vallee

Consulting Engineers,
Architects & Planners

March 29, 2021

County of Norfolk
Robinson Administration Building
185 Robinson Street, Suite 200
Simcoe, ON N3Y 5L6

**Attention:** **Tricia Givens, M.Sc.(Pl), MCIP, RPP**

**Reference:** **SPA, ZBA, and OPA**
**Denzo Townhouses**
**11 Elizabeth Road, Simcoe, Norfolk County**
**Our Project #20-013**

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G. Douglas Vallee Limited has been retained by Denzo Group Inc. to make an application for an Official Plan Amendment, Zoning By-law Amendment and Site Plan Approval for eight (8) residential street townhouse dwelling units located at 11 Elizabeth Road, Simcoe, Norfolk County.

Please accept this package as our complete submission to Norfolk County. The fees for the applications are as follows:

- Combined Official Plan and Zoning By-law Amendment (Regular): $4,480
- Site Plan (Regular): $3,594

A pre-consultation was completed for the subject lands on February 26, 2020. A fee of $372 was provided, and is credited against these applications. The total cost of the applications, less the pre-consultation fee, is $7,702. Further to our emails and phone calls regarding the fees, **please send an invoice for the fee amount to G. Doulas Vallee Limited. (Address at bottom of cover letter)**

Due to COVID restrictions, signed and stamped copies will be provided on subsequent submissions.

The following items are attached for your reference:

1. Development Application Form (Contains information for SPA, OPA and ZBA)
2. A copy of the Parcel Register (PIN) for the subject lands
3. Functional Servicing Report (prepared by G. Douglas Vallee Limited, dated February 1, 2021)
4. Servicing Drawings (prepared by G. Douglas Vallee Limited, dated February 2, 2021)
5. Site Plan Drawing (prepared by Archicreation Design Studio Inc., dated February 9, 2021)
6. Traffic Impact Study (prepared by RC Spencer Associates Inc., dated August 2020)
7. Geotechnical Investigation (prepared by A&A Environmental Consultants Inc. dated July 2, 2020)
8. Planning Justification Report (By G. Douglas Vallee Limited, dated February 22, 2021) including the following appendices:
   a. Draft Site Plan
   b. Provincial Policy Statement 2020 Policy Compliance
   c. Norfolk County Official Plan Policy Compliance
   d. Modified Generic Risk Assessment Letter (prepared by A&A Environmental Consultants Inc. dated August 26, 2020)

An elevation plan and photometrics plan will be submitted after the first round of comments are received from the County.

Thank you for your time to review this file. As always, please feel free to contact us with any questions or comments that you may have.

Yours truly,

Eldon Darbyson, Director of Planning
**G. DOUGLAS VALLEE LIMITED**
Consulting Engineers, Architects & Planners
H:\Projects\2020\20-013 Denzo Group Townhouses\Agency\Submissions\2021-02-23 - SPA OPA & ZBA Submission 1\Source Files\00 - Cover Letter 2021-03-29.docx

**For Office Use Only**:

| | | | |
|---|---|---|---|
| File Number | OPNPL2021197/ZNPL2021198/ | Public Notice Sign | |
| Related File Number | SPPL2021199 | Application Fee | $7,702 (OPA/ZBA, Site Plan, pre-con deduction) |
| Pre-consultation Meeting | February 26, 2020 | Conservation Authority Fee | |
| Application Submitted | March 1, 2021 | Well & Septic Info Provided | |
| Complete Application | July 7, 2021 | Planner | N. Goodbrand |

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

- [x] Official Plan Amendment
- [x] Zoning By-Law Amendment
- [ ] Temporary Use By-law
- [ ] Draft Plan of Subdivision/Vacant Land Condominium
- [ ] Condominium Exemption
- [x] Site Plan Application
- [ ] Consent/Severance
- [ ] Minor Variance
- [ ] Easement/Right-of-Way
- [ ] Extension of a Temporary Use By-law
- [ ] Part Lot Control
- [ ] Cash-in-Lieu of Parking
- [ ] Renewable Energy Project or Radio Communication Tower

Please explain the desired end result of this application (for example: a special zoning provision on the subject lands, changing the zone and/or official plan designation of the subject lands, creating a certain number of lots, or similar)

The desired result of this application is to remove the Hazard Land designation from the subject lands and to obtain a site specific Urban Residential Type 4 Zone (R4) category to faciliate the development of 8 street townhouse units on the property known as 11 Elizabeth Road in Simcoe.

**Property Assessment Roll Number:** 3310401001297000000

## A. Applicant Information

**Name of Owner** 26403023 Ontario Inc.Operating as the Denzo Group Inc.

It is the responsibility of the owner or applicant to notify the planner of any changes in ownership within 30 days of such a change.

Address 601 Southworth Street

Town and Postal Code Welland, Ontario  L3B 2A2

Phone Number

Cell Number (289) 880-4110

Email info@allekoncontractinginc.com

**Name of Applicant** Same as above

Address

Town and Postal Code

Phone Number

Cell Number

Email

**Name of Agent** G. Douglas Vallee Limited (Eldon Darbyson)

Address 2 Talbot Street North

Town and Postal Code Simcoe, Ontario N3Y 3W4

Phone Number (519) 426-6270

Cell Number (905) 321-2029

Email eldondarbyson@gdvallee.ca

Please specify to whom all communications should be sent.  Unless otherwise directed, all correspondence and notices in respect of this application will be forwarded to the agent noted above.

○ Owner ◉ Agent ○ Applicant

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

## B. Location, Legal Description and Property Information

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

   PIN (50189-0090)
   Lot 6 Plan 279; Norfolk County

   Municipal Civic Address: 11 Elizabeth Road

   Present Official Plan Designation(s): Commercial and Hazard Lands

   Present Zoning: Service Commercial Zone (CS)

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

   ○ Yes ◉ No If yes, please specify:

   _____

3. Present use of the subject lands:
   Vacant

4. Please describe all existing buildings or structures on the subject lands and whether they are to 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 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:

   N/A

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.

   8 Street Townhouse Units proposed - See Site Plan drawing for details

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:

   8 Street Townhouse Units proposed - See Site Plan drawing for details

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:

9. Existing use of abutting properties:

   Residential (across the street) and Commercial

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

    ◯ Yes ◉ No If yes, describe the easement or restrictive covenant and its effect:

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:

   The lands are subject to a Hazard Lands designation which can be removed in accordance with the updated Conservation Authority flood plain mapping. The current zoning does not permit the proposed 8 street townhouse units.

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

   The amendment to the Official Plan can be supported. The current zoning does not permit residential land uses.

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):
   Only changes mapping.

6. Description of land intended to be severed in metric units:
   Frontage: _____
   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: _____
   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):
   _____

| 9. **Site Information** | **Existing** | **Proposed** |
|---|---|---|
| Please indicate unit of measurement, for example: m, $m^2$ or % | | |
| Lot frontage | 58.8m | |
| Lot depth | 33.8m | |
| Lot width | 58.8m | |
| Lot area | 1,897m2 | |
| Lot coverage | | 39% |
| Front yard | | 6m |
| Rear yard | | 7.5m |
| Left Interior side yard | | 4m |
| Right Interior side yard | | 2.4m |
| Exterior side yard (corner lot) | | |
| Landscaped open space | | |
| Entrance access width | | |
| Exit access width | | |
| Size of fencing or screening | | |
| Type of fencing | | |

10. Building Size

| | | |
|---|---|---|
| Number of storeys | | 3 |
| Building height | | <=11m |
| Total ground floor area | | 731 sq. m |
| Total gross floor area | | 2193 sq. m |
| Total useable floor area | | 1901 sq. m |

11. Off Street Parking and Loading Facilities

| | | |
|---|---|---|
| Number of off street parking spaces | | 16 |
| Number of visitor parking spaces | | |
| Number of accessible parking spaces | | |
| Number of off street loading facilities | | |

12. Residential (if applicable)

Number of buildings existing: 0

Number of buildings proposed: 8 (joined together as street townhouses)

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

If yes, describe: _____

| **Type** | **Number of Units** | **Floor Area per Unit in $m^2$** |
|---|---|---|
| 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: _____

Number of buildings proposed: _____

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

If yes, describe:

_____

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

Seating Capacity (for assembly halls or similar): _____

Total number of fixed seats: _____

Describe the type of business(es) proposed: _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

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)

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)

## 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):

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:
   Geotechnical Investigation
   Borehole Testing Type text here

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 120m

   **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 120m

   **Floodplain**
   ☐ On the subject lands or ☑ within 500 meters – distance 120m

   **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 adjacent

   **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
- ( ) Individual wells
- ( ) Communal wells
- ( ) Other (describe below)

_____

Sewage Treatment

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

_____

Storm Drainage

- (●) Storm sewers
- ( ) Other (describe below)
- ( ) Open ditches

_____

2. Existing or proposed access to subject lands:

- (●) Municipal road
- ( ) Unopened road
- ( ) Provincial highway
- ( ) Other (describe below)

Name of road/street: _____

## G. Other Information

1. Does the application involve a local business? ( ) Yes (●) No
   If yes, how many people are employed on the subject lands?

   _____

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.

## 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

☐ 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 Ministry of Environment and Climate Change, Ministry of Transportation or 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 approval for site plan, 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 for the registration of all transfer(s) of land to the County, and/or transfer(s) of 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 — Date: Feb 24 2021

## 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 2640323 Ontario Inc. am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize G. Douglas Vallee Limited 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.

Mohammed Eqdaih — Owner — Date: Feb 24, 2021

Owner — Date

Owner — Date

**N. Declaration**

I, Mohammed Eqlaih of Hamilton

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:

_____

_____

Owner/Applicant Signature

In _____

This _____day of _____

A.D., 20____

_____

A Commissioner, etc.

**N. Declaration**

I, Mohammed Eqlaih of Hamilton

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:

NIAGARA REGION

Owner/Applicant Signature

In THE CITY OF NIAGARA FALLS

This 24th day of FEBRUARY

A.D., 20 21

A Commissioner, etc.

ELDON FRASER DARBYSON, a commissioner, etc.,
Province of Ontario, for G. Douglas Vallee Limited.
Expires March 28, 2022.

* CERTIFIED IN ACCORDANCE WITH THE LAND TITLES ACT * SUBJECT TO RESERVATIONS IN CROWN GRANT *

PROPERTY DESCRIPTION: LT 6 PL 279; NORFOLK COUNTY

PROPERTY REMARKS:

ESTATE/QUALIFIER:
FEE SIMPLE
LT CONVERSION QUALIFIED

RECENTLY:
FIRST CONVERSION FROM BOOK

PIN CREATION DATE:
2006/08/21

OWNERS' NAMES
26403023 ONTARIO INC.

CAPACITY SHARE

| REG. NUM. | DATE | INSTRUMENT TYPE | AMOUNT | PARTIES FROM | PARTIES TO | CERT/ CHKD |
|---|---|---|---|---|---|---|
| ** PRINTOUT INCLUDES ALL DOCUMENT TYPES (DELETED INSTRUMENTS NOT INCLUDED) ** | | | | | | |
| **SUBJECT, ON FIRST REGISTRATION UNDER THE LAND TITLES ACT, TO: | | | | | | |
| ** SUBSECTION 44(1) OF THE LAND TITLES ACT, EXCEPT PARAGRAPH 11, PARAGRAPH 14, PROVINCIAL SUCCESSION DUTIES * | | | | | | |
| ** AND ESCHEATS OR FORFEITURE TO THE CROWN. | | | | | | |
| ** THE RIGHTS OF ANY PERSON WHO WOULD, BUT FOR THE LAND TITLES ACT, BE ENTITLED TO THE LAND OR ANY PART OF | | | | | | |
| ** IT THROUGH LENGTH OF ADVERSE POSSESSION, PRESCRIPTION, MISDESCRIPTION OR BOUNDARIES SETTLED BY | | | | | | |
| ** CONVENTION. | | | | | | |
| ** ANY LEASE TO WHICH THE SUBSECTION 70(2) OF THE REGISTRY ACT APPLIES. | | | | | | |
| **DATE OF CONVERSION TO LAND TITLES: 2006/08/21 ** | | | | | | |
| NK124124 | 2019/10/01 | TRANSFER | $90,000 | BRADSHAW FUELS LTD. | 26403023 ONTARIO INC. | C |

NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

vallee

Consulting Engineers,
Architects & Planners

February 1, 2021

26403023 Ontario Inc., Operating as the Denzo Group Inc.
601 Southworth Street
Welland, ON
L3B 2A2

**Attention:** **Mr. Mohammed Eqdaih**

**Reference:** **Functional Servicing Report**
**26403023 Ontario Inc., Operating as the Denzo Group Inc.**
**11 Elizabeth Road, Simcoe, Norfolk County, Ontario N3Y 4K4**
**Our Project #20-013**

## Background

The Denzo Group Inc. is proposing the development of a property located at 11 Elizabeth Road, Simcoe, Norfolk County, Ontario for the purpose of constructing residential dwellings. This process will include the rezoning of the subject lands from a Service Commercial Zone with a holding provision (CS[H]) to an Urban Residential Type 4 Zone (R4). The subject lands are vacant in the existing condition, and encompass an area of approximately 0.19ha. The site is rectangular, with the western property line fronting onto Elizabeth Road. It is proposed that the subject lands be subdivided into eight (8) lots for eight (8) street-fronting townhouse dwellings.

This report has been prepared as a component of the site plan approval application for the subject lands.

## Development Concept

A site plan drawing has been completed by Archicreation Design Studio Inc. that shows the proposed layout of the eight (8) street-fronting townhouses.

### *Sanitary*

There is no existing sanitary sewer in front of the subject lands on Elizabeth Road. Consultation with Terry Hall and Devin Hunter from Norfolk County occurred over email on Wednesday, August 12, 2020. The consultation has led to the following proposal:

- A new sanitary maintenance hole will be constructed on the existing sanitary sewer at the intersection of Elizabeth Road and Queensway West to make a connection to the existing sanitary sewer flowing along Queensway West. It is proposed that the connection be made with a doghouse maintenance hole.

- Gravity sanitary sewers will be extended along the roadway of Elizabeth Road up to the southwest corner of the subject lands. The gravity sanitary sewers will maintain a minimum horizontal separation of 2.5m from the existing watermain. Refer to drawing 20-013-C106.
- A gravity sanitary sewer will extend from the proposed maintenance hole at the center of Elizabeth Road to a monitoring maintenance hole on the property line at the southwest corner of the subject lands.
- A common easement area will be established in the front yard of the subject lands. This will allow for sanitary service forcemains to pass across the front yards of each street-fronting townhouse lot. Refer to drawing C101 – General Plan of Services for the proposed servicing layouts.
- Sanitary forcemains will be connected to the monitoring maintenance hole at the property line. Flows from the units will be generated by pumps in the basement of each dwelling unit.

The restoration of Elizabeth Road and the intersection at Queensway West will be required for the sanitary sewer installation. Refer to drawing 20-013-C106 for the restoration and connection details. Modelling by Norfolk County's consultant will be required to determine the capacity available in the sanitary sewers downstream of the Queensway West connection.

### *Water*

An existing 200mm watermain is located in the municipal right-of-way in front of the subject lands. Each of the eight (8) townhouse dwellings will have their own water service. The water services will be connected to the existing 200mm watermain through the use of stainless-steel saddles. Restoration of the east side of Elizabeth Road will be required across the frontage of the subject lands.

Fire flows for the subject lands will be provided by the fire hydrant located on the west side of Elizabeth Road, approximately 26m north of Mill Pond Court (Fire Hydrant ID SIM0273). The subject lands are located within a 70m radius from the fire hydrant. Modelling from Norfolk County's consultant will be required to determine the available pressures and flow rates from the fire hydrant, and from the watermain to ensure the maximum design demand can be achieved while maintaining an allowable pressure.

### *Storm*

The subject lands are currently considered a commercial zone with a storm water runoff allocation based on a commercial runoff coefficient. The existing storm sewers on Elizabeth Road would have been designed to accommodate these commercial runoff volumes. The proposed development of the subject lands results in a lower runoff coefficient than is allocated to commercial lands. The result is a lower volume of storm water runoff in the post-development condition than what the existing storm sewers were sized for. This reduction justifies that no storm water management quantity control will be required.

To prevent runoff from the subject lands to the neighboring properties, a storm sewer network with rear-yard catch basins is proposed. Rear-yard catch basins are required for two reasons: The neighboring property to the south drains onto the subject lands in the existing condition, and the rear yard line of the subject lands is lower than Elizabeth Road. The lower elevation of the rear yard prevents back to front drainage for the subject lands. This storm sewer network will connect to the existing storm sewer on Elizabeth Road at the north side of the subject lands.

The proposed storm sewer network is designed to contain the 5-year storm event. The site will have an overland flow route to Elizabeth Road during storm events greater than the 5-year storm.

## Sanitary Sewer Capacity Review

The rezoning of the subject lands is underway to make them part of the Urban Residential Type 4 Zone (R4). As such, the sanitary sewer flows generated by the proposed buildings were calculated using the Norfolk County Design Criteria – Section 9 for residential lands.

The sanitary flow calculations are attached in Appendix A. A breakdown of the maximum peak sanitary sewer flows anticipated for a single unit and the entire development are detailed in Table 1 as follows:

**Table 1**

| Sanitary Flow Generation | |
|---|---|
| **Sanitary Flow Source** | **Anticipated Peak Sanitary Flow (L/s)** |
| Single Unit | 0.081 |
| Eight Units | 0.554 |

Each unit will be equipped with a pumping station that will pump the generated sanitary flow through a forcemain to the proposed monitoring maintenance hole. The forcemains will remain on the subject lands and will require a common easement area along the front yard of each lot. Therefore, each sanitary pump and forcemain must be capable of providing the anticipated peak sanitary flow of 0.081 L/s for each unit.

A gravity sanitary sewer network will be constructed with the upstream end at the monitoring maintenance hole. The downstream end will be located at a proposed maintenance hole at the intersection of Elizabeth Road and Queensway West. Appendix B contains the sanitary sewer design sheet for the proposed gravity sanitary sewers. The anticipated peak sanitary flow at the connection on Queensway West will be 0.554 L/s. Modelling from Norfolk County's consultant will determine if there is capacity available downstream of the Queensway West connection.

The construction of the sanitary sewers along Elizabeth Road will require trenching within the municipal right-of-way. Therefore, the restoration of Elizabeth Road from the subject lands to the intersection of Queensway West will be required. Refer to drawing 20-013-C106 for restoration and connection details.

## Watermain Modelling

As indicated in the Development Concept section, each of the eight (8) proposed units on the subject lands will have their own water services. The water services will be designed in accordance with Norfolk County's Design Criteria – Section 10. The water services will provide domestic flows only. The water services will connect to the existing 200mm watermain in the Elizabeth Road municipal right-of-way using stainless steel saddles. Fire flows will be provided from Fire Hydrant SIM0273 on the west side of Elizabeth Road, 26m north of Mill Pond Court.

As per Norfolk County's Design Criteria, the design water demand for the subject lands is governed by the maximum daily demand plus fire flow. Appendix C contains the calculations for the maximum design water demand required for the proposed development. Fire flows are in accordance with the requirements of the latest edition of "Water Supply for Public Fire Protection" A Guide to Recommended Practice by Fire Underwriters Survey (FUS). Since final design for the proposed buildings has not been completed, assumptions are required to determine the required fire flow. These assumptions are detailed in the

calculations found in Appendix C. Based on the FUS and the Norfolk County Design Criteria – Section 10 for residential dwellings, the design water demand will be 166.9 L/s. Modelling from Norfolk County's consultant will be required to determine if the design water demand and minimum pressures can be achieved from the fire hydrant and existing watermain in front of the subject lands.

## Storm Servicing and Storm Water Management

### *Storm Water Management*

The subject lands are currently in a Service Commercial Zone with a holding provision (CS[H]). The subject lands are bounded on all sides by the CS(H) zone. Norfolk County's Design Criteria – Section 7.8.04 indicates that the runoff coefficient for storm sewer design for commercial lands is 0.90. Therefore, it is assumed that the existing storm sewers on Elizabeth Road have been sized to accommodate the subject lands based on the aforementioned runoff coefficient.

In the post-development condition, the subject lands will have a composite runoff coefficient equalling 0.58. The post-development drainage areas can be seen in Figure 2 contained in Appendix D. The decrease in runoff coefficients result in a decrease of flow generated by the subject lands.

**Table 2**

| Storm Water Runoff During 4-hour Chicago Storm | | | |
|---|---|---|---|
| Return Period | Pre-Development ($m^3$) | Post-Development ($m^3$) | Net Change in Runoff ($m^3$) |
| | R=0.9 | R=0.58 | |
| 2-year | 67.23 | 43.60 | -23.63 |
| 5-year | 82.77 | 53.68 | -29.09 |
| 10-year | 95.75 | 62.09 | -33.66 |
| 25-year | 112.72 | 73.10 | -39.62 |
| 50-year | 124.56 | 80.78 | -43.78 |
| 100-year | 143.24 | 92.89 | -50.35 |

To determine the runoff volume generated in the pre-development and post-development condition, the rainfall intensity formulas provided in Norfolk County's Design Criteria – Section 7.8.02 were modelled to the 4-hour Chicago Storm in Visual OTTHYMO. Calculations to obtain the pre-development and post-development runoff coefficients and volumes can be found in Appendix E. The results from the calculations are shown above in Table 2.

It is seen that the total runoff volume for the 2-year through 100-year storm events decrease from pre-development to post-development. It is implicit that the decrease in runoff coefficients from the pre-development to post-development condition will also result in a decrease for the runoff flow at any point during a specified storm.

Since the subject lands are currently serviced by the storm sewers on Elizabeth Road, the decrease in runoff flows and volumes will not impact the ability of the storm sewers to service the subject lands in the post-development condition. Therefore, no storm water management methods are recommended.

### *Storm Servicing*

The existing drainage pattern for the subject lands is sheet flow in a south to north direction. Drainage enters the subject lands from the parking lot to the south. The existing drainage crosses the subject lands and enters the neighboring property to the north (50 Riverside Road). The drainage enters a catch basin on the west side of the neighboring property's parking lot, adjacent to Elizabeth Road.

In the post-development condition, storm runoff in the front yards of the street-fronting townhouse dwellings will be directed towards Elizabeth Road. Drainage from the side yards and rear yard will be directed to proposed rear yard catch basins. The catch basins will be connected to a storm sewer network that runs along the northern side yard. A common easement area will be required for the proposed storm network.

The internal storm sewer network will be connected to the storm sewer within the municipal right-of-way for Elizabeth Road. The existing storm sewer is 250mm in diameter. Therefore, the proposed storm sewers will be 250mm in diameter to prevent downsizing of pipes as the storm water proceeds downstream, despite Norfolk County's Design Criteria – Section 7.8.09. Drawing C105 – Storm Drainage Areas shows the storm drainage areas for the internal catch basins. The storm sewers will be constructed in accordance with Norfolk County's Design Criteria – Section 7. A storm sewer design sheet has been included in Appendix F.

## Summary

The following summary comments are provided regarding the development of the subject lands.

- The proposed development of the subject lands will include eight (8) residential street-fronting townhouse dwellings. The dwellings will be located on their own lots.
- Gravity sanitary sewers will be extended from Queensway West, north along Elizabeth Road, then from Elizabeth Road to the southwest corner of the subject lands.
- The eight (8) residential dwellings will have sanitary service forcemains that connect to the monitoring maintenance hole on the property line at the southwest corner of the subject lands.
- A common easement area will be required in the front yards of the eight (8) lots created for the sanitary service forcemains and for the sanitary inspection maintenance hole.
- Pumping stations will be required within each unit to provide sanitary flow to the monitoring maintenance hole.
- Modelling from Norfolk County's consultant will determine the available sanitary sewer capacity at the proposed connection to the sanitary sewer at Queensway West and Elizabeth Road.
- Eight (8) water services will provide domestic water flows to the eight (8) dwellings proposed on the subject lands. The water services will conform to Norfolk County's Design Criteria. The water services will be connected to the existing 200mm watermain on Elizabeth Road.
- Fire flows for the subject lands will be supplied by Fire Hydrant SIM0273, north of the intersection of Elizabeth Road and Mill Pond Court.
- Modelling from Norfolk County's consultant will determine the available flows and pressures from the existing watermain and fire hydrant for the subject lands.
- In the existing condition, runoff calculations from the subject lands use a higher runoff coefficient than the proposed condition. Therefore, no storm water management will be required.
- The subject lands will require an internal storm sewer network to capture surface runoff, requiring a common easement area.

- The internal storm sewer network will connect to the existing 250mm storm sewer on Elizabeth Road on the north side of the subject lands.

Pending the results of the modelling from Norfolk County's consultant, the proposed servicing for the subject lands is complete and functional.

Yours truly,

CERTIFIED ENGINEERING TECHNOLOGIST
OACETT
ONTARIO
DONALD C BEAN
Nº 902093
2021-02-17

Donald C. Bean, C.E.T., Civil Engineering Technologist
**G. DOUGLAS VALLEE LIMITED**
Consulting Engineers, Architects & Planners

LICENSED PROFESSIONAL ENGINEER
J. D. VALLEE
FEB 2
2021
PROVINCE OF ONTARIO

John D. Vallee, P.Eng., President
**G. DOUGLAS VALLEE LIMITED**
Consulting Engineers, Architects & Planners
H:\Projects\2020\20-013 Denzo Group Townhouses\Design\FSR\20-013 - Functional Servicing Report.docx

# APPENDIX A
## Sanitary Flow Calculations

vallee
Consulting Engineers, Architects & Planners

| | | | |
|---|---|---|---|
| Subject: | 11 Elizabeth Road - Single Unit | | |
| Date: | Sep-20 | By: | DCB |
| Project #: | 20-013 | Page | |

**Norfolk County Design Criteria Section 9.2 - Sanitary Sewage Flow**

**9.2.01 Tributary Population**

| | | |
|---|---|---|
| Residential Development: | 2.75 | persons/unit |
| Number of Units: | 1 | unit |
| Number of Persons: | 3 | persons |

**9.2.02 Sewage Flow**

| | | |
|---|---|---|
| Residential Development: | 0.45 | $m^3$/person/day |
| Average Sewage Flow: | 1.35 | $m^3$/day |
| Average Sewage Flow: | 0.016 | L/s |

**9.2.03 Peak Sanitary Flow Factor**

Residential Peaking Factor Formula:
M = 1 + (14 / (4 + P^0.5)); 2 < M <5

| | |
|---|---|
| P = | 0.003 |
| M = | 4.453 |

**9.2.04 Infiltration Allowance**

| | | |
|---|---|---|
| Infiltration Allowance: | 0.28 | L/s/ha |
| Largest Lot Area of a Single Unit: | 402.04 | sq. m |
| Largest Lot Area of a Single Unit: | 0.040204 | ha |
| Infiltration Allowance: | 0.011 | L/s |

**9.2.05 Design Flow**

Design Flow:
Design Flow = (Average Sewage Flow * Peak Sanitary Flow Factor) + Infiltration Allowance

| | | |
|---|---|---|
| Design Flow = | 0.081 | L/s |

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| | | | |
|---|---|---|---|
| Subject: | 11 Elizabeth Road - Eight Units | | |
| Date: | Sep-20 | By: | DCB |
| Project #: | 20-013 | Page | |

**Norfolk County Design Criteria Section 9.2 - Sanitary Sewage Flow**

**9.2.01 Tributary Population**

| | | |
|---|---|---|
| Residential Development: | 2.75 | persons/unit |
| Number of Units: | 8 | units |
| Number of Persons: | 22 | persons |

**9.2.02 Sewage Flow**

| | | |
|---|---|---|
| Residential Development: | 0.45 | $m^3$/person/day |
| Average Sewage Flow: | 9.9 | $m^3$/day |
| Average Sewage Flow: | 0.115 | L/s |

**9.2.03 Peak Sanitary Flow Factor**

Residential Peaking Factor Formula:
M = 1 + (14 / (4 + P^0.5)); 2 < M <5

| | |
|---|---|
| P = | 0.022 |
| M = | 4.375 |

**9.2.04 Infiltration Allowance**

| | | |
|---|---|---|
| Infiltration Allowance: | 0.28 | L/s/ha |
| Lot Area of Subject Lands: | 1897.22 | sq. m |
| Lot Area of Subject Lands: | 0.19 | ha |
| Infiltration Allowance: | 0.053 | L/s |

**9.2.05 Design Flow**

Design Flow:
Design Flow = (Average Sewage Flow * Peak Sanitary Flow Factor) + Infiltration Allowance

| | | |
|---|---|---|
| Design Flow = | 0.554 | L/s |

# APPENDIX B
## Sanitary Sewer Design Sheet

# SANITARY SEWER DESIGN SHEET

Pipe Material PVC
N 0.013

Project: 11 Elizabeth Road - Denzo Group Townhouses

Job No. 20-013

Date 29-Sep-20
Designed by DCB
Checked by JDV
Sheet of : 1 of 1

| Location | | | | Area | | | | | | Flow | | | Sewer Design | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | Street | From MH | To MH | Section Ha | Cumul. Ha | Section Units | Cumul Units | Total Pop. | M=Peak Factor | Q(i) L/s | Q(s) L/s | Q(d) L/s | Material | Size mm | Length m | N | Slope % | 95% Cap L/s | Used Cap % | Full V m/s |
| | | | | | | | | | | | | | | | | | | | | |
| 1 | Elizabeth Road | UNITS | SAMH4 | 0.19 | 0.19 | 8 | 8 | 22 | 4.375 | 0.053 | 0.501 | 0.554 | FORCEMAIN | - | - | - | - | - | - | - |
| - | Elizabeth Road | SAMH4 | SAMH3 | 0.00 | 0.19 | 0 | 8 | 22 | 4.375 | 0.053 | 0.501 | 0.554 | PVC | 200 | 11.3 | 0.013 | 0.60% | 24.1 | 2.2 | 0.81 |
| - | Elizabeth Road | SAMH3 | SAMH2 | 0.00 | 0.19 | 0 | 8 | 22 | 4.375 | 0.053 | 0.501 | 0.554 | PVC | 200 | 15.2 | 0.013 | 0.60% | 24.1 | 2.2 | 0.81 |
| - | Elizabeth Road | SAMH2 | SAMH1 | 0.00 | 0.19 | 0 | 8 | 22 | 4.375 | 0.053 | 0.501 | 0.554 | PVC | 200 | 39 | 0.013 | 0.60% | 24.1 | 2.2 | 0.81 |
| | | | | | | | | | | | | | | | | | | | | |

Design Information:

Q(s) = Sewage Flow = P q M / 86.4
Q(i) = Infiltration Flow = I A
Q(d) = Peak Design Flow = Q(s) + Q(i)

P = Population in thousands
M = Peaking Factor = 1 + 14 / (4 + P^.5)
A = Tributary Area

q = Per Capita Flow= **450** L/cap d
I = Peak Extraneous Flow = **0.28** L/s/ha
Population Density **2.75** persons /unit

# APPENDIX C
## Maximum Design Water Demand Calculations

vallee
Consulting Engineers, Architects & Planners

| | | | |
|---|---|---|---|
| Subject: | 11 Elizabeth Road - Water Demand | | |
| Date: | 2020-09-29 | By: | DCB |
| Project #: | 20-013 | Page | |

**Fire Flow Calculation**
(Long Method)

EIGHT UNITS

1) Fire Flow Requirement

$F_1=220C(A^{1/2})$ (l/min)

| | | |
|---|---|---|
| C= | 1 | Construction coefficient for wood frame construction (assumed exterior walls are masonry or such non-combustable material) |
| A= | 1462.62 | Total Floor Area $m^2$ (Assuming 2-storey construction with basement greater than 50% below grade) |
| = | 1462.62 | Fire Area $m^2$ |

$F_1$= 8414 l/min

2) Occupancy

Dwellings; Low Hazard Occupancy
Limited Combustable = -15%

$F_2=0.85F_1$ (l/min)

$F_2$= 7152 l/min

3) Sprinkler System

No Reduction (Assumed that there is no sprinkler system)

$F_3=0.0F_2$ (l/min)

$F_3$= 0 l/min

4) Seperation

>45m from north wall to structure on 50 Riverside Road (0%)
12.7m between east wall and storage containers on neighboring property (15%)
11.2m between south wall and north wall on 7 Elizabeth Road (15%)
42m from west wall to east wall on 95 Queensway West (5%)

F4=(0.15+0.15+0.05)*F2 (l/min)

$F_4$= 2503 l/min

**Total Fire Flow**

$F=F_2-F_3+F_4$ = 9655 l/min
= 10000 l/min (Round to the nearest 1,000 l/min)
= 166.7 l/s

**Maximum Daily Demand**

| | | |
|---|---|---|
| Number of Units | 8 | units |
| People Per Unit | 2.75 | people/unit |
| Number of People | 22 | people |
| Av. Daily Demand Per Capita | 0.45 | $m^3$/capita/day |
| Maximum Daily Demand Peaking Factor | 2.25 | |
| Maximum Daily Demand | 22.3 | $m^3$/day |
| Maximum Daily Demand | 0.26 | l/s |

**Maximum Hourly Demand**

| | | |
|---|---|---|
| Number of Units | 8 | units |
| People Per Unit | 2.75 | people/unit |
| Number of People | 22 | people |
| Av. Daily Demand Per Capita | 0.45 | $m^3$/capita/day |
| Maximum Hourly Demand Peaking Factor | 4 | |
| Maximum Hourly Demand | 39.6 | $m^3$/day |
| Maximum Hourly Demand | 0.46 | l/s |

**Maximum Design Demand**

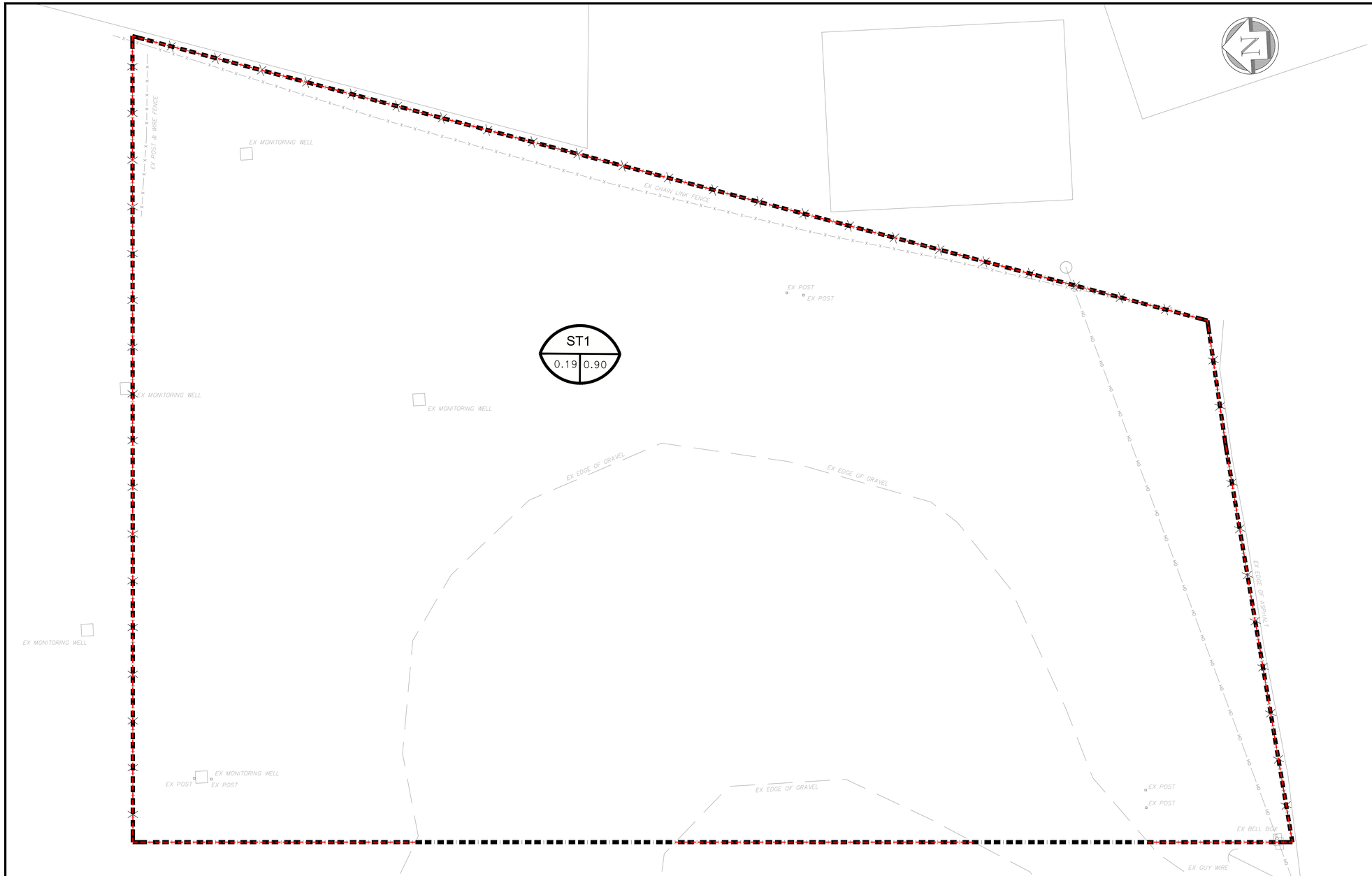
Greater of Maximum Daily Demand Plus Fire Flow or Maximum Hourly Demand

Maximum Daily Demand + Fire Flow = 166.9 l/s

# APPENDIX D

**Figure 1 – Pre-Development Drainage Areas**

**Figure 2 – Post-Development Drainage Areas**




## LEGEND

- ST1 / 0.99 | 0.95 — STORM DRAINAGE AREA NUMBER; RUNOFF COEFFICIENT; AREA (ha)
- OVERLAND FLOW (MAJOR)
- STORM DRAINAGE BOUNDARY

DATE LAST PLOTTED : January 5, 2021

| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
| 2 | JAN 12/21 | SUBMITTED FOR SITE PLAN APPROVAL |

**NOTE:**
THE CONTRACTOR IS CAUTIONED THAT ALL OF THE EXISTING UTILITIES ARE NOT INDICATED ON THIS DRAWING. THE CONTRACTOR MUST ARRANGE FOR LOCATES FROM EACH AREA UTILITY COMPANY PRIOR TO ANY CONSTRUCTION OR EXCAVATION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES INCLUDING THOSE NOT INDICATED ON THIS DRAWING. G. DOUGLAS VALLEE LTD. CAN NOT ACCEPT RESPONSIBILITY FOR DAMAGE TO ANY EXISTING UTILITY WHICH MAY OR MAY NOT BE INDICATED ON THIS DRAWING.

ALL WORK, MATERIALS AND PROCESSES TO ABIDE TO NORFOLK COUNTY STANDARDS AND SPECIFICATIONS

EXISTING SURVEY FOR THE SUBJECT LANDS WAS COMPLETED BY JEWITT & DIXON DATED DECEMBER 6, 2019. REFER TO PLAN P19 03 A1301, PROJECT NUMBER 19-2383.

## BENCHMARKS

SITE BENCHMARK #1
ELEV: 213.928m (GEODETIC)

SPIKE IN FACE OF WOOD HYDRO POLE ON THE SOUTHWEST CORNER OF MILLPOND COURT AND ELIZABETH STREET.

## LEGAL DESCRIPTION

ALL OF LOT 6, REGISTERED PLAN 279, TOWN OF SIMCOE, NORFOLK COUNTY, ONTARIO.

## APPLICANT INFORMATION

MOHAMMED EODAIH
26403023 ONTARIO INC.
TELEPHONE NUMBER: (289) 880-4110

ADDRESS:
601 SOUTHWORTH STREET, WELLAND, ON L3B 2A2

## DRAWING LIST



**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
1 3 5
HORIZONTAL : 1:100

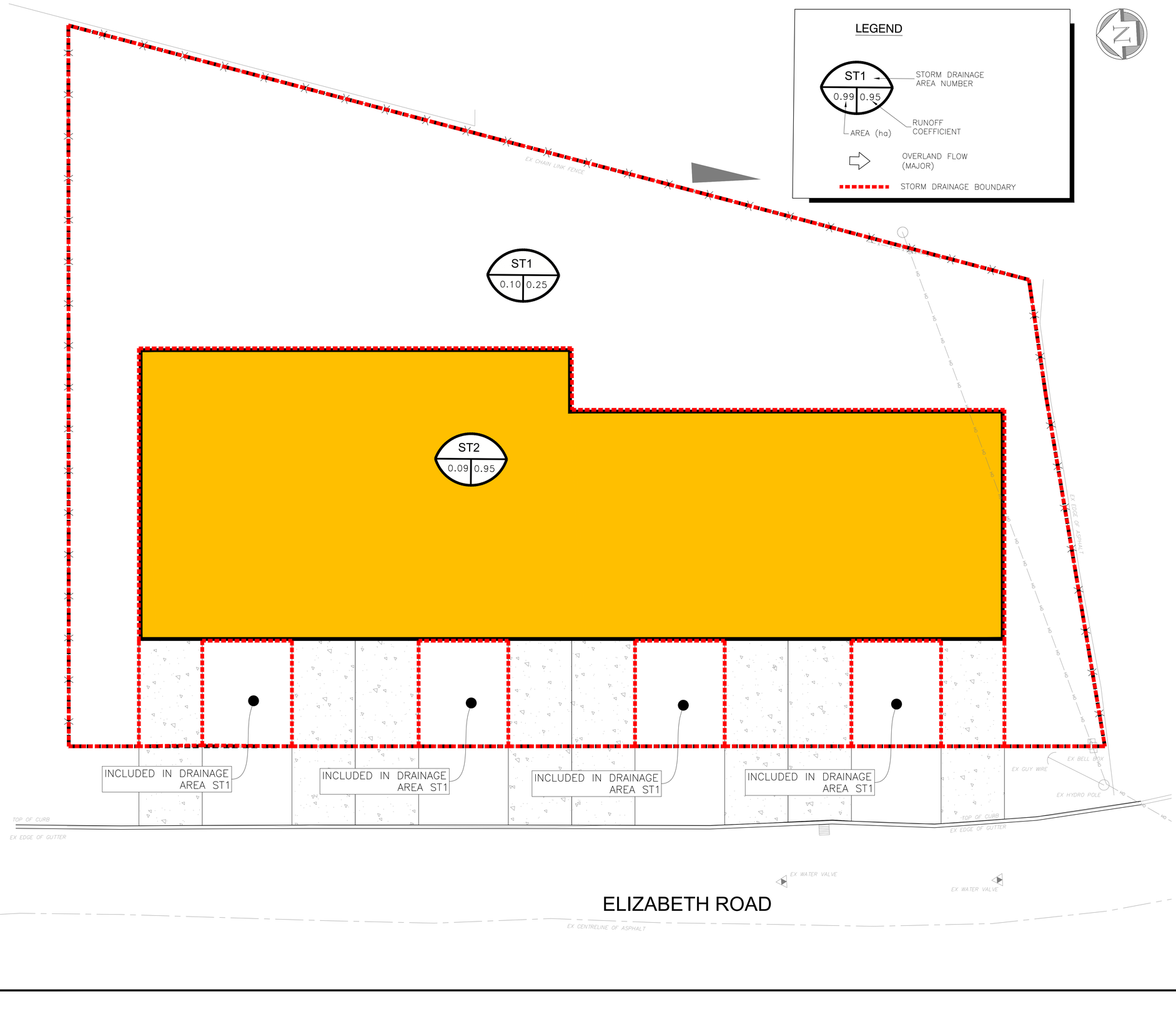

vallee
Consulting Engineers, Architects & Planners
G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270


Stamp

Project Title
DENZO TOWNHOUSES
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

Drawing Title
PRE-DEVELOPMENT DRAINAGE AREAS

| | |
|---|---|
| Designed by : DCB | Drawn By : DCB |
| Checked by : JDV | Date Started : 1/5/2021 |
| Drawing Scale : 1:100 | Drawing No. FIG1 |
| Project No. 20-013 | |




| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
| 2 | JAN 12/21 | SUBMITTED FOR SITE PLAN APPROVAL |

**NOTE:**
THE CONTRACTOR IS CAUTIONED THAT ALL OF THE EXISTING UTILITIES ARE NOT INDICATED ON THIS DRAWING. THE CONTRACTOR MUST ARRANGE FOR LOCATES FROM EACH AREA UTILITY COMPANY PRIOR TO ANY CONSTRUCTION OR EXCAVATION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES INCLUDING THOSE NOT INDICATED ON THIS DRAWING. G. DOUGLAS VALLEE LTD. CAN NOT ACCEPT RESPONSIBILITY FOR DAMAGE TO ANY EXISTING UTILITY WHICH MAY OR MAY NOT BE INDICATED ON THIS DRAWING.

ALL WORK, MATERIALS AND PROCESSES TO ABIDE TO NORFOLK COUNTY STANDARDS AND SPECIFICATIONS

EXISTING SURVEY FOR THE SUBJECT LANDS WAS COMPLETED BY JEWITT & DIXON DATED DECEMBER 6, 2019. REFER TO PLAN P19 03 A1301, PROJECT NUMBER 19-2383.

## BENCHMARKS
SITE BENCHMARK #1
ELEV: 213.928m (GEODETIC)

SPIKE IN FACE OF WOOD HYDRO POLE ON THE SOUTHWEST CORNER OF MILLPOND COURT AND ELIZABETH STREET.

## LEGAL DESCRIPTION
ALL OF LOT 6, REGISTERED PLAN 279, TOWN OF SIMCOE, NORFOLK COUNTY, ONTARIO.

## APPLICANT INFORMATION
MOHAMMED EODAIH
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ADDRESS:
601 SOUTHWORTH STREET, WELLAND, ON L3B 2A2

## DRAWING LIST


**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
1 3 5
HORIZONTAL : 1:100

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(519) 426-6270

Stamp

Project Title
DENZO TOWNHOUSES
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

Drawing Title
POST-DEVELOPMENT DRAINAGE AREAS

| | |
|---|---|
| Designed by : DCB | Drawn By : DCB |
| Checked by : JDV | Date Started : 10/13/2020 |
| Drawing Scale : 1:100 | Drawing No. FIG2 |
| Project No. 20-013 | |

DATE LAST PLOTTED : January 5, 2021

# APPENDIX E

## Pre-Development and Post-Development Runoff Calculations

vallee
Consulting Engineers, Architects & Planners

| | | | |
|---|---|---|---|
| Subject: | 11 Elizabeth Road Stormwater Runoff | | |
| Date: | 2020-09-29 | By: | DCB |
| Project #: | 20-013 | Total Pg | 1 |

**Rainfall Intensity**

i = a / (( t + b ) ^ c)

Rainfall for 2-year through 100-year design storm (NCDC 7.8.02) modelled to 4-hour Chicago Storm

| Total Rainfall During 4-hour Chicago Storm | | | | |
|---|---|---|---|---|
| Return Period | a | b | c | Total Rainfall (mm)* |
| 2-year | 529.711 | 4.501 | 0.745 | 39.38 |
| 5-year | 583.017 | 3.007 | 0.703 | 48.48 |
| 10-year | 670.324 | 3.007 | 0.698 | 56.08 |
| 25-year | 721.533 | 2.253 | 0.679 | 66.02 |
| 50-year | 766.038 | 1.898 | 0.668 | 72.96 |
| 100-year | 801.041 | 1.501 | 0.657 | 83.9 |

*Refer to Visual OTTHYMO modelling affixed to these calculations

**Pre-Development Drainage Areas**

Catchment Area Breakdown:

| | | | | | | |
|---|---|---|---|---|---|---|
| ST1 | 0.1897 | ha | Commercial | C | 0.9 | As Per Norfolk County Design Criteria Section 7.8.04 |
| A (overall) | 0.1897 | ha | | C (overall) | 0.9 | |
| A (overall) | 1897 | m² | | | | |

**Post-Development Drainage Areas**

Catchment Area Breakdown:

| | | | | | | |
|---|---|---|---|---|---|---|
| ST1 | 0.10 | ha | Grass | C | 0.25 | As Per Norfolk County Design Criteria Section 7.8.04 |
| ST2 | 0.09 | ha | Asphalt/Roof | C | 0.95 | As Per Norfolk County Design Criteria Section 7.8.04 |
| A (overall) | 0.1897 | ha | | C (overall) | 0.58 | |
| A (overall) | 1897 | m² | | | | |

**Storm Water Runoff**

| Storm Water Runoff During 4-hour Chicago Storm | | |
|---|---|---|
| Return Period | Pre-Development ($m^3$)* | Post-Development ($m^3$)* |
| 2-year | 67.23 | 43.60 |
| 5-year | 82.77 | 53.68 |
| 10-year | 95.75 | 62.09 |
| 25-year | 112.72 | 73.10 |
| 50-year | 124.56 | 80.78 |
| 100-year | 143.24 | 92.89 |

*Runoff values are calculated by: C-Value * Site Area * Total Percipitation

```
================================================================================
========================

       V    V   I    SSSSS  U   U    A    L              (v 5.1.2004)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


 Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat

  Output  filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\87c130
e8-a5f0-4e10-9e3f-f74f9c4b9c96\scenar
  Summary filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\87c130
e8-a5f0-4e10-9e3f-f74f9c4b9c96\scenar


DATE: 09/29/2020                          TIME: 02:47:42

USER:



COMMENTS: _____________________________________________________________


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  ********************************************
  ** SIMULATION : CH10                       **
  ********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\Jamie\AppD
|                  |              ata\Local\Temp\
```

| | edc0a178-8142-4729-a7d2-2db443dc52fd\2a48ea27
| Ptotal= 56.08 mm | Comments: CH10

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.17 | 3.58 | 1.17 | 11.51 | 2.17 | 10.31 | 3.17 | 5.05 |
| 0.33 | 3.99 | 1.33 | 25.32 | 2.33 | 8.66 | 3.33 | 4.70 |
| 0.50 | 4.50 | 1.50 | 133.60 | 2.50 | 7.52 | 3.50 | 4.39 |
| 0.67 | 5.21 | 1.67 | 32.00 | 2.67 | 6.65 | 3.67 | 4.14 |
| 0.83 | 6.27 | 1.83 | 19.73 | 2.83 | 5.38 | 3.83 | 3.91 |
| 1.00 | 8.00 | 2.00 | 12.95 | 3.00 | 5.49 | 4.00 | 3.63 |

---

| CALIB | |
|---|---|
| STANDHYD ( 0002) | Area (ha)= 0.19 |
| ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 89.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.17 | 0.02 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 35.56 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.083 | 3.58 | 1.083 | 11.51 | 2.083 | 10.31 | 3.08 | 5.05 |
| 0.167 | 3.58 | 1.167 | 11.51 | 2.167 | 10.31 | 3.17 | 5.05 |
| 0.250 | 3.99 | 1.250 | 25.32 | 2.250 | 8.66 | 3.25 | 4.70 |
| 0.333 | 3.99 | 1.333 | 25.32 | 2.333 | 8.66 | 3.33 | 4.70 |
| 0.417 | 4.50 | 1.417 | 133.60 | 2.417 | 7.52 | 3.42 | 4.39 |
| 0.500 | 4.50 | 1.500 | 133.60 | 2.500 | 7.52 | 3.50 | 4.39 |
| 0.583 | 5.21 | 1.583 | 32.00 | 2.583 | 6.65 | 3.58 | 4.14 |
| 0.667 | 5.21 | 1.667 | 32.00 | 2.667 | 6.65 | 3.67 | 4.14 |
| 0.750 | 6.27 | 1.750 | 19.73 | 2.750 | 5.38 | 3.75 | 3.91 |
| 0.833 | 6.27 | 1.833 | 19.73 | 2.833 | 5.38 | 3.83 | 3.91 |
| 0.917 | 8.00 | 1.917 | 12.95 | 2.917 | 5.49 | 3.92 | 3.63 |
| 1.000 | 8.00 | 2.000 | 12.95 | 3.000 | 5.49 | 4.00 | 3.63 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 133.60 | 81.18 |
| | over (min) | 5.00 | 5.00 |
| Storage Coeff. | (min)= | 1.22 (ii) | 3.85 (ii) |
| Unit Hyd. Tpeak | (min)= | 5.00 | 5.00 |
| Unit Hyd. peak | (cms)= | 0.33 | 0.25 |

```
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.00          0.067 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      55.08        31.36          52.46
     TOTAL RAINFALL   (mm)=      56.08        56.08          56.08
     RUNOFF COEFFICIENT   =       0.98         0.56           0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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       V    V   I    SSSSS  U   U    A    L              (v 5.1.2004)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat

  Output  filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\ec4fde
13-5bae-4029-b10b-87d4ebd0c374\scenar
  Summary filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\ec4fde
13-5bae-4029-b10b-87d4ebd0c374\scenar


DATE: 09/29/2020                          TIME: 02:47:42

USER:
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COMMENTS: _____

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**********
** SIMULATION : CH100 **
**********

| READ STORM | Filename: C:\Users\Jamie\AppData\Local\Temp\edc0a178-8142-4729-a7d2-2db443dc52fd\b715f56f |
|---|---|
| Ptotal= 83.90 mm | Comments: CH100 |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.17 | 4.50 | 1.17 | 16.86 | 2.17 | 14.83 | 3.17 | 6.60 |
| 0.33 | 5.05 | 1.33 | 41.07 | 2.33 | 12.12 | 3.33 | 6.10 |
| 0.50 | 5.82 | 1.50 | 205.92 | 2.50 | 10.31 | 3.50 | 5.66 |
| 0.67 | 6.83 | 1.67 | 54.56 | 2.67 | 9.02 | 3.67 | 5.28 |
| 0.83 | 8.41 | 1.83 | 29.17 | 2.83 | 8.03 | 3.83 | 4.98 |
| 1.00 | 11.07 | 2.00 | 19.28 | 3.00 | 7.24 | 4.00 | 4.70 |

---

| CALIB |
|---|
| STANDHYD ( 0002) |
| ID= 1 DT= 5.0 min |

Area (ha)= 0.19
Total Imp(%)= 90.00 Dir. Conn.(%)= 89.00

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.17 | 0.02 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 35.56 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.083 | 4.50 | 1.083 | 16.86 | 2.083 | 14.83 | 3.08 | 6.60 |
| 0.167 | 4.50 | 1.167 | 16.86 | 2.167 | 14.83 | 3.17 | 6.60 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0.250 | 5.05 | 1.250 | 41.07 | 2.250 | 12.12 | 3.25 | 6.10 |
| 0.333 | 5.05 | 1.333 | 41.07 | 2.333 | 12.12 | 3.33 | 6.10 |
| 0.417 | 5.82 | 1.417 | 205.92 | 2.417 | 10.31 | 3.42 | 5.66 |
| 0.500 | 5.82 | 1.500 | 205.92 | 2.500 | 10.31 | 3.50 | 5.66 |
| 0.583 | 6.83 | 1.583 | 54.56 | 2.583 | 9.02 | 3.58 | 5.28 |
| 0.667 | 6.83 | 1.667 | 54.56 | 2.667 | 9.02 | 3.67 | 5.28 |
| 0.750 | 8.41 | 1.750 | 29.17 | 2.750 | 8.03 | 3.75 | 4.98 |
| 0.833 | 8.41 | 1.833 | 29.17 | 2.833 | 8.03 | 3.83 | 4.98 |
| 0.917 | 11.07 | 1.917 | 19.28 | 2.917 | 7.24 | 3.92 | 4.70 |
| 1.000 | 11.07 | 2.000 | 19.28 | 3.000 | 7.24 | 4.00 | 4.70 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 205.92 | 152.12 | |
| over (min) | 5.00 | 5.00 | |
| Storage Coeff. (min)= | 1.03 (ii) | 3.23 (ii) | |
| Unit Hyd. Tpeak (min)= | 5.00 | 5.00 | |
| Unit Hyd. peak (cms)= | 0.34 | 0.27 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.10 | 0.01 | 0.105 (iii) |
| TIME TO PEAK (hrs)= | 1.50 | 1.50 | 1.50 |
| RUNOFF VOLUME (mm)= | 82.90 | 55.26 | 79.85 |
| TOTAL RAINFALL (mm)= | 83.90 | 83.90 | 83.90 |
| RUNOFF COEFFICIENT = | 0.99 | 0.66 | 0.95 |

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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FINISH

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```
       V    V   I    SSSSS  U   U    A    L             (v 5.1.2004)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat

Output filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\d132f111-f77a-446c-b996-39badb7c4a3a\scenar
Summary filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\d132f111-f77a-446c-b996-39badb7c4a3a\scenar

DATE: 09/29/2020 TIME: 02:47:42

USER:

COMMENTS: _____

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**********
** SIMULATION : CH2 **
**********

| READ STORM | Filename: C:\Users\Jamie\AppData\Local\Temp\edc0a178-8142-4729-a7d2-2db443dc52fd\457b6554 |
|---|---|
| Ptotal= 39.38 mm | Comments: CH2 |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.17 | 3.25 | 1.17 | 8.94 | 2.17 | 8.15 | 3.17 | 4.39 |
| 0.33 | 3.56 | 1.33 | 16.92 | 2.33 | 7.01 | 3.33 | 4.11 |
| 0.50 | 3.96 | 1.50 | 78.82 | 2.50 | 6.20 | 3.50 | 3.89 |
| 0.67 | 4.52 | 1.67 | 21.89 | 2.67 | 5.59 | 3.67 | 3.68 |
| 0.83 | 5.31 | 1.83 | 13.00 | 2.83 | 5.11 | 3.83 | 3.51 |
| 1.00 | 6.55 | 2.00 | 9.88 | 3.00 | 4.72 | 4.00 | 3.35 |

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=   0.19
|ID= 1 DT= 5.0 min |   Total Imp(%)=  90.00   Dir. Conn.(%)=  89.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.17         0.02
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      35.56        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    3.25 | 1.083    8.94 | 2.083    8.15 |  3.08    4.39
              0.167    3.25 | 1.167    8.94 | 2.167    8.15 |  3.17    4.39
              0.250    3.56 | 1.250   16.92 | 2.250    7.01 |  3.25    4.11
              0.333    3.56 | 1.333   16.92 | 2.333    7.01 |  3.33    4.11
              0.417    3.96 | 1.417   78.82 | 2.417    6.20 |  3.42    3.89
              0.500    3.96 | 1.500   78.82 | 2.500    6.20 |  3.50    3.89
              0.583    4.52 | 1.583   21.89 | 2.583    5.59 |  3.58    3.68
              0.667    4.52 | 1.667   21.89 | 2.667    5.59 |  3.67    3.68
              0.750    5.31 | 1.750   13.00 | 2.750    5.11 |  3.75    3.51
              0.833    5.31 | 1.833   13.00 | 2.833    5.11 |  3.83    3.51
              0.917    6.55 | 1.917    9.88 | 2.917    4.72 |  3.92    3.35
              1.000    6.55 | 2.000    9.88 | 3.000    4.72 |  4.00    3.35

     Max.Eff.Inten.(mm/hr)=      78.82        38.04
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      1.51 (ii)    4.75 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.33         0.22
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.04         0.00         0.039 (iii)
     TIME TO PEAK    (hrs)=      1.50         1.50          1.50
     RUNOFF VOLUME    (mm)=     38.38        18.35         36.18
     TOTAL RAINFALL   (mm)=     39.38        39.38         39.38
     RUNOFF COEFFICIENT   =      0.97         0.47          0.92

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
```

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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```
       V    V   I    SSSSS  U   U    A    L              (v 5.1.2004)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```



*****  D E T A I L E D  O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat

Output filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\cf244351-62bc-4d4c-b1eb-5e4030311c13\scenar
Summary filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\cf244351-62bc-4d4c-b1eb-5e4030311c13\scenar

DATE: 09/29/2020 TIME: 02:47:42

USER:

COMMENTS: _____

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```
  **********************************************
  ** SIMULATION : CH25                        **
  **********************************************
```

| READ STORM | Filename: C:\Users\Jamie\AppData\Local\Temp\edc0a178-8142-4729-a7d2-2db443dc52fd\3864e79b |
|---|---|
| Ptotal= 66.02 mm | Comments: CH25 |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.17 | 4.50 | 1.17 | 13.67 | 2.17 | 12.32 | 3.17 | 6.27 |
| 0.33 | 4.98 | 1.33 | 27.69 | 2.33 | 10.44 | 3.33 | 5.00 |
| 0.50 | 5.61 | 1.50 | 158.85 | 2.50 | 9.14 | 3.50 | 5.84 |
| 0.67 | 6.45 | 1.67 | 35.08 | 2.67 | 8.15 | 3.67 | 5.18 |
| 0.83 | 7.70 | 1.83 | 20.60 | 2.83 | 7.39 | 3.83 | 4.90 |
| 1.00 | 9.70 | 2.00 | 15.24 | 3.00 | 6.78 | 4.00 | 4.65 |

---

| CALIB | |
|---|---|
| STANDHYD ( 0002) | Area (ha)= 0.19 |
| ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 89.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.17 | 0.02 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 35.56 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.083 | 4.50 | 1.083 | 13.67 | 2.083 | 12.32 | 3.08 | 6.27 |
| 0.167 | 4.50 | 1.167 | 13.67 | 2.167 | 12.32 | 3.17 | 6.27 |
| 0.250 | 4.98 | 1.250 | 27.69 | 2.250 | 10.44 | 3.25 | 5.00 |
| 0.333 | 4.98 | 1.333 | 27.69 | 2.333 | 10.44 | 3.33 | 5.00 |
| 0.417 | 5.61 | 1.417 | 158.85 | 2.417 | 9.14 | 3.42 | 5.84 |
| 0.500 | 5.61 | 1.500 | 158.85 | 2.500 | 9.14 | 3.50 | 5.84 |
| 0.583 | 6.45 | 1.583 | 35.08 | 2.583 | 8.15 | 3.58 | 5.18 |
| 0.667 | 6.45 | 1.667 | 35.08 | 2.667 | 8.15 | 3.67 | 5.18 |
| 0.750 | 7.70 | 1.750 | 20.60 | 2.750 | 7.39 | 3.75 | 4.90 |
| 0.833 | 7.70 | 1.833 | 20.60 | 2.833 | 7.39 | 3.83 | 4.90 |
| 0.917 | 9.70 | 1.917 | 15.24 | 2.917 | 6.78 | 3.92 | 4.65 |
| 1.000 | 9.70 | 2.000 | 15.24 | 3.000 | 6.78 | 4.00 | 4.65 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 158.85 | 105.35 |
| | over (min) | 5.00 | 5.00 |

```
     Storage Coeff.  (min)=       1.14 (ii)    3.59 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.34         0.26
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.01          0.080 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.50           1.50
     RUNOFF VOLUME    (mm)=      65.02        39.66          62.22
     TOTAL RAINFALL   (mm)=      66.02        66.02          66.02
     RUNOFF COEFFICIENT   =       0.98         0.60           0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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================================================================================
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       V    V   I    SSSSS  U   U    A    L              (v 5.1.2004)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 5.1\VO2\voin.dat

  Output  filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\e78e2f
d3-5f2d-4a44-bbe1-15299cd0c529\scenar
  Summary filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\e78e2f
d3-5f2d-4a44-bbe1-15299cd0c529\scenar
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DATE: 09/29/2020 TIME: 02:47:42

USER:

COMMENTS: _____

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```
  **********************************************
  ** SIMULATION : CH5                          **
  **********************************************
```

| READ STORM | Filename: C:\Users\Jamie\AppData\Local\Temp\edc0a178-8142-4729-a7d2-2db443dc52fd\5dc340c3 |
|---|---|
| Ptotal= 48.48 mm | Comments: CH5 |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.17 | 3.53 | 1.17 | 10.19 | 2.17 | 9.15 | 3.17 | 4.55 |
| 0.33 | 3.66 | 1.33 | 21.62 | 2.33 | 7.70 | 3.33 | 4.22 |
| 0.50 | 4.04 | 1.50 | 112.37 | 2.50 | 6.68 | 3.50 | 3.96 |
| 0.67 | 4.67 | 1.67 | 27.76 | 2.67 | 5.94 | 3.67 | 3.73 |
| 0.83 | 5.61 | 1.83 | 15.75 | 2.83 | 5.39 | 3.83 | 3.53 |
| 1.00 | 7.11 | 2.00 | 11.43 | 3.00 | 4.93 | 4.00 | 3.35 |

---

| CALIB | |
|---|---|
| STANDHYD ( 0002) | Area (ha)= 0.19 |
| ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 89.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.17 | 0.02 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 35.56 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME | RAIN | TIME | RAIN | TIME | RAIN | TIME | RAIN |
|---|---|---|---|---|---|---|---|

| hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr |
|---|---|---|---|---|---|---|---|
| 0.083 | 3.53 | 1.083 | 10.19 | 2.083 | 9.15 | 3.08 | 4.55 |
| 0.167 | 3.53 | 1.167 | 10.19 | 2.167 | 9.15 | 3.17 | 4.55 |
| 0.250 | 3.66 | 1.250 | 21.62 | 2.250 | 7.70 | 3.25 | 4.22 |
| 0.333 | 3.66 | 1.333 | 21.62 | 2.333 | 7.70 | 3.33 | 4.22 |
| 0.417 | 4.04 | 1.417 | 112.37 | 2.417 | 6.68 | 3.42 | 3.96 |
| 0.500 | 4.04 | 1.500 | 112.37 | 2.500 | 6.68 | 3.50 | 3.96 |
| 0.583 | 4.67 | 1.583 | 27.76 | 2.583 | 5.94 | 3.58 | 3.73 |
| 0.667 | 4.67 | 1.667 | 27.76 | 2.667 | 5.94 | 3.67 | 3.73 |
| 0.750 | 5.61 | 1.750 | 15.75 | 2.750 | 5.39 | 3.75 | 3.53 |
| 0.833 | 5.61 | 1.833 | 15.75 | 2.833 | 5.39 | 3.83 | 3.53 |
| 0.917 | 7.11 | 1.917 | 11.43 | 2.917 | 4.93 | 3.92 | 3.35 |
| 1.000 | 7.11 | 2.000 | 11.43 | 3.000 | 4.93 | 4.00 | 3.35 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 112.37 | 62.74 | | |
| over (min) | 5.00 | 5.00 | | |
| Storage Coeff. (min)= | 1.31 (ii) | 4.12 (ii) | | |
| Unit Hyd. Tpeak (min)= | 5.00 | 5.00 | | |
| Unit Hyd. peak (cms)= | 0.33 | 0.24 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 0.05 | 0.00 | 0.056 (iii) | |
| TIME TO PEAK (hrs)= | 1.50 | 1.50 | 1.50 | |
| RUNOFF VOLUME (mm)= | 47.48 | 25.26 | 45.02 | |
| TOTAL RAINFALL (mm)= | 48.48 | 48.48 | 48.48 | |
| RUNOFF COEFFICIENT = | 0.98 | 0.52 | 0.93 | |

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

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```
       V    V   I    SSSSS  U   U    A    L             (v 5.1.2004)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

Developed and Distributed by Civica Infrastructure

***** D E T A I L E D O U T P U T *****

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Output filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\96bffa
fa-00e5-4827-9132-67b18049c2d2\scenar
Summary filename:
C:\Users\Jamie\AppData\Local\Civica\VH5\dd2e0cb7-a7fe-41cc-aa26-b2876733ae87\96bffa
fa-00e5-4827-9132-67b18049c2d2\scenar

DATE: 09/29/2020 TIME: 02:47:42

USER:

COMMENTS: _____

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**********
** SIMULATION : CH50 **
**********

---

| READ STORM | Filename: C:\Users\Jamie\AppD
| | ata\Local\Temp\
| | edc0a178-8142-4729-a7d2-2db443dc52fd\8e04b1e9
| Ptotal= 72.96 mm | Comments: CH50

---

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.17 | 3.99 | 1.17 | 14.27 | 2.17 | 12.62 | 3.17 | 5.79 |
| 0.33 | 4.45 | 1.33 | 33.90 | 2.33 | 10.39 | 3.33 | 5.33 |
| 0.50 | 5.08 | 1.50 | 186.56 | 2.50 | 8.89 | 3.50 | 4.98 |
| 0.67 | 5.97 | 1.67 | 44.81 | 2.67 | 7.80 | 3.67 | 4.65 |
| 0.83 | 7.29 | 1.83 | 23.44 | 2.83 | 6.96 | 3.83 | 4.37 |
| 1.00 | 9.53 | 2.00 | 16.26 | 3.00 | 6.30 | 4.00 | 4.14 |

---

---

| CALIB | |
|---|---|
| STANDHYD ( 0002) | Area (ha)= 0.19 |
| ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 89.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.17 | 0.02 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 35.56 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.083 | 3.99 | 1.083 | 14.27 | 2.083 | 12.62 | 3.08 | 5.79 |
| 0.167 | 3.99 | 1.167 | 14.27 | 2.167 | 12.62 | 3.17 | 5.79 |
| 0.250 | 4.45 | 1.250 | 33.90 | 2.250 | 10.39 | 3.25 | 5.33 |
| 0.333 | 4.45 | 1.333 | 33.90 | 2.333 | 10.39 | 3.33 | 5.33 |
| 0.417 | 5.08 | 1.417 | 186.56 | 2.417 | 8.89 | 3.42 | 4.98 |
| 0.500 | 5.08 | 1.500 | 186.56 | 2.500 | 8.89 | 3.50 | 4.98 |
| 0.583 | 5.97 | 1.583 | 44.81 | 2.583 | 7.80 | 3.58 | 4.65 |
| 0.667 | 5.97 | 1.667 | 44.81 | 2.667 | 7.80 | 3.67 | 4.65 |
| 0.750 | 7.29 | 1.750 | 23.44 | 2.750 | 6.96 | 3.75 | 4.37 |
| 0.833 | 7.29 | 1.833 | 23.44 | 2.833 | 6.96 | 3.83 | 4.37 |
| 0.917 | 9.53 | 1.917 | 16.26 | 2.917 | 6.30 | 3.92 | 4.14 |
| 1.000 | 9.53 | 2.000 | 16.26 | 3.000 | 6.30 | 4.00 | 4.14 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 186.56 | 129.84 | |
| over (min) | | 5.00 | 5.00 | |
| Storage Coeff. (min)= | | 1.07 (ii) | 3.36 (ii) | |
| Unit Hyd. Tpeak (min)= | | 5.00 | 5.00 | |
| Unit Hyd. peak (cms)= | | 0.34 | 0.26 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.09 | 0.01 | 0.095 (iii) |
| TIME TO PEAK | (hrs)= | 1.50 | 1.50 | 1.50 |
| RUNOFF VOLUME | (mm)= | 71.96 | 45.63 | 69.05 |
| TOTAL RAINFALL | (mm)= | 72.96 | 72.96 | 72.96 |
| RUNOFF COEFFICIENT | = | 0.99 | 0.63 | 0.95 |

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

# APPENDIX F
## Storm Sewer Design Sheet

# STORM SEWER DESIGN SHEET

| | A | B | C |
|---|---|---|---|
| 5 Year Storm | 583.017 | 3.007 | 0.703 |

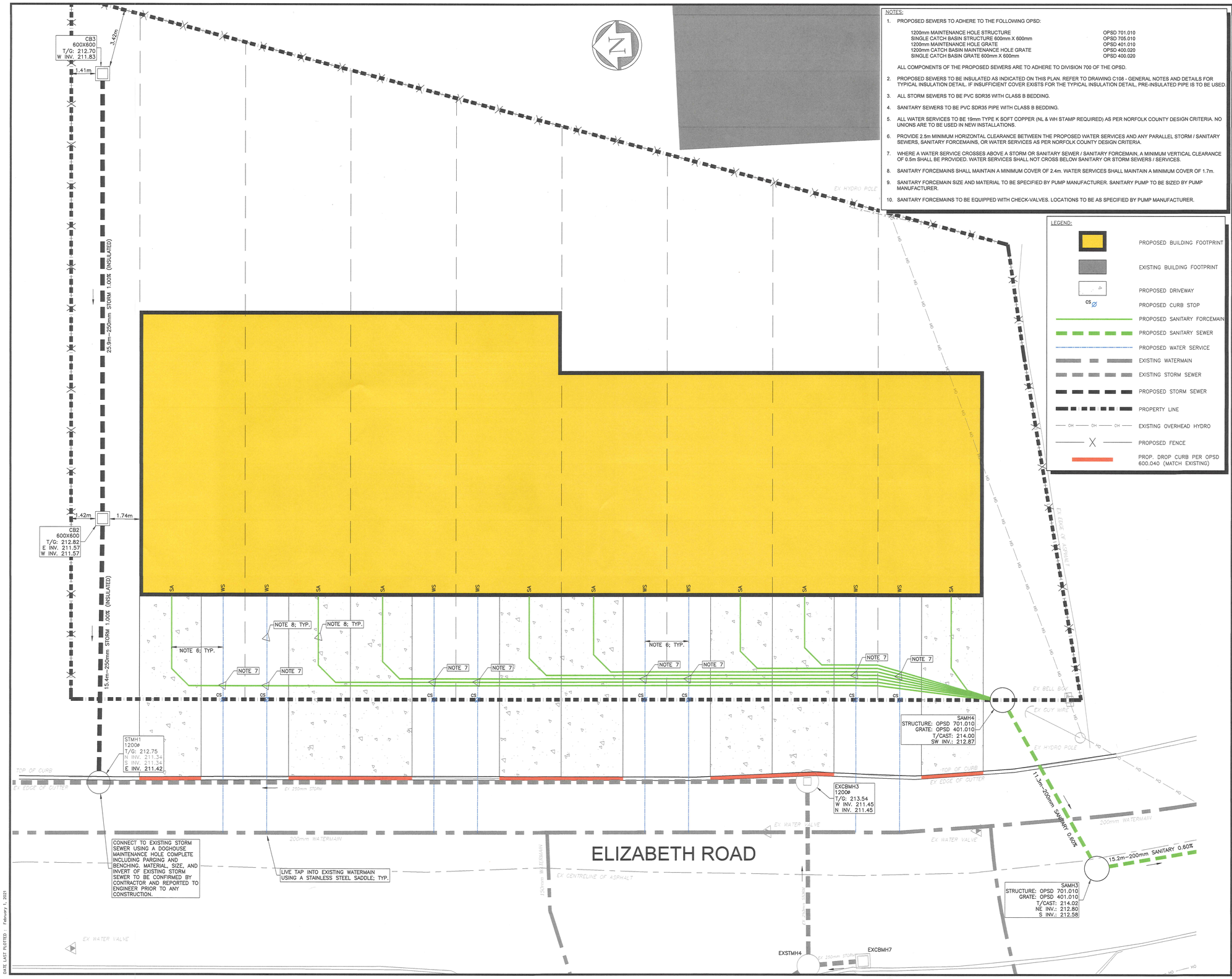
Pipe Material: PVC/concrete
n: 0.013 (PVC 450mm AND LESS)
n: 0.013 (CONCRETE IN EXCESS OF 450mm)

Project: 20-013 - Denzo Townhouses
Municipality: Simcoe - Norfolk County

Date 13-Oct-20
Designed by DCB
Checked by JDV
Sheet of : 1 of 1

| Location | | | Area | | | | Individ. | Cumulative | Time | Rainfall | Des. Flow | Sewer Design | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | From | To | C= 0.25 ha | C= 0.95 ha | C= 0.9 ha | Avg. C | C*A ha | C*A ha | of Concentration min | mm/hr | 2.778*I*A*C L/s | Size mm | Slope % | Cap L/s | Des Q % of Cap % | Vel m/s | Length m | Time min |
| ST1 | CB3 | CB2 | 0.074 | 0.041 | 0.014 | 0.54 | 0.070 | 0.070 | 5.0 | 135 | 26.2 | 250 | 1.00% | 59.47 | 44% | 1.2 | 25.9 | 0.4 |
| ST2 | CB2 | STMH1 | 0.007 | | | 0.25 | 0.002 | 0.072 | 5.4 | 131 | 26.1 | 250 | 1.00% | 59.47 | 44% | 1.2 | 15.4 | 0.2 |

# DRAWINGS




NOTES:

1. PROPOSED SEWERS TO ADHERE TO THE FOLLOWING OPSD:

| | |
|---|---|
| 1200mm MAINTENANCE HOLE STRUCTURE | OPSD 701.010 |
| SINGLE CATCH BASIN STRUCTURE 600mm X 600mm | OPSD 705.010 |
| 1200mm MAINTENANCE HOLE GRATE | OPSD 401.010 |
| 1200mm CATCH BASIN MAINTENANCE HOLE GRATE | OPSD 400.020 |
| SINGLE CATCH BASIN GRATE 600mm X 600mm | OPSD 400.020 |

   ALL COMPONENTS OF THE PROPOSED SEWERS ARE TO ADHERE TO DIVISION 700 OF THE OPSD.
2. PROPOSED SEWERS TO BE INSULATED AS INDICATED ON THIS PLAN. REFER TO DRAWING C108 - GENERAL NOTES AND DETAILS FOR TYPICAL INSULATION DETAIL. IF INSUFFICIENT COVER EXISTS FOR THE TYPICAL INSULATION DETAIL, PRE-INSULATED PIPE IS TO BE USED.
3. ALL STORM SEWERS TO BE PVC SDR35 WITH CLASS B BEDDING.
4. SANITARY SEWERS TO BE PVC SDR35 PIPE WITH CLASS B BEDDING.
5. ALL WATER SERVICES TO BE 19mm TYPE K SOFT COPPER (NL & WH STAMP REQUIRED) AS PER NORFOLK COUNTY DESIGN CRITERIA. NO UNIONS ARE TO BE USED IN NEW INSTALLATIONS.
6. PROVIDE 2.5m MINIMUM HORIZONTAL CLEARANCE BETWEEN THE PROPOSED WATER SERVICES AND ANY PARALLEL STORM / SANITARY SEWERS, SANITARY FORCEMAINS, OR WATER SERVICES AS PER NORFOLK COUNTY DESIGN CRITERIA.
7. WHERE A WATER SERVICE CROSSES ABOVE A STORM OR SANITARY SEWER / SANITARY FORCEMAIN, A MINIMUM VERTICAL CLEARANCE OF 0.5m SHALL BE PROVIDED. WATER SERVICES SHALL NOT CROSS BELOW SANITARY OR STORM SEWERS / SERVICES.
8. SANITARY FORCEMAINS SHALL MAINTAIN A MINIMUM COVER OF 2.4m. WATER SERVICES SHALL MAINTAIN A MINIMUM COVER OF 1.7m.
9. SANITARY FORCEMAIN SIZE AND MATERIAL TO BE SPECIFIED BY PUMP MANUFACTURER. SANITARY PUMP TO BE SIZED BY PUMP MANUFACTURER.
10. SANITARY FORCEMAINS TO BE EQUIPPED WITH CHECK-VALVES. LOCATIONS TO BE AS SPECIFIED BY PUMP MANUFACTURER.

LEGEND:

- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDING FOOTPRINT
- PROPOSED DRIVEWAY
- PROPOSED CURB STOP
- PROPOSED SANITARY FORCEMAIN
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPERTY LINE
- EXISTING OVERHEAD HYDRO
- PROPOSED FENCE
- PROP. DROP CURB PER OPSD 600.040 (MATCH EXISTING)

| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
| 2 | JAN 12/21 | SUBMITTED FOR SITE PLAN APPROVAL |

**NOTE:**
THE CONTRACTOR IS CAUTIONED THAT ALL OF THE EXISTING UTILITIES ARE NOT INDICATED ON THIS DRAWING. THE CONTRACTOR MUST ARRANGE FOR LOCATES FROM EACH AREA UTILITY COMPANY PRIOR TO ANY CONSTRUCTION OR EXCAVATION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES INCLUDING THOSE NOT INDICATED ON THIS DRAWING. G. DOUGLAS VALLEE LTD. CAN NOT ACCEPT RESPONSIBILITY FOR DAMAGE TO ANY EXISTING UTILITY WHICH MAY OR MAY NOT BE INDICATED ON THIS DRAWING.

ALL WORK, MATERIALS AND PROCESSES TO ABIDE TO NORFOLK COUNTY STANDARDS AND SPECIFICATIONS

EXISTING SURVEY FOR THE SUBJECT LANDS WAS COMPLETED BY JEWITT & DIXON DATED DECEMBER 6, 2019. REFER TO PLAN P19 03 A1301, PROJECT NUMBER 19-2383.

## BENCHMARKS

SITE BENCHMARK #1
ELEV: 213.928m (GEODETIC)

SPIKE IN FACE OF WOOD HYDRO POLE ON THE SOUTHWEST CORNER OF MILLPOND COURT AND ELIZABETH STREET.

## LEGAL DESCRIPTION

ALL OF LOT 6, REGISTERED PLAN 279, TOWN OF SIMCOE, NORFOLK COUNTY, ONTARIO.

## APPLICANT INFORMATION

MOHAMMED EQDAIH
2640302 3 ONTARIO INC.
TELEPHONE NUMBER: (289) 880-4110

ADDRESS:
601 SOUTHWORTH STREET, WELLAND, ON L3B 2A2

## DRAWING LIST



**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
1 3 5
HORIZONTAL : 1:100


vallee
Consulting Engineers, Architects & Planners
G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270

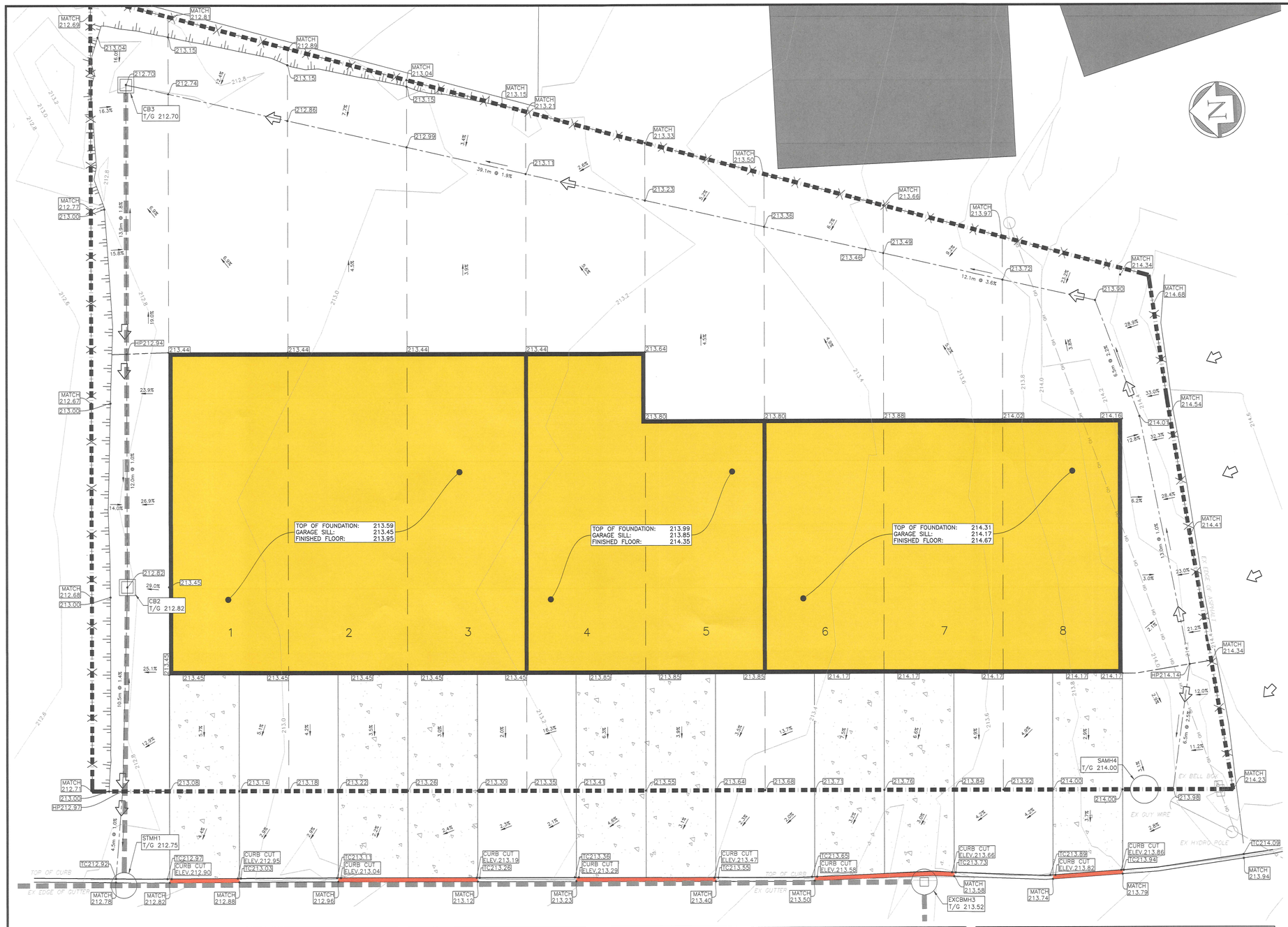

Stamp: LICENSED PROFESSIONAL ENGINEER J. D. VALLEE FEB 2 2021 PROVINCE OF ONTARIO

Project Title
DENZO TOWNHOUSES
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

Drawing Title
SITE SERVICING PLAN

| | |
|---|---|
| Designed by : D. C. B. | Drawn By : D. C. B. |
| Checked by : J. D. V. | Date Started : 1/5/2021 |
| Drawing Scale : 1:100 | Drawing No. C101 |
| Project No. 20-013 | |

DATE LAST PLOTTED : February 1, 2021




| TOP OF FOUNDATION CALCULATION UNITS 1–3: | |
|---|---|
| GARAGE SILL: | 213.45 |
| BACK OF GARAGE: (6m @ 2.0%) | +0.12 |
| 2 RISERS @ 0.19m: | +0.38 |
| FIN. FLOOR: | 213.95 (+0.50 GARAGE SILL) |
| 2"X6" SILL PLATE: | –0.04 |
| 3/8" PLYWOOD: | –0.02 |
| 11–7/8" TJI JOIST: | –0.30 |
| T/FDN: | 213.59 (+0.14 GARAGE SILL) |

| TOP OF FOUNDATION CALCULATION UNITS 4–5: | |
|---|---|
| GARAGE SILL: | 213.85 |
| BACK OF GARAGE: (6m @ 2.0%) | +0.12 |
| 2 RISERS @ 0.19m: | +0.38 |
| FIN. FLOOR: | 214.35 (+0.50 GARAGE SILL) |
| 2"X6" SILL PLATE: | –0.04 |
| 3/8" PLYWOOD: | –0.02 |
| 11–7/8" TJI JOIST: | –0.30 |
| T/FDN: | 213.99 (+0.14 GARAGE SILL) |

| TOP OF FOUNDATION CALCULATION UNITS 6–8: | |
|---|---|
| GARAGE SILL: | 214.17 |
| BACK OF GARAGE: (6m @ 2.0%) | +0.12 |
| 2 RISERS @ 0.19m: | +0.38 |
| FIN. FLOOR: | 214.67 (+0.50 GARAGE SILL) |
| 2"X6" SILL PLATE: | –0.04 |
| 3/8" PLYWOOD: | –0.02 |
| 11–7/8" TJI JOIST: | –0.30 |
| T/FDN: | 214.31 (+0.14 GARAGE SILL) |

LEGEND:

- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDING FOOTPRINT
- —x—x— PROPOSED FENCE
- TC218.00 PROPOSED TOP OF CURB ELEVATION
- 1.0% PROPOSED GRADE
- 218.00 PROPOSED SPOT ELEVATION
- HP218.00 PROPOSED HIGH POINT SPOT ELEVATION
- 218.00 EXISTING CONTOUR ELEVATION
- PROPERTY LINE
- OVERLAND FLOW (MAJOR)
- GRADE AT A MAXIMUM 3:1 SLOPE
- PROPOSED SWALE
- PROPOSED GRADE BREAK
- PROPOSED DROP CURB PER OPSD 600.040 (MATCH EXISTING)

NOTES:

1. EXISTING CONCRETE CURB ALONG PROPERTY FRONTAGE TO BE REMOVED AND REPLACED WITH CONCRETE CURB AS PER OPSD 600.040 (MATCH EXISTING). PROPOSED DROP CURBS AS PER LEGEND.

DATE LAST PLOTTED : February 1, 2021

| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
| 2 | JAN 12/21 | SUBMITTED FOR SITE PLAN APPROVAL |

NOTE:
THE CONTRACTOR IS CAUTIONED THAT ALL OF THE EXISTING UTILITIES ARE NOT INDICATED ON THIS DRAWING. THE CONTRACTOR MUST ARRANGE FOR LOCATES FROM EACH AREA UTILITY COMPANY PRIOR TO ANY CONSTRUCTION OR EXCAVATION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES INCLUDING THOSE NOT INDICATED ON THIS DRAWING. G. DOUGLAS VALLEE LTD. CAN NOT ACCEPT RESPONSIBILITY FOR DAMAGE TO ANY EXISTING UTILITY WHICH MAY OR MAY NOT BE INDICATED ON THIS DRAWING.

ALL WORK, MATERIALS AND PROCESSES TO ABIDE TO NORFOLK COUNTY STANDARDS AND SPECIFICATIONS

EXISTING SURVEY FOR THE SUBJECT LANDS WAS COMPLETED BY JEWITT & DIXON DATED DECEMBER 6, 2019. REFER TO PLAN P19 03 A1301, PROJECT NUMBER 19–2383.

## BENCHMARKS

SITE BENCHMARK #1
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SPIKE IN FACE OF WOOD HYDRO POLE ON THE SOUTHWEST CORNER OF MILLPOND COURT AND ELIZABETH STREET.

## LEGAL DESCRIPTION

ALL OF LOT 6, REGISTERED PLAN 279, TOWN OF SIMCOE, NORFOLK COUNTY, ONTARIO.

## APPLICANT INFORMATION

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## DRAWING LIST



**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
1 3 5
HORIZONTAL : 1:100


vallee
Consulting Engineers, Architects & Planners
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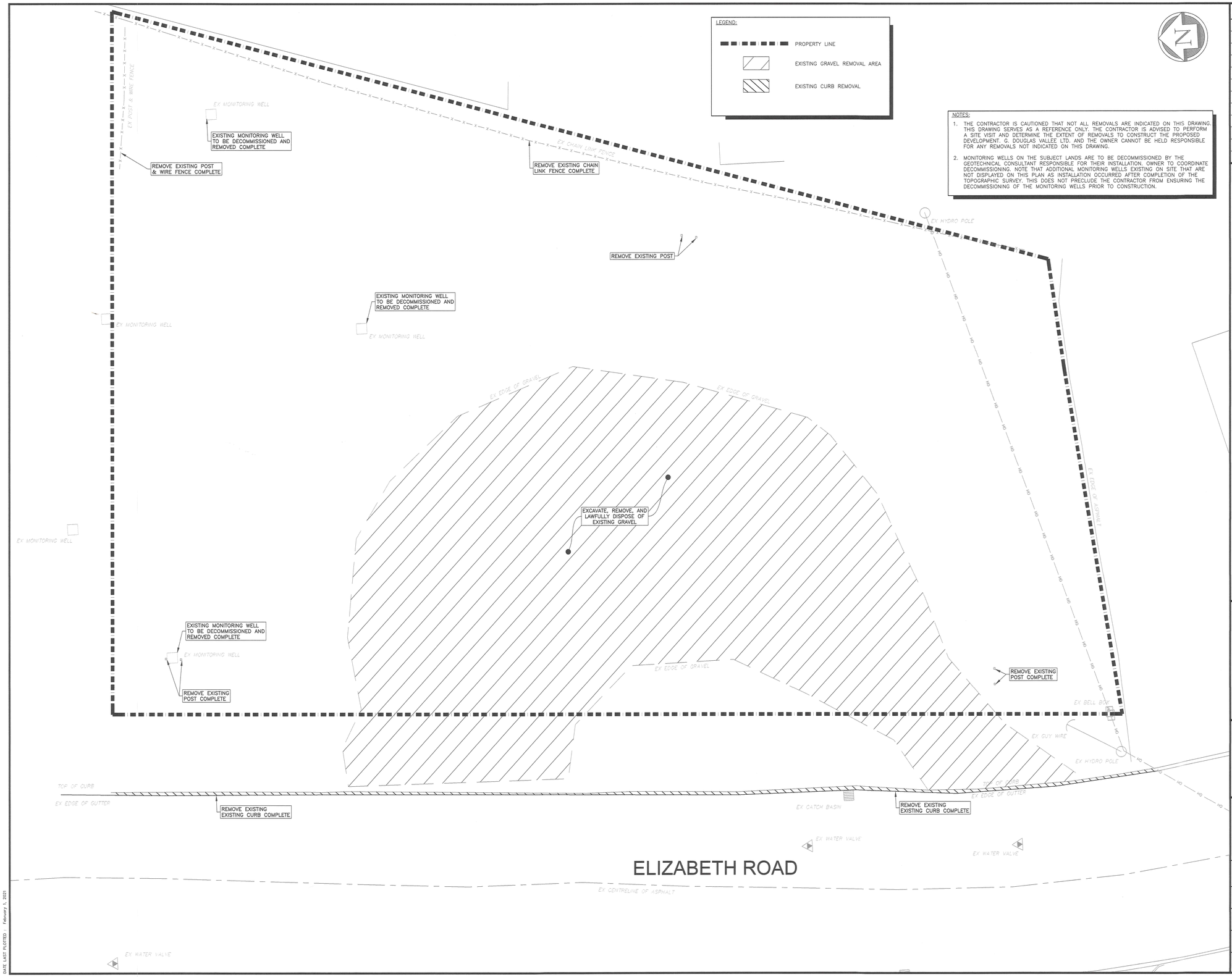
(519) 426-6270


Stamp
LICENSED PROFESSIONAL ENGINEER
J. D. VALLEE
FEB 2 2021
PROVINCE OF ONTARIO

Project Title
**DENZO TOWNHOUSES**
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

Drawing Title
**GRADING PLAN**

| | |
|---|---|
| Designed by : D. C. B. | Drawn By : D. C. B. |
| Checked by : J. D. V. | Date Started : 2/1/2021 |
| Drawing Scale : 1:100 | Drawing No. C102 |
| Project No. 20-013 | |




| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
| 2 | JAN 12/21 | SUBMITTED FOR SITE PLAN APPROVAL |

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## BENCHMARKS
SITE BENCHMARK #1
ELEV: 213.928m (GEODETIC)

SPIKE IN FACE OF WOOD HYDRO POLE ON THE SOUTHWEST CORNER OF MILLPOND COURT AND ELIZABETH STREET.

## LEGAL DESCRIPTION
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2640302 3 ONTARIO INC.
TELEPHONE NUMBER: (289) 880-4110

ADDRESS:
601 SOUTHWORTH STREET, WELLAND, ON L3B 2A2

## DRAWING LIST
20-013-C101 - SITE SERVICING PLAN
20-013-C102 - GRADING PLAN
20-013-C103 - REMOVALS PLAN
20-013-C104 - EROSION CONTROL PLAN
20-013-C105 - STORM DRAINAGE AREAS PLAN
20-013-C106 - ELIZABETH ROAD P&P
20-013-C107 - STANDARD NOTES AND DETAILS

**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
1 3 5
HORIZONTAL : 1:100

vallee
Consulting Engineers, Architects & Planners
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2 TALBOT STREET NORTH
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LICENSED PROFESSIONAL ENGINEER
D. VALLEE
FEB 22 2021
PROVINCE OF ONTARIO

Project Title
DENZO TOWNHOUSES
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

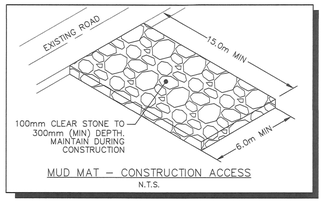
Drawing Title
REMOVALS PLAN

| | |
|---|---|
| Designed by : D. C. B. | Drawn By : D. C. B. |
| Checked by : J. D. V. | Date Started : 1/5/2021 |
| Drawing Scale : 1:100 | Drawing No. C103 |
| Project No. 20-013 | |


## EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DESIGN AND PROVISION OF ALL SEDIMENT CONTROL MEASURES AS MAY BE REQUIRED TO PROTECT THE WORK SITE OR THE ADJACENT LANDS, REGARDLESS OF THE SOURCE OR ORIGIN OF EROSION OR SEDIMENTS. IF THE ENGINEER IS NOT SATISFIED WITH THE EXTENT OF THE MEASURES TAKEN, THE ENGINEER MAY DIRECT THAT ADDITIONAL CONTROLS BE PUT IN PLACE.

   THE ENGINEER'S REQUIREMENTS FOR SEDIMENT AND EROSION CONTROL SHALL BE CONSIDERED ABSOLUTE MINIMUMS. THE ULTIMATE RESPONSIBILITY TO ENSURE THAT THE MEASURES ARE ADEQUATE SHALL LIE SOLELY ON THE CONTRACTOR. ANY DAMAGE RESULTING FROM FAILURE OF THESE MEASURES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
2. PROTECT ALL EXPOSED SURFACES AND CONTROL ALL RUNOFF DURING CONSTRUCTION.
3. ALL EROSION CONTROL MEASURES TO BE IN PLACE UNTIL RESTORATION IS COMPLETE.
4. MAINTAIN EROSION CONTROL MEASURES DURING CONSTRUCTION.
5. ALL COLLECTED SEDIMENT TO BE DISPOSED OF AT AN APPROVED LOCATION.
6. MINIMIZE AREA DISTURBED DURING CONSTRUCTION.
7. ALL DEWATERING TO BE DISPOSED OF IN AN APPROVED SEDIMENTATION BASIN.
8. PROTECT ALL PIPE ENDS FROM SEDIMENT INTRUSION WITH GEOTEXTILE (TERRAFIX 270R OR APPROVED EQUIVALENT).
9. PROTECT ALL CATCH BASINS AND CATCH BASIN MAINTENANCE HOLES FROM SEDIMENT INTRUSION WITH TERRAFIX GEOSYNTHETICS INC. HIGH-FLOW SILTSACK®. MAINTAIN CATCH BASINS AND CATCH BASIN MAINTENANCE HOLES IN WORKING ORDER. DO NOT ALLOW SILTATION AND SEDIMENTATION TO PREVENT WATER FLOW.
10. KEEP ALL SUMPS CLEAN DURING CONSTRUCTION.
11. PREVENT WIND-BLOWN DUST.




MUD MAT – CONSTRUCTION ACCESS
N.T.S.

## LEGEND:

- PROPOSED BUILDING FOOTPRINT
- PROPOSED LIGHT DUTY SILT FENCE AS PER OPSD 219.110
- 218.00 — EXISTING CONTOUR ELEVATION
- PROPERTY LINE
- OVERLAND FLOW (MAJOR)
- GRADE AT A MAXIMUM 3:1 SLOPE
- PROPOSED SWALE
- PROPOSED GRADE BREAK
- PROPOSED DROP CURB PER OPSD 600.040 (MATCH EXISTING)

| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
| 2 | JAN 12/21 | SUBMITTED FOR SITE PLAN APPROVAL |

**NOTE:**
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ALL WORK, MATERIALS AND PROCESSES TO ABIDE TO NORFOLK COUNTY STANDARDS AND SPECIFICATIONS

EXISTING SURVEY FOR THE SUBJECT LANDS WAS COMPLETED BY JEWITT & DIXON DATED DECEMBER 6, 2019. REFER TO PLAN P19 03 A1301, PROJECT NUMBER 19-2383.

## BENCHMARKS

SITE BENCHMARK #1
ELEV: 213.928m (GEODETIC)

SPIKE IN FACE OF WOOD HYDRO POLE ON THE SOUTHWEST CORNER OF MILLPOND COURT AND ELIZABETH STREET.

## LEGAL DESCRIPTION

ALL OF LOT 6, REGISTERED PLAN 279, TOWN OF SIMCOE, NORFOLK COUNTY, ONTARIO.

## APPLICANT INFORMATION

MOHAMMED EQDAIH
2640323 ONTARIO INC.
TELEPHONE NUMBER: (289) 880-4110

ADDRESS:
601 SOUTHWORTH STREET, WELLAND, ON L3B 2A2

## DRAWING LIST



**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
2 6 10
HORIZONTAL : 1:200

vallee
Consulting Engineers, Architects & Planners
G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270

Stamp
LICENCED PROFESSIONAL ENGINEER
J. D. VALLEE
FEB 2 2021
PROVINCE OF ONTARIO

Project Title
**DENZO TOWNHOUSES**
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

Drawing Title
**EROSION CONTROL PLAN**

| | |
|---|---|
| Designed by : D. C. B. | Drawn By : D. C. B. |
| Checked by : J. D. V. | Date Started : 2/1/2021 |
| Drawing Scale : 1:200 | Drawing No. C104 |
| Project No. 20-013 | |

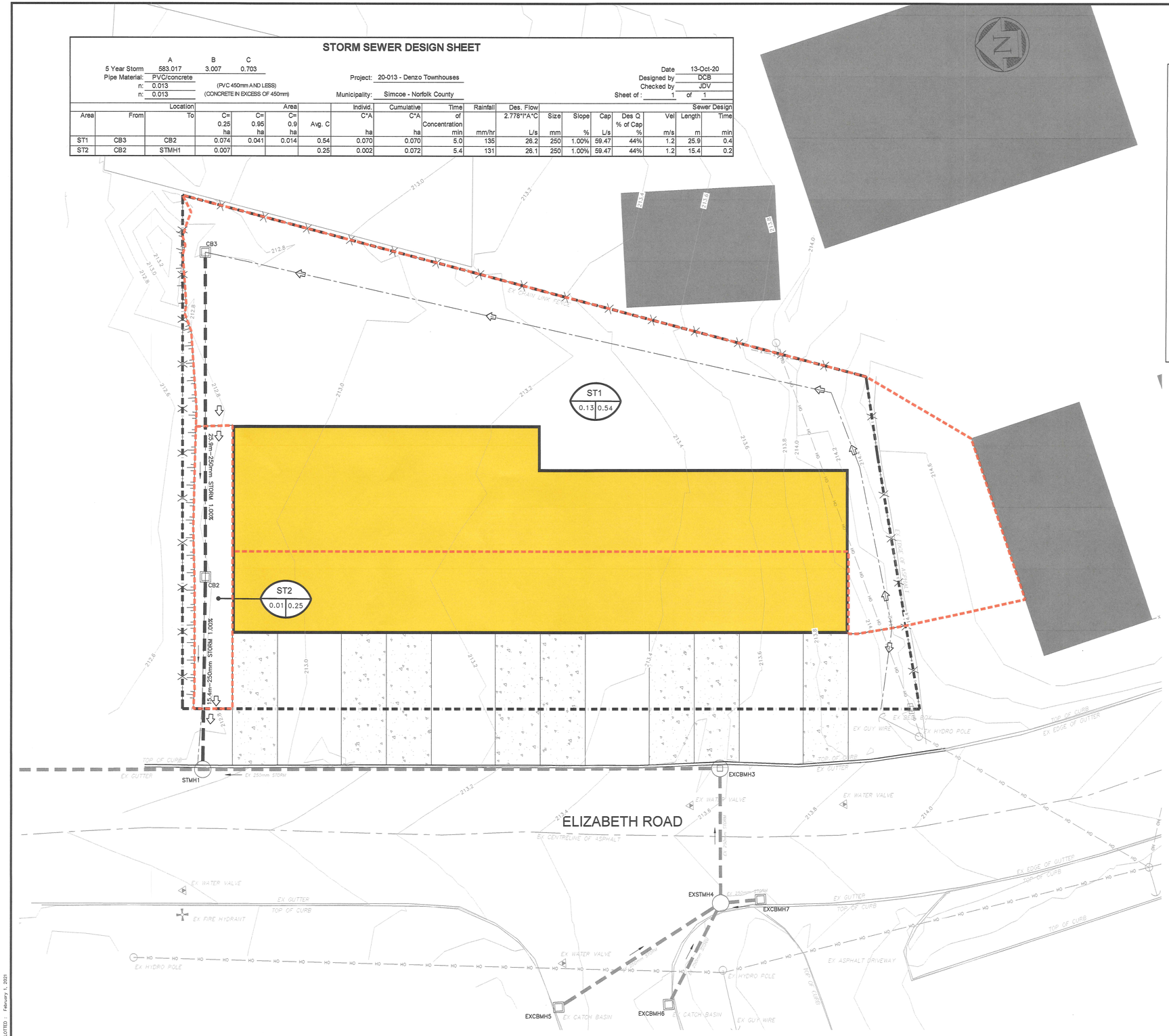
DATE LAST PLOTTED : February 1, 2021

## STORM SEWER DESIGN SHEET

| | A | B | C |
|---|---|---|---|
| 5 Year Storm | 583.017 | 3.007 | 0.703 |
| Pipe Material: | PVC/concrete | | |
| n: | 0.013 | (PVC 450mm AND LESS) | |
| n: | 0.013 | (CONCRETE IN EXCESS OF 450mm) | |

Project: 20-013 - Denzo Townhouses
Municipality: Simcoe - Norfolk County
Date 13-Oct-20
Designed by DCB
Checked by JDV
Sheet of : 1 of 1

| Location | | | Area | | | | Indivd. | Cumulative | Time | Rainfall | Des. Flow | Sewer Design | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | From | To | C= 0.25 ha | C= 0.95 ha | C= 0.9 ha | Avg. C | C*A ha | C*A ha | of Concentration min | mm/hr | 2.778*I*A*C L/s | Size mm | Slope % | Cap L/s | Des Q % of Cap | Vel m/s | Length m | Time min |
| ST1 | CB3 | CB2 | 0.074 | 0.041 | 0.014 | 0.54 | 0.070 | 0.070 | 5.0 | 135 | 26.2 | 250 | 1.00% | 59.47 | 44% | 1.2 | 25.9 | 0.4 |
| ST2 | CB2 | STMH1 | 0.007 | | | 0.25 | 0.002 | 0.072 | 5.4 | 131 | 26.1 | 250 | 1.00% | 59.47 | 44% | 1.2 | 15.4 | 0.2 |




### LEGEND

- ST1 / 0.99 | 0.95 — STORM DRAINAGE AREA NUMBER; AREA (ha); RUNOFF COEFFICIENT
- OVERLAND FLOW (MAJOR)
- STORM DRAINAGE BOUNDARY
- 218.00 — CONTOUR ELEVATION
- PROPERTY LINE
- GRADE AT A MAXIMUM 3:1 SLOPE
- PROPOSED SWALE
- PROPOSED GRADE BREAK
- PROPOSED DROP CURB PER OPSD 600.040 (MATCH EXISTING)
- PROPOSED STORM SEWER
- EXISTING STORM SEWER

| REV. No. | DATE | REVISION |
|---|---|---|
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| 2 | JAN 12/21 | SUBMITTED FOR SITE PLAN APPROVAL |

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### BENCHMARKS

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### LEGAL DESCRIPTION

ALL OF LOT 6, REGISTERED PLAN 279, TOWN OF SIMCOE, NORFOLK COUNTY, ONTARIO.

### APPLICANT INFORMATION

MOHAMMED EQDAIH
2640323 ONTARIO INC.
TELEPHONE NUMBER: (289) 880-4110

ADDRESS:
601 SOUTHWORTH STREET, WELLAND, ON L3B 2A2

### DRAWING LIST

20-013-C101 – SITE SERVICING PLAN
20-013-C102 – GRADING PLAN
20-013-C103 – REMOVALS PLAN
20-013-C104 – EROSION CONTROL PLAN
20-013-C105 – STORM DRAINAGE AREAS PLAN
20-013-C106 – ELIZABETH ROAD P&P
20-013-C107 – STANDARD NOTES AND DETAILS

**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
HORIZONTAL : 1:150


vallee
Consulting Engineers, Architects & Planners
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SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270

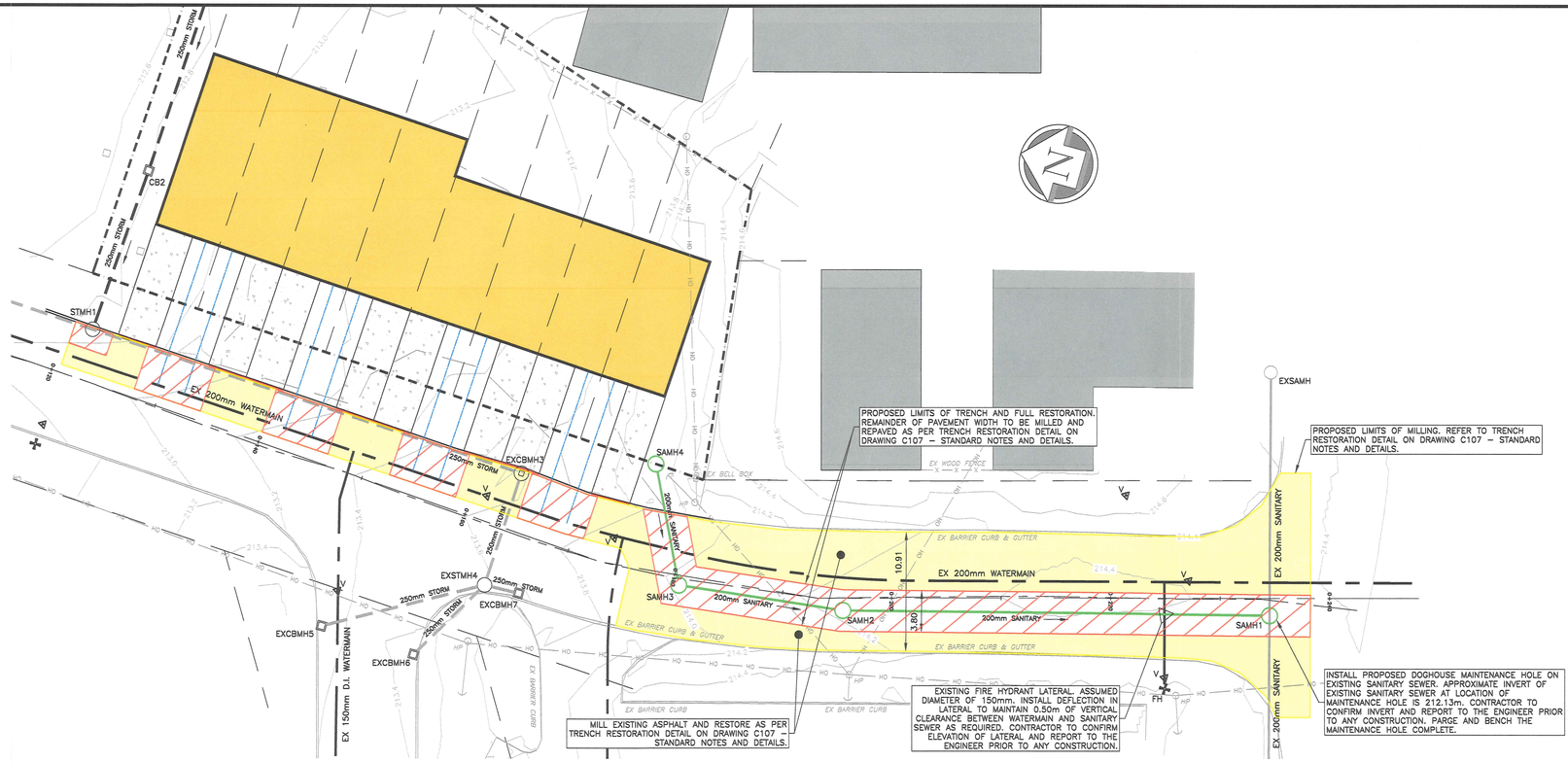

Stamp
LICENSED PROFESSIONAL ENGINEER
J. D. VALLEE
FEB 2 2021
PROVINCE OF ONTARIO

Project Title
DENZO TOWNHOUSES
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

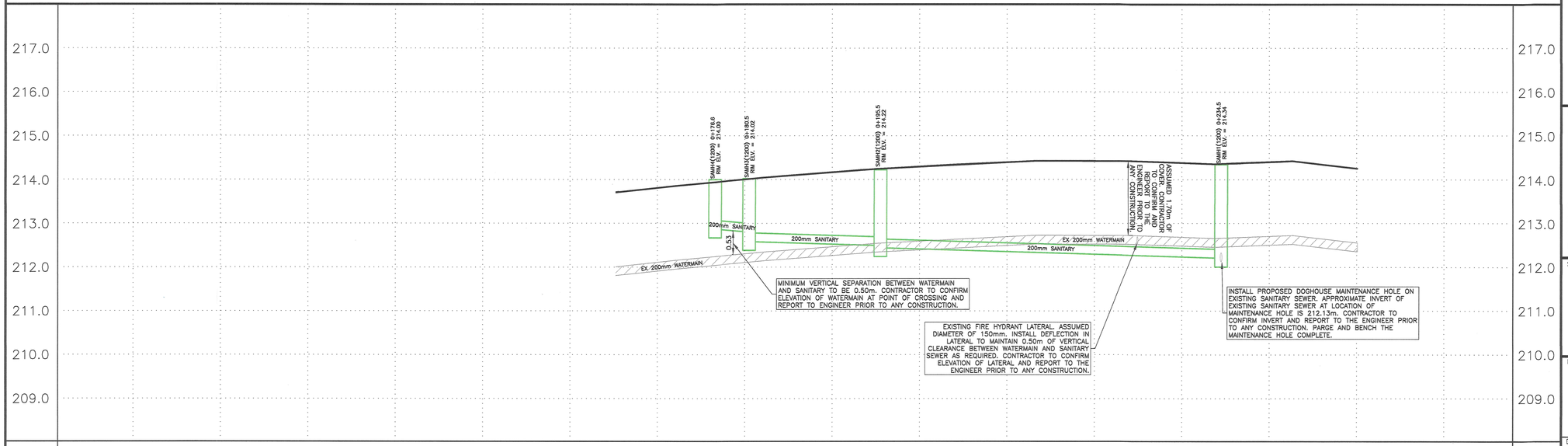
Drawing Title
STORM DRAINAGE AREAS PLAN

| | |
|---|---|
| Designed by : DCB | Drawn By : DCB |
| Checked by : JDV | Date Started : 2/1/2021 |
| Drawing Scale : 1:150 | Drawing No. C105 |
| Project No. 20-013 | |

DATE LAST PLOTTED : February 1, 2021




# ELIZABETH ROAD PLAN & PROFILE




| | | | | | |
|---|---|---|---|---|---|
| CHAINAGE | 0+160 | 0+200 | 0+220 | 0+240 | CHAINAGE |
| FINAL CENTRE LINE ROAD ELEVATIONS | 214.01 | 214.30 | 214.43 | 214.40 | FINAL CENTRE LINE ROAD ELEVATIONS |
| STORM SEWER | | | | | STORM SEWER |
| SANITARY SEWER | 11.3m OF 200mm PVC SDR 35 SANITARY CLASS B BEDDING @ 0.60%<br>212.875IN 212.60OE<br>15.2m OF 200mm PVC SDR 35 SANITARY CLASS B BEDDING @ 0.60%<br>212.49IN 212.44S | | 39.0m OF 200mm PVC SDR 35 SANITARY CLASS B BEDDING @ 0.60%<br>212.21IN 212.13E | | SANITARY SEWER |

DATE LAST PLOTTED : February 2, 2021

| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
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## BENCHMARKS
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## LEGAL DESCRIPTION
ALL OF LOT 6, REGISTERED PLAN 279, TOWN OF SIMCOE, NORFOLK COUNTY, ONTARIO.

## APPLICANT INFORMATION
MOHAMMED EQDAIH
26403023 ONTARIO INC.
TELEPHONE NUMBER: (289) 880-4110

ADDRESS:
601 SOUTHWORTH STREET, WELLAND, ON L3B 2A2

## DRAWING LIST


**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
HORIZONTAL : 1 : 250
VERTICAL : 1 : 50

vallee
Consulting Engineers, Architects & Planners
G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270

Stamp
LICENSED PROFESSIONAL ENGINEER J. D. VALLEE FEB 2 2021 PROVINCE OF ONTARIO

Project Title
**DENZO TOWNHOUSES**
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

Drawing Title
ELIZABETH ROAD P&P
---

| | |
|---|---|
| Designed by : DCB | Drawn By : DCB |
| Checked by : JDV | Date Started : 2/2/21 |
| Drawing Scale : AS SHOWN | Drawing No. C106 |
| Project No. 20-013 | |

## GENERAL NOTES

1. PRIOR TO CLOSING ANY STREET, THE CONTRACTOR SHALL OBTAIN CLEARANCE BY FILLING OUT THE COUNTY'S NOTICE OF ROAD CLOSURE FORM AND NOTIFY SCHOOL BUS OPERATORS OF STREETS USED FOR DETOUR AND THE DURATION OF THE DETOUR. THE CONTRACTOR MUST SUPPLY AND MAINTAIN ADEQUATE LOCAL DETOUR SIGNS AND LIGHTS. THE CONTRACTOR MUST MAINTAIN MAXIMUM ACCESS TO ALL PROPERTIES AS DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY MEASURES TO CONTROL SILT ENTERING THE STORM DRAINAGE SYSTEM TO THE SPECIFICATIONS OUTLINED IN THE GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES PREPARED BY THE MINISTRY OF NATURAL RESOURCES. THESE MEASURES ARE TO BE INSTALLED PRIOR TO COMMENCING ANY CONSTRUCTION FOR THIS STREET AND ARE TO REMAIN IN PLACE UNTIL CONSTRUCTION HAS BEEN COMPLETED TO THE SPECIFICATIONS OF THE ENGINEER.
3. THE CONTRACTOR IS TO MEET ALL THE REQUIREMENTS OF THE OWNERS OF UTILITIES IN THE CONSTRUCTION AREA, AND MUST MAKE SATISFACTORY ARRANGEMENTS WITH THE UTILITY COMPANIES FOR CROSSING THEIR INSTALLATIONS AND FOR PROVIDING ADEQUATE PROTECTION DURING CONSTRUCTION.
4. PRIOR TO COMMENCING ANY CONSTRUCTION, ALL EXISTING UNDERGROUND UTILITIES SHALL BE LOCATED AND MARKED. ANY UTILITIES DAMAGED OR DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER AT THE CONTRACTORS EXPENSE.
5. ALL ORGANIC, SUITABLE OR UNSUITABLE MATERIALS BENEATH THE ROAD ALLOWANCES MUST BE REMOVED AND THESE AREAS BACKFILLED WITH AN APPROVED FILL MATERIAL, ALL TO THE SATISFACTION OF THE ENGINEER.
6. PRIOR TO COMMENCING ANY CONSTRUCTION, ALL EXISTING SEWER OUTLET INFORMATION, BENCHMARKS, DIMENSIONS, ELEVATIONS AND GRADES MUST BE CHECKED AND VERIFIED AND ANY DISCREPANCIES REPORTED TO THE ENGINEER IMMEDIATELY.
7. PDC's SHALL BE 125mmø PVC SDR28 WITH CLASS 'B' BEDDING. PDC's SHALL BE LAID AT A 2% (min) GRADE c/w 22.5° OR 45° LONG RADIUS BENDS AS REQUIRED. 22.5° OR 45° LONG RADIUS BENDS AND A MINIMUM 2% GRADE TO AVOID CONFLICTS WITH EXISTING SEWERS, WATERMAINS AND UTILITIES.
8. WATERMAIN FITTINGS SHALL BE MECHANICAL JOINT OR PUSH-ON JOINT INSTALLED WITH APPROVED MECHANICAL THRUST RESTRAINTS.

## ROAD & BOULEVARD RESTORATION

ALL DISTURBED AREAS SHALL BE RESTORED AS FOLLOWS:

i. ALL ROAD CUTS SHALL BE RESTORED WITH
   - 40mm HL3 SURFACE ASPHALT (97% MARSHALL)
   - 50mm HL8 BASE ASPHALT (97% MARSHALL)
   - 150mm GRANULAR "A" BASE (100% SPMDD)
   - 300mm GRANULAR "B" TYPE 2 SUBBASE (100% SPMDD)

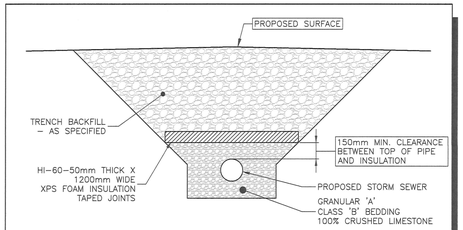
   GRANULAR "B" TO BE EXTENDED 0.3m BEHIND EDGE OF THE PAVEMENT

ii. BOULEVARDS SHALL BE RESTORED WITH SOD OVER 100mm TOPSOIL (min) UNLESS OTHERWISE NOTED

iii. ASPHALT DRIVEWAYS SHALL BE RESTORED WITH 150mm OF GRANULAR "A" (100% SPMDD) WITH 50mm OF HL3A ASPHALT (97% MARSHALL)

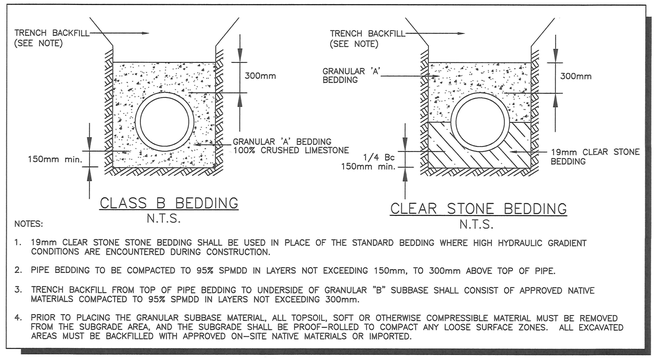
iv. GRAVEL DRIVEWAYS SHALL BE RESTORED WITH 150mm OF GRANULAR "A" (100% SPMDD)

v. CONCRETE DRIVEWAYS SHALL BE RESTORED WITH 150mm OF GRANULAR "A" (100% SPMDD) WITH 150mm OF CONCRETE (OPSS MIX. 30MPa MINIMUM)



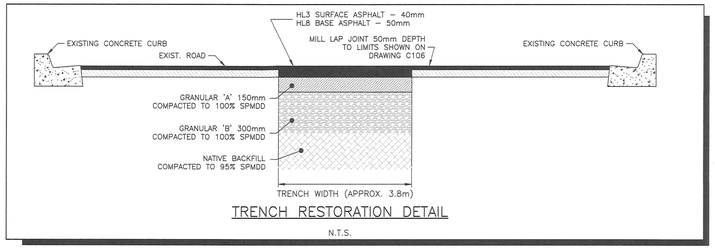

TYPICAL INSULATION DETAIL

NTS



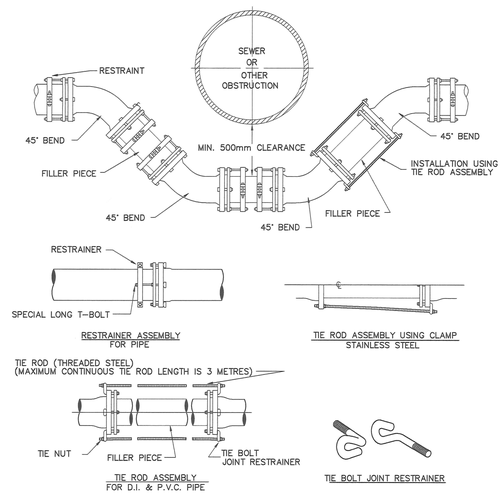

NOTES:

1. 19mm CLEAR STONE STONE BEDDING SHALL BE USED IN PLACE OF THE STANDARD BEDDING WHERE HIGH HYDRAULIC GRADIENT CONDITIONS ARE ENCOUNTERED DURING CONSTRUCTION.
2. PIPE BEDDING TO BE COMPACTED TO 95% SPMDD IN LAYERS NOT EXCEEDING 150mm, TO 300mm ABOVE TOP OF PIPE.
3. TRENCH BACKFILL FROM TOP OF PIPE BEDDING TO UNDERSIDE OF GRANULAR "B" SUBBASE SHALL CONSIST OF APPROVED NATIVE MATERIALS COMPACTED TO 95% SPMDD IN LAYERS NOT EXCEEDING 300mm.
4. PRIOR TO PLACING THE GRANULAR SUBBASE MATERIAL, ALL TOPSOIL, SOFT OR OTHERWISE COMPRESSIBLE MATERIAL MUST BE REMOVED FROM THE SUBGRADE AREA, AND THE SUBGRADE SHALL BE PROOF-ROLLED TO COMPACT ANY LOOSE SURFACE ZONES. ALL EXCAVATED AREAS MUST BE BACKFILLED WITH APPROVED ON-SITE NATIVE MATERIALS OR IMPORTED.




TRENCH RESTORATION DETAIL

N.T.S.




WATERMAIN DEFLECTION DETAIL

| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | MAR 20/20 | ISSUED FOR COUNTY REVIEW |
| 1 | JUL 07/20 | REVISED PER COUNTY COMMENTS |
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### LEGAL DESCRIPTION

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### APPLICANT INFORMATION

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TELEPHONE NUMBER: (289) 880-4110

ADDRESS:
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### DRAWING LIST



**PRELIMINARY**
**NOT TO BE USED FOR CONSTRUCTION**

SCALE:
3 6
HORIZONTAL : #####

vallee
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Stamp
J. D. VALLEE
FEB 2 2021
PROVINCE OF ONTARIO

Project Title
DENZO TOWNHOUSES
11 ELIZABETH ROAD
SIMCOE - NORFOLK COUNTY

Drawing Title
STANDARD NOTES AND DETAILS

| | |
|---|---|
| Designed by : DCB | Drawn By : DCB |
| Checked by : JDV | Date Started : 1/5/2021 |
| Drawing Scale : 1:150 | Drawing No. C107 |
| Project No. 20-013 | |

DATE LAST PLOTTED : February 1, 2021


*SURVEY LEGEND*

| | | |
|---|---|---|
| BELL BOX | SHOWN | BBX |
| BENCH MARK | SHOWN | BM |
| CATCH BASIN | SHOWN | CB |
| TOP OF FOUNDATION | SHOWN | TOF |
| FIRE HYDRANT | SHOWN | FH |
| WATER VALVE | SHOWN | WV |
| HYDRO POLE | SHOWN | HP |
| MAN HOLE | SHOWN | MH |
| TEST WELL | SHOWN | TW |

| | | | |
|---|---|---|---|
| ZONING<br>R4 (STREET TOWNHOUSE) | LOT NO:<br>6 | PLAN NO:<br>279 | LOT FRONTAGE LOT DEPTH<br>59 m 33.8 m |
| LOT AREA | PROPOSED INDIVIDUAL LOT AREAS ( 8 UNITS) | | MIN.LOT AREA ALLOWED |
| OVERALL LOT AREA<br>1897.22 m² | LOT A 240.39 m²<br>LOT B 230.34 m²<br>LOT C 220.33 m²<br>LOT D 210.31 m²<br>LOT E 200.31 m²<br>LOT F 190.30 m²<br>LOT G 180.28 m²<br>LOT H 170.30 m² | | 156 m² |
| | PROPOSED | | MIN. ALLOWED |
| LOT FRONTAGE<br>FRONT YARD<br>INTERIOR SIDE YARD<br>EXTERIOR SIDE YARD<br>REAR YARD | 6.15 m<br>6 m<br>4 m, 2.54 m<br>NONE<br>7.5 m | | 6.5 m<br>6 m<br>1.2 m<br>6 m<br>7.5 m |
| BUILDING HEIGHT | PROPOSED | | MAX. ALLOWED |
| | 11 m | | 11 m |
| BUILDING AREA | 731.13 m² | | |
| COVERAGE | 38.53% | | |
| GARAGE PARKING DIM. | 4.04m X 6.10m | | |
| PARKING DIMENSIONS | PROPOSED | | MIN. ALLOWED |
| | 3.6m X 6m | | 3m X 5.8m |

PROPERTY LINE

1.8m HIGH CLOSED BOARD FENCE

ASPHALT PAVED DRIVEWAY TYPICAL

GREEN SPACE TYPICAL

BUILDING FOOTPRINT

| Rev. | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| B | 09 FEB 2021 | ISSUED FOR ZONING | TE | AS |
| A | 06 AUG 2020 | ISSUED FOR ZONING | TE | AS |

CONSULTING ENGINEER

ARCHICREATION DESIGN STUDIO Inc.
6-425 Hespeler Rd Suite 118
Cambridge,ON N1R 8J6 T: (647)924-7611

PROJECT: TOWN HOMES
LOT 6, PLAN 279

ADDRESS: 1 ELIZABETH STREET SIMCOE, ON

OWNER:

SHEET TITLE: SITE PLAN

| DESIGNED BY | DRAWN BY | CHECKED BY | APPROVED BY |
|---|---|---|---|
| XXXXXX | XXXXXX | T.SABRAH | T.SABRAH |
| DATE | SCALE | SHEET NO. | PROJECT NO. |
| July 2020 | 1 : 300 | 1 OF 1 | HK01 |

DRAWING NO: AA01

SEAL

FILE PATH:

# 11 ELIZABETH ROAD

# SIMCOE, ON

# TRAFFIC IMPACT BRIEF

**Prepared by:**

RC SPENCER ASSOCIATES INC.
Consulting Engineers
**Windsor:** 800 University Avenue W. – Windsor ON N9A 5R9
**Leamington:** 18 Talbot Street W. – Leamington ON N8H 1M4
**Chatham-Kent:** 49 Raleigh Street – Chatham ON N7M 2M6
**London:** 660 Inverness Avenue – London ON N6H 5R4

File No.: 20-1041 August 2020

# 11 ELIZABETH ROAD

# SIMCOE, ON

# TRAFFIC IMPACT BRIEF

## Table of Contents

## INTRODUCTION AND BACKGROUND

The Denzo Group Inc. is proposing a residential development on Elizabeth Road, directly north of Queensway West (Highway 3) in Simcoe, Ontario, one block west of Norfolk Street North (Highway 24). Primary access to Elizabeth Road is gained from Norfolk Street North via Riverside Road, as well as from Queensway West. The study area is illustrated on Figure 1. Norfolk Street is a north / south arterial road that provides regional access to and from Simcoe. Queensway West is an arterial road that is part of provincial Highway 3. Elizabeth Road is a local north / south roadway; it begins at Queensway West and turns into Riverside Road, an east-west local street, at its north end.

The developer is proposing a low-rise townhome development consisting of 8 units with one site access to / from Elizabeth Road. The site plan is provided on Figure 2. The purpose of this study is to examine the implications of the proposed development on traffic operations in the defined study area.

## EXISTING CONDITIONS

Turning movement counts were obtained by Pyramid Traffic on 7 August 2019 for the intersections of Norfolk Street North at Second Avenue and Hunt Street at Queensway West; both intersections are controlled by stop signs on the minor streets. Second Avenue is immediately north of Riverside Road at Norfolk Street North, so northbound traffic from the site would pass through this intersection. Hunt Street is approximately a half kilometre west of the Elizabeth Road at Queensway West intersection. These turning movement counts were chosen as the basis for analysis because they were collected close to the site and capture traffic operations that were unaffected by the ongoing global pandemic.

All turning movement counts are provided in Appendix A. These counts were analyzed using the Synchro 10 program, which calculates various parameters of intersection performance, such as level of service (LOS), intersection capacity utilization (ICU), and control delay.

## TRIP GENERATION AND DISTRIBUTION

Trip generation for the proposed development was estimated from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10$^{th}$ Edition). The dataset's average rate was used instead of the fitted curve because the value of the independent variables is in the lower range of the dataset; the fitted curve equation does not pass through the origin.

ITE Land Use Code 220 - Multi Family Housing (Low-Rise) is the most appropriate code for this use; it provides average trip generation rates of 0.46 trips per dwelling unit in the AM peak hour with 23% entering and 77% exiting, and 0.56 trips per dwelling unit in the PM peak hour with 63% in and 37% exiting. The trips generated by the proposed development are estimated as follows: 4 trips during the AM peak hour, with 1 entering and 3 exiting the site, and 4 trips during the PM peak hour, with 3 entering and 1 exiting the site. The details of the trip generation analysis are contained in Appendix B.

Site generated traffic would be entering and exiting the site by way of Elizabeth Road or Riverside Road. Since the estimated site generated traffic volumes are very nominal, it is anticipated that site generated traffic would have a negligible effect on the surrounding intersections.

## CAPACITY AND LEVEL OF SERVICE ANALYSIS

Detailed analysis using the Synchro 10 analysis program was carried out for the intersections of Norfolk Street North at Second Avenue and Hunt Street at Queensway West for AM and PM peak hours with respect to the existing traffic volumes. The results from the Synchro 10 reports are summarized in Tables 1 and 2; the detailed results are provided in Appendix C.

**Table 1: Level of Service by Approach – Norfolk Street North (Highway 24) at Second Avenue West**

| Scenario | Norfolk Street North at Second Avenue West | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | | PM Peak Hour | | | |
| | E/B | W/B | N/B | S/B | E/B | W/B | N/B | S/B |
| Existing Traffic | B | B | A | A | B | C | A | A |

**Table 2: Level of Service by Approach – Queensway West (Highway 3) at Hunt Street North**

| Scenario | Queensway West (Highway 3) at Hunt Street North | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | | PM Peak Hour | | | |
| | E/B | W/B | N/B | S/B | E/B | W/B | N/B | S/B |
| Existing Traffic | A | A | B | B | A | A | B | C |

The results of the analyses show that the non-signalized intersection of Norfolk Street North at Second Avenue is performing satisfactorily in both AM and PM peak hours. Level of service on the minor streets is LOS B; the exception is westbound traffic in the PM peak hour, which exhibits a LOS C. Therefore, it is anticipated that the intersection will continue to operate at a satisfactory level of service.

The non-signalized intersection of Hunt Street at Queensway West is also performing satisfactorily in both AM and PM peak hours. Level of service on the minor streets is LOS B; the exception is southbound traffic in the PM peak hour, which exhibits a LOS C. Therefore, it is anticipated that the intersection will continue to operate at a satisfactory level of service well into the future.

Based on these observations, when site generated traffic is added to the existing area traffic, there will be no perceivable effect on traffic operations; therefore, it is not necessary to illustrate the future traffic scenarios.

## SUMMARY AND CONCLUSIONS

The Denzo Group Inc. is proposing a low-rise townhome development consisting of 8 units with one site access to / from Elizabeth Road, directly north of Queensway West (Highway 3) in Simcoe, Ontario, one block west of Norfolk Street North (Highway 24). Primary access to Elizabeth Road is gained from Norfolk Street North via Riverside Road, as well as from Queensway West.

After modelling the traffic network and extracting the relevant traffic operations metrics, it can be concluded that the proposed townhome development on Elizabeth Road will have no perceivable effect on area traffic operations.

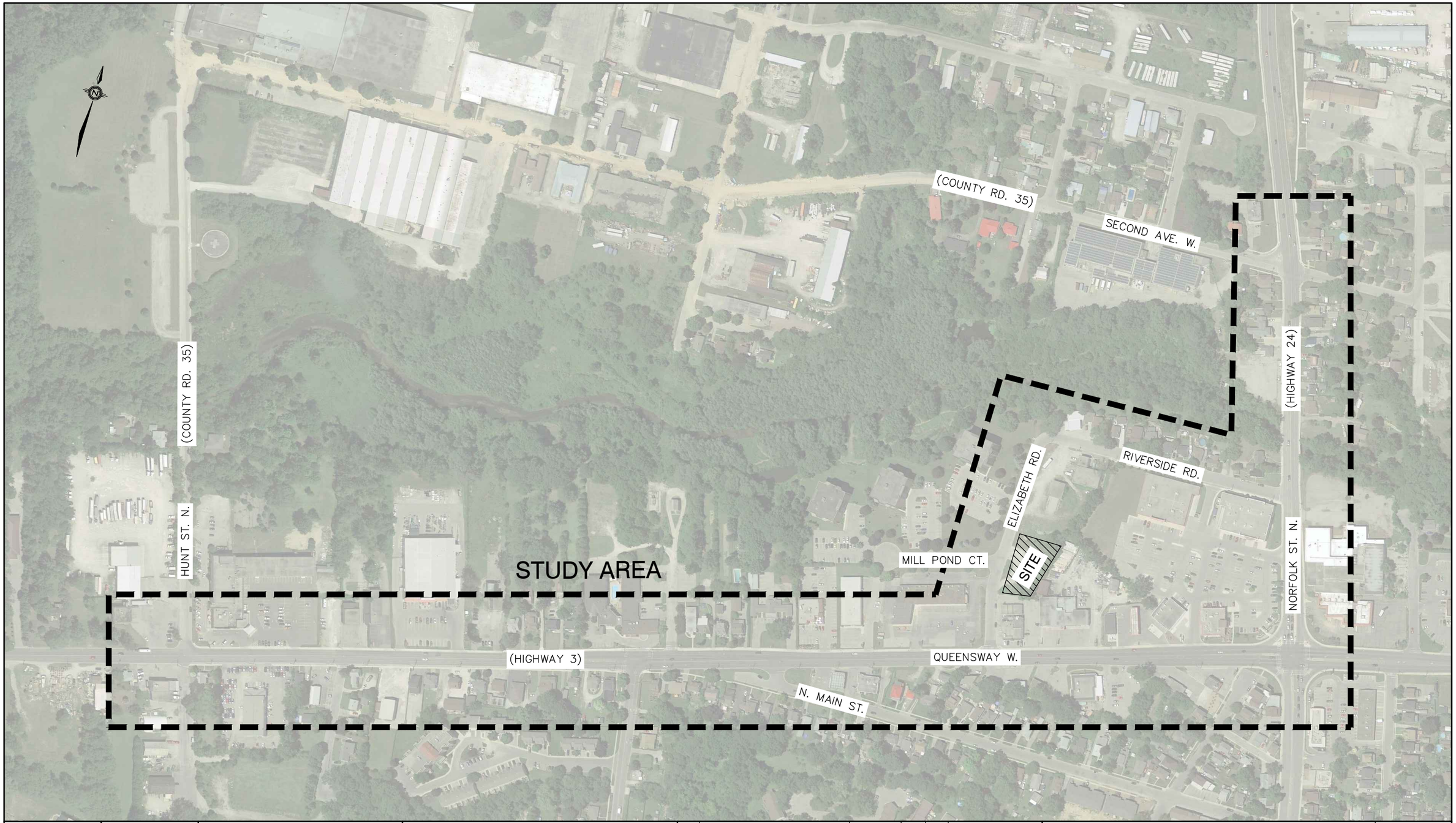
All of which is respectfully submitted,

**RC Spencer Associates Inc.**



**John D. Tofflemire, M.A.Sc., P.Eng.**
**Manager, Leamington Office**

**Aaron D. Blata, M.Eng., P.Eng., PTOE**
**Traffic Operations Project Engineer**




RC SPENCER ASSOCIATES INC.
Consulting Engineers
**Windsor:** 800 University Avenue W. – Windsor ON N9A 5R9
**Leamington:** 18 Talbot Street W. – Leamington ON N8H 1M4
**Chatham-Kent:** 49 Raleigh Street – Chatham ON N7M 2M6
Professional Engineers Ontario

| NO. | REVISION | DATE | BY | APP |
|---|---|---|---|---|
| 1. | COMPLETED REPORT FIGURES | 19 AUG 2020 | J.B. | A.D.B. |

| | |
|---|---|
| DESIGN | A.D.B. |
| CHECKED | A.D.B. |
| DRAWN | J.B. |
| CHECKED | A.D.B. |
| DATE | AUGUST 2020 |
| SCALE | N.T.S. |

11 ELIZABETH ROAD, SIMCOE – T.I.S.

STUDY AREA

PROJECT NO. 20–1041

FIGURE NO. 1

OF 2


RC SPENCER ASSOCIATES INC.
Consulting Engineers
**Windsor:** 800 University Avenue W. – Windsor ON N9A 5R9
**Leamington:** 18 Talbot Street W. – Leamington ON N8H 1M4
**Chatham-Kent:** 49 Raleigh Street – Chatham ON N7M 2M6
Professional Engineers
Ontario

| NO. | REVISION | DATE | BY | APP |
|---|---|---|---|---|
| 1. | COMPLETED REPORT FIGURES | 19 AUG 2020 | J.B. | A.D.B. |

DESIGN A.D.B.
CHECKED A.D.B.
DRAWN J.B.
CHECKED A.D.B.
DATE AUGUST 2020
SCALE N.T.S.

11 ELIZABETH ROAD, SIMCOE – T.I.S.

# SITE PLAN

PROJECT NO. 20–1041
FIGURE NO. 2
OF 2

# Appendix A

# TRAFFIC COUNTS

## Norfolk Street North at Second Avenue West
## Hunt Street North at Queensway West (Highway 3)

# *Norfolk St N @ Second Ave*

## Morning Peak Diagram

**Specified Period**
**From:** 7:00:00
**To:** 9:00:00

**One Hour Peak**
**From:** 8:00:00
**To:** 9:00:00

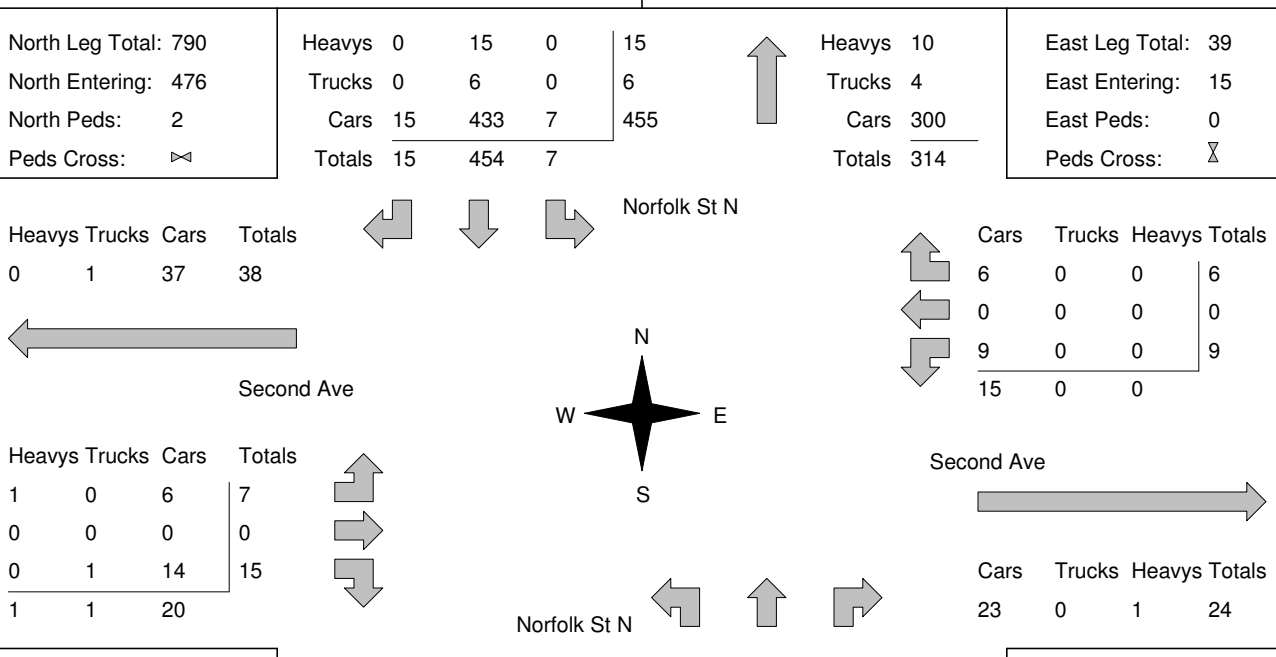
**Municipality:** Simcoe
**Site #:** 0000000002
**Intersection:** Norfolk St N & Second Ave
**TFR File #:** 2
**Count date:** 7-Aug-2019

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Norfolk St N runs N/S




**Comments**

# *Norfolk St N @ Second Ave*

## Mid-day Peak Diagram

**Specified Period**
**From:** 11:00:00
**To:** 14:00:00

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

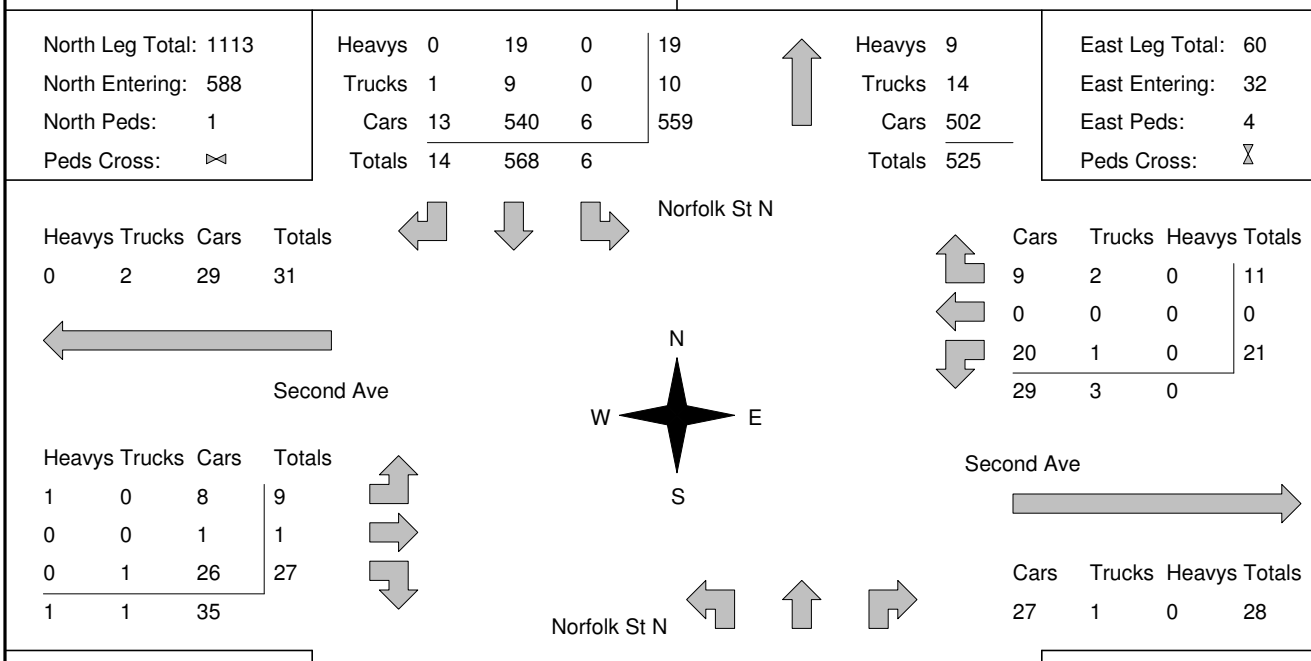
**Municipality:** Simcoe
**Site #:** 0000000002
**Intersection:** Norfolk St N & Second Ave
**TFR File #:** 2
**Count date:** 7-Aug-2019

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Norfolk St N runs N/S




**Comments**

# *Norfolk St N @ Second Ave*

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 18:00:00

**One Hour Peak**
**From:** 16:15:00
**To:** 17:15:00

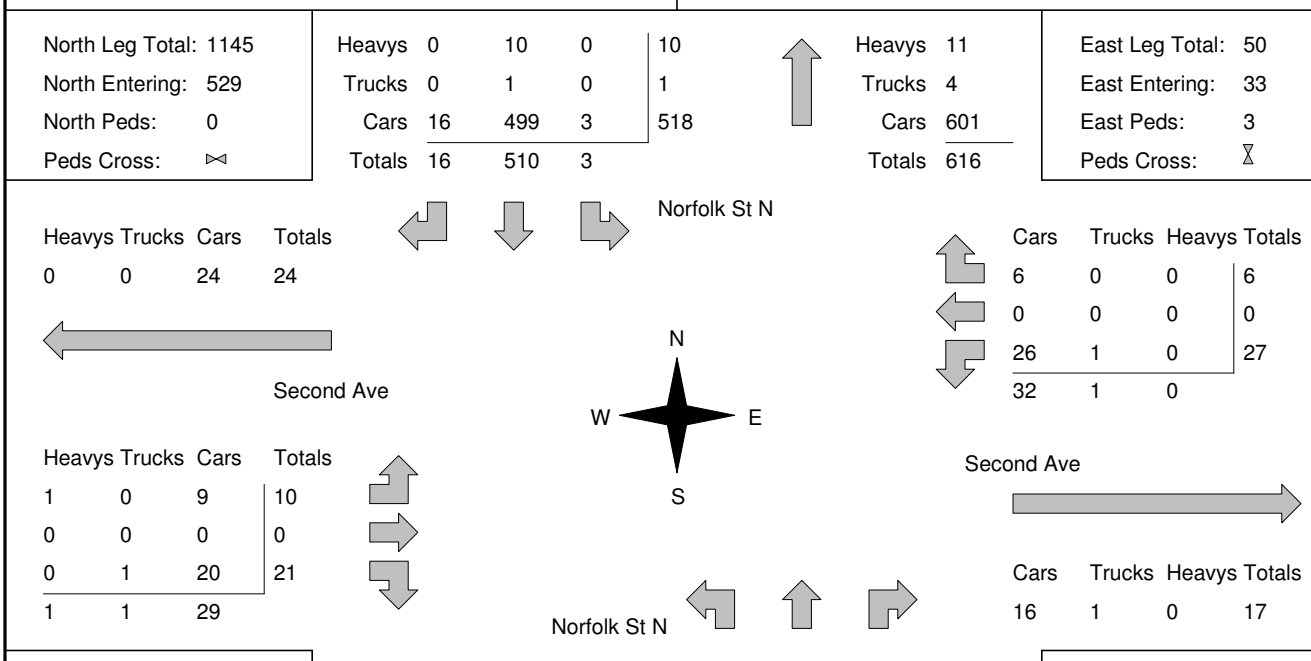
**Municipality:** Simcoe
**Site #:** 0000000002
**Intersection:** Norfolk St N & Second Ave
**TFR File #:** 2
**Count date:** 7-Aug-2019

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Norfolk St N runs N/S




### Comments

# *Norfolk St N @ Second Ave*

## Total Count Diagram

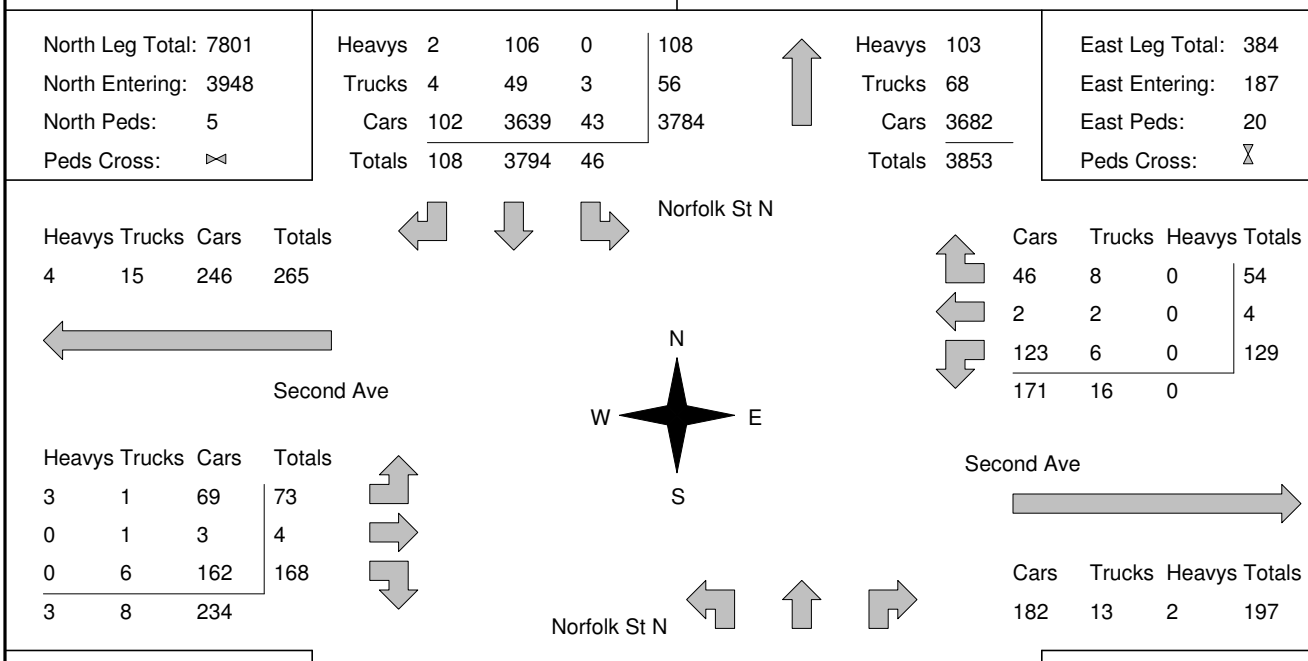
**Municipality:** Simcoe
**Site #:** 0000000002
**Intersection:** Norfolk St N & Second Ave
**TFR File #:** 2
**Count date:** 7-Aug-2019

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Norfolk St N runs N/S




**Comments**

# *Hunt St @ Queensway West*

## Morning Peak Diagram

**Specified Period**
**From:** 7:00:00
**To:** 9:00:00

**One Hour Peak**
**From:** 8:00:00
**To:** 9:00:00

**Municipality:** Simcoe
**Site #:** 0000000001
**Intersection:** Queensway West & Hunt St
**TFR File #:** 1
**Count date:** 7-Aug-2019

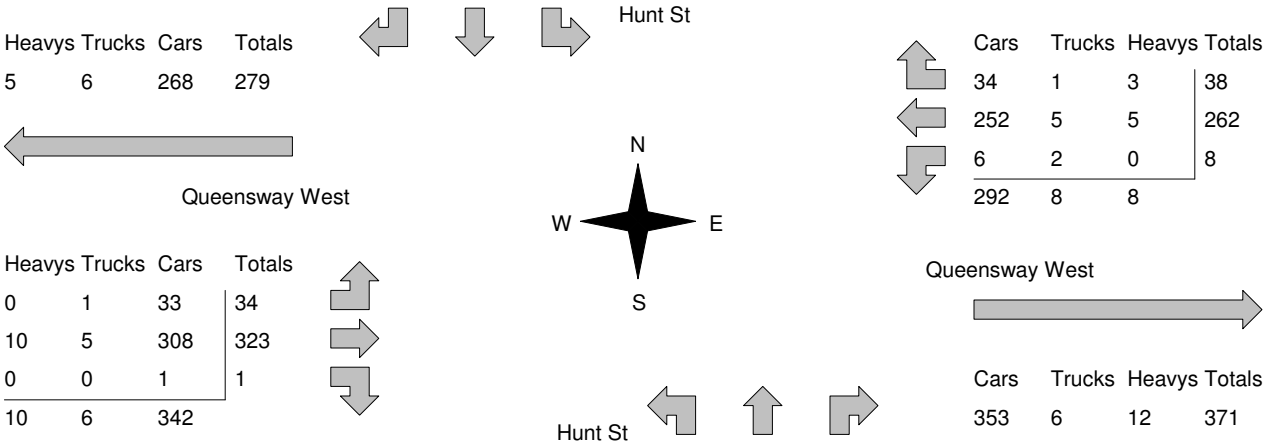
**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Queensway West runs W/E

| | | | | |
|---|---|---|---|---|
| North Leg Total: | 131 | | | |
| North Entering: | 59 | | | |
| North Peds: | 1 | | | |
| Peds Cross: | ⋈ | | | |
| Heavys | 0 | 0 | 2 | 2 |
| Trucks | 0 | 0 | 0 | 0 |
| Cars | 14 | 0 | 43 | 57 |
| Totals | 14 | 0 | 45 | |
| Heavys | 3 | | | |
| Trucks | 2 | | | |
| Cars | 67 | | | |
| Totals | 72 | | | |
| East Leg Total: | 679 | | | |
| East Entering: | 308 | | | |
| East Peds: | 0 | | | |
| Peds Cross: | ⧖ | | | |




| | | | | |
|---|---|---|---|---|
| Peds Cross: | ⧖ | | | |
| West Peds: | 0 | | | |
| West Entering: | 358 | | | |
| West Leg Total: | 637 | | | |
| Cars | 7 | | | |
| Trucks | 2 | | | |
| Heavys | 0 | | | |
| Totals | 9 | | | |
| Cars | 2 | 0 | 2 | 4 |
| Trucks | 1 | 0 | 1 | 2 |
| Heavys | 0 | 0 | 0 | 0 |
| Totals | 3 | 0 | 3 | |
| Peds Cross: | ⋈ | | | |
| South Peds: | 1 | | | |
| South Entering: | 6 | | | |
| South Leg Total: | 15 | | | |

## Comments

# *Hunt St @ Queensway West*

## Mid-day Peak Diagram

**Specified Period**
**From:** 11:00:00
**To:** 14:00:00

**One Hour Peak**
**From:** 11:45:00
**To:** 12:45:00

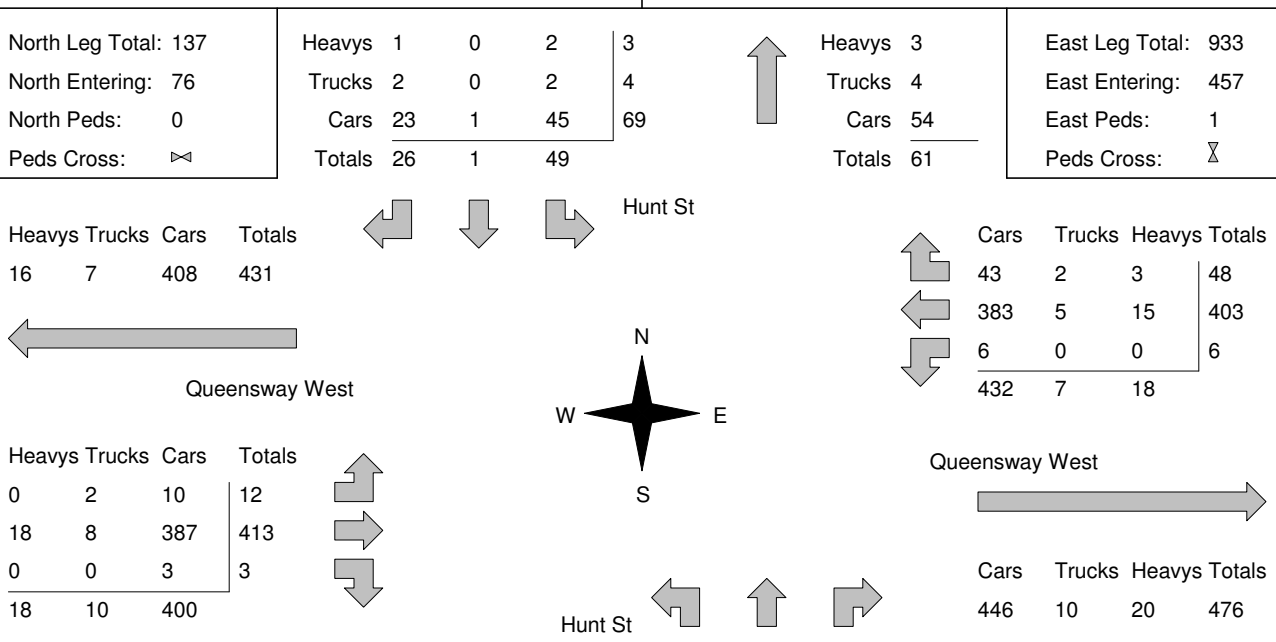
**Municipality:** Simcoe
**Site #:** 0000000001
**Intersection:** Queensway West & Hunt St
**TFR File #:** 1
**Count date:** 7-Aug-2019

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Queensway West runs W/E




### Comments

# *Hunt St @ Queensway West*

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 18:00:00

**One Hour Peak**
**From:** 15:00:00
**To:** 16:00:00

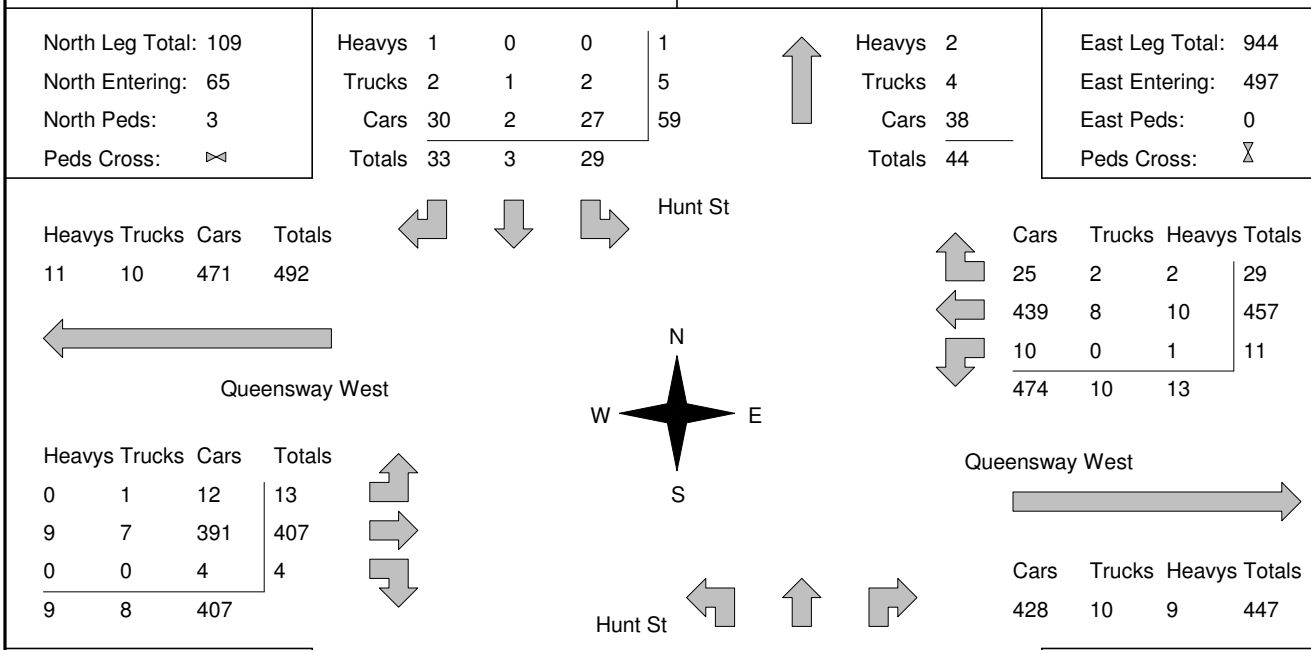
**Municipality:** Simcoe
**Site #:** 0000000001
**Intersection:** Queensway West & Hunt St
**TFR File #:** 1
**Count date:** 7-Aug-2019

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Queensway West runs W/E




### Comments

# *Hunt St @ Queensway West*

## Total Count Diagram

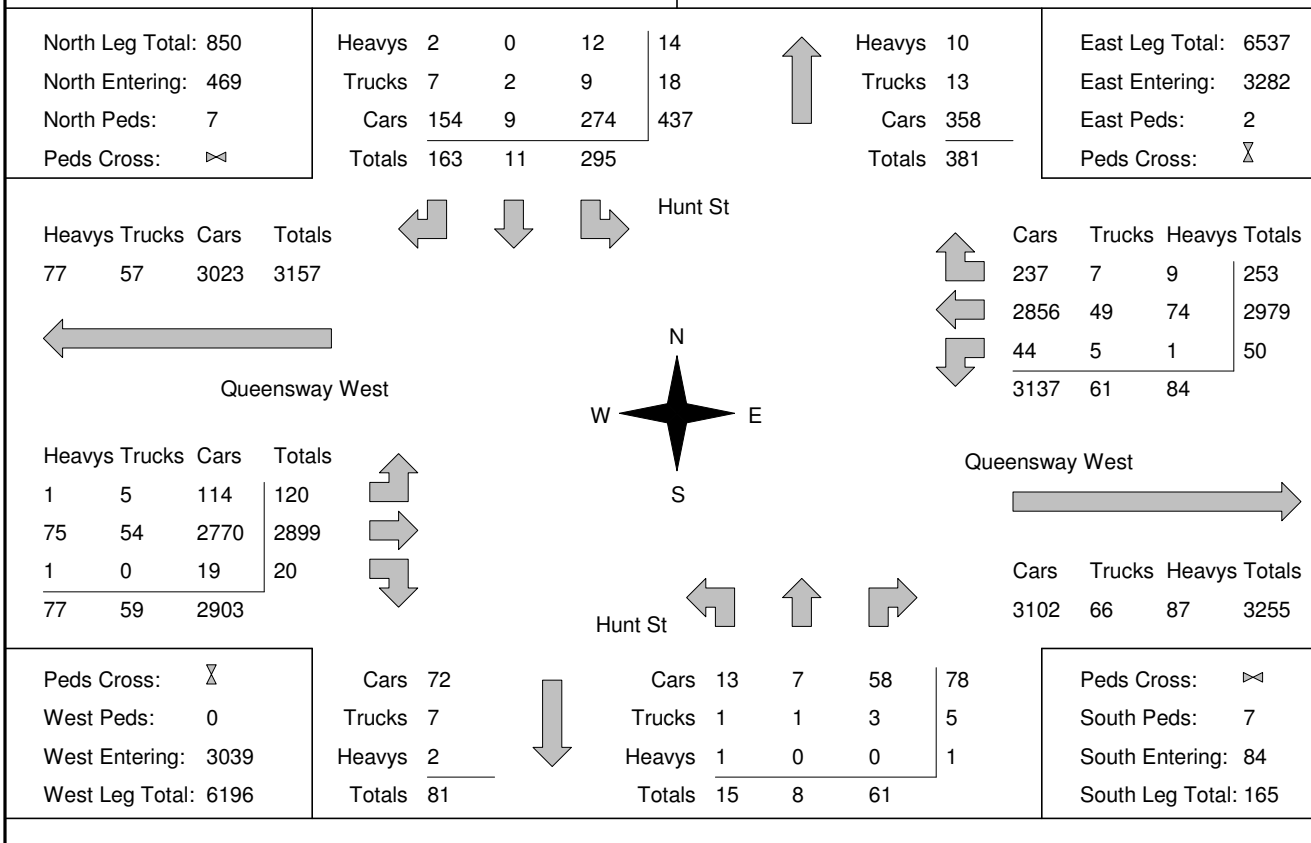
**Municipality:** Simcoe
**Site #:** 0000000001
**Intersection:** Queensway West & Hunt St
**TFR File #:** 1
**Count date:** 7-Aug-2019

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Non-Signalized Intersection ****

**Major Road:** Queensway West runs W/E




### Comments

## Appendix B

# ITE TRIP GENERATION MANUAL – 10TH EDITION REFERENCES

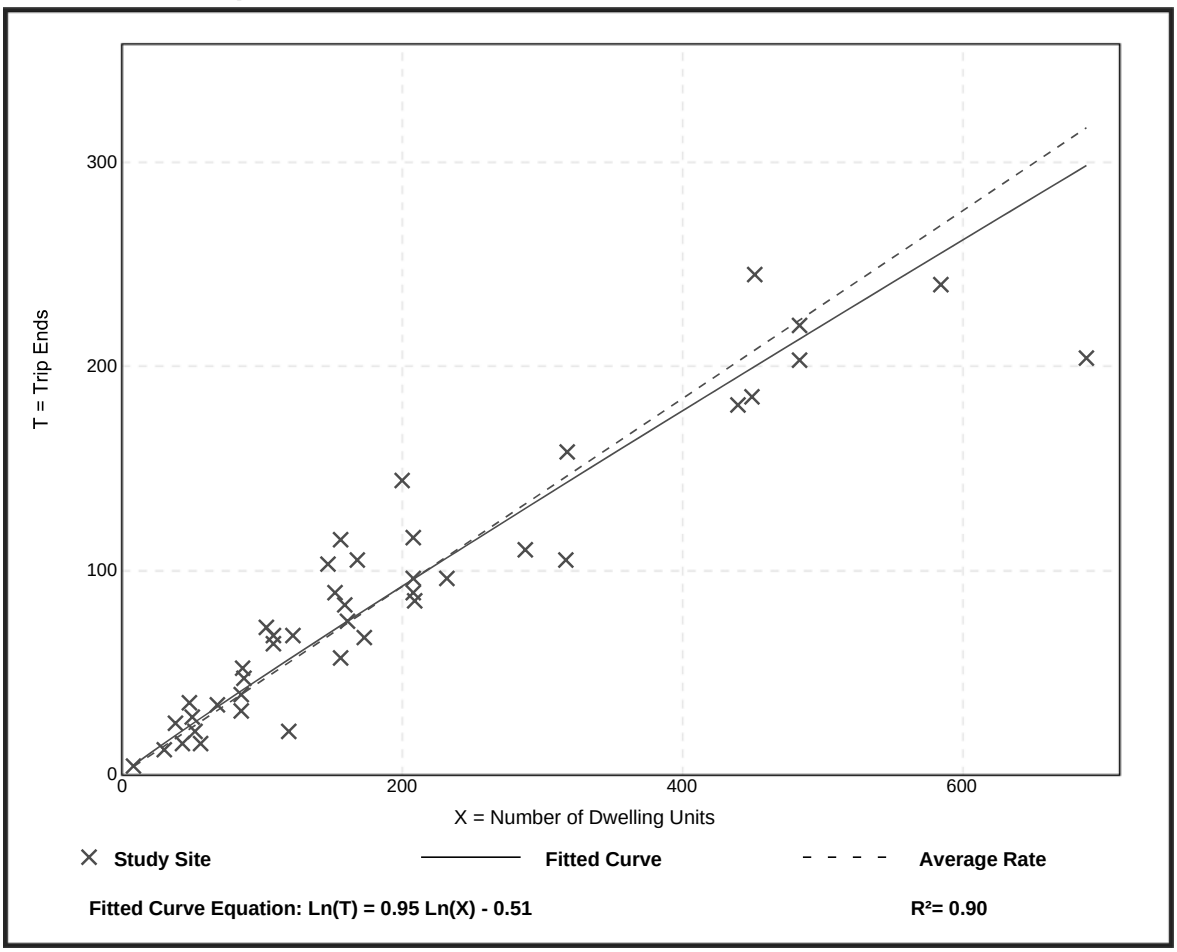
# Multifamily Housing (Low-Rise)
(220)

| | |
|---|---|
| **Vehicle Trip Ends vs:** | **Dwelling Units** |
| **On a:** | **Weekday,** |
| | **Peak Hour of Adjacent Street Traffic,** |
| | **One Hour Between 7 and 9 a.m.** |
| **Setting/Location:** | **General Urban/Suburban** |
| Number of Studies: | 42 |
| Avg. Num. of Dwelling Units: | 199 |
| Directional Distribution: | 23% entering, 77% exiting |

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.46 | 0.18 - 0.74 | 0.12 |

## Data Plot and Equation



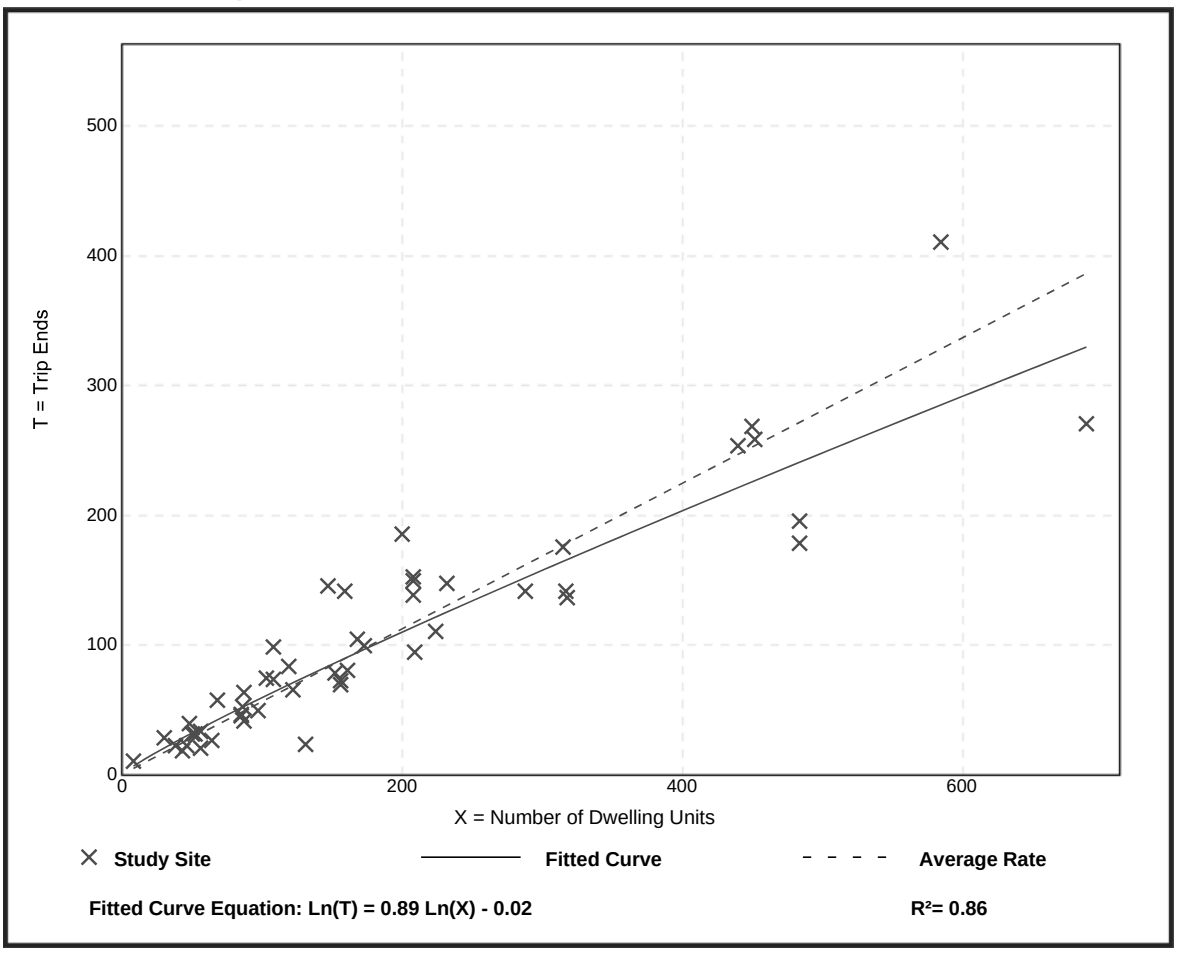
# Multifamily Housing (Low-Rise)
(220)

| | |
|---|---|
| **Vehicle Trip Ends vs:** | **Dwelling Units** |
| **On a:** | **Weekday,** |
| | **Peak Hour of Adjacent Street Traffic,** |
| | **One Hour Between 4 and 6 p.m.** |
| **Setting/Location:** | **General Urban/Suburban** |
| Number of Studies: | 50 |
| Avg. Num. of Dwelling Units: | 187 |
| Directional Distribution: | 63% entering, 37% exiting |

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.56 | 0.18 - 1.25 | 0.16 |

## Data Plot and Equation



## Proposed Site Development Trip Generation and Distribution

**Project:** 11 Elizabeth Road Traffic Impact Brief

**Site:** 11 Elizabeth Road, Simcoe, Ontario

**Assumed Land Use (1):** Multifamily Housing (Low-Rise) - ITE No. 220

**Average Vehicle Trip Ends vs.:** Dwelling Units

**ITE Trip Generation Data collected on a:** Weekday

| | | | | |
|---|---|---|---|---|
| **AM Peak Hour:** | 0.46 | = Average Rate | 23 | % Entering |
| | | | 77 | % Exiting |
| **PM Peak Hour:** | 0.56 | = Average Rate | 63 | % Entering |
| | | | 37 | % Exiting |

| Assumed Land Use (1): Multifamily Housing (Low-Rise) - ITE No. 220 | | | | |
|---|---|---|---|---|
| | **No. of Units** | **Trips Generated** | **Trips Entering** | **Trips Exiting** |
| **AM Peak** | 8 | 4 | 1 | 3 |
| **PM Peak** | 8 | 4 | 3 | 1 |

| Total Trips | | |
|---|---|---|
| | **Trips Entering** | **Trips Exiting** |
| **AM Peak** | 1 | 3 |
| **PM Peak** | 3 | 1 |

# Appendix C

# DETAILED SYNCHRO RESULTS

## Norfolk Street North at Second Avenue West
## Hunt Street North at Queensway West (Highway 3)

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 7 | 0 | 15 | 9 | 0 | 6 | 23 | 301 | 17 | 7 | 454 | 15 |
| Future Vol, veh/h | 7 | 0 | 15 | 9 | 0 | 6 | 23 | 301 | 17 | 7 | 454 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 14 | 0 | 7 | 0 | 0 | 0 | 4 | 4 | 6 | 0 | 5 | 0 |
| Mvmt Flow | 8 | 0 | 16 | 10 | 0 | 7 | 25 | 327 | 18 | 8 | 493 | 16 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 731 | 912 | 255 | 649 | 895 | 173 | 493 | 0 | 0 | 345 | 0 | 0 |
| Stage 1 | 517 | 517 | - | 386 | 386 | - | - | - | - | - | - | - |
| Stage 2 | 214 | 395 | - | 263 | 509 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.78 | 6.5 | 7.04 | 7.5 | 6.5 | 6.9 | 4.18 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.78 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.78 | 5.5 | - | 6.5 | 5.5 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.64 | 4 | 3.37 | 3.5 | 4 | 3.3 | 2.24 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 288 | 276 | 729 | 359 | 282 | 847 | 1053 | - | - | 1225 | - | - |
| Stage 1 | 480 | 537 | - | 614 | 614 | - | - | - | - | - | - | - |
| Stage 2 | 735 | 608 | - | 725 | 541 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 278 | 266 | 729 | 341 | 271 | 847 | 1053 | - | - | 1225 | - | - |
| Mov Cap-2 Maneuver | 278 | 266 | - | 341 | 271 | - | - | - | - | - | - | - |
| Stage 1 | 466 | 532 | - | 596 | 596 | - | - | - | - | - | - | - |
| Stage 2 | 708 | 590 | - | 702 | 536 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 12.9 | 13.3 | 0.7 | 0.1 |
| HCM LOS | B | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1053 | - | - | 481 | 448 | 1225 | - | - |
| HCM Lane V/C Ratio | 0.024 | - | - | 0.05 | 0.036 | 0.006 | - | - |
| HCM Control Delay (s) | 8.5 | 0.1 | - | 12.9 | 13.3 | 8 | 0 | - |
| HCM Lane LOS | A | A | - | B | B | A | A | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0.2 | 0.1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 0 | 21 | 27 | 0 | 6 | 8 | 600 | 14 | 3 | 510 | 16 |
| Future Vol, veh/h | 10 | 0 | 21 | 27 | 0 | 6 | 8 | 600 | 14 | 3 | 510 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 10 | 0 | 5 | 4 | 0 | 0 | 0 | 2 | 7 | 0 | 2 | 0 |
| Mvmt Flow | 11 | 0 | 23 | 29 | 0 | 7 | 9 | 652 | 15 | 3 | 554 | 17 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 913 | 1254 | 286 | 961 | 1238 | 334 | 554 | 0 | 0 | 667 | 0 | 0 |
| Stage 1 | 569 | 569 | - | 678 | 678 | - | - | - | - | - | - | - |
| Stage 2 | 344 | 685 | - | 283 | 560 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.7 | 6.5 | 7 | 7.58 | 6.5 | 6.9 | 4.1 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.7 | 5.5 | - | 6.58 | 5.5 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.7 | 5.5 | - | 6.58 | 5.5 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.6 | 4 | 3.35 | 3.54 | 4 | 3.3 | 2.2 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 216 | 173 | 702 | 208 | 177 | 668 | 1026 | - | - | 932 | - | - |
| Stage 1 | 455 | 509 | - | 404 | 455 | - | - | - | - | - | - | - |
| Stage 2 | 623 | 451 | - | 695 | 514 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 211 | 170 | 702 | 198 | 174 | 668 | 1026 | - | - | 932 | - | - |
| Mov Cap-2 Maneuver | 211 | 170 | - | 198 | 174 | - | - | - | - | - | - | - |
| Stage 1 | 449 | 506 | - | 398 | 449 | - | - | - | - | - | - | - |
| Stage 2 | 608 | 445 | - | 669 | 511 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 14.8 | 23.8 | 0.2 | 0.1 |
| HCM LOS | B | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1026 | - | - | 401 | 227 | 932 | - | - |
| HCM Lane V/C Ratio | 0.008 | - | - | 0.084 | 0.158 | 0.003 | - | - |
| HCM Control Delay (s) | 8.5 | 0.1 | - | 14.8 | 23.8 | 8.9 | 0 | - |
| HCM Lane LOS | A | A | - | B | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0.3 | 0.6 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 34 | 323 | 1 | 8 | 262 | 38 | 3 | 0 | 3 | 45 | 0 | 14 |
| Future Vol, veh/h | 34 | 323 | 1 | 8 | 262 | 38 | 3 | 0 | 3 | 45 | 0 | 14 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 3 | 5 | 0 | 25 | 4 | 11 | 33 | 0 | 33 | 4 | 0 | 0 |
| Mvmt Flow | 37 | 351 | 1 | 9 | 285 | 41 | 3 | 0 | 3 | 49 | 0 | 15 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 326 | 0 | 0 | 352 | 0 | 0 | 587 | 770 | 176 | 574 | 750 | 163 |
| Stage 1 | - | - | - | - | - | - | 426 | 426 | - | 324 | 324 | - |
| Stage 2 | - | - | - | - | - | - | 161 | 344 | - | 250 | 426 | - |
| Critical Hdwy | 4.16 | - | - | 4.6 | - | - | 8.16 | 6.5 | 7.56 | 7.58 | 6.5 | 6.9 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 7.16 | 5.5 | - | 6.58 | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 7.16 | 5.5 | - | 6.58 | 5.5 | - |
| Follow-up Hdwy | 2.23 | - | - | 2.45 | - | - | 3.83 | 4 | 3.63 | 3.54 | 4 | 3.3 |
| Pot Cap-1 Maneuver | 1223 | - | - | 1054 | - | - | 334 | 333 | 748 | 397 | 342 | 859 |
| Stage 1 | - | - | - | - | - | - | 501 | 589 | - | 657 | 653 | - |
| Stage 2 | - | - | - | - | - | - | 743 | 640 | - | 726 | 589 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1223 | - | - | 1054 | - | - | 316 | 317 | 748 | 381 | 326 | 859 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 316 | 317 | - | 381 | 326 | - |
| Stage 1 | - | - | - | - | - | - | 482 | 567 | - | 632 | 646 | - |
| Stage 2 | - | - | - | - | - | - | 723 | 634 | - | 695 | 567 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.9 | 0.2 | 13.2 | 14.6 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 444 | 1223 | - | - | 1054 | - | - | 439 |
| HCM Lane V/C Ratio | 0.015 | 0.03 | - | - | 0.008 | - | - | 0.146 |
| HCM Control Delay (s) | 13.2 | 8 | 0.1 | - | 8.4 | 0 | - | 14.6 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0 | 0.1 | - | - | 0 | - | - | 0.5 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 13 | 407 | 4 | 11 | 457 | 29 | 2 | 2 | 11 | 29 | 3 | 33 |
| Future Vol, veh/h | 13 | 407 | 4 | 11 | 457 | 29 | 2 | 2 | 11 | 29 | 3 | 33 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 8 | 4 | 0 | 9 | 4 | 14 | 0 | 50 | 9 | 7 | 33 | 9 |
| Mvmt Flow | 14 | 442 | 4 | 12 | 497 | 32 | 2 | 2 | 12 | 32 | 3 | 36 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 529 | 0 | 0 | 446 | 0 | 0 | 746 | 1025 | 223 | 787 | 1011 | 265 |
| Stage 1 | - | - | - | - | - | - | 472 | 472 | - | 537 | 537 | - |
| Stage 2 | - | - | - | - | - | - | 274 | 553 | - | 250 | 474 | - |
| Critical Hdwy | 4.26 | - | - | 4.28 | - | - | 7.5 | 7.5 | 7.08 | 7.64 | 7.16 | 7.08 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.5 | 6.5 | - | 6.64 | 6.16 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.5 | 6.5 | - | 6.64 | 6.16 | - |
| Follow-up Hdwy | 2.28 | - | - | 2.29 | - | - | 3.5 | 4.5 | 3.39 | 3.57 | 4.33 | 3.39 |
| Pot Cap-1 Maneuver | 994 | - | - | 1063 | - | - | 306 | 168 | 759 | 273 | 192 | 713 |
| Stage 1 | - | - | - | - | - | - | 547 | 452 | - | 483 | 450 | - |
| Stage 2 | - | - | - | - | - | - | 714 | 408 | - | 718 | 485 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 994 | - | - | 1063 | - | - | 279 | 162 | 759 | 259 | 185 | 713 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 279 | 162 | - | 259 | 185 | - |
| Stage 1 | - | - | - | - | - | - | 537 | 443 | - | 474 | 443 | - |
| Stage 2 | - | - | - | - | - | - | 662 | 401 | - | 690 | 476 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0.3 | 13.5 | 16.9 |
| HCM LOS | | | B | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 441 | 994 | - | - | 1063 | - | - | 373 |
| HCM Lane V/C Ratio | 0.037 | 0.014 | - | - | 0.011 | - | - | 0.189 |
| HCM Control Delay (s) | 13.5 | 8.7 | 0.1 | - | 8.4 | 0.1 | - | 16.9 |
| HCM Lane LOS | B | A | A | - | A | A | - | C |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0.7 |

# Geotechnical Investigation for a Proposed Development of a Residential Property at 11 Elizabeth Road, Simcoe, Ontario

## Report # 5422 – Eqdaih Simcoe Geotech
## July 2, 2020

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# 1.0 INTRODUCTION

## 1.1 Proposed Construction

Mr. Mohammed Eqdaih (the Client), retained the services of A & A Environmental Consultants Inc. (A&A), to conduct a geotechnical investigation for a proposed development of potentially eight townhouse units on a property located at 11 Elizabeth Road, Simcoe, Ontario. A total number of eight boreholes were advanced and sampled for this geotechnical investigation. The information obtained is used to provide recommendations that will allow for the design of foundations and pavements at the site. See Section 4.0 for additional details of the proposed development.

## 1.2 Purpose and Limitations of Report

The purpose of this study is to provide geotechnical information, recommendations and comments for the design and construction of the proposed development. The number of boreholes has been selected to provide representative information sufficient to determine parameters needed for design, specifications and construction of the proposed development. Conditions elsewhere near or beneath the footprint of the structures may be found to differ, during construction, from those at the borehole locations. Should this occur, the contractor should contact the design engineer for recommendations as how to best proceed and what changes if any, should be made.

The information in this report is intended for this specific proposed structure and has been prepared for the client, and their nominated engineers and designers. It is assumed that the designers will use all appropriate contemporary standards, governing regulations, and codes in the performance of their work. Third party use or reproduction, in part or in full, of this report is prohibited without written authorization from A&A. This report is also subject to the Statement of Limitations which from an integral part of this document.

## 1.3 Liaison during design and/or Construction

On-going liaison with A&A during the final design and construction phases of the project is recommended to confirm that they are in keeping with the intentions of this report.

# 2.0 SCOPE OF WORK

## 2.1 Proposed Scope of Work

The scope of work for the geotechnical investigation of the proposed development is as follows:

- Advance five boreholes to explore the subsurface soil and groundwater conditions at the subject site. All five boreholes will be advanced to a maximum depth of 7.62 meters below ground level(mbgl) or 25 feet below ground level (fbgl).
- Conduct three In-Situ tests by advancing three boreholes to a maximum depth of 8.69 mbgl or 28.5 feet below ground level (fbgl) to obtain shear strength information of the soil.
- Submit one select soil sample to a geotechnical laboratory to provide information for the soil samples recovered.
- Prepare a geotechnical report summarizing the results of the field investigation and laboratory testing program, to include discussion of specific concerns that need to be addressed during design and/or construction. Specifically, the report is to include:
    - Site plan showing locations of the boreholes;
    - Borehole records;
    - Recommendations for:
        - Site preparation;
        - Construction dewatering if required;
        - Earthworks;
        - Potential reuse of existing fill materials and/or native soils indicated in the boreholes;
        - Excavation requirements;
        - Geotechnical resistances for foundation designs at ULS and SLS conditions;
        - Lateral earth pressure coefficients for existing soils and typical imported materials;

# 3.0 SITE DESCRIPTION

## 3.1 Current Land Use and Location

The subject property is zoned 'Service Commercial SC(H)' according to the Norfolk County Zoning By-law (Figure 1, Appendix A). The approximate UTM coordinates of the site are Zone 17T; 556362 m Easting and 4743882 m Northing. The area inspected is rectangular in shape. The subject site is an irregular shaped property on the east side of Elizabeth Road and is currently a vacant lot.

## 3.2 Topography and Drainage

The topographic map shows the subject site at an elevation of 215 metres above sea level (masl) (Figure 5). The surrounding area has a range of 212 masl to 215 masl. The site itself is located at the east side of Elizabeth Road. Surface water is expected to infiltrate the permeable ground surface and/or flow towards the catchment basins located along Elizabeth Road. The site gently slopes from Elizabeth Road toward to the northwest. Based on the topography the groundwater is inferred to flow towards Sutton's Pond and Lynn Valley Creek in a northwest direction.

# 4.0 PROPOSED DEVELOPMENT

According to the concept plan, it is understood that the proposed residential property will potentially consist of the following:

- Eight two-storey townhouse units with an approximate total area of 620 $m^2$
- Parking spaces;
- There will be one access points to the subject site, off of Elizabeth Road.

The general arrangement of the proposed development is illustrated in Figure 2, Appendix A.

# 5.0 METHOD OF INVESTIGATION

## 5.1 Field Investigation

A&A engaged a utility locating company to map locations of public and private underground utilities. A&A then scheduled the drilling of boreholes for sampling in accordance with the borehole drilling and sampling plan.

The geotechnical investigation for the planned development consisted of the following activities:

- On May 12, 2020, A&A attended the site located at 11 Elizabeth Road, Simcoe, Ontario, for a geotechnical investigation. During this time A&A advanced five boreholes across the subject site (BH-1 to BH-5) using continuous-flight augers with a rotary drill to explore the soil type and stratification, and groundwater level, based on the site plan provided by the client at that time.
- On June 15, 2020, A&A attend the site based on a new site plan configuration to preform additional geotechnical work. During this time, A&A advanced three boreholes (BH-201 to BH-203) using a track mounted drill unit with solid stem augers. Split spoon samplers were used for standard penetration tests and to o btain soil samples from the boreholes. The stratigraphy in each borehole was recorded in the field at regular intervals and samples collected by the A&A personnel. See Table 1 for each borehole advanced depth and location. Figure 4 in Appendix A depicts the locations of the boreholes in relation to the proposed development.
- One sample was selected for geotechnical analysis as the lithology and soil conditions across the site were uniform. All geotechnical boreholes were refilled with low-permeability bentonite pellets.

**Table 1 – Borehole Advanced Depths and Location**

| Borehole | Location | Depth (m) |
|---|---|---|
| BH-1 | South area of middle part of the subject site, within the proposed footprint of building units. | 7.62 |
| BH-2 | East corner of middle part of the subject site, within the proposed footprint of building units. | 7.62 |
| BH-3 | West area of the middle part of the subject site, within the proposed footprint of building units. | 7.62 |
| BH-4 | Northeast corner of middle part of the subject site, within the proposed footprint of building units. | 7.62 |
| BH-5 | Northwest corner of middle part of the subject site, within the proposed footprint of building units. | 7.62 |
| BH-201 | South area of middle part of the subject site, within the proposed footprint of building units. | 8.38 |
| BH-202 | West area of the middle part of the subject site, within the proposed footprint of building units. | 8.69 |
| BH-203 | North area of the middle part of the subject site, within the proposed footprint of building units. | 7.62 |

## 5.2 Sampling Procedures

Select sample recovered from the geotechnical investigation were, submitted to Orbit Engineering Inc. (Orbit), a certified geotechnical and materials testing laboratory. The scope of the geotechnical laboratory testing program includes the following:

- In-situ water content per ASTM D2216;
- Grain size analyses per ASTM D422 & D2217;
- Atterburg Limits per ASTM 4318;
- Standard Proctor – ASTM D698

The results of the laboratory tests are discussed in the text of this report. The results of the moisture content tests are shown on the Borehole Records in Appendix B. The results of the grain size distribution tests are also shown on the borehole records (Appendix B) and are illustrated in Appendix C.

# 6.0 LABORATORY TESTING AND RESULTS OF INVESTIGATION

## 6.1 Subsurface Conditions Overview

The borehole logs provided in Appendix B summarize the soil types observed during drilling. Explanation of the symbols and terms used to describe the borehole records are also included in Appendix B.

The select bagged sample taken from BH-5 was analyzed for natural moisture content, grain size analysis, Atterberg limits, and Standard Proctor.

It should be noted that the boundaries between the strata on the borehole records have been inferred from drilling observations and non-continuous sampling. The boundaries generally represent a transition from one soil type to another and should not be inferred to represent an exact plane of geological change. Further, conditions will vary between and beyond the boreholes.

All boreholes were terminated due to being below the intended foundations of the proposed development. The strength variations are detailed in the borehole logs in Appendix B.

The combination of lab results and standard penetration test N values (blows/foot) were then used to estimate geotechnical resistance values. This translation was based on generally accepted, recorded correlations from thousands of similar tests. Soil characteristics for each hole may be found in Appendices B & C.

## 6.2 Detailed Summary

All eight boreholes revealed underlain the surface to be characterised as follows:

- **Subbase**

  All of the boreholes encountered a layer of subbase at the ground surface. The thickness of the topsoil layer ranged from approximately 0 – 30 cm. The subbase layer was light gray in colour, dry and had no odour in any of the boreholes.

- **Silt and sand trace clay**

  After the subbase material, a silt and sand deposit with trace clay was found in all boreholes at a depth between 0.3 mbgl to 8.7 mbgl. This was dark grey to brown in colour, moist to wet and had a hydrocarbon odour in all of the boreholes. The SPT-N values within the silt and sand trace clay layer varies within a wide range of 2 to 22 within the zone of major stressing of foundations. Based on the laboratory and in-situ test results, the soil of this composition will behave geotechnically much like a cohesionless soil. It should be noted that the hydrocarbon odour can be a sign of petroleum contamination, which can affect the soils physical properties.

## 6.3 Summary of Subsurface Conditions to Anticipated Depths of Construction

In the following tables (Tables 2–5), the relevant properties of the various deposits are briefly described. For details of the subsurface conditions, reference should be made to the individual borehole logs. The "Notes on Sample Description" preceding the borehole logs are an integral part of and should be read in conjunction with this report. Note that microstructural transformation of the soil could occur based on the hydrocarbon odours and could have a significant effect on its liquid limit and plastic limit.

**Table 2 – Typical Values of Moisture Content**

| BH # | Sample Depth (m) | Soil Description | Water Content (%) |
|---|---|---|---|
| BH-5 | 0.76 – 1.52 | Silt and Sand, trace Clay | 16.00 |

**Table 3 – Typical Values of Atterburg Limits (%)**

| BH # | Sample Depth (m) | Soil Description | Atterburg Limits | | |
|---|---|---|---|---|---|
| | | | $W_L$ | $W_P$ | $I_P$ |
| BH-5 | 0.76 – 1.52 | Silt and Sand, trace Clay | 17.10 | 12.80 | 4.30 |

**Table 4 – Sieve and Hydrometer Analysis**

| BH # | Grain Size Content % | | | | Sample Depth (m) | Sample Description |
|---|---|---|---|---|---|---|
| | Gravel | Sand | Silt | Clay | | |
| BH-5 | 0 | 47 | 46 | 7 | 0.76 – 1.52 | Silt and Sand, trace Clay |

**Table 5 – Standard Proctor Test**

| BH # | Max Dry Density (kg/m3) | Optimum Moisture (%) |
|---|---|---|
| BH-5 | 1961 | 10.3 |

## 6.4 Summary of SPT testing

Summary of the SPT test results for the variation of N values with depth is presented in Table 6. Within the zone of major stressing of foundations for the proposed development, the cohesionless soil of very loose to compact in consistency was observed based on the in-situ testing measurements. The results obtained from the investigation indicate increase in shear strength of the soil with depth.

**Table 6 – Variation of N value with Depth**

| Depth (mbgl) | SPT N values (blows/300 mm penetration) | | |
|---|---|---|---|
| | BH-201 | BH-202 | BH-203 |
| 0.0 to 0.46 | 28 | 44 | 30 |
| 0.76 to 1.22 | 12 | 5 | 2 |
| 1.52 to 1.98 | 5 | 3 | 7 |
| 2.29 to 2.74 | 2 | 6 | 6 |
| 3.05 to 3.35 | 13 | 15 | 14 |
| 3.81 to 4.27 | 22 | 10 | 16 |
| 4.57 to 5.03 | 14 | 10 | 8 |
| 5.33 to 5.79 | 12 | 10 | 20 |
| 6.10 to 6.55 | 19 | 13 | 49 |
| 6.71 to 7.16 | 44 | 49 | 51 |
| 7.62 to 8.08 | 44 | 35 | --- |
| 8.38 to 8.84 | --- | 42 | --- |

## 6.5 Groundwater Conditions

Groundwater and surface water are expected to flow towards the natural slope of the ground surface. The site is mostly flat with slight sloping towards the northern boundary of the subject site. During the drilling, water levels were found between 2.5 to 3.0 mbgl. Groundwater levels are not anticipated to have stabilized during the short term of the investigation. Seasonal variations in the water table should be anticipated, with higher levels occurring during wet weather conditions and lower levels occurring during dry weather conditions.

# 7.0 DESIGN DISCUSSION AND RECOMMENDATIONS

## 7.1 General Considerations

The comments provided in this report are intended only for the guidance of engineers, architects and contractors with a good knowledge of geotechnical designs. The numbers of boreholes investigated are within the recommended number for a subject site that demonstrates consistent sub surface characteristics. Contractors and/or subcontractors bidding on or undertaking the work should, in this light be reasonably assured that conditions will not vary significantly. They may seek permission from owners to access the site for their own type of investigations, as well may make their own interpretations of the factual borehole results contained in this report. The following general comments are provided with respect to the conditions encountered and the intended scope of development.

The main concern in the subject site is that the soil and groundwater is contaminated. The contamination in the groundwater system can result in complex dispersal and plume patterns, which is a long-term source of subsurface contamination which may cause environmental concern. Additionally, physical properties of the soil (such as Atterberg limits, shear strength parameters) may be affected due to the contamination. Note that the soil condition may change with time due to the possible complex plume pattern that can affect the recommendations provided in this report. On-going liaison with A&A during the final design and construction phases of the project is highly recommended.

## 7.2 Foundation

It should be noted that limited design information was available at the time of this report. Due to soil condition at the subject site, the townhouse building must be supported either by end-bearing pile or compacted engineered fill to replace the existing contaminated soil.

In accordance with the 2010 National Building Code of Canada (NBCC), the use of Limit States Design (LSD) is required for the design of buildings and their structural components including foundations. The limit states of LSD design are classified into two groups; the Ultimate Limit

States (ULS) and the Serviceability Limit States (SLS). The recommended geotechnical resistances for the building foundations are presented for ULS and SLS conditions.

For foundation design this ultimate resistance value is reduced using a Geotechnical Resistance Factor, $\Phi$, which is based on the reliability index of the geotechnical data used to determine the ultimate resistance for the foundation loading case. The resistance factor values presented on Table 7 should be used for foundation design.

**Table 7 – Geotechnical Resistance Factors for Foundations**

| Geotechnical Case | Resistance Factors, $\Phi$ |
|---|---|
| **SHALLOW FOUNDATION** | |
| Vertical resistance by semi-empirical analysis and in-situ test data | 0.5 |
| Horizontal resistance against sliding (based on friction) | 0.8 |
| **DEEP FOUNDATIONS (PILES)** | |
| Vertical resistance by semi-empirical analysis and in-situ test data | 0.4 |
| Vertical resistance from analysis of dynamic monitoring results | 0.5 |
| Vertical resistance from analysis of static load test results | 0.6 |
| Uplift resistance by semi-empirical analysis and in-situ test data | 0.3 |
| Uplift resistance from analysis of static load test results | 0.4 |
| Lateral load resistance | 0.5 |

The values given for Serviceability Limit States (SLS) geotechnical resistances are based on settlement values of less than 25 mm. Total differential settlements within a building should also be less than 19 mm.

### 7.2.1 Shallow Foundation

The ultimate bearing capacity for a shallow foundation in the soil with the estimated shear strength parameters is calculated for a square footing with a minimum width of $B = 1\,m$. The proposed townhouse buildings may be founded between 1.2 mbgl and 1.5 mbgl and designed for a geotechnical resistance provided in Table 8 at SLS (assuming 25 mm of settlement) and factored ultimate bearing resistance at ULS. Factored geotechnical bearing resistance at ULS is

calculated by applying the geotechnical resistance factor of $\Phi = 0.5$ for shallow foundation designs. The minimum footing width should be 1.0 m regardless of bearing capacity considerations. The contaminated soil below the footing can either be removed and replaced by engineered fill, or a grade raise to 1.2 mbgl be considered. To create a stable working surface and minimize the settlement, OPSS Granular A or equivalent compacted to 100% Standard Proctor Maximum Dry Density (SPMDD) should be placed in maximum 200 mm loose lifts.

**Table 8 – Recommended Geotechnical Resistance Values**

| Borehole | Development | $\Phi q_{ult}$ at ULS (kPa) | $q_{all}$ at SLS (kPa) |
|---|---|---|---|
| BH-201 to 203 | Townhouse Units* | 326 | 204 |
| *The sandy silt soil deposit must be replaced by engineered fill as explained above, or a grade raise to 1.2 mbgl to be considered. | | | |

The un-factored horizontal resistance of the shallow foundations to sliding can be calculated using the following un-factored coefficient of friction:

- 0.30 between new engineered fill consisting of OPSS Granular A or B (Type II) and precast concrete

In accordance with Table 7, a resistance factor against sliding of $\Phi = 0.8$ should be applied to obtain the resistance at ULS.

Prior to pouring concrete for the footings, the footing subgrade should be cleaned of all deleterious materials such as topsoil, fill, softened, disturbed or caved materials, as well as any standing water. If construction proceeds during freezing weather conditions, adequate temporary frost protection for the footing bases and concrete must be provided. Native soils and engineered fill materials tend to weather rapidly and deteriorate on exposure to the atmosphere and surface water. Hence, foundation bases which remain open for an extended period of time should be protected by a skim coat of lean concrete. It is recommended that all excavated footing bases must be evaluated by a qualified geotechnical engineer to ensure that the founding soils exposed at the excavation base are consistent with the design bearing pressure intended by the geotechnical engineer.

The exposed subgrade should be proof-rolled to minimize differential settlement and to increase the bearing capacity. During the excavation, if loose material is found at the foundation level, the contractor is to remove all the loose material (until the dense soil is reached) and replace it with engineering fill granular material. Given this scenario, a conventional spread footing placed at this level should be founded on engineered fill if it is to have appropriate support. This engineered fill must consist of approved OPSS Granular A or equivalent materials compacted to 100% SPMDD. If a grade raise is considered, the proof-rolled and compacted surface of the existing native soils will provide a satisfactory base for the placement and compaction of the engineered fill. Full-time supervision and in-situ density testing should be carried out by a geotechnical engineer during placement of engineered fill beneath all structures and settlement sensitive areas.

Backfilling of foundations shall be carried out with approved OPSS Granular B material provided. It can be placed in maximum 300 mm loose lifts and compacted to a minimum of 98% SPMDD. Filling should continue until the design subgrade elevations are obtained.

### 7.2.2 Deep Foundation

Within the footprint of the two-storey townhouse buildings, soils at about 1.2 m depth below existing grade within the influence zone are generally in a very loose to compact condition and will not sustain building loads on conventional strip and spread footings without excessive settlements. Additionally, the petroleum hydrocarbons could have some effects on the shear strength of the subsurface soils and these soils may be marginally suitable for strip and spread footing foundations. Accordingly, pile foundations are recommended for the two-storey townhouse buildings, if the contaminated soil is not to be replaced with compacted engineered fill.

Suitable foundation options for the townhouse units include driven precast concrete pile and driven steel piles. Precast concrete end bearing piles are considered suitable for this project. The use of drilled cast-in-place piles would likely be less feasible given the potential for sloughing soils and extensive seepage. Alternative options can be considered once the final design is known.

#### 7.2.2.1 Axial load resistance

In general, piles under compressive axial load derive their load-carrying capacity from both toe and shaft resistance. However, because the displacement required to mobilize end-bearing and shaft resistance are different, it is common practice to consider only one of the resistance components: either toe resistance or shaft resistance. A pile driven in the cohesionless soil contaminated with petroleum products derives its capacity almost entirely from toe resistance, and hence, the pile bearing resistance under the axial load must be calculated based on toe resistance only.

As stated, a foundation system suitable to support the proposed townhouse units may be a system of driven precast concrete friction piles. The precast concrete piles may be designed based on the factored toe bearing resistance values estimated from the SPT test results.

Driven steel piles may be alternatively used to support the building structure. Driven steel piles typically consist of open or closed end pipe piles, or H-piles. Closed end pipe piles would be expected to meet suitable penetration resistance and may be the preferred driven steel pile solution.

The steel pipe pile with a minimum diameter of 300 mm and a minimum thickness of 9 is recommended to be driven to at least 7 to 8 m below final grade depending on the pile cap elevations; the perimeter piles caps would be deeper due to frost protection requirements.

The ultimate geotechnical axial capacity of a single pile in the cohesionless soils can be estimated from the results of the SPT. The ultimate factored toe bearing resistance for driven piles below 7.0 m is estimated 2152 kPa using the SPT test results. Due to the SPT test limitations, a geotechnical resistance factor of $\Phi = 0.3$ is used to calculate factored value for the ultimate bearing resistance. The factored tensile bearing resistance of 1614 kPa can be used for the piles under tensile loads at ULS.

For axial loading conditions, the SLS resistance is addressed by determining the limiting load to maintain foundation settlements below the allowable limits under service loads. Basically, the foundation loads, configurations and serviceability tolerances should be known to properly calculate geotechnical SLS resistance values. For the recommended driven concrete pile with $d =$

$0.7\ m$ and $L = 7.5\ m$, however, the factored resistance load at SLS is calculated to be 504 kN. For the driven steel pile with $d = 0.3\ m$ and $L = 7.5\ m$, the factored resistance load at SLS is calculated to be 126 kN. In general, the SLS case could govern foundation design based on their dimensions. The settlement potential of the proposed foundation should be checked once foundation design and loading conditions are finalized.

Other design and construction recommendations for driven precast concrete and steel piles are as follows:

- Pre-boring to a depth of approximately 2 m should be considered for all driven piles to enhance pile alignment and to limit vibrations for existing structures. The pre-bored hole diameter should be slightly larger than the nominal pile diameter. All piles should be driven continuously to their required depth once driving is initiated.
- The piles should not be driven beyond practical refusal to avoid over stressing the steel section. The practical refusal criteria should be determined prior to piling once the hammer energies and pile details are known. For preliminary purposes, 10 blows per 25 mm for the last 250 mm can be used. The hammer type and energy should be matched to achieve this termination set at refusal to avoid potential over driving which may be harmful to the driving equipment.
- For steel pile, the driving energies and driving criteria should be determined based on wave equation analysis (WEAP) for the proposed equipment. For preliminary purposes, steel piles should be driven using maximum hammer energies of 450 to 600 J per square centimetre of pile cross section. For precast concrete, a hammer capable of delivering a minimum rated energy of 40 KJ per blow should be used.
- The steel piles should be inspected prior to installation to confirm that the appropriate material specifications are satisfied; and to check that there are no protrusions on the shaft or at the tip which could result in voids along the shaft as the pile is driven.
- Monitoring of the pile installation by experienced geotechnical personnel is recommended to confirm that the piles are installed in accordance with design assumptions and that the driving criteria are satisfied. A complete driving record of blows

per 250 mm of penetration for each pile should be obtained and reviewed by the pile designer.

- Corrosion is seldom a problem for steel piles driven into natural soil. Steps should be taken to protect the piles when these conditions occur. Solutions include the application of coatings (such as coal tar epoxy) before driving, encasement by cast-in place concrete jackets, cathodic protection, specification of copper content in the steel, or combinations of these. A common practice is to increase the steel section, typically by 1.5 mm, to provide an allowance for corrosion.
- Piles driven through new fills should be assumed to have a down-drag (negative skin friction) equal to 15 kPa for the section of pile shaft within the fill. Down drag is not part of the ULS pile analysis. Down drag is an ultimate load that should be used for the structure check in the pile section and the SLS check for any settlement of sensitive component.
- Pile spacing should not be less than three pile diameters, measured center to center. Where groups of piles are to be installed, the piles should be installed starting at the center with outer piles installed last. The elevations of the tops of piles already installed should be monitored as adjacent piles are driven in order to determine if heaving of the piles has occurred. Piles that have heaved must be re-driven. If groups of piles are installed at a pile spacing less than the minimum, a group reduction factor must be applied to the capacity of each pile. Group reduction factor values can be provided upon request. A&A should be contacted to review the requirement for a group reduction factor.

#### 7.2.2.2 Lateral load resistance

Considering limit states design, lateral loading on piles is generally a serviceability limit state for geotechnical design as maximum tolerable displacements are reached before the ultimate geotechnical capacity. This section describes the general considerations and methodology for designing driven piles for the lateral loading, which is a SLS. The SLS condition describes the load-deformation behaviour of the pile, as it relates to serviceability of the structure.

Lateral displacement of the pile within the soil and lateral displacement of the pile may be determined based on the pile-soil interaction behaviour, expressed as p-y curves (where “p” is unit load or resistance and “y” is lateral deflection). The load transfer curves (p-y curves) can be taken from selected soil profiles. The p-y curves in soil are nonlinear and are generally based on semi-empirical methods, where data collected from pile lateral load tests are used to calibrate algorithms based on theoretical solutions to a beam-column supported on soil.

## 7.3 Frost Considerations

For any shallow structures, all exterior foundations and foundations in unheated areas must be provided with a minimum soil cover of 1.2 m or equivalent insulation for frost protection. The foundation depths recommended below are with respect to final grading levels. A perimeter drain tile, leading to an outward discharge, should be placed at the exterior face of the foundation wall where any high-water table can cause freeze thaw damage or unacceptable infiltration to the foundation.

Piles supporting components in unheated structures may be subject to upward frost jacking forces. For these foundations, the frost pressures are likely to develop along pile shafts, and along the underside and sides of pile caps or grade beams. If not properly resisted, frost uplift forces may cause irrecoverable vertical movement in the pile and may lead to impaired functionality of the structure. All pile caps/grade beams in unheated areas such as loading docks and exterior structures should be provided with 2.0 m of soil cover for frost protection or equivalent insulation. It is recommended that a compressible material, such as “voidform” (or equivalent), be placed between the underside of the pile cap or grade beam and the soil. In such a case, uplift pressure acting on the underside of the pile caps or grade beams may be taken as the crushing strength of the compressible medium. The minimum thickness of the “voidform” should be 150 mm. The finished grade adjacent to each pile cap or grade beam should be capped with clay, and sloped away, so that surface runoff is not allowed to infiltrate and collect in the void space. If water is allowed to accumulate in the void space, then full frost heaving pressures will likely occur on the underside of the pile caps and grade beams. Note that all piles should be structurally designed to resist frost heave forces if the piles are allowed to freeze during construction.

## 7.4 Slab-On-Grade Floor Using Engineered Fill

Prior to construction of the floor slab, all topsoil, construction debris and deleterious materials must be removed from the ground surface. The floor area should then be raised to within 200 mm underside of the floor slab using OPSS Granular B engineered fill or equivalent, placed in maximum 300 mm loose lifts and compacted to 98% SPMDD. To create a stable working surface and to distribute loadings, compacted OPSS Granular A or equivalent should be placed over the Granular B materials, below all floor slabs. The compacted OPSS Granular A or equivalent should be 200 mm thick at minimum, compacted to 100% SPMDD.

Floor slabs below unheated buildings or equipment should be provided with adequate insulation to prevent cracking from potential frost heave unless the compacted Granular A base is placed on clean limestone bedrock. A 100 mm thickness of high-density Styrofoam insulation, extending horizontally 1.8 m beyond the building/slab footprint, should be adequate to prevent frost heave where necessary.

For preliminary design, the module of vertical subgrade reaction ($K_s$) for granular material over the encountered subgrade materials is approximated to be $20\ MN/m^3$. This value should be modified by appropriate shape and depth factors to determine the vertical sub grade modulus ($K_s$) for slabs and bases.

## 7.5 Earthquake Design Parameters

The parameters for determination of the Site Classification for Seismic Site Response are set out in Table 4.1.8.4.A of the 2012 Ontario Building Code (OBC). The classification is based on the determination of the average shear wave velocity in the top 30 metres of the site stratigraphy, where shear wave velocity ($V_s$) measurements have been taken. In the absence of such measurements, the classification is estimated on the basis of empirical analysis of un-drained shear strength or penetration resistance. The applicable penetration resistance is that which has been corrected to a rod energy efficiency of 60% of the theoretical maximum or the ($N_{60}$) value.

Based on the SPT-N values from borehole information, the subsurface stratigraphy generally comprises of soft soil. On this basis, the site designation for seismic analysis is **Class E** according to Table 4.1.8.4.A from the quoted code.

## 7.6 Lateral Earth Pressure on Walls

The structures should be designed to withstand lateral earth pressure using the following equation:

$$p = k(\gamma h + q)$$

Where *p* is lateral earth pressure, *k* is coefficient of lateral earth pressure assumed to be 0.5 for at-rest condition, $\gamma$ is backfill unit weight assumed to be 20 $kN/m^3$, *h* is depth from the ground surface and *q* is surcharge at ground surface adjacent to the wall. The above expression assumes that backfill consisting of free-draining granular material with a drainage system to prevent the build-up of hydrostatic pressure behind the wall. The granular backfill should be compacted to at least 98% SPMDD, placed in maximum 200 mm lifts.

## 7.7 Groundwater Control

For foundation excavations extending below the groundwater level, it will be necessary to lower and maintain the groundwater level below the excavation base. As described in the section 6.5, the water levels were observed between 2.5 to 3.0 mbgl. If the developer considers a basement from the proposed development, the basement foundation needs to be above the groundwater level, in order to avoid any off-site water discharge.

## 7.8 Site Grading and Engineered Fill Construction

Site grading operations involving "cut and fill" procedures in the order of $\pm 1$ m are expected through the site. It is recommended to construct engineered fill in areas to be raised in order to suitably support the infrastructure servicing and lightly loaded building structures.

It is noted that topsoil stripping operations should be conducted when the ground is not wet and will support large scale construction equipment. Over-stripping can result when the ground

conditions are wet and unstable.

Inorganic onsite native soil deposits from potential "cut" areas may potentially be reused to construct engineered fill capable of supporting building structures and infrastructure servicing. The natural moisture content of the "cut" soils to be used as engineered fill should be within 2% below their optimum moisture contents to achieve the specified degree of compaction.

Any shortfall of fill material required for site grading operations may be made with similarly graded imported soils for the various purposes described above. It is recommended that any proposed imported source materials be tested prior to importing, in order to ensure that the environmental quality of the imported fill meets all environmental approval criteria and to ensure that the natural moisture content of the fill is suitable for compaction.

It is recommended that engineered fill construction be conducted during the summer and early fall months when drier warmer weather conditions typically exist as the onsite soils are sensitive to moisture and will become difficult to handle and compact to the specified degree of compaction when wet.

The onsite deposits are frost-susceptible. Constructing engineered fill, backfilling footings, foundation walls and service trenches using these finer grained soils during the winter months is not advisable, unless suitable weather conditions prevail, the soils are at suitable moisture content, and strict procedures are followed and monitored on a full-time basis by the geotechnical engineer.

The onsite soils are susceptible to softening and deformation when exposed to excessive moisture and construction traffic. As a result, it is imperative that the grading/filling operations are planned and maintained to direct surface water run-off to low points and then be positively drained by suitable means. During periods of wet weather, construction traffic should be directed along the designated construction routes so as not to disturb and rut the exposed subgrade soil. Temporary construction roads consisting of clear crushed material (such as crushed stone or recycled concrete) may be required during poor weather conditions such as a wet spring or fall.

## 7.9 Site Servicing

### 7.9.1 Excavation Conditions

It is anticipated that municipal water-main and sewer servicing will generally be in the range of 2 to 4 m below final design grades. Excavation side slopes should comply with the current "Regulations for Construction Projects under the Ontario Occupational Health and Safety Act". The native or re-compacted fill soils can be generally classified as Type 4 soils. Excavation in the Type 4 soils may be sloped from its bottom with a slope having a minimum gradient of one vertical to three horizontal units. The excavation side slopes should be suitably protected from erosion processes. For the conventional excavation depth, it is not anticipated to encounter major water flow into the excavation. Should unstable and/or wet conditions be encountered, side slopes are to be flattened to a stable configuration. The geotechnical engineer should be retained to examine and inspect cut slopes to ensure construction safety.

### 7.9.2 Pipe Bedding

The native and re-compacted fill soil will generally provide suitable subgrade support to sewer and watermain servicing provided that the integrity of the base of the trench excavations can be maintained during construction. Any unsuitable soils exposed at the pipe subgrade should be sub-excavated and replaced with a minimum 150 mm bedding thickness of OPSS Granular A, compacted to at least 98% SPMDD. The bedding requirements for the services should be in accordance with Ontario Provincial Standard Drawings (OPSD) standards and the local municipality's standards. Granular A should be used to backfill around the pipe to at least 150 mm above the top of the pipe. From the springline to 300 mm above the obvert of the pipe, sand cover shall be used. Particular attention should be given to ensure material placed beneath the haunches of the pipe is adequately compacted.

### 7.9.3 Trench Backfill

Backfilling of service trenches under proposed pavement areas shall be carried out using approved imported soils or imported OPSS approved Granular B materials provided it can be placed in maximum 300 mm lifts and compacted to a minimum of 98% SPMDD. The onsite fill

materials may not meet compaction requirements or may contain substantial amounts of silt and therefore, are not considered suitable to be used as backfill. It is expected that most material will have to be imported. Materials such as organic soils, contaminated soils, overly wet soils, boulders and frozen materials (if work is carried out in the winter months) should not be used for backfilling. Backfilling operations should follow closely after excavation so that only a minimal length of trench slope is exposed at any one time to minimize potential problems. This will potentially minimize over-wetting of the subgrade material. Particular attention should be given to make sure frozen material is not used as backfill should construction extend into the winter season.

Proctor compaction tests must show that the soil is capable of being compacted to a satisfactory density; results submitted to A&A for approval and then be delivered on site within 2% of its optimum moisture content. Materials that have been imported and approved for use that are stored onsite should be maintained within 2% of their optimum moisture content. They should also be protected from the weather with tarps.

### 7.9.4 Pavement Structures (Parking Areas and Access Roads)

It is our understanding from the proposed development that new driveways and parking areas will be constructed for this project. The subgrade for pavement structures is generally expected to consist of silt and sand and potentially engineered fill. The recommended pavement structure is outlined in Table 9, based on the anticipated traffic volume and subgrade conditions. No traffic study was available at the time of this report, consequently, the recommended pavement structure should be considered for preliminary design purposes only.

It is assumed that pavement construction will be carried out under dry periods and the subgrade will be stable under the load of construction equipment. If the subgrade is unstable or wet, additional thickness of subbase course material may be required. It should be noted that the recommended pavement structure is not intended to support heavy construction vehicles such as concrete trucks. Consequently, heavy construction traffic should be limited to areas with suitable temporary access roads. The access roads shall consist of a minimum of 450 mm of stony

Granular B material placed on a woven geogrid to preclude mixing of the subgrade into the Granular B. A surface coat of recycled asphalt shall be placed on the surface to provide a seal.

**Table 9 – Minimum Pavement Structure Requirements**

| Pavement layer | Thickness (mm) | Material |
|---|---|---|
| Surface Course Asphalt | 40 | OPSS H.L3 |
| Binder Course Asphalt | 65 | OPSS H.L8 |
| Base Layer | 250 | OPSS Granular A |
| Subbase Layer | 300 | OPSS Granular B |

The granular base and sub-base layers should be uniformly compacted to 100% SPMDD. The asphalt materials should be compacted to a minimum of 92% of the Marshal Maximum Relative Density (MRD), as tested by using nuclear density gauge.

Prior to placing the pavement subbase layer, the subgrade should be prepared and heavily proof-rolled under the supervision of the geotechnical engineer. Any weak or soft areas encountered at the original surface must be further sub-excavated and replaced with suitable approved backfill compacted to 98% SPMDD to provide uniform subgrade support condition. The subgrade should be compacted to 98% SPMDD for at least the upper 500 mm. Stringent compaction and placement control procedures shall be maintained to ensure uniform subgrade moisture and density conditions are achieved.

It should be noted that even with well-compacted trench backfill, some settlement can be expected after construction. In this regard, surface course asphalt shall be placed at least one year after trench backfill is completed.

The finished pavement surface should be graded to promote runoff to designated surface drainage areas and catch basins. Subdrains should be installed to intercept excess subsurface moisture and prevent subgrade softening. To minimize problems of differential movement between the pavement and catch basins/manholes due to frost action, the backfill around the structures should consist of free draining granular. It is recommended to install longitudinal subdrain with positive drainage outlets at the subgrade level along the edges of the roadway

construction. The subdrain stubs should be extended at least ten m from catch basins, along the uphill sides.

### 7.9.5 Curbs and Sidewalks

The concrete for any new exterior curbs and sidewalks should be proportioned, mixed, placed, and cured in accordance with the requirements of OPSS 353, OPSS 1350 and the municipality. During cold weather, the freshly placed concrete should be covered with insulating blankets to protect against freezing. The subgrade for the sidewalks should consist of undisturbed natural soil or well compacted fill. A minimum 100 mm thick layer of compacted (minimum 98% SPMDD) Granular A is recommended below sidewalk slabs.

# 8.0 LIMITATIONS OF REPORT

This report has been prepared for Mohammed Eqdaih as a geotechnical investigation for the proposed development located at 11 Elizabeth Road, Simcoe, Ontario. Further dissemination of this report is not permitted without A&A's prior written approval. A&A has carefully assessed all information provided to them during this investigation but makes no guarantees or warranties as to the accuracy or completeness of this provided information.

The comments given in this report are intended only for the guidance of design engineers and architects. Contractors bidding on or undertaking the work, should in this light, decide that further field investigations, and interpretations of the factual borehole results are necessary to draw their own conclusions as to how the subsurface conditions may affect them. Should soil conditions during excavation for the foundations prove to be different than what have been described in this report, the author of this report should be notified as soon as possible. No liability or claims may be made by owners or third parties against A&A for factors outside (A&A's) control. An independent quality control firm must be made available for all concrete and compaction testing associated with construction. All testing results should be made available to the owner, designers, consultant and general contractor.

The site investigation and recommendations follow generally accepted practice for Geotechnical Consultants in Ontario. Materials testing has been completed in accordance with ASTM or CSA Standards or modifications of these standards that have become standard practice.


July 2, 2020
Mehdi Heidari, Ph.D., P.Eng.

# 9.0 REFERENCES

Bowles, & E., J. (1996). *Foundation Analysis and Design.* McGraw Hill Inc.

*Canadian foundation engineering manual. 4th Edition.* (2006). Richmond, B.C : Canadian Geotechnical Society.

Sowers, G. (1979). *Introductory Soil Mechanics and Foundations: Geotechnical Engineering.* New York: MacMillan.

Terzaghi, K., & Peck, R. (1967). *Soil Mechanics in Engineering Practice.* New York: John Wiley.

# APPENDIX A – Site Drawings

**Figure 1 – Site Location Map for 11 Elizabeth Road, Simcoe, ON**

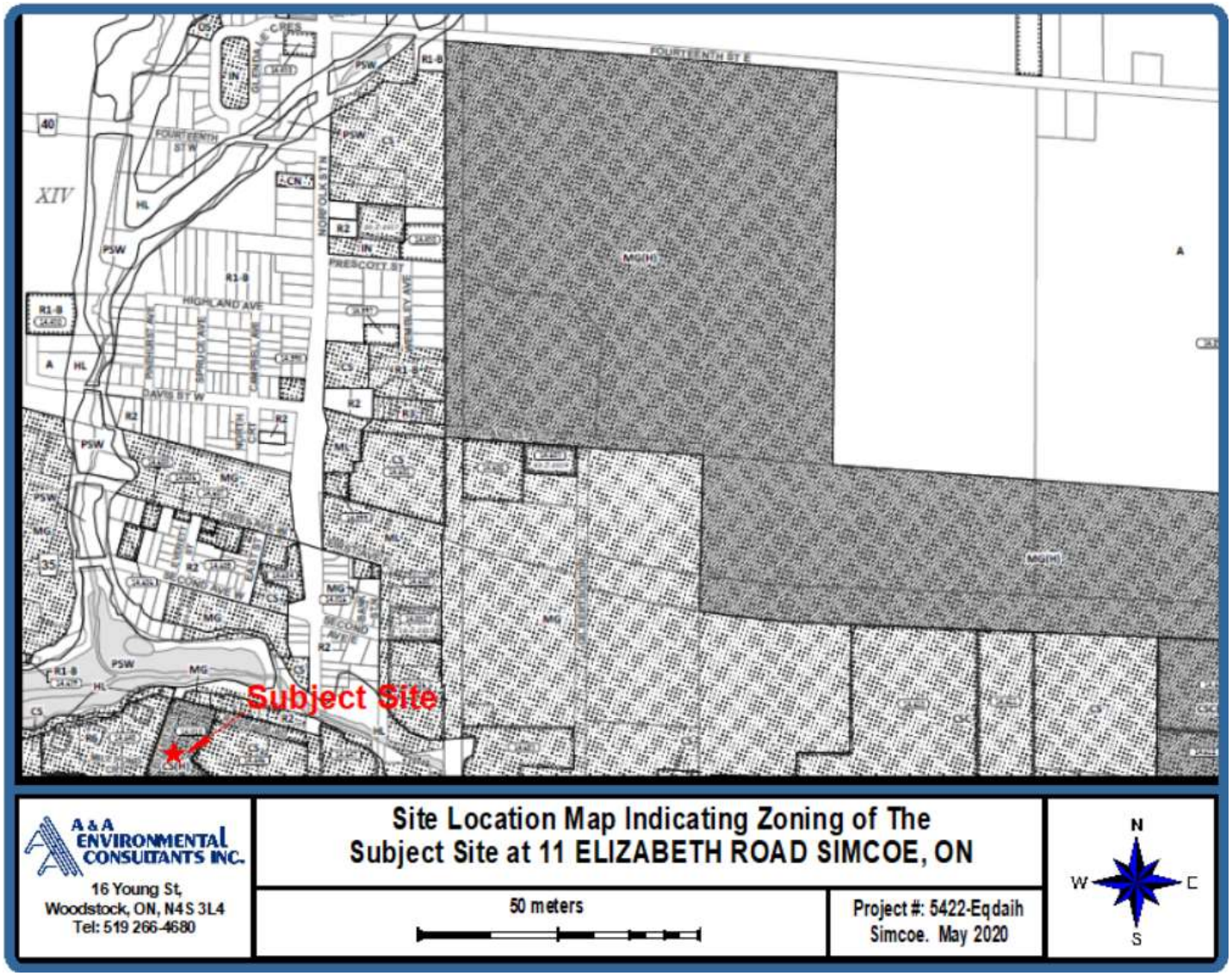


**Figure 2 – Proposed Development**

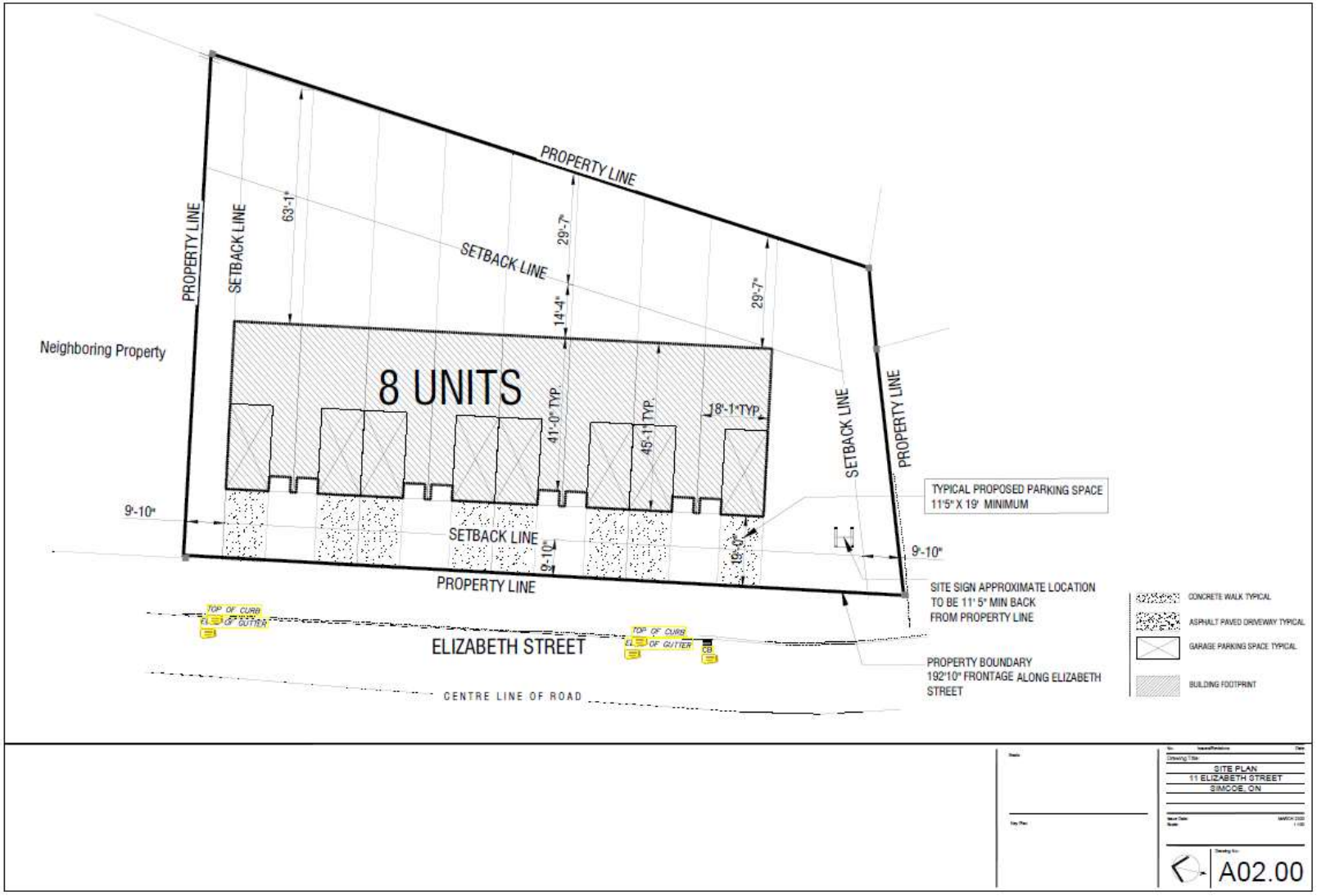


**Figure 3 – Geotechnical Borehole Locations, Site Image**

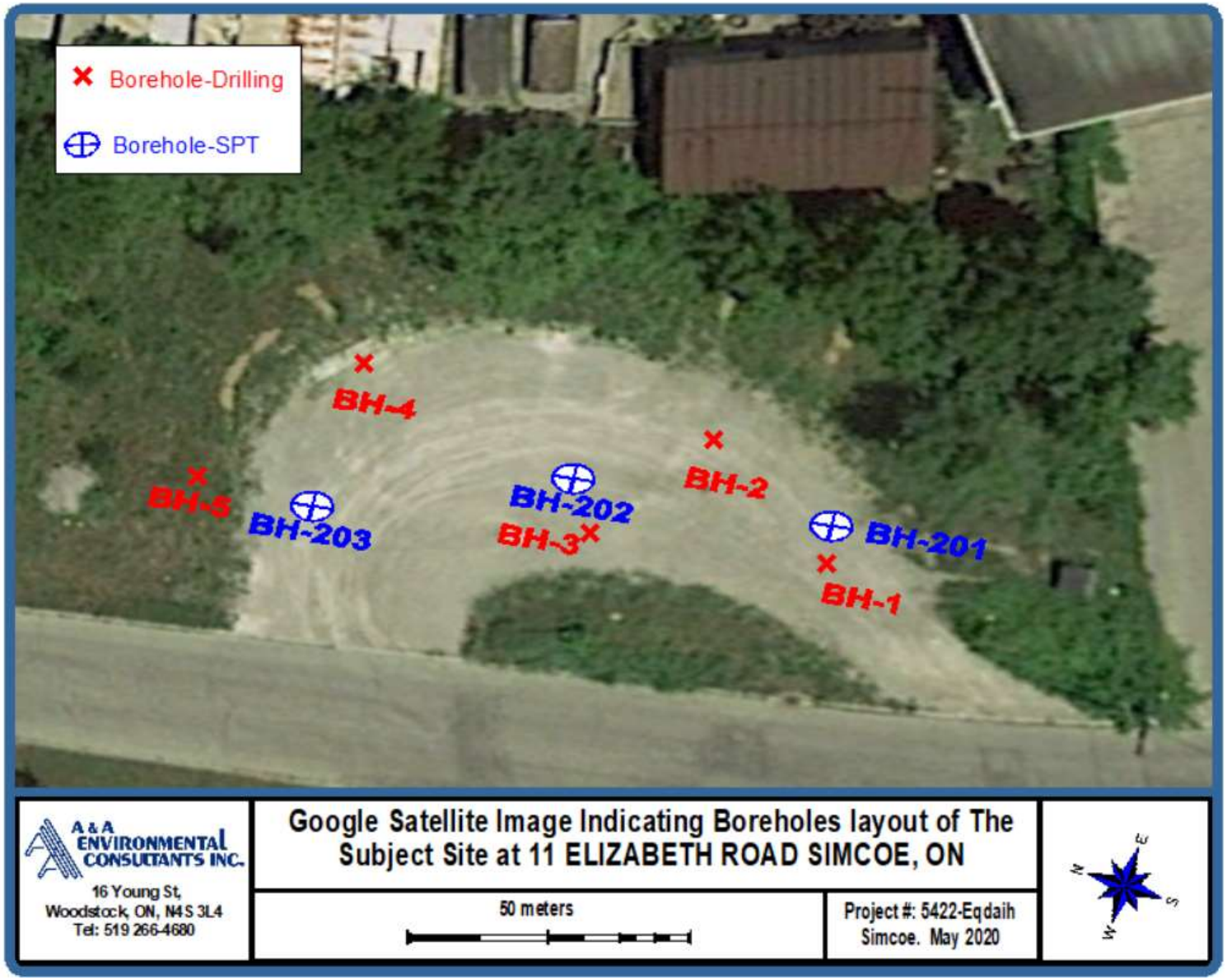


**Figure 4 – Geotechnical Borehole Locations, Site Plan**

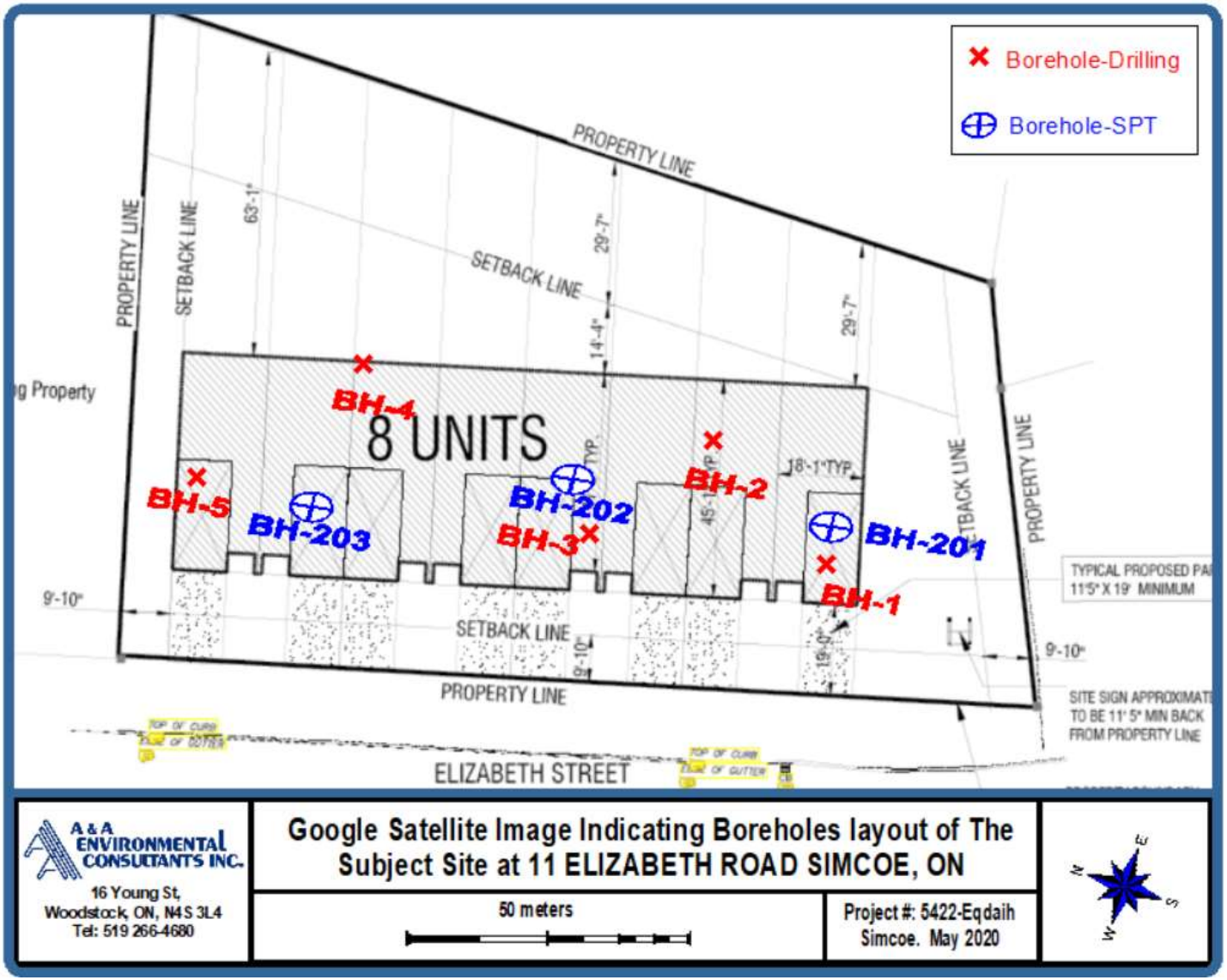


**Figure 5 – Topographic Map of Subject Study Area**

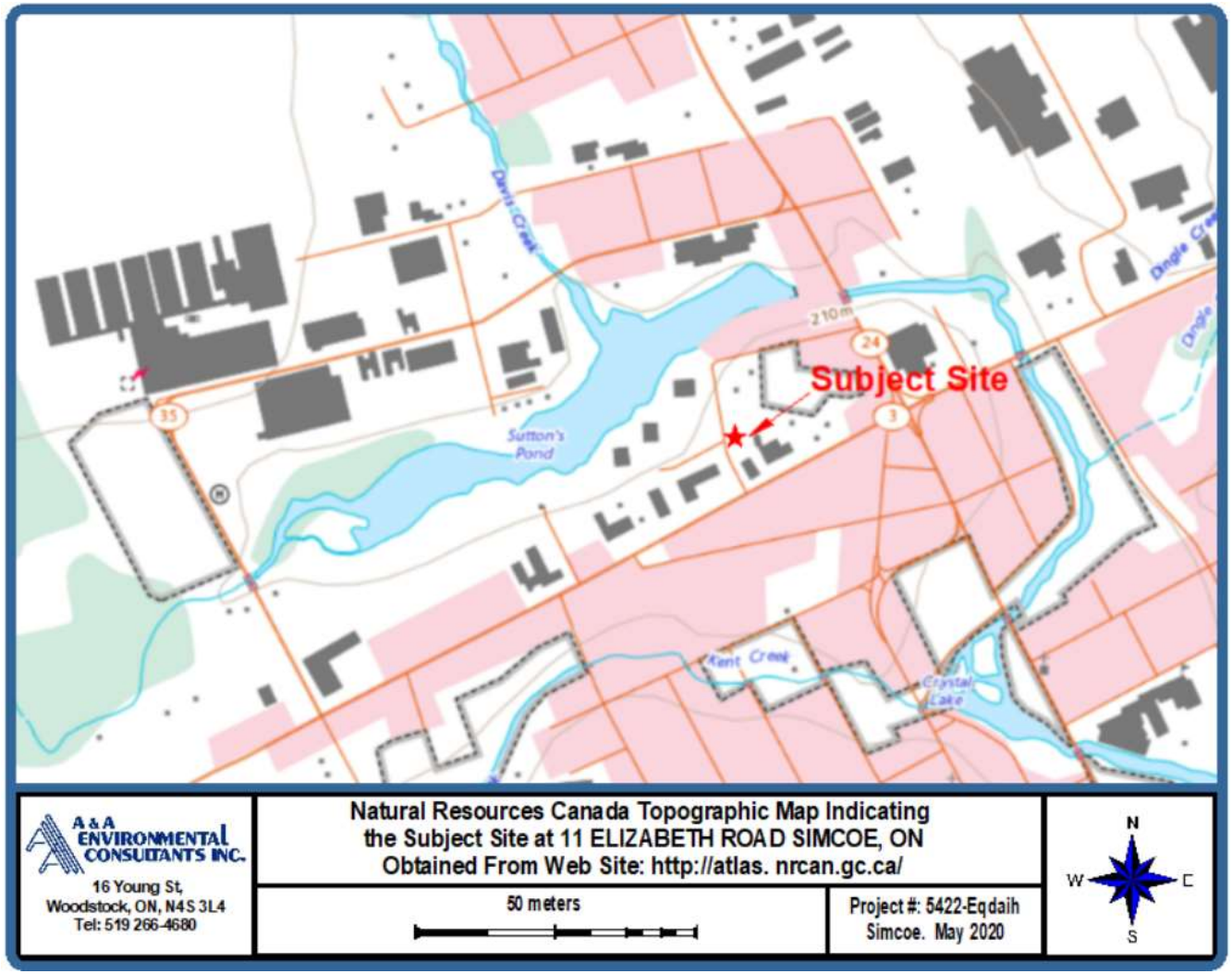
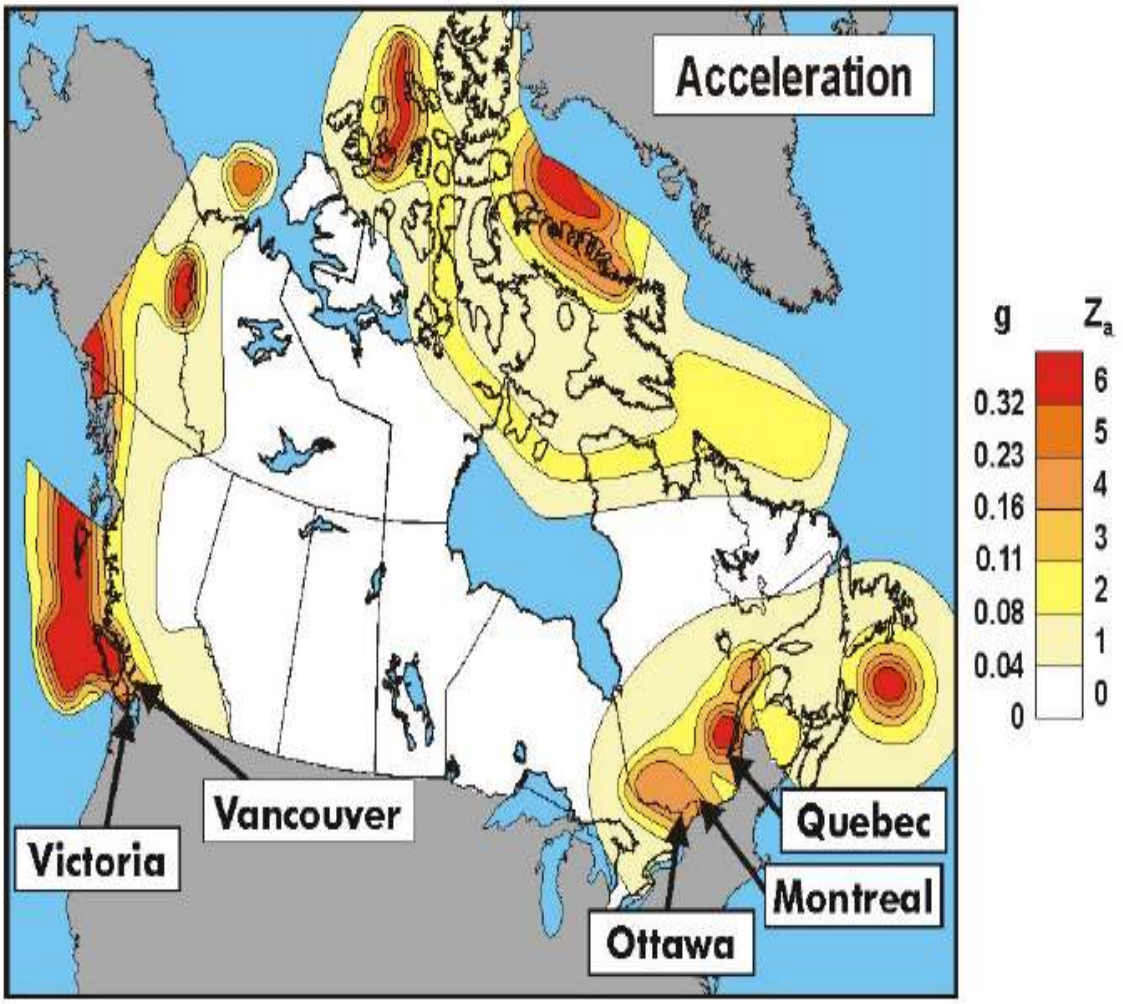


**Figure 6 – Earthquake Zoning Hazards**

Hazard



# APPENDIX B – Borehole Logs and Explanation of Terms and Symbols

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** South portion of proposed building. | **BOREHOLE NO: BH - 1** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS

| DEPTH (ft) | DEPTH (m) | SOIL PROFILE | Soil Description | SAMPLE TYPE | SAMPLE NO | BLOWS / 150 mm | Blowcount 10 20 30 40 50 / PPM 100 200 300 400 | Monitoring Well | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | Ground Surface | | | | | | |
| 0.0 | 0.0 | | Gravel | | | | | | |
| 1.0 | | | Clayey Sandy Silt<br>Medium brown, moist, PHC odours. | | 1 | | | | |
| 2.0 | | | | | | | | | |
| 3.0 | 1.0 | | | | | | | | |
| 4.0 | | | | | | | | | |
| 5.0 | | | | | | | | | |
| 6.0 | 2.0 | | Black staining observed. | | 2 | | | | |
| 7.0 | | | | | | | | | |
| 8.0 | | | | | | | | | |
| 9.0 | | | | | | | | | |
| 10.0 | 3.0 | | | | | | | | |
| 11.0 | | | | | | | | | |
| 12.0 | | | | | 3 | | | | |
| 13.0 | 4.0 | | | | | | | | |
| 14.0 | | | | | | | | | |
| 15.0 | | | Black & grey staining. | | | | | | |
| 16.0 | | | | | | | | | |
| 17.0 | 5.0 | | | | 4 | | | | |
| 18.0 | | | Wet. | | | | | | |
| 19.0 | | | | | | | | | |
| 20.0 | 6.0 | | | | | | | | |
| 21.0 | | | | | | | | | |
| 22.0 | | | | | 5 | | | | |
| 23.0 | 7.0 | | | | | | | | |
| 24.0 | | | | | | | | | |
| 25.0 | | | End of Log | | | | | | |
| 26.0 | 8.0 | | | | | | | | |
| 27.0 | | | | | | | | | |
| 28.0 | | | | | | | | | |
| 29.0 | | | | | | | | | |
| 30.0 | 9.0 | | | | | | | | |

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 25 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** Conventional |
| **DRILL DATE:** May 12, 2020 | **PAGE:** 1 of 1 |

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** Southeast portion of proposed building. | **BOREHOLE NO: BH - 02** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS

| DEPTH (ft) | DEPTH (m) | SOIL PROFILE | Soil Description | SAMPLE TYPE | SAMPLE NO | BLOWS / 150 mm | Blowcount 10 20 30 40 50 / PPM 100 200 300 400 | Monitoring Well | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | Ground Surface | | | | | | |
| 0.0 | 0.0 | | Gravel | | | | | | |
| 1.0 | | | Clayey Silty Sand Medium brown and grey, moist, PHC odours. | | 1 | | | | |
| 2.0 | | | | | | | | | |
| 3.0 | 1.0 | | | | | | | | |
| 4.0 | | | | | | | | | |
| 5.0 | | | | | 2 | | | | |
| 6.0 | 2.0 | | | | | | | | |
| 7.0 | | | | | | | | | |
| 8.0 | | | | | | | | | |
| 9.0 | | | | | | | | | |
| 10.0 | 3.0 | | | | 3 | | | | |
| 11.0 | | | | | | | | | |
| 12.0 | | | | | | | | | |
| 13.0 | 4.0 | | | | | | | | |
| 14.0 | | | | | | | | | |
| 15.0 | | | | | 4 | | | | |
| 16.0 | | | | | | | | | |
| 17.0 | 5.0 | | | | | | | | |
| 18.0 | | | | | | | | | |
| 19.0 | | | | | | | | | |
| 20.0 | 6.0 | | | | | | | | |
| 21.0 | | | | | | | | | |
| 22.0 | | | Wet. | | 5 | | | | |
| 23.0 | 7.0 | | | | | | | | |
| 24.0 | | | | | | | | | |
| 25.0 | | | End of Log | | | | | | |
| 26.0 | 8.0 | | | | | | | | |
| 27.0 | | | | | | | | | |
| 28.0 | | | | | | | | | |
| 29.0 | | | | | | | | | |
| 30.0 | 9.0 | | | | | | | | |

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 25 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** Conventional |
| **DRILL DATE:** May 12, 2020 | **PAGE:** 1 of 1 |

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** Central portion of proposed building. | **BOREHOLE NO: BH - 03** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS

| DEPTH (ft) | DEPTH (m) | SOIL PROFILE | Soil Description | SAMPLE TYPE | SAMPLE NO | BLOWS / 150 mm | Blowcount 10 20 30 40 50 / PPM 100 200 300 400 | Monitoring Well | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | Ground Surface | | | | | | |
| 0.0 | 0.0 | | Gravel | | | | | | |
| 1.0 | | | Clayey Sandy Silt Medium brown, moist, PHC odours. | | 1 | | | | |
| 2.0 | | | | | | | | | |
| 3.0 | 1.0 | | | | | | | | |
| 4.0 | | | | | | | | | |
| 5.0 | | | | | | | | | |
| 6.0 | 2.0 | | Moist. | | 2 | | | | |
| 7.0 | | | | | | | | | |
| 8.0 | | | | | | | | | |
| 9.0 | | | | | | | | | |
| 10.0 | 3.0 | | | | | | | | |
| 11.0 | | | | | 3 | | | | |
| 12.0 | | | | | | | | | |
| 13.0 | 4.0 | | | | | | | | |
| 14.0 | | | | | | | | | |
| 15.0 | | | Grey. | | | | | | |
| 16.0 | | | | | | | | | |
| 17.0 | 5.0 | | | | 4 | | | | |
| 18.0 | | | | | | | | | |
| 19.0 | | | | | | | | | |
| 20.0 | 6.0 | | | | | | | | |
| 21.0 | | | | | 5 | | | | |
| 22.0 | | | | | | | | | |
| 23.0 | 7.0 | | | | | | | | |
| 24.0 | | | | | | | | | |
| 25.0 | | | End of Log | | | | | | |
| 26.0 | 8.0 | | | | | | | | |
| 27.0 | | | | | | | | | |
| 28.0 | | | | | | | | | |
| 29.0 | | | | | | | | | |
| 30.0 | 9.0 | | | | | | | | |

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 25 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** Conventional |
| **DRILL DATE:** May 12, 2020 | **PAGE:** 1 of 1 |

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** Northeast portion of proposed building. | **BOREHOLE NO: BH-4** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS

| DEPTH (ft) | DEPTH (m) | SOIL PROFILE | Soil Description | SAMPLE TYPE | SAMPLE NO | BLOWS / 150 mm | Blowcount 10 20 30 40 50 / PPM 100 200 300 400 | Monitoring Well | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | Ground Surface | | | | | | |
| 0.0 | 0.0 | | Gravel | | | | | | |
| 1.0 | | | Clayey Sandy Silt<br>Medium brown and black staining, moist, PHC odours. | | 1 | | | | |
| 2.0 | | | | | | | | | |
| 3.0 | 1.0 | | | | | | | | |
| 4.0 | | | | | | | | | |
| 5.0 | | | | | | | | | |
| 6.0 | | | Grey, wet, no more black staining observed. | | 2 | | | | |
| 7.0 | 2.0 | | | | | | | | |
| 8.0 | | | Saturated. | | | | | | |
| 9.0 | | | | | | | | | |
| 10.0 | 3.0 | | | | | | | | |
| 11.0 | | | | | | | | | |
| 12.0 | | | | | 3 | | | | |
| 13.0 | 4.0 | | Sand<br>Grey, saturated, PHC odours. | | | | | | |
| 14.0 | | | | | | | | | |
| 15.0 | | | | | | | | | |
| 16.0 | 5.0 | | | | 4 | | | | |
| 17.0 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| 19.0 | | | Faint PHC odours. | | | | | | |
| 20.0 | 6.0 | | | | | | | | |
| 21.0 | | | | | | | | | |
| 22.0 | | | | | 5 | | | | |
| 23.0 | 7.0 | | | | | | | | |
| 24.0 | | | | | | | | | |
| 25.0 | | | End of Log | | | | | | |
| 26.0 | | | | | | | | | |

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 30 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** Conventional |
| **DRILL DATE:** May 12, 2020 | **PAGE:** 1 of 1 |

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** North portion of proposed building. | **BOREHOLE NO: BH - 05** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS

| DEPTH (ft) | DEPTH (m) | SOIL PROFILE | Soil Description | SAMPLE TYPE | SAMPLE NO | BLOWS / 150 mm | Blowcount 10 20 30 40 50 / PPM 100 200 300 400 | Monitoring Well | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | Ground Surface | | | | | | |
| 0.0 | 0.0 | | Gravel | | | | | | |
| 1.0 | | | Clayey Sandy Silt<br>Medium brown, moist, PHC odours. | | 1 | | | | |
| 2.0 | | | | | | | | | |
| 3.0 | 1.0 | | | | | | | | |
| 4.0 | | | | | | | | | |
| 5.0 | | | | | 2 | | | | |
| 6.0 | 2.0 | | | | | | | | |
| 7.0 | | | | | | | | | |
| 8.0 | | | | | | | | | |
| 9.0 | | | | | | | | | |
| 10.0 | 3.0 | | | | 3 | | | | |
| 11.0 | | | | | | | | | |
| 12.0 | | | | | | | | | |
| 13.0 | 4.0 | | | | | | | | |
| 14.0 | | | | | | | | | |
| 15.0 | | | Black and grey staining,<br>Strong PHC odours. | | 4 | | | | |
| 16.0 | | | | | | | | | |
| 17.0 | 5.0 | | | | | | | | |
| 18.0 | | | | | | | | | |
| 19.0 | | | | | | | | | |
| 20.0 | 6.0 | | | | 5 | | | | |
| 21.0 | | | | | | | | | |
| 22.0 | | | | | | | | | |
| 23.0 | 7.0 | | | | | | | | |
| 24.0 | | | | | | | | | |
| 25.0 | | | End of Log | | | | | | |
| 26.0 | 8.0 | | | | | | | | |
| 27.0 | | | | | | | | | |
| 28.0 | | | | | | | | | |
| 29.0 | | | | | | | | | |
| 30.0 | 9.0 | | | | | | | | |

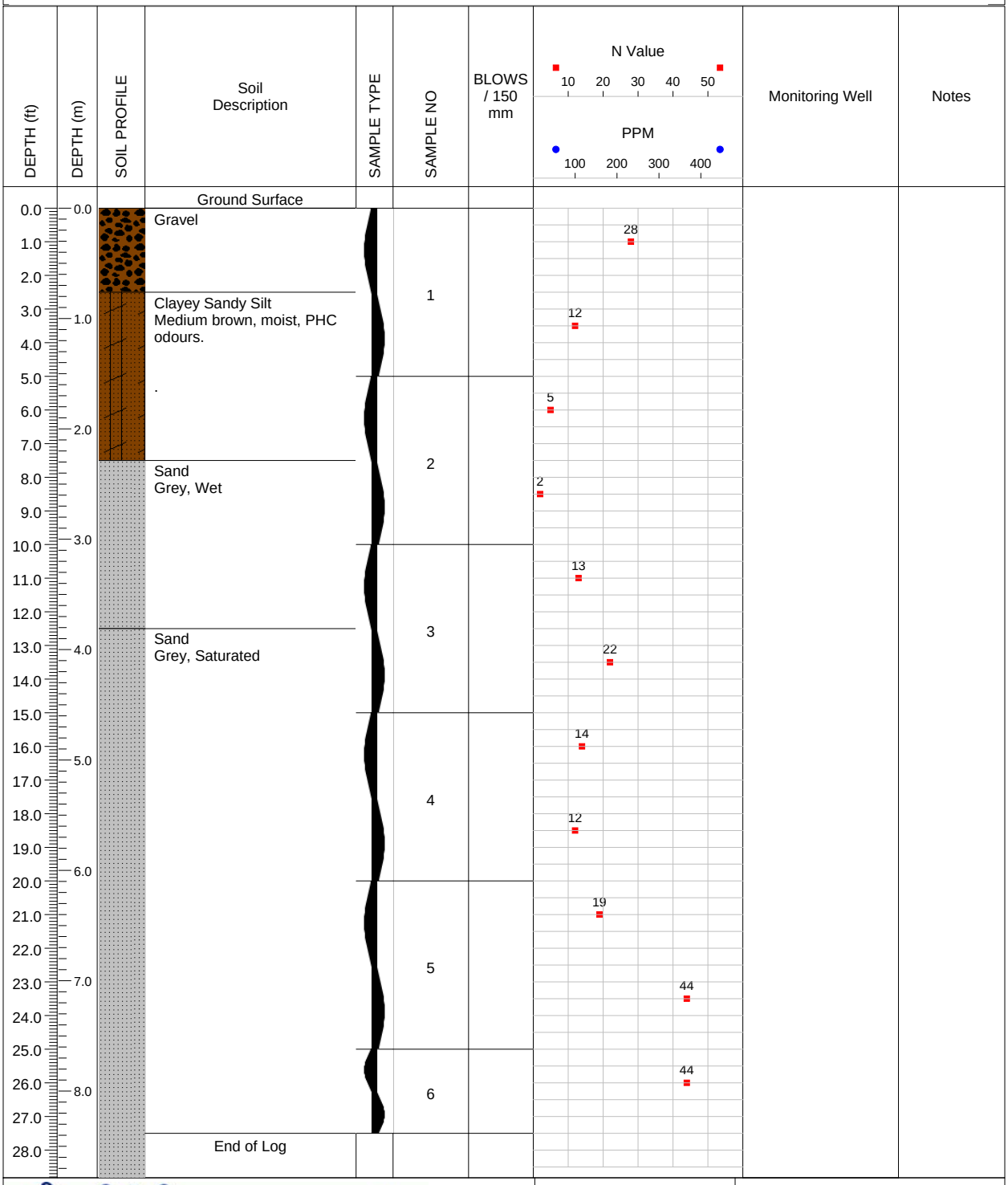
A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 25 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** Conventional |
| **DRILL DATE:** May 12, 2020 | **PAGE:** 1 of 1 |

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** South Section of Proposed Building | **BOREHOLE NO: BH - 201** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS



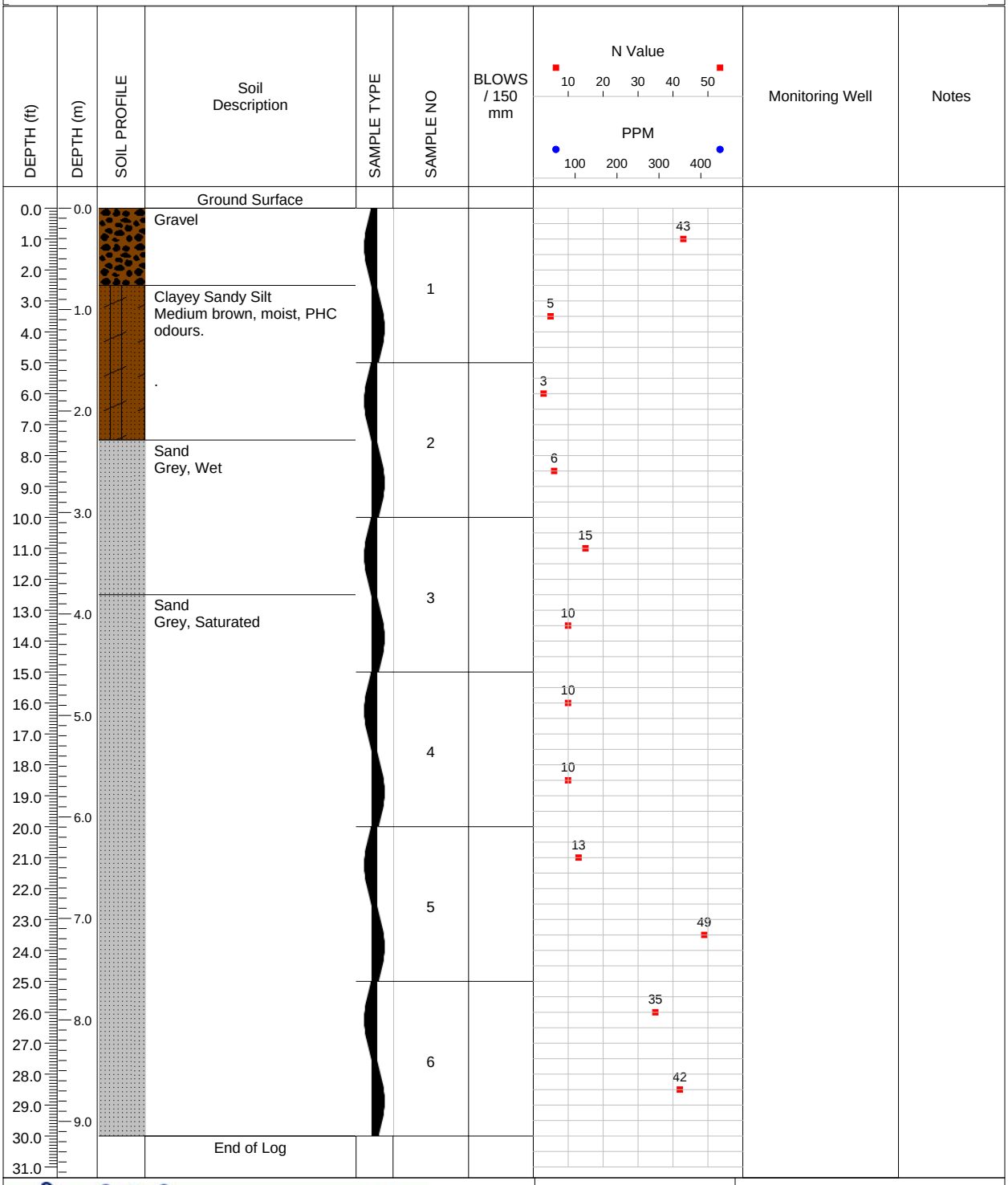

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 27.5 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** SPT |
| **DRILL DATE:** June 15, 2020 | **PAGE:** 1 of 1 |

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** Central portion of proposed building. | **BOREHOLE NO: BH - 202** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS



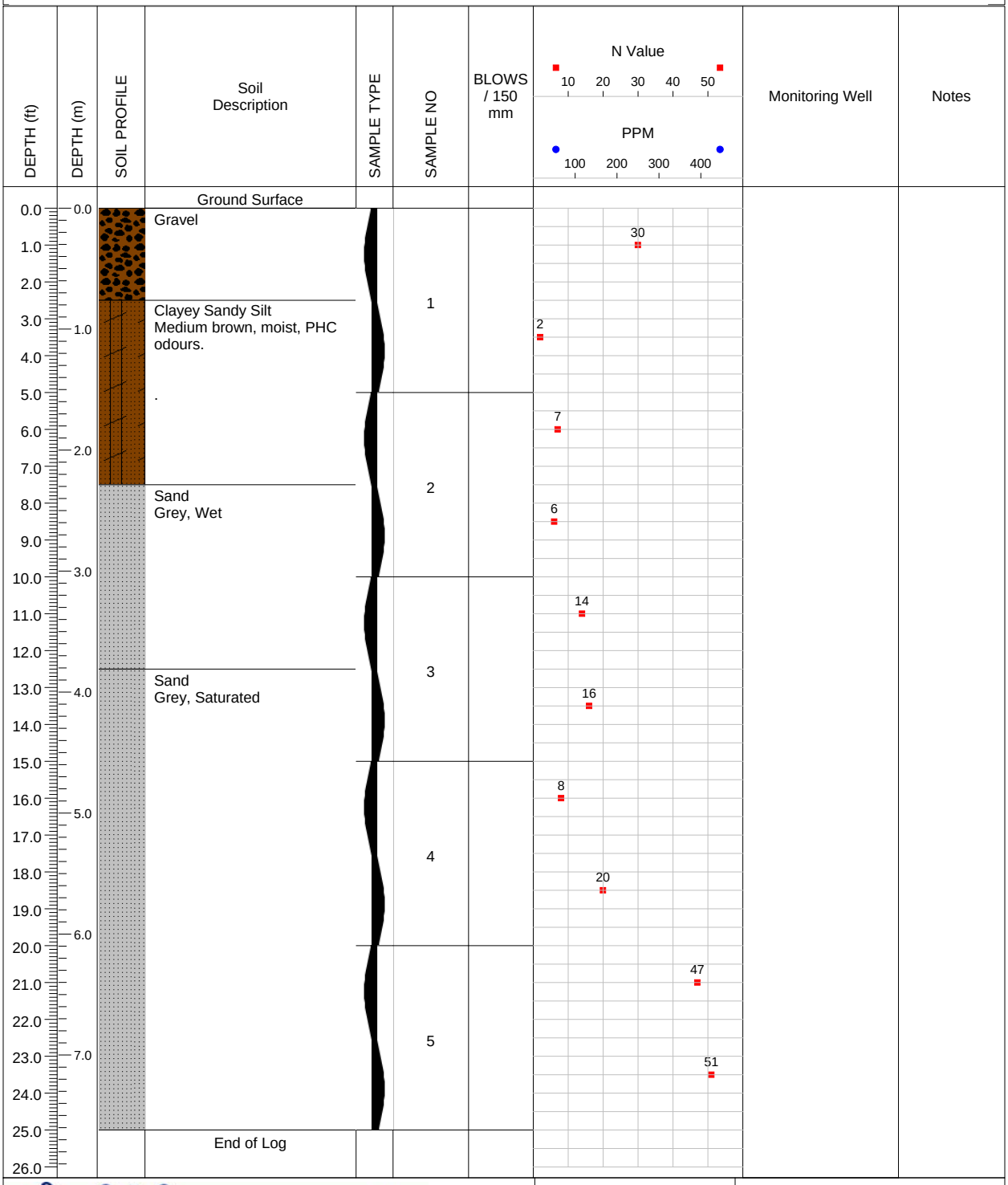

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 30 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** SPT |
| **DRILL DATE:** June 15, 2020 | **PAGE:** 1 of 1 |

| | | |
|---|---|---|
| **PROJECT:** Geotechnical Investigation | **BH LOCATION:** North Section of Proposed Building | **BOREHOLE NO: BH - 203** |
| **PROJECT NO:** 5422 | **LOCATION:** 11 Elizabeth Street, Simcoe, Ontario | |
| **PROJECT MANAGER:** M. Heidari | **COMPANY NAME:** A&A Environmental Consultants Inc. | |

SAMPLE TYPE SHELBY TUBE CORE SAMPLE SPT SAMPLE GRAB SAMPLE NO RECOVERY

BACKFILL TYPE BENTONITE PEA GRAVEL SLOUGH GROUT DRILL CUTTINGS




A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young Street Woodstock, ON

| | |
|---|---|
| **LOGGED BY:** T. Thornton | **COMPLETION DEPTH:** 25 Feet |
| **REVIEWED BY:** A. Rasoul | **DRILL METHOD:** SPT |
| **DRILL DATE:** June 15, 2020 | **PAGE:** 1 of 1 |

# Explanation of Terms and Symbols

The terms and symbols used on the borehole logs to summarize the results of field investigation and subsequent laboratory testing are described in these pages.

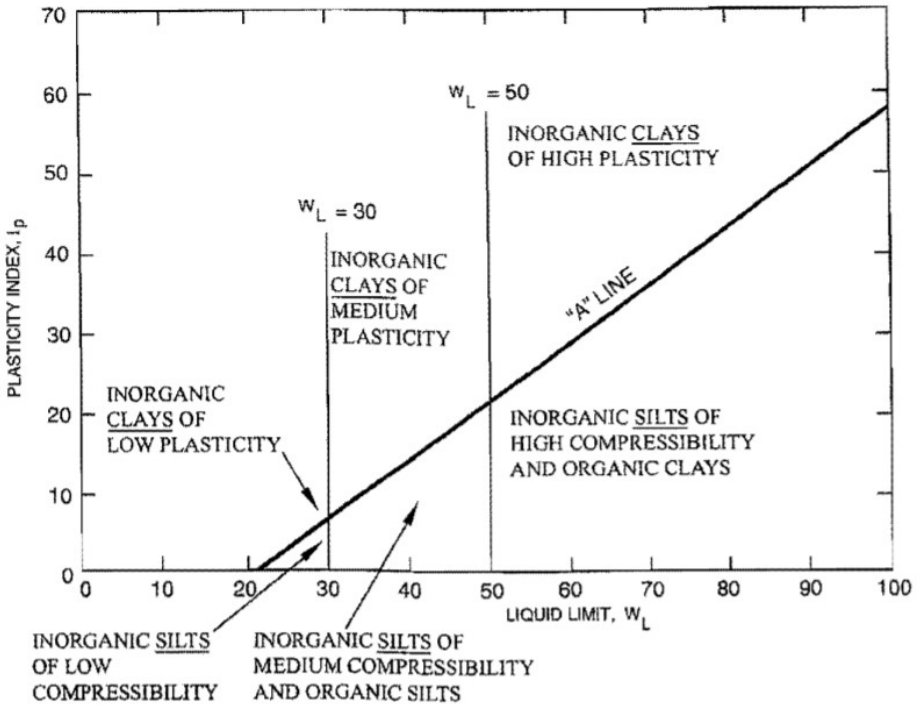
Abbreviations, graphic symbols and relevant test method designations are as follows:

| | |
|---|---|
| $w$ | Water Content |
| $w_L, LL$ | Liquid Limit |
| $w_p, PL$ | Plastic Limit |
| $I_p$ | Plasticity Index |
| $\gamma$ | Soil unit weight |
| $K$ | Coefficient of Lateral earth pressure |
| $K_s$ | Module of vertical subgrade reaction |
| **p** | Lateral earth pressure |
| **q** | Surcharge load |
| **h** | Depth from the ground surface |
| **B** | Width of rectangular footing |
| $P$ | Hydrostatic uplift pressure |
| $d$ | Depth of structure's base below the design water level |
| $\gamma_w$ | Unit weight of water |
| $\Phi$ | Geotechnical resistance factor |
| $\phi$ | Internal friction angle of soil |
| $c$ | Cohesion |
| $c_u, S_u$ | Undrained shear strength |
| $V_s$ | Shear wave velocity |
| **SPT-N** | Penetration resistance |
| **SPMMD** | Standard Proctor Maximum Dry Density |
| **MRD** | Marshal Maximum Relative Density |

Soils are classified and described according to their engineering properties and behaviours.

| | | |
|---|---|---|
| **noun** | gravel, sand, silt, clay | **> 35 % and main fraction** |
| **"and"** | and gravel, and silt, etc. | **>35 %** |
| **adjective** | gravelly, sandy, silty, clayey, etc. | **20 to 35 %** |
| **"some"** | some sand, some silt, etc. | **10 to 20%** |
| **"trace"** | trace sand, trace silt, etc. | **1 to 10 %** |

The plasticity chart (after Casagrande, 1948):




Correlation of soil parameters with uncorrected SPT values for: a) cohesionless soils and b) cohesive soil

| Compactness Condition | SPT N-INDEX (blows per 0.3 m) |
|---|---|
| Very Loose | 0 to 4 |
| Loose | 4 to 10 |
| Compact | 10 to 30 |
| Dense | 30 to 50 |
| Very Dense | >50 |

**(a)**

| Consistency | Undrained Shear Strength (kPa) | SPT N-INDEX (blows per 0.3 m) |
|---|---|---|
| Very soft | < 12 | 0 to 2 |
| Soft | 12 - 25 | 2 to 4 |
| Firm | 25-50 | 4 to 8 |
| Stiff | 50 - 100 | 8 to 15 |
| Very stiff | 100 - 200 | 15 to 30 |
| Hard | >200 | >30 |

**(b)**

- *Standard Penetration Tests (SPT); followed the methods described in ASTM Standard D1586-08a. The number of blows by a 63.5 kg (140 lb) hammer dropped from 760 mm (30 in.) is recorded for a depth of 460 mm (18"). The last two 150 mm distances (total = 300 mm) are used to calculate the SPT-N index.*

# APPENDIX C – Grain Size Distribution and Test Results

Orbit Engineering Limited
1900 Clark Boulevard, Unit 9
Brampton, ON, L6T 0E9
Tel: +1 905 494 0074
Fax: +1 855 666 3355
www.orbitengineering.ca,
info@orbitengineering.ca

# GEOTECHNICAL TESTING REPORT DATA

## 5422– EQDAIH SIMCOE, ON

**Prepared for:**

**A & A ENVIRONMENTAL CONSULTINGS INC.**

**By:**

**Orbit Engineering Limited**

**Project No. OE201046AG**

May 20, 2020

ORBITENGINEERING
Consulting Engineers

Orbit Engineering Limited
1900 Clark Boulevard, Unit 9
Brampton, ON, L6T 0E9
Tel: +1 905 494 0074
Fax: +1 855 666 3355
www.orbitengineering.ca,
info@orbitengineering.ca

May 20, 2020

A&A Environmental Consultants
16 Young Street
Woodstock, Ontario
N4S 3L4
Email: tdemers@aaenvironmental.ca

**Attention:** **Dr. Mehdi Heidari, Ph D., P Eng., - Principle Geotechnical Engineer**

**RE:**
**LABORATORY TEST RESULTS - Project: 5422 – Eqdaih Simcoe, ON**

Dear Mr. Mehdi,

Orbit Engineering Limited (Orbit) is pleased to provide the Final LABORATORY TESTING REPORT DATA for the above-mentioned project. The report presents the results of laboratory testing carried out on soil samples received at Orbit Laboratory on May 14th, 2020 and May 19th, 2020
The laboratory testing included the following:

1. Water Moisture Content - ASTM D2216;
2. Particle Size Analysis (Hydrometer) - ASTM D422 - D2217
3. Atterberg Limits - ASTM 4318.
4. Standard Proctor – ASTM D698

The results of the testing are summarized in the attached Table 1 and details of testing results are shown in Appendix **A**.

We trust that this information meets your present requirements. If we can be of additional assistance in this regard, please contact this office.

For and on behalf of Orbit Engineering Limited,

**Aly Ahmed**, Ph D, P.Eng.,
Lab Supervisor

**Hafiz Muneeb Ahmad**, M.Sc.,P.Eng.,
Principal Engineer

Orbit Engineering Limited
1900 Clark Boulevard, Unit 9
Brampton, ON, L6T 0E9
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Fax: +1 855 666 3355
www.orbitengineering.ca,
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Professional Supervising Engineer

**Table 1: Summary of Laboratory Testing Results (A & A Project: 5422 – Eqdaih Simcoe, ON)**

| Sample No. | Depth (ft) | Water Content (%) | Atterberg Limits (%) | | | Soil Compositions (%) | | | | Soil Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | LL | PL | PI | Gravel | Sand | Silt | Clay | |
| **BH 205** | 2.5 – 5.0 | 16.0 | 17.1 | 12.8 | 4.3 | 0 | 47 | 46 | 7 | Silt and Sand, trace Clay |
| | | | | | | | | | | |

**Standard Proctor Test:**

**MDD: 1961 kg/m$^3$**

**OMC: 10.3%**

## CLOSURE

We trust that this information is satisfactory for your present requirements. Should you have any questions or require additional information, please do not hesitate to contact this office.

For and Behalf of Orbit Engineering Limited,

**Ameer Rizvi, B.Sc.**
Lab Technician

**Aly Ahmed,** Ph D., P.Eng.
Lab Supervisor

Reviewed by:

**Hafiz Muneeb Ahmad**, M.Sc.,P.Eng.
Principal Engineer
Professional Supervising Engineer

# NATURAL MOISTURE CONTENT

LABORATORY SERVICES

LS - 703

| | | | |
|---|---|---|---|
| Project No.: | OE201046AG | Borehole No. | BH205 |
| Lab Technician: | Ameer Rizvi | Date | 20-May-20 |

| NATURAL MOISTURE CONTENT | | | | |
|---|---|---|---|---|
| **Sample No.** | **Weight of tare (g)** | **Weight of tare + soil (g)** | **Weight of tare + soil (dry) (g)** | **Moisture content (%)** |
| BH205 @2.5-5 | 6.43 | 378.5 | 327.17 | **16.0** |
| | | | | |
| | | | | |

Aly Ahmed

Aly Ahmed, Ph D., P Eng

Lab Supervisor

ORBIT ENGINEERING

# ATTERBERG LIMITS

LABORATORY SERVICES

(LS-703, 704/D4318)

## PLASTICITY CHART WORKSHEET

| | | | |
|---|---|---|---|
| **Date :** | **20-May-20** | **Lab Number :** | **354** |
| **Project Number :** | **OE201046AG** | **Figure Number :** | **A0** |
| **Drawing Number :** | | | |
| **Soil Description :** | | | |

| Borehole Number | Sample Type | Sample Number | Natural MC (%) | Depth ( ft ) | Liquid Limit ( % ) | Plastic Limit ( % ) | Plasticity Index ( % ) | Liquidity Index ( % ) |
|---|---|---|---|---|---|---|---|---|
| BH205 | CL-ML | BH205-S1 | 16.00 | 2.5-5 | 17.10 | 12.80 | 4.30 | 0.74 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
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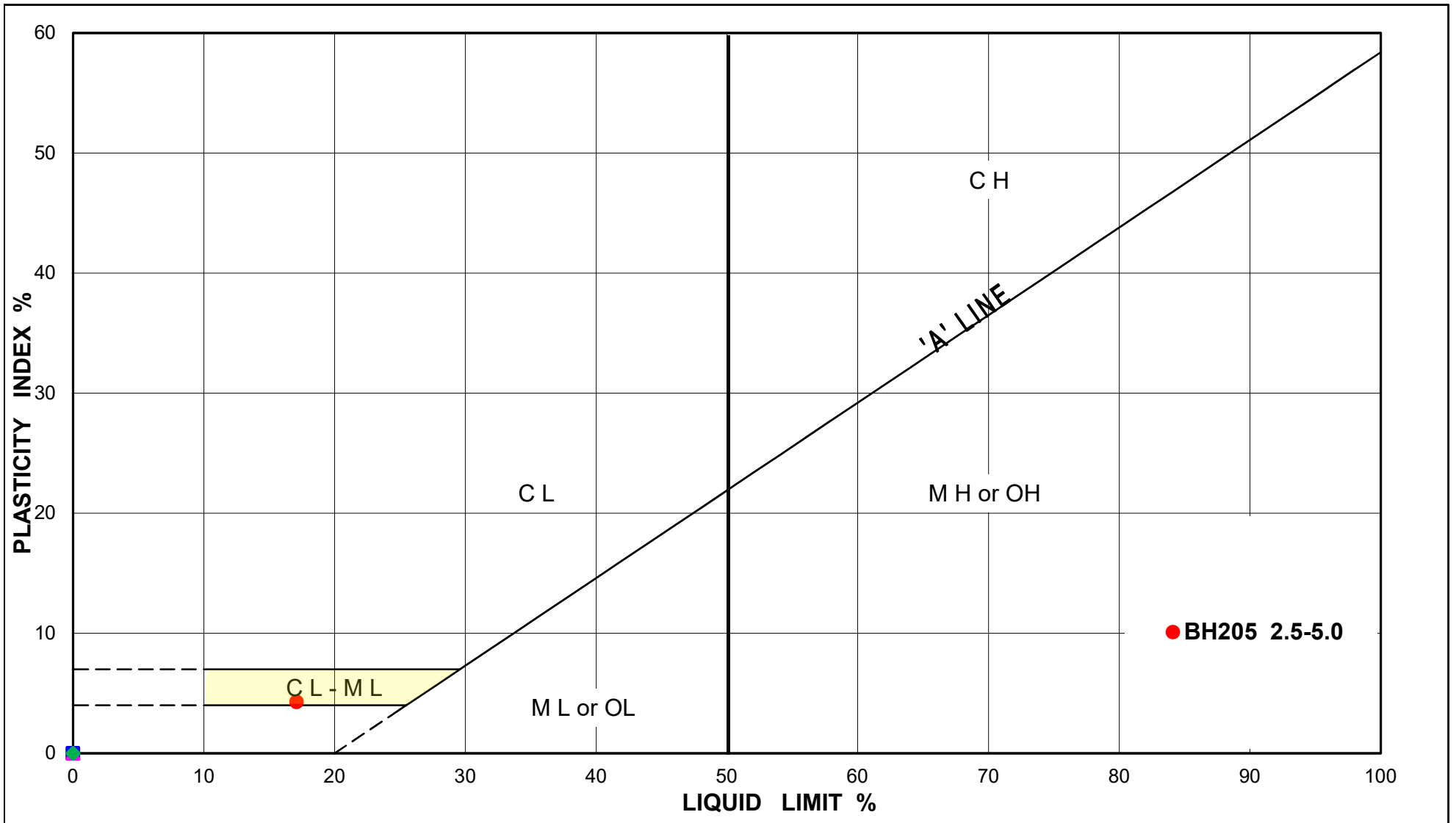
| | | | | | | | | |

Aly Ahmed

Aly Ahmed, Ph D., P Eng
Lab Supervisor




ORBITENGINEERING

# PLASTICITY CHART

| | |
|---|---|
| Project No: | OE201046AG |
| Drawing No. | B3 |
| Date: | 19-May-20 |

ORBITENGINEERING

# ATTERBERG LIMITS

(LS-703, 704/D4318)

LABORATORY SERVICES

Project No.: OE201046AG

Borehole No: BH205

Operator: Ameer Rizvi

Date: 19-May-20

| **LIQUID LIMIT** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE NO. | 2.5-5.0 | | | | | | | | |
| NO OF BLOWS | 31 | 25 | 20 | | | | | | |
| DISH NO | 1 | 2 | 3 | | | | | | |
| DISH + WET SOIL | 36.49 | 35.89 | 36.89 | | | | | | |
| DISH + DRY SOIL | 34.31 | 33.76 | 34.53 | | | | | | |
| MOISTURE | 2.18 | 2.13 | 2.36 | | | | | | |
| DISH | 21.17 | 21.28 | 21.15 | | | | | | |
| DRY SOIL | 13.14 | 12.48 | 13.38 | | | | | | |
| % MOISTURE | 16.59 | 17.07 | 17.64 | | | | | | |
| **PLASTIC LIMIT** | | | | | | | | | |
| DISH NO | 4 | 5 | | | | | | | |
| DISH + WET SOIL | 31.2 | 30.79 | | | | | | | |
| DISH + DRY SOIL | 30.07 | 29.69 | | | | | | | |
| MOISTURE | 1.13 | 1.1 | | | | | | | |
| DISH | 21.23 | 21.12 | | | | | | | |
| DRY SOIL | 8.84 | 8.57 | | | | | | | |
| % MOISTURE | 12.78 | 12.84 | | | | | | | |
| PLASTIC LIMIT % | 12.8 | | | | | | | | |
| LIQUID LIMIT % | 17.1 | | | | | | | | |
| **PLASTICITY INDEX** | 4.3 | | | | | | | | |

Aly Ahmed

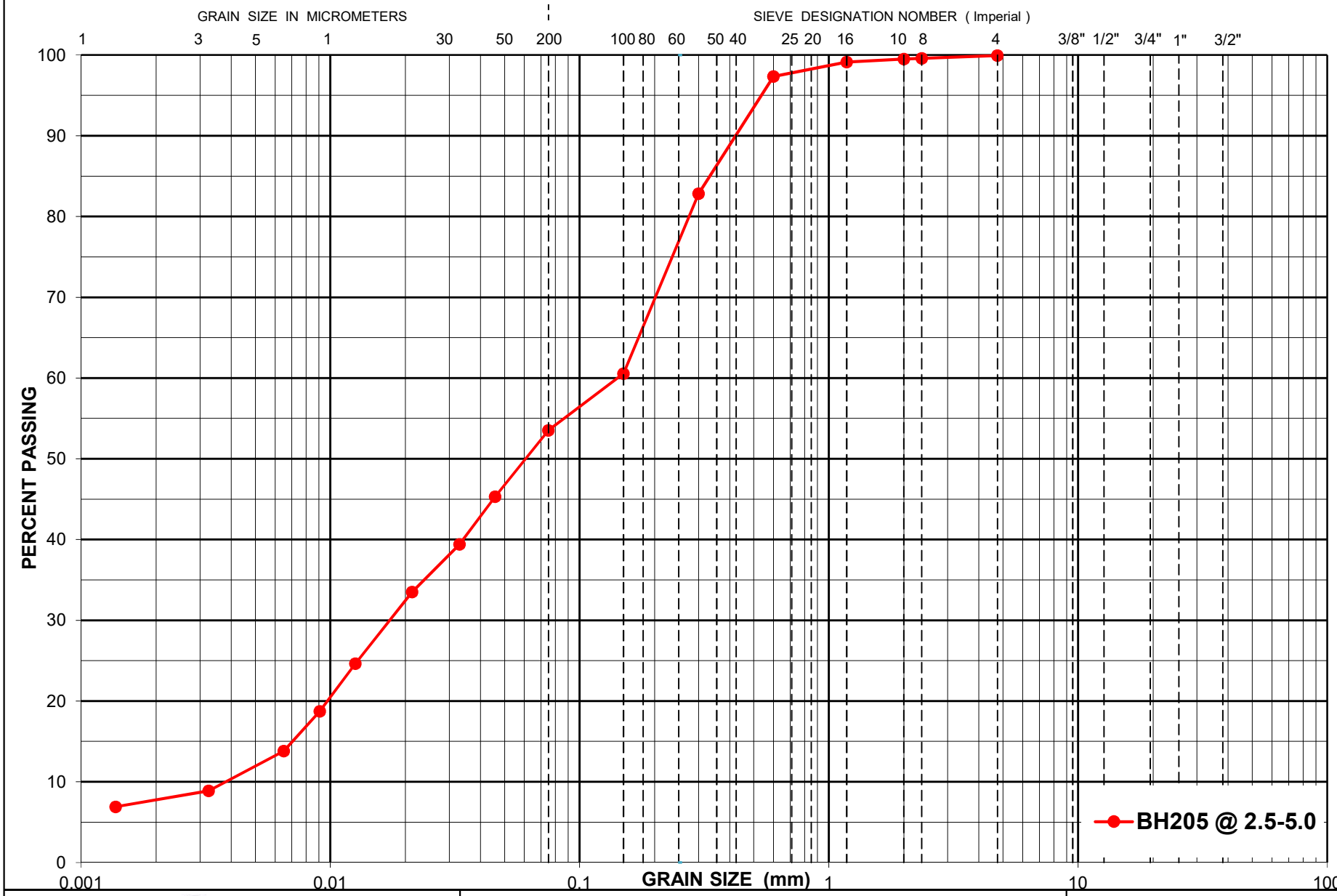
Aly Ahmed, Ph D., P Eng

Lab Supervisor

LS 702/D 422

## UNIFIED SOIL CLASSIFICATION SYSTEM

| CLAY AND SILT | SAND | | | GRAVEL | |
|---|---|---|---|---|---|
| | Fine | Medium | Coarse | Fine | Coarse |

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# GRAIN SIZE DISTRIBUTION

| | |
|---|---|
| Figure No.: | B1 |
| PROJECT No. : | OE201046AG |
| DATE : | May 20, 2020 |

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1900 Clark Blvd., Unit 9, Brampton,
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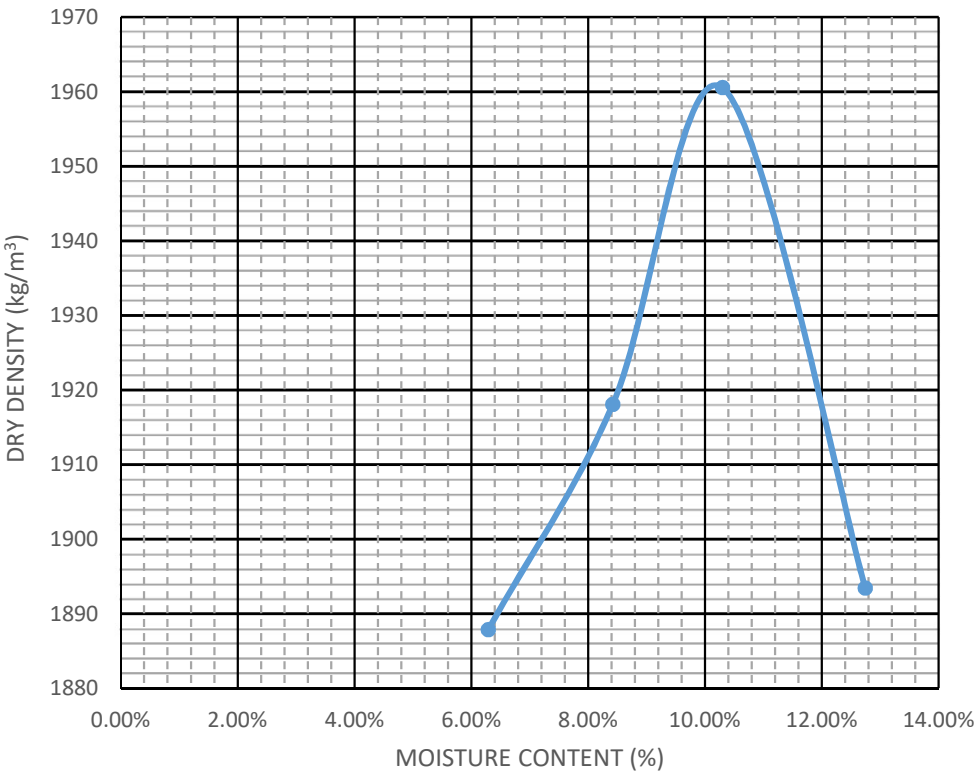
# Proctor Test Report

| | |
|---|---|
| Project Name | A&A Environmental ( 5422-Eqdaih Simcoe ) |
| Project Number | OE201046AG |
| Max Dry Density (kg/m$^3$) | **1961** |
| Corrected Max Dry Density (kg/m$^3$) | |
| Optimum Moisture (%) | **10.3** |
| Corrected Optimum Moisture (%) | |
| Sample Type: | Silt and Sand, trace Clay |
| Supplier: | Native Soil |
| Sample Location: | Composite BH |
| Sampled By: | A&A Envirronmental |
| Date Sampled: | Unknown |
| Lab No. | 873 |
| Date Tested: | 19-May-20 |
| Method: Standard/Modified | Standard |
| Technician: | AR |



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Brampton, Ontario L6T0E9
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# Proctor Test Report

Project Number: OE201046AG

Project Name: A&A Environmental ( 5422-Eqdaih Simcoe )

| Trial No. | 1 | 2 | 3 | 4 | | |
|---|---|---|---|---|---|---|
| Mold Number | A | A | A | A | | |
| WT Sample Wet + Mold | 11148 | 11303 | 11479 | 11420 | | |
| Wt Mold(GMS) | 6888 | 6888 | 6888 | 6888 | | |
| Volume of Mold (m3) | 0.002123 | 0.002123 | 0.002123 | 0.002123 | | |
| Wet Density (kg/m3) | 2006.6 | 2079.6 | 2162.5 | 2134.7 | | |
| DRY DENSITY (kg/m3) | 1887.8 | 1918.1 | 1960.5 | 1893.4 | | |
| Tare Number | 1 | 15 | 17 | 18 | | |
| WT Sample Wet + Tare (GMS) | 350.90 | 370.23 | 385.8 | 400.37 | | |
| Wt Sample Dry + Tare (GMS) | 331.09 | 342.81 | 351.4 | 357.1 | | |
| WT Tare (GMS) | 16.15 | 17.24 | 17.49 | 17.57 | | |
| WT Dry Soil (GMS) | 314.94 | 325.57 | 333.91 | 339.53 | | |
| WT Water (GMS) | 19.81 | 27.42 | 34.4 | 43.27 | | |
| WATER CONTENT W% | 6.29% | 8.42% | 10.30% | 12.74% | | |

Max Dry Density (kg/m3): 1961

Corr. Max Dry Density (kg/m3):

Optimum Moisture (%): 10.3

Corr. Optimum Moisture (%):

Estimated Field Density:

Sample Type: Silt and Sand, trace Clay

Supplier: Native Soil

Sample Location: Composite BH

Sampled By: A&A Envirronmental

Date Sampled: Unknown

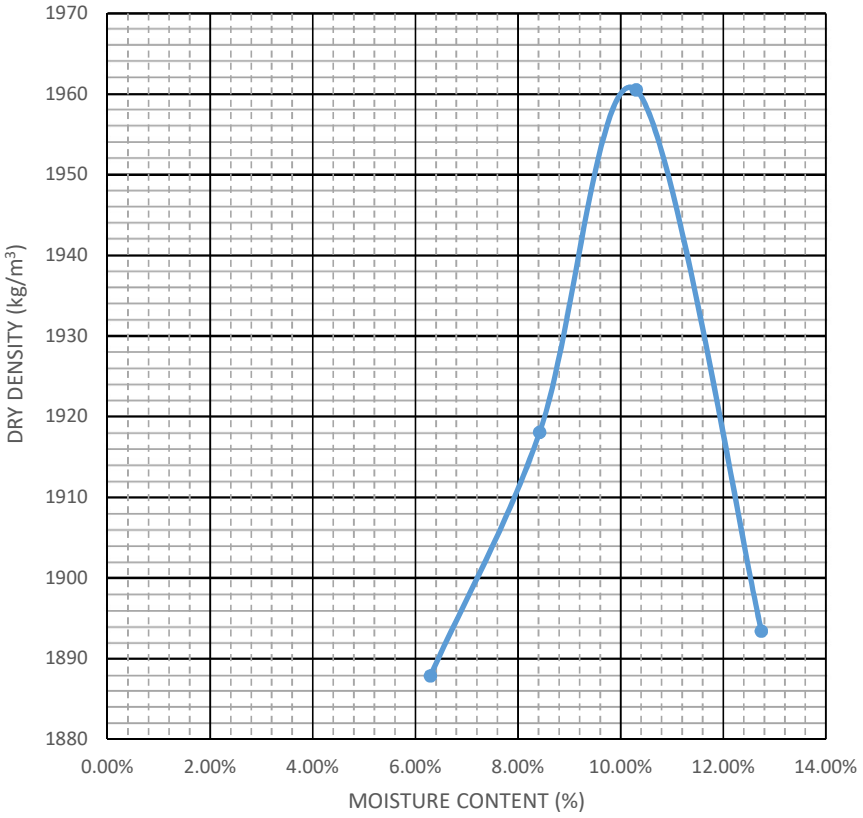
Lab No. 873

Date Tested: 19-May-20

Method: Standard/Modified Standard

Sheet No:

Technician: AR



vallee

Consulting Engineers,
Architects & Planners

March 1, 2021

County of Norfolk
Robinson Administration Building
185 Robinson Street, Suite 200
Simcoe, ON N3Y 5L6

**Attention:** **Tricia Givens, M.Sc.(Pl), MCIP, RPP**

**Reference:** **Planning Justification Report**
**Application for Official Plan/Zoning By-law Amendment I-Z-2014**
**G. Douglas Vallee Limited on behalf of Denzo Group Inc.**
**11 Elizabeth Road, Simcoe, Norfolk County**
**Our Project 20-013**

**Introduction:**
G. Douglas Vallee Limited has been retained by Denzo Group Inc. to make application for an Official Plan Amendment and Zoning By-law Amendment to permit 8 residential street townhouse dwelling units in Simcoe, Norfolk County. The lands are designated Commercial and Hazard Lands in accordance with the Official Plan. The lands are zoned Service Commercial Zone (CS). The purpose of this Planning Justification Report is to provide planning support to amend the Official Plan to remove the Hazard Lands designation and to rezone the subject lands from Service Commercial Zone (CS) to site specific Service Commercial Zone to permit street townhouses.

These applications:

- Comply with the Norfolk County Official Plan.
- Are consistent with the intent of the Provincial Policy Statement 2020.
- Add to the mix of housing types established in the area.
- Generate an acceptable level of traffic.
- Utilize existing infrastructure and do not create adverse affects on the County water and sanitary sewer systems.
- Represent good planning.

**Site Description:**
The lands are located at 11 Elizabeth Road in Simcoe, within the urban settlement boundary, north of Queensway West and south of Mill Pond Road. The topography represents a gradual slope of approximately 2 metres from the highest elevations from the northerly and southerly property lines towards the centre of the property.

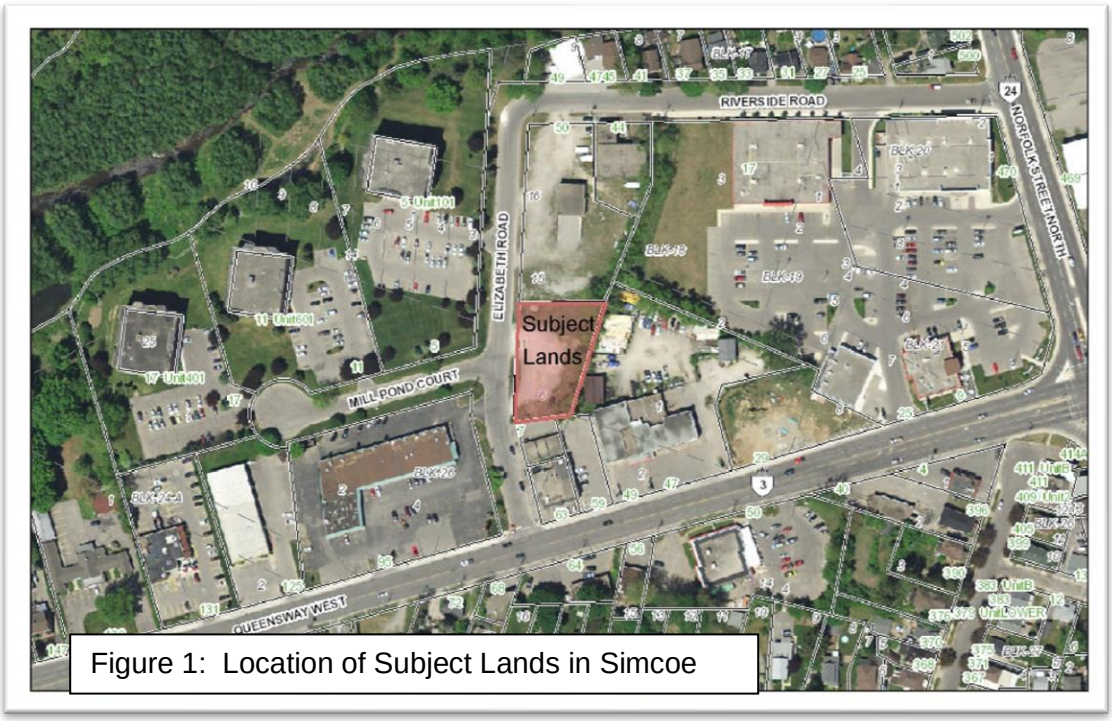



Figure 1: Location of Subject Lands in Simcoe

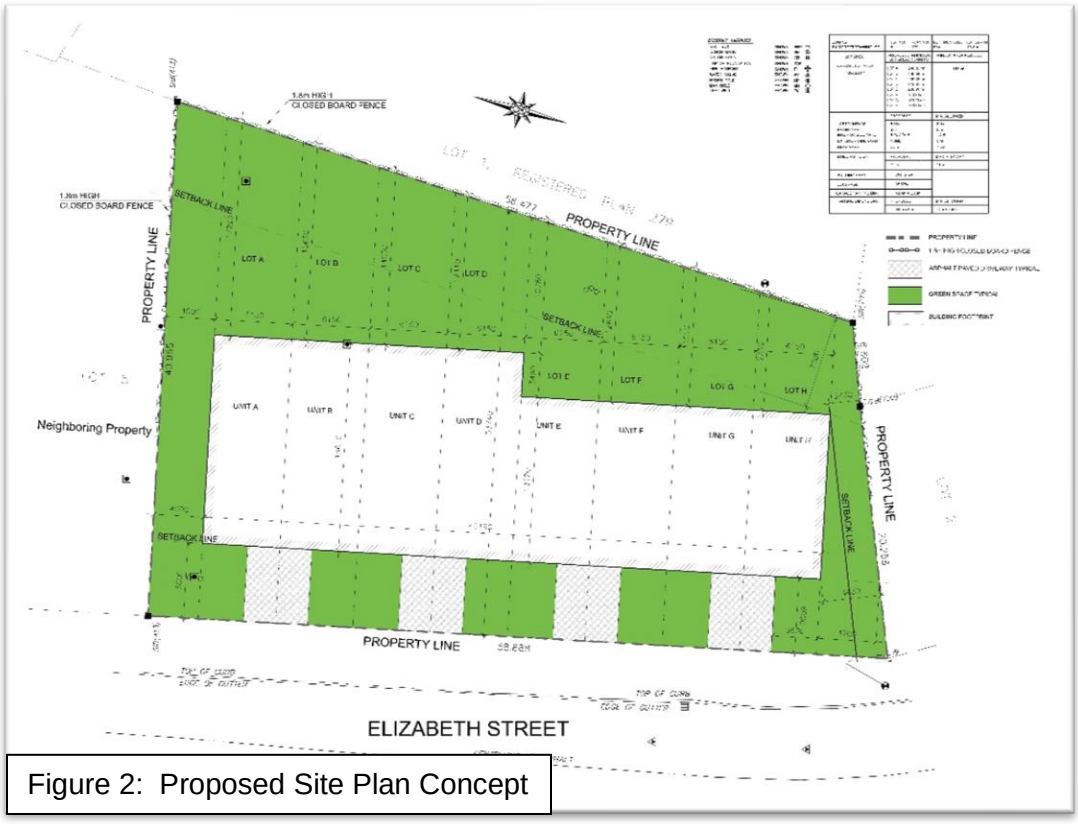



Figure 2: Proposed Site Plan Concept

Surrounding and Existing Land Uses

- The lands abutting to the east are the Queensway Tire Service.
- To the south is the Hi-Way Restaurant.
- To the south-west is the Chamber commercial plaza.
- To the west and north-west is the Mill Pond Residential Apartment buildings.
- To the north is an existing building not currently being used. It is our understanding that these lands are being considered for a residential apartment building.
- The subject lands are currently vacant.

**Background:**

The proposed development lands appear to have been vacant with the exception for some open storage according to 1964 Aerial photography. Supporting information has been prepared and submitted with these applications including:

- Traffic Impact Study (prepared by RC Spencer Associates Inc. dated August 20, 2020)
- Geotechnical Investigation (prepared by A&A Environmental Consultants Inc. dated July 2, 2020)
- Modified Generic Risk Assessment Letter (prepared by A&A Environmental Consultants Inc. dated August 26, 2020)
- Functional Servicing Report (prepared by G. Douglas Vallee Limited dated February 1, 2021.)

Appendices to this report include the following:

Appendix A - Draft Site Plan
Appendix B – Provincial Policy Statement 2020 Policy Compliance
Appendix C – Norfolk County Official Plan Policy Compliance
Appendix D – Modified Generic Risk Assessment Letter

This application was submitted to include the information and material required under Section 34 (10.1) and 22 (4) of the *Planning Act* as part of a complete application.

**Planning Review:**

The proposed Official Plan and Zoning By-law amendments were prepared in light of several planning documents including the Provincial Policy Statement, the County Official Plan and Zoning By-law.

Provincial Policy Statement (2020)

The subject land is identified as being within a Settlement Area according to the Provincial Policy Statement, 2020 (PPS). The PPS provides policy direction for appropriate land use planning and development patterns to achieve healthy, liveable, and resilient communities that will protect resources

of provincial interest, public health and safety, the quality of the natural and built environment, and will facilitate economic growth.

It is encouraged that planning authorities consider infilling, redevelopment and intensification in a compact form in areas that support active transportation and can take advantage of existing infrastructure.

The PPS requires that no adverse effects occur to human health or jeopardize human safety. The Modified Generic Risk Assessment (MGRA) letter prepared by A&A Environmental Consultants Inc. demonstrates that this company has over 25 years of experience in environmental consulting in Ontario.

> *"A&A has proposed and been retained to remediate the groundwater and complete a Modified Generic Risk Assessment (MGRA) for the soil in order to comply with O. Reg. 153/04 to file an Record of Site Condition with the Ministry of the Environment, Conservation, and Parks (MECP)."*

The letter indicates that they have,

> *"used the approach of completing MGRA's to obtain Record of Site Condition approval multiple times and are confident that this is the most cost effective and realistic approach for the site located at 11 Elizabeth Road."*

The letter further describes the stages to remediation, pre-submission to be approved by the Ministry, the development of a risk management plan,

A decision by Council to approve the Official Plan and Zoning By-law amendment will be consistent with PPS, 2020. Details describing the applicable Provincial policies and how the application is consistent with the PPS are included in Appendix C.

Norfolk County Official Plan

The lands are designated Commercial and Hazard Lands in accordance with the Official Plan. The removal of the Hazard Lands designation can be supported as the Long Point Region Conservation Authority has recently updated their flood line mapping which reveals that the lands are no longer in a floodplain. Furthermore, there are no natural heritage features on the site. The details of compliance with the Official Plan are demonstrated in Appendix D.

Several sections of the Official Plan apply when considering zoning by-law amendments and are discussed in detail under Appendix D. On a high level, details of the Official Plan policies are captured by the overarching Goals and Objectives. Section 2.2 of the Official Plan set out six "Goals and Objectives" to which the following five are applicable to the proposed residential development:

- Protecting and Enhancing the Natural Environment;
- Maintaining and Enhancing the Rural and Small-Town Character;
- Maintaining a High Quality of Life;
- Upgrading and Expanding Infrastructure; and
- A Well Governed, Well Planned and Sustainable County.

The proposed zoning by-law amendment achieves the 'Goals and Objectives' of the Official Plan as demonstrated in Appendix D.

The lands are currently designated Hazard Lands due to floodplain mapping. The Long Point Region Conservation Authority has since updated their floodplain mapping which reveals that the mapping no longer includes the subject property. As such, the amendment to the Official Plan to remove the Hazard designation can be supported.

The lands are contaminated. Prior to development of the townhouse units, the lands will be subject to Ministry requirements for achieving a 'Record of Site Condition (RSC)" to facilitate residential development. This will ensure the health and safety of the future residents of the townhouses.

The subject lands are within the 'adjacent lands' to a Provincially Significant Wetland, however, there is existing development between the subject lands and the Provincially Significant Wetland (PSW) located to the north. No impacts to the PSW are anticipated as a result of the residential development. Therefore, an Environmental Impact Study has not been requested by the County or Conservation Authority.

The proposed 8-unit street townhouse application will provide a compact form of additional housing choices and character to the existing mix of residential and commercial development in the area. This will result in an efficient use of land of high quality providing a variety of housing forms and a level of affordability. The lands are subject to site plan control to ensure County development standards are achieved.

The subject lands are vacant and underutilized. The lands are less than 2,000$m^2$ in area and are too small to facilitate a reasonably sized commercial building with associated parking, landscaping and snow storage. The lands are near a network of sidewalks and in accordance with Schedule I-3 "Active Transportation" of the Official Plan, is within 330 metres to a future candidate active transportation trail on Norfolk Street North, and within 1 kilometre of the Trans Canada Trail located on Davis Street West. The County Official Plan supports the development of vacant and underutilized lands that are compact and efficiently used and lends support to the location of the development being within close proximity to active transportation and potential active transportation networks as identified on Schedule "I".

Norfolk County's existing infrastructure will be reviewed by Norfolk County's consultant (RV Anderson Associates) in consideration of the connections proposed to service this development and in light of a Functional Servicing Report prepared by G. Douglas Vallee Limited. Extensions to bring the services along the frontage of the subject lands are required. The proposed infrastructure will be designed and constructed in accordance with Norfolk County's requirements, and will be subject to Norfolk County's approval through the site plan process.

The lands are near existing residential, commercial and institutional uses including the Simcoe Composite School, several places of worship, parks and the Post Office. Through the site plan process, appropriate landscape buffering can be considered to improve compatibility with the adjacent uses.

Summary of Official Plan review

The proposed Official Plan and zoning by-law amendment meets the policies of the Official Plan. The Hazard land designation can be removed. The development concept represents an appropriate land use considering the size of the property, proximity to existing residential and commercial uses, availability of servicing, avoidance of Conservation Authority regulated floodplains, the provision of buffering and landscaping, and that mitigation and/or cleanup of the contamination on the site must be completed prior to residential development occurring on the lands. Accordingly, the proposed applications meet the intent and purpose of the Official Plan and represent good planning.

Norfolk County Comprehensive Zoning By-law 1-Z-2018

The lands are currently zoned Service Commercial Zone (CS). This zone permits single detached, semi-detached, duplex and apartment dwellings. It is proposed to add another residential dwelling unit type to the list of permitted uses in the form of a street townhouse to the permitted uses of the CS Zone. As such, it is proposed that the street townhouses be subject to the Urban Residential Type 4 Zone (R4) provisions with minor modifications.

Accessory residential dwelling units are permitted with street townhouses subject to section 3.2.3 of the zoning by-law.

The proposed development will comply with the R4 Zone provisions with minor requests for modifications as follows:

| Zoning Table for<br><br>Section 5.4 | Urban Residential Type 4 Zone (R4) | Notes: |
|---|---|---|
| 5.4.2 PERMITTED USES | | |
| | Street Townhouse | **Special Exception to permit Street Townhouses in the CS Zone** |
| 5.4.2 ZONE PROVISIONS FOR STREET TOWNHOUSE DWELLINGS | | |
| Minimum Lot Area<br>i) Interior | 156m$^2$ | Min 170m$^2$ |
| Minimum Lot Frontage<br>i) Interior | 6.5m | **Proposed Min Lot Frontage**<br>**Interior: 6.1 metres** |
| c) Front Yard Setback | 6m | 6m |
| d) Exterior Side Setback | 6m | N/A |
| e) Interior Side Yard Setback | 1.2m | **2.4 metres proposed to improve buffering** |
| f) Rear Yard Setback | 7.5m | 7.5m |
| g) Min separation between townhouse dwellings | 2m | N/A |

| | | |
|---|---|---|
| h) Maximum Building Height | 11m | TBD |
| 4.9 Parking Space Requirements for Residential Uses | | |
| Street Townhouse Dwelling | 2 spaces per unit | 1 space in garage, 1 space in driveway |

Summary of Zoning By-law review

To improve compatibility, it is proposed to increase to the southerly interior side yard setback from 1.2 metres to 2.4 metres thereby increasing the buffer area between the subject lands and adjacent commercial property. In order to maximize the efficient use of lands and to reflect market trends in unit type and size, a site specific zone provision is proposed to reduce to the interior lot minimum lot frontage from 6.5 metres to 6 metres.

There are no impacts generated from reducing the interior and corner lot minimum frontages. The increase in the southerly side yard setback to Unit H shown in Figure 2 also increases the amenity space enjoyed by this unit. The development will meet all other zone provisions of the County's Zoning By-law.

The property is being designed to incorporate an increased rear yard amenity space. This has the effect of improving the buffer area from the adjacent commercial lands. Through the site plan process, buffering in the form of fencing will be considered.

The proposal to develop a 8 street townhouse units with the above noted site specific provisions facilitates a well-planned and designed development and represents an efficient use of lands that caters to various housing and social needs.

Planning Analysis:

The proposed Official Plan and Zoning By-law Amendment are in keeping with the general purpose and intent of the Provincial Policy Statement (PPS). The PPS contains policies that address human health and safety in respect to the soil contamination on this site. As such the following process will be completed by A&A Environmental to ensure the property can be developed for residential purposes.

A&A Environmental will prepare an Environmental Site Assessment (ESA) to support a Record of Site Condition (RSC) Application in accordance with Ontario Regulation 153/04 (revised December 2009 and implemented July 1st, 2011). They will complete the report and application form for submission to the Ministry of Environmental Conservation and Parks (MECP), that will subsequently provide a Letter of Acknowledgement that the RSC has been filed in the Environmental Site Registry. The letter of acknowledgement can be sent to the ministry, along with the RSC that will be made publicly available on the Environmental Site Registry website.

For this particular site A&A Environmental is completing a Phase II ESA with a Tier III Risk Assessment (RA) that will be support the RSC application, as the contamination on site in the soil and groundwater is not being fully remediated. The RA will provide stipulations for construction, design, and future monitoring, that will need to be carried out in accordance with the Environmental Protection Act.

Through the RSC process a Certificate of Property Use (CPU) will be issued, outlining the safety measures necessary in order to mitigate the risk to both human and ecological health.

To ensure compliance in this regard, it is recommended that Norfolk County include a condition of Site Plan Approval that an occupancy permit will not be granted until the RSC and CPU is complete. Therefore, there is no risk to the future inhabitants of the 8-unit street townhouse development, the owner or the County.

The proposed Official Plan amendment is in keeping with the general purpose and intent of the Official Plan. The Hazard Lands overlay designation can be removed. A development permit is required by the Conservation Authority subject to O. Reg. 178/06 and will occur subsequent to the approval of a site plan application. This also ensures that the construction plans of the building meet Conservation Authority standards.

The proposed zoning by-law amendment to permit an 8-unit street townhouse development as a special exception in the CS Zone complies with the general intent and purpose of the Official Plan and Zoning By-law. The lands are quite small in size to accommodate a viable commercial use. The most appropriate use of lands is to permit residential development. The amendment to include an alternative form of residential development (street townhouses) is encouraged by the Official Plan and is compatible with surrounding land uses. The reduced frontage is appropriate to maximize the number of dwelling units without compromising usable amenity areas.

Through the site plan process, appropriate screening of the side and rear yard amenity spaces is proposed. This will improve privacy and compatibility with the surrounding uses in addition to the increased setback.

*Traffic:*

There are no traffic concerns identified as a result of this application. The traffic report prepared by RC Spencer indicates,

> *"….it can be concluded that the proposed townhome development on Elizabeth Road will have no perceivable effect on area traffic operations."*

*Modified Generic Risk Assessment:*

Initial soil testing revealed levels of contamination that fail MECP standards. A&A consulting was retained to explore the feasibility of rehabilitating the site to ensure that the property could be cleaned to an acceptable and safe standard to permit residential development. It was determined that remediating all the contamination would not allow the project to remain financially feasible. Therefore, A&A in their experience, proposed a hybrid solution of a partial remediation and a Modified Generic Risk Assessment. These two documents must be reviewed and approved by MECP in accordance with their standards. The MECP is also obligated to protect human health and safety as required in the PPS. Should this process fail, the site would not be developed. A&A has provided a letter to explain the process and their confidence at achieving MECP approval. Therefore, it is recommended that prior to Norfolk County granting site plan approval, a Record of Site Condition be obtained and submitted to the

County to ensure the protection of human health and safety. A holding provision is not required as the development is subject to site plan control.

Conclusion:

The proposed Official Plan and Zoning By-law Amendment implement the policies of the PPS and the Norfolk County Official Plan. The supporting studies submitted with the application conclude that residential development can occur subject to receiving a Record of Site Condition from the Ministry of Environment, Conservation and Parks. The analysis of this application is supportive. Accordingly, it is our opinion that the applications:

- model good planning;
- avoid natural and human made hazards;
- ensure the protection of human health and safety;
- facilitate a development with the most appropriate land use; and
- ensures efficiency and compatibility with the surrounding land uses.

As such it is requested that Staff and Council consider a favourable recommendation and decision to amend the Official Plan and Zoning By-law to permit 8 street townhouses subject to site specific provisions.

Yours truly,

Eldon Darbyson, BES, MCIP, RPP
Director of Planning
**G. DOUGLAS VALLEE LIMITED**
Consulting Engineers, Architects & Planners
H:\Projects\2020\20-013 Denzo Group Townhouses\Agency\PJR\2021.03.01 - Planning Justification Report.docx


*SURVEY LEGEND*

| | | |
|---|---|---|
| BELL BOX | SHOWN | BBX |
| BENCH MARK | SHOWN | BM |
| CATCH BASIN | SHOWN | CB |
| TOP OF FOUNDATION | SHOWN | TOF |
| FIRE HYDRANT | SHOWN | FH |
| WATER VALVE | SHOWN | WV |
| HYDRO POLE | SHOWN | HP |
| MAN HOLE | SHOWN | MH |
| TEST WELL | SHOWN | TW |

| | | | |
|---|---|---|---|
| ZONING<br>R4 (STREET TOWNHOUSE) | LOT NO:<br>6 | PLAN NO:<br>279 | LOT FRONTAGE LOT DEPTH<br>59 m 33.8 m |
| LOT AREA | PROPOSED INDIVIDUAL LOT AREAS ( 8 UNITS) | | MIN.LOT AREA ALLOWED |
| OVERALL LOT AREA<br>1897.22 m² | LOT A 240.39 m²<br>LOT B 230.34 m²<br>LOT C 220.33 m²<br>LOT D 210.31 m²<br>LOT E 200.31 m²<br>LOT F 190.30 m²<br>LOT G 180.28 m²<br>LOT H 170.30 m² | | 156 m² |
| | PROPOSED | | MIN. ALLOWED |
| LOT FRONTAGE<br>FRONT YARD<br>INTERIOR SIDE YARD<br>EXTERIOR SIDE YARD<br>REAR YARD | 6.15 m<br>6 m<br>4 m, 2.54 m<br>NONE<br>7.5 m | | 6.5 m<br>6 m<br>1.2 m<br>6 m<br>7.5 m |
| BUILDING HEIGHT | PROPOSED | | MAX. ALLOWED |
| | 11 m | | 11 m |
| BUILDING AREA | 731.13 m² | | |
| COVERAGE | 38.53% | | |
| GARAGE PARKING DIM. | 4.04m X 6.10m | | |
| PARKING DIMENSIONS | PROPOSED | | MIN. ALLOWED |
| | 3.6m X 6m | | 3m X 5.8m |

PROPERTY LINE

1.8m HIGH CLOSED BOARD FENCE

ASPHALT PAVED DRIVEWAY TYPICAL

GREEN SPACE TYPICAL

BUILDING FOOTPRINT

| Rev. | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| B | 09 FEB 2021 | ISSUED FOR ZONING | TE | AS |
| A | 06 AUG 2020 | ISSUED FOR ZONING | TE | AS |

CONSULTING ENGINEER

ARCHICREATION DESIGN STUDIO Inc.
6-425 Hespeler Rd Suite 118
Cambridge,ON N1R 8J6 T: (647)924-7611

PROJECT: TOWN HOMES
LOT 6, PLAN 279

ADDRESS: 1 ELIZABETH STREET SIMCOE, ON

OWNER:

SHEET TITLE: SITE PLAN

| DESIGNED BY | DRAWN BY | CHECKED BY | APPROVED BY |
|---|---|---|---|
| XXXXXX | XXXXXX | T.SABRAH | T.SABRAH |
| DATE | SCALE | SHEET NO. | PROJECT NO. |
| July 2020 | 1 : 300 | 1 OF 1 | HK01 |

DRAWING NO: AA01

SEAL

FILE PATH:

**Appendix B**

**Provincial Policy Statement 2020 – Policy Compliance**

This appendix demonstrates how the proposed application is consistent with those applicable policies of the Provincial Policy Statement.

| Policy | Comment |
|---|---|
| **1.1 Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns**<br>Policy 1.1.1 outlines that healthy, liveable, and safe communities are sustained by: | |
| a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term; | Yes. Lands are appropriate for residential. Too small for commercial. |
| b) accommodating an appropriate affordable and market-based range and mix of residential types (including single-detached, additional residential units, multi-unit housing, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs; | Yes. Adds a compact form of residential development to cater to various incomes and mix of housing types in the area. |
| c) avoiding development and land use patterns which may cause environmental or public health and safety concerns; | Yes. Lands not within flood plain. |
| d) avoiding development and land use patterns that would prevent the efficient expansion of settlement areas in those areas which are adjacent or close to settlement areas; | N/A |
| e) promoting the integration of land use planning, growth management, transit-supportive development, intensification and infrastructure planning to achieve cost-effective development patterns, optimization of transit investments, and standards to minimize land consumption and servicing costs; | Yes. Lands located near public transit. |
| f) improving accessibility for persons with disabilities and older persons by addressing land use barriers which restrict their full participation in society; | Yes. Sidewalk network is available and near public transit. |

| | |
|---|---|
| g) ensuring that necessary infrastructure and public service facilities are or will be available to meet current and projected needs;<br><br>h) promoting development and land use patterns that conserve biodiversity; and;<br><br>i) preparing for the regional and local impacts of a changing climate. | Yes. Infrastructure and various services exist in the area.<br><br>N/A<br><br>N/A |
| Policy 1.1.3.1 states that *settlement areas* shall be the focus of growth and development. | Lands are within a settlement area. |
| Policy 1.1.3.2 states that land use patterns within settlement areas shall be based on densities and a mix of land uses which:<br>a) efficiently use land and resources;<br><br>b) are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansion;<br><br>c) minimize negative impacts to air quality and climate change, and promote energy efficiency;<br><br>d) prepare for the impacts of a changing climate;<br><br>e) support active transportation;<br><br>f) are transit-supportive, where transit is planned, exists or may be developed; and<br><br>g) are freight-supportive. | <br><br>Yes.<br><br>Yes.<br><br>N/A<br><br>Located outside of flood plain.<br>Yes. Located near trail network and sidewalks.<br>Yes. Located near public transit.<br><br>N/A |
| Land use patterns within settlement areas shall also be based on a range of uses and opportunities for intensification and redevelopment in accordance with the criteria in policy 1.1.3.3, where this can be accommodated. | Yes. Adds to the range of uses on vacant undersized lands. |
| Policy 1.1.3.3 states that planning authorities shall identify appropriate locations and promote opportunities for transit-supportive development, accommodating a significant supply and range of housing options through intensification and redevelopment where this can be accommodated taking into account existing building stock or areas, including brownfield sites, and the availability of suitable existing or | Yes. This policy encourages the proposed development. The site is intended to be remediated to permit residential. Public transit is available within walking distance. |

| | |
|---|---|
| planned infrastructure and public service facilities required to accommodate projected needs. | |
| Policy 1.1.3.4 states that appropriate development standards should be promoted which facilitate intensification, redevelopment and compact form, while avoiding or mitigating risks to public health and safety. | Yes. The development intensifies the area in a compact form and is not located in a flood plain. |
| Policy 1.1.3.5 states that planning authorities shall establish and implement minimum targets for intensification and redevelopment within built-up areas, based on local conditions. However, where provincial targets are established through provincial plans, the provincial target shall represent the minimum target for affected areas. | Yes. The County Official Plan indicates that the County shall target that a minimum 25 percent of its annual residential growth be accommodated through infill, intensification and redevelopment within the existing built-up areas in the Urban Areas with full municipal services. |
| **1.2.6 Land Use Compatibility**<br><br>Policy 1.2.6.1 states that major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures.<br><br>A sensitive land use means buildings, amenity areas, or outdoor spaces where routine or normal activities occurring at reasonably expected times would experience one or more adverse effects from contaminant discharges generated by a nearby major facility. Sensitive land uses may be a part of the natural or built environment. Examples may include, but are not limited to: residences, day care centres, and educational and health facilities.<br><br>A major facility means facilities which may require separation from sensitive land uses, including but not limited to airports, manufacturing uses, transportation infrastructure and corridors, rail facilities, marine facilities, sewage treatment | There are no major facilities in the area that would affect sensitive land uses. |

| | |
|---|---|
| facilities, waste management systems, oil and gas pipelines, industries, energy generation facilities and transmission systems, and resource extraction activities. | |
| **1.4 Housing**<br><br>Policy 1.4 directs planning authorities to provide for an appropriate range and mix of housing types and densities. | Yes. This adds to the range and mix of housing types and densities in the area. |
| Policy 1.4.3 requires planning authorities to provide for an appropriate range and mix of housing options and densities to meet projected market-based and affordable housing needs of current and future residents of the regional market area by:<br>b) permitting and facilitating:<br>1. all housing options required to meet the social, health, economic and well-being requirements of current and future residents, including special needs requirements and needs arising from demographic changes and employment opportunities; and<br>2. all types of residential intensification, including additional residential units, and redevelopment in accordance with policy 1.1.3.3;<br><br>c) directing the development of new housing towards locations where appropriate levels of infrastructure and public service facilities are or will be available to support current and projected needs;<br><br>d) promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation and transit in areas where it exists or is to be developed;<br><br>e) requiring transit-supportive development and prioritizing intensification, including potential air rights development, in proximity to transit, including corridors and stations; and | This section applies to the approval authority.<br><br>The development adds to the range of housing options and is located in an area near existing commercial businesses.<br><br>Yes. Represents residential intensification.<br><br>Yes. The area contains existing infrastructure and public services facilities.<br><br>Yes. The development for street townhouses is an appropriate density for the size of the lands near sidewalks, public transit and existing and future trails.<br><br>N/A |

| | |
|---|---|
| f) establishing development standards for residential intensification, redevelopment and new residential development which minimize the cost of housing and facilitate compact form, while maintaining appropriate levels of public health and safety. | Yes. The development intensifies the residential land base in a compact form, located outside of a flood plain. |

Summary:

The proposed development will facilitate the construction of 8 street townhouse dwelling units on an existing vacant parcel of land within the County's Settlement Area. The proposed zoning amendment adds to the range of housing in the area. The form of development contributes the County's existing residential building supply, improves the mix of land uses in the area, adds to the diversity unit configurations available, and will appeal to individuals with different needs and financial abilities. The lands have access to existing municipal infrastructure and will not cause any environmental or public health and safety concerns once contamination is removed or mitigated. The lands are outside of the flood plain. Municipal servicing is available on Riverside Road and Queensway West which can be extended to the subject property at the developers cost and will be confirmed through the site plan application.

### 1.5 Public Spaces, Recreation, Parks, Trails and Open Space

Section 1.5 addresses healthy communities and the provision of public spaces, recreation, parks, trails and open space.

The lands are too small to provide parkland. Therefore, 5% of the value of the lands will be paid to the County in lieu of parkland in accordance with County policies. It will facilitate active transportation and community connectivity due to the proximity of local businesses and services and fosters social interaction through existing recreation in the area. More specifically, the development is within one (1) kilometre of public parks, restaurants, pharmaceutical stores and within a five (5) minute walk to Norfolk Street North which is being considered for a future active transportation route.

There are no evident natural heritage, agricultural or cultural heritage and archaeological implications as a result of the proposed amendments. There is a Provincially Significant Wetland (PSW) being the Mill Pond Creek to the north of the subject lands. At the time of preparing this report and in consideration of the pre-consultation comments, no concerns were raised in respect to the development of the lands in relation to the PSW.

## 1.6 Infrastructure and Public Service Facilities

Policy 1.6 discusses the efficient use of infrastructure, utilities and green infrastructure.

The subject lands will take advantage of existing infrastructure and coordinate the installation of utilities. Green infrastructure in the form of street trees are required by the County. The lands will contain permeable surfaces in the form of sodded boulevards open space areas unoccupied by buildings, structures and driveways.

## 1.8 Energy Conservation, Air Quality and Climate Change

Policy 1.8.1 states that planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns which:

b) promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;

e) encourage transit-supportive development and intensification to improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion;

The proposed development is in a location that encourages active transportation in and between residential and employment and institutional uses. The lands are in close proximity to various commercial and institutional uses which provide employment opportunities to the future residents of the development.

## 2.1 Natural Heritage

Policy 2.1.1 states that natural features and areas shall be protected for the long term.

Policy 2.1.2 states that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

Policy 2.1.5 states that development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Policy 2.1.8 states that development and site alteration shall not be permitted on *adjacent lands* to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has

been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

The lands are located south of the PSW on a municipal road where existing uses separate the subject lands from the PSW. No concerns have been identified by the County or Long Point Region Conservation Authority. Accordingly, the natural features continue to be protected for the long term.

## 3.0 Protecting Public Health and Safety

Policy 3.0 discusses natural and human-made hazardous lands, where development is prohibited or permitted subject to conditions addressing flooding and erosion.

The Long Point Region Conservation Authority supports the removal of the hazard land designation as they have recently released new mapping which demonstrates that the lands are not within the flood plain. This forms the basis of amending the Official Plan to remove the Hazard Land designation to permit development envisioned in the County Official Plan.

## 3.2 Human-Made Hazards

3.2.1 Development on, abutting or adjacent to lands affected by mine hazards; oil, gas and salt hazards; or former mineral mining operations, mineral aggregate operations or petroleum resource operations may be permitted only if rehabilitation or other measures to address and mitigate known or suspected hazards are under way or have been completed.

3.2.2 Sites with contaminants in land or water shall be assessed and remediated as necessary prior to any activity on the site associated with the proposed use such that there will be no adverse effects.

3.2.3 Planning authorities should support, where feasible, on-site and local re-use of excess soil through planning and development approvals while protecting human health and the environment.

A Record of Site Condition (RSC) is required by the Ministry of Environment Conservation and Parks (MECP) to allow residential development on the subject lands as they contain contamination unsuitable for residential development. The letter prepared by A&A Environmental Consultants and dated August 26, 2020, demonstrates that obtaining the RSC is achievable. In their experience, it is proposed that a hybrid solution of a partial remediation and a Modified Generic Risk Assessment be prepared and submitted to the MECP. Therefore, it is recommended that an RSC be required as a condition of site plan approval. Accordingly, Section 3.2 of the PPS can be satisfied upon approval by the MECP.

**Appendix C**

**Norfolk County Official Plan – Policy Compliance**

| Section | Policy | Comments |
|---|---|---|
| 2 | 2.2 Goals and Objectives | 5 of 6 are applicable – Rationale provided in report - Supportive |
| 3 | Natural Heritage | Schedule C identifies the subject property being within the adjacent lands to an existing Provincially Significant Wetland. However, there is existing development between the subject property and the Provincially Significant wetland, there are not natural features on site and the development will occur on full municipal services. The County and the Conservation Authority did not identify the need for an Environmental Impact Study (EIS) to address the wetland. Should it be determined that an EIS is required, this can be a condition of Site Plan approval. There are no Source Water Protection areas identified on or near the subject lands in accordance with Schedule D. |
| 3.5 | Natural Heritage Systems | There does not appear to be any features that affect the subject lands. |
| 4.8 | Potentially Contaminated Sites | These policies discuss the identification of contaminated sites and appropriate development / re-development of sites in accordance with the Environmental Protection Act and triggers the need to produce a Record of Site Condition. A consultant has been retained to address the contamination and produce a record of site condition. |
| 5.3 | Housing | Supports mix of unit types, densities, compact form, development of underutilized and vacant lands within the existing neighbourhoods, has access to suitable road network and pedestrian sidewalks and active transportation networks and compatibility can be improved through |

| | | |
|---|---|---|
| | | site specific landscaping and buffering. See discussion below. |
| 5.4 | Community Design | See details below. |
| 5.6.2 | Linked to Open Space and Natural Heritage System | The subject lands are not located within or near a natural heritage system. However, the lands are near the Trans Canada Trail system and the Regional Road No 24 candidate active transportation route. |
| 5.7.4 | Archaeological Resources | The County has not identified this property as having probability for archaeological resources. |
| 6.5.1 | Simcoe Urban Area | The proposed applications do not offend the policies of the Waterford Urban Area. |
| 6.5.1.5 | Queensway Corridor Special Policy Area | The proposal is not affected by these special policies. |
| 7.11 | Commercial Designation | Residential is permitted. Subject to special policy area 6.5.1.5 Queensway Corridor Special Policy Area. See details below. |
| 8.9 | Water and Wastewater Services | Municipal Services exist in the area. |
| 9.6.2 | Zoning By-law Amendments | The complete application submission addresses all requirements of this section including but not limited to a planning justification report, water and sanitary modelling reports, stormwater management report and a traffic report. |
| 9.6.5 | Site Plan Control | A site plan application for the development of the street townhouse units is required. |
| 9.7.1 | Environmental Impact Study | Not identified as required. |

<u>Section 5.3 - Housing</u>

This section provides the County with direction on where and how to grow, outlines County opportunities and studies for implementing affordable housing strategies, encouraging the provision of a mix of housing types and conversion of rental properties. Section 5.3 i) indicates that:

> "The County shall first consider surplus municipal land for affordable housing and shall work with other levels of government to make surplus land available to providers of affordable housing at little or no cost."

Section 5.3 j) indicates that:

> "The County shall encourage opportunities for more affordable housing to be provided in the Downtown Areas.

The proposed development helps the County to implement applicable housing policies through the provision of a mix of housing types and increased densities; however, is not located in the lands identified for affordable housing priority.

Section 5.3.1 Residential Intensification discusses intensification in existing residential developments within the built-up area of the Official Plan. The subject lands are located within the built-up area as indicated on Schedule B-15 of the Official Plan.

| | |
|---|---|
| Housing shall, in part, be provided through urban residential intensification, which may include….:<br>a) infill development and residential development of vacant land or underutilized land in existing neighbourhoods | The proposal represents appropriate infilling within an existing neighbourhood on vacant and underutilized land. |
| 5.3.1 b) states in part:<br>"The County shall target that a minimum 25 percent of its annual residential growth be accommodated through infill, intensification and redevelopment within the existing built-up areas in the Urban Areas with full municipal services. | The proposal implements this policy. |
| f) The County shall consider applications for infill development, intensification and redevelopment of sites and buildings through intensification based on the following criteria: | |
| i) the development proposal is within an Urban Area, and is appropriately located in the context of the residential intensification study; | Land are located in the Urban Area and intensification study identified this area to be within the built-up area. |
| ii) the existing water and sanitary sewer services can accommodate the additional development; | Services exist and will be reviewed through the site plan application. |
| iii) the road network can accommodate the traffic generated; | Traffic Impact Study does not identify any deficiencies. |
| iv) the proposed development is compatible with the existing development and physical character of the adjacent properties and surrounding neighbourhood; and | Lands are a mix of commercial and residential land uses. Commercial land uses are not intense and are located on small parcels of land. Buffering and landscaping proposed on the site improve compatibility. |

| | |
|---|---|
| v) the proposed development is consistent with the policies of the appropriate Land Use Designation associated with the land. | Residential is permitted. |

Section 5.4 – Community Design

The proposed 8-unit street townhouse application helps minimize land consumption, enhances the tree canopy, and has access to a safe network of sidewalks.

The lands are compatible with adjacent land uses, enhanced buffering in the form of increased setbacks, buffering and landscaping are proposed. Details related to buffering and landscaping will be reviewed in detail through the site plan approvals process.

Section 7.11 - Commercial Designation

The Commercial Designation encourages the establishment of commercial uses and permits limited residential development provided that the uses do not negatively impact the planned function of the Commercial areas. Residential uses are permitted as follows:

i) in a building of commercial character, residential uses shall only be permitted above the ground floor; and
ii) in a building of residential character, either single detached or multiple dwelling, residential and/or commercial uses shall be permitted, provided the residential character of the building is maintained.

The proposed land use is for 8 street townhouse units which will be designed with residential character and therefore is permitted.

7.11.2 Land Use Policies

The following policies apply to land designated Commercial.

| | |
|---|---|
| a) Commercial development shall be compatible with surrounding uses and shall be adequately buffered from adjacent sensitive land uses. | Through site plan control, compatibility and buffering will be improved between commercial and residential uses. The dwellings will be located close to the road in |

| | |
|---|---|
| | accordance with zoning setbacks thereby increasing the buffering distance around the periphery of the property. The existing commercial uses are located on small parcels of land and do not appear to be capable of becoming intense uses. |
| b) Adequate off-street parking and loading spaces shall be provided in accordance with the Zoning By-law. | Each dwelling unit must provide 2 parking spaces. |
| c) Commercial uses shall only locate on Provincial Highways, subject to the approval of the Province and the County, or arterial or collector roads, subject to the approval of the County. | N/A |
| d) A high standard of site design shall be required through site plan control. | The development is subject to site plan control. |
| e) Proposals to designate additional land as Commercial within the County shall be subject to the policies of Section 9.6.1 (Official Plan Amendments) and the criteria outlined in Section7.10.2 (f) (Shopping Centre Commercial Designation – Land Use Policies), notwithstanding the size of the proposed use(s), or the presence or absence of a proposed Large Retail Use. | N/A |

A & A Environmental Consultants Inc.
16 Young Street
Woodstock, Ontario N4S 3L4
Tel: 519-266-4680
Fax: 519-266-3666

Offices in: Kirkland Lake North Bay Toronto Woodstock

August 26, 2020

To Whom it may concern:

## Re: Modified Generic Risk Assessment to support an O. Reg. 153/04 Record of Site Condition for the Property Located at 11 Elizabeth Street, Simcoe, Ontario

A & A Environmental Consultants Inc. (A&A) has been retained to complete a Phase I & Phase II Environmental Site Assessment (ESA) in accordance to O. Reg. 153/04 to support a Record of Site Condition (RSC) application for the property located at 11 Elizabeth Street, Simcoe, Ontario. A&A previously conducted a Phase II ESA in 2019, along with Canadian Engineering Group also completing a supplemental Phase II ESA in 2019. Both of these reports identified petroleum hydrocarbon (PHC) and volatile organic compound (VOC) contamination in both the soil and groundwater. A&A has proposed and been retained to remediate the groundwater and complete a Modified Generic Risk Assessment (MGRA) for the soil in order to comply with O. Reg. 153/04 to file an RSC with the Ministry of the Environment, Conservation, and Parks (MECP).

A&A is a multi-disciplinary environmental consulting firm offering a wide variety of services; specializing in Phase I and Phase II Environmental Site Assessments, Record of Site Conditions, and Risk Assessments. A&A has more than 25 years of experience in environmental consulting within the province of Ontario. We have performed thousands of projects from small scale Phase I ESAs, to large scale risk assessments for “brownfields” sites. We have a number of senior experience staff who consult in a variety of disciplines and offer our clients expert knowledge in both the technical aspects of a project and the environmental regulations applicable.

A&A has used the approach of completing MGRAs to obtain RSC approval multiple times in the past, and is confident that this is the most cost effective and realistic approach for the site located at 11 Elizabeth Street, Simcoe, Ontario. This approach will be completed in three stages, that will span over the next few years.

The first stage will involve the installation of injections wells across the subject site. The injection wells will be installed into the shallow aquifer to treat the impacted groundwater. The permanent injection wells will provide frequent access to reach the groundwater for treatment during the remediation program. The injections wells will be used to inject the chemical oxidation and the bioremediation reagent. It is proposed that one injection event, lasting up to four weeks will occur before conducting groundwater testing. Subsequent injection programs may be required if the results of the follow up monitoring program after completing the first round of injection

show exceedances in the levels of PHC and VOCs. Injection rounds will continue until the results of analysis of samples collected from four consecutive quarterly sampling event are below the applicable site condition standards for PHCs and VOCs, in accordance with O. Reg. 153/04 subsection 40, paragraph 8, of Schedule E.

After the groundwater remediation program is complete A&A will be completing the MGRA to address the contaminants remaining in the soil. The MGRA will be completed in accordance with O. Reg. 153/04 (as amended) to ensure the structure and technical requirements are performed under a defensible process, while reducing the administrative and documentary requirements. The scope of work will include completing a data gap analysis, preparation of a pre-submission form to be sent and approved by the MECP, development of a risk management plan, preparation of the MGRA for the MECP, response to technical review comments of the MGRA from the MECP, and a review of the Certificate of Property Use (CPU) as proposed by the MECP.

Once the CPU has been issued by the MECP, A&A will file the RSC in accordance with the risk management measures laid out by the MECP. Due to the preliminary stage of the project at this time, the MECP has not been consulted on the risk management measures that will be implemented on site. Some risk management measures that have been commonly used for PHC and VOC contamination in the soil are:

- Engineered Barriers
- Vapour Intrusion Measures
- Site Specific Health and Safety Plans
- Soil Management Plans

Along with risk management measures for the subject site, A&A, in coordination with the MECP will determine the requirements for monitoring and maintenance of the risk management measures implemented on the subject site.

A&A is confident that the approach of completing the groundwater remediation and MGRA to obtain the RSC approval is the most cost effective and realistic option that will supported by the MECP. Please do not hesitate to contact us should you have any questions.

Sincerely,

Victoria Sowden, HBSc. (Geo), Cert. Env. Mgt.
Senior Environmental Consultant
A&A Environmental Consultants Inc.
16 Young Street
Woodstock, ON N4S 3L4
519-266-4680

vallee

Consulting Engineers,
Architects & Planners

March 1, 2021

County of Norfolk
Robinson Administration Building
185 Robinson Street, Suite 200
Simcoe, ON N3Y 5L6

**Attention:** **Tricia Givens, M.Sc.(Pl), MCIP, RPP**

**Reference:** **Planning Justification Report**
**Application for Official Plan/Zoning By-law Amendment I-Z-2014**
**G. Douglas Vallee Limited on behalf of Denzo Group Inc.**
**11 Elizabeth Road, Simcoe, Norfolk County**
**Our Project 20-013**

**Introduction:**
G. Douglas Vallee Limited has been retained by Denzo Group Inc. to make application for an Official Plan Amendment and Zoning By-law Amendment to permit 8 residential street townhouse dwelling units in Simcoe, Norfolk County. The lands are designated Commercial and Hazard Lands in accordance with the Official Plan. The lands are zoned Service Commercial Zone (CS). The purpose of this Planning Justification Report is to provide planning support to amend the Official Plan to remove the Hazard Lands designation and to rezone the subject lands from Service Commercial Zone (CS) to site specific Service Commercial Zone to permit street townhouses.

These applications:

- Comply with the Norfolk County Official Plan.
- Are consistent with the intent of the Provincial Policy Statement 2020.
- Add to the mix of housing types established in the area.
- Generate an acceptable level of traffic.
- Utilize existing infrastructure and do not create adverse affects on the County water and sanitary sewer systems.
- Represent good planning.

**Site Description:**
The lands are located at 11 Elizabeth Road in Simcoe, within the urban settlement boundary, north of Queensway West and south of Mill Pond Road. The topography represents a gradual slope of approximately 2 metres from the highest elevations from the northerly and southerly property lines towards the centre of the property.

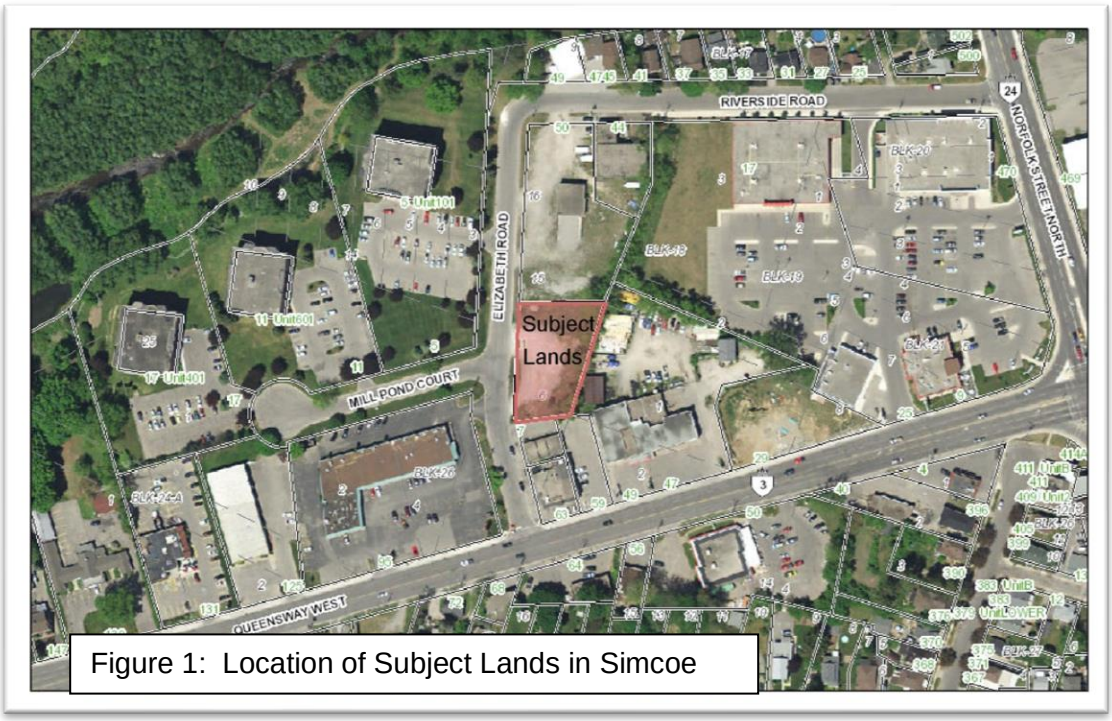



Figure 1: Location of Subject Lands in Simcoe

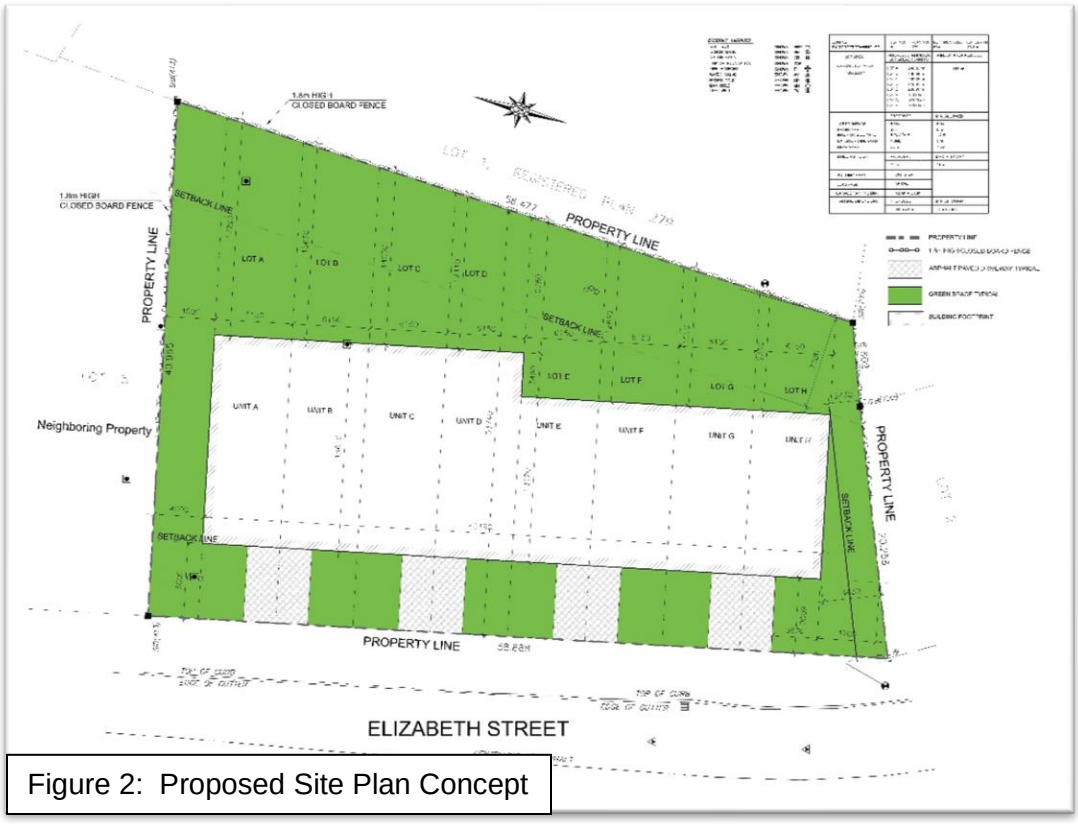



Figure 2: Proposed Site Plan Concept

Surrounding and Existing Land Uses

- The lands abutting to the east are the Queensway Tire Service.
- To the south is the Hi-Way Restaurant.
- To the south-west is the Chamber commercial plaza.
- To the west and north-west is the Mill Pond Residential Apartment buildings.
- To the north is an existing building not currently being used. It is our understanding that these lands are being considered for a residential apartment building.
- The subject lands are currently vacant.

**Background:**

The proposed development lands appear to have been vacant with the exception for some open storage according to 1964 Aerial photography. Supporting information has been prepared and submitted with these applications including:

- Traffic Impact Study (prepared by RC Spencer Associates Inc. dated August 20, 2020)
- Geotechnical Investigation (prepared by A&A Environmental Consultants Inc. dated July 2, 2020)
- Modified Generic Risk Assessment Letter (prepared by A&A Environmental Consultants Inc. dated August 26, 2020)
- Functional Servicing Report (prepared by G. Douglas Vallee Limited dated February 1, 2021.)

Appendices to this report include the following:

Appendix A - Draft Site Plan
Appendix B – Provincial Policy Statement 2020 Policy Compliance
Appendix C – Norfolk County Official Plan Policy Compliance
Appendix D – Modified Generic Risk Assessment Letter

This application was submitted to include the information and material required under Section 34 (10.1) and 22 (4) of the *Planning Act* as part of a complete application.

**Planning Review:**

The proposed Official Plan and Zoning By-law amendments were prepared in light of several planning documents including the Provincial Policy Statement, the County Official Plan and Zoning By-law.

Provincial Policy Statement (2020)

The subject land is identified as being within a Settlement Area according to the Provincial Policy Statement, 2020 (PPS). The PPS provides policy direction for appropriate land use planning and development patterns to achieve healthy, liveable, and resilient communities that will protect resources

of provincial interest, public health and safety, the quality of the natural and built environment, and will facilitate economic growth.

It is encouraged that planning authorities consider infilling, redevelopment and intensification in a compact form in areas that support active transportation and can take advantage of existing infrastructure.

The PPS requires that no adverse effects occur to human health or jeopardize human safety. The Modified Generic Risk Assessment (MGRA) letter prepared by A&A Environmental Consultants Inc. demonstrates that this company has over 25 years of experience in environmental consulting in Ontario.

> *"A&A has proposed and been retained to remediate the groundwater and complete a Modified Generic Risk Assessment (MGRA) for the soil in order to comply with O. Reg. 153/04 to file an Record of Site Condition with the Ministry of the Environment, Conservation, and Parks (MECP)."*

The letter indicates that they have,

> *"used the approach of completing MGRA's to obtain Record of Site Condition approval multiple times and are confident that this is the most cost effective and realistic approach for the site located at 11 Elizabeth Road."*

The letter further describes the stages to remediation, pre-submission to be approved by the Ministry, the development of a risk management plan,

A decision by Council to approve the Official Plan and Zoning By-law amendment will be consistent with PPS, 2020. Details describing the applicable Provincial policies and how the application is consistent with the PPS are included in Appendix C.

Norfolk County Official Plan

The lands are designated Commercial and Hazard Lands in accordance with the Official Plan. The removal of the Hazard Lands designation can be supported as the Long Point Region Conservation Authority has recently updated their flood line mapping which reveals that the lands are no longer in a floodplain. Furthermore, there are no natural heritage features on the site. The details of compliance with the Official Plan are demonstrated in Appendix D.

Several sections of the Official Plan apply when considering zoning by-law amendments and are discussed in detail under Appendix D. On a high level, details of the Official Plan policies are captured by the overarching Goals and Objectives. Section 2.2 of the Official Plan set out six "Goals and Objectives" to which the following five are applicable to the proposed residential development:

- Protecting and Enhancing the Natural Environment;
- Maintaining and Enhancing the Rural and Small-Town Character;
- Maintaining a High Quality of Life;
- Upgrading and Expanding Infrastructure; and
- A Well Governed, Well Planned and Sustainable County.

The proposed zoning by-law amendment achieves the 'Goals and Objectives' of the Official Plan as demonstrated in Appendix D.

The lands are currently designated Hazard Lands due to floodplain mapping. The Long Point Region Conservation Authority has since updated their floodplain mapping which reveals that the mapping no longer includes the subject property. As such, the amendment to the Official Plan to remove the Hazard designation can be supported.

The lands are contaminated. Prior to development of the townhouse units, the lands will be subject to Ministry requirements for achieving a 'Record of Site Condition (RSC)" to facilitate residential development. This will ensure the health and safety of the future residents of the townhouses.

The subject lands are within the 'adjacent lands' to a Provincially Significant Wetland, however, there is existing development between the subject lands and the Provincially Significant Wetland (PSW) located to the north. No impacts to the PSW are anticipated as a result of the residential development. Therefore, an Environmental Impact Study has not been requested by the County or Conservation Authority.

The proposed 8-unit street townhouse application will provide a compact form of additional housing choices and character to the existing mix of residential and commercial development in the area. This will result in an efficient use of land of high quality providing a variety of housing forms and a level of affordability. The lands are subject to site plan control to ensure County development standards are achieved.

The subject lands are vacant and underutilized. The lands are less than 2,000$m^2$ in area and are too small to facilitate a reasonably sized commercial building with associated parking, landscaping and snow storage. The lands are near a network of sidewalks and in accordance with Schedule I-3 "Active Transportation" of the Official Plan, is within 330 metres to a future candidate active transportation trail on Norfolk Street North, and within 1 kilometre of the Trans Canada Trail located on Davis Street West. The County Official Plan supports the development of vacant and underutilized lands that are compact and efficiently used and lends support to the location of the development being within close proximity to active transportation and potential active transportation networks as identified on Schedule "I".

Norfolk County's existing infrastructure will be reviewed by Norfolk County's consultant (RV Anderson Associates) in consideration of the connections proposed to service this development and in light of a Functional Servicing Report prepared by G. Douglas Vallee Limited. Extensions to bring the services along the frontage of the subject lands are required. The proposed infrastructure will be designed and constructed in accordance with Norfolk County's requirements, and will be subject to Norfolk County's approval through the site plan process.

The lands are near existing residential, commercial and institutional uses including the Simcoe Composite School, several places of worship, parks and the Post Office. Through the site plan process, appropriate landscape buffering can be considered to improve compatibility with the adjacent uses.

Summary of Official Plan review

The proposed Official Plan and zoning by-law amendment meets the policies of the Official Plan. The Hazard land designation can be removed. The development concept represents an appropriate land use considering the size of the property, proximity to existing residential and commercial uses, availability of servicing, avoidance of Conservation Authority regulated floodplains, the provision of buffering and landscaping, and that mitigation and/or cleanup of the contamination on the site must be completed prior to residential development occurring on the lands. Accordingly, the proposed applications meet the intent and purpose of the Official Plan and represent good planning.

Norfolk County Comprehensive Zoning By-law 1-Z-2018

The lands are currently zoned Service Commercial Zone (CS). This zone permits single detached, semi-detached, duplex and apartment dwellings. It is proposed to add another residential dwelling unit type to the list of permitted uses in the form of a street townhouse to the permitted uses of the CS Zone. As such, it is proposed that the street townhouses be subject to the Urban Residential Type 4 Zone (R4) provisions with minor modifications.

Accessory residential dwelling units are permitted with street townhouses subject to section 3.2.3 of the zoning by-law.

The proposed development will comply with the R4 Zone provisions with minor requests for modifications as follows:

| Zoning Table for<br><br>Section 5.4 | Urban Residential Type 4 Zone (R4) | Notes: |
|---|---|---|
| 5.4.2 PERMITTED USES | | |
| | Street Townhouse | **Special Exception to permit Street Townhouses in the CS Zone** |
| 5.4.2 ZONE PROVISIONS FOR STREET TOWNHOUSE DWELLINGS | | |
| Minimum Lot Area<br>i) Interior | 156m$^2$ | Min 170m$^2$ |
| Minimum Lot Frontage<br>i) Interior | 6.5m | **Proposed Min Lot Frontage**<br>**Interior: 6.1 metres** |
| c) Front Yard Setback | 6m | 6m |
| d) Exterior Side Setback | 6m | N/A |
| e) Interior Side Yard Setback | 1.2m | **2.4 metres proposed to improve buffering** |
| f) Rear Yard Setback | 7.5m | 7.5m |
| g) Min separation between townhouse dwellings | 2m | N/A |

| | | |
|---|---|---|
| h) Maximum Building Height | 11m | TBD |
| 4.9 Parking Space Requirements for Residential Uses | | |
| Street Townhouse Dwelling | 2 spaces per unit | 1 space in garage, 1 space in driveway |

Summary of Zoning By-law review

To improve compatibility, it is proposed to increase to the southerly interior side yard setback from 1.2 metres to 2.4 metres thereby increasing the buffer area between the subject lands and adjacent commercial property. In order to maximize the efficient use of lands and to reflect market trends in unit type and size, a site specific zone provision is proposed to reduce to the interior lot minimum lot frontage from 6.5 metres to 6 metres.

There are no impacts generated from reducing the interior and corner lot minimum frontages. The increase in the southerly side yard setback to Unit H shown in Figure 2 also increases the amenity space enjoyed by this unit. The development will meet all other zone provisions of the County's Zoning By-law.

The property is being designed to incorporate an increased rear yard amenity space. This has the effect of improving the buffer area from the adjacent commercial lands. Through the site plan process, buffering in the form of fencing will be considered.

The proposal to develop a 8 street townhouse units with the above noted site specific provisions facilitates a well-planned and designed development and represents an efficient use of lands that caters to various housing and social needs.

Planning Analysis:

The proposed Official Plan and Zoning By-law Amendment are in keeping with the general purpose and intent of the Provincial Policy Statement (PPS). The PPS contains policies that address human health and safety in respect to the soil contamination on this site. As such the following process will be completed by A&A Environmental to ensure the property can be developed for residential purposes.

A&A Environmental will prepare an Environmental Site Assessment (ESA) to support a Record of Site Condition (RSC) Application in accordance with Ontario Regulation 153/04 (revised December 2009 and implemented July 1st, 2011). They will complete the report and application form for submission to the Ministry of Environmental Conservation and Parks (MECP), that will subsequently provide a Letter of Acknowledgement that the RSC has been filed in the Environmental Site Registry. The letter of acknowledgement can be sent to the ministry, along with the RSC that will be made publicly available on the Environmental Site Registry website.

For this particular site A&A Environmental is completing a Phase II ESA with a Tier III Risk Assessment (RA) that will be support the RSC application, as the contamination on site in the soil and groundwater is not being fully remediated. The RA will provide stipulations for construction, design, and future monitoring, that will need to be carried out in accordance with the Environmental Protection Act.

Through the RSC process a Certificate of Property Use (CPU) will be issued, outlining the safety measures necessary in order to mitigate the risk to both human and ecological health.

To ensure compliance in this regard, it is recommended that Norfolk County include a condition of Site Plan Approval that an occupancy permit will not be granted until the RSC and CPU is complete. Therefore, there is no risk to the future inhabitants of the 8-unit street townhouse development, the owner or the County.

The proposed Official Plan amendment is in keeping with the general purpose and intent of the Official Plan. The Hazard Lands overlay designation can be removed. A development permit is required by the Conservation Authority subject to O. Reg. 178/06 and will occur subsequent to the approval of a site plan application. This also ensures that the construction plans of the building meet Conservation Authority standards.

The proposed zoning by-law amendment to permit an 8-unit street townhouse development as a special exception in the CS Zone complies with the general intent and purpose of the Official Plan and Zoning By-law. The lands are quite small in size to accommodate a viable commercial use. The most appropriate use of lands is to permit residential development. The amendment to include an alternative form of residential development (street townhouses) is encouraged by the Official Plan and is compatible with surrounding land uses. The reduced frontage is appropriate to maximize the number of dwelling units without compromising usable amenity areas.

Through the site plan process, appropriate screening of the side and rear yard amenity spaces is proposed. This will improve privacy and compatibility with the surrounding uses in addition to the increased setback.

*Traffic:*

There are no traffic concerns identified as a result of this application. The traffic report prepared by RC Spencer indicates,

> *"….it can be concluded that the proposed townhome development on Elizabeth Road will have no perceivable effect on area traffic operations."*

*Modified Generic Risk Assessment:*

Initial soil testing revealed levels of contamination that fail MECP standards. A&A consulting was retained to explore the feasibility of rehabilitating the site to ensure that the property could be cleaned to an acceptable and safe standard to permit residential development. It was determined that remediating all the contamination would not allow the project to remain financially feasible. Therefore, A&A in their experience, proposed a hybrid solution of a partial remediation and a Modified Generic Risk Assessment. These two documents must be reviewed and approved by MECP in accordance with their standards. The MECP is also obligated to protect human health and safety as required in the PPS. Should this process fail, the site would not be developed. A&A has provided a letter to explain the process and their confidence at achieving MECP approval. Therefore, it is recommended that prior to Norfolk County granting site plan approval, a Record of Site Condition be obtained and submitted to the

County to ensure the protection of human health and safety. A holding provision is not required as the development is subject to site plan control.

Conclusion:

The proposed Official Plan and Zoning By-law Amendment implement the policies of the PPS and the Norfolk County Official Plan. The supporting studies submitted with the application conclude that residential development can occur subject to receiving a Record of Site Condition from the Ministry of Environment, Conservation and Parks. The analysis of this application is supportive. Accordingly, it is our opinion that the applications:

- model good planning;
- avoid natural and human made hazards;
- ensure the protection of human health and safety;
- facilitate a development with the most appropriate land use; and
- ensures efficiency and compatibility with the surrounding land uses.

As such it is requested that Staff and Council consider a favourable recommendation and decision to amend the Official Plan and Zoning By-law to permit 8 street townhouses subject to site specific provisions.

Yours truly,

Eldon Darbyson, BES, MCIP, RPP
Director of Planning
**G. DOUGLAS VALLEE LIMITED**
Consulting Engineers, Architects & Planners
H:\Projects\2020\20-013 Denzo Group Townhouses\Agency\PJR\2021.03.01 - Planning Justification Report.docx


*SURVEY LEGEND*

| | | |
|---|---|---|
| BELL BOX | SHOWN | BBX |
| BENCH MARK | SHOWN | BM |
| CATCH BASIN | SHOWN | CB |
| TOP OF FOUNDATION | SHOWN | TOF |
| FIRE HYDRANT | SHOWN | FH |
| WATER VALVE | SHOWN | WV |
| HYDRO POLE | SHOWN | HP |
| MAN HOLE | SHOWN | MH |
| TEST WELL | SHOWN | TW |

| | | | |
|---|---|---|---|
| ZONING<br>R4 (STREET TOWNHOUSE) | LOT NO:<br>6 | PLAN NO:<br>279 | LOT FRONTAGE LOT DEPTH<br>59 m 33.8 m |
| LOT AREA | PROPOSED INDIVIDUAL LOT AREAS ( 8 UNITS) | | MIN.LOT AREA ALLOWED |
| OVERALL LOT AREA<br>1897.22 m² | LOT A 240.39 m²<br>LOT B 230.34 m²<br>LOT C 220.33 m²<br>LOT D 210.31 m²<br>LOT E 200.31 m²<br>LOT F 190.30 m²<br>LOT G 180.28 m²<br>LOT H 170.30 m² | | 156 m² |
| | PROPOSED | | MIN. ALLOWED |
| LOT FRONTAGE<br>FRONT YARD<br>INTERIOR SIDE YARD<br>EXTERIOR SIDE YARD<br>REAR YARD | 6.15 m<br>6 m<br>4 m, 2.54 m<br>NONE<br>7.5 m | | 6.5 m<br>6 m<br>1.2 m<br>6 m<br>7.5 m |
| BUILDING HEIGHT | PROPOSED | | MAX. ALLOWED |
| | 11 m | | 11 m |
| BUILDING AREA | 731.13 m² | | |
| COVERAGE | 38.53% | | |
| GARAGE PARKING DIM. | 4.04m X 6.10m | | |
| PARKING DIMENSIONS | PROPOSED | | MIN. ALLOWED |
| | 3.6m X 6m | | 3m X 5.8m |

PROPERTY LINE

1.8m HIGH CLOSED BOARD FENCE

ASPHALT PAVED DRIVEWAY TYPICAL

GREEN SPACE TYPICAL

BUILDING FOOTPRINT

| Rev. | DATE | DESCRIPTION | DRAWN | CHECK |
|---|---|---|---|---|
| B | 09 FEB 2021 | ISSUED FOR ZONING | TE | AS |
| A | 06 AUG 2020 | ISSUED FOR ZONING | TE | AS |

CONSULTING ENGINEER

ARCHICREATION DESIGN STUDIO Inc.
6-425 Hespeler Rd Suite 118
Cambridge,ON N1R 8J6 T: (647)924-7611

PROJECT: TOWN HOMES
LOT 6, PLAN 279

ADDRESS: 1 ELIZABETH STREET SIMCOE, ON

OWNER:

SHEET TITLE: SITE PLAN

| DESIGNED BY | DRAWN BY | CHECKED BY | APPROVED BY |
|---|---|---|---|
| XXXXXX | XXXXXX | T.SABRAH | T.SABRAH |
| DATE | SCALE | SHEET NO. | PROJECT NO. |
| July 2020 | 1 : 300 | 1 OF 1 | HK01 |

DRAWING NO: AA01

SEAL

FILE PATH:

**Appendix B**

**Provincial Policy Statement 2020 – Policy Compliance**

This appendix demonstrates how the proposed application is consistent with those applicable policies of the Provincial Policy Statement.

| Policy | Comment |
|---|---|
| **1.1 Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns**<br>Policy 1.1.1 outlines that healthy, liveable, and safe communities are sustained by: | |
| a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term; | Yes. Lands are appropriate for residential. Too small for commercial. |
| b) accommodating an appropriate affordable and market-based range and mix of residential types (including single-detached, additional residential units, multi-unit housing, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs; | Yes. Adds a compact form of residential development to cater to various incomes and mix of housing types in the area. |
| c) avoiding development and land use patterns which may cause environmental or public health and safety concerns; | Yes. Lands not within flood plain. |
| d) avoiding development and land use patterns that would prevent the efficient expansion of settlement areas in those areas which are adjacent or close to settlement areas; | N/A |
| e) promoting the integration of land use planning, growth management, transit-supportive development, intensification and infrastructure planning to achieve cost-effective development patterns, optimization of transit investments, and standards to minimize land consumption and servicing costs; | Yes. Lands located near public transit. |
| f) improving accessibility for persons with disabilities and older persons by addressing land use barriers which restrict their full participation in society; | Yes. Sidewalk network is available and near public transit. |

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| g) ensuring that necessary infrastructure and public service facilities are or will be available to meet current and projected needs;<br><br>h) promoting development and land use patterns that conserve biodiversity; and;<br><br>i) preparing for the regional and local impacts of a changing climate. | Yes. Infrastructure and various services exist in the area.<br><br>N/A<br><br>N/A |
| Policy 1.1.3.1 states that *settlement areas* shall be the focus of growth and development. | Lands are within a settlement area. |
| Policy 1.1.3.2 states that land use patterns within settlement areas shall be based on densities and a mix of land uses which:<br>a) efficiently use land and resources;<br><br>b) are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansion;<br><br>c) minimize negative impacts to air quality and climate change, and promote energy efficiency;<br><br>d) prepare for the impacts of a changing climate;<br><br>e) support active transportation;<br><br>f) are transit-supportive, where transit is planned, exists or may be developed; and<br><br>g) are freight-supportive. | <br><br>Yes.<br><br>Yes.<br><br>N/A<br><br>Located outside of flood plain.<br>Yes. Located near trail network and sidewalks.<br>Yes. Located near public transit.<br><br>N/A |
| Land use patterns within settlement areas shall also be based on a range of uses and opportunities for intensification and redevelopment in accordance with the criteria in policy 1.1.3.3, where this can be accommodated. | Yes. Adds to the range of uses on vacant undersized lands. |
| Policy 1.1.3.3 states that planning authorities shall identify appropriate locations and promote opportunities for transit-supportive development, accommodating a significant supply and range of housing options through intensification and redevelopment where this can be accommodated taking into account existing building stock or areas, including brownfield sites, and the availability of suitable existing or | Yes. This policy encourages the proposed development. The site is intended to be remediated to permit residential. Public transit is available within walking distance. |

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| planned infrastructure and public service facilities required to accommodate projected needs. | |
| Policy 1.1.3.4 states that appropriate development standards should be promoted which facilitate intensification, redevelopment and compact form, while avoiding or mitigating risks to public health and safety. | Yes. The development intensifies the area in a compact form and is not located in a flood plain. |
| Policy 1.1.3.5 states that planning authorities shall establish and implement minimum targets for intensification and redevelopment within built-up areas, based on local conditions. However, where provincial targets are established through provincial plans, the provincial target shall represent the minimum target for affected areas. | Yes. The County Official Plan indicates that the County shall target that a minimum 25 percent of its annual residential growth be accommodated through infill, intensification and redevelopment within the existing built-up areas in the Urban Areas with full municipal services. |
| **1.2.6 Land Use Compatibility**<br><br>Policy 1.2.6.1 states that major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures.<br><br>A sensitive land use means buildings, amenity areas, or outdoor spaces where routine or normal activities occurring at reasonably expected times would experience one or more adverse effects from contaminant discharges generated by a nearby major facility. Sensitive land uses may be a part of the natural or built environment. Examples may include, but are not limited to: residences, day care centres, and educational and health facilities.<br><br>A major facility means facilities which may require separation from sensitive land uses, including but not limited to airports, manufacturing uses, transportation infrastructure and corridors, rail facilities, marine facilities, sewage treatment | There are no major facilities in the area that would affect sensitive land uses. |

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| facilities, waste management systems, oil and gas pipelines, industries, energy generation facilities and transmission systems, and resource extraction activities. | |
| **1.4 Housing**<br><br>Policy 1.4 directs planning authorities to provide for an appropriate range and mix of housing types and densities. | Yes. This adds to the range and mix of housing types and densities in the area. |
| Policy 1.4.3 requires planning authorities to provide for an appropriate range and mix of housing options and densities to meet projected market-based and affordable housing needs of current and future residents of the regional market area by:<br>b) permitting and facilitating:<br>1. all housing options required to meet the social, health, economic and well-being requirements of current and future residents, including special needs requirements and needs arising from demographic changes and employment opportunities; and<br>2. all types of residential intensification, including additional residential units, and redevelopment in accordance with policy 1.1.3.3;<br><br>c) directing the development of new housing towards locations where appropriate levels of infrastructure and public service facilities are or will be available to support current and projected needs;<br><br>d) promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation and transit in areas where it exists or is to be developed;<br><br>e) requiring transit-supportive development and prioritizing intensification, including potential air rights development, in proximity to transit, including corridors and stations; and | This section applies to the approval authority.<br><br>The development adds to the range of housing options and is located in an area near existing commercial businesses.<br><br>Yes. Represents residential intensification.<br><br>Yes. The area contains existing infrastructure and public services facilities.<br><br>Yes. The development for street townhouses is an appropriate density for the size of the lands near sidewalks, public transit and existing and future trails.<br><br>N/A |

| | |
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| f) establishing development standards for residential intensification, redevelopment and new residential development which minimize the cost of housing and facilitate compact form, while maintaining appropriate levels of public health and safety. | Yes. The development intensifies the residential land base in a compact form, located outside of a flood plain. |

Summary:

The proposed development will facilitate the construction of 8 street townhouse dwelling units on an existing vacant parcel of land within the County's Settlement Area. The proposed zoning amendment adds to the range of housing in the area. The form of development contributes the County's existing residential building supply, improves the mix of land uses in the area, adds to the diversity unit configurations available, and will appeal to individuals with different needs and financial abilities. The lands have access to existing municipal infrastructure and will not cause any environmental or public health and safety concerns once contamination is removed or mitigated. The lands are outside of the flood plain. Municipal servicing is available on Riverside Road and Queensway West which can be extended to the subject property at the developers cost and will be confirmed through the site plan application.

### 1.5 Public Spaces, Recreation, Parks, Trails and Open Space

Section 1.5 addresses healthy communities and the provision of public spaces, recreation, parks, trails and open space.

The lands are too small to provide parkland. Therefore, 5% of the value of the lands will be paid to the County in lieu of parkland in accordance with County policies. It will facilitate active transportation and community connectivity due to the proximity of local businesses and services and fosters social interaction through existing recreation in the area. More specifically, the development is within one (1) kilometre of public parks, restaurants, pharmaceutical stores and within a five (5) minute walk to Norfolk Street North which is being considered for a future active transportation route.

There are no evident natural heritage, agricultural or cultural heritage and archaeological implications as a result of the proposed amendments. There is a Provincially Significant Wetland (PSW) being the Mill Pond Creek to the north of the subject lands. At the time of preparing this report and in consideration of the pre-consultation comments, no concerns were raised in respect to the development of the lands in relation to the PSW.

## 1.6 Infrastructure and Public Service Facilities

Policy 1.6 discusses the efficient use of infrastructure, utilities and green infrastructure.

The subject lands will take advantage of existing infrastructure and coordinate the installation of utilities. Green infrastructure in the form of street trees are required by the County. The lands will contain permeable surfaces in the form of sodded boulevards open space areas unoccupied by buildings, structures and driveways.

## 1.8 Energy Conservation, Air Quality and Climate Change

Policy 1.8.1 states that planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns which:

b) promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;

e) encourage transit-supportive development and intensification to improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion;

The proposed development is in a location that encourages active transportation in and between residential and employment and institutional uses. The lands are in close proximity to various commercial and institutional uses which provide employment opportunities to the future residents of the development.

## 2.1 Natural Heritage

Policy 2.1.1 states that natural features and areas shall be protected for the long term.

Policy 2.1.2 states that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

Policy 2.1.5 states that development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Policy 2.1.8 states that development and site alteration shall not be permitted on *adjacent lands* to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has

been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

The lands are located south of the PSW on a municipal road where existing uses separate the subject lands from the PSW. No concerns have been identified by the County or Long Point Region Conservation Authority. Accordingly, the natural features continue to be protected for the long term.

## 3.0 Protecting Public Health and Safety

Policy 3.0 discusses natural and human-made hazardous lands, where development is prohibited or permitted subject to conditions addressing flooding and erosion.

The Long Point Region Conservation Authority supports the removal of the hazard land designation as they have recently released new mapping which demonstrates that the lands are not within the flood plain. This forms the basis of amending the Official Plan to remove the Hazard Land designation to permit development envisioned in the County Official Plan.

## 3.2 Human-Made Hazards

3.2.1 Development on, abutting or adjacent to lands affected by mine hazards; oil, gas and salt hazards; or former mineral mining operations, mineral aggregate operations or petroleum resource operations may be permitted only if rehabilitation or other measures to address and mitigate known or suspected hazards are under way or have been completed.

3.2.2 Sites with contaminants in land or water shall be assessed and remediated as necessary prior to any activity on the site associated with the proposed use such that there will be no adverse effects.

3.2.3 Planning authorities should support, where feasible, on-site and local re-use of excess soil through planning and development approvals while protecting human health and the environment.

A Record of Site Condition (RSC) is required by the Ministry of Environment Conservation and Parks (MECP) to allow residential development on the subject lands as they contain contamination unsuitable for residential development. The letter prepared by A&A Environmental Consultants and dated August 26, 2020, demonstrates that obtaining the RSC is achievable. In their experience, it is proposed that a hybrid solution of a partial remediation and a Modified Generic Risk Assessment be prepared and submitted to the MECP. Therefore, it is recommended that an RSC be required as a condition of site plan approval. Accordingly, Section 3.2 of the PPS can be satisfied upon approval by the MECP.

**Appendix C**

**Norfolk County Official Plan – Policy Compliance**

| Section | Policy | Comments |
|---|---|---|
| 2 | 2.2 Goals and Objectives | 5 of 6 are applicable – Rationale provided in report - Supportive |
| 3 | Natural Heritage | Schedule C identifies the subject property being within the adjacent lands to an existing Provincially Significant Wetland. However, there is existing development between the subject property and the Provincially Significant wetland, there are not natural features on site and the development will occur on full municipal services. The County and the Conservation Authority did not identify the need for an Environmental Impact Study (EIS) to address the wetland. Should it be determined that an EIS is required, this can be a condition of Site Plan approval. There are no Source Water Protection areas identified on or near the subject lands in accordance with Schedule D. |
| 3.5 | Natural Heritage Systems | There does not appear to be any features that affect the subject lands. |
| 4.8 | Potentially Contaminated Sites | These policies discuss the identification of contaminated sites and appropriate development / re-development of sites in accordance with the Environmental Protection Act and triggers the need to produce a Record of Site Condition. A consultant has been retained to address the contamination and produce a record of site condition. |
| 5.3 | Housing | Supports mix of unit types, densities, compact form, development of underutilized and vacant lands within the existing neighbourhoods, has access to suitable road network and pedestrian sidewalks and active transportation networks and compatibility can be improved through |

| | | |
|---|---|---|
| | | site specific landscaping and buffering. See discussion below. |
| 5.4 | Community Design | See details below. |
| 5.6.2 | Linked to Open Space and Natural Heritage System | The subject lands are not located within or near a natural heritage system. However, the lands are near the Trans Canada Trail system and the Regional Road No 24 candidate active transportation route. |
| 5.7.4 | Archaeological Resources | The County has not identified this property as having probability for archaeological resources. |
| 6.5.1 | Simcoe Urban Area | The proposed applications do not offend the policies of the Waterford Urban Area. |
| 6.5.1.5 | Queensway Corridor Special Policy Area | The proposal is not affected by these special policies. |
| 7.11 | Commercial Designation | Residential is permitted. Subject to special policy area 6.5.1.5 Queensway Corridor Special Policy Area. See details below. |
| 8.9 | Water and Wastewater Services | Municipal Services exist in the area. |
| 9.6.2 | Zoning By-law Amendments | The complete application submission addresses all requirements of this section including but not limited to a planning justification report, water and sanitary modelling reports, stormwater management report and a traffic report. |
| 9.6.5 | Site Plan Control | A site plan application for the development of the street townhouse units is required. |
| 9.7.1 | Environmental Impact Study | Not identified as required. |

<u>Section 5.3 - Housing</u>

This section provides the County with direction on where and how to grow, outlines County opportunities and studies for implementing affordable housing strategies, encouraging the provision of a mix of housing types and conversion of rental properties. Section 5.3 i) indicates that:

> "The County shall first consider surplus municipal land for affordable housing and shall work with other levels of government to make surplus land available to providers of affordable housing at little or no cost."

Section 5.3 j) indicates that:

> "The County shall encourage opportunities for more affordable housing to be provided in the Downtown Areas.

The proposed development helps the County to implement applicable housing policies through the provision of a mix of housing types and increased densities; however, is not located in the lands identified for affordable housing priority.

Section 5.3.1 Residential Intensification discusses intensification in existing residential developments within the built-up area of the Official Plan. The subject lands are located within the built-up area as indicated on Schedule B-15 of the Official Plan.

| | |
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| Housing shall, in part, be provided through urban residential intensification, which may include….:<br>a) infill development and residential development of vacant land or underutilized land in existing neighbourhoods | The proposal represents appropriate infilling within an existing neighbourhood on vacant and underutilized land. |
| 5.3.1 b) states in part:<br>"The County shall target that a minimum 25 percent of its annual residential growth be accommodated through infill, intensification and redevelopment within the existing built-up areas in the Urban Areas with full municipal services. | The proposal implements this policy. |
| f) The County shall consider applications for infill development, intensification and redevelopment of sites and buildings through intensification based on the following criteria: | |
| i) the development proposal is within an Urban Area, and is appropriately located in the context of the residential intensification study; | Land are located in the Urban Area and intensification study identified this area to be within the built-up area. |
| ii) the existing water and sanitary sewer services can accommodate the additional development; | Services exist and will be reviewed through the site plan application. |
| iii) the road network can accommodate the traffic generated; | Traffic Impact Study does not identify any deficiencies. |
| iv) the proposed development is compatible with the existing development and physical character of the adjacent properties and surrounding neighbourhood; and | Lands are a mix of commercial and residential land uses. Commercial land uses are not intense and are located on small parcels of land. Buffering and landscaping proposed on the site improve compatibility. |

| | |
|---|---|
| v) the proposed development is consistent with the policies of the appropriate Land Use Designation associated with the land. | Residential is permitted. |

Section 5.4 – Community Design

The proposed 8-unit street townhouse application helps minimize land consumption, enhances the tree canopy, and has access to a safe network of sidewalks.

The lands are compatible with adjacent land uses, enhanced buffering in the form of increased setbacks, buffering and landscaping are proposed. Details related to buffering and landscaping will be reviewed in detail through the site plan approvals process.

Section 7.11 - Commercial Designation

The Commercial Designation encourages the establishment of commercial uses and permits limited residential development provided that the uses do not negatively impact the planned function of the Commercial areas. Residential uses are permitted as follows:

i) in a building of commercial character, residential uses shall only be permitted above the ground floor; and
ii) in a building of residential character, either single detached or multiple dwelling, residential and/or commercial uses shall be permitted, provided the residential character of the building is maintained.

The proposed land use is for 8 street townhouse units which will be designed with residential character and therefore is permitted.

7.11.2 Land Use Policies

The following policies apply to land designated Commercial.

| | |
|---|---|
| a) Commercial development shall be compatible with surrounding uses and shall be adequately buffered from adjacent sensitive land uses. | Through site plan control, compatibility and buffering will be improved between commercial and residential uses. The dwellings will be located close to the road in |

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| | accordance with zoning setbacks thereby increasing the buffering distance around the periphery of the property. The existing commercial uses are located on small parcels of land and do not appear to be capable of becoming intense uses. |
| b) Adequate off-street parking and loading spaces shall be provided in accordance with the Zoning By-law. | Each dwelling unit must provide 2 parking spaces. |
| c) Commercial uses shall only locate on Provincial Highways, subject to the approval of the Province and the County, or arterial or collector roads, subject to the approval of the County. | N/A |
| d) A high standard of site design shall be required through site plan control. | The development is subject to site plan control. |
| e) Proposals to designate additional land as Commercial within the County shall be subject to the policies of Section 9.6.1 (Official Plan Amendments) and the criteria outlined in Section7.10.2 (f) (Shopping Centre Commercial Designation – Land Use Policies), notwithstanding the size of the proposed use(s), or the presence or absence of a proposed Large Retail Use. | N/A |

A & A Environmental Consultants Inc.
16 Young Street
Woodstock, Ontario N4S 3L4
Tel: 519-266-4680
Fax: 519-266-3666

Offices in: Kirkland Lake North Bay Toronto Woodstock

August 26, 2020

To Whom it may concern:

## Re: Modified Generic Risk Assessment to support an O. Reg. 153/04 Record of Site Condition for the Property Located at 11 Elizabeth Street, Simcoe, Ontario

A & A Environmental Consultants Inc. (A&A) has been retained to complete a Phase I & Phase II Environmental Site Assessment (ESA) in accordance to O. Reg. 153/04 to support a Record of Site Condition (RSC) application for the property located at 11 Elizabeth Street, Simcoe, Ontario. A&A previously conducted a Phase II ESA in 2019, along with Canadian Engineering Group also completing a supplemental Phase II ESA in 2019. Both of these reports identified petroleum hydrocarbon (PHC) and volatile organic compound (VOC) contamination in both the soil and groundwater. A&A has proposed and been retained to remediate the groundwater and complete a Modified Generic Risk Assessment (MGRA) for the soil in order to comply with O. Reg. 153/04 to file an RSC with the Ministry of the Environment, Conservation, and Parks (MECP).

A&A is a multi-disciplinary environmental consulting firm offering a wide variety of services; specializing in Phase I and Phase II Environmental Site Assessments, Record of Site Conditions, and Risk Assessments. A&A has more than 25 years of experience in environmental consulting within the province of Ontario. We have performed thousands of projects from small scale Phase I ESAs, to large scale risk assessments for “brownfields” sites. We have a number of senior experience staff who consult in a variety of disciplines and offer our clients expert knowledge in both the technical aspects of a project and the environmental regulations applicable.

A&A has used the approach of completing MGRAs to obtain RSC approval multiple times in the past, and is confident that this is the most cost effective and realistic approach for the site located at 11 Elizabeth Street, Simcoe, Ontario. This approach will be completed in three stages, that will span over the next few years.

The first stage will involve the installation of injections wells across the subject site. The injection wells will be installed into the shallow aquifer to treat the impacted groundwater. The permanent injection wells will provide frequent access to reach the groundwater for treatment during the remediation program. The injections wells will be used to inject the chemical oxidation and the bioremediation reagent. It is proposed that one injection event, lasting up to four weeks will occur before conducting groundwater testing. Subsequent injection programs may be required if the results of the follow up monitoring program after completing the first round of injection

show exceedances in the levels of PHC and VOCs. Injection rounds will continue until the results of analysis of samples collected from four consecutive quarterly sampling event are below the applicable site condition standards for PHCs and VOCs, in accordance with O. Reg. 153/04 subsection 40, paragraph 8, of Schedule E.

After the groundwater remediation program is complete A&A will be completing the MGRA to address the contaminants remaining in the soil. The MGRA will be completed in accordance with O. Reg. 153/04 (as amended) to ensure the structure and technical requirements are performed under a defensible process, while reducing the administrative and documentary requirements. The scope of work will include completing a data gap analysis, preparation of a pre-submission form to be sent and approved by the MECP, development of a risk management plan, preparation of the MGRA for the MECP, response to technical review comments of the MGRA from the MECP, and a review of the Certificate of Property Use (CPU) as proposed by the MECP.

Once the CPU has been issued by the MECP, A&A will file the RSC in accordance with the risk management measures laid out by the MECP. Due to the preliminary stage of the project at this time, the MECP has not been consulted on the risk management measures that will be implemented on site. Some risk management measures that have been commonly used for PHC and VOC contamination in the soil are:

- Engineered Barriers
- Vapour Intrusion Measures
- Site Specific Health and Safety Plans
- Soil Management Plans

Along with risk management measures for the subject site, A&A, in coordination with the MECP will determine the requirements for monitoring and maintenance of the risk management measures implemented on the subject site.

A&A is confident that the approach of completing the groundwater remediation and MGRA to obtain the RSC approval is the most cost effective and realistic option that will supported by the MECP. Please do not hesitate to contact us should you have any questions.

Sincerely,

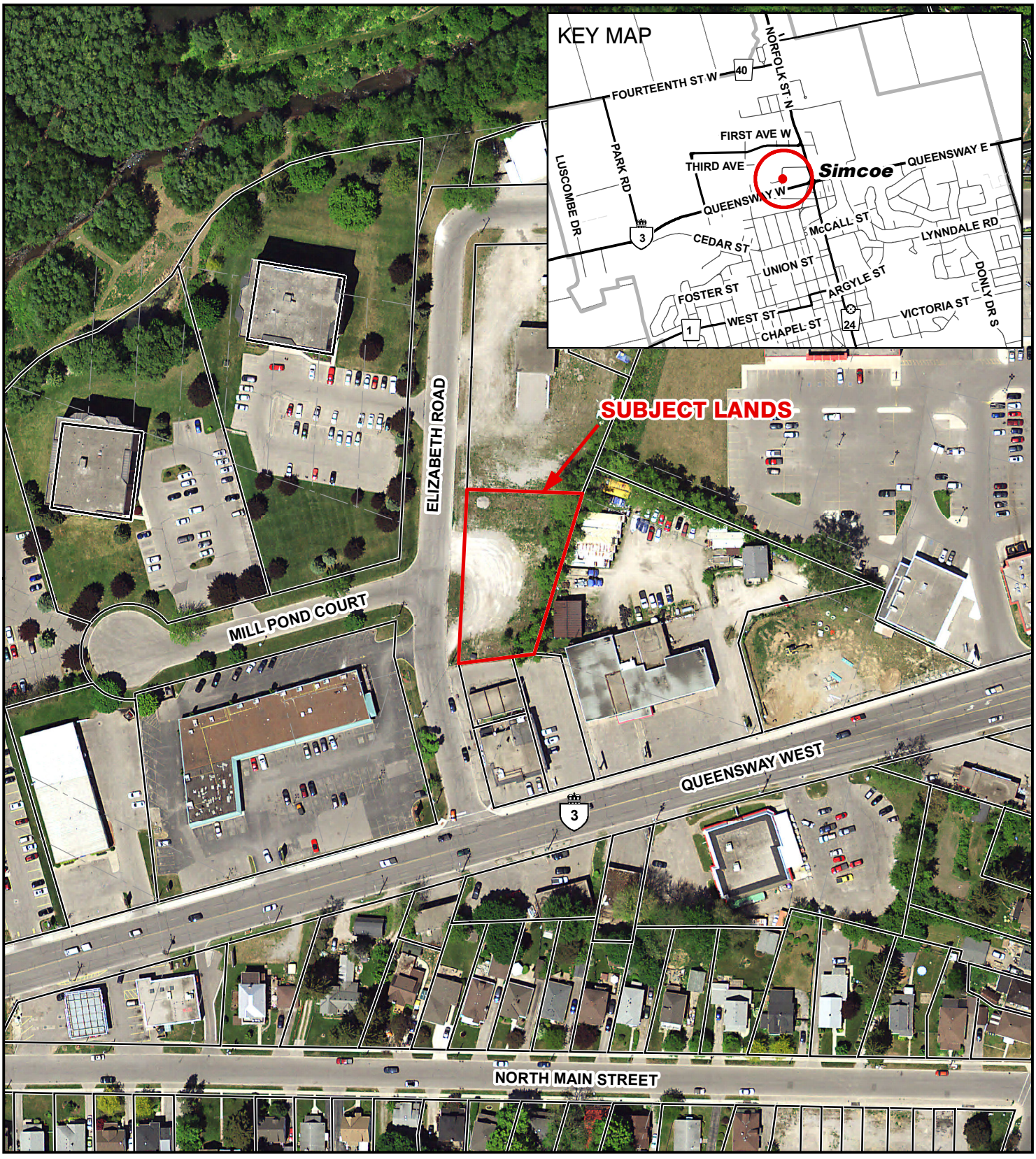
Victoria Sowden, HBSc. (Geo), Cert. Env. Mgt.
Senior Environmental Consultant
A&A Environmental Consultants Inc.
16 Young Street
Woodstock, ON N4S 3L4
519-266-4680

**MAP A**

CONTEXT MAP

Urban Area of SIMCOE

OPNPL2021197
ZNPL2021198
SPPL2021199




2021-07-08

## Legend

Subject Lands

2015 Air Photo

N

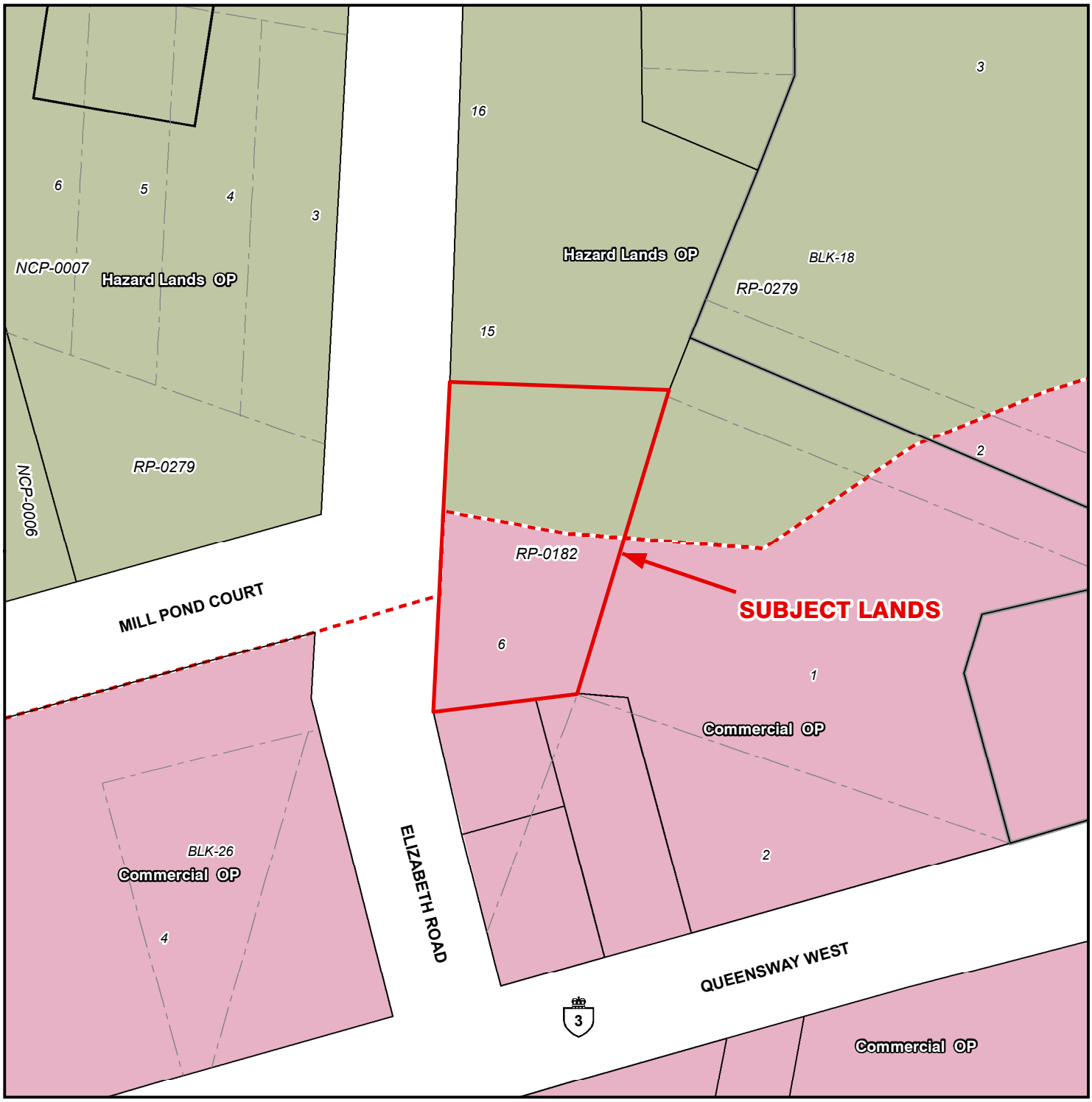
10 5 0 10 20 30 40 Meters

**MAP B**

# PROPOSED OFFICIAL PLAN AMENDMENT MAP

Urban Area of SIMCOE

OPNPL2021197
ZNPL2021198
SPPL2021199




## Legend

Subject Lands

## Official Plan Designations

Hazard Lands

Commercial

Special Policy Area

Urban Area Boundary

2021-07-08

**From: CS**
**To: CS with special provision**

N

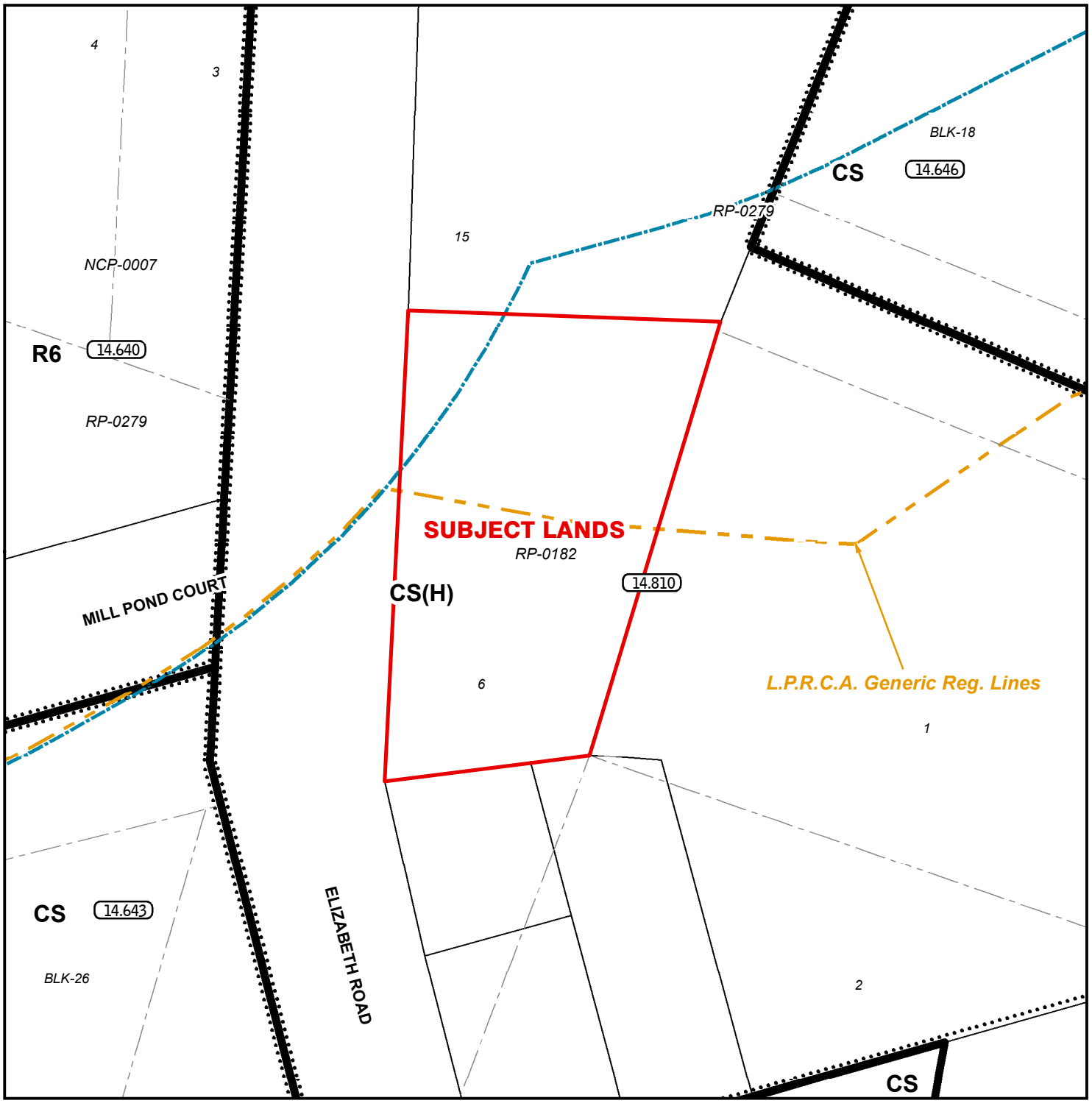
8 4 0 8 16 24 32 Meters

**MAP C**

# PROPOSED ZONING BY-LAW AMENDMENT MAP

Urban Area of SIMCOE

OPNPL2021197
ZNPL2021198
SPPL2021199




2021-07-08

LEGEND

- Subject Lands
- Adjacent Lands
- LPRCA Generic RegLines

ZONING BY-LAW 1-Z-2014

(H) - Holding

CS - Service Commercial Zone

R6 - Residential R6 Zone

**From: CS**
**To: CS with special provision**

N

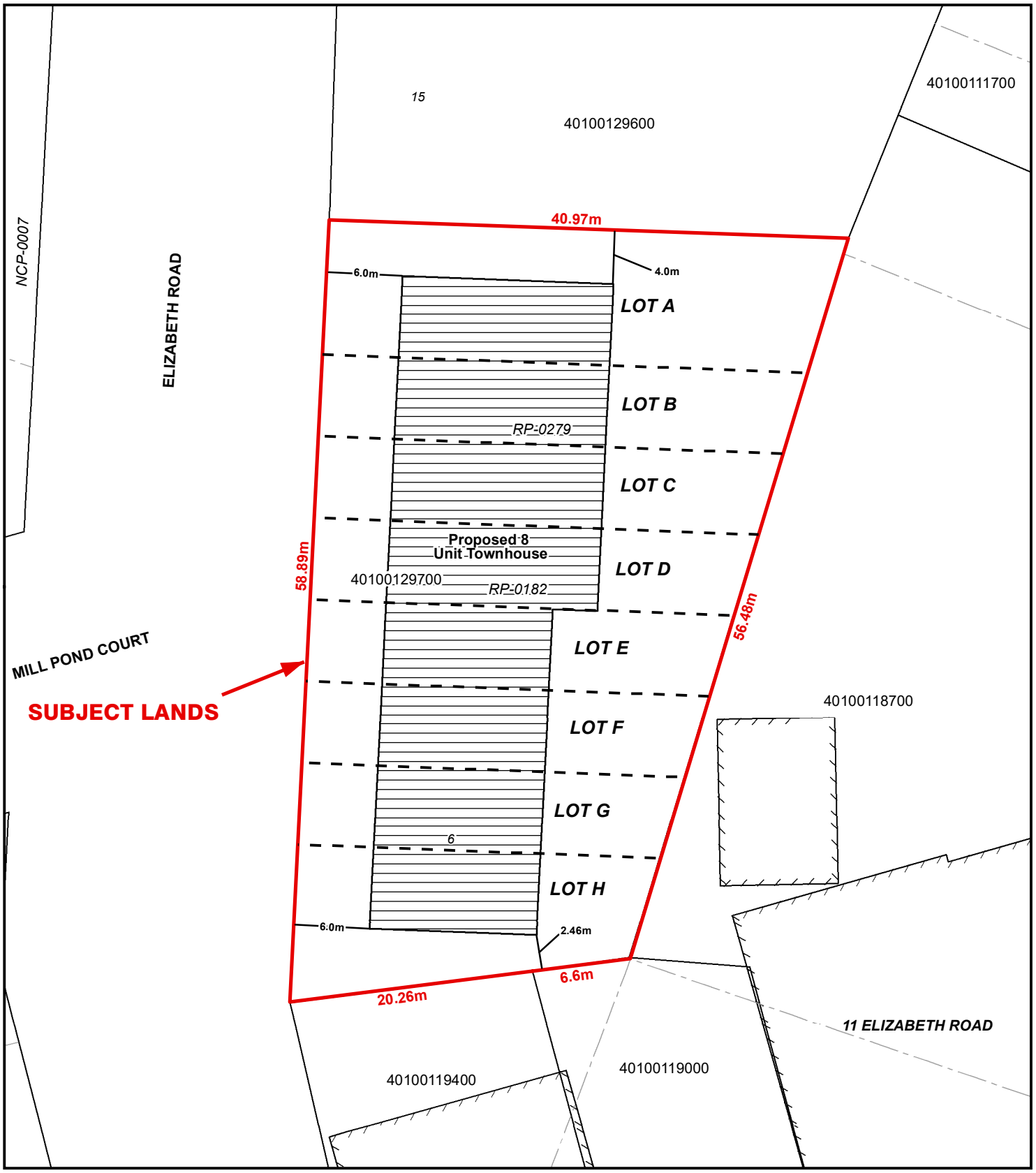
5.5 2.75 0 5.5 11 16.5 22 Meters

**MAP D**

# CONCEPTUAL PLAN

Urban Area of SIMCOE

OPNPL2021197
ZNPL2021198
SPPL2021199




## Legend

Subject Lands

2021-07-08

N

3 1.5 0 3 6 9 12 Meters