the range of 5 and 9 used to determine site sensitivity and application of Generic Standards. Based on these conditions, the site is not considered to be a potentially sensitive site.

Land Use: The subject site is currently in industrial/commercial land use. Surrounding land use is primarily industrial/commercial and residential. No change in land use is being considered therefore the lab data will be compared to the standards for ICC land use.

Groundwater Use: The Site and surrounding properties obtain their potable water from a municipal supply that is derived from groundwater sources. Based on this condition, the potable groundwater site condition standards are applicable.

Depth and Soil Texture Criteria Selection: The native soils found in the subsurface include sand and gravel and sandy Silt Till. Based on visual observation, the Site soils do not contain a significant enough (>70%) fraction of fine grained particles to warrant usage of the fine to medium-textured soil standards. As such, the coarse-grained standard will be applied.

Based on the above information and assumptions, the restoration criteria for this site correspond to Generic Site Condition Standards for a Potable Ground Water Condition using the ICC land use Standards for a coarse-textured soil. (Ont. Reg. 153/04 as amended, Table 2).

8.0 LABORATORY ANALYSES RESULTS

Selected worse-case soil samples from each of the boreholes were submitted to ALS Laboratory Group of Waterloo, Ontario for laboratory analysis. ALS is a CAEAL (Canadian Association of Environmental Analytical Laboratories) accredited laboratory. The results of the completed laboratory soil samples with comparison to the applicable Table 2 SCS are provided in data tables in Appendix C. The detailed Laboratory Certificates of Analysis (C of A) are included in Appendix D.

Available information for the property and surrounding properties indicates the potential for adverse soil and groundwater impact at the site was most likely limited to localized areas and specific chemical parameters VOC, BTEX, F1 – F4 fraction Petroleum Hydrocarbons, PAH and Metals parameters.

The results of the soil and groundwater analyses and a summary of the analytical results compared to the applicable MECP Standards for the subject property are discussed below.

8.1 Soil Chemical Analysis – VOC, BTEX and F1 – F4 PHC

The selection of drilling and sampling locations was based upon our review of the site history and the potential contaminants of concern. Selected, worse-case soil samples from the boreholes were analyzed for VOC and Petroleum Hydrocarbons (F1 – F4 PHC) parameters.

One selected soil sample from each of the six boreholes was submitted for laboratory analysis of the VOC and PHC parameters. The results indicated that the soil sample did not contain any concentration of the VOC or PHC parameters above the Table 2 SCS.

The results of the soil VOC, BTEX and PHC analyses with comparison to the Table 2 SCS are provided in Table 2 and 3, Appendix C. The detailed laboratory Certificate of Analysis is contained in Appendix D.

8.2 Soil Chemical Analysis – Metals

A total of six selected soil samples, one from each borehole, were submitted for laboratory analysis of the Metals parameters. The results indicated that none of the soil samples contained concentrations of the Metals parameters in excess of the Table 2 standard.

The results of the soil Metals analyses with comparison to the Table 2 SCS are provided in Table 5, Appendix C. The detailed laboratory Certificate of Analysis is contained in Appendix D.

8.3 Soil Chemical Analysis – Polycyclic Aromatic Hydrocarbons

A total of six selected soil samples, one from each of the boreholes, were submitted for laboratory analysis of the PAH parameters. The results indicated that none of the soil samples contained PAH parameter concentrations in excess of the Table 2 SCS. The results of the soil PAH analyses with comparison to the Table 2 SCS are provided in Table 4, Appendix C. The detailed laboratory Certificate of Analysis is contained in Appendix D.

8.4 Groundwater Chemical Analysis – VOC, BTEX and F1 – F4 PHC

Groundwater samples were obtained from four of the groundwater monitoring wells (BH/MW's 1, 2, 3 and 4) installed on the property and were submitted for laboratory analysis of the VOC and F1 – F4 PHC parameters. The results indicated that there were no concentrations of the VOC, BTEX or PHC parameters in excess of the Table 2 SCS.

The results of the groundwater VOC, BTEX and PHC analyses are provided in Tables 6 and 7, Appendix C. The detailed laboratory certificate of Analysis is contained in Appendix D.

8.5 Groundwater Chemical Analysis – Polycyclic Aromatic Hydrocarbons

Groundwater samples were obtained from the four groundwater monitoring wells (BH/MW-1, 2, 3 and 4) installed on the property and were submitted for laboratory analysis of the PAH parameters. The results indicated that there were trace concentrations of PAH parameters in excess of the applicable Table 2 SCS determined for the groundwater samples from BH/MW's 2, 3 and 4. The groundwater analysis for PAH is well known to be affected by trace amounts of sediment in the sample and this was likely the case here. In order to clarify these initial results, these wells were re-sampled on December 28, 2021 using dedicated bailers to attempt to minimize sediment content in the samples. The results of the groundwater re-sampling confirmed that no detectable PAH concentrations were present in any of the groundwater samples.

The results of the groundwater PAH analyses are provided in Table 8, Appendix C. The detailed laboratory certificate of Analysis is contained in Appendix D.

9.0 OBSERVATIONS AND SUMMARIZED RESULTS

The following section summarizes the observations and conclusions of the Phase 2 ESA activities:

- A total of six (6) exploratory boreholes were advanced on the subject property on December 13, 2021. Indications of potential environmental impairment was not noted during the drilling of the boreholes;

- Selected soil samples from the exploratory boreholes were submitted for laboratory analysis of the VOC, BTEX, PHC, PAH and Metals parameters;

- Groundwater monitoring wells were installed at four of the borehole locations (BH/MW's 1, 2, 3 and 4);

- Representative, groundwater samples from the groundwater monitoring wells were obtained and submitted for laboratory analysis of the VOC, BTEX, PHC and PAH parameters;

- The results of the completed soil vapour screening along with visual and olfactory observations did not indicate potential impairment with VOC/PHC or PAH parameters;

- The results of the completed soil analyses indicated that no exceedances of the Table 2 SCS for any VOC, PHC or PAH parameters were determined through lab analysis for the soil samples from the boreholes.

- The results of the completed groundwater analyses were compared to the Ont. Reg. 153/04 (as amended) Table 2 Site Condition Standards (SCS) and indicated that the groundwater samples from BH/MW's 2, 3 and 4 initially contained trace concentrations of PAH parameters in excess of the Table 2 SCS. The three wells were re-sampled on December 28, 2021 and submitted for analysis of the PAH parameters. The results of the groundwater re-sampling confirmed that there were no detectable concentrations of any PAH parameters in any of the samples, therefore meeting the Table 2 SCS;

- Based on the results of the completed Phase 2 ESA, there are no indications of the presence of contaminated soil or groundwater at the subject Site. The Site appears suitable for the on-going industrial/commercial land use.

10.0 STATEMENT OF LIMITATIONS

This report was prepared for the exclusive use of Robinson Buick GMC and financial institutions providing purchase/mortgage financing. This report is based on information and data collected during the completion of an environmental investigation of the Site carried out by Bluewater Geoscience Consultants Inc., and is based solely on the site conditions encountered at the time of the assessment and the applicable guidelines in place at the time of this investigation.

This report is not to be reproduced or released to any other party, in whole or in part, without the express written consent of Bluewater Geoscience Consultants Inc. It should be noted that the observations and recommendations presented in this report are limited to the actual locations explored and laboratory parameters analyzed. The information presented in terms of the thickness and types of the sub-soils encountered, groundwater levels and chemical testing results, etc., are only applicable to the actual locations explored. Variations may be present between these locations. Should significant variation become apparent during later investigations, it may be necessary to re-evaluate the recommendations of this report. The results of an investigation of this nature should, in no way, be construed as a warranty that the site is free from any and all contamination from past or current practices since conditions may be different from the locations tested.

This assessment was carried out using existing historical information as available from various agencies and no assurance is made regarding the accuracy or completeness of this information. This assessment is subject to any restrictions placed by physical obstructions, precipitation, denied access, inaccessible areas, time constraints, cost constraints, readily available documentation, safety considerations, confidentiality, and availability of knowledgeable individuals for interview purposes. A reasonable site evaluation may not identify latent or hidden contamination. Information in this assessment may also change with time and thus only be accurate on the collection date. This site assessment is a compilation and assessment of available data regarding the subject site and in no way should be considered as a recommendation or rejection of a potential property purchase.

If new information is discovered during future work, including excavation, borings or other studies, Bluewater Geoscience Consultants Inc. should be requested to re-evaluate the conclusions presented in this report and to provide amendments as required. The analytical test results are assumed to be Correct, and performed according to all current regulations. No audit of the laboratory's methods or procedures was performed.

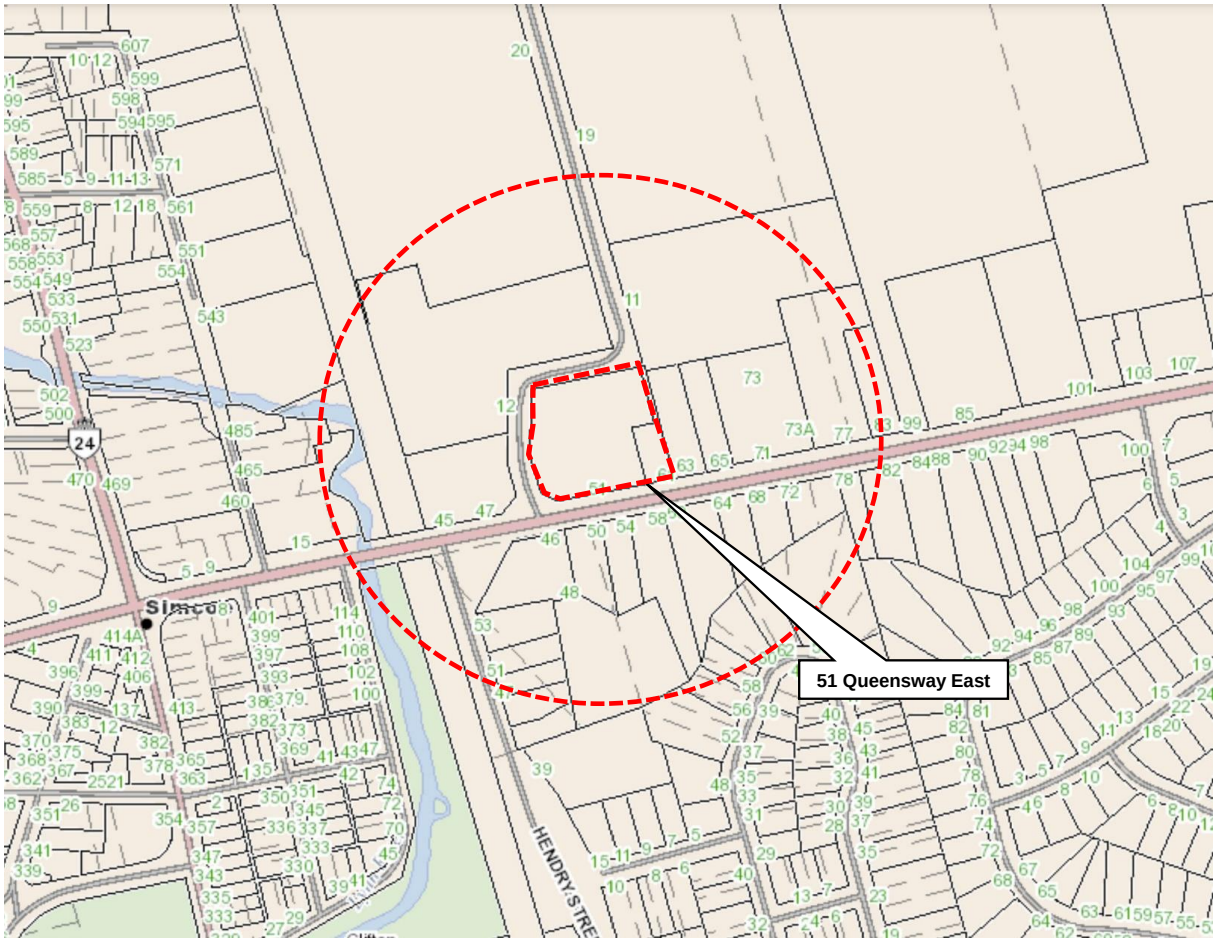
This assessment does not include, nor is it intended to include, any option regarding the suitability of any structure on the site for any particular function, the integrity of the on-site buildings or the geotechnical conditions on the site. Inspections of buildings do not include compliance with building, gas, electrical or boiler codes, or any other federal, provincial or municipal codes not associated with environmental concerns. Should concerns regarding any issue other than environmental matters arise as a result of our investigations, appropriately qualified professionals should address them.

11.0 CLOSURE

Bluewater Geoscience Consultants Inc. operates under a Certificate of Authorization from The Association of Professional Geoscientists of Ontario (APGO). Breton Lemieux is a MOE-registered Qualified Person (QP_{ESA}) and a licensed Professional Geoscientist with over thirty years of international environmental consulting experience. Mr. Lemieux has a Geologic Technologist Diploma from Sir Sandford Fleming College in Lindsay, Ontario, an Honours Bachelor of Science degree in Geology from the University of the West Indies in Kingston, Jamaica and a Master of Science degree in Earth Sciences from the University of Waterloo. His experience includes conducting Phase I, II and III ESA's at a wide variety of contaminated sites, underground storage tank removal supervision, water supply development, environmental building science and other site environmental monitoring projects.

APPENDIX A

FIGURES



Approximate Property Boundary

Phase One ESA Study Area (250m radius from centre of Site)

0m 120m 240m 360m

Base Plan from County of Norfolk

BLUEWATER
GEOSCIENCE CONSULTANTS INC

42 Shadyridge Place
Kitchener, Ontario
N2N 3J1

Ph: (519) 744-4123
Fax: (519) 744-1863

Location Plan

51 Queensway East
Simcoe, Ontario

Project No. BG-804 Figure 1

Date:	Dwn By:	Chkd. By:	Scale:
11/3/2021	WL	BJL	As shown

Base Plan from Google Earth

BLUEWATER GEOSCIENCE

CONSULTANTS INC.

42 Shadyridge Place
Kitchener, Ontario
N2N 3J1

Ph: (519) 744-4123
www.bluewatergeoscience.ca

Borehole/Monitoring Well Location Plan
51 Queensway East
Simcoe, ON.
Phase 2 ESA

December 20, 2021

Project # BG-804 Figure 2

APPENDIX B

BOREHOLE LOGS

BOREHOLE LOG

Bluewater Geoscience

Borehole #: BH/MW-1

Client: Robinson Buick GMC

Project Location: 51 Queensway East, Simcoe

Drilling Contractor: CMT

Drill Method: Direct Push

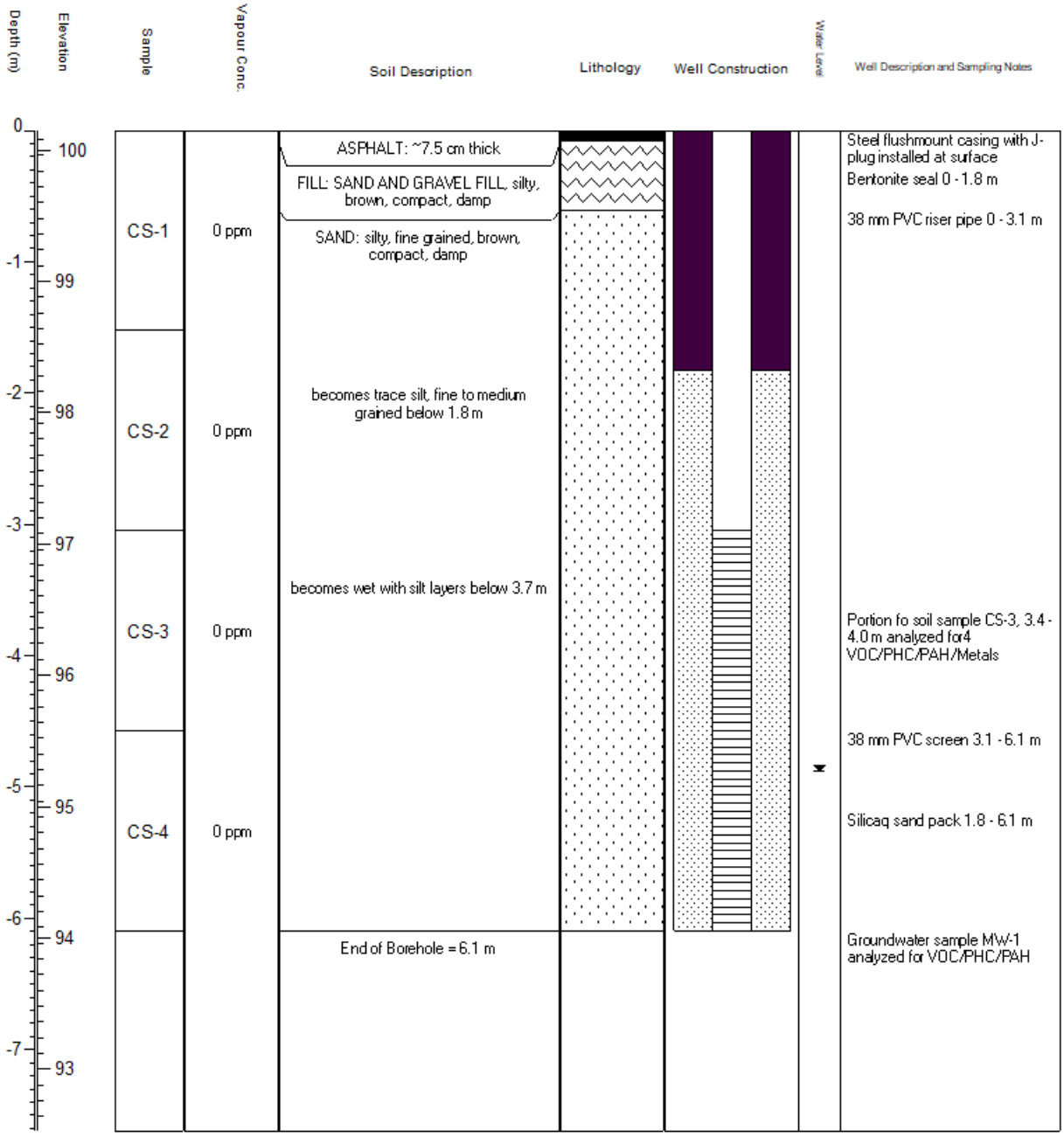
Logged by: BJL

Drill Date: December 15, 2021

Ground Elevation: 100.15 m Local

Top of Pipe Elevation: 99.99 m Local

Job # - BG-804



BOREHOLE LOG

Bluewater Geoscience

Borehole #: BH/MW-2

Client: Robinson Buick GMC

Project Location: 51 Queensway East, Simcoe

Drilling Contractor: CMT

Drill Method: Direct Push

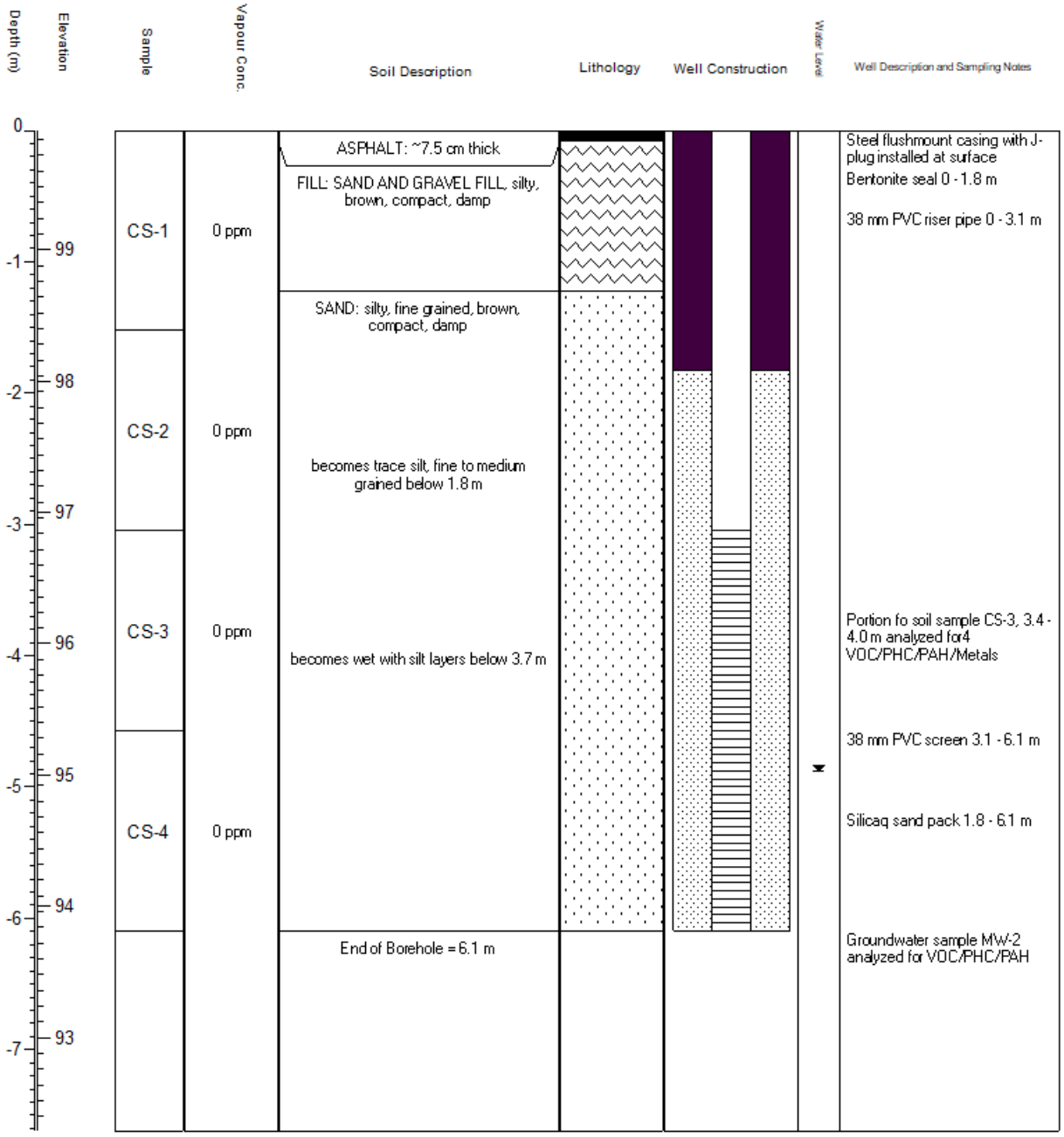
Logged by: BJL

Drill Date: December 15, 2021

Ground Elevation: 99.91 m Local

Top of Pipe Elevation: 99.77 m Local

Job # - BG-804



BOREHOLE LOG

Borehole #: BH/MW-3

Client: Robinson Buick GMC

Project Location: 51 Queensway East, Simcoe

Drilling Contractor: CMT

Drill Method: Direct Push

Logged by: BJL

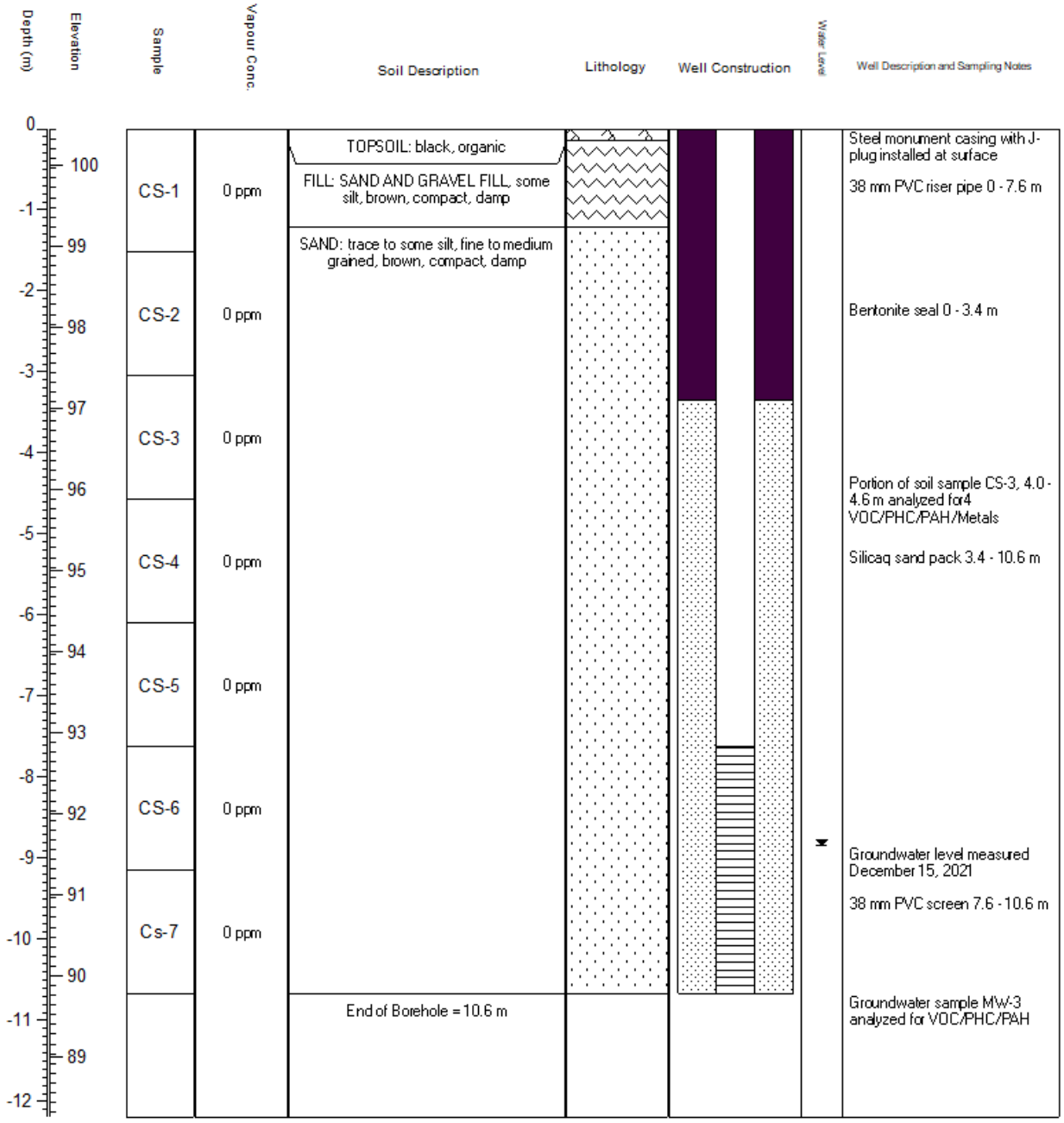
Bluewater Geoscience

Drill Date: December 15, 2021

Ground Elevation: 100.45 m Local

Top of Pipe Elevation: 101.39 m Local

Job # - BG-804



BOREHOLE LOG

Bluewater Geoscience

Borehole #: BH/MW-4

Client: Robinson Buick GMC

Project Location: 51 Queensway East, Simcoe

Drilling Contractor: CMT

Drill Method: Direct Push

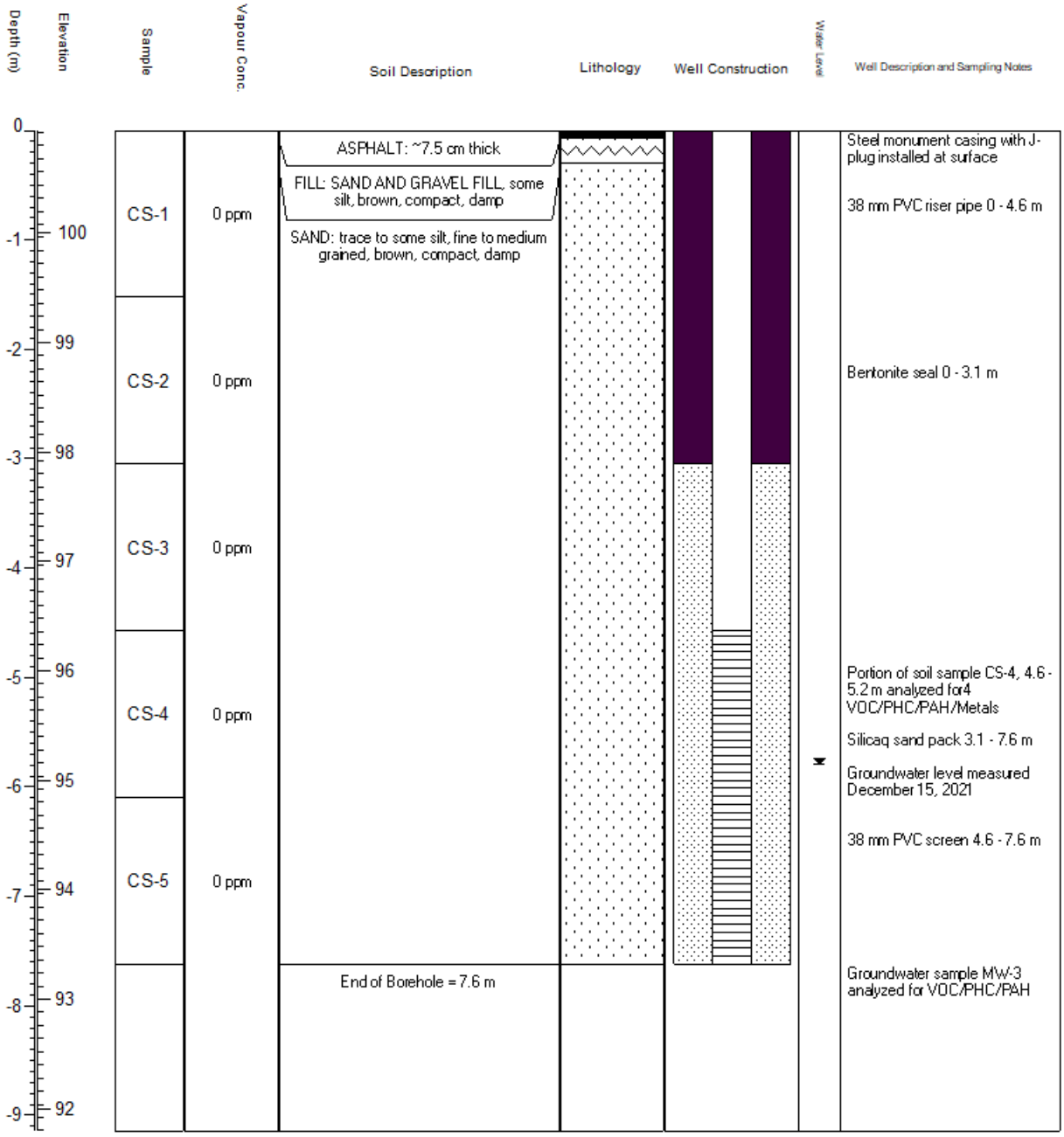
Logged by: BJL

Drill Date: December 15, 2021

Ground Elevation: 100.94 m Local

Top of Pipe Elevation: 100.78 m Local

Job # - BG-804



BOREHOLE LOG

Bluewater Geoscience

Borehole #: BH - 5

Client: Robinson Buick GMC

Project Location: 51 Queensway East, Simcoe

Drilling Contractor: CMT

Drill Method: Direct Push

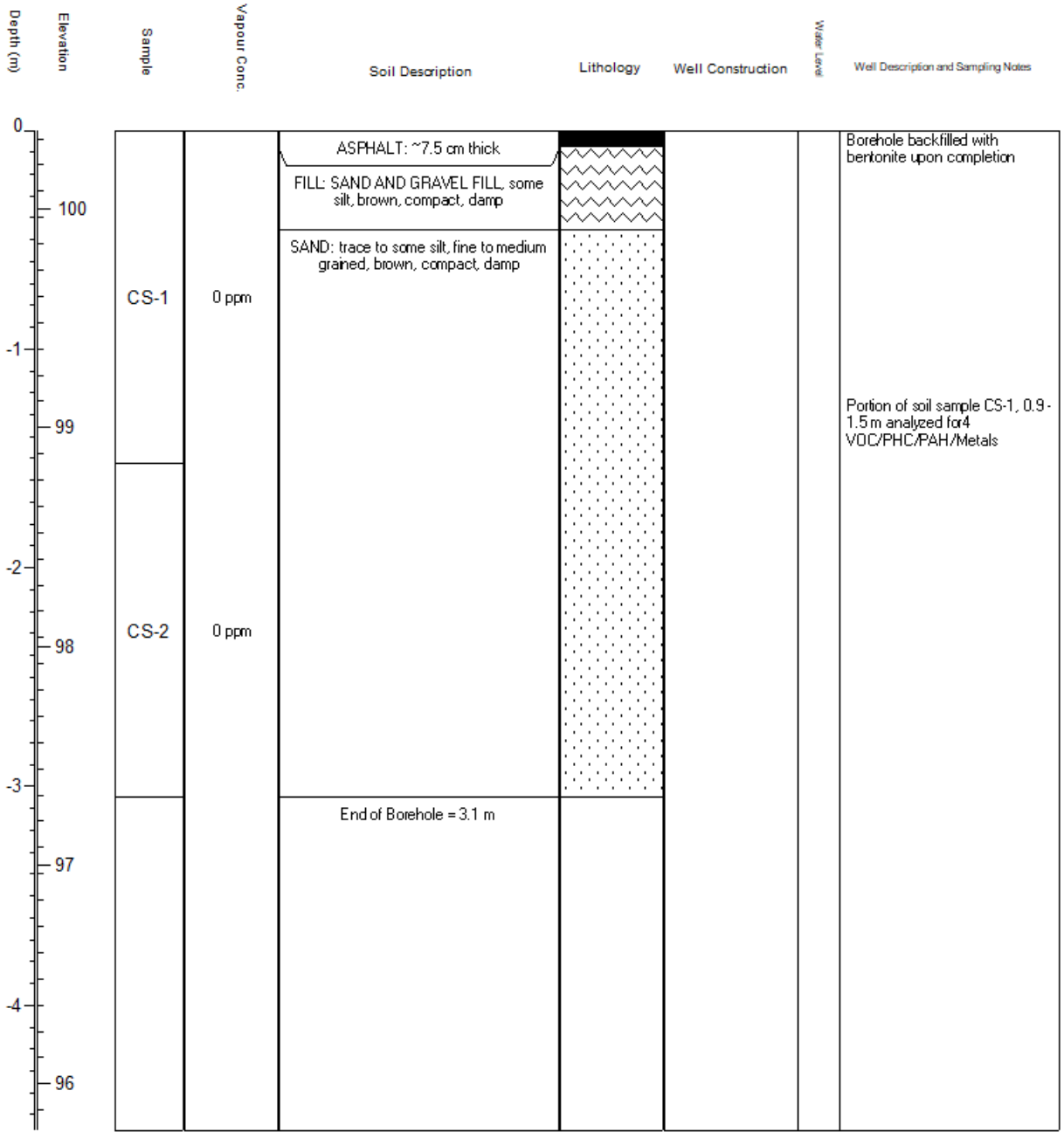
Logged by: BJL

Drill Date: December 15, 2021

Ground Elevation: 100.36 m Local

Top of Pipe Elevation: NA

Job # - BG-804



BOREHOLE LOG

Bluewater Geoscience

Borehole #: BH - 6

Client: Robinson Buick GMC

Project Location: 51 Queensway East, Simcoe

Drilling Contractor: CMT

Drill Method: Direct Push

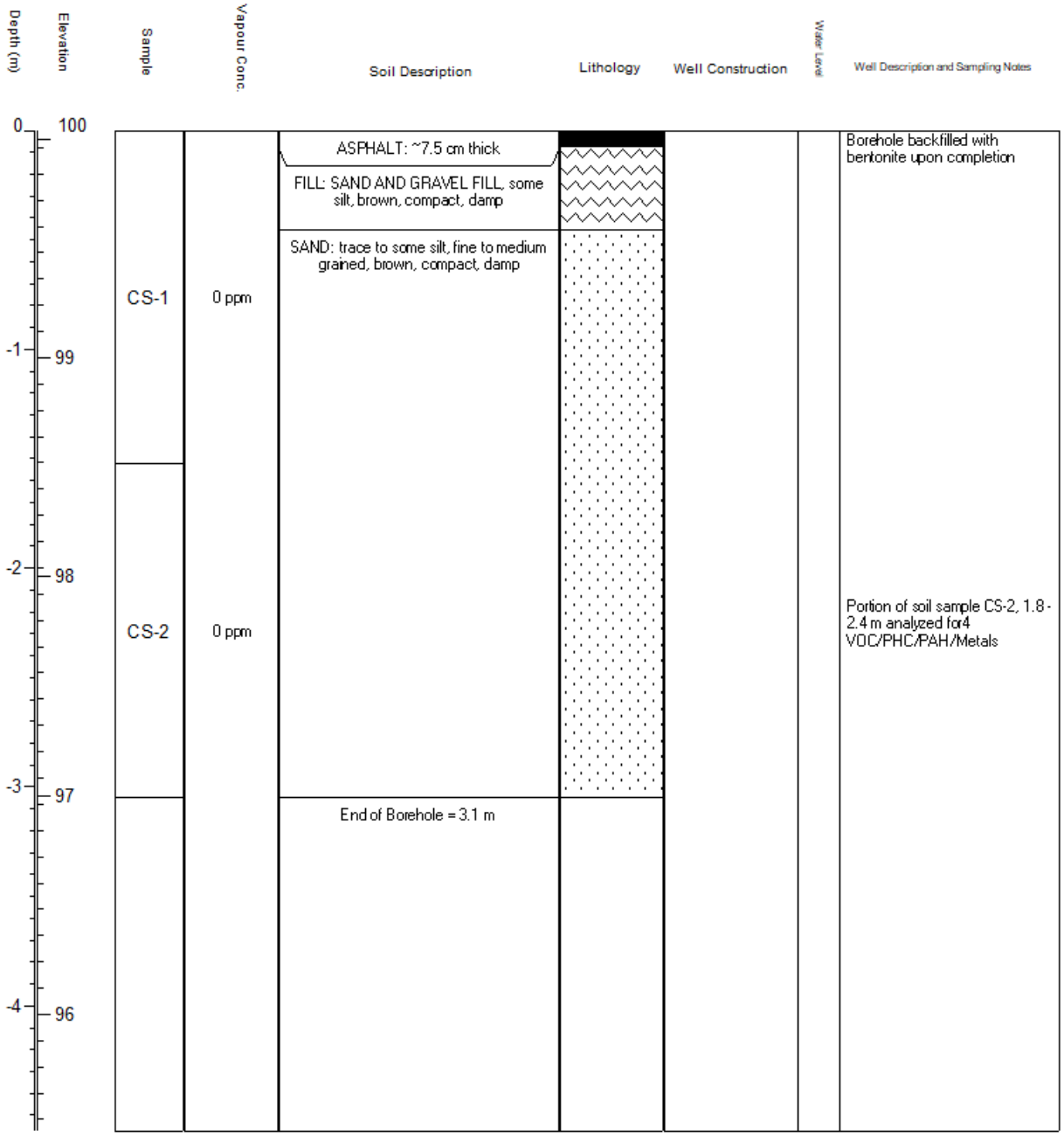
Logged by: BJL

Drill Date: December 15, 2021

Ground Elevation: 100.04 m Local

Top of Pipe Elevation: NA

Job # - BG-804



APPENDIX C

MONITORING WELL
AND
LABORATORY SOIL AND GROUNDWATER
RESULTS TABLES

Table 1: Groundwater Monitoring Data
51 Queensway East, Simcoe
BG-804

BH/MW #	Ground surface Elevation (m)	Stickup/ Stickdown	Top of Pipe eleveation m- Local	Depth to Water - btor Dec.15'21	Groundwater Elevation Dec.15'21	DNAPL/LNAPL Present
1	100.15	-0.16	99.99	4.82	95.17	No
2	99.91	-0.14	99.77	4.42	95.35	No
3	100.45	0.94	101.39	9.95	91.44	No
4	100.94	-0.16	100.78	5.85	94.93	No

BH/MW #	Ground surface Elevation (m)	Stickup/ Stickdown	Top of Pipe eleveation m- Local	Depth to Water - btor Dec.28'21	Groundwater Elevation Dec.28'21	DNAPL/LNAPL Present
1	100.15	-0.16	99.99	4.8	95.19	No
2	99.91	-0.14	99.77	4.52	95.25	No
3	100.45	0.94	101.39	9.91	91.48	No
4	100.94	-0.16	100.78	5.81	94.97	No

TBM is top of ground surface at NW building corner of main building

Table 2: Laboratory VOC Soil Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 ICC SCS coarse-texture (ug/g)	BH-1, CS-3 3.4 - 4.0 m (ug/g)	BH-2, CS-3 3.4 - 4.0 m (ug/g)	BH-3, CS-3 4.0 - 4.6 m (ug/g)
Acetone	16	<0.5	<0.5	<0.5
Benzene	0.21	<0.0068	<0.0068	<0.0068
Bromodichloromethane	1.5	<0.05	<0.05	<0.05
Bromoform	0.27	<0.05	<0.05	<0.05
Bromomethane	0.05	<0.05	<0.05	<0.05
Carbon tetrachloride	0.05	<0.05	<0.05	<0.05
Chlorobenzene	2.4	<0.05	<0.05	<0.05
Dibromochloromethane	2.3	<0.05	<0.05	<0.05
Chloroform	0.05	<0.05	<0.05	<0.05
1,2-Dibromomethane	0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	1.2	<0.05	<0.05	<0.05
1.3-Dichlorobenzene	4.8	<0.05	<0.05	<0.05
1,4-dichlorobenzene	0.083	<0.05	<0.05	<0.05
Dichlorodifluoromethane	16	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.47	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05	<0.05	<0.05	<0.05
cis-1,2Dichloroethylene	1.9	<0.05	<0.05	<0.05
trans-1,2Dichloroethylene	0.084	<0.05	<0.05	<0.05
1,3-Dichloropropene	0.05	<0.042	<0.042	<0.042
Methylene Chloride	0.1	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropene	0.05	<0.03	<0.03	<0.03
trans-1,3-Dichloropropene	0.05	<0.03	<0.03	<0.03
Ethyl benzene	1.1	<0.018	<0.018	<0.018
Hexane	2.8	<0.05	<0.05	<0.05
Methyl ethyl ketone	16	<0.5	<0.5	<0.5
Methyl isobutyl Ketone	1.7	<0.5	<0.5	<0.5
MTBE	0.75	<0.05	<0.05	<0.05
Styrene	0.7	<0.05	<0.05	<0.05
1,1,1,2-tetrachloroethane	0.058	<0.05	<0.05	<0.05
1,1,2,2-tetrachloroethane	0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.28	<0.05	<0.05	<0.05
Toluene	2.3	<0.08	<0.08	<0.08
1,1,1-trichloroethane	0.38	<0.05	<0.05	<0.05
1,1,2-trichloroethane	0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.061	<0.01	<0.01	<0.01
Trichlorofluoromethane	4	<0.05	<0.05	<0.05
Vinyl Chloride	0.02	<0.02	<0.02	<0.02
Xylenes)Total)	3.1	<0.05	<0.05	<0.05

Table 2 cont'd: Laboratory VOC Soil Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 ICC SCS coarse-texture (ug/g)	BH-4, CS-4 4.6 - 5.2 m (ug/g)	BH-5, CS-1 0.9 - 1.5 m (ug/g)	BH-6, CS-2 1.85 - 2.4 m (ug/g)
Acetone	16	<0.5	<0.5	<0.5
Benzene	0.21	<0.0068	<0.0068	<0.0068
Bromodichloromethane	1.5	<0.05	<0.05	<0.05
Bromoform	0.27	<0.05	<0.05	<0.05
Bromomethane	0.05	<0.05	<0.05	<0.05
Carbon tetrachloride	0.05	<0.05	<0.05	<0.05
Chlorobenzene	2.4	<0.05	<0.05	<0.05
Dibromochloromethane	2.3	<0.05	<0.05	<0.05
Chloroform	0.05	<0.05	<0.05	<0.05
1,2-Dibromomethane	0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	1.2	<0.05	<0.05	<0.05
1.3-Dichlorobenzene	4.8	<0.05	<0.05	<0.05
1,4-dichlorobenzene	0.083	<0.05	<0.05	<0.05
Dichlorodifluoromethane	16	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.47	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05	<0.05	<0.05	<0.05
cis-1,2Dichloroethylene	1.9	<0.05	<0.05	<0.05
trans-1,2Dichloroethylene	0.084	<0.05	<0.05	<0.05
1,3-Dichloropropene	0.05	<0.042	<0.042	<0.042
Methylene Chloride	0.1	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropene	0.05	<0.03	<0.03	<0.03
trans-1,3-Dichloropropene	0.05	<0.03	<0.03	<0.03
Ethyl benzene	1.1	<0.018	<0.018	<0.018
Hexane	2.8	<0.05	<0.05	<0.05
Methyl ethyl ketone	16	<0.5	<0.5	<0.5
Methyl isobutyl Ketone	1.7	<0.5	<0.5	<0.5
MTBE	0.75	<0.05	<0.05	<0.05
Styrene	0.7	<0.05	<0.05	<0.05
1,1,1,2-tetrachloroethane	0.058	<0.05	<0.05	<0.05
1,1,2,2-tetrachloroethane	0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.28	<0.05	<0.05	<0.05
Toluene	2.3	<0.08	<0.08	<0.08
1,1,1-trichloroethane	0.38	<0.05	<0.05	<0.05
1,1,2-trichloroethane	0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.061	<0.01	<0.01	<0.01
Trichlorofluoromethane	4	<0.05	<0.05	<0.05
Vinyl Chloride	0.02	<0.02	<0.02	<0.02
Xylenes)Total)	3.1	<0.05	<0.05	<0.05

Table 3: Laboratory PHC Soil Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 ICC SCS coarse-texture (ug/g)	BH-1, CS-3 3.4 - 4.0 m (ug/g)	BH-2, CS-3 3.4 - 4.0 m (ug/g)	BH-3, CS-3 4.0 - 4.6 m (ug/g)	BH-4, CS-4 4.6 - 5.2 m (ug/g)	BH-5, CS-1 0.9 - 1.5 m (ug/g)	BH-6, CS-2 1.85 - 2.4 m (ug/g)
PHC-F1 (C6-C10)	55	<5	<5	<5	<5	<5	<5
PHC F1-BTEX	55	<5	<5	<5	<5	<5	<5
PHC-F2	98	<10	<10	<10	<10	<10	<10
PHC-F3	300	<50	<50	<50	<50	<50	<50
PHC-F4	2800	<50	<50	<50	<50	<50	<50

Values shown in **BOLD** exceed Table 2 ICC SCS
RPI = residential/parkland/institutional land use
ICC = industrial/commercial/community

Table 4: Laboratory PAH Soil Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 ICC Coarse Soil (ug/g)	BH-1, CS-3 3.4 - 4.0 m (ug/g)	BH-2, CS-3 3.4 - 4.0 m (ug/g)	BH-3, CS-3 4.0 - 4.6 m (ug/g)	BH-4, CS-4 4.6 - 5.2 m (ug/g)	BH-5, CS-1 0.9 - 1.5 m (ug/g)	BH-6, CS-2 1.85 - 2.4 m (ug/g)
Acenaphthene	7.9	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	0.67	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)anthracene	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	0.78	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	6.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	0.78	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenzo(ah)anthracene	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.69	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	62	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(123,cd)pyrene	0.38	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1+2 Methylnaphthalene	0.99	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
1-Methylnaphthalene	0.99	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
2-Methylnaphthalene	0.99	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Naphthalene	0.6	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	6.2	<0.046	<0.046	<0.046	<0.046	<0.046	<0.046
Pyrene	78	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Values shown in **BOLD** exceed Table 2 ICC SCS
RPI = residential/parkland/institutional land use
ICC = industrial/commercial/community

Table 5: Laboratory Metals Soil Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 ICC Coarse Soil (ug/g)	BH-1, CS-3 3.4 - 4.0 m (ug/g)	BH-2, CS-3 3.4 - 4.0 m (ug/g)	BH-3, CS-3 4.0 - 4.6 m (ug/g)	BH-4, CS-4 4.6 - 5.2 m (ug/g)	BH-5, CS-1 0.9 - 1.5 m (ug/g)	BH-6, CS-2 1.85 - 2.4 m (ug/g)
Antimony	7.5	<1	<1	<1	<1	<1	<1
Arsenic	18	2.1	4.3	1.8	1.5	1.7	1.7
Barium	390	8.9	14	10.5	9	7.1	7.4
Beryllium	4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	120	<5	<5	<5	<5	<5	<5
Cadmium	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	160	5.3	9.4	8.3	6.3	6.2	5.2
Cobalt	22	2.3	4.3	2.9	2.1	2.2	2.1
Copper	140	9.1	13.4	8.2	7.2	6.8	6.8
Lead	120	4.4	12.6	4.9	3.9	4.9	4
Molybdenum	6.9	<1	<1	<1	<1	<1	<1
Nickel	100	4.8	7.9	5.2	3.8	3.9	4.2
Selenium	2.4	<1	<1	<1	<1	<1	<1
Silver	20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Uranium	23	<1	<1	<1	<1	<1	<1
Vanadium	86	11.5	18.9	23.4	15.8	16.2	11.5
Zinc	340	20.9	33.7	22.3	22.1	21.3	19.3

Values shown in ***BOLD*** exceed Table 2 ICC SCS
RPI = residential/parkland/institutional land use
ICC = industrial/commercial/community

Table 6: Laboratory VOC Groundwater Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 SCS ug/L	BH/MW-1 Dec.15'21 ug/L	BH/MW-2 Dec.15'21 ug/L	BH/MW-3 Dec.15'21 ug/L	BH/MW-4 Dec.15'21 ug/L
Acetone	2,700.00	<30	<30	<30	<30
Benzene	5.00	<0.5	<0.5	<0.5	0.58
Bromodichloromethane	16.00	<2	<2	<2	<2
Bromoform	25.00	<5	<5	<5	<5
Bromomethane	0.89	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.79	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	30.00	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	25.00	<2	<2	<2	<2
Chloroform	2.40	<1	<1	<1	<1
1,2-Dibromomethane	0.20	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	3.00	<0.5	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	59.00	<0.5	<0.5	<0.5	<0.5
1,4-dichlorobenzene	1.00	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	590.00	<2	<2	<2	<2
1,1-Dichloroethane	5.00	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	1.60	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	1.60	<0.5	<0.5	<0.5	<0.5
cis-1,2Dichloroethylene	1.60	<0.5	<0.5	<0.5	<0.5
trans-1,2Dichloroethylene	1.60	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene	0.50	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	50.00	<5	<5	<5	<5
1,2-Dichloropropane	5.00	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene		<0.3	<0.3	<0.3	<0.3
trans-1,3-Dichloropropene		<0.3	<0.3	<0.3	<0.3
Ethyl benzene	2.40	<0.5	<0.5	<0.5	<0.5
Hexane	51.00	<0.5	<0.5	<0.5	<0.5
Methyl ethyl ketone	1,800.00	<20	<20	<20	<20
Methyl isobutyl Ketone	640.00	<20	<20	<20	<20
MTBE	15.00	<2	<2	<2	<2
Styrene	5.40	<0.5	<0.5	<0.5	<0.5
1,1,1,2-tetrachloroethane	1.10	<0.5	<0.5	<0.5	<0.5
1,1,2,2-tetrachloroethane	1.00	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	1.60	<0.5	<0.5	<0.5	<0.5
Toluene	24.00	0.9	<0.5	<0.5	<0.5
1,1,1-trichloroethane	200.00	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	4.70	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	1.60	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	150.00	<5	<5	<5	<5
Vinyl Chloride	0.50	<0.5	<0.5	<0.5	<0.5
Xylenes)Total)	300.00	0.79	<0.5	<0.5	0.88

Table 7: Laboratory Groundwater F1 - F4 PHC Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 SCS ug/L	BH/MW-1 Dec.15'21 ug/L	BH/MW-2 Dec.15'21 ug/L	BH/MW-3 Dec.15'21 ug/L	BH/MW-4 Dec.15'21 ug/L
PHC-F1 (C6-C10)	750	<25	<25	<25	<25
PHC F1 - BTEX	750	<25	<25	<25	<25
PHC - F2	150	<100	<100	<100	<100
PHC - F3	500	<250	<250	<250	<250
PHC - F4	500	<250	<250	<250	420

N/A = Not Analyzed
Values shown in **BOLD** exceed Table 2 SCS

Table 8: Laboratory PAH Groundwater Analysis
51 Queensway East, Simcoe
BG-804

Parameter	Ont. Reg. 153/04 Table 2 SCS ug/L	BH/MW-1 Dec.15'21 ug/L	BH/MW-2 Dec.15'21 ug/L	BH/MW-3 Dec.15'21 ug/L	BH/MW-4 Dec.15'21 ug/L	BH/MW-2 Dec.28'21 ug/L	BH/MW-3 Dec.28'21 ug/L	BH/MW-4 Dec.28'21 ug/L
Acenaphthene	4.1	0.088	0.141	0.128	0.091	<0.02	<0.02	<0.02
acenaphthylene	1	<0.02	<0.02	<0.02	0.021	<0.02	<0.02	<0.02
Anthracene	2.4	<0.02	0.445	0.308	<0.046	<0.02	<0.02	<0.02
Banzo(a)anthracene	1	<0.02	0.321	0.234	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	0.01	<0.01	**0.227**	**0.197**	**0.019**	<002	<002	<002
Benzo(b)fluoranthene	0.1	<0.02	**0.272**	**0.246**	<0.02	<0.02	<0.02	<0.02
Benzo(g,h,i)perylene	0.2	<0.02	0.113	0.101	0.027	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	0.1	<0.02	**0.11**	0.09	<0.02	<0.02	<0.02	<0.02
Chrysene	0.1	<0.02	**0.245**	**0.183**	<0.02	<0.02	<0.02	<0.02
Dibenz(a,h)anthracene	0.2	<0.02	0.025	0.022	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.41	<0.02	**0.795**	**0.649**	0.028	<0.02	<0.02	<0.02
Fluorene	120	<0.02	0.222	0.218	0.094	<0.02	<0.02	<0.02
Indeno(1,2,3-cd)pyrene	0.2	<0.02	0.123	0.114	<0.02	<0.02	<0.02	<0.02
1+2 Methylnapthalenes	3.2	1.91	0.316	0.331	1.97	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2	1.11	0.156	0.161	1.07	<0.02	<0.02	<0.02
2-Methylnaphthalene	3.2	0.796	0.16	0.17	0.905	<0.02	<0.02	<0.02
Naphthalene	11	0.373	1.04	1.01	0.432	<0.05	<0.05	<0.05
Phenanthrene	1	0.105	0.868	0.769	0.151	<0.02	<0.02	<0.02
Pyrene	4.1	<0.02	0.609	0.454	0.028	<0.02	<0.02	<0.02

Values shown in ***BOLD*** exceed Table 2 SCS

APPENDIX D

LABORATORY SOIL AND GROUNDWATER CERTIFICATES OF ANALYSIS

BLUEWATER GEOSCIENCE
ATTN: BRETON LEMIEUX
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1

Date Received: 14-DEC-21
Report Date: 21-DEC-21 15:09 (MT)
Version: FINAL

Client Phone: 519-744-4123

Certificate of Analysis

Lab Work Order #: L2672267

Project P.O. #: NOT SUBMITTED
Job Reference: BG- 804
C of C Numbers:
Legal Site Desc:

Gayle Braun
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-1 BH-1, CS-2							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Physical Tests							
% Moisture	8.73		0.25	%	17-DEC-21		
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	21-DEC-21	40	50
Arsenic (As)	2.1		1.0	ug/g	21-DEC-21	18	18
Barium (Ba)	8.9		1.0	ug/g	21-DEC-21	670	670
Beryllium (Be)	<0.50		0.50	ug/g	21-DEC-21	8	10
Boron (B)	<5.0		5.0	ug/g	21-DEC-21	120	120
Cadmium (Cd)	<0.50		0.50	ug/g	21-DEC-21	1.9	1.9
Chromium (Cr)	5.3		1.0	ug/g	21-DEC-21	160	160
Cobalt (Co)	2.3		1.0	ug/g	21-DEC-21	80	100
Copper (Cu)	9.1		1.0	ug/g	21-DEC-21	230	300
Lead (Pb)	4.4		1.0	ug/g	21-DEC-21	120	120
Molybdenum (Mo)	<1.0		1.0	ug/g	21-DEC-21	40	40
Nickel (Ni)	4.8		1.0	ug/g	21-DEC-21	270	340
Selenium (Se)	<1.0		1.0	ug/g	21-DEC-21	5.5	5.5
Silver (Ag)	<0.20		0.20	ug/g	21-DEC-21	40	50
Thallium (Tl)	<0.50		0.50	ug/g	21-DEC-21	3.3	3.3
Uranium (U)	<1.0		1.0	ug/g	21-DEC-21	33	33
Vanadium (V)	11.5		1.0	ug/g	21-DEC-21	86	86
Zinc (Zn)	20.9		5.0	ug/g	21-DEC-21	340	340
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	18-DEC-21	16	28
Benzene	<0.0068		0.0068	ug/g	18-DEC-21	0.32	0.4
Bromodichloromethane	<0.050		0.050	ug/g	18-DEC-21	1.5	1.9
Bromoform	<0.050		0.050	ug/g	18-DEC-21	0.61	1.7
Bromomethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	18-DEC-21	0.21	0.71
Chlorobenzene	<0.050		0.050	ug/g	18-DEC-21	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	18-DEC-21	2.3	2.9
Chloroform	<0.050		0.050	ug/g	18-DEC-21	0.47	0.18
1,2-Dibromoethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	1.2	1.7
1,3-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	9.6	12
1,4-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	0.2	0.57
Dichlorodifluoromethane	<0.050		0.050	ug/g	18-DEC-21	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	0.064	0.48
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.3	2.5
Methylene Chloride	<0.050		0.050	ug/g	18-DEC-21	1.6	2
1,2-Dichloropropane	<0.050		0.050	ug/g	18-DEC-21	0.16	0.68
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	18-DEC-21	0.059	0.081
Ethylbenzene	<0.018		0.018	ug/g	18-DEC-21		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-1 BH-1, CS-2							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Volatile Organic Compounds							
						1.1	1.6
n-Hexane	<0.050		0.050	ug/g	18-DEC-21	46	88
Methyl Ethyl Ketone	<0.50		0.50	ug/g	18-DEC-21	70	88
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	18-DEC-21	31	210
MTBE	<0.050		0.050	ug/g	18-DEC-21	1.6	2.3
Styrene	<0.050		0.050	ug/g	18-DEC-21	34	43
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.087	0.11
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.094
Tetrachloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
Toluene	<0.080		0.080	ug/g	18-DEC-21	6.4	9
1,1,1-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	6.1	12
1,1,2-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.11
Trichloroethylene	<0.010		0.010	ug/g	18-DEC-21	0.55	0.61
Trichlorofluoromethane	<0.050		0.050	ug/g	18-DEC-21	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	18-DEC-21	0.032	0.25
o-Xylene	<0.020		0.020	ug/g	18-DEC-21		
m+p-Xylenes	<0.030		0.030	ug/g	18-DEC-21		
Xylenes (Total)	<0.050		0.050	ug/g	18-DEC-21	26	30
Surrogate: 4-Bromofluorobenzene	78.1		50-140	%	18-DEC-21		
Surrogate: 1,4-Difluorobenzene	95.4		50-140	%	18-DEC-21		
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	18-DEC-21	55	65
F1-BTEX	<5.0		5.0	ug/g	21-DEC-21	55	65
F2 (C10-C16)	<10		10	ug/g	21-DEC-21	230	250
F2-Naphth	<10		10	ug/g	21-DEC-21		
F3 (C16-C34)	<50		50	ug/g	21-DEC-21	1700	2500
F3-PAH	<50		50	ug/g	21-DEC-21		
F4 (C34-C50)	<50		50	ug/g	21-DEC-21	3300	6600
Total Hydrocarbons (C6-C50)	<72		72	ug/g	21-DEC-21		
Chrom. to baseline at nC50	YES			No Unit	21-DEC-21		
Surrogate: 2-Bromobenzotrifluoride	87.6		60-140	%	21-DEC-21		
Surrogate: 3,4-Dichlorotoluene	72.8		60-140	%	18-DEC-21		
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.050		0.050	ug/g	20-DEC-21	21	29
Acenaphthylene	<0.050		0.050	ug/g	20-DEC-21	0.15	0.17
Anthracene	<0.050		0.050	ug/g	20-DEC-21	0.67	0.74
Benzo(a)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96
Benzo(a)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.3	0.3
Benzo(b&j)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96
Benzo(g,h,i)perylene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6
Benzo(k)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96
Chrysene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6
Dibenz(a,h)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.1	0.1
Fluoranthene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6
Fluorene	<0.050		0.050	ug/g	20-DEC-21	62	69
Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.76	0.95

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-1 BH-1, CS-2							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	<0.042		0.042	ug/g	20-DEC-21	30	42
1-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42
2-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42
Naphthalene	<0.013		0.013	ug/g	20-DEC-21	9.6	28
Phenanthrene	<0.046		0.046	ug/g	20-DEC-21	12	16
Pyrene	<0.050		0.050	ug/g	20-DEC-21	96	96
Surrogate: 2-Fluorobiphenyl	79.4		50-140	%	20-DEC-21		
Surrogate: d14-Terphenyl	93.4		50-140	%	20-DEC-21		
L2672267-2 BH-2, CS-2							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Physical Tests							
% Moisture	10.1		0.25	%	17-DEC-21		
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	21-DEC-21	40	50
Arsenic (As)	4.3		1.0	ug/g	21-DEC-21	18	18
Barium (Ba)	14.0		1.0	ug/g	21-DEC-21	670	670
Beryllium (Be)	<0.50		0.50	ug/g	21-DEC-21	8	10
Boron (B)	<5.0		5.0	ug/g	21-DEC-21	120	120
Cadmium (Cd)	<0.50		0.50	ug/g	21-DEC-21	1.9	1.9
Chromium (Cr)	9.4		1.0	ug/g	21-DEC-21	160	160
Cobalt (Co)	4.3		1.0	ug/g	21-DEC-21	80	100
Copper (Cu)	13.4		1.0	ug/g	21-DEC-21	230	300
Lead (Pb)	12.6		1.0	ug/g	21-DEC-21	120	120
Molybdenum (Mo)	<1.0		1.0	ug/g	21-DEC-21	40	40
Nickel (Ni)	7.9		1.0	ug/g	21-DEC-21	270	340
Selenium (Se)	<1.0		1.0	ug/g	21-DEC-21	5.5	5.5
Silver (Ag)	<0.20		0.20	ug/g	21-DEC-21	40	50
Thallium (Tl)	<0.50		0.50	ug/g	21-DEC-21	3.3	3.3
Uranium (U)	<1.0		1.0	ug/g	21-DEC-21	33	33
Vanadium (V)	18.9		1.0	ug/g	21-DEC-21	86	86
Zinc (Zn)	33.7		5.0	ug/g	21-DEC-21	340	340
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	18-DEC-21	16	28
Benzene	<0.0068		0.0068	ug/g	18-DEC-21	0.32	0.4
Bromodichloromethane	<0.050		0.050	ug/g	18-DEC-21	1.5	1.9
Bromoform	<0.050		0.050	ug/g	18-DEC-21	0.61	1.7
Bromomethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	18-DEC-21	0.21	0.71
Chlorobenzene	<0.050		0.050	ug/g	18-DEC-21	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	18-DEC-21	2.3	2.9
Chloroform	<0.050		0.050	ug/g	18-DEC-21	0.47	0.18
1,2-Dibromoethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	1.2	1.7

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-2 BH-2, CS-2							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Volatile Organic Compounds							
1,3-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	9.6	12
1,4-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	0.2	0.57
Dichlorodifluoromethane	<0.050		0.050	ug/g	18-DEC-21	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	0.064	0.48
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.3	2.5
Methylene Chloride	<0.050		0.050	ug/g	18-DEC-21	1.6	2
1,2-Dichloropropane	<0.050		0.050	ug/g	18-DEC-21	0.16	0.68
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	18-DEC-21	0.059	0.081
Ethylbenzene	<0.018		0.018	ug/g	18-DEC-21	1.1	1.6
n-Hexane	<0.050		0.050	ug/g	18-DEC-21	46	88
Methyl Ethyl Ketone	<0.50		0.50	ug/g	18-DEC-21	70	88
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	18-DEC-21	31	210
MTBE	<0.050		0.050	ug/g	18-DEC-21	1.6	2.3
Styrene	<0.050		0.050	ug/g	18-DEC-21	34	43
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.087	0.11
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.094
Tetrachloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
Toluene	<0.080		0.080	ug/g	18-DEC-21	6.4	9
1,1,1-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	6.1	12
1,1,2-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.11
Trichloroethylene	<0.010		0.010	ug/g	18-DEC-21	0.55	0.61
Trichlorofluoromethane	<0.050		0.050	ug/g	18-DEC-21	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	18-DEC-21	0.032	0.25
o-Xylene	<0.020		0.020	ug/g	18-DEC-21		
m+p-Xylenes	<0.030		0.030	ug/g	18-DEC-21		
Xylenes (Total)	<0.050		0.050	ug/g	18-DEC-21	26	30
Surrogate: 4-Bromofluorobenzene	86.0		50-140	%	18-DEC-21		
Surrogate: 1,4-Difluorobenzene	103.6		50-140	%	18-DEC-21		
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	18-DEC-21	55	65
F1-BTEX	<5.0		5.0	ug/g	21-DEC-21	55	65
F2 (C10-C16)	<10		10	ug/g	21-DEC-21	230	250
F2-Naphth	<10		10	ug/g	21-DEC-21		
F3 (C16-C34)	<50		50	ug/g	21-DEC-21	1700	2500
F3-PAH	<50		50	ug/g	21-DEC-21		
F4 (C34-C50)	<50		50	ug/g	21-DEC-21	3300	6600
Total Hydrocarbons (C6-C50)	<72		72	ug/g	21-DEC-21		
Chrom. to baseline at nC50	YES			No Unit	21-DEC-21		
Surrogate: 2-Bromobenzotrifluoride	87.6		60-140	%	21-DEC-21		
Surrogate: 3,4-Dichlorotoluene	81.4		60-140	%	18-DEC-21		
Polycyclic Aromatic Hydrocarbons							

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2		
L2672267-2 BH-2, CS-2									
Sampled By: BJL on 13-DEC-21									
Matrix: SOIL									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	<0.050		0.050	ug/g	20-DEC-21	21	29		
Acenaphthylene	<0.050		0.050	ug/g	20-DEC-21	0.15	0.17		
Anthracene	<0.050		0.050	ug/g	20-DEC-21	0.67	0.74		
Benzo(a)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96		
Benzo(a)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.3	0.3		
Benzo(b&j)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96		
Benzo(g,h,i)perylene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6		
Benzo(k)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96		
Chrysene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6		
Dibenz(a,h)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.1	0.1		
Fluoranthene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6		
Fluorene	<0.050		0.050	ug/g	20-DEC-21	62	69		
Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.76	0.95		
1+2-Methylnaphthalenes	<0.042		0.042	ug/g	20-DEC-21	30	42		
1-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42		
2-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42		
Naphthalene	<0.013		0.013	ug/g	20-DEC-21	9.6	28		
Phenanthrene	<0.046		0.046	ug/g	20-DEC-21	12	16		
Pyrene	<0.050		0.050	ug/g	20-DEC-21	96	96		
Surrogate: 2-Fluorobiphenyl	71.4		50-140	%	20-DEC-21				
Surrogate: d14-Terphenyl	83.7		50-140	%	20-DEC-21				
L2672267-3 BH-3, CS-3									
Sampled By: BJL on 13-DEC-21									
Matrix: SOIL									
Physical Tests									
% Moisture	4.66		0.25	%	17-DEC-21				
Metals									
Antimony (Sb)	<1.0		1.0	ug/g	21-DEC-21	40	50		
Arsenic (As)	1.8		1.0	ug/g	21-DEC-21	18	18		
Barium (Ba)	10.5		1.0	ug/g	21-DEC-21	670	670		
Beryllium (Be)	<0.50		0.50	ug/g	21-DEC-21	8	10		
Boron (B)	<5.0		5.0	ug/g	21-DEC-21	120	120		
Cadmium (Cd)	<0.50		0.50	ug/g	21-DEC-21	1.9	1.9		
Chromium (Cr)	8.3		1.0	ug/g	21-DEC-21	160	160		
Cobalt (Co)	2.9		1.0	ug/g	21-DEC-21	80	100		
Copper (Cu)	8.2		1.0	ug/g	21-DEC-21	230	300		
Lead (Pb)	4.9		1.0	ug/g	21-DEC-21	120	120		
Molybdenum (Mo)	<1.0		1.0	ug/g	21-DEC-21	40	40		
Nickel (Ni)	5.2		1.0	ug/g	21-DEC-21	270	340		
Selenium (Se)	<1.0		1.0	ug/g	21-DEC-21	5.5	5.5		
Silver (Ag)	<0.20		0.20	ug/g	21-DEC-21	40	50		
Thallium (Tl)	<0.50		0.50	ug/g	21-DEC-21	3.3	3.3		
Uranium (U)	<1.0		1.0	ug/g	21-DEC-21	33	33		
Vanadium (V)	23.4		1.0	ug/g	21-DEC-21	86	86		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-3 BH-3, CS-3							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Metals							
Zinc (Zn)	22.3		5.0	ug/g	21-DEC-21	340	340
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	18-DEC-21	16	28
Benzene	<0.0068		0.0068	ug/g	18-DEC-21	0.32	0.4
Bromodichloromethane	<0.050		0.050	ug/g	18-DEC-21	1.5	1.9
Bromoform	<0.050		0.050	ug/g	18-DEC-21	0.61	1.7
Bromomethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	18-DEC-21	0.21	0.71
Chlorobenzene	<0.050		0.050	ug/g	18-DEC-21	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	18-DEC-21	2.3	2.9
Chloroform	<0.050		0.050	ug/g	18-DEC-21	0.47	0.18
1,2-Dibromoethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	1.2	1.7
1,3-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	9.6	12
1,4-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	0.2	0.57
Dichlorodifluoromethane	<0.050		0.050	ug/g	18-DEC-21	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	0.064	0.48
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.3	2.5
Methylene Chloride	<0.050		0.050	ug/g	18-DEC-21	1.6	2
1,2-Dichloropropane	<0.050		0.050	ug/g	18-DEC-21	0.16	0.68
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	18-DEC-21	0.059	0.081
Ethylbenzene	<0.018		0.018	ug/g	18-DEC-21	1.1	1.6
n-Hexane	<0.050		0.050	ug/g	18-DEC-21	46	88
Methyl Ethyl Ketone	<0.50		0.50	ug/g	18-DEC-21	70	88
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	18-DEC-21	31	210
MTBE	<0.050		0.050	ug/g	18-DEC-21	1.6	2.3
Styrene	<0.050		0.050	ug/g	18-DEC-21	34	43
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.087	0.11
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.094
Tetrachloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
Toluene	<0.080		0.080	ug/g	18-DEC-21	6.4	9
1,1,1-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	6.1	12
1,1,2-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.11
Trichloroethylene	<0.010		0.010	ug/g	18-DEC-21	0.55	0.61
Trichlorofluoromethane	<0.050		0.050	ug/g	18-DEC-21	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	18-DEC-21	0.032	0.25
o-Xylene	<0.020		0.020	ug/g	18-DEC-21		
m+p-Xylenes	<0.030		0.030	ug/g	18-DEC-21		
Xylenes (Total)	<0.050		0.050	ug/g	18-DEC-21	26	30
Surrogate: 4-Bromofluorobenzene	86.4		50-140	%	18-DEC-21		
Surrogate: 1,4-Difluorobenzene	105.8		50-140	%	18-DEC-21		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
L2672267-3	BH-3, CS-3									
Sampled By:	BJL on 13-DEC-21									
Matrix:	SOIL						#1	#2		
Hydrocarbons										
	F1 (C6-C10)	<5.0		5.0	ug/g	18-DEC-21	55	65		
	F1-BTEX	<5.0		5.0	ug/g	21-DEC-21	55	65		
	F2 (C10-C16)	<10		10	ug/g	21-DEC-21	230	250		
	F2-Naphth	<10		10	ug/g	21-DEC-21				
	F3 (C16-C34)	<50		50	ug/g	21-DEC-21	1700	2500		
	F3-PAH	<50		50	ug/g	21-DEC-21				
	F4 (C34-C50)	<50		50	ug/g	21-DEC-21	3300	6600		
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	21-DEC-21				
	Chrom. to baseline at nC50	YES			No Unit	21-DEC-21				
	Surrogate: 2-Bromobenzotrifluoride	90.6		60-140	%	21-DEC-21				
	Surrogate: 3,4-Dichlorotoluene	74.2		60-140	%	18-DEC-21				
Polycyclic Aromatic Hydrocarbons										
	Acenaphthene	<0.050		0.050	ug/g	20-DEC-21	21	29		
	Acenaphthylene	<0.050		0.050	ug/g	20-DEC-21	0.15	0.17		
	Anthracene	<0.050		0.050	ug/g	20-DEC-21	0.67	0.74		
	Benzo(a)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96		
	Benzo(a)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.3	0.3		
	Benzo(b&j)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96		
	Benzo(g,h,i)perylene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6		
	Benzo(k)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96		
	Chrysene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6		
	Dibenz(a,h)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.1	0.1		
	Fluoranthene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6		
	Fluorene	<0.050		0.050	ug/g	20-DEC-21	62	69		
	Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.76	0.95		
	1+2-Methylnaphthalenes	<0.042		0.042	ug/g	20-DEC-21	30	42		
	1-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42		
	2-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42		
	Naphthalene	<0.013		0.013	ug/g	20-DEC-21	9.6	28		
	Phenanthrene	<0.046		0.046	ug/g	20-DEC-21	12	16		
	Pyrene	<0.050		0.050	ug/g	20-DEC-21	96	96		
	Surrogate: 2-Fluorobiphenyl	73.1		50-140	%	20-DEC-21				
	Surrogate: d14-Terphenyl	86.0		50-140	%	20-DEC-21				
L2672267-4	BH-4, CS-4									
Sampled By:	BJL on 13-DEC-21									
Matrix:	SOIL						#1	#2		
Physical Tests										
	% Moisture	12.2		0.25	%	17-DEC-21				
Metals										
	Antimony (Sb)	<1.0		1.0	ug/g	21-DEC-21	40	50		
	Arsenic (As)	1.5		1.0	ug/g	21-DEC-21	18	18		
	Barium (Ba)	9.0		1.0	ug/g	21-DEC-21	670	670		
	Beryllium (Be)	<0.50		0.50	ug/g	21-DEC-21	8	10		
	Boron (B)	<5.0		5.0	ug/g	21-DEC-21	120	120		
	Cadmium (Cd)	<0.50		0.50	ug/g	21-DEC-21	1.9	1.9		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-4 BH-4, CS-4							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Metals							
Chromium (Cr)	6.3		1.0	ug/g	21-DEC-21	160	160
Cobalt (Co)	2.1		1.0	ug/g	21-DEC-21	80	100
Copper (Cu)	7.2		1.0	ug/g	21-DEC-21	230	300
Lead (Pb)	3.9		1.0	ug/g	21-DEC-21	120	120
Molybdenum (Mo)	<1.0		1.0	ug/g	21-DEC-21	40	40
Nickel (Ni)	3.8		1.0	ug/g	21-DEC-21	270	340
Selenium (Se)	<1.0		1.0	ug/g	21-DEC-21	5.5	5.5
Silver (Ag)	<0.20		0.20	ug/g	21-DEC-21	40	50
Thallium (Tl)	<0.50		0.50	ug/g	21-DEC-21	3.3	3.3
Uranium (U)	<1.0		1.0	ug/g	21-DEC-21	33	33
Vanadium (V)	15.8		1.0	ug/g	21-DEC-21	86	86
Zinc (Zn)	22.1		5.0	ug/g	21-DEC-21	340	340
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	18-DEC-21	16	28
Benzene	<0.0068		0.0068	ug/g	18-DEC-21	0.32	0.4
Bromodichloromethane	<0.050		0.050	ug/g	18-DEC-21	1.5	1.9
Bromoform	<0.050		0.050	ug/g	18-DEC-21	0.61	1.7
Bromomethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	18-DEC-21	0.21	0.71
Chlorobenzene	<0.050		0.050	ug/g	18-DEC-21	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	18-DEC-21	2.3	2.9
Chloroform	<0.050		0.050	ug/g	18-DEC-21	0.47	0.18
1,2-Dibromoethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	1.2	1.7
1,3-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	9.6	12
1,4-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	0.2	0.57
Dichlorodifluoromethane	<0.050		0.050	ug/g	18-DEC-21	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	0.064	0.48
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.3	2.5
Methylene Chloride	<0.050		0.050	ug/g	18-DEC-21	1.6	2
1,2-Dichloropropane	<0.050		0.050	ug/g	18-DEC-21	0.16	0.68
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	18-DEC-21	0.059	0.081
Ethylbenzene	<0.018		0.018	ug/g	18-DEC-21	1.1	1.6
n-Hexane	<0.050		0.050	ug/g	18-DEC-21	46	88
Methyl Ethyl Ketone	<0.50		0.50	ug/g	18-DEC-21	70	88
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	18-DEC-21	31	210
MTBE	<0.050		0.050	ug/g	18-DEC-21	1.6	2.3
Styrene	<0.050		0.050	ug/g	18-DEC-21	34	43
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.087	0.11
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.094
Tetrachloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-4 BH-4, CS-4							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Volatile Organic Compounds							
Toluene	<0.080		0.080	ug/g	18-DEC-21	6.4	9
1,1,1-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	6.1	12
1,1,2-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.11
Trichloroethylene	<0.010		0.010	ug/g	18-DEC-21	0.55	0.61
Trichlorofluoromethane	<0.050		0.050	ug/g	18-DEC-21	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	18-DEC-21	0.032	0.25
o-Xylene	<0.020		0.020	ug/g	18-DEC-21		
m+p-Xylenes	<0.030		0.030	ug/g	18-DEC-21		
Xylenes (Total)	<0.050		0.050	ug/g	18-DEC-21	26	30
Surrogate: 4-Bromofluorobenzene	86.3		50-140	%	18-DEC-21		
Surrogate: 1,4-Difluorobenzene	104.1		50-140	%	18-DEC-21		
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	18-DEC-21	55	65
F1-BTEX	<5.0		5.0	ug/g	21-DEC-21	55	65
F2 (C10-C16)	<10		10	ug/g	21-DEC-21	230	250
F2-Naphth	<10		10	ug/g	21-DEC-21		
F3 (C16-C34)	<50		50	ug/g	21-DEC-21	1700	2500
F3-PAH	<50		50	ug/g	21-DEC-21		
F4 (C34-C50)	<50		50	ug/g	21-DEC-21	3300	6600
Total Hydrocarbons (C6-C50)	<72		72	ug/g	21-DEC-21		
Chrom. to baseline at nC50	YES			No Unit	21-DEC-21		
Surrogate: 2-Bromobenzotrifluoride	90.7		60-140	%	21-DEC-21		
Surrogate: 3,4-Dichlorotoluene	86.1		60-140	%	18-DEC-21		
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.050		0.050	ug/g	20-DEC-21	21	29
Acenaphthylene	<0.050		0.050	ug/g	20-DEC-21	0.15	0.17
Anthracene	<0.050		0.050	ug/g	20-DEC-21	0.67	0.74
Benzo(a)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96
Benzo(a)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.3	0.3
Benzo(b&j)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96
Benzo(g,h,i)perylene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6
Benzo(k)fluoranthene	<0.050		0.050	ug/g	20-DEC-21	0.96	0.96
Chrysene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6
Dibenz(a,h)anthracene	<0.050		0.050	ug/g	20-DEC-21	0.1	0.1
Fluoranthene	<0.050		0.050	ug/g	20-DEC-21	9.6	9.6
Fluorene	<0.050		0.050	ug/g	20-DEC-21	62	69
Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	20-DEC-21	0.76	0.95
1+2-Methylnaphthalenes	<0.042		0.042	ug/g	20-DEC-21	30	42
1-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42
2-Methylnaphthalene	<0.030		0.030	ug/g	20-DEC-21	30	42
Naphthalene	<0.013		0.013	ug/g	20-DEC-21	9.6	28
Phenanthrene	<0.046		0.046	ug/g	20-DEC-21	12	16
Pyrene	<0.050		0.050	ug/g	20-DEC-21	96	96
Surrogate: 2-Fluorobiphenyl	68.8		50-140	%	20-DEC-21		
Surrogate: d14-Terphenyl	80.7		50-140	%	20-DEC-21		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-5 BH-5, CS-1 Sampled By: BJL on 13-DEC-21 Matrix: SOIL							
Physical Tests							
% Moisture	4.90		0.25	%	17-DEC-21		
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	21-DEC-21	40	50
Arsenic (As)	1.7		1.0	ug/g	21-DEC-21	18	18
Barium (Ba)	7.1		1.0	ug/g	21-DEC-21	670	670
Beryllium (Be)	<0.50		0.50	ug/g	21-DEC-21	8	10
Boron (B)	<5.0		5.0	ug/g	21-DEC-21	120	120
Cadmium (Cd)	<0.50		0.50	ug/g	21-DEC-21	1.9	1.9
Chromium (Cr)	6.2		1.0	ug/g	21-DEC-21	160	160
Cobalt (Co)	2.2		1.0	ug/g	21-DEC-21	80	100
Copper (Cu)	6.8		1.0	ug/g	21-DEC-21	230	300
Lead (Pb)	4.9		1.0	ug/g	21-DEC-21	120	120
Molybdenum (Mo)	<1.0		1.0	ug/g	21-DEC-21	40	40
Nickel (Ni)	3.9		1.0	ug/g	21-DEC-21	270	340
Selenium (Se)	<1.0		1.0	ug/g	21-DEC-21	5.5	5.5
Silver (Ag)	<0.20		0.20	ug/g	21-DEC-21	40	50
Thallium (Tl)	<0.50		0.50	ug/g	21-DEC-21	3.3	3.3
Uranium (U)	<1.0		1.0	ug/g	21-DEC-21	33	33
Vanadium (V)	16.2		1.0	ug/g	21-DEC-21	86	86
Zinc (Zn)	21.3		5.0	ug/g	21-DEC-21	340	340
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	18-DEC-21	16	28
Benzene	<0.0068		0.0068	ug/g	18-DEC-21	0.32	0.4
Bromodichloromethane	<0.050		0.050	ug/g	18-DEC-21	1.5	1.9
Bromoform	<0.050		0.050	ug/g	18-DEC-21	0.61	1.7
Bromomethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	18-DEC-21	0.21	0.71
Chlorobenzene	<0.050		0.050	ug/g	18-DEC-21	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	18-DEC-21	2.3	2.9
Chloroform	<0.050		0.050	ug/g	18-DEC-21	0.47	0.18
1,2-Dibromoethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	1.2	1.7
1,3-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	9.6	12
1,4-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	0.2	0.57
Dichlorodifluoromethane	<0.050		0.050	ug/g	18-DEC-21	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	0.064	0.48
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.3	2.5
Methylene Chloride	<0.050		0.050	ug/g	18-DEC-21	1.6	2
1,2-Dichloropropane	<0.050		0.050	ug/g	18-DEC-21	0.16	0.68
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	18-DEC-21	0.059	0.081
Ethylbenzene	<0.018		0.018	ug/g	18-DEC-21		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-5 BH-5, CS-1							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Volatile Organic Compounds							
						1.1	1.6
n-Hexane	<0.050		0.050	ug/g	18-DEC-21	46	88
Methyl Ethyl Ketone	<0.50		0.50	ug/g	18-DEC-21	70	88
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	18-DEC-21	31	210
MTBE	<0.050		0.050	ug/g	18-DEC-21	1.6	2.3
Styrene	<0.050		0.050	ug/g	18-DEC-21	34	43
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.087	0.11
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.094
Tetrachloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
Toluene	<0.080		0.080	ug/g	18-DEC-21	6.4	9
1,1,1-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	6.1	12
1,1,2-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.11
Trichloroethylene	<0.010		0.010	ug/g	18-DEC-21	0.55	0.61
Trichlorofluoromethane	<0.050		0.050	ug/g	18-DEC-21	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	18-DEC-21	0.032	0.25
o-Xylene	<0.020		0.020	ug/g	18-DEC-21		
m+p-Xylenes	<0.030		0.030	ug/g	18-DEC-21		
Xylenes (Total)	<0.050		0.050	ug/g	18-DEC-21	26	30
Surrogate: 4-Bromofluorobenzene	89.2		50-140	%	18-DEC-21		
Surrogate: 1,4-Difluorobenzene	105.9		50-140	%	18-DEC-21		
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	18-DEC-21	55	65
F1-BTEX	<5.0		5.0	ug/g	21-DEC-21	55	65
F2 (C10-C16)	<10		10	ug/g	21-DEC-21	230	250
F2-Naphth	<10		10	ug/g	21-DEC-21		
F3 (C16-C34)	<50		50	ug/g	21-DEC-21	1700	2500
F3-PAH	<50		50	ug/g	21-DEC-21		
F4 (C34-C50)	<50		50	ug/g	21-DEC-21	3300	6600
Total Hydrocarbons (C6-C50)	<72		72	ug/g	21-DEC-21		
Chrom. to baseline at nC50	YES			No Unit	21-DEC-21		
Surrogate: 2-Bromobenzotrifluoride	92.0		60-140	%	21-DEC-21		
Surrogate: 3,4-Dichlorotoluene	89.1		60-140	%	18-DEC-21		
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.050		0.050	ug/g	21-DEC-21	21	29
Acenaphthylene	<0.050		0.050	ug/g	21-DEC-21	0.15	0.17
Anthracene	<0.050		0.050	ug/g	21-DEC-21	0.67	0.74
Benzo(a)anthracene	<0.050		0.050	ug/g	21-DEC-21	0.96	0.96
Benzo(a)pyrene	<0.050		0.050	ug/g	21-DEC-21	0.3	0.3
Benzo(b&j)fluoranthene	<0.050		0.050	ug/g	21-DEC-21	0.96	0.96
Benzo(g,h,i)perylene	<0.050		0.050	ug/g	21-DEC-21	9.6	9.6
Benzo(k)fluoranthene	<0.050		0.050	ug/g	21-DEC-21	0.96	0.96
Chrysene	<0.050		0.050	ug/g	21-DEC-21	9.6	9.6
Dibenz(a,h)anthracene	<0.050		0.050	ug/g	21-DEC-21	0.1	0.1
Fluoranthene	<0.050		0.050	ug/g	21-DEC-21	9.6	9.6
Fluorene	<0.050		0.050	ug/g	21-DEC-21	62	69
Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	21-DEC-21	0.76	0.95

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-5 BH-5, CS-1							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	<0.042		0.042	ug/g	21-DEC-21	30	42
1-Methylnaphthalene	<0.030		0.030	ug/g	21-DEC-21	30	42
2-Methylnaphthalene	<0.030		0.030	ug/g	21-DEC-21	30	42
Naphthalene	<0.013		0.013	ug/g	21-DEC-21	9.6	28
Phenanthrene	<0.046		0.046	ug/g	21-DEC-21	12	16
Pyrene	<0.050		0.050	ug/g	21-DEC-21	96	96
Surrogate: 2-Fluorobiphenyl	96.1		50-140	%	21-DEC-21		
Surrogate: d14-Terphenyl	92.3		50-140	%	21-DEC-21		
L2672267-6 BH-6, CS-2							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Physical Tests							
% Moisture	4.03		0.25	%	17-DEC-21		
Metals							
Antimony (Sb)	<1.0		1.0	ug/g	21-DEC-21	40	50
Arsenic (As)	1.7		1.0	ug/g	21-DEC-21	18	18
Barium (Ba)	7.4		1.0	ug/g	21-DEC-21	670	670
Beryllium (Be)	<0.50		0.50	ug/g	21-DEC-21	8	10
Boron (B)	<5.0		5.0	ug/g	21-DEC-21	120	120
Cadmium (Cd)	<0.50		0.50	ug/g	21-DEC-21	1.9	1.9
Chromium (Cr)	5.2		1.0	ug/g	21-DEC-21	160	160
Cobalt (Co)	2.1		1.0	ug/g	21-DEC-21	80	100
Copper (Cu)	6.8		1.0	ug/g	21-DEC-21	230	300
Lead (Pb)	4.0		1.0	ug/g	21-DEC-21	120	120
Molybdenum (Mo)	<1.0		1.0	ug/g	21-DEC-21	40	40
Nickel (Ni)	4.2		1.0	ug/g	21-DEC-21	270	340
Selenium (Se)	<1.0		1.0	ug/g	21-DEC-21	5.5	5.5
Silver (Ag)	<0.20		0.20	ug/g	21-DEC-21	40	50
Thallium (Tl)	<0.50		0.50	ug/g	21-DEC-21	3.3	3.3
Uranium (U)	<1.0		1.0	ug/g	21-DEC-21	33	33
Vanadium (V)	11.5		1.0	ug/g	21-DEC-21	86	86
Zinc (Zn)	19.3		5.0	ug/g	21-DEC-21	340	340
Volatile Organic Compounds							
Acetone	<0.50		0.50	ug/g	18-DEC-21	16	28
Benzene	<0.0068		0.0068	ug/g	18-DEC-21	0.32	0.4
Bromodichloromethane	<0.050		0.050	ug/g	18-DEC-21	1.5	1.9
Bromoform	<0.050		0.050	ug/g	18-DEC-21	0.61	1.7
Bromomethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	18-DEC-21	0.21	0.71
Chlorobenzene	<0.050		0.050	ug/g	18-DEC-21	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	18-DEC-21	2.3	2.9
Chloroform	<0.050		0.050	ug/g	18-DEC-21	0.47	0.18
1,2-Dibromoethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	1.2	1.7

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672267-6 BH-6, CS-2							
Sampled By: BJL on 13-DEC-21							
Matrix: SOIL							
Volatile Organic Compounds							
1,3-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	9.6	12
1,4-Dichlorobenzene	<0.050		0.050	ug/g	18-DEC-21	0.2	0.57
Dichlorodifluoromethane	<0.050		0.050	ug/g	18-DEC-21	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	0.064	0.48
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.3	2.5
Methylene Chloride	<0.050		0.050	ug/g	18-DEC-21	1.6	2
1,2-Dichloropropane	<0.050		0.050	ug/g	18-DEC-21	0.16	0.68
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	18-DEC-21		
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	18-DEC-21	0.059	0.081
Ethylbenzene	<0.018		0.018	ug/g	18-DEC-21	1.1	1.6
n-Hexane	<0.050		0.050	ug/g	18-DEC-21	46	88
Methyl Ethyl Ketone	<0.50		0.50	ug/g	18-DEC-21	70	88
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	18-DEC-21	31	210
MTBE	<0.050		0.050	ug/g	18-DEC-21	1.6	2.3
Styrene	<0.050		0.050	ug/g	18-DEC-21	34	43
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.087	0.11
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.094
Tetrachloroethylene	<0.050		0.050	ug/g	18-DEC-21	1.9	2.5
Toluene	<0.080		0.080	ug/g	18-DEC-21	6.4	9
1,1,1-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	6.1	12
1,1,2-Trichloroethane	<0.050		0.050	ug/g	18-DEC-21	0.05	0.11
Trichloroethylene	<0.010		0.010	ug/g	18-DEC-21	0.55	0.61
Trichlorofluoromethane	<0.050		0.050	ug/g	18-DEC-21	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	18-DEC-21	0.032	0.25
o-Xylene	<0.020		0.020	ug/g	18-DEC-21		
m+p-Xylenes	<0.030		0.030	ug/g	18-DEC-21		
Xylenes (Total)	<0.050		0.050	ug/g	18-DEC-21	26	30
Surrogate: 4-Bromofluorobenzene	88.7		50-140	%	18-DEC-21		
Surrogate: 1,4-Difluorobenzene	109.4		50-140	%	18-DEC-21		
Hydrocarbons							
F1 (C6-C10)	<5.0		5.0	ug/g	18-DEC-21	55	65
F1-BTEX	<5.0		5.0	ug/g	21-DEC-21	55	65
F2 (C10-C16)	<10		10	ug/g	21-DEC-21	230	250
F2-Naphth	<10		10	ug/g	21-DEC-21		
F3 (C16-C34)	<50		50	ug/g	21-DEC-21	1700	2500
F3-PAH	<50		50	ug/g	21-DEC-21		
F4 (C34-C50)	<50		50	ug/g	21-DEC-21	3300	6600
Total Hydrocarbons (C6-C50)	<72		72	ug/g	21-DEC-21		
Chrom. to baseline at nC50	YES			No Unit	21-DEC-21		
Surrogate: 2-Bromobenzotrifluoride	82.8		60-140	%	21-DEC-21		
Surrogate: 3,4-Dichlorotoluene	82.2		60-140	%	18-DEC-21		
Polycyclic Aromatic Hydrocarbons							

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse) **#2: T2-Soil-Ind/Com/Commu Property Use (Fine)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2		
L2672267-6 BH-6, CS-2									
Sampled By: BJL on 13-DEC-21									
Matrix: SOIL									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	<0.050		0.050	ug/g	21-DEC-21	21	29		
Acenaphthylene	<0.050		0.050	ug/g	21-DEC-21	0.15	0.17		
Anthracene	<0.050		0.050	ug/g	21-DEC-21	0.67	0.74		
Benzo(a)anthracene	<0.050		0.050	ug/g	21-DEC-21	0.96	0.96		
Benzo(a)pyrene	<0.050		0.050	ug/g	21-DEC-21	0.3	0.3		
Benzo(b&j)fluoranthene	<0.050		0.050	ug/g	21-DEC-21	0.96	0.96		
Benzo(g,h,i)perylene	<0.050		0.050	ug/g	21-DEC-21	9.6	9.6		
Benzo(k)fluoranthene	<0.050		0.050	ug/g	21-DEC-21	0.96	0.96		
Chrysene	<0.050		0.050	ug/g	21-DEC-21	9.6	9.6		
Dibenz(a,h)anthracene	<0.050		0.050	ug/g	21-DEC-21	0.1	0.1		
Fluoranthene	<0.050		0.050	ug/g	21-DEC-21	9.6	9.6		
Fluorene	<0.050		0.050	ug/g	21-DEC-21	62	69		
Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	21-DEC-21	0.76	0.95		
1+2-Methylnaphthalenes	<0.042		0.042	ug/g	21-DEC-21	30	42		
1-Methylnaphthalene	<0.030		0.030	ug/g	21-DEC-21	30	42		
2-Methylnaphthalene	<0.030		0.030	ug/g	21-DEC-21	30	42		
Naphthalene	<0.013		0.013	ug/g	21-DEC-21	9.6	28		
Phenanthrene	<0.046		0.046	ug/g	21-DEC-21	12	16		
Pyrene	<0.050		0.050	ug/g	21-DEC-21	96	96		
Surrogate: 2-Fluorobiphenyl	96.1		50-140	%	21-DEC-21				
Surrogate: d14-Terphenyl	91.2		50-140	%	21-DEC-21				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-SOIL-ICC-C/F

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
F1-F4-511-CALC-WT	Soil	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-S

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Soil	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Soil	F2-F4-O.Reg 153/04 (July 2011)	CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from soil with 1:1 hexane:acetone using a rotary extractor. Extracts are treated with silica gel to remove polar organic interferences. F2, F3, & F4 are analyzed by GC-FID. F4G-sg is analyzed gravimetrically.

Notes:
1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16.
2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34.
3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50.
4. F4G: Gravimetric Heavy Hydrocarbons
5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment.
6. Where both F4 (C34-C50) and F4G-sg are reported for a sample, the larger of the two values is used for comparison against the relevant CCME guideline for F4.
7. F4G-sg cannot be added to the C6 to C50 hydrocarbon results to obtain an estimate of total extractable hydrocarbons.
8. This method is validated for use.
9. Data from analysis of validation and quality control samples is available upon request.
10. Reported results are expressed as milligrams per dry kilogram, unless otherwise indicated.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MET-200.2-CCMS-WT	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020B (mod)

Soil/sediment is dried, disaggregated, and sieved (2 mm). For tests intended to support Ontario regulations, the <2mm fraction is ground to pass through a 0.355 mm sieve. Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.

Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H2S) may be excluded if lost during sampling, storage, or digestion.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

METHYLNAPS-CALC-WT	Soil	ABN-Calculated Parameters	SW846 8270
MOISTURE-WT	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)

Reference Information

PAH-511-WT	Soil	PAH-O.Reg 153/04 (July 2011)	SW846 3510/8270

A representative sub-sample of soil is fortified with deuterium-labelled surrogates and a mechanical shaking techniqueis used to extract the sample with a mixture of methanol and toluene. The extracts are concentrated and analyzed by GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

VOC-1,3-DCP-CALC-WT	Soil	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Soil	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT	**Soil**							
Batch R5680676								
WG3676194-4 DUP		**WG3676194-3**						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	18-DEC-21
WG3676194-2 LCS								
F1 (C6-C10)			98.7		%		80-120	18-DEC-21
WG3676194-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	18-DEC-21
Surrogate: 3,4-Dichlorotoluene			93.6		%		60-140	18-DEC-21
WG3676194-5 MS		**WG3676194-3**						
F1 (C6-C10)			102.8		%		60-140	18-DEC-21
F2-F4-511-WT	**Soil**							
Batch R5681728								
WG3676392-3 DUP		**WG3676392-5**						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	21-DEC-21
F3 (C16-C34)		<50	<50	RPD-NA	ug/g	N/A	30	21-DEC-21
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	21-DEC-21
WG3676392-2 LCS								
F2 (C10-C16)			91.7		%		80-120	21-DEC-21
F3 (C16-C34)			95.3		%		80-120	21-DEC-21
F4 (C34-C50)			97.9		%		80-120	21-DEC-21
WG3676392-1 MB								
F2 (C10-C16)			<10		ug/g		10	21-DEC-21
F3 (C16-C34)			<50		ug/g		50	21-DEC-21
F4 (C34-C50)			<50		ug/g		50	21-DEC-21
Surrogate: 2-Bromobenzotrifluoride			98.2		%		60-140	21-DEC-21
WG3676392-4 MS		**WG3676392-5**						
F2 (C10-C16)			91.9		%		60-140	21-DEC-21
F3 (C16-C34)			95.4		%		60-140	21-DEC-21
F4 (C34-C50)			98.9		%		60-140	21-DEC-21
MET-200.2-CCMS-WT	**Soil**							
Batch R5681769								
WG3677796-2 CRM		**WT-SS-2**						
Antimony (Sb)			106.6		%		70-130	21-DEC-21
Arsenic (As)			110.8		%		70-130	21-DEC-21
Barium (Ba)			112.9		%		70-130	21-DEC-21
Beryllium (Be)			100.7		%		70-130	21-DEC-21
Boron (B)			8.8		mg/kg		3.5-13.5	21-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R5681769								
WG3677796-2 CRM		**WT-SS-2**						
Cadmium (Cd)			116.3		%		70-130	21-DEC-21
Chromium (Cr)			109.1		%		70-130	21-DEC-21
Cobalt (Co)			110.8		%		70-130	21-DEC-21
Copper (Cu)			112.0		%		70-130	21-DEC-21
Lead (Pb)			124.2		%		70-130	21-DEC-21
Molybdenum (Mo)			115.5		%		70-130	21-DEC-21
Nickel (Ni)			112.6		%		70-130	21-DEC-21
Selenium (Se)			0.15		mg/kg		0-0.34	21-DEC-21
Silver (Ag)			98.4		%		70-130	21-DEC-21
Thallium (Tl)			0.091		mg/kg		0.029-0.129	21-DEC-21
Uranium (U)			119.4		%		70-130	21-DEC-21
Vanadium (V)			110.9		%		70-130	21-DEC-21
Zinc (Zn)			106.9		%		70-130	21-DEC-21
WG3677796-6 DUP		**WG3677796-5**						
Antimony (Sb)		0.42	0.46		ug/g	10	30	21-DEC-21
Arsenic (As)		7.64	7.30		ug/g	4.5	30	21-DEC-21
Barium (Ba)		47.4	42.9		ug/g	10	40	21-DEC-21
Beryllium (Be)		0.20	0.22		ug/g	7.7	30	21-DEC-21
Boron (B)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	21-DEC-21
Cadmium (Cd)		0.467	0.432		ug/g	7.9	30	21-DEC-21
Chromium (Cr)		15.1	14.6		ug/g	3.2	30	21-DEC-21
Cobalt (Co)		3.11	3.06		ug/g	1.7	30	21-DEC-21
Copper (Cu)		30.0	24.8		ug/g	19	30	21-DEC-21
Lead (Pb)		112	113		ug/g	0.8	40	21-DEC-21
Molybdenum (Mo)		0.86	0.92		ug/g	6.1	40	21-DEC-21
Nickel (Ni)		7.51	7.11		ug/g	5.4	30	21-DEC-21
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	21-DEC-21
Silver (Ag)		0.20	0.21		ug/g	3.6	40	21-DEC-21
Thallium (Tl)		0.050	0.055		ug/g	7.7	30	21-DEC-21
Uranium (U)		0.354	0.377		ug/g	6.1	30	21-DEC-21
Vanadium (V)		12.5	11.7		ug/g	6.2	30	21-DEC-21
Zinc (Zn)		104	103		ug/g	1.1	30	21-DEC-21
WG3677796-4 LCS								

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R5681769								
WG3677796-4 LCS								
Antimony (Sb)			103.5		%		80-120	21-DEC-21
Arsenic (As)			107.5		%		80-120	21-DEC-21
Barium (Ba)			101.9		%		80-120	21-DEC-21
Beryllium (Be)			91.3		%		80-120	21-DEC-21
Boron (B)			89.0		%		80-120	21-DEC-21
Cadmium (Cd)			107.0		%		80-120	21-DEC-21
Chromium (Cr)			105.5		%		80-120	21-DEC-21
Cobalt (Co)			104.7		%		80-120	21-DEC-21
Copper (Cu)			103.9		%		80-120	21-DEC-21
Lead (Pb)			110.1		%		80-120	21-DEC-21
Molybdenum (Mo)			98.2		%		80-120	21-DEC-21
Nickel (Ni)			103.9		%		80-120	21-DEC-21
Selenium (Se)			106.1		%		80-120	21-DEC-21
Silver (Ag)			100.6		%		80-120	21-DEC-21
Thallium (Tl)			106.9		%		80-120	21-DEC-21
Uranium (U)			108.9		%		80-120	21-DEC-21
Vanadium (V)			106.5		%		80-120	21-DEC-21
Zinc (Zn)			102.4		%		80-120	21-DEC-21
WG3677796-1 MB								
Antimony (Sb)			<0.10		mg/kg		0.1	21-DEC-21
Arsenic (As)			<0.10		mg/kg		0.1	21-DEC-21
Barium (Ba)			<0.50		mg/kg		0.5	21-DEC-21
Beryllium (Be)			<0.10		mg/kg		0.1	21-DEC-21
Boron (B)			<5.0		mg/kg		5	21-DEC-21
Cadmium (Cd)			<0.020		mg/kg		0.02	21-DEC-21
Chromium (Cr)			<0.50		mg/kg		0.5	21-DEC-21
Cobalt (Co)			<0.10		mg/kg		0.1	21-DEC-21
Copper (Cu)			<0.50		mg/kg		0.5	21-DEC-21
Lead (Pb)			<0.50		mg/kg		0.5	21-DEC-21
Molybdenum (Mo)			<0.10		mg/kg		0.1	21-DEC-21
Nickel (Ni)			<0.50		mg/kg		0.5	21-DEC-21
Selenium (Se)			<0.20		mg/kg		0.2	21-DEC-21
Silver (Ag)			<0.10		mg/kg		0.1	21-DEC-21
Thallium (Tl)			<0.050		mg/kg		0.05	21-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R5681769								
WG3677796-1 MB								
Uranium (U)			<0.050		mg/kg		0.05	21-DEC-21
Vanadium (V)			<0.20		mg/kg		0.2	21-DEC-21
Zinc (Zn)			<2.0		mg/kg		2	21-DEC-21
MOISTURE-WT	**Soil**							
Batch R5680098								
WG3676162-3 DUP		**L2672034-8**						
% Moisture		13.1	14.1		%	6.7	20	17-DEC-21
WG3676162-2 LCS								
% Moisture			99.7		%		90-110	17-DEC-21
WG3676162-1 MB								
% Moisture			<0.25		%		0.25	17-DEC-21
PAH-511-WT	**Soil**							
Batch R5681066								
WG3676276-3 DUP		**WG3676276-5**						
1-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	20-DEC-21
2-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	20-DEC-21
Acenaphthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Acenaphthylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Benzo(a)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Benzo(a)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Benzo(b&j)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Benzo(g,h,i)perylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Benzo(k)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Chrysene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Dibenz(a,h)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Fluorene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
Naphthalene		<0.013	<0.013	RPD-NA	ug/g	N/A	40	20-DEC-21
Phenanthrene		<0.046	<0.046	RPD-NA	ug/g	N/A	40	20-DEC-21
Pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	20-DEC-21
WG3676276-2 LCS								
1-Methylnaphthalene			79.7		%		50-140	20-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Soil**							
Batch R5681066								
WG3676276-2 LCS								
2-Methylnaphthalene			79.7		%		50-140	20-DEC-21
Acenaphthene			78.4		%		50-140	20-DEC-21
Acenaphthylene			77.7		%		50-140	20-DEC-21
Anthracene			81.3		%		50-140	20-DEC-21
Benzo(a)anthracene			89.3		%		50-140	20-DEC-21
Benzo(a)pyrene			87.2		%		50-140	20-DEC-21
Benzo(b&j)fluoranthene			88.9		%		50-140	20-DEC-21
Benzo(g,h,i)perylene			69.4		%		50-140	20-DEC-21
Benzo(k)fluoranthene			91.1		%		50-140	20-DEC-21
Chrysene			87.5		%		50-140	20-DEC-21
Dibenz(a,h)anthracene			72.6		%		50-140	20-DEC-21
Fluoranthene			90.7		%		50-140	20-DEC-21
Fluorene			85.0		%		50-140	20-DEC-21
Indeno(1,2,3-cd)pyrene			67.8		%		50-140	20-DEC-21
Naphthalene			86.7		%		50-140	20-DEC-21
Phenanthrene			87.9		%		50-140	20-DEC-21
Pyrene			87.3		%		50-140	20-DEC-21
WG3676276-1 MB								
1-Methylnaphthalene			<0.030		ug/g		0.03	20-DEC-21
2-Methylnaphthalene			<0.030		ug/g		0.03	20-DEC-21
Acenaphthene			<0.050		ug/g		0.05	20-DEC-21
Acenaphthylene			<0.050		ug/g		0.05	20-DEC-21
Anthracene			<0.050		ug/g		0.05	20-DEC-21
Benzo(a)anthracene			<0.050		ug/g		0.05	20-DEC-21
Benzo(a)pyrene			<0.050		ug/g		0.05	20-DEC-21
Benzo(b&j)fluoranthene			<0.050		ug/g		0.05	20-DEC-21
Benzo(g,h,i)perylene			<0.050		ug/g		0.05	20-DEC-21
Benzo(k)fluoranthene			<0.050		ug/g		0.05	20-DEC-21
Chrysene			<0.050		ug/g		0.05	20-DEC-21
Dibenz(a,h)anthracene			<0.050		ug/g		0.05	20-DEC-21
Fluoranthene			<0.050		ug/g		0.05	20-DEC-21
Fluorene			<0.050		ug/g		0.05	20-DEC-21
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	20-DEC-21
Naphthalene			<0.013		ug/g		0.013	20-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Soil**							
Batch R5681066								
WG3676276-1 MB								
Phenanthrene			<0.046		ug/g		0.046	20-DEC-21
Pyrene			<0.050		ug/g		0.05	20-DEC-21
Surrogate: 2-Fluorobiphenyl			77.4		%		50-140	20-DEC-21
Surrogate: d14-Terphenyl			89.3		%		50-140	20-DEC-21
WG3676276-4 MS		**WG3676276-5**						
1-Methylnaphthalene			84.7		%		50-140	20-DEC-21
2-Methylnaphthalene			83.9		%		50-140	20-DEC-21
Acenaphthene			82.1		%		50-140	20-DEC-21
Acenaphthylene			80.4		%		50-140	20-DEC-21
Anthracene			85.1		%		50-140	20-DEC-21
Benzo(a)anthracene			94.1		%		50-140	20-DEC-21
Benzo(a)pyrene			89.5		%		50-140	20-DEC-21
Benzo(b&j)fluoranthene			98.0		%		50-140	20-DEC-21
Benzo(g,h,i)perylene			50.1		%		50-140	20-DEC-21
Benzo(k)fluoranthene			96.6		%		50-140	20-DEC-21
Chrysene			90.2		%		50-140	20-DEC-21
Dibenz(a,h)anthracene			61.4		%		50-140	20-DEC-21
Fluoranthene			98.6		%		50-140	20-DEC-21
Fluorene			88.0		%		50-140	20-DEC-21
Indeno(1,2,3-cd)pyrene			51.7		%		50-140	20-DEC-21
Naphthalene			89.4		%		50-140	20-DEC-21
Phenanthrene			91.6		%		50-140	20-DEC-21
Pyrene			92.1		%		50-140	20-DEC-21
Batch R5681576								
WG3677247-3 DUP		**WG3677247-5**						
1-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	21-DEC-21
2-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	21-DEC-21
Acenaphthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Acenaphthylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Benzo(a)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Benzo(a)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Benzo(b&j)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Benzo(g,h,i)perylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Soil**							
Batch R5681576								
WG3677247-3 DUP		**WG3677247-5**						
Benzo(k)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Chrysene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Dibenz(a,h)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Fluorene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
Naphthalene		<0.013	<0.013	RPD-NA	ug/g	N/A	40	21-DEC-21
Phenanthrene		<0.046	<0.046	RPD-NA	ug/g	N/A	40	21-DEC-21
Pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	21-DEC-21
WG3677247-2 LCS								
1-Methylnaphthalene			94.2		%		50-140	21-DEC-21
2-Methylnaphthalene			94.2		%		50-140	21-DEC-21
Acenaphthene			90.8		%		50-140	21-DEC-21
Acenaphthylene			91.8		%		50-140	21-DEC-21
Anthracene			84.5		%		50-140	21-DEC-21
Benzo(a)anthracene			89.7		%		50-140	21-DEC-21
Benzo(a)pyrene			91.6		%		50-140	21-DEC-21
Benzo(b&j)fluoranthene			89.1		%		50-140	21-DEC-21
Benzo(g,h,i)perylene			62.8		%		50-140	21-DEC-21
Benzo(k)fluoranthene			92.6		%		50-140	21-DEC-21
Chrysene			91.3		%		50-140	21-DEC-21
Dibenz(a,h)anthracene			65.4		%		50-140	21-DEC-21
Fluoranthene			90.2		%		50-140	21-DEC-21
Fluorene			87.5		%		50-140	21-DEC-21
Indeno(1,2,3-cd)pyrene			68.7		%		50-140	21-DEC-21
Naphthalene			90.7		%		50-140	21-DEC-21
Phenanthrene			88.4		%		50-140	21-DEC-21
Pyrene			89.8		%		50-140	21-DEC-21
WG3677247-1 MB								
1-Methylnaphthalene			<0.030		ug/g		0.03	21-DEC-21
2-Methylnaphthalene			<0.030		ug/g		0.03	21-DEC-21
Acenaphthene			<0.050		ug/g		0.05	21-DEC-21
Acenaphthylene			<0.050		ug/g		0.05	21-DEC-21
Anthracene			<0.050		ug/g		0.05	21-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Soil**							
Batch R5681576								
WG3677247-1 MB								
Benzo(a)anthracene			<0.050		ug/g		0.05	21-DEC-21
Benzo(a)pyrene			<0.050		ug/g		0.05	21-DEC-21
Benzo(b&j)fluoranthene			<0.050		ug/g		0.05	21-DEC-21
Benzo(g,h,i)perylene			<0.050		ug/g		0.05	21-DEC-21
Benzo(k)fluoranthene			<0.050		ug/g		0.05	21-DEC-21
Chrysene			<0.050		ug/g		0.05	21-DEC-21
Dibenz(a,h)anthracene			<0.050		ug/g		0.05	21-DEC-21
Fluoranthene			<0.050		ug/g		0.05	21-DEC-21
Fluorene			<0.050		ug/g		0.05	21-DEC-21
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	21-DEC-21
Naphthalene			<0.013		ug/g		0.013	21-DEC-21
Phenanthrene			<0.046		ug/g		0.046	21-DEC-21
Pyrene			<0.050		ug/g		0.05	21-DEC-21
Surrogate: 2-Fluorobiphenyl			96.5		%		50-140	21-DEC-21
Surrogate: d14-Terphenyl			89.4		%		50-140	21-DEC-21
WG3677247-4 MS		**WG3677247-5**						
1-Methylnaphthalene			97.3		%		50-140	21-DEC-21
2-Methylnaphthalene			97.1		%		50-140	21-DEC-21
Acenaphthene			93.6		%		50-140	21-DEC-21
Acenaphthylene			93.8		%		50-140	21-DEC-21
Anthracene			88.1		%		50-140	21-DEC-21
Benzo(a)anthracene			92.1		%		50-140	21-DEC-21
Benzo(a)pyrene			93.9		%		50-140	21-DEC-21
Benzo(b&j)fluoranthene			93.1		%		50-140	21-DEC-21
Benzo(g,h,i)perylene			69.6		%		50-140	21-DEC-21
Benzo(k)fluoranthene			94.5		%		50-140	21-DEC-21
Chrysene			93.8		%		50-140	21-DEC-21
Dibenz(a,h)anthracene			71.8		%		50-140	21-DEC-21
Fluoranthene			92.4		%		50-140	21-DEC-21
Fluorene			91.0		%		50-140	21-DEC-21
Indeno(1,2,3-cd)pyrene			70.4		%		50-140	21-DEC-21
Naphthalene			93.3		%		50-140	21-DEC-21
Phenanthrene			91.8		%		50-140	21-DEC-21
Pyrene			92.0		%		50-140	21-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R5680676								
WG3676194-4 DUP		**WG3676194-3**						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	18-DEC-21
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	18-DEC-21
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	18-DEC-21
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	18-DEC-21
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	18-DEC-21
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	18-DEC-21
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	18-DEC-21
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	18-DEC-21
Styrene		<0.050	<0.050		ug/g			18-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R5680676								
WG3676194-4 DUP		**WG3676194-3**						
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	18-DEC-21
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	18-DEC-21
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	18-DEC-21
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	18-DEC-21
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	18-DEC-21
WG3676194-2 LCS								
1,1,1,2-Tetrachloroethane			89.2		%		60-130	18-DEC-21
1,1,2,2-Tetrachloroethane			96.8		%		60-130	18-DEC-21
1,1,1-Trichloroethane			88.7		%		60-130	18-DEC-21
1,1,2-Trichloroethane			97.3		%		60-130	18-DEC-21
1,1-Dichloroethane			83.5		%		60-130	18-DEC-21
1,1-Dichloroethylene			87.9		%		60-130	18-DEC-21
1,2-Dibromoethane			97.9		%		70-130	18-DEC-21
1,2-Dichlorobenzene			96.4		%		70-130	18-DEC-21
1,2-Dichloroethane			94.8		%		60-130	18-DEC-21
1,2-Dichloropropane			93.3		%		70-130	18-DEC-21
1,3-Dichlorobenzene			96.8		%		70-130	18-DEC-21
1,4-Dichlorobenzene			97.1		%		70-130	18-DEC-21
Acetone			95.6		%		60-140	18-DEC-21
Benzene			87.8		%		70-130	18-DEC-21
Bromodichloromethane			99.4		%		50-140	18-DEC-21
Bromoform			103.1		%		70-130	18-DEC-21
Bromomethane			84.4		%		50-140	18-DEC-21
Carbon tetrachloride			85.9		%		70-130	18-DEC-21
Chlorobenzene			93.1		%		70-130	18-DEC-21
Chloroform			90.1		%		70-130	18-DEC-21
cis-1,2-Dichloroethylene			92.1		%		70-130	18-DEC-21
cis-1,3-Dichloropropene			94.5		%		70-130	18-DEC-21
Dibromochloromethane			93.6		%		60-130	18-DEC-21
Dichlorodifluoromethane			51.8		%		50-140	18-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R5680676								
WG3676194-2 LCS								
Ethylbenzene			89.8		%		70-130	18-DEC-21
n-Hexane			80.7		%		70-130	18-DEC-21
Methylene Chloride			88.7		%		70-130	18-DEC-21
MTBE			91.1		%		70-130	18-DEC-21
m+p-Xylenes			98.1		%		70-130	18-DEC-21
Methyl Ethyl Ketone			93.1		%		60-140	18-DEC-21
Methyl Isobutyl Ketone			98.2		%		60-140	18-DEC-21
o-Xylene			97.0		%		70-130	18-DEC-21
Styrene			100.4		%		70-130	18-DEC-21
Tetrachloroethylene			88.2		%		60-130	18-DEC-21
Toluene			89.5		%		70-130	18-DEC-21
trans-1,2-Dichloroethylene			88.0		%		60-130	18-DEC-21
trans-1,3-Dichloropropene			97.0		%		70-130	18-DEC-21
Trichloroethylene			84.3		%		60-130	18-DEC-21
Trichlorofluoromethane			80.0		%		50-140	18-DEC-21
Vinyl chloride			71.9		%		60-140	18-DEC-21
WG3676194-1 MB								
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	18-DEC-21
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	18-DEC-21
1,1,1-Trichloroethane			<0.050		ug/g		0.05	18-DEC-21
1,1,2-Trichloroethane			<0.050		ug/g		0.05	18-DEC-21
1,1-Dichloroethane			<0.050		ug/g		0.05	18-DEC-21
1,1-Dichloroethylene			<0.050		ug/g		0.05	18-DEC-21
1,2-Dibromoethane			<0.050		ug/g		0.05	18-DEC-21
1,2-Dichlorobenzene			<0.050		ug/g		0.05	18-DEC-21
1,2-Dichloroethane			<0.050		ug/g		0.05	18-DEC-21
1,2-Dichloropropane			<0.050		ug/g		0.05	18-DEC-21
1,3-Dichlorobenzene			<0.050		ug/g		0.05	18-DEC-21
1,4-Dichlorobenzene			<0.050		ug/g		0.05	18-DEC-21
Acetone			<0.50		ug/g		0.5	18-DEC-21
Benzene			<0.0068		ug/g		0.0068	18-DEC-21
Bromodichloromethane			<0.050		ug/g		0.05	18-DEC-21
Bromoform			<0.050		ug/g		0.05	18-DEC-21
Bromomethane			<0.050		ug/g		0.05	18-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R5680676								
WG3676194-1 MB								
Carbon tetrachloride			<0.050		ug/g		0.05	18-DEC-21
Chlorobenzene			<0.050		ug/g		0.05	18-DEC-21
Chloroform			<0.050		ug/g		0.05	18-DEC-21
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	18-DEC-21
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	18-DEC-21
Dibromochloromethane			<0.050		ug/g		0.05	18-DEC-21
Dichlorodifluoromethane			<0.050		ug/g		0.05	18-DEC-21
Ethylbenzene			<0.018		ug/g		0.018	18-DEC-21
n-Hexane			<0.050		ug/g		0.05	18-DEC-21
Methylene Chloride			<0.050		ug/g		0.05	18-DEC-21
MTBE			<0.050		ug/g		0.05	18-DEC-21
m+p-Xylenes			<0.030		ug/g		0.03	18-DEC-21
Methyl Ethyl Ketone			<0.50		ug/g		0.5	18-DEC-21
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	18-DEC-21
o-Xylene			<0.020		ug/g		0.02	18-DEC-21
Styrene			<0.050		ug/g		0.05	18-DEC-21
Tetrachloroethylene			<0.050		ug/g		0.05	18-DEC-21
Toluene			<0.080		ug/g		0.08	18-DEC-21
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	18-DEC-21
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	18-DEC-21
Trichloroethylene			<0.010		ug/g		0.01	18-DEC-21
Trichlorofluoromethane			<0.050		ug/g		0.05	18-DEC-21
Vinyl chloride			<0.020		ug/g		0.02	18-DEC-21
Surrogate: 1,4-Difluorobenzene			99.4		%		50-140	18-DEC-21
Surrogate: 4-Bromofluorobenzene			86.3		%		50-140	18-DEC-21
WG3676194-5 MS		**WG3676194-3**						
1,1,1,2-Tetrachloroethane			95.8		%		50-140	18-DEC-21
1,1,2,2-Tetrachloroethane			101.9		%		50-140	18-DEC-21
1,1,1-Trichloroethane			98.5		%		50-140	18-DEC-21
1,1,2-Trichloroethane			105.9		%		50-140	18-DEC-21
1,1-Dichloroethane			93.9		%		50-140	18-DEC-21
1,1-Dichloroethylene			100.8		%		50-140	18-DEC-21
1,2-Dibromoethane			105.8		%		50-140	18-DEC-21
1,2-Dichlorobenzene			103.6		%		50-140	18-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R5680676								
WG3676194-5 MS		**WG3676194-3**						
1,2-Dichloroethane			103.9		%		50-140	18-DEC-21
1,2-Dichloropropane			102.3		%		50-140	18-DEC-21
1,3-Dichlorobenzene			104.7		%		50-140	18-DEC-21
1,4-Dichlorobenzene			104.6		%		50-140	18-DEC-21
Acetone			106.6		%		50-140	18-DEC-21
Benzene			97.1		%		50-140	18-DEC-21
Bromodichloromethane			108.9		%		50-140	18-DEC-21
Bromoform			108.6		%		50-140	18-DEC-21
Bromomethane			98.5		%		50-140	18-DEC-21
Carbon tetrachloride			94.7		%		50-140	18-DEC-21
Chlorobenzene			101.3		%		50-140	18-DEC-21
Chloroform			99.6		%		50-140	18-DEC-21
cis-1,2-Dichloroethylene			101.2		%		50-140	18-DEC-21
cis-1,3-Dichloropropene			102.0		%		50-140	18-DEC-21
Dibromochloromethane			100.3		%		50-140	18-DEC-21
Dichlorodifluoromethane			80.3		%		50-140	18-DEC-21
Ethylbenzene			98.0		%		50-140	18-DEC-21
n-Hexane			94.0		%		50-140	18-DEC-21
Methylene Chloride			98.3		%		50-140	18-DEC-21
MTBE			99.8		%		50-140	18-DEC-21
m+p-Xylenes			106.5		%		50-140	18-DEC-21
Methyl Ethyl Ketone			99.8		%		50-140	18-DEC-21
Methyl Isobutyl Ketone			102.9		%		50-140	18-DEC-21
o-Xylene			105.5		%		50-140	18-DEC-21
Styrene			108.0		%		50-140	18-DEC-21
Tetrachloroethylene			95.4		%		50-140	18-DEC-21
Toluene			98.3		%		50-140	18-DEC-21
trans-1,2-Dichloroethylene			97.5		%		50-140	18-DEC-21
trans-1,3-Dichloropropene			105.4		%		50-140	18-DEC-21
Trichloroethylene			90.8		%		50-140	18-DEC-21
Trichlorofluoromethane			94.9		%		50-140	18-DEC-21
Vinyl chloride			87.7		%		50-140	18-DEC-21

Quality Control Report

Workorder: L2672267 Report Date: 21-DEC-21

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

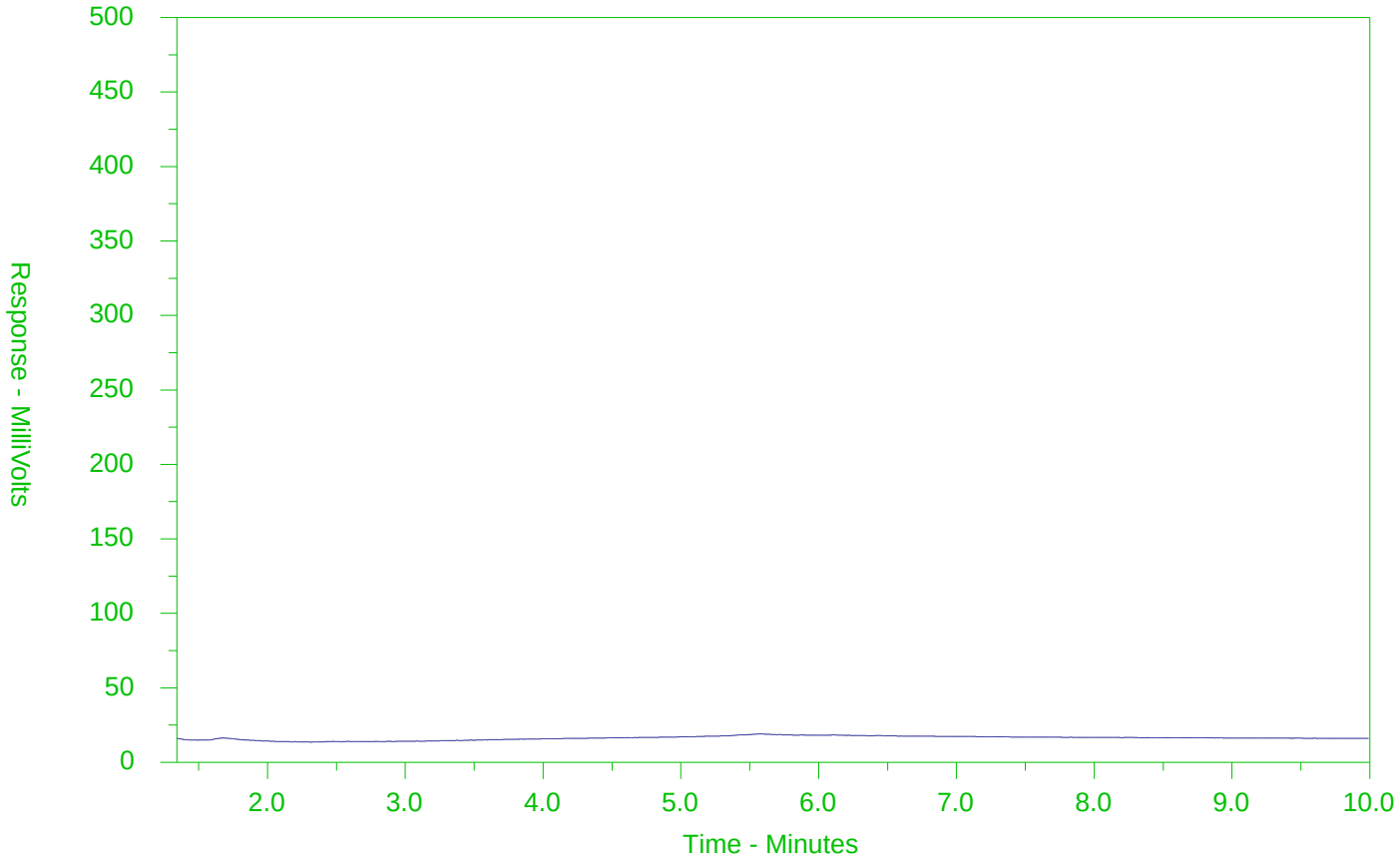
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672267-1
Client Sample ID: BH-1, CS-2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

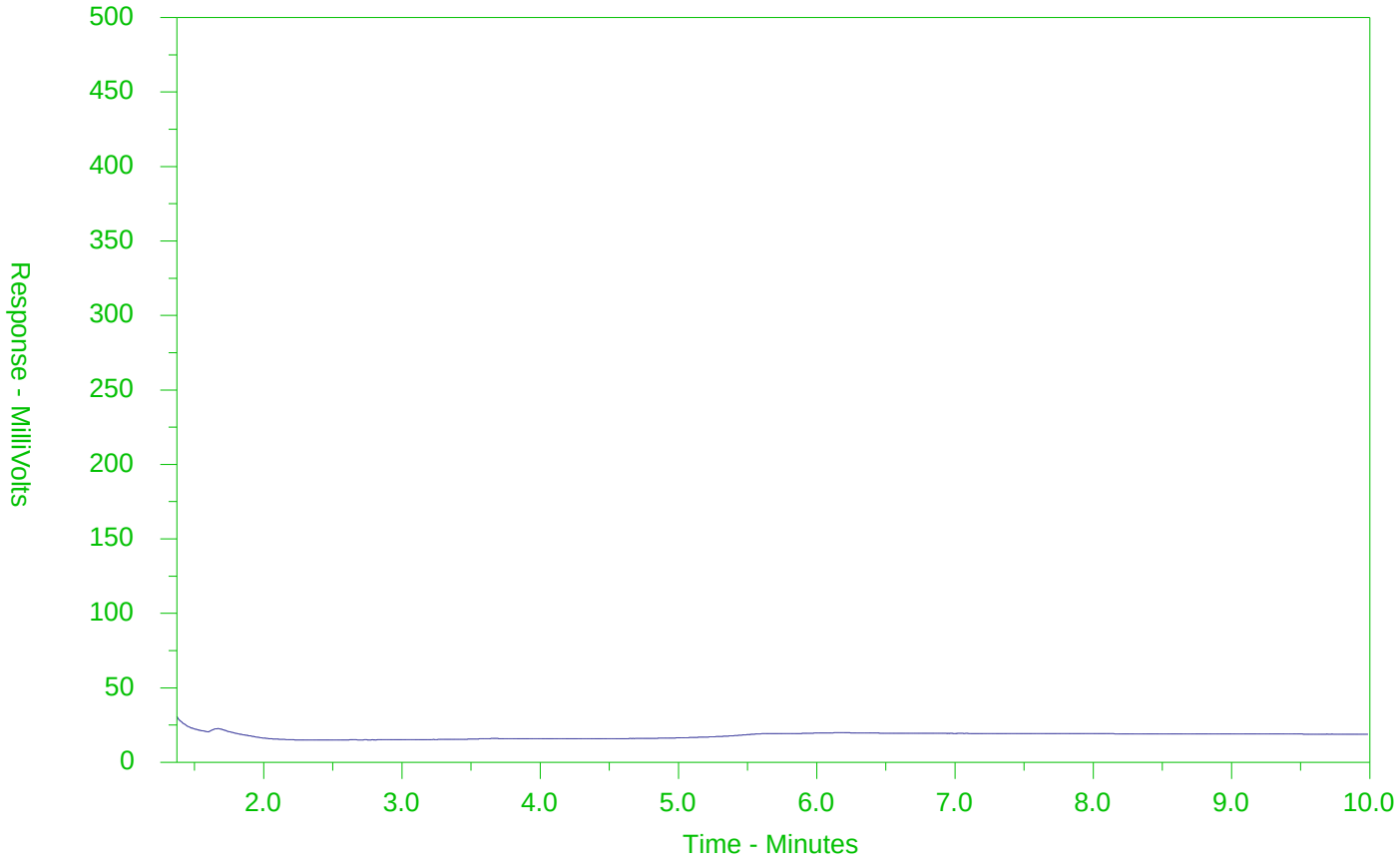
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672267-2
Client Sample ID: BH-2, CS-2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

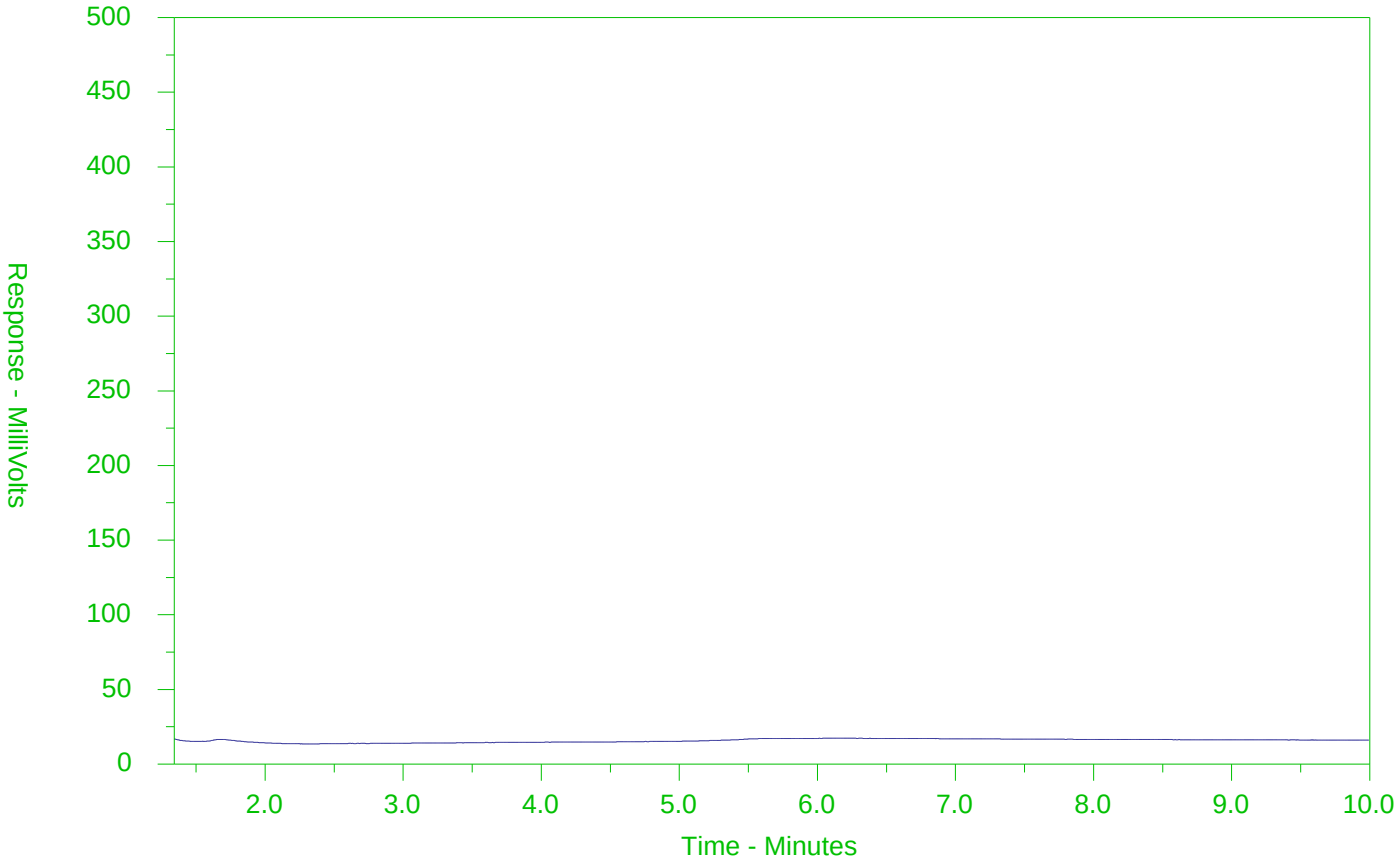
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672267-3
Client Sample ID: BH-3, CS-3



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

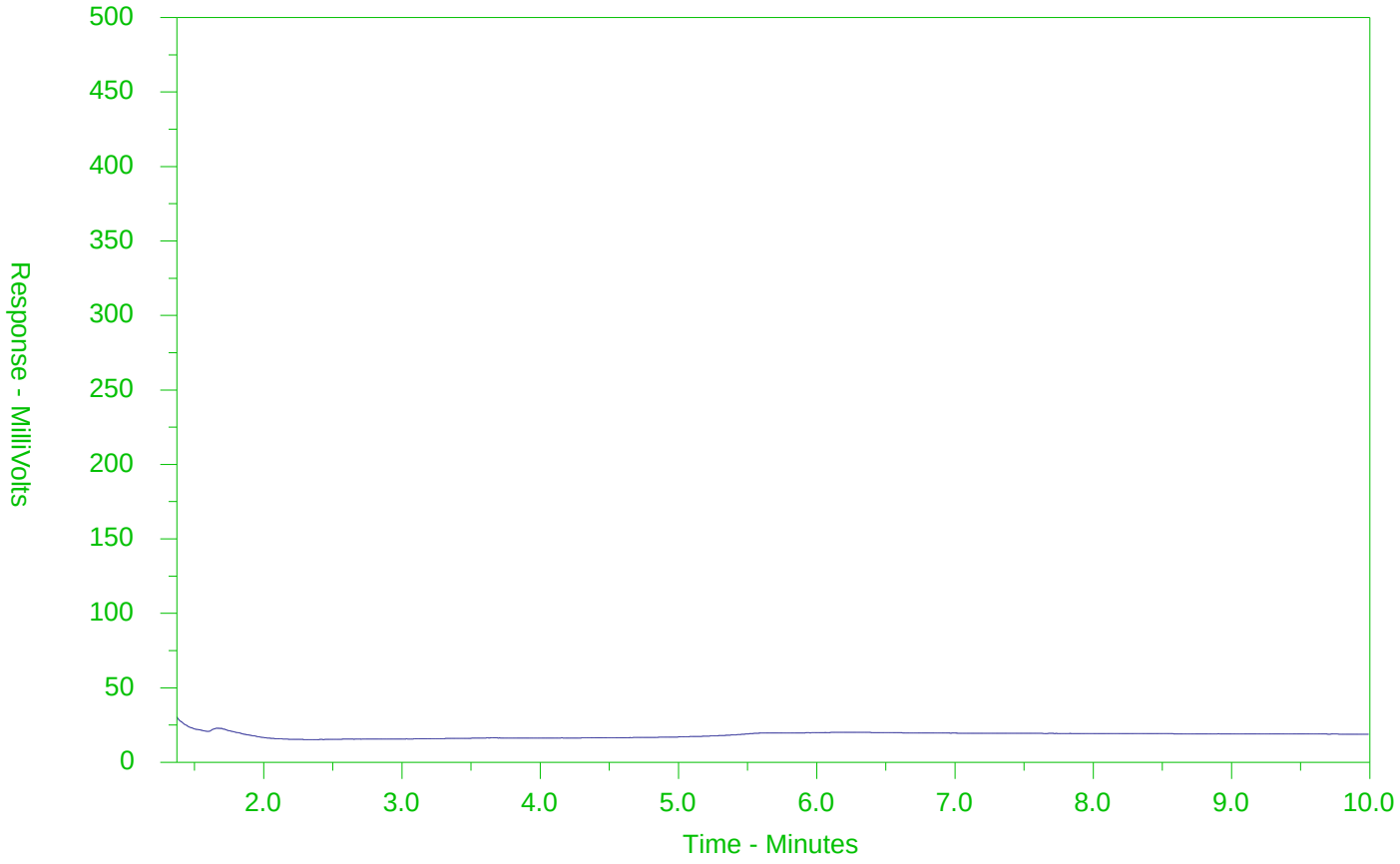
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672267-4
Client Sample ID: BH-4, CS-4



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

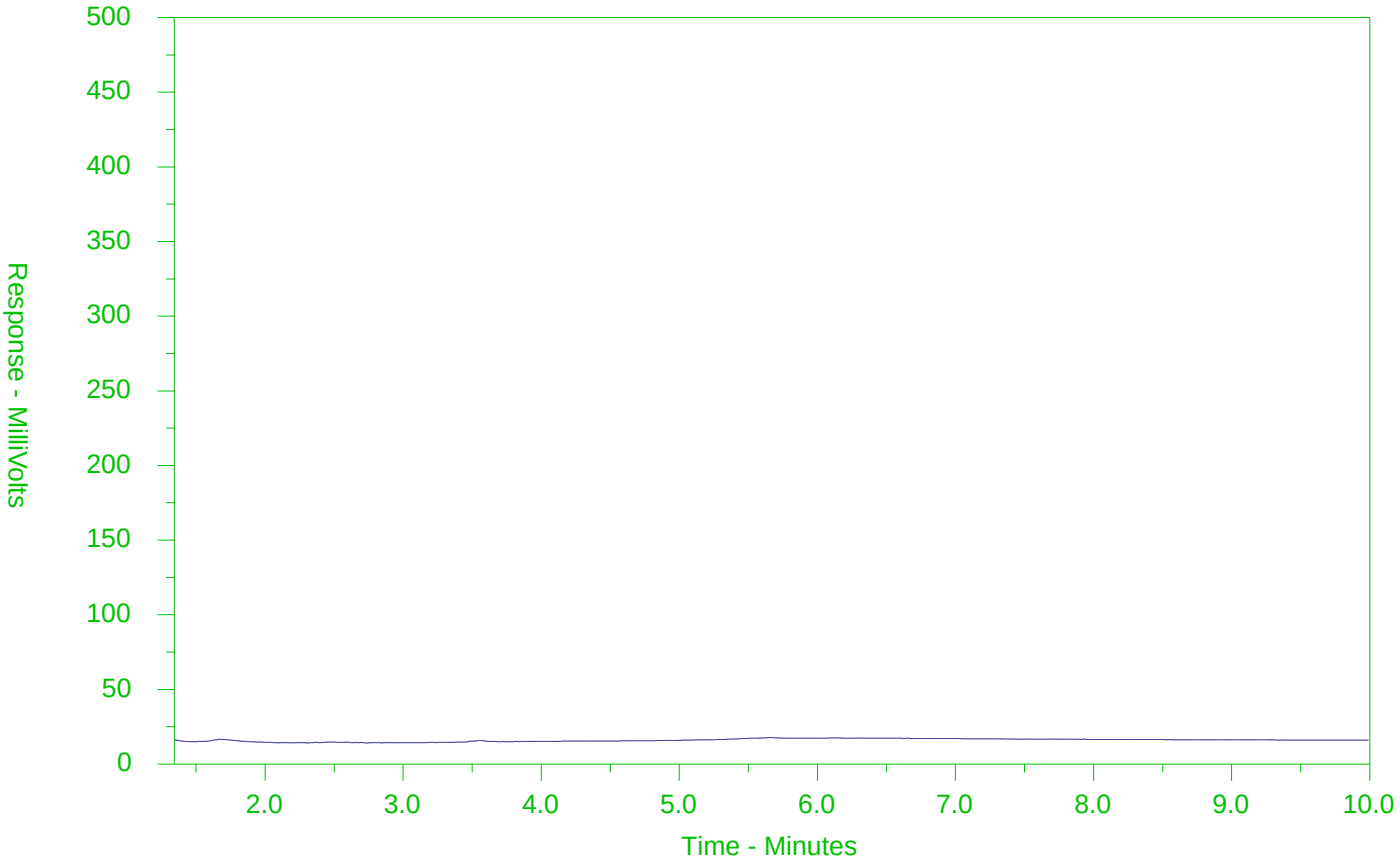
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672267-5
Client Sample ID: BH-5, CS-1



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

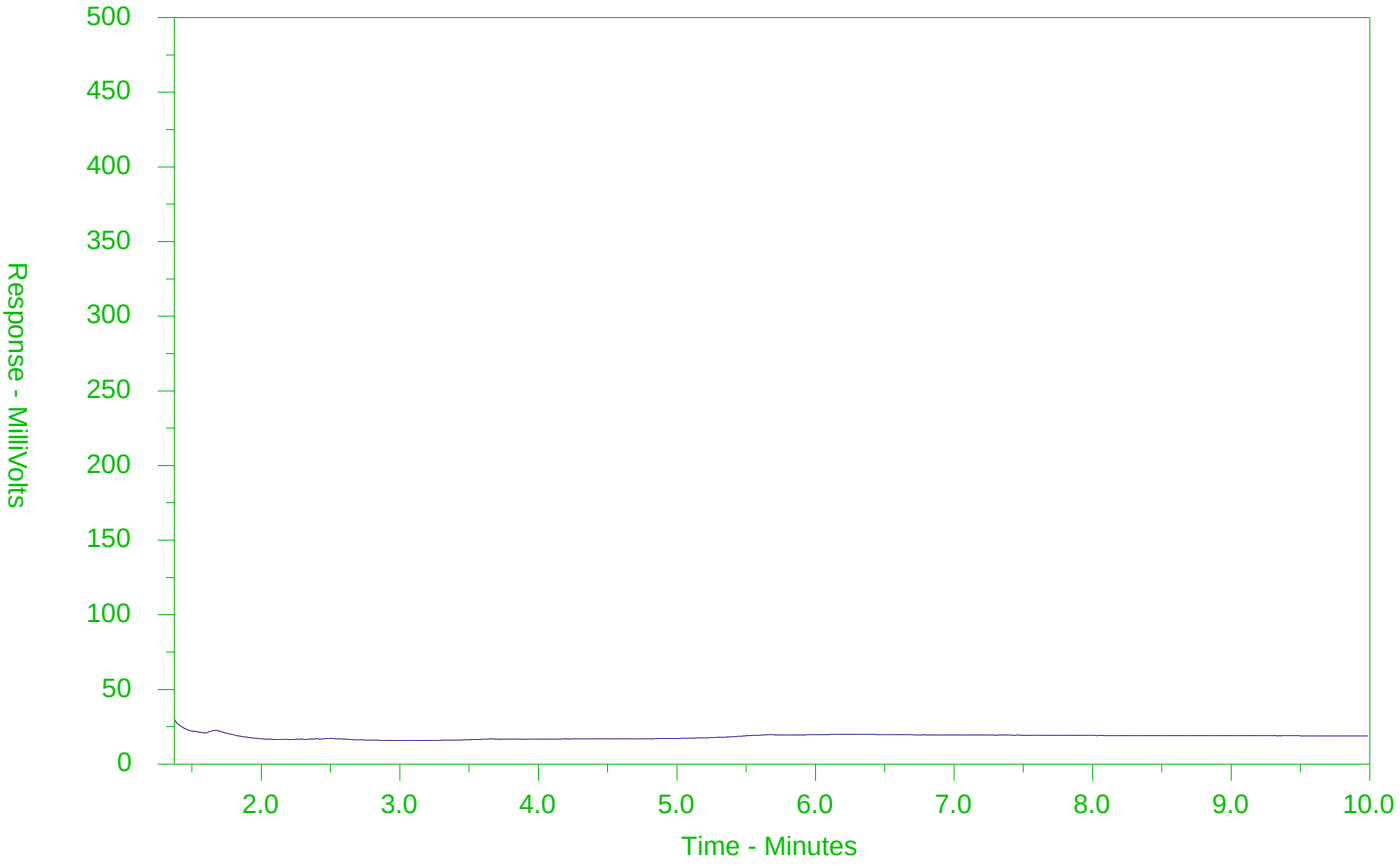
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672267-6
Client Sample ID: BH-6, CS-2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 895814

Page 1 of 1

www.alsglobal.com

Toll Free: 1 800 668 9878

L2672267-COFC

Report To	Contact and company name below will appear on the final report
Company:	Bluewater Geoscience
Contact:	B. Lemieux
Phone:	
Company address below will appear on the final report	
Street:	
City/Province:	
Postal Code:	

Compare Results to Criteria

Select Distribution: ☒ EMAIL ☐ MAIL

Email 1 or Fax

Email 2

Email 3

Invoice To	Same as Report To ☒ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☒ NO
Company:	
Contact:	

Invoice Recipients

Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Project Information	
ALS Account # / Quote #:	Q87598
Job #:	BG-804
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): L2672267

ALS Contact: GAYLE

Sampler: B.L

Turnaround Time (TAT) Requested

- ☒ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	VOC + F1-F4 + BTEX	PAH	METALS	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH-1, CS-2	13/12/21		Soil	4	X	X	X			
	BH-2, CS-2										
	BH-3, CS-3										
	BH-4, CS-4										
	BH-5, CS-1										
	BH-6, CS-2										

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☒ NO	Table 2 ICC SCS
Are samples for human consumption/ use? ☐ YES ☒ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☒ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				10.4			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: BL	Date: DEC 13/21	Time:	Received by:	Date:	Time:	Received by:	Date: 12/14 PM	Time: 12:10

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

BLUEWATER GEOSCIENCE
ATTN: BRETON LEMIEUX
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1

Date Received: 15-DEC-21
Report Date: 22-DEC-21 13:39 (MT)
Version: FINAL

Client Phone: 519-744-4123

Certificate of Analysis

Lab Work Order #: L2672833

Project P.O. #: NOT SUBMITTED
Job Reference: BG-804
C of C Numbers: 20-895812
Legal Site Desc:

Gayle Braun
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672833-1 MW-1							
Sampled By: BJL on 15-DEC-21							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L	17-DEC-21	2700	2700
Benzene	<0.50		0.50	ug/L	17-DEC-21	5	5
Bromodichloromethane	<2.0		2.0	ug/L	17-DEC-21	16	16
Bromoform	<5.0		5.0	ug/L	17-DEC-21	25	25
Bromomethane	<0.50		0.50	ug/L	17-DEC-21	0.89	0.89
Carbon tetrachloride	<0.20		0.20	ug/L	17-DEC-21	0.79	5
Chlorobenzene	<0.50		0.50	ug/L	17-DEC-21	30	30
Dibromochloromethane	<2.0		2.0	ug/L	17-DEC-21	25	25
Chloroform	<1.0		1.0	ug/L	17-DEC-21	2.4	22
1,2-Dibromoethane	<0.20		0.20	ug/L	17-DEC-21	0.2	0.2
1,2-Dichlorobenzene	<0.50		0.50	ug/L	17-DEC-21	3	3
1,3-Dichlorobenzene	<0.50		0.50	ug/L	17-DEC-21	59	59
1,4-Dichlorobenzene	<0.50		0.50	ug/L	17-DEC-21	1	1
Dichlorodifluoromethane	<2.0		2.0	ug/L	17-DEC-21	590	590
1,1-Dichloroethane	<0.50		0.50	ug/L	17-DEC-21	5	5
1,2-Dichloroethane	<0.50		0.50	ug/L	17-DEC-21	1.6	5
1,1-Dichloroethylene	<0.50		0.50	ug/L	17-DEC-21	1.6	14
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L	17-DEC-21	1.6	17
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L	17-DEC-21	1.6	17
Methylene Chloride	<5.0		5.0	ug/L	17-DEC-21	50	50
1,2-Dichloropropane	<0.50		0.50	ug/L	17-DEC-21	5	5
cis-1,3-Dichloropropene	<0.30		0.30	ug/L	17-DEC-21		
trans-1,3-Dichloropropene	<0.30		0.30	ug/L	17-DEC-21		
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	17-DEC-21	0.5	0.5
Ethylbenzene	<0.50		0.50	ug/L	17-DEC-21	2.4	2.4
n-Hexane	<0.50		0.50	ug/L	17-DEC-21	51	520
Methyl Ethyl Ketone	<20		20	ug/L	17-DEC-21	1800	1800
Methyl Isobutyl Ketone	<20		20	ug/L	17-DEC-21	640	640
MTBE	<2.0		2.0	ug/L	17-DEC-21	15	15
Styrene	<0.50		0.50	ug/L	17-DEC-21	5.4	5.4
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L	17-DEC-21	1.1	1.1
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	17-DEC-21	1	1
Tetrachloroethylene	<0.50		0.50	ug/L	17-DEC-21	1.6	17
Toluene	0.90		0.50	ug/L	17-DEC-21	24	24
1,1,1-Trichloroethane	<0.50		0.50	ug/L	17-DEC-21	200	200
1,1,2-Trichloroethane	<0.50		0.50	ug/L	17-DEC-21	4.7	5
Trichloroethylene	<0.50		0.50	ug/L	17-DEC-21	1.6	5
Trichlorofluoromethane	<5.0		5.0	ug/L	17-DEC-21	150	150
Vinyl chloride	<0.50		0.50	ug/L	17-DEC-21	0.5	1.7
o-Xylene	0.32		0.30	ug/L	17-DEC-21		
m+p-Xylenes	0.47		0.40	ug/L	17-DEC-21		
Xylenes (Total)	0.79		0.50	ug/L	17-DEC-21	300	300
Surrogate: 4-Bromofluorobenzene	97.8		70-130	%	17-DEC-21		
Surrogate: 1,4-Difluorobenzene	99.7		70-130	%	17-DEC-21		
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L	17-DEC-21	750	750

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
L2672833-1	MW-1									
Sampled By:	BJL on 15-DEC-21									
Matrix:	WATER						#1	#2		
Hydrocarbons										
	F1-BTEX	<25		25	ug/L	22-DEC-21	750	750		
	F2 (C10-C16)	<100		100	ug/L	21-DEC-21	150	150		
	F2-Naphth	<100		100	ug/L	22-DEC-21				
	F3 (C16-C34)	<250		250	ug/L	21-DEC-21	500	500		
	F3-PAH	<250		250	ug/L	22-DEC-21				
	F4 (C34-C50)	<250		250	ug/L	21-DEC-21	500	500		
	Total Hydrocarbons (C6-C50)	<370		370	ug/L	22-DEC-21				
	Chrom. to baseline at nC50	YES			ppm	21-DEC-21				
	Surrogate: 2-Bromobenzotrifluoride	88.6		60-140	%	21-DEC-21				
	Surrogate: 3,4-Dichlorotoluene	86.6		60-140	%	17-DEC-21				
Polycyclic Aromatic Hydrocarbons										
	Acenaphthene	0.088		0.020	ug/L	22-DEC-21	4.1	4.1		
	Acenaphthylene	<0.020		0.020	ug/L	22-DEC-21	1	1		
	Anthracene	<0.030	DLM	0.030	ug/L	22-DEC-21	2.4	2.4		
	Benzo(a)anthracene	<0.020		0.020	ug/L	22-DEC-21	1	1		
	Benzo(a)pyrene	<0.010		0.010	ug/L	22-DEC-21	0.01	0.01		
	Benzo(b&j)fluoranthene	<0.020		0.020	ug/L	22-DEC-21	0.1	0.1		
	Benzo(g,h,i)perylene	<0.020		0.020	ug/L	22-DEC-21	0.2	0.2		
	Benzo(k)fluoranthene	<0.020		0.020	ug/L	22-DEC-21	0.1	0.1		
	Chrysene	<0.020		0.020	ug/L	22-DEC-21	0.1	0.1		
	Dibenz(a,h)anthracene	<0.020		0.020	ug/L	22-DEC-21	0.2	0.2		
	Fluoranthene	<0.020		0.020	ug/L	22-DEC-21	0.41	0.41		
	Fluorene	0.082		0.020	ug/L	22-DEC-21	120	120		
	Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	22-DEC-21	0.2	0.2		
	1+2-Methylnaphthalenes	1.91		0.028	ug/L	22-DEC-21	3.2	3.2		
	1-Methylnaphthalene	1.11		0.020	ug/L	22-DEC-21	3.2	3.2		
	2-Methylnaphthalene	0.796		0.020	ug/L	22-DEC-21	3.2	3.2		
	Naphthalene	0.373		0.050	ug/L	22-DEC-21	11	11		
	Phenanthrene	0.105		0.020	ug/L	22-DEC-21	1	1		
	Pyrene	<0.020		0.020	ug/L	22-DEC-21	4.1	4.1		
	Surrogate: Chrysene d12	76.7		50-150	%	22-DEC-21				
	Surrogate: Naphthalene d8	100.4		60-140	%	22-DEC-21				
	Surrogate: Phenanthrene d10	95.2		60-140	%	22-DEC-21				
L2672833-2	MW-2									
Sampled By:	BJL on 15-DEC-21									
Matrix:	WATER						#1	#2		
Volatile Organic Compounds										
	Acetone	<30	OWP	30	ug/L	17-DEC-21	2700	2700		
	Benzene	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5		
	Bromodichloromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	16	16		
	Bromoform	<5.0	OWP	5.0	ug/L	17-DEC-21	25	25		
	Bromomethane	<0.50	OWP	0.50	ug/L	17-DEC-21	0.89	0.89		
	Carbon tetrachloride	<0.20	OWP	0.20	ug/L	17-DEC-21	0.79	5		
	Chlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	30	30		
	Dibromochloromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	25	25		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2		
L2672833-2	MW-2									
Sampled By:	BJL on 15-DEC-21									
Matrix:	WATER									
Volatile Organic Compounds										
	Chloroform	<1.0	OWP	1.0	ug/L	17-DEC-21	2.4	22		
	1,2-Dibromoethane	<0.20	OWP	0.20	ug/L	17-DEC-21	0.2	0.2		
	1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	3	3		
	1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	59	59		
	1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	1	1		
	Dichlorodifluoromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	590	590		
	1,1-Dichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5		
	1,2-Dichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	5		
	1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	14		
	cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17		
	trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17		
	Methylene Chloride	<5.0	OWP	5.0	ug/L	17-DEC-21	50	50		
	1,2-Dichloropropane	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5		
	cis-1,3-Dichloropropene	<0.30	OWP	0.30	ug/L	17-DEC-21				
	trans-1,3-Dichloropropene	<0.30	OWP	0.30	ug/L	17-DEC-21				
	1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	17-DEC-21	0.5	0.5		
	Ethylbenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	2.4	2.4		
	n-Hexane	<0.50	OWP	0.50	ug/L	17-DEC-21	51	520		
	Methyl Ethyl Ketone	<20	OWP	20	ug/L	17-DEC-21	1800	1800		
	Methyl Isobutyl Ketone	<20	OWP	20	ug/L	17-DEC-21	640	640		
	MTBE	<2.0	OWP	2.0	ug/L	17-DEC-21	15	15		
	Styrene	<0.50	OWP	0.50	ug/L	17-DEC-21	5.4	5.4		
	1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1.1	1.1		
	1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1	1		
	Tetrachloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17		
	Toluene	<0.50	OWP	0.50	ug/L	17-DEC-21	24	24		
	1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	200	200		
	1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	4.7	5		
	Trichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	5		
	Trichlorofluoromethane	<5.0	OWP	5.0	ug/L	17-DEC-21	150	150		
	Vinyl chloride	<0.50	OWP	0.50	ug/L	17-DEC-21	0.5	1.7		
	o-Xylene	<0.30	OWP	0.30	ug/L	17-DEC-21				
	m+p-Xylenes	<0.40	OWP	0.40	ug/L	17-DEC-21				
	Xylenes (Total)	<0.50		0.50	ug/L	17-DEC-21	300	300		
	Surrogate: 4-Bromofluorobenzene	97.3		70-130	%	17-DEC-21				
	Surrogate: 1,4-Difluorobenzene	99.6		70-130	%	17-DEC-21				
Hydrocarbons										
	F1 (C6-C10)	<25	OWP	25	ug/L	17-DEC-21	750	750		
	F1-BTEX	<25		25	ug/L	22-DEC-21	750	750		
	F2 (C10-C16)	<100		100	ug/L	21-DEC-21	150	150		
	F2-Naphth	<100		100	ug/L	22-DEC-21				
	F3 (C16-C34)	<250		250	ug/L	21-DEC-21	500	500		
	F3-PAH	<250		250	ug/L	22-DEC-21				
	F4 (C34-C50)	<250		250	ug/L	21-DEC-21	500	500		
	Total Hydrocarbons (C6-C50)	<370		370	ug/L	22-DEC-21				
	Chrom. to baseline at nC50	YES			ppm	21-DEC-21				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672833-2	MW-2							
Sampled By:	BJL on 15-DEC-21							
Matrix:	WATER							
Hydrocarbons								
	Surrogate: 2-Bromobenzotrifluoride	92.6		60-140	%	21-DEC-21		
	Surrogate: 3,4-Dichlorotoluene	80.5		60-140	%	17-DEC-21		
Polycyclic Aromatic Hydrocarbons								
	Acenaphthene	0.141		0.020	ug/L	22-DEC-21	4.1	4.1
	Acenaphthylene	<0.020		0.020	ug/L	22-DEC-21	1	1
	Anthracene	0.445		0.020	ug/L	22-DEC-21	2.4	2.4
	Benzo(a)anthracene	0.321		0.020	ug/L	22-DEC-21	1	1
	Benzo(a)pyrene	0.227		0.010	ug/L	22-DEC-21	*0.01	*0.01
	Benzo(b&j)fluoranthene	0.272		0.020	ug/L	22-DEC-21	*0.1	*0.1
	Benzo(g,h,i)perylene	0.113		0.020	ug/L	22-DEC-21	0.2	0.2
	Benzo(k)fluoranthene	0.110		0.020	ug/L	22-DEC-21	*0.1	*0.1
	Chrysene	0.245		0.020	ug/L	22-DEC-21	*0.1	*0.1
	Dibenz(a,h)anthracene	0.025		0.020	ug/L	22-DEC-21	0.2	0.2
	Fluoranthene	0.795		0.020	ug/L	22-DEC-21	*0.41	*0.41
	Fluorene	0.222		0.020	ug/L	22-DEC-21	120	120
	Indeno(1,2,3-cd)pyrene	0.123		0.020	ug/L	22-DEC-21	0.2	0.2
	1+2-Methylnaphthalenes	0.316		0.028	ug/L	22-DEC-21	3.2	3.2
	1-Methylnaphthalene	0.156		0.020	ug/L	22-DEC-21	3.2	3.2
	2-Methylnaphthalene	0.160		0.020	ug/L	22-DEC-21	3.2	3.2
	Naphthalene	1.04		0.050	ug/L	22-DEC-21	11	11
	Phenanthrene	0.868		0.020	ug/L	22-DEC-21	1	1
	Pyrene	0.609		0.020	ug/L	22-DEC-21	4.1	4.1
	Surrogate: Chrysene d12	98.5		50-150	%	22-DEC-21		
	Surrogate: Naphthalene d8	105.8		60-140	%	22-DEC-21		
	Surrogate: Phenanthrene d10	98.9		60-140	%	22-DEC-21		
L2672833-3	MW-3							
Sampled By:	BJL on 15-DEC-21							
Matrix:	WATER							
Volatile Organic Compounds								
	Acetone	<30	OWP	30	ug/L	17-DEC-21	2700	2700
	Benzene	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5
	Bromodichloromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	16	16
	Bromoform	<5.0	OWP	5.0	ug/L	17-DEC-21	25	25
	Bromomethane	<0.50	OWP	0.50	ug/L	17-DEC-21	0.89	0.89
	Carbon tetrachloride	<0.20	OWP	0.20	ug/L	17-DEC-21	0.79	5
	Chlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	30	30
	Dibromochloromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	25	25
	Chloroform	<1.0	OWP	1.0	ug/L	17-DEC-21	2.4	22
	1,2-Dibromoethane	<0.20	OWP	0.20	ug/L	17-DEC-21	0.2	0.2
	1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	3	3
	1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	59	59
	1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	1	1
	Dichlorodifluoromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	590	590
	1,1-Dichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5
	1,2-Dichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	5

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672833-3	MW-3							
Sampled By:	BJL on 15-DEC-21							
Matrix:	WATER							
Volatile Organic Compounds								
	1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	14
	cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17
	trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17
	Methylene Chloride	<5.0	OWP	5.0	ug/L	17-DEC-21	50	50
	1,2-Dichloropropane	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5
	cis-1,3-Dichloropropene	<0.30	OWP	0.30	ug/L	17-DEC-21		
	trans-1,3-Dichloropropene	<0.30	OWP	0.30	ug/L	17-DEC-21		
	1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	17-DEC-21	0.5	0.5
	Ethylbenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	2.4	2.4
	n-Hexane	<0.50	OWP	0.50	ug/L	17-DEC-21	51	520
	Methyl Ethyl Ketone	<20	OWP	20	ug/L	17-DEC-21	1800	1800
	Methyl Isobutyl Ketone	<20	OWP	20	ug/L	17-DEC-21	640	640
	MTBE	<2.0	OWP	2.0	ug/L	17-DEC-21	15	15
	Styrene	<0.50	OWP	0.50	ug/L	17-DEC-21	5.4	5.4
	1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1.1	1.1
	1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1	1
	Tetrachloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17
	Toluene	<0.50	OWP	0.50	ug/L	17-DEC-21	24	24
	1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	200	200
	1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	4.7	5
	Trichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	5
	Trichlorofluoromethane	<5.0	OWP	5.0	ug/L	17-DEC-21	150	150
	Vinyl chloride	<0.50	OWP	0.50	ug/L	17-DEC-21	0.5	1.7
	o-Xylene	<0.30	OWP	0.30	ug/L	17-DEC-21		
	m+p-Xylenes	<0.40	OWP	0.40	ug/L	17-DEC-21		
	Xylenes (Total)	<0.50		0.50	ug/L	17-DEC-21	300	300
	Surrogate: 4-Bromofluorobenzene	96.9		70-130	%	17-DEC-21		
	Surrogate: 1,4-Difluorobenzene	99.7		70-130	%	17-DEC-21		
Hydrocarbons								
	F1 (C6-C10)	<25	OWP	25	ug/L	17-DEC-21	750	750
	F1-BTEX	<25		25	ug/L	22-DEC-21	750	750
	F2 (C10-C16)	<100		100	ug/L	21-DEC-21	150	150
	F2-Naphth	<100		100	ug/L	22-DEC-21		
	F3 (C16-C34)	<250		250	ug/L	21-DEC-21	500	500
	F3-PAH	<250		250	ug/L	22-DEC-21		
	F4 (C34-C50)	<250		250	ug/L	21-DEC-21	500	500
	Total Hydrocarbons (C6-C50)	<370		370	ug/L	22-DEC-21		
	Chrom. to baseline at nC50	YES			ppm	21-DEC-21		
	Surrogate: 2-Bromobenzotrifluoride	96.3		60-140	%	21-DEC-21		
	Surrogate: 3,4-Dichlorotoluene	80.4		60-140	%	17-DEC-21		
Polycyclic Aromatic Hydrocarbons								
	Acenaphthene	0.128		0.020	ug/L	22-DEC-21	4.1	4.1
	Acenaphthylene	<0.020		0.020	ug/L	22-DEC-21	1	1
	Anthracene	0.308		0.020	ug/L	22-DEC-21	2.4	2.4
	Benzo(a)anthracene	0.234		0.020	ug/L	22-DEC-21	1	1
	Benzo(a)pyrene	0.197		0.010	ug/L	22-DEC-21	*0.01	*0.01

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672833-3	MW-3							
Sampled By:	BJL on 15-DEC-21							
Matrix:	WATER							
Polycyclic Aromatic Hydrocarbons								
	Benzo(b&j)fluoranthene	0.246		0.020	ug/L	22-DEC-21	*0.1	*0.1
	Benzo(g,h,i)perylene	0.101		0.020	ug/L	22-DEC-21	0.2	0.2
	Benzo(k)fluoranthene	0.090		0.020	ug/L	22-DEC-21	0.1	0.1
	Chrysene	0.183		0.020	ug/L	22-DEC-21	*0.1	*0.1
	Dibenz(a,h)anthracene	0.022		0.020	ug/L	22-DEC-21	0.2	0.2
	Fluoranthene	0.649		0.020	ug/L	22-DEC-21	*0.41	*0.41
	Fluorene	0.218		0.020	ug/L	22-DEC-21	120	120
	Indeno(1,2,3-cd)pyrene	0.114		0.020	ug/L	22-DEC-21	0.2	0.2
	1+2-Methylnaphthalenes	0.331		0.028	ug/L	22-DEC-21	3.2	3.2
	1-Methylnaphthalene	0.161		0.020	ug/L	22-DEC-21	3.2	3.2
	2-Methylnaphthalene	0.170		0.020	ug/L	22-DEC-21	3.2	3.2
	Naphthalene	1.01		0.050	ug/L	22-DEC-21	11	11
	Phenanthrene	0.769		0.020	ug/L	22-DEC-21	1	1
	Pyrene	0.454		0.020	ug/L	22-DEC-21	4.1	4.1
	Surrogate: Chrysene d12	86.5		50-150	%	22-DEC-21		
	Surrogate: Naphthalene d8	117.0		60-140	%	22-DEC-21		
	Surrogate: Phenanthrene d10	96.3		60-140	%	22-DEC-21		
L2672833-4	MW-4							
Sampled By:	BJL on 15-DEC-21							
Matrix:	WATER							
Volatile Organic Compounds								
	Acetone	<30	OWP	30	ug/L	17-DEC-21	2700	2700
	Benzene	0.58	OWP	0.50	ug/L	17-DEC-21	5	5
	Bromodichloromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	16	16
	Bromoform	<5.0	OWP	5.0	ug/L	17-DEC-21	25	25
	Bromomethane	<0.50	OWP	0.50	ug/L	17-DEC-21	0.89	0.89
	Carbon tetrachloride	<0.20	OWP	0.20	ug/L	17-DEC-21	0.79	5
	Chlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	30	30
	Dibromochloromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	25	25
	Chloroform	<1.0	OWP	1.0	ug/L	17-DEC-21	2.4	22
	1,2-Dibromoethane	<0.20	OWP	0.20	ug/L	17-DEC-21	0.2	0.2
	1,2-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	3	3
	1,3-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	59	59
	1,4-Dichlorobenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	1	1
	Dichlorodifluoromethane	<2.0	OWP	2.0	ug/L	17-DEC-21	590	590
	1,1-Dichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5
	1,2-Dichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	5
	1,1-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	14
	cis-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17
	trans-1,2-Dichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17
	Methylene Chloride	<5.0	OWP	5.0	ug/L	17-DEC-21	50	50
	1,2-Dichloropropane	<0.50	OWP	0.50	ug/L	17-DEC-21	5	5
	cis-1,3-Dichloropropene	<0.30	OWP	0.30	ug/L	17-DEC-21		
	trans-1,3-Dichloropropene	<0.30	OWP	0.30	ug/L	17-DEC-21		
	1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	17-DEC-21	0.5	0.5

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2672833-4	MW-4							
Sampled By:	BJL on 15-DEC-21							
Matrix:	WATER							
Volatile Organic Compounds								
	Ethylbenzene	<0.50	OWP	0.50	ug/L	17-DEC-21	2.4	2.4
	n-Hexane	<0.50	OWP	0.50	ug/L	17-DEC-21	51	520
	Methyl Ethyl Ketone	<20	OWP	20	ug/L	17-DEC-21	1800	1800
	Methyl Isobutyl Ketone	<20	OWP	20	ug/L	17-DEC-21	640	640
	MTBE	<2.0	OWP	2.0	ug/L	17-DEC-21	15	15
	Styrene	<0.50	OWP	0.50	ug/L	17-DEC-21	5.4	5.4
	1,1,1,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1.1	1.1
	1,1,2,2-Tetrachloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	1	1
	Tetrachloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	17
	Toluene	1.05	OWP	0.50	ug/L	17-DEC-21	24	24
	1,1,1-Trichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	200	200
	1,1,2-Trichloroethane	<0.50	OWP	0.50	ug/L	17-DEC-21	4.7	5
	Trichloroethylene	<0.50	OWP	0.50	ug/L	17-DEC-21	1.6	5
	Trichlorofluoromethane	<5.0	OWP	5.0	ug/L	17-DEC-21	150	150
	Vinyl chloride	<0.50	OWP	0.50	ug/L	17-DEC-21	0.5	1.7
	o-Xylene	0.37	OWP	0.30	ug/L	17-DEC-21		
	m+p-Xylenes	0.51	OWP	0.40	ug/L	17-DEC-21		
	Xylenes (Total)	0.88		0.50	ug/L	17-DEC-21	300	300
	Surrogate: 4-Bromofluorobenzene	97.2		70-130	%	17-DEC-21		
	Surrogate: 1,4-Difluorobenzene	99.3		70-130	%	17-DEC-21		
Hydrocarbons								
	F1 (C6-C10)	<25	OWP	25	ug/L	17-DEC-21	750	750
	F1-BTEX	<25		25	ug/L	22-DEC-21	750	750
	F2 (C10-C16)	<100		100	ug/L	21-DEC-21	150	150
	F2-Naphth	<100		100	ug/L	22-DEC-21		
	F3 (C16-C34)	<250		250	ug/L	21-DEC-21	500	500
	F3-PAH	<250		250	ug/L	22-DEC-21		
	F4 (C34-C50)	420		250	ug/L	21-DEC-21	500	500
	Total Hydrocarbons (C6-C50)	420		370	ug/L	22-DEC-21		
	Chrom. to baseline at nC50	YES			ppm	21-DEC-21		
	Surrogate: 2-Bromobenzotrifluoride	87.4		60-140	%	21-DEC-21		
	Surrogate: 3,4-Dichlorotoluene	84.0		60-140	%	17-DEC-21		
Polycyclic Aromatic Hydrocarbons								
	Acenaphthene	0.091		0.020	ug/L	22-DEC-21	4.1	4.1
	Acenaphthylene	0.021	R	0.020	ug/L	22-DEC-21	1	1
	Anthracene	<0.046	DLM	0.046	ug/L	22-DEC-21	2.4	2.4
	Benzo(a)anthracene	<0.020		0.020	ug/L	22-DEC-21	1	1
	Benzo(a)pyrene	0.019		0.010	ug/L	22-DEC-21	*0.01	*0.01
	Benzo(b&j)fluoranthene	<0.020		0.020	ug/L	22-DEC-21	0.1	0.1
	Benzo(g,h,i)perylene	0.027		0.020	ug/L	22-DEC-21	0.2	0.2
	Benzo(k)fluoranthene	<0.020		0.020	ug/L	22-DEC-21	0.1	0.1
	Chrysene	<0.020		0.020	ug/L	22-DEC-21	0.1	0.1
	Dibenz(a,h)anthracene	<0.020		0.020	ug/L	22-DEC-21	0.2	0.2
	Fluoranthene	0.028		0.020	ug/L	22-DEC-21	0.41	0.41
	Fluorene	0.094		0.020	ug/L	22-DEC-21	120	120
	Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	22-DEC-21	0.2	0.2

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2		
L2672833-4 MW-4									
Sampled By: BJL on 15-DEC-21									
Matrix: WATER									
Polycyclic Aromatic Hydrocarbons									
1+2-Methylnaphthalenes	1.97		0.028	ug/L	22-DEC-21	3.2	3.2		
1-Methylnaphthalene	1.07		0.020	ug/L	22-DEC-21	3.2	3.2		
2-Methylnaphthalene	0.905		0.020	ug/L	22-DEC-21	3.2	3.2		
Naphthalene	0.432		0.050	ug/L	22-DEC-21	11	11		
Phenanthrene	0.151		0.020	ug/L	22-DEC-21	1	1		
Pyrene	0.028		0.020	ug/L	22-DEC-21	4.1	4.1		
Surrogate: Chrysene d12	87.8		50-150	%	22-DEC-21				
Surrogate: Naphthalene d8	123.5		60-140	%	22-DEC-21				
Surrogate: Phenanthrene d10	94.4		60-140	%	22-DEC-21				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
R	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
OWP	Organic water sample contained visible sediment (must be included as part of analysis). Measured concentrations of organic substances in water can be biased high due to presence of sediment.

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260

Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

20-895812

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Quality Control Report

Workorder: L2672833 Report Date: 22-DEC-21

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT	**Water**							
Batch R5680324								
WG3676077-4 DUP		**WG3676077-3**						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	17-DEC-21
WG3676077-1 LCS								
F1 (C6-C10)			83.8		%		80-120	17-DEC-21
WG3676077-2 MB								
F1 (C6-C10)			<25		ug/L		25	17-DEC-21
Surrogate: 3,4-Dichlorotoluene			109.5		%		60-140	17-DEC-21
WG3676077-5 MS		**WG3676077-3**						
F1 (C6-C10)			90.9		%		60-140	17-DEC-21
F2-F4-511-WT	**Water**							
Batch R5681561								
WG3676273-2 LCS								
F2 (C10-C16)			105.7		%		70-130	21-DEC-21
F3 (C16-C34)			106.5		%		70-130	21-DEC-21
F4 (C34-C50)			112.5		%		70-130	21-DEC-21
WG3676273-1 MB								
F2 (C10-C16)			<100		ug/L		100	21-DEC-21
F3 (C16-C34)			<250		ug/L		250	21-DEC-21
F4 (C34-C50)			<250		ug/L		250	21-DEC-21
Surrogate: 2-Bromobenzotrifluoride			86.1		%		60-140	21-DEC-21
PAH-511-WT	**Water**							
Batch R5681564								
WG3676273-2 LCS								
1-Methylnaphthalene			114.1		%		50-140	21-DEC-21
2-Methylnaphthalene			110.2		%		50-140	21-DEC-21
Acenaphthene			100.8		%		60-130	21-DEC-21
Acenaphthylene			95.2		%		60-130	21-DEC-21
Anthracene			92.0		%		50-140	21-DEC-21
Benzo(a)anthracene			93.4		%		60-140	21-DEC-21
Benzo(a)pyrene			94.0		%		50-140	21-DEC-21
Benzo(b&j)fluoranthene			93.8		%		60-130	21-DEC-21
Benzo(g,h,i)perylene			113.3		%		50-140	21-DEC-21
Benzo(k)fluoranthene			98.3		%		50-140	21-DEC-21
Chrysene			88.6		%		60-140	21-DEC-21
Dibenz(a,h)anthracene			95.7		%		50-140	21-DEC-21
Fluoranthene			106.3		%		60-140	21-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R5681564								
WG3676273-2 LCS								
Fluorene			102.8		%		60-130	21-DEC-21
Indeno(1,2,3-cd)pyrene			100.7		%		50-140	21-DEC-21
Naphthalene			111.8		%		50-130	21-DEC-21
Phenanthrene			102.0		%		60-140	21-DEC-21
Pyrene			92.7		%		60-140	21-DEC-21
WG3676273-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	21-DEC-21
2-Methylnaphthalene			<0.020		ug/L		0.02	21-DEC-21
Acenaphthene			<0.020		ug/L		0.02	21-DEC-21
Acenaphthylene			<0.020		ug/L		0.02	21-DEC-21
Anthracene			<0.020		ug/L		0.02	21-DEC-21
Benzo(a)anthracene			<0.020		ug/L		0.02	21-DEC-21
Benzo(a)pyrene			<0.010		ug/L		0.01	21-DEC-21
Benzo(b&j)fluoranthene			<0.020		ug/L		0.02	21-DEC-21
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	21-DEC-21
Benzo(k)fluoranthene			<0.020		ug/L		0.02	21-DEC-21
Chrysene			<0.020		ug/L		0.02	21-DEC-21
Dibenz(a,h)anthracene			<0.020		ug/L		0.02	21-DEC-21
Fluoranthene			<0.020		ug/L		0.02	21-DEC-21
Fluorene			<0.020		ug/L		0.02	21-DEC-21
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	21-DEC-21
Naphthalene			<0.050		ug/L		0.05	21-DEC-21
Phenanthrene			<0.020		ug/L		0.02	21-DEC-21
Pyrene			<0.020		ug/L		0.02	21-DEC-21
Surrogate: Naphthalene d8			100.3		%		60-140	21-DEC-21
Surrogate: Phenanthrene d10			96.7		%		60-140	21-DEC-21
Surrogate: Chrysene d12			70.5		%		50-150	21-DEC-21
VOC-511-HS-WT	**Water**							
Batch R5680324								
WG3676077-4 DUP		**WG3676077-3**						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R5680324								
WG3676077-4 DUP		**WG3676077-3**						
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	17-DEC-21
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	17-DEC-21
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-DEC-21
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	17-DEC-21
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	17-DEC-21
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	17-DEC-21
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	17-DEC-21
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-DEC-21
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-DEC-21
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	17-DEC-21
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	17-DEC-21
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	17-DEC-21
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	17-DEC-21
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	17-DEC-21
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	17-DEC-21
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
trans-1,3-Dichloropropene		<0.30	<0.30		ug/L			17-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R5680324								
WG3676077-4 DUP		**WG3676077-3**						
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	17-DEC-21
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	17-DEC-21
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	17-DEC-21
WG3676077-1 LCS								
1,1,1,2-Tetrachloroethane			104.5		%		70-130	17-DEC-21
1,1,2,2-Tetrachloroethane			103.3		%		70-130	17-DEC-21
1,1,1-Trichloroethane			107.8		%		70-130	17-DEC-21
1,1,2-Trichloroethane			105.8		%		70-130	17-DEC-21
1,1-Dichloroethane			105.8		%		70-130	17-DEC-21
1,1-Dichloroethylene			108.1		%		70-130	17-DEC-21
1,2-Dibromoethane			105.2		%		70-130	17-DEC-21
1,2-Dichlorobenzene			106.4		%		70-130	17-DEC-21
1,2-Dichloroethane			107.0		%		70-130	17-DEC-21
1,2-Dichloropropane			106.7		%		70-130	17-DEC-21
1,3-Dichlorobenzene			106.8		%		70-130	17-DEC-21
1,4-Dichlorobenzene			107.6		%		70-130	17-DEC-21
Acetone			115.7		%		60-140	17-DEC-21
Benzene			105.5		%		70-130	17-DEC-21
Bromodichloromethane			114.8		%		70-130	17-DEC-21
Bromoform			103.9		%		70-130	17-DEC-21
Bromomethane			111.4		%		60-140	17-DEC-21
Carbon tetrachloride			108.1		%		70-130	17-DEC-21
Chlorobenzene			106.5		%		70-130	17-DEC-21
Chloroform			107.3		%		70-130	17-DEC-21
cis-1,2-Dichloroethylene			103.1		%		70-130	17-DEC-21
cis-1,3-Dichloropropene			106.7		%		70-130	17-DEC-21
Dibromochloromethane			106.8		%		70-130	17-DEC-21
Dichlorodifluoromethane			107.9		%		50-140	17-DEC-21
Ethylbenzene			104.7		%		70-130	17-DEC-21
n-Hexane			107.9		%		70-130	17-DEC-21
m+p-Xylenes			106.2		%		70-130	17-DEC-21
Methyl Ethyl Ketone			107.8		%		60-140	17-DEC-21
Methyl Isobutyl Ketone			94.3				60-140	

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R5680324								
WG3676077-1 LCS								
Methyl Isobutyl Ketone			94.3		%		60-140	17-DEC-21
Methylene Chloride			107.8		%		70-130	17-DEC-21
MTBE			103.1		%		70-130	17-DEC-21
o-Xylene			104.6		%		70-130	17-DEC-21
Styrene			106.5		%		70-130	17-DEC-21
Tetrachloroethylene			106.1		%		70-130	17-DEC-21
Toluene			105.0		%		70-130	17-DEC-21
trans-1,2-Dichloroethylene			108.8		%		70-130	17-DEC-21
trans-1,3-Dichloropropene			105.6		%		70-130	17-DEC-21
Trichloroethylene			106.6		%		70-130	17-DEC-21
Trichlorofluoromethane			107.9		%		60-140	17-DEC-21
Vinyl chloride			99.3		%		60-140	17-DEC-21
WG3676077-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	17-DEC-21
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	17-DEC-21
1,1,1-Trichloroethane			<0.50		ug/L		0.5	17-DEC-21
1,1,2-Trichloroethane			<0.50		ug/L		0.5	17-DEC-21
1,1-Dichloroethane			<0.50		ug/L		0.5	17-DEC-21
1,1-Dichloroethylene			<0.50		ug/L		0.5	17-DEC-21
1,2-Dibromoethane			<0.20		ug/L		0.2	17-DEC-21
1,2-Dichlorobenzene			<0.50		ug/L		0.5	17-DEC-21
1,2-Dichloroethane			<0.50		ug/L		0.5	17-DEC-21
1,2-Dichloropropane			<0.50		ug/L		0.5	17-DEC-21
1,3-Dichlorobenzene			<0.50		ug/L		0.5	17-DEC-21
1,4-Dichlorobenzene			<0.50		ug/L		0.5	17-DEC-21
Acetone			<30		ug/L		30	17-DEC-21
Benzene			<0.50		ug/L		0.5	17-DEC-21
Bromodichloromethane			<2.0		ug/L		2	17-DEC-21
Bromoform			<5.0		ug/L		5	17-DEC-21
Bromomethane			<0.50		ug/L		0.5	17-DEC-21
Carbon tetrachloride			<0.20		ug/L		0.2	17-DEC-21
Chlorobenzene			<0.50		ug/L		0.5	17-DEC-21
Chloroform			<1.0		ug/L		1	17-DEC-21
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	17-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R5680324								
WG3676077-2 MB								
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	17-DEC-21
Dibromochloromethane			<2.0		ug/L		2	17-DEC-21
Dichlorodifluoromethane			<2.0		ug/L		2	17-DEC-21
Ethylbenzene			<0.50		ug/L		0.5	17-DEC-21
n-Hexane			<0.50		ug/L		0.5	17-DEC-21
m+p-Xylenes			<0.40		ug/L		0.4	17-DEC-21
Methyl Ethyl Ketone			<20		ug/L		20	17-DEC-21
Methyl Isobutyl Ketone			<20		ug/L		20	17-DEC-21
Methylene Chloride			<5.0		ug/L		5	17-DEC-21
MTBE			<2.0		ug/L		2	17-DEC-21
o-Xylene			<0.30		ug/L		0.3	17-DEC-21
Styrene			<0.50		ug/L		0.5	17-DEC-21
Tetrachloroethylene			<0.50		ug/L		0.5	17-DEC-21
Toluene			<0.50		ug/L		0.5	17-DEC-21
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	17-DEC-21
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	17-DEC-21
Trichloroethylene			<0.50		ug/L		0.5	17-DEC-21
Trichlorofluoromethane			<5.0		ug/L		5	17-DEC-21
Vinyl chloride			<0.50		ug/L		0.5	17-DEC-21
Surrogate: 1,4-Difluorobenzene			100.5		%		70-130	17-DEC-21
Surrogate: 4-Bromofluorobenzene			97.9		%		70-130	17-DEC-21
WG3676077-5 MS		**WG3676077-3**						
1,1,1,2-Tetrachloroethane			109.9		%		50-140	17-DEC-21
1,1,2,2-Tetrachloroethane			112.5		%		50-140	17-DEC-21
1,1,1-Trichloroethane			114.2		%		50-140	17-DEC-21
1,1,2-Trichloroethane			113.5		%		50-140	17-DEC-21
1,1-Dichloroethane			115.2		%		50-140	17-DEC-21
1,1-Dichloroethylene			113.2		%		50-140	17-DEC-21
1,2-Dibromoethane			111.5		%		50-140	17-DEC-21
1,2-Dichlorobenzene			111.3		%		50-140	17-DEC-21
1,2-Dichloroethane			118.1		%		50-140	17-DEC-21
1,2-Dichloropropane			115.7		%		50-140	17-DEC-21
1,3-Dichlorobenzene			109.0		%		50-140	17-DEC-21
1,4-Dichlorobenzene			110.4		%		50-140	17-DEC-21

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R5680324								
WG3676077-5 MS		**WG3676077-3**						
Acetone			130.7		%		50-140	17-DEC-21
Benzene			112.9		%		50-140	17-DEC-21
Bromodichloromethane			126.4		%		50-140	17-DEC-21
Bromoform			112.4		%		50-140	17-DEC-21
Bromomethane			112.4		%		50-140	17-DEC-21
Carbon tetrachloride			114.4		%		50-140	17-DEC-21
Chlorobenzene			111.2		%		50-140	17-DEC-21
Chloroform			116.7		%		50-140	17-DEC-21
cis-1,2-Dichloroethylene			109.9		%		50-140	17-DEC-21
cis-1,3-Dichloropropene			111.5		%		50-140	17-DEC-21
Dibromochloromethane			114.3		%		50-140	17-DEC-21
Dichlorodifluoromethane			104.6		%		50-140	17-DEC-21
Ethylbenzene			105.3		%		50-140	17-DEC-21
n-Hexane			110.7		%		50-140	17-DEC-21
m+p-Xylenes			107.6		%		50-140	17-DEC-21
Methyl Ethyl Ketone			119.2		%		50-140	17-DEC-21
Methyl Isobutyl Ketone			101.9		%		50-140	17-DEC-21
Methylene Chloride			117.3		%		50-140	17-DEC-21
MTBE			110.9		%		50-140	17-DEC-21
o-Xylene			106.1		%		50-140	17-DEC-21
Styrene			108.0		%		50-140	17-DEC-21
Tetrachloroethylene			105.2		%		50-140	17-DEC-21
Toluene			106.4		%		50-140	17-DEC-21
trans-1,2-Dichloroethylene			113.1		%		50-140	17-DEC-21
trans-1,3-Dichloropropene			104.9		%		50-140	17-DEC-21
Trichloroethylene			111.5		%		50-140	17-DEC-21
Trichlorofluoromethane			112.0		%		50-140	17-DEC-21
Vinyl chloride			101.0		%		50-140	17-DEC-21

Quality Control Report

Workorder: L2672833 Report Date: 22-DEC-21

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

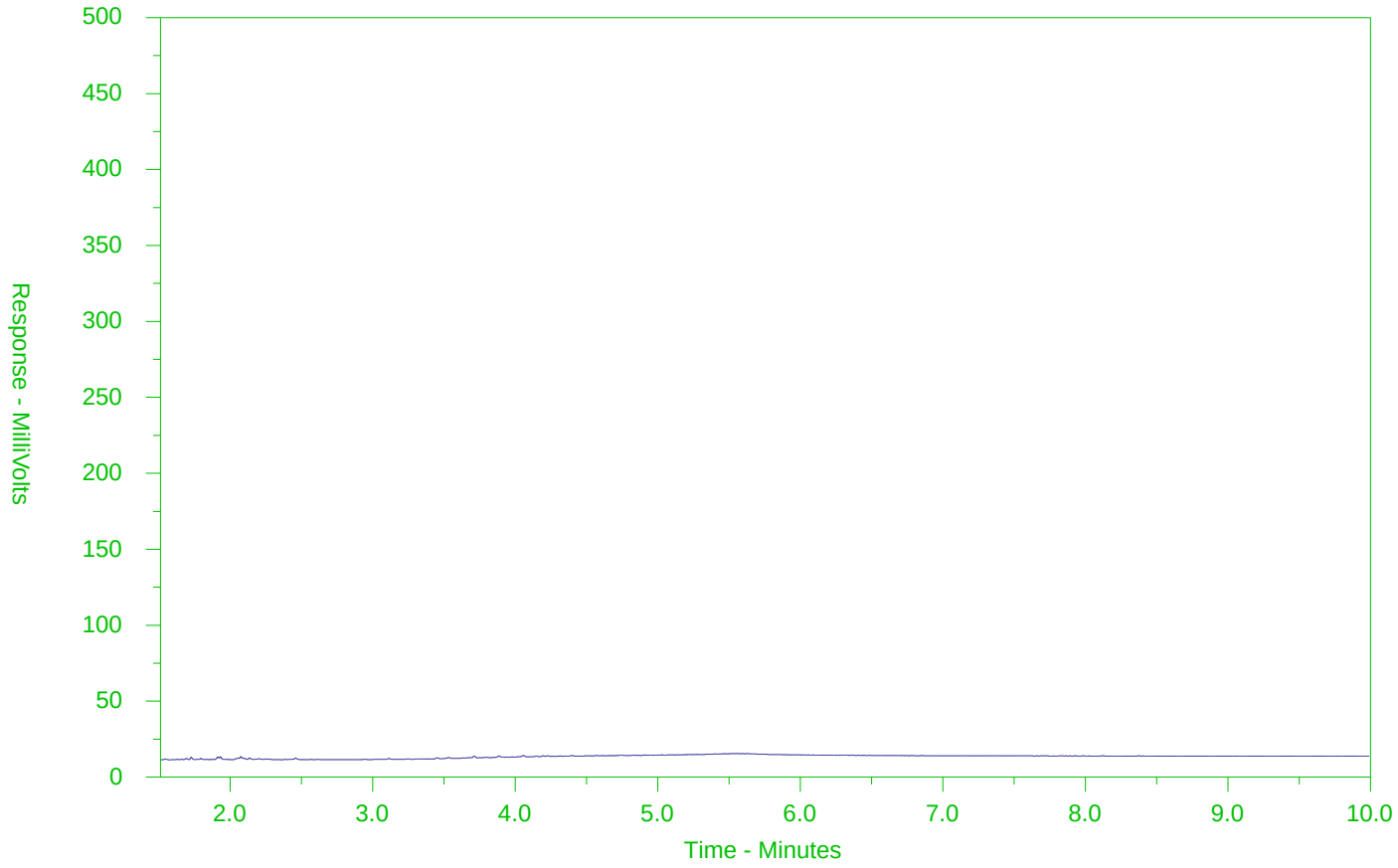
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672833-1
Client Sample ID: MW-1



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

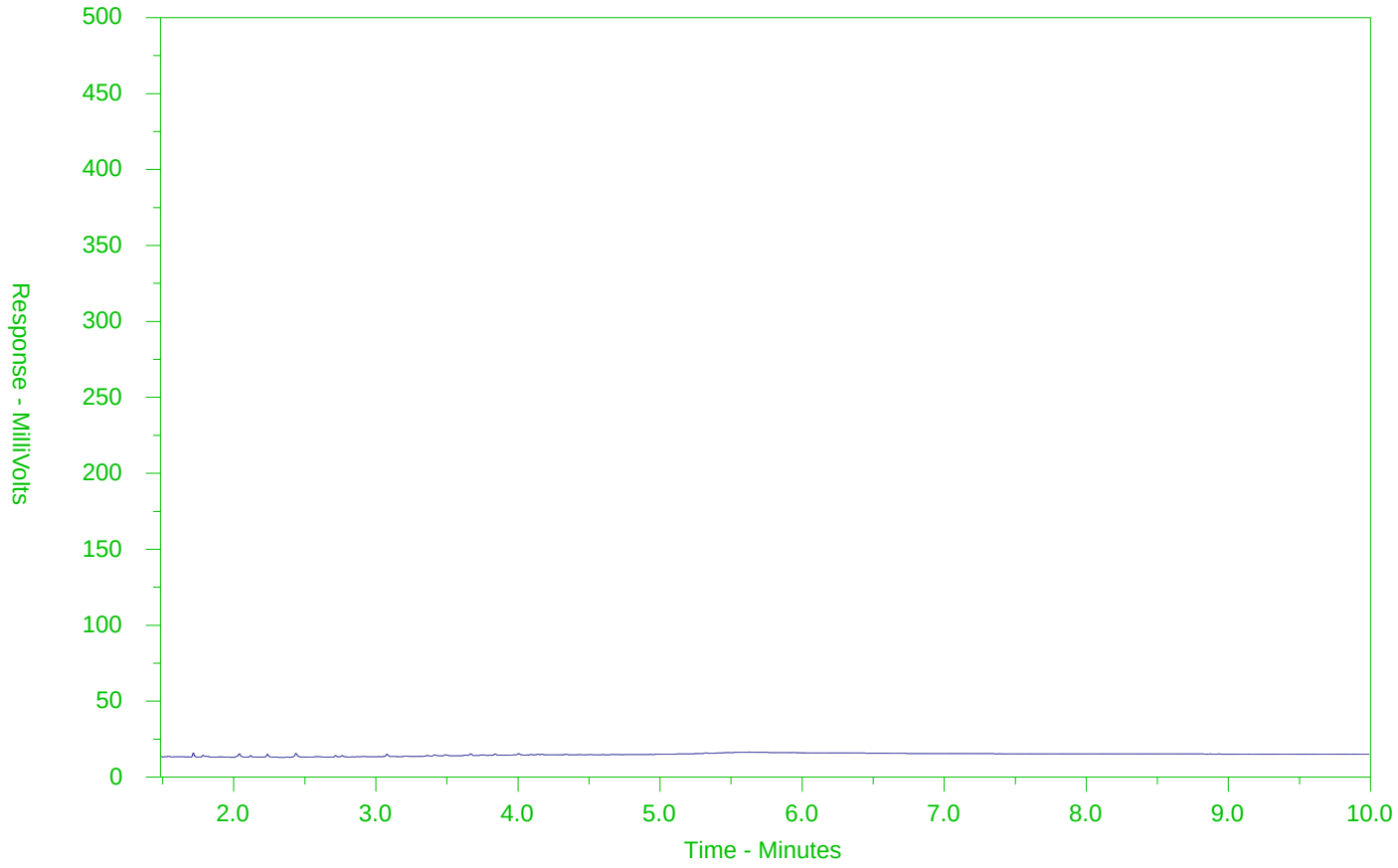
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672833-2
Client Sample ID: MW-2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

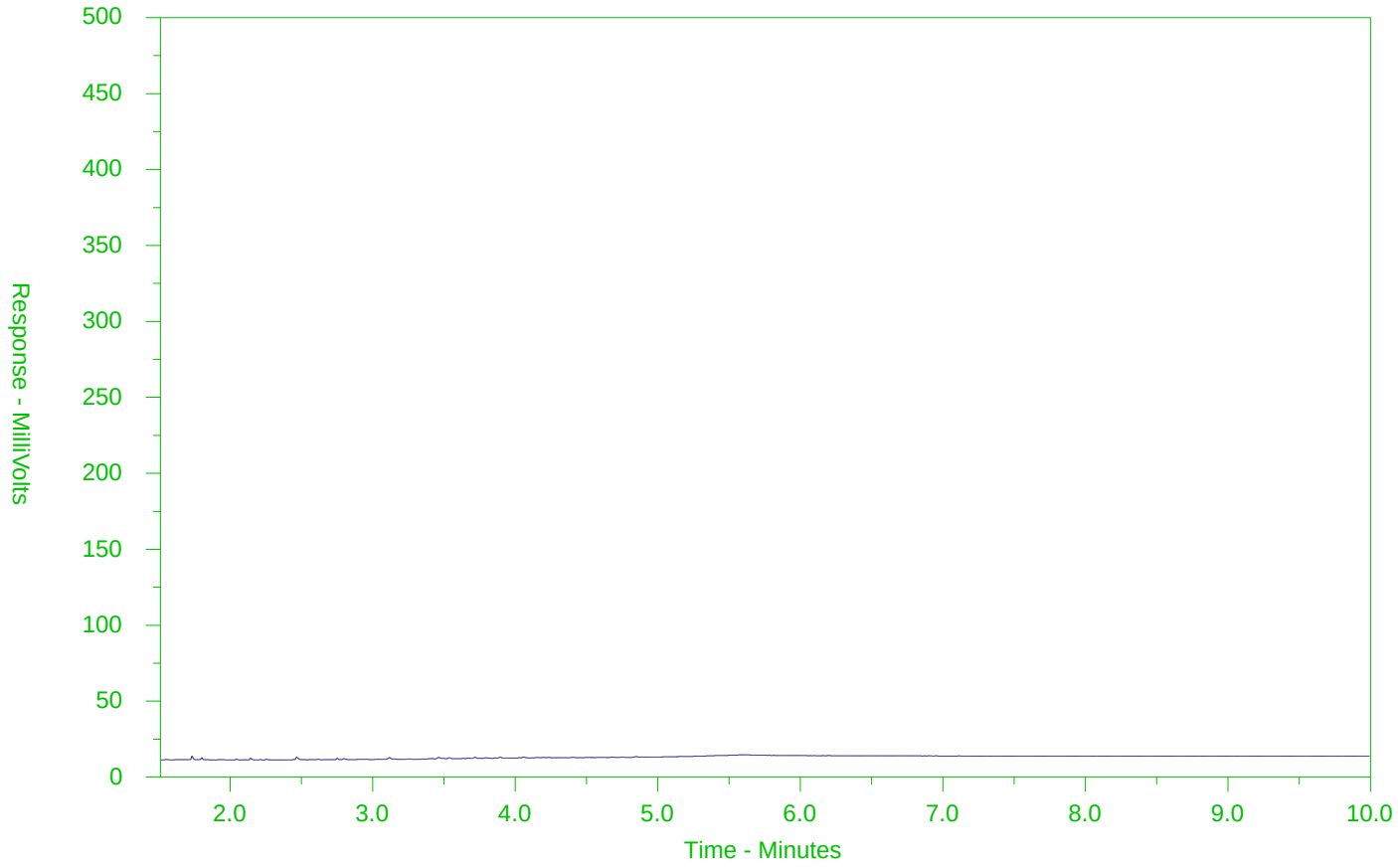
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672833-3
Client Sample ID: MW-3



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

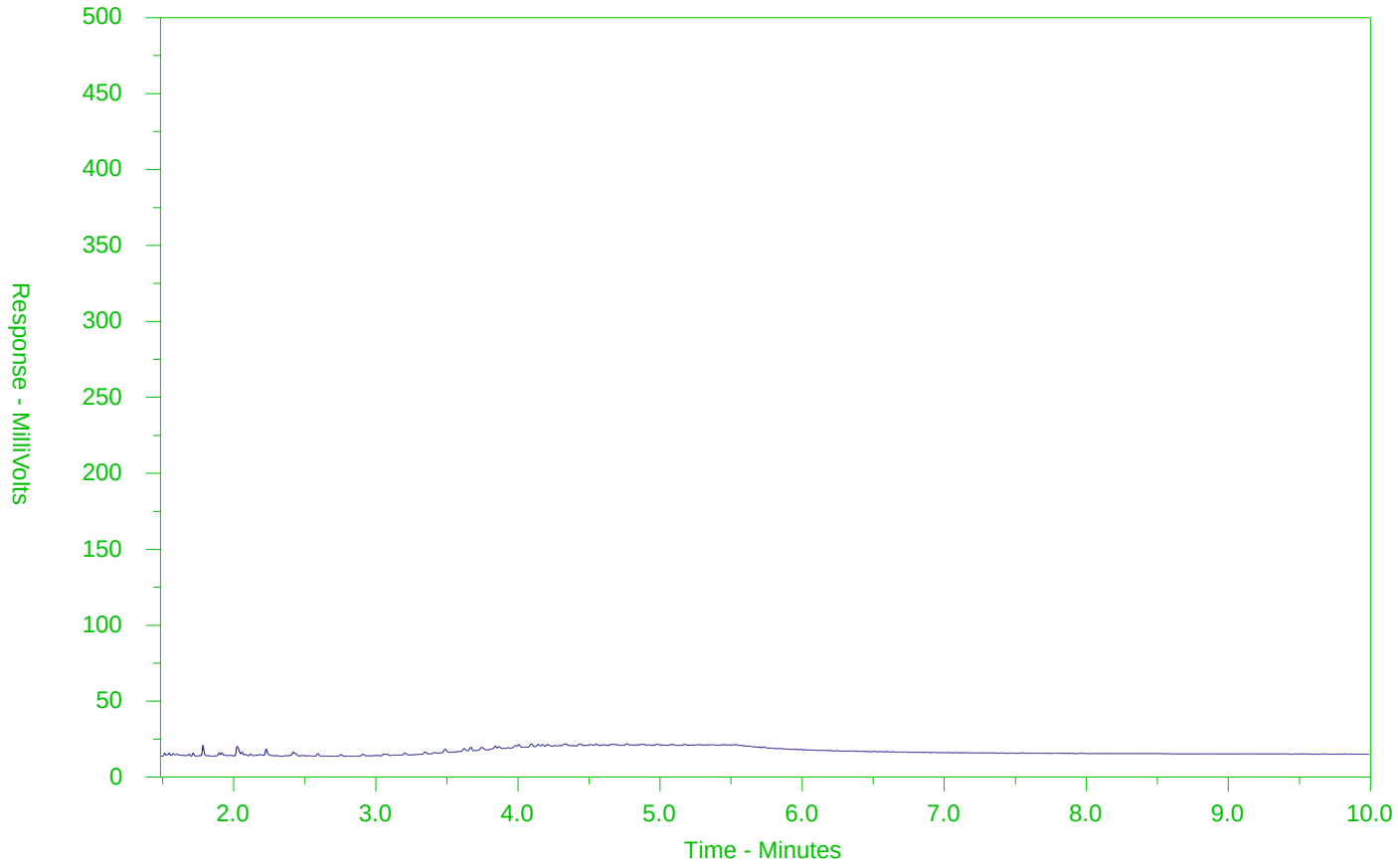
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2672833-4
Client Sample ID: MW-4



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

ALS www.alsglobal.com

L2672833-COFC

rm

COC Number: 20 - 895812

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Bluewater Geoscience
Contact:	B. Lemieux
Phone:	
	Company address below will appear on the final report
Street:	
City/Province:	
Postal Code:	
Invoice To	Same as Report To ☒ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☒ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☒ PDF ☐ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☒ YES ☐ NO ☐ N/A

☒ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Email 3

Invoice Recipients

Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Turnaround Time (TAT) Requested

☒ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:	Q87598
Job #:	BG-804
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): L2672833

ALS Contact: GAYLE

Sampler: BJL

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	VOC/F/rFL PHC	OAH	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	MW-1	15/12/21		GW	4	X	X			
	MW-2	↓		↓	4	↓	↓			
	MW-3				4					
	MW-4				4					

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☒ NO

Are samples for human consumption/ use? ☐ YES ☒ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Table 2 SCS

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☒ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification. ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
6	7.9

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
BJL	Dec. 15/21	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
UE	12/15/21	13:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

BLUEWATER GEOSCIENCE
ATTN: BRETON LEMIEUX
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1

Date Received: 28-DEC-21
Report Date: 10-JAN-22 12:49 (MT)
Version: FINAL

Client Phone: 519-744-4123

Certificate of Analysis

Lab Work Order #: L2675644

Project P.O. #: NOT SUBMITTED
Job Reference: BG-804
C of C Numbers:
Legal Site Desc:

Gayle Braun
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2675644-1 MW-4							
Sampled By: BJC on 28-DEC-21							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	10-JAN-22	4.1	4.1
Acenaphthylene	<0.020		0.020	ug/L	10-JAN-22	1	1
Anthracene	<0.020		0.020	ug/L	10-JAN-22	2.4	2.4
Benzo(a)anthracene	<0.020		0.020	ug/L	10-JAN-22	1	1
Benzo(a)pyrene	<0.010		0.010	ug/L	10-JAN-22	0.01	0.01
Benzo(b&j)fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2
Benzo(k)fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1
Chrysene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1
Dibenz(a,h)anthracene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2
Fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.41	0.41
Fluorene	<0.020		0.020	ug/L	10-JAN-22	120	120
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2
1+2-Methylnaphthalenes	<0.028		0.028	ug/L	10-JAN-22	3.2	3.2
1-Methylnaphthalene	<0.020		0.020	ug/L	10-JAN-22	3.2	3.2
2-Methylnaphthalene	<0.020		0.020	ug/L	10-JAN-22	3.2	3.2
Naphthalene	<0.050		0.050	ug/L	10-JAN-22	11	11
Phenanthrene	<0.020		0.020	ug/L	10-JAN-22	1	1
Pyrene	<0.020		0.020	ug/L	10-JAN-22	4.1	4.1
Surrogate: Chrysene d12	97.0		50-150	%	10-JAN-22		
Surrogate: Naphthalene d8	47.6	SLMI	60-140	%	10-JAN-22		
Surrogate: Phenanthrene d10	98.5		60-140	%	10-JAN-22		
L2675644-2 MW-2							
Sampled By: BJC on 28-DEC-21							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	10-JAN-22	4.1	4.1
Acenaphthylene	<0.020		0.020	ug/L	10-JAN-22	1	1
Anthracene	<0.020		0.020	ug/L	10-JAN-22	2.4	2.4
Benzo(a)anthracene	<0.020		0.020	ug/L	10-JAN-22	1	1
Benzo(a)pyrene	<0.010		0.010	ug/L	10-JAN-22	0.01	0.01
Benzo(b&j)fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2
Benzo(k)fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1
Chrysene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1
Dibenz(a,h)anthracene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2
Fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.41	0.41
Fluorene	<0.020		0.020	ug/L	10-JAN-22	120	120
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2
1+2-Methylnaphthalenes	<0.028		0.028	ug/L	10-JAN-22	3.2	3.2
1-Methylnaphthalene	<0.020		0.020	ug/L	10-JAN-22	3.2	3.2
2-Methylnaphthalene	<0.020		0.020	ug/L	10-JAN-22	3.2	3.2
Naphthalene	<0.050		0.050	ug/L	10-JAN-22	11	11
Phenanthrene	<0.020		0.020	ug/L	10-JAN-22	1	1
Pyrene	<0.020		0.020	ug/L	10-JAN-22	4.1	4.1

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
L2675644-2	MW-2									
Sampled By:	BJC on 28-DEC-21									
Matrix:	WATER						#1	#2		
Polycyclic Aromatic Hydrocarbons										
	Surrogate: Chrysene d12	102.8		50-150	%	10-JAN-22				
	Surrogate: Naphthalene d8	64.0		60-140	%	10-JAN-22				
	Surrogate: Phenanthrene d10	98.3		60-140	%	10-JAN-22				
L2675644-3	MW-3									
Sampled By:	BJC on 28-DEC-21									
Matrix:	WATER						#1	#2		
Polycyclic Aromatic Hydrocarbons										
	Acenaphthene	<0.020		0.020	ug/L	10-JAN-22	4.1	4.1		
	Acenaphthylene	<0.020		0.020	ug/L	10-JAN-22	1	1		
	Anthracene	<0.020		0.020	ug/L	10-JAN-22	2.4	2.4		
	Benzo(a)anthracene	<0.020		0.020	ug/L	10-JAN-22	1	1		
	Benzo(a)pyrene	<0.010		0.010	ug/L	10-JAN-22	0.01	0.01		
	Benzo(b&j)fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1		
	Benzo(g,h,i)perylene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2		
	Benzo(k)fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1		
	Chrysene	<0.020		0.020	ug/L	10-JAN-22	0.1	0.1		
	Dibenz(a,h)anthracene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2		
	Fluoranthene	<0.020		0.020	ug/L	10-JAN-22	0.41	0.41		
	Fluorene	<0.020		0.020	ug/L	10-JAN-22	120	120		
	Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	10-JAN-22	0.2	0.2		
	1+2-Methylnaphthalenes	<0.028		0.028	ug/L	10-JAN-22	3.2	3.2		
	1-Methylnaphthalene	<0.020		0.020	ug/L	10-JAN-22	3.2	3.2		
	2-Methylnaphthalene	<0.020		0.020	ug/L	10-JAN-22	3.2	3.2		
	Naphthalene	<0.050		0.050	ug/L	10-JAN-22	11	11		
	Phenanthrene	<0.020		0.020	ug/L	10-JAN-22	1	1		
	Pyrene	<0.020		0.020	ug/L	10-JAN-22	4.1	4.1		
	Surrogate: Chrysene d12	92.9		50-150	%	10-JAN-22				
	Surrogate: Naphthalene d8	65.7		60-140	%	10-JAN-22				
	Surrogate: Phenanthrene d10	97.7		60-140	%	10-JAN-22				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
SLMI	Surrogate recovery was outside ALS DQO (Low) due to Matrix Interference.

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011 and as of November 30, 2020), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Quality Control Report

Workorder: L2675644 Report Date: 10-JAN-22

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R5690078								
WG3679911-2 LCS								
1-Methylnaphthalene			80.5		%		50-140	10-JAN-22
2-Methylnaphthalene			75.0		%		50-140	10-JAN-22
Acenaphthene			85.2		%		60-130	10-JAN-22
Acenaphthylene			78.6		%		60-130	10-JAN-22
Anthracene			78.6		%		50-140	10-JAN-22
Benzo(a)anthracene			84.7		%		60-140	10-JAN-22
Benzo(a)pyrene			80.5		%		50-140	10-JAN-22
Benzo(b&j)fluoranthene			75.0		%		60-130	10-JAN-22
Benzo(g,h,i)perylene			78.5		%		50-140	10-JAN-22
Benzo(k)fluoranthene			86.8		%		50-140	10-JAN-22
Chrysene			108.4		%		60-140	10-JAN-22
Dibenz(a,h)anthracene			82.8		%		50-140	10-JAN-22
Fluoranthene			94.0		%		60-140	10-JAN-22
Fluorene			91.7		%		60-130	10-JAN-22
Indeno(1,2,3-cd)pyrene			87.6		%		50-140	10-JAN-22
Naphthalene			75.2		%		50-130	10-JAN-22
Phenanthrene			94.8		%		60-140	10-JAN-22
Pyrene			92.8		%		60-140	10-JAN-22
WG3679911-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	10-JAN-22
2-Methylnaphthalene			<0.020		ug/L		0.02	10-JAN-22
Acenaphthene			<0.020		ug/L		0.02	10-JAN-22
Acenaphthylene			<0.020		ug/L		0.02	10-JAN-22
Anthracene			<0.020		ug/L		0.02	10-JAN-22
Benzo(a)anthracene			<0.020		ug/L		0.02	10-JAN-22
Benzo(a)pyrene			<0.010		ug/L		0.01	10-JAN-22
Benzo(b&j)fluoranthene			<0.020		ug/L		0.02	10-JAN-22
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	10-JAN-22
Benzo(k)fluoranthene			<0.020		ug/L		0.02	10-JAN-22
Chrysene			<0.020		ug/L		0.02	10-JAN-22
Dibenz(a,h)anthracene			<0.020		ug/L		0.02	10-JAN-22
Fluoranthene			<0.020		ug/L		0.02	10-JAN-22
Fluorene			<0.020		ug/L		0.02	10-JAN-22
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	10-JAN-22

Quality Control Report

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Water**							
Batch R5690078								
WG3679911-1 MB								
Naphthalene			<0.050		ug/L		0.05	10-JAN-22
Phenanthrene			<0.020		ug/L		0.02	10-JAN-22
Pyrene			<0.020		ug/L		0.02	10-JAN-22
Surrogate: Naphthalene d8			89.3		%		60-140	10-JAN-22
Surrogate: Phenanthrene d10			98.5		%		60-140	10-JAN-22
Surrogate: Chrysene d12			103.5		%		50-150	10-JAN-22

Quality Control Report

Workorder: L2675644 Report Date: 10-JAN-22

Client: BLUEWATER GEOSCIENCE
42 SHADYRIDGE PLACE
KITCHENER ON N2N 3J1
Contact: BRETON LEMIEUX

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 -

HD

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Bluewater Ecoscience
Contact:	S LEMIEUX
Phone:	
	Company address below will appear on the final report
Street:	
City/Province:	
Postal Code:	

Reports / Recipients	
Select Report Format:	☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☑ YES ☐ NO ☐ N/A
☑ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	
Email 2	
Email 3	

Turnaround	
☑ Routine [R] if received by 3p	
☐ 4 day [P4] if received by 3pm	
☐ 3 day [P3] if received by 3p	
☐ 2 day [P2] if received by 3p	
☐ 1 day [E] if received by 3pm	
☐ Same day [E2] if received by	
may apply to rush requests on Weekends, Statutory Holidays etc	
Date and Time Required for all E&P TATs:	hh mm pm

L2675644-COFC

L HERE

For all tests with rush TATs requested, please contact your AM to confirm availability.

Invoice To		
	Same as Report To	☑ YES ☐ NO
	Copy of Invoice with Report	☐ YES ☑ NO
Company:		
Contact:		

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	
Email 2	

Project Information	
ALS Account # / Quote #:	Q27598
Job #:	BG-BOT
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): L2675644

ALS Contact: GAYLE

Sampler: BSL

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	MW-1	20/12/21		GW	2	X		
	MW-2	"		"	2	X		
	MW-3	"		"	2	X		

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	table 2 SCS
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
	2.9

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: BSL	Date: Dec 16/21	Time:	Received by:	Date:	Time:	Received by: HD	Date: 12/28	Time: 1340

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Functional Servicing and Stormwater Management Design Report

51 Queensway East
County of Norfolk (Simcoe)

GMBP File: 423025

December 2023

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
330 TRILLIUM DRIVE, UNIT D , KITCHENER ON N2E 3J2 P: 519-748-1440
WWW.GMBLUEPLAN.CA

TABLE OF CONTENTS

APPENDICES

STORM WATER MANAGEMENT REPORT

51 QUEENSWAY EAST (HIGHWAY 3)

COUNTY OF NORFOLK (SIMCOE)

DECEMBER 2023

GMBP FILE: 423025

1. INTRODUCTION

In support of site plan approval for the proposed development located at 51 Queensway East in the County of Norfolk (Simcoe), GM BluePlan Engineering Limited has prepared this report to document the site servicing and stormwater management design for the site.

The Owner is required to have a Professional Engineer design a stormwater management system and have said Engineer supervise and certify that the stormwater management system was installed in accordance with the approvals given under Section 41 of the Planning Act.

The site layout was prepared by SRM Architects Inc. (Dated November 28, 2023).

2. SITE INFORMATION

2.1 Existing Site Conditions

The 0.98-hectare site is located within the County of Norfolk (Simcoe) and is known municipally at 51 Queensway East. The site is utilized as a car dealership and is bound by Gilbertson Drive to the north, existing commercial development to the east, Queensway East (Highway 3) to the south and, Gilbertson Drive to the west.

3. PROPOSED DEVELOPMENT

The intent of the Owner at this time is to construct two (2) building additions, along with the associated driving and parking areas. Access to the site will be provided via Queensway East (Highway 3) and Gilbertson Drive.

3.1 Site Grading

The site layout is shown on the engineering drawings prepared by GM BluePlan Engineering Limited.

The site grading has been prepared as per the County of Norfolk (Simcoe) Servicing Standards Urban and Rural Developments.

3.2 Water Supply

Water supply for the two (2) building additions will be provided via connections to the existing building. The existing building is serviced via extended from the existing watermain on Queensway.

3.3 Sanitary Servicing

Sanitary service for the two (2) building additions will be provided via connections to the existing building. The existing building is serviced via an existing sanitary service extended from the existing 200mm diameter sanitary sewer on Queensway.

3.4 Storm Servicing

All runoff generated on site will be captured and conveyed by the existing on-site storm sewer, prior to discharge to the existing 300mm diameter storm sewer at the intersection of Queensway and Gilbertson Drive.

4. STORMWATER MANAGEMENT

4.1 Stormwater Management Criteria

The stormwater management criteria for this site is as follows:

1. The post-development runoff generated from the site is to be attenuated to the pre-development levels during all design storm events.
2. Enhanced water quality control (80% TSS Removal) will be required on-site to remove suspended solids prior to discharge from the site.
3. Major storm flows are to be routed overland to an appropriate outlet.

County of Norfolk design storm parameters were used to model the full range of design storm events. The Chicago Rainfall Distribution parameters and the total depth of rainfall for the analysis are as follows:

Table No. 1: County of Norfolk Rainfall Distribution Parameters

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
a =	529.711	583.017	670.324	721.533	766.038	801.041
b =	4.501	3.007	3.007	2.253	1.898	1.501
c =	0.745	0.703	0.698	0.679	0.668	0.657
r =	0.400	0.400	0.400	0.400	0.400	0.400
Duration (minutes) =	180	180	180	180	180	180
Rainfall Depth (mm) =	32.583	44.904	52.991	63.151	71.090	78.830

The Horton infiltration method was used in the runoff calculations. The parameters used in MIDUSS are as follows:

Table No. 2: Horton Infiltration Parameters

	Impervious Areas	Pervious Areas
Maximum Infiltration	0.0 mm/hr	75.0 mm/hr
Minimum Infiltration	0.0 mm/hr	12.5 mm/hr
Lag Constant	0.0 hr	0.25 hr
Depression Storage	1.5 mm	5.0 mm

The hydrologic model MIDUSS was used to create runoff hydrographs and to route the flows through the storage structures.

4.2 Existing Condition

Under existing conditions, the 0.98-hectare site was modelled as two (2) catchments (see **Figure No. 1**). The existing condition MIDUSS modelling files are included in **Appendix A.**

Catchment 10 (0.88-hectares, 95% impervious) represents the majority of the site. Runoff generated from Catchment 10 is captured and conveyed via the existing on-site storm sewers, ultimately discharging to the existing 300mm diameter storm sewer on Gilbertson Drive.

Catchment 20 (0.10-hectares, 100% impervious) represents the existing car dealership building. Runoff generated from Catchment 20 sheetflows overland is captured and conveyed by the on-site storm sewers, ultimately discharging to the existing 300mm diameter storm sewer on Gilbertson Drive.

The existing conditions flow rates were calculated using MIDUSS software to route the hydrographs. The following table summarizes the existing conditions flow rates for the full range of design storm events.

Table No. 3: Existing Condition Flow Rates

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Catchment 10	0.181 m^3/s	0.248 m^3/s	0.292 m^3/s	0.352 m^3/s	0.398 m^3/s	0.444 m^3/s
Catchment 20	0.007 m^3/s	0.010 m^3/s	0.012 m^3/s	0.014 m^3/s	0.015 m^3/s	0.017 m^3/s
Total	**0.185 m^3/s**	**0.254 m^3/s**	**0.299 m^3/s**	**0.361 m^3/s**	**0.408 m^3/s**	**0.455 m^3/s**

4.3 Allowable Release Rates

The allowable release rates from the site under post-development conditions are as follows:

Table No. 4: Allowable Release Rates

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Allowable Release	**0.185 m^3/s**	**0.254 m^3/s**	**0.299 m^3/s**	**0.361 m^3/s**	**0.408 m^3/s**	**0.455 m^3/s**

Post-Development flow rates generated from the site will be attenuated to the allowable release rates during all design storm events.

4.4 Post-Development Condition

Under post-development conditions, the entire 0.98-hectare site was modelled as four (4) catchments (see **Figure No. 2**). The post-development condition MIDUSS modelling files are included in **Appendix A**.

Catchment 100 (0.82-hectares, 95% impervious) represents the parking area and remaining of the site.

Runoff generated from Catchment 100 will be captured and conveyed the existing on-site storm sewers, ultimately discharging to the existing 300mm diameter storm sewer on Gilbertson Drive. Major storm runoff sheetflows overland to Gilbertson Drive and Queensway East (Highway ON-3).

GILBERTSON DRIVE

QUEENSWAY EAST (HIGHWAY 3)

GILBERTSON DRIVE

423025
ROBINSON CHEVROLET
51 QUEENSWAY EAST
SIMCOE
NORFOLK COUNTY

N

LEGEND

- DRAINAGE AREA BOUNDARY
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

301 — CATCHMENT NUMBER
1.115 | 65 — % IMPERVIOUS
CATCHMENT AREA IN HECTARES

EXISTING BODY SHOP GARAGE

EXISTING ONE STOREY CAR DEALERSHIP

NORTH SERVICE BAY BEING REMOVED

ROOF DRAIN DISCHARGE UNDERGROUND

ROOF DRAIN DISCHARGE TO GRADE

OPEN AIR OUTDOOR STORAGE ENCLOSURE

20 | 0.10 | 100

10 | 0.88 | 95

MH.16 — EX. 450Ø STM — EX. 200Ø STM — CICB.13 — SPIKE 101 ELEV = 220.60 — CUT CROSS 1 ELEV = 219.82 — MH.17 — SPIKE 103 ELEV = 220.60 — LS HP — CB.4 — CB.7 — SPIKE 104 ELEV = 221.55 — CB.2 — CB.3 — CB.5 — CB.6 — MH.18 — CBMH.19 — WV1 — CB.11 — CB.9 — SPIKE 102 ELEV = 222.54 — EX. 375Ø STM — EX. 300Ø STM

5 0 5 10 20
1:500 (m)

EXISTING CONDITIONS
DRAINAGE AREA PLAN

Figure No. 1

BluePlan ENGINEERING

423025
DECEMBER 2023
Scale: 1:500 | NAD 1983 UTM Zone 17N

FILE:W:\Kitchener\423-2023\423025 51 Queensway East Simcoe\Design Phase\Drawings\423025 - SWM Figures.dwg LAYOUT:Exist Cond
LAST SAVED BY:Ebirch, 12/12/2023 2:45:54 PM PLOTTED BY:Evan Birch - GM BluePlan 12/12/2023 2:46:56 PM

Catchment 201 (0.08-hectares, 100% impervious) represents the rooftop of the existing building.

Since the rooftop of the proposed building is flat, and roof drains are provided under the Ontario Building Code, natural storage and attenuation of stormwater will occur. To recreate the natural storage and attenuation of stormwater on the roof of the proposed building, runoff from Catchment 201 has been modelled with four (4) roof drains with six (6) weirs open per drain, based on the assumption that there is a roof drain for every 464.5m^2 (5,000 ft^2) of rooftop area and that the average depth of water stored on the rooftop will not exceed the design criteria of 100 mm, with a maximum storage depth of 100 mm at the roof drains. Please note a roof drain with six (6) weirs represents a standard, fully open roof drain.

Runoff generated from catchment 201 will continue to be directed to the existing on-site storm sewer system.

Catchment 202 (0.03-hectares, 100% impervious) represents the rooftop of the proposed building addition.

Since the rooftop of the proposed building is flat, and roof drains are provided under the Ontario Building Code, natural storage and attenuation of stormwater will occur. To recreate the natural storage and attenuation of stormwater on the roof of the proposed building, runoff from Catchment 202 will be attenuated through the use of two (2) roof drains with six (6) weirs open per drain, based on the assumption that there is a roof drain for every 464.5m^2 (5,000 ft^2) of rooftop area and that the average depth of water stored on the rooftop will not exceed the design criteria of 100 mm, with a maximum storage depth of 100 mm at the roof drains. Please note a roof drain with six (6) weirs represents a standard, fully open roof drain.

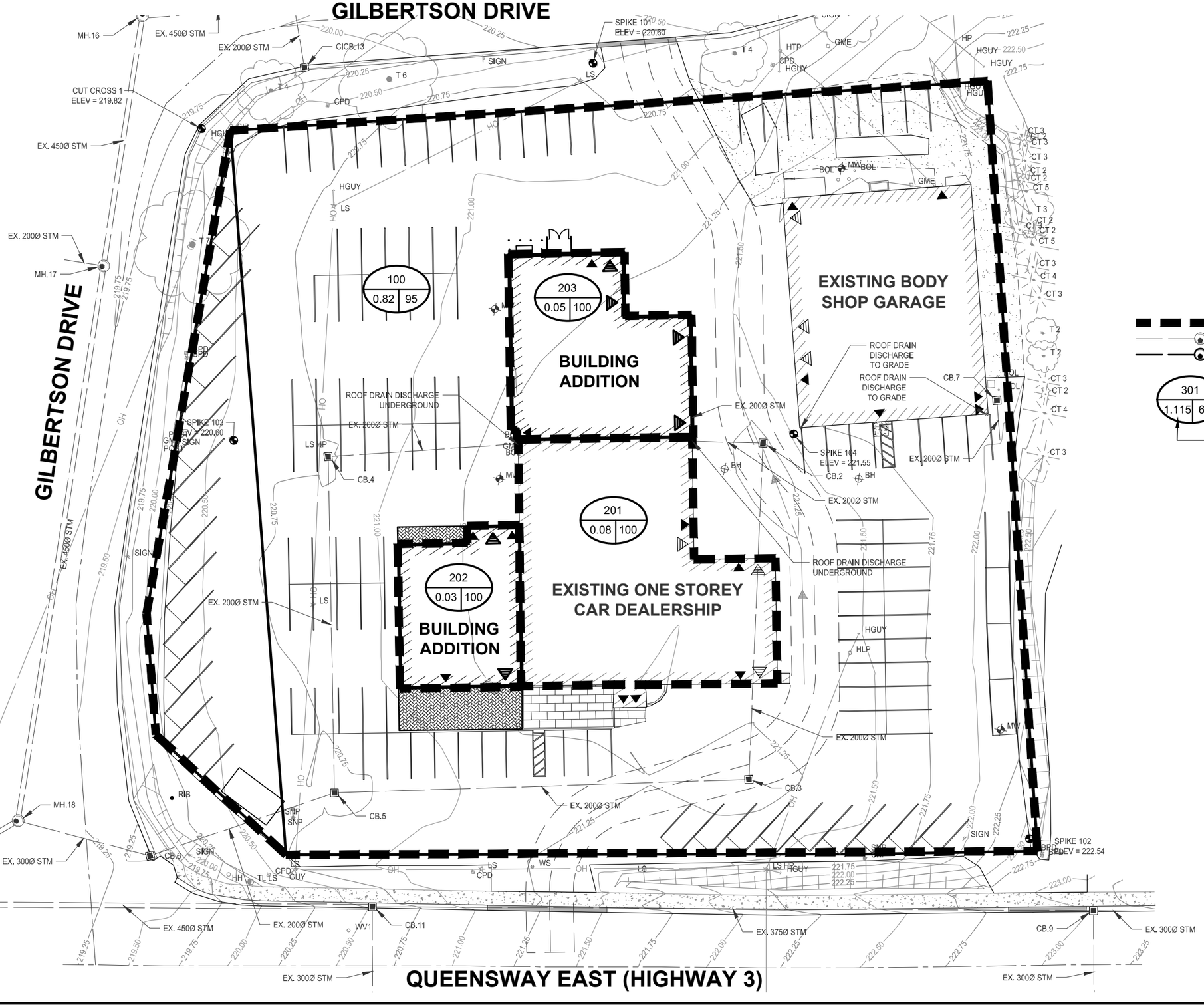
Runoff generated from catchment 202 will continue to be directed to the existing on-site storm sewer system.

Catchment 203 (0.05-hectares, 100% impervious) represents the rooftop of the proposed building addition.

Since the rooftop of the proposed building is flat, and roof drains are provided under the Ontario Building Code, natural storage and attenuation of stormwater will occur. To recreate the natural storage and attenuation of stormwater on the roof of the proposed building, runoff from Catchment 203 will be attenuated through the use of three (3) roof drains with six (6) weirs open per drain, based on the assumption that there is a roof drain for every 464.5m^2 (5,000 ft^2) of rooftop area and that the average depth of water stored on the rooftop will not exceed the design criteria of 100 mm, with a maximum storage depth of 100 mm at the roof drains. Please note a roof drain with six (6) weirs represents a standard, fully open roof drain.

Runoff generated from catchment 203 will continue to be directed to the existing on-site storm sewer system.

Quality control for runoff generated from Catchments will be provided by an oil/girt separate structure (Stormceptor EF6 or approved equivalent) prior to discharge to the existing storm sewer on Gilbertson Drive. Details of the oil/grit separate structure sizing have been provided in Appendix A.



423025
ROBINSON CHEVROLET
51 QUEENSWAY EAST
SIMCOE
NORFOLK COUNTY

N

LEGEND

- DRAINAGE AREA BOUNDARY
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

301 / 1.115 | 65 — CATCHMENT NUMBER; % IMPERVIOUS; CATCHMENT AREA IN HECTARES

5 0 5 10 20
1:500 (m)

POST DEVELOPMENT CONDITION DRAINAGE AREA PLAN

Figure No. 2

BluePlan ENGINEERING

423025
DECEMBER 2023
Scale: 1:500 | NAD 1983 UTM Zone 17N

FILE:W:\Kitchener\423-2023\423025 51 Queensway East Simcoe\Design Phase\Drawings\423025 - SWM Figures.dwg LAYOUT:Prop Cond
LAST SAVED BY:Ebirch, 12/12/2023 2:45:54 PM PLOTTED BY:Evan Birch - GM BluePlan 12/12/2023 2:47:01 PM

4.5 Routing

The hydrologic model MIDUSS was used to create the storm runoff hydrographs and to route the hydrographs.

A copy of the hydrologic modelling is included in Appendix A.

The post-development uncontrolled flow rates are summarized in Table 5 below.

Table 5: Post-Development Condition Uncontrolled Flow Rates

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Catchment 100	0.168 m^3/s	0.231 m^3/s	0.272 m^3/s	0.328 m^3/s	0.371 m^3/s	0.414 m^3/s
Catchment 201	0.018 m^3/s	0.025 m^3/s	0.029 m^3/s	0.035 m^3/s	0.040 m^3/s	0.044 m^3/s
Catchment 202	0.007 m^3/s	0.009 m^3/s	0.011 m^3/s	0.013 m^3/s	0.015 m^3/s	0.017 m^3/s
Catchment 203	0.011 m^3/s	0.016 m^3/s	0.018 m^3/s	0.022 m^3/s	0.025 m^3/s	0.028 m^3/s
Total (Uncontrolled)	**0.205 m^3/s**	**0.281 m^3/s**	**0.330 m^3/s**	**0.399 m^3/s**	**0.450 m^3/s**	**0.502 m^3/s**

Table No. 6, 7 and 8 below compare the stage/storage/discharge capacities of each design storm events.

Table No. 6: Catchment 201 – Existing Building Rooftop Stage-Storage-Discharge Table

	Available Capacity			Actual Capacity Used		
	Peak Flow m^3/s	Storage Volume m^3	Storage Elevation m	Peak Flow m^3/s	Storage Volume m^3	Storage Elevation m
Rooftop	0.000	0.0	0.000	---	---	---
2-Year	---	---	---	0.007	9.13	0.011
5-Year	---	---	---	0.009	12.046	0.015
10-Year	---	---	---	0.011	14.04	0.018
25-Year	---	---	---	0.012	16.40	0.021
50-Year	---	---	---	0.014	18.23	0.023
100-Year	---	---	---	0.015	19.98	0.025
Overflow	0.060	80.00	0.100	---	---	---

Table No. 7: Catchment 202 – Proposed Building Addition Rooftop Stage-Storage-Discharge Table

	Available Capacity			Actual Capacity Used		
	Peak Flow m^3/s	Storage Volume m^3	Storage Elevation m	Peak Flow m^3/s	Storage Volume m^3	Storage Elevation m
Rooftop	0.000	0.0	0.000	---	---	---
2-Year	---	---	---	0.003	2.91	0.010
5-Year	---	---	---	0.004	3.84	0.013
10-Year	---	---	---	0.005	4.47	0.015
25-Year	---	---	---	0.005	5.22	0.017
50-Year	---	---	---	0.006	5.787	0.019
100-Year	---	---	---	0.007	6.33	0.021
Overflow	0.030	30.00	0.100	---	---	---

Table No. 8: Catchment 203 – Proposed Building Addition Rooftop Stage-Storage-Discharge Table

	Available Capacity			Actual Capacity Used		
	Peak Flow m^3/s	Storage Volume m^3	Storage Elevation m	Peak Flow m^3/s	Storage Volume m^3	Storage Elevation m
Rooftop	0.000	0.0	0.000	---	---	---
2-Year	---	---	---	0.005	5.29	0.011
5-Year	---	---	---	0.006	7.00	0.014
10-Year	---	---	---	0.007	8.17	0.016
25-Year	---	---	---	0.008	9.55	0.019
50-Year	---	---	---	0.009	10.61	0.021
100-Year	---	---	---	0.010	11.62	0.023
Overflow	0.045	50.00	0.100	---	---	---

The following table summarizes the post-development flow rates from the site.

Table No. 9: Post-Development Condition Flow Rates

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Catchment 100 (Uncontrolled)	0.168 m^3/s	0.231 m^3/s	0.272 m^3/s	0.328 m^3/s	0.371 m^3/s	0.414 m^3/s
Catchment 201 (controlled)	0.007 m^3/s	0.009 m^3/s	0.011 m^3/s	0.012 m^3/s	0.014 m^3/s	0.015 m^3/s
Catchment 202 (controlled)	0.003 m^3/s	0.004 m^3/s	0.005 m^3/s	0.005 m^3/s	0.006 m^3/s	0.007 m^3/s
Catchment 203 (controlled)	0.005 m^3/s	0.006 m^3/s	0.007 m^3/s	0.008 m^3/s	0.009 m^3/s	0.010 m^3/s
Total	**0.177 m^3/s**	**0.243 m^3/s**	**0.286 m^3/s**	**0.346 m^3/s**	**0.391 m^3/s**	**0.436 m^3/s**

The following table compares the post-development flow rates from the site to the allowable release rates.

Table No. 10: Comparison of Flow Rates

	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Allowable Release	0.185 m^3/s	0.254 m^3/s	0.299 m^3/s	0.361 m^3/s	0.408 m^3/s	0.455 m^3/s
Total Post-Development Flow	0.177 m^3/s	0.243 m^3/s	0.286 m^3/s	0.346 m^3/s	0.391 m^3/s	0.436 m^3/s

Therefore, the post-development flow rates from the site have been attenuated to less than the allowable release rates.

5. SEDIMENT AND EROSION CONTROL PLAN

Silt fence will be installed along the property boundary in all locations where runoff will discharge from the site to adjacent lands. The silt fence will serve to minimize the opportunity for water borne sediments to be washed on to the adjacent properties.

Once manholes and catch basins have been installed, the grates will be wrapped with filter cloth. This feature will be maintained until all construction has been completed.

Inspection and maintenance of all silt fencing will start after installation is complete. The fence will be inspected on a weekly basis during active construction or after a rainfall event of 13 mm or greater. Maintenance will be carried out, within 48 hours, on any part of the fencing found to need repair.

Once construction and landscaping has been substantially completed, the silt fence will be removed and, any accumulated sediment will be removed.

6. MAINTENANCE PLAN

To ensure that the stormwater management system continues to function as designed and constructed, we recommend that the following inspections and maintenance activities be completed on an annual basis:

1. Is there any noticeable damage to the asphalt (i.e., erosion, blockages)? If yes, complete any necessary repairs.
2. Is there any indication of a spill (i.e., frothy water, oily sheen)? If yes, investigate, inform the appropriate agencies, and complete the necessary clean-up and restoration.
3. Inspect all roof drains and associated piping. Remove and dispose of any accumulated sediment, trash/littler debris (i.e., leaves)
4. Inspect the oil/grit structure and complete any necessary maintenance/repair activities as identified by the manufacturer.
5. Inspect all catchbasins, and manholes. Remove and dispose of any accumulated sediment, trash/litter, debris (i.e., sediment, garbage, leaves, etc.).

Please note that any structures identified during the annual inspection to be worn, missing or damaged are to be repaired or replaced within 48 hours.

7. CONCLUSIONS

In summary, the features of the servicing and stormwater management for the proposed development located at 51 Queensway East in Simcoe are as follows:

1. Water supply for the building additions will be provided via connections to the existing building. The existing building is serviced via extended from the existing watermain on Queensway.
2. Sanitary service for the building additions will be provided via connections to the existing building. The existing building is serviced via an existing sanitary service extended from the existing 200mm diameter sanitary sewer on Queensway.
3. Peak flows discharging from the site are less than the allowable release rate during all design storm events.
4. All runoff generated on site will be captured and conveyed by the existing on-site storm sewer, prior to discharge to the existing 300mm diameter storm sewer at the intersection of Queensway and Gilbertson Drive.
5. Quality control treatment is provided by an oil/girt separate structure (Stormceptor EF6 or approved equivalent) located close to the display area prior to discharge to the existing storm sewer.
6. Prior to construction, silt fence will be installed along the property boundary in all locations where runoff will discharge from the site to adjacent lands. This will minimize the transport of sediment off-site during the construction period.
7. The Owner/Agent is to provide the Mechanical and Structural Engineers with copies of the Functional Servicing and Stormwater Management Report and the Site Grading and Servicing Plan (GM BluePlan Engineering Limited Drawing No. 2) for their use in the design of the proposed rooftop stormwater management measures.
8. A qualified Structural Engineer must review and verify that the roof of the existing building and the roof of the proposed building additions have the structural capacity to carry the loading of the stored rainfall and all other loading in accordance with OBC 2012.
9. To ensure that the average depth of water storage on the rooftop of the existing building and the roof of the proposed building additions does not exceed the design criteria of 100 mm, with a maximum storage depth of 100 mm at the roof drains, we recommend that a qualified Mechanical Engineer review and verify the requirement for overflow structures to be included in the design.

All of which is respectfully submitted.

GM BLUEPLAN ENGINEERING LIMITED

Per:

Angela Kroetsch, P. Eng.
AK/hb

W:\Kitchener\423-2023\423025 51 Queensway East Simcoe\Design Phase\Reports - SWM, FSR, Design Brief, Etc\423025 SWM Report - December 2023.Docx

APPENDIX A:

Stormwater Management Analysis:
Stage-Storage-Discharge Table
MIDUSS Modelling Files
Oil/Grit Separator Sizing

51 Queensway East
County of Norfolk (Simcoe)
Our File: 423025
December 18, 2023

Catchment 20: Existing Rooftop Storage

Design Discharge Rate =	1.50	l/min/mm/weir	2.50E-05	$m^3/s/mm/weir$
Max. Average Storage Depth =	100	mm		
Design Discharge =	150.0	l/min/weir	0.0025	$m^3/s/weir$
No. of Drains =	4			
No. Weirs/Drain =	6			
Allowable Release Rate =	3600.0	l/min	0.060	m^3/s
Rooftop Area =	1,000	m^2	(flat rooftop area that is available for storage)	

Therefore: 464.5 sq m/Roof Drain or 5000 sq ft/Roof Drain as per OBC

STAGE-STORAGE-DISCHARGE TABLE

Stage (m)	Storage (m^3)	Discharge (m^3/s)
0.000	0.0	0.000
0.025	25.0	0.015
0.050	50.0	0.030
0.075	75.0	0.045
0.100	100.0	0.060

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                             W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                                 423025_Ex_2yr.out"
"                Licensee name:                                               gmbp"
"                Company                                                         "
"                Date & Time last used:                 12/18/2023 at 3:24:20 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      529.711   Coefficient A"
"        4.501   Constant B"
"        0.745   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity            98.992    mm/hr"
"             Total depth                  32.583    mm"
"            6   002hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 20"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           20   Catchment 20"
"      100.000   % Impervious"
"        0.100   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.100   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.023     0.000     0.000     0.000 c.m/sec"
"             Catchment 20           Pervious   Impervious Total Area "
"             Surface Area           0.000      0.100      0.100      hectare"
"             Time of concentration  22.099     1.419      1.419      minutes"
"             Time to Centroid       96.686     88.730     88.730     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        0.00       32.58      32.58      c.m"
"             Rainfall losses        31.999     2.066      2.066      mm"
"             Runoff depth           0.584      30.517     30.517     mm"
"             Runoff volume          0.00       30.52      30.52      c.m"
"             Runoff coefficient     0.000      0.937      0.937      "
"             Maximum flow           0.000      0.023      0.023      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.023     0.023     0.000     0.000"
" 54          POND DESIGN"
"         0.023   Current peak flow    c.m/sec"
"         0.010   Target outflow    c.m/sec"
"          30.5   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.100   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01500    25.000"
"                  0.05000   0.03000    50.000"
"                  0.07500   0.04500    75.000"
"                   0.1000   0.06000   100.000"
"              Peak outflow                  0.007    c.m/sec"
"              Maximum level                 0.012    metre"
"              Maximum storage              12.500    c.m"
"              Centroidal lag                1.942   hours"
"                   0.023     0.023     0.007     0.000 c.m/sec"
" 40          HYDROGRAPH Next link "
"            5   Next link "
"                     0.023     0.007     0.007     0.000"
" 33          CATCHMENT 10"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           10   Catchment 10"
"       95.000   % Impervious"
"        0.880   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.044   Pervious Area"
"       30.000   Pervious length"
```

```
"        2.500   Pervious slope"
"        0.836   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.181     0.007     0.007     0.000 c.m/sec"
"             Catchment 10           Pervious   Impervious Total Area "
"             Surface Area           0.044      0.836      0.880      hectare"
"             Time of concentration  32.454     2.083      2.114      minutes"
"             Time to Centroid       104.353    89.739     89.754     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        14.34      272.39     286.73     c.m"
"             Rainfall losses        31.998     1.942      3.445      mm"
"             Runoff depth           0.585      30.641     29.138     mm"
"             Runoff volume          0.26       256.16     256.41     c.m"
"             Runoff coefficient     0.018      0.940      0.894      "
"             Maximum flow           0.000      0.181      0.181      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.181     0.185     0.007     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.181     0.185     0.185     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                 0.185    c.m/sec"
"             Hydrograph volume          286.930    c.m"
" 38          START/RE-START TOTALS 10"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.936    hectare"
"             Total % impervious                       95.510"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                             W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                                 423025_Ex_5yr.out"
"                Licensee name:                                               gmbp"
"                Company                                                         "
"                Date & Time last used:                 12/18/2023 at 3:26:05 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      583.017   Coefficient A"
"        3.007   Constant B"
"        0.703   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           135.065    mm/hr"
"             Total depth                  44.904    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 20"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           20   Catchment 20"
"      100.000   % Impervious"
"        0.100   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.100   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.031     0.000     0.000     0.000 c.m/sec"
"             Catchment 20           Pervious   Impervious Total Area "
"             Surface Area           0.000      0.100      0.100      hectare"
"             Time of concentration  10.300     1.253      1.253      minutes"
"             Time to Centroid       87.293     88.237     88.237     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        0.00       44.90      44.90      c.m"
"             Rainfall losses        38.482     2.581      2.581      mm"
"             Runoff depth           6.422      42.323     42.323     mm"
"             Runoff volume          0.00       42.32      42.32      c.m"
"             Runoff coefficient     0.000      0.943      0.943      "
"             Maximum flow           0.000      0.031      0.031      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.031     0.031     0.000     0.000"
" 54          POND DESIGN"
"         0.031   Current peak flow    c.m/sec"
"         0.010   Target outflow    c.m/sec"
"          42.3   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.100   Maximum water level    metre"
"         0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                 0.02500   0.01500    25.000"
"                 0.05000   0.03000    50.000"
"                 0.07500   0.04500    75.000"
"                  0.1000   0.06000   100.000"
"             Peak outflow                  0.010    c.m/sec"
"             Maximum level                 0.017    metre"
"             Maximum storage              16.575    c.m"
"             Centroidal lag                1.934   hours"
"                  0.031     0.031     0.010     0.000 c.m/sec"
" 40          HYDROGRAPH Next link "
"            5   Next link "
"                     0.031     0.010     0.010     0.000"
" 33          CATCHMENT 10"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           10   Catchment 10"
"       95.000   % Impervious"
"        0.880   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.044   Pervious Area"
"       30.000   Pervious length"
```

```
"        2.500   Pervious slope"
"        0.836   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.248     0.010     0.010     0.000 c.m/sec"
"             Catchment 10           Pervious   Impervious Total Area "
"             Surface Area           0.044      0.836      0.880      hectare"
"             Time of concentration  15.126     1.840      1.945      minutes"
"             Time to Centroid       91.756     89.109     89.130     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        19.76      375.40     395.16     c.m"
"             Rainfall losses        38.442     2.144      3.959      mm"
"             Runoff depth           6.462      42.760     40.945     mm"
"             Runoff volume          2.84       357.48     360.32     c.m"
"             Runoff coefficient     0.144      0.952      0.912      "
"             Maximum flow           0.002      0.248      0.248      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.248     0.254     0.010     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.248     0.254     0.254     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                 0.254    c.m/sec"
"             Hydrograph volume          402.642    c.m"
" 38          START/RE-START TOTALS 10"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.936    hectare"
"             Total % impervious                       95.510"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                             W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                                423025_Ex_10yr.out"
"                Licensee name:                                              gmbp"
"                Company                                                        "
"                Date & Time last used:                 12/18/2023 at 3:27:31 PM"
" 31          TIME PARAMETERS"
"         5.000   Time Step"
"       180.000   Max. Storm length"
"      1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"             1   Chicago storm"
"       670.324   Coefficient A"
"         3.007   Constant B"
"         0.698   Exponent C"
"         0.400   Fraction R"
"       180.000   Duration"
"         1.000   Time step multiplier"
"              Maximum intensity           156.914    mm/hr"
"              Total depth                  52.991    mm"
"             6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 20"
"             1   Triangular SCS"
"             1   Equal length"
"             2   Horton equation"
"            20   Catchment 20"
"       100.000   % Impervious"
"         0.100   Total Area"
"        10.000   Flow length"
"         1.000   Overland Slope"
"         0.000   Pervious Area"
"        10.000   Pervious length"
"         1.000   Pervious slope"
"         0.100   Impervious Area"
"        10.000   Impervious length"
"         1.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"        75.000   Pervious Max.infiltration"
"        12.500   Pervious Min.infiltration"
"         0.250   Pervious Lag constant (hours)"
"         5.000   Pervious Depression storage"
"         0.015   Impervious Manning 'n'"
"         0.000   Impervious Max.infiltration"
"         0.000   Impervious Min.infiltration"
"         0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.037     0.000     0.000     0.000 c.m/sec"
"             Catchment 20           Pervious   Impervious Total Area "
"             Surface Area           0.000      0.100      0.100      hectare"
"             Time of concentration  8.174      1.180      1.180      minutes"
"             Time to Centroid       87.208     87.806     87.806     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        0.00       52.99      52.99      c.m"
"             Rainfall losses        41.278     2.931      2.931      mm"
"             Runoff depth           11.713     50.060     50.060     mm"
"             Runoff volume          0.00       50.06      50.06      c.m"
"             Runoff coefficient     0.000      0.945      0.945      "
"             Maximum flow           0.000      0.037      0.037      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.037     0.037     0.000     0.000"
" 54          POND DESIGN"
"         0.037   Current peak flow    c.m/sec"
"         0.010   Target outflow    c.m/sec"
"          50.1   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.100   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01500    25.000"
"                  0.05000   0.03000    50.000"
"                  0.07500   0.04500    75.000"
"                   0.1000   0.06000   100.000"
"              Peak outflow                  0.012    c.m/sec"
"              Maximum level                 0.019    metre"
"              Maximum storage              19.349    c.m"
"              Centroidal lag                1.926   hours"
"                   0.037     0.037     0.012     0.000 c.m/sec"
" 40          HYDROGRAPH Next link "
"            5   Next link "
"                     0.037     0.012     0.012     0.000"
" 33          CATCHMENT 10"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           10   Catchment 10"
"        95.000   % Impervious"
"         0.880   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.044   Pervious Area"
"        30.000   Pervious length"
```

```
"        2.500   Pervious slope"
"        0.836   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.292     0.012     0.012     0.000 c.m/sec"
"             Catchment 10           Pervious   Impervious Total Area "
"             Surface Area           0.044      0.836      0.880      hectare"
"             Time of concentration  12.005     1.733      1.856      minutes"
"             Time to Centroid       90.836     88.747     88.772     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        23.32      443.01     466.32     c.m"
"             Rainfall losses        41.295     2.278      4.229      mm"
"             Runoff depth           11.696     50.713     48.762     mm"
"             Runoff volume          5.15       423.96     429.11     c.m"
"             Runoff coefficient     0.221      0.957      0.920      "
"             Maximum flow           0.004      0.290      0.292      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.292     0.299     0.012     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.292     0.299     0.299     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                 0.299    c.m/sec"
"             Hydrograph volume          479.169    c.m"
" 38          START/RE-START TOTALS 10"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.936    hectare"
"             Total % impervious                       95.510"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                            ie METRIC"
"                Job folder:                              W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                                 423025_Ex_25yr.out"
"                Licensee name:                                                gmbp"
"                Company                                                          "
"                Date & Time last used:                 12/18/2023 at 3:28:41 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      721.533   Coefficient A"
"        2.253   Constant B"
"        0.679   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           187.916    mm/hr"
"             Total depth                  63.151    mm"
"            6   025hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 20"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           20   Catchment 20"
"      100.000   % Impervious"
"        0.100   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.100   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.044     0.000     0.000     0.000 c.m/sec"
"             Catchment 20           Pervious   Impervious Total Area "
"             Surface Area           0.000      0.100      0.100      hectare"
"             Time of concentration  6.845      1.098      1.098      minutes"
"             Time to Centroid       87.750     87.515     87.515     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        0.00       63.15      63.15      c.m"
"             Rainfall losses        44.810     3.399      3.399      mm"
"             Runoff depth           18.340     59.752     59.752     mm"
"             Runoff volume          0.00       59.75      59.75      c.m"
"             Runoff coefficient     0.000      0.946      0.946      "
"             Maximum flow           0.000      0.044      0.044      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.044     0.044     0.000     0.000"
" 54          POND DESIGN"
"         0.044   Current peak flow    c.m/sec"
"         0.010   Target outflow    c.m/sec"
"          59.8   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.100   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01500    25.000"
"                  0.05000   0.03000    50.000"
"                  0.07500   0.04500    75.000"
"                   0.1000   0.06000   100.000"
"              Peak outflow                  0.014    c.m/sec"
"              Maximum level                 0.023    metre"
"              Maximum storage              22.622    c.m"
"              Centroidal lag                1.922   hours"
"                   0.044     0.044     0.014     0.000 c.m/sec"
" 40          HYDROGRAPH Next link "
"            5   Next link "
"                     0.044     0.014     0.014     0.000"
" 33          CATCHMENT 10"
"             1   Triangular SCS"
"             1   Equal length"
"             2   Horton equation"
"            10   Catchment 10"
"        95.000   % Impervious"
"         0.880   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.044   Pervious Area"
"        30.000   Pervious length"
```

```
"        2.500   Pervious slope"
"        0.836   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.352     0.014     0.014     0.000 c.m/sec"
"             Catchment 10           Pervious   Impervious Total Area "
"             Surface Area           0.044      0.836      0.880      hectare"
"             Time of concentration  10.052     1.612      1.745      minutes"
"             Time to Centroid       91.221     88.570     88.611     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        27.79      527.94     555.73     c.m"
"             Rainfall losses        44.649     2.472      4.581      mm"
"             Runoff depth           18.502     60.679     58.570     mm"
"             Runoff volume          8.14       507.28     515.42     c.m"
"             Runoff coefficient     0.293      0.961      0.927      "
"             Maximum flow           0.006      0.350      0.352      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.352     0.361     0.014     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.352     0.361     0.361     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                 0.361    c.m/sec"
"             Hydrograph volume          575.169    c.m"
" 38          START/RE-START TOTALS 10"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.936    hectare"
"             Total % impervious                       95.510"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                             W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                                423025_Ex_50yr.out"
"                Licensee name:                                              gmbp"
"                Company                                                        "
"                Date & Time last used:                 12/18/2023 at 3:29:50 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      766.038   Coefficient A"
"        1.898   Constant B"
"        0.668   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           210.855    mm/hr"
"             Total depth                  71.090    mm"
"            6   050hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 20"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           20   Catchment 20"
"      100.000   % Impervious"
"        0.100   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.100   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.050     0.000     0.000     0.000 c.m/sec"
"             Catchment 20           Pervious   Impervious Total Area "
"             Surface Area           0.000      0.100      0.100      hectare"
"             Time of concentration  6.199      1.048      1.048      minutes"
"             Time to Centroid       88.527     87.383     87.383     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        0.00       71.09      71.09      c.m"
"             Rainfall losses        46.858     3.712      3.712      mm"
"             Runoff depth           24.232     67.378     67.378     mm"
"             Runoff volume          0.00       67.38      67.38      c.m"
"             Runoff coefficient     0.000      0.948      0.948      "
"             Maximum flow           0.000      0.050      0.050      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.050     0.050     0.000     0.000"
" 54          POND DESIGN"
"         0.050   Current peak flow    c.m/sec"
"         0.010   Target outflow    c.m/sec"
"          67.4   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.100   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01500    25.000"
"                  0.05000   0.03000    50.000"
"                  0.07500   0.04500    75.000"
"                   0.1000   0.06000   100.000"
"              Peak outflow                  0.015    c.m/sec"
"              Maximum level                 0.025    metre"
"              Maximum storage              25.124    c.m"
"              Centroidal lag                1.919   hours"
"                   0.050     0.050     0.015     0.000 c.m/sec"
" 40          HYDROGRAPH Next link "
"            5   Next link "
"                     0.050     0.015     0.015     0.000"
" 33          CATCHMENT 10"
"             1   Triangular SCS"
"             1   Equal length"
"             2   Horton equation"
"            10   Catchment 10"
"        95.000   % Impervious"
"         0.880   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.044   Pervious Area"
"        30.000   Pervious length"
```

```
"        2.500   Pervious slope"
"        0.836   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.398     0.015     0.015     0.000 c.m/sec"
"             Catchment 10           Pervious   Impervious Total Area "
"             Surface Area           0.044      0.836      0.880      hectare"
"             Time of concentration  9.104      1.539      1.679      minutes"
"             Time to Centroid       91.940     88.430     88.495     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        31.28      594.31     625.59     c.m"
"             Rainfall losses        46.623     2.717      4.913      mm"
"             Runoff depth           24.466     68.372     66.177     mm"
"             Runoff volume          10.77      571.59     582.36     c.m"
"             Runoff coefficient     0.344      0.962      0.931      "
"             Maximum flow           0.009      0.395      0.398      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.398     0.408     0.015     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.398     0.408     0.408     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                 0.408    c.m/sec"
"             Hydrograph volume          649.736    c.m"
" 38          START/RE-START TOTALS 10"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.936    hectare"
"             Total % impervious                       95.510"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                         Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                             W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                              423025_Ex_100yr.out"
"                Licensee name:                                              gmbp"
"                Company                                                        "
"                Date & Time last used:                 12/18/2023 at 3:31:11 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      801.041   Coefficient A"
"        1.501   Constant B"
"        0.657   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           234.168    mm/hr"
"             Total depth                  78.830    mm"
"            6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 20"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           20   Catchment 20"
"      100.000   % Impervious"
"        0.100   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.100   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.055     0.000     0.000     0.000 c.m/sec"
"             Catchment 20           Pervious   Impervious Total Area "
"             Surface Area           0.000      0.100      0.100      hectare"
"             Time of concentration  5.704      1.005      1.005      minutes"
"             Time to Centroid       89.479     87.348     87.348     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        0.00       78.83      78.83      c.m"
"             Rainfall losses        48.334     3.951      3.951      mm"
"             Runoff depth           30.496     74.879     74.879     mm"
"             Runoff volume          0.00       74.88      74.88      c.m"
"             Runoff coefficient     0.000      0.950      0.950      "
"             Maximum flow           0.000      0.055      0.055      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.055     0.055     0.000     0.000"
" 54          POND DESIGN"
"         0.055   Current peak flow    c.m/sec"
"         0.010   Target outflow    c.m/sec"
"          74.9   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         0.100   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01500    25.000"
"                  0.05000   0.03000    50.000"
"                  0.07500   0.04500    75.000"
"                   0.1000   0.06000   100.000"
"              Peak outflow                  0.017    c.m/sec"
"              Maximum level                 0.028    metre"
"              Maximum storage              27.507    c.m"
"              Centroidal lag                1.919   hours"
"                   0.055     0.055     0.017     0.000 c.m/sec"
" 40          HYDROGRAPH Next link "
"            5   Next link "
"                     0.055     0.017     0.017     0.000"
" 33          CATCHMENT 10"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"           10   Catchment 10"
"        95.000   % Impervious"
"         0.880   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.044   Pervious Area"
"        30.000   Pervious length"
```

```
"        2.500   Pervious slope"
"        0.836   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.444     0.017     0.017     0.000 c.m/sec"
"             Catchment 10           Pervious   Impervious Total Area "
"             Surface Area           0.044      0.836      0.880      hectare"
"             Time of concentration  8.376      1.476      1.620      minutes"
"             Time to Centroid       92.791     88.317     88.410     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        34.69      659.02     693.71     c.m"
"             Rainfall losses        48.214     2.998      5.259      mm"
"             Runoff depth           30.616     75.832     73.571     mm"
"             Runoff volume          13.47      633.96     647.43     c.m"
"             Runoff coefficient     0.388      0.962      0.933      "
"             Maximum flow           0.012      0.440      0.444      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.444     0.455     0.017     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.444     0.455     0.455     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                 0.455    c.m/sec"
"             Hydrograph volume          722.307    c.m"
" 38          START/RE-START TOTALS 10"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.936    hectare"
"             Total % impervious                       95.510"
" 19          EXIT"
```

51 Queensway East
County of Norfolk (Simcoe)
Our File: 423025
December 18, 2023

Catchment 201: Proposed Rooftop Storage

Design Discharge Rate =	1.50	l/min/mm/weir	2.50E-05	$m^3/s/mm/weir$
Max. Average Storage Depth =	100	mm		
Design Discharge =	150.0	l/min/weir	0.0025	$m^3/s/weir$
No. of Drains =	4			
No. Weirs/Drain =	6			
Allowable Release Rate =	3600.0	l/min	0.060	m^3/s
Rooftop Area =	800	m^2	(flat rooftop area that is available for storage)	

Therefore: 464.5 sq m/Roof Drain or 5000 sq ft/Roof Drain as per OBC

STAGE-STORAGE-DISCHARGE TABLE

Stage (m)	Storage (m^3)	Discharge (m^3/s)
0.000	0.0	0.000
0.025	20.0	0.015
0.050	40.0	0.030
0.075	60.0	0.045
0.100	80.0	0.060

51 Queensway East
County of Norfolk (Simcoe)
Our File: 423025
December 18, 2023

Catchment 202: Proposed Rooftop Storage

Design Discharge Rate =	1.50	l/min/mm/weir	2.50E-05	$m^3/s/mm/weir$
Max. Average Storage Depth =	100	mm		
Design Discharge =	150.0	l/min/weir	0.0025	$m^3/s/weir$
No. of Drains =	2			
No. Weirs/Drain =	6			
Allowable Release Rate =	1800.0	l/min	0.030	m^3/s
Rooftop Area =	300	m^2	(flat rooftop area that is available for storage)	

Therefore: 464.5 sq m/Roof Drain or 5000 sq ft/Roof Drain as per OBC

STAGE-STORAGE-DISCHARGE TABLE

Stage (m)	Storage (m^3)	Discharge (m^3/s)
0.000	0.0	0.000
0.025	7.5	0.008
0.050	15.0	0.015
0.075	22.5	0.023
0.100	30.0	0.030

51 Queensway East
County of Norfolk (Simcoe)
Our File: 423025
December 18, 2023

Catchment 203: Proposed Rooftop Storage

Design Discharge Rate =	1.50	l/min/mm/weir	2.50E-05	$m^3/s/mm/weir$
Max. Average Storage Depth =	100	mm		
Design Discharge =	150.0	l/min/weir	0.0025	$m^3/s/weir$
No. of Drains =	3			
No. Weirs/Drain =	6			
Allowable Release Rate =	2700.0	l/min	0.045	m^3/s
Rooftop Area =	500	m^2	(flat rooftop area that is available for storage)	

Therefore: 464.5 sq m/Roof Drain or 5000 sq ft/Roof Drain as per OBC

STAGE-STORAGE-DISCHARGE TABLE

Stage (m)	Storage (m^3)	Discharge (m^3/s)
0.000	0.0	0.000
0.025	12.5	0.011
0.050	25.0	0.023
0.075	37.5	0.034
0.100	50.0	0.045

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 07, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:                          W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                  423025_PostDev_UC_2yr.out"
"                Licensee name:                                        gmbp"
"                Company                                                  "
"                Date & Time last used:             12/14/2023 at 2:09:44 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      529.711   Coefficient A"
"        4.501   Constant B"
"        0.745   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity            98.992    mm/hr"
"             Total depth                  32.583    mm"
"            6   002hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.018     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  22.099     1.419      1.419      minutes"
"             Time to Centroid       96.686     88.730     88.730     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        0.00       26.07      26.07      c.m"
"             Rainfall losses        31.999     2.066      2.066      mm"
"             Runoff depth           0.584      30.517     30.517     mm"
"             Runoff volume          0.00       24.41      24.41      c.m"
"             Runoff coefficient     0.000      0.937      0.937      "
"             Maximum flow           0.000      0.018      0.018      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.018     0.018     0.000     0.000"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.007     0.018     0.000     0.000 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  22.099     1.419      1.419      minutes"
"             Time to Centroid       96.686     88.730     88.730     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        0.00       9.77       9.77       c.m"
"             Rainfall losses        31.999     2.066      2.066      mm"
"             Runoff depth           0.584      30.517     30.517     mm"
```

```
"             Runoff volume          0.00       9.16       9.16       c.m"
"             Runoff coefficient     0.000      0.937      0.937      "
"             Maximum flow           0.000      0.007      0.007      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.007     0.025     0.000     0.000"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.011     0.025     0.000     0.000 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  22.099     1.419      1.419      minutes"
"             Time to Centroid       96.686     88.730     88.730     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        0.00       16.29      16.29      c.m"
"             Rainfall losses        31.999     2.066      2.066      mm"
"             Runoff depth           0.584      30.517     30.517     mm"
"             Runoff volume          0.00       15.26      15.26      c.m"
"             Runoff coefficient     0.000      0.937      0.937      "
"             Maximum flow           0.000      0.011      0.011      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.011     0.037     0.000     0.000"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          100   Catchment 100"
"       95.000   % Impervious"
"        0.820   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.041   Pervious Area"
"       30.000   Pervious length"
"        2.500   Pervious slope"
"        0.779   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.168     0.037     0.000     0.000 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  32.454     2.083      2.114      minutes"
"             Time to Centroid       104.353    89.739     89.754     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        13.36      253.82     267.18     c.m"
"             Rainfall losses        31.998     1.942      3.445      mm"
"             Runoff depth           0.585      30.641     29.138     mm"
"             Runoff volume          0.24       238.69     238.93     c.m"
"             Runoff coefficient     0.018      0.940      0.894      "
"             Maximum flow           0.000      0.168      0.168      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.168     0.205     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.168     0.205     0.205     0.000"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Node 1"
"             Maximum flow                  0.205    c.m/sec"
"             Hydrograph volume           287.757    c.m"
"                     0.168     0.205     0.205     0.205"
" 40          HYDROGRAPH   Confluence    1"
"            7   Confluence "
"            1   Node #"
"                Node 1"
```

```
"             Maximum flow                  0.205    c.m/sec"
"             Hydrograph volume           287.757    c.m"
"                     0.168     0.205     0.205     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                  0.205    c.m/sec"
"             Hydrograph volume           287.757    c.m"
" 38          START/RE-START TOTALS 1"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                          W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                  423025_PostDev_UC_5yr.out"
"                Licensee name:                                          gmbp"
"                Company                                                    "
"                Date & Time last used:             12/14/2023 at 2:10:20 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      583.017   Coefficient A"
"        3.007   Constant B"
"        0.703   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           135.065    mm/hr"
"             Total depth                  44.904    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.025     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  10.300     1.253      1.253      minutes"
"             Time to Centroid       87.293     88.237     88.237     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        0.00       35.92      35.92      c.m"
"             Rainfall losses        38.482     2.581      2.581      mm"
"             Runoff depth           6.422      42.323     42.323     mm"
"             Runoff volume          0.00       33.86      33.86      c.m"
"             Runoff coefficient     0.000      0.943      0.943      "
"             Maximum flow           0.000      0.025      0.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.025     0.025     0.000     0.000"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.009     0.025     0.000     0.000 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  10.300     1.253      1.253      minutes"
"             Time to Centroid       87.293     88.237     88.237     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        0.00       13.47      13.47      c.m"
"             Rainfall losses        38.482     2.581      2.581      mm"
"             Runoff depth           6.422      42.323     42.323     mm"
```

```
"             Runoff volume          0.00       12.70      12.70      c.m"
"             Runoff coefficient     0.000      0.943      0.943      "
"             Maximum flow           0.000      0.009      0.009      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.009     0.035     0.000     0.000"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.016     0.035     0.000     0.000 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  10.300     1.253      1.253      minutes"
"             Time to Centroid       87.293     88.237     88.237     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        0.00       22.45      22.45      c.m"
"             Rainfall losses        38.482     2.581      2.581      mm"
"             Runoff depth           6.422      42.323     42.323     mm"
"             Runoff volume          0.00       21.16      21.16      c.m"
"             Runoff coefficient     0.000      0.943      0.943      "
"             Maximum flow           0.000      0.016      0.016      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.016     0.050     0.000     0.000"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          100   Catchment 100"
"       95.000   % Impervious"
"        0.820   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.041   Pervious Area"
"       30.000   Pervious length"
"        2.500   Pervious slope"
"        0.779   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.231     0.050     0.000     0.000 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  15.126     1.840      1.945      minutes"
"             Time to Centroid       91.756     89.109     89.130     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        18.41      349.80     368.22     c.m"
"             Rainfall losses        38.442     2.144      3.959      mm"
"             Runoff depth           6.462      42.760     40.945     mm"
"             Runoff volume          2.65       333.10     335.75     c.m"
"             Runoff coefficient     0.144      0.952      0.912      "
"             Maximum flow           0.002      0.231      0.231      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.231     0.281     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.231     0.281     0.281     0.000"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Node 1"
"             Maximum flow                 0.281    c.m/sec"
"             Hydrograph volume          403.469    c.m"
"                     0.231     0.281     0.281     0.281"
" 40          HYDROGRAPH   Confluence    1"
"            7   Confluence "
"            1   Node #"
"                Node 1"
```

```
"             Maximum flow                  0.281    c.m/sec"
"             Hydrograph volume           403.469    c.m"
"                     0.231     0.281     0.281     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                  0.281    c.m/sec"
"             Hydrograph volume           403.469    c.m"
" 38          START/RE-START TOTALS 1"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 07, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:                          W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                  423025_PostDev_UC_10yr.out"
"                Licensee name:                                          gmbp"
"                Company                                                    "
"                Date & Time last used:              12/14/2023 at 2:10:55 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      670.324   Coefficient A"
"        3.007   Constant B"
"        0.698   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          156.914    mm/hr"
"             Total depth                 52.991    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.029     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  8.174      1.180      1.180      minutes"
"             Time to Centroid       87.208     87.806     87.806     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        0.00       42.39      42.39      c.m"
"             Rainfall losses        41.278     2.931      2.931      mm"
"             Runoff depth           11.713     50.060     50.060     mm"
"             Runoff volume          0.00       40.05      40.05      c.m"
"             Runoff coefficient     0.000      0.945      0.945      "
"             Maximum flow           0.000      0.029      0.029      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.029     0.029     0.000     0.000"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.011     0.029     0.000     0.000 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  8.174      1.180      1.180      minutes"
"             Time to Centroid       87.208     87.806     87.806     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        0.00       15.90      15.90      c.m"
"             Rainfall losses        41.278     2.931      2.931      mm"
"             Runoff depth           11.713     50.060     50.060     mm"
```

```
"             Runoff volume          0.00       15.02      15.02      c.m"
"             Runoff coefficient     0.000      0.945      0.945      "
"             Maximum flow           0.000      0.011      0.011      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.011     0.040     0.000     0.000"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.018     0.040     0.000     0.000 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  8.174      1.180      1.180      minutes"
"             Time to Centroid       87.208     87.806     87.806     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        0.00       26.50      26.50      c.m"
"             Rainfall losses        41.278     2.931      2.931      mm"
"             Runoff depth           11.713     50.060     50.060     mm"
"             Runoff volume          0.00       25.03      25.03      c.m"
"             Runoff coefficient     0.000      0.945      0.945      "
"             Maximum flow           0.000      0.018      0.018      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.018     0.059     0.000     0.000"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          100   Catchment 100"
"       95.000   % Impervious"
"        0.820   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.041   Pervious Area"
"       30.000   Pervious length"
"        2.500   Pervious slope"
"        0.779   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.272     0.059     0.000     0.000 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  12.005     1.733      1.856      minutes"
"             Time to Centroid       90.836     88.747     88.772     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        21.73      412.80     434.53     c.m"
"             Rainfall losses        41.295     2.278      4.229      mm"
"             Runoff depth           11.696     50.713     48.762     mm"
"             Runoff volume          4.80       395.06     399.85     c.m"
"             Runoff coefficient     0.221      0.957      0.920      "
"             Maximum flow           0.004      0.271      0.272      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.272     0.330     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.272     0.330     0.330     0.000"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Node 1"
"             Maximum flow                  0.330    c.m/sec"
"             Hydrograph volume           479.948    c.m"
"                     0.272     0.330     0.330     0.330"
" 40          HYDROGRAPH   Confluence    1"
"            7   Confluence "
"            1   Node #"
"                Node 1"
```

```
"             Maximum flow                  0.330    c.m/sec"
"             Hydrograph volume           479.948    c.m"
"                     0.272     0.330     0.330     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                  0.330    c.m/sec"
"             Hydrograph volume           479.948    c.m"
" 38          START/RE-START TOTALS 1"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                          W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                  423025_PostDev_UC_25yr.out"
"                Licensee name:                                          gmbp"
"                Company                                                    "
"                Date & Time last used:              12/14/2023 at 2:11:31 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      721.533   Coefficient A"
"        2.253   Constant B"
"        0.679   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          187.916    mm/hr"
"             Total depth                 63.151    mm"
"            6   025hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.035     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  6.845      1.098      1.098      minutes"
"             Time to Centroid       87.750     87.515     87.515     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        0.00       50.52      50.52      c.m"
"             Rainfall losses        44.810     3.399      3.399      mm"
"             Runoff depth           18.340     59.752     59.752     mm"
"             Runoff volume          0.00       47.80      47.80      c.m"
"             Runoff coefficient     0.000      0.946      0.946      "
"             Maximum flow           0.000      0.035      0.035      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.035     0.035     0.000     0.000"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.013     0.035     0.000     0.000 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  6.845      1.098      1.098      minutes"
"             Time to Centroid       87.750     87.515     87.515     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        0.00       18.95      18.95      c.m"
"             Rainfall losses        44.810     3.399      3.399      mm"
"             Runoff depth           18.340     59.752     59.752     mm"
```

```
"             Runoff volume          0.00       17.93      17.93      c.m"
"             Runoff coefficient     0.000      0.946      0.946      "
"             Maximum flow           0.000      0.013      0.013      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.013     0.048     0.000     0.000"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.022     0.048     0.000     0.000 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  6.845      1.098      1.098      minutes"
"             Time to Centroid       87.750     87.515     87.515     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        0.00       31.58      31.58      c.m"
"             Rainfall losses        44.810     3.399      3.399      mm"
"             Runoff depth           18.340     59.752     59.752     mm"
"             Runoff volume          0.00       29.88      29.88      c.m"
"             Runoff coefficient     0.000      0.946      0.946      "
"             Maximum flow           0.000      0.022      0.022      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.022     0.071     0.000     0.000"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          100   Catchment 100"
"       95.000   % Impervious"
"        0.820   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.041   Pervious Area"
"       30.000   Pervious length"
"        2.500   Pervious slope"
"        0.779   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.328     0.071     0.000     0.000 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  10.052     1.612      1.745      minutes"
"             Time to Centroid       91.221     88.570     88.611     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        25.89      491.95     517.84     c.m"
"             Rainfall losses        44.649     2.472      4.581      mm"
"             Runoff depth           18.502     60.679     58.570     mm"
"             Runoff volume          7.59       472.69     480.27     c.m"
"             Runoff coefficient     0.293      0.961      0.927      "
"             Maximum flow           0.006      0.326      0.328      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.328     0.399     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.328     0.399     0.399     0.000"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Node 1"
"             Maximum flow                 0.399    c.m/sec"
"             Hydrograph volume          575.878    c.m"
"                     0.328     0.399     0.399     0.399"
" 40          HYDROGRAPH   Confluence    1"
"            7   Confluence "
"            1   Node #"
"                Node 1"
```

```
"             Maximum flow                  0.399    c.m/sec"
"             Hydrograph volume           575.878    c.m"
"                     0.328     0.399     0.399     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                  0.399    c.m/sec"
"             Hydrograph volume           575.878    c.m"
" 38          START/RE-START TOTALS 1"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                         Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                              W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                    423025_PostDev_UC_50yr.out"
"                Licensee name:                                            gmbp"
"                Company                                                      "
"                Date & Time last used:                12/14/2023 at 2:12:14 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      766.038   Coefficient A"
"        1.898   Constant B"
"        0.668   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           210.855    mm/hr"
"             Total depth                  71.090    mm"
"            6   050hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.040     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  6.199      1.048      1.048      minutes"
"             Time to Centroid       88.527     87.383     87.383     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        0.00       56.87      56.87      c.m"
"             Rainfall losses        46.858     3.712      3.712      mm"
"             Runoff depth           24.232     67.378     67.378     mm"
"             Runoff volume          0.00       53.90      53.90      c.m"
"             Runoff coefficient     0.000      0.948      0.948      "
"             Maximum flow           0.000      0.040      0.040      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.040     0.040     0.000     0.000"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.015     0.040     0.000     0.000 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  6.199      1.048      1.048      minutes"
"             Time to Centroid       88.527     87.383     87.383     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        0.00       21.33      21.33      c.m"
"             Rainfall losses        46.858     3.712      3.712      mm"
"             Runoff depth           24.232     67.378     67.378     mm"
```

```
"             Runoff volume          0.00       20.21      20.21      c.m"
"             Runoff coefficient     0.000      0.948      0.948      "
"             Maximum flow           0.000      0.015      0.015      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.015     0.055     0.000     0.000"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.025     0.055     0.000     0.000 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  6.199      1.048      1.048      minutes"
"             Time to Centroid       88.527     87.383     87.383     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        0.00       35.54      35.54      c.m"
"             Rainfall losses        46.858     3.712      3.712      mm"
"             Runoff depth           24.232     67.378     67.378     mm"
"             Runoff volume          0.00       33.69      33.69      c.m"
"             Runoff coefficient     0.000      0.948      0.948      "
"             Maximum flow           0.000      0.025      0.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.025     0.079     0.000     0.000"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          100   Catchment 100"
"       95.000   % Impervious"
"        0.820   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.041   Pervious Area"
"       30.000   Pervious length"
"        2.500   Pervious slope"
"        0.779   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.371     0.079     0.000     0.000 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  9.104      1.539      1.679      minutes"
"             Time to Centroid       91.940     88.430     88.495     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        29.15      553.79     582.94     c.m"
"             Rainfall losses        46.623     2.717      4.913      mm"
"             Runoff depth           24.466     68.372     66.177     mm"
"             Runoff volume          10.03      532.62     542.65     c.m"
"             Runoff coefficient     0.344      0.962      0.931      "
"             Maximum flow           0.008      0.368      0.371      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.371     0.450     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.371     0.450     0.450     0.000"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Node 1"
"             Maximum flow                 0.450    c.m/sec"
"             Hydrograph volume          650.456    c.m"
"                     0.371     0.450     0.450     0.450"
" 40          HYDROGRAPH   Confluence    1"
"            7   Confluence "
"            1   Node #"
"                Node 1"
```

```
"             Maximum flow                  0.450    c.m/sec"
"             Hydrograph volume           650.456    c.m"
"                     0.371     0.450     0.450     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                  0.450    c.m/sec"
"             Hydrograph volume           650.456    c.m"
" 38          START/RE-START TOTALS 1"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 07, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:                          W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                  423025_PostDev_UC_100yr.out"
"                Licensee name:                                          gmbp"
"                Company                                                    "
"                Date & Time last used:              12/14/2023 at 2:12:48 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      801.041   Coefficient A"
"        1.501   Constant B"
"        0.657   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          234.168    mm/hr"
"             Total depth                 78.830    mm"
"            6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.044     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  5.704      1.005      1.005      minutes"
"             Time to Centroid       89.479     87.348     87.348     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        0.00       63.06      63.06      c.m"
"             Rainfall losses        48.334     3.951      3.951      mm"
"             Runoff depth           30.496     74.879     74.879     mm"
"             Runoff volume          0.00       59.90      59.90      c.m"
"             Runoff coefficient     0.000      0.950      0.950      "
"             Maximum flow           0.000      0.044      0.044      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.044     0.044     0.000     0.000"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.017     0.044     0.000     0.000 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  5.704      1.005      1.005      minutes"
"             Time to Centroid       89.479     87.348     87.348     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        0.00       23.65      23.65      c.m"
"             Rainfall losses        48.334     3.951      3.951      mm"
"             Runoff depth           30.496     74.879     74.879     mm"
```

```
"             Runoff volume          0.00       22.46      22.46      c.m"
"             Runoff coefficient     0.000      0.950      0.950      "
"             Maximum flow           0.000      0.017      0.017      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.017     0.061     0.000     0.000"
" 33          CATCHMENT 203"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.028     0.061     0.000     0.000 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  5.704      1.005      1.005      minutes"
"             Time to Centroid       89.479     87.348     87.348     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        0.00       39.42      39.42      c.m"
"             Rainfall losses        48.334     3.951      3.951      mm"
"             Runoff depth           30.496     74.879     74.879     mm"
"             Runoff volume          0.00       37.44      37.44      c.m"
"             Runoff coefficient     0.000      0.950      0.950      "
"             Maximum flow           0.000      0.028      0.028      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.028     0.088     0.000     0.000"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          100   Catchment 100"
"       95.000   % Impervious"
"        0.820   Total Area"
"       30.000   Flow length"
"        2.500   Overland Slope"
"        0.041   Pervious Area"
"       30.000   Pervious length"
"        2.500   Pervious slope"
"        0.779   Impervious Area"
"       30.000   Impervious length"
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.414     0.088     0.000     0.000 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  8.376      1.476      1.620      minutes"
"             Time to Centroid       92.791     88.317     88.410     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        32.32      614.09     646.41     c.m"
"             Rainfall losses        48.214     2.998      5.259      mm"
"             Runoff depth           30.616     75.832     73.571     mm"
"             Runoff volume          12.55      590.73     603.29     c.m"
"             Runoff coefficient     0.388      0.962      0.933      "
"             Maximum flow           0.011      0.410      0.414      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.414     0.502     0.000     0.000"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                     0.414     0.502     0.502     0.000"
" 40          HYDROGRAPH   Combine    1"
"            6   Combine "
"            1   Node #"
"                Node 1"
"             Maximum flow                  0.502    c.m/sec"
"             Hydrograph volume           723.092    c.m"
"                     0.414     0.502     0.502     0.502"
" 40          HYDROGRAPH   Confluence    1"
"            7   Confluence "
"            1   Node #"
"                Node 1"
```

```
"             Maximum flow                  0.502    c.m/sec"
"             Hydrograph volume           723.092    c.m"
"                     0.414     0.502     0.502     0.000"
" 64          SHOW TABLE"
"            2   Flow hydrograph"
"            5   Outflow Hydrograph"
"             Maximum flow                  0.502    c.m/sec"
"             Hydrograph volume           723.092    c.m"
" 38          START/RE-START TOTALS 1"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                             W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                          423025_PostDev_2yr.out"
"                Licensee name:                                            gmbp"
"                Company                                                      "
"                Date & Time last used:                 12/14/2023 at 1:49:36 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      529.711   Coefficient A"
"        4.501   Constant B"
"        0.745   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity            98.992    mm/hr"
"             Total depth                  32.583    mm"
"            6   002hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.018     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  22.099     1.419      1.419      minutes"
"             Time to Centroid       96.686     88.730     88.730     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        0.00       26.07      26.07      c.m"
"             Rainfall losses        31.999     2.066      2.066      mm"
"             Runoff depth           0.584      30.517     30.517     mm"
"             Runoff volume          0.00       24.41      24.41      c.m"
"             Runoff coefficient     0.000      0.937      0.937      "
"             Maximum flow           0.000      0.018      0.018      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.018     0.018     0.000     0.000"
" 54          POND DESIGN"
"        0.018   Current peak flow    c.m/sec"
"        0.185   Target outflow    c.m/sec"
"         24.4   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                 0.02500   0.01500    20.000"
"                 0.05000   0.03000    40.000"
"                 0.07500   0.04500    60.000"
"                  0.1000   0.06000    80.000"
"             Peak outflow                  0.007    c.m/sec"
"             Maximum level                 0.011    metre"
"             Maximum storage               9.126    c.m"
"             Centroidal lag                1.849   hours"
"                  0.018     0.018     0.007     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.007    c.m/sec"
"             Hydrograph volume            24.414    c.m"
"                     0.018     0.018     0.007     0.007"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.018     0.000     0.007     0.007"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.007     0.000     0.007     0.007 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  22.099     1.419      1.419      minutes"
"             Time to Centroid       96.686     88.730     88.730     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        0.00       9.77       9.77       c.m"
"             Rainfall losses        31.999     2.066      2.066      mm"
"             Runoff depth           0.584      30.517     30.517     mm"
"             Runoff volume          0.00       9.16       9.16       c.m"
"             Runoff coefficient     0.000      0.937      0.937      "
"             Maximum flow           0.000      0.007      0.007      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.007     0.007     0.007     0.007"
" 54          POND DESIGN"
"        0.007   Current peak flow    c.m/sec"
"        0.185   Target outflow    c.m/sec"
"          9.2   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                0.02500   0.00800     7.500"
"                0.05000   0.01500    15.000"
"                0.07500   0.02300    22.500"
```

```
"                0.1000   0.03000    30.000"
"             Peak outflow                  0.003    c.m/sec"
"             Maximum level                 0.010    metre"
"             Maximum storage               2.906    c.m"
"             Centroidal lag                1.739   hours"
"                  0.007     0.007     0.003     0.007 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.010    c.m/sec"
"             Hydrograph volume            33.569    c.m"
"                     0.007     0.007     0.003     0.010"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.007     0.000     0.003     0.010"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           2   Horton equation"
"         203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.011     0.000     0.003     0.010 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  22.099     1.419      1.419      minutes"
"             Time to Centroid       96.686     88.730     88.730     minutes"
"             Rainfall depth         32.583     32.583     32.583     mm"
"             Rainfall volume        0.00       16.29      16.29      c.m"
"             Rainfall losses        31.999     2.066      2.066      mm"
"             Runoff depth           0.584      30.517     30.517     mm"
```

```
"             Runoff volume          0.00       15.26      15.26      c.m"
"             Runoff coefficient     0.000      0.937      0.937      "
"             Maximum flow           0.000      0.011      0.011      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.011     0.011     0.003     0.010"
" 54          POND DESIGN"
"         0.011   Current peak flow    c.m/sec"
"         0.185   Target outflow    c.m/sec"
"          15.3   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         3.000   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01100    12.500"
"                  0.05000   0.02300    25.000"
"                  0.07500   0.03400    37.500"
"                   0.1000   0.04500    50.000"
"             Peak outflow                  0.005    c.m/sec"
"             Maximum level                 0.011    metre"
"             Maximum storage               5.290    c.m"
"             Centroidal lag                1.794   hours"
"                  0.011     0.011     0.005     0.010 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.015    c.m/sec"
"             Hydrograph volume            48.827    c.m"
"                     0.011     0.011     0.005     0.015"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.011     0.000     0.005     0.015"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          100   Catchment 100"
"        95.000   % Impervious"
"         0.820   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.041   Pervious Area"
"        30.000   Pervious length"
"         2.500   Pervious slope"
"         0.779   Impervious Area"
"        30.000   Impervious length"
```

```
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.168     0.000     0.005     0.015 c.m/sec"
"            Catchment 100          Pervious   Impervious Total Area "
"            Surface Area           0.041      0.779      0.820      hectare"
"            Time of concentration  32.454     2.083      2.114      minutes"
"            Time to Centroid       104.353    89.739     89.754     minutes"
"            Rainfall depth         32.583     32.583     32.583     mm"
"            Rainfall volume        13.36      253.82     267.18     c.m"
"            Rainfall losses        31.998     1.942      3.445      mm"
"            Runoff depth           0.585      30.641     29.138     mm"
"            Runoff volume          0.24       238.69     238.93     c.m"
"            Runoff coefficient     0.018      0.940      0.894      "
"            Maximum flow           0.000      0.168      0.168      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.168     0.168     0.005     0.015"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.168     0.168     0.168     0.015"
" 40         HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"            Maximum flow                 0.177    c.m/sec"
"            Hydrograph volume          287.757    c.m"
"                    0.168     0.168     0.168     0.177"
" 40         HYDROGRAPH   Confluence    100"
"           7   Confluence "
"         100   Node #"
"               Total Outflows from Site"
"            Maximum flow                 0.177    c.m/sec"
"            Hydrograph volume          287.757    c.m"
"                    0.168     0.177     0.168     0.000"
" 38         START/RE-START TOTALS 100"
"           3   Runoff Totals on EXIT"
"            Total Catchment area                     0.980    hectare"
"            Total Impervious area                    0.939    hectare"
"            Total % impervious                      95.816"
" 19         EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                             W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                          423025_PostDev_5yr.out"
"                Licensee name:                                            gmbp"
"                Company                                                      "
"                Date & Time last used:                12/14/2023 at 1:54:31 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      583.017   Coefficient A"
"        3.007   Constant B"
"        0.703   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           135.065    mm/hr"
"             Total depth                  44.904    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.025     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  10.300     1.253      1.253      minutes"
"             Time to Centroid       87.293     88.237     88.237     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        0.00       35.92      35.92      c.m"
"             Rainfall losses        38.482     2.581      2.581      mm"
"             Runoff depth           6.422      42.323     42.323     mm"
"             Runoff volume          0.00       33.86      33.86      c.m"
"             Runoff coefficient     0.000      0.943      0.943      "
"             Maximum flow           0.000      0.025      0.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.025     0.025     0.000     0.000"
" 54          POND DESIGN"
"        0.025   Current peak flow    c.m/sec"
"        0.254   Target outflow    c.m/sec"
"         33.9   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                 0.02500   0.01500    20.000"
"                 0.05000   0.03000    40.000"
"                 0.07500   0.04500    60.000"
"                  0.1000   0.06000    80.000"
"             Peak outflow                  0.009    c.m/sec"
"             Maximum level                 0.015    metre"
"             Maximum storage              12.046    c.m"
"             Centroidal lag                1.841   hours"
"                  0.025     0.025     0.009     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.009    c.m/sec"
"             Hydrograph volume            33.858    c.m"
"                     0.025     0.025     0.009     0.009"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.025     0.000     0.009     0.009"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.009     0.000     0.009     0.009 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  10.300     1.253      1.253      minutes"
"             Time to Centroid       87.293     88.237     88.237     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        0.00       13.47      13.47      c.m"
"             Rainfall losses        38.482     2.581      2.581      mm"
"             Runoff depth           6.422      42.323     42.323     mm"
"             Runoff volume          0.00       12.70      12.70      c.m"
"             Runoff coefficient     0.000      0.943      0.943      "
"             Maximum flow           0.000      0.009      0.009      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.009     0.009     0.009     0.009"
" 54          POND DESIGN"
"        0.009   Current peak flow    c.m/sec"
"        0.254   Target outflow    c.m/sec"
"         12.7   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                0.02500   0.00800     7.500"
"                0.05000   0.01500    15.000"
"                0.07500   0.02300    22.500"
```

```
"                0.1000   0.03000    30.000"
"             Peak outflow                  0.004    c.m/sec"
"             Maximum level                 0.013    metre"
"             Maximum storage               3.838    c.m"
"             Centroidal lag                1.731   hours"
"                  0.009     0.009     0.004     0.009 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.013    c.m/sec"
"             Hydrograph volume            46.555    c.m"
"                     0.009     0.009     0.004     0.013"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.009     0.000     0.004     0.013"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           2   Horton equation"
"         203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.016     0.000     0.004     0.013 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  10.300     1.253      1.253      minutes"
"             Time to Centroid       87.293     88.237     88.237     minutes"
"             Rainfall depth         44.904     44.904     44.904     mm"
"             Rainfall volume        0.00       22.45      22.45      c.m"
"             Rainfall losses        38.482     2.581      2.581      mm"
"             Runoff depth           6.422      42.323     42.323     mm"
```

```
"             Runoff volume          0.00       21.16      21.16      c.m"
"             Runoff coefficient     0.000      0.943      0.943      "
"             Maximum flow           0.000      0.016      0.016      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.016     0.016     0.004     0.013"
" 54          POND DESIGN"
"         0.016   Current peak flow    c.m/sec"
"         0.254   Target outflow    c.m/sec"
"          21.2   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         3.000   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01100    12.500"
"                  0.05000   0.02300    25.000"
"                  0.07500   0.03400    37.500"
"                   0.1000   0.04500    50.000"
"             Peak outflow                  0.006    c.m/sec"
"             Maximum level                 0.014    metre"
"             Maximum storage               7.005    c.m"
"             Centroidal lag                1.786   hours"
"                  0.016     0.016     0.006     0.013 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.019    c.m/sec"
"             Hydrograph volume            67.717    c.m"
"                     0.016     0.016     0.006     0.019"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.016     0.000     0.006     0.019"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          100   Catchment 100"
"        95.000   % Impervious"
"         0.820   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.041   Pervious Area"
"        30.000   Pervious length"
"         2.500   Pervious slope"
"         0.779   Impervious Area"
"        30.000   Impervious length"
```

```
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.231     0.000     0.006     0.019 c.m/sec"
"            Catchment 100          Pervious   Impervious Total Area "
"            Surface Area           0.041      0.779      0.820      hectare"
"            Time of concentration  15.126     1.840      1.945      minutes"
"            Time to Centroid       91.756     89.109     89.130     minutes"
"            Rainfall depth         44.904     44.904     44.904     mm"
"            Rainfall volume        18.41      349.80     368.22     c.m"
"            Rainfall losses        38.442     2.144      3.959      mm"
"            Runoff depth           6.462      42.760     40.945     mm"
"            Runoff volume          2.65       333.10     335.75     c.m"
"            Runoff coefficient     0.144      0.952      0.912      "
"            Maximum flow           0.002      0.231      0.231      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.231     0.231     0.006     0.019"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.231     0.231     0.231     0.019"
" 40         HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"            Maximum flow                  0.243    c.m/sec"
"            Hydrograph volume           403.469    c.m"
"                    0.231     0.231     0.231     0.243"
" 40         HYDROGRAPH   Confluence    100"
"           7   Confluence "
"         100   Node #"
"               Total Outflows from Site"
"            Maximum flow                  0.243    c.m/sec"
"            Hydrograph volume           403.469    c.m"
"                    0.231     0.243     0.231     0.000"
" 38         START/RE-START TOTALS 100"
"           3   Runoff Totals on EXIT"
"            Total Catchment area                      0.980    hectare"
"            Total Impervious area                     0.939    hectare"
"            Total % impervious                       95.816"
" 19         EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 07, 2010"
"           10   Units used:                                        ie METRIC"
"                Job folder:                          W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                      423025_PostDev_10yr.out"
"                Licensee name:                                          gmbp"
"                Company                                                    "
"                Date & Time last used:              12/14/2023 at 1:56:46 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      670.324   Coefficient A"
"        3.007   Constant B"
"        0.698   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           156.914    mm/hr"
"             Total depth                  52.991    mm"
"            6   010hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.029     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  8.174      1.180      1.180      minutes"
"             Time to Centroid       87.208     87.806     87.806     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        0.00       42.39      42.39      c.m"
"             Rainfall losses        41.278     2.931      2.931      mm"
"             Runoff depth           11.713     50.060     50.060     mm"
"             Runoff volume          0.00       40.05      40.05      c.m"
"             Runoff coefficient     0.000      0.945      0.945      "
"             Maximum flow           0.000      0.029      0.029      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.029     0.029     0.000     0.000"
" 54          POND DESIGN"
"        0.029   Current peak flow    c.m/sec"
"        0.299   Target outflow    c.m/sec"
"         40.0   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                 0.02500   0.01500    20.000"
"                 0.05000   0.03000    40.000"
"                 0.07500   0.04500    60.000"
"                  0.1000   0.06000    80.000"
"             Peak outflow                  0.011    c.m/sec"
"             Maximum level                 0.018    metre"
"             Maximum storage              14.040    c.m"
"             Centroidal lag                1.834   hours"
"                  0.029     0.029     0.011     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.011    c.m/sec"
"             Hydrograph volume            40.048    c.m"
"                     0.029     0.029     0.011     0.011"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.029     0.000     0.011     0.011"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.011     0.000     0.011     0.011 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  8.174      1.180      1.180      minutes"
"             Time to Centroid       87.208     87.806     87.806     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        0.00       15.90      15.90      c.m"
"             Rainfall losses        41.278     2.931      2.931      mm"
"             Runoff depth           11.713     50.060     50.060     mm"
"             Runoff volume          0.00       15.02      15.02      c.m"
"             Runoff coefficient     0.000      0.945      0.945      "
"             Maximum flow           0.000      0.011      0.011      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.011     0.011     0.011     0.011"
" 54          POND DESIGN"
"        0.011   Current peak flow    c.m/sec"
"        0.299   Target outflow    c.m/sec"
"         15.0   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                0.02500   0.00800     7.500"
"                0.05000   0.01500    15.000"
"                0.07500   0.02300    22.500"
```

```
"                0.1000   0.03000    30.000"
"             Peak outflow                  0.005    c.m/sec"
"             Maximum level                 0.015    metre"
"             Maximum storage               4.468    c.m"
"             Centroidal lag                1.724   hours"
"                  0.011     0.011     0.005     0.011 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.015    c.m/sec"
"             Hydrograph volume            55.066    c.m"
"                     0.011     0.011     0.005     0.015"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.011     0.000     0.005     0.015"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           2   Horton equation"
"         203   Catchment 203"
"      100.000   % Impervious"
"       0.050   Total Area"
"      10.000   Flow length"
"       1.000   Overland Slope"
"       0.000   Pervious Area"
"      10.000   Pervious length"
"       1.000   Pervious slope"
"       0.050   Impervious Area"
"      10.000   Impervious length"
"       1.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      75.000   Pervious Max.infiltration"
"      12.500   Pervious Min.infiltration"
"       0.250   Pervious Lag constant (hours)"
"       5.000   Pervious Depression storage"
"       0.015   Impervious Manning 'n'"
"       0.000   Impervious Max.infiltration"
"       0.000   Impervious Min.infiltration"
"       0.050   Impervious Lag constant (hours)"
"       1.500   Impervious Depression storage"
"                     0.018     0.000     0.005     0.015 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  8.174      1.180      1.180      minutes"
"             Time to Centroid       87.208     87.806     87.806     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        0.00       26.50      26.50      c.m"
"             Rainfall losses        41.278     2.931      2.931      mm"
"             Runoff depth           11.713     50.060     50.060     mm"
```

```
"             Runoff volume          0.00       25.03      25.03      c.m"
"             Runoff coefficient     0.000      0.945      0.945      "
"             Maximum flow           0.000      0.018      0.018      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.018     0.018     0.005     0.015"
" 54          POND DESIGN"
"         0.018   Current peak flow    c.m/sec"
"         0.299   Target outflow    c.m/sec"
"          25.0   Hydrograph volume    c.m"
"             5.   Number of stages"
"         0.000   Minimum water level    metre"
"         3.000   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01100    12.500"
"                  0.05000   0.02300    25.000"
"                  0.07500   0.03400    37.500"
"                   0.1000   0.04500    50.000"
"             Peak outflow                  0.007    c.m/sec"
"             Maximum level                 0.016    metre"
"             Maximum storage               8.167    c.m"
"             Centroidal lag                1.779   hours"
"                  0.018     0.018     0.007     0.015 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.022    c.m/sec"
"             Hydrograph volume            80.097    c.m"
"                     0.018     0.018     0.007     0.022"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.018     0.000     0.007     0.022"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          100   Catchment 100"
"        95.000   % Impervious"
"         0.820   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.041   Pervious Area"
"        30.000   Pervious length"
"         2.500   Pervious slope"
"         0.779   Impervious Area"
"        30.000   Impervious length"
```

```
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.272     0.000     0.007     0.022 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  12.005     1.733      1.856      minutes"
"             Time to Centroid       90.836     88.747     88.772     minutes"
"             Rainfall depth         52.991     52.991     52.991     mm"
"             Rainfall volume        21.73      412.80     434.53     c.m"
"             Rainfall losses        41.295     2.278      4.229      mm"
"             Runoff depth           11.696     50.713     48.762     mm"
"             Runoff volume          4.80       395.06     399.85     c.m"
"             Runoff coefficient     0.221      0.957      0.920      "
"             Maximum flow           0.004      0.271      0.272      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                     0.272     0.272     0.007     0.022"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                     0.272     0.272     0.272     0.022"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.286    c.m/sec"
"             Hydrograph volume           479.948    c.m"
"                     0.272     0.272     0.272     0.286"
" 40          HYDROGRAPH   Confluence    100"
"           7   Confluence "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.286    c.m/sec"
"             Hydrograph volume           479.948    c.m"
"                     0.272     0.286     0.272     0.000"
" 38          START/RE-START TOTALS 100"
"           3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                              W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                          423025_PostDev_25yr.out"
"                Licensee name:                                            gmbp"
"                Company                                                      "
"                Date & Time last used:                 12/14/2023 at 1:58:27 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      721.533   Coefficient A"
"        2.253   Constant B"
"        0.679   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           187.916    mm/hr"
"             Total depth                  63.151    mm"
"            6   025hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.035     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  6.845      1.098      1.098      minutes"
"             Time to Centroid       87.750     87.515     87.515     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        0.00       50.52      50.52      c.m"
"             Rainfall losses        44.810     3.399      3.399      mm"
"             Runoff depth           18.340     59.752     59.752     mm"
"             Runoff volume          0.00       47.80      47.80      c.m"
"             Runoff coefficient     0.000      0.946      0.946      "
"             Maximum flow           0.000      0.035      0.035      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.035     0.035     0.000     0.000"
" 54          POND DESIGN"
"        0.035   Current peak flow    c.m/sec"
"        0.361   Target outflow    c.m/sec"
"         47.8   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                 0.02500   0.01500    20.000"
"                 0.05000   0.03000    40.000"
"                 0.07500   0.04500    60.000"
"                  0.1000   0.06000    80.000"
"             Peak outflow                 0.012    c.m/sec"
"             Maximum level                0.021    metre"
"             Maximum storage             16.401    c.m"
"             Centroidal lag               1.829   hours"
"                  0.035     0.035     0.012     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                 0.012    c.m/sec"
"             Hydrograph volume           47.801    c.m"
"                     0.035     0.035     0.012     0.012"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.035     0.000     0.012     0.012"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.013     0.000     0.012     0.012 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  6.845      1.098      1.098      minutes"
"             Time to Centroid       87.750     87.515     87.515     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        0.00       18.95      18.95      c.m"
"             Rainfall losses        44.810     3.399      3.399      mm"
"             Runoff depth           18.340     59.752     59.752     mm"
"             Runoff volume          0.00       17.93      17.93      c.m"
"             Runoff coefficient     0.000      0.946      0.946      "
"             Maximum flow           0.000      0.013      0.013      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.013     0.013     0.012     0.012"
" 54          POND DESIGN"
"        0.013   Current peak flow    c.m/sec"
"        0.361   Target outflow    c.m/sec"
"         17.9   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                0.02500   0.00800     7.500"
"                0.05000   0.01500    15.000"
"                0.07500   0.02300    22.500"
```

```
"                0.1000   0.03000    30.000"
"             Peak outflow                  0.005    c.m/sec"
"             Maximum level                 0.017    metre"
"             Maximum storage               5.218    c.m"
"             Centroidal lag                1.719   hours"
"                  0.013     0.013     0.005     0.012 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.018    c.m/sec"
"             Hydrograph volume            65.727    c.m"
"                     0.013     0.013     0.005     0.018"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.013     0.000     0.005     0.018"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           2   Horton equation"
"         203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.022     0.000     0.005     0.018 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  6.845      1.098      1.098      minutes"
"             Time to Centroid       87.750     87.515     87.515     minutes"
"             Rainfall depth         63.151     63.151     63.151     mm"
"             Rainfall volume        0.00       31.58      31.58      c.m"
"             Rainfall losses        44.810     3.399      3.399      mm"
"             Runoff depth           18.340     59.752     59.752     mm"
```

```
"             Runoff volume          0.00       29.88      29.88      c.m"
"             Runoff coefficient     0.000      0.946      0.946      "
"             Maximum flow           0.000      0.022      0.022      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.022     0.022     0.005     0.018"
" 54          POND DESIGN"
"         0.022   Current peak flow    c.m/sec"
"         0.361   Target outflow    c.m/sec"
"          29.9   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         3.000   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                 0.02500   0.01100    12.500"
"                 0.05000   0.02300    25.000"
"                 0.07500   0.03400    37.500"
"                  0.1000   0.04500    50.000"
"             Peak outflow                  0.008    c.m/sec"
"             Maximum level                 0.019    metre"
"             Maximum storage               9.554    c.m"
"             Centroidal lag                1.774   hours"
"                  0.022     0.022     0.008     0.018 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.026    c.m/sec"
"             Hydrograph volume            95.603    c.m"
"                     0.022     0.022     0.008     0.026"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.022     0.000     0.008     0.026"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          100   Catchment 100"
"        95.000   % Impervious"
"         0.820   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.041   Pervious Area"
"        30.000   Pervious length"
"         2.500   Pervious slope"
"         0.779   Impervious Area"
"        30.000   Impervious length"
```

```
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.328     0.000     0.008     0.026 c.m/sec"
"            Catchment 100          Pervious   Impervious Total Area "
"            Surface Area           0.041      0.779      0.820      hectare"
"            Time of concentration  10.052     1.612      1.745      minutes"
"            Time to Centroid       91.221     88.570     88.611     minutes"
"            Rainfall depth         63.151     63.151     63.151     mm"
"            Rainfall volume        25.89      491.95     517.84     c.m"
"            Rainfall losses        44.649     2.472      4.581      mm"
"            Runoff depth           18.502     60.679     58.570     mm"
"            Runoff volume          7.59       472.69     480.27     c.m"
"            Runoff coefficient     0.293      0.961      0.927      "
"            Maximum flow           0.006      0.326      0.328      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.328     0.328     0.008     0.026"
" 40         HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.328     0.328     0.328     0.026"
" 40         HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"            Maximum flow                  0.346    c.m/sec"
"            Hydrograph volume           575.878    c.m"
"                    0.328     0.328     0.328     0.346"
" 40         HYDROGRAPH   Confluence    100"
"           7   Confluence "
"         100   Node #"
"               Total Outflows from Site"
"            Maximum flow                  0.346    c.m/sec"
"            Hydrograph volume           575.878    c.m"
"                    0.328     0.346     0.328     0.000"
" 38         START/RE-START TOTALS 100"
"           3   Runoff Totals on EXIT"
"            Total Catchment area                      0.980    hectare"
"            Total Impervious area                     0.939    hectare"
"            Total % impervious                       95.816"
" 19         EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                            Version 2.25  rev. 473"
"                MIDUSS created                          Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                              W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                          423025_PostDev_50yr.out"
"                Licensee name:                                            gmbp"
"                Company                                                      "
"                Date & Time last used:                 12/14/2023 at 1:59:59 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      766.038   Coefficient A"
"        1.898   Constant B"
"        0.668   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           210.855    mm/hr"
"             Total depth                  71.090    mm"
"            6   050hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.040     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  6.199      1.048      1.048      minutes"
"             Time to Centroid       88.527     87.383     87.383     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        0.00       56.87      56.87      c.m"
"             Rainfall losses        46.858     3.712      3.712      mm"
"             Runoff depth           24.232     67.378     67.378     mm"
"             Runoff volume          0.00       53.90      53.90      c.m"
"             Runoff coefficient     0.000      0.948      0.948      "
"             Maximum flow           0.000      0.040      0.040      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.040     0.040     0.000     0.000"
" 54          POND DESIGN"
"        0.040   Current peak flow    c.m/sec"
"        0.408   Target outflow    c.m/sec"
"         53.9   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                 0.02500   0.01500    20.000"
"                 0.05000   0.03000    40.000"
"                 0.07500   0.04500    60.000"
"                  0.1000   0.06000    80.000"
"             Peak outflow                 0.014    c.m/sec"
"             Maximum level                0.023    metre"
"             Maximum storage             18.229    c.m"
"             Centroidal lag               1.827   hours"
"                  0.040     0.040     0.014     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                 0.014    c.m/sec"
"             Hydrograph volume           53.902    c.m"
"                     0.040     0.040     0.014     0.014"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.040     0.000     0.014     0.014"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.015     0.000     0.014     0.014 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  6.199      1.048      1.048      minutes"
"             Time to Centroid       88.527     87.383     87.383     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        0.00       21.33      21.33      c.m"
"             Rainfall losses        46.858     3.712      3.712      mm"
"             Runoff depth           24.232     67.378     67.378     mm"
"             Runoff volume          0.00       20.21      20.21      c.m"
"             Runoff coefficient     0.000      0.948      0.948      "
"             Maximum flow           0.000      0.015      0.015      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.015     0.015     0.014     0.014"
" 54          POND DESIGN"
"        0.015   Current peak flow    c.m/sec"
"        0.408   Target outflow    c.m/sec"
"         20.2   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                0.02500   0.00800     7.500"
"                0.05000   0.01500    15.000"
"                0.07500   0.02300    22.500"
```

```
"                0.1000   0.03000    30.000"
"            Peak outflow                  0.006    c.m/sec"
"            Maximum level                 0.019    metre"
"            Maximum storage               5.787    c.m"
"            Centroidal lag                1.717   hours"
"                 0.015     0.015     0.006     0.014 c.m/sec"
" 40         HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"            Maximum flow                  0.020    c.m/sec"
"            Hydrograph volume            74.116    c.m"
"                    0.015     0.015     0.006     0.020"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.015     0.000     0.006     0.020"
" 33         CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           2   Horton equation"
"         203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.025     0.000     0.006     0.020 c.m/sec"
"            Catchment 203          Pervious   Impervious Total Area "
"            Surface Area           0.000      0.050      0.050      hectare"
"            Time of concentration  6.199      1.048      1.048      minutes"
"            Time to Centroid       88.527     87.383     87.383     minutes"
"            Rainfall depth         71.090     71.090     71.090     mm"
"            Rainfall volume        0.00       35.54      35.54      c.m"
"            Rainfall losses        46.858     3.712      3.712      mm"
"            Runoff depth           24.232     67.378     67.378     mm"
```

```
"             Runoff volume          0.00       33.69      33.69      c.m"
"             Runoff coefficient     0.000      0.948      0.948      "
"             Maximum flow           0.000      0.025      0.025      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.025     0.025     0.006     0.020"
" 54          POND DESIGN"
"         0.025   Current peak flow    c.m/sec"
"         0.408   Target outflow    c.m/sec"
"          33.7   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         3.000   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                  0.02500   0.01100    12.500"
"                  0.05000   0.02300    25.000"
"                  0.07500   0.03400    37.500"
"                   0.1000   0.04500    50.000"
"             Peak outflow                  0.009    c.m/sec"
"             Maximum level                 0.021    metre"
"             Maximum storage              10.608    c.m"
"             Centroidal lag                1.772   hours"
"                  0.025     0.025     0.009     0.020 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.029    c.m/sec"
"             Hydrograph volume           107.805    c.m"
"                     0.025     0.025     0.009     0.029"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.025     0.000     0.009     0.029"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          100   Catchment 100"
"        95.000   % Impervious"
"         0.820   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.041   Pervious Area"
"        30.000   Pervious length"
"         2.500   Pervious slope"
"         0.779   Impervious Area"
"        30.000   Impervious length"
```

```
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.371     0.000     0.009     0.029 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  9.104      1.539      1.679      minutes"
"             Time to Centroid       91.940     88.430     88.495     minutes"
"             Rainfall depth         71.090     71.090     71.090     mm"
"             Rainfall volume        29.15      553.79     582.94     c.m"
"             Rainfall losses        46.623     2.717      4.913      mm"
"             Runoff depth           24.466     68.372     66.177     mm"
"             Runoff volume          10.03      532.62     542.65     c.m"
"             Runoff coefficient     0.344      0.962      0.931      "
"             Maximum flow           0.008      0.368      0.371      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.371     0.371     0.009     0.029"
" 40          HYDROGRAPH Copy to Outflow"
"           8   Copy to Outflow"
"                    0.371     0.371     0.371     0.029"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.391    c.m/sec"
"             Hydrograph volume           650.456    c.m"
"                    0.371     0.371     0.371     0.391"
" 40          HYDROGRAPH   Confluence    100"
"           7   Confluence "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.391    c.m/sec"
"             Hydrograph volume           650.456    c.m"
"                    0.371     0.391     0.371     0.000"
" 38          START/RE-START TOTALS 100"
"           3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                       Sunday, February 07, 2010"
"           10   Units used:                                          ie METRIC"
"                Job folder:                          W:\Kitchener\423-2023\"
"                423025 51 Queensway East Simcoe\Design Phase\Design Data\Modelling
Files"
"                Output filename:                     423025_PostDev_100yr.out"
"                Licensee name:                                           gmbp"
"                Company                                                     "
"                Date & Time last used:               12/14/2023 at 2:01:49 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      801.041   Coefficient A"
"        1.501   Constant B"
"        0.657   Exponent C"
"        0.400   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity           234.168    mm/hr"
"             Total depth                  78.830    mm"
"            6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          201   Catchment 201"
"      100.000   % Impervious"
"        0.080   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.080   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
```

```
"        1.500   Impervious Depression storage"
"                     0.044     0.000     0.000     0.000 c.m/sec"
"             Catchment 201          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.080      0.080      hectare"
"             Time of concentration  5.704      1.005      1.005      minutes"
"             Time to Centroid       89.479     87.348     87.348     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        0.00       63.06      63.06      c.m"
"             Rainfall losses        48.334     3.951      3.951      mm"
"             Runoff depth           30.496     74.879     74.879     mm"
"             Runoff volume          0.00       59.90      59.90      c.m"
"             Runoff coefficient     0.000      0.950      0.950      "
"             Maximum flow           0.000      0.044      0.044      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.044     0.044     0.000     0.000"
" 54          POND DESIGN"
"        0.044   Current peak flow    c.m/sec"
"        0.455   Target outflow    c.m/sec"
"         59.9   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                 0.02500   0.01500    20.000"
"                 0.05000   0.03000    40.000"
"                 0.07500   0.04500    60.000"
"                  0.1000   0.06000    80.000"
"             Peak outflow                 0.015    c.m/sec"
"             Maximum level                0.025    metre"
"             Maximum storage             19.979    c.m"
"             Centroidal lag               1.826   hours"
"                  0.044     0.044     0.015     0.000 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                 0.015    c.m/sec"
"             Hydrograph volume           59.903    c.m"
"                     0.044     0.044     0.015     0.015"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.044     0.000     0.015     0.015"
" 33          CATCHMENT 202"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
```

```
"          202   Catchment 202"
"      100.000   % Impervious"
"        0.030   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.030   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.017     0.000     0.015     0.015 c.m/sec"
"             Catchment 202          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.030      0.030      hectare"
"             Time of concentration  5.704      1.005      1.005      minutes"
"             Time to Centroid       89.479     87.348     87.348     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        0.00       23.65      23.65      c.m"
"             Rainfall losses        48.334     3.951      3.951      mm"
"             Runoff depth           30.496     74.879     74.879     mm"
"             Runoff volume          0.00       22.46      22.46      c.m"
"             Runoff coefficient     0.000      0.950      0.950      "
"             Maximum flow           0.000      0.017      0.017      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.017     0.017     0.015     0.015"
" 54          POND DESIGN"
"        0.017   Current peak flow    c.m/sec"
"        0.455   Target outflow    c.m/sec"
"         22.5   Hydrograph volume    c.m"
"           5.   Number of stages"
"        0.000   Minimum water level    metre"
"        0.100   Maximum water level    metre"
"        0.000   Starting water level    metre"
"            0   Keep Design Data: 1 = True; 0 = False"
"                  Level Discharge    Volume"
"                  0.000     0.000     0.000"
"                0.02500   0.00800     7.500"
"                0.05000   0.01500    15.000"
"                0.07500   0.02300    22.500"
```

```
"                0.1000   0.03000    30.000"
"             Peak outflow                  0.007    c.m/sec"
"             Maximum level                 0.021    metre"
"             Maximum storage               6.329    c.m"
"             Centroidal lag                1.716   hours"
"                  0.017     0.017     0.007     0.015 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"           6   Combine "
"         100   Node #"
"               Total Outflows from Site"
"             Maximum flow                  0.021    c.m/sec"
"             Hydrograph volume            82.367    c.m"
"                     0.017     0.017     0.007     0.021"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.017     0.000     0.007     0.021"
" 33          CATCHMENT 203"
"           1   Triangular SCS"
"           1   Equal length"
"           2   Horton equation"
"         203   Catchment 203"
"      100.000   % Impervious"
"        0.050   Total Area"
"       10.000   Flow length"
"        1.000   Overland Slope"
"        0.000   Pervious Area"
"       10.000   Pervious length"
"        1.000   Pervious slope"
"        0.050   Impervious Area"
"       10.000   Impervious length"
"        1.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                     0.028     0.000     0.007     0.021 c.m/sec"
"             Catchment 203          Pervious   Impervious Total Area "
"             Surface Area           0.000      0.050      0.050      hectare"
"             Time of concentration  5.704      1.005      1.005      minutes"
"             Time to Centroid       89.479     87.348     87.348     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        0.00       39.42      39.42      c.m"
"             Rainfall losses        48.334     3.951      3.951      mm"
"             Runoff depth           30.496     74.879     74.879     mm"
```

```
"             Runoff volume          0.00       37.44      37.44      c.m"
"             Runoff coefficient     0.000      0.950      0.950      "
"             Maximum flow           0.000      0.028      0.028      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.028     0.028     0.007     0.021"
" 54          POND DESIGN"
"         0.028   Current peak flow    c.m/sec"
"         0.455   Target outflow    c.m/sec"
"          37.4   Hydrograph volume    c.m"
"            5.   Number of stages"
"         0.000   Minimum water level    metre"
"         3.000   Maximum water level    metre"
"         0.000   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                   0.000     0.000     0.000"
"                 0.02500   0.01100    12.500"
"                 0.05000   0.02300    25.000"
"                 0.07500   0.03400    37.500"
"                  0.1000   0.04500    50.000"
"             Peak outflow                  0.010    c.m/sec"
"             Maximum level                 0.023    metre"
"             Maximum storage              11.616    c.m"
"             Centroidal lag                1.771   hours"
"                  0.028     0.028     0.010     0.021 c.m/sec"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.031    c.m/sec"
"             Hydrograph volume           119.806    c.m"
"                     0.028     0.028     0.010     0.031"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.028     0.000     0.010     0.031"
" 33          CATCHMENT 100"
"            1   Triangular SCS"
"            1   Equal length"
"            2   Horton equation"
"          100   Catchment 100"
"        95.000   % Impervious"
"         0.820   Total Area"
"        30.000   Flow length"
"         2.500   Overland Slope"
"         0.041   Pervious Area"
"        30.000   Pervious length"
"         2.500   Pervious slope"
"         0.779   Impervious Area"
"        30.000   Impervious length"
```

```
"        2.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       75.000   Pervious Max.infiltration"
"       12.500   Pervious Min.infiltration"
"        0.250   Pervious Lag constant (hours)"
"        5.000   Pervious Depression storage"
"        0.015   Impervious Manning 'n'"
"        0.000   Impervious Max.infiltration"
"        0.000   Impervious Min.infiltration"
"        0.050   Impervious Lag constant (hours)"
"        1.500   Impervious Depression storage"
"                    0.414     0.000     0.010     0.031 c.m/sec"
"             Catchment 100          Pervious   Impervious Total Area "
"             Surface Area           0.041      0.779      0.820      hectare"
"             Time of concentration  8.376      1.476      1.620      minutes"
"             Time to Centroid       92.791     88.317     88.410     minutes"
"             Rainfall depth         78.830     78.830     78.830     mm"
"             Rainfall volume        32.32      614.09     646.41     c.m"
"             Rainfall losses        48.214     2.998      5.259      mm"
"             Runoff depth           30.616     75.832     73.571     mm"
"             Runoff volume          12.55      590.73     603.29     c.m"
"             Runoff coefficient     0.388      0.962      0.933      "
"             Maximum flow           0.011      0.410      0.414      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.414     0.414     0.010     0.031"
" 40          HYDROGRAPH Copy to Outflow"
"            8   Copy to Outflow"
"                    0.414     0.414     0.414     0.031"
" 40          HYDROGRAPH   Combine    100"
"            6   Combine "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.436    c.m/sec"
"             Hydrograph volume           723.092    c.m"
"                    0.414     0.414     0.414     0.436"
" 40          HYDROGRAPH   Confluence    100"
"            7   Confluence "
"          100   Node #"
"                Total Outflows from Site"
"             Maximum flow                  0.436    c.m/sec"
"             Hydrograph volume           723.092    c.m"
"                    0.414     0.436     0.414     0.000"
" 38          START/RE-START TOTALS 100"
"            3   Runoff Totals on EXIT"
"             Total Catchment area                      0.980    hectare"
"             Total Impervious area                     0.939    hectare"
"             Total % impervious                       95.816"
" 19          EXIT"
```

Stormceptor®

Rinker MATERIALS™

Stormceptor® EF Sizing Report

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

12/18/2023

Province:	Ontario
City:	Simcoe
Nearest Rainfall Station:	TORONTO INTL AP
Climate Station Id:	6158731
Years of Rainfall Data:	20

Site Name:	

Drainage Area (ha):	0.98
% Imperviousness:	96.00

Runoff Coefficient 'c': 0.87

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

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	26.70
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	1016
Estimated Average Annual Sediment Volume (L/yr):	826

Project Name:	51 Queensway East
Project Number:	423025
Designer Name:	Harshadkumar Bhatt
Designer Company:	GM BluePlan
Designer Email:	harshadkumar.bhatt@gmblueplan.ca
Designer Phone:	519-824-8150
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	79
EF6	88
EF8	92
EF10	96
EF12	97

Recommended Stormceptor EF Model: EF6

Estimated Net Annual Sediment (TSS) Load Reduction (%): 88

Water Quality Runoff Volume Capture (%): > 90

imbrium

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 waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

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

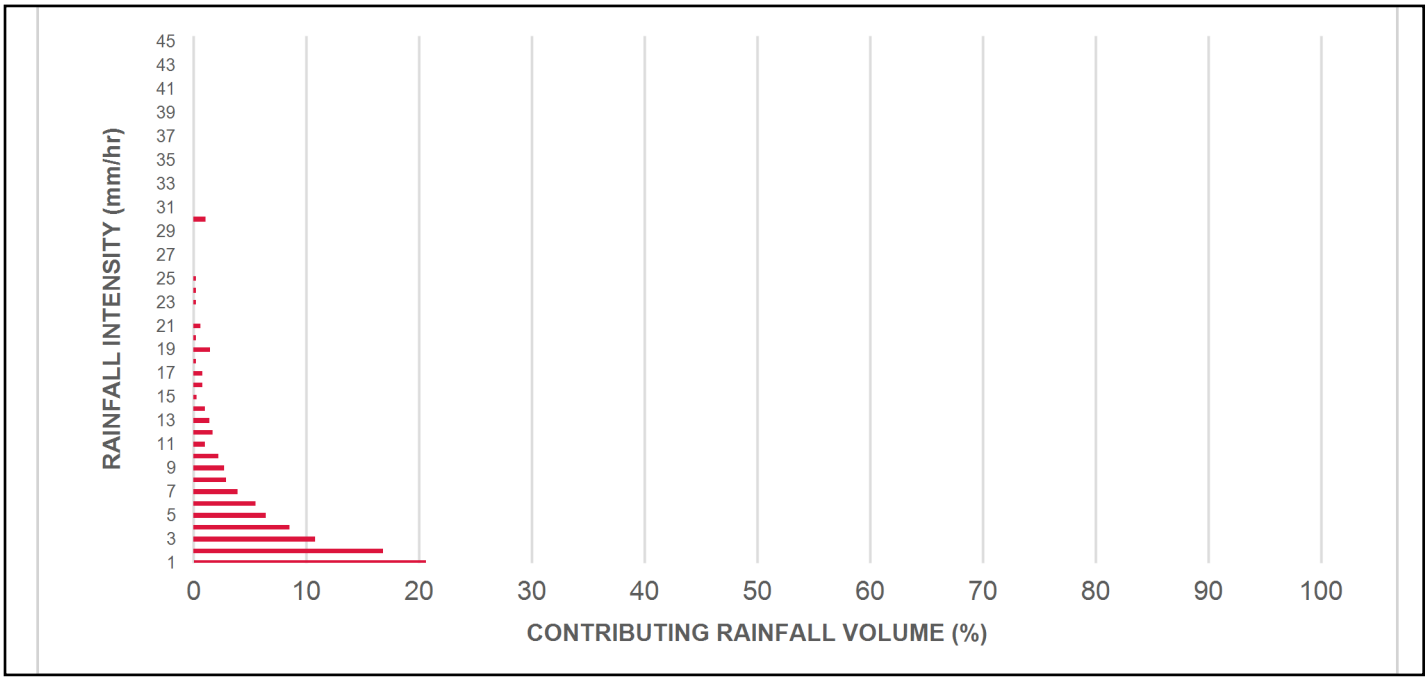
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

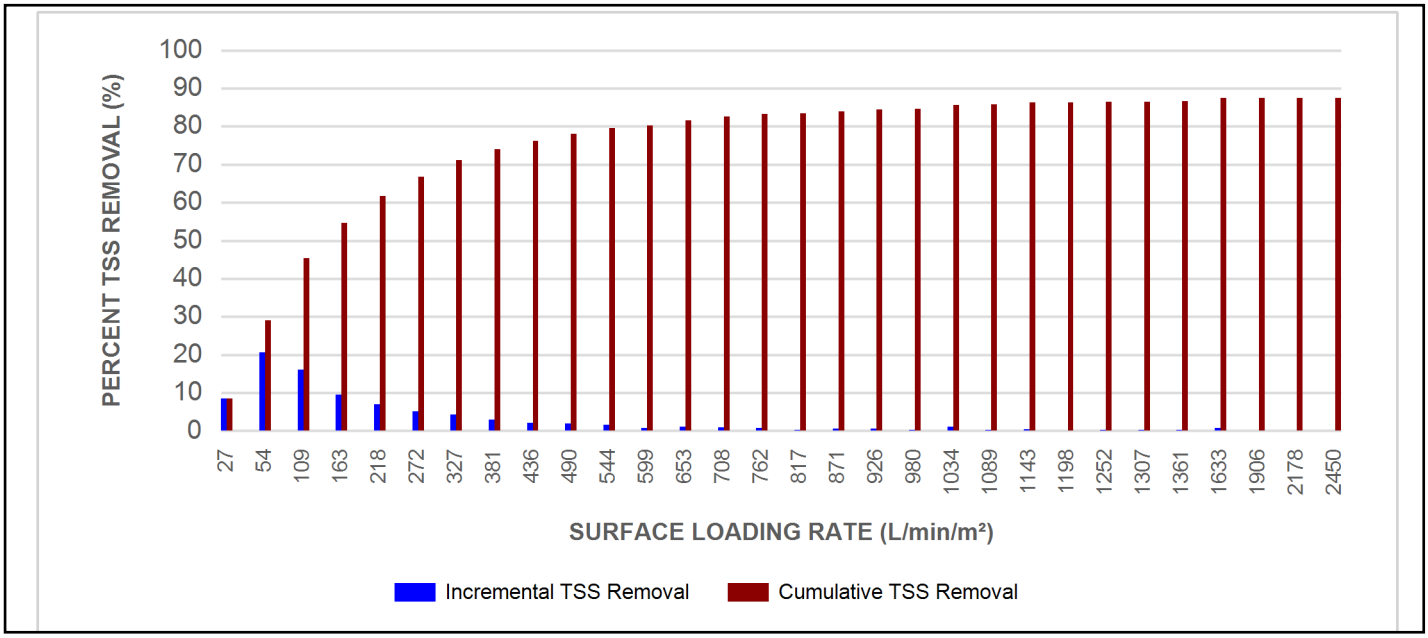
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.19	72.0	27.0	100	8.5	8.5
1.00	20.6	29.1	2.39	143.0	54.0	100	20.6	29.1
2.00	16.8	45.9	4.77	286.0	109.0	96	16.1	45.3
3.00	10.8	56.7	7.16	430.0	163.0	88	9.5	54.7
4.00	8.5	65.2	9.55	573.0	218.0	83	7.0	61.7
5.00	6.4	71.6	11.93	716.0	272.0	80	5.1	66.8
6.00	5.5	77.0	14.32	859.0	327.0	78	4.2	71.1
7.00	3.9	81.0	16.71	1002.0	381.0	75	3.0	74.0
8.00	2.9	83.9	19.09	1146.0	436.0	73	2.1	76.1
9.00	2.7	86.5	21.48	1289.0	490.0	72	1.9	78.1
10.00	2.2	88.7	23.87	1432.0	544.0	72	1.6	79.6
11.00	1.0	89.7	26.25	1575.0	599.0	71	0.7	80.3
12.00	1.7	91.3	28.64	1718.0	653.0	70	1.2	81.5
13.00	1.4	92.8	31.03	1862.0	708.0	70	1.0	82.5
14.00	1.0	93.7	33.41	2005.0	762.0	70	0.7	83.2
15.00	0.3	94.0	35.80	2148.0	817.0	69	0.2	83.4
16.00	0.8	94.8	38.19	2291.0	871.0	69	0.5	83.9
17.00	0.8	95.7	40.57	2434.0	926.0	68	0.6	84.5
18.00	0.2	95.8	42.96	2578.0	980.0	68	0.1	84.6
19.00	1.5	97.3	45.34	2721.0	1034.0	68	1.0	85.6
20.00	0.2	97.5	47.73	2864.0	1089.0	69	0.1	85.8
21.00	0.6	98.2	50.12	3007.0	1143.0	70	0.4	86.2
22.00	0.0	98.2	52.50	3150.0	1198.0	71	0.0	86.2
23.00	0.2	98.4	54.89	3293.0	1252.0	73	0.2	86.4
24.00	0.2	98.6	57.28	3437.0	1307.0	73	0.2	86.5
25.00	0.2	98.9	59.66	3580.0	1361.0	75	0.2	86.7
30.00	1.1	100.0	71.60	4296.0	1633.0	65	0.7	87.5
35.00	0.0	100.0	83.53	5012.0	1906.0	56	0.0	87.5
40.00	0.0	100.0	95.46	5728.0	2178.0	49	0.0	87.5
45.00	0.0	100.0	107.40	6444.0	2450.0	43	0.0	87.5
Estimated Net Annual Sediment (TSS) Load Reduction =								**87 %**

Climate Station ID: 6158731 *Years of Rainfall Data*: 20

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



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

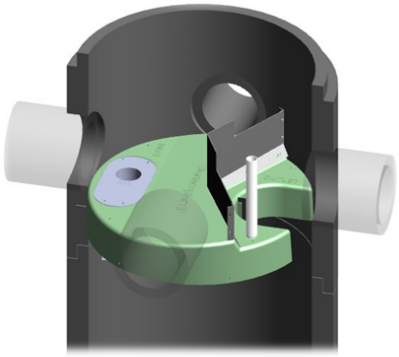
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

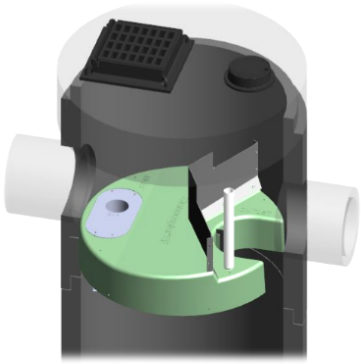
DESIGN FLEXIBILITY

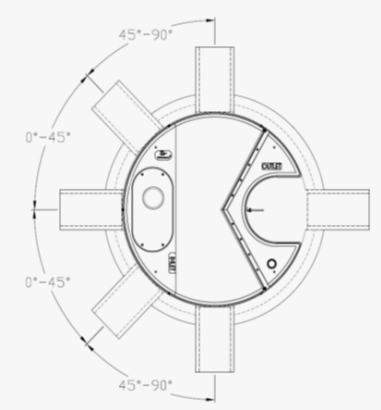
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

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

Pollutant Capacity

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

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

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

STANDARD STORMCEPTOR EF/EFO DRAWINGS

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

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

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

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The **minimum** sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

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

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

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

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

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

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

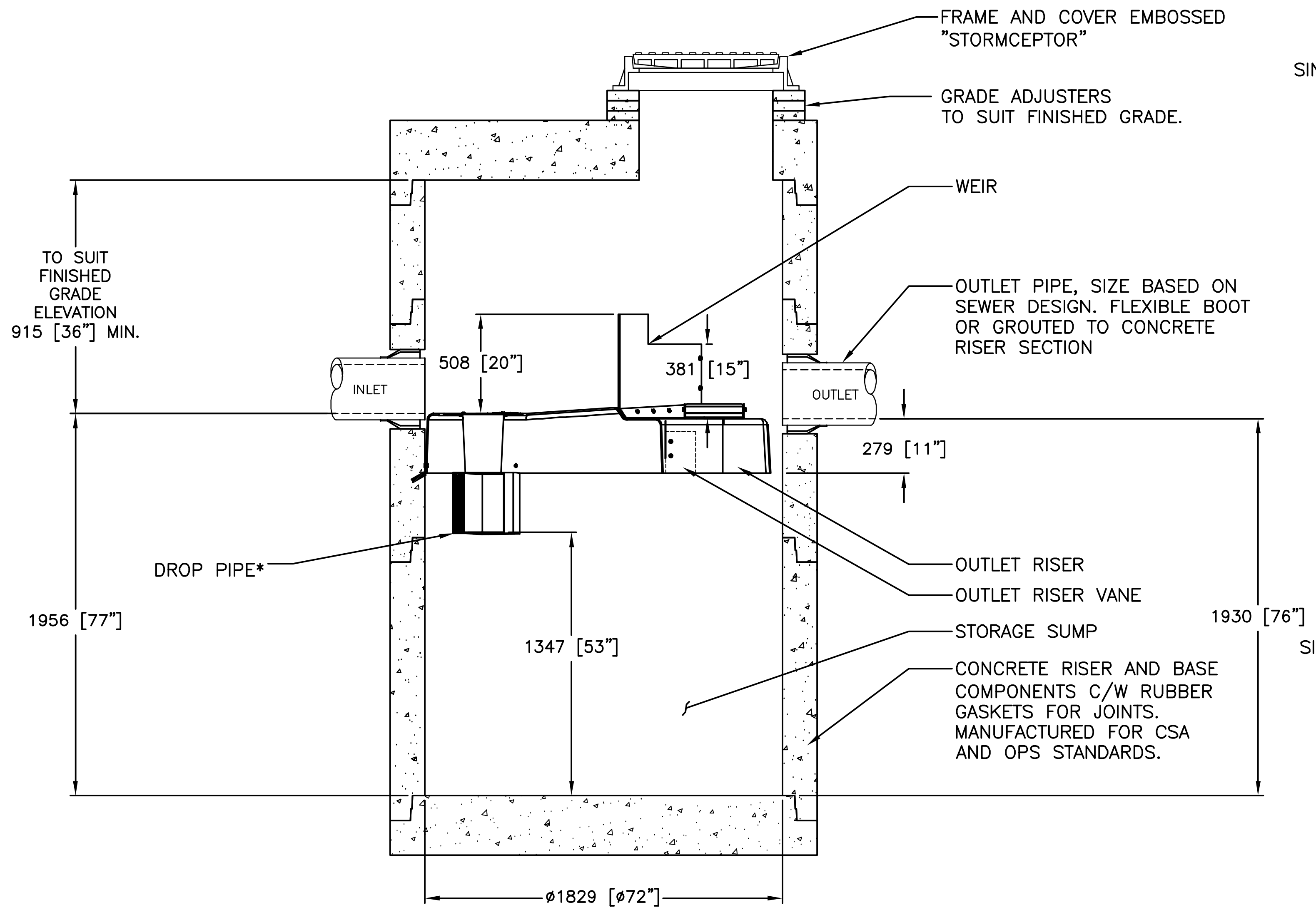
The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

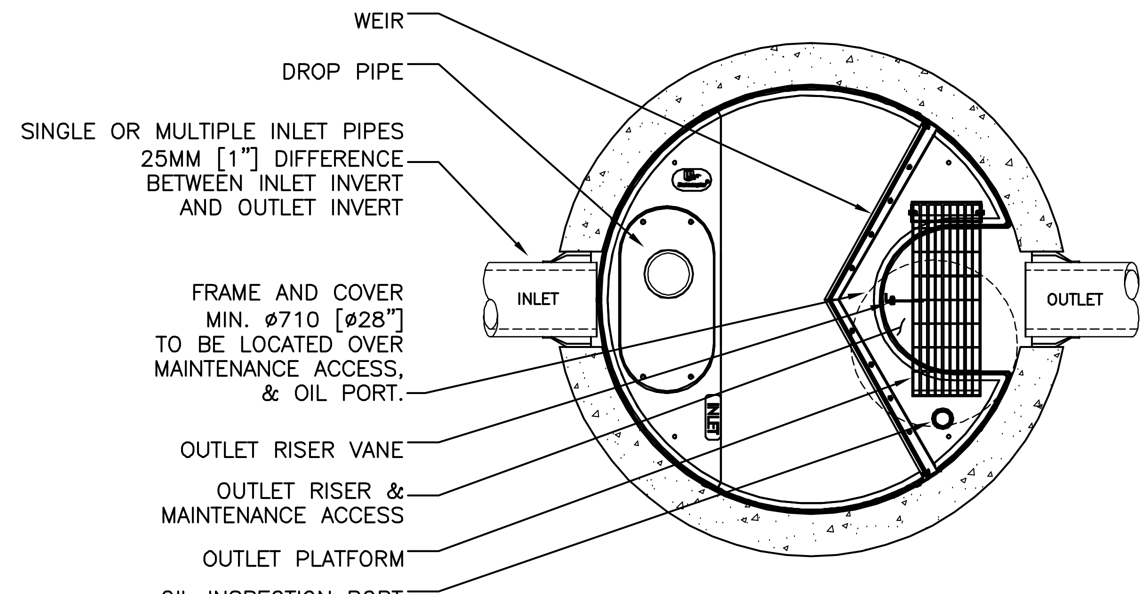
The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

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

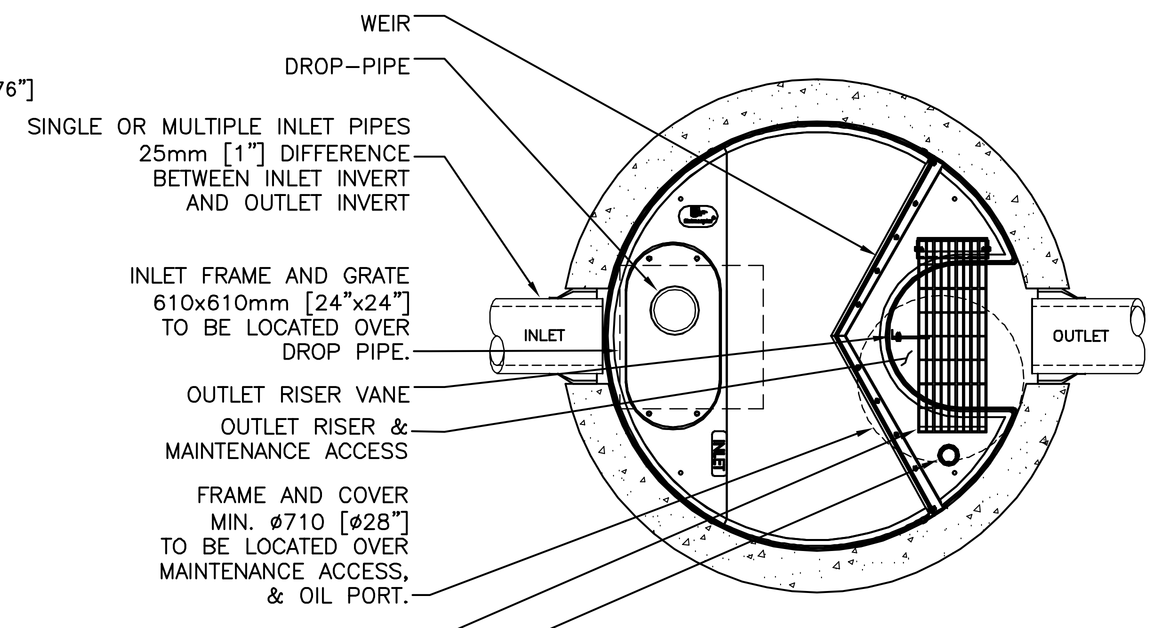
DRAWING NOT TO BE USED FOR CONSTRUCTION



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF6 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO6 (OIL CAPTURE CONFIGURATION).

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

INSTALLATION NOTES

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

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).

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EF6				
STRUCTURE ID					*
WATER QUALITY FLOW RATE (L/s)					*
PEAK FLOW RATE (L/s)					*
RETURN PERIOD OF PEAK FLOW (yrs)					*
DRAINAGE AREA (HA)					*
DRAINAGE AREA IMPERVIOUSNESS (%)					*
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

MARK	DATE	REVISION DESCRIPTION	BY
####	####	####	####
####	####	####	####
####	####	####	####
1	6/8/18	OUTLET PLATFORM	JSK
0	05/26/17	INITIAL RELEASE	JSK

Stormceptor® EF

SCALE = NTS

imbrium

DATE: 5/26/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EF6	SEQUENCE No.: *
SHEET: 1 OF 1	

I:\IMBRIUM\PRODUCTS\STORMCEPTOR EF\0 DRAWINGS & DETAILS\STANDARD DETAILS\EF6-DETAIL.DWG 4/12/2019 10:50 AM

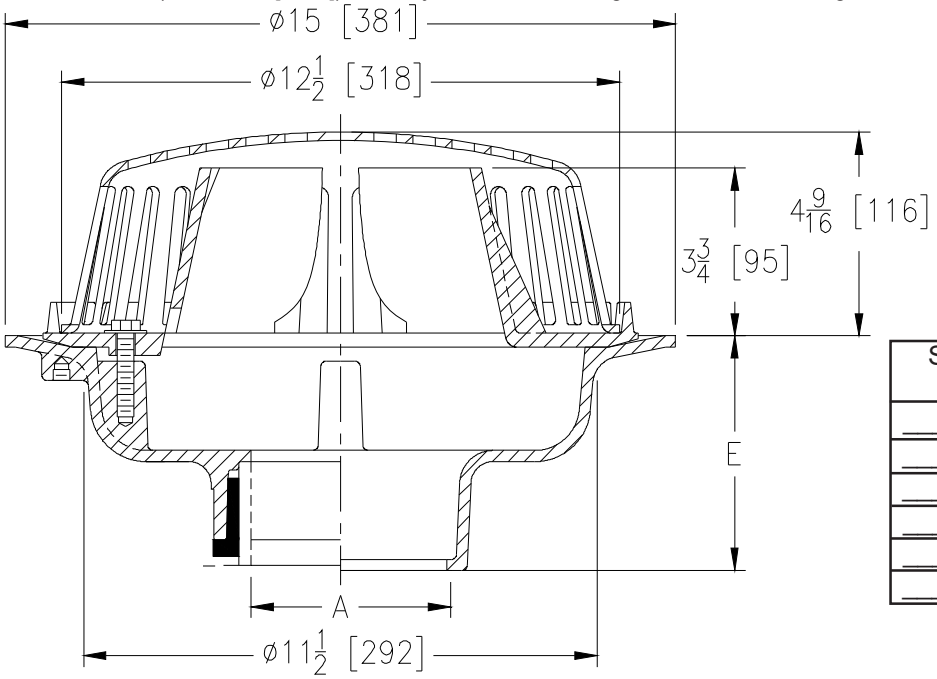
Z105

CONTROL-FLO ROOF DRAIN
W/ PARABOLIC WEIR

SPECIFICATION SHEET

TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Specify Number of Notches in Weir	
___-N1	One Notch
___-N2	Two Notches
___-N3	Three Notches
___-N4	Four Notches
___-N5	Five Notches
___-N6	Six Notches

A- Pipe Size In.[mm]	Approx. Wt. Lbs. [kg]	Dome Open Area Sq. In. [cm²]
2,3,4 [51,76,102]	34 [15]	103 [665]

ENGINEERING SPECIFICATION: ZURN Z105
15" [381mm] Diameter Control-Flo roof drain for dead-level roof construction, Dura-Coated cast iron body, Control-Flo weir shall be linear functioning with integral membrane flashing clamp/gravel guard and Poly-Dome. All data shall be verified proportional to flow rates. Each notch will allow 10 GPM [LPM] of flow per 1" [25mm] of rain water build up above the drain.

OPTIONS (Check/specify appropriate options)

PIPE SIZE
3, 4 [76, 102]
2 , 3, 4 [51, 76, 102]
2 , 3, 4 [51, 76, 102]

(Specify size/type) **OUTLET**
_____ IC Inside Caulk
_____ NH No-Hub
_____ NL Neo-Loc

E BODY HT. DIM.
5-1/4 [133]
5-1/4 [133]
4-9/16 [116]

PREFIXES
____ Z D.C.C.I. Body with Poly-Dome*
____ ZA D.C.C.I. Body with Aluminum Dome
____ ZC D.C.C.I. Body with Cast Iron Dome

SUFFIXES
____ -C Underdeck Clamp
____ -DP Top-Set® Deck Plate (Replaces both -C & -R)
____ -E Static Extension 1 [25] thru 4 [102] (Specify Ht.)
____ -EA Adjustable Extension Assembly 2-1/8 [54] thru 3-1/2 [89]
____ -G Galvanized Cast Iron
____ -R Roof Sump Receiver
____ -TC Neo-Loc Test Cap Gasket (2,3,4 [51,76,102] NL Bottom Outlet Only)
____ -VP Vandal Proof Secured Top
____ -10 6 [152] High Parabolic Weir for Sloped Roof (ZC or ZA)

* Regularly furnished unless otherwise specified.

Zurn Industries, LLC | **Specification Drainage Operation**
1801 Pittsburgh Avenue, Erie, PA U.S.A. 16502 · Ph. 855-663-9876, Fax 814-454-7929
In Canada | **Zurn Industries Limited**
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 · Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

Rev. K
Date: 09/25/17
C.N. No. 137793
Prod. | Dwg. No. Z105