

**For Office Use Only:**

File Number	<u>ZNPL2022013</u>	Public Notice Sign	<u></u>
Related File Number	<u></u>	Application Fee	<u>\$5,495</u>
Pre-consultation Meeting	<u>May 26 2021</u>	Conservation Authority Fee	<u></u>
Application Submitted	<u>Dec 8 2021</u>	Well & Septic Info Provided	<u></u>
Complete Application	<u>Jan 10 2022</u>	Planner	<u>Mohammad Alam</u>

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

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

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

Change the zoning of the subject lands from R1-B(H) to R2 to permit the construction of 3 semi-detached dwellings.

**Property Assessment Roll Number:** 33501004800

## A. Applicant Information

**Name of Owner** Brook Green Group Inc. - C/O Paul Van Benthem

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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** 3067 Council Ring Road

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**Town and Postal Code** Mississauga, L5L 1N7

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**Phone Number** 416-363-3833

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**Cell Number**

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**Email** pvbemail@gmail.com

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**Name of Applicant** Brook Green Group Inc. - C/O Paul Van Benthem

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**Address** 3067 Council Ring Road

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**Town and Postal Code** Mississauga, L5L 1N7

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**Phone Number** 416-363-3833

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**Cell Number**

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**Email** pvbemail@gmail.com

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**Name of Agent** G. Douglas Vallee Limited

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**Address** 2 Talbot St. North

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**Town and Postal Code** Simcoe, N3Y 3W4

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**Phone Number** 519-426-6270

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**Cell Number**

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**Email** scottpuillandre@gdvallee.ca

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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 both owner and agent noted above.

☐ Owner ☐ Agent ☐ Applicant

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

Kuber Mortgage Investment Corporation 406-3852 Finch Avenue East Toronto, ON  
M1T 3T9

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## B. Location, Legal Description and Property Information

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

WAT PLAN 19B BLK 17 PT LOT 1 RP 37R7056 PART 2

Municipal Civic Address: No Civic Address

Present Official Plan Designation(s): Urban Residential

Present Zoning: R1-B(H)

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

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

3. Present use of the subject lands:

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:

Vacant

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.

Vacant

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:

3 semi-detached dwellings

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:

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

Has been vacant for decades

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9. Existing use of abutting properties:

Residential

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

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

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### C. Purpose of Development Application

**Note: Please complete all that apply.**

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

Change the zoning of the subject lands from R1-B(H) to R2 to permit the construction of 3 semi-detached dwellings.

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

Current zoning does not permit semi-detached dwellings

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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:

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

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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):

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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: \_\_\_\_\_

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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):

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**9. Site Information****Zoning****Proposed**

Please indicate unit of measurement, for example: m, m<sup>2</sup> or %

Lot frontage	_____	_____
Lot depth	_____	_____
Lot width	_____	_____
Lot area	_____	_____
Lot coverage	_____	_____
Front yard	_____	_____
Rear yard	_____	_____
Left Interior side yard	_____	_____
Right Interior side yard	_____	_____
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	_____	_____
Building height	_____	_____
Total ground floor area	_____	_____
Total gross floor area	_____	_____
Total useable floor area	_____	_____

**11. Off Street Parking and Loading Facilities**

Number of off street parking spaces	_____	_____
Number of visitor parking spaces	_____	_____
Number of accessible parking spaces	_____	_____
Number of off street loading facilities	_____	_____

12. Residential (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: \_\_\_\_\_

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

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

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: \_\_\_\_\_

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, or 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):

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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:

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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:

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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:

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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:

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

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

**Livestock facility or stockyard** (submit MDS Calculation with application)

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Wooded area**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Municipal Landfill**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Sewage treatment plant or waste stabilization plant**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

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

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Floodplain**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Rehabilitated mine site**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Non-operating mine site within one kilometre**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Active mine site within one kilometre**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

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

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Active railway line**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Seasonal wetness of lands**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Erosion**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

**Abandoned gas wells**

☐ On the subject lands or ☐ within 500 meters – distance \_\_\_\_\_

## F. Servicing and Access

1. Indicate what services are available or proposed:

### Water Supply

- |  |   |
|--|---|
| <input type="checkbox"/> Municipal piped water | <input type="checkbox"/> Communal wells         |
| <input type="checkbox"/> Individual wells      | <input type="checkbox"/> Other (describe below) |
- 

### Sewage Treatment

- |   |   |
|---|---|
| <input type="checkbox"/> Municipal sewers                               | <input type="checkbox"/> Communal system        |
| <input type="checkbox"/> Septic tank and tile bed in good working order | <input type="checkbox"/> Other (describe below) |
- 

### Storm Drainage

- |   |                                       |
|---|---------------------------------------|
| <input type="checkbox"/> Storm sewers           | <input type="checkbox"/> Open ditches |
| <input type="checkbox"/> Other (describe below) |                                       |
- 

2. Existing or proposed access to subject lands:

- |   |   |
|---|---|
| <input type="checkbox"/> Municipal road | <input type="checkbox"/> Provincial highway     |
| <input type="checkbox"/> Unopened road  | <input type="checkbox"/> 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.

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## **H. Supporting Material to be submitted by Applicant**

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

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



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

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

- ☐ Zoning Deficiency Form
- ☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)
- ☐ Architectural Plan
- ☐ Buildings Elevation Plan
- ☐ Cut and Fill Plan
- ☐ Erosion and Sediment Control Plan
- ☐ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)
- ☐ Landscape Plan
- ☐ Photometric (Lighting) Plan
- ☐ Plan and Profile Drawings
- ☐ Site Servicing Plan
- ☐ Storm water Management Plan
- ☐ Street Sign and Traffic Plan
- ☐ Street Tree Planting Plan
- ☐ Tree Preservation Plan
- ☐ Archaeological Assessment
- ☐ Environmental Impact Study

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

Site Plan applications will require the following supporting materials:

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

Standard condominium exemptions will require the following supporting materials:

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

Your development approval might also be dependent on 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


Nov / 24 / 2021  
\_\_\_\_\_  
Date

#### M. Owner's Authorization

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

I/We Paul Van Benthem am/are the registered owner(s) of the lands that is the subject of this application.

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

  
\_\_\_\_\_  
Owner

Nov 24 / 2021  
\_\_\_\_\_  
Date

\_\_\_\_\_  
Owner

\_\_\_\_\_  
Date

**N. Declaration**

I, Paul Van Benthem of Mississauga

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:

Town of Danforth

  
Owner/Applicant Signature

In Norfolk County

This 24 day of November

A.D., 2021

  
A Commissioner, etc.

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

SFO CAPITAL INC

000106

DATE 2 0 21 - 1 2 - 0 1  
Y Y Y Y M M D D

PAY to  
the order of

Norfolk County

\$ 5495.00

five thousand four hundred & ninety five ~~xx~~ DOLLARS

THE BANK OF NOVA SCOTIA  
www.scotiabank.com 1-800-4-SCOTIA  
SHERIDAN CENTRE  
2225 ERIN MILLS PARKWAY  
MISSISSAUGA, ONTARIO L5K 1T9

13482

100  
SFO CAPITAL INC



RE Zoning bylaw amendment

PER

⑈000106⑈ ⑆13482⑈002⑆ 00010⑈15⑈





# vallee

*Consulting Engineers,  
Architects & Planners*

November 15, 2021

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

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

Dear Tricia,

**Reference: Planning Justification Report  
Application for Zoning Bylaw Amendment  
G. Douglas Vallee Limited on behalf of Brook Green Group Inc.  
Vacant Land, (Roll# 33501004800)**

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## Introduction

G. Douglas Vallee Limited has been retained by Brook Green Group Inc. (C/O Paul Van Benthem) to make application for a zoning bylaw amendment regarding a vacant lot – Roll# 33501004800 – on Mechanic Street West in Waterford. It is proposed to change the zoning of a portion of this property in order to enable the construction of three semi-detached dwellings. As depicted on Appendix A, the purpose of this planning application is to rezone the lands shown as Part 1 from R1-B(H) to R2.

Appendix B provides a conceptual site plan for the entire block of land. Consent applications have been submitted to the Norfolk County Committee of Adjustment requesting a boundary adjustment and the creation of a lot for the 3 semi-detached dwellings. It is recognized that additional planning applications will need to be submitted to permit the condominium development. However, these applications will be submitted when revised concept plans and supporting studies have been completed.

This Planning Justification Report provides planning support and information to Norfolk County Staff and Council to consider when reviewing the subject application, specifically as it relates to the **rezoning of Part 1 on Appendix A** representing the 3 semi-detached dwellings (6 units).

This application is:

- Complementary of surrounding land uses;
- Consistent with the Provincial Policy Statement 2020;
- Consistent with the Norfolk County Official Plan; and
- In keeping with the general intent and purpose of the Norfolk County Zoning Bylaw.

As indicated above, planning applications have been submitted to the Norfolk County Committee of Adjustment to complete the following – as shown on Appendix A:

1. Minor boundary adjustment (Part 2) to convey the small parcel of land to Part 3;
2. Consent to create a new residential parcel (Part 1) from the Part 3 lands.

**G. DOUGLAS VALLEE LIMITED**  
**Consulting Engineers, Architects & Planners**



Professional Engineers

Authorized by the Association of Professional Engineers of Ontario  
to offer professional engineering services.



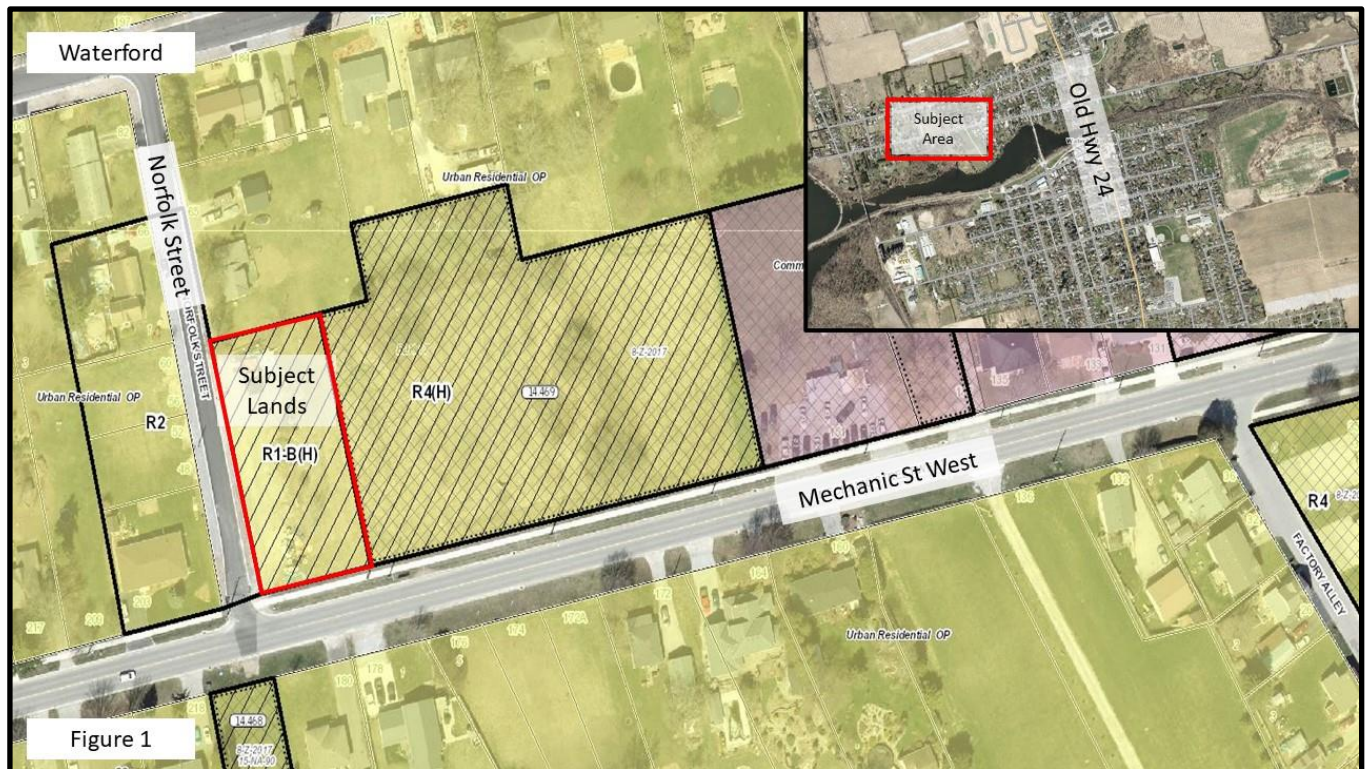
Ontario Association  
of Architects

Supporting documents have been provided, including:

1. Appendix A – Rezoning Schematic Sketch
2. Appendix B – Conceptual Site Plan
3. Appendix C – Provincial Policy Statement 2020 Policy Compliance
4. Appendix D – Norfolk County Official Plan Policy Compliance

### Site Description

The subject lands are approximately 0.2ha in area located within the urban settlement area of Waterford at the intersection of Mechanic Street West and Norfolk Street. The property is located on the north side of Mechanic Street and is currently vacant. The Official Plan designates the lands Urban Residential and is zoned R1-B(H) and R4(H) with a special provision 14.469 under the Norfolk County Zoning Bylaw. Surrounding lands uses are mainly residential with a commercial used motor vehicle sales establishment on the adjoining lot to the east.



### Background

In addition to the Appendices of this report, supporting studies have been prepared and submitted with this application, including:

1. Traffic Impact Study (prepared by RC Spencer Associated Inc. dated October 2021); and

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**Consulting Engineers, Architects & Planners**

2. Functional Servicing Report (prepared by G. Douglas Vallee Limited, dated October 21, 2021).

### **Planning Analysis**

The proposed zoning bylaw amendment was prepared in light of several planning documents including the Planning Act, the Provincial Policy Statement, the Norfolk County Official Plan and Norfolk County Zoning Bylaw.

#### Planning Act

Section 2 of the Planning Act outlines matters of provincial interest. Section 3 of the Planning Act requires that, in exercising any authority that affects a planning matter, planning authorities “shall be consistent with the policy statements” issued under the Act and “shall conform with the provincial plans that are in effect on that date, or shall not conflict with them, as the case may be”.

Section 34 of the Planning Act allows for the consideration of amendments to the Zoning Bylaw.

#### Provincial Policy Statement (PPS)

The subject lands are within a Settlement Area (Waterford) as defined by 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 through efficient development that will protect resources of provincial interest, public health and safety, the quality of the natural and built environment, and will facilitate economic growth.

The PPS encourages intensification and redevelopment within established settlement areas which shall be the focus of growth and development within the province. These developments will provide increased density and housing options for residents of Norfolk County.

A decision by Council to approve the 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 subject property is designated Urban Residential in accordance with Schedule “B-18” of the Norfolk County Official Plan.

Several sections of the Official Plan apply when considering zoning bylaw 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

**G. DOUGLAS VALLEE LIMITED**  
**Consulting Engineers, Architects & Planners**



- A Well Governed, Well Planned and Sustainable County.

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

The proposed development 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 adds to the mix of residential dwelling types. The lands are subject to site plan control to ensure County development standards are achieved.

This development is located near the On-Road cycling route identified on Schedule I-5 "Active Transportation" of the Official Plan. 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".

#### Summary of Official Plan review

The proposed Official Plan and zoning bylaw amendment meets the policies of the Official Plan. The development is ideally located within a 10minute walk to downtown Waterford to provide residents with access to services and local businesses. The development concept represents an appropriate land use considering the size of the property, proximity to existing residential and commercial uses, and availability of servicing. 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

In accordance with Appendix A, the lands are currently zoned R1-B(H), R1-A, and R4(H) with a site-specific provision 14.469 which permits a maximum of twenty-five (25) dwelling units. In order to permit the semi-detached dwellings, the following is proposed to rezone the lands shown on Appendix A as Part 1 from R1-B(H) to R2.

The R2 zone for Part 1 on Appendix A will permit the construction of three semi-detached dwellings and a total of six dwelling units, which will comply with all provisions under Section 5.2 of the zoning bylaw. Future division of land for the semi-detached units will be through exemption of part lot control.

Approval of this zoning bylaw amendment would implement the necessary zoning to permit the semi-detached dwellings shown on Appendix B. Future planning applications supported by revised concept plans and supporting studies will be submitted for review and approval in order to facilitate the townhouse condominium development.

#### Services

A conceptual Functional Servicing Report (FSR) was completed by G. Douglas Vallee Limited to review the servicing capacities in area. The report was prepared to support the phased construction of this development, recognizing the semi-detached units are independent of the proposed condominium corporation. Below is a brief outline of this report:

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**Consulting Engineers, Architects & Planners**



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to offer professional engineering services.



### Water And Waste Water

The proposed semi-detached units will be serviced by individual sanitary services that connect to the existing 200mm sanitary sewer along Norfolk Street. The existing 150mm watermain on Norfolk Street shall serve as the water supply for the proposed semi-detached units.

An analysis of the hydraulic modelling will be conducted by the County consultants to determine the water servicing capacity and constraints on the existing water system to ensure adequate system flows and pressure.

### Storm Water

The 6 semi-detached lots fronting onto Norfolk Street will be individually owned and therefore do not require stormwater management controls such as a stormwater pond. In the post development condition, runoff from the proposed semi-detached lots will flow uncontrolled to the existing Norfolk Street storm sewer, ultimately releasing to the existing storm sewer along Mechanic Street West. These are to be considered infill lots which do not typically require stormwater management.

### Traffic

A traffic impact study was completed by RC Spencer Associated Inc. dated October 2021. The study area included the stop-controlled intersection of Norfolk Street at Mechanic Street West (Concession 8 Townsend), the site accesses, and the stop-controlled intersection of Mechanic Street West at Main Street North. The study considers the development of six semi-detached homes and 16 townhomes, totaling 22 dwellings, and concludes that the proposed development will not have adverse impacts on the area traffic operations.

### **Compatibility**

The surrounding land uses are mainly residential in the form of single detached dwellings within the R1-A and R2 zones. The proposed zoning bylaw amendment is purposing to change the zoning of the subject lands to R2. The permitted housing types within the R2 zone are single detached, semi-detached and duplex dwellings.

This application is compatible with the surrounding land uses as it would provide a similar form of housing to the area.

### **Conclusion**

The proposed Zoning Bylaw Amendment implements the policies of the PPS and Norfolk County Official Plan as demonstrated in Appendix A and B respectively. The proposed semi-detached dwellings will meet all provisions of the respective section in the bylaw. Future planning application will be submitted for review and approval for the condominium development at a later date.

The analysis of this application is supportive. Accordingly, it is our opinion that the application:

- Is complementary of and compatible with surrounding land uses;
- Introduces appropriate infill development;
- Is consistent with the Provincial Policy Statement 2020;
- Is consistent with the Norfolk County Official Plan;

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- Maintains the general intent and purpose of the Norfolk County Zoning Bylaw; and
- Represents good planning.

As such it is requested that Staff and Council consider a favourable recommendation and decision to amend the Norfolk County Zoning By-law to permit the R2 zone on the subject lands.

Yours Truly,

Report prepared by:



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Scott Puillandre, CD, MSc  
Planner  
**G. DOUGLAS VALLEE LIMITED**  
Consulting Engineers, Architects & Planners

Report reviewed by:



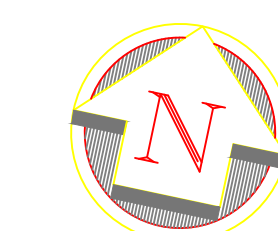
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Eldon Darbyson, BES, MCIP, RPP  
Director of Planning  
**G. DOUGLAS VALLEE LIMITED**  
Consulting Engineers, Architects & Planners

H:\Projects\2021\21-012 SFO Townhouses Waterford\Agency\Committee Of Adjustment

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**Consulting Engineers, Architects & Planners**



[illegible]

**LEGAL DESCRIPTION**  
ROLL NUMBER 1: 33501004800  
ROLL NUMBER 2: 33501001850  
LEGAL DESCRIPTION 1: WAT PLAN 19B BLK 17 PT LOT 1 RP  
37R7056 PART 2  
LEGAL DESCRIPTION 2: WAT PLAN 19B BLK 17 PT LOT 1 RP  
37R7056 PART 1


**APPLICANT INFORMATION**  
PAUL VAN BENTHAM  
SFO CAPITAL INC.  
(416)-363-3833  
47 COLBORNE STREET, SUITE 307, TORONTO, ON M5E 1P8

## DRAWING LIST

21-012-C100 - CONCEPT PLAN

SCALE:

5 10



HORIZONTAL : 1:250

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G. DOUGLAS VALLEE LIMITED  
2 TALBOT STREET NORTH  
SIMCOE ONTARIO N3Y 3W4  
(519) 426-6270


PROJECT TITLE:  
SFO TOWNHOUSES WATERFORD  
CONCEPT PLAN  
WATERFORD - NORFOLK COUNTY  
NORFOLK STREET & MECHANIC STREET WEST

DRAWING TITLE:  
CONCEPT PLAN 2

CHECKED BY: JDV/SP	DRAWN BY: DCB/LH
DRAWING SCALE: 1:250	DRAWING NO.: <b>C102</b>
PROJECT NO.: <b>21-012</b>	



**Appendix B to Planning Justification Report**  
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**Provincial Policy Statement 2020 – Policy Compliance Table**

This appendix demonstrates how the proposed application is consistent with applicable policies of the Provincial Policy Statement 2020.

Section	Policy	Comments	
1.1	<p><b>Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns</b>  <b>Policy 1.1.1 outlines that healthy, liveable, and safe communities are sustained by:</b></p> <p>a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term;</p> <p>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;</p> <p>c) avoiding development and land use patterns which may cause environmental or public health and safety concerns;</p> <p>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;</p>	<p>a) The subject lands are appropriate for residential development. As a residential lot in an urban area this application is encouraged by these policies</p> <p>b) This development adds a compact form of residential development to cater to various incomes and mix of housing types in the area.</p> <p>c) The proposed development is in a residential area and not in near any environmental hazards.</p> <p>d) N/A</p>	✓

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	<p>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;</p> <p>f) improving accessibility for persons with disabilities and older persons by addressing land use barriers which restrict their full participation in society;</p> <p>g) ensuring that necessary infrastructure and public service facilities are or will be available to meet current and projected needs;</p> <p>h) promoting development and land use patterns that conserve biodiversity; and;</p> <p>i) preparing for the regional and local impacts of a changing climate.</p>	<p>e) The proposed development is located within the serviced urban area of Waterford and close to the Trans Canada Trail to promote cycling.</p> <p>f) Sidewalk network is available to provide access to the downtown area.</p> <p>g) Infrastructure and various services exist in the area. Capacity does exist within these services to support the development.</p> <p>h) N/A</p> <p>i) N/A</p>	✓
<b>1.1.3.1</b>	States that settlement areas shall be the focus of growth and development.	The subject lands are within the urban boundary of Waterford.	✓
<b>1.1.3.2</b>	<p><b>States that land use patterns within settlement areas shall be based on densities and a mix of land uses which:</b></p> <p>a) efficiently use land and resources;</p> <p>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;</p>	<p>a) Compact form of development on an existing lot of record.</p> <p>b) Municipal services are available to this development with no requirement for extension.</p>	✓

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	<p>c) minimize negative impacts to air quality and climate change, and promote energy efficiency;</p> <p>d) prepare for the impacts of a changing climate;</p> <p>e) support active transportation;</p> <p>f) are transit-supportive, where transit is planned, exists or may be developed; and</p> <p>g) are freight-supportive.</p>	<p>c) The location of this development promotes active transportation</p> <p>d) N/A</p> <p>e) The location of the development provides walkability to a number of nearby services and easy access to the Trans Canada Trail system indicated on Schedule I-5 of the Official Plan.</p> <p>f) Located within 800m of a Ride-Norfolk stop in the downtown area.</p> <p>g) N/A</p>	✓
	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.	This development adds to the range of uses on vacant underutilized lands.	✓
<b>1.1.3.3</b>	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 planned infrastructure and public service facilities required to accommodate projected needs.	This policy encourages the proposed development. These lands are currently underutilized and will help the county grow through intensification.	✓

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<b>1.1.3.4</b>	Appropriate development standards should be promoted which facilitate intensification, redevelopment and compact form, while avoiding or mitigating risks to public health and safety.	The development intensifies the area in a compact form and is not located in a flood plain.	✓
<b>1.1.3.5</b>	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.	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.	✓
<b>1.4</b>	<b>Housing</b> Planning authorities to provide for an appropriate range and mix of housing types and densities.	This development adds to the range and mix of housing types and densities in the area.	✓
<b>1.4.3</b>	<b>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:</b> b) permitting and facilitating: <ol style="list-style-type: none"> <li>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</li> <li>all types of residential intensification, including additional residential units, and redevelopment in accordance with policy 1.1.3.3;</li> </ol> c) directing the development of new housing towards locations where appropriate levels of infrastructure and public service	b) The development adds to the range of housing options and is located in an area near existing commercial businesses.  c) Represents residential intensification. Infrastructure and public services	✓



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	<p>facilities are or will be available to support current and projected needs;</p> <p>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;</p> <p>e) requiring transit-supportive development and prioritizing intensification, including potential air rights development, in proximity to transit, including corridors and stations; and</p> <p>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.</p>	<p>already exist in the Waterford urban area.</p> <p>d) The area contains existing infrastructure and public services facilities. This type of development represents efficient land use patterns in close proximity to public transportation and encourages active transportation.</p> <p>e) N/A</p> <p>f) N/A</p>	<p>✓</p>
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**Summary of Section 1 and 2:**

The proposed infill development will facilitate the construction of three semi-detached dwellings on an existing vacant parcel of land within the County's Settlement Area. The proposed zoning amendments will help add 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 of 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. Municipal servicing is available which can be extended to the subject property at the developers cost.

**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

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within 500m to public parks, restaurants, pharmaceutical shops and stores in the downtown area. The development is also within 300m to the Trans Canada Trail identified on Schedule I of the Official Plan.

**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 to nearby 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.

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**Norfolk County Official Plan – Policy Compliance Table**

This appendix demonstrates how the proposed application is consistent with those applicable policies of the Norfolk County Official Plan.

<b>Section</b>	<b>Policy</b>	<b>Comments</b>	
<b>2.2</b>	<p><b>Goals and Objectives</b></p> <p>This section of the Official Plan sets out six “Goals and Objectives” to which the following five are applicable to the proposed residential development:</p> <ul style="list-style-type: none"> <li>• Strong and Diversified Economy;</li> <li>• Maintaining and Enhancing the Rural and Small-Town Character;</li> <li>• Maintaining a High Quality of Life;</li> <li>• Upgrading and Expanding Infrastructure; and</li> <li>• A Well Governed, Well Planned and Sustainable County.</li> </ul>	<p>The proposed Zoning Bylaw Amendments maintain the general purpose and intent of the Official Plan’s Goals and Objectives by providing compact and efficient residential development within the serviced urban area of Waterford. The location of the development will provide its residents with easy access to commercial and social services located in the downtown areas.</p> <p>The proposed development will increase the range of housing options which will provide residents with access to much needed housing to live and work in Norfolk County.</p>	✓
<b>5.3</b>	<p><b>Housing</b></p> <p>The provision of housing is an essential part of planning in Norfolk County. The County shall ensure that a full range of housing types are provided to meet the anticipated demand and demographic change.</p> <p>5.3 e) Under this section the County shall encourage innovative and appropriate housing development that exhibits design and adaptability characteristics, and may represent non-traditional additions to the County’s housing stock.</p> <p>5.3 g) Further the County shall encourage that housing be considered when opportunities for redevelopment become available. This includes the redevelopment of existing single-use and underutilized areas with full municipal services, such</p>	<p>The proposed application is consistent with the policies of this section of the official plan. This residential development will provide a compact form of housing for area residents.</p> <p>The proposed development adds semi-detached dwellings to the local area which is in character with the existing neighbourhood.</p> <p>Currently this parcel of land remains underutilized and vacant. The proposed application will make effective use of the land and provide efficient access to social services by enabling walkability to the downtown area.</p>	✓

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	as shopping plazas, business and employment sites and older commercial and residential areas, especially where the land is in close proximity to human services. Special attention shall be given to the design of buildings, the landscaping treatment and features of the site to ensure that the proposed redevelopment is physically compatible with the adjacent uses.		
	<p>5.3.1 The intensification of urban residential development reduces the need to use vacant designated land on the periphery of the Urban Areas. It also reduces the need for urban expansions encroaching into the Agricultural Area. Urban residential intensification, infilling and redevelopment of existing areas allows for the efficient provision of urban services thereby helping to minimize the costs of providing services while meeting an important component of the County's housing needs.</p> <p>The following shall be the policy of the County:</p> <p>a) Housing shall, in part, be provided through urban residential intensification, which may include any of the following:</p> <ul style="list-style-type: none"> <li>i. small scale intensification through modifications to an existing dwelling to include a second unit or construction of a new building containing one or two units;</li> <li>ii. infill development and residential development of vacant land or underutilized land in existing neighbourhoods; and/or</li> <li>iii. redevelopment which includes either the replacement of existing residential uses</li> </ul>	<p>a) As an infill development this application is encouraged by the policies of this section in the official plan. The proposed development will facilitate urban residential intensification on a vacant underutilized parcel of land that is compatible with the existing neighbourhood.</p>	✓

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	<p>with compatible new residential developments at a high density or the replacement of non-residential uses with compatible residential or mixed-use development with a residential component.</p>		
	<p>b) 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 boundary of the Built-Up areas of Simcoe, Port Dover, Delhi, Waterford and Port Rowan are indicated on Schedule "B" to this Plan and delineates the extent of existing development at the time of the approval of the Official Plan Amendment implementing the Five-Year Review of the Official Plan. Development within the Built-Up Area boundary will be considered as infill development and development situated between the Built-Up Area boundary and the boundary of the Urban Area will be considered as greenfield development.</p>	<p>b) As an infill development this application is encouraged by this section of the official plan. The proposed development will help the county meet its targets.</p>	✓
	<p>f) The County shall consider applications for infill development, intensification and redevelopment of sites and buildings through intensification based on the following criteria:</p> <ul style="list-style-type: none"> <li>i. the development proposal is within an Urban Area, and is appropriately located in the context of the residential intensification study;</li> </ul>	<p>f) The proposed application is for a residential development on an existing lot of record within the serviced urban area of Waterford. As a residential development within a residential area, this application is compatible with existing development.</p> <p>An analysis of the existing service network indicates there is sufficient capacity to support the development.</p>	✓

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	<ul style="list-style-type: none"> <li>ii. the existing water and sanitary sewer services can accommodate the additional development;</li> <li>iii. the road network can accommodate the traffic generated;</li> <li>iv. the proposed development is compatible with the existing development and physical character of the adjacent properties and surrounding neighbourhood; and</li> <li>v. the proposed development is consistent with the policies of the appropriate Land Use Designation associated with the land.</li> </ul>	A Traffic Impact Study was completed by RC Spencer Inc. which considered to totality of the entire site (including the adjacent future condominium). It determined that the proposed development will not adversely impact area traffic operations and does not require geometric and / or traffic control improvements.	✓
<b>6.4</b>	<b>Urban Areas</b> This section of the Official Plan identifies the six Urban Areas of Norfolk County – Delhi, Courtland, Port Dove, Port Rowan, Simcoe, and Waterford – as the focal points for growth and development activity.	The proposed application is within the urban boundary of Waterford and will help Norfolk County meet its growth targets.	✓
<b>6.5.4</b>	<b>The County will support and promote the continued development of Waterford as an important urban community and agricultural support centre in the County. The following shall be the policy of the County:</b> <ul style="list-style-type: none"> <li>a) Waterford is the closest Urban Area to Highway No. 403. The County shall encourage employment growth and development in the Urban Area.</li> <li>b) Many of the historic residences in the Waterford Urban Area are of cultural heritage</li> </ul>	This development is located within the urban boundary of Waterford and does not offend these policies. This development is ideally located to provide access to the trail opportunities in Waterford	✓

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	<p>value or interest. The County will encourage the maintenance, rehabilitation, and adaptive reuse of the historic residences.</p> <p>c) Trail linkage opportunities exist in the Waterford Urban Area due to the presence of abandoned rail corridors and other linear open space features. The County will encourage the development of trails integrating Waterford with other areas of the County.</p>		
<b>8.9.1</b>	<p><b>Services in Urban Areas</b></p> <p>8.9.1 c) All development in the Urban Areas shall be fully serviced by municipal piped water supply and waste water treatment systems, save and except for circumstances outlined in Section 8.9.1f) (Services in Urban Areas). Notwithstanding this, appropriate development shall be permitted in the Courtland Urban Area on the basis of a municipal water system and private waste water disposal systems.</p> <p>e) Infilling of vacant areas within the Urban Areas which are already provided with full municipal services is encouraged, and shall be a criterion when evaluating proposed plans of subdivision and consents, with respect to the extension of services, utilities or the associated construction.</p>	<p>The subject property has access to full municipal services along Norfolk and Mechanic Street. As an infill development proposal, this application is encouraged by the policies of this section.</p> <p>Individual free-hold units service laterals would be installed to all dwelling units.</p>	<p>✓</p> <p>✓</p>
<b>9.4.2</b>	<p><b>Holding Provisions</b></p> <p>Holding zones may be established in order to achieve orderly development and ensure that policies established in this Plan have been met. Council may place a holding symbol on the zone that prevents</p>	<p>As freehold units, a traffic impact study and functional servicing report has been completed. Future division of land for the semi-detached units will be completed</p>	

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	<p>development from occurring until the County is satisfied that certain conditions have been met, allowing Council to indicate support for the development in principle, while identifying the need for additional actions prior to development proceeding. Specific actions or requirements for the lifting of the holding provision shall be set out in the County's Zoning By-law or the amendment thereto.</p> <p>These actions or requirements include, but are not necessarily limited to, the following:</p> <ul style="list-style-type: none"> <li>a) The allocation of municipal servicing capacity on the part of Council;</li> <li>b) The phasing and logical progression of development;</li> <li>c) The provision of adequate service or road infrastructure and works;</li> <li>d) The completion and confirmation that environmental contamination remediation has occurred on site, or that satisfactory verification of suitable environmental site condition is received by the County;</li> <li>e) The completion of an appropriate supporting study(ies) to the satisfaction of the County, in consultation with other agencies, as required;</li> <li>f) Confirmation that the requisite permits and approvals from external authorities have been received;</li> <li>g) The completion of a development or the subdivision of land, including the negotiation of a development or subdivision agreement;</li> <li>h) That site plan approval has been granted by the County, and a site plan agreement has</li> </ul>	<p>through part lot control. The construction of each unit will be subject to the submission of any grading plans and servicing requirements including water and sanitary connections. All requirements have been met to remove the Holding provision on this parcel.</p> <p>The holding provision will remain in place on the condominium development portion of the lands until all site plan requirements have been met to permit construction.</p>	<p>✓</p>
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	<p>been entered into, pursuant to the provisions of the Planning Act; and/or</p> <p>i) That the specific policies of this Plan have been complied with</p>		
<b>9.6</b>	<p><b>Development Control</b></p> <p>9.6.1 c) The County shall consider the following criteria when reviewing applications to amend this Plan:</p> <ul style="list-style-type: none"> <li>i) the manner in which the proposed amendment conforms to prevailing Provincial policy and regulations;</li> <li>ii) the manner in which the proposed amendment conforms to the Strategic Plan prepared in support on this Plan;</li> <li>iii) the manner in which the proposed amendment conforms to the Goals and Objectives, and policies of this Plan;</li> <li>iv) the impacts of the proposed amendment on the provision of and demand for municipal services, infrastructure and facilities;</li> <li>v) the adequacy of the proposed servicing solution with respect to the servicing policies of this Plan;</li> <li>vi) the impact of the proposed amendment on surrounding land uses, the transportation system, municipal services and community amenities and services;</li> <li>vii) the impact of the proposed amendment on the community structure and nature of the Urban Areas and/or Hamlet Areas;</li> <li>viii) the impact of the proposed amendment on cultural heritage resources and/or Natural Heritage Features;</li> </ul>	<p>The proposed application is for a Zoning Bylaw amendment in order to facilitate the semi-detached dwelling units. The development will be located on an existing lot of record within the Urban Settlement area of Waterford and will have access to adequate municipal water and sanitary services.</p> <p>This type of development will provide the citizens of Norfolk with increased housing options and is supported and encouraged by provincial and County land use planning policies.</p>	✓

**Appendix C to Planning Justification Report**  
**Corner of Norfolk Street and Mechanic Street West, Waterford**  
**Our Project 21-012 SFO Townhouses**

	<ul style="list-style-type: none"> <li>ix) the impact on agricultural uses and land;</li> <li>x) the impact of the proposed amendment on the financial sustainability of the County; and</li> <li>xi) any other information determined by the County, in consultation with the appropriate, agencies, to be relevant and applicable.</li> </ul>		
<b>9.10.5</b>	<p><b>Parkland Dedication</b></p> <p>g) The County may accept cash-in-lieu of the land dedication to be paid into a special account and used as specified in the Planning Act. Council will consider cash-in-lieu of parkland dedication under the following circumstances:</p> <ul style="list-style-type: none"> <li>i) where the required land dedication fails to provide an area of suitable shape, size or location for development as public parkland;</li> <li>ii) where the required dedication of land would render the remainder of the site unsuitable or impractical for development; and/or</li> <li>iii) where it is preferable to have consolidated parkland of a substantial size servicing a wide area.</li> <li>iv) The County may establish a flat rate for cash-in-lieu payments for parkland dedications from new residential, commercial and industrial lots created by consent.</li> </ul>	<p>g) Given the small size of this development, it is proposed the County accept cash-in-lieu of the land dedication as land dedication would render the parcel unsuitable for development and the size of physical parkland would be inadequate.</p>	✓

# **NORFOLK STREET DEVELOPMENT WATERFORD, ON**

## **TRAFFIC IMPACT BRIEF**



**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

# NORFOLK STREET DEVELOPMENT, WATERFORD, ON

## TRAFFIC IMPACT BRIEF (OCTOBER 2021)

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**Figure 1:** Study Area

**Figure 2:** Site Plan

**Figure 3:** Site Generated Traffic (AM / PM Peak Hour)

**Figure 4:** Existing Traffic (AM / PM Peak Hour)

**Figure 5:** Existing + Site Generated Traffic (AM / PM Peak Hour)

**Figure 6A:** Sight Line Analysis: Westerly Site Access at Mechanic Street West

**Figure 6B:** Sight Line Analysis: Easterly Site Access at Mechanic Street West

### Appendix A: Traffic Counts

- Norfolk Street at Mechanic Street West
- Mechanic Street West at Main Street North

### Appendix B: ITE Trip Generation Manual – 10th Edition References

- Single Family Detached Housing AM Peak
- Single Family Detached Housing PM Peak
- Proposed Site Development Trip Generation and Distribution

### **Appendix C: Traffic Projection Figures**

- Norfolk Street at Mechanic Street West
- Westerly Site Access at Mechanic Street West
- Easterly Site Access at Mechanic Street West
- Mechanic Street West at Main Street North

### **Appendix D: Detailed Synchro Results**

- Norfolk Street at Mechanic Street West
- Westerly Site Access at Mechanic Street West
- Easterly Site Access at Mechanic Street West
- Mechanic Street West at Main Street North

### **Appendix E: Sight Line Calculations**

- Westerly Site Access at Mechanic Street West
- Easterly Site Access at Mechanic Street West

## INTRODUCTION AND BACKGROUND

A residential development has been proposed for lands in the northwest area of the Community of Waterford, Ontario, specifically at the northeast corner of Norfolk Street at Mechanic Street West. Waterford is situated in Norfolk County, approximately 10 km north of the Town of Simcoe.

As may be noted on Figure 1, Main Street North (Old Highway 24) and Mechanic Street West (Concession 8 Townsend) are part of the arterial grid system in Waterford and the principal means of external access to and from the area. Mechanic Street West is an east / west roadway which intersects with Main Street North (Old Highway 24) in Waterford, approximately 800m east of the development site, and with (new) Highway 24 approximately 3 km to the west. Main Street North is a north / south roadway which runs from (new) Highway 24 near Simcoe, northerly through Waterford, toward Brantford. Norfolk Street is a north / south local roadway which is just one block long, between Mechanic Street West and College Street West.

The study area includes the stop-controlled intersection of Norfolk Street at Mechanic Street West (Concession 8 Townsend), the two proposed site accesses at Mechanic Street West, and the stop-controlled intersection of Mechanic Street West at Main Street North, noting that Mechanic Street West becomes Deer Park Road east of Main Street.

The preliminary site plan is provided on Figure 2 and consists of six semi-detached homes and 16 townhomes, which totals 22 dwelling units. This development is proposed for construction in a single phase. According to Norfolk County's Transportation Impact Study Guidelines, a Traffic Impact Study (TIS) will be required if any of the following conditions are met:

*"A transportation impact study (TIS) should be completed for every development proposal within Norfolk County that may have an impact on the County road network. Generally speaking, developments that are expected to produce 75 vehicle trips to and from a development would constitute as having an impact. However, the County may request a TIS for developments that produce less than 75 trips in situations where other issues, including but not limited to: safety concerns, significant traffic peaking, and other operational concerns are identified, at the discretion of County staff."*

The anticipated number of trips generated by the proposed development is described in more detail below, but preliminary estimates suggest that 22 dwelling units will generate much less trips than the threshold of 75 total vehicle trips per hour specified in the Norfolk County TIS Guidelines. Therefore, it is concluded that a full transportation impact study is not warranted; a traffic impact brief will suffice. The purpose of this brief is to examine the proposed development and its effect on area traffic operations, particularly on Mechanic Street West.

## TRAFFIC DATA COLLECTION

As provided in Appendix A, turning movement counts were obtained by Pyramid Traffic Inc. on 28 September 2021 for the intersections of:

- Norfolk Street at Mechanic Street West; and
- Concession 8 Townsend at Main Street North (Old Highway 24).

## METHODOLOGY

The baseline traffic counts provided the basis for industry-standard traffic operations analysis; the software package utilized for the analysis (Synchro 11) calculates various parameters of intersection performance, such as level of service (LOS), intersection capacity utilization (ICU), control delay, and queue lengths on individual approaches.

Unsignalized level of service results are reported based on the following industry standard:

Level of Service	Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

## TRIP GENERATION AND DISTRIBUTION

Trip generation for the proposed development was estimated from the Institute of Transportation Engineers Trip Generation Manual (10<sup>th</sup> 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 210 (Single-Family Detached Housing) is the most appropriate and conservative code for the 22 proposed residential units. Land Use Code 210 provides generation rates of 0.74 trips per unit in the AM peak hour with 25% entering and 75% exiting, and 0.99 trips per unit in the PM peak hour, with 63% entering and 37% exiting.

The details of the trip generation analysis are provided in Appendix B, noting that separate estimates were developed for AM and PM peak hours. The total trips generated by these uses are estimated to be 4 entering and 12 exiting during the AM peak hour, and 14 entering and 8 exiting during the PM peak hour.

Site generated traffic was distributed to the adjacent streets at the proposed site accesses based on the proximity of the units to the proposed accesses. The distribution of turning movements resulting from the trip generation at each proposed access was based on the directional flow of existing traffic volumes on Mechanic Street West, as taken from the turning movement counts. Figure 3 illustrates the site generated traffic volumes during the respective AM and PM peak hours.

## **CAPACITY AND LEVEL OF SERVICE ANALYSIS**

Detailed analysis was carried out for all intersections for AM and PM peak hours with respect to the following traffic scenarios:

- Existing Traffic;
- Existing + Site Generated Traffic.

Figures 4 to 5 summarize total traffic estimates that result from the addition of site generated traffic to the existing traffic in the study area. The effect of adding site generated traffic from the proposed development to existing traffic volumes at each specific intersection can be found in Appendix C. The resulting Synchro 10 simulation reports are provided in Appendix D.

To quantify the effect of traffic growth on individual intersections within the study area and to assess the need for geometric or traffic infrastructure improvements, the Synchro results were summarized as follows:

### **Norfolk Street at Mechanic Street West**

Under existing volumes, the existing tee intersection of Norfolk Street at Mechanic Street West is a tee intersection controlled by a southbound stop condition. Under existing volumes, all approaches operate at an excellent level of service. As observed from Table 1, traffic generated by the proposed development will result in no change to the level of service.



**Table 1: Level of Service by Approach – Norfolk Street at Mechanic Street West**

Scenario	Norfolk Street at Mechanic Street 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	A	A	-	A	A	A	-	A
Existing + Site Generated Traffic	A	A	-	A	A	A	-	A

### **Westerly Site Access at Mechanic Street West**

The proposed tee intersection of the Westerly Site Access at Mechanic Street West will be controlled by a southbound stop condition. Based on the results provided in Table 2, it is anticipated that the new intersection will operate at a good level of service.

**Table 2: Level of Service by Approach – Westerly Site Access at Mechanic Street West**

Scenario	Westerly Site Access at Mechanic Street West							
	AM Peak Hour				PM Peak Hour			
	E/B	W/B	N/B	S/B	E/B	W/B	N/B	S/B
Existing + Site Generated Traffic	A	A	-	A	A	A	-	A

### **Easterly Site Access at Mechanic Street West**

The proposed tee intersection of the Easterly Site Access at Mechanic Street West will be controlled by a southbound stop condition. Based on the results provided in Table 3, it is anticipated that the new intersection will operate at a good level of service.

**Table 3: Level of Service by Approach – Easterly Site Access at Mechanic Street West**

Scenario	Easterly Site Access at Mechanic Street West							
	AM Peak Hour				PM Peak Hour			
	E/B	W/B	N/B	S/B	E/B	W/B	N/B	S/B
Existing + Site Generated Traffic	A	A	-	A	A	A	-	A

### **Mechanic Street West / Deer Park Road at Main Street North**

The existing intersection of Mechanic Street West / Deer Park Road at Main Street North (Old Highway 24) is an eastbound / westbound stop-controlled intersection. Based on the results provided in Table 4, all approaches are anticipated to operate satisfactorily with the addition of site generated traffic; the addition of site generated traffic will not result in a change to the approach levels of service.

**Table 4: Level of Service by Approach – Mechanic Street West / Deer Park Road at Main Street North**

Scenario	Mechanic St. W. / Deer Park Rd. at Main St. N.							
	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
Existing + Site Generated Traffic	B	B	A	A	B	C	A	A

## GEOMETRIC AND TRAFFIC CONTROL IMPROVEMENTS

Based on the level of service results and the low volumes of traffic generated by the residential development, it is the engineers' opinion that geometric and traffic control improvements are not required. As a result, no additional warrant evaluations were undertaken.

## SIGHT LINE ANALYSIS

Sight line analyses were completed for the following intersections:

- Westerly Site Access at Mechanic Street West; and
- Easterly Site Access at Mechanic Street West.

The analyses were completed in accordance with the TAC Geometric Design Guide for Canadian Roads (2017). The posted speed limit on Mechanic Street West is 50 km/h, so the analysis was completed for a 60 km/h design speed. As calculated in Appendix E, the intersection sight distance is determined to be 125m for the worst-case left turn egress maneuver. Intersection sight distance for a right turn egress maneuver is determined to be 108m.

As illustrated on Figures 6A and 6B, there is sufficient sight distance in both directions for safe egress from the site accesses; however, the developer and road authority should assure themselves that all boulevard areas within the right-of-way are clear of potential obstructions.

## SUMMARY AND CONCLUSIONS

A residential development has been proposed for lands situated at the northeast corner of Norfolk Street and Mechanic Street West in the Community of Waterford, Ontario, which is situated approximately 10 km north of the Town of Simcoe. The development site is located in the northwest area of the community. Main Street North (Old Highway 24) and Mechanic Street West (Concession 8 Townsend) are part of the arterial grid system in Waterford and the principal means of external access to and from the area.

Norfolk Street is a north / south local roadway which is just one block long. Mechanic Street West is an east / west roadway which intersects with Highway 24 approximately 3 km to the east of Waterford and with Main Street North (Old Highway 24) to the west. Mechanic Street West is known as Deer Park Road to the east of Main Street North. Main Street North is a north / south roadway which joins Highway 24 south of Waterford and north of Simcoe.

The study area includes the stop-controlled intersection of Norfolk Street at Mechanic Street West (Concession 8 Townsend), the site accesses, and the stop-controlled intersection of Mechanic Street West at Main Street North. The proposed site plan consists of six semi-detached homes and 16 townhomes, totalling 22 dwelling units; the development is proposed for construction in a single phase.

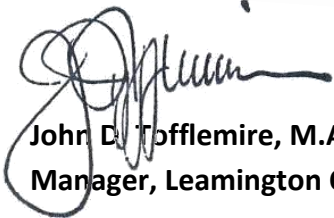
Using recently obtained turning movement counts and applying the best available trip generation and distribution data and methodologies, an analysis was completed to measure the operational impact of the proposed development on area traffic operations. Upon completion of the analysis, it was concluded that:

- The southbound stop-controlled tee intersection of Norfolk Street at Mechanic Street West is currently operating at good levels of service; following the construction of the proposed development, these levels of service will not be adversely affected;
- Both proposed Mechanic Street West site accesses will operate at good levels of service;
- The eastbound / westbound stop-controlled intersection of Mechanic Street West at Main Street North (Old Highway 24) is operating at satisfactory levels of service under existing traffic conditions; following the construction of the proposed development, these levels of service will not be adversely affected;
- Geometric and / or traffic control improvements are not required;
- There is sufficient decision sight distance to accommodate safe all-directional egress from both proposed site accesses; however, the developer and road authority should assure themselves that all boulevard areas within the right-of-way are clear of potential obstructions.

Therefore, based on the results of the technical work, it is the engineers' opinion that the proposed development will not adversely impact area traffic operations.

All of which is respectfully submitted,

**RC Spencer Associates Inc.**

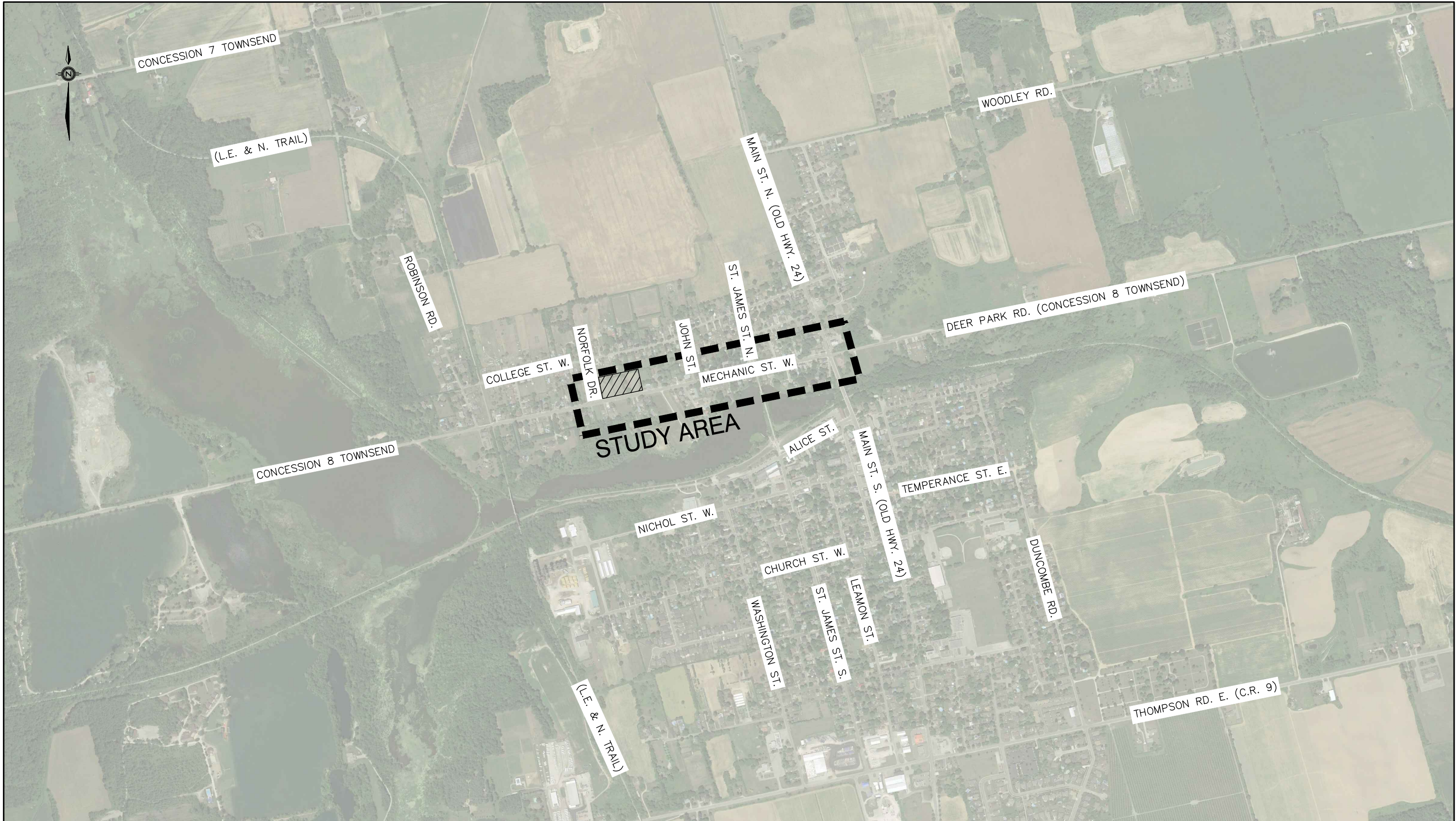
A handwritten signature in black ink, appearing to read "John D. Tofflemire".



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

A handwritten signature in black ink, appearing to read "Aaron D. Blata".

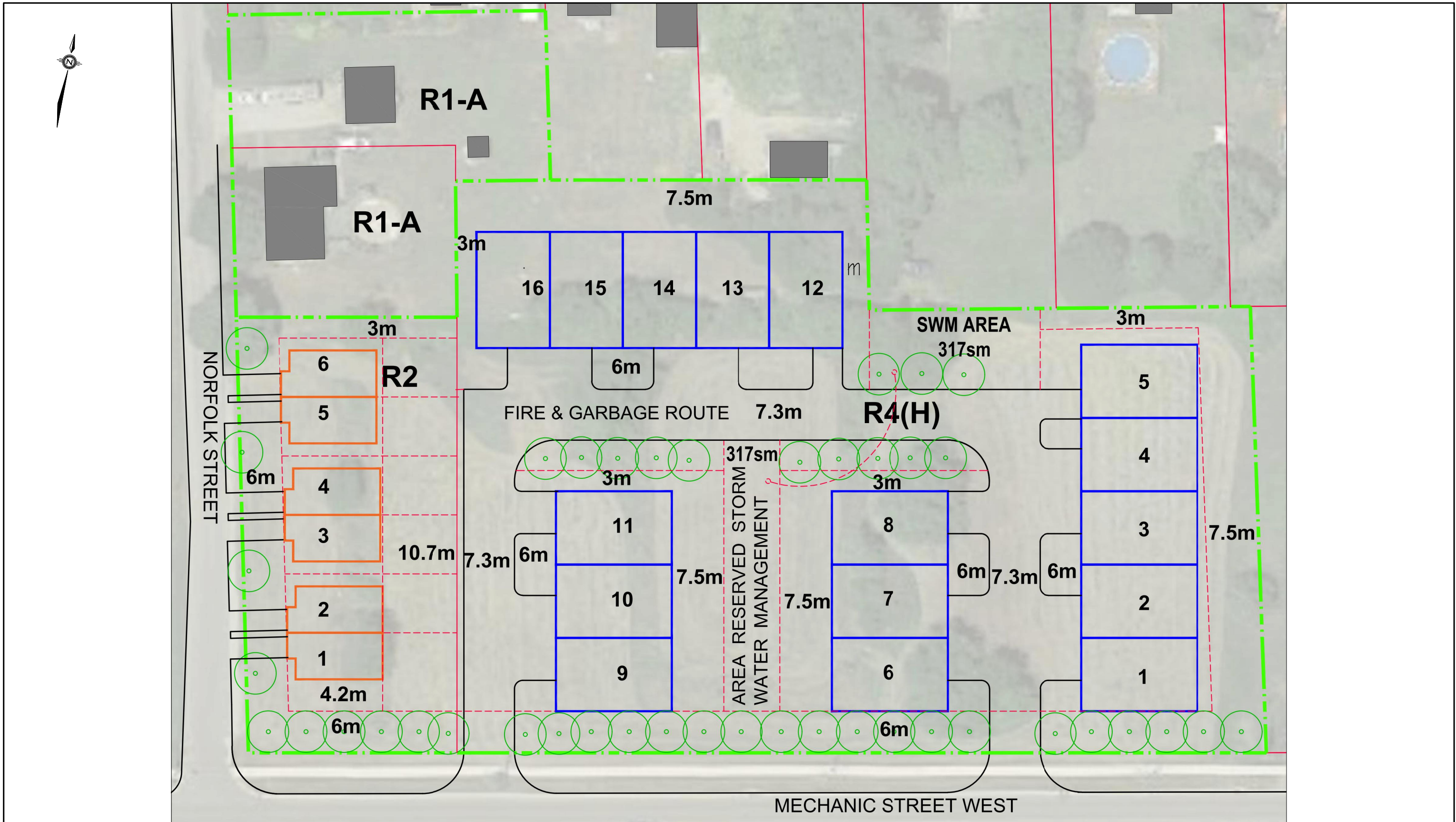
Aaron D. Blata, M.Eng., P.Eng., PTOE  
Associate / Traffic Operations Project Engineer







			<div><div><div><div>RC SPENCER ASSOCIATES INC.</div><div>Consulting Engineers</div><div>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</div></div><div>Professional Engineers Ontario</div></div></div>										DESIGN	A.D.B.	NORFOLK ST. DEVELOPMENT, WATERFORD – TIS	PROJECT NO.	21-1184
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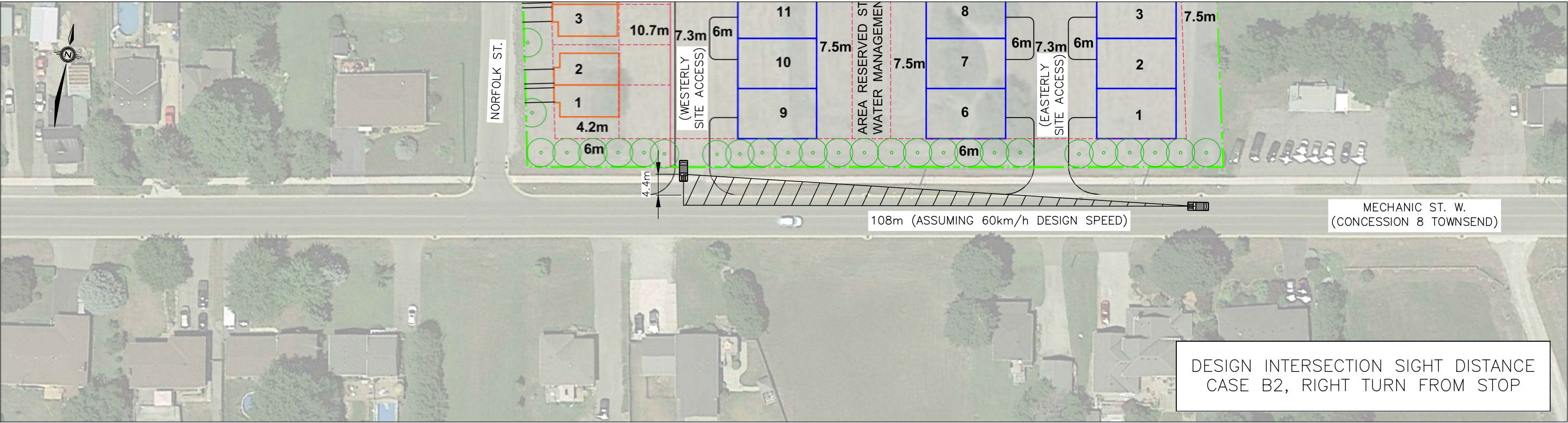
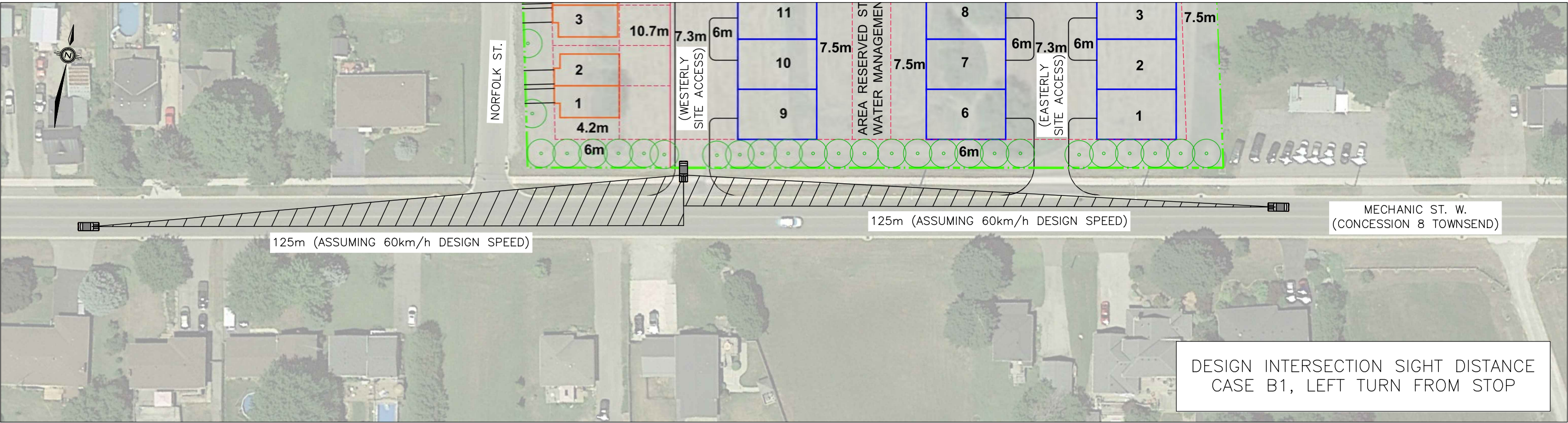
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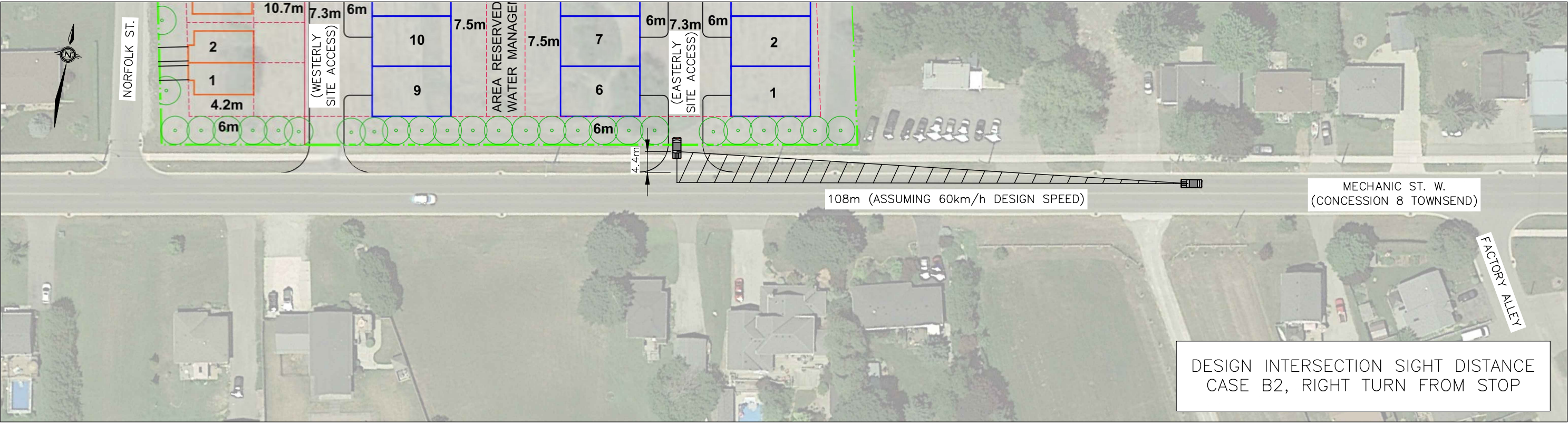
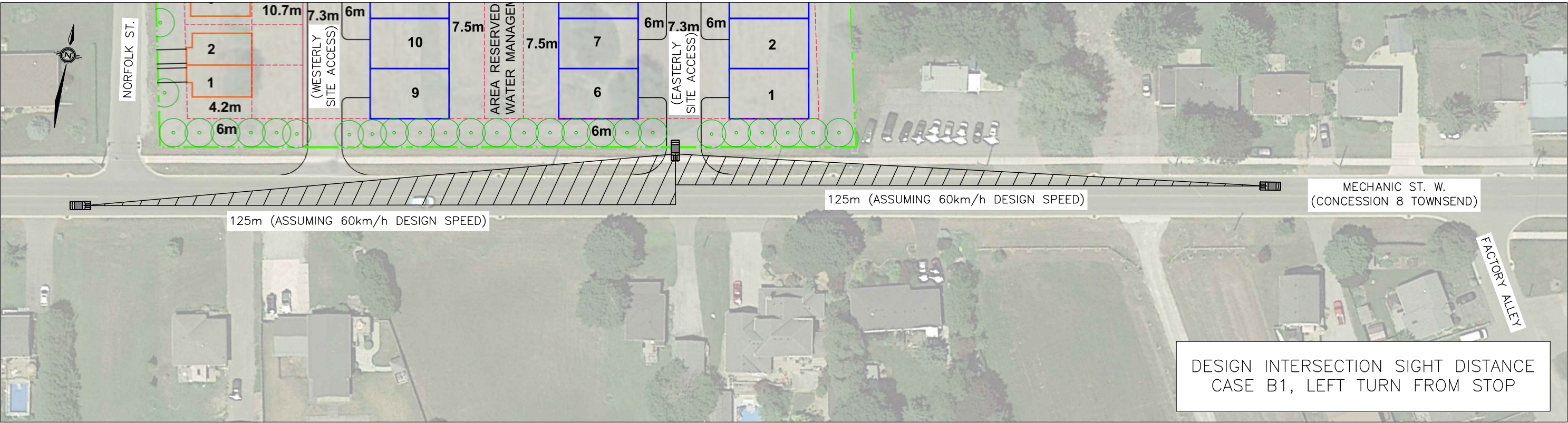








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1.	COMPLETED REPORT FIGURES	05 OCT 2021	F.C.	A.D.B.	DATE	OCTOBER 2021				SIGHT LINE ANALYSIS: WESTERLY SITE ACCESS AT MECHANIC STREET WEST	OF	
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## **Appendix A**

# **TRAFFIC DATA COLLECTION**

**Norfolk Street at Mechanic Street West  
Mechanic Street West at Main Street North (Old  
Highway 24)**

# Mechanic St W @ Norfolk St

## 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:** Waterford

**Site #:** 0000000001

**Intersection:** Mechanic St W & Norfolk St

**TFR File #:** 1

**Count date:** 28-Sep-2021

### Weather conditions:

Clear/Dry

### Person(s) who counted:

Cam

### \*\* Non-Signalized Intersection \*\*

**Major Road:** Mechanic St W runs W/E

North Leg Total: 8

North Entering: 3

North Peds: 4

Peds Cross:  $\times$

Heavys	0	0	0
Trucks	0	0	0
Cars	0	3	3
<b>Totals</b>	<b>0</b>	<b>3</b>	



Heavys 1

Trucks 0

Cars 4

**Totals 5**

East Leg Total: 86

East Entering: 40

East Peds: 0

Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
2	0	33	35

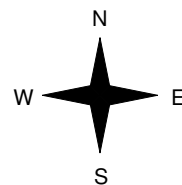


Mechanic St W

Heavys	Trucks	Cars	Totals
0	0	0	0
3	0	40	43
<b>3</b>	<b>0</b>	<b>40</b>	



Norfolk St



Cars	Trucks	Heavys	Totals
4	0	1	5
33	0	2	35
<b>37</b>	<b>0</b>	<b>3</b>	



Mechanic St W



Cars	Trucks	Heavys	Totals
43	0	3	46

Peds Cross:  $\times$

West Peds: 0

West Entering: 43

West Leg Total: 78

## Comments

# Mechanic St W @ Norfolk St

## Mid-day Peak Diagram

### Specified Period

**From:** 11:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 13:00:00

**To:** 14:00:00

**Municipality:** Waterford

**Site #:** 0000000001

**Intersection:** Mechanic St W & Norfolk St

**TFR File #:** 1

**Count date:** 28-Sep-2021

### Weather conditions:

Clear/Dry

### Person(s) who counted:

Cam

### \*\* Non-Signalized Intersection \*\*

**Major Road:** Mechanic St W runs W/E

North Leg Total: 8

North Entering: 1

North Peds: 3

Peds Cross:  $\times$

Heavys	0	0	0
Trucks	0	0	0
Cars	0	1	1
<b>Totals</b>	<b>0</b>	<b>1</b>	



Heavys 0

Trucks 0

Cars 7

**Totals 7**

East Leg Total: 102

East Entering: 49

East Peds: 0

Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
1	0	43	44

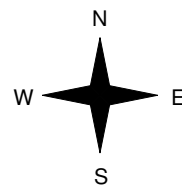


Mechanic St W

Heavys	Trucks	Cars	Totals
0	0	2	2
3	0	49	52
<b>3</b>	<b>0</b>	<b>51</b>	



Norfolk St



Cars	Trucks	Heavys	Totals
5	0	0	5
43	0	1	44
<b>48</b>	<b>0</b>	<b>1</b>	



Mechanic St W



Cars	Trucks	Heavys	Totals
50	0	3	53

Peds Cross:  $\times$

West Peds: 0

West Entering: 54

West Leg Total: 98

## Comments

# Mechanic St W @ Norfolk St

## 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:** Waterford

**Site #:** 0000000001

**Intersection:** Mechanic St W & Norfolk St

**TFR File #:** 1

**Count date:** 28-Sep-2021

### Weather conditions:

Clear/Dry

### Person(s) who counted:

Cam

### \*\* Non-Signalized Intersection \*\*

**Major Road:** Mechanic St W runs W/E

North Leg Total: 9

North Entering: 4

North Peds: 11

Peds Cross: 8

Heavys	Trucks	Cars	Totals
0	0	0	0
0	0	0	0
1	3	4	4
1	3		3



Heavys 0

Trucks 1

Cars 4

Totals 5

East Leg Total: 149

East Entering: 80

East Peds: 0

Peds Cross: 8

Heavys	Trucks	Cars	Totals
6	0	72	78

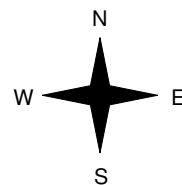


Mechanic St W

Heavys	Trucks	Cars	Totals
0	0	2	2
2	1	63	66
2	1	65	



Norfolk St



Cars	Trucks	Heavys	Totals
2	1	0	3
71	0	6	77
73	1	6	



Mechanic St W



Cars	Trucks	Heavys	Totals
66	1	2	69

Peds Cross: 8

West Peds: 0

West Entering: 68

West Leg Total: 146

## Comments



# Mechanic St W @ Norfolk St

## Total Count Diagram

**Municipality:** Waterford  
**Site #:** 0000000001  
**Intersection:** Mechanic St W & Norfolk St  
**TFR File #:** 1  
**Count date:** 28-Sep-2021

**Weather conditions:**  
 Clear/Dry  
**Person(s) who counted:**  
 Cam

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

**Major Road:** Mechanic St W runs W/E

North Leg Total: 68  
 North Entering: 24  
 North Peds: 36  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
1	0	4	5
0	0	19	19
1	0	23	23



Heavys	Trucks	Cars	Totals
2	1	41	44
1	0	0	0
0	0	0	0

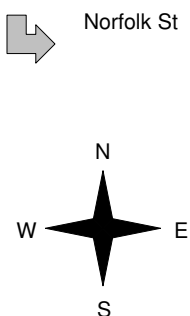
East Leg Total: 800  
 East Entering: 386  
 East Peds: 0  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
17	4	337	358



Mechanic St W

Heavys	Trucks	Cars	Totals
1	0	10	11
22	5	368	395
23	5	378	



Cars	Trucks	Heavys	Totals
31	1	1	33
333	4	16	353
364	5	17	

Mechanic St W



Cars	Trucks	Heavys	Totals
387	5	22	414

Peds Cross:  $\times$   
 West Peds: 0  
 West Entering: 406  
 West Leg Total: 764

**Comments**



# Mechanic St W @ Main St N

## 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:** Waterford

**Site #:** 0000000002

**Intersection:** Main St N & Mechanic St W

**TFR File #:** 2

**Count date:** 28-Sep-2021

### Weather conditions:

Clear/Dry

### Person(s) who counted:

Cam

### \*\* Non-Signalized Intersection \*\*

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

North Leg Total: 457

North Entering: 226

North Peds: 0

Peds Cross:  $\times$

Heavys	1	12	0	13
Trucks	1	4	0	5
Cars	6	202	0	208
Totals	8	218	0	



Heavys	10
Trucks	2
Cars	219
Totals	231

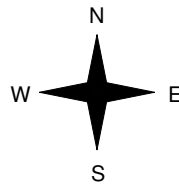
East Leg Total: 18  
East Entering: 12  
East Peds: 6  
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
3	1	39	43



Mechanic St W

Heavys	Trucks	Cars	Totals
1	0	11	12
0	0	0	0
2	0	50	52
3	0	61	



Main St N

Cars	Trucks	Heavys	Totals
2	0	0	2
2	0	0	2
8	0	0	8
12	0	0	

Concession 8 Townsend



Cars	Trucks	Heavys	Totals
6	0	0	6

Peds Cross:  $\times$   
West Peds: 3  
West Entering: 64  
West Leg Total: 107

Cars	260	Cars	31	206	6	243
Trucks	4	Trucks	0	2	0	2
Heavys	14	Heavys	2	9	0	11
Totals	278	Totals	33	217	6	



Peds Cross:  $\times$   
South Peds: 0  
South Entering: 256  
South Leg Total: 534

## Comments

# Mechanic St W @ Main St N

## 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:** Waterford

**Site #:** 0000000002

**Intersection:** Main St N & Mechanic St W

**TFR File #:** 2

**Count date:** 28-Sep-2021

### Weather conditions:

Clear/Dry

### Person(s) who counted:

Cam

### \*\* Non-Signalized Intersection \*\*

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

North Leg Total: 451

North Entering: 227

North Peds: 0

Peds Cross:  $\nlessgtr$

Heavys	0	6	0	6
Trucks	0	5	0	5
Cars	11	203	2	216
Totals	11	214	2	



Heavys 4

Trucks 1

Cars 219

Totals 224

East Leg Total: 22

East Entering: 9

East Peds: 3

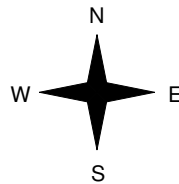
Peds Cross:  $\nlessgtr$

Heavys	Trucks	Cars	Totals
0	0	56	56



Mechanic St W

Heavys	Trucks	Cars	Totals
0	0	12	12
1	0	2	3
1	1	39	41
2	1	53	



Main St N

Cars	Trucks	Heavys	Totals
4	0	0	4
0	0	0	0
5	0	0	5
9	0	0	

Concession 8 Townsend



Cars	Trucks	Heavys	Totals
12	0	1	13

Peds Cross:  $\nlessgtr$

West Peds: 2

West Entering: 56

West Leg Total: 112

Cars	247
Trucks	6
Heavys	7
Totals	260



Cars	45	203	8	256
Trucks	0	1	0	1
Heavys	0	4	0	4
Totals	45	208	8	

Peds Cross:  $\nlessgtr$

South Peds: 2

South Entering: 261

South Leg Total: 521

## Comments

# Mechanic St W @ Main St N

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 15:45:00

**To:** 16:45:00

**Municipality:** Waterford

**Site #:** 0000000002

**Intersection:** Main St N & Mechanic St W

**TFR File #:** 2

**Count date:** 28-Sep-2021

### Weather conditions:

Clear/Dry

### Person(s) who counted:

Cam

### \*\* Non-Signalized Intersection \*\*

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

North Leg Total: 580

North Entering: 308

North Peds: 0

Peds Cross:  $\times$

Heavys	1	6	0	7
Trucks	0	2	0	2
Cars	17	280	2	299
<b>Totals</b>	<b>18</b>	<b>288</b>	<b>2</b>	

Heavys	9
Trucks	5
Cars	258
<b>Totals</b>	<b>272</b>

East Leg Total: 29

East Entering: 16

East Peds: 2

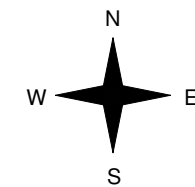
Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
2	1	92	95



Mechanic St W

Heavys	Trucks	Cars	Totals
1	0	9	10
1	0	4	5
3	0	67	70
<b>5</b>	<b>0</b>	<b>80</b>	



Main St N

Cars	Trucks	Heavys	Totals
2	0	3	5
2	0	0	2
9	0	0	9
<b>13</b>	<b>0</b>	<b>3</b>	

Concession 8 Townsend



Cars	Trucks	Heavys	Totals
11	0	2	13

Peds Cross:  $\times$

West Peds: 1

West Entering: 85

West Leg Total: 180

Cars	356	Cars	73	247	5	325
Trucks	2	Trucks	1	5	0	6
Heavys	9	Heavys	1	5	1	7
<b>Totals</b>	<b>367</b>	<b>Totals</b>	<b>75</b>	<b>257</b>	<b>6</b>	



Peds Cross:  $\times$

South Peds: 0

South Entering: 338

South Leg Total: 705

## Comments

# Mechanic St W @ Main St N

## Total Count Diagram

**Municipality:** Waterford  
**Site #:** 0000000002  
**Intersection:** Main St N & Mechanic St W  
**TFR File #:** 2  
**Count date:** 28-Sep-2021

**Weather conditions:**  
 Clear/Dry  
**Person(s) who counted:**  
 Cam

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

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

North Leg Total: 3758  
 North Entering: 1842  
 North Peds: 1  
 Peds Cross:  $\times$

	Heavys	Trucks	Cars	Totals
North	5	46	2	53
West	1	25	0	26
East	85	1665	13	1763
<b>Totals</b>	<b>91</b>	<b>1736</b>	<b>15</b>	

	Heavys	Trucks	Cars	Totals
North	57	26	1833	1916

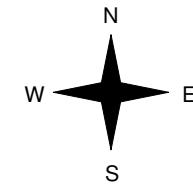
East Leg Total: 158  
 East Entering: 73  
 East Peds: 32  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
17	5	469	491



Mechanic St W

Heavys	Trucks	Cars	Totals
4	3	86	93
4	0	9	13
16	3	398	417
24	6	493	



Main St N

Cars	Trucks	Heavys	Totals
19	1	3	23
7	0	4	11
38	0	1	39
64	1	8	

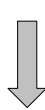
Concession 8 Townsend



Cars	Trucks	Heavys	Totals
74	0	11	85

Peds Cross:  $\times$   
 West Peds: 9  
 West Entering: 523  
 West Leg Total: 1014

	Cars	Trucks	Heavys	Totals
West	2101	28	63	2192



	Cars	Trucks	Heavys	Totals
West	377	4	8	389
North	1728	22	50	1800
East	52	0	5	57
<b>Totals</b>	<b>2157</b>	<b>26</b>	<b>63</b>	

Peds Cross:  $\times$   
 South Peds: 15  
 South Entering: 2246  
 South Leg Total: 4438

## Comments

## **Appendix B**

# **ITE TRIP GENERATION MANUAL – 10<sup>TH</sup> EDITION REFERENCES**

# Single-Family Detached Housing (210)

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: 173

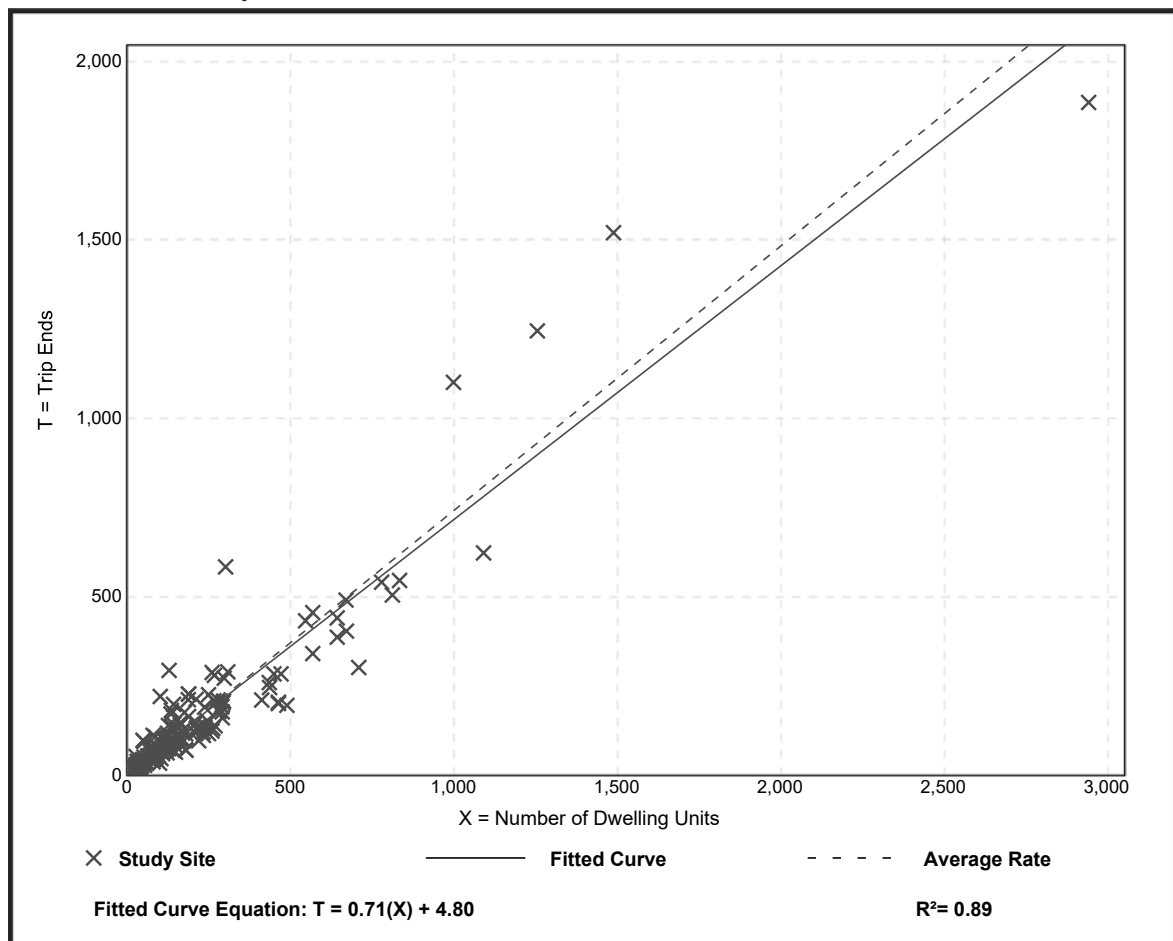
Avg. Num. of Dwelling Units: 219

Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

## Data Plot and Equation



# Single-Family Detached Housing (210)

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: 190

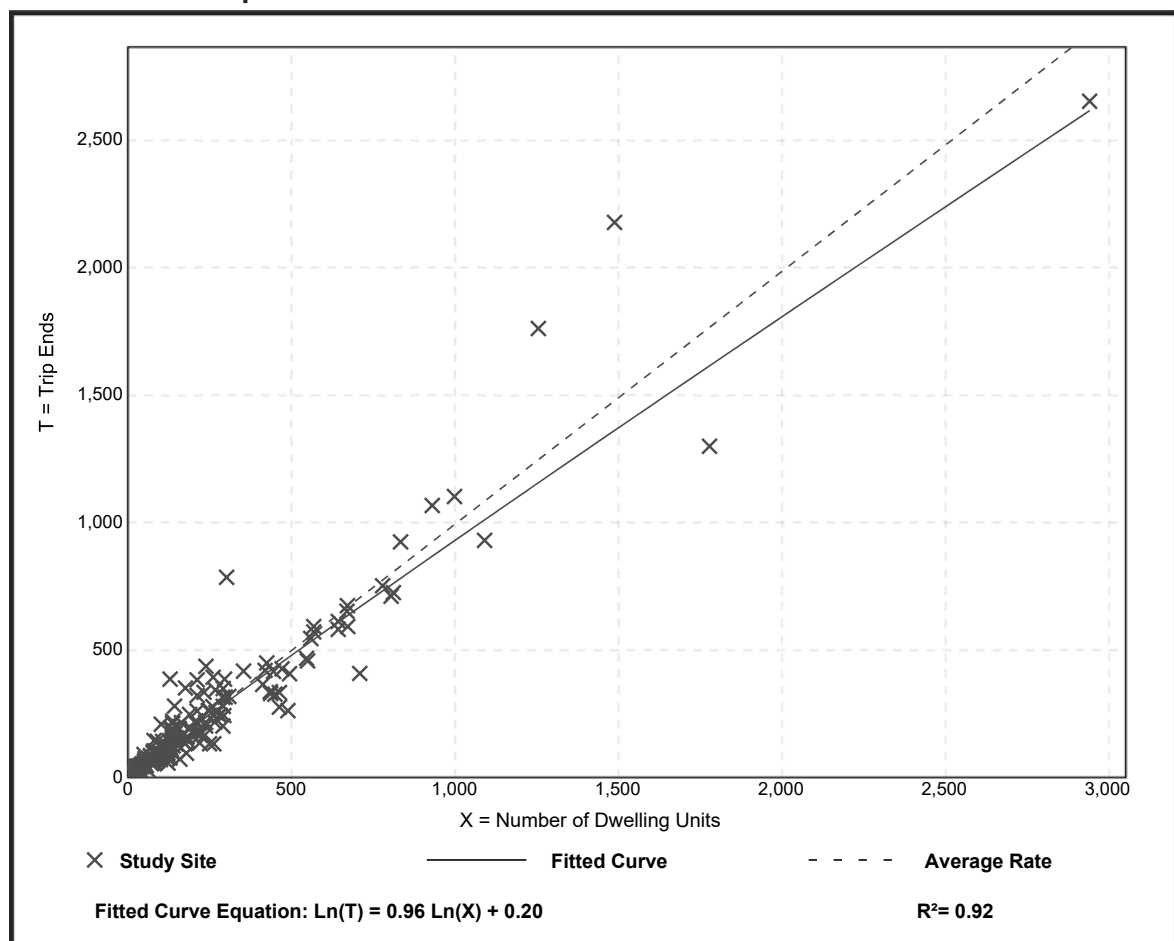
Avg. Num. of Dwelling Units: 242

Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

## Data Plot and Equation



### Proposed Site Development Trip Generation and Distribution

**Project:** Norfolk Street Development Traffic Impact Study

**Site:** Waterford, County of Norfolk, Ontario

**Assumed Land Use (1):** Single-Family Detached Housing - ITE No. 210

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

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

**AM Peak Hour:**

0.74
------

 = Average Rate 

25
75

 % Entering  
% Exiting

**PM Peak Hour:**

0.99
------

 = Average Rate 

63
37

 % Entering  
% Exiting

---

Assumed Land Use (1): Single-Family Detached Housing - ITE No. 210				
	Dwelling Units	Trips Generated	Trips Entering	Trips Exiting
<b>AM Peak</b>	22	16	4	12
<b>PM Peak</b>	22	22	14	8

Total Trips		
	Trips Entering	Trips Exiting
<b>AM Peak</b>	4	12
<b>PM Peak</b>	14	8



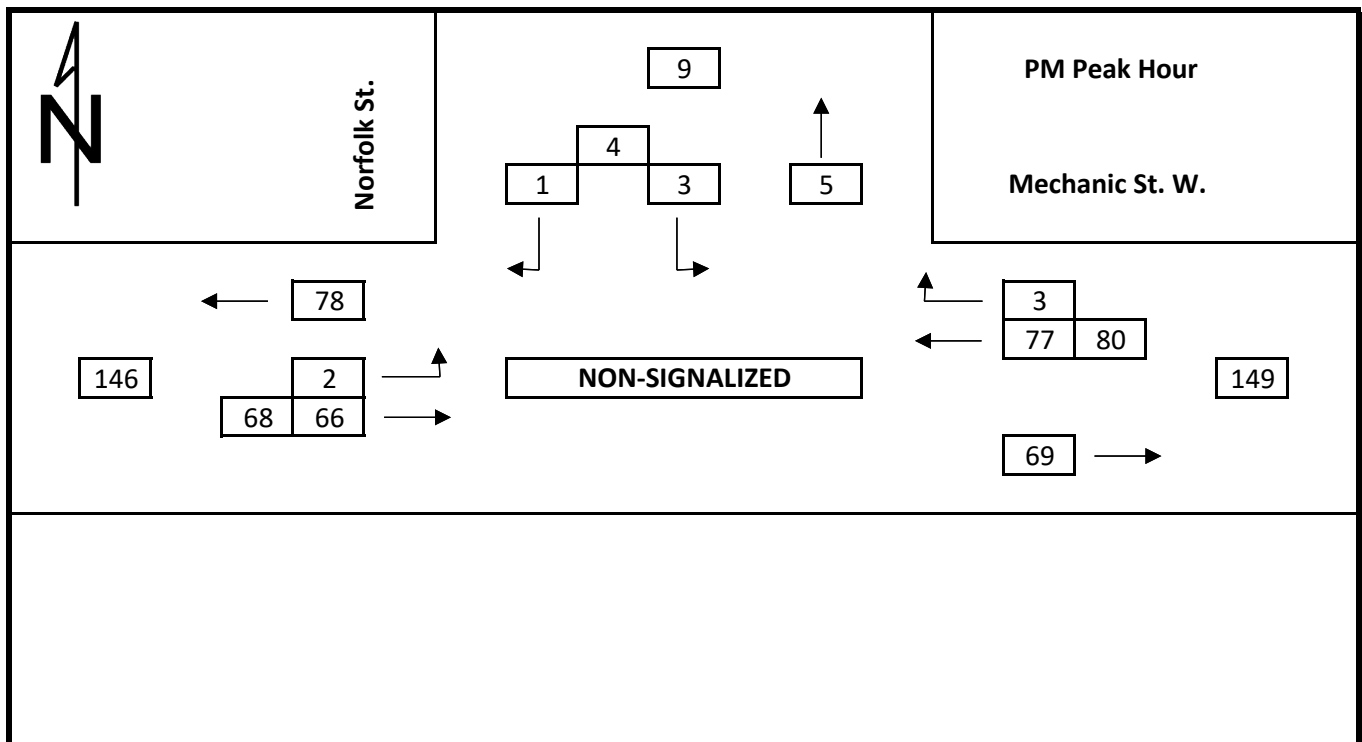
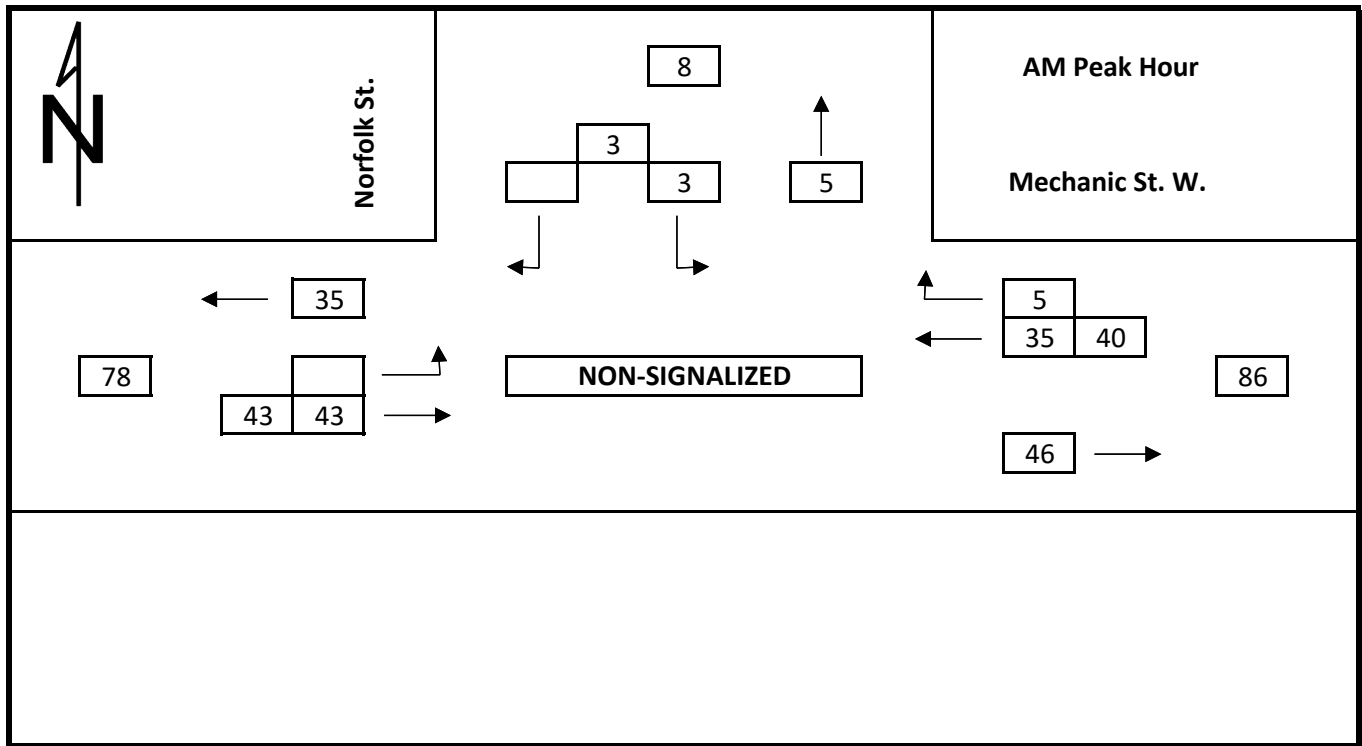
## **Appendix C**

# **TRAFFIC PROJECTION FIGURES**

**Norfolk Street at Mechanic Street West  
Westerly Site Access at Mechanic Street West  
Easterly Site Access at Mechanic Street West  
Mechanic Street West at Main Street North (Old  
Highway 24)**

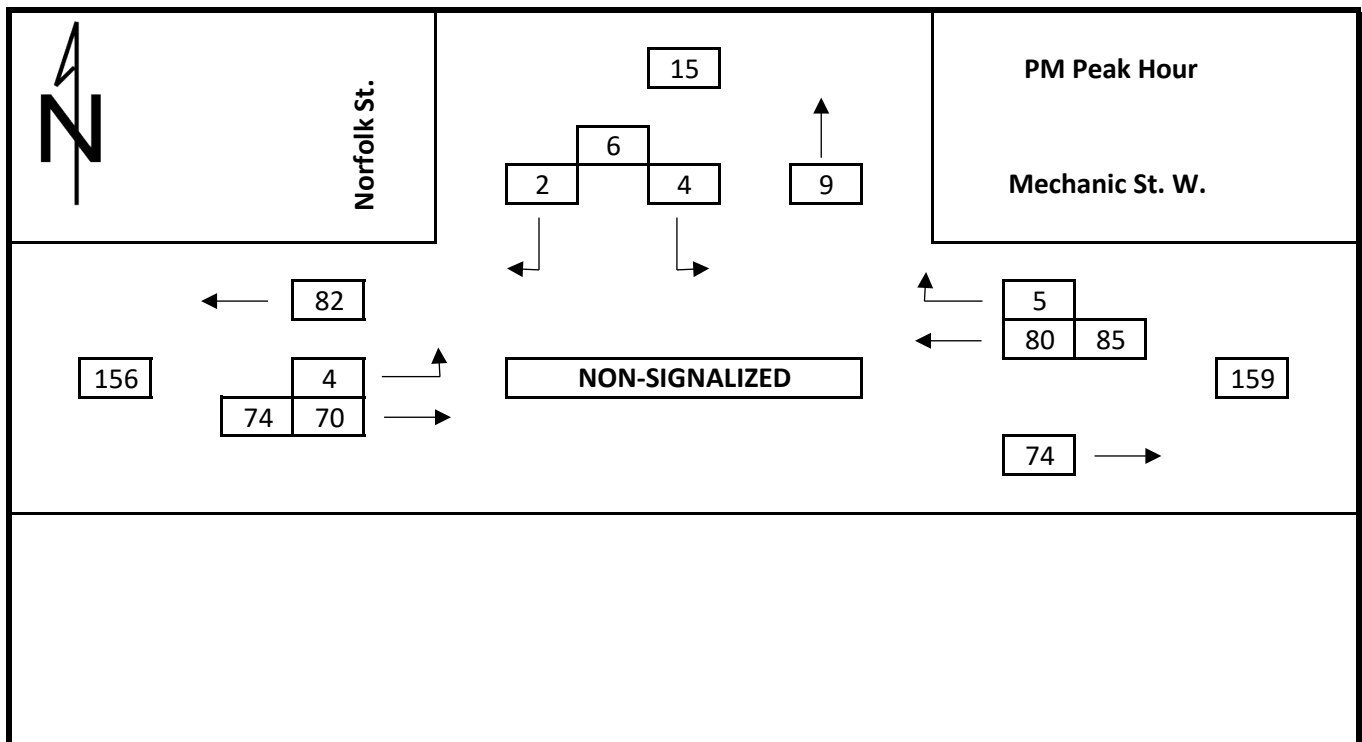
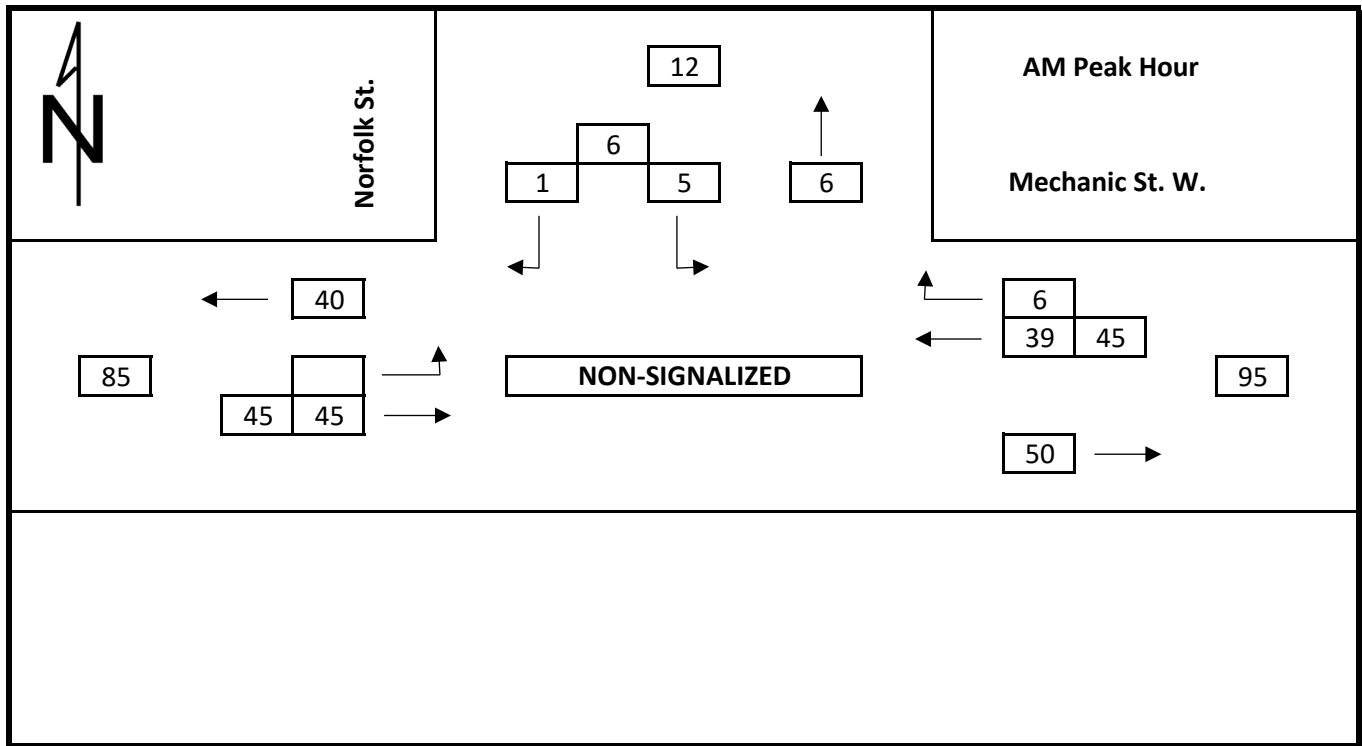
# Existing Traffic Counts

## Norfolk Street at Mechanic Street West

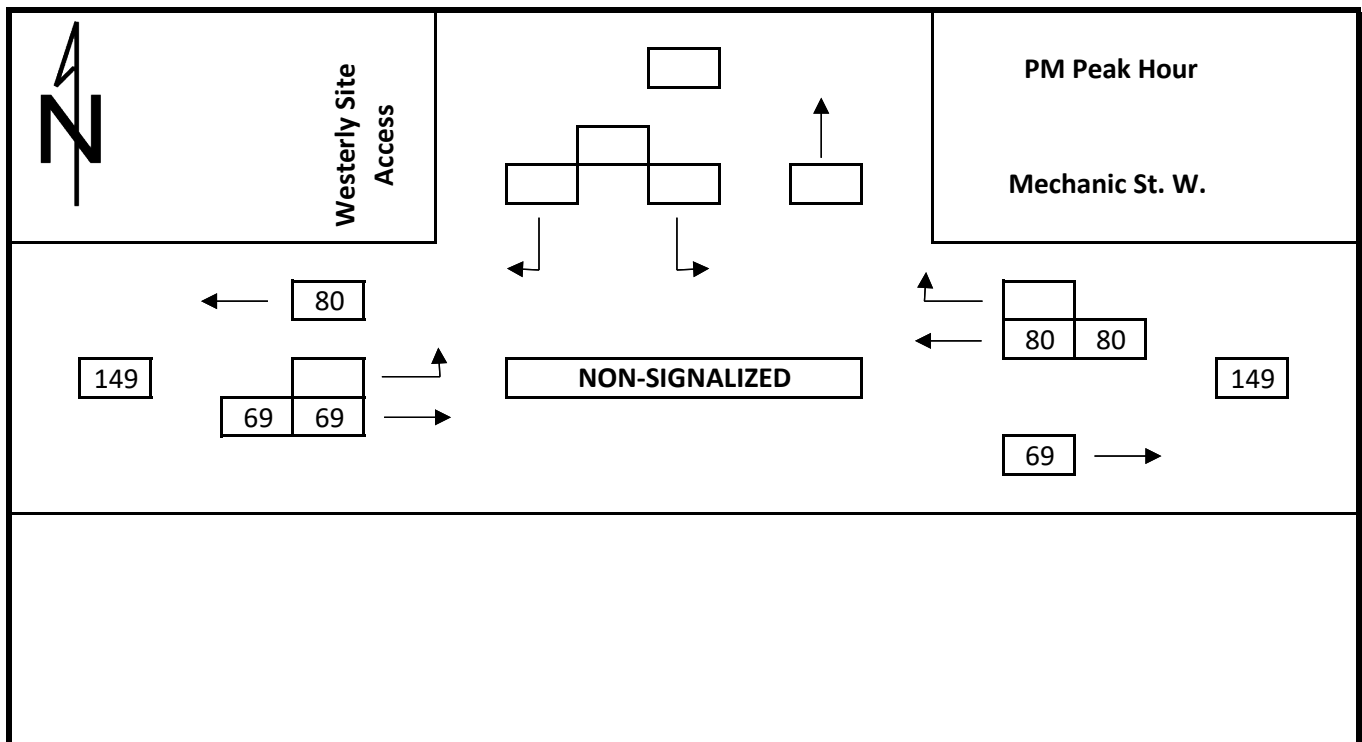
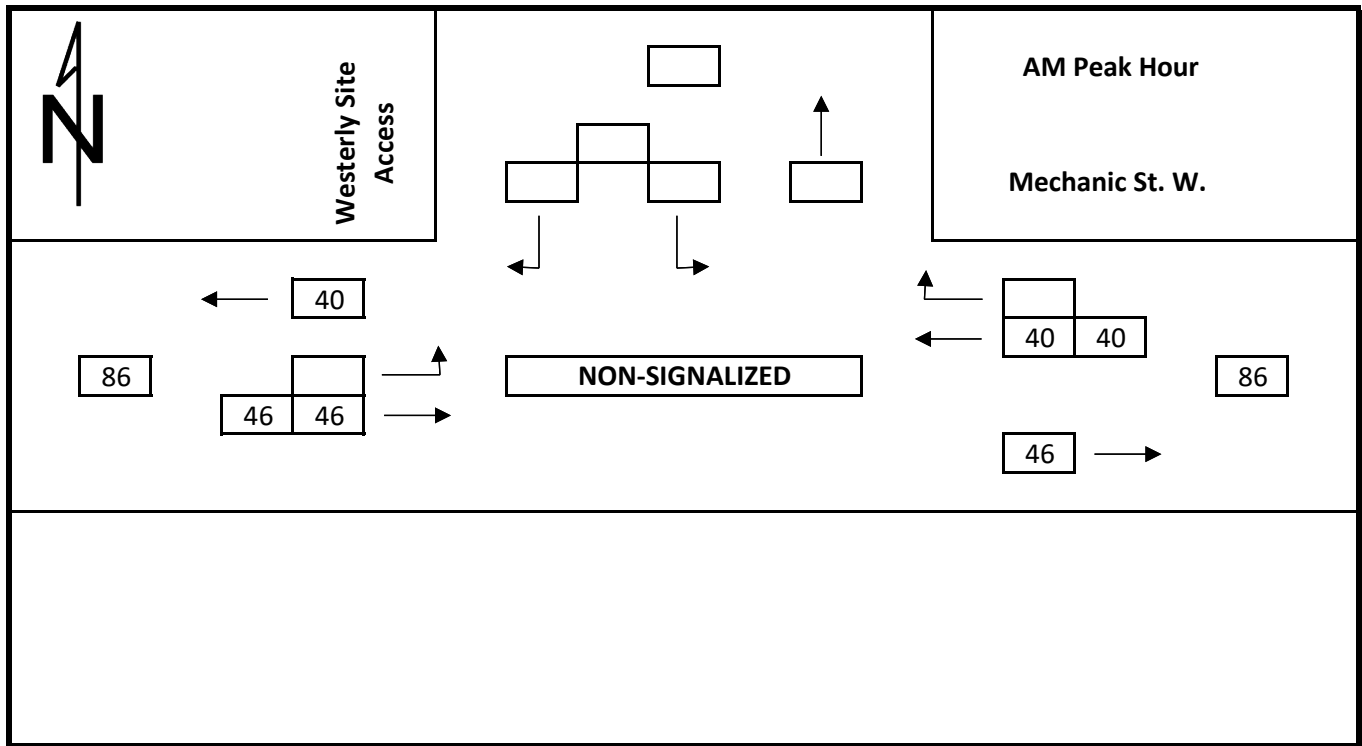


# Existing + Site Generated Traffic

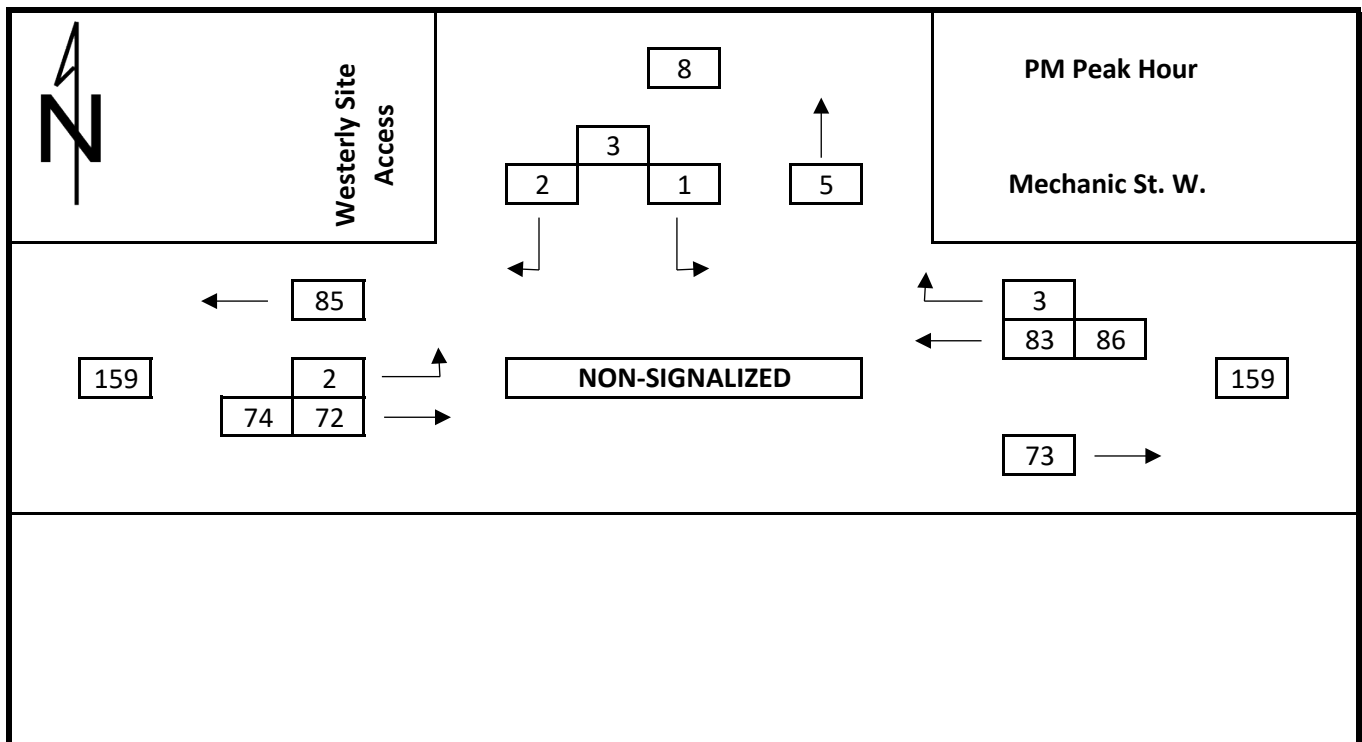
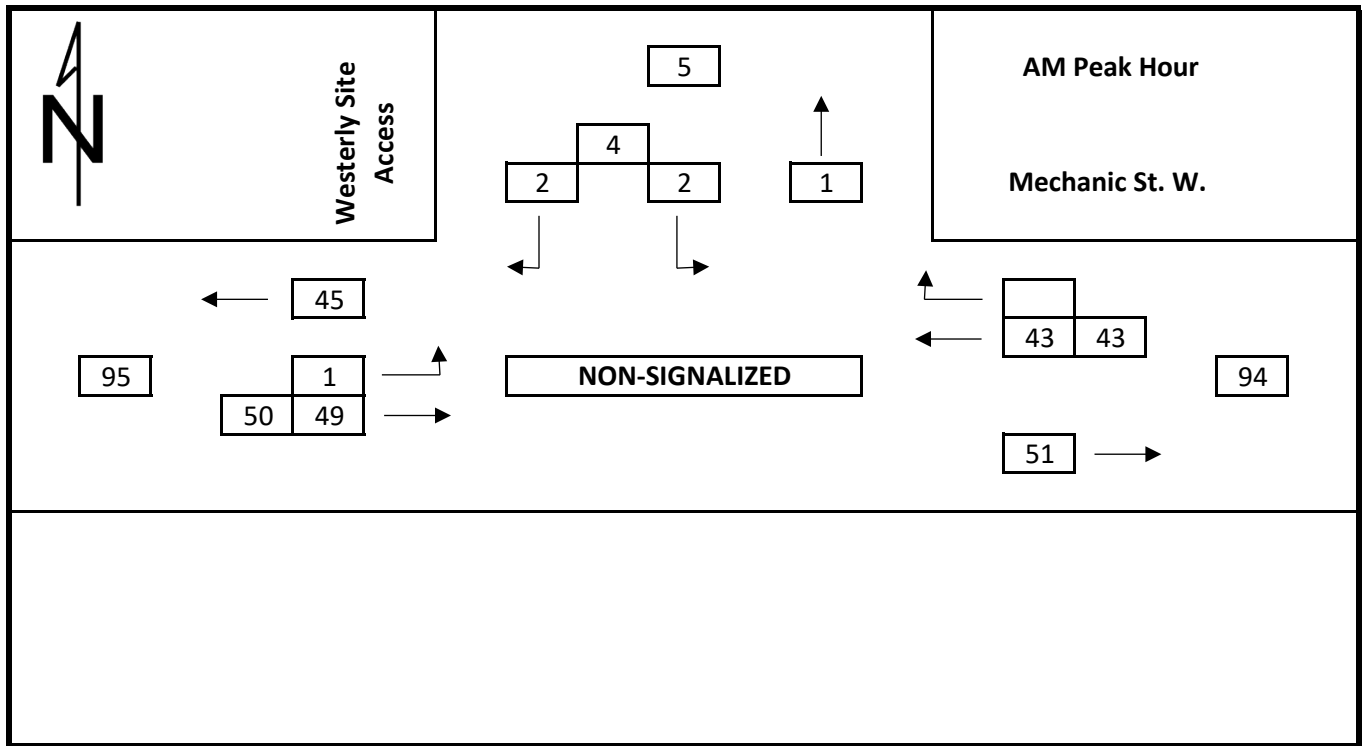
## Norfolk Street at Mechanic Street West



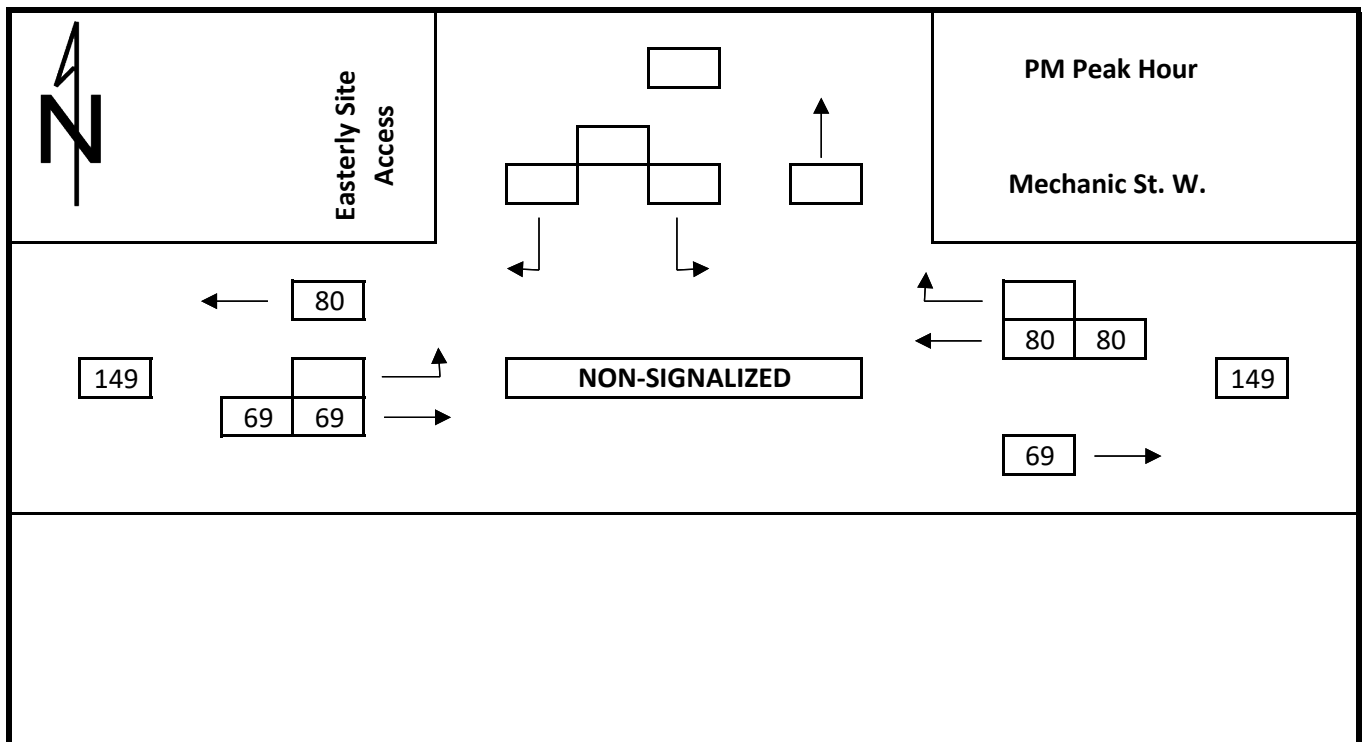
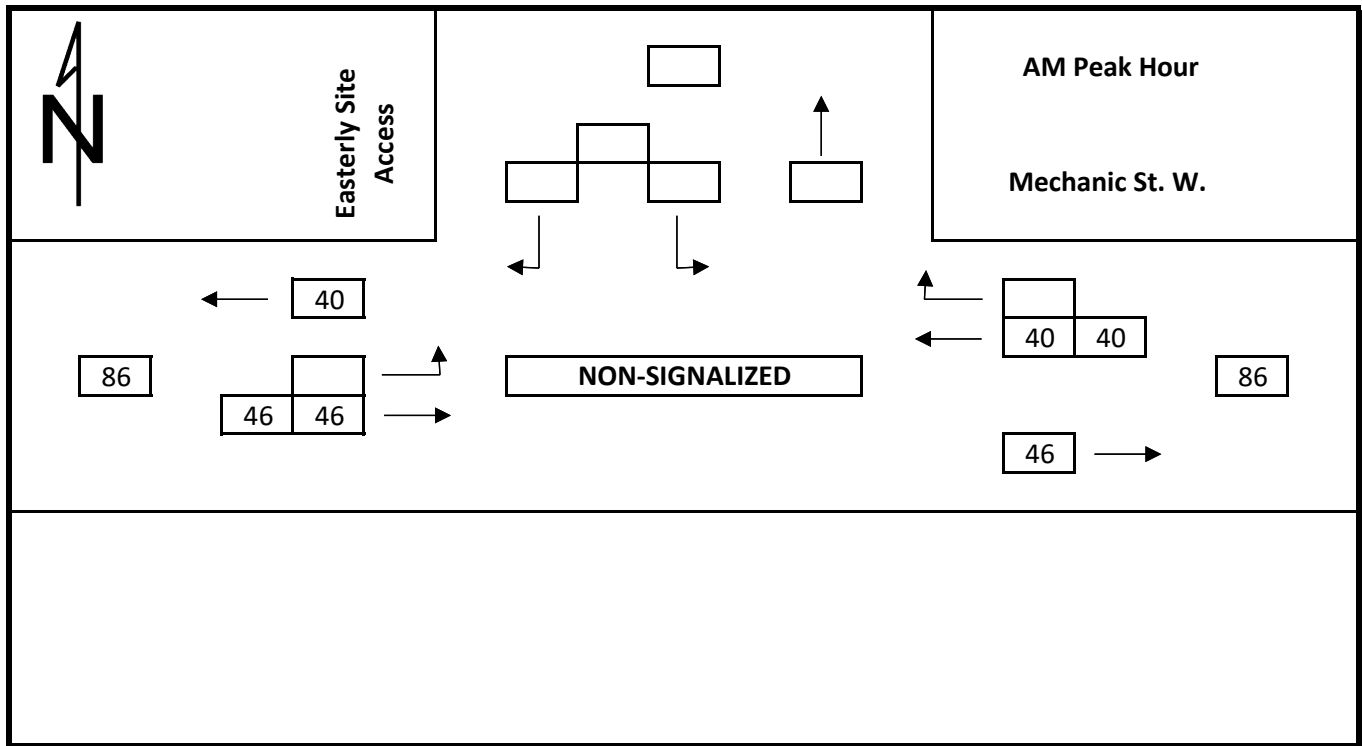
**Existing Traffic Counts**  
Westerly Site Access at Mechanic Street West



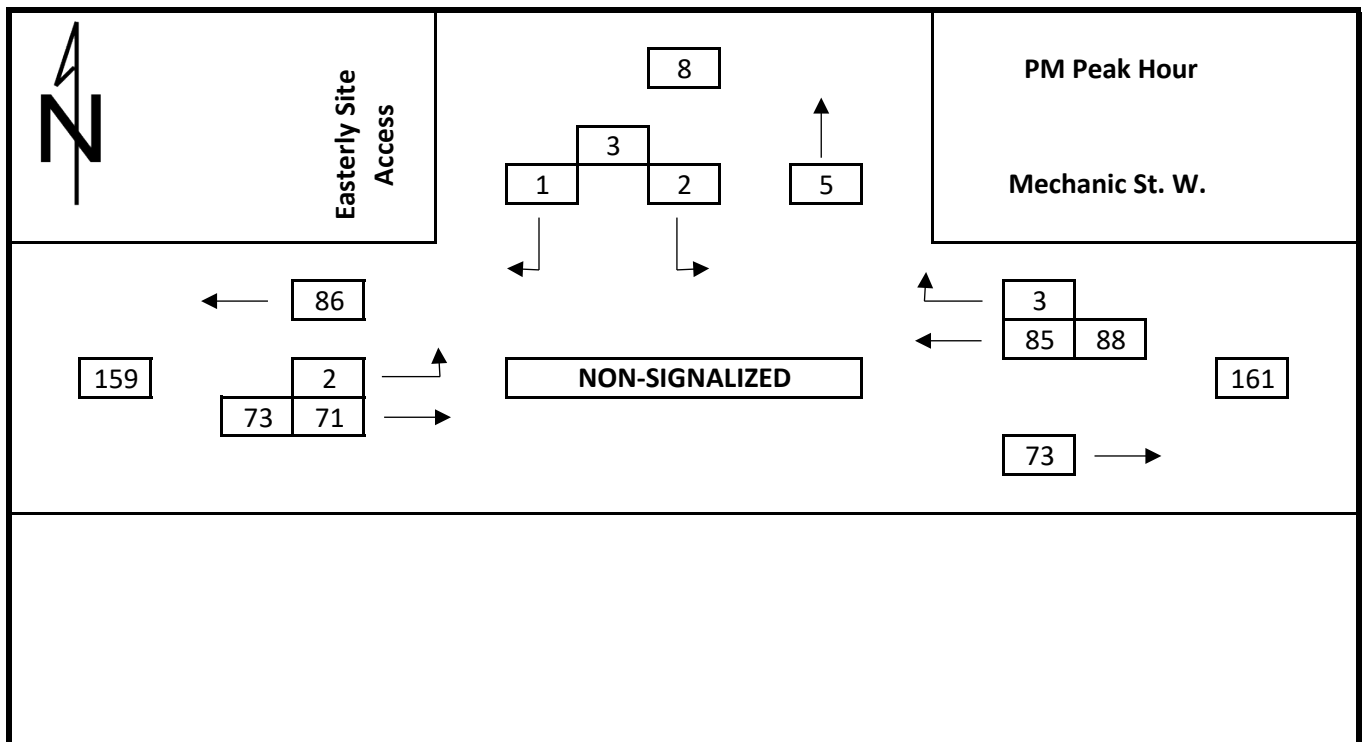
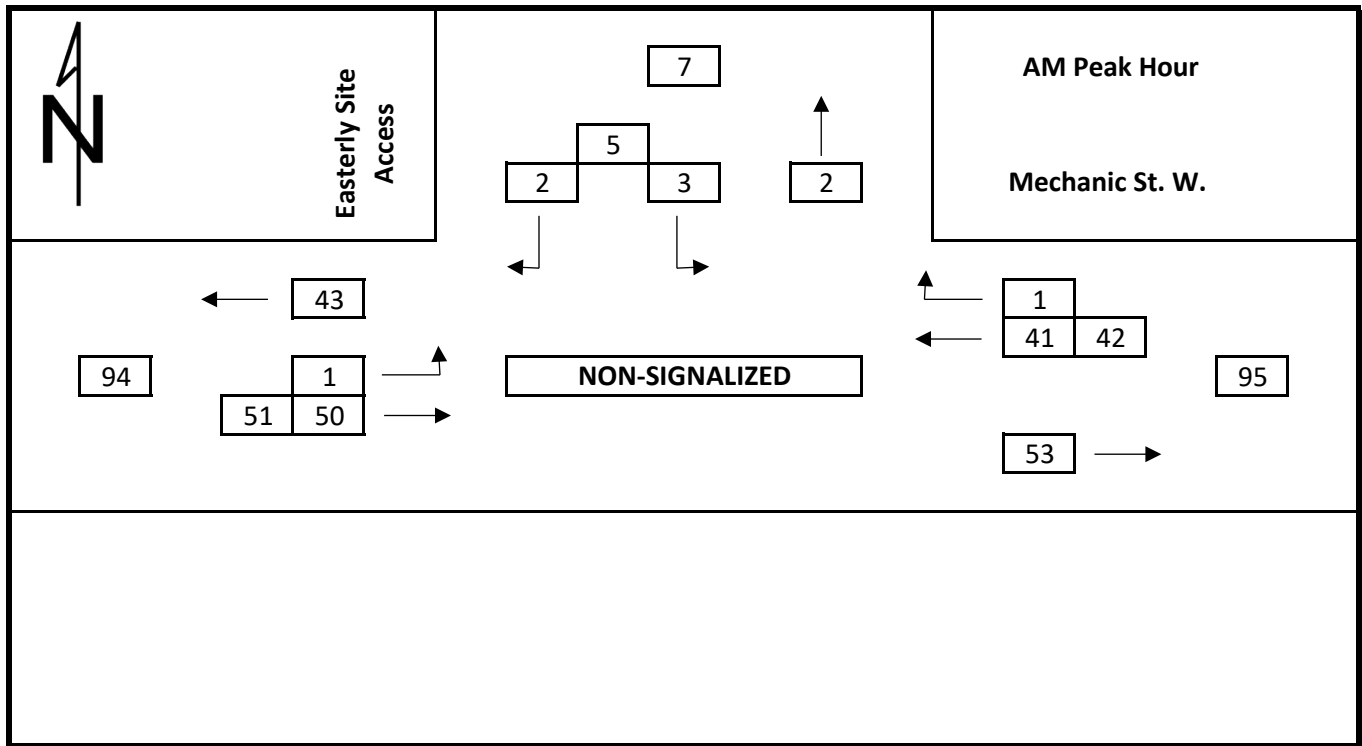
**Existing + Site Generated Traffic**  
Westerly Site Access at Mechanic Street West



**Existing Traffic Counts**  
Easterly Site Access at Mechanic Street West

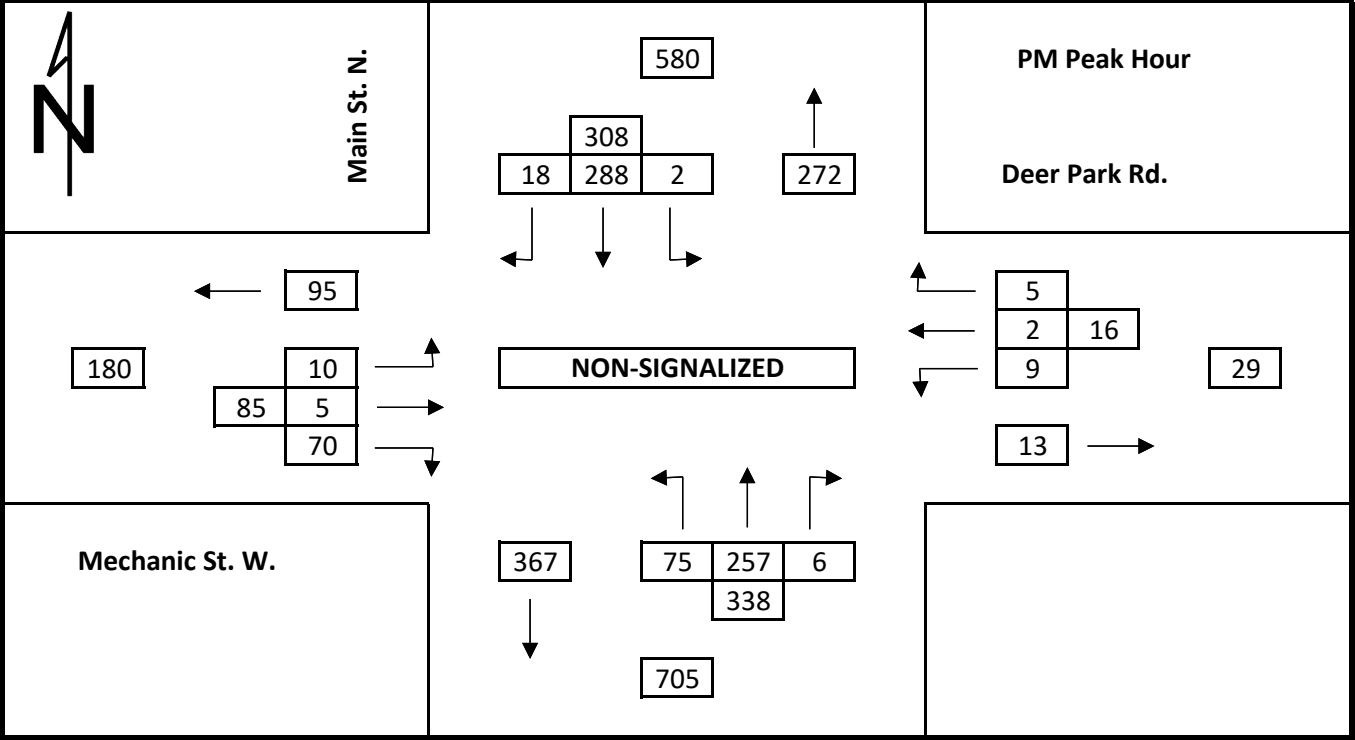
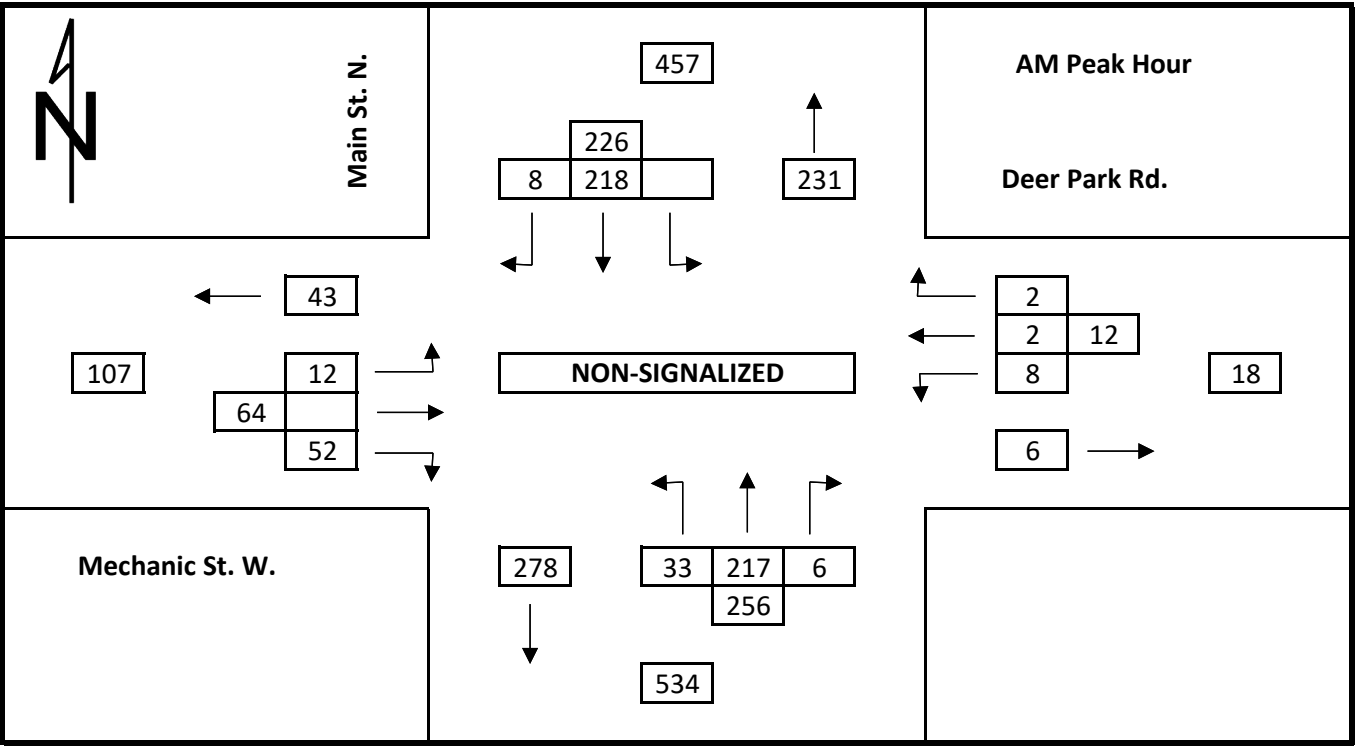


**Existing + Site Generated Traffic**  
Easterly Site Access at Mechanic Street West



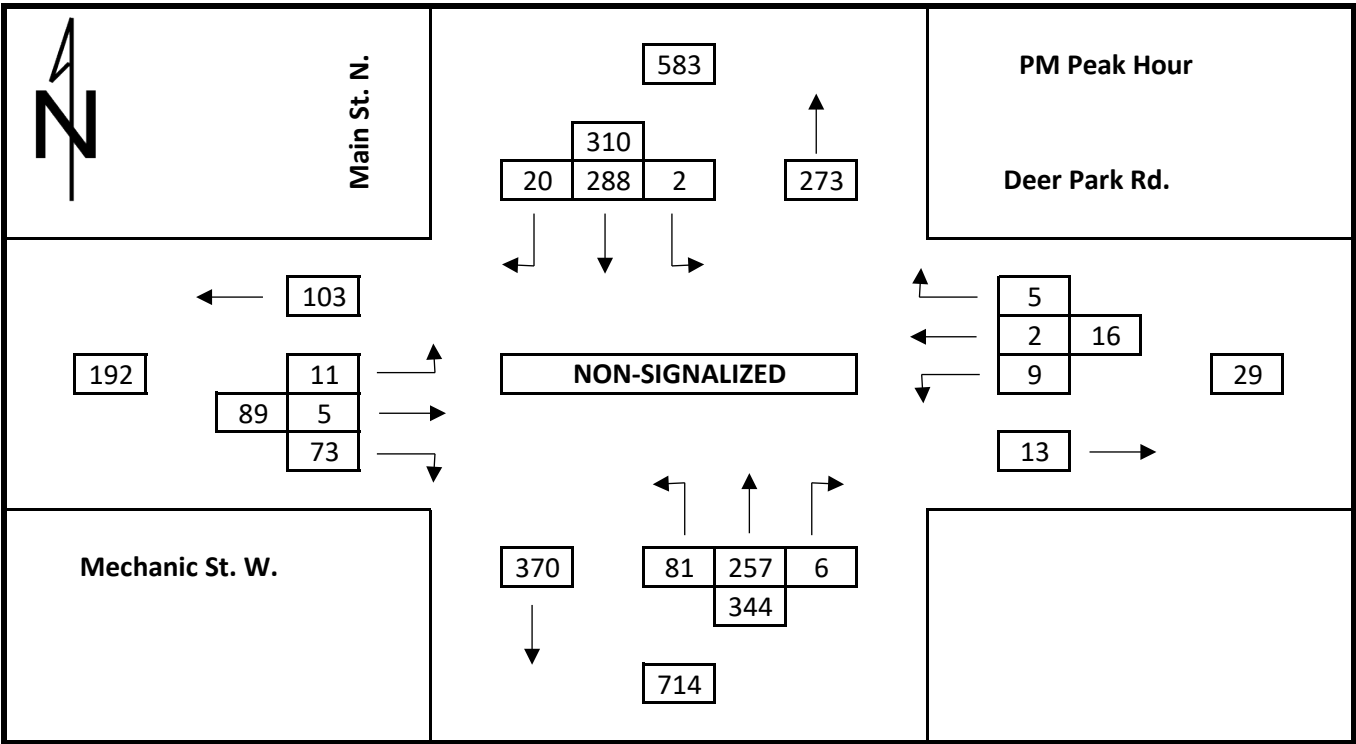
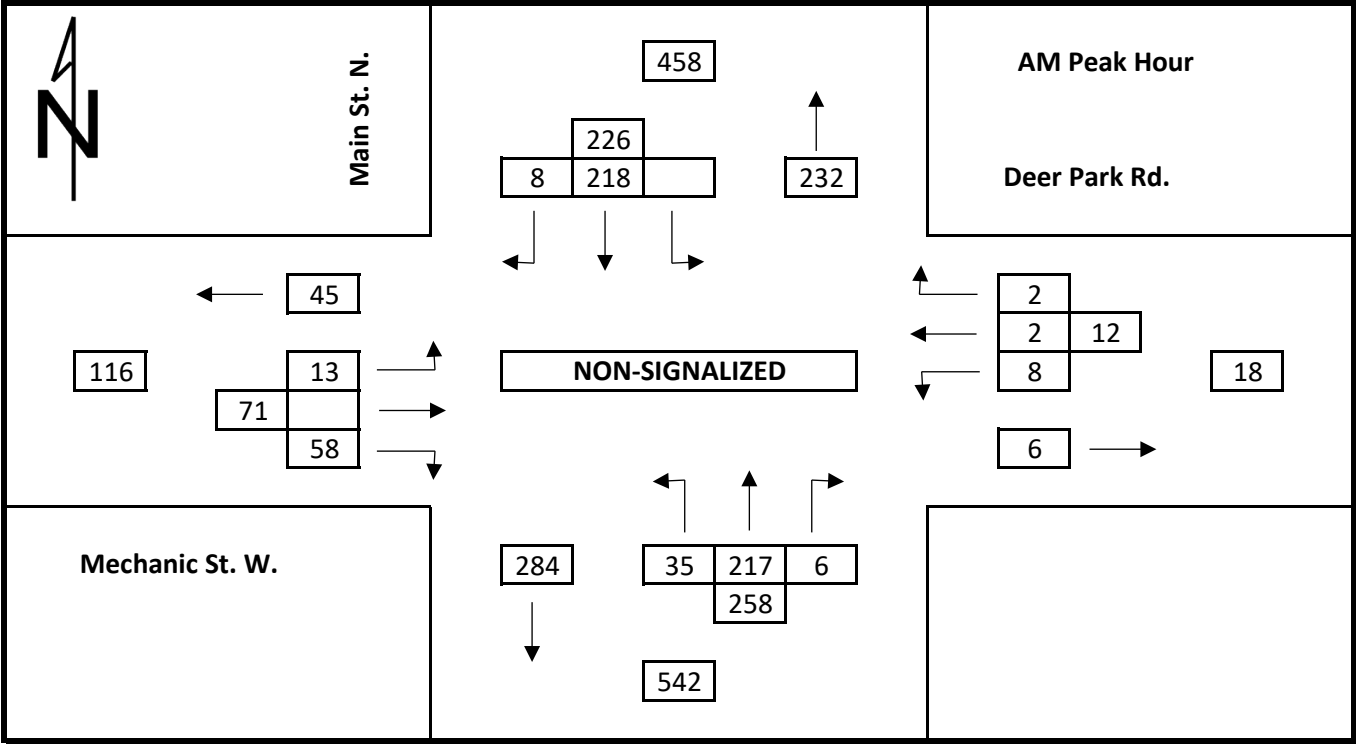
# Existing Traffic Counts

## Mechanic Street West at Main Street North





# Existing + Site Generated Traffic Mechanic Street West at Main Street North






## **Appendix D**

# **DETAILED SYNCHRO RESULTS**

**Norfolk Street at Mechanic Street West  
Westerly Site Access at Mechanic Street West  
Easterly Site Access at Mechanic Street West  
Mechanic Street West at Main Street North (Old  
Highway 24)**

Intersection




Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	43	35	5	3	0
Future Vol, veh/h	0	43	35	5	3	0
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	7	6	25	0	0
Mvmt Flow	0	47	38	5	3	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	47	0	0 92 45
Stage 1	-	-	- 45 -
Stage 2	-	-	- 47 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1573	-	- 913 1031
Stage 1	-	-	- 983 -
Stage 2	-	-	- 981 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1568	-	- 908 1028
Mov Cap-2 Maneuver	-	-	- 908 -
Stage 1	-	-	- 980 -
Stage 2	-	-	- 978 -




Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1568	-	-	-	908
HCM Lane V/C Ratio	-	-	-	-	0.004
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	66	77	3	3	1
Future Vol, veh/h	2	66	77	3	3	1
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	4	8	33	0	0
Mvmt Flow	2	72	84	3	3	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	98	0	-	0	173	97
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	76	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1508	-	-	-	822	965
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	952	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1494	-	-	-	806	956
Mov Cap-2 Maneuver	-	-	-	-	806	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	943	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		9.3		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1494	-	-	-	839	
HCM Lane V/C Ratio	0.001	-	-	-	0.005	
HCM Control Delay (s)	7.4	0	-	-	9.3	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Intersection




Int Delay, s/veh 0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	45	39	6	5	1
Future Vol, veh/h	0	45	39	6	5	1
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	7	6	25	0	0
Mvmt Flow	0	49	42	7	5	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	53	0	0 99 50
Stage 1	-	-	- 50 -
Stage 2	-	-	- 49 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1566	-	- 905 1024
Stage 1	-	-	- 978 -
Stage 2	-	-	- 979 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1561	-	- 900 1021
Mov Cap-2 Maneuver	-	-	- 900 -
Stage 1	-	-	- 975 -
Stage 2	-	-	- 976 -




Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1561	-	-	-	918
HCM Lane V/C Ratio	-	-	-	-	0.007
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	70	80	5	4	2
Future Vol, veh/h	4	70	80	5	4	2
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	4	8	33	0	0
Mvmt Flow	4	76	87	5	4	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	103	0	-	0	185	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	84	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1502	-	-	-	809	960
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	792	951
Mov Cap-2 Maneuver	-	-	-	-	792	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	936	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		9.3		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1488	-	-	-	839	
HCM Lane V/C Ratio	0.003	-	-	-	0.008	
HCM Control Delay (s)	7.4	0	-	-	9.3	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Intersection




Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	49	43	0	2	2
Future Vol, veh/h	1	49	43	0	2	2
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	6	8	0	0	0
Mvmt Flow	1	53	47	0	2	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	51	0	106
Stage 1	-	-	51
Stage 2	-	-	55
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1568	-	897
Stage 1	-	-	977
Stage 2	-	-	973
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1563	-	891
Mov Cap-2 Maneuver	-	-	891
Stage 1	-	-	973
Stage 2	-	-	970

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	8.8
HCM LOS			A




Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1563	-	-	-	951
HCM Lane V/C Ratio	0.001	-	-	-	0.005
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	72	83	3	1	2
Future Vol, veh/h	2	72	83	3	1	2
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	4	8	0	0	0
Mvmt Flow	2	78	90	3	1	2
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	104	0	-	0	185	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	82	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1500	-	-	-	809	957
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	946	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1486	-	-	-	794	948
Mov Cap-2 Maneuver	-	-	-	-	794	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	937	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		9.1		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1486	-	-	-	890	
HCM Lane V/C Ratio	0.001	-	-	-	0.004	
HCM Control Delay (s)	7.4	0	-	-	9.1	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	



Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	50	41	1	3	2
Future Vol, veh/h	1	50	41	1	3	2
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	6	8	0	0	0
Mvmt Flow	1	54	45	1	3	2




Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	50	0	0 106 50
Stage 1	-	-	- 50 -
Stage 2	-	-	- 56 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1570	-	- 897 1024
Stage 1	-	-	- 978 -
Stage 2	-	-	- 972 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1565	-	- 891 1021
Mov Cap-2 Maneuver	-	-	- 891 -
Stage 1	-	-	- 974 -
Stage 2	-	-	- 969 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1565	-	-	-	939
HCM Lane V/C Ratio	0.001	-	-	-	0.006
HCM Control Delay (s)	7.3	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	71	85	3	2	1
Future Vol, veh/h	2	71	85	3	2	1
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	4	8	0	0	0
Mvmt Flow	2	77	92	3	2	1





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	106	0	0 186 105
Stage 1	-	-	- 105 -
Stage 2	-	-	- 81 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1498	-	- 808 955
Stage 1	-	-	- 924 -
Stage 2	-	-	- 947 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1484	-	- 793 946
Mov Cap-2 Maneuver	-	-	- 793 -
Stage 1	-	-	- 915 -
Stage 2	-	-	- 938 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1484	-	-	-	838
HCM Lane V/C Ratio	0.001	-	-	-	0.004
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Mechanic St. W. / Deer Park Rd. at Main St. N.  
Waterford, Ontario

Existing Traffic AM Peak  
Existing Geometric Configuration





Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	52	8	2	2	33	217	6	0	218	8
Future Vol, veh/h	12	0	52	8	2	2	33	217	6	0	218	8
Conflicting Peds, #/hr	0	0	0	0	0	0	3	0	6	6	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	9	0	4	0	0	0	6	5	0	0	8	25
Mvmt Flow	13	0	57	9	2	2	36	236	7	0	237	9
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	559	566	245	588	567	246	249	0	0	249	0	0
Stage 1	245	245	-	318	318	-	-	-	-	-	-	-
Stage 2	314	321	-	270	249	-	-	-	-	-	-	-
Critical Hdwy	7.19	6.5	6.24	7.1	6.5	6.2	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.19	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.19	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4	3.336	3.5	4	3.3	2.254	-	-	2.2	-	-
Pot Cap-1 Maneuver	429	436	789	423	436	798	1294	-	-	1328	-	-
Stage 1	743	707	-	698	657	-	-	-	-	-	-	-
Stage 2	682	655	-	740	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	415	419	787	381	419	794	1291	-	-	1321	-	-
Mov Cap-2 Maneuver	415	419	-	381	419	-	-	-	-	-	-	-
Stage 1	718	705	-	672	633	-	-	-	-	-	-	-
Stage 2	656	631	-	687	702	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	11		13.8			1			0			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1291	-	-	674	424	1321	-	-				
HCM Lane V/C Ratio	0.028	-	-	0.103	0.031	-	-	-				
HCM Control Delay (s)	7.9	0	-	11	13.8	0	-	-				
HCM Lane LOS	A	A	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0	-	-				

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	70	9	2	5	75	257	6	2	288	18
Future Vol, veh/h	10	5	70	9	2	5	75	257	6	2	288	18
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	10	20	4	0	0	60	3	4	15	0	3	5
Mvmt Flow	11	5	76	10	2	5	82	279	7	2	313	20

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	778	780	324	817	787	285	334	0	0	288	0	0
Stage 1	328	328	-	449	449	-	-	-	-	-	-	-
Stage 2	450	452	-	368	338	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.7	6.24	7.1	6.5	6.8	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.2	5.7	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.7	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.18	3.336	3.5	4	3.84	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	304	307	712	298	326	635	1220	-	-	1286	-	-
Stage 1	668	616	-	593	576	-	-	-	-	-	-	-
Stage 2	573	541	-	656	644	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	281	281	711	245	298	634	1219	-	-	1284	-	-
Mov Cap-2 Maneuver	281	281	-	245	298	-	-	-	-	-	-	-
Stage 1	614	614	-	544	529	-	-	-	-	-	-	-
Stage 2	520	497	-	579	642	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.7		17.2		1.8		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1219	-	-	560	312	1284	-
HCM Lane V/C Ratio	0.067	-	-	0.165	0.056	0.002	-
HCM Control Delay (s)	8.2	0	-	12.7	17.2	7.8	0
HCM Lane LOS	A	A	-	B	C	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.6	0.2	0	-

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	58	8	2	2	35	217	6	0	218	8
Future Vol, veh/h	13	0	58	8	2	2	35	217	6	0	218	8
Conflicting Peds, #/hr	0	0	0	0	0	0	3	0	6	6	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	9	0	4	0	0	0	6	5	0	0	8	25
Mvmt Flow	14	0	63	9	2	2	38	236	7	0	237	9
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	563	570	245	595	571	246	249	0	0	249	0	0
Stage 1	245	245	-	322	322	-	-	-	-	-	-	-
Stage 2	318	325	-	273	249	-	-	-	-	-	-	-
Critical Hdwy	7.19	6.5	6.24	7.1	6.5	6.2	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.19	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.19	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4	3.336	3.5	4	3.3	2.254	-	-	2.2	-	-
Pot Cap-1 Maneuver	426	434	789	419	434	798	1294	-	-	1328	-	-
Stage 1	743	707	-	694	655	-	-	-	-	-	-	-
Stage 2	679	653	-	737	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	411	416	787	373	416	794	1291	-	-	1321	-	-
Mov Cap-2 Maneuver	411	416	-	373	416	-	-	-	-	-	-	-
Stage 1	716	705	-	667	629	-	-	-	-	-	-	-
Stage 2	652	628	-	678	702	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	11		13.9			1.1			0			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1291	-	-	674	417	1321	-	-				
HCM Lane V/C Ratio	0.029	-	-	0.115	0.031	-	-	-				
HCM Control Delay (s)	7.9	0	-	11	13.9	0	-	-				
HCM Lane LOS	A	A	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0	-	-				

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	5	73	9	2	5	81	257	6	2	288	20
Future Vol, veh/h	11	5	73	9	2	5	81	257	6	2	288	20
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	10	20	4	0	0	60	3	4	15	0	3	5
Mvmt Flow	12	5	79	10	2	5	88	279	7	2	313	22
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	791	793	325	831	801	285	336	0	0	288	0	0
Stage 1	329	329	-	461	461	-	-	-	-	-	-	-
Stage 2	462	464	-	370	340	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.7	6.24	7.1	6.5	6.8	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.2	5.7	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.7	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.18	3.336	3.5	4	3.84	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	298	301	712	291	320	635	1218	-	-	1286	-	-
Stage 1	667	615	-	584	569	-	-	-	-	-	-	-
Stage 2	565	534	-	654	643	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	274	274	711	237	291	634	1217	-	-	1284	-	-
Mov Cap-2 Maneuver	274	274	-	237	291	-	-	-	-	-	-	-
Stage 1	609	613	-	533	519	-	-	-	-	-	-	-
Stage 2	510	487	-	575	641	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	12.9		17.6			1.9			0.1			
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1217	-	-	553	303	1284	-	-				
HCM Lane V/C Ratio	0.072	-	-	0.175	0.057	0.002	-	-				
HCM Control Delay (s)	8.2	0	-	12.9	17.6	7.8	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.6	0.2	0	-	-				

## **Appendix E**

# **SIGHT LINE CALCULATIONS**

**Westerly Site Access at Mechanic Street West  
Easterly Site Access at Mechanic Street West**

## 21-1184: Norfolk Street Development, Waterford TIS - Sight Line Analysis

### Design Intersection Sight Distance (TAC Geometric Design Guide for Canadian Roads)

Design Speed: 60km/h (Posted Speed Limit = 50 km/h)

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap ( $t_g$ )(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20 )	11.5
Longer truck	To be established by road authority

Intersection Stopping Distance (**ISD**) =  $0.278 V_{\text{major}} t_g$

Where:

ISD = intersection sight distance (m)  
(length of the leg of sight triangle along the major road)  
 $V_{\text{major}}$  = design speed of the major road (km/h)  
 $t_g$  = time gap for minor road vehicle to enter the major road (s)

ISD<sub>passenger car</sub> (left turn from stop) =  $0.278 \times 60 \times 7.5 = \mathbf{125 \text{ m}}$

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap ( $t_g$ )(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20 )	10.5

ISD<sub>passenger car</sub> (right turn from stop) =  $0.278 \times 60 \times 6.5 = \mathbf{108 \text{ m}}$





# vallee

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M5E 1P8

**Attention:** Mr. Paul VanBentham

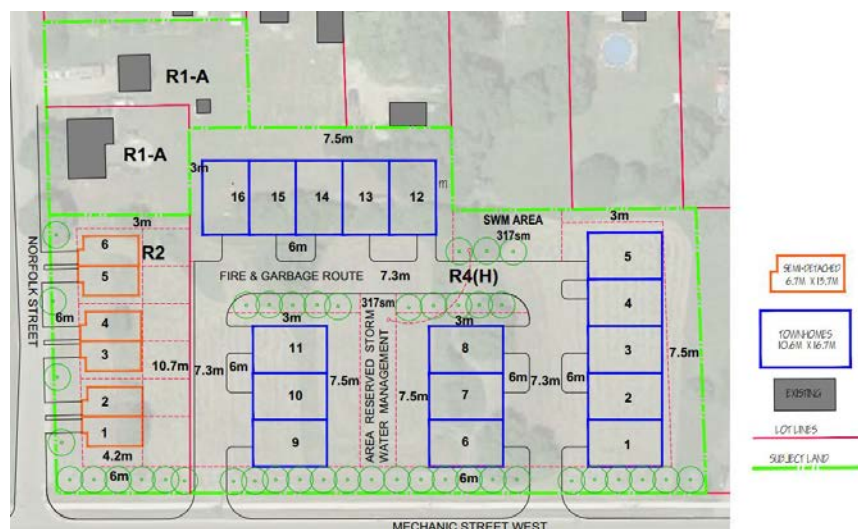
**Reference:** Conceptual Functional Servicing Report  
SFO Townhouses  
Waterford – Norfolk County  
Project No. 21-012

## Introduction

This Conceptual Functional Servicing Report has been prepared in support of the planning applications required for the construction of 6 two-story semi-detached dwelling units along Norfolk Street and a 16 single story group townhouse unit condominium along Mechanic Street West in Waterford – Norfolk County. This report has been prepared to support the phased construction of this development, recognizing the semi-detached units are independent of the proposed condominium corporation. This report presents the conceptual functional servicing for the proposed development, including sanitary servicing, storm servicing and domestic and fire water servicing.

## Background

The proposed 1.04 ha development site is situated on the north side of Mechanic Street West and east of Norfolk Street in Waterford – Norfolk County. The subject lands are bound by Mechanic Street West, Norfolk Street, existing residential houses to the north, and car dealership to the east. Refer to Figure 1.



**Figure 1 - Site Location**

2 Talbot Street North, Simcoe, ON N3Y 3W4 ■ Phone: 519 426-6270 ■ Fax: 519 426-6277 ■ [www.gdvallee.ca](http://www.gdvallee.ca)

The development site is currently vacant land, primarily comprised of grassed meadow. The parcel is zoned as “Urban Residential Type 2 - R2” and “Hamlet Residential Type 4 - R4(H)”. The proposed residential development shall consist of the following construction:

- 6 semi-detached units (0.19ha);
  - Supporting water and sanitary servicing connections to Norfolk Street.
- 16 townhouse units (0.85 ha);
  - Storm, sanitary and water infrastructure to support proposed construction;
  - Stormwater management facility;
- Curbs, sidewalks, swales and other miscellaneous items to support proposed construction.

## Sanitary Servicing

As-constructed drawings from Norfolk County indicate existing 200mm diameter asbestos cement sanitary gravity sewers along Norfolk Street and Mechanic Street West. Sanitary flows from the 6 semi-detached units are proposed to discharge to the existing 200mm sanitary sewer along Norfolk Street via individual sanitary services. Sanitary flows from the 16 townhouse units are proposed to discharge to the existing 200mm sanitary sewer along Mechanic Street West.

Sanitary design flows for the proposed development were calculated using the Norfolk County Design Criteria, as presented in Table 1. In summary, the proposed development is anticipated to generate an additional sanitary flow of approximately 1.65 L/s to the existing sanitary sewer along Mechanic Street West.

<b>Table 1 Sanitary Design Flow Information</b>	
Total Number of Units	Total: 22 units Proposed: 6 semi-detached and 16 townhouse units
Population Density (persons/units)	2.75
Per Capita Flow (L/person/day)	450
Peak Extraneous Flow (L/sec/hectare)	0.28
Development Area (ha)	1.05
Infiltration Flow (L/s)	0.29
Sewage Flow (L/s)	1.35
Peak Design Flow (L/s)	1.65

In 2012, G. Douglas Vallee Ltd. completed the design for the reconstruction of Mechanic Street West (Vallee Project No. 12-128/ Norfolk County Project No. PW-E-13-060). The corresponding sanitary drainage area drawing and design sheet for the existing sanitary sewer on Mechanic Street West from Robinson Road to Main Street North is provided in Appendix A. These have been updated to include the proposed development, as presented on drawing SAN-Mechanic Street Sanitary Drainage Areas, attached in Appendix A. Based on these calculations it can be concluded that the existing sanitary sewer along Mechanic Street West has adequate capacity to support the proposed development.

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**Consulting Engineers, Architects & Planners**

To confirm the calculations presented, it is recommended that sanitary hydraulic modelling be completed by the Norfolk County consultant to determine if the existing County infrastructure provides adequate capacity to accommodate the estimated sanitary design flow from the proposed development further downstream.

## Stormwater Management

Under existing conditions, runoff from the site drains overland in a southerly direction towards Mechanic Street West. As part of the Mechanic Street West reconstruction project (Vallee Project No. 12-128/Norfolk County Project No. PW-E-13-060), a storm sewer drainage area plan and design sheet were completed for storm sewer network along Mechanic Street West, as presented in Appendix B. The subject development site was included within the drainage areas from the original design and was given a runoff coefficient of 0.45, which corresponds to single-detached residential land use. Consequently, this condition has been utilized as the design target for the stormwater management design for the proposed development. This objective includes reducing the post development peak flow rates from the site to levels that do not exceed the original design condition flow rates, for all storm events up to and including the 100-year storm event.

In the post development condition, runoff from proposed semi-detached lots will flow uncontrolled to the existing Norfolk Street storm sewer, ultimately releasing to existing storm sewer along Mechanic Street West. These are to be considered infill lots which do not typically require stormwater management. Runoff from the external drainage area to the north of the subject property will remain uncontrolled, and drain overland towards Mechanic Street West as it does under pre-development conditions. Runoff from the proposed townhouse condominium development will be detained and released at a rate such that the total initial design peak flow rates from the subject site are not exceeded. Minor storm events (2-year and 5-year) will be conveyed to the proposed SWM storage facility through a storm sewer network and major storm events will flow overland. Runoff released from the storage facility will be directed to the existing municipal 675mm diameter storm sewer along Mechanic Street West. Refer to drawing SWM – Stormwater Management Drainage Areas in Appendix B.

The original storm drainage areas drawing and design sheet from Vallee Project No. 12-128/Norfolk County Project No. PW-E-13-060 have been updated to reflect the proposed development condition, and are located in Appendix B. Based on these calculations, it can be concluded that by controlling the townhouse condominium development area to the original design condition, the existing storm sewer has adequate capacity to support the flows from the proposed development.

Visual OTTHYMO was utilized to create a preliminary SWM model and determine the storage volume required to meet the stormwater quantity design target. Using a storage volume of 120 m<sup>3</sup> and two control orifices, the total post-development design flows from the subject site and external drainage area can be reduced to less than the total initial design flow rates, as displayed in Table 2. Supporting calculations can be found in Appendix B.

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Table 2 Initial Design to Post-Development Flow Rates			
Event	Pre (cms)	Post (cms)	Net Change (cms)
2-year	0.013	0.011	-0.002
5-year	0.033	0.032	-0.001
10-year	0.054	0.053	-0.001
25-year	0.089	0.075	-0.014
50-year	0.118	0.100	-0.018
100-year	0.156	0.121	-0.035

Stormwater quality control for the site will be analyzed during the detailed design stage. At that time, multiple quality control solutions will be investigated, such as low-impact development (LID) treatment and oil grit separators (OGS), and the most practical solution that meets the municipal design criteria will be proposed.

## Water Servicing

As-constructed drawings indicate an existing 150mm diameter watermain along the east side of Norfolk Street and a 200mm diameter watermain along the north side of Mechanic Street West. The 6 proposed semi-detached units that front on Norfolk Street will each have their own water service off Norfolk Street. The remaining 16 townhouse units will utilize the existing 200mm watermain on Mechanic Street West as the water supply.

An analysis of the hydraulic modelling will be conducted by the County consultants to determine the water servicing capacity and constraints on the existing water system to ensure adequate system flows and pressure for the aforementioned domestic and fire demands. Norfolk County's design criteria stipulates the following requirements for system pressures, and the system shall be designed to meet the greater of either of the following requirements;

- Fire flow conditions– not less than 140 kPa
- Normal operating conditions – not less than 280 kPa

## Domestic Water Demand

The following summarizes the domestic water flow information for the proposed development:

- Total Number of Units: 22
- Population Density: 2.75 persons per unit
- Population: 61 people
- Average Daily Water Demand (per person) 0.450 m<sup>3</sup>/person/day
- Average Daily Water Demand: 27.45 m<sup>3</sup>/day (0.32 L/s)
- Maximum Day Demand Factor: 2.25

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- Maximum Day Demand: 61.76 m<sup>3</sup>/day (0.71 L/s)
- Peak Hourly Demand Factor (Residential) 4.00
- Peak Hourly Demand 109.80 m<sup>3</sup>/day (1.27 L/s)

### **Fire Water Service**

According to the County GIS online mapping and County record drawings, there are two existing fire hydrants located in close proximity to the development site. Both hydrants are located on the north side of Mechanic Street West; one just east of Norfolk Street, and the second in front of #151 Mechanic Street West.

Typically, available fire flow during the maximum day demand is the critical criteria when evaluating a watermain distribution system's ability to service a residential subdivision. The estimated fire flow requirement for the development has been determined using both the recommendations of the Fire Underwriters Survey – 1999 (FUS) and the Ontario Building Code (OBC) method. Using the FUS recommendations and the OBC fire flow calculation procedure, the minimum required fire flow was determined to be 133 L/s and 45 L/s, respectively. It should be noted that the FUS method is generally conservative. As such, the required flow for proposed development is estimated to be 45 L/s. Supporting calculations for both methods are detailed in Appendix C. Firewalls have been utilized to decrease the required fire flow, and will be refined further in the detailed design process.

The Norfolk County ISMP estimates that the available fire flow in the existing watermain on Mechanic Street West ranges from 83 L/s to 159 L/s, as displayed in Appendix C. Therefore, the available municipal watermain is anticipated to provide sufficient flow to service the development. It should be noted that the ISMP modeling was from 2015, consequently, it is recommended that Norfolk County review against their current model and provide more current available demands to confirm that the supply is adequate.

## **Conclusions and Recommendations**

The functional servicing design for the proposed development can be summarized as follows:

- The proposed semi-detached units will be serviced by individual sanitary services that connect to the existing 200mm sanitary sewer along Norfolk Street.
- The proposed townhouse units will be service by a new sanitary sewer network that connects to the existing 200mm sanitary sewer along Mechanic Street West.
- A peak sanitary design flow of approximately 1.65 L/s is anticipated from the proposed development.
- An analysis of the existing sanitary sewer network on Mechanic Street West indicates that there is sufficient capacity to support the sanitary flows from the proposed development. However, modelling from the Norfolk County's consultant is recommended to determine the impact of the proposed additional sanitary flows further downstream.
- Overland flow (major storm events) storm sewers (minor storm events) will convey stormwater to the proposed SWM storage facility, ultimately releasing to the existing 675 mm municipal storm sewer along Mechanic Street West via a storm sewer.
- No stormwater controls are proposed for the 6 semi-detached lots fronting onto Norfolk Street.

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**Consulting Engineers, Architects & Planners**

- Peak flows associated with the post-development conditions for the 16 unit townhouse condominium development site can be controlled to less than the initial design flows under all storm events.
- Quality control will be analyzed during the detailed design stage.
- The existing 150mm watermain on Norfolk Street shall serve as the water supply for the proposed semi-detached units.
- The existing 200mm watermain on Mechanic Street West shall serve as the water supply for the proposed townhouse units.
- An analysis of the hydraulic modelling will be conducted by the County consultants to determine the water servicing capacity and constraints on the existing water system to ensure adequate system flows and pressure for the aforementioned domestic and fire demands.
- The domestic maximum day demand and peak hourly demand were found to be 0.71 L/s and 1.21 L/s, respectively.
- The required fire flow demand for the proposed development was determined using both the FUS method and OBC method and was found to be 133 L/s and 45 L/s, respectively, which is within the estimated range of available fire flow.

It is recommended that this report be provided to the Norfolk County and the Long Point Region Conservation Authority in support of the application for site plan approval of the proposed development.

We trust that this information is complete and sufficient for submission. Should you have any questions or require further information please do not hesitate to contact us

**Respectfully submitted,**



Natalie Biesinger, B.A.Sc., EIT  
G. DOUGLAS VALLEE LIMITED  
Consulting Engineers, Architects and Planners



John Iezzi, P. Eng.  
G. DOUGLAS VALLEE LIMITED  
Consulting Engineers, Architects and Planners

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**Consulting Engineers, Architects & Planners**



Appendix A

- 12-128 SAN1 – Sanitary Areas
- 12-128 Sanitary Sewer Design Sheet
- 21-012 SAN – Mechanic Street Sanitary Drainage Areas

Appendix B

- 12-128 STM – Storm Areas
- 12-128 Storm Sewer Design Sheet
- 21-012 STM – Mechanic Street Storm Drainage Areas
- 21-012 SWM – Stormwater Management Drainage Areas
- 21-012 SWM Parameters and Calculations

Appendix C

- Fire Calculation Distances
- FUS Calculations
- OBC Calculations
- Norfolk ISMP Maps

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**Consulting Engineers, Architects & Planners**



Authorized by the Association of Professional Engineers of Ontario  
to offer professional engineering services.



## **APPENDIX A**

**12-128 SAN1 – Sanitary Areas**

**12-128 Sanitary Sewer Design Sheet**

**21-012 SAN – Mechanic Street Sanitary Drainage Areas**





DATE LAST PLOTTED: January 22, 2013



**G. DOUGLAS VALLEE LIMITED**  
2 TALBOT STREET NORTH  
SIMCOE, ONTARIO N3Y 3W4  
(519) 426-6270

Project Title	MECHANIC STREET RECONSTRUCTION
Location	WATERFORD
Drawing Title	SANITARY AREAS

Stamp

REV. No.	DATE	REVISION	REV. No.	DATE	REVISION

Designed by : ---	Drawn By : ---
Checked by : ---	Date Started : January 25, 2013
Drawing Scale : NTS	

Project No.  
**12-128**

Drawing No.  
**SAN1**



# SANITARY SEWER DESIGN SHEET

Pipe Material AC  
N 0.013

Project: Mechanic Street Existing Sanitary

Job No. 12128

Date 28-Jan-13  
Designed by \_\_\_\_\_  
Checked by \_\_\_\_\_  
Sheet of : 1 of 1

Location				Area				Total Pop.	M=Peak Factor	Flow			Sewer Design						
Area	Street	From	To	Section	Cumul.	Section	Cumul			Q(i)	Q(s)	Q(d)	Material	Size	Length	N	Slope	Cap	Full V
		MH	MH	Ha	Ha	Units	Units			L/s	L/s	L/s		mm	m		%	L/s	m/s
A2	Mechanic St	114	113	2.7	2.7	7	7	19	4.4	0.8	0.4	1.2	PVC	200		0.013	0.40%	20.7	0.66
A3	Mechanic St	113	112	1.7	4.4	13	20	55	4.3	1.2	1.2	2.5	PVC	200		0.013	2.77%	54.6	1.74
A4	Mechanic St	112	111	3.3	7.7	7	27	74	4.3	2.2	1.7	3.8	PVC	200		0.013	2.49%	51.8	1.65
A5	Mechanic St	111	110	3.4	11.1	6	33	91	4.3	3.1	2.0	5.1	PVC	200		0.013	3.38%	60.3	1.92
A6	Mechanic St	110	109	3.6	14.7	6	39	107	4.2	4.1	2.4	6.5	PVC	200		0.013	1.87%	44.9	1.43
A7	Mechanic St	109	108	1.8	16.5	4	43	118	4.2	4.6	2.6	7.2	PVC	200		0.013	0.51%	23.4	0.75
A8	Mechanic St	108	107	1.4	17.9	6	49	135	4.2	5.0	3.0	8.0	PVC	200		0.013	0.40%	20.7	0.66
A9	Mechanic St	107	106	1.3	19.2	11	60	165	4.2	5.4	3.6	9.0	PVC	300		0.013	0.15%	37.5	0.53
A1	Mechanic St	106	105	27.6	46.8	120	180	495	4.0	13.1	10.3	23.4	PVC	300		0.013	0.26%	49.3	0.70
A10	Mechanic St	105	104	1.1	47.9	8	188	517	4.0	13.4	10.7	24.1	PVC	300		0.013	0.12%	33.5	0.47
A11	Mechanic St	104	103	0.7	48.6	5	193	531	4.0	13.6	10.9	24.6	PVC	300		0.013	0.16%	38.7	0.55
A12	Mechanic St	103	102	3.1	51.7	30	223	613	3.9	14.5	12.5	27.0	PVC	300		0.013	0.03%	16.7	0.24
A13	Mechanic St	118	102	1.1	1.10	10	10	28	4.4	0.3	0.6	0.9	PVC	200		0.013	4.97%	73.1	2.33
	Shadow Lake	102	101	1	52.80	2	235	646	3.9	14.8	13.2	28.0	PVC	300		0.013	0.26%	49.3	0.70

## Design Information:

Q(s) = Sewage Flow =  $P \cdot q \cdot M / 86.4$

Q(i) = Infiltration Flow =  $I \cdot A$

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

55

persons /ha

Population Density

2.75

persons /unit



SANITARY SEWER DESIGN SHEET

Pipe Material AC  
N 0.013

Project: SFO Townhouses  
Job No. 21-012

Date 12-Oct-21  
Designed by NLB  
Checked by JI  
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 %	Cap L/s	Full V m/s
Site	Mechanic St	114	113	1.05	1.05	22	22	61	4.3	0.29	1.35	1.65	AC	200		0.013	0.40%	20.7	0.66
A2	Mechanic St	114	113	2.7	2.7	7	7	19	4.4	0.8	0.4	1.2	AC	200		0.013	0.40%	20.7	0.66
A3	Mechanic St	113	112	1.7	4.4	13	20	55	4.3	1.2	1.2	2.5	AC	200		0.013	2.77%	54.6	1.74
A4	Mechanic St	112	111	3.3	7.7	7	27	74	4.3	2.2	1.7	3.8	AC	200		0.013	2.49%	51.8	1.65
A5	Mechanic St	111	110	3.4	11.1	6	33	91	4.3	3.1	2.0	5.1	AC	200		0.013	3.38%	60.3	1.92
A6	Mechanic St	110	109	3.6	14.7	27	60	165	4.2	4.1	3.6	7.7	AC	200		0.013	1.87%	44.9	1.43
A7	Mechanic St	109	108	1.8	16.5	4	64	176	4.2	4.6	3.8	8.4	AC	200		0.013	0.51%	23.4	0.75
A8	Mechanic St	108	107	1.4	17.9	6	70	193	4.2	5.0	4.2	9.2	AC	200		0.013	0.40%	20.7	0.66
A9	Mechanic St	107	106	1.3	19.2	11	81	223	4.1	5.4	4.8	10.2	AC	300		0.013	0.15%	37.5	0.53
A1	Mechanic St	106	105	27.6	46.8	120	201	553	4.0	13.1	11.4	24.5	AC	300		0.013	0.26%	49.3	0.70
A10	Mechanic St	105	104	1.1	47.9	8	209	575	3.9	13.4	11.8	25.2	AC	300		0.013	0.12%	33.5	0.47
A11	Mechanic St	104	103	0.7	48.6	5	214	589	3.9	13.6	12.1	25.7	AC	300		0.013	0.16%	38.7	0.55
A12	Mechanic St	103	102	3.1	51.7	30	244	671	3.9	14.5	13.6	28.1	AC	300		0.013	0.21%	44.3	0.63
A13	Mechanic St	118	102	1.1	1.10	10	10	28	4.4	0.3	0.6	0.9	AC	200		0.013	4.97%	73.1	2.33
	Shadow Lake	102	101	1	52.80	2	256	704	3.9	14.8	14.3	29.1	AC	300		0.013	0.26%	49.3	0.70

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 =  $1 + 14 / (4 + P^{0.5})$

A = Tributary Area

q = Per Capita Flow=

I = Peak Extraneous Flow =

Population Density

Population Density

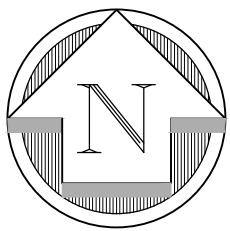
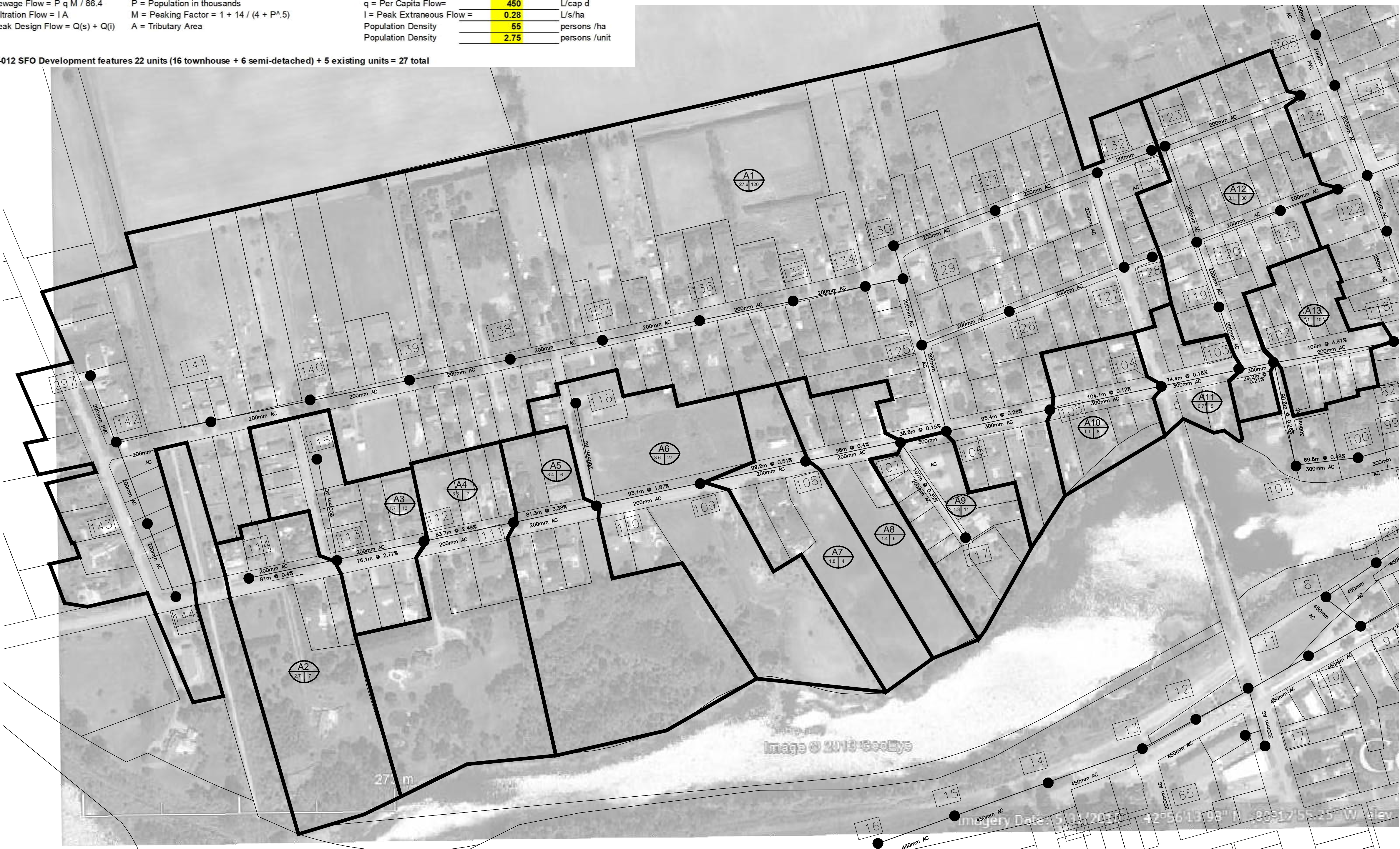
L/cap d

L/s/ha

persons /ha

persons /unit

Note: 21-012 SFO Development features 22 units (16 townhouse + 6 semi-detached) + 5 existing units = 27 total



REV. No.	DATE	REVISION

A1-  
0.99 0.45  
AREA (ha)  
SANITARY AREA NUMBER  
NUMBER OF UNITS



G. DOUGLAS VALLEE LIMITED  
2 TALBOT STREET NORTH  
SIMCOE, ONTARIO N3Y 3W4  
(519) 426-6270

Stamp

**PRELIMINARY**  
NOT TO BE USED  
FOR CONSTRUCTION

Project Title  
SFO TOWNHOUSES  
WATERFORD, NORFOLK COUNTY

Drawing Title  
MECHANIC STREET SANITARY  
DRAINAGE AREAS

Designed by : NLB	Drawn By : NLB
Checked by : JI	Date Started : OCT 12, 2021
Drawing Scale : NTS	Drawing No. SAN
Project No. 21-012	



## **APPENDIX B**

**12-128 STM – Storm Areas**

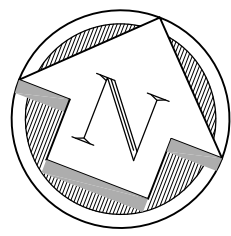
**12-128 Storm Sewer Design Sheet**

**21-012 STM – Mechanic Street Storm Drainage Areas**

**21-012 SWM – Stormwater Management Drainage Areas**

**21-012 SWM Parameters and Calculations**

DATE LAST PLOTTED :



REV. No.	DATE	REVISION
0	FEB 2013	SUBMIT TO COUNTY

NOTE:

CONTOUR DATA TAKEN FROM ONTARIO  
BASE MAP 10 17 5550 47500  
(MNR 1986)



G. DOUGLAS VALLEE LIMITED  
2 TALBOT STREET NORTH  
SIMCOE, ONTARIO N3Y 3W4  
(519) 426-6270



Project Title  
**MECHANIC STREET  
RECONSTRUCTION**  
NORFOLK COUNTY PROJECT #  
PW-E-13-60

Drawing Title  
**STORM AREAS**

Designed by :	RCS	Drawn By :	RCS
Checked by :	TGS	Date Started :	FEB 2013
Drawing Scale :	1:2000	Drawing No.	<b>STM</b>
Project No.	12-128		

# STORM SEWER DESIGN SHEET

Storm 5-year Simcoe		
A= 583.017	B= 3.007	C=
Pipe Material PVC<=450, Concrete >450		
n 0.013		

0.703

Project	<u>Mechanic Street to Mechanic St Drain</u>
---------	---

Town/County Waterford - Norfolk County

Date Feb 19/13

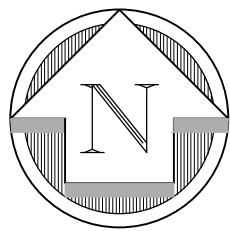
Designed by TGS

Checked by JDV

Sheet of : 1 of           

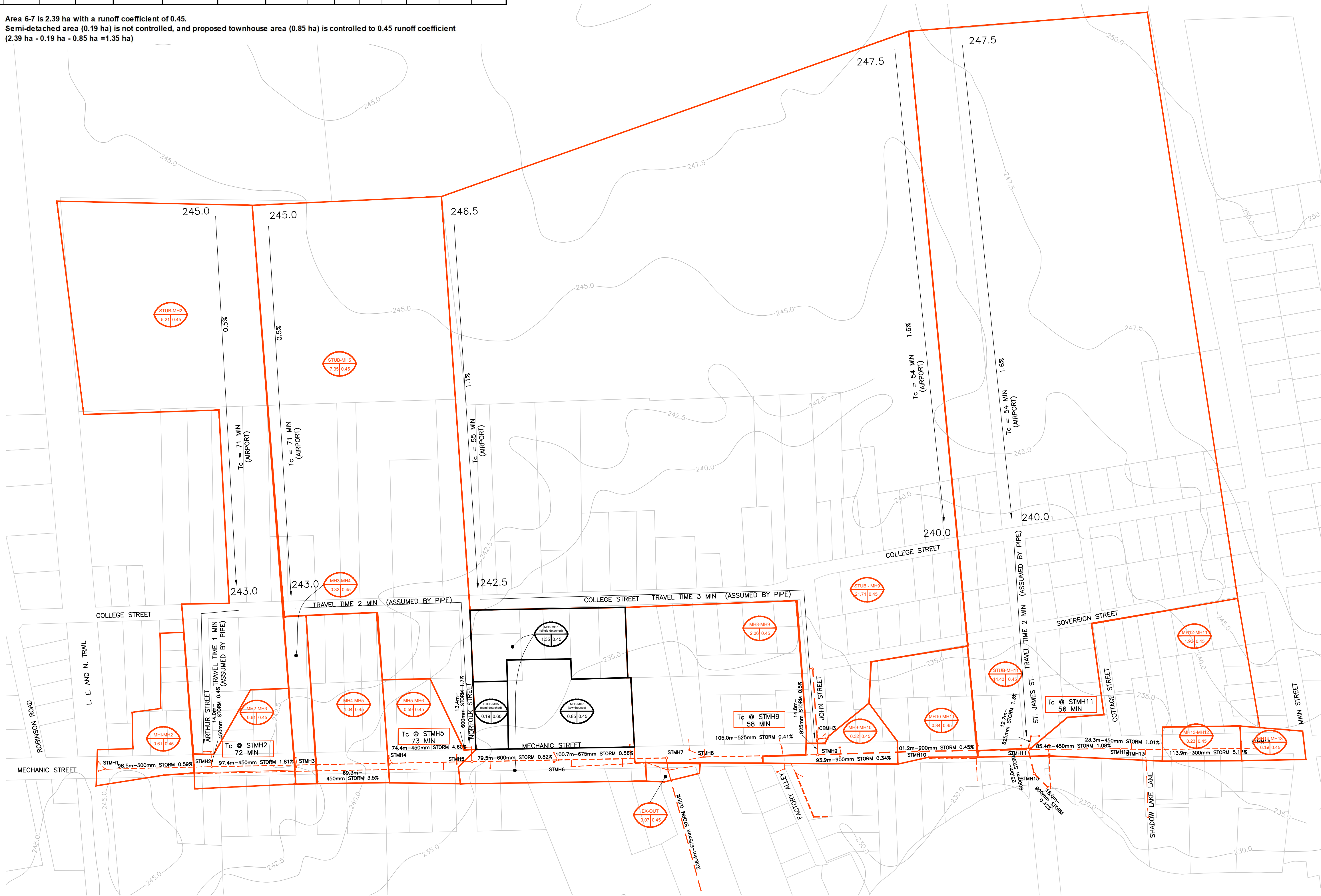
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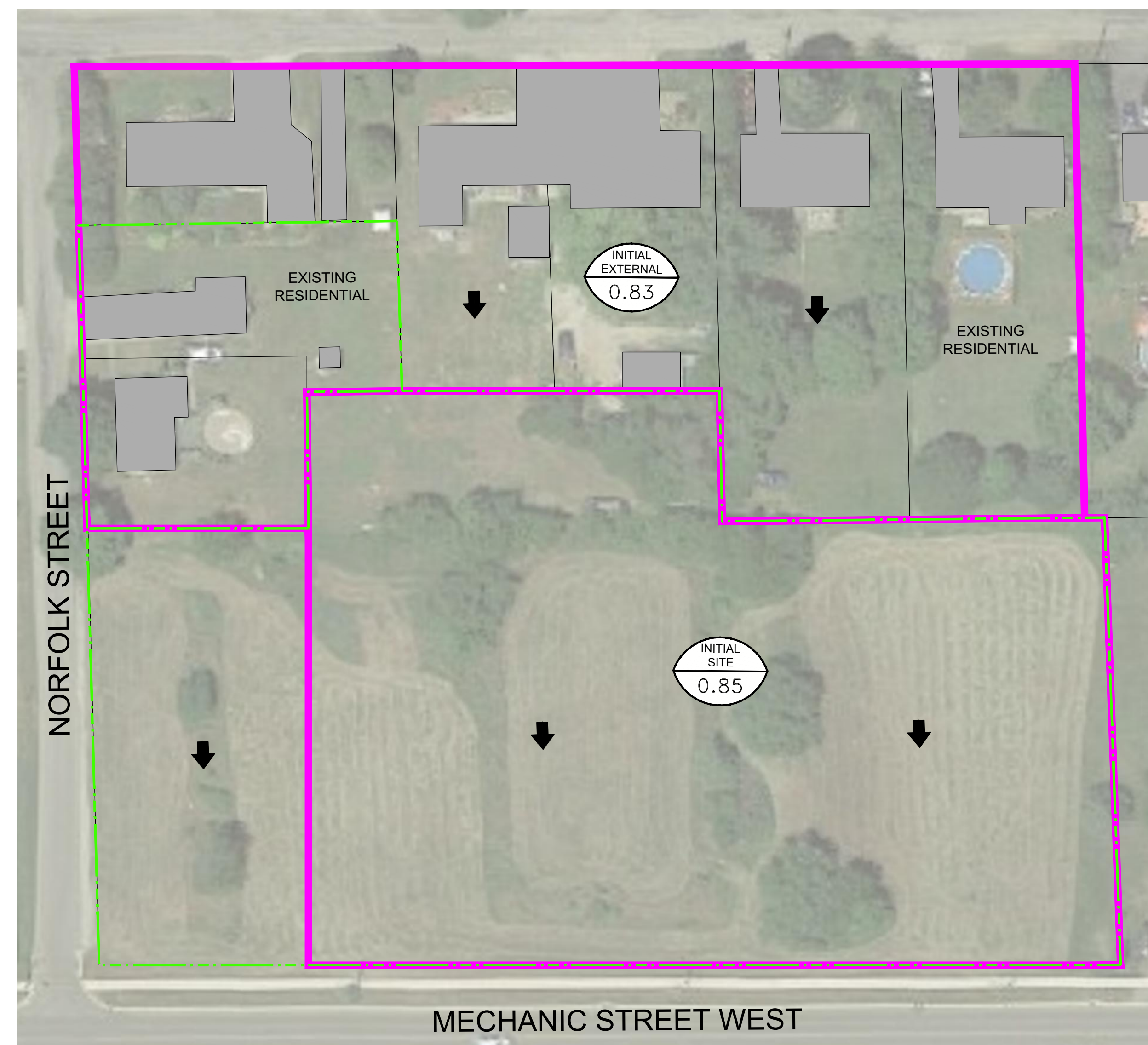


STORM SEWER DESIGN SHEET																	
Storm 5-year Simcoe										Date Oct 12/21							
A= 583.017		B= 3.007		C= 0.703		Project SFO Townhouses											
Pipe Material PVC<=450, Concrete >450				n 0.013		Town/County Waterford - Norfolk County											
										Designed by NLB							
										Checked by JI							
										Sheet 1 of 1							
Location			Area			Individual R'A	Cumulative R'A	Time of	Rainfall	Flow 2.78*I*A*R	Size	Slope	Cap	Vel	Length	Time	Flow/Cap
Area	From	To	Ha	Ha	Ha			Concentration min	mm/hr	U/s	mm	%	U/s	m/s	m	min	%
			0.45	0.6	0.75												
1-2	1	2	0.61			0.27	0.27	15.00	76.40	58.3	300	0.59%	74.28	1.051	98.5	1.56229	78.5%
Stub-2	Stub (CBMH1)	2	5.21			2.34	2.62	72.00	28.02	204.0	450	0.40%	180.3	1.134	14	0.2058	113.1%
2-3	2	3	0.61			0.27	2.89	72.21	27.97	225.0	450	1.18%	309.7	1.947	97.4	0.83363	72.6%
3-4	3	4	0.32			0.14	3.04	73.04	27.75	234.3	450	3.50%	533.4	3.354	69.3	0.34439	43.9%
4-5	4	5	1.04			0.47	3.51	73.38	27.66	269.6	450	4.60%	611.5	3.845	74.4	0.32252	44.1%
Stub-5	Stub (CBMH2)	5	7.35			3.31	6.81	73.71	27.58	522.4	600	1.70%	800.6	2.831	13.4	0.07888	65.3%
Stub-5	Stub (CBMH2)	5		0.19		0.11	6.93	73.71	27.58	531.1	600	1.70%	800.6	2.831	13.4	0.07888	66.3%
5-6	5	6	0.59			0.27	7.19	73.79	27.56	551.1	600	0.82%	556	1.966	79.5	0.67379	99.1%
6-7	6	7	1.35			0.61	7.80	74.46	27.39	594.0	675	0.56%	629	1.758	100.7	0.95477	94.4%
6-7	6	7	0.85			0.38	8.18	74.46	27.39	623.1	675	0.56%	629	1.758	100.7	0.95477	99.1%
7-Out	7	Outlet	0.07			0.03	8.21	75.41	27.16	620.1	675	0.55%	623.4	1.742	206.4	1.97466	99.5%

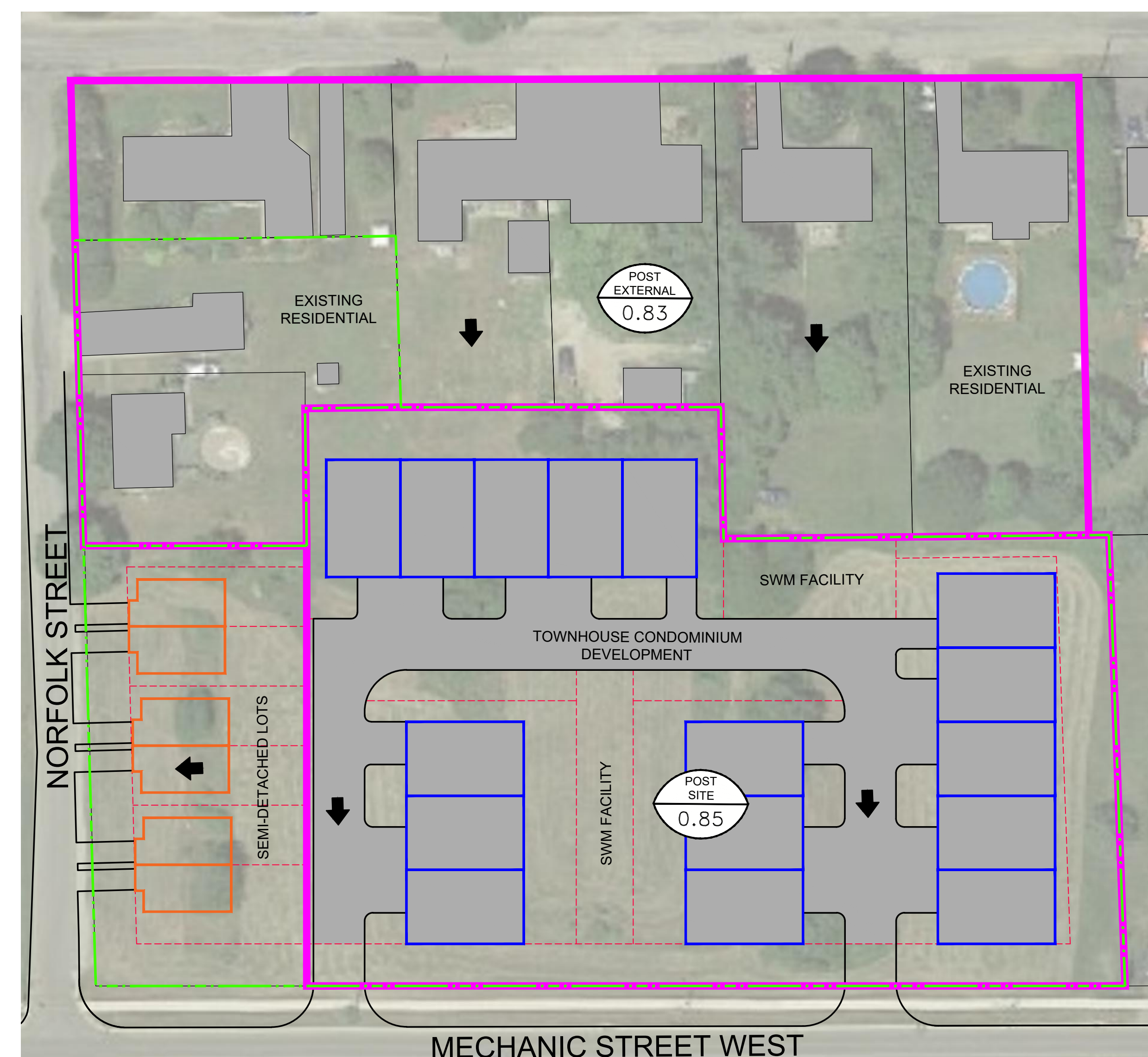
Notes: Original Design: Area 6-7 is 2.39 ha with a runoff coefficient of 0.45.  
Proposed Design: Semi-detached area (0.19 ha) is not controlled, and proposed townhouse area (0.85 ha) is controlled to 0.45 runoff coefficient (2.39 ha - 0.19 ha - 0.85 ha =1.35 ha)



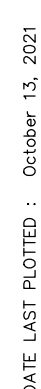
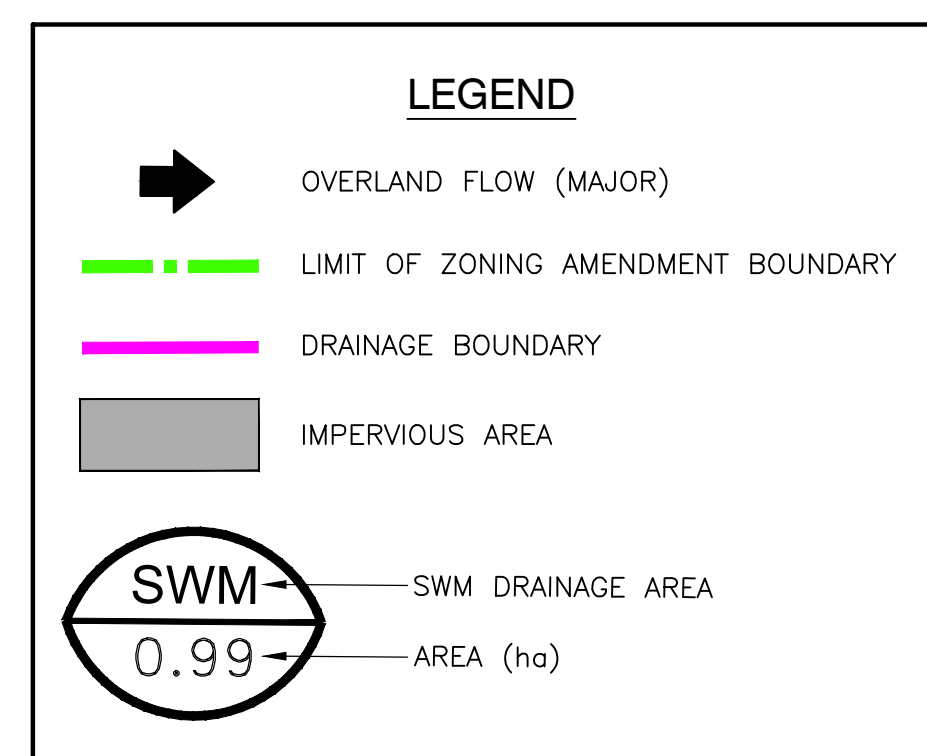




## INITIAL DESIGN CONDITION



## POST DEVELOPMENT CONDITION





### Initial Design Catchment Parameters

Drainage Area (ha)	Area (ha)	Runoff Coeff.	TIMP (%)	XIMP (%)
External	0.833	0.45	30.8%	0%
Site	0.851	0.45	30.8%	0%

$$C = 0.9 (\% \text{ imperv}) + 0.25 (1 - \% \text{ Imperv})$$

$$\% \text{ Imperv} = \frac{C - 0.25}{0.65} \times 100$$

### Post-Development Catchment Parameters

Drainage Area (ha)	Area (ha)	Imperv. Area (ha)	Directly Connected Imperv. (ha)	TIMP (%)	XIMP (%)
		(2)	(3)	(2)/(1)	(3)/(1)
External	0.833	0.188	0.000	22.6%	0.0%
Site	0.851	0.459	0.176	53.9%	20.7%

### Soil Parameters & Infiltration Trench Depth

Soil Type	AB - Mainly gravelly sandy till, sandy textures over gravelly sandy till
CN (-)	62
Ia Undeveloped (mm)	31
Ia Developed (mm)	13.6
Infiltration Rate (i) (m/hr)	0.0114
Void Ratio (Vr)	0.4
Drainage Time (ts) (hr)	48
Max allowable stone depth (drmax) (m)	1.37

### Initial Design Flow Rates

Design Storm	Q (m3/s)
2	0.013
5	0.033
10	0.054
25	0.089
50	0.118
100	0.156

### Initial Design Rainfall Volumes

Return Period	Pre-Development		
	Area (ha.)	Vol. (mm)	Vol. (m3)
2	1.68	4.968	83.7
5		10.644	179.2
10		15.063	253.7
25		21.437	361.0
50		26.875	452.6
100		32.535	547.9

### Post-Development Rainfall Volumes from Remaining Controlled Area

Return Period	Remaining Post Area		
	Area (ha.)	Vol. (mm)	Vol. (m3)
2	1.68	8.175	137.7
5		14.775	248.8
10		19.711	331.9
25		26.661	449.0
50		32.501	547.3
100		38.521	648.7

100 YR Post - 100 YR Initial (m3)	100.8
Overall Target Pond Storage (20% Surplus) (m3)	121.0

### Pond Parameters

Bottom Elev. (m) 233.00  
 Side Slopes (#:1) -  
 Area (m2) 153.00

### Orifice Parameters

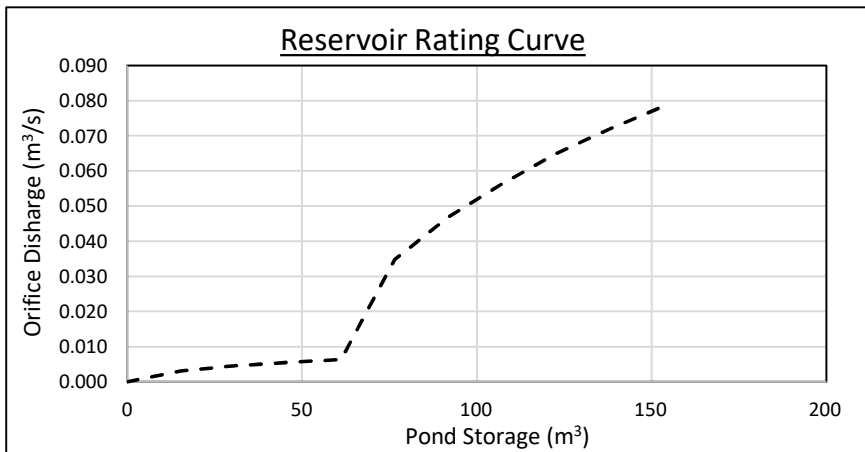
Ipex Inlet Control Device  
**Orifice #1** Tempest Vortex LMF-100  
 Elevation 233.00 m  
 Diameter 0.200 m  
**Orifice #2** Area 0.0314 m2  
 Elevation 233.40 m

### Stage-Storage-Discharge

Description	Elevation (m)	Stage (m)	Pond Volume (m3)	Total Volume (ha.m)	Q (m3/s) Orifice 1	Q (m3/s) Orifice 2	Total Q (m3/s)
Bottom	233.00	0.0	0.0	0.0000	0.000	0.000	0.000
	233.10	0.1	15.3	0.0015	0.003	0.000	0.003
	233.20	0.2	30.6	0.0031	0.005	0.000	0.005
	233.30	0.3	45.9	0.0046	0.006	0.000	0.006
	233.40	0.4	61.2	0.0061	0.006	0.000	0.006
	233.50	0.5	76.5	0.0076	0.007	0.028	0.035
	233.60	0.6	91.8	0.0092	0.008	0.039	0.047
	233.70	0.7	107.1	0.0107	0.008	0.048	0.056
	233.80	0.8	122.4	0.0122	0.009	0.055	0.065
	233.90	0.9	137.7	0.0138	0.010	0.062	0.072
Top of Active Storage	234.00	1.0	153.0	0.0153	0.010	0.068	0.078

LMF-100  
 0  
 3.1  
 4.5  
 5.5  
 6.3  
 7  
 7.6  
 8.2  
 9.3  
 9.8  
 10.3

\*Storage volumes obtained from AutoCAD Civil 3D



### Initial Design to Post-Development Flow Rates

Return Period	Q (m3/s)			Check
	Initial	Post	Net	
2	0.013	0.011	-0.002	✓
5	0.033	0.032	-0.001	✓
10	0.054	0.053	-0.001	✓
25	0.089	0.075	-0.014	✓
50	0.118	0.100	-0.018	✓
100	0.156	0.121	-0.035	✓

### Stage-Storage

Description	Elevation (m)	Ponding Depth (m)	Total Volume (m3)
Bottom	233.00	0.0	0.0
	233.10	0.1	15.3
	233.20	0.2	30.6
	233.30	0.3	45.9
	233.40	0.4	61.2
	233.50	0.5	76.5
	233.60	0.6	91.8
	233.70	0.7	107.1
	233.80	0.8	122.4
	233.90	0.9	137.7
Top of Active Storage	234.00	1.0	153.0

\*Storage volumes obtained from AutoCAD Civil 3D

### Approximate Stages from OTTHYMO Model

Return Period	Utilized Storage (m3)	Ponding Depth (m)	Elev. (m)
2	49	0.32	233.82
5	68	0.44	233.94
10	75	0.49	233.99
25	88	0.58	234.08
50	103	0.67	234.17
100	117	0.76	234.26

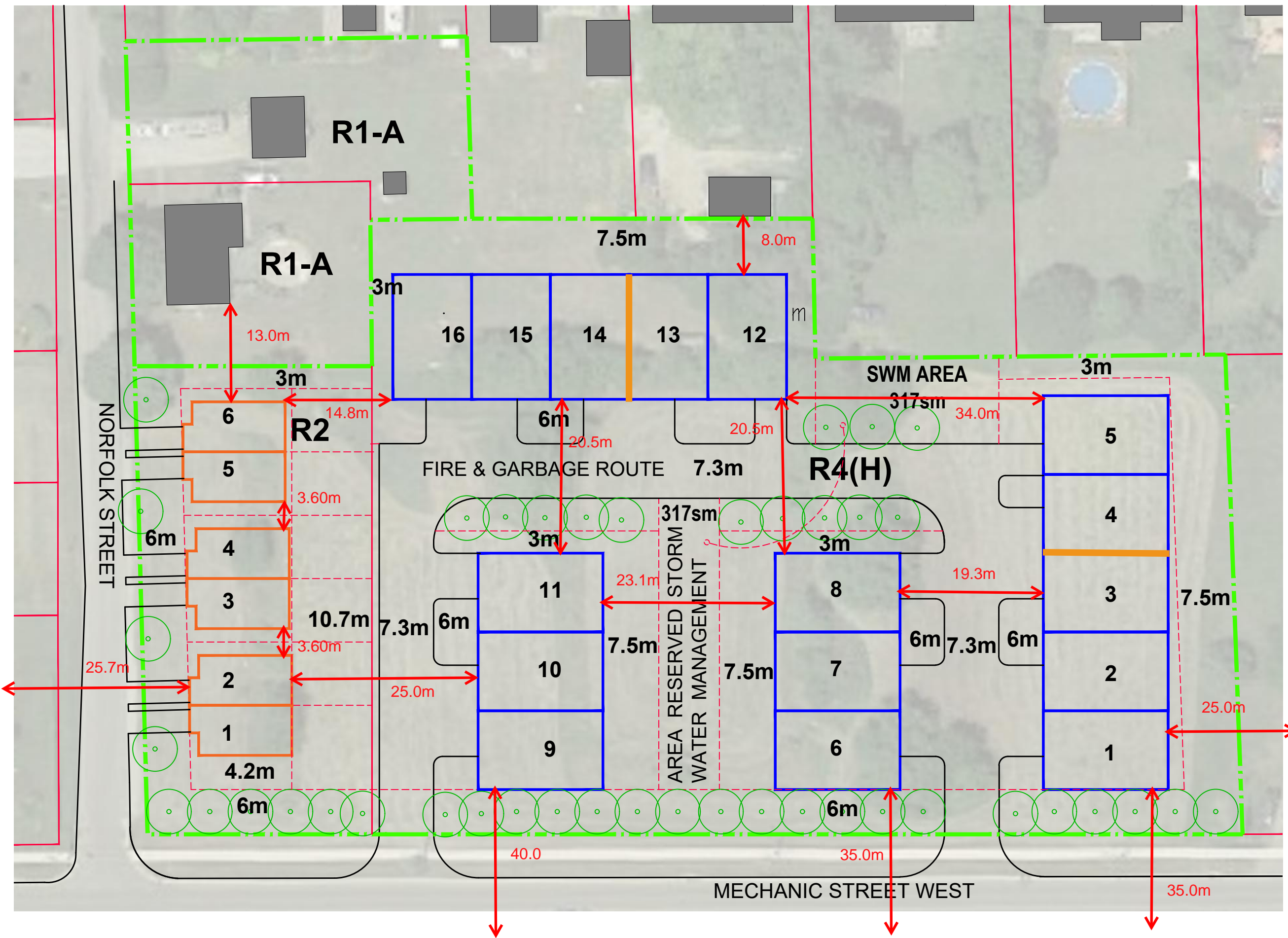
## **APPENDIX C**

**Fire Calculation Distances**

**FUS Calculations**

**OBC Calculations**

**Norfolk ISMP Maps**



- SEMI-DETACHED  
6.7M X 13.7M
- TOWNHOMES  
10.6M X 16.7M
- EXISTING
- LOT LINES
- SUBJECT LAND
- PROPOSED FIREWALL

### Semi-Detached Units 3-4

1) Fire Flow Requirement

$$F_1 = 220C(A^{1/2}) \quad (\text{L/min})$$

C= 1.5 Construction coefficient for wood frame construction

A= 183.6 Floor Area m<sup>2</sup> = main floor area  
 = 367.2 Fire Area m<sup>2</sup> = main floor area + second floor area

$$F_1 = 6323 \text{ L/min}$$

$$F_1 = \mathbf{6000 \text{ L/min}} \quad (\text{Round to the nearest 1,000 l/min})$$

2) Occupancy

Occupancy Type: Residential Non-Combustible

Reduction: 25%

Surcharge: 0%

$$F_2 = F_1 + (F_1 * \text{Reduction/Surcharge}) \quad (\text{L/min})$$

$$F_2 = \mathbf{4500 \text{ L/min}}$$

3) Sprinkler System

Sprinkler System: Not Applicable (assumed no sprinkler system in service)

Reduction: 0%

$$F_3 = F_2 * \text{Reduction} \quad (\text{L/min})$$

$$F_3 = \mathbf{0 \text{ L/min}}$$

4) Seperation

<u>Location</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Surcharge</u>
Front	West	25.7	10%
Side	North	3.6	20%
Side	South	3.6	20%
Rear	East	25.0	10%
		Total:	60%

Separation Surcharges

0 to 3m	25%
3.1m to 10m	20%
10.1m to 20m	15%
20.1 to 30m	10%
30.1 to 45m	5%

$$F_4 = (\text{TOTAL}) * F_2 \quad (\text{L/min})$$

$$F_4 = \mathbf{2700 \text{ L/min}}$$

Total Fire Flow

$$F = F_2 - F_3 + F_4 = 7200 \text{ L/min}$$

$$= \mathbf{7000 \text{ L/min}} \quad (\text{Round to the nearest 1,000 l/min})$$

$$= \mathbf{116.7 \text{ L/s}}$$

Notes: 1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999

2) 9999 denotes either the nearest building > 45m away or a fire wall is provided

### Townhouse Units 1-3

1) Fire Flow Requirement

$$F_1 = 220C(A^{1/2}) \quad (\text{L/min})$$

C= 1.5 Construction coefficient for wood frame construction

A= 531.1 Floor Area m<sup>2</sup> = main floor area  
 = 531.1 Fire Area m<sup>2</sup> = main floor area (no second floor)

F<sub>1</sub>= 7605 L/min

**F<sub>1</sub>= 8000 L/min** (Round to the nearest 1,000 l/min)

2) Occupancy

Occupancy Type: Residential Non-Combustible

Reduction: 25%

Surcharge: 0%

$$F_2 = F_1 + (F_1 * \text{Reduction} / \text{Surcharge}) \quad (\text{L/min})$$

**F<sub>2</sub>= 6000 L/min**

3) Sprinkler System

Sprinkler System: Not Applicable (assumed no sprinkler system in service)

Reduction: 0%

$$F_3 = F_2 * \text{Reduction} \quad (\text{L/min})$$

**F<sub>3</sub>= 0 L/min**

4) Seperation

<u>Location</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Surcharge</u>	<u>Separation Surcharges</u>	
Front	West	19.3	15%	0 to 3m	25%
Side	North	9999.0	0%	3.1m to 10m	20%
Side	South	35.0	5%	10.1m to 20m	15%
Rear	East	25.0	10%	20.1 to 30m	10%
Total:			30%	30.1 to 45m	5%

$$F_4 = (\text{TOTAL}) * F_2 \quad (\text{L/min})$$

**F<sub>4</sub>= 1800 L/min**

Total Fire Flow

$$F = F_2 - F_3 + F_4 = 7800 \text{ L/min}$$

$$= 8000 \text{ L/min} \quad (\text{Round to the nearest 1,000 l/min})$$

$$= 133.3 \text{ L/s}$$

Notes: 1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999  
 2) 9999 denotes either the nearest building > 45m away or a fire wall is provided



### Townhouse Units 4-5

1) Fire Flow Requirement

$$F_1 = 220C(A^{1/2}) \quad (\text{L/min})$$

C= 1.5 Construction coefficient for wood frame construction

A= 354.0 Floor Area m<sup>2</sup> = main floor area  
 = 354.0 Fire Area m<sup>2</sup> = main floor area (no second floor)

$$F_1 = 6209 \text{ L/min}$$

$$F_1 = \mathbf{6000 \text{ L/min}} \quad (\text{Round to the nearest 1,000 l/min})$$

2) Occupancy

Occupancy Type: Residential Non-Combustible

Reduction: 25%

Surcharge: 0%

$$F_2 = F_1 + (F_1 * \text{Reduction/Surcharge}) \quad (\text{L/min})$$

$$F_2 = \mathbf{4500 \text{ L/min}}$$

3) Sprinkler System

Sprinkler System: Not Applicable (assumed no sprinkler system in service)

Reduction: 0%

$$F_3 = F_2 * \text{Reduction} \quad (\text{L/min})$$

$$F_3 = \mathbf{0 \text{ L/min}}$$

4) Seperation

<u>Location</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Surcharge</u>	<u>Separation Surcharges</u>	
Front	West	34.0	5%	0 to 3m	25%
Side	North	9999.0	0%	3.1m to 10m	20%
Side	South	9999.0	0%	10.1m to 20m	15%
Rear	East	9999.0	0%	20.1 to 30m	10%
Total:			5%	30.1 to 45m	5%

$$F_4 = (\text{TOTAL}) * F_2 \quad (\text{L/min})$$

$$F_4 = \mathbf{225 \text{ L/min}}$$

Total Fire Flow

$$F = F_2 - F_3 + F_4 = 4725 \text{ L/min}$$

$$= \mathbf{5000 \text{ L/min}} \quad (\text{Round to the nearest 1,000 l/min})$$

$$= \mathbf{83.3 \text{ L/s}}$$

Notes: 1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999  
 2) 9999 denotes either the nearest building > 45m away or a fire wall is provided

### Townhouse Units 6-8

1) Fire Flow Requirement

$$F_1 = 220C(A^{1/2}) \text{ (L/min)}$$

C= 1.5 Construction coefficient for wood frame construction

A= 531.1 Floor Area m<sup>2</sup> = main floor area  
 = 531.1 Fire Area m<sup>2</sup> = main floor area (no second floor)

F<sub>1</sub>= 7605 L/min

**F<sub>1</sub>= 8000 L/min** (Round to the nearest 1,000 l/min)

2) Occupancy

Occupancy Type: Residential Non-Combustible

Reduction: 25%

Surcharge: 0%

$$F_2 = F_1 + (F_1 * \text{Reduction/Surcharge}) \text{ (L/min)}$$

**F<sub>2</sub>= 6000 L/min**

3) Sprinkler System

Sprinkler System: Not Applicable (assumed no sprinkler system in service)

Reduction: 0%

$$F_3 = F_2 * \text{Reduction} \text{ (L/min)}$$

**F<sub>3</sub>= 0 L/min**

4) Seperation

<u>Location</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Surcharge</u>	<u>Separation Surcharges</u>	
Front	East	19.3	15%	0 to 3m	25%
Side	North	20.5	10%	3.1m to 10m	20%
Side	South	35.0	5%	10.1m to 20m	15%
Rear	West	23.1	10%	20.1 to 30m	10%
Total:			40%	30.1 to 45m	5%

$$F_4 = (\text{TOTAL}) * F_2 \text{ (L/min)}$$

**F<sub>4</sub>= 2400 L/min**

Total Fire Flow

$$F = F_2 - F_3 + F_4 = 8400 \text{ L/min}$$

$$= 8000 \text{ L/min} \text{ (Round to the nearest 1,000 l/min)}$$

$$= 133.3 \text{ L/s}$$

Notes: 1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999  
 2) 9999 denotes either the nearest building > 45m away or a fire wall is provided

### Townhouse Units 12-13

1) Fire Flow Requirement

$$F_1 = 220C(A^{1/2}) \text{ (L/min)}$$

C= 1.5 Construction coefficient for wood frame construction

A= 354.0 Floor Area m<sup>2</sup> = main floor area  
 = 354.0 Fire Area m<sup>2</sup> = main floor area (no second floor)

F<sub>1</sub>= 6209 L/min

**F<sub>1</sub>= 6000 L/min** (Round to the nearest 1,000 l/min)

2) Occupancy

Occupancy Type: Residential Non-Combustible

Reduction: 25%

Surcharge: 0%

$$F_2 = F_1 + (F_1 * \text{Reduction} / \text{Surcharge}) \text{ (L/min)}$$

**F<sub>2</sub>= 4500 L/min**

3) Sprinkler System

Sprinkler System: Not Applicable (assumed no sprinkler system in service)

Reduction: 0%

$$F_3 = F_2 * \text{Reduction} \text{ (L/min)}$$

**F<sub>3</sub>= 0 L/min**

4) Seperation

<u>Location</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Surcharge</u>	<u>Separation Surcharges</u>	
Front	South	20.5	10%	0 to 3m	25%
Side	East	34.0	5%	3.1m to 10m	20%
Side	West	9999.0	0%	10.1m to 20m	15%
Rear	North	8.0	20%	20.1 to 30m	10%
Total:			35%	30.1 to 45m	5%

$$F_4 = (\text{TOTAL}) * F_2 \text{ (L/min)}$$

**F<sub>4</sub>= 1575 L/min**

Total Fire Flow

$$F = F_2 - F_3 + F_4 = 6075 \text{ L/min}$$

$$= 6000 \text{ L/min} \text{ (Round to the nearest 1,000 l/min)}$$

$$= 100.0 \text{ L/s}$$

Notes: 1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999  
 2) 9999 denotes either the nearest building > 45m away or a fire wall is provided

### Townhouse Units 14-16

1) Fire Flow Requirement

$$F_1 = 220C(A^{1/2}) \quad (\text{L/min})$$

C= 1.5 Construction coefficient for wood frame construction

A= 531.1 Floor Area m<sup>2</sup> = main floor area  
 = 531.1 Fire Area m<sup>2</sup> = main floor area (no second floor)

F<sub>1</sub>= 7605 L/min

**F<sub>1</sub>= 8000 L/min** (Round to the nearest 1,000 l/min)

2) Occupancy

Occupancy Type: Residential Non-Combustible

Reduction: 25%

Surcharge: 0%

$$F_2 = F_1 + (F_1 * \text{Reduction} / \text{Surcharge}) \quad (\text{L/min})$$

**F<sub>2</sub>= 6000 L/min**

3) Sprinkler System

Sprinkler System: Not Applicable (assumed no sprinkler system in service)

Reduction: 0%

$$F_3 = F_2 * \text{Reduction} \quad (\text{L/min})$$

**F<sub>3</sub>= 0 L/min**

4) Seperation

<u>Location</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Surcharge</u>	<u>Separation Surcharges</u>	
Front	South	20.5	10%	0 to 3m	25%
Side	East	9999.0	0%	3.1m to 10m	20%
Side	West	14.8	15%	10.1m to 20m	15%
Rear	North	11.0	15%	20.1 to 30m	10%
Total:			40%	30.1 to 45m	5%

$$F_4 = (\text{TOTAL}) * F_2 \quad (\text{L/min})$$

**F<sub>4</sub>= 2400 L/min**

Total Fire Flow

$$F = F_2 - F_3 + F_4 = 8400 \text{ L/min}$$

$$= 8000 \text{ L/min} \quad (\text{Round to the nearest 1,000 l/min})$$

$$= \mathbf{133.3 \text{ L/s}}$$

Notes: 1) All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999  
 2) 9999 denotes either the nearest building > 45m away or a fire wall is provided

## ON-SITE FIRE PROTECTION SUPPLY CALCULATION

### Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Project: 21-012 SFO Townhouses Building/Block #: Semi-Detached Units 3-4  
Project Location: Waterford, ON Firewalls/Sprinkler:

#### Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m<sup>2</sup> or Less ☐  
Building height is 2 Storeys or Less ☒  
Building does not have a Group B Occupancy (Care or Detention) ☒  
Building does not require a sprinkler system or standpipe and hose system ☒  
Limiting distance from the property line is at least 13 m if the building has an F-1 (high hazard industrial) occupancy ☒  
Building constitutes no significant environmental contamination potential under fire conditions ☒  
On-Site Supply Required? YES

#### Calculation Information:

$$Q = K * V * S_{Tot}$$

where: Q = Minimum supply of water in litres (L)  
V = Total Building Volume in cubic metres  
K = Water supply coefficient from Table 1  
S<sub>Tot</sub> = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + ... etc.]$$

where: S<sub>Side</sub> = values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of the OBC Guideline  
S<sub>Tot</sub> = need not exceed 2.0 (see Section 7.0 of the OBC Guideline)

#### Determining K Value:

Major Occupancy Classification Residential Occupancies  
Group C  
Division -  
Building is of combustible construction. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire resistance rating.  
K Factor 23

#### Determining Building Volume:

Average Length (m) 13.7  
Average Width (m) 13.4  
Height, including basements (m) 11.0  
Building Volume (m<sup>3</sup>) 2019

#### Total Spatial Coefficient:

	Exposure Distance (m)	Factor
North Side	3.6	0.6
East Side	>10	0
South Side	3.6	0.6
West Side	>10	0

S<sub>Tot</sub> Factor 2.2

#### Minimum Water Supply Flow:

Q (L) 102,181

#### Minimum Water Supply Flow Rate OBC:

2700 L/min  
45.0 L/sec

Table 2: Minimum Water Supply Flow Rates	
Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m <sup>2</sup> (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) <sup>(1)</sup> 3600 (If Q > 108,000L and ≤ 135,000L) <sup>(1)</sup> 4500 (If Q > 135,000L and ≤ 162,000L) <sup>(1)</sup> 5400 (If Q > 162,000L and ≤ 190,000L) <sup>(1)</sup> 6300 (If Q > 190,000L and ≤ 270,000L) <sup>(1)</sup> 9000 (If Q > 270,000L) <sup>(1)</sup>

Note: <sup>(1)</sup> Q=KVS<sub>Tot</sub> as referenced in Section 3(a)

## ON-SITE FIRE PROTECTION SUPPLY CALCULATION

### Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Project: 21-012 SFO Townhouses Building/Block #: Townhouse Units 1-3  
Project Location: Waterford, ON Firewalls/Sprinkler:

#### Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m<sup>2</sup> or Less ☐  
Building height is 2 Storeys or Less ☒  
Building does not have a Group B Occupancy (Care or Detention) ☒  
Building does not require a sprinkler system or standpipe and hose system ☒  
Limiting distance from the property line is at least 13 m if the building has an F-1 (high hazard industrial) occupancy ☒  
Building constitutes no significant environmental contamination potential under fire conditions ☒  
On-Site Supply Required? YES

#### Calculation Information:

$$Q = K * V * S_{Tot}$$

where: Q = Minimum supply of water in litres (L)  
V = Total Building Volume in cubic metres  
K = Water supply coefficient from Table 1  
S<sub>Tot</sub> = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + ... etc.]$$

where: S<sub>Side</sub> = values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of the OBC Guideline  
S<sub>Tot</sub> = need not exceed 2.0 (see Section 7.0 of the OBC Guideline)

#### Determining K Value:

Major Occupancy Classification Residential Occupancies  
Group C  
Division -  
Building is of combustible construction. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire resistance rating.  
K Factor 23

#### Determining Building Volume:

Average Length (m) 16.7  
Average Width (m) 31.8  
Height, including basements (m) 7.0  
Building Volume (m<sup>3</sup>) 3717

#### Total Spatial Coefficient:

Exposure Distance (m)	Factor
North Side >10	0
East Side >10	0
South Side >10	0
West Side >10	0

S<sub>Tot</sub> Factor 1

#### Minimum Water Supply Flow:

Q (L) 85,501

#### Minimum Water Supply Flow Rate OBC:

2700 L/min  
45.0 L/sec

Table 2: Minimum Water Supply Flow Rates	
Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m <sup>2</sup> (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) <sup>(1)</sup> 3600 (If Q > 108,000L and ≤ 135,000L) <sup>(1)</sup> 4500 (If Q > 135,000L and ≤ 162,000L) <sup>(1)</sup> 5400 (If Q > 162,000L and ≤ 190,000L) <sup>(1)</sup> 6300 (If Q > 190,000L and ≤ 270,000L) <sup>(1)</sup> 9000 (If Q > 270,000L) <sup>(1)</sup>

Note: <sup>(1)</sup> Q=KVS<sub>Tot</sub> as referenced in Section 3(a)

## ON-SITE FIRE PROTECTION SUPPLY CALCULATION

### Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Project: 21-012 SFO Townhouses Building/Block #: Townhouse Units 4-5  
 Project Location: Waterford, ON Firewalls/Sprinkler:

#### Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m<sup>2</sup> or Less ☐  
 Building height is 2 Storeys or Less ☒  
 Building does not have a Group B Occupancy (Care or Detention) ☒  
 Building does not require a sprinkler system or standpipe and hose system ☒  
 Limiting distance from the property line is at least 13 m if the building has an F-1 (high hazard industrial) occupancy ☒  
 Building constitutes no significant environmental contamination potential under fire conditions ☒  
 On-Site Supply Required? YES

#### Calculation Information:

$$Q = K * V * S_{Tot}$$

where: Q = Minimum supply of water in litres (L)  
 V = Total Building Volume in cubic metres  
 K = Water supply coefficient from Table 1  
 S<sub>Tot</sub> = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + ... etc.]$$

where: S<sub>Side</sub> = values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of the OBC Guideline  
 S<sub>Tot</sub> = need not exceed 2.0 (see Section 7.0 of the OBC Guideline)

#### Determining K Value:

Major Occupancy Classification Residential Occupancies  
 Group C  
 Division -  
 Building is of combustible construction. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire resistance rating.  
**K Factor 23**

#### Determining Building Volume:

Average Length (m) 16.7  
 Average Width (m) 21.2  
 Height, including basements (m) 7.0  
**Building Volume (m<sup>3</sup>) 2478**

#### Total Spatial Coefficient:

Exposure Distance (m)	Factor
North Side >10	0
East Side >10	0
South Side >10	0
West Side >10	0

**S<sub>Tot</sub> Factor 1**

#### Minimum Water Supply Flow:

**Q (L) 57,000**

#### Minimum Water Supply Flow Rate OBC:

**2700 L/min**  
**45.0 L/sec**

Table 2: Minimum Water Supply Flow Rates	
Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m <sup>2</sup> (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) <sup>(1)</sup> 3600 (If Q > 108,000L and ≤ 135,000L) <sup>(1)</sup> 4500 (If Q > 135,000L and ≤ 162,000L) <sup>(1)</sup> 5400 (If Q > 162,000L and ≤ 190,000L) <sup>(1)</sup> 6300 (If Q > 190,000L and ≤ 270,000L) <sup>(1)</sup> 9000 (If Q > 270,000L) <sup>(1)</sup>

Note: <sup>(1)</sup> Q=KVS<sub>Tot</sub> as referenced in Section 3(a)

## ON-SITE FIRE PROTECTION SUPPLY CALCULATION

### Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Project: 21-012 SFO Townhouses Building/Block #: Townhouse Units 12-13  
Project Location: Waterford, ON Firewalls/Sprinkler:

#### Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m<sup>2</sup> or Less ☐  
Building height is 2 Storeys or Less ☒  
Building does not have a Group B Occupancy (Care or Detention) ☒  
Building does not require a sprinkler system or standpipe and hose system ☒  
Limiting distance from the property line is at least 13 m if the building has an F-1 (high hazard industrial) occupancy ☒  
Building constitutes no significant environmental contamination potential under fire conditions ☒  
On-Site Supply Required? YES

#### Calculation Information:

$$Q = K * V * S_{Tot}$$

where: Q = Minimum supply of water in litres (L)  
V = Total Building Volume in cubic metres  
K = Water supply coefficient from Table 1  
S<sub>Tot</sub> = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + ... etc.]$$

where: S<sub>Side</sub> = values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of the OBC Guideline  
S<sub>Tot</sub> = need not exceed 2.0 (see Section 7.0 of the OBC Guideline)

#### Determining K Value:

Major Occupancy Classification Residential Occupancies  
Group C  
Division -  
Building is of combustible construction. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire resistance rating.  
K Factor 23

#### Determining Building Volume:

Average Length (m) 16.7  
Average Width (m) 21.2  
Height, including basements (m) 7.0  
Building Volume (m<sup>3</sup>) 2478

#### Total Spatial Coefficient:

	Exposure Distance (m)	Factor
North Side	8	0.2
East Side	>10	0
South Side	>10	0
West Side	>10	0

S<sub>Tot</sub> Factor 1.2

#### Minimum Water Supply Flow:

Q (L) 68,401

#### Minimum Water Supply Flow Rate OBC:

2700 L/min  
45.0 L/sec

Table 2: Minimum Water Supply Flow Rates	
Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m <sup>2</sup> (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) <sup>(1)</sup> 3600 (If Q > 108,000L and ≤ 135,000L) <sup>(1)</sup> 4500 (If Q > 135,000L and ≤ 162,000L) <sup>(1)</sup> 5400 (If Q > 162,000L and ≤ 190,000L) <sup>(1)</sup> 6300 (If Q > 190,000L and ≤ 270,000L) <sup>(1)</sup> 9000 (If Q > 270,000L) <sup>(1)</sup>

Note: <sup>(1)</sup> Q=KVS<sub>Tot</sub> as referenced in Section 3(a)



## ON-SITE FIRE PROTECTION SUPPLY CALCULATION

### Per Fire Protection Water Supply Guideline, Ontario Building Code Division 3, Part B, 3.2.5.7

Project: 21-012 SFO Townhouses Building/Block #: Townhouse Units 14-16  
Project Location: Waterford, ON Firewalls/Sprinkler:

#### Conditions not requiring On-Site Fire Protection:

Building area is Less than 200 m<sup>2</sup> or Less ☐  
Building height is 2 Storeys or Less ☒  
Building does not have a Group B Occupancy (Care or Detention) ☒  
Building does not require a sprinkler system or standpipe and hose system ☒  
Limiting distance from the property line is at least 13 m if the building has an F-1 (high hazard industrial) occupancy ☒  
Building constitutes no significant environmental contamination potential under fire conditions ☒  
On-Site Supply Required? YES

#### Calculation Information:

$$Q = K * V * S_{Tot}$$

where: Q = Minimum supply of water in litres (L)  
V = Total Building Volume in cubic metres  
K = Water supply coefficient from Table 1  
S<sub>Tot</sub> = total of spatial coefficient values from property line exposures on all sides, as obtained from the formula:

$$S_{Tot} = 1.0 + [(S_{Side1}) + (S_{Side2}) + (S_{Side3}) + ... etc.]$$

where: S<sub>Side</sub> = values are obtained from Figure 1, as modified by Sections 6.3 (e) and 6.3 (f) of the OBC Guideline  
S<sub>Tot</sub> = need not exceed 2.0 (see Section 7.0 of the OBC Guideline)

#### Determining K Value:

Major Occupancy Classification Residential Occupancies  
Group C  
Division -  
Building is of combustible construction. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire resistance rating.  
K Factor 23

#### Determining Building Volume:

Average Length (m) 16.7  
Average Width (m) 31.8  
Height, including basements (m) 7.0  
Building Volume (m<sup>3</sup>) 3717

#### Total Spatial Coefficient:

Exposure Distance (m)	Factor
North Side >10	0
East Side >10	0
South Side >10	0
West Side >10	0

S<sub>Tot</sub> Factor 1

#### Minimum Water Supply Flow:

Q (L) 85,501

#### Minimum Water Supply Flow Rate OBC:

2700 L/min  
45.0 L/sec

Table 2: Minimum Water Supply Flow Rates	
Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m <sup>2</sup> (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) <sup>(1)</sup> 3600 (If Q > 108,000L and ≤ 135,000L) <sup>(1)</sup> 4500 (If Q > 135,000L and ≤ 162,000L) <sup>(1)</sup> 5400 (If Q > 162,000L and ≤ 190,000L) <sup>(1)</sup> 6300 (If Q > 190,000L and ≤ 270,000L) <sup>(1)</sup> 9000 (If Q > 270,000L) <sup>(1)</sup>

Note: <sup>(1)</sup> Q=KVS<sub>Tot</sub> as referenced in Section 3(a)

Ontario Building Code Tables and Figures

XX

Table 3.1.2.1.  
Major Occupancy Classification

Forming Part of Sentences 3.1.2.1.(1), 3.1.2.2.(1) and 3.11.2.1.(3)

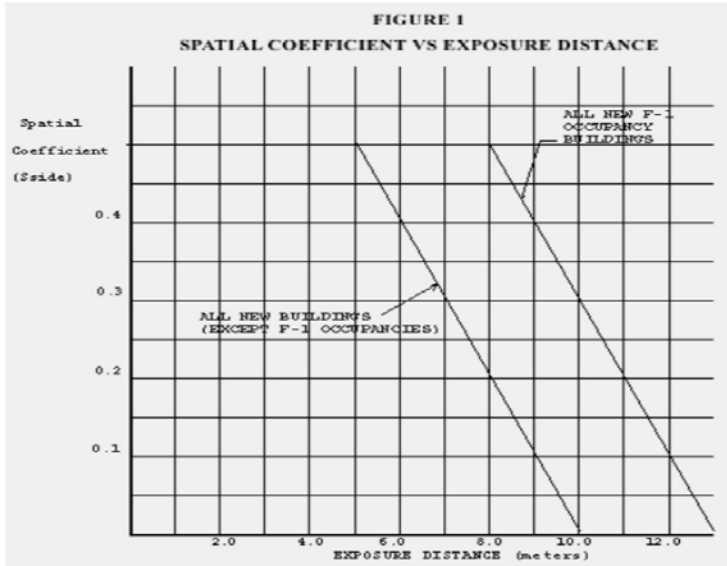
Item	Column 1 Group	Column 2 Division	Column 3 Description of Major Occupancies
1.	A	1	Assembly occupancies intended for the production and viewing of the performing arts
2.	A	2	Assembly occupancies not elsewhere classified in Group A
3.	A	3	Assembly occupancies of the arena type
4.	A	4	Assembly occupancies in which occupants are gathered in the open air
5.	B	1	Detention occupancies
6.	B	2	Care and treatment occupancies
7.	B	3	Care occupancies
8.	C	---	Residential occupancies
9.	D	---	Business and personal services occupancies
10.	E	---	Mercantile occupancies
11.	F	1	High hazard industrial occupancies
12.	F	2	Medium hazard industrial occupancies
13.	F	3	Low hazard industrial occupancies

Table 2:  
Minimum Water Supply Flow Rates

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m² (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) <sup>(1)</sup> 3600 (If Q > 108,000L and ≤ 135,000L) <sup>(1)</sup> 4500 (If Q > 135,000L and ≤ 162,000L) <sup>(1)</sup> 5400 (If Q > 162,000L and ≤ 190,000L) <sup>(1)</sup> 6300 (If Q > 190,000L and ≤ 270,000L) <sup>(1)</sup> 9000 (If Q > 270,000L) <sup>(1)</sup>

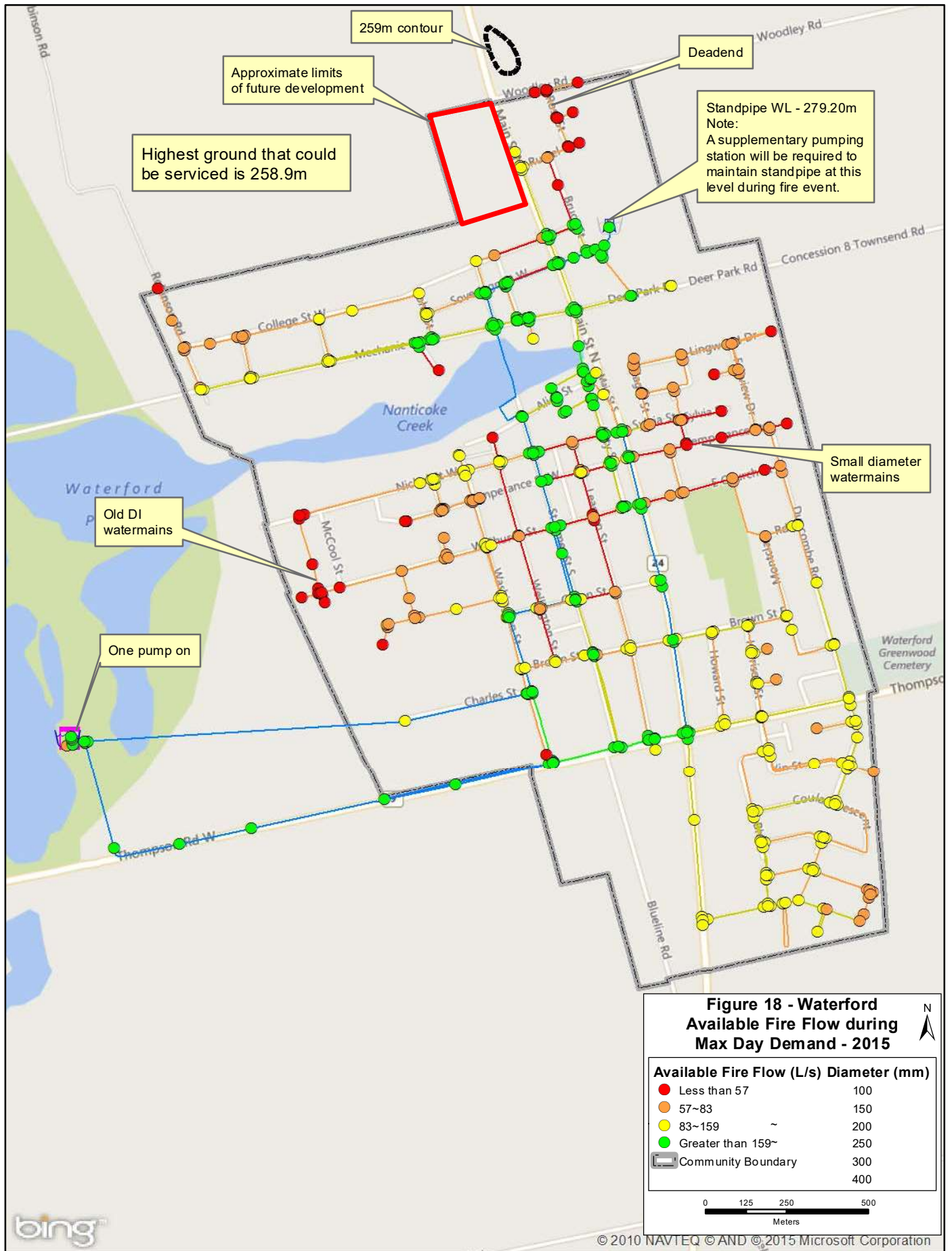
Note: <sup>(1)</sup> Q=KVS<sub>Tot</sub> as referenced in Section 3(a)

Table 1: Water Supply Coefficient - K					
TYPE OF CONSTRUCTION			Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code		
			A-2 B-1 B-2 B-3 C D	A-4 F-3 A-3<	E-1 F-2
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.			10	12	14
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.			16	19	22
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.			18	22	25
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.			23	28	32
Column 1			2	3	4











**MAP A**  
**CONTEXT MAP**  
Urban Area of WATERFORD

ZNPL2022013

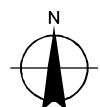


**Legend**

-  Subject Lands
-  Lands Owned

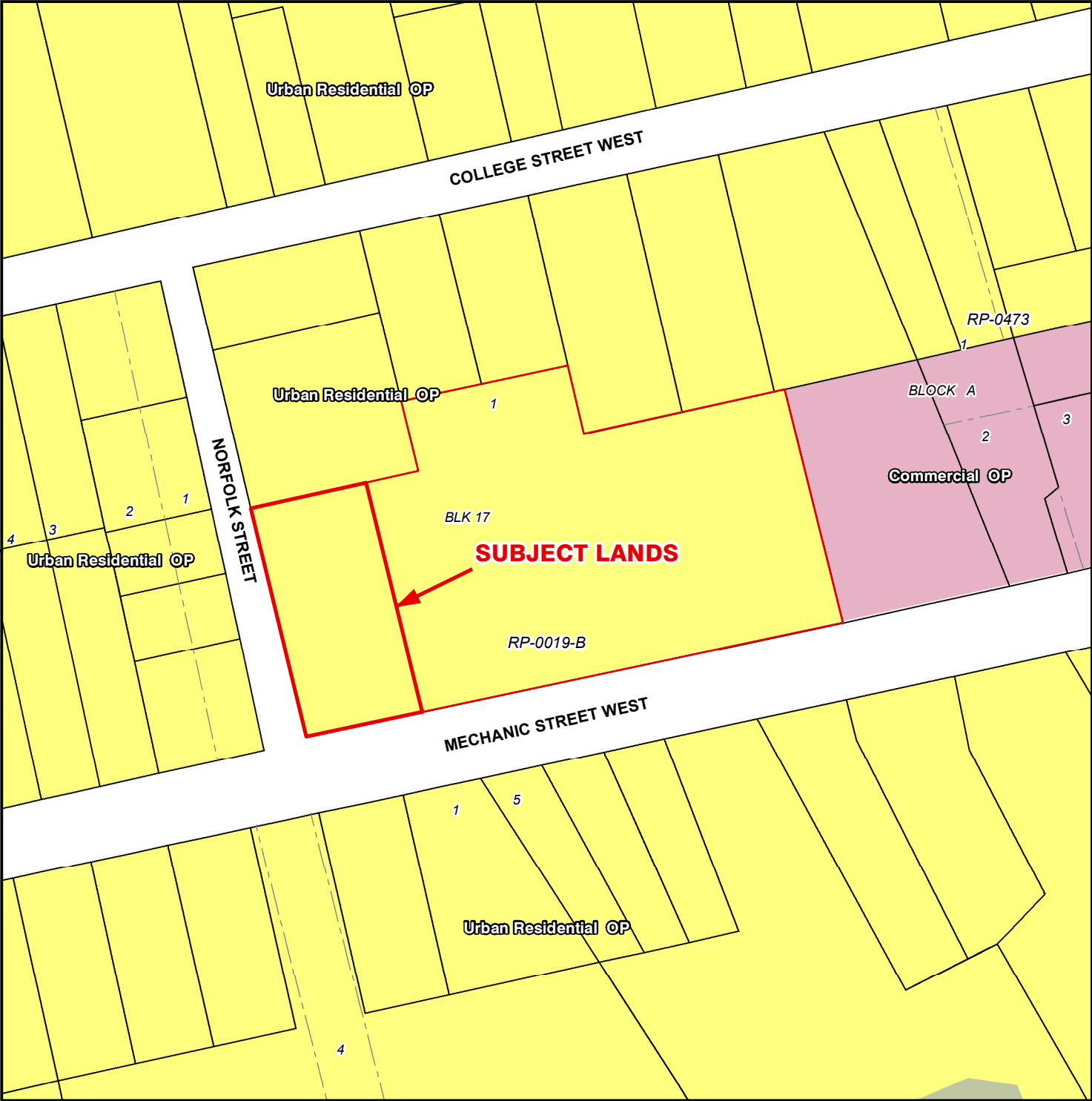
2020 Air Photo

2022-01-14





10 5 0 10 20 30 40  
Meters









**Legend**

-  Subject Lands
-  Lands Owned

**Official Plan Designations**

-  Hazard Lands
-  Urban Residential
-  Commercial
-  Urban Area Boundary

2022-01-14

**From: R1(H)**  
**To: R2(H)**

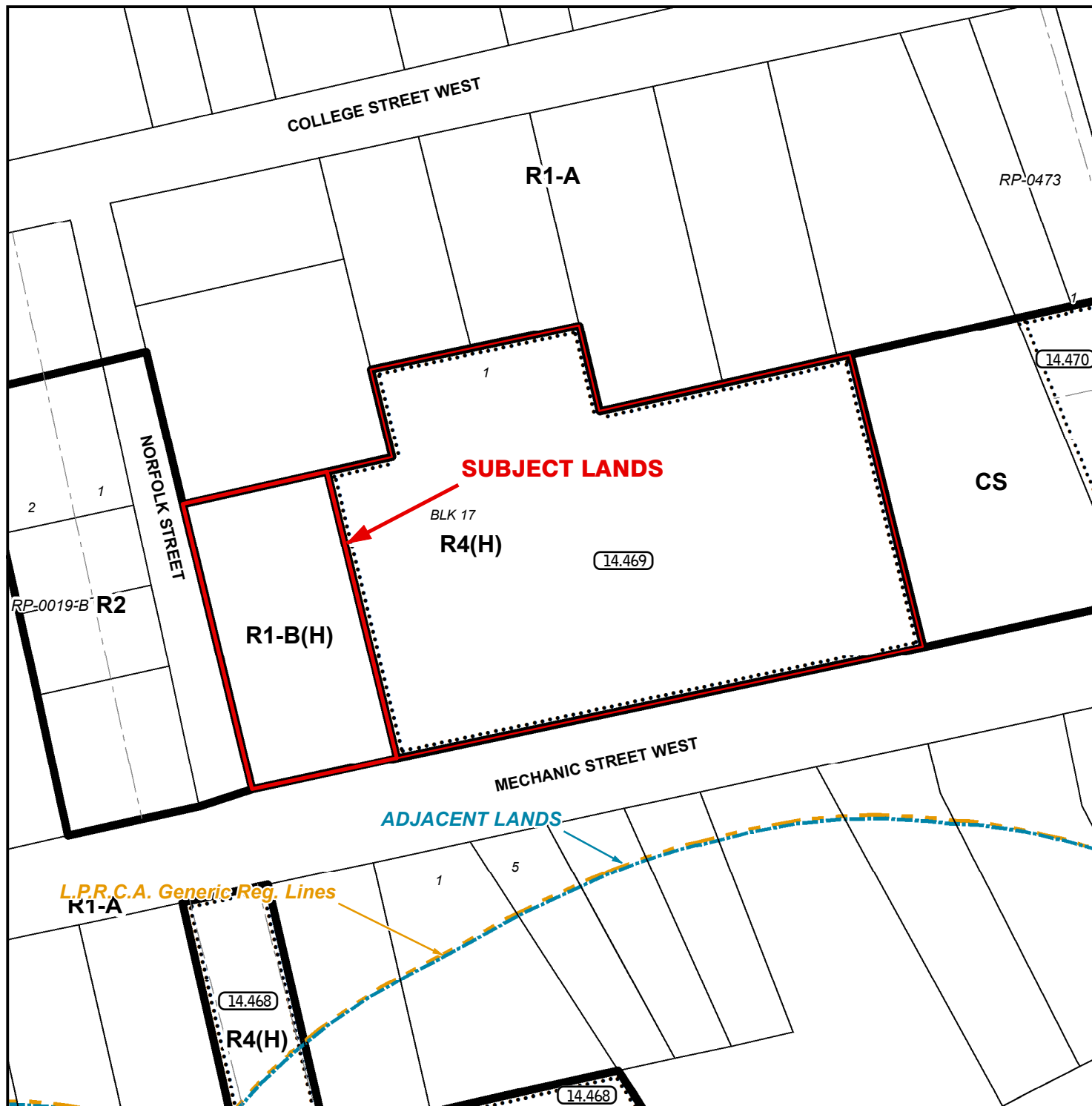


10 5 0 10 20 30 40 Meters



**PROPOSED ZONING BY-LAW AMENDMENT MAP**

Urban Area of WATERFORD



1/18/2022

ZONING BY-LAW 1-Z-2014

**From: R1-B(H)  
To: R2(H)**

(H) - Holding

CS - Service Commercial Zone

R1-A - Residential R1-A Zone

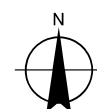
R1-B - Residential R1-B Zone

R2 - Residential R2 Zone

R4 - Residential R4 Zone

**LEGEND**

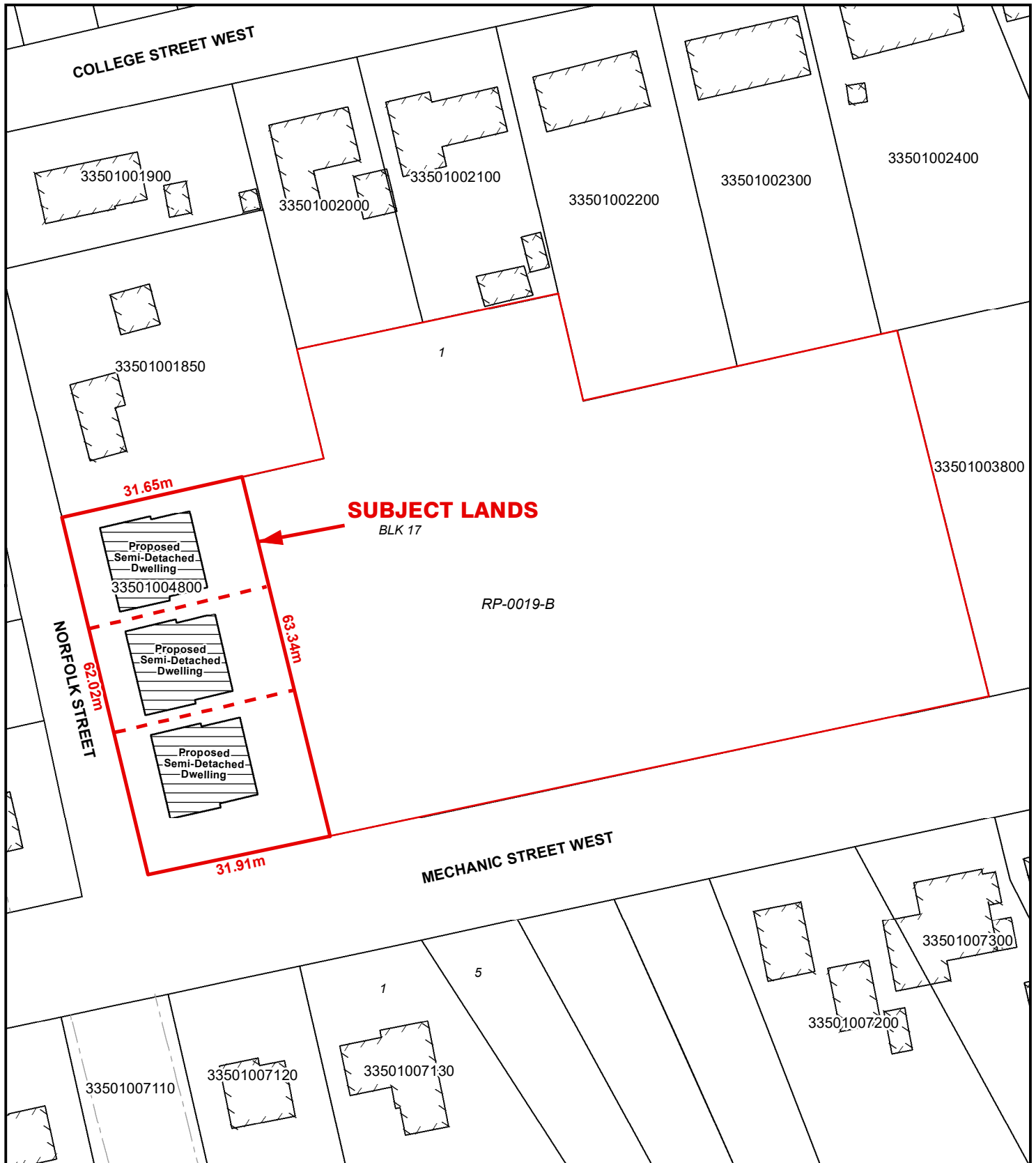
- Subject Lands
- Lands Owned
- Adjacent Lands
- LPRCA Generic RegLines



9.54.75 0 9.5 19 28.5 38 Meters

**CONCEPTUAL PLAN**

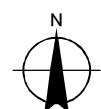
Urban Area of WATERFORD



**Legend**

- Subject Lands
- Lands Owned

2022-01-14



7.5 3.75 0 7.5 15 22.5 30 Meters