**February 20, 2025**

**Norfolk County**
Planning and Development Department
12 Gilbertson Drive
Simcoe, Ontario N3Y 4N5

**Attention: Ms. Alisha Cull, Manager of Planning Services, Community Development Division**

**Re: Zoning By-law Amendment & Draft Plan of Subdivision**
227 Decou Road, Simcoe, ON
TBG Project No. 25326

On behalf of LIV (Simcoe) LP ("Owner"), the Biglieri Group Ltd. ("TBG") is pleased to submit applications for Zoning By-law Amendment (ZBA) and Draft Plan of Subdivision (DPS) (the "Applications") in the Town of Simcoe, for the lands municipally known as 227 Decou Road ("Subject Lands" or "Lands") and legally described as Part Lots 2 and 3, Concession 5 Woodhouse, Comprising Part 2, Plan 37R11505 Norfolk County. A Pre-Application Consultation meeting was held on November 12, 2025 with Norfolk County staff and representatives of Six Nations of the Grand River, which informed the proposed development plan and contents included in the Applications.

## Site and Surrounding Area

The Subject Lands are 20.68-hectares irregularly shaped parcel in the southeast corner of Simcoe's Urban Area Boundary. They have a total broken lot frontage of approximately 246.58 metres on Decou Road, spread between three segments due to interruptions by five adjacent properties. The Lands are west of Ireland Road, north of Decou Road, East of Norfolk Street (Highway 24), and south of Victoria Street. They are currently undeveloped and used for agricultural purposes.

The area surrounding the Subject Lands consists of a mix of agricultural, residential, industrial, and institutional uses. West of the subject site is Lynn Valley Trail, a multi-use pathway within the Brook Conservation Area, a wooded area surrounded by low-rise residential uses. The Lynn Valley Trail generally follows the path of the Lynn River, which is west of the Subject Lands. To the north is a residential community consisting of

single-detached, semi-detached and townhouse dwellings. East of the Lands is Sprucedale Youth Centre operated by the Ontario Ministry of Children and Youth Services. Directly to the south, abutting the Subject Land's southern border, are five residential dwellings on estate lots fronting Decou Road. There are other residential lots fronting Decou Road on its south side, as well as wooded areas. Pott's Cemetery abuts the southeast corner of the Lands.

There are active development applications to the northwest and east of the Subject Lands which will introduced a mix of residential units consistent with the proposed development. Adjacent developments have been considered in the preparation of these Applications with regard to connectivity, servicing, access to public parkland, and general community connectivity.

## Proposed Development

The proposed development seeks to establish a residential subdivision consisting of between 268 and 509 residential units, with a mix of single-detached and street townhouse dwellings. A Draft Plan of Subdivision was prepared as part of the Applications which reflects this unit range. A Conceptual Site Plan was also prepared, which presents a hypothetical development scenario of 125 single detached units and 279 street townhouse units, for a total of 404 units across the Subject Lands. The ultimate unit mix and count will be determined through a phased development approach based on future market and economic conditions. The Lands have a total area of 20.68 hectares, of which 11.35 hectares are proposed for residential development. The remainder of the Lands will accommodate public parkland, a stormwater management pond, public trail access, underground infrastructure and public roads.

## Supporting Documents

The following reports and plans are included in support of the Applications.

| # | Report/Plan Title | Consultant | Date |
|---|---|---|---|
| 1 | Covering Letter | The Biglieri Group | February 20, 2026 |
| 2 | Draft Plan of Subdivision Application Form | N/A | |
| 3 | Zoning Amendment Application Form | N/A | |
| 4 | Planning Rationale Report | The Biglieri Group | February 20, 2026 |
| 5 | Draft Plan of Subdivision | The Biglieri Group | February 5, 2026 |

| | | | |
|---|---|---|---|
| 6 | Conceptual Subdivision Plan | The Biglieri Group | February 17, 2026 |
| 7 | Phasing Plan | The Biglieri Group | February 12, 2026 |
| 8 | On-Street Parking Plan | The Biglieri Group | February 19, 2026 |
| 9 | Draft Zoning By-law Amendment | The Biglieri Group | N/A |
| 10 | Survey | West & Ruuska Ontario Land Surveyors | March 30, 2022 |
| 11 | Environmental Impact Study | GeoProcess Research Associates | February 17, 2026 |
| 12 | Transportation Impact Study | C.F. Crozier & Associates Inc. | February, 2026 |
| 13 | Functional Servicing and Stormwater Management Report | S. Llewellyn and Associates Ltd. | February, 2026 |
| 14 | Preliminary Civil Drawings | S. Llewellyn and Associates Ltd. | February, 2026 |
| 15 | Phase 1 Environmental Site Assessment | Landtek Limited Consulting Engineers | September, 2025 |
| 16 | Archaeological Assessment (Stage 1-3) | Mayer Heritage Consultants Inc. | November, 2008 |
| 17 | Archaeological Assessment (Stage 4) | Mayer Heritage Consultants Inc. | October, 2009 |
| 18 | Geotechnical Investigation | Zitia Group | December, 2009 |

Respectfully,
**THE BIGLIERI GROUP LTD.**



Rachelle Laroque, RPP, MCIP, BES, MSc
Partner



Robert McQuillan, BCom, MPl
Planner



Michael Barone, BES
Planner

Biglieri

2472 Kingston Rd
Toronto, ON M1N 1V3

21 King St W, Suite 1502
Hamilton, ON L8R 4W7

tbg@thebiglierigroup.com
thebiglierigroup.com

T (416) 693-9155

# Development Application for Draft Plan of Subdivision / Vacant Plan of Condominium

## Complete Application

The application must be completed by the owner or authorized agent. Where the application is being submitted by an agent, the owner's written authorization is required. If the lands subject to this application are owned by more than one owner, the authorization of all owners is required. Submission of this application constitutes consent for authorized municipal staff to inspect the subject lands.

It is the responsibility of the applicant to research and evaluate the site and the proposal to ensure that the development will protect and preserve the health, safety and welfare of future residents. Sufficient studies for the completion of the application should be carried out prior to submission and should be reflected in the application form.

The requested information in this application form must be provided by the applicant and will be used to process the application pursuant to the requirements of Section 51 of the Planning Act, Ontario Regulation 544/06, and the Condominium Act.

A pre-submission meeting may be requested by staff or arranged at the request of the applicant. A pre-submission review is not required prior to submission of this application but can be provided upon request.

## Online Application Process

All applications must be submitted online via the County's CityView Portal. The portal can be accessed here: Welcome - CityView Portal. The applicant will submit the materials required as part of a complete application. Once the County confirms receipt of a complete submission, the applicant will be contacted and provided further direction for payment options.

## Pre-Consultation Meeting:

Pre-consultation is highly recommended for Draft Plan of Subdivision or Vacant Plan of Condominium applications. The purpose of a pre-consultation meeting is to provide the applicant with an opportunity to present the proposed development, discuss opportunities and constraints, and for the County and Agency staff to identify the submission requirements. The requirements, as detailed in the pre-consultation meeting notes, are valid for one year after the meeting date.

If the application for draft plan of subdivision/condominium is being submitted in conjunction with an application for a Zoning By-law Amendment and/or application for an Official Plan Amendment, all applications must be completed and submitted together.

**User Fees:**

The planning application fee will be determined when the application can be deemed complete according to Norfolk County Community Planning user fees: User Fees | Norfolk County
Cash, debit, credit or cheque payable to Norfolk County in the amount set out in the user fees By-Law that will be accepted and deposited once the application has been deemed complete.

An additional agency plan review fee may apply. Please see below for more information and forward fees directly to the applicable agency, as required:

**Grand River Conservation Authority**
Plan Review fees | Grand River Conservation Authority

**Long Point Region Conservation Authority**
Planning Fees - Long Point Region Conservation Authority

**Development Application Process**

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

The County will refund the original fee if applicants withdraw their applications before circulation. If your drawings are recirculated, there will be an additional fee. If more than three reviews of engineering drawings are requested due to revisions by the owner or failure to revise engineering drawings as requested, the County will charge an additional fee.

**Contact Us**

For additional information or assistance completing this application, please contact a Planner at 519-426-5870 or planning@norfolkcounty.ca.

The information submitted on this form is collected under the authority of the Freedom of Information and Protection of Privacy Act (FIPPA) and Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) for Norfolk County employees to use for the purpose of preparing and registering a development agreement.

Questions about the collection of personal information through this form may be directed to the Agreement and Development Coordinator or Information and Privacy Coordinator, Corporation of Norfolk County, 50 Colborne Street South, Simcoe ON

**For Office Use Only**:

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

---

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

☐ Draft Plan of Subdivision
☐ Vacant Plan of Condominium
☐ Condominium Exemption

Please describe the proposed development

_____
_____
_____

**Property Assessment Roll Number:** _____

## A. Applicant Information

*Note: It is the responsibility of the owner to notify the Planner of any changes in ownership or authorized applicant within 30 days of such a change*

### Registered Owner(s)

Company Name: _____ Phone number: _____

Contact Name: _____ E-mail: _____

Address: _____ Date property was acquired: _____

Municipality/Postal Code: _____

### Authorized Applicant (if different than registered owner)

Company Name: _____ Municipality/Postal Code: _____

Contact Name: _____ Phone number: _____

Address: _____ E-mail: _____

### Authorized Agent

Company Name: _____ Address: _____

Contact Name: _____ Municipality/Postal Code: _____

Phone number: _____ E-mail: _____

**Name of Surveyor**

Company Name: _____ Municipality/Postal Code: _____

Contact Name: _____ Phone number: _____

Address: _____ E-mail: _____

**Name of Solicitor**

Company Name: _____ Municipality/Postal code: _____

Contact Name: _____ Phone number: _____

Address: _____ E-mail: _____

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

☐ Owner ☐ Applicant ☐ Agent

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

_____

## B. Location, Legal Description and Property Description

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

_____

Municipal address:
227 Decou Road, Simcoe
_____

Present Official Designation(s):

_____

_____

Present zoning:

_____

_____

Date of acquisition of the subject property (if known): _____

2. Is the property encumbered by any easements (existing or proposed)? If so, please describe:

_____

3. Please complete the description of proposed uses:

| Proposed Land Uses | Number of Residential Units | Number of Lots/ Blocks | Area in Hectares | Density Proposed (Units Per Hectare) | Parking Provided |
|---|---|---|---|---|---|
| Single Detached Dwellings | | | | | |
| Semi-Detached Dwellings | | | | | |
| Townhouse Dwellings (street, stacked, group) | | | | | |
| Apartments Residential | | | | | |
| Additional Residential Units | | | | | |
| Other residential (Specify) | | | | | |
| Commercial | | | | | |
| Office | | | | | |
| Industrial | | | | | |
| Institutional | | | | | |
| Open Space (i.e. parks) +Walkway blocks | | | | | |
| Agricultural | | | | | |
| Roads | | | | | |
| Other (specify) | | | | | |
| **TOTAL** | | | | | |

4. Additional information for Vacant Plan of Condominium applications only:

   i. Describe the condominium details:

   _____

   _____

   ii. Has the site plan been approved? ☐ Yes ☐ No

   Site plan file number: _____

   iii. Has a site plan agreement been registered? ☐ Yes ☐ No

iv. Has a building permit been issued? ☐ Yes ☐ No

v. Is the proposed development under construction? ☐ Yes ☐ No

vi. Is this a conversion of an existing building containing rental residential units?

☐ Yes ☐ No

If yes, indicate the number of units to be converted: _____

vii. Does the development include affordable housing units? ☐ Yes ☐ No

If yes, indicate the number of units to be converted: _____

**C. Existing Land Uses for the Site and Surrounding Area**

1. Describe the existing use and if known the length of time the existing uses have continued on the subject lands:

_____
_____
_____

2. Are any existing buildings on the subject lands designated under the Ontario Heritage Act as being of significant heritage value or interest?

☐ Yes ☐ No

If yes, identify and provide details of the building:

_____

3. Indicate land use of abutting properties

_____
_____

4. Is the proposal part of a phased development? If so, provide the name of the phased development and associated file number of the previous phases:

_____

5. Has the subject property ever been or currently is the subject of a Planning Act application?

- Plan of Subdivision ☐ Yes ☐ No
- Official Plan Amendment ☐ Yes ☐ No
- Zoning Bylaw, or Zoning Order Amendment ☐ Yes ☐ No

- Site Plan ☐ Yes ☐ No
- Consent/Minor Variance ☐ Yes ☐ No

  If yes, please indicate the application file number and the status of the application_____

6. Is the subject property covered by a Minister's zoning order?

   ☐ Yes ☐ No

   If yes, indicate the Ontario Regulation Number:_____

7. Is the water, sewage, or road works associated with the proposed development subject to the provisions of the Environmental Assessment Act?

   ☐ Yes ☐ No

8. Related Planning Applications – List all existing and proposed development applications affecting lands within 120 metres of the subject property:

| Type of Planning Act application | File No. | Address |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

**D. Previous Use of Lands:**

1. Has there been industrial or commercial use on the subject lands or adjacent lands? ☐ Yes ☐ No ☐ Unknown

   If yes, specify the uses (for example: gas station or petroleum storage):

   _____

2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites?

   ☐ Yes ☐ No ☐ Unknown

   Provide the information you used to determine the answers to the above questions:

   _____

3. If you answered yes to any of the above questions in Section D, a land uses inventory listing all known former land uses of the subject lands, and/or when applicable, the adjacent lands, is required.

   Is the land use inventory of former land uses attached? ☐ Yes ☐ No

## E. Provincial Policy

1. Complete the following Environmental Features, Infrastructure and Development Context table as required:

| Environmental Features, Infrastructure and Development Context | On-site | Within 500 metres |
|---|---|---|
| Class I Industrial Use[1] | ☐ | ☐ |
| Class II Industrial Use[1] | ☐ | ☐ |
| Class 3 Industrial Use[1] | ☐ | ☐ |
| Landfill site | ☐ | ☐ |
| Sewage treatment plant and waste stabilization plant | ☐ | ☐ |
| Significant wetlands | ☐ | ☐ |
| Significant habitat of endangered and threatened species | ☐ | ☐ |
| Significant fish habitat, valley lands, areas of natural and scientific interest, wildlife habitat | ☐ | ☐ |
| Sensitive groundwater recharge areas, headwaters and aquifers | ☐ | ☐ |
| Erosion hazards | ☐ | ☐ |
| Floodplains | ☐ | ☐ |
| Active railway line | ☐ | ☐ |
| Existing and/or planned controlled access highways or freeways | ☐ | ☐ |
| High voltage electric transmission line | ☐ | ☐ |
| Agricultural operations | ☐ | ☐ |
| Mineral aggregate resource area | ☐ | ☐ |
| Mineral aggregate operations | ☐ | ☐ |
| Existing pits and quarries | ☐ | ☐ |
| Significant archaeological resources | ☐ | ☐ |
| Hazardous sites[2] | ☐ | ☐ |
| Source water protection (Wellhead Protection Area (WHPA) A, B or C; Issue Contributing Area; Intake Protection Zone | ☐ | ☐ |

[1] *Class 1, 2,3 Industrial Use – Refer to D-6-1 Industrial Categorization Criteria of the Ministry of the Environment Conservation and Parks*

[2] *Hazardous sites - means property or lands that could be unsafe for development and site alteration due to naturally occurring hazards.*

2. For each feature or development circumstance of potential concern identified in Section E.1. explain how regard was had to the Provincial Planning Statement.

_____

_____

_____

3. 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 Planning Statement?

☐ Yes ☐ No

If no, please explain: _____

**F. Servicing and Access**

1. Indicate what services are available or proposed:

| **Water Supply** | | **Storm Drain** | |
|---|---|---|---|
| Municipal piped water | ☐ | Storm sewers | ☐ |
| Individual wells | ☐ | Open ditches | ☐ |
| Communal wells | ☐ | Other (describe below): | ☐ |
| Other (describe below): | ☐ | Stormwater Management Pond | |

| **Sewage Treatment** | | **Existing or proposed access to subject lands** | |
|---|---|---|---|
| Municipal sewers | ☐ | Municipal road | ☐ |
| Communal system | ☐ | Provincial highway | ☐ |

| | | | |
|---|---|---|---|
| Septic tank and tile bed in good working order | ☐ | Unopened road | ☐ |
| Other (describe below): | ☐ | Name of road/street:_____ | |
| | | Other (describe below): | ☐ |

2. Is the property located within a designated municipal drain boundary?
   No.

**G. Other Information**

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

   If yes, how many jobs are provided 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.

   _____
   _____
   _____

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

All other requirements as per the pre-consultation meeting will apply. All final plans must include the owner's signature as well as the engineer's signature and seal. The statement of acknowledgement must be signed in this regard.

"I confirm that the required drawings have been completed and submitted as specified in the general requirements along with the requirements outlined in the Pre-consultation notes. I understand that the application may not be deemed complete until planning staff are satisfied with the content and format of the required drawings."



Authorized Applicant/Agent Signature

Date

## H. Development Agreements

A development agreement will be required as part of the subdivision and condominium applications. You should contact the Agreement Administrator for further details of the requirements, including but not limited to insurance coverage, professional liability for the engineer(s), additional fees and performance securities.

## I. Transfers, Easements and Postponement of Interest

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

## J. 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 purpose of making inspections associated with this application, during normal and reasonable working hours.

## K. 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.

Ben Jaeff _____ Feb 12, 2026 _____

Owner/ Authorized Applicant Signature Date

Norfolk COUNTY

## L. 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 LIV (SIMCOE) GP INC. am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize The Biglieri Group c/o Rachelle Larocque 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.

Ben Jomeff
Owner

Feb 12, 2026
Date

Owner

Date

## M. Declaration

I, Rachelle Larocque of The Biglieri Group Ltd.

solemnly declare that:

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

Declared before me at:

Owner/Authorized Applicant Signature

In CITY OF TORONTO

This 13 day of February

A.D., 2026

E Hill

A Commissioner, etc.

Emily Marie Hill, a Commissioner, etc., Province of Ontario, for The Biglieri Group Ltd. and The Living Wall An Ecological Sound Barrier Solution Inc., Expires November 15, 2027.

# Development Application for Zoning By-law Amendment

## Complete Application

The application must be completed by the owner or authorized agent. If the application is being submitted by an agent, the owner's written authorization is required. If the lands subject to this application are owned by more than one owner, the authorization of all owners is required. Submission of this application constitutes consent for authorized municipal staff to inspect the subject lands.

It is the responsibility of the applicant to research and evaluate the site and the proposal to ensure that the development will conform to the interests of the health, safety and welfare of future residents. Sufficient studies for the completion of the application should be carried out prior to submission and should be reflected in the application form.

## Online Application Process

All applications must be submitted online via the County's CityView Portal. The portal can be accessed here: Welcome - CityView Portal. The applicant will submit the materials required as part of a complete application. Once the County confirms receipt of a complete submission, the applicant will be contacted and provided further directions for payment options.

## Pre-Consultation Meeting:

Pre-Consultation is highly recommended for Zoning By-law Amendment applications. The purpose of a Pre-Consultation meeting is to provide the applicant with an opportunity to present the proposed development, discuss potential issues, and for the Norfolk County and external agencies to identify the application requirements. The requirements, as detailed in the Pre-Consultation meeting comments, are valid for one year after the meeting date.

## User Fees:

The planning application fee will be determined when the application can be deemed complete according to Norfolk County Community Planning user fees: User Fees | Norfolk County

Additional agency plan review fees may apply. Please see below for more information and forward fees directly to the applicable agency, as required:

**Grand River Conservation Authority**
Plan Review fees | Grand River Conservation Authority
**Long Point Region Conservation Authority**
Planning Fees - Long Point Region Conservation Authority

Cash, debit, credit or cheque payable to Norfolk County in the amount set out in the User Fees By-Law that will be accepted and deposited once the application has been deemed complete.

**Development Application Process**

Norfolk County staff will circulate the complete application to adjacent landowners, public agencies, and internal departments. Planning Act decision timeframes will apply in accordance with the provisions of Section 34 of the Planning Act Norfolk County collects personal information submitted through this form under the authority of the Municipal Freedom of Information and Protection Act. Norfolk County will use this information for the purposes indicated by this form. Questions about collecting personal information can be directed to Norfolk GIS Services at NorfolkGIS@norfolkcounty.ca.

Additional studies required for a complete application along with peer reviews may be required and shall be provided at the applicant's sole expense. In these cases, Norfolk County staff will select the company to complete the peer review.

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

**Contact Us**

For additional information or assistance completing this application, please contact a Planner at 519-426-5870 or planning@norfolkcounty.ca.

**Notification Sign Requirements**

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

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

**For Office Use Only**:

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

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

☐ Zoning By-Law Amendment – Regular

☐ Zoning By-Law Amendment - Major

☐ Zoning By-Law Amendment - Minor

☐ Temporary Use By-law

**Property Assessment Roll Number:** _____

## A. Applicant Information

*Note: It is the responsibility of the owner to notify the Planner of any changes in ownership or authorized applicant within 30 days of such a change*

**Name of Owner** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

**Name of Authorized Applicant** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

**Name of Authorized Agent** _____

Address _____

Town and Postal Code _____

Phone Number _____

Cell Number _____

Email _____

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

☐ Owner ☐ Agent ☐ Applicant

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

_____

_____

**B. Location, Legal Description and Property Information**

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

   _____

   _____

   Municipal Civic Address: _____

   Land acquisition date (if known): _____

   Present Official Plan Designation(s): Urban Residential, Designated Greenfield

   Present Zoning: _____

2. Is there a site-specific provision on the subject lands?

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

   _____

3. Present use of the subject lands:

   _____
   _____

4. Please describe **all existing** buildings or structures on the subject lands and whether they will be retained, demolished or removed.

   _____
   _____
   _____

5. If an addition to an existing building is being proposed, please explain the proposed use.

   _____
   _____
   _____

6. Please describe **all proposed** buildings or structures/additions on the subject lands.

   _____
   _____

7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being of cultural heritage value or interest?

   ☐ Yes ☐ No

   If yes, identify and provide details:

   _____
   _____

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

   _____

9. Existing use of abutting properties:

   _____

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

    ☐ Yes ☐ No

    If yes, describe the easement or restrictive covenant and its effect:

    _____

## C. Purpose of Development Application

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

1. Please describe the proposed development on the subject lands:

   _____
   _____
   _____

2. Please explain why it is not possible to comply with the provisions of the Zoning By-law :

   _____
   _____
   _____

3. Have the subject land or lands within 120 metres ever been and/or currently are the subject of a Planning Act application:
   - Plan of Subdivision ☐ Yes ☐ No
   - Official Plan Amendment ☐ Yes ☐ No
   - Zoning Bylaw, or Zoning Order Amendment ☐ Yes ☐ No
   - Site Plan ☐ Yes ☐ No
   - Consent/Minor Variance ☐ Yes ☐ No

   If yes, indicate the application file number and the status of the application_____
   _____

## D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands?

   ☐ Yes ☐ No ☐ Unknown

If yes, specify the uses (for example: gas station or petroleum storage):

_____
_____

2. Is there reason to believe the subject lands may have been contaminated by former

uses on the site or adjacent sites?

☐ Yes ☐ No ☐ Unknown

3. Provide the information you used to determine the answers to the above questions:

_____

_____

4. If you answered yes to any of the above questions in Section D, a previous land use inventory showing all known former uses of the subject lands, and/or when applicable, the adjacent lands, is required.

   Is the land use inventory of former land uses attached? ☐ Yes ☐ No

**E. Provincial Planning Statement**

1. Is the requested amendment consistent with the Provincial Planning Statement issued under subsection 3(1) of the *Planning Act, R.S.O. 1990, c. P. 13*?

   ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

   _____

2. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the Provincial Planning Statement?

   ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

   _____

3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection?

   ☐ Yes ☐ No

   If no, please explain:

   _____

   _____

*Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C, Intake Protection Zone (IP-Z), Issue Contributing Area (ICA), please attach relevant information and approved mitigation measures from the Risk Management 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**

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

**Significant Woodland**

☐ 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 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** | | **Storm Drain** | |
|---|---|---|---|
| Municipal piped water | ☐ | Storm sewers | ☐ |
| Individual wells | ☐ | Open ditches | ☐ |
| Communal wells | ☐ | Other (describe below): _____ | ☐ |
| Other (describe below): _____ | ☐ | | |

| **Sewage Treatment** | | **Existing or proposed access to subject lands** | |
|---|---|---|---|
| Municipal sewers | ☐ | Municipal road | ☐ |
| Communal system | ☐ | Provincial highway | ☐ |
| Septic tank and tile bed in good working order | ☐ | Unopened road | ☐ |
| Other (describe below): _____ | ☐ | Name of road/street:_____ | |
| | | Other (describe below): _____ | ☐ |

2. Does the application require development on privately owned and operated individual or communal septic systems, and more than 4500 litres of effluent produced per day as a result of the development being completed?

   ☐ Yes ☐ No

   If yes, provide (i) Servicing Options Report and (ii) hydrogeological report with submission.

## 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. Indicate below or on a separate attachment, the applicant's proposed strategy for consulting with the public on the request for a zoning by-law amendment.

_____
_____

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

_____
_____
_____

## H. Supporting Material to be submitted by Applicant

In order for your application to be considered complete, folded hard copies and an electronic version of the site plan drawings, additional plans, studies and reports will be required in addition to a sketch plan in accordance with Ontario Regulation 545/06.

A sketch showing, in metric units:

a) the boundaries and dimensions of the subject land;

b) the location, size and type of all existing and proposed buildings and structures on the subject land, indicating their distance from the front lot line, rear lot line and side lot lines;

c) the approximate location of all natural and artificial features (*for example, buildings, railways, roads, watercourses, drainage ditches, banks of rivers or streams, wetlands, wooded areas, wells and septic tanks*) that,

   i. are located on the subject land and on land that is adjacent to it, and

   ii. in the applicant's opinion, may affect the application;

d) the current uses of land that is adjacent to the subject land;

e) the location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right of way;

f) if access to the subject land will be by water only, the location of the parking and docking facilities to be used; and

g) the location and nature of any easement affecting the subject land

The following additional plans, studies and reports, including but not limited to, **may** be required as part of a complete application submission:

- ☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)
- ☐ Cut and Fill Plan
- ☐ Erosion and Sediment Control Plan
- ☐ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)
- ☐ 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
- ☐ Agricultural Impact Assessment
- ☐ Geotechnical Study / Hydrogeological Review
- ☐ Minimum Distance Separation Calculations
- ☐ Noise or Vibration Study
- ☐ Record of Site Condition
- ☐ Stormwater Management Report
- ☐ Traffic Impact Study

The approval of the proposed development might be subject to additional federal or provincial legislation, municipal by-laws or other agency approvals.

Norfolk COUNTY

## I. Transfers, Easements and Postponement of Interest

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

## J. 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 purpose of making inspections associated with this application, during normal and reasonable working hours.

## K. 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 purpose of processing this application.

Ben Tiessen — Feb 12, 2026

Owner/Authorized Applicant Signature — Date

## L. Owner's Authorization

If the authorized 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 LIV (SIMCOE) GP INC. am/are the registered and authorized owner(s) of the lands that is the subject of this application.

I/We authorize The Biglieri Group c/o Rachelle Larocque 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 — Date

Ben Tiessen — Feb 12, 2026

Owner — Date

Norfolk COUNTY

**M. Declaration**

I, Rachelle Larocque of The Biglieri Group Ltd.

solemnly declare that:

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

Declared before me at:

Owner/Authorized Applicant Signature

In the City of Hamilton

This 13 day of February

A.D., 2026

Emily Marie Hill, a Commissioner, etc., Province of Ontario, for The Biglieri Group Ltd. and The Living Wall An Ecological Sound Barrier Solution Inc., Expires November 15, 2027.

# PLANNING RATIONALE REPORT

**Address**
227 Decou Road,
Town of Simcoe, Norfolk County

**Client**
LIV (Simcoe) GP Inc.

**Project No.** 25326

**Date** February.20.2026

Biglieri

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# 1. INTRODUCTION

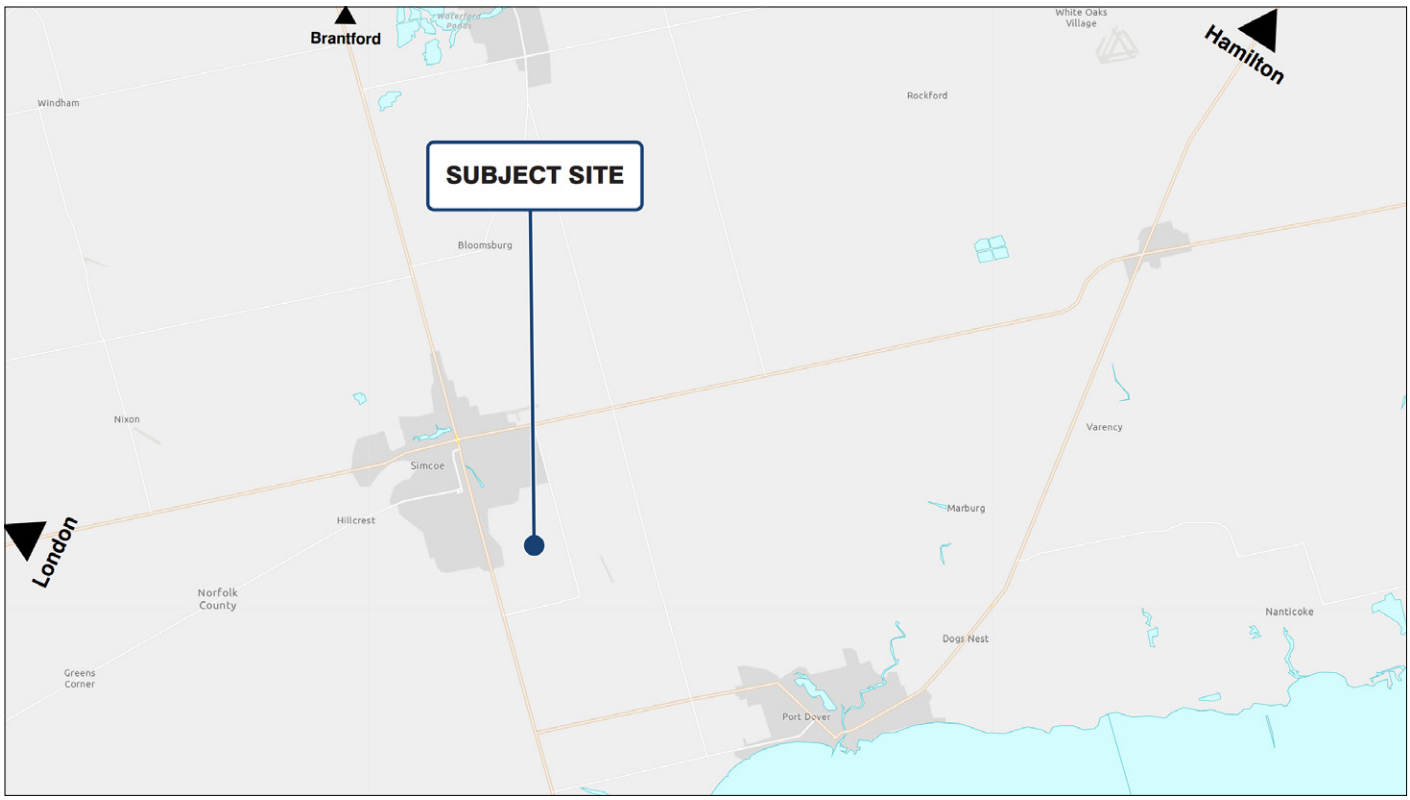
This Planning Rationale Report has been prepared in support of applications for Zoning By-law Amendment (ZBA) and Draft Plan of Subdivision (DPS) (the "Applications"). The Applications are being filed by LIV (Simcoe) GP Inc. (the "Owner" and "Applicant") to permit a low-rise residential subdivision consisting of single-detached residential units, street townhouse dwelling units, public parkland, a stormwater management pond, and public rights-of-way (the "Proposal") located at 227 Decou Road in the Town of Simcoe ("Subject Lands" or "Lands").

The Subject Lands are located on the north side of Decou Road, west of the intersection of Decou Road and Ireland Road. Access to the Subject Lands is provided via Decou Road to the south and Woodway Trail to the northeast. The Lands form an irregularly shaped parcel (see **Figure 1 – Location Map**) and are legally described as:

- PART LOTS 2 AND 3, CONCESSION 5 WOODHOUSE, COMPRISING PART 2, PLAN 37R11505 NORFOLK COUNTY

The Proposal seeks to establish a residential subdivision consisting of between 268 and 509 residential units, with a mix of single-detached and street townhouse dwellings. A Draft Plan of Subdivision was prepared as part of the Applications which reflects this unit range. A Conceptual Site Plan was also prepared, which presents a hypothetical development scenario of 125 single detached units and 279 street townhouse units, for a total of 404 units across the Subject Lands. The ultimate unit mix and count will be determined through a phased development approach based on future market and economic conditions. The Lands have a total area of 20.68 hectares, of which 11.35 hectares are proposed for residential development. The remainder of the Lands will accommodate public parkland, a stormwater management pond, public trail access, underground infrastructure and public roads.

Figure 1. **Locational Context Map**



This Planning Rationale Report evaluates the merits of the development proposal in the context of all applicable provincial and local policies. We conclude that the Proposal is consistent with the Provincial Planning Statement (2024) and conforms to the Norfolk County Official Plan (Consolidated to January 1, 2023).

In subsequent sections of this report, we describe the Lands and vision for development in detail. Then, the consistency with and conformity to relevant land use planning policies is discussed. Finally, land- and policy-based investigations that were undertaken as part of this planning exercise are summarized.

For the reasons presented throughout this Planning Rationale Report, it is our opinion that the proposal represents good planning, and we recommend the approval of the requested Zoning By-law Amendment and Draft Plan of Subdivision.

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# 2. SITE DESCRIPTION & LOCATION

2.1 The Subject Lands

2.2 Surrounding Area

2.3 Transportation Network

2.4 Community Service & Facilities

2.5 Emerging Development Context

## 2.1 The Subject Lands

The Subject Lands are located in the community of Simcoe in Norfolk County. The Lands are approximately 2 kilometres southeast of Simcoe's central area (**Figure 2 – Subject Site**) and are positioned at the southeast edge of the community's Urban Area Boundary. The lands are 20.68 hectares in size with frontage on Decou Road and Woodway Trail. The frontage along Decou Road is discontinuous due to the position of abutting properties, resulting in three distinct frontages of 26.25 metres, 74.83 metres and 145.50 metres, totalling 246.58 metres. The frontage on Woodway Trail is 20 metres. Topographically, there is substantial grade variation on the site, as the Lands slope toward the southwest. At present, the Lands do not contain any buildings or structures. They are used as agricultural cropland and are actively farmed. There is limited tree cover along the southern and south-western boundaries of the property.

Figure 2. **Aerial Context Map**



Figure 3. **Close-Up Aerial of the Subject Site**




Figure 4. **Photo of Site From Decou Road (A)**



Figure 5. **Photo of Site From Decou Road (B)**



Figure 6. **Photo of Site From Woodway Trail (A)**



Figure 7. **Photo of Site From Woodway Trail (B)**



### 2.1.1 Policy Context

The Subject Lands are situated within the Simcoe Urban Area per the Norfolk County Official Plan (May 9, 2006). They are designated *Urban Residential* and contain a *Designated Greenfield* overlay on OP Schedule B-15. The *Urban Residential* designation permits a variety of residential dwelling typologies in support of low- and medium-densities as well as neighbourhood facilities that are supportive of a residential environment. Policy 2.2.6.2 of the Norfolk County Official Plan encourages the efficient use of greenfield lands in urban areas. Decou Road is a *Collector Road* per Schedule E-2 of the OP. Schedule I-2 indicates that there is an *Existing Off-Road Trail* to the west of the Lands, and further, that there are additional trail routes considered throughout the Lands.

Norfolk County Zoning By-law 1-Z-2014 zones the subject site *(D) Development Zone,* permitting limited residential uses, and *(MG(H)) General Industrial*, permitting limited industrial land uses. A Zoning By-law Amendment is required to bring the Subject Lands into conformity with the Norfolk County Official Plan land use designations and to enable the Proposal.

Figure 8. **Community Structure – Schedule A-1 of the Norfolk County Official Plan**

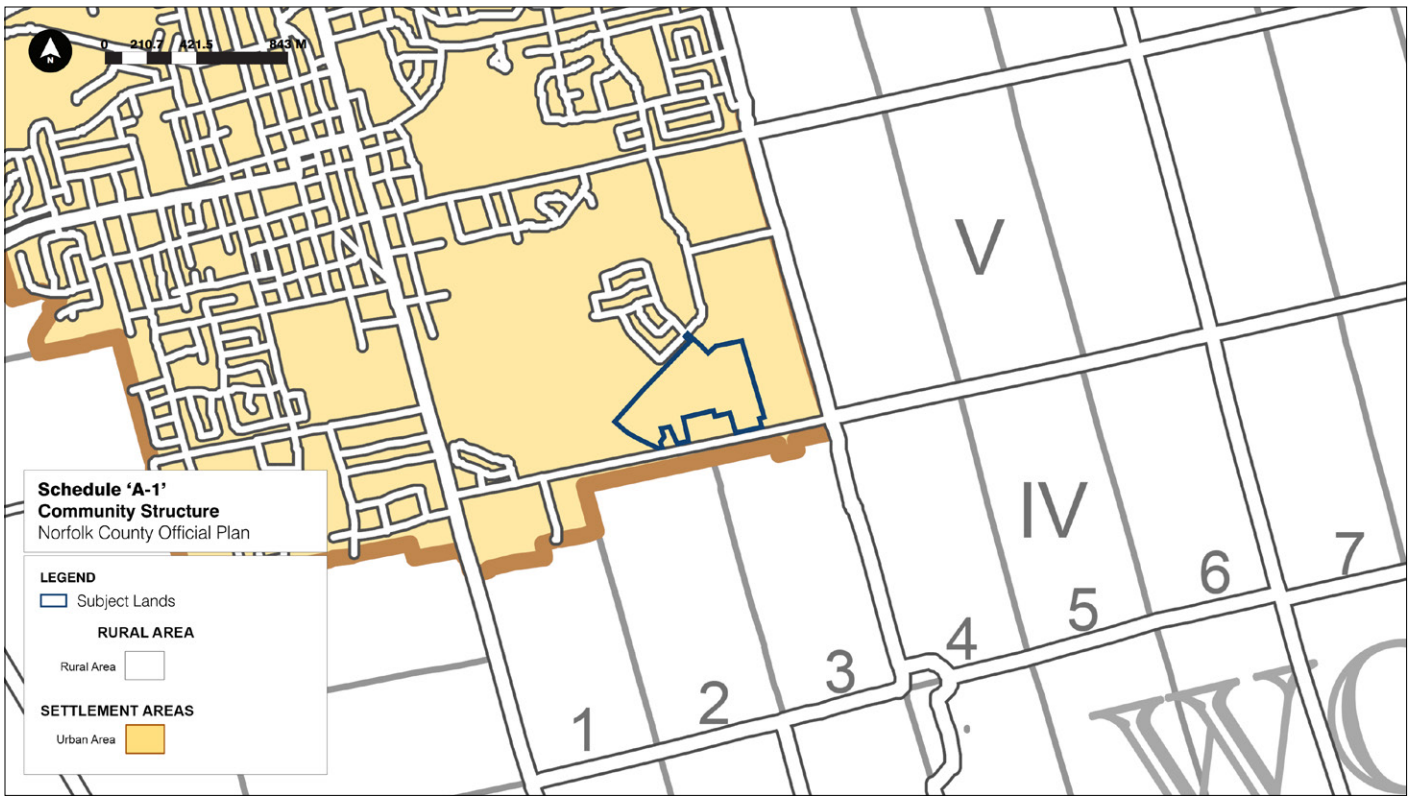


Figure 9. **Land Use – Schedule B-15 of the Norfolk County Official Plan**

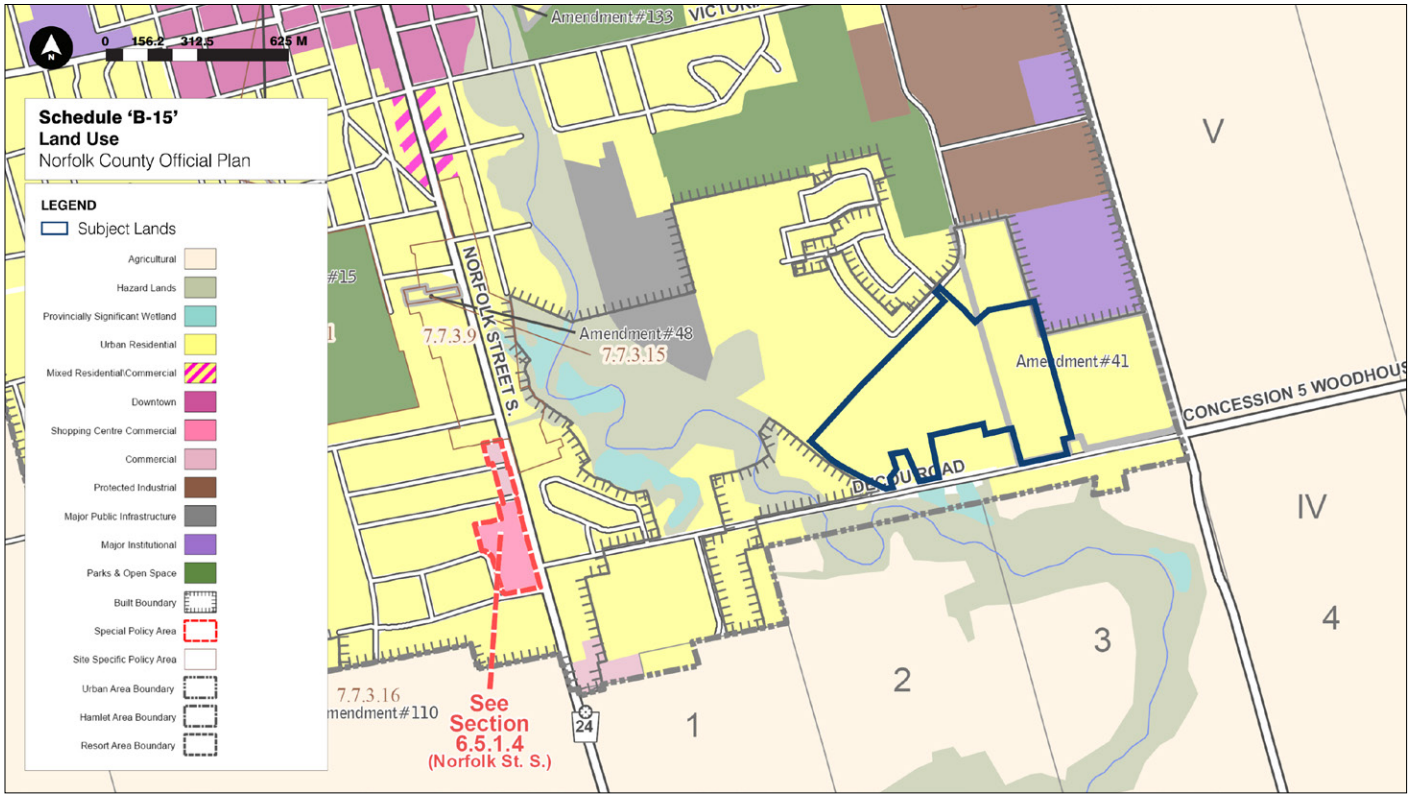
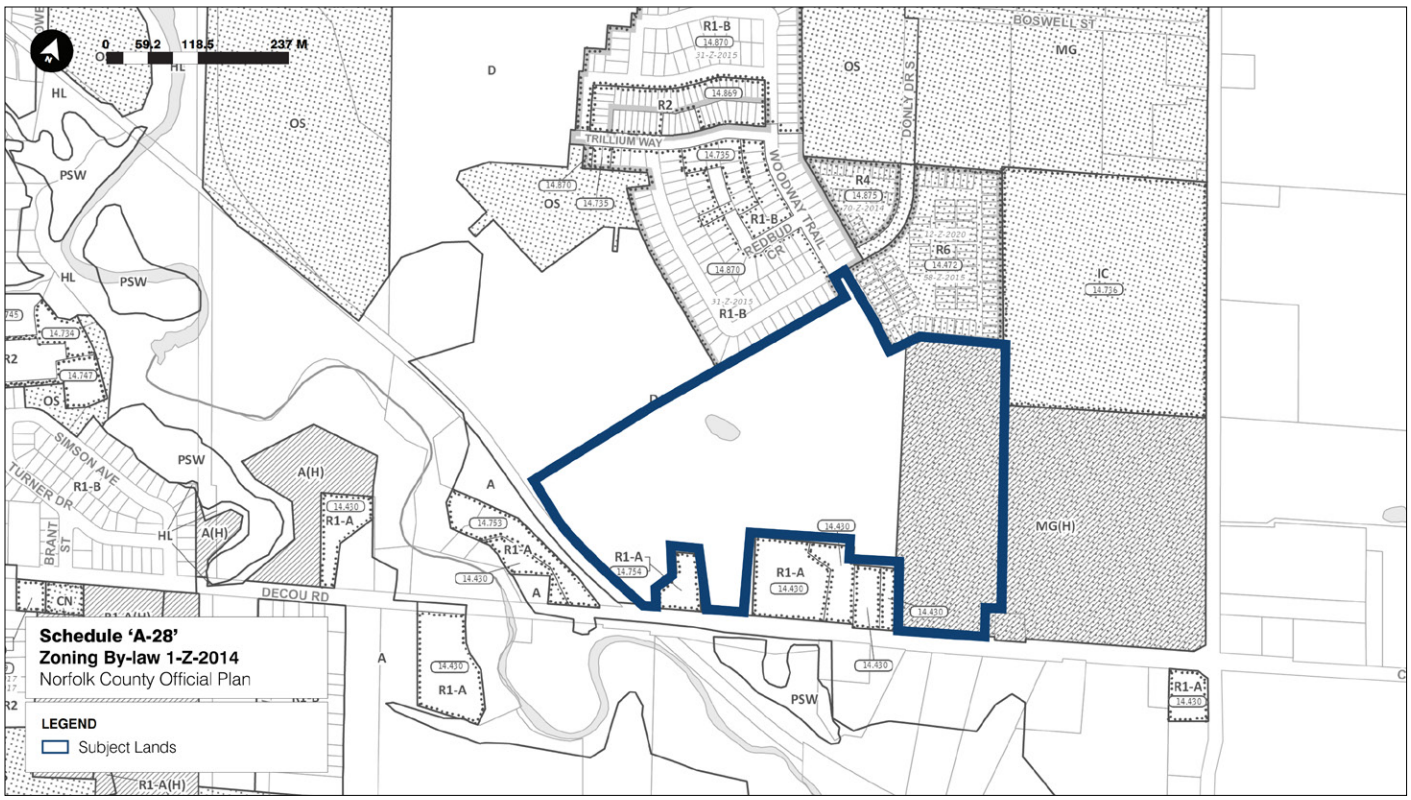



Figure 10. **Zoning – Schedule A-28 of Zoning By-law 1-Z-2014**



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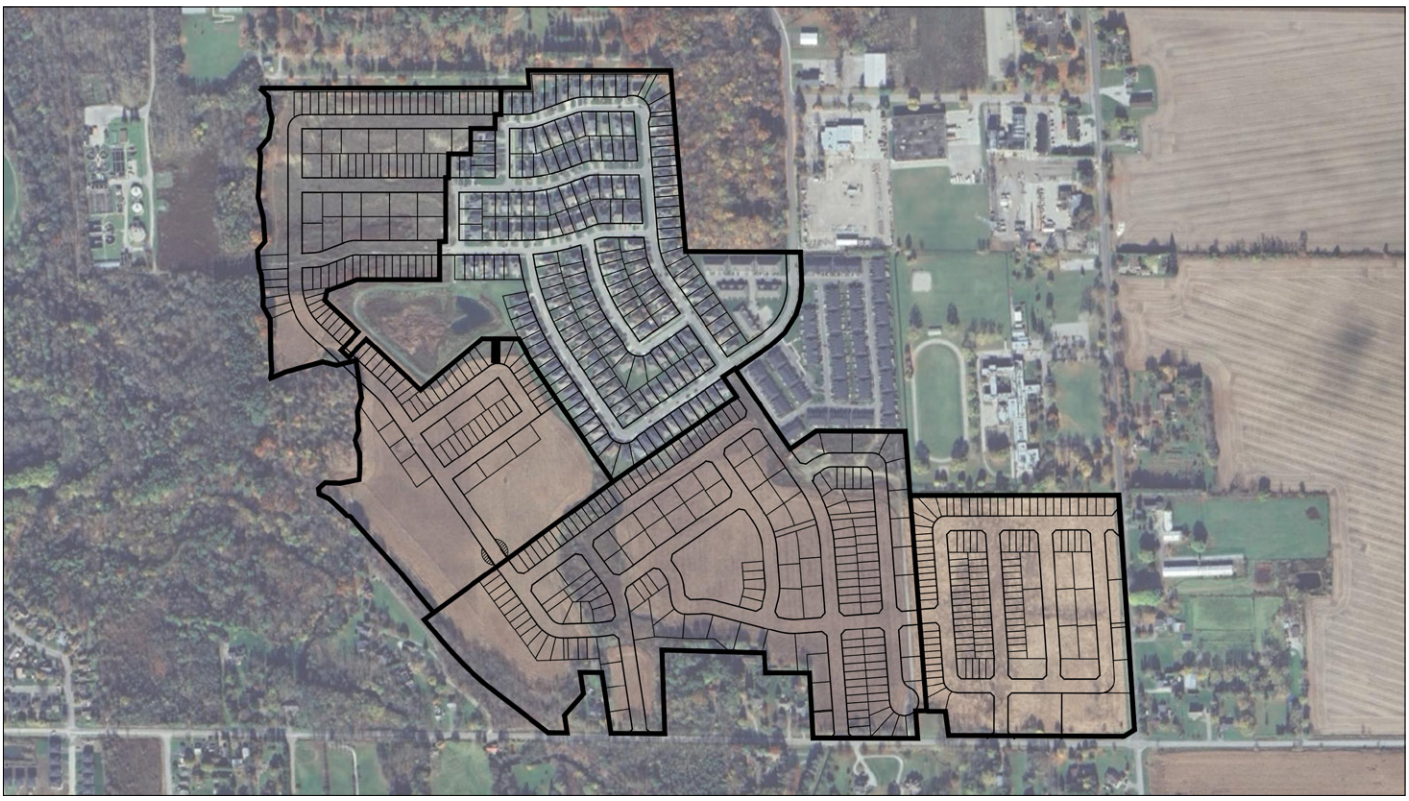
## 2.2 Surrounding Area

The Subject Lands are located at the interface of a future residential subdivision to the northwest and east. Land uses to the north, east and west are generally characterized by residential, natural heritage and institutional uses. Land uses to the south are generally characterized by estate residential, agricultural and natural heritage uses. The Simcoe Urban Area Boundary is located south of Decou Road. The following text offers a detailed description of surrounding land uses.

Figure 11. **Composite Aerial Context Map**



**North**: There is an existing residential subdivision located directly north of the Subject Lands. The northern property line abuts this subdivision, as well as future phases which are currently going through the approvals process (Woodways Trail Plan of Subdivision). Residential uses to the north consist of single-detached, semi-detached, and condominium townhouse dwelling units. Further north is the Norfolk Oakwood Cemetery, Fanshawe College - Simcoe/ Norfolk Regional Campus, and industrial land uses.

Figure 12. **North Photo: Subdivision Streetscape**



Figure 13. **North Photo: Subdivision Streetscape**



Figure 14. **North Photo: Subdivision Shared Property Line**



Figure 15. **North Photo: Condominium Townhouses**



**East**: The lands directly to the east currently contain agricultural cropland and are draft approved to accommodate a residential subdivision consisting of single-detached dwellings, street townhouses, and condominium semi-detached and townhouse units. Further east is Ireland Road, an arterial road. The Subject Lands also borders Sprucedale Youth Centre, an institution for youth referred through the Ontario Courts system for corrections and rehabilitation.

Figure 16. **East Photo: Agricultural Cropland**



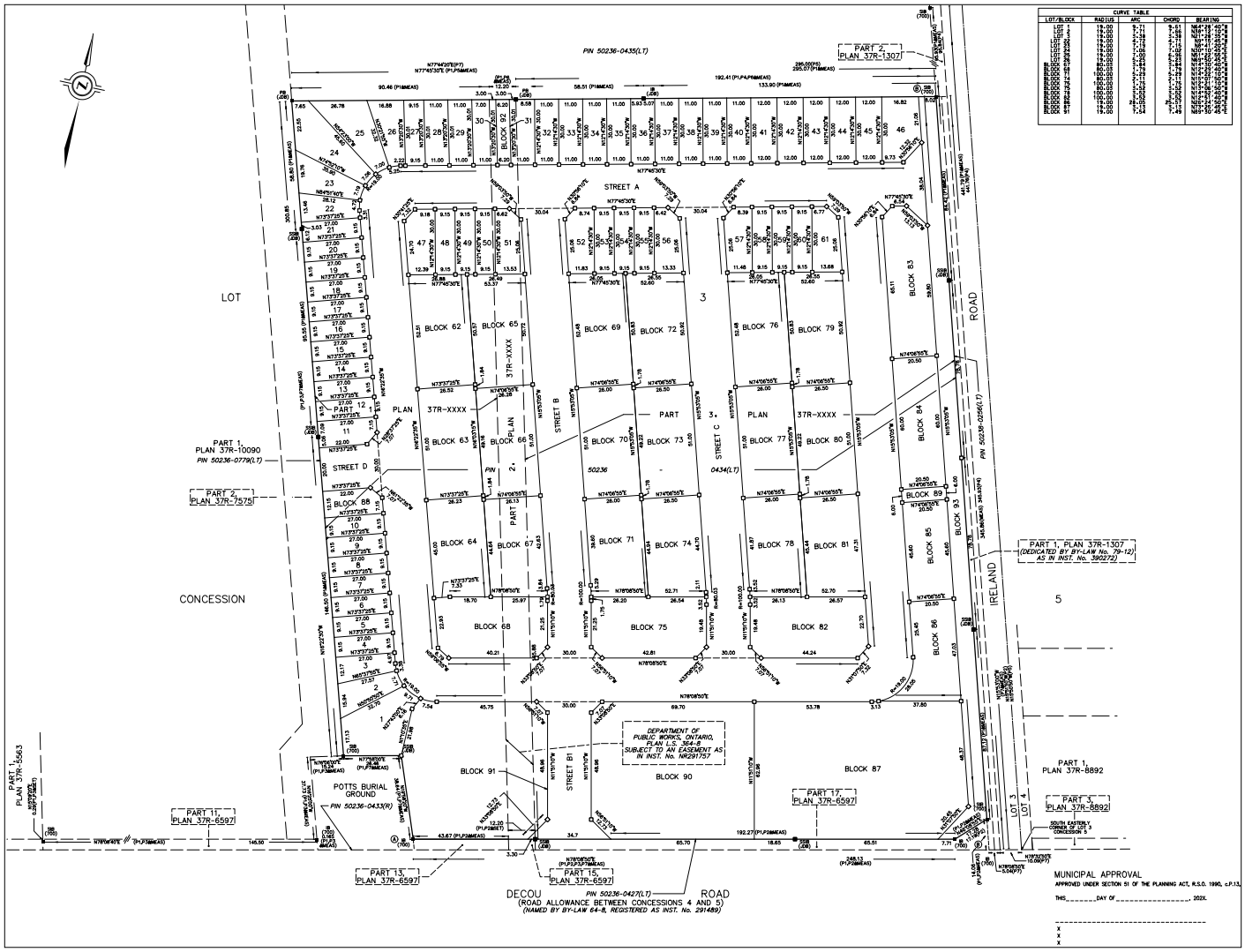
Figure 17. **East Photo: Sprucedale Youth Centre (Front)**



Figure 18. **East Photo: Sprucedale Youth Centre (Fence)**



Figure 19. **Calibrex M-Plan to the East**



**South:** Directly south of the Subject Lands are various estate residential properties fronting Decou Road on its north and south sides. There is also Potts Burial Ground Cemetery. Further south are provincially significant wetlands, woodlands and agricultural cropland. The Simcoe Urban Area Boundary is south of estate residential lots fronting on the south side of Decou Road.

Figure 20. **South Photo: Potts Burial Ground Cemetery**



Figure 21. **South Photo: Estate Residential (North Side of Decou)**



Figure 22. **South Photo: Estate Residential (South Side of Decou)**



Figure 23. **South Photo: Estate Residential (South Side of Decou)**



**West**: Immediately west of the Subject Lands are woodlands, Lynn Valley Creek Trail, woodlands, and some estate residential properties. Further west is the Brook Conservation Area which includes provincially significant wetlands and hazard lands. The existing wastewater treatment plant is also located to the west on the opposite side of the Lynn Valley Creek. There are residential subdivisions further west.

Figure 24. **West Photo: Estate Residential (North Side of Decou)**



Figure 25. **West Photo: Woodlands**



Figure 26. **West Photo: Woodlands**



Figure 27. **West Photo: Lynn Valley Trail**



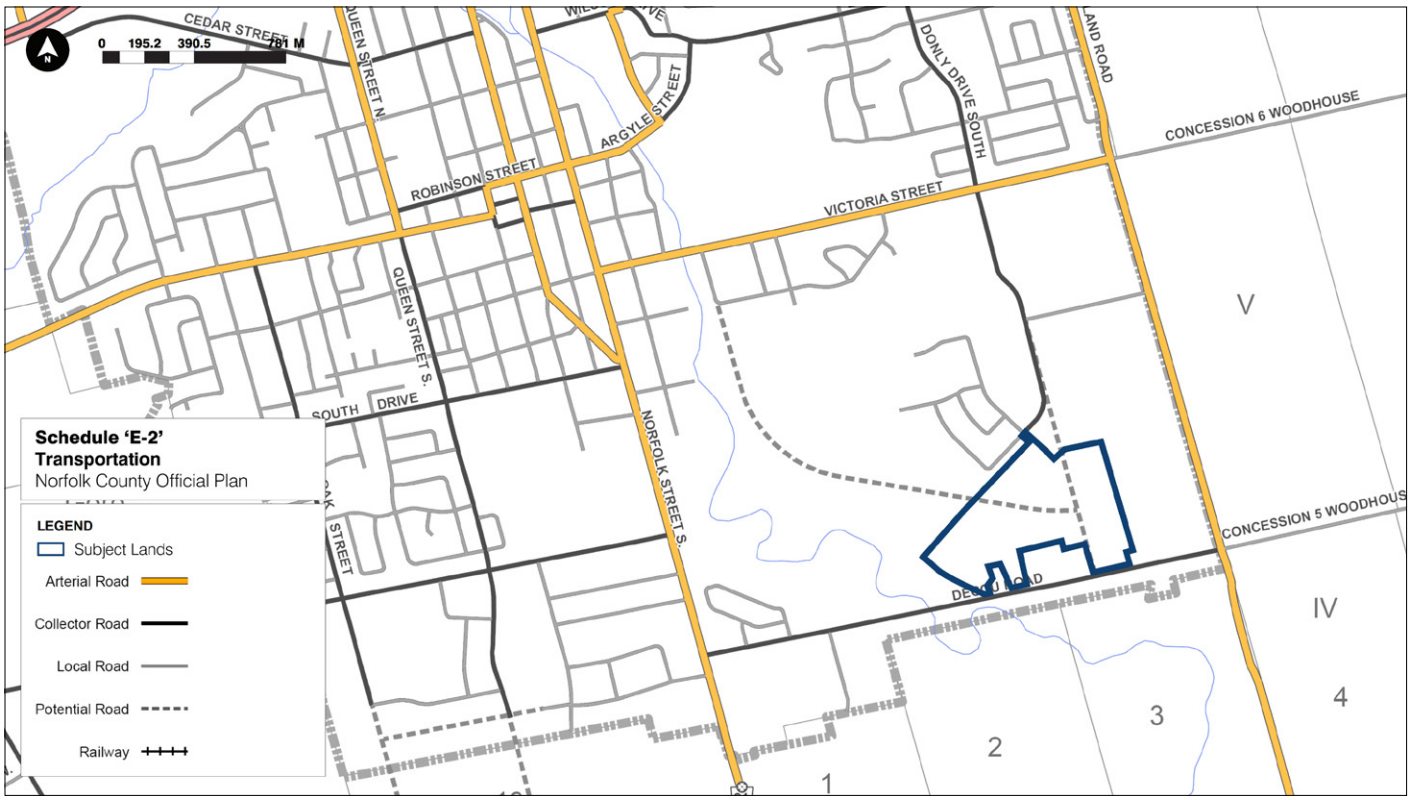
## 2.3 Transportation Network

### 2.3.1 Road Network

The Subject Lands have direct frontage onto Decou Road to the south which is classified as a Collector Road in the OP. Access will be provided to Woodway Trail, a local road, to the northwest, as well as a future Woodway Trail connection when the future phases of the Woodways Trail Subdivision is registered. The Lands have nearby access to Provincial Highway 24 (Norfolk Street) via Decou Road, which is a major north-south artery within the community of Simcoe. Highway 24 provides access to the City of Brantford to the north, and communities along the Lake Erie shore to the south.

Access to Provincial Highway 3 (Queensway) is provided via Ireland Road to the east of the Subject Lands. Highway 3 is the major east-west connection within the community of Simcoe. It provides connectivity to Haldimand County, Niagara Region, and the Canada-United States Border at Fort Erie to the east. It provides connections to Delhi, Tillsonburg, and Highway 401 to the west.

Figure 28. **Transportation – Schedule E-2 of the Norfolk County Official Plan**



### 2.3.2 Active Transportation

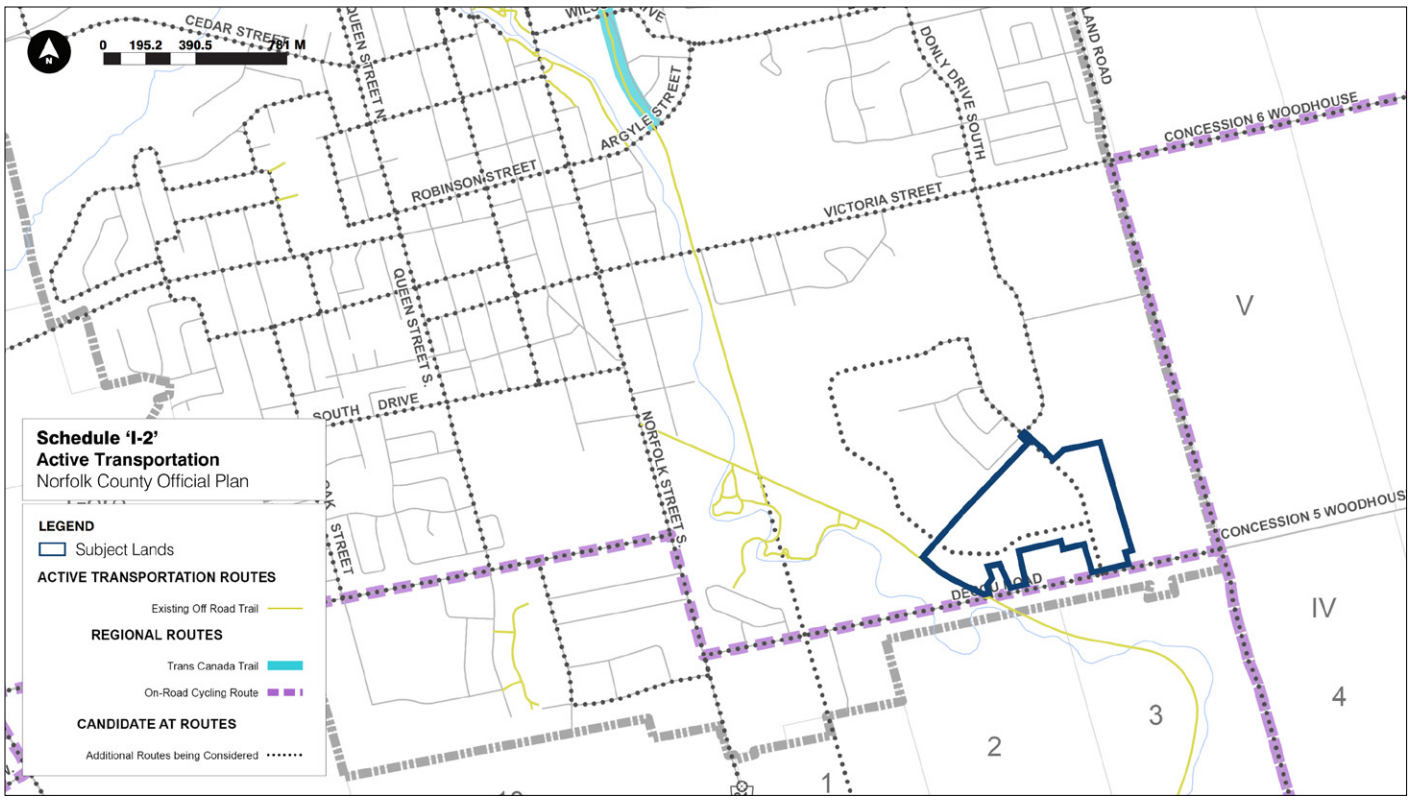
Given the rural context, there are minimal existing active transportation options for accessing the Subject Lands and within the Town of Simcoe itself. An On-Road Cycling Route is noted on Schedule 1-2 of the Official Plan along Decou Road adjacent to the Subject Lands. East of the Subject Lands, this On-Road Cycling Route continues in a north-south direction along Ireland Road. West of the Subject Lands, the route continues in an east-west direction along Evergreen Hill Road. Despite this designation, there have been no upgrades to Decou Road to construct on-road bike lanes or sidewalks. It is assumed that at some point in the future the County will consider upgrades to their active transportation facilities to provide pedestrian and cyclist connections. Sidewalk connections to Woodway Trail to the north will be created through this development and there are currently sidewalks in the built-out areas.

The proposal will create pedestrian connectivity to the north. Sidewalk connections will be created to the proposed subdivision to the east to fully connect the neighbourhood on a pedestrian level.

The Lynn Valley Trail, an Off-Road Walking Trail that follows the route of the former CNR rail line, crosses Decou Road at the western property line of the Subject Lands. This trail provides pedestrian access to Norfolk Street South to the west, Victoria Street to the north, and Downtown Simcoe to the northwest. The Lynn Valley Trail is approximately 10 kilometres in length, primarily travelling in a northwest-southeast direction providing pedestrian and cycling access between the Town of Simcoe and the Town of Port Dover. The trail is primarily comprised of crushed stone but contains paved portions from Decou Road travelling west to Norfolk Street South as well as north to Argyle Street and downtown Simcoe.

This trail connects to the Norfolk Sunrise Trail and Waterford Heritage Trail in the north, providing a

Figure 29. **Active Transportation – Schedule I-2 of the Norfolk County Official Plan.**



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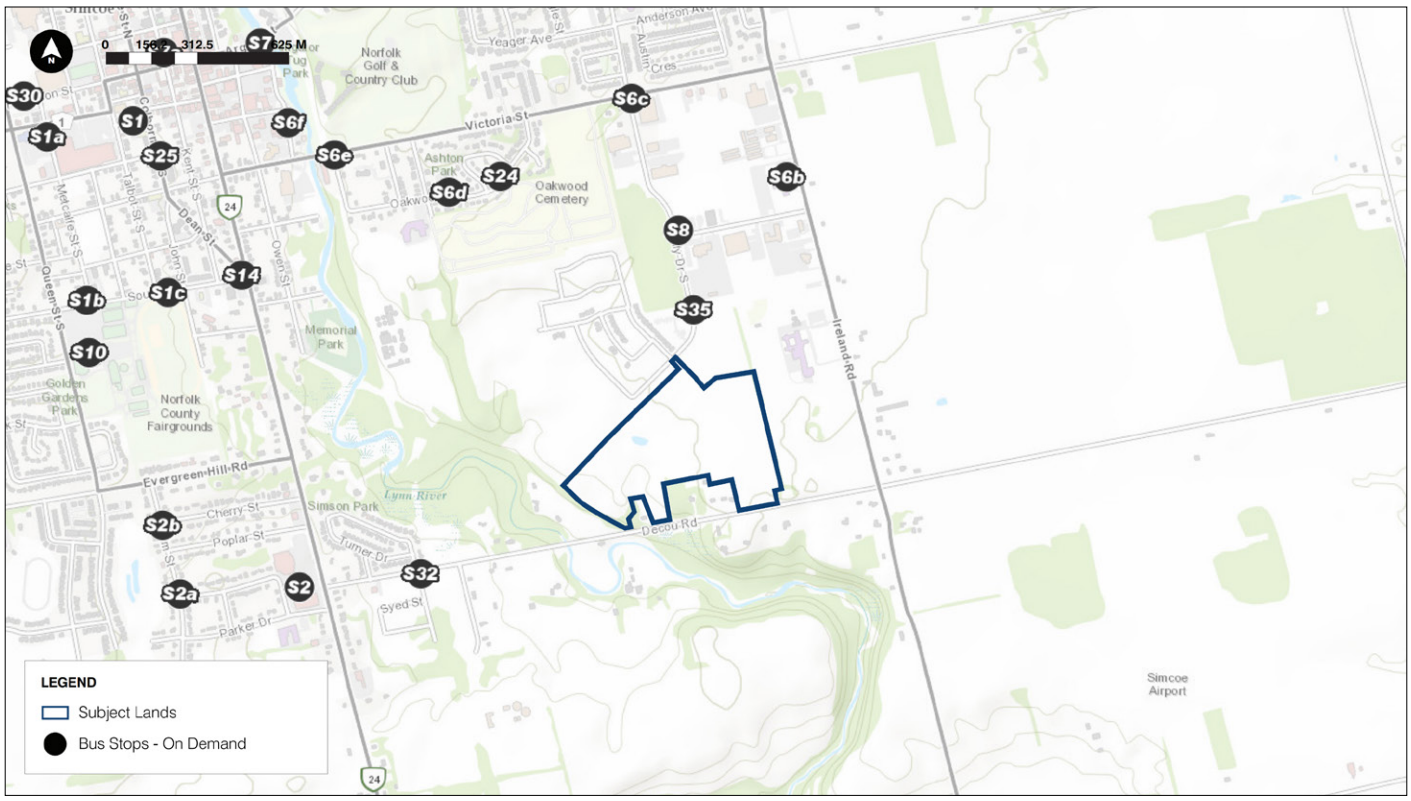
pedestrian and cycling connection between the Town of Simcoe and the Town of Waterford, before continuing further north beyond the Norfolk County limits. The Norfolk Sunrise Trail forms part of the Trans Canada Trail Network.

### 2.3.3 Public Transit Network

Norfolk County operates the "Ride Norfolk" service, which is an on-demand transit service, operating across Norfolk County from Monday to Friday, 7:30 a.m. to 6:00 p.m. Riders can request trips through a mobile app, website, or via phone. Riders select their pick-up point and destination from available bus stops on a first-come, first-serve basis. The nearest Ride Norfolk stop to the Subject Lands is located approximately 300 metres north of the Subject Lands, along Donly Drive South. Another Ride Norfolk stop is located 700 metres west of the Subject Lands, at the intersection of Decou Road and Simson Avenue.

Ride Norfolk has one fixed-route service with scheduled pick-up and drop-off times, providing service between Simcoe and Brantford. This route also has stops in Waterford, Wilsonville, Brant, and Mount Pleasant. Two routes are scheduled per day, departing from Simcoe Public Library at 9:15 a.m. and 3:20 p.m. and arriving at the Brantford Bus Terminal at 10:05 a.m. and 4:10 p.m. respectively, totalling an approximate trip length of 50-minutes. Service from the Brantford Bus Terminal departs at 10:28 a.m. and 4:30 p.m. and arrives at the Simcoe Public Library at approximately 11:13 a.m. and 5:20 p.m.

Figure 30. **Norfolk County Transit Stops**



## 2.4 Community Service & Facilities

The Subject Lands are located near several public service facilities located in the Simcoe (**Figure 31 – Community Services & Facilities**). These facilities are outlined in the following table.

Figure 31. **Community Services & Facilities**

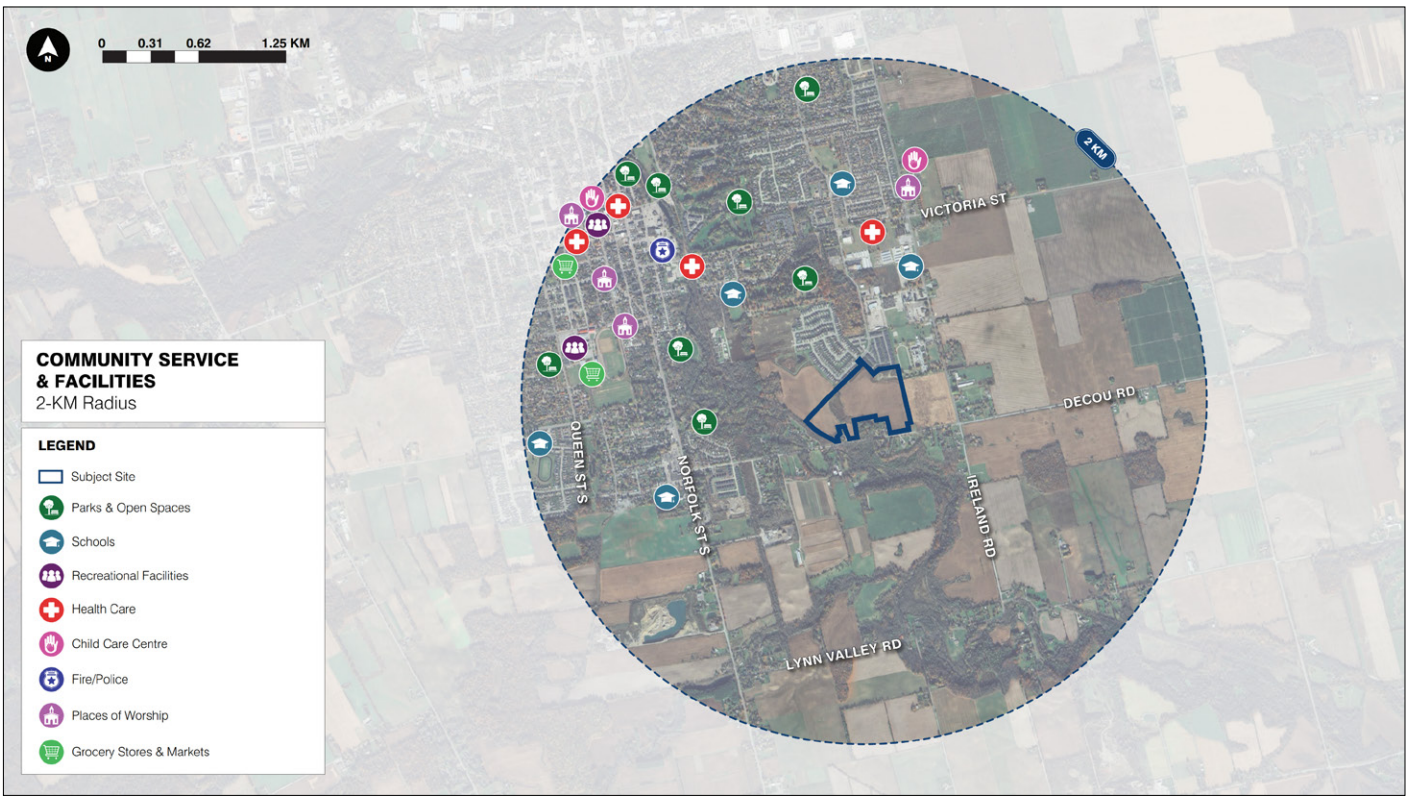





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Table 1. **Services and Facilities**

| Service/Facility Name | Radius |
|---|---|
| Public Transit | |
| Ride Norfolk Stop S35 | 300 m north |
| Ride Norfolk Stop S32 | 700 m west |
| Elementary Schools | |
| Saint Joseph's School | 1,000 m northwest |
| West Lynn Public School | 1,200 m west |
| Lynndale Heights Public School | 1,200 m north |
| Secondary Schools | |
| Holy Trinity Catholic High School | 2,000 m west |
| Post-Secondary Schools | |
| Fanshawe College – Simcoe/Norfolk Regional Campus | 800 m northeast |
| Parks | |
| Norfolk Oakwood Cemetery | 750 m north |
| Brook Conservation Area | 850 m west |
| Simcoe Memorial Park | 1,000 m northwest |
| Norfolk Golf Club | 1,100 m northwest |
| Lynn Valley Trail / Norfolk Sunrise Trail – Trailhead | 1,700 m northwest |
| Golden Gardens Park | 1,800 m west |
| Crestlynn Park | 1,900 m north |
| Briarwood Acres Park | 2,000 m northwest |
| Lynnwood Park | 2,000 m northwest |
| Recreational Facilities | |
| Annaleise Carr Aquatic Centre | 1,800 m west |
| Simcoe Recreation Centre | 1,800 m west |
| Norfolk County Public Library – Simcoe Branch | 2,000 m northwest |
| Grocery Stores and Markets | |
| Sobeys | 1,100 m west |
| Fielder's Deli | 1,100 m west |
| Simcoe Farmers' Market | 1,600 m west |
| Food Basics | 1,900 m northwest |
| Giant Tiger | 2,000 m northwest |
| Walmart | 2,000 m north |
| Health Care | |
| Victoria Health Chiropractor Centre | 1,000 m north |
| CarePartners Home Nursing Care | 1,300 m northwest |
| ParaMed Home Health Care | 2,000 m northwest |
| CBI Home Health Care | 2,000 m northwest |
| Norfolk Family Health Team – Simcoe Office | 2,200 m northwest |

| | |
|---|---|
| Norfolk General Hospital | 2,400 m northwest |
| **Child Care Centres** | |
| Calvary Daycare Centre | 1,400 m northeast |
| Haldimand Norfolk Reach – EarlyON Child Care Centre | 2,000 m northwest |
| **First Responder Centres** | |
| Norfolk County Paramedic Services | 1,500 m northwest |
| Norfolk County Station 1 | 1,500 m northwest |
| **Places of Worship** | |
| Calvary Pentecostal Church Simcoe | 1,300 m north |
| Simcoe Seventh-Day Adventist Church | 1,500 m northwest |
| St. James United Church | 1,700 m northwest |
| St Paul's Presbyterian Church | 2,000 m northwest |

## 2.5 Emerging Development Context

The Subject Lands are located at the interface of a future residential subdivision to the northwest and east. The Plan of Subdivision to the northeast – the Woodway Trails Subdivision – proposes single, semi-detached, street townhouse, condominium townhouse and mid-rise residential typologies, public roads, and a stormwater management pond. The development area is 20.68 hectares in size. The Proposal has been designed to connect with the Woodway Trails Subdivision, ensuring logical connections of public streets and civil services. The Proposal will provide the Woodway Trails Subdivision with vehicle and pedestrian access to Decou Road. This plan has not yet been given Draft Plan of Subdivision approval at the time of writing this report, however, the subject proposal has assumed that the plan submitted is the final design for road and servicing connections.

The Plan of Subdivision to the east – the Calibrex Lands – has received Draft Plan of Subdivision Approval from Norfolk County. The proposed development consists of single detached, street townhouse, and condominium townhouse residential units, as well as public roads and civil infrastructure. The Proposal has been designed to connect with the Calibrex Lands, ensuring logical connections for public streets and services.

This Proposal includes a centrally located 1.05-hectare public park. This park will be accessible to future residents on the Subject Lands, as well as the Woodway Trails Subdivision and the Calibrex Lands. In total, the three development areas represent substantial residential growth in this area of Simcoe.

# 3. DEVELOPMENT PROPOSAL

**3.1 Description of the Proposed Development**

**3.2 Required Approvals**

## 3.1 Description of the Proposed Development

The Proposal seeks to establish a residential subdivision consisting of between 268 and 509 residential units at final build-out. The final unit range and type will be determined on a phase-by-phase basis in consultation with the County. The Proposal includes a range of unit types and sizes. Single-detached dwellings are proposed on lot sizes with frontages of 11.0-metres and 12.2-metres. Street townhouses are proposed with 6.1-metre frontages. At full build-out, the subdivision is estimated to accommodate a population of between 645 and 1,220 people. The Proposal will be constructed in phases. Through this phased development approach, the unit count will be clarified, and efforts will be made to deliver a mix of single-detached dwellings and street townhouses consistently throughout the phasing plan.

The Proposal will introduce two vehicular access points to Decou Road: one on the east side of the development area, and one to the west. Both rights-of-way will provide connectivity to the existing and proposed subdivisions to the north, northwest and east. The existing Woodway Trail right-of-way to the north, will be extended through the Subject Lands, and will provide the two connection points to Decou Road. The future Woodway Trail to the northwest of the Lands will also be extended through the development area. Public sidewalks will be introduced throughout, offering pedestrian connectivity. The Proposal includes nine public streets. One street provides an east-west connection to the Calibrex Lands to the east.

A public park is proposed centrally within the development area and is 1.05-hectares in size. This represents 6% of the total land area. The park is positioned equidistant to the existing residential subdivision to the north, and the proposed residential subdivisions to the northwest and east (Woodway Trails and Calibrex Lands), ensuring neighbouring residential areas will have sufficient access to parkland at full build-out.

A 1.16-hectare stormwater management pond is included at the southwest corner of the Lands; an area of lowest topography. Access to public trails will be contemplated throughout the detailed design process, and may be included around the stormwater management pond. Municipal servicing, including water and sanitary sewers, will be introduced throughout, and will connect to adjacent developments areas. It is anticipated that the area surrounding the stormwater management pond and western extension of Woodway Trail will be the first phase for development.

The Owner and their representatives met with Norfolk County staff and representatives of Six Nations of the Grand River on November 12, 2025 for a Pre-Application Consultation meeting, during which time a high-level concept of the Proposal was discussed, and preliminary feedback was received. This meeting informed a revised Proposal which is included as part of this application.

Figure 32. **Conceptual Site Plan**

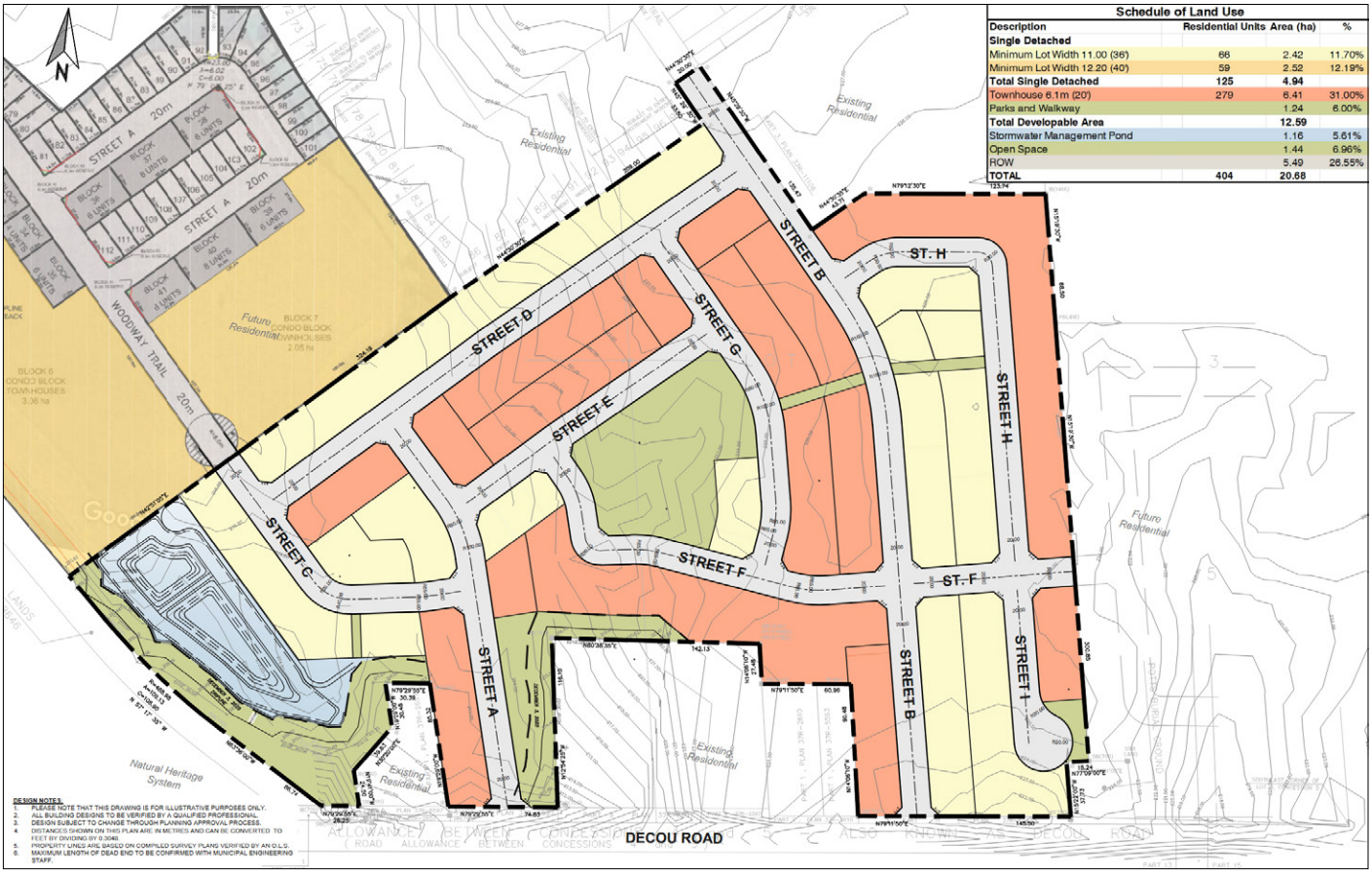


Table 2. **Site Statistics**

| | |
|---|---|
| Residential Units | 268-509 units |
| Unit Typologies | Single-detached and street townhouses |
| Right of Way Widths | 20 metres |
| Rights of Way | 5.49 hectares |
| Public Parkland | 1.05 hectares |
| Public Walkway | 0.12 hectares |
| Stormwater Management Pond | 1.16 hectares |
| Natural Heritage System | 1.44 hectares |

## 3.2 Required Approvals

Applications for Zoning By-law Amendment (ZBA) and Draft Plan of Subdivision are required to facilitate the Proposal. A ZBA will rezone the Subject Lands from *(D) Development Zone* and *(MG(H)) General Industrial* to an appropriate residential zone to enable residential land uses and bring zoning into conformity with the *Urban Residential* Official Plan Designation. A Draft Plan of Subdivision will establish lots, blocks, parks, stormwater ponds, and rights-of-way.

# 4. POLICY CONTEXT

4.1 Overview

4.2 Planning Act (1990)

4.3 Provincial Planning Statement (2024)

4.4 Norfolk County Official Plan (2006/2008)

4.5 Comprehensive Zoning By-law 1-Z-2014

4.6 Supporting Documentation

## 4.1 Overview

The Norfolk County Official Plan (May 9, 2006) indicates that the community of Simcoe is an *Urban Area* on Schedule A-1. The Subject Lands are positioned within Simcoe's Urban Area Boundary on Schedule A. Furthermore, the site is designated *Urban Residential* (B-15), which permits a variety of urban residential dwelling types reflective of low and medium density typologies. The Lands also contain a *Designated Greenfield* overlay (B-15). Decou Road is indicated as a *Collector Road* (E-2), and there are a handful of *Existing off-road trails* (I-2) directly adjacent to the subject site to the west/southwest.

The Norfolk County Zoning By-law 1-Z-2014 (July 14, 2014) zones the Lands *(D) Development Zone,* permitting limited residential uses, and *(MG(H)) General Industrial*, permitting limited industrial land uses.

## 4.2 Planning Act (1990)

The Planning Act, R.S.O. 1990, c. P.13 (the "Planning Act) is the primary piece of legislation that governs land use planning in Ontario. It provides the legal foundation for how land can be used, developed, and protected, and ensures that planning decisions are made in a way that promotes orderly growth, environmental sustainability, and the public interest.

### 4.2.1 Provincial Interest

Section 2 of the Planning Act outlines the matters of provincial interest for which the council of a municipality, a local board, a planning board and the Tribunal shall have regard in carrying out their responsibilities pursuant to the legislation. Matters of provincial interest include, among others:

- the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems;
- the orderly development of safe and healthy communities;
- the adequate provision of a full range of housing, including affordable housing;
- the adequate provision of employment opportunities;
- the appropriate location of growth and development;
- the promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians;
- the promotion of built form that is well designed encourages a sense of place and provides for public spaces that are of high quality, safe, accessible, attractive and vibrant; and
- the mitigation of greenhouse gas emissions and adaptation to a changing climate.

Section 2.1(1) requires that when approval authorities make a decision under subsection 17(34) of the Planning Act or the Tribunal makes a decision in respect of an appeal, it shall have regard to:

> *(a) any decision that is made under this Act by a municipal council or by an approval authority and relates to the same planning matter; and*
>
> *(b) any information and material that the municipal council or approval authority considered in making the decision described in clause (a).*

Accordingly, we have set out the criteria for evaluating development applications for which decision-makers must have regard when carrying out their planning responsibilities (Section 2 of the Planning Act), and have provided a response to each criterion in the following table:

Table 3. **Section 2 Planning Act Criteria & Responses**

| Criteria Section 2 of the Planning Act | Responses |
|---|---|
| (a) the protection of ecological systems, including natural areas, features and functions; | The Proposal will protect ecological systems, including the existing natural heritage system on and adjacent to the Subject Lands. An Environmental Impact Study prepared by GeoProcess Research Associates is included as part of the Application package. In collaboration with Norfolk County and Long Point Conservation Authority, a site staking exercise was undertaken along the western portion of the Lands to determine limits of the existing woodland. This established the developable area, from which setbacks are applied to environmental features. No natural heritage features were identified on the subject site. More information is available in GeoProcess' report. |
| (b) the protection of the agricultural resources of the Province; | The Subject Lands are designated for *Urban Residential* land uses and as a *Designated Greenfield Area*. As such, Norfolk County has identified the Lands as a priority location for Simcoe's growth. Existing agricultural activities are an interim land use. |
| (c) the conservation and management of natural resources and the mineral resource base; | Schedule J-5 of the Official Plan identifies that there are buried aggregate resources, however, the proximity to the existing residential lands and the location within the Urban Boundary of Simcoe does not make their extraction feasible or practical. |
| (d) the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest; | A Stage 1-3 Archaeological Assessment prepared by Mayer Heritage Consultants Inc., dated November 2008, has been completed for the Subject Lands and are included within the Application package. A Stage 4 Archaeological Assessment is underway and will be submitted to Norfolk County and Six Nations of the Grand River as part of the clearance of conditions process. |

| | |
|---|---|
| (e) the supply, efficient use and conservation of energy and water; | The Proposal will be serviced by the community of Simcoe's existing municipal water and sanitary system which will be further extended along Decou Road and the western extension of Woodway Trail. A Functional Servicing Report prepared by SLA Consulting Engineers ("SLA") is enclosed within this Application package. It outlines the proposed site servicing approach and demonstrates servicing capacity in this area. |
| (f) the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems; | As noted above, the Proposal will be serviced by the community of Simcoe's existing municipal water and sanitary system which will be further extended along Decou Road and the western extension of Woodway Trail. A Functional Servicing Report prepared by SLA is enclosed within this Application package. It outlines the proposed site servicing approach and demonstrates servicing capacity in this area. Waste management will be managed by Norfolk County following full-build out and occupancy. |
| (g) the minimization of waste; | The Proposal aims to minimize excess waste through site preparation and construction. Excessive waste is not anticipated following full build-out and measures will be implemented through the construction process to minimize waste produced. |
| (h) the orderly development of safe and healthy communities; | The Subject Lands are located within the Urban Area Boundary of the community of Simcoe, are designated *Urban Residential* and *Designated Greenfield Area.* Adjacent lands are under development. The Proposal represents orderly development within the area, contributing to a connected and cohesive community. Notably, the Proposal contributes public road and sidewalk connections to adjacent development areas. |
| (h.1) the accessibility for persons with disabilities to all facilities, services and matters to which this Act applies; | Public sidewalks and walkways will be constructed to municipal standards for accessibility. Any interior accessibility requirements will be at the discretion of the future homeowners. |
| (i) the adequate provision and distribution of educational, health, social, cultural and recreational facilities; | As noted in section 2.4 of this report, the community of Simcoe is well served by educational, health, social, cultural, and recreational facilities, from which future residents on the Subject Lands will benefit. The proposed development will include connections to trails as well as a central park to serve the immediate neighbourhood. The local school boards were contacted to confirm if a school site was required to be incorporated into the development plan. No request for a school site was made, however, an ongoing review of capacity is being completed. |
| (j) the adequate provision of a full range of housing, including affordable housing; | The Proposal will include a range of residential unit sizes, including single-detached and street townhouse dwellings. Affordable housing is not contemplated as part of the Proposal at this time. |
| (k) the adequate provision of employment opportunities; | The Subject Lands are designated for residential land uses in the Norfolk County Official Plan. Development and construction may spur employment opportunities as the Proposal is built-out. It is anticipated the Proposal will support future residents who work remotely. |

| | |
|---|---|
| (l) the protection of the financial and economic well-being of the Province and its municipalities; | The cost of providing services required to enable the Proposal, including its construction, will be borne by the developer. As such, the Proposal will not negatively impact the financial wellbeing of Norfolk County, and will increase revenue via development charges and future property taxes that will be generated. |
| (m) the co-ordination of planning activities of public bodies; | Pre-Application Consultation comments from Norfolk County, the Long Point Region Conservation Authority (LPRCA), Six Nations of the Grand River, and other relevant agencies and public bodies have been taken into account and appropriately addressed. |
| (n) the resolution of planning conflicts involving public and private interests; | Any public comments pertaining to the proposed development will be addressed appropriately. |
| (o) the protection of public health and safety; | The Proposal has been designed to protect public health and safety. Appropriate buffer areas are applied to the natural heritage system. All construction-related activities will comply with all applicable laws and safety guidelines. |
| (p) the appropriate location of growth and development; | The Proposal is appropriately located to accommodate residential growth in Simcoe. The Subject Lands are designated *Urban Residential* with a *Designated Greenfield* overlay in the OP, reflecting the appropriateness of residential uses in this context. Furthermore, the Proposal connects to existing and future residential developments to the north, northwest and east. |
| (q) the promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians; | The Proposal includes sidewalks throughout in support of pedestrian connectivity within the subdivision. Future residents may benefit from Norfolk County's on-demand transit service. Broader growth in this area of Simcoe may warrant a more fulsome public transit service provision in the future should Norfolk County wish to offer it. Proposed dwellings will be designed consistent with Ontario Building Code standards for sustainability. |
| (r) the promotion of built form that,<br><br>(i) is well-designed,<br><br>(ii) encourages a sense of place, and<br><br>(iii) provides for public spaces that are of high quality, safe, accessible, attractive and vibrant; | The proposed built form will introduce well-designed single-detached and street townhouse dwellings consistent with existing and proposed designs in the Simcoe community.<br><br>The existing natural heritage areas will help create a sense of place, and provide for safe, accessible, attractive public spaces in proximity to the future residential uses. Furthermore, the proposed park will be a high quality, attractive and vibrant space for residents to use and interact. |
| (s) the mitigation of greenhouse gas emissions and adaptation to a changing climate. | Where possible, measures to mitigate greenhouse gas emissions will be incorporated into the development and construction plan. These will be further evaluated during the detailed design phase of work. |

### 4.2.2 Subdivision of Land

Part VI, Sections 50 – 57 of the Planning Act provide the legislative framework for the subdivision of land in Ontario. Section 51(24) sets out the criteria upon which a Draft Plan of Subdivision is assessed. Section 51(24) specifies that, when evaluating a draft plan of subdivision, several factors must be considered, including the health, safety, convenience, accessibility for persons with disabilities, and welfare of current and future residents. Additionally, the review should assess the subdivision's alignment with provincial interests, whether it is premature or in the public interest, conformity with official plans, the suitability of the land for its intended use, and the inclusion of affordable housing, if applicable. The adequacy of highways, lot dimensions, restrictions on the land, natural resource conservation, utilities, school sites, public land dedication, energy efficiency, and the relationship with site plan control matters are also important considerations.

Accordingly, we have set out the criteria for evaluating subdivisions (Sections 51(24)) under the Planning Act in table form, and have provided a response to each criterion in the following table:

Table 4. **Section 51(24) Planning Act Criteria & Responses**

| Criteria Section 51(24) of the Planning Act | Responses |
|---|---|
| (a) the effect of development of the proposed subdivision on matters of provincial interest as referred to in section 2; | The matters of provincial interest in section 2 of the Planning Act have been reviewed (Table 3) and it was determined that the Applications have regard for these matters. |
| (b) whether the proposed subdivision is premature or in the public interest; | The Subject Lands are designated *Urban Residential* and *Designated Greenfield Area* in the OP. As such, Norfolk County determined the Lands are a priority location for residential growth. The proposed development is not premature. A Zoning By-law Amendment is being pursued to bring the zoning regulations into conformity with Official Plan permission. |
| (c) whether the plan conforms to the official plan and adjacent plans of subdivision, if any; | The Proposal conforms to the Norfolk County Official Plan, which designates the subject site *Urban Residential.* Collaboration with adjacent landowners has been undertaken to ensure conformity and connectivity with adjacent residential development plans, and to identify opportunities to enhance the subdivision communities. |
| (d) the suitability of the land for the purposes for which it is to be subdivided; | The Lands currently do not contain any buildings or structures. Land-based investigation have been undertaken which confirm suitability for development. |

| | |
|---|---|
| (d.1) if any affordable housing units are being proposed, the suitability of the proposed units for affordable housing; | The Proposal offers a range of housing types, but does not include affordable housing units. However, the proposed range of housing typologies offer broader housing options for people in different life stages and with different affordability needs. |
| (e) the number, width, location and proposed grades and elevations of highways, and the adequacy of them, and the highways linking the highways in the proposed subdivision with the established highway system in the vicinity and the adequacy of them; | The Proposal fronts onto Decou Road (collector road) and Woodway Trail (local road), enabling connectivity with the area's existing road network. Existing and future road connections will be designed to accommodate the anticipated traffic generated by the proposed development.<br><br>Within the Subject Lands, the internal public road network will be designed to accommodate traffic levels across the proposed subdivision according to municipal standards. |
| (f) the dimensions and shapes of the proposed lots; | The Draft Plan of Subdivision has laid out lots for single detached dwellings with frontages of 11.0 and 12.2 metres, and street townhouse dwellings with frontages of 6.1 metres per unit. |
| (g) the restrictions or proposed restrictions, if any, on the land proposed to be subdivided or the buildings and structures proposed to be erected on it and the restrictions, if any, on adjoining land; | There are no restrictions anticipated with the development of the Subject Lands. |
| (h) conservation of natural resources and flood control; | The Proposal will protect natural resources, including the existing natural heritage system on and near the Subject Lands. An Environmental Impact Study prepared by GeoProcess Research Associates is included as part of the Application package. In collaboration with Norfolk County and Long Point Conservation Authority, a site staking exercise was undertaken along the western portion of the Lands to determine limits of the existing woodland. This established the developable area, from which setbacks are applied to environmental features. More information is available in GeoProcess' report. |
| (i) the adequacy of utilities and municipal services; | The Lands will be accommodated by an extension of existing municipal servicing which currently exists to the north. The Functional Servicing Report prepared by SLA outlines the adequacy of municipal servicing capacity and describes the servicing approach for the proposed development in detail. |
| (j) the adequacy of school sites; | Through the Pre-Application Consultation process, the Proposal was reviewed by Grand Erie District School Board. The school board indicated that the Lands are not required to accommodate a school site at this time. |

| | |
|---|---|
| (k) the area of land, if any, within the proposed subdivision that, exclusive of highways, is to be conveyed or dedicated for public purposes; | Public parkland, public rights-of-way and stormwater management infrastructure will be conveyed to Norfolk County. |
| (l) the extent to which the plan's design optimizes the available supply, means of supplying, efficient use and conservation of energy; and | The Proposal efficiently uses lands available to provide a range of housing typologies. All proposed buildings will be constructed according to the minimum standards of the Ontario Building Code for energy efficiency. Other/additional energy efficiency and conservation measures will be at the discretion of future landowners. |
| (m) the interrelationship between the design of the proposed plan of subdivision and site plan control matters relating to any development on the land, if the land is also located within a site plan control area designated under subsection 41 (2) of this Act or subsection 114 (2) of the City of Toronto Act, 2006. | The Proposal seeks approval of a Draft Plan of Subdivision by Norfolk County. This Proposal is not subject to Site Plan Control. |

### 4.2.3 Conclusion

Based on the foregoing, it is our opinion that the Proposal meets the criteria set out in Sections 2 and 51(24) of the Planning Act.

## 4.3 Provincial Planning Statement (2024)

The Ministry of Municipal Affairs and Housing ("MMAH") released a new Provincial Planning Statement ("PPS") which came into effect on October 20, 2024. The PPS is intended to be a streamlined land use policy framework that replaces the Provincial Policy Statement 2020 and the Growth Plan for the Greater Golden Horseshoe 2019. It builds on housing-supportive policies from both documents and provides municipalities with the tools and flexibility to increase housing supply, align development with infrastructure for a competitive economy, support rural viability, and protect agricultural lands, the environment, and public health and safety. The PPS provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario's policy-led planning system, the PPS sets the policy foundation for regulating the development and use of land province-wide, helping achieve the provincial goal of meeting the needs of a fast-growing province while enhancing the quality of life for all Ontarians. All land use planning decisions made must be consistent with the policies in the PPS.

### 4.3.1 Planning for People and Homes (2.1)

The following policies outlined under Section 2.1 – Planning for People and Homes – provide general policy directives for land use planning in Ontario.

1. *As informed by provincial guidance, planning authorities shall base population and employment growth forecasts on Ontario Population Projections published by the Ministry of Finance and may modify, as appropriate.*

2. *Notwithstanding policy 2.1.1, municipalities may continue to forecast growth using population and employment forecasts previously issued by the Province for the purposes of land use planning.*

Ministry of Finance population projections indicate that the Haldimand-Norfolk Census Subdivision had a 2024 population of 130,217, and is projected to have a population of 171,587 by 2051. It should be noted that the Ministry of Finance does not provide separate forecasts for the County of Haldimand and the County of Simcoe individually. In the Norfolk County Official Plan, County Council endorsed utilizing population and employment forecasts of 92,700 residents and 34,100 jobs by 2051. The proposed plan of subdivision will assist the County in achieving their population targets as the development will result in between 645 and 1,220 people. It is anticipated that a portion of the future residents will be work from home, representing a small number of jobs as well.

4. *To provide for an appropriate range and mix of housing options and densities required to meet projected requirements of current and future residents of the regional market area, planning authorities shall:*

    a) *maintain at all times the ability to accommodate residential growth for a minimum of 15 years through lands which are designated and available for residential development; and*

    b) *maintain at all times where new development is to occur, land with servicing capacity sufficient to provide at least a three-year supply of residential units available through lands suitably zoned, including units in draft approved or registered plans.*

The Proposal introduces an appropriate range and mix of housing options to meet anticipated housing demands within Norfolk County and the community of Simcoe. The Proposal will add between 268 and 509 residential units to the County's housing supply that will consist of varying housing typologies including single-detached and street townhouse units. This range of housing will help the County to address the changing housing needs of current and future residents.

This mix of housing also creates a more accessible housing market for people in all stages of life. Furthermore, the proposed dwelling units in this development will help achieve the population projections established in the Norfolk County Official Plan and Ministry of Finance population projections.

6. *Planning authorities should support the achievement of complete communities by:*

    a) *accommodating an appropriate range and mix of land uses, housing options, transportation options with multimodal access, employment, public service facilities and other institutional uses (including schools and associated child care facilities, longterm care facilities, places of worship and cemeteries), recreation, parks and open space, and other uses to meet long-term needs;*

    b) *improving accessibility for people of all ages and abilities by addressing land use barriers which restrict their full participation in society; and*

    c) *improving social equity and overall quality of life for people of all ages, abilities, and incomes, including equity-deserving groups.*

The Subject Lands are situated in an area appropriate to accommodate residential growth and which can foster the development of a complete community. The Proposal will introduce diversified housing options to the community of Simcoe. By providing a range of unit and lot sizes, it will help meet the needs of a population composed of different social and economic backgrounds and needs. The Proposal has also been designed to feature a central park area and trail blocks to provide an array of recreational opportunities for future residents.

These features will be configured to support pedestrian mobility throughout the site and will incorporate sidewalks and other active transportation infrastructures into the design. Additionally, the Subject Lands are situated in proximity to existing services and facilities, including an arena, recreation centre, and a baseball diamond that can be of use by future residents.

### 4.3.2 Housing (2.2)

The following policies provide provincial policy direction for the development of housing.

1. *Planning authorities shall provide for an appropriate range and mix of housing options and densities to meet projected needs of current and future residents of the regional market area by:*

    *a) establishing and implementing minimum targets for the provision of housing that is affordable to low and moderate income households, and coordinating land use planning and planning for housing with Service Managers to address the full range of housing options including affordable housing needs;*

    *b) permitting and facilitating:*

        1. *all housing options required to meet the social, health, economic and wellbeing requirements of current and future residents, including additional needs housing and needs arising from demographic changes and employment opportunities; and*

    *c) promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation; and*

    *d) requiring transit-supportive development and prioritizing intensification, including potential air rights development, in proximity to transit, including corridors and stations.*

As described in PPS Section 2.2, planning authorities shall permit and facilitate the development of all housing options required to meet the needs of current and future residents. The Proposal will add to the community of Simcoe's housing options by introducing between 268 and 509 residential units in single-detached and street townhouse typologies. This is to be facilitated through the development of vacant land in Simcoe's Urban Area Boundary for residential land uses at a density consistent with or greater than that of the surrounding neighbourhood. While the Proposal does not include the provision of affordable housing, units of different sizes will offer housing options for various household sizes, needs and affordability levels. The Proposal contributes to efficient land use patterns that are scaled to the small-town nature of Simcoe.

Development of the Subject Lands for housing also incorporates opportunities to provide linkages and access points to adjacent trail systems which connect Simcoe and Norfolk County at-large. These elements will support active transportation in and around the proposed development. Increased residential density in this area will continue to support and increase ridership of the Ride Norfolk service.

A Housing Needs Assessment completed by Watson & Associates Economists Ltd. on behalf of Norfolk County found that the County will require a broad choice of new housing products in order to achieve its population growth forecast. As the County continues to grow, demand for new housing within the community is anticipated. The Housing Needs Assessment concluded that Norfolk County is expected to experience strong growth between 2025 and 2051, requiring the County's housing base to expand by 26% (7,640 units) to accommodate the forecasted population growth.

It also concludes that Norfolk County should focus residential development within the settlement areas on vacant sites. The Proposal utilizes existing vacant lands within a settlement area, provides a greater range of housing types, and achieves the recommendations in the Housing Needs Assessment.

### 4.3.3 Settlement Areas (2.3)

Section 2.3.1 of the PPS provides general policies for settlement areas which are addressed in the following text.

1. *Settlement areas shall be the focus of growth and development. Within settlement areas, growth should be focused in, where applicable, strategic growth areas, including major transit station areas.*

2. *Land use patterns within settlement areas should be based on densities and a mix of land uses which:*

    a) *efficiently use land and resources;*

    b) *optimize existing and planned infrastructure and public service facilities;*

    c) *support active transportation;*

    d) *are transit-supportive, as appropriate; and*

    e) *are freight-supportive.*

5. *Planning authorities are encouraged to establish density targets for designated growth areas, based on local conditions. Large and fast-growing municipalities are encouraged to plan for a target of 50 residents and jobs per gross hectare in designated growth areas.*

The Subject Lands are located within the Urban Area Boundary of the community of Simcoe and are thus an appropriate location for residential growth. The Subject Lands are within an area that has been planned for residential development by the County given the location within the urban boundary and the residential designation. The Subject Lands are abutting existing and planned residential development and have been designed to create a cohesive and connected neighbourhood. Further, the Proposal optimizes planned and existing municipal water and wastewater servicing infrastructure and will be connected through the western extension of Woodway Trail. Connecting the servicing through Woodway Trail will also create efficiencies by providing servicing connections for the Calibrex lands and potentially removing the need for the installation of a pumping station. Furthermore, it is located near existing community services and facilities which will serve to benefit future residents. Connections to nearby trail networks are contemplated to support active transportation and passive recreational uses, providing connections within Simcoe and Norfolk County more broadly.

The Proposal will achieve between 33 and 62 persons and jobs per gross hectare, which meets and exceeds the Provincial target. The proposed development efficiently uses the lands available and has proposed a density consistent to neighbouring developments.

### 4.3.4 General Policies for Infrastructure and Public Service Facilities (3.1)

The following are the policies which address public service facilities in the PPS:

1. *Infrastructure & public service facilities shall be provided in an efficient manner while accommodating projected needs. Planning for infrastructure and public service facilities shall be coordinated & integrated with land use planning & growth management so that they:*

    a) *are financially viable over their life cycle, which may be demonstrated through asset management planning;*

    b) *leverage the capacity of development proponents, where appropriate; and*

    c) *are available to meet current and projected needs.*

2. *Before consideration is given to developing new infrastructure and public service facilities:*

    a) *the use of existing infrastructure & public service facilities should be optimized; and*

The Proposal is located within Simcoe's Urban Area Boundary which is serviced by municipal water and wastewater. A Functional Servicing and Stormwater Management Report prepared by SLA is included with the Application and demonstrates that the Proposal efficiently and optimally uses existing and planned municipal infrastructure.

Future residents will benefit from existing public service facilities in the Simcoe area. As part of the Pre-Application Consultation process with Norfolk County, Grand Erie District School Board did not identify that a school site would be required on the Subject Lands at this time, and further coordination between the school board and County would reveal optimal locations for schools to serve Simcoe's growth

### 4.3.5 Transportation Systems (3.2)

1. *Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, are appropriate to address projected needs, and support the use of zero- and low- emission vehicles.*

2. *Efficient use should be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.*

The proposed development will provide safe and efficient transportation options for pedestrians and drivers. The Proposal will extend Woodway Trail, which currently terminates at the northern border of the Subject Lands and provide connection to Decou Road, providing additional access to the existing subdivision to the north. The internal street network within the Subject Lands will provide connectivity to Calibrex lands to the east and Woodway Trails Subdivision to the northwest. Two road accesses are provided to Decou Road which are adequately spaced to ensure that traffic conflicts will not be created. Sidewalks will be provided throughout the Proposal to ensure pedestrian connectivity. The proposal was designed to ensure sufficient access and egress for pedestrians and vehicles. Active transportation is supported by access to nearby trails, providing a safe and energy efficient means of transportation and passive recreation for future residents.

### 4.3.6 Sewage, Water and Stormwater (3.6)

1. *Planning for sewage and water services shall:*
   a. *accommodate forecasted growth in a timely manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and existing private communal sewage services and private communal water services;*
   b. *ensure that these services are provided in a manner that:*
      (1) *can be sustained by the water resources upon which such services rely;*
      (2) *is feasible and financially viable over their life cycle;*
      (3) *protects human health and safety, and the natural environment, including the quality and quantity of water; and*
      (4) *aligns with comprehensive municipal planning for these services, where applicable.*
   c. *promote water and energy conservation and efficiency;*
   d. *integrate servicing and land use considerations at all stages of the planning process;*
   e. *consider opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply; and*
   f. *be in accordance with the servicing options outlined through policies 3.6.2, 3.6.3, 3.6.4 and 3.6.5.*

2. *Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety. For clarity, municipal sewage services and municipal water services include both centralized servicing systems and decentralized servicing systems.*

The Proposal draws upon existing municipal sewage and water infrastructure which will be extended throughout the Subject Lands from existing services in the Woodway Trails subdivision to the north. The development of the subject lands will also provide servicing connections to the east for the Calibrex property and potentially eliminate the need for a temporary pumping station on Calibrex's lands. A Functional Servicing and Stormwater Management Report prepared by SLA is included with this Application Submission, and provides further details regarding the servicing design, capacity within the Simcoe system, and servicing connects to the Woodways Trail subdivision to the north and Calibrex to the east. Water and energy conservation will be undertaken throughout the building and construction process, and dwellings will be constructed to Ontario Building Code Standards for energy efficiency.

8. *Planning for stormwater management shall:*
   a) *be integrated with planning for sewage and water services and ensure that systems are optimized, retrofitted as appropriate, feasible and financially viable over their full life cycle;*
   b) *minimize, or, where possible, prevent or reduce increases in stormwater volumes and contaminant loads;*
   c) *minimize erosion and changes in water balance including through the use of green infrastructure;*

*d) mitigate risks to human health, safety, property and the environment;*

*e) maximize the extent and function of vegetative and pervious surfaces;*

*f) promote best practices, including stormwater attenuation and re-use, water conservation and efficiency, and low impact development; and*

*g) align with any comprehensive municipal plans for stormwater management that consider cumulative impacts of stormwater from development on a watershed scale.*

The Proposal includes a 1.16-hectare stormwater management pond at the lowest topography on the Subject Lands. A Functional Servicing and Stormwater Management Report by SLA is included with this Application which provides greater detail on the anticipated peak flows during storm events and the expected attenuation needs. The report includes grading and erosion plans for the Lands. It describes in detail how stormwater will be managed and accommodated, and how stormwater management, water and sanitary infrastructure has been designed in an integrated manner. The stormwater management pond will be designed to address both quantity and quality of stormwater before being released into the appropriate storm outlet. Preliminary information provided by Norfolk Discussions with County staff have indicated that they may wish to explore having the stormwater management pond on the Subject Lands receive some stormwater flows from Woodway Trails Subdivision. Based on the proposed grading for the adjacent lands there may be flows that can be directed to this pond, and confirmation of this can take will be reviewed and coordinated during the detailed design process, and based on further discussions with the County and Woodway Trails owner.

### 4.3.7 Public Spaces, Recreation, Parks, Trails and Open Spaces

Policies in Section 3.9 contribute to an active, health and inclusive community design.

*1. Healthy, active, and inclusive communities should be promoted by:*

*a) planning public streets, spaces and facilities to be safe, meet the needs of persons of all ages and abilities, including pedestrians, foster social interaction and facilitate active transportation and community connectivity;*

*b) planning and providing for the needs of persons of all ages and abilities in the distribution of a full range of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and, where practical, water-based resources;*

*d) recognizing provincial parks, conservation reserves, and other protected areas, and minimizing negative impacts on these areas.*

The Proposal introduces public streets consistent with Norfolk County design standards. A central public park that is 1.05 hectares in size will serve as a community anchor and a gathering place for future residents. All public facilities will be designed to be AODA-compliant to meet the needs of residents of all ages and abilities. Public streets will have sidewalks for pedestrian connectivity, and access points to trails will be provided. Furthermore, a trail system around the proposed stormwater management pond will be contemplated during the detailed design phase of the subdivision approval.

### 4.3.8 Natural Heritage (4.1)

Policies in Section 4.1 contribute to the protection and preservation of natural heritage features.

1. *Natural features and areas shall be protected for the long term.*

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

Based on the comments provided by the County and Long Point Region Conservation Authority the only natural heritage features impacting the property is an existing woodland on an adjacent property. A full Environmental Impact Study (EIS) was completed for the property to ensure that all environmental features were considered and impacts were appropriately mitigated, and because the development would encroach into the dripline of the existing woodlands. A woodland dripline staking exercise was undertaken on December 3, 2025, which determined the limits of the Subject Lands' development with regard to woodlands on and near the Lands. The staking exercise was jointly pursued by Norfolk County Staff, Long Point Region Conservation Authority, and GeoProcess Research Associates. The established dripline confirmed areas that are required for ecological protection on and adjacent to the Subject Lands. Appropriate buffering and setbacks were applied to these features.

### 4.3.9 Conclusion

Overall, in our opinion, the Proposal is consistent with the Provincial Planning Statement including the policies outlined for efficient use of land and infrastructure within settlement areas, the provision of a range and mix of housing options, the promotion of economic development and competitiveness, and the creation of healthy, active, and inclusive communities. The development wisely uses municipal infrastructure that is existing or planned and will not impact any natural heritage features.

## 4.4 Norfolk County Official Plan (2006/2008)

The Norfolk County Official Plan (2006) ("OP") was adopted by Norfolk County Council on May 9, 2006 and was approved by the Ministry of Municipal Affairs on December 23, 2008. It is the guiding land use planning policy document for this jurisdiction as the community of Simcoe does not have an Official Plan. It contains policies pertaining to both the County as a whole and more locally for its constituent municipalities therein. This section addresses the Proposal's conformity to the OP policies in the context of the community of Simcoe.

The Subject Lands are in the community of Simcoe and are identified on Schedule A-1 of the OP as being an *Urban Area*. As per Schedule B-15 of the OP, which is the land use plan for the community of Simcoe, the lands are designated as *Urban Residential* and *Designated Greenfield* area.

In all sections reviewed below, the most relevant policies were included. Where policies did not apply to the project, they were not included.

### 4.4.1 Sustainable Natural Heritage (3)

**3.2 Watershed Management**

*f) The County shall encourage the protection and restoration of Natural Heritage Features to improve water quality and quantity.*

The Proposal aligns with the policy of the County as it ensures both the protection and enhancement of local Natural Heritage Features. The Proposal introduces a stormwater management pond to safeguard water resources and uphold overall water quality and erosion control.

For more information, please refer to the Stormwater Management report prepared by SLA in support of the Applications. In addition, an Environmental Impact Study has also been completed to ensure that there is no negative impact to the adjacent natural heritage system and Lynn Creek Valley.

*h) The County shall require the use of stormwater management facilities downstream of new developments, where appropriate, to mitigate development impacts on stormwater quantity and quality. The County shall promote naturalized and unfenced stormwater management facilities, constructed with gentle slopes. Applications for development may be required to be supported by a stormwater management study.*

A Stormwater Management report has been prepared by SLA, submitted as part of the Applications. This report provides the detailed implementation of stormwater management practices and use of the proposed stormwater management pond on the southwestern portion of the Subject Lands. The proposed stormwater management pond has been designed to accommodate peak flows for the Subject Lands and recognizes that there may be the need to accommodate storm flows from the existing subdivision to the northeast. The pond will be designed to accommodate and treat stormwater for both quality and quantity during storm events before out-letting into Lynn Creek. The stormwater pond is proposed to use naturalized and unfenced stormwater management techniques.

*k) The County shall encourage the reduction of water consumption levels through the promotion of the efficient use of water, in cooperation with the private sector and the community, and may specify appropriate water conservation measures within existing and new development.*

Municipal water conservation measures, such as the reduction of water consumption and the efficient use of water, will be discussed between the Owner and County staff throughout the development process.

### 3.5 Natural Heritage Systems

*3.5.1 Provincially Significant Features*

a) *Development and site alteration shall not be permitted in a Provincially Significant Feature unless in accordance with provincial and federal requirements.*

The Subject Lands are not located in any Provincially Significant Feature and are therefore not subject to restricted to the above-mentioned development permissions.

b) *Development and site alteration shall not be permitted on lands adjacent to the natural heritage features and areas, unless the ecological function of the adjacent land has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated. The extent of adjacent land shall be defined as indicated in Table 1. An Environmental Impact Study (EIS) in accordance with Section 9.7.1 (Environmental Impact Study) of this Plan shall be required for all development proposals adjacent to or abutting areas identified as Provincially Significant Features.*

A small portion of the Subject Lands are located within 120 metres of Provincially Significant Wetlands found directly south of Decou Road. Through an Environmental Impact Study conducted by GeoProcess Research Associates, the ecological function of the adjacent land was evaluated, and it was demonstrated that there will be no negative impacts on the natural features and their sustaining ecological or hydrologic functions. Please refer to the above-mentioned EIS for more information.

*3.5.2 Natural Heritage Features*

b) *Development or site alteration proposed in, or adjacent to, a Natural Heritage Feature(s), whether illustrated on Schedule "C" or only described in Table 2, shall be subject to the completion of an Environmental Impact Study, in accordance with Section 9.7.1 (Environmental Impact Study) of this Plan. Development or site alteration in, or adjacent to, such features shall not be permitted unless it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated. The extent of adjacent land shall be defined as indicated in Table 2.*

As seen on *Schedule C-5 Natural Heritage* of the OP and as described in *Table 2: Extent of Land Adjacent to a Natural Heritage Feature* within the OP, the Subject Lands are adjacent to Natural Heritage Features, including Significant Woodland, and Provincially Significant Wetland. An EIS, prepared by GeoProcess Research Associates, demonstrates there will be no negative impacts on the natural features of the woodlands and the ecological functions that sustain them. Please refer to the above-mentioned EIS for more information.

d) *The clearing of woodlands through the Forest Conservation By-law may be subject to the completion of an Environmental Impact Study.*

There are no areas of Significant Woodlands designated on the Subject Lands, and as such, no clearing of Significant Woodlands is proposed to facilitate the Applications. However, there are significant woodlands on the adjacent property, with the dripline and associated buffers impacting the subject lands. The dripline and buffers have been appropriately reflected on the proposed plan.

g) *This Plan encourages the retention of woodlands or portions of woodlands. It is further encouraged that wherever possible and appropriate, trees be replanted to replace trees removed if a development proceeds. This Plan encourages the conservation or replanting of roadside and fence-line shrubs and trees, and riparian area vegetation, wherever possible and appropriate in the context of new development.*

There are no Significant Woodlands designated on the Subject Lands, however, the required buffers and dripline for the Significant Woodlands to the south and west encroach onto the Subject Lands and have thus been examined for potential impact. As there is no tree removal on the Subject Lands, appropriate measures to ensure that there is no negative impact to adjacent woodlands has been considered. Further, the Proposal contemplates the planting of roadside trees and additional vegetation within the proposed areas for parks and open space, which will achieve the goal of the OP to preserve and enhance the existing tree cover in the County.

### 4.4.2 Natural Resources (4.6)

A portion of the Subject Lands has been identified as having buried mineral aggregates, and thus the following policies have been reviewed. It is our opinion that because of the location of the site within the settlement area of Simcoe, and proximity to existing residential uses, the extraction of these resources is not practical or feasible.

**4.6 Natural Resources**

*4.6.1 Mineral Aggregates*

b) *Aggregate Resource Areas shall be protected for future use. More precise boundaries of the Aggregate Resource Areas may be established through consultation with the Ministry of Natural Resources and Forestry. Subject to consultation with the Ministry, minor modifications to the boundaries of the Aggregate Resource Areas shall not require an amendment to this Plan.*

Similar to the vast majority of the built-up area of the community of Simcoe, a portion of the Subject Lands are designated as *Buried Aggregate Resource Area* in *Schedule J-5 Natural Resources* of the OP. Although OP policy states that Aggregate Resource Areas shall be protected for future use, the size of the site and the proximity to existing residential uses would be very difficult to mitigate any negative impacts to neighbouring properties. Further, although the Lands have been identified in the OP, there has been no investigation into the quality or quantity of aggregate to determine if the extraction is financially viable. The Subject Lands are within the settlement boundary of Simcoe and the proposal will maintain conformity with the OP as the Lands are also designated *Urban Residential* on Schedule B-15, which supports residential development.

The development of these Lands for residential purposes without further exploring the viability of aggregate extraction is appropriate as the location of the site would make extraction difficult to undertake without significant compatibility issues.

> c) *Development and changes in land use which would prevent future access, use or extraction shall not be permitted in and adjacent to identified Aggregate Resource Areas on Schedule "J", unless it can be demonstrated that:*
>
> i) *aggregate resources use would not be feasible; or*
>
> ii) *the proposed development and change in land use serves a greater long term interest of the general public; and*
>
> iii) *issues of public health, public safety and environmental impact are addressed.*

The proposed subdivision would enable a land use which would make the potential for the extraction of aggregate resources impossible, however, the proposed residential uses are more appropriate and compatible with the surrounding neighbourhood. The Subject Lands, as previously identified, are within the settlement area and surrounding by residential uses, which are considered to be sensitive receptors. Introducing an aggregate extraction operation in this location would create public safety and compatibility issues with land uses and traffic. The proposed residential land use, which the Lands are also designated for, is appropriate and better serves the needs of the neighbourhood. The Proposal will increase Norfolk County's housing supply and will serve to accommodate the County's projected growth. Therefore, the *Buried Aggregate Resource Area* designation for the Subject Lands, as seen in *Schedule J-5 Natural Resources* of the OP, should not prevent the proposed residential development on the Lands.

> h) *In the undeveloped portions of designated Urban Areas, Hamlet Areas, or Resort Areas, where aggregate resources have been identified, extraction shall be encouraged to ensure the economic opportunity is not lost, provided the disruption to nearby sensitive and incompatible uses can be mitigated. The aggregate resources should be removed before allowing urban development, unless otherwise provided for by the policies of this Plan.*

As the Subject Lands are located directly adjacent to an existing residential development, it would be inappropriate for the extraction of aggregate resources to occur on the Lands. Extraction of aggregate resources would not be compatible with surrounding land uses and would act as a nuisance to and result in the disruption of sensitive adjacent sensitive land uses, such as the residential neighbourhood to the north of the Subject Lands and the proposed residential subdivisions to both the east and west of the Lands. Therefore, the removal of aggregate resources from the Subject Lands prior to urban development should not be considered.

### 4.4.3 Maintaining Healthy Communities (5)

Section 5 of the OP presents policies for maintaining healthy communities, including housing, community design and recreation which are addressed in this section of the report.

**5.3 Housing**

a) *At all times, the County shall maintain the ability to accommodate residential growth for a minimum of 10 years through land which is designated and available for residential development. Additionally, the County shall ensure that where new development is to occur, land with servicing capacity sufficient to provide at least a 3-year supply of residential units in draft approved and registered plans, or in cases of residential intensification and redevelopment, land appropriately zoned in the Zoning By-law and available for development or redevelopment.*

The proposed development will assist the County in ensuring that there are residential units available to accommodate a minimum of 10 years of residential development. Based on the information provided by County staff, as well as the Functional Servicing Report prepared by SLA, there is servicing available to accommodate the proposed development within Simcoe and will not require any upgrades.

b) *The County shall ensure that a full range of housing types and densities are provided to meet the anticipated demand and demographic change. All forms of housing required to meet the social, health and well-being of current and future residents, including those with special needs shall be encouraged. The County shall target that 15 percent of all new housing built in Norfolk County be multi-residential dwellings and 15 percent be semi-detached and townhouse dwellings.*

As previously outlined, the Proposal includes a range of residential dwelling types, including single-detached and townhouse dwellings. A range in size of units is also proposed within these housing forms, providing various options for current and future residents. The Proposal does not include any multi-residential dwellings but provides sufficient townhouse dwellings to ensure an appropriate density for the Subject Lands as a whole. Although no affordable housing units are proposed in the development, the range in housing forms and lot sizes will accommodate a range of household incomes.

h) *The County shall develop zoning provisions that are sufficiently flexible to permit a broad and varied range of housing forms, types, sizes and tenures, including accessory apartments in houses, except in locations serviced by individual or communal waste water disposal systems.*

A Zoning By-law Amendment is required to facilitate the Proposal to ensure that a broad and varied range of housing forms, types, sizes and tenures can be developed. The Subject Lands' current zoning, *Development (D)* and *General Industrial (MG)*, does not permit the development of residential uses as required by the OP. Therefore, a ZBA application is submitted alongside this report to rezone the lands to Residential Type 2 Zone (R2-XX) with site specific exemptions to permit the required range of housing forms and as outlined within the Draft Plan of Subdivision. Additionally, Provincial Policy, including Bill 23, More Homes Built Faster Act, 2022, permits two additional residential units on a lot as-of-right. This provincial policy ensures that the County's zoning provisions are sufficiently flexible to permit additional residential units on the Subject Lands.

**5.4 Community Design**

*b) Through the review of development applications, including plans of subdivision, site plans and other development proposals, the County:*

*i) shall ensure that new development is designed in keeping with the traditional character of the Urban Areas, in a manner that both preserves the traditional image of the Urban Areas and enhances the sense of place within the County while maintaining the community image of existing settlement areas;*

The Proposal effectively ensures that planned development on the Subject Lands keeps with the traditional character of the surrounding Urban Residential area. The Proposal reflects the form and character of the surrounding low-rise residential neighbourhood and has been designed with the neighbouring proposed developments in mind. The Proposal is consistent and compatible with the character of the surrounding area and development densities are consistent with existing residential areas.

*ii) shall promote efficient and cost-effective development design patterns that minimize land consumption;*

The Proposal efficiently minimizes land consumption through effective development design patterns such as providing sufficient access to existing development to the north, proposed development to both the east and west, and to Decou Road to the south. Additionally, the Proposal maximizes land use by providing an easily accessible public park in the centre of the Subject Lands. The Proposal also effectively makes use of existing municipal servicing and provides access to nearby community facilities including Simcoe Memorial Park, the Simcoe Farmers' Market, the Lynn Valley Trail, and more.

*iii) shall promote the improvement of the physical character, appearance and safety of streetscapes, civic spaces, and parks;*

The Proposal is consistent and compatible with the character of the surrounding area and development densities are consistent with both existing and proposed residential areas adjacent to the Lands. Appropriate zone regulations are proposed to ensure privacy and provide appropriate amenity areas for residents. Gentle increases in density are provided to ensure the improvement of the physical character and appearance of the Proposal. The new municipal roadways created as part of the Proposal will be classified as local roads, and will primarily serve the Subject Lands, with the extension of Woodway Trail providing a north-south connection. Sidewalks will be provided on at least one side of the new streets, which is consistent with surrounding developments, and will provide safe pedestrian connections. The large park space located in the centre of the Proposal is easily accessible from all areas of the Subject Lands and ensures a continued public presence and eyes on the street, improving neighbourhood character, and safety.

*iv) shall encourage tree retention and tree replacement;*

The Subject Lands are currently used for agricultural purposes and therefore do not have trees requiring retention or replacement. However, through the detailed design process of the draft plan of subdivision street trees will be incorporated per the City's standards. The presence of street trees in Urban Areas in crucial in improving air quality and reducing energy use on the Subject Lands through additional shading and protection. They are also valuable for improving the aesthetics of the development.

v) *shall ensure that design is sympathetic to the heritage character of an area, including the area's cultural heritage resources;*

The Subject Lands do not contain cultural heritage resources. The Proposal's design is compatible with nearby cultural heritage resources, including the Potts Cemetery, located adjacent to the Subject Lands on the southeast corner. The Proposal will not impact this cultural heritage resource. Residential development on the Subject Lands will reflect the character of its neighbouring residential properties, both existing and proposed, ensuring that the Proposal is sympathetic to the character of the surrounding development.

vi) *shall strongly encourage design that considers and, wherever possible, continues existing and traditional street patterns and neighbourhood structure; and*

The Proposal continues traditional street patterns as it provides direct access points between Decou Road, a Collector Road to the south of the Subject Lands, and residential neighbourhoods to the north. It will also provide access and egress opportunities between the Subject Lands and proposed development on the lands directly adjacent to both the east and the west.

vii) *may require, at the County's sole discretion, that proponents submit design guidelines with development applications, establishing how the policies of this Section have been considered and addressed. Such guidelines may also be required to address related issues of residential streetscaping, landscaping, setbacks, sidewalks, signage, garage placement, and architectural treatment.*

Design guidelines have not been requested as part of the Applications. Should the County require these, they could be created as part of a condition of draft plan approval and incorporated into the final subdivision agreement.

c) *Adequate measures shall be taken to ensure that the permitted uses have no adverse effects on adjacent land uses. Adequate buffering shall be provided between any uses where land use conflicts might be expected, and such buffering may include provisions for grass strips and appropriate planting of trees and shrubs, berms or fence screening, and other means as appropriate. Modifications to building orientation may also be appropriate buffering measures, but not in replacement of appropriate plantings.*

Adjacent lands to the north, east, west, and south (137 & 179-207 Decou Road) of the Subject Lands are all comprised of currently existing or proposed low-density residential dwellings. Additionally, an adjacent residential subdivision to the north is comprised of housing of similar size and neighbourhood structure to that of the Proposal. To the northeast of the Subject Lands is the Sprucedale Youth Centre, a juvenile detention facility. Adequate buffering between this facility and proposed residential development will be provided to eliminate any land use conflicts or adverse effects on the future residents of the Lands. The Sprucedale Youth Centre has a large fence with a visual barrier spanning across the boundary of the property, ensuring adequate safety and security of the Subject Lands. The Proposal does not include any public pathway or area of direct access to the facility, both ensuring sufficient screening and buffering between the two land uses.

g) *Streetscaping that reflects the intended character of settlement areas is encouraged. In particular, traditional streetscaping in the Downtown Designations of the Urban Areas will be encouraged.*

The Proposal provides 20 metre public rights-of-way for all local streets within the Subject Lands, with sidewalks constructed along each right-of-way. This provides adequate space for pedestrians as well as sufficient levels of on-street parking for residents and visitors, promoting a lively and community-based environment, reflecting the intended character of the Proposal. A conceptual parking plan has been provided as part of the submission to confirm on-street parking can be accommodated.

*h) A high quality of park and open space design is strongly encouraged. The land for parkland dedication shall be carefully selected to facilitate their use as a central focal point for new or existing neighbourhoods.*

Within the Proposal, parkland has been selected in a central location of the development, effectively facilitating its use as a central focal point for the neighbourhood. The neighbourhood is expertly designed to provide a 1.05-hectare communal public space for use of all residents in the area. Trail blocks are also proposed to provide quick and efficient pedestrian access to the parkland for residents living along the periphery of the Subject Lands and a further distance from the proposed park.

*j) The County may require the provision of certain pedestrian, cycling and trail linkages through the development approvals process.*

The Subject Lands are adjacent to the Lynn Valley Trail along the western property line and can be accessed by the western access point to Decou Road. This trail provides pedestrian and cycling access between Downtown Simcoe to the north and the Town of Port Dover to the south, spanning approximately ten (10) kilometres in length.

Further, the Lynn Valley Trail provides linkages to various other pedestrian and cycling trails in the area including the Norfolk Sunrise Trail and Waterford Heritage Trail north of the Subject Lands. Additionally, the Subject Lands have direct access to the community of Simcoe's On-Road Cycling Route via Decou Road, as seen on *Schedule I-2 Active Transportation* of the OP. This cycling route generally travels in an east-west direction throughout the southern portion of the community of Simcoe.

*m) The County shall encourage development design considering the principles of Crime Prevention Through Environmental Design (CPTED). Specifically, the County shall encourage proponents of new development to use appropriate lighting to deter crime and to situate buildings on lots to maximize natural surveillance.*

The Proposal considers principles of CPTED through the intuitive design strategies. The Proposal maximizes natural surveillance as it situates both single detached dwellings and townhomes on visible lots, ensuring sufficient lighting and observation by residents on both outdoor and public spaces. Additionally, public space such as the proposed parkland is situated in an area that is both visible and easily accessible, deterring crime and unwelcome activity from the area. Any in-park lighting will be at the discretion of the County at the time of parkland development.

*n) To promote environmental sustainable development, the County shall encourage the design of sustainable neighbourhoods in keeping with Leadership in Energy and Environmental Design - Neighbourhood Development (LEED ND) design principles in accordance with the policies under Section 11.8.2.1 Sustainable Neighbourhood Design of the Lakeshore Special Policy Area Secondary Plan.*

Throughout the development process, sustainable development principles, such as *Leadership in Energy and Environmental Design - Neighbourhood Development (LEED ND)* design principles, will be considered.

**5.6 Recreation**

*5.6.1 Parks*

*b) Provision for parks shall generally be in accordance with the standards provided in Section 5.6.1.1, 5.6.1.2, 5.6.1.3, and 5.6.1.4.*

According to the 2021 Canadian census, the average household size in Norfolk County is 2.4 people. As the Applications propose between 268 and 509 residential units, it can be estimated that this will accommodate a population growth of between 645 and 1,220 residents. *Section 5.6.1.2* of the OP states that the minimum standard of neighbourhood park size within the development is 1 hectare per 1,000 population. By using this calculation, the 1.05 hectares of proposed parkland exceeds the required minimum standard, as stated in the OP. The neighbourhood park is designed to accommodate the recreational needs of local residents and is centrally located within a safe and convenient walking distance. All residents on the Subject Lands are well within an 800 metre or 10-minute walking distance to the proposed neighbourhood park. Additionally, the proposed parkland dedication (1.05 hectares) which represents 5.1% of the total land area, which is consistent with the minimum of 5% of the total land area outlined in the *Planning Act*. The size and shape of the parkland proposed creates a programmable park space, which can support play fields, playground equipment, sports fields, etc.. The ability to program this space by the County in the future will create a community focal point, serving the subject lands as well as the subdivision to the north and east which have proposed park space which have limited programming ability.

*c) Where parks are located adjacent to existing and proposed residential areas, appropriate measures may be taken to minimize potential adverse effects associated with recreation activity areas and parking areas.*

Parking area for the 1.05-hectare parkland is not proposed as the park is located centrally and is within 800 metres, or a 10-minute walk, of all residential dwellings on the Subject Lands. On-street parking within close proximity to this parkland will be provided. The park fronts along three public rights-of-way, providing greater ease of accessibility to the area. However, both rights-of-way do not provide immediate access to any entrance or exit points off the Subject Lands, ensuring that potential adverse effects relating to safety for children and users of the park area are minimized.

### 4.4.4 Managing Growth (6)

Section 6 of the OP presents policies for managing the County's growth, including its community structure and growth framework and growth in its urban areas.

**6.3 Community Structure and Growth Framework**

*a) The growth management and settlement structure of the County is comprised of two major interrelated parts: Settlement Areas and the Rural Area. The Settlement Areas include two components, one of which is Urban Areas.*

The Subject Lands are located within the Urban Settlement Area of Simcoe. As stated in the OP, by 2051, the community of Simcoe is projected to have a population of 34,299 as well as approximately 14,291 households, and 11,594 jobs. The Proposal will assist in the facilitation of population and household growth in the community of Simcoe.

**6.4 Urban Areas**

*b) It is the policy of this Plan that the Urban Areas will incorporate the following:*

*i) a full range of housing types, including affordable and special needs housing;*

The proposal provides a range of housing types, including single-detached dwellings and townhouses. Although no affordable housing units are proposed in the development, the range in housing forms and lot sizes will accommodate a variety of household incomes. At the time of construction, accessory apartments may be incorporated into the design and construction of the dwellings.

*ii) business opportunities at appropriate locations to provide a wide range of employment and services to residents, businesses and visitors;*

The Subject Lands provide direct access, both by vehicle and active transportation, to employment and commercial areas in the community of Simcoe, including downtown Simcoe (all located within two kilometres of the Lands), which provides a wide range of employment and services to new residents. No blocks for employment use have been incorporated into the design, however, the proximity to employment and commercial areas ensure that the site will be well serviced.

*iii) full municipal services, as feasible and appropriate, and an appropriate level of transportation infrastructure;*

The Proposal plans to use full municipal services including water, stormwater, and sewage, contributing to a feasible and efficient development of the Subject Lands. The water and sanitary connections will be provided through the Woodways Trail to the north and there is servicing capacity within Simcoe to accommodate the proposed development. The proposal includes public streets throughout the development to service the development area and provide connections within the broader community. Street connections will be provided to both the existing Woodway Trail and future Woodway Trail to the north. Two connection points are proposed at the south end of the Subject Lands. The site is well serviced for transportation connections.

*iv) a concentration of community services for the County, including social, cultural, entertainment, health, educational and other supporting facilities; and*

The Subject Lands offer an opportunity to accommodate growth within an existing urban area. The community of Simcoe is well serviced by commercial facilities including shops, restaurants, banks, supermarkets, and department stores. Further, it is served by publicly funded schools, hospital, a satellite campus of Fanshawe College, a recreation centre, a baseball diamond, arena, and public parks. All general and community services are within a two-kilometre radius of the Subject Lands. As such, the proposed development makes efficient use of existing facilities in the area.

*v) an open space, natural heritage and recreational network that is integrated with open spaces throughout the County, and provides appropriate passive, natural and active areas.*

The Proposal promotes activity through the proposed park area and adjacent connections to walking and cycling trails connecting the Subject Lands to both areas of natural heritage and a high concentration of community services. As working from home has continued to gain popularity, residents moving to the community and the Subject Lands are likely to spend increased time at home, leading to a connected and communal environment within the Subject Lands.

> c) *The County shall ensure through its planning activities that each Urban Area develops with efficient land use patterns that minimize the extension of municipal services and infrastructure and will sustain the community and financial well-being of the County over the long-term.*

The Proposal emphasizes efficient land use patterns as it allows for the opportunity to accommodate significant growth within an existing Urban Area, using urban design strategies that match and expand on that of the surrounding residential area. The Proposal avoids urban expansion by developing within the existing delineated urban boundary on lands designated for future development. It also provides connections to existing roadways and opens opportunities for natural and efficient expansion of municipal infrastructure in an orderly manner. As the Proposal provides a sufficient increase in households to the community of Simcoe's urban area, it contributes to Simcoe's function as Norfolk County's major service centre, addressing the diverse needs of the County's residents.

### 4.4.5 Managing Land Use (7)

Section 7 of the OP addresses policies related to managing land uses in the County. This includes for the Urban Residential Designation, which is the designation of the Subject Lands. These relevant policies are discussed in this section of the report.

**7.7 Urban Residential Designation**

*7.7.1 Permitted Uses*

> a) *The predominant use of land shall be a variety of urban dwelling types, including single detached dwellings, semi-detached dwellings, duplex dwellings and similar low-profile residential buildings not exceeding 2 dwelling units per lot.*

Proposed land uses include single-detached and street townhouse dwelling in various sizing formats. These land uses conform to permission for the Urban Residential Designation.

> b) *Medium density residential uses shall be permitted including triplex dwellings, fourplex dwellings, row or block townhouse dwellings, converted dwellings containing more than two dwelling units, walk-up apartments and similar medium profile residential buildings, subject to the policies of Section 7.7.2 (b) (Urban Residential Designation – Land Use Policies).*

Street townhouses are proposed. The density, height and character of these units have regard to adjacent uses and reflect existing and proposed development in the area. The Proposal also ensures that the development is adequately serviced by parkland and school facilities and provides direct access to a collector road (Decou Road, which is accessible via two rights-of-way on the southern portion of the Subject Lands).

Additionally, the height and massing of the proposed townhouse units have regard to and conform with that of adjacent single-detached residential units.

> d) *An accessory residential dwelling unit or garden suite shall be permitted subject to the policies of Sections 5.3.3.1 (Accessory Residential Dwellings) and 5.3.3.2 (Garden Suites) of this Plan.*

Bill 23, the More Homes Built Faster Act, 2022 amended the Planning Act to allow up to three (3) residential units as-of-right on a residential lot, including accessory residential dwelling units and/or a garden suite. Any infill intensification occurring on the Subject Lands will follow in accordance with the policies of *Sections 5.3.3.1 (Accessory Residential Dwellings)* and *5.3.3.2 (Garden Suites)* of the OP.

> h) *Neighbourhood parks and parkettes, as defined in Section 5.6.1 (Parks) of this Plan shall be permitted, whereas community parks, major parks and other largescale recreational uses shall only be permitted in the Parks and Open Space Designation, through the policies of Section 7.15.1 (Parks and Open Space Designation – Permitted Uses).*

The Proposal includes a 1.05-hectare Neighbourhood Park to be located on the Subject Lands, which are designated *Urban Residential* on *Schedule B-15 Land Use* of the OP.

> j) *A home occupation in a dwelling unit shall be permitted, except where an accessory dwelling unit, garden suite, or bed and breakfast establishment exists on the lot, provided the use does not change the residential character of the building and lot, and residential remains the principal use. The use shall be compatible with the surrounding residential uses.*

Home occupations will be permitted in residential dwellings on the Subject Lands. All home occupations will conform with associated policy in the OP, including policy within *Section 7.7.1 Urban Residential Designation Permitted Uses*. Home occupations will be at the discretion of future homeowners and in accordance with the policies in the Official Plan and regulations in the Zoning By-law.

> n) *Uses accessory to any of the permitted uses in the Residential Designation are permitted.*

Accessory uses will be permitted within residential dwellings on the Subject Lands. All accessory uses will conform with associated policy in the OP, including policy within *Section 7.7.1 Urban Residential Designation Permitted Uses*.

*7.7.2 Land Use Policies*

> a) *Single, semi-detached and duplex housing forms shall generally have an average net density of 15 units per hectare (uph), save and except for land designated Urban Residential in the Courtland Urban Area, where private servicing limitations shall determine the density of development.*

Between 268 and 509 residential units are proposed on the Subject Lands and which yields a net density of between 21 and 40 uph in single-detached and street townhouse typologies, based on the total developable area of the property. Although the proposed density on the Subject Lands is higher than that of 15 uph encouraged in the OP, increased density is required to achieve sufficient housing to accommodate the levels of growth projected in Norfolk County.

In Norfolk County's 2025 Housing Needs Assessment, completed by Watson & Associates Economists Ltd., it was concluded that the County is expected to experience strong growth between 2025 and 2051, requiring the County's housing base to expand by 26% (7,640 units) to accommodate the forecasted population growth. The Housing Needs Assessment also concludes that Norfolk County should focus residential development within the settlement areas on vacant sites, which is consistent with the Proposal on the Subject Lands. The increased density is appropriate as it will still be compatible with the existing and planned residential developments to the north and east. The lot sizes are consistent with what is proposed in these developments.

b) *Triplex, fourplex, townhouses, and other medium density housing forms, shall generally have a net density of between 15 and 30 uph, save and except for in the Courtland Urban Area where private servicing limitations shall determine the density of development. New medium density residential development and other uses that are similar in terms of profile, shall meet the following criteria:*

i) *the density, height and character of the development shall have regard to adjacent uses;*

The Proposal includes street townhouse dwelling units on lots with frontages of 6.1 metres. Given that the Proposal includes a range of units at this time, the unit count will be further clarified throughout the phased development process. Effort will be made to deliver a street townhouse density between 15 and 30 uph, while also considering the Norfolk's need for an increase to its housing supply to accommodate its forecasted population growth to 2051, as concluded in Norfolk County's Housing Needs Assessment. In addition, the density, height, and character of the Proposal will be consistent with that of its surroundings including both existing and proposed residential development located adjacent to the Subject Lands.

ii) *the height and massing of the buildings at the edge of the medium density residential development shall have regard to the height and massing of the buildings in any adjacent low density residential area and may be subject to additional setbacks, or landscaping to provide an appropriate buffer;*

Townhouse dwellings located at the edge of the residential development or located adjacent to single-detached dwelling units will have regard to the height and massing of low-density residential development through the provision of appropriate buffers to ensure a smooth transition between land uses. However, as requested by County staff during a Pre-Application Consultation meeting for the Proposal on November 12, 2025, townhouses facing townhouses will be avoided to prevent potential parking issues and traffic concerns. Accordingly, the concept plan demonstrates how efforts have been made for street townhouses and single-detached dwellings to be located on opposite sides of the same right-of-way to ensure that increased pressures related to traffic and parking are spread evenly across the entirety of the Subject Lands. Precise lotting is to be confirmed with County staff through detailed design for each phase.

iii) *the development will be encouraged to have direct access to an arterial or collector road, where possible and appropriate;*

The Lands have direct access to a collector road, that being Decou Road on the southern border of the property, and an arterial road, that being Ireland Road which can be accessed through the proposed development on the Calibrex Lands, located directly to the east of the Subject Lands.

*iv) the watermains and sanitary sewers shall be capable of accommodating the development, or the proponent shall commit to extending services at no cost to the County, save and except for in the Courtland Urban Area, where private septic systems shall be permitted;*

Through the Functional Servicing Report, prepared by SLA and submitted in support of the Applications, have determined that County watermains and sanitary sewers shall be capable of accommodating the Proposal on the Subject Lands.

*v) the development is adequately serviced by parks and school facilities;*

The Subject Lands are adequately serviced by parkland through the development of a 1.05-hectare park, accessible within a10-minute walk of all residential lots on the site. At this time, local school boards have not identified that additional school capacity will be required to serve the Proposal. Further discussions with school boards are anticipated through the development process.

*vii) the development shall be designed and landscaped, and buffering shall be provided to ensure that the visual impact of the development on adjacent uses is minimized;*

The Proposal is designed to provide appropriate buffering between adjacent non-residential land uses, such as the Sprucedale Youth Centre, northeast of the Subject Lands, minimizing the potential impacts of differing land uses on one another.

*viii) except for a triplex dwelling, fourplex dwelling or other similar small-scale developments, a report on the adequacy of the road network to accommodate the expected traffic flows, and the adequacy of water and sewer services may be required from the proponent and approved by the County; and*

A Transportation Impact Study (prepared by Crozier Consulting Engineers) and a Functional Servicing Report (prepared by SLA) have been submitted in support of the Applications to determine the adequacy of the road network to accommodate expected traffic flows and the adequacy of both water and sewer services on the Subject Lands.

*f) Development within the Urban Residential Designation shall be further subject to the policies of Section 6.4 (Urban Areas) and 6.5 (Specific Urban Area Policies) of this Plan.*

The Proposal is consistent with Norfolk County OP policy, including policies outlined in *Section 6.4 (Urban Areas)* and *6.5 (Specific Urban Area Policies)*. The Proposal is located on lands designated as *Urban Residential* on *Schedule B-15 Land Use* of the OP, meaning it was determined that the Lands shall be developed to accommodate projected growth and development for the 20-year planning horizon to 2036, as outlined in the OP. Infill development on vacant or underutilized lands subject to the *Urban Residential* designation is encouraged within *Section 6.4 (Urban Areas)* of the OP. The Proposal will incorporate full municipal services and an appropriate level of transportation infrastructure, community services for the County (such as the 1.05-hectares of dedicated parkland), and integration with the County's existing recreational network, such as the Lynn Valley walking and cycling trail.

The Proposal prioritizes efficient land use patterns that minimize the extension of municipal services and infrastructure, which will effectively assist in sustaining the community and the financial well-being of the County over the long-term. Therefore, as described above, the Proposal encourages the development of vacant land on the edge of existing built-up portions of the Urban Areas that includes water supply, sanitary sewers, roads, parks, and other services as required by the County. The Proposal supports and promotes the continued development of Simcoe as a complete, balanced, and sustainable urban community containing an efficient pattern of development.

### 4.4.6 Transportation Networks (8.2-8.3)

Sections 8.2 and 8.3 of the OP present transportation-related policies in Norfolk County. These policies are addressed in this section of the report.

**8.2 The Transportation Network**

g) *The automobile will continue to be the main mode of transportation within the County due to its predominantly rural character, small and dispersed population, and size of the Urban Areas. Notwithstanding this, a land use pattern, density and mix of uses shall be promoted in the Urban Areas that reduces growth in the length and number of vehicle trips, and creates the potential for public transit viability and other alternative and sustainable transportation modes such as walking and cycling.*

The automobile will be the main mode of transportation to and from the Subject Lands, however the Proposal provides the potential for increased public transit, walking, and cycling viability for intra-community travel.

Two Ride Norfolk on-demand bus stops are located within a 10-minute walk of the Subject Lands, including one on Donly Drive South (300 metres north of the Subject Lands) and another at the intersection of Decou Road and Simson Avenue (700 metres west of the Subject Lands). Additionally, the Subject Lands are located directly adjacent to the Lynn Valley Trail, providing pedestrian and cycling access to prominent areas of retail and employment in the community of Simcoe. This effectively reduces the number and length of vehicle trips required for residents of the area.

The design of the proposed plan has been completed to ensure automobile and pedestrian connections to the existing and proposed residential subdivisions to the north (Woodways Trail) and east (Calibrex). These connections will create a connected network of roads, providing options for access to these sites, as well as encouraging pedestrian and cyclist movements. The extension of Woodway Trail through the site to Decou Road will create a critical connection which has been highlighted by County staff and Council as being a high priority to provide multiple access points to the existing and planned Woodway Trail subdivisions. Currently, the lands to the north have a single access via Donly Drive, with an emergency connection through the Oakwood Cemetery, which is not a practical long-term solution. The design of the subject subdivision has identified and responded to the needs of the community and provide multiple road accesses to Decou Road. Further, the Phasing Plan prepared identified that the first phase of the development will be to create the connection of the westerly extension of Woodway Trail to Decou Road, which will provide the secondary access to the existing and planned neighbourhoods and responds to the requests of Staff and Council.

h) *Safe and convenient pedestrian interfaces with roads shall be encouraged.*

The Proposal includes sidewalks along all proposed public rights-of-way. This provides safe and convenient pedestrian access to the entirety of the Subject Lands including communal spaces and pedestrian interfaces.

i) *The impact of a development proposal on the transportation system, including the means of access, shall be examined through a Traffic Impact Study. Only those development proposals that can be accommodated in the existing system will be permitted. Where the transportation system is not adequate, the County shall require, as a condition of development approval, that the proponent of the development:*

   i) *improve the system in the vicinity of the proposed development without the County incurring any costs;*

   ii) *make the necessary financial contributions for the required improvements; and/or*

   iii) *dedicate rights-of-way for the development of roads.*

A Transportation Impact Study (TIS) has been prepared by Crozier Consulting Engineers and is included as part of the Applications. The TIS assesses the impact of the Proposal on the transportation system, including the means of access and egress. Please see the TIS, submitted as part of the Applications, for further information.

*8.2.4 Public Transit*

b) *Development within Urban Areas shall, where appropriate, take into consideration the safe and convenient provision of transit services.*

The Proposal includes safe and convenient pedestrian connections to nearby Ride Norfolk on-demand bus stops. Additionally, the land-use pattern and increased density proposed on the Subject Lands encourages further transit use for residents of the area. If deemed appropriate by the County, the Subject Lands will be able to service a Ride Norfolk on-demand bus stop location.

**8.3 Walking, Cycling and Trails**

a) *Existing and proposed trails for walking and cycling are generally illustrated on Schedule "I" to this Plan. The County shall work towards providing bicycle and pedestrian paths, separated from the roadway, on existing and proposal roads, on abandoned rail corridors, on utility corridors, and within parks and open spaces, as appropriate. Priority shall be given to the development and enhancement of routes illustrated on Schedule "I" of this Plan.*

The Lynn Valley Trail, which runs directly adjacent to the Subject Lands along an abandoned rail corridor, is highlighted as an Existing Off Road Trail on *Schedule I-2 Active Transportation* of the OP, which will provide convenient pedestrian access to residents of the development. Additionally, Schedule I-2 lists various routes running through the Subject Lands as "Additional Routes being Considered" by Norfolk County. These routes are proposed to run along two separate public rights-of-way on the Subject Lands, one in an east-west direction – providing access to the west side of the Subject Lands – and the other in a north-south direction – providing pedestrian access through the Subject Lands to Donly Drive South in the north and Decou Road in the south. The Proposal is crucial in the development and enhancement of these routes, improving pedestrian infrastructure and ease of travel within the area and community of Simcoe as a whole.

*i) The County will require that sidewalks be well lit and be accessible for all users, including people with disabilities.*

The Proposal will include sidewalks throughout the Subject Lands, providing pedestrian connection to the existing built-up area of Simcoe as well as the proposed residential developments adjacent to the Subject Lands.

*j) The County will, where appropriate, include requirements for walking, cycling and trail infrastructure in the approval of site plan and other development applications.*

Included within the Draft Plan of Subdivision are sidewalks on all proposed rights-of-way as well as connections to existing cycling and trail infrastructure, including access to both the Lynn Valley Trail and Decou Road (a designated On-Road Cycling Route). Pedestrian access to the lands to both the north and east as well as Decou Road to the south is proposed to ensure efficient access throughout the Subject Lands and areas directly adjacent. Additional trail blocks are proposed to ensure ample connectivity and accessibility for pedestrians and cyclists commuting within the Subject Lands.

### 4.4.7 Servicing Infrastructure (8.8-8.13)

The OP present policies related to servicing, including utilities and telecommunications, water and wastewater, and waste management. These policies are addressed in this section of the report.

**8.9 Water and Wastewater Services**

*8.9.1 Services in Urban Areas*

*a) The County shall ensure that both municipal water supply and wastewater treatment systems perform within permitted operating standards. Limitations on the capacity or operating performance of these systems are recognized as a constraint to further development. The County shall continue to monitor treatment capacities and operational effectiveness of these municipal systems.*

The Proposal will make efficient use of existing municipal water supply and wastewater treatment systems within permitted operating standards. Attached as part of the Applications, a Functional Servicing Report has been prepared by SLA to assess the impact of the Proposal on municipal servicing infrastructure. According to a June 12, 2025 Staff Report to Norfolk County Council, the Simcoe Water Pollution Control Plant average daily flow is rated at 15,400 $m^3$ and has sufficient capacity to meet the County's growth needs beyond 2051.

*b) Development in proximity to any waste water treatment plant shall adhere to the minimum separation distances and standards of the appropriate Ministry of the Environment and Climate Change Guidelines. Prior to the approval of any development of a sensitive land use in proximity to a waste water treatment plant, the Ministry of the Environment and Climate Change shall be consulted, and its standards shall be satisfied. The County may, to deal with specific situations, require separation distances that are greater than the minimum standards set by the Ministry.*

The Ministry of the Environment and Climate Change states that a minimum separation distance of 100 metres shall be provided between Sensitive Land Uses such as residential developments. The Subject Lands are located approximately 800 metres southeast of the Simcoe Water Pollution Control Plant, well beyond the 100-metre minimum separation distance, effectively adhering to provincial separation distances and standards.

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 8.9.1 f) (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.*

The Proposal will be fully serviced by municipal-piped water supply and wastewater treatment systems, in accordance with policy within Section 8.9.1 of the OP. As previously mentioned, attached as part of the Applications, a Functional Servicing Report has been prepared by SLA to assess the impact of the Proposal on municipal servicing infrastructure.

*8.9.3 Servicing Allocation and Phasing*

b) *The timing of development in the Urban Areas shall be managed so that:*

i) *there is a logical extension of municipal services that avoids the "leapfrogging" of large undeveloped tracts of land between the existing urban development area and the proposed development;*

The Subject Lands are located directly adjacent to a large residential neighbourhood to the north, avoiding the "leapfrogging" of large undeveloped tracts of land between existing urban development and the Subject Lands. The landowner is currently in discussions with the County and neighbouring landowners to coordinate the installation of servicing so that it is efficiently and effectively installed. Additionally, the Subject Lands are to be developed in accordance with the adjacent lands to both the east and west, ensuring a logical extension of municipal services and a smooth transition of development from the previously mentioned residential neighbourhood to the north.

ii) *a compact form and pattern of development is maintained;*

The concept subdivision plan displays the proposed form and pattern of residential development that is compact and is an efficient use of land. The Proposal represents an efficient use of residential development through the construction of single-detached and townhouse dwelling units with quick access to walking and cycling routes, parkland, and connections to collector and arterial roads. The Proposal also ensures that appropriate stormwater measures are undertaken through the construction of a 1.16-hectare stormwater management pond. Further, the Proposal will include the construction of new municipal roads and improvements to access to existing municipal rights of way, support growth and accessibility in the community. As outlined above, the development proposes a higher unit per hectare than is generally provided by the Official Plan with respect to single detached and townhouse dwellings, however, this is appropriate to ensure the wise use of land and to create a compact development.

iii) *the provision of all municipal services, as appropriate, proceeds in an economically viable manner; and*

The Proposal will use municipal services for all water, stormwater, and sanitary infrastructure on the Subject Lands. This infrastructure will be expanded from existing servicing on adjacent lands, ensuring economically viable residential growth in the urban areas of Norfolk County.

iv) *first priority is given to reserving servicing capacity for infilling, intensification and redevelopment.*

As the Proposal is within the urban area and is planned for growth within the community of Simcoe Urban Area, servicing capacity for the Subject Lands is available to accommodate the Proposal.

*8.9.4 Stormwater Management*

a) *Stormwater management facilities for all new developments shall be designed, constructed and managed to the satisfaction of the County. Where feasible, regional stormwater management facilities that serve a drainage area that may include several developments will be encouraged by the County.*

A stormwater management pond has been incorporated into the plan at the lowest point of the site to efficiently and effectively capture runoff during storm events. Based on the information prepared by SLA, there is currently uncontrolled runoff from a neighbouring site onto the subject lands. This overland flow has been incorporated into the overall calculations and the pond will be appropriately sized to accommodate the additional flows. The proposed stormwater management pond is designed to serve the needs of the Proposal and to support conservation on the Subject Lands by capturing, treating, and releasing anticipated stormwater generated by the development.

c) *Stormwater management facilities shall be designed to manage stormwater quality and quantity through a treatment train approach, at an appropriate level, as defined in consultation with the appropriate Conservation Authority. The integration of natural vegetative features in new facilities shall be required and the naturalization of existing stormwater management facilities is encouraged. The installation of low impact development measures and green infrastructure will be encouraged.*

The proposed stormwater management pond is designed to manage stormwater quality and quantity, including the integration of natural vegetative features. For further information, please see the Functional Servicing and Stormwater Management report prepared by SLA and submitted as part of this Application. It is anticipated that the ultimate design of the stormwater management pond will be completed through the detailed design stage of the draft plan of subdivision.

d) *Prior to the approval of a development application, the County shall require the preparation and approval of a stormwater management plan which either implements the management concept of the Subwatershed Study, if prepared, or is completed in accordance with guidelines of the appropriate Conservation Authority and the current Ministry of the Environment and Climate Change Stormwater Planning and Design Manual. At its sole discretion, the County may, defer these requirements to the detailed design phase, and implement the policies of this Subsection as a condition of development approval.*

The stormwater management plan, provided as part of the Functional Servicing and Stormwater Management Report prepared by SLA, has been prepared in accordance with the County's Municipal Design Standards. The stormwater management pond will include naturalized landscaping and buffers to the adjacent Lynn Creek and to the significant woodlands. There is no Subwatershed Study for this area, and so the County's Municipal Design Standards govern stormwater management requirements. These Standards have been reviewed, and the proposed design is found to be in compliance.

e) *Prior to development approval, the development proponent shall consider, where appropriate, enhancing the vegetation, wildlife habitats and corridors in and along the stormwater management system and the receiving watercourses. Additionally, the proponent shall provide, where appropriate, public access to and along the stormwater management system and the receiving watercourse where such areas can be used to form part of a trail or open space system. In order to ensure that the size, configuration and grade of the land surrounding the facility can be efficiently programmed as a component of a trail or open space system, it may be necessary to prepare a landscape design prior to development approval.*

Public access to the proposed stormwater management pond will be considered throughout the detailed design phase. Access to the stormwater management pond may be available at the intersection of two proposed public rights-of-way, providing connection to Woodway Trail to the north and the Lynn Valley Trail to the west, potentially forming part of the County's existing trail system. Further investigation to determine if this is feasible will be completed as the more detailed engineering drawings are prepared.

f) *The implementation of storm water management practices shall take into consideration the potential impact of climate change, including the following:*

i) *More extreme thermal impacts on aquatic and terrestrial ecology;*

ii) *Increased seasonal evapotranspiration rates;*

iii) *Uncertainty in hydrologic predictions and models;*

iv) *Potential for more extreme high-contaminant concentrations in storm water;*

v) *Increased stress in water supply and treatment affecting water quality; and*

vi) *the potential for increased frequency and intensity of major storm events.*

Please see the Functional Servicing and Stormwater Management report prepared by SLA submitted as part of the Applications for detailed implementation of stormwater management practices and the potential impact of climate change.

**8.10 Waste Management**

c) *Residential composting shall be encouraged.*

Residential composting on the Subject Lands will be encouraged. It is not the intent to include any restrictive covenants on the property which would prevent household composting. Information regarding the municipal waste collection program will be provided to future homeowners, including information regarding the County's composting bin program.

# 4.5 Comprehensive Zoning By-law 1-Z-2014

## 4.5.1 Draft Zoning By-law Amendment and Zoning Review

An Amendment to Norfolk County Zoning By-law 1-Z-2014 will be required to rezone portions of the Subject Lands from *Development (D)* and *General Industrial (MG(H))* to:

- *Urban Residential Type 2 Zone (R2-xx)* with site specific performance standards to permit single-detached dwellings, townhouse dwellings, parkland, and a stormwater management pond.

Table 5. **R2 Zone Compliance Matrix**

| Performance Standard | | Permitted within the R2 Zone (Semi-Detached) | Proposed R2-XX | Compliance Met? Yes/No) |
|---|---|---|---|---|
| 5.2.1 | Permitted Uses | | | |
| a) | | *dwelling, single detached* | dwelling, single detached | Yes |
| b) | | *dwelling, semi-detached* | | |
| c) | | *dwelling, duplex* | Street Townhouse | No |
| d) | | *bed & breakfast,* subject to Subsection 3.4 | | |
| e) | | *day care nursery* | | |
| f) | | *home occupation* | | |
| g) | | *accessory residential dwelling unit,* subject to Subsection 3.2.3 | | |
| 5.2.3 | Zone Provisions | | | |
| a) | minimum lot area: | | | |
| | i) interior lot | 255 $m^2$ | N/A | No |
| | | | N/A | No |
| | ii) corner lot | 345 $m^2$ | N/A | No |
| | | | N/A | No |
| | | | N/A | No |
| b) | minimum lot frontage: | | | |
| | i) interior lot | 8.5 m | 8.5m (Single Detached) | Yes |
| | | | 6.0m (Townhouses) | No |
| | ii) corner lot | 11.5 m (corner unit) | 8.5m (Single Detached) | No |
| | | | 6.0m (Townhouses) | No |
| c) | minimum front yard: | 6 m | 4.5m (front main wall) | No |
| | | | 6.0m to front wall of attached private garage | No |
| d) | minimum exterior side yard: | 6 m | 2.4m | No |
| e) | minimum interior side yard: | | 1.2m & 0.6m | |
| | iii) attached private garage | 3 m | | No |
| f) | minimum rear yard: | 7.5 m | 6.0m | No |
| g) | maximum building height: | 11 m *[8-Z-2017]* | 11m | Yes |

| | | | | |
|---|---|---|---|---|
| 5.2.5 | Projection of an Attached Garage<br>wall projection of an attached garage facing the street in an R2 Zone<br>*(measured from the wall of the garage facing the front lot line to the nearest structural element of the front wall of the dwelling facing the front lot line, including any covered porch which extends along the entire front wall of the dwelling, but excluding eaves, stairs or gutters)*<br><br>*This provision shall not apply where:* | 3.5 m | (-)1.5m | Yes |
| a) | the front wall of the dwelling and the wall of the attached garage containing the opening for vehicular access do not face the same lot line; | | N/A | N/A |
| b) | the width of the attached garage is less than 60 percent of the width of the dwelling; or, | | N/A | N/A |
| c) | a duplex or single detached dwelling is located on a lot with a lot frontage of 15 metres or greater. | | N/A | N/A |

## 4.6 Supporting Documentation

In support of the applications for Zoning By-law Amendment and Draft Plan of Subdivision, a number of reports and studies were prepared in support of the proposed designs. Full copies of these studies have been provided under separate cover as part of the submission package. A summary of these studies has been provided below.

### 4.6.1 Functional Servicing & Stormwater Management Report

A Functional Servicing and Stormwater Management Report ("FSSR"), dated February 2026, was prepared by S. Llewellyn & Associates Ltd. ("SLA") for the Subject Site. The FSSR details the availability and servicing plan requirements for water, wastewater, and storm servicing for the proposed subdivision in accordance with the standards of Norfolk County, the LPRCA, and general industry practice. The FSSR includes a preliminary Servicing Plan, Storm Drainage Area plan, and storm sewer design sheet.

The proposed Storm sewer system is designed to convey a 5-year minor storm event to a proposed SWM facility (pond), controlling all minor flows to a proposed 1050mm culvert at the site's SW corner, then to the Lynn River. The SWM pond offers 10,101$m^3$ storage capacity, where a 100-year storm event requires 7,646$m^3$. External flows will be conveyed via the proposed road network to SWM pond; major flows to be captured by (proposed) ditch inlets in the rear yard of townhouses adjacent to the proposed development. Discharge will be controlled to pre-development rates, including for 100-year storm event flows. An orifice control system will provide for quantity controls within the SWM pond. A hierarchical Low-Impact Development ("LID") framework is proposed for retention, filtration and detention, including downspout disconnections. Rainwater harvesting, pervious pipes, pavement, and/or biofilters are also considered. The detention treatment area is 21.27ha, with 51% perceived imperviousness.

The SWM pond includes a permanent pool element for quality control. Proposed sediment and erosion control measures include silt fencing, mud mats, thoughtfully locating topsoil stockpiles, stabilizing disturbed areas, and more.

The subject site is serviced by existing 300mm and 375mm sanitary sewers along the Trillium Way extension, connecting to a 900mm trunk to the Simcoe Water Pollution Control Plant. Sanitary flows will be directed north to connect to this system. Part of the existing 300mm sanitary sewer is proposed to be upgraded to 375mm. Dwellings will see 125mm connections. Total flows for all dwellings (peak flow + infiltration) equal to 26.9 litres/second (L/S).

For water, 200mm watermains exist along the Trillium Way extension and Woodway Trails (connecting to Boswell Street's 300mm watermain), and Decou Road. The proposed development will generate maximum demands of 13.03 L/S daily and 23.16L/S hourly from 1,111 residents (404 units, 2.75 persons/unit). Twenty (20) municipal fire hydrants are proposed with 150 metre minimum separations. Proposed servicing will extend the Trillium Way extension's 200mm watermain, and connect to the existing Woodway Trail and future Calibrex Development's 200mm watermain(s). Watermain hydraulic analysis and Hydrant flow testing will be completed at a later date.

The FSSR concludes the proposed development will have sufficient stormwater, sanitary, and water servicing capacity, if it implements the enclosed grading and servicing plan, water and servicing systems, and erosion and sediment controls, to the requirements of Norfolk County and the LPRCA.

### 4.6.2 Geotechnical Investigation

Geotechnical Investigations were completed on the Subject Lands. These investigations were prepared by LVM Naylor, dated December 2009. The report provides recommendations pertaining to development of the Subject Lands, including site grading, site servicing, pavements, residential buildings, excavations and dewatering, and stormwater management.

Based on the results of the geotechnical investigation, the subsurface stratigraphy comprises topsoil overlying major deposits of silt and sand. The stabilized unconfined groundwater table generally occurs between Elevation 215 and 217 metres, except at the southwest boundary where the groundwater level is between 207 and 209 metres. The horizontal hydraulic gradient is from the northeast to the southwest towards the Lynn River. Based on the results of the geotechnical investigation, the site is deemed as well-suited for the proposed residential development, however, the presence of sub-artesian groundwater and shallow groundwater in the low-lying areas will affect design and construction.

### 4.6.3 Transportation Impact Study

A Transportation Impact Study was completed by C.F. Crozier & Associates Inc. ("Crozier") to evaluate the proposed residential development. The Concept Plan consists of 125 single-detached units and 279 townhouses, but has been assessed conservatively as 509 townhouse units. The study concluded that while certain study intersections experience operational constraints under future background conditions, the addition of site-generated traffic can be accommodated within the available road network capacity. Consistent with background studies, signalization of the intersection of Queensway East and Ireland Road is recommended, although not warranted under future total volumes. Ongoing monitoring of the overall road network is also recommended. The proposed site accesses meet applicable spacing, alignment, and sight distance requirements.

The study concludes that the development can be supported from a transportation operations and safety perspective.

### 4.6.4 Archaeological Assessment Stage 1-3

A Stage 1-3 Archaeological Assessment has been prepared by Mayer Heritage Consultants Inc. The Archaeological Assessment Stage 2 general survey recovered Euro-Canadian and pre-Contact Aboriginal artifacts from one-hundred-and-one (101) locations. All non-diagnostic artifacts were flagged and left in the field for proper situ mapping during future fieldwork. Forty-one (41) of these sites were subject to Stage 3 excavations where each surface artifact was recorded and mapped. A Stage 4 excavation is warranted for seventeen (17) locations as they represent significant archaeological resources, and will take place prior to site alteration. It is anticipated this stage 4 assessment will be a requirement of any future conditions to draft plan approval.

### 4.6.5 Environmental Site Assessment

A Phase 1 Environmental Site Assessment ("ESA") was completed by Landtek Limited for the subject site in September 2025. The ESA finds the irregularly-shaped site in a rural context, featuring agricultural crop cover with no structures present. The site surroundings are a mix of agricultural and residential uses. Geologically, subject site soils are generally composed of sand and gravel, on top of limestone, shale, dolostone rock associated with subsets of the Onondaga Formation. A small portion of the subject site is in the regulated area of the LPRCA. No chemical manufacturing/ storage, above- or under-ground storage tanks, nor significant depths of fill from ravines or watercourses were identified on the subject site. However, fill of uncertain quality was found on the north end of the site during Landtek's site reconnaissance. The ESA concludes that, based on the historical agricultural uses of the subject site, pesticides may be present in shallow soils, and has the potential to pose concern.

Landtek thus recommends contemplating a limited Phase 2 ESA for due diligence, to ascertain both existing soil quality, and any potential fill removal needs, for the subject site.

### 4.6.6 Environmental Impact Study

An Environmental Impact Study ("EIS") has been prepared by GeoProcess Research Associates, dated February 19, 2026. The subject site is located within the Black Creek-Lynn River subwatershed, in the broader Long Point Region watershed, with deciduous woodlands to the south/southwest, and Provincially Significant Wetlands approximately 20 metres directly south (adjacent to Decou Road) associated with the Backus Woods Wetlands Complex. The site is located upon soils with rapid infiltration and recharge rates. The site contains Provincially Significant Woodlands, and features a 0.1 hectare deciduous shrub thicket (THDM2), a 1.7 hectare deciduous woodland community ("WOD") crossing the site on its western side toward the LE&N rail trail and Lynn River, and a 1.4 hectare deciduous forest community (FOD) predominantly located on properties between the site and the north side of Decou Road.

The Species at Risk assessment screening yielded a Butternut tree (S2 "imperiled", *endangered*) and nine (9) Barn Swallows (S4B, *breeding pop. apparently secure)* in proximity of the subject site. The butternut tree is within the woodland on the adjacent property, and a buffer has been provided to this woodland and dripline. The Barn Swallows were identified as flying over the subject lands, however, there is no nesting habitat on-site. Eastern Milk snakes, Eastern Wood-pewee, and Snapping Turtle(s) could feasibly occupy habitats on or near the subject site, however were not found during the field investigations.

A 10 metre Vegetative Protection Zone ("VPZ") has been proposed from the significant woodlands to the lands on the adjacent properties, measured from the staked dripline. Where encroachments into the VPZs are required to permit the development (roads and stormwater management pond), compensation is proposed. Based on the areas of encroachment, a net gain in compensation area is proposed of approximately 1,362 square metres. For impacts to significant woodlands, there may be a variety of direct or indirect short-term and/or minor residual effects from construction. The EIS includes recommendations to minimize potential impact to the adjacent NHS areas during the construction of the subdivision. The EIS concludes that the proposed development fulfills applicable policy requirements and can proceed without negative natural impacts by implementing the proposed mitigation measures.

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# 5. CONCLUSION

The Biglieri Group Ltd. was retained by LIV (Simcoe) GP Inc. to prepare planning applications and obtain the municipal approvals required to facilitate a residential development on the lands municipally known as 226 Decou Road in the community of Simcoe. The Proposal seeks a Zoning By-law Amendment and Plan of Subdivision. The existing zoning of *Development (D)* and *General Industrial (HG)* does not permit residential uses. The Proposal consists of residential units in the form of single-detached and street townhouse dwelling typologies, a stormwater management pond, park, trail, and public rights-of-way.

This Planning Rationale Report has evaluated the merits of the proposed applications in the context of all applicable Provincial and County policies, and relevant non-statutory policies. It is our opinion that the Proposal is consistent with the policies as set out in the Planning Act (1990) and Provincial Planning Statement (2024) and conforms to the Norfolk County Official Plan (2006/2008).

For all the foregoing reasons, as well as other reasons as outlined in this report, it is our professional opinion that the Proposal is appropriate and desirable, represents good planning, and warrants the support of Norfolk County.

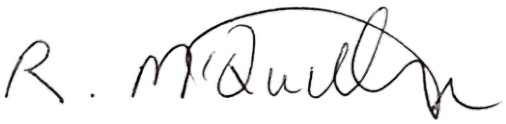
If you should have any questions or concerns, please contact the undersigned at your earliest convenience.

Respectfully submitted,

**THE BIGLIERI GROUP LTD.**



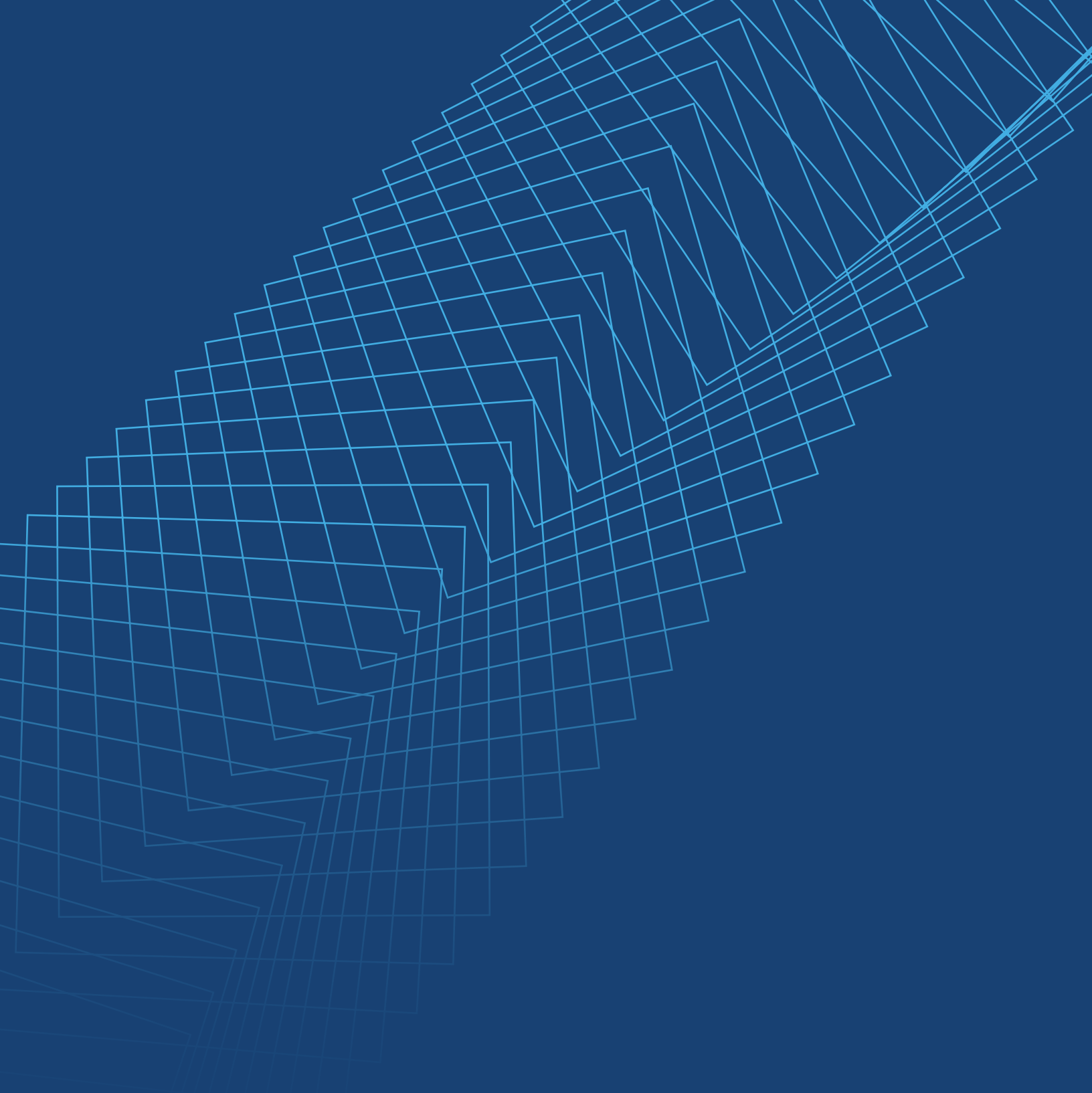
**Rachelle Larocque**, M.Sc, BES, RPP, MCIP
Partner



**Robert McQuillan**, BCom, MPl
Planner



**Michael Barone**, BES
Junior Planner



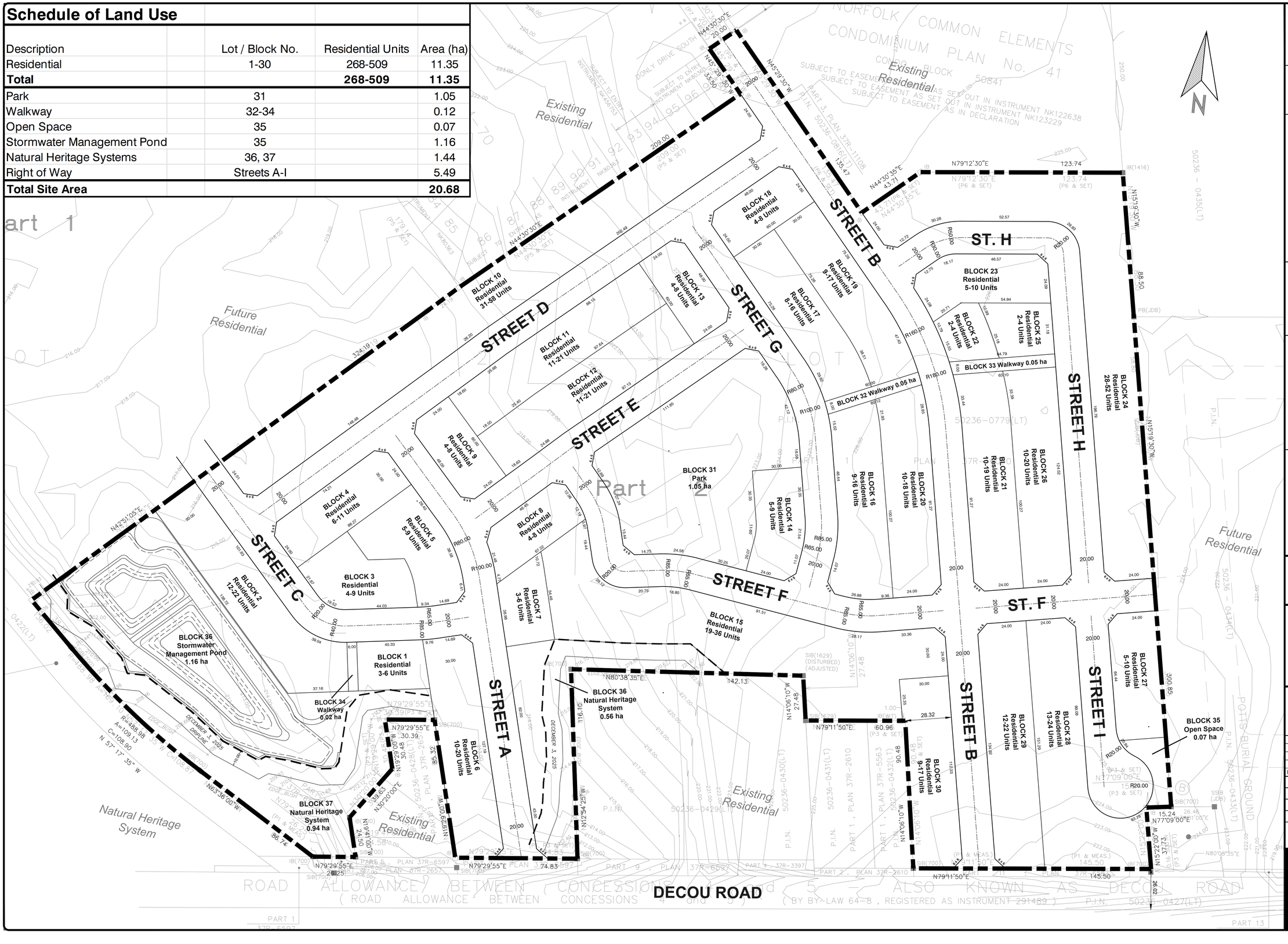
**Toronto Office**
2472 Kignston Road
City of Toronto, ON M1N 1V3

**Hamilton Office**
21 King Street W, Suite 1502
City of Hamilton, ON L8P 4W7

**thebiglierigroup.com**
tbg@thebiglierigroup.com
T (416) 693-9155

## Schedule of Land Use

| Description | Lot / Block No. | Residential Units | Area (ha) |
|---|---|---|---|
| Residential | 1-30 | 268-509 | 11.35 |
| **Total** | | **268-509** | **11.35** |
| Park | 31 | | 1.05 |
| Walkway | 32-34 | | 0.12 |
| Open Space | 35 | | 0.07 |
| Stormwater Management Pond | 35 | | 1.16 |
| Natural Heritage Systems | 36, 37 | | 1.44 |
| Right of Way | Streets A-I | | 5.49 |
| **Total Site Area** | | | **20.68** |

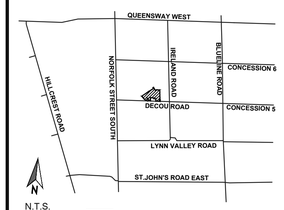



TITLE:

# DRAFT PLAN OF SUBDIVISION

LEGAL DESCRIPTION:
DRAFT PLAN OF SUBDIVISION
PART OF LOTS 2 AND 3
CONCESSION 5
GEOGRAPHIC TOWNSHIP OF WOODHOUSE
NORFOLK COUNTY

KEY PLAN:




REQUIRED INFORMATION:

AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990.

(a) SEE PLAN
(b) SEE PLAN
(c) SEE KEY MAP
(d) SEE SCHEDULE OF LAND USE
(e) SEE PLAN
(f) SEE PLAN
(g) SEE PLAN
(h) PIPED WATER TO BE PROVIDED
(i) SILT, SAND, SAND AND GRAVEL, GLACIAL TILL, CLAY
(j) SEE PLAN
(k) SANITARY & STORM SEWERS TO BE PROVIDED
(l) SEE PLAN
NOTE: CONTOURS RELATE TO CANADIAN GEODETIC DATUM

SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATE AND CORRECTLY SHOWN IN ACCORDANCE WITH A PLAN OF SURVEY PREPARED BY WEST & RUUSKA LTD.

TED S. KUTYLA, O.L.S.
WEST & RUUSKA LTD.

DATE

OWNER'S CERTIFICATE:

I HEREBY AUTHORIZE THE BIGLIERI GROUP LTD. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE NORFOLK COUNTY

LIV (SIMCOE) GP INC.

DATE

## DECOU ROAD RESIDENTIAL DEVELOPMENT

APPROVAL STAMP:

## LIV COMMUNITIES

| No. | Description | Date | Int. |
|---|---|---|---|
| REVISIONS | | | |
| 3 | | | |
| 2 | SHIFTED STREET A AND ADJUSTED BLOCKS | 2026/02/06 | EC |
| 1 | FIRST DRAFT | 2026/01/19 | EC |

PROJECT No.: 25326
DATE: January 19, 2026
SCALE: 1:1000
DRAFTED BY: EC
CHECKED BY:

DRAWING No.: **DP-01**


Biglieri
2472 Kingston Road, Toronto
21 King Street W, Suite 1502, Hamilton
(416) 693-9155
thebiglierigroup.com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## Schedule of Land Use

| Description | Residential Units | Area (ha) | % |
|---|---|---|---|
| **Single Detached** | | | |
| Minimum Lot Width 11.00 (36') | 66 | 2.42 | 11.70% |
| Minimum Lot Width 12.20 (40') | 59 | 2.52 | 12.19% |
| **Total Single Detached** | **125** | **4.94** | |
| Townhouse 6.1m (20') | 279 | 6.41 | 31.00% |
| Parks and Walkway | | 1.24 | 6.00% |
| **Total Developable Area** | | **12.59** | |
| Stormwater Management Pond | | 1.16 | 5.61% |
| Open Space | | 1.44 | 6.96% |
| ROW | | 5.49 | 26.55% |
| **TOTAL** | **404** | **20.68** | |

**DESIGN NOTES:**

1. PLEASE NOTE THAT THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL BUILDING DESIGNS TO BE VERIFIED BY A QUALIFIED PROFESSIONAL.
3. DESIGN SUBJECT TO CHANGE THROUGH PLANNING APPROVAL PROCESS.
4. DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.
5. PROPERTY LINES ARE BASED ON COMPILED SURVEY PLANS VERIFIED BY AN O.L.S.
6. MAXIMUM LENGTH OF DEAD END TO BE CONFIRMED WITH MUNICIPAL ENGINEERING STAFF.

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# CONCEPT SITE PLAN

ADDRESS:
227 Decou Road,
Simcoe

Project No:
25326

Scale:
1:2500

Drawing No:
CSP-02

February 17, 2026

Designed By:
EC

Biglieri

# CONCEPT SITE PLAN

ADDRESS:
227 Decou Road,
Simcoe

Project No:
25326

Scale:
1:2500

Drawing No:
CSP-02

February 17, 2026

Designed By:
EC

Biglieri

## Schedule of Land Use

| Description | Residential Units | Area (ha) | % |
|---|---|---|---|
| **Single Detached** | | | |
| Minimum Lot Width 11.00 (36') | 66 | 2.42 | 11.70% |
| Minimum Lot Width 12.20 (40') | 59 | 2.52 | 12.19% |
| **Total Single Detached** | **125** | **4.94** | |
| Townhouse 6.1m (20') | 279 | 6.41 | 31.00% |
| Parks and Walkway | | 1.24 | 6.00% |
| **Total Developable Area** | | **12.59** | |
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| Open Space | | 1.44 | 6.96% |
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## Schedule of Land Use

| Description | Lot / Block No. | Residential Units | Area (ha) |
|---|---|---|---|
| Residential | 1-30 | 268-509 | 11.35 |
| **Total** | | **268-509** | **11.35** |
| Park | 31 | | 1.05 |
| Walkway | 32-34 | | 0.12 |
| Open Space | 35 | | 0.07 |
| Stormwater Management Pond | 35 | | 1.16 |
| Natural Heritage Systems | 36, 37 | | 1.44 |
| Right of Way | Streets A-I | | 5.49 |
| **Total Site Area** | | | **20.68** |

*** Phasing subject to review and confirmation with county through detailed design**

PHASE 1
PHASE 2
PHASE 3
PHASE 4
PHASE 5
PHASE 6
PHASE 7
PHASE 8

BLOCK 1 Residential 3-6 Units
BLOCK 2 Residential 12-22 Units
BLOCK 3 Residential 4-9 Units
BLOCK 4 Residential 6-11 Units
BLOCK 5 Residential 5-9 Units
BLOCK 6 Residential 10-20 Units
BLOCK 7 Residential 3-6 Units
BLOCK 8 Residential 4-8 Units
BLOCK 9 Residential 4-8 Units
BLOCK 10 Residential 31-58 Units
BLOCK 11 Residential 11-21 Units
BLOCK 12 Residential 11-21 Units
BLOCK 13 Residential 4-8 Units
BLOCK 14 Residential 5-9 Units
BLOCK 15 Residential 19-36 Units
BLOCK 16 Residential 9-16 Units
BLOCK 17 Residential 8-16 Units
BLOCK 18 Residential 4-8 Units
BLOCK 19 Residential 9-17 Units
BLOCK 20 Residential 10-18 Units
BLOCK 21 Residential 10-19 Units
BLOCK 22 Residential 2-4 Units
BLOCK 23 Residential 5-10 Units
BLOCK 24 Residential 8-15 Units
BLOCK 25 Residential 2-4 Units
BLOCK 26 Residential 20-37 Units
BLOCK 27 Residential 10-20 Units
BLOCK 29 Residential 13-24 Units
BLOCK 30 Residential 12-22 Units
BLOCK 31 Residential 9-17 Units
BLOCK 31 Park 1.05 ha
BLOCK 32
BLOCK 33
BLOCK 34 Walkway 0.02 ha
BLOCK 35 Open Space 0.07 ha
BLOCK 36 Stormwater Management Pond 1.16 ha
BLOCK 37 Natural Heritage System 0.94 ha
BLOCK 38 Natural Heritage System 0.56 ha

STREET A
STREET B
STREET C
STREET E
STREET F
STREET G
STREET H
STREET I

DECOU ROAD

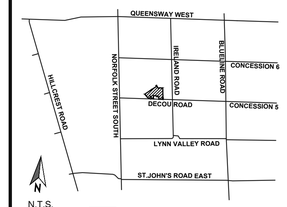
Existing Residential
Future Residential
Natural Heritage System

TITLE:

# PHASE PLAN

LEGAL DESCRIPTION:
DRAFT PLAN OF SUBDIVISION
PART OF LOTS 2 AND 3
CONCESSION 5
GEOGRAPHIC TOWNSHIP OF WOODHOUSE
NORFOLK COUNTY

KEY PLAN:

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(i) SILT, SAND, SAND AND GRAVEL, GLACIAL TILL, CLAY
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SURVEYOR'S CERTIFICATE:

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TED S. KUTYLA, O.L.S.
WEST & RUUSKA LTD.

DATE

OWNER'S CERTIFICATE:

I HEREBY AUTHORIZE THE BIGLIERI GROUP LTD. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE NORFOLK COUNTY

DATE

APPROVAL STAMP:

REVISIONS

| No. | Description | Date | Int. |
|---|---|---|---|
| 3 | | | |
| 2 | | | |
| 1 | FIRST DRAFT | 2026/01/19 | EC |

| | |
|---|---|
| PROJECT No.: | 25326 |
| DATE: | February 12, 2026 |
| SCALE: | 1:1000 |
| DRAFTED BY: EC | CHECKED BY: |
| DRAWING No.: | **DP-01** |


Biglieri
2472 Kingston Road, Toronto
21 King Street W, Suite 1502, Hamilton
(416) 693-9155
thebiglierigroup.com


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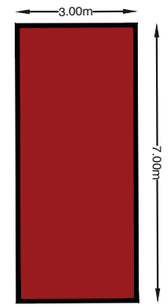
# ON-STREET PARKING PLAN

ADDRESS:
227 Decou Road,
Simcoe

**LEGEND**

- SINGLES
- TOWNHOUSES
- PARKLAND AND OPEN SPACE
- SWM
- ROADS

**PARKING SPACE SIZE:**




**PARKING INFORMATION:**

Parking requirement:
- Distance to Driveway: 1.2 metre
- Distance to Intersection: 9.0 metres
- Distance to Fire Hydrant/Community Mailbox: 3.0 metres

Driveway Width:
- Singles 11.00m (36'): 3.0 metres
- Singles 12.20m (40'): 6.0 metres
- Townhouses: 3.0 metres

On-Street Parking Provided: 152 Spaces

Residential (Off-Street) Parking Provided: 808 Spaces
(1 Driveway, 1 Garage)

Project No:
25326

Scale:
1:2500

Drawing No:
OS-1

February 19, 2026

Designed By:
EC

BIGLIERI GROUP

**The Corporation of Norfolk County**
**By-Law 30-Z-2023**

**Being a By-Law to Amend Zoning By-law 1-Z-2014, as amended, for property described as PART LOTS 2 AND 3, CONCESSION 5 WOODHOUSE, COMPRISING PART 2, PLAN 37R11505 NORFOLK COUNTY.**

Whereas Norfolk Council is empowered to enact this By-Law, by virtual of the provisions of Section 34 and Section 36(1) of the *Planning Act, R.S.O. 1990, CHAPTER P.12,* as amended; and

Whereas this By-Law conforms to the Norfolk County Official Plan; and
Now therefore the Council of The Corporation of Norfolk County herby enacts as follows:

1. That Schedule A-28 of By-Law 1-Z-2014, as amended, is hereby further amended by changing the zoning of the subject lands identified as Part 1 and Part 2 on Map A (attached to and forming part of this By-Law), in accordance with the following:

   Part 1: from Development Zone (D) to Urban Residential Type 2 Zone (R2-XX) with special provisions 14.XXXX and 14.YYYY;

   Part 2: from Development Zone (D) to Open Space (OS).

2. That Subsection 14 Special Provisions is hereby further amended by adding 14.XXXX; as follows:

   14.XXXX – In addition to the uses *permitted* in the R2 *Zone*, a *street townhouse* shall also be *permitted* on the subject lands identified as Part 1 on Map A (attached to and forming part of this By-law).

3. That Subsection 14 Special Provisions is hereby further amended by adding 14.YYYY; as follows:

   14.YYYY – In lieu of the corresponding provisions on the subject lands identified as Part 1 and Part 2 on Map A (attached to and forming part of this By-law), the following shall apply:

Part 1

a) Minimum Lot Area
*That no minimum lot areas are required.*

b) Minimum Lot Frontage – Interior Lot:
*6.0 metres (street townhouses)*
*8.5 metres (single-detached and semi-detached dwellings)*

c) Minimum Lot Frontage – Corner Lot:
*6.0 metres (street townhouses)*
*8.5 metres (single-detached and semi-detached dwellings)*

d) Minimum Front Yard Setback
*4.5 metres to the front main wall of the dwelling*
*6.0 metres to the front main wall of the attached private garage*

e) Minimum Exterior Side Yard Setback
*2.4 metres*

f) Minimum Interior Side Yard Setback
*Detached private garage or parking space accessed via front yard:*
*1.2 metres*
*Detached private garage or parking space accessed from rear lane:*
*0.6 metres*

g) Minimum Rear Yard Setback
*6 metres*

h) Minimum Front Yard Soft Landscaping
*50% (street townhouses)*
*40% (single-detached and semi-detached dwellings)*

*i)* Encroachment of *Deck or Unenclosed Porch* into *Front Yard Setback*
1.5 metres

Part 1 and Part 2

a) A sight triangle shall be measured back from an intersection a distance of 6 metres along the street lines.

Enacted and passed this XX day of XX, 20XX

_____

Mayor: A. Martin

_____

County Clerk: G. Scharback




R2-XX Residential Type 2

OS Open Space

**Zones 1-Z-2014**

Zone

Zone with Holding Provision

Land Parcels

Special Provisions

Site Plan Control

1:5,000

0 235 470 940 ft

0 70 140 280 m

Norfolk GIS

Norfolk GIS
© Norfolk County

METRIC: DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

| SCHEDULE | | | |
|---|---|---|---|
| PART | LOT | CONCESSION | P.I.N. |
| 1 | PART OF 2 | 5 | PART OF 50236-0779(LT) |
| 2 | PARTS OF 2 and 3 | 5 | PART OF 50236-0779(LT) |
| 3 | PART OF 2 | 5 | PART OF 50236-0779(LT) |

PARTS 1, 2 and 3 COMPRISE ALL OF P.I.N. 50236-0779(LT).
PART 3 SUBJECT TO EASEMENT AS IN INSTRUMENT NR456753.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATED March 29, 2022

JIM JOHNSON, O.L.S.

PLAN 37R-11505

RECEIVED AND DEPOSITED

DATED 2022/03/30

Silva Bantleva

REPRESENTATIVE FOR LAND REGISTRAR FOR THE LAND TITLES DIVISION OF NORFOLK (No. 37)

# *PLAN OF SURVEY OF*

## PARTS OF LOTS 2 and 3
## CONCESSION 5
## GEOGRAPHIC TOWNSHIP OF WOODHOUSE
## NORFOLK COUNTY

SCALE – 1 : 1500

50 40 30 20 10 0 50 150 Metres

WEST & RUUSKA LTD.

NOTE:

BEARINGS ARE REFERRED TO THE EAST LIMIT OF PART 1, PLAN 37R-10090.

BEARINGS CAN BE CONVERTED TO GRID BY ROTATING COUNTER CLOCKWISE BY 01°02'35".

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999612.

*OBSERVED REFERENCE POINTS (ORPs)*
*CANSEL CAN-NET REAL TIME NETWORK OBSERVATION UTM ZONE 17 NAD83 (CSRS) (1997.0) COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10*

| POINT ID | NORTHING | EASTING |
|---|---|---|
| ORP A | 4742257.10 | 558636.28 |
| ORP B | 4741643.89 | 558816.44 |

COORDINATES CANNOT, IN THEMSELVES BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN

LEGEND

| | | |
|---|---|---|
| ⊡ | DENOTES | SET MONUMENT |
| ■ | - | FOUND MONUMENT |
| IB | - | IRON BAR |
| SIB | - | STANDARD IRON BAR |
| SSIB | - | SHORT STANDARD IRON BAR |
| 1889 | - | WEST & RUUSKA LTD., O.L.S. |
| P1 | - | PLAN 37R-6597 |
| P2 | - | PLAN 37R-5563 |
| P3 | - | PLAN 37R-10090 |
| P4 | - | PLAN 37M-55 |
| P5 | - | PLAN 37M-70 |
| P6 | - | PLAN NOSCP41 |
| P7 | - | PLAN 37R-10849 |
| PB | - | PLASTIC BAR |

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

2. THE SURVEY WAS COMPLETED ON THE 11th DAY OF MARCH, 2022.

DATED: March 15, 2022

JIM JOHNSON
ONTARIO LAND SURVEYOR

WEST & RUUSKA LTD.
Ontario Land Surveyors
17 NELSON STREET, BRANTFORD, ONTARIO, N3T 2M6
Telephone (519)752-8641

DRAWN BY: Ted S. KUTYLA, CST. CET | Z170060

# Environmental Impact Study

## 227 Decou Road, Simcoe, Norfolk County

Prepared for

**L!V Communities**

1005 Skyview Drive, Suite 301
Burlington, ON L7P 5B1

February 19, 2026
Project No. P2025-1014

Prepared by

**GeoProcess Research Associates Inc.**
133 King Street West
PO Box 65506 DUNDAS
Dundas, ON L9H 6Y6

## Version History

| Version | Date | Issue | Description | Author | Approved |
|---|---|---|---|---|---|
| V1 | 2026-02-17 | Draft | EIS | EV/TS/AJ | KL |
| V2 | 2026-02-19 | Final | EIS | EV/TS/AJ | KL |

# FORWARD

GeoProcess RESEARCH ASSOCIATES
Knowledge Research Consulting

City of Hamilton
133 King St West, Dundas
L9H 6Y6, ON

February 19, 2026

Ben Jones
Director of Land Development
L!V Communities
1005 Skyview Drive, Suite 301
Burlington, ON L7P 5B1

**Re: 227 Decou Road, Norfolk County, Environmental Impact Study, L!V Communities**

Dear Mr. Jones:

GeoProcess Research Associates Inc. (GeoProcess) is pleased to present the following Environmental Impact Study (EIS) for 227 Decou Road, Simcoe, in Norfolk County.

This EIS reports the findings from both in-field and desktop assessments conducted by GeoProcess and identifies the potential impacts and mitigation measures associated with the proposed development as they relate to the properties' natural heritage and hydrological features and functions.

Regards,

**GEOPROCESS RESEARCH ASSOCIATES INC**



Emily Veres
Terrestrial Ecologist



Kate Lillie
Senior Ecologist

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# 1. Introduction

GeoProcess Research Associates Inc. (GeoProcess) has been retained by L!V Communities to complete a Scoped Environmental Impact Study (EIS) for the lands located at 227 Decou Road in Simcoe, Norfolk County, Ontario. This is herein referred to as the "Subject Property". The "Study Area" is defined as the Subject Property plus an additional 120 metres (m) of adjacent lands. Refer to Map 1 for a review of the property location and boundary. It is our understanding that the Subject Property is the proposed site of a residential development, and an EIS is required to characterize the natural heritage system, assess potential impacts, and inform the limits of development.

The Subject Property falls under the jurisdiction of Norfolk County and the Long Point Region Conservation Authority (LPRCA). The Subject Property is adjacent to a Provincially Significant Woodland (PSW), which lies to the south of the property and is recognized by the Natural Heritage Information Centre (NHIC). The Study Area also contains Significant Woodland, which is recognized by Norfolk County under Schedule C-5 of the Norfolk County Official Plan (OP). Additionally, the south end of the Subject Property contains lands designated as 'Adjacent Land' under Schedule C-5.

According to Section 3.5.1 of the Norfolk County OP, development and site alteration is not permitted on adjacent lands unless it is demonstrated through an EIS that there will be no negative impacts on adjacent natural heritage features. This scoped EIS focuses on the Significant Woodlands on the Subject Property as directed through pre-consultation with Norfolk County.

This scoped EIS establishes the extent and function of the Natural Heritage System (NHS) within the Study Area based on field studies and policy conformity of the Norfolk County, LPRCA, and the Province of Ontario. It has been prepared to assess potential negative impacts that the proposed development may have on the NHS, in particular the Significant Woodlands, recommend mitigation measures, and provide an analysis of the required buffers and developable limit of the Subject Property to protect or enhance existing natural heritage features and functions.

## 1.1. Study Area

The Subject Property is approximately 21 hectares (ha) in size and is situated along Decou Road in Norfolk County, Ontario. The Property is approximately 830 m east of Highway 24, 300 m west of Ireland Road, and 850 m south of Victoria Street. Located within the Black Creek-Lynn River subwatershed, the nearest watercourse is Lynn River, which is less than 1 kilometre (km) south of the Subject Property. NHIC-mapped woodlands are present directly south of the property, and a Provincially Significant Wetland (PSW) is mapped south of Decou Road, approximately 30 m beyond the southernmost edge of the property boundary. Residential lands are situated directly north of the property, while agricultural land exists to the east. The Lake Erie & Northern Railway Trail (LE & N Rail Trail) is to the west of the Subject Property.

# 2. Policy Context

Land use is regulated by various agencies with authority under legislation, including acts, regulations, and by-laws. These intergovernmental agencies establish and implement policy frameworks to govern their respective jurisdictions in relation to natural heritage, water, fisheries, urban/rural development, municipal infrastructure, and other environmental features. This section outlines the relevant statutes, regulations,

policies, and plans that govern development within the Study Area to provide an understanding of regulated features, prohibited activities, and development opportunities.

## 2.1. Land Use

Land use policies, plans, and regulations that govern development and related activities aim to guide the orderly disposition of land, prioritize public health and safety, support economic prosperity, and protect the quality of the natural and built environment. The following sections detail the land use policies and regulations applicable to the Study Area.

### 2.1.1. Provincial Planning Statement (2024)

The Provincial Planning Statement (PPS) 2024 is administered under Section 3 of the *Planning Act*. It became effective October 20, 2024, and replaces the Provincial Policy Statement 2020. The PPS applies to planning decisions made on or after that date. It provides policy direction for land use and development within the Province of Ontario and provides for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment. The policies of the PPS may be complemented by provincial and municipal plans and policies.

The PPS defines eight natural heritage features, listed below, and provides planning polices for each. The function of natural heritage features and areas is further clarified by the definition of a Natural Heritage System, which is *"a system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems."*

- Significant wetlands
- Coastal wetlands
- Fish habitat
- Significant woodlands
- Significant valleylands
- Habitat of Endangered species and Threatened species
- Significant Wildlife Habitat
- Significant Areas of Natural and Scientific Interest (ANSIs)

Sections 4.0 and 5.0 of the PPS deal with development and site alteration, and where these activities shall not be permitted. Section 4.0 policies surround the conservation of biodiversity and protection of the health of the Great Lakes, natural heritage, water, agricultural, mineral and cultural heritage and archaeological resources for their economic, environmental and social benefits. Section 5.0 directs development away from areas of natural or human-made hazards to mitigate risks to public health or safety, and property damage from natural hazards, including the risks that may be associated with the impacts of a changing climate.

Policies in Section 4.1 are particularly relevant as they surround development and site alteration in and adjacent to natural heritage features. These policies and select others are outlined below in Table 1.

*Table 1. Applicable Policies of the Provincial Planning Statement*

| Policy Number | Policy |
|---|---|
| *(4.1 - Natural Heritage)* 4.1.2 | The diversity and connectivity of natural features in an area and the long-term *ecological function* and biodiversity of *natural heritage systems*, should be maintained, restored or where possible, improved, recognizing linkages between and among *natural heritage features and areas*, *surface water features* and *ground water features*. |
| 4.1.3 | *Natural heritage systems* shall be identified in Ecoregions 6E & 7E, recognizing that *natural heritage systems* will vary in size and form in *settlement areas, rural areas*, and *prime agricultural areas*. |
| 4.1.4 | *Development* and site alteration shall not be permitted in: a) *significant wetlands* in Ecoregions 5E, 6E and 7E; and, b) *significant coastal wetlands*. |
| 4.1.5 | Development and site alteration shall not be permitted in: a) *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E and 7E; b) *significant woodlands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River); c) *significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River); d) *significant wildlife habitat*; e) *significant areas of natural and scientific interest*; and f) *coastal wetlands* in Ecoregions 5E, 6E and 7E that are not subject to policy 4.1.4(b) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. |
| 4.1.7 | *Development and site alteration* shall not be permitted in *habitat of endangered species and threatened species*, except in accordance with *provincial and federal requirements*. |
| 4.1.8 | *Development* and *site alteration* shall not be permitted on *adjacent lands* to the *natural heritage features and areas* identified in policies 4.1.4, 4.1.5 and 4.1.6 unless the *ecological function* of the *adjacent lands* has been evaluated and it has been demonstrated that there will be no *negative impacts* on the natural features or on their *ecological functions*. |
| 5.2.4 | Planning authorities shall prepare for the impacts of a changing climate that may increase the risk associated with natural hazards. |

### 2.1.2. Norfolk County Official Plan (2025 Consolidation)

The Norfolk County Official Plan (OP) was adopted by council on May 9, 2006, and last updated on October 16, 2025. The OP is the principal land use planning tool for Norfolk County and provides a policy framework for land use and development within the county.

Under Schedule A-1 of the OP, the Subject Property is within the Simcoe Urban Area. Schedule B-15 of the OP shows that the Study Area is Designated Greenfield lands zoned Urban Residential and is outside the limits of the current Built Boundary. Natural Heritage Features are outlined in Schedule C-5. Lands towards the southern end of the Subject Property fall under the Adjacent Lands designation associated with the wetland south of Decou Road. The wetland south of Decou Road, approximately 30 m from the property, is designated as a Provincially Significant Wetland (PSW). The woodlands along and beyond the southern

property boundary are designated as Significant Woodland. Schedule C-4 maps the Study Area to be outside of any source water protection zones.

The Official Plan divides lands-based environmental considerations into three categories, including:

- Provincially Significant Features (PSFs)
- Natural Heritage Features (NHFs)
- Hazard Lands

The policies in this section focus on the County's requirements for this Scoped EIS to address the Significant Woodlands within the Study Area. The requirements for a Scoped EIS are detailed in Section 9.7.1.2 of the OP.

Policy 3.5.1b prohibits development and site alteration on lands adjacent to the Natural Heritage Features (NHF), unless such lands have been evaluated, and it is demonstrated that there will be no negative impacts on the natural features or their ecological functions. The boundaries of Natural Heritage Features and their associated Adjacent Lands are defined in Table 2.

*Table 2. Extent of Land Adjacent to a Natural Heritage Feature*
*(Adapted from Table 2 of the Norfolk County Official Plan)*

| Natural Heritage Feature | Feature Boundary Definition | Extent of Adjacent Land |
|---|---|---|
| Significant Woodlands | Established by Norfolk County | Dripline plus 10 metres |
| Habitat of endangered and threatened species | Defined by Provincial/ Federal authorities. | 100 metres |
| Significant wildlife habitat | Defined by MNRF, and/or County. | 50 metres |
| Natural Areas (including Carolinian Canada sites) | As defined by the County Natural Areas Inventory. | 50 metres |

Policy 3.5.2b requires an EIS for development adjacent to NHFs, as such activities will not be permitted unless demonstrated that there will be no negative impacts on the features or on their ecological functions that cannot be adequately mitigated.

Pursuant to section 3.5.2c, the County prohibits development in habitat of endangered and/or threatened species unless in accordance with applicable Provincial/Federal requirements and the ecological function of the adjacent lands has been evaluated through an EIS in accordance with the Endangered Species Act (ESA), demonstrating no negative impacts.

Policy 3.5.2e notes that Forestry and Planning staff may be consulted to assist in further refinement of Significant Woodlands when required. Furthermore, Policy 3.5.2g encourages the retention of woodlands or portions of woodlands and the replacement of removed trees for development. The Plan also encourages the conservation/replanting of roadside and fence-line shrubs/trees, and riparian area vegetation (Policy 3.5.2g).

Policy 3.5.2h requires consultation with the Norfolk Environmental Advisory Committee and the use of the MNR Natural Heritage Reference Manual for the completion of an EIS to ensure consistency with Natural Heritage Features policies. Policy 3.5.2i encourages opportunities for creating new habitats, natural vegetation regeneration, conserving natural landforms and functions, protecting water resources, and

promoting environmental education. It is required to consider the enhancement of vegetation, wildlife habitats and corridors in the SWM system and the receiving watercourses (8.8.4e).

Policy 9.7.1.3a requires that a scoped EIS (SEIS) consult with the MNR, Environment and Climate Change Canada (ECCC) and other relevant agencies, and the study shall be prepared to their satisfaction.

### 2.1.3. O. Reg. 41/24 Prohibited Activities, Exemptions, and Permits (2024)

Ontario Regulation 41/24 (effective April 1, 2024), issued under the *Conservation Authorities Act* (CA Act), replaced all 36 individual Conservation Authority regulations with a single, province-wide regulation. This regulation emphasizes public safety and removes the "pollution" and "conservation of land" tests for permitting. Conservation Authorities may grant permission for development if, in their opinion, the proposal will not affect flood control, erosion, dynamic beaches, or unstable soil/bedrock, and will not create conditions that could jeopardize health, safety, or property in the event of a natural hazard.

Section 28(1) of the CA Act prohibits the following activities within a Conservation Authority's jurisdiction:

> (1) the alteration of watercourses or wetlands, and
>
> (2) development within hazardous lands, wetlands, river/stream valleys, Great Lakes/inland lake shorelines subject to flooding/erosion/dynamic beach hazards, and other areas designated by regulation.

The Subject Property is within Long Point Region Conservation Authority (LPRCA) watershed, is partially within LPRCA regulated area; however, it does not contain LPRCA-regulated features.

#### 2.1.3.1. Long Point Region Conservation Authority Policies for the Administration of O. Reg. 41/24

The Long Point Region Conservation Authority (LPRCA) Policies for the Administration of the Prohibited Activities, Exemptions and Permits Regulation, Ontario Regulation 41/24 outlines the regulated areas, prohibited and exempt activities, and required assessments for development within the LPRCA jurisdiction.

Development activities are generally prohibited within a Regulated Area but may be permitted if demonstrated that new hazards are not created nor increased in susceptibility, there are no adverse hydraulic or fluvial impacts on rivers, creeks, streams, or watercourses, grading is minimized, sedimentation and erosion is minimized, and the control of flooding or erosion is not adversely affected (7.1.1 and 7.1.2).

Connected ponds outflowing into a watercourse may be permitted. A site plan/other site-specific study demonstrates no negative impact on the downstream water quality or thermal regime, and maximum berm heights above existing grades do not exceed 0.3 metres within the flood or erosion hazard, and all remaining fill is removed from the hazard area (9.1.10).

## 2.2. Environment

The statutes and regulations in this section generally aim to protect wildlife and aquatic species that are sensitive or susceptible to land use and development activities, which may cause detriment to the natural environment, its systems, and functions.

### 2.2.1. Species at Risk Act (2002)

The *Species at Risk Act* (2002) is a federal statute passed to prevent the disappearance of wildlife species in Canada through the recovery of wildlife species that are extirpated, endangered, or threatened due to anthropogenic activity and to manage species of special concern to prevent them from becoming endangered or threatened. Activities in proximity to species protected under the Species at Risk Act (SARA) are subject to regulatory approval from the appropriate enforcing authority. SARA is administered by Environment and Climate Change Canada (ECCC).

ECCC's approval is required under SARA if an activity affects a federally protected terrestrial species at risk.

### 2.2.2. Migratory Birds Convention Act (1994)

The *Migratory Birds Convention Act* (1994) serves to protect and conserve migratory birds, their nests and eggs in Canada. It is prohibited under the MBCA to damage, destroy, disturb or remove the nest of a migratory bird that contains a live bird or viable egg. However, a permit may be issued under the MBCA for various activities with conditions for the husbandry, release, scaring, capture, killing or disposal of migratory birds.

The removal of existing trees on the Property will be subject to regulations under the *Migratory Birds Convention Act* (MBCA). This EIS has been completed in accordance with the MBCA and associated regulations in consultation with Environment and Climate Change Canada as required.

#### 2.2.2.1. Migratory Bird Regulations (2022)

The Migratory Birds Regulations (2022) protects migratory birds, their eggs, and nests by prohibiting activities that cause them harm. Migratory birds, their nests or eggs can be harmed as a result of many activities including those that do not primarily target a bird but may cause harm, such as:

- Clearing trees or other vegetation
- Draining or flooding land
- Using fish gear

Unless authorized under the regulation (MBR 2022), the following activities are prohibited:

- Capture, kill, take, injure, or harass a migratory bird or attempt to do so
- Destroy, take or disturb an egg
- Damage, destroy, remove or disturb a nest shelter, eider duck shelter or duck box unless the following exceptions apply:
    1. Nest does not contain a live migratory bird or viable egg
    2. Nest was not built by a species that is listed under Schedule 1 of the regulation

The following measures can be undertaken to prevent harming migratory birds, nests, and eggs:

- Understand how migratory birds and their nests are legally protected
- Consult the nesting calendar to plan potentially harmful activities outside of breeding season and migration periods
- Plan activities and determine what measures can be taken to avoid causing harm
- Develop and implement preventative and mitigation measures

### 2.2.3. Endangered Species Act (2007)

The *Endangered Species Act* (ESA) (2007) was amended on June 5, 2025, through the passing of Bill 5 and is to be replaced with the *Species Conservation Act*, 2025, at a later date. The purpose of the ESA (2007) is to provide protection and conservation to species at risk while considering social and economic factors for sustainable economic growth in Ontario. The protected species and their habitat are designated by the Committee on the Status of Species at Risk in Ontario (COSSARO) as endangered, threatened, extirpated, or of special concern, and the Government of Ontario adds species to the Species at Risk in Ontario (SARO) list based on COSSARO recommendations. These designations are defined as:

> **Endangered**: A species shall be classified as an endangered species if it lives in the wild in Ontario but is facing imminent extinction or extirpation.
>
> **Threatened**: A species shall be classified as a threatened species if it lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening to lead to its extinction or extirpation.
>
> **Extirpated**: A species shall be classified as an extirpated species if it lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.

Under the amended ESA, for the purposes of protection under the Act, habitat does not include places where the species formerly occurred or has the potential to be reintroduced unless existing members of the species depend on that area. The ESA defines habitat as the following:

> **For animal species:** habitat is a dwelling place that is occupied or habitually occupied for breeding, rearing, staging, wintering or hibernating, and the area immediately around a dwelling place.
>
> **For vascular plant species:** habitat is the surrounding critical root zone.
>
> **For all other species:** habitat is an area on which any member of a species directly depends in order to carry on its life processes.

The ESA (Subsection 9(1)) outlines the prohibitions regarding harm to species and states that:

*"No person shall,*

*(a) kill, harm, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*

*(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,*

*(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*

*(ii) any part of a living or dead member of a species referred to in subclause (i),*

*(iii) anything derived from a living or dead member of a species referred to in subclause (i); or*

*(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii)."*

Clause 10 (1)(a) of the ESA also states that:

*"No person shall damage or destroy the habitat of*

- a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.
- a species that is listed on the Species at Risk in Ontario List as an extirpated species, if the species is prescribed by the regulations for the purpose of this clause. 2007, c. 6, s. 10 (1)."

There are three applicable regulations under the ESA, 2007; O. Reg. 230/08 - the Species at Risk in Ontario (SARO) List, O. Reg. 242/08 (General), and O. Reg 830/21 (Exemptions – Barn Swallow, Bobolink, Eastern Meadowlark and Butternut). These regulations identify which species and habitats receive protection and provide direction on their current implementation under the ESA.

Prior authorization or issuance of permit from the MECP and/or the Ministry of Natural Resources (MNR) is required to carry out activities that would otherwise be prohibited or regulated under the ESA unless exempt under Ontario Regulation 242/08.

# 3. Methodology

The following sections provide the methodologies followed to complete the background studies and execute the field program designed to characterize the natural heritage features and their functions within the Study Area.

## 3.1. Background Studies

Literature and data pertaining to the Subject Property were reviewed and evaluated to obtain natural heritage and background planning policy information. A list of documents and information sources consulted to support this study are provided below:

- Norfolk County Official Plan (2023)
- Long Point Region Conservation Authority Regulated Areas Mapping Tool
- *Endangered Species Act (2007)* and Species at Risk in Ontario List (O. Reg. 230/08)
- Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits (April 2024)
- Natural Heritage Information Centre (NHIC) database information, 1 km x 1 km squares 17NH5741, 17NH5742, 17NH5841
- Ontario Breeding Bird Atlas (OBBA) and eBird
- Ontario Reptile and Amphibian Atlas (Ontario Nature)
- Ontario Butterfly Atlas (Jones et al. 2025)
- Ontario Moth Atlas (Edwards et al. 2025)
- Citizen science databases: eBird and iNaturalist- NHIC Rare Species of Ontario
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map (DFO 2025)
- Google Earth Pro

## 3.2. Field Work

GeoProcess conducted field studies to characterize and inventory the natural heritage features and wildlife activity of the Subject Property and surrounding landscape. A summary of the field work details is provided in Table 3.

*Table 3. Completed Field Work*

| Activity | Timing | Date | Staff |
|---|---|---|---|
| Floristic Studies | Spring (May-June)<br>Summer (July-August)<br>Fall (September-October) | July 4, 2025<br>August 15, 2025<br>September 26, 2025 | T. Synard, E. Veres |
| Woodland Dripline Staking with Agency | - | December 3, 2025 | K. Glasbergen, Norfolk County |
| Breeding Bird Surveys | Visit 1<br>Visit 2 | June 27, 2025<br>July 11, 2025 | D. Graham |
| Snag Surveys | Leaf-off | November 20, 2025 | E. Veres, T. Synard |
| Incidental Wildlife Surveys | - | Throughout all site visits | All staff |

### 3.2.1. Floristic Studies

An Ecological Land Classification (ELC) with a three-season botanical inventory of all floristic species was completed on July 4, 2025, August 15, 2025, and September 26, 2025. Species nomenclature and ranking was determined provincially by the Ministry of Natural Resources Natural Heritage Information Centre Database (S-ranks). Vegetation communities were mapped and described according to the ELC system for Southern Ontario (Lee et al. 1998). Vegetation community boundaries were determined using desktop analysis and further refined in the field. The results of this assessment are found in Section 4.4, Map 3, and Appendix B.

### 3.2.2. Woodland Dripline Staking

Delineation of the woodland boundary was completed on December 3, 2025, through a dripline staking exercise with Norfolk County. The location of this boundary is shown on Map 3.

### 3.2.3. Breeding Bird Surveys

Breeding bird surveys were undertaken on June 27, 2025, and July 11, 2025, by a breeding bird expert under appropriate weather conditions. The area was surveyed using a travelling count approach to search for birds within the feature, recording presence, abundance and level of breeding evidence using the Ontario Breeding Bird Atlas (OBBA) protocols. Travelling counts are one of the survey methods that are listed under the OBBA and are implemented when the surveyor is travelling more than 50 m. Using the travelling count method, bird surveys were conducted on an 'area search' basis. This method involves the surveyor restricting their species list to a particular area such as a woodlot, wetland or field. This approach is also included as an

observation type within the OBBA. Results and analysis of these surveys are presented in Section 4.5 and Map 3.

### 3.2.4. Snag Surveys

GeoProcess staff conducted a snag survey, also referred to as a bat maternity roost survey, on November 20, 2025, to assess the presence or absence of potential bat maternity roosting habitat within the Subject Property. Surveys were conducted following the Ontario Ministry of Natural Resources and Forestry (MNRF 2017) Protocol for Species at Risk Bats within Treed Habitats, suitable for identifying potential maternity roost trees for *Myotis sp.* bats, as it occurred during leaf-off conditions. The survey included an assessment of all living and dead trees with a Diameter at Breast Height (DBH) of 10 centimetres (cm) or greater with loose or naturally exfoliating bark, cavities, hollows, or cracks that may provide suitable bat maternity roosting habitat. Surveys are conducted during the leaf-off period so that the view of tree cavities, cracks, and loose bark is not obscured by foliage. The results of the survey are provided in Section 4.6.

### 3.2.5. Incidental Wildlife Surveys

Formal surveys for mammals, reptiles, and insects were not completed; however, incidental observations were documented while completing all site visits. The results are presented in Section 4.7.

### 3.2.6. Species at Risk Screening and Assessment

An assessment and screening of potential Species at Risk (SAR) was conducted for the Subject Property based on Federal and Provincial status. Following the MECP Client's Guide to Preliminary SAR Screening (2019), this screening was based on a review of the NHIC, regional species list, atlases (i.e. OBBA, butterfly, moth, and reptile and amphibian), and citizen science databases (i.e. iNaturalist, eBird). Data sources utilized for the screening are described in Appendix C. The SAR assessment results are further discussed in Section 5.

### 3.2.7. Significant Wildlife Habitat Screening and Assessment

A screening for Significant Wildlife Habitat (SWH) following the Ministry of Natural Resources and Forestry Significant Wildlife Habitat Technical Guide (2000) and Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (2015) was conducted for the Subject Property. Potential SWH identified was assessed during the complementary field studies. The results of this assessment are found in Section 6 and Appendix D.

# 4. Existing Conditions

The following discussion presents the existing conditions of the Study Area and summarizes the results of field surveys completed to characterize the natural heritage features and their functions within the Study Area.

## 4.1. General Landscape Position

The Study Area is within the Black Creek-Lynn River subwatershed of the greater Long Point Region watershed. The Long Point Region watershed falls within the Carolinian Forest Zone of Canada, a deciduous forest life zone known for its high biodiversity and number of rare species. The Subject Property is bordered by residential and recreational lands to the north, agricultural lands to the east and west. Deciduous woodlands are present to the south and southwest of the property, including Provincially Significant Wetlands (PSW) directly south of Decou Road. A permanent watercourse, Lynn River, exists beyond the southern border of the property, which flows south and drains into Lake Erie. The Brook Conservation Area is a 30-acre conservation area managed by the LPRCA and is located approximately 0.5 km to the west of the Subject Property. An old rail trail, the LE & N Trail, passes along the southwest border of the Subject Property, following along the Lynn River, and ending in Port Dover.

## 4.2. Physiography and Geology

The Subject Property is located within the Norfolk Sand Plain physiographic region of Southern Ontario (Chapman and Putnam 1984). The sands and silts of the Norfolk Sand Plain region were deposited by historic glacial Lakes Whittlesey and Warren roughly 13,000 years ago, leading to soils with rapid infiltration and recharge rates. These rich, well-draining soils contribute to the productive agricultural sector within the region. Surficial geology around the Subject Property is comprised of coarse-textured glaciolacustrine deposits, including sand, gravel, minor silt, and clay. Bedrock geology within the Subject Property can be dated back to the Upper Silurian Epoch of the Paleozoic Era, with the rock types consisting of limestone, dolostone, shale, sandstone, gypsum, and salt.

## 4.3. Natural Heritage Systems

### 4.3.1. Provincially Significant Wetlands

A PSW is present approximately 20 m south of the Subject Property boundary, on the southern side of Decou Road. These wetlands are approximately 1.3 ha in size and, according to current Regulated Areas mapping provided by the Long Point Region Conservation Authority, belong to the Backus Woods Wetlands Complex. The Backus Woods Wetlands Complex is recognized as a significant remnant of the fractured Carolinian ecological zone and provides habitat to plant species unique to the Carolinian zone.

### 4.3.2. Significant Woodlands

The Subject Property contains Significant Woodland, which is recognized by Norfolk County under Schedule C-5 of the Norfolk County Official Plan (OP). These are mature deciduous woodlands that extend beyond the Subject Property and surround the Lynn River.

### 4.3.3. Lynn River

The Lynn River crosses through the Study Area, south of the Subject Property, towards the southeast, where it ultimately converges with Lake Erie at Port Dover. The Lynn River does not enter the Subject Property boundary. A small drainage feature initiates on the Subject Property within the woodland and drains south through a culvert under Decou Road into the Lynn River.

## 4.4. Vegetation Communities

A three-season botanical inventory of all floristic species present on the Subject Property was completed alongside vegetation community classification following the ELC system for Southern Ontario (Lee et al. 1998). A total of 97 vascular plants were recorded during the botanical inventory and vegetation community classifications. Of those 96 plants, 90 were identified to species level. Of those 90 species, 66 are native to Ontario, and 24 are introduced. A full botanical inventory can be found in Appendix A.

Invasive species such as Norway maple (*Acer platanoides*), black locust (*Robinia pseudoacacia*), and tatarian honeysuckle (*Lonicera tatarica)* are present in the wooded communities. One species at risk was observed within the Subject Property during field surveys, butternut (*Juglans cinerea*), which is listed as endangered in Ontario.

### 4.4.1. Ecological Land Classification

The results of the ELC are presented in Table 4 and shown on Map 3. Three vegetation communities were identified within the Subject Property.

*Table 4. Ecological Land Classification Communities*

| ELC Code and Classification | Characteristic Vegetation | | Comments |
|---|---|---|---|
| WOD: Deciduous Woodland | Canopy | Black walnut (*Juglans nigra*), American basswood (*Tilia americana*) | A deciduous woodland community containing a ravine with a small drainage feature. |
| | Sub-canopy | Black walnut, green ash (*Fraxinus pennsylvanica*), American basswood | The one section along the edge of this community and the agricultural field to the north contained moisture-loving species, including great blue lobelia (*Lobelia siphilitica*). |
| | Understory | Green ash, alternate-leaved dogwood (*Cornus alternifolia*) | |
| | Ground | Eastern skunk cabbage (*Symplocarpus foetidus*), black raspberry (*Rubus occidentalis*), broad-leaved enchanter's nightshade (*Circaea canadensis*) | Soils with an effective texture of silty loam. |
| FOD: Deciduous Forest | Canopy | Black walnut, sugar maple (*Acer saccharum*), trembling aspen (*Populus tremuloides*) | Visual assessment from the edge of the community only as no site access was granted. |
| | Sub-canopy | Black walnut, sugar maple, eastern white cedar (*Thuja occidentalis*) | Several potential endangered butternut trees were observed within this community, but could not be properly accessed to confirm an identification to species level. |
| | Understory | Alternate-leaved dogwood (*Cornus alternifolia*), black raspberry (*Rubus occidentalis*) | |
| | Ground | Tall goldenrod (*Solidago altissima*), black raspberry, white avens (*Geum canadense*) | |

| ELC Code and Classification | | Characteristic Vegetation | Comments |
|---|---|---|---|
| THDM2: Dry-Fresh Deciduous Shrub Thicket | Canopy | Eastern cottonwood (*Populus deltoides*), black locust (*Robinia pseudoacacia*) | A small cultural willow thicket.<br><br>Soils with an effective texture of sand and an absence of mottles or gley, indicating a fresh moisture regime. |
| | Sub-canopy | Interior sandbar willow (*Salix interior*), eastern cottonwood (*Populus deltoides*), black locust | |
| | Understory | Interior sandbar willow, cottony willow (*Salix eriocephala*) | |
| | Ground | Tall goldenrod, field horsetail (*Equisetum arvense*), panicled aster (*Symphyotrichum lanceolatum*) | |

**Deciduous Woodland (WOD)**

A 1.7 ha deciduous woodland community crosses the Subject Property boundary into the LE & N Rail Trail, directly north of Decou Road. The most abundant canopy and sub-canopy species in this community were black walnut (*Juglans nigra*) and basswood (*Tilia americana*), with the introduced species black locust present to a lesser extent. Several walnut trees in this community exhibited bark that showed potential hybrid characteristics. Given the historical presence of English walnut (*Juglans regia*) recorded in the area, these trees may be hybrids between black and English walnut. Green ash (*Fraxinus pennsylvanica*) was also present in the sub-canopy and understory. Additional understory species included alternate-leaved dogwood (*Cornus alternifolia*), black elderberry (*Sambucus canadensis*), and tatarian honeysuckle. The ground layer contained a variety of herbaceous species, with white avens (*Geum canadense*), broadleaf enchanter's nightshade (*Circaea canadensis*), and riverbank grape (*Vitis riparia*). Abundant patches of eastern skunk cabbage (*Symplocarpus foetidus*) and spotted jewelweed (*Impatiens capensis*) occurred along the riparian borders of the drainage feature crossing through the community. The edges between the woodland community and the farmland to the north contained wetter areas with moisture-loving species like great blue lobelia (*Lobelia siphilitica*) and Joe-pye weed (*Eutrochium maculatum*).

**Deciduous Forest (FOD)**

A 1.4 ha deciduous forest community that sits predominantly on private property beyond the southern Property boundary, directly north of Decou Road. There was a wide variety of tree species in the canopy layer, with black walnut, sugar maple (*Acer saccharum*), trembling aspen (*Populus tremuloides*) and slippery elm (*Ulmus rubra*) occurring commonly. One Chinese chestnut (*Castanea mollissima*) was present in the canopy layer, and several diseased trees resembling the Endangered butternut (*Juglans cinerea*) were present in the canopy and sub-canopy layers. Additional species in the canopy and sub-canopy included black locust, eastern white cedar (*Thuja occidentalis*), Norway spruce (*Picea abies*), black cherry (*Prunus serotina*), and yellow birch (*Betula allegheniensis*). Black raspberry (*Rubus occidentalis*), alternate-leaved dogwood, and green ash (*Fraxinus pennsylvanica*) were occasional in the understory. Tall goldenrod (*Solidago altissima*), black raspberry, white avens, and Virginia stickseed (*Hackelia virginiana*) were common ground-layer species. This community contained an informal trail and contained several snag trees that could provide potential bat habitat.

**Dry-Fresh Deciduous Shrub Thicket (THDM2)**

A small (0.1 ha) thicket community is located along the northwestern border of the Subject Property behind the houses along Donly Drive South. This community appears to be a remnant of the much larger woodland community that is no longer present on-site but is still shown on aerial imagery. Trees in the canopy and sub-canopy layers occurred sparsely, with eastern cottonwood (*Populus deltoides*) and black locust. Interior sandbar willow (*Salix interior*) was the most abundant species in both the sub-canopy and understory, with cottony willow (*Salix eriocephala*) occurring occasionally in the understory and ground layer. Rough horsetail (*Equisetum hymale*) and tall goldenrod were abundant in the ground layer, with a variety of aster species, such as New England aster (*Symphyotrichum novae-angliae*) and panicled aster (*Symphyotrichum lanceolatum*), occurring occasionally.

### 4.4.2. Hedgerow Assessment

While hedgerows are not recognized as an ELC community, they can contain trees or plants of interest and provide habitat and corridors for wildlife. Assessment of the hedgerows within the Subject Property were conducted to gather information on the dominant plant species, approximate Diameter at Breast Height (DBH) and assess their connection to the surrounding landscape. This includes identifying if the hedgerows provide a linkage to other natural heritage features, including watercourses and Headwater Drainage Features (HDFs), and if they provide habitat for wildlife, including suitable habitat for bats through the presence of snags.

One hedgerow was identified within the Subject Property along the southern property boundary, connecting to the deciduous forest to the east. It is approximately 50 m in length and varies between 10-20 m in width. This hedgerow contains a roadside ditch, and as such, many of species within it are tolerant of moist soils. The canopy is predominantly composed of black locust, with a small amount of eastern cottonwood. The sub-canopy is composed of white mulberry (*Morus alba*) and Manitoba maple (*Acer negundo*). Shrub and small tree species in the understory include black locust, staghorn sumac (*Rhus typhina*), alternate-leaved dogwood, red osier dogwood (*Cornus sericea*), and common buckthorn (*Rhamnus cathartica*). A small live stump of what used to be a mature crack willow (*Salix euxina*) is also present in the understory, sprouting suckering branches. Forb species in the ground layer include spotted jewelweed, brown-eyed Susan (*Rudbeckia triloba*), shining aster (*Symphyotrichum firmum*), and panicled aster.

## 4.5. Wildlife Surveys

### 4.5.1. Breeding Bird Surveys

Breeding bird surveys were undertaken on two separate dates by a breeding bird expert under appropriate weather conditions (Table 5). The Subject Property is almost entirely occupied by an agricultural field planted in corn at the time of the surveys. There is a small amount of deciduous forest in the southwest corner of the Subject Property and a very small, treed area south of Donly Drive South where it bends 90 degrees. A small amount of natural cover shown on earlier aerial images, which ran through the agricultural field, has now been planted in corn. Based on the site conditions, birds were identified as occupying the agricultural field or forest.

The area surveyed was thoroughly covered by walking about the perimeter of the site and recording presence, abundance, and level of breeding evidence (using OBBA protocols).

*Table 5. Breeding Bird Survey Conditions*

| Visit Date | Visit Time | Temp. Range [C] | Cloud Cover [%] | Wind Speed [Beaufort Scale] |
|---|---|---|---|---|
| June 27 | 6:30 – 8:00 | 17 – 19 | 50 – 80 | 1 – 0 |
| July 11 | 6:30 – 8:30 | 22 – 24 | 100 – 80 | 0 - 0 |

Species heard and or observed within the search area were recorded, and the highest level of breeding evidence (using OBBA protocols) was determined after completion of both surveys (Table 6). Species at Risk in Ontario (SARO) and the federal Species at Risk Act (SARA) rankings were attributed to each species.

*Table 6. Breeding Bird Survey Results*

| Common Name | Scientific Name | # of Observations in the Agricultural Field | # of Observations in the Forest | Breeding Level[1] | SARO/ SARA | S-rank |
|---|---|---|---|---|---|---|
| Turkey Vulture | *Cathartes aura* | 5 | | Flyover | | S5B,S3N |
| Killdeer | *Charadrius vociferus* | 1 | | Flyover | | S4B |
| Mourning Dove | *Zenaida macroura* | 3 | | X | | S5 |
| Red-bellied Woodpecker | *Melanerpes carolinus* | | 1 | S | | S5 |
| Northern Flicker | *Colaptes auratus* | | 1 | S | | S5 |
| Red-eyed Vireo | *Vireo olivaceus* | | 1 | T | | S5B |
| Blue Jay | *Cyanocitta cristata* | | 4 | T | | S5 |
| American Crow | *Corvus brachyrhynchos* | 1 | 1 | Flyover/T | | S5 |
| **Barn Swallow** | ***Hirundo rustica*** | **9** | | **Flyover** | **SC/THR** | **S4B** |
| Black-capped Chickadee | *Poecile atricapillus* | | 1 | T | | S5 |
| House Wren | *Troglodytes aedon* | | 1 | T | | S5B |
| Carolina Wren | *Thryothorus ludovicianus* | | 2 | A | | S4 |
| American Robin | *Turdus migratorius* | 2 | 3 | H/CF | | S5 |
| Eastern Bluebird | *Sialia sialis* | | 2 | FY | | S5B,S4N |
| Gray Catbird | *Dumetella carolinensis* | | 2 | P | | S5B,S3N |
| European Starling | *Sturnus vulgaris* | 10 | | H | | SNA |
| Cedar Waxwing | *Bombycilla cedrorum* | 5 | 8 | Flyover/H | | S5 |
| Chipping Sparrow | *Spizella passerina* | | 2 | FY | | S5B,S3N |
| Savannah Sparrow | *Passerculus sandwichensis* | 4 | | A | | S5B,S3N |
| Song Sparrow | *Melospiza melodia* | 4 | 4 | T/A | | S5 |
| Northern Cardinal | *Cardinalis cardinalis* | | 1 | S | | S5 |
| Indigo Bunting | *Passerina cyanea* | | 2 | A | | S5B |
| Red-winged Blackbird | *Agelaius phoeniceus* | 1 | 5 | Flyover/FY | | S5 |
| Common Grackle | *Quiscalus quiscula* | 2 | | Flyover | | S5 |
| Brown-headed Cowbird | *Molothrus ater* | 4 | 2 | H/H | | S5 |
| Baltimore Oriole | *Icterus galbula* | | 1 | T | | S4B |
| American Goldfinch | *Spinus tristis* | 5 | 3 | H/T | | S5 |
| House Finch | *Haemorhous mexicanus* | 5 | 4 | P/FY | | SNA |
| House Sparrow | *Passer domesticus* | 1 | 2 | Flyover/H | | SNA |

*Note(s): [1]In the species columns, Breeding Level was identified for each species based on the highest level observed. The number recorded represents the highest one-day total for that species with the associated breeding code. [2]The S-rank is a subnational conservation status rank for species in Ontario. The S-rank system is used to describe how rare a species is in the province, with S1 species being extremely rare and S5 species being demonstrably secure.*

*Table 7. Species Ranking System*

| Rank System | Code | Meaning |
|---|---|---|
| **OBBA Breeding Level** | | |
| **Possible** | **H** | Species observed in breeding season in suitable nesting habitat. |
| | **S** | Singing male present or breeding calls heard in breeding season in suitable habitat. |
| **Probable** | **P** | Pair observed in their breeding season in suitable habitat. |
| | **T** | Permanent territory presumed through registration of territorial song or presence of adult bird in breeding habitat on at least 2 days, one week or more apart at the same place. |
| | **D** | Courtship or display between a male and female, or two males including courtship feeding and copulation. |
| | **V** | Visiting probable nest site. |
| | **A** | Agitated behaviour or anxiety calls of adults. |
| | **B** | Brood patch on adult female or cloacal protuberance on adult male. |
| | **N** | Nest building or excavation of nest hole. |
| **Confirmed** | **DD** | Distraction display or injury feigning. |
| | **NU** | Used nest or eggshell found (occupied/laid during atlas period). |
| | **FY** | Recently fledged young or downy young. |
| | **AE** | Adults leaving or entering nest site in circumstances indicating occupied nest. |
| | **FS** | Adult carrying faecal sac. |
| | **CF** | Adult carrying food for young. |
| | **NE** | Nest containing eggs. |
| | **NY** | Nest with young seen or heard. |
| **NHIC S-Rank** | | |
| **SH** | Possibly Extirpated (Historical); species occurred historically and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. | |
| **S1** | Critically Imperiled. Extremely rare in Ontario; usually 5 or fewer occurrences in the province. | |
| **S2** | Imperiled. Very rare in Ontario; usually between 6 and 20 occurrences in the province. | |
| **S3** | Vulnerable. Rare to uncommon in Ontario; usually between 21 and 60 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining. | |
| **S4** | Apparently secure. Considered to be common in Ontario. It denotes a species that is apparently secure, with over 80 occurrences in the province. | |
| **S5** | Secure. Indicates that a species is widespread in Ontario. It is demonstrably secure in the province. | |
| **?** | Indicates some uncertainty with the classification due to insufficient information. | |
| **SNR** | Not Ranked. | |
| **SNA** | Not Applicable, a conservation status rank is not applicable because the species is not a suitable target for conservation activities. | |
| **ESA & SARA Designations** | | |
| **SC** | Special Concern. | |
| **END** | Endangered. | |
| **THR** | Threatened. | |
| **EX** | Extirpated. | |

Of the 29 summer resident bird species, 25 were recorded with some breeding evidence; one species of conservation concern, the barn swallow, was observed as a 'fly over' during field surveys. Species of conservation concern include species that are listed under the *Endangered Species Act* (ESA), Species at Risk in Ontario (SARO) list or *Species at Risk Act* (SARA); and provincially rare species (NHIC S-rank of S1 to S3).

The highest level of breeding evidence obtained during surveys was "confirmed" breeding (OBBA 2001); this evidence was obtained for five species, due to observations of recently fledged young (FY) and birds carrying food (CF). Twelve species were observed exhibiting "probable" breeding behaviour as pairs observed in their breeding season in suitable habitat (P), singing in permanent territory during both rounds of surveys (T), and exhibiting agitated behaviour or anxiety calls (A). The remaining eight summer residents with some breeding evidence were observed singing (S) in suitable habitat (H) during the breeding season, indicating "possible" breeding evidence (OBBA 2001).

## 4.6. Snag Survey

A snag survey was completed during the leaf-off period on November 20, 2025, by GeoProcess to assess the presence and quality of snags within the Subject Property. The survey included an assessment of trees meeting the definition of a snag as outlined by the MNRF as any living or dead standing trees with a DBH of 10 cm or greater with loose or naturally exfoliating bark, cavities, hollows, and/or cracks that provide suitable bat maternity roosting habitat (Table 8). A photoplate with photos of each snag can be found in Appendix E.

*Table 8. Snag Survey Results*

| Tree GPS # | Common Name | Scientific Name | DBH (cm) | Height Class | Cavity | Loose or Exfoliating Bark | Crack | Knot Hole | Other Snag within 10 m | Decay Class 1-3 | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 363 | Black Locust | *Robinia pseudoacacia* | 55 | 1 | Yes | Yes | Yes | No | No | Yes | Woodpecker cavities, bark peeling off, vertical crack down the middle, forest edge. |
| 366 | Ash species | *Fraxinus sp.* | 46 | 3 | No | Yes | Yes | No | Yes | No | Emerald Ash Borer damage, canopy lost, bark peeling off, broken branches, forest edge. |
| 367 | Black Locust | *Robinia pseudoacacia* | 53 | 1 | Yes | Yes | Yes | Yes | No | Yes | Broken branches, holes near base and in middle of trunk, forest edge. |
| 368 | Silver Maple or Freeman Maple | *Acer saccharinum* or *Acer rubrum x saccharinum* | 87 | 2 | Yes | Yes | Yes | Yes | Yes | No | Woodpecker holes, only half of the tree has bark, branches broken, forest edge, a good snag. |
| 369 | Chinese Chestnut | *Castanea mollissima* | 31, 65 | 2 | Yes | Yes | No | Yes | No | Yes | Cavities near base, cracks, bark peeling off, dead branches, forest edge. |
| 370 | Black Cherry | *Prunus serotina* | 43 | 1 | Yes | Yes | No | Yes | No | Yes | Naturally flaking bark, knot holes, forest edge. |
| 371 | Basswood | *Tilia americana* | 40 | 2 | No | Yes | No | Yes | No | No | No canopy left, cankers, bark peeling off, forest edge. |
| 372 | Black Walnut | *Juglans nigra* | 85 | 1 | No | Yes | No | Yes | Yes | Yes | Some broken branches, knotholes, dying branches near bottom, some bark peeling, forest edge. |
| 373 | Potential Walnut hybrid | *Juglans sp.* | 38 | 1 | Yes | Yes | Yes | No | Yes | No | Woodpecker holes, large crack down middle, some bark peeling, forest edge. |

| Tree GPS # | Common Name | Scientific Name | DBH (cm) | Height Class | Cavity | Loose or Exfoliating Bark | Crack | Knot Hole | Other Snag within 10 m | Decay Class 1-3 | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 374 | Sugar Maple | *Acer saccharum* | 30 | 1 | No | Yes | No | Yes | Yes | Yes | Knot holes throughout, natural peeling bark, forest edge. |
| 375 | Unknown | Unknown | 28 | 2 | Yes | Yes | Yes | No | Yes | No | Bark mostly gone, remaining bark peeling off, cracks, dead branches, canopy lost, forest edge. |
| 376 | Potential Walnut hybrid | *Juglans sp.* | 40 | 1 | Yes | Yes | No | No | Yes | No | Bark peeling, dead and dying branches, cankers. |
| 377 | Potential Walnut hybrid | *Juglans sp.* | 36 | 2 | Yes | Yes | Yes | No | Yes | No | Cracks, some cavities, park peeling all over, forest edge, broken branches leaving gaps, no canopy left. |
| 378 | Potential Walnut hybrid | *Juglans sp.* | 78 | 1 | Yes | Yes | Yes | No | Yes | No | Lots of loose bark, large cracks, some cavities. Part of canopy intact still. |
| 379 | Basswood | *Tilia americana* | 25 | 1 | Yes | No | No | No | Yes | Yes | Lots of disease, cavities throughout. |
| 380 | Basswood | *Tilia americana* | 28, 29, 34, 36 | 1 | Yes | No | Yes | No | Yes | Yes | Multi-stem but only one trunk is a snag, with cavities and a large crack near the middle of the tree. |
| 381 | Potential Walnut Hybrid | *Juglans sp.* | 60 | 1 | Yes | Yes | Yes | No | Yes | Yes | Some broken branches, cavities. One branch is a chimney. Some woodpecker cavities, cracks, bark peeling, forest edge. |
| 382 | Basswood | *Tilia americana* | 34, 22, 27, 38 | 1 | Yes | No | No | No | No | Yes | Multi-stem, cankers, and woodpecker cavities throughout. |
| 383 | Shagbark Hickory | *Carya ovata* | 24, 24, 24 | 1 | No | Yes | No | No | No | Yes | Multi-stem, naturally very shaggy bark, squirrel drey at top. |

| Tree GPS # | Common Name | Scientific Name | DBH (cm) | Height Class | Cavity | Loose or Exfoliating Bark | Crack | Knot Hole | Other Snag within 10 m | Decay Class 1-3 | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 384 | Manitoba Maple | *Acer negundo* | 59 | 1 | Yes | Yes | Yes | Yes | No | Yes | Some dying branches, peeling bark, cavities near base, drey halfway up, crack near base. |
| 385 | Manitoba Maple | *Acer negundo* | 63 | 1 | No | No | No | Yes | No | No | Only two holes, one at base and one at breast height. Drey in canopy. |
| 386 | Manitoba Maple | *Acer negundo* | 36 | 2 | No | No | No | Yes | No | Yes | Living tree with a broken branch and two knot holes. |
| 387 | Manitoba Maple | *Acer negundo* | 32 | 1 | No | No | No | Yes | No | Yes | Leaf clusters in canopy, knot holes. |

The MNRF identifies snags in early stages of decay (decay class 1-3) as the preferred habitat of SAR and non-SAR bats (Figure 1); however, bats will also roost outside of decay class 1-3. Therefore, all suitable snags were documented.

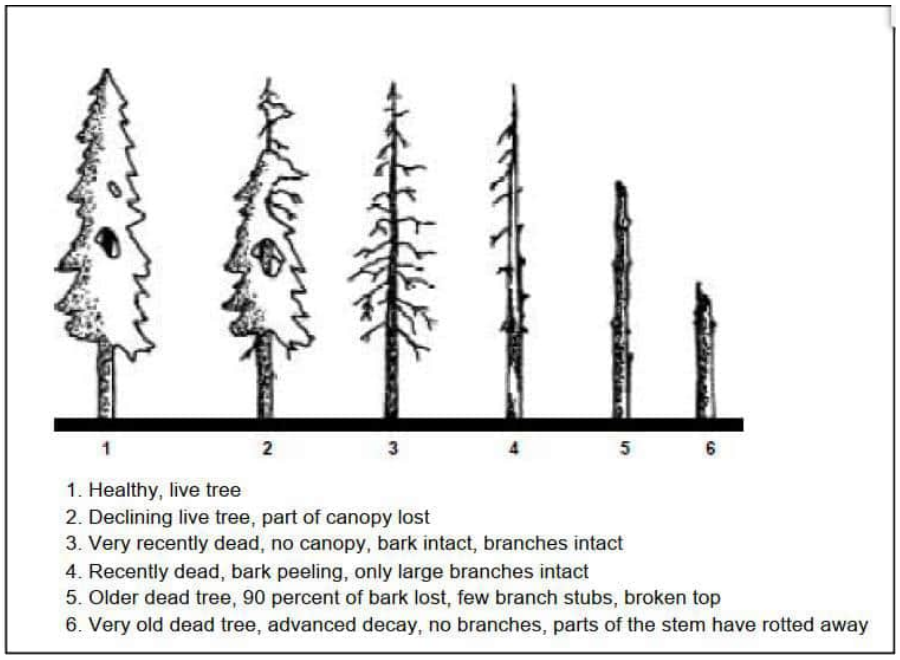


*Figure 1. Snag Classification from the MNRF (2017)*

## 4.7. Incidental Wildlife

Incidental wildlife was recorded during each site visit; the observations are provided in Table 9.

*Table 9. Incidental Wildlife Summary*

| Common Name | Scientific Name | S-Rank |
|---|---|---|
| White-tailed Deer | *Odocoileus virginianus* | S5 |
| American Goldfinch | *Spinus tristis* | S5 |
| Eastern Gray Squirrel | *Sciurus carolinensis* | S5 |
| Hickory Tussock Moth | *Lophocampa caryae* | S5 |
| Gray Catbird | *Dumetella carolinensis* | S5B,S3N |
| Eastern Chipmunk | *Tamias striatus* | S5 |
| Northern Dog-day Cicada | *Neotibicen canicularis* | S5 |
| Northern Leopard Frog | *Lithobates pipiens* | S5 |
| Hoary Long-horned Bee | *Peponapis pruinosa* | S2S3 |
| Northern Flicker | *Colaptes auratus* | S5 |
| Indigo Bunting | *Passerina cyanea* | S5B |
| Blue Jay | *Cyanocitta cristata* | S5 |
| Black-capped Chickadee | *Poecile atricapillus* | S5 |
| American Crow | *Corvus brachyrhynchos* | S5 |
| Coyote | *Canis latrans* | S5 |
| Spotted Tussock Moth | *Lophocampa maculata* | S5 |

| Common Name | Scientific Name | S-Rank |
|---|---|---|
| Virginia Tiger Moth | *Spilosoma virginica* | S5 |
| Carolina Wren | *Thryothorus ludovicianus* | S4 |
| Dark-eyed Junco | *Junco hyemalis* | S5 |
| American Tree Sparrow | *Spizelloides arborea* | S5 |
| Mourning Dove | *Zenaida macroura* | S5 |
| White-breasted Nuthatch | *Sitta carolinensis* | S5 |
| Red Squirrel | *Tamiasciurus hudsonicus* | S5 |

# 5. Species at Risk Screening

Existing information regarding Species at Risk (SAR) within the Study Area is summarized from data collected through a desktop review and in-field surveys. A desktop background review was conducted using the Natural Heritage Information Centre (NHIC) database, Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Mapping, and the surrounding areas SAR lists. Species status under the federal Species at Risk Act (SARA) and the provincial *Endangered Species Act* Species at Risk in Ontario (SARO) list were used. Provincially rare species (S-rank S1, S2, and S3) were also identified based on their Ministry of Natural Resources Natural Heritage Information Centre Database (S-ranks).

## 5.1. SAR Screening

Details of the desktop SAR screening include an amalgamation of historical occurrence records within the vicinity of the proposed works following the MECP Client's Guide to Preliminary SAR Screening (2019) using current NHIC database records (Atlas ID: 17NH5741, 17NH5742, 17NH5841), DFO Aquatic Species at Risk Mapping, atlases (Ontario Breeding Bird, Butterfly, Moth, Reptile and Amphibian; Atlas Square: 17TNH54), and citizen science databases (iNaturalist and eBird). Descriptions of the various data sources are included in Appendix C.

Observations of SAR within these squares do not necessarily represent observations within the boundaries of the Study Area. The SAR screening results provided in Table 10 was compiled from the data sources mentioned above on July 2, 2025.

The DFO Aquatic Species at Risk Map screening indicated no distribution or critical habitat of aquatic SAR within the Subject Property or the surrounding area.

*Table 10. SAR Screening Results*

| Species | | Status | | |
|---|---|---|---|---|
| Scientific Name | Common Name | S-rank | SARO | SARA |
| **Birds** | | | | |
| *Ammodramus savannarum*[2] | Grasshopper Sparrow | S4B | SC | - |
| *Cardellina canadensis*[2] | Canada Warbler | S5B | SC | THR |
| *Chaetura pelagica*[2] | Chimney Swift | S3B | THR | THR |
| *Contopus virens*[1,2,4] | Eastern Wood-pewee | S4B | SC | SC |

| Species | | Status | | |
|---|---|---|---|---|
| Scientific Name | Common Name | S-rank | SARO | SARA |
| *Dolichonyx orzyivorus*[2,4] | Bobolink | S4B | THR | THR |
| *Euphaus carolinus*[4] | Rusty Blackbird | S4B,S3N | SC | SC |
| *Hirundo rustica*[2] | Barn Swallow | S4B | SC | THR |
| *Hylocichla mustelina*[1,2] | Wood Thrush | S4B | SC | THR |
| *Melanerpes erythrocephalus*[1,2,6] | Red-headed Woodpecker | S3 | END | END |
| *Riparia riparia*[2] | Bank Swallow | S4B | THR | THR |
| *Sturnella magna*[1] | Eastern Meadowlark | S4B,S3N | THR | THR |
| **Amphibians and Reptiles** | | | | |
| *Chelydra serpentina*[1,3] | Snapping Turtle | S4 | SC | SC |
| *Chrysemys picta marginata*[3] | Midland Painted Turtle | S4 | - | SC |
| *Emydoidea blandingii*[3] | Blanding's Turtle | S3 | THR | - |
| *Graptemys geographica*[3] | Northern Map Turtle | S3 | SC | SC |
| *Heterodon platirhinos*[3] | Eastern Hog-nosed Snake | S3 | THR | THR |
| *Lampropeltis triangulum*[3] | Eastern Milksnake | S4 | NAR | SC |
| *Thamnophis saurita*[1] | Eastern Ribbonsnake | S4 | SC | - |
| **Insects** | | | | |
| *Bombus affinis*[1] | Rusty-patched Bumble Bee | S1 | END | END |
| *Danaus plexippus*[5] | Monarch | S4B,S2N | SC | END |
| *Epeoloides pilosulus*[1] | Macropis Cuckoo Bee | S1 | DD | END |
| **Plants** | | | | |
| *Hieracium longipilum*[1] | Hairy Hawkweed | SX | - | - |
| *Phegopteris hexagonoptera*[1] | Broad Beech Fern | S3 | SC | SC |
| *Phlox subulata*[1] | Moss Phlox | S1? | - | - |
| *Vicia caroliniana*[1] | Carolina Vetch | S2? | - | - |
| *Viola pedata*[1] | Bird's-foot Violet | S1 | END | END |

*Sources: [1] NHIC Database, [2] OBBA, [3] Ontario Reptile and Amphibian Atlas, [4] eBird Database, [5] Ontario Butterfly Atlas, [6] iNaturalist*

## 5.2. SAR Assessment

An assessment of the above SAR was completed by comparing species habitat needs against the findings of the field surveys for the Study Area. The assessment found that the Study Area has the potential to provide habitat for the following species.

**Butternut (*Juglans cinerea)***

The butternut is listed as 'S2?' (imperiled) in Ontario and is considered Endangered under both provincial SARO and federal SARA. Butternut can be found in the sunny clearings and edges of deciduous forests, and prefers moist, well-draining soils. It can also be found along streams and in floodplains. This species is shade intolerant and readily hybridizes with several exotic *Juglans* species, including the Japanese walnut (*Juglans ailantifolia*) and the Persian walnut (*Juglans regia*).

Once a widespread canopy tree species in southern Ontario, the butternut has been in decline since the introduction of the non-native butternut canker (*Sirococcus clavigignenti-juglandacearum*) to Ontario in the 1990s. Most butternut trees in Ontario are infected with this fungus, with surviving trees few and far between. Trees that persist despite infection are potential sources for genetic disease resistance or tolerance and are crucial for the recovery of the population.

One butternut species was confirmed within the deciduous forest (FOD) community, a few metres south of the Subject Property boundary. Several other potential butternut trees were identified in this community; however, access and genetic testing would be required to confirm if they were butternut or hybrids.

**Eastern Milk Snake (*Lampropeltis triangulum*)**

The eastern milk snake is ranked 'S4' (apparently secure) in Ontario and is listed as Special Concern under Schedule 1 of the federal *Species at Risk Act* (SARA). It is a non-venomous constrictor snake with brightly coloured, variable patterning and glossy, smooth scales. This species is threatened by a variety of factors, including habitat loss and degradation, road mortality, and persecution by humans. Although no eastern milk snakes were reported during field studies, this species was flagged during the desktop Species at Risk screening by the Ontario Reptile and Amphibian Atlas.

Given this species' use of open and edge habitats, including farm fields and forest edges, for thermoregulation, it is possible that eastern milk snake could occur within the Study Area, which contains an abundance of both farm fields and forest edges.

**Eastern Wood-pewee (*Contopus virens*)**

This species is ranked 'S4B' (breeding population apparently secure) in Ontario and is listed as Special Concern under SARO and SARA. The eastern wood-pewee is a small, grayish-brown flycatcher that inhabits forests and woodlands, with a preference for woodland edges and forest clearings. It breeds mostly in mature and intermediate-age deciduous and mixed forests (less often in coniferous forests), having an open understory. It is often associated with forests dominated by sugar maple (*Acer saccharum*), elm (*Ulmus sp.*) and oak (*Quercus sp.*). It is usually associated with forest clearings and edges within the vicinity of its nest. (COSEWIC, 2012). Threats to this species include habitat loss and fragmentation, declining insect populations, and predation.

Based on observations noted during breeding bird surveys, the forest found on the southwest side of the Subject Property may provide suitable nesting habitat for this species.

**Snapping Turtle (Chelydra serpentina)**

The snapping turtle is ranked 'S4' (apparently secure) in Ontario and is listed as Special Concern under both SARO and SARA. This species is Canada's largest freshwater turtle species, and is distinguished by their large, dark shells and long, triangular-shaped tails. Hatchlings have pronounced ridges along the length of their shell that smooth out with age. Threats to this species include slow maturation rates, nest predation, road mortality, and loss of habitat.

Although this species was not observed during field work, citizen science records (iNaturalist observations) show photographic evidence of three different snapping turtles inhabiting the woods less than 200 meters from the Subject Property boundary. The loose soils observed in certain locations within the Study Area could provide suitable nesting habitat for this species.

**Barn Swallow (*Hirundo rustica*) – confirmed presence**

The barn swallow is ranked 'S4B' (breeding population apparently secure) in Ontario and is listed as Threatened by SARA and Special Concern under the ESA. The barn swallow is a migratory songbird with distinct shiny dark blue feathers on its back and upper wings, and reddish colouring on its forehead, breast, and throat, with colouring more vibrant on males. This species aerial forages over open areas within about 400 m of its nest site (COSEWIC 2021). This species primarily builds its nests on man-made structures, including barns, bridges, and ledges, and as such tends to live in close association with humans. Although a common bird species, the barn swallow population has been in decline in Ontario in recent years. Barn swallows are aerial insectivores, and as such are threatened by practices such as pesticide use, which can diminish insect populations. Additional threats to the species include habitat loss, predation, and loss of access to historic nesting sites.

During breeding bird surveys, nine barn swallows were observed aerial foraging over the agricultural field in the eastern part of the Subject Property. Built structures and suitable natural sites do not occur within the Subject Property, hence nesting on the Subject Property is not possible. However, potential nest sites likely occur within 400 m of the Subject Property.

# 6. Significant Wildlife Habitat Screening

Significant Wildlife Habitat (SWH) is considered a natural heritage feature and is protected as per Section 4.1 of the Provincial Planning Statement, 2024. The Significant Wildlife Habitat Technical Guide (OMNRF 2000) aids in land use planning by providing the identification, description, and prioritization of significant wildlife habitat in Ontario. The associated Ecoregion Criteria Schedules are used to further provide detailed criteria for assessing and confirming SWH within Ontario.

## 6.1. Screening

Significant (and/or sensitive) Wildlife Habitat features and functions as described within the OMNRF Significant Wildlife Habitat Ecoregion Criteria Schedule for Region 7E (OMNRF 2015) were reviewed and evaluated for the Study Area. The document groups wildlife habitat into four main categories:

- Seasonal Concentration Areas of Animals
- Rare Vegetation Communities or Specialized Habitats for Wildlife
- Habitat for Species of Conservation Concern
- Animal Movement Corridors

The full screening found in Appendix D consisted of a review of the Ecological Land Classification (ELC) codes and habitat criteria for candidate SWH. Any SWH on the Subject Property or adjacent lands was noted in Appendix D, Column 4, and a rationale was provided in Column 5. In the case of potential SWH, Confirmed Defining Criteria Studies were reviewed, and applicable mitigation measures (in summary form) were also provided in Column 5.

The results of the assessment indicated the presence of candidate and confirmed SWH within two of the four categories. These are described further in the subsection below.

### 6.1.1. Seasonal Concentration of Animals

#### 6.1.1.1. Bat Maternity Colonies (Candidate)

The criteria for Bat Maternity Colonies includes all ecosites in FOD, FOM, SWD, and SWM ELC communities. The colonies are typically located in mature deciduous or mixed forests with greater than 10 wildlife trees per hectare, with the wildlife trees having a DBH greater than 25 cm. Ontario bat species prefer snags in early stages of decay (decay class 1-3). Acoustic analysis surveys would be required to confirm presence/absence of bat species within the Subject Property. The Significant Woodland within the Subject Property contains more than 10 snags, all with a DBH greater than 25 cm and therefore provides candidate habitat.

### 6.1.2. Rare Vegetation Communities or Specialized Habitat for Wildlife

#### 6.1.2.1. Turtle Nesting Areas (Candidate)

Wetland communities associated with the Lynn River are present within 100 m of the Subject Property. Snapping turtles have been recorded on the citizen science site iNaturalist as occurring in the nearby LE & N Rail Trail south of the Subject Property. Nesting snapping turtles could make use of the exposed mineral soils along the cropland edges throughout the Property, which were observed to have a significant sandy component.

#### 6.1.2.2. Seeps and Springs (Candidate)

Some evidence of seepage was observed within the deciduous woodland community (WOD) within the Subject Property, with areas abundant in eastern skunk cabbage (*Symplocarpus foetidus*), which is a seep indicator species, as well as other small patches of wet species such as great blue lobelia (*Lobelia siphilitica*), spotted jewelweed (*Impatiens capensis*), and spotted joe-pye weed (*Eutrochium maculatum*) near the drainage feature.

#### 6.1.3. Habitat for Species of Conservation Concern

##### 6.1.3.1. NHIC Species Element Occurrences and Field Observations of Special Concern and Rare Wildlife Species

Two species of Special Concern were identified in the SAR screening as potentially having habitat within the Study Area: snapping turtle and eastern wood-pewee. Neither the snapping turtle nor the eastern wood-pewee was confirmed as present within the Subject Property; however, habitat exists within the Significant Woodlands on and adjacent to the Property.

# 7. Proposed Development

The proposed site plan will occupy an approximate area of 20.68 ha to accommodate the construction of single detached and townhouse residential buildings, which will include a stormwater management pond in the southwest end of the property, and park/open space areas. The proposed development also includes a natural heritage system, which includes the woodlands along the southern property boundary.

## 7.1. Natural Heritage System Buffers

A 10 m Vegetation Protection Zone (VPZ) was established for the natural heritage system, which is comprised of the Significant Woodlands along the southern property boundary. The 10 m VPZ aligns with the 10 m buffers accepted in the draft plan for the bordering property to the north, which was approved by Norfolk County in 2025.

## 7.2. Additional Natural Heritage System Area

Encroachment areas of 177 $m^2$ on the VPZ and 163 $m^2$ of the woodlands, associated with the daylight triangle for Street A and the outlet structure for the stormwater management pond, are proposed to be compensated by an additional 1702 $m^2$ of woodland area to be restored. This restored area will be added to the Natural Heritage System to the east of the proposed street along the south of the Property connecting to Decou Road (Street A). Please refer to Map 5 for the location of the encroachment area and additional Natural Heritage System area. This represents a net gain of 1362 $m^2$ for the NHS.

## 7.3. Stormwater Management, Grading and Servicing Requirements

Drainage from the site currently drains south into culverts across Decou Road and towards Lynn River. A preliminary Functional Servicing and Stormwater Management Report was prepared by S. Llewellyn & Associates Limited (February 2026). The stormwater management (SWM) pond (wet pond) is proposed in the southwest corner of the Subject Property and is proposed to outlet to the existing drainage feature located within the Significant Woodland, which outlets at the south side of Decou Road toward the Lynn River. The post-development discharge rates for the proposed development will be directed south towards Lynn River and are to be controlled to the pre-development discharge rates for all storm events up to and including the 100-year event. Stormwater runoff will meet Level 1 (Enhanced) stormwater quality control (80% total suspended solids removal and 90% average runoff treatment). Erosion and sediment control measures will be implemented in accordance with the standards of Norfolk County and LPRCA. Stormwater will be managed within the proposed development through a municipal storm sewer system and Low Impact Development features.

Regrading is proposed within the 10 m VPZ to ensure the proposed drainage is conveyed to the SWM pond and existing drainage feature. Minor grading is also proposed within the VPZ and woodland near the existing drainage feature to facilitate the SWM pond outlet. See Map 5 for the location of the proposed SWM pond outlet as well as the VPZ and woodland encroachment area.

# 8. Environmental Impact Assessment

This section summarizes the natural heritage features within and adjacent to the Subject Property and assesses the potential impacts of development on these features as well as proposed mitigation measures.

## 8.1. Impact Summary Table

Impacts on the various natural heritage features within and adjacent to the Subject Property were considered in the impact analysis. Table 11 presents the natural heritage components considered in this assessment, the proposed activity with potential to impact that component, potential short- and long-term impacts, recommended mitigation measures, and if any residual effects are anticipated. Potential impacts were assessed using secondary source information, including an overlay of the proposed site plan.

The impact assessment considers the components of the natural heritage system identified through background review and field assessments that have the potential to be impacted by the proposed development. Each valued component of the natural heritage system has been assessed for impacts and recommended mitigation measures. The valued components assessed for this scoped EIS are:

- Surface Water
- Significant Woodlands
- Species at Risk and Significant Wildlife Habitat

*Table 11. Impact Summary Table*

| Valued Component | Feature/Function | Discussion | Proposed Activity | Identified Impact | Impact Risk | Mitigation Measures | Impact Assessment | Predicted Impact Effects |
|---|---|---|---|---|---|---|---|---|
| Surface Water | Drainage Feature within the Subject Property. | A drainage feature is present within the south end of the Subject Property and drains under Decou Road and into Lynn River. | Grading, servicing, and development | Release of petroleum or other contaminants into Lynn River downstream. | High – can cause contamination downstream | To prevent contaminant runoff into the nearby watercourse, equipment maintenance and refuelling need to be controlled to prevent any discharge of petroleum products. Construction material, excess material, construction debris, and empty containers should be stored in one location with proper containment and spill control measure in place. | Contaminant runoff into the drainage feature on site can harm aquatic wildlife downstream, particularly in the long-term. The appropriate best management practices and mitigation measures can greatly reduce the risk. | No residual effects are expected if mitigation measures are followed. |
| | | | | Release of sediment into Lynn River downstream. | High – can impact downstream systems | To prevent the release of sediment into the watercourse during active construction, erosion and sediment controls (ESC) are to be installed and inspected on a regular basis. | The installation and inspection of ESC have been demonstrated to reduce sediment loading into nearby watercourses. The key is regular maintenance of the ESC measures. | No residual effects are anticipated with the installation and maintenance of ESC. |
| | | | Stormwater Management | Increased runoff due to impermeable surfaces. | High – increased potential for erosion, higher flows, and downstream flooding | SWM plan incorporates stormwater quality controls, which is designed to capture sediment and release water at a slower rate to minimize high peak flows into the Lynn River. | SWM ponds have been shown to be efficient at removing sediment from stormwater prior to its release into the environment. In general, stormwater released from storm ponds has considerably lower sediment releases than the existing agricultural land use does. The quantity control provided by the SWM ponds has been designed to reduce the potential of causing downstream channel instability, such as bed and bank erosion. Downstream flood flows should not be increased. | The implementation of stormwater management and SWM pond on the site is expected to result in less sedimentation additions to Lynn River from stormwater compared to existing conditions. |

| Valued Component | Feature/Function | Discussion | Proposed Activity | Identified Impact | Impact Risk | Mitigation Measures | Impact Assessment | Predicted Impact Effects |
|---|---|---|---|---|---|---|---|---|
| | | | | Release of warm water into Lynn River from the SWM pond. Water retained in the SWM pond can warm during the summer months from sun exposure. Releasing this warm water into the drainage feature, which flows into Lynn River, a cool water system. | High – increased water temperatures in cool water systems can have detrimental effects on aquatic wildlife. | Mitigation measures to reduce thermal impacts include creating a deeper permanent pool, the incorporation of a bottom draw outlet, and native plantings around the perimeters of the proposed SWM pond. | By creating a deeper than typical SWM pond, it can create a thermocline in the pond, in which cooler water sits at the pond of the pond, in the location of the bottom draw. This has been shown to be an effective method of discharging cooler water from a SWM pond. The location of the proposed SWM pond is adjacent to the Significant Woodland, which contains tall, mature trees to aid in shading the pond. Additional native plantings around the pond will also contribute to shade as the plants mature. | With the shading of the pond and discharge of stormwater through the drainage channel in the woodland, it is anticipated that water will be cooled before entering Lynn River. Based on the permanent nature and size of Lynn River, thermal impacts from stormwater are anticipated to be negligible. |
| Significant Woodland | FOD and WOD communities | The Norfolk County OP has mapped Significant Woodlands present within the Subject Property and directly beyond the southern property boundary. | Grading, Servicing & Development | Release of dust as a result of construction activities. | Low – construction will not occur within the woodland. | Implement best practices for dust suppression measures during site grading when conditions are dry or strong winds are anticipated.<br><br>10 m VPZ from the woodland driplines.<br><br>Erosion and sediment control measures, including the delineation of the construction area with silt fencing. | Implementation of ESC and best practices measures will keep dust and sediment from being released into the Significant Woodland communities. | Impacts from dust to the surrounding landscape should be minimal if dust suppression measures are taken. No residual effects expected. |
| | | | | Potential spread of invasive species | Moderate – potential for invasive species to be spread through construction equipment. | Machinery is a major vector for spreading terrestrial invasive species into new areas as they may spread seeds or plant parts to other properties. Contractors are to follow Clean Equipment Protocol for Industry (2013) as laid out by | Numerous invasive plant species were found on-site during floristic surveys: black locust (*Robinia pseudoacacia*), European buckthorn (*Rhamnus cathartica*), Japanese knotweed (*Reynoutria japonica*), Tatarian honeysuckle (*Lonicera tatarica*), and Norway maple (*Acer platanoides*). Travel to and from the | Minimal residual effects are expected while adhering to the recommended mitigation measures. |

| Valued Component | Feature/Function | Discussion | Proposed Activity | Identified Impact | Impact Risk | Mitigation Measures | Impact Assessment | Predicted Impact Effects |
|---|---|---|---|---|---|---|---|---|
| | | | | | | the Ontario Invasive Plants Council. | site following construction can cause the spread of these species. By following best practices, the spread of invasive species can be reduced and controlled. | |
| | | | | Soil compaction outside of the construction zone. Soil compaction can damage the rooting zone of trees, resulting in a decline in health and potentially even death of the tree. | Low – majority of the woodland will remain un-touched. | 10 m VPZ from the woodland driplines.<br><br>Erosion and sediment control measures, including the delineation of the construction area with silt fencing. | With both the setback and the silt fencing to cordon off construction areas, it is unlikely that any compaction will occur within or on the boundaries of the woodland communities present. | Minimal residual effects anticipated while adhering to the recommended mitigation measures. |
| | | | | Encroachment into the woodland by site activities. | Moderate – small portion of the woodland to be disturbed. | 10 m VPZ from the woodland driplines.<br><br>Planting of the VPZ with native trees, shrubs, and seed mix so that it is composed of natural, self-sustaining vegetation.<br><br>Delineation of construction zone through silt fencing to deter workers from creating informal trails or encroaching onto natural areas. | By delineating the limits of construction clearly, and by regularly inspecting development limit fencing, encroachment into the Significant Woodland should be temporary in the area of the proposed SWM pond outlet.<br><br>A list of species of importance identified by the Six Nations of the Grand River community has been referenced and several species of interest are located within the woodland. The 10 m VPZ provides protection of these species.<br><br>Native plantings in the VPZ will provide a buffer between development and the woodland, deterring encroachment post-construction. | No negative residual effects are anticipated should mitigation measures be followed. |

| Valued Component | Feature/Function | Discussion | Proposed Activity | Identified Impact | Impact Risk | Mitigation Measures | Impact Assessment | Predicted Impact Effects |
|---|---|---|---|---|---|---|---|---|
| | | | | SWM Pond outfall encroachment into VPZ and woodland. | High – disturbance to vegetation and vegetation loss within the woodland. | Additional NHS area is being added to the east of Street A to compensate for permanent loss of woodland where the outlet structure will be installed.<br><br>The area that requires grading to support installation of the outlet structure will be minimized to the extent possible and restored to woodland post construction.<br><br>The construction area is to be clearly demarcated with ESC or tree protection fencing. Any retained trees inadvertently injured during construction should be properly pruned by a qualified arborist post-construction to support successful wound healing.<br><br>Fleximat cable concrete mat proposed at outfall location, which supports vegetation growth.<br><br>Provide a 10 m buffer around any butternut trees.<br><br>Denser native plantings are recommended beside the disturbed/impacted areas to minimize edge effects. | Loss of vegetation and impact to potential butternut trees and snags within the area.<br><br>Temporary disturbance in the woodland to allow for the grading and construction of the SWM pond outlet.<br>Fleximat cable is proposed as it is preferred to rip-rap lined outfall channels, as it will support vegetation growth and is not an impediment to wildlife movement. | Short-term effects are anticipated if mitigation measures are followed. |

| Valued Component | Feature/Function | Discussion | Proposed Activity | Identified Impact | Impact Risk | Mitigation Measures | Impact Assessment | Predicted Impact Effects |
|---|---|---|---|---|---|---|---|---|
| | | | | Grading within the VPZ. | Moderate | Installation of tree protection fencing and ESC fencing to protect vegetation on the Property. Butternuts are to be protected in place with a minimum 10 m setback. | Grading within the VPZ can result in potential damage to woodland edge trees from large machinery and allow for erosion of bare soils into natural areas without appropriate protections. | Minimal residual impacts are anticipated if mitigation measures are followed. |
| | | | Tree and vegetation clearing to accommodate the proposed Street A (connecting to Decou Road). | Loss of woodland features. | Low – only a small portion of the woodland edge is proposed for removal. | Tree Preservation measures described in Section 9.1 should be adhered to whenever possible to limit negative impacts to the health of the trees within the Study Area.<br><br>Compensation through native plantings should occur within the NHS and VPZ. Denser plantings are recommended beside the disturbed/impacted areas to minimize edge effects. | Vegetation removal can result in loss of canopy cover and habitat. The proposed development results in a total loss of 177 $m^2$ from VPZ encroachment and a total loss of 163 $m^2$ from woodland encroachment, which will be compensated for by an additional area of 1702 $m^2$ to the NHS, resulting in a net gain to the NHS of 1362 $m^2$.<br><br>A temporary loss of 350 $m^2$ woodland to support grading to accommodate installation of the SWM outlet structure is required. This area will be restored to woodland post-construction. | While trees will be removed to accommodate the arterial road, a net improvement is anticipated with the additional NHS area, which will add to the area of the Significant Woodlands and help to buffer any potential impacts. |
| | | | | Disturbance to wildlife | Low – only a small portion of the woodland edge is proposed for removal. | Vegetation and tree clearing should not occur between April 1 and October 31 to avoid contraventions of the *Migratory Birds Convention Act* (1994), and to protect roosting bat habitat. | Vegetation removal can result in the loss of habitat for wildlife. Native plantings in the VPZ and additional NHS area will provide future habitat for wildlife as the plantings mature. | Minimal residual impacts are predicted from the loss of edge habitat and the overall net gain of NHS. |

| Valued Component | Feature/Function | Discussion | Proposed Activity | Identified Impact | Impact Risk | Mitigation Measures | Impact Assessment | Predicted Impact Effects |
|---|---|---|---|---|---|---|---|---|
| Species at Risk and Significant Wildlife Habitat | Butternut | One confirmed butternut tree was observed during the field surveys in the FOD community. | No proposed activity in the FOD community. | No potential impact. | Low – no proposed activity where butternuts are located. | 10 m VPZ provided to the woodlands containing the butternut. | No anticipated impacts. | No anticipated effects. |
| | Bat Maternity Colonies | Presence of potential bat maternity colonies within the Significant Woodland. Confirmation would require acoustic monitoring and analysis. | Potential snag removal from the FOD community to accommodate required daylight triangles for Street A. | Loss of potential bat habitat. | Low – few snags will potentially be removed. | No tree removal during the active bat period (April 1-October 31). | The majority of snag trees across the Property will be retained. | No measurable impacts to maternity roosting habitat is anticipated given the extent of woodlands in the immediate vicinity,. |
| | Turtle Nesting Areas | Snapping turtles are known to occur along the trails associate with the nearby Brook Conservation Area. Exposed mineral soil at several areas along cropland edges throughout the Property provide potential nesting areas. | Grading, servicing, and development | Release of sediment into the watercourse. | Low – ESC measures limit sedimentation. | 10 m VPZ from the woodland driplines.<br><br>Erosion and sediment control (ESC) measures, including the delineation of the construction area with silt fencing. | With both the setback and the silt fencing it is unlikely that impacts will occur on any turtle nesting habitat. | Minimal residual effects anticipated while adhering to the recommended mitigation measures. |
| | Seeps and Springs | Potential for seeps and springs to occurin the southern portion of the Property within the Significant Woodland. | Grading, servicing, and development | Sediment release into the seeps and springs, disruption to groundwater flows. | Moderate | 10 m VPZ from the woodland driplines.<br><br>Implementation of sediment and erosion control measures will reduce sedimentation into the woodland during the construction phase. | Seeps and springs are important feeding and drinking areas for wildlife and support unique plant and animal species. The proposed mitigation measures will maintain the overall form and functions of the springs and seeps. | No residual effects anticipated with the implementation of proper mitigation measures. |
| | Habitat for Species of Conservation Concern | There is potential eastern wood-pewee habitat within the Significant Woodland. | Development adjacent to the Significant Woodlands. | Noise from construction. | Low – short-term disturbance. | Limited measures can be employed as a certain level of construction noise will occur.<br><br>Limit construction activities at sunrise and sunset during the active spring breeding bird season. | Construction noise will cause temporary disturbance to birds in the immediate vicinity, including any eastern wood-pewees. This disturbance will be short-term. | Potential for short-term noise disturbance to eastern wood-pewee. |

| Valued Component | Feature/Function | Discussion | Proposed Activity | Identified Impact | Impact Risk | Mitigation Measures | Impact Assessment | Predicted Impact Effects |
|---|---|---|---|---|---|---|---|---|
| | | | | Bird Strikes/Death by impact with windows | Moderate – birds could fly into the windows on the new houses. | Pre-installation measures include: exterior window coverings (i.e. shutters or muntins), installation of awnings and overhangs, avoiding the installation of vegetation on the interior of the building adjacent to exterior facing windows, grade-level ventilation grates should have a porosity no greater than 20 mm x 20 mm or 40 mm x 10 mm.<br>Post-installation Solutions: install deterrent measures on the outside of the windows, like decals, ribbon, tape. Turn off lights at night during migration periods.<br>It is recommended that houses backing onto the FOD community consider including bird strike mitigation measures or provide an awareness pamphlet with the home sale package. | New developments close to natural areas with glass surfaces pose a threat to birds. Birds can see through glass and what is reflected on glass, but not the glass itself. | Bird-friendly measures are recommended for installation in the entire building. For more information on bird strikes and bird-friendly building design, visit FLAP Canada's website.<br>It is unlikely that all bird strikes can be eliminated, but by employing mitigation measures, particularly in areas of higher strike potential, bird strike occurrences can be reduced. |
| | | Snapping Turtle | Grading, servicing, and development | Release of sediment and contaminants into the watercourse downstream. | Low - ESC measures limit sedimentation, and native plantings mitigate contamination. | 10 m VPZ from the woodland driplines.<br><br>Erosion and sediment control (ESC) measures, including the delineation of the construction area with silt fencing. | Additional sediment and contaminant inputs can disturb or alter snapping turtle habitat; however, with both the setback and the silt fencing, it is unlikely that impacts will occur on any turtle nesting habitat. | No residual effects are expected if ESC mitigation measures are followed. |

## 8.2. Direct Impact Assessment

Direct impacts are attributed to the proposed development activities, often occurring during the construction phase or associated with physically altering the landscape or removing vegetation communities. Construction activities, including grading, servicing, and site development, can have direct impacts on surrounding habitats and local and migrating wildlife.

The proposed development will result in the removal of a small portion of the woodland (163.435 $m^2$) and VPZ (177.402 $m^2$) near Decou Road. Vegetation and tree removals are proposed to accommodate the construction of road and associated daylight triangle. Temporary disturbance of the woodland will occur to accommodate the grading and construction for installation of the SWM pond outlet. The footprint of the outlet will result in permanent loss of that area, while the area where grading is required will be restored post-construction and only represents a temporary loss of woodland.

Potential direct impacts on the Significant Woodland include:

- Increase in noise levels impacting local and migrating wildlife, which can be problematic during the breeding season.
- Increase in dust levels during construction. Fine sediments and particulate matter could be distributed throughout the Significant Woodlands through saltation (e.g. movement of sediment via wind).
- Vegetation removal, removing minor wildlife habitat.
- Edge impacts on the Significant Woodlands due to dumping, soil compaction, and removal or introduction of non-native vegetation.
- Dispersal of sediment into the drainage feature on site, resulting in sedimentation of the watercourse downstream and impacting aquatic habitat.
- Change in surface runoff to the adjacent natural heritage features due to grade changes and the addition of impermeable surfaces.
- Contaminant runoff to the adjacent natural heritage features from changes in land use.

*Table 12. Direct Impact Assessment*

| Impact | Impact Assessment | Mitigation Measures | Residual Effects |
|---|---|---|---|
| Noise from construction activity | Excessive noise could displace breeding birds within adjacent wooded areas. Noise may result in the avoidance of the adjacent areas during construction. However, as the wildlife observed within the Study Area are largely tolerant to disturbances, they are anticipated to return to the area once construction activities end. | Since construction noise is difficult to mitigate, the most effective measure is to limit construction activities during the breeding bird season (April to August). | Minor and short-lived residual effects due to the short-term nature of construction activity. |

| Impact | Impact Assessment | Mitigation Measures | Residual Effects |
|---|---|---|---|
| Dust from construction activity | Dust from construction activities can drift to natural areas and adjacent residential communities. Dust travel should be limited with proper controls. | Water suppression of dust should occur for all construction activities. | Residual effects are anticipated to be minor and short-term, given that appropriate mitigation measures are incorporated to reduce levels of dust due to construction. |
| Tree and vegetation removal | Tree and vegetation removal is proposed in a small section along the southern border of the property where Street A is proposed to connect to Decou Road. | Limit clearing activities during the breeding bird season and active bat period (April 1 to October 31). Implementing native plantings will help account for the loss of habitat. | Residual effects are anticipated to be minor and short-term. Wildlife may have to choose to inhabit a different location within the woodlands. An additional 1702 $m^2$ will be added to the NHS, providing future wildlife habitat. |
| Edge impacts | The edges of the Significant Woodland could experience dumping, soil compaction and the introduction of non-native vegetation during construction. | To mitigate the formation of habitat edge effects, native vegetation will be planted in the VPZ to buffer the new habitat edge.<br>Implementation of construction maintenance plan and fencing to delineate where the extent of the development footprint is limited to.<br>Machinery can be a vector for spreading terrestrial invasive species into new areas as they may carry seeds or plant parts to other properties. Contractors are to follow clean equipment best management practices. | Residual effects are anticipated to be minor and short-term, given the appropriate mitigation measures are incorporated to prevent dumping, soil compaction, and non-native species spread in the Significant Woodland. The new habitat edge will be buffered from development and residential activity once the native plantings in the VPZ establish and begin to grow. Denser plantings are recommended in disturbed areas to minimize edge effects. |

| Impact | Impact Assessment | Mitigation Measures | Residual Effects |
|---|---|---|---|
| Sediment loading off-site | Sediment can enter downstream water bodies, especially during storm events, through erosion of exposed earth. This is particularly associated with site grading activities and storage of fill. | With implementation and maintenance of proper Erosion and Sediment Control (ESC) measures, impacts to adjacent lands should be minimal. | No adverse effects from construction generated sediment runoff are expected with the implementation and maintenance of an approved ESC plan. |
| Increased surface runoff | Changing site grading and adding impermeable surfaces to the landscape can reduce infiltration of surface water into the soil. The resulting increase in surface water runoff can alter the natural water balance of the natural heritage system and disrupt aquatic ecological functions. | Control the volume and surface water discharged into the drainage feature through the SWM pond to match pre-construction conditions. | The SWM pond will be constructed to control the quantity and quality of stormwater. Downstream impacts such as increased flooding and channel destabilization is not anticipated. |
| Contaminant runoff | Increases in contaminant runoff from oils, gasoline, grease and other materials into the natural heritage system could result in increased pollutant load if not managed properly. This is particularly associated with construction activities, salt storage, and improper disposal of residential contaminants. | Control water contamination through best management practices such as safely storing all chemicals and fuels, having spill kits on-site, do not clean equipment near natural areas. Conduct vehicular maintenance and refuelling at least 30 m away from the surrounding natural heritage system. | No adverse effects from contaminant runoff are expected with the implementation of best management practices. |

Based on the proposed mitigation measures, setbacks, and existing conditions of the site, the proposed site development will not result in any measurable changes to the composition, structure, or function of the natural heritage features.

## 8.3. Indirect Impact Assessment

Indirect impacts are those which occur as a secondary result of the proposed activity, and not necessarily as a direct result of the activity. These are usually associated with effects such as population growth, density changes, or alterations/additions to road networks. Indirect impacts can include light pollution, which can cause confusion in migrating birds at night, potentially resulting in window strikes. Mitigation recommendations are provided where possible.

The Subject Property is predominantly agricultural, with neighbouring agricultural, residential, and natural lands. The proposed development will increase vehicle traffic in the local area, resulting in an increase in daily

car trips and associated impacts such as increased noise, light, risk of roadkill, and risk of contaminant runoff. Although an increase in car trips increases the potential for vehicle-wildlife interactions, the development is not resulting in new roads in areas of critical wildlife movement between natural heritage features.

There is also the potential for anthropogenic disturbance within the Significant Woodland in the form of informal trails and garbage dumping. This is a concern as the woodland supports one SAR vegetation species, butternut, and contains SWH habitat for SAR birds such as the eastern wood-pewee. To minimize these impacts, planting of the VPZ and NHS with native trees, shrubs, and seed mix, reflective of the local species and guided by the Six Nations of the Grand River species of cultural importance, along the development interface will reduce access opportunities. In addition, having formal trail linkages from the community to the LE & N Rail Trail will encourage residents to use established trails and not create informal trails.

### 8.4. Cumulative Impacts

Cumulative impacts are environmental changes due to past, present, and the reasonably foreseeable future. Cumulative impacts on the adjacent natural heritage system are difficult to predict and isolate from existing influences. The Subject Property and much of the surrounding landscape have experienced ongoing disturbance from historical land use, most notably agricultural use and, in more recent years, residential development to the north of the Property.

The neighbouring natural heritage features will experience changes as a result of the land use shifting from agricultural to residential, as more foot traffic and vehicle traffic will be brought into the area. The Significant Woodland will be retained and protected with a 10 m buffer. It is expected that the proposed development will not measurably alter the surrounding natural heritage features, but some changes to form and function are expected due to the shift from agricultural land use to residential land use. Implementing mitigation measures will ensure that possible cumulative impacts are minimal and decrease the amount of stress put on the neighbouring natural heritage features.

## 9. Mitigation Measures and Recommendations

The following mitigation measures are recommended to avoid and minimize impacts. The measures have two distinct intended outcomes: mitigation to reduce the impact on the natural heritage system and mitigation to reduce the impact of active construction.

### 9.1. Natural Heritage System Measures

Before machinery is active on site, a visual search of the work area should be conducted before work commences each day. Visual inspections will aim to locate snakes, turtles, and other ground-dwelling wildlife such as small mammals. Visual searches should also include inspection of machinery and equipment left in the work area overnight before starting equipment to ensure that wildlife is safely out of the work area.

Other natural heritage system measures include:

- Inspection by a qualified person(s) to conduct regular monitoring of all sediment erosion measures implemented to ensure they are in working order. Any deficiencies observed are to be recorded and immediately reported to the site contractor.

- Minimize outdoor lighting and direct it down and away from natural areas. A particular effort should be made to reduce lighting near the Significant Woodlands.
- Architectural considerations to minimize bird strikes, which could include window glazing, frosting or etching, UV-treated glass, or exterior window coverings (i.e. shutters or muntins), awnings or canopies over entryways.
- Provide native plantings reflective of the local area within the VPZ and NHS. Denser native plantings should occur beside disturbed/impacted areas to minimize edge effects.

### 9.1.1. Tree Preservation Measures

One butternut (*Juglans cinerea*) tree was identified within the Study Area in the FOD community (Figure 2). Several butternut hybrids were also identified within the Study Area throughout the FOD and WOD communities. Further assessment for any butternuts that may be disturbed through development should be completed before any grading of the site occurs. Butternut trees will be protected in place through the 10 m VPZ for the woodlands.

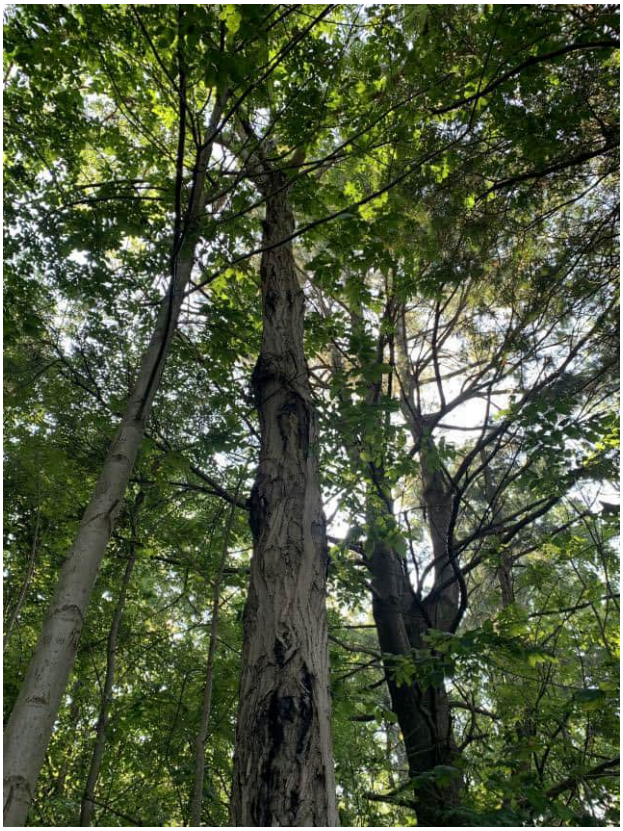

*Figure 2. Butternut (Juglans cinerea) within FOD Community*

## 9.2. Construction Measures

General construction-related mitigation measures include the following:

- Clearing of vegetation within the Subject Property as part of site preparation and vegetation clearing should be conducted outside of the breeding bird and active bat periods (April 1 to October 31). If clearing is to proceed within the breeding bird window, the Subject Property should be screened by a qualified bird biologist within 48 hours of work commencing to determine if any migratory songbirds are nesting within the work zone. Any identified nests are to be protected until it is confirmed that the young have fledged from the nest.
- Construction activities should be avoided at sunrise and sunset when birds are most active during the breeding bird season to reduce construction noise impacts.
- Implementation of the erosion and sediment control plan (ESC) is recommended to prevent releases of sediment into the adjacent natural areas. The ESC plan and monitoring should be reviewed and carried out by a qualified professional (i.e. CAN-CISEC certification). Any deficiencies observed are to be recorded and immediately reported to the site contractor. Gaps in fencing should be repaired immediately. ESC measures should not be removed until the site is deemed sufficiently stabilized by a qualified environmental professional.
- Heavy machinery should be washed before entering the Subject Property to prevent the spread of invasive species.
- Topsoil removed during stripping is recommended to be stockpiled for reapplication post-construction.
- A construction work plan should designate specific locations for stockpiling soils and other materials or outline the location of materials trucked offsite.
- Implementation of dust control measures is recommended to reduce dust impacts on the adjacent lands.

# 10. Policy Conformity

The proposed development conforms with the policies of the Norfolk County Official Plan, provincial policies, and federal requirements as it relates to natural heritage and hazards. Currently available planning and design for the proposed development indicate no negative impacts to the ecological and hydrological function of the natural heritage features. Restoration, enhancement, and mitigation measures identified for the Study Area will promote the protection of natural features outlined in this scoped EIS.

*Table 13. Policy Conformity*

| Environmental Feature | Regulatory Document | Policy/Regulation | Rationale |
|---|---|---|---|
| **Natural Heritage System Boundaries and Designation** | Norfolk County Official Plan (2025) | 3.5 *The Official Plan separates land-based environmental considerations into three categories:*<br>*a) Provincially Significant Features…*<br>*b) Natural Heritage Features, as described in Section 3.5.2 (Natural Heritage Features), and identified on Schedule "C" to this Plan*<br>*c) Hazard Lands…*<br>*…The delineation of these environmental considerations may be refined through the preparation of a detailed Environmental Impact Study (EIS), pursuant to Section 9.7.1 (Environmental Impact Study) of this Plan* (NCOP 2025).<br>3.5.2e *Forestry and Planning staff may be consulted to assist in further refinement of Significant Woodlands when required* EIS (NCOP 2025). | The Subject Property is within designated adjacent lands and contains Significant Woodlands as illustrated on Schedule C-5. According to the Official Plan, lands within 10 m of Significant Woodlands are considered adjacent lands. For this Scoped EIS, as identified by the County, the focus will be on the Significant Woodland and its associated constraints. The mapped adjacent lands in Schedule C-5 associated with the PSW across Decou Road is not within the scope of this study.<br>This EIS delineates the boundaries of the Significant Woodlands and refined the limits of the features as staked in the field with Norfolk County Staff, detailed in Section 3.2.2. |
| **Development within Natural Heritage Systems and Adjacent Lands** | Provincial Planning Statement (2024)<br>Norfolk County Official Plan (2025) | Section 4.1.8 *"Development…*shall not be permitted on *adjacent lands…*unless the *ecological function* of the *adjacent lands* has been evaluated and…demonstrated that there will be no *negative impacts…*" (PPS, 2024).<br>3.5.1b *Development and site alteration shall not be permitted on lands adjacent to the natural heritage features and areas, unless the ecological function of the adjacent land has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated. The extent of adjacent land shall be defined as indicated in Table 1* (NCOP 2025).<br>3.5.2b *Development or site alteration proposed in, or adjacent to, a Natural Heritage Feature(s), whether illustrated on Schedule "C" or only described in Table 2, shall be subject to the completion of an Environmental Impact Study, in accordance with Section 9.7.1 (Environmental Impact Study) of this Plan. Development or site alteration in, or adjacent to, such features shall not be permitted unless it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated* (NCOP, 2025). | Development and site alteration is proposed within lands adjacent to the Significant Woodlands and within the Significant Woodlands. This SEIS assesses the woodland features, evaluates their significance as well as the potential impacts of development on these features, and demonstrates that the proposal will result in no negative impacts on the natural features or on their ecological functions.<br>The proponent proposes development within the WOD woodland and its associated adjacent lands to accommodate a stormwater management (SWM) facility, specifically, the outlet infrastructure for the SWM pond.<br>The proposed development also includes very minor encroachment into the FOD woodland and its associated adjacent lands to |

| Environmental Feature | Regulatory Document | Policy/Regulation | Rationale |
|---|---|---|---|
| | | | accommodate street alignment to the west of the woodland feature.<br>The proposed development and related activities have been assessed by this SEIS and determined to be in conformity with these policies, as demonstrated in Section 8, such that there will be no negative impacts on the features or their functions, and where potential impacts may occur, they can be adequately mitigated. |
| **Significant Woodlands, Woodlands and Forestry** | Provincial Planning Statement (2024)<br>Migratory Birds Regulations (2022)<br>Norfolk County Official Plan (2025) | 4.1.5 *Development and site alteration shall not be permitted in…* b) *significant woodland*s in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Marys River)*…unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions* (PPS, 2024).<br>Migratory birds, their nests or eggs can be harmed as a result of many activities, including clearing trees or other vegetation. Unless authorized under the regulation, it is prohibited to: capture, kill, take, injure, or harass a migratory bird, and to damage, destroy, remove or disturb a nest shelter (MBR, 2022). | The Significant Woodlands are assessed as designated in the Official Plan and as verified through field studies. The two distinct features include the Significant Woodlands (FOD) east of Street A and the Significant Woodlands (WOD) west of Street A, which is contiguous with the Lynn River Valley Corridor.<br>This study conforms with this PPS policy 4.1.5 as it meets the conditions in which development may be permitted within Significant Woodlands by demonstrating that there will be no negative impacts on the natural features or their ecological functions. |
| **Habitat of Endangered/Threatened Species and Significant Wildlife Habitat** | Provincial Planning Statement (2024)<br>Endangered Species Act (2007)<br>Migratory Birds Convention Act | 4.1.5 *Development and site alteration shall not be permitted in…* d) *significant wildlife habitat…unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions* (PPS, 2024).<br>4.1.7. *"Development…*shall not be permitted in *habitat of endangered species and threatened species*, except in accordance with *provincial and federal requirements*" (PPS, 2024).<br>Subsection 9(1) "*No person shall, (a) kill, harm, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species"* (ESA, 2007).<br>Clause 10(1)(a): *"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species."* (ESA, 2007). | The field studies and assessments completed in this EIS for Species at RIsk, as detailed in Section 5.2, concluded that nesting habitat for Eastern wood-pewee is possibly occurring, habitat for Butternut is confirmed for one individual and possibly occurring for others but requires further assessment, habitat for Eastern Milksnake is present and the species is possibly occurring, the Study Area provides habitat for Snapping Turtle, and habitat for Barn Swallow is likely occurring outside the Subject Property with confirmed presence of the species within the property. |

| Environmental Feature | Regulatory Document | Policy/Regulation | Rationale |
|---|---|---|---|
| | (1994) and Migratory Bird Regulations (2022)<br><br>Norfolk County Official Plan (2025) | The Migratory Birds Regulations (2022) protects migratory birds, their eggs, and nests by prohibiting activities that cause them harm. Migratory birds, their nests or eggs can be harmed as a result of many activities including those that do not primarily target a bird but may cause harm, such as:<br>• Clearing trees or vegetation<br>• Draining or flooding land (MBCA 1994; MBR 2022).<br>3.5.2c The County recognizes the importance of Endangered and Threatened species, and the protection afforded…under the *Endangered Species Act*.<br>*i.* *…The identification of habitat for endangered… or threatened species shall be determined in consultation with the* MNR….<br>*ii.* *Adjacent lands to the habitat…shall be delineated in accordance with Table 2.*<br>iii. *…development shall not be permitted on adjacent lands…unless the ecological function of the adjacent lands has been evaluated through an Environmental Impact Study…that demonstrates…to the County* and…MNR, and other relevant agency… *that there will be no negative impacts on the wildlife habitats.*<br>iv. *… Where there is likelihood that a development proposal will impact species at risk or their habitat, the applicant will be required to consult with the Ministry of Natural Resources and Forestry to ensure the requirements of the Endangered Species Act are met.* | Based on the assessment and evaluation for Significant Wildlife Habitat, this SEIS has determined that the Subject Property provides candidate habitat for Bat Maternity Colonies; however, acoustic surveys are required for confirmation. Other potential Significant wildlife habitats include turtle nesting areas and seeps and springs, as detailed in Section 6.1.2.<br>No development is proposed within the confirmed habitat of Threatened/Endangered species or associated adjacent lands. Recommendations for tree removals and clearing have been provided such that they avoid prohibited activities under the *Migratory Birds Convention Act*.<br>This EIS evaluates the ecological function of the development lands and demonstrates that there will be no negative impacts on the identified Species at Risk or candidate significant wildlife habitat as a result of the development.<br>Based on the information available at the time of this study, the field studies completed, and subsequent assessments, the proposed development conforms with the ESA and is not likely to negatively impact species at risk or their habitat and thus, consultation with the MNR is not required. |

| Environmental Feature | Regulatory Document | Policy/Regulation | Rationale |
|---|---|---|---|
| **Protection, Restoration, and Enhancement** | Provincial Planning Statement (2024)<br><br>Norfolk County Official Plan (2025) | Section 4.1.2. *diversity and connectivity of natural feature…and the long-term ecological function and biodiversity of natural heritage systems should be maintained, restored* (PPS, 2024).<br>3.5.2g *This Plan encourages the retention of woodlands or portions of woodlands. It is…encouraged…wherever possible and appropriate, trees be replanted to replace trees removed if a development proceeds. This Plan encourages the conservation or replanting of roadside and fence-line shrubs and trees, and riparian area vegetation, wherever possible and appropriate in the context of new development* (NCOP 2025).<br>3.5.2i *Council encourages opportunities that may arise with development proposals for creating new habitats, natural vegetation regeneration, conserving natural landforms and functions, for protecting and enhancing groundwater and surface water resources, and for promoting environmental education and interpretation* (NCOP 2025).<br>4.6.4d *The County shall encourage landowners to maintain and restore riparian buffers and natural vegetation adjacent to streams* (NCOP 2025).<br>5.5c *The County shall support the use of a mix of indigenous plant species and trees having historic or cultural significance in these landscape areas*.<br>9.7.1.1d *Identification and evaluation of impact avoidance, enhancement and mitigating measures proposed, including, but not limited to:*<br>i. …<br>ii. …<br>iii. …<br>iv. …<br>v. *Opportunities for the enhancement of the Natural Heritage Feature, function, or area resulting from positive effects*. | The development proposes to retain the existing Significant Woodlands, and protection measures will be implemented through the application of a 10 metre Vegetation Protection Zone/Setback, which is to be planted with native and self-sustaining vegetation.<br>Although the development proposes to direct the SWM pond to outlet into the drainage feature within the WOD Significant Woodland, disturbed areas are proposed to be replanted and restored with native plantings where feasible.<br>The development proposal also includes a very minor encroachment by Street A into the FOD Significant Woodland on the southwestern corner of the feature. This encroachment covers a total area of 177 $m^2$ of the VPZ and 163 $m^2$ of the woodland, which will be restored through the addition of a much larger 1702 $m^2$ area east of Steet A. This addition to the NHS will enhance the existing Significant Woodland by increasing the total wooded area.<br>In consultation with the Six Nations of the Grand River, a planting list of culturally significant plants was developed, and will be incorporated into the areas proposed for restoration and enhancement. |
| **Natural Heritage Buffers and Vegetation Protection Zones (VPZs)** | | 9.7.1.1e Recommendations and conclusions based on the above evaluation of impact avoidance, enhancement and mitigating measures shall outline the preferred alternative for impact avoidance, enhancement and mitigation, including:<br>i. …<br>ii. …<br>iii. …<br>iv. appropriate buffers/setbacks<br>vi. … | Appropriate buffers and setback have been recommended for all natural features within the property and immediately adjacent, including a 10-metre buffer for the Significant Woodlands. |

| Environmental Feature | Regulatory Document | Policy/Regulation | Rationale |
|---|---|---|---|
| **Mitigation** | Norfolk County Official Plan (2025)<br><br>LPRCA Policies for the Administration of Ontario Regulation 41/24 | 9.7.1.1d Identification and evaluation of impact avoidance, enhancement and mitigating measures proposed, including, but not limited to:<br>i. the assessment of all feasible mitigating measures.<br>ii. those effects that can be reduced or eliminated by the various mitigating measures.<br>iii. a detailed description of the proposed mitigating measures to eliminate or reduce the negative effects.<br>iv. the relative effectiveness of implementing these mitigating measures should be estimated, and the extent of any remaining impacts discussed.<br>7.1.2 *Development activities, interference or alteration within a Regulated Area may be permitted where it can be demonstrated through appropriate technical studies and/or assessments, site plans and/or other plans as required by the LPRCA that…*<br>*g) sedimentation and erosion during construction and post construction is minimized using best management practices including site, landscape, infrastructure and/or facility design (whichever is applicable based on the scale and scope of the project), construction controls, and appropriate remedial measures…k) the control of flooding, erosion… or unstable soil or bedrock is not adversely affected during and post development* (LPRCA 2024). | This EIS provides robust recommendations for mitigation measures to avoid and minimize impacts, as detailed in Section 9.<br>The recommendations include consideration for sedimentation and erosion during and post construction and the implementation of best management practices. |
| **Stormwater (Natural Heritage)** | Norfolk County Official Plan (2025) | 8.9.4c *Stormwater management facilities shall be designed to manage stormwater quality and quantity through a treatment train approach, at an appropriate level, as defined in consultation with the appropriate Conservation Authority. The integration of natural vegetative features in new facilities shall be required, and the naturalization of existing stormwater management facilities is encouraged. The installation of low impact development measures and green infrastructure will be encouraged (NCOP 2025).*<br>8.9.4e *Prior to development approval, the development proponent shall consider, where appropriate, enhancing the vegetation, wildlife habitats and corridors in and along the stormwater management system and the receiving watercourses. Additionally, the proponent shall provide, where appropriate, public access to and along the stormwater management system and the receiving watercourse … (NCOP 2025).*<br>8.9.4f *The implementation of storm water management practices shall take into consideration the potential impact of climate change, including the following:* | The disturbed area surrounding the outfall encroachment into the woodland will be restored to woodland post-construction through plantings of native trees, shrubs and seed mix. The VPZ to woodland adjacent to the SWM pond will also be planted with native trees, shrubs and seed mix to mitigate impacts to the woodland.<br>Mitigation measures are proposed to ensure potential impacts to downstream systems are not impacted.<br>This SEIS, as detailed in Section 7.3 and Section 8, reviews the impacts identified in policy 8.9.4f of the NCOP and demonstrates that there will be no negative impacts downstream of the SWM pond. |

| Environmental Feature | Regulatory Document | Policy/Regulation | Rationale |
|---|---|---|---|
| | | i. *More extreme thermal impacts on aquatic and terrestrial ecology*<br>ii. *Increased seasonal evapotranspiration rates*<br>iii. *Uncertainty in hydrologic predictions and models*<br>iv. *Potential for more extreme high-contaminant concentrations in stormwater*<br>v. *Increased stress in water supply and treatment affecting water quality*<br>vi. *The potential for increased frequency and intensity of major storm events (NCOP 2025).*<br>9.1.10 *Connected Ponds with no water intakes from the watercourse but which outflow into the watercourse may be permitted, provided that the provisions of Sections 7.1.2-7.1.3…are met and a site plan and/or other site-specific study demonstrates that:*<br>*a) there is no negative impact on the downstream water quality or thermal regime, and*<br>*maximum berm heights above existing grades do not exceed 0.3 metres (1 foot) within the Riverine Flooding or Erosion Hazard and all remaining fill is removed from the hazard area* (LPRCA 2024). | |
| **EIS Guidelines** | | 3.5.2h *The County shall require consultation with the Norfolk Environmental Advisory Committee and the use of Ministry of Natural Resources and Forestry Natural Heritage Reference Manual for the completion of an EIS…to ensure that development proposals are consistent with the Natural Heritage Features policies* (NCOP 2025).<br>9.7.1.2 The SEIS shall include:<br>a) *A Proposal Description in accordance with Section 9.7.1…including a description of the study area, the reasoning behind the choice of study area…the choice of Natural Heritage Features and functions to be examined; and, the choice of seasons and times of year to conduct the biophysical inventory*.<br>*b) A Biophysical Inventory of the subject land, and potentially affected adjacent lands, in accordance with Section 9.7.1*<br>*c) A classification of the subject land, and affected adjacent lands, using the* MNR ELC *for Southern Ontario, in accordance with Section 9.7.1*<br>d) *A classification and evaluation of unevaluated wetlands on the subject land, and affected adjacent lands, using the* MNR OWES system*…in accordance with Section 9.7.1*<br>e) *An assessment of the significance of the natural heritage features and functions on the subject land, based on criteria outlined in the current* | This EIS was completed in conformance with the requirements of a Scoped Environmental Impact Statement (SEIS) pursuant to policy 9.7.1.2 of the Official Plan.<br>Consultation with Norfolk County for the completion of this SEIS was conducted as required.<br>The proposed development is not expected to result in adverse impacts on the natural heritage features and hazards are not expected to be aggravated or jeopardize public health and safety. As such, the development is in conformity with policy 9.7.1.3c and should be permitted. |

| Environmental Feature | Regulatory Document | Policy/Regulation | Rationale |
|---|---|---|---|
| | | *natural areas inventory for the County, and the…* MNR *Significant Wildlife Habitat Technical Guide*<br>f) An assessment of the impacts of the proposed undertaking, in accordance with Section 9.7.1…and Section 11.5.3 c) and (e), including the identification and evaluation of:<br>i. on-site effects (e.g., elimination of habitat)<br>ii. off-site effects (e.g., sediment transported downstream)<br>iii. short-term and long-term effects<br>iv. the hydrological function of the wetland<br>v. effects on the use of natural heritage features, functions, or areas by people (e.g., recreational or educational uses)<br>g) The identification and evaluation of impact avoidance, enhancement and mitigation measures, in accordance with Section 9.7.1<br>h) Recommendations and conclusions, in accordance with Section 9.7.1<br>9.7.1.3a In the preparation and review of an EIS or SEIS, the Ministry of Natural Resources and Forestry, the Ministry of the Environment and Climate Change and other appropriate agencies may be consulted as to the nature and extent of the physical hazard and/or sensitive features.<br>9.7.1.3c If the detrimental impact of the proposed use on the Natural Heritage Feature and/or the physical hazard cannot be adequately mitigated, then the development shall not be permitted. | |

# 11. Closing

This scoped EIS completed a policy review, conducted biophysical surveys to document the existing ecological conditions, reviewed the proposed site plan, functional servicing and stormwater management report. A net loss of 177 $m^2$ from VPZ encroachment and 163 $m^2$ from woodland encroachment is anticipated; however, an additional area of 1702 $m^2$ is proposed to be added to Natural Heritage System east of Street A. Post-development discharge rates from the proposed development are to be controlled to the pre-development rates for all storm events up to and including the 100-year event. Stormwater runoff from the proposed development and SWM pond shall meet Level 1 (Enhanced) stormwater quality control (80% total suspended solids removal and 90% average runoff treatment). From a natural heritage perspective, the proposed plan meets the requirements of the Norfolk County Official Plan and, with the implementation of the mitigation measures, can proceed without negative impacts to the natural environment.

# 12. References

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# Environmental Impact Study
# 227 Decou Road, Simcoe, Norfolk County

Prepared for L!V Communities

February 19, 2026

Prepared by:



Emily Veres, BAS, CERPIT
Terrestrial Ecologist



Aisha Jinadu, BES
Environmental Planner

Reviewed by:



Kate Lillie, HBSc, EP, ISA
Senior Ecologist

## Disclaimer

We certify that the services performed by GeoProcess Research Associates were conducted in a manner consistent with the level of care, skill and diligence to be reasonably exercised by members of the engineering and science professions.

Information obtained during the site investigations or received from third parties does not exhaustively cover all possible environmental conditions or circumstances that may exist in the study area. If a service is not expressly indicated, it should not be assumed that it was provided. Any discussion of the environmental conditions is based upon information provided and available at the time the conclusions were formulated.

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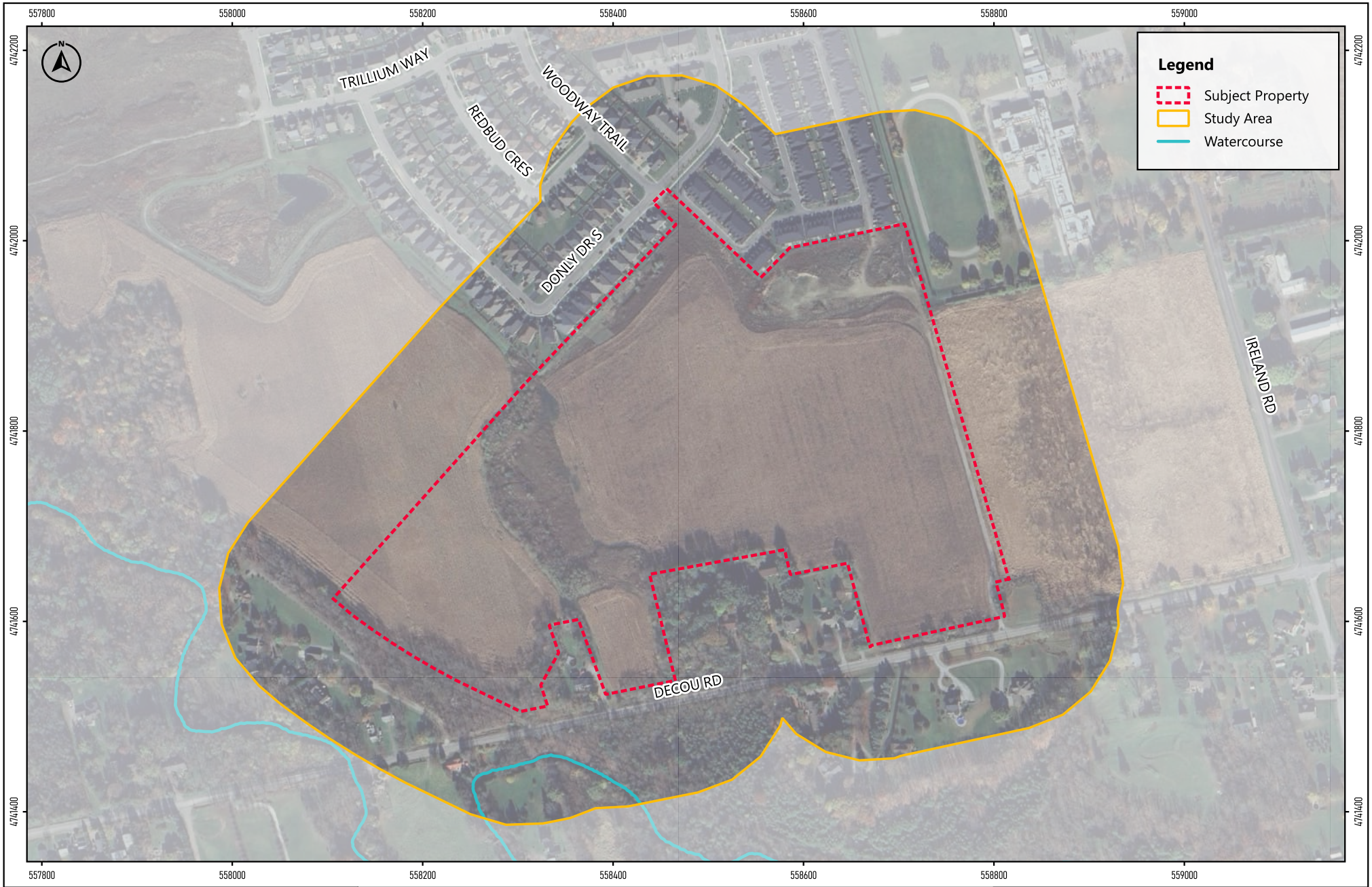
Project Number P2025-1014

# Maps




GeoProcess RESEARCH ASSOCIATES

CREATED BY: PA
CHECKED BY: KL
PROJECT NO.: P2025-1014
DATE: Feb 11, 2026

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NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Imagery from Google Earth
[2] Watercourse layer: Ontario Hydro Network
[3] Road layer: Ontario Road Network

**Map 1.**

Key Map

**Environmental Impact Study**
**227 Decou Road, Norfolk County**

L!V Communities

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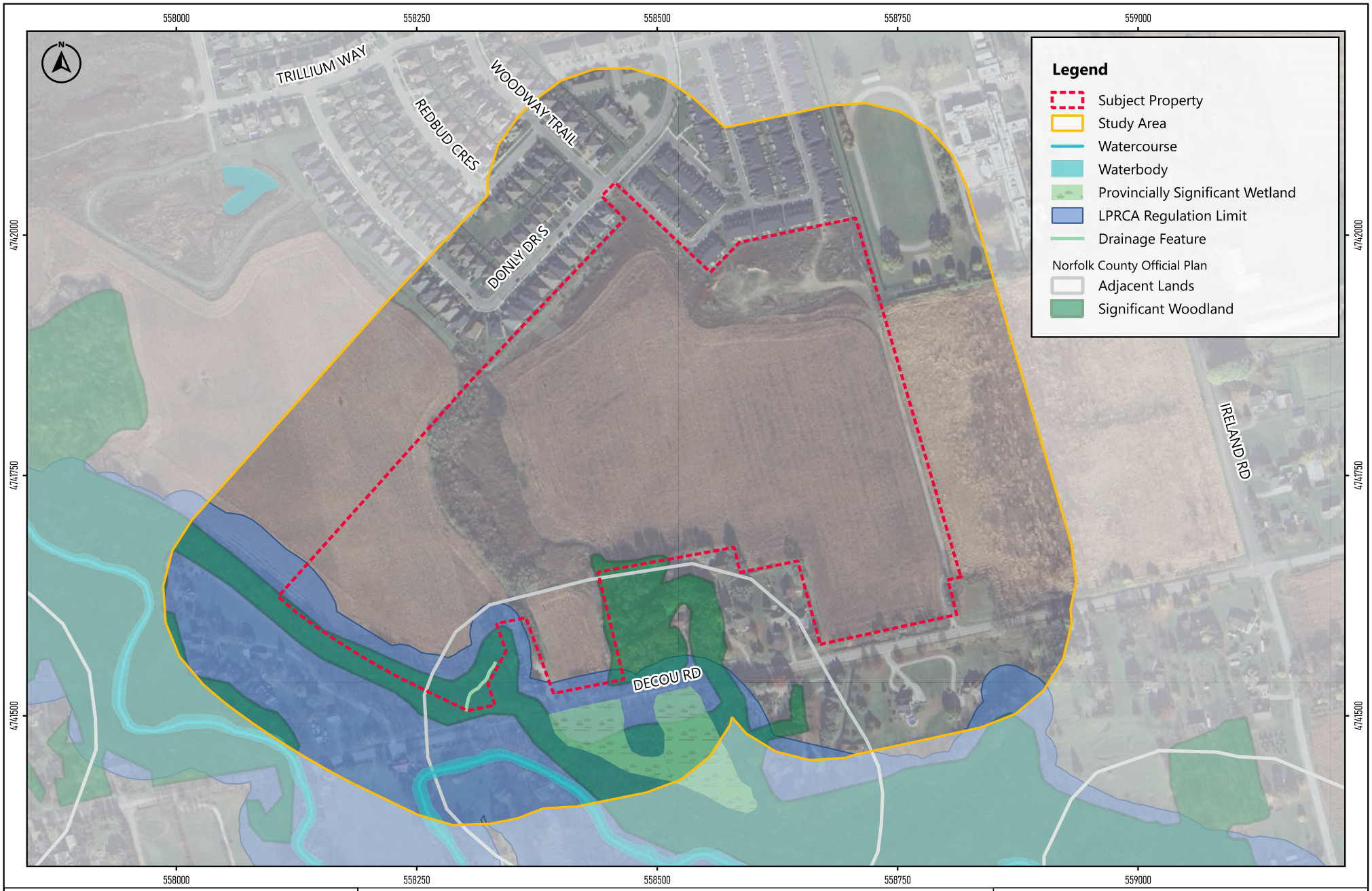


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0 100 200 m

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Notes:
[1] Imagery from Google Earth
[2] Watercourse and waterbody layer: Ontario Hydro Network
[3] Wetland layer: Land Information Ontario
[4] Road layer: Ontario Road Network
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**Map 2.**

Existing Conditions

**Environmental Impact Study**
**227 Decou Road, Norfolk County**

L!V Communities

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DATE: Feb 11, 2026

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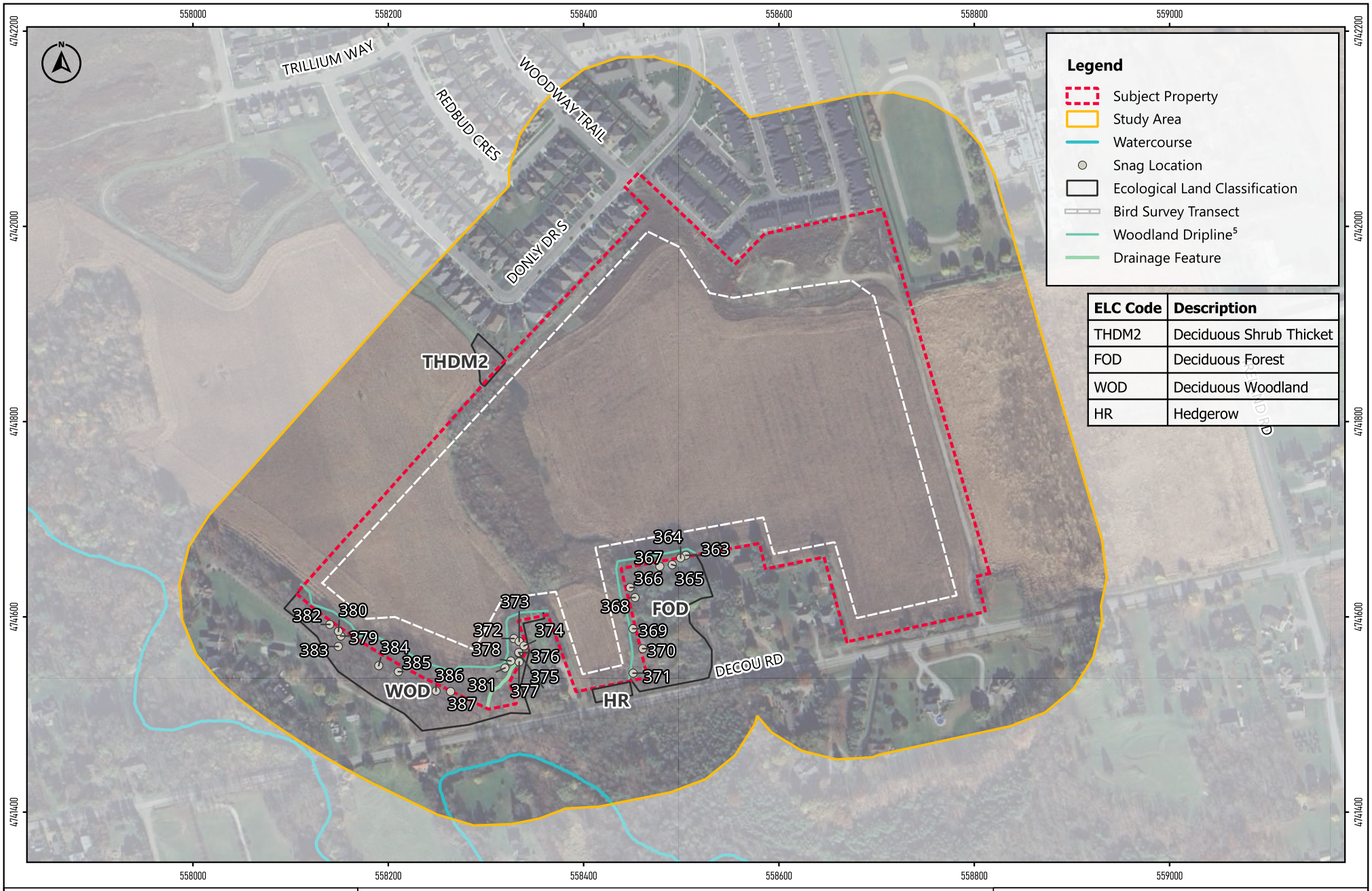


| ELC Code | Description |
|---|---|
| THDM2 | Deciduous Shrub Thicket |
| FOD | Deciduous Forest |
| WOD | Deciduous Woodland |
| HR | Hedgerow |

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DATE: Feb 11, 2026

0 100 200 m

NAD83 / UTM zone 17N (EPSG:26917)

Notes:
[1] Imagery from Google Earth
[2] Watercourse layer: Ontario Hydro Network
[3] Road layer: Ontario Road Network
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[5] Woodland Dripline Layer: Staked with Norfolk County December 3, 2025

**Map 3.**
Natural Heritage Surveys

**Environmental Impact Study**
**227 Decou Road, Norfolk County**

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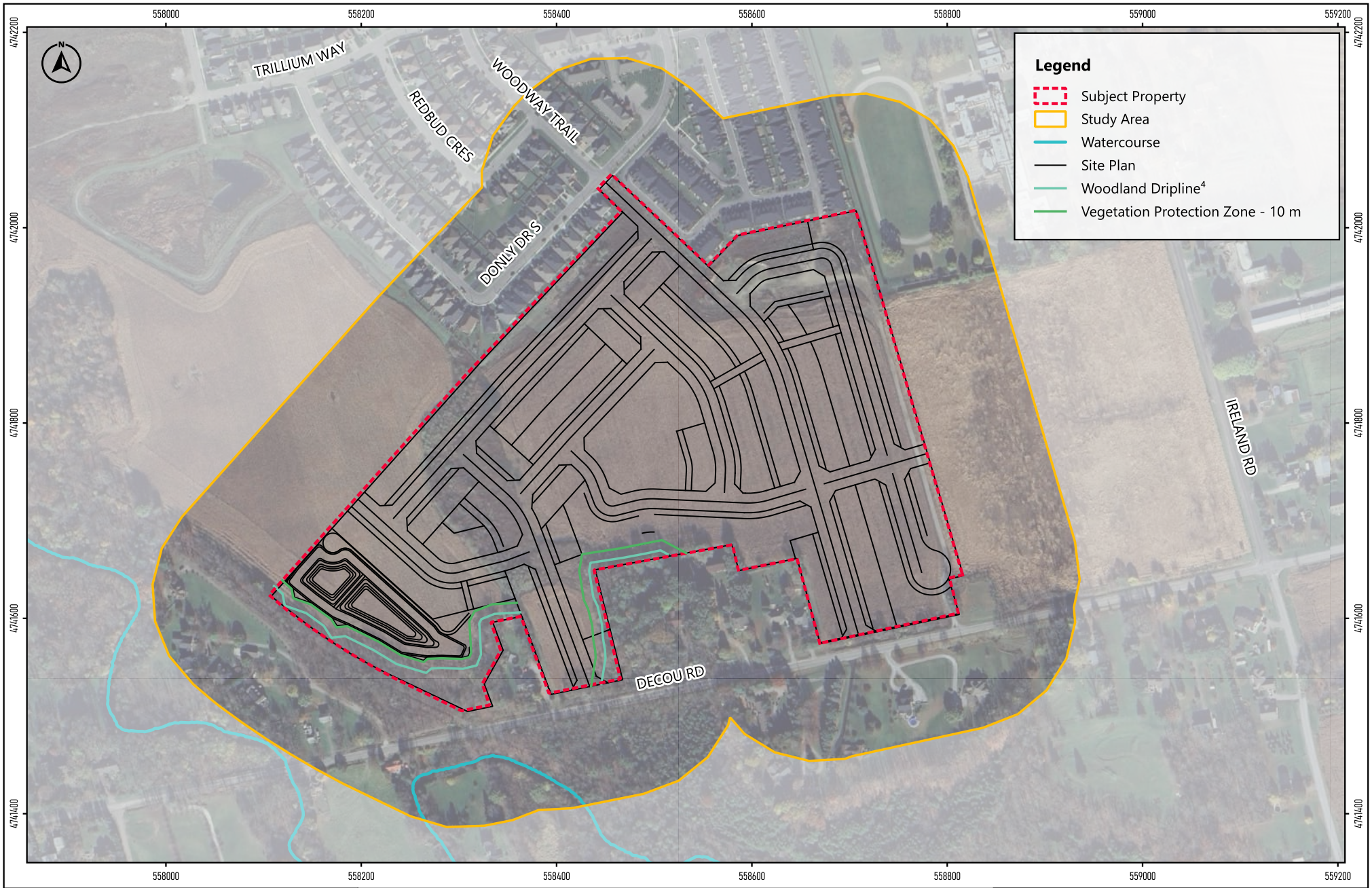


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Notes:
[1] Imagery from Google Earth
[2] Watercourse layer: Ontario Hydro Network
[3] Road layer: Ontario Road Network
[4] Woodland Dripline Layer: Staked with Norfolk County December 3, 2025

**Map 4.** Site Plan

**Environmental Impact Study**
**227 Decou Road, Norfolk County**

L!V Communities

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Notes:
[1] Imagery from Google Earth
[2] Watercourse layer: Ontario Hydro Network
[3] Road layer: Ontario Road Network
[4] Woodland Dripline Layer: Staked with Norfolk County December 3, 2025

**Map 5.**
Encroachment Area

**Environmental Impact Study**
**227 Decou Road, Norfolk County**

L!V Communities

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DATE: Feb 13, 2026

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# Appendix A

## Approved Terms of Reference

Kate Lillie

From: Kate Lillie
Sent: January 9, 2026 8:30 AM
To: 'Alisha Cull'; 'Jakob Schira'; 'Adam Biddle'
Cc: 'Ken Glasbergen'
Subject: RE: 227 Decou Road - Terms of Reference for Scoped EIS

Thanks Alisha and Forestry team. We appreciate your quick review and reply.

Kate

GeoProcess
RESEARCH ASSOCIATES
133 King Street West
PO Box 65506
Dundas, ON, L9H 6Y6
www.geoprocess.com

**Kate Lillie** HBSc, EP, ISA
Senior Ecologist (she/her)
klillie@geoprocess.com
647-268-7139
Barrie, Ontario

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From: Alisha Cull <Alisha.Cull@norfolkcounty.ca>
Sent: January 8, 2026 1:34 PM
To: Kate Lillie <klillie@geoprocess.com>; Jakob Schira <Jakob.Schira@norfolkcounty.ca>; Adam Biddle <Adam.Biddle@norfolkcounty.ca>
Cc: Ken Glasbergen <kglasbergen@geoprocess.com>
Subject: RE: 227 Decou Road - Terms of Reference for Scoped EIS

Hi Kate, Forestry has indicated that the TOR are acceptable.
Thank you,
Alisha

**Alisha Cull, BES, MCIP, RPP, Ec.D.**
Manager of Planning Services
Planning and Realty Services
Community and Development Services
12 Gilbertson Dr., Simcoe, Ontario, N3Y 3A3
519-426-5870 x5080

Norfolk County

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From: Kate Lillie <klillie@geoprocess.com>
Sent: Tuesday, December 23, 2025 11:03 AM
To: Jake.Schira@norfolkcounty.ca; Adam Biddle <Adam.Biddle@norfolkcounty.ca>
Cc: Alisha Cull <Alisha.Cull@norfolkcounty.ca>; Ken Glasbergen <kglasbergen@geoprocess.com>
Subject: 227 Decou Road - Terms of Reference for Scoped EIS

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

Hi Adam and Jake,

GeoProcess has been retained by L!V Communities to complete an Environmental Impact Study (EIS) for 227 Decou Road, Simcoe in Norfolk County. A pre-consultation meeting was held on November 12, 2025, where it was determined that a scoped EIS would be required to address significant woodlands. In keeping with this requirement, we've prepared the attached Terms of Reference (ToR) for your review and approval which outlines the studies and assessment that would be completed as part of a scoped EIS.

As you know from meeting us on site to confirm the dripline recently, work is well underway for the EIS. However, we would like to receive your approval on the ToR to ensure we've captured everything required before the report is finalized and submitted as part of the application.

Please let us know if you have any questions or additions/revisions for us to include in the ToR.

All the best for a happy holiday season.

Thanks,
Kate

GeoProcess
RESEARCH ASSOCIATES
133 King Street West
PO Box 65506
Dundas, ON, L9H 6Y6
www.geoprocess.com

**Kate Lillie** HBSc, EP, ISA
Senior Ecologist (she/her)

klillie@geoprocess.com
647-268-7139
Barrie, Ontario

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# EIS Terms of Reference

December 23, 2025

Norfolk County
County Administration Building
50 Colborne Street South
Simcoe, Ontario, N3Y 4H3

**Re: Environmental Impact Study Terms of Reference**
**227 Decou Rd, Simcoe, Norfolk County**

---

GeoProcess Research Associates Inc. (GeoProcess) has been retained by L!V Communities to complete an Environmental Impact Study (EIS) for a proposed development at 227 Decou Rd, Simcoe in Norfolk County (Map 1). This is herein referred to as the "Subject Property." The proposed EIS study encompasses the Subject Property plus the surrounding 120 m from the Property boundary, which is referred to as the "Study Area". It is understood that the Subject Property is proposed for residential development, and an EIS is required to characterize the natural heritage system, assess potential impacts, and inform the limits of development.




*Figure 1: Norfolk County OP Schedule C-5 - Natural Heritage*

The Subject Property falls within the jurisdictions of Norfolk County and Long Point Region Conservation Authority (LPRCA). The Property is adjacent to a Provincially Significant Wetland (PSW) which lies to the south of the property and is recognized by the Ontario Natural Heritage Information Centre (NHIC). The Study Area also contains Significant Woodland, which is recognized by Norfolk County under Schedule C-5 of the Norfolk County Official Plan (OP). Additionally, the south end of the Property contains lands designated as 'Adjacent Land' under Schedule C-5.

PO Box 65506 Dundas
DUNDAS, ON, L9H 6Y6
905.466.6721
www.geoprocessresearch.com

According to Section 3.5.1 of the Norfolk County OP, development and site alteration is not permitted on adjacent lands unless it is demonstrated through an EIS that there will be no negative impacts on adjacent Natural Heritage Features.

Based on a review of the Study Area, applicable policies and regulations, and requirements identified through pre-consultation with Norfolk County (Nov. 12, 2025), a scoped EIS is required to demonstrate no negative impact on the natural heritage system (significant woodland) and to define constraints. This Terms of Reference specifically details the EIS requirements prescribed by the County based on local, regional, Conservation Authority, provincial, and federal policies and/or regulations applicable to the Subject Property.

## 1. Governing Policies Applicable to the Study Area

The following policies outline the EIS requirements and other regulations as applicable to the Study Area.

**Norfolk County Official Plan (2023)**

Development and site alteration is regulated under the Official Plan and is implemented by Norfolk County. Development and site alteration within the Study Area is subject to the policies of the Norfolk County Official Plan and the EIS will be completed in accordance with the OP.

Section 3.5.1. of the OP states that: *Provincially Significant Features include Provincially Significant Wetlands (PSWs), and habitat of endangered species and threatened species. Provincially Significant Wetlands are designated on Schedule "B", as described in Section 7.4 (Provincially Significant Wetlands Designation). Schedule "C" delineates the PSWs and approximates the adjacent 120 metres in the context of the Natural Heritage Features.*

*In accordance with common practice relating to such features, the habitat of endangered species and threatened species are not illustrated on the schedules to this Plan.*

*The following shall be the policy of the County:*

*a) Development and site alteration shall not be permitted in a Provincially Significant Feature unless in accordance with provincial and federal requirements.*

*b) Development and site alteration shall not be permitted on lands adjacent to the natural heritage features and areas, unless the ecological function of the adjacent land has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated. The extent of adjacent land shall be defined as indicated in Table 1. An Environmental Impact Study (EIS) in accordance with Section 9.7.1 (Environmental Impact Study) of this Plan shall be required for all development proposals adjacent to or abutting areas identified as Provincially Significant Features.*

***Table 1:*** *Adapted from Table 1: Land Subject to EIS Policies Adjacent to Provincially Significant Features*

| **No Development or Site Alteration Within Boundary of Feature** | | ***Adjacent Land Definition*** | |
|---|---|---|---|
| **Provincially Significant Feature** | **Boundary Definition** | **Extent of Adjacent Land** | **Conditions under which Development** |

| | | | and Site Alteration may be Permitted on Adjacent Land |
|---|---|---|---|
| Provincially Significant Wetlands and Coastal Wetlands | Based on evaluation carried out in accordance with Ministry of Natural Resources and forestry's Ontario Wetland Evaluation procedures, and as illustrated on Schedules "B" and "C". | 120 metres | EIS demonstrates that there will be no negative impacts on the natural features and their sustaining ecological or hydrologic functions. |

Regarding Natural Heritage Features identified on Schedule C, including significant woodlands, Section 3.5.1. of the OP states that:

*a) Natural Heritage Features identified on Schedule "C" and/or Table 2 to this Plan shall be subject to the policies of the underlying land use designation, as shown on Schedule "B", and the policies of this Section of the Plan.*

*b) Development or site alteration proposed in, or adjacent to, a Natural Heritage Feature(s), whether illustrated on Schedule "C" or only described in Table 2, shall be subject to the completion of an Environmental Impact Study, in accordance with Section 9.7.1 (Environmental Impact Study) of this Plan. Development or site alteration in, or adjacent to, such features shall not be permitted unless it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions that cannot be adequately mitigated. The extent of adjacent land shall be defined as indicated in Table 2.*

***Table 2:** Adapted from Table 2: Extent of Land Adjacent to a Natural Heritage Feature*

| Natural Heritage Feature | Boundary Definition | Extent of Adjacent Land |
|---|---|---|
| Significant Woodlands | Based on evaluation criteria established and conducted by Norfolk County, as illustrated on Schedule "C". | Dripline plus 10 metres |
| Significant Valleyland (not included on Schedule "C" to this Plan) | Conservation Authority regulatory lines, flood plain mapping or unstable slope mapping where available or the edge of any other associated natural heritage feature, whichever is greater. | Stable top of-bank, determined in consultation with LPRCA or GRCA |

| | | |
|---|---|---|
| Habitat of endangered species and threatened species | As defined by Provincial or Federal authorities. | 100 metres |
| Significant Wildlife Habitat | As defined by MNRF, and/or by the County in the future Natural Heritage System Strategy, further to Section 6.4.3 (Natural Heritage System Strategy). | 50 metres |
| Watercourses (without mapping or regulations from LPRCA or GRCA) | The top of bank of the watercourse or drain as defined in consultation with the County and LPRCA or GRCA. | Land within 15 metres of the top of bank, or a feature defined by Section 4.3 of this Plan. |
| Fish habitat (not included on Schedule "C" to this Plan) | A setback of 30 metres from the highwater edge of an aquatic habitat or as defined through the EIS. The definition of fish habitat can be affected by an EIS. | 30 metres from the highwater mark |
| Natural Areas, as identified in the Natural Areas Inventory, and including Carolinian Canada sites | As defined by the County Natural Areas Inventory. | 50 metres |

In addition to a detailed outline of what an EIS should include, Section 9.7.1. states that: *In consultation with the Norfolk Environmental Advisory Committee, Norfolk County Planning, and the appropriate Conservation Authority where appropriate, a scoped EIS may be prepared for minor planning applications. The nature and scope of a particular development proposal shall serve to define the type of EIS and review criteria to be addressed. Draft Terms of Reference are subject to the approval of NEAC for both full and scoped Environmental Impact Studies."*

**Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits**

Under *Ontario Regulation 41/24*, NCPA regulates lands within the following areas and development activities within these lands:

- Hazardous lands,
- Wetlands,
- River or stream valleys,
- Areas adjacent or close to the shoreline of the Great Lakes – St. Lawrence River System or to an inland lake and that may be affected by flooding, erosion or dynamic beach hazards, and
- Other areas, including areas within 30 metres of a wetland.

Development activities within and adjacent to any of the CA regulated features within the Study Area are subject the relevant regulations under the CA Act and the EIS will be completed in accordance with NPCA guidelines.

**Endangered Species Act (2007)**

The purpose of *Endangered Species Act* (2007) is to provide protection and conservation to species at risk while considering social and economic factors for sustainable economic growth in Ontario. The ESA (Subsection 9(1)) outlines the prohibitions regarding harm to species and states that:

*"No person shall,*

*(a) kill, harm, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*

*(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,*

*(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*

*(ii) any part of a living or dead member of a species referred to in subclause (i),*

*(iii) anything derived from a living or dead member of a species referred to in subclause (i); or*

*(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii)."*

Clause 10 (1)(a) of the ESA also states that:

*"No person shall damage or destroy the habitat of*

- *a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.*
- *a species that is listed on the Species at Risk in Ontario List as an extirpated species, if the species is prescribed by the regulations for the purpose of this clause."* 2007, c. 6, s. 10 (1).

Should the Study Area be subject to regulations under the Endangered Species Act (ESA), the EIS will be completed in accordance with the ESA in consultation with the MNRF and/or the MECP as required.

**Migratory Birds Convention Act (1994)**

The *Migratory Birds Convention Act* (MBCA), (1994) serves to protect and conserve migratory birds, their nests and eggs in Canada. It is prohibited under the MBCA to damage, destroy, disturb or remove the nest of a migratory bird that contains a live bird or viable egg. However, a permit may be issued under the MBCA for various activities with conditions for the husbandry, release, scaring, capture, killing or disposal of migratory birds.

Should the Study Area be subject to regulations under the MBCA, the EIS will be completed in accordance with the MBCA and associated regulations in consultation with Environment and Climate Change Canada as required.

# 2. EIS Study Elements

The following provides the proposed study elements required to complete the EIS. The EIS will define the boundaries of the local natural heritage features (significant woodland), and the extent and treatment of the required buffers. This will determine an appropriate development limit and recommended mitigation measures to reduce/eliminate predicted impacts to the natural heritage system. Overall, the EIS is intended to demonstrate that the proposed development will not result in any negative impacts to the previously outlined features.

## 2.1. Background Review

A review of the existing background information will be completed. This will include a review of relevant Federal, Provincial and Municipal Act, Policies and Regulations (i.e. Provincial Planning Statement, Norfolk County OP, LPRCA Regulations, etc.) and existing reports associated with the Study area or adjacent lands, if accessible. Existing ecological databases such as the Ontario Breeding Bird Atlas, iNaturalist, and Ontario Ministry of Natural Resources Natural Heritage Information Centre (NHIC) will be reviewed. A desktop Species at Risk (SAR) and Significant Wildlife Habitat (SWH) screening will be completed using available background documents, including information acquired from the Ministry of Environment, Conservation and Parks (MECP). Species identified through the field inventories will be ranked using federal, provincial and local rankings.

## 2.2. Ecological Studies

Characterization of the natural heritage features and functions of the Study Area will include:

**Floristic Studies:** Vegetation characterization of the vegetation within and 120 m from the proposed development will be completed following the Ontario Ministry of Natural Resources Ecological Land Classification (ELC) protocol. The characterization will include a three-season inventory, which will be completed in 2025. A full botanical species list, and where applicable, a map showing rare or uncommon vegetation communities or species will be provided.

**Woodland Dripline Staking:** A staking of the woodland dripline will be completed with Norfolk County staff. Significant Woodlands require a 10 m buffer from dripline, as outlined in Section 3.5.2 of the Norfolk County Official Plan; therefore, establishing the dripline limit is critical.

**Snag Surveys:** There are wooded features within the Study Area that may be proposed to be impacted in the future. Snag surveys will be conducted for these features following the Ministry of Natural Resources and Forestry current bat habitat survey protocol for Species at Risk Bats within Treed Habitats (MNRF 2017 and 2022). Slight adaptations to the protocol will occur to fit the timing of the project. Surveys include an assessment of all trees with a diameter at breast height (dbh) of 10 cm or greater, living or dead, with loose or naturally exfoliating bark, cavities, hollows, or cracks. Completed data forms and locational mapping will be provided for any identified snags.

**Breeding Bird Surveys:** The breeding bird survey will follow the Ontario Breeding Bird Atlas (OBBA 2001) protocol. Visits will occur a minimum of seven days apart. All visits will occur between sunrise and 10 am in appropriate weather conditions (light winds, no heavy rain, good visibility) from mid-May to Mid-July.

**Incidental Wildlife Surveys:** Formal surveys for mammals, reptiles and insects are not proposed but incidental observations of these species will be recorded.

**Species at Risk Screening:** An assessment and screening of potential Species at Risk will be conducted for the Property based on Federal and Provincial status. Following the MECP (2019) *Client's Guide to Preliminary SAR Screening,* this screening will be based on a review of the Natural Heritage Information Center Database information (current), Ontario Breeding Bird Atlas (current), Ontario Butterfly Atlas (current), Ontario Moth Atlas (current), DFO Aquatic Species at Risk Distribution Mapping and iNaturalist (current), including Ontario Nature's "Herps of Ontario" project for Herpetofauna and any additional lists provided by the MECP. When the preliminary screening is prepared, it will be submitted as a memo to sar@ontario.ca for assignment to a management biologist for review.

**Significant Wildlife Habitat Assessment:** A desktop analysis of Significant Wildlife Habitat following the Ministry of Natural Resources and Forestry Significant Wildlife Habitat Technical Guide (2000) and Significant Wildlife Habitat Criteria Schedule for Ecoregion 7E (January 2015) will be conducted for the Study Area. Potential SWH will be assessed during field studies.

**Non-Ecological Studies:** In addition to the ecological characterization of the site, the EIS will include a discussion regarding stormwater management, servicing, and site grading plans.

## 3. Proposed EIS Structure

The EIS report will have the following proposed structure:

1. Introduction
    1.1. Study area
2. Policy Context
    2.1. Provincial Policy Statement
    2.2. Endangered Species Act
    2.3. Norfolk County Official Plan
    2.4. Long Point Regional Conservation Authority
3. Methodology
    3.1. Background Studies
    3.2. Field Work
4. Existing Conditions
    4.1. Physiography and geology
    4.2. Natural Heritage Systems
    4.3. Vegetation
        4.3.1. Botanical Inventory
        4.3.2. Ecological Land Classification
    4.4. Incidental Wildlife
5. Species at Risk Screening
6. Significant Wildlife Habitat Screening
7. Proposed Development
    7.1. Natural Heritage System Buffers
    7.2. Stormwater Management
    7.3. Grading and Servicing Requirements

8. Environmental Impact Assessment
   8.1. Impact Summary Table
   8.2. Direct Impact Assessment
   8.3. Indirect Impact Assessment
   8.4. Cumulative Impact Assessment
9. Mitigation Measures
   9.1. Natural Heritage System Measures
   9.2. Construction Measures
10. Policy Conformity
11. Recommendations
12. References
13. Maps
14. Appendices

## 4. Closing

The proposed scoped EIS will characterize and assess the natural heritage features (significant woodland), and their functions, located on and adjacent to the Study Area. Further, the EIS is intended to demonstrate that the proposed development will not result in any negative impacts on the Natural Heritage System Features that occur on and adjacent to the site as identified within the Norfolk County OP. An assessment of the impacts and recommended mitigation measures will be provided within the context of the proposed development at 227 Decou Road, in Simcoe, Norfolk County, Ontario. The EIS will provide an analysis of the required buffers and the developable limit of the Subject Property. Detailed mapping of the study area and results of the ecological assessments will also be included. This Terms of Reference provides the approach and study elements which will be followed throughout the study process.

If you have any questions regarding this submission, please do not hesitate to contact us.

Regards,

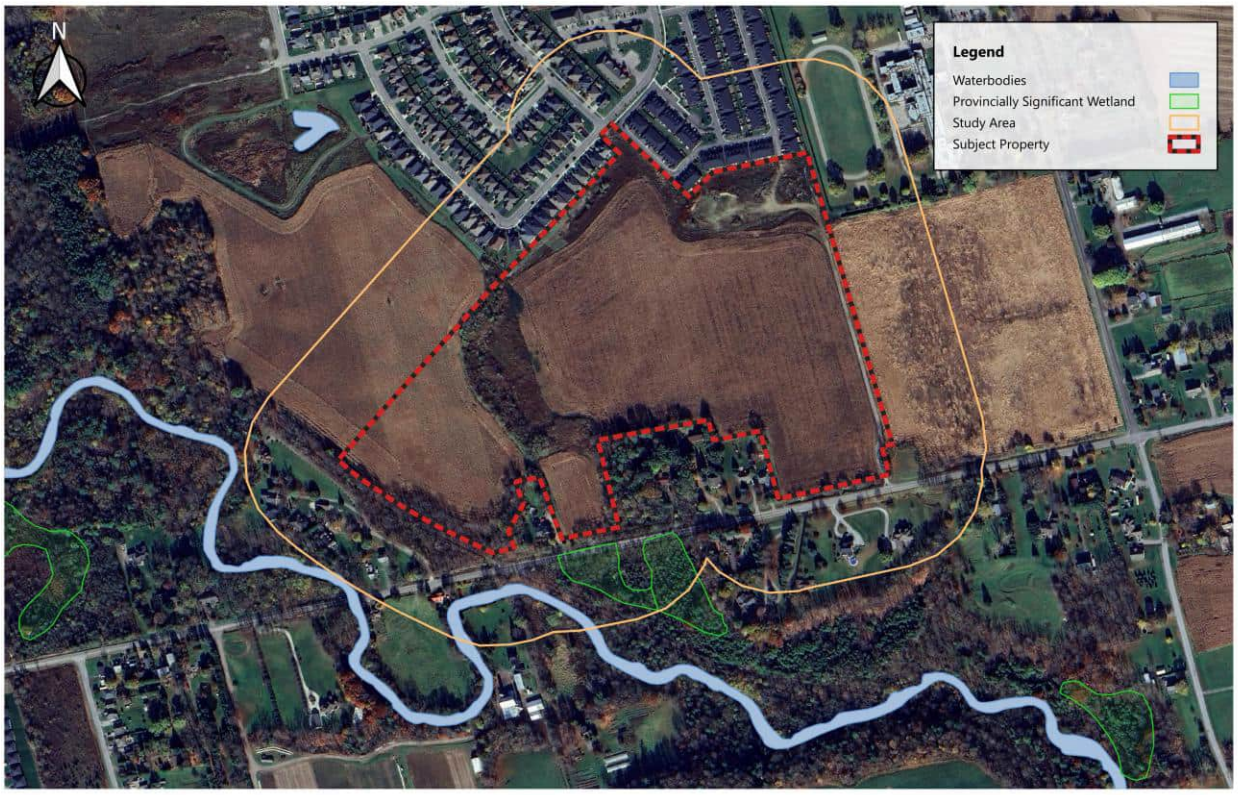
**GEOPROCESS RESEARCH ASSOCIATES INC**



Kate Lillie, HBSc., EP, ISA
Senior Ecologist

# Appendix

## Map 1




GeoProcess RESEARCH ASSOCIATES

| | | | |
|---|---|---|---|
| CREATED BY: | TS | PROJECT NO.: | P2025-1014 |
| CHECKED BY: | KG | DATE: | Jul 02, 2025 |

0 100 200 300 400 m

NADB3.UTM Zone 17N (EPSG:26917)

Notes:
[1] Satellite imagery from Google Earth.
[2] Contains information licensed under the Open Government License- Ontario.

**Map #1.**

Reference Map

**EIS for 227 Decou Road, Norfolk County**

LIV Communities

G:\Shared drives\Projects-2025\P2025-1014 EIS for 227 Decou Road, Simcoe\GIS\Export\ToR\Reference Map 1 2025-06-26.qgz

# Appendix B

## Complete List of Vascular Plant Species

*Table B1. Complete List of Vascular Plant Species within the Subject Property*

| Scientific Name | Common Name | Polygon(s) | S-Rank[1] | CoC[2] | CoW[3] | Regional Rank[4] |
|---|---|---|---|---|---|---|
| *Acalypha rhomboidea* | Common Three-seeded Mercury | WOD | S5 | 0 | 3 | C |
| *Acer negundo* | Manitoba Maple | FOD, HR | S5 | 0 | 0 | C |
| *Acer platanoides* | Norway Maple | WOD, FOD | SNA | - | 5 | IU |
| *Acer rubrum* | Red Maple | FOD | S5 | 4 | 0 | C |
| *Acer saccharum* | Sugar Maple | WOD, FOD | S5 | 4 | 3 | C |
| *Acer x freemanii* | (*Acer rubrum* X *Acer saccharinum*) | THDM2 | SNA | 6 | -5 | hyb |
| *Alliaria petiolata* | Garlic Mustard | WOD, FOD | SNA | - | 0 | IC |
| *Anemonastrum canadense* | Canada Anemone | FOD | S5 | 3 | -3 | U |
| *Apios americana* | American Groundnut | WOD | S5 | 6 | -3 | C |
| *Arctium sp.* | Burdock species | WOD, THDM2 | - | - | - | - |
| *Arisaema triphyllum* | Jack-in-the-pulpit | FOD | S5 | 5 | -3 | C |
| *Betula alleghaniensis* | Yellow Birch | FOD | S5 | 6 | 0 | C |
| *Bidens frondosa* | Devil's Beggarticks | HR | S5 | 3 | -3 | C |
| *Carex plantaginea* | Plantain-leaved Sedge | WOD | S5 | 7 | 5 | U |
| *Carex sp.* | Sedge species | FOD | - | - | - | - |
| *Castanea mollissima* | Chinese Chestnut | FOD | - | - | - | - |
| *Celastrus orbiculatus* | Oriental Bittersweet | WOD | SNA | - | 5 | IR |
| *Celtis occidentalis* | Common Hackberry | WOD | S4 | 8 | 0 | U |
| *Chelidonium majus* | Greater Celandine | FOD | SNA | - | 5 | IU |
| *Chenopodiastrum simplex* | Maple-leaved Goosefoot | WOD | S5 | 0 | 5 | U |
| *Chenopodium album* | Common Lamb's-quarters | WOD | SNA | - | 3 | IC |
| *Circaea canadensis* | Broad-leaved Enchanter's Nightshade | WOD, FOD, THDM2 | S5 | 2 | 3 | C |
| *Cornus alternifolia* | Alternate-leaved Dogwood | WOD, FOD, HR | S5 | 6 | 3 | C |
| *Cornus sericea* | Red-osier Dogwood | HR | S5 | 2 | -3 | C |
| *Digitaria sp.* | Digitaria grass species | WOD | - | - | - | - |
| *Echinocystis lobata* | Wild Cucumber | WOD, FOD | S5 | 3 | -3 | C |
| *Elymus virginicus* | Virginia Wildrye | WOD | S5 | 5 | -3 | C |
| *Epilobium parviflorum* | Small-flowered Hairy Willowherb | FOD | SNA | - | 3 | IU |
| *Equisetum hyemale* | Common Scouring-rush | THDM2 | S5 | 2 | 0 | C |
| *Erechtites hieraciifolius* | Eastern Burnweed | WOD | S5 | 2 | 3 | C |
| *Erigeron annuus* | Annual Fleabane | THDM2 | S5 | 0 | 3 | U |

| Scientific Name | Common Name | Polygon(s) | S-Rank[1] | CoC[2] | CoW[3] | Regional Rank[4] |
|---|---|---|---|---|---|---|
| *Fraxinus pennsylvanica* | Green Ash | WOD | S4 | 3 | -3 | C |
| *Galium aparine* | Common Bedstraw | THDM2 | S5 | 4 | 3 | C |
| *Geum aleppicum* | Yellow Avens | THDM2 | S5 | 2 | 0 | U |
| *Geum canadense* | Canada Avens | WOD, FOD, THDM2 | S5 | 3 | 0 | C |
| *Hackelia virginiana* | Virginia Stickseed | WOD, FOD | S5 | 5 | 3 | C |
| *Impatiens capensis* | Spotted Jewelweed | WOD, FOD, HR | S5 | 4 | -3 | C |
| *Juglans cinerea* | Butternut | FOD | S2? | 6 | 3 | C |
| *Juglans nigra* | Black Walnut | WOD, FOD | S4? | 5 | 3 | C |
| *Juglans sp.* | Potential Walnut Hybrid | WOD | - | - | - | - |
| *Lapsana communis* | Common Nipplewort | FOD | SNA | - | 3 | IU |
| *Leonurus cardiaca* | Common Motherwort | WOD | SNA | - | 5 | IC |
| *Lilium michiganense* | Michigan Lily | WOD | S4 | 7 | -3 | C |
| *Lobelia inflata* | Indian-tobacco | WOD | S5 | 3 | 3 | C |
| *Lobelia siphilitica* | Great Blue Lobelia | WOD | S5 | 6 | -3 | C |
| *Lonicera tatarica* | Tatarian Honeysuckle | WOD | SNA | - | 3 | IC |
| *Medicago lupulina* | Black Medick | THDM2 | SNA | - | 3 | IC |
| *Morus alba* | White Mulberry | THDM2, HR | SNA | - | 0 | IU |
| *Oxalis stricta* | Upright Yellow Wood-sorrel | WOD, FOD | SNA | - | 3 | C |
| *Panicum capillare* | Common Panicgrass | WOD | S5 | 0 | 0 | C |
| *Parthenocissus quinquefolia* | Virginia Creeper | WOD, FOD | S4? | 6 | 3 | U |
| *Persicaria virginiana* | Virginia Smartweed | WOD | S4 | 6 | 0 | C |
| *Phalaris arundinacea* | Reed Canary grass | FOD | S5 | 0 | -3 | C |
| *Phleum pratense* | Common Timothy | THDM2 | SNA | - | 3 | IC |
| *Phytolacca americana* | Common Pokeweed | WOD, FOD | S4 | 3 | 3 | C |
| *Picea abies* | Norway Spruce | FOD | SNA | - | 5 | IR |
| *Pinus strobus* | Eastern White Pine | FOD | S5 | 4 | 3 | C |
| *Plantago major* | Common Plantain | THDM2 | SNA | - | 3 | IC |
| *Populus deltoides* | Eastern Cottonwood | THDM2, HR | S5 | 4 | 0 | C |
| *Populus tremuloides* | Trembling Aspen | FOD | S5 | 2 | 0 | C |
| *Prunus serotina* | Black Cherry | FOD, WOD | S5 | 3 | 3 | C |
| *Prunus virginiana* | Chokecherry | WOD | S5 | 2 | 3 | C |
| *Quercus alba* | White Oak | FOD | S5 | 6 | 3 | C |
| *Ranunculus recurvatus* | Hooked Buttercup | WOD | S5 | 4 | -3 | C |
| *Reynoutria japonica* | Japanese Knotweed | WOD | SNA | - | 3 | IU |

| Scientific Name | Common Name | Polygon(s) | S-Rank[1] | CoC[2] | CoW[3] | Regional Rank[4] |
|---|---|---|---|---|---|---|
| *Rhamnus cathartica* | European Buckthorn | FOD, HR | SNA | - | 0 | IU |
| *Rhus typhina* | Staghorn Sumac | HR | S5 | 1 | 3 | C |
| *Ribes cynosbati* | Eastern Prickly Gooseberry | WOD | S5 | 4 | 3 | C |
| *Robinia pseudoacacia* | Black Locust | WOD, FOD, THDM2, HR | SNA | - | 3 | IC |
| *Rosa multiflora* | Multiflora Rose | WOD | SNA | - | 3 | IU |
| *Rubus allegheniensis* | Allegheny Blackberry | FOD | S5 | 2 | 3 | C |
| *Rubus idaeus* | Red Raspberry | FOD | S5 | 2 | 3 | - |
| *Rubus occidentalis* | Black Raspberry | WOD, FOD | S5 | 2 | 5 | C |
| *Rudbeckia triloba* | Brown-eyed Susan | WOD, HR | SNA | - | 3 | IC |
| *Salix eriocephala* | Cottony Willow | THDM2 | S5 | 4 | -3 | C |
| *Salix euxina* | Crack Willow | HR | SNA | - | 0 | IC |
| *Salix interior* | Sandbar Willow | THDM2 | S5 | 1 | -3 | C |
| *Sambucus canadensis* | Common Elderberry | WOD | S5 | 5 | -3 | C |
| *Silene latifolia* | White Campion | FOD | SNA | - | 5 | IC |
| *Solanum emulans* | Eastern Black Nightshade | WOD | S5 | 1 | 3 | - |
| *Solidago flexicaulis* | Zigzag Goldenrod | WOD | S5 | 6 | 3 | C |
| *Solidago sp.* | Goldenrod species | WOD, FOD, THDM2 | - | - | - | - |
| *Symphyotrichum firmum* | Glossy-leaved Aster | THDM2, HR | S4? | 4 | -3 | - |
| *Symphyotrichum lanceolatum* | Panicled Aster | THDM2, HR | S5 | 3 | -3 | C |
| *Symphyotrichum lateriflorum* | Calico Aster | WOD, FOD | S5 | 3 | 0 | C |
| *Symphyotrichum novae-angliae* | New England Aster | THDM2 | S5 | 2 | -3 | C |
| *Symphyotrichum urophyllum* | Arrow-leaved Aster | WOD, THDM2 | S4 | 6 | 5 | C |
| *Symplocarpus foetidus* | Eastern Skunk Cabbage | WOD | S5 | 7 | -5 | C |
| *Thalictrum pubescens* | Tall Meadow-rue | WOD | S5 | 5 | -3 | C |
| *Thuja occidentalis* | Eastern White Cedar | WOD, FOD | S5 | 4 | -3 | C |
| *Tilia americana* | Basswood | WOD, FOD | S5 | 4 | 3 | C |
| *Trifolium hybridum* | Alsike Clover | WOD | SNA | - | 3 | IC |
| *Ulmus rubra* | Slippery Elm | FOD | S5 | 6 | 0 | U |
| *Urtica gracilis ssp. gracilis* | Slender Stinging Nettle | FOD | S5 | 2 | 0 | C |
| *Viola sp.* | Violet species | WOD | - | - | - | - |

| Scientific Name | Common Name | Polygon(s) | S-Rank[1] | CoC[2] | CoW[3] | Regional Rank[4] |
|---|---|---|---|---|---|---|
| *Vitis riparia* | Riverbank Grape | WOD, FOD, THDM2, HR | S5 | 0 | 0 | C |

[1]S-Rank refers to the subnational rank that indicates the rarity and risk of a species within a region, ranging from S1, which indicates a critically imperiled species, to S5, which indicates a regionally secure species.

[2]CoC refers to the coefficient of conservatism, which indicates species sensitivity to disturbance on a scale of 0 to 10, with the most conservative or sensitive plants receiving a score of 10 and the least receiving a score of 0.

[3]CoW refers to the coefficient of wetness, which indicates a species' tolerance for soil moisture on a scale of 5 to -5, with -5 being species with a high tolerance for soil moisture, and 5 being species with a low tolerance.

[4]The letter codes given for species status in the Haldimand-Norfolk region are: I – introduced, C – common, U – uncommon, R – rare, H – historic records only (generally >30 years), X – present; status unknown or not specified in source lists, ? – unconfirmed report, hyb – hybrid species.

# Appendix C

## Species at Risk Screening Resources

*Table C1. SAR Screening Resources*

| Screening Resource | Description |
|---|---|
| Natural Heritage Information Center (NHIC) | The Natural Heritage Information Center (NHIC), operated by the Ontario Ministry of Natural Resources and Forestry, collects, reviews, manages and distributes information on Ontario's biodiversity. Data distributed by the NHIC is used in conservation and natural resource management decision making and was a primary resource for this report. Through the NHIC Make-a-Map tool, data on species, plant communities, wildlife concentration areas and natural areas is made accessible to the public and professionals using generalized 1-kilometer grid units to protect sensitive information. The mapping interface provides current and historical occurrences of SAR within the specified grid unit. The database also identifies environmental designations which provide insight into habitat potential including wetland, areas of natural and scientific interests and woodlands. |
| Breeding Bird Atlas | The atlas divides the province into 10×10 km squares and then birders find as many breeding species as possible in each square. Atlassers who know birds well by song complete 5-minute "Point Counts", 25 of which are required to provide an index of the abundance of each species in a square. Data from every square are mapped to show the distribution of each species. Point count data from each square show how the relative abundance of each species varies across the province. |
| eBird | eBird data document bird distribution, abundance, habitat use, and trends through checklist data collected within a simple, scientific framework. Birders enter when, where, and how they went birding, and then fill out a checklist of all the birds seen and heard during the outing. eBird's free mobile app allows offline data collection anywhere in the world, and the website provides many ways to explore and summarize your data and other observations from the global eBird community. eBird hotspots that are within 1 km of the Study Area are selected for species review. |
| Ontario Moth Atlas | The Ontario Moth Atlas is a project of the Toronto Entomologists' Association. The atlas currently covers about 250 species from 7 of the best-known families. The atlas presently includes 62,000 records. The last update of the atlas was in April 2020. The atlas is updated at least every 3 months. Most atlas data come from iNaturalist records. However, there is some data from Chris Schmidt of Agriculture Canada, the BOLD (Barcode of Life Datasystems) project of the University of Guelph, and from other records submitted directly to the TEA. The atlas uses the same 10×10 km squares at the Breeding Bird Atlas. |
| Ontario Butterfly Atlas | The Ontario Butterfly Atlas is a project of the Toronto Entomologists' Association (TEA). The TEA has been accumulating records and publishing annual seasonal summaries (Ontario Lepidoptera) for 50 years, with the first edition appearing in 1969. Atlas data comes from eButterfly records, iNaturalist records, BAMONA records, and records submitted directly to the TEA. The atlas uses the same 10×10 km squares at the Breeding Bird Atlas. |
| i-Naturalist | i-Naturalist is a nature app that helps public identify plants and animals. Using algorithms as well as scientists and taxonomic experts' multiple observations can be identified at a research scale. This data generated by the iNat community can be used in science and conservation. The program actively distributes the data in venues where scientists and land managers can find it. I-Naturalist has a project group for (NHIC) Rare species of Ontario. GeoProcess only records observations with-in 1 km of the Study Area. |
| Fisheries and Ocean Canada Aquatic Species at Risk Maps | The DFO has compiled critical habitat and distribution data for aquatic species listed under the Species at Risk Act (SARA). The interactive map is intended to provide an overview of the distribution of aquatic species at risk and the presence of their critical habitat within Canadian waters. The official source of information is the Species at Risk Public Registry. Using this map, a 1 km radius circle is outlined around aquatic features located within the Study Area. |

# Appendix D

## Significant Wildlife Habitat Screening EcoRegion 7E

*Table D1. Significant Wildlife Habitat for Ecoregion 7E*

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
|---|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria | | | |
| **Seasonal Concentration Areas of Animals** | | | | | | |
| Waterfowl Stopover and Staging Areas (Terrestrial) | American Black Duck<br>Northern Pintail<br>Gadwall<br>Blue-winged Teal<br>Green-winged Teal<br>American Wigeon<br>Northern Shoveler<br>Tundra Swan | CUM CUT1<br>Plus, evidence of annual spring flooding within these ecosites<br>*Fields with seasonal flooding and waste grains in certain areas are specific to Tundra Swan | • Fields with sheet water during Spring (mid-March to May).<br>• Agricultural fields with waste grain are not SWH unless they have spring sheet water available. | No | • No candidate habitat for waterfowl stopover and staging areas (terrestrial). | • Any mixed species aggregations of 100+ individuals.<br>• The flooded field plus 100-300m radius, dependant on localized site and adjacent land use.<br>• Annual use of habitat is documented from information sources or field studies.<br>• Specific evaluation methods required. |
| Waterfowl Stopover and Staging Areas (Aquatic) | Canada Goose<br>Cackling Goose<br>Snow Goose<br>American Black Duck<br>Northern Pintail<br>Northern Shoveler<br>American Wigeon<br>Gadwall<br>Green-winged Teal<br>Blue-winged Teal<br>Hooded Merganser<br>Common Merganser<br>Lesser Scaup<br>Greater Scaup<br>Long-tailed Duck<br>Surf Scoter<br>White-winged Scoter<br>Black Scoter<br>Ring-necked Duck<br>Common Goldeneye<br>Bufflehead<br>Redhead<br>Ruddy Duck<br>Red-breasted Merganser<br>Brant<br>Canvasback<br>Ruddy Duck | MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 | • Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration.<br>• Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. | No | • No candidate habitat for waterfowl stopover and staging areas (aquatic). | • Aggregations of 100+ of species listed for 7 days, results in >700 waterfowl use days.<br>• Areas with annual staging for ruddy ducks, canvasbacks and redheads.<br>• The combined area of the ELC ecosites and a 100m radius area.<br>• Wetland area and shorelines associated with sites identified within the SWHTG, Appendix K, are significant wildlife habitat.<br>• Annual use of habitat is documented from information sources or field studies.<br>• Specific evaluation methods required. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
|---|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria | | | |
| Shorebird Migratory Stopover Area | Greater Yellowlegs<br>Lesser Yellowlegs<br>Marbled Godwit<br>Hudsonian Godwit<br>Black-bellied Plover<br>American Golden Plover<br>Semipalmated Plover<br>Solitary Sandpiper<br>Spotted Sandpiper<br>Semipalmated Sandpiper<br>Pectoral Sandpiper<br>White-rumped Sandpiper<br>Baird's Sandpiper<br>Least Sandpiper<br>Purple Sandpiper<br>Stilt Sandpiper<br>Short-billed Dowitcher<br>Red-necked Phalarope<br>Whimbrel Ruddy Turnstone<br>Sanderling<br>Dunlin | BBO1 BBO2<br>BBS1 BBS2 BBT1 BBT2<br>SDO1 SDS2 SDT1<br>MAM1 MAM2 MAM3<br>MAM4 MAM5 | • Shorelines of lakes, rivers, and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats.<br>• Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores in May to mid-June and early July to October.<br>• No sewage treatment ponds. | No | • No candidate habitat for shorebird migratory stopover areas. | • Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period.<br>• Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant.<br>• The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area.<br>• Annual use of habitat is documented from information sources or field studies<br>• Specific evaluation methods required. |
| Raptor Wintering Area | Rough-legged Hawk<br>Red-tailed Hawk<br>Northern Harrier<br>American Kestrel<br>Snowy Owl<br>Special Concern: Short-eared Owl, Bald Eagle | Combo of one of each Community Series from:<br>Forest (FOD FOM FOC) and<br>Upland (CUM CUT CUS CUW)<br><br>Bald Eagle: Forest on shoreline area adjacent to large rivers and lakes FOD FOM FOC SWM SWC | A combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.<br>• Need to be >20ha with a combo of forest and upland.<br>• Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands.<br>• Field area of the habitat is to be wind swept with limited snow depth or accumulation.<br>• Eagle sites have open water and large trees and snags available for roosting. | No | • No candidate habitat for raptor wintering areas. | • One or more Short-eared Owls, OR one of more Bald Eagles, OR at least 10 individuals and two of the listed hawk/owl species.<br>• To be significant, a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds.<br>• For an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area.<br>• Specific evaluation methods required. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
|---|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria | | | |
| Bat Hibernacula | Big Brown Bat<br>Tri-coloured Bat | CCR1 CCR2 CCA1 CCA2<br>*Buildings are not to be considered SWH | May be found in caves, mine shafts, underground foundations, and Karsts.<br>• Active mine sites are not considered SWH. | No | • No crevices, caves or abandoned mines were observed to accommodate hibernating bats.<br>• No candidate habitat for bat hibernacula. | • All sites with confirmed hibernating bats are SWH.<br>• Area includes 200m radius around the entrance of the hibernaculum for most development types and 1000m for wind farms.<br>• Studies are to be conducted during the peak swarming period (Aug.-Sept.).<br>• Specific survey methods required. |
| Bat Maternity Colonies | Big Brown Bat<br>Silver-haired Bat | All Ecosites in:<br>FOD FOM<br>SWD SWM | • Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered SWH).<br>• Not found in caves or mines in ON.<br>• Located in mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees.<br>• Prefer snags in early stages of decay (class 1-3 or class 1 or class 2).<br>• Silver-haired Bats prefer older mixed or deciduous forests with at least 21 snags/ha. | **Yes** | • Potential bat maternity habitat observed throughout Study Area during snag surveys. | • Maternity Colonies with confirmed use by >10 Big Brown Bats, >5 Adult Female Silver-haired Bats.<br>• The area of the habitat includes the entire woodland or a forest stand ELC Ecosite, or an Ecoelement containing the maternity colonies.<br>• Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects" |
| Turtle Wintering Areas | Midland Painted Turtle<br>Special Concern:<br>Northern Map Turtle,<br>Snapping Turtle | Snapping and Midland Painted:<br>SW MA OA SA and FEO/BOO Series.<br><br>Northern Map:<br>Open water areas such as deeper rivers or streams and lakes. | • Wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates.<br>• Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. | No | • There are no ponds suitable for turtle wintering areas located in the Study Area. | • Presence of 5 over-wintering Midland Painted Turtles is significant.<br>• One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant.<br>• The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | | | • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. | | | pool where the turtles are over wintering is the SWH.<br>• Search for congregations in Basking Areas in spring and fall. |
| Reptile Hibernaculum | Eastern Gartersnake<br>Northern Watersnake<br>Northern Red-bellied Snake<br>Northern Brownsnake<br>Smooth Green Snake<br>Northern Ring-necked Snake<br>Special Concern:<br>Milksnake<br>Eastern Ribbonsnake | Any ecosite other that very wet. Talus, Rock Barren, Crevice, Cave, Alvar may be directly related.<br>Observations of congregations in spring or fall is good indicator. | • Sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line, such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH.<br>• Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line.<br>• Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. | No | • No potential snake hibernacula features were observed.<br>• No candidate habitat for snake hibernacula. | • Presence of snake hibernacula used by a minimum of 5 individuals of a snake sp. or individuals of 2 or more snake spp.<br>• Congregations of a minimum of 5 individuals of a snake sp. Or individuals of 2 or more snake spp. near potential hibernacula (e.g. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct).<br>• If there are Special Concern Species present, then site is SWH.<br>• The feature in which the hibernacula is located plus a 30m radius area is the SWH.<br>• Hibernacula are used annually, often by the same individuals (strong site fidelity), and other life processes often take place nearby. |
| Colonially-Nesting Bird Breeding Habitat (Bank and Cliff) | Cliff Swallow<br>Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies) | Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles, cliff faces, bridge abutments, silos, barns.<br>CUM1 CUS1 BLS1 CLO1 CLT1 CUT1 BLO1 BLT1 CLS1 | • Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area.<br>• Does not include man-made structures or licenced Mineral Aggregate Operation. | No | • No bank or cliff swallow nesting habitat was observed.<br>• No candidate habitat for colonial-nesting birds. | • Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season.<br>• A colony identified as SWH will include a 50m radius habitat area from the peripheral nests.<br>• Field surveys to observe and count swallow nests are to be completed during the breeding season.<br>• Specific evaluation methods required. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| Colonially-Nesting Bird Breeding Habitat (Tree/Shrub) | Great Blue Heron<br>Black-crowned Night Heron<br>Great Egret<br>Green Heron | SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1 | • Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.<br>• Most nests in trees are 11-15m from ground, near the top of the tree. | No | • No groups of large stick nests were observed during field investigations.<br>• No candidate habitat for tree/shrub colonial nesting birds. | • Presence of 2 or more active nests of Great Blue Heron or other listed species.<br>• The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony, or any island <15.0ha with a colony is the SWH.<br>• Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April-Aug) or by evidence such as the presence of fresh guano, dead young and/or eggshells. |
| Colonially-Nesting Bird Breeding Habitat (Ground) | Herring Gull<br>Great Black-backed Gull<br>Little Gull<br>Ring-billed Gull<br>Common Tern<br>Caspian Tern<br>Brewer's Blackbird | Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map).<br><br>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)<br>MAM1-6<br>MAS1-3<br>CUM CUT CUS | Nesting colonies on islands or peninsulas associated with open water or in marshy areas. Brewers' Blackbird colonies found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. | No | •No rocky islands or peninsulas are present within the Study Area.<br>• No Brewer's blackbirds encountered (in southern Ontario, Brewer's Blackbird known occurrences are primarily restricted to the Bruce Peninsula; none are known to occur in London Area)<br>• No candidate habitat for | • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern.<br>• Presence of 5 or more pairs for Brewer's Blackbird.<br>• Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant.<br>• The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony, or any island <3.0ha with a colony is the SWH.<br>• Studies would be done during May/June when actively nesting.<br>• Specific evaluation methods required |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | | | | | ground colonial nesting birds was identified. | |
| Migratory Butterfly Stopover Areas | Painted Lady<br>Red Admiral<br>Special Concern:<br>Monarch | Combo of one of each:<br>Field (CUM CUT CUS) and<br>Forest (FOC FOD FOM CUP) | • Minimum 10ha in size with combo of field and forest located within 5km of Lake Erie or Lake Ontario.<br>• Should not be disturbed.<br>• Field/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat.<br>• Should provide protection from the elements, often spits of land or areas with the shortest distance to cross the Great Lakes. | No | •Study Area not within 5km of Lake Erie<br>• No meadows communities onsite. | • Presence of Monarch Use Days (MUD) during Fall migration (Aug/Oct)<br>• Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD.<br>•MUD of >5000 **or** >3000 with the presence of Painted Ladies or Red Admirals is to be considered significant. |
| Landbird Migratory Stopover Areas | All migratory songbirds | All Ecosites within:<br>FOC FOM FOD<br>SWC SWM SWD | • Woodlots >5ha in size and within 5km of Lake Erie and Lake Ontario.<br>• If woodlands are rare in area, smaller size can be considered.<br>• If multiple woodlands located along shoreline, those 2km from shoreline are more significant.<br>• Sites have a variety of habitats; forest, grassland and wetland complexes.<br>• The largest sites are more significant.<br>• Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Erie and Lake Ontario, are Candidate SWH. | No | •Study Area not within 5km of Lake Erie<br>• No candidate habitat for migratory landbird stopover areas. | • Use of the habitat by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates.<br>• Studies should be completed during spring (Mar-May) and fall (Aug-Oct) migration using standardized assessment techniques.<br>• Specific evaluation methods required. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| Deer Winter Congregation Areas | White-tailed deer | All forested ecosites within:<br>FOC FOM FOD<br>SWC SWM SWD<br>Conifer plantations much smaller than 50 ha may be used. | • Woodlots >100 ha in size, or if large woodlots are rare in a planning area woodlots >50ha.<br>• Large woodlots >100ha and up to 1500ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha.<br>• Woodlots with high densities of deer due to artificial feeding are not significant. | No | • No large woodlots >100ha were encountered.<br>• No candidate habitat for deer winter congregation areas. | • Will be mapped by MNRF.<br>• All woodlots exceeding the criteria are significant unless determined not to be by the MNRF.<br>• Studies to be completed during winter when >20cm of snow is on the ground, using aerial survey or pellet count. |
| **Rare Vegetation Communities** | | | | | | |
| Cliffs and Talus Slopes | N/A | Any Ecosite within:<br>TAO TAS TAT<br>CLO CLS CLT | • A Cliff is vertical to near vertical bedrock >3m in height.<br>• A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. Most cliff and talus slopes occur along the Niagara Escarpment. | No | • No cliffs or talus slopes were identified.<br>• No candidate habitat for cliffs or talus slopes. | • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes |
| Sand Barren | N/A | SBO1 SBS1 SBT1<br>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicketlike (SBS1), or more closed and treed (SBT1). Tree cover always < 60% | • A sand barren area >0.5ha in size.<br>• Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat, such as forest or savannah.<br>• Vegetation can vary from patchy and barren to tree covered, but less than 60%. | No | • No sand barrens were identified.<br>• No candidate habitat for sand barrens. | • Confirm any ELC Vegetation Type for Sand Barrens.<br>• Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). |
| Alvar | N/A | ALO1 ALS1 ALT1<br>FOC1 FOC2<br>CUM2 CUS2 CUT2-1<br>CUW2 | • An Alvar site >0.5ha in size, only known sites are found in the western islands of Lake Erie.<br>• An alvar is typically a level, | No | • No alvars were identified.<br>• No candidate | • Studies that identify four of the five ***Alvar Indicator Species*** at a Candidate Alvar site is Significant.<br>• Site must not be dominated by exotic or introduced species (<50% |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | | *Five Alvar Indicator Species:*<br>1) Carex crawei<br>2) Panicum philadelphicum<br>3) Eleocharis compressa<br>4) Scutellaria parvula<br>5) Trichostema brachiatum | mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought.<br>• Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands, and comprising several characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species.<br>• Vegetation cover varies from patchy to barren, with a less than 60% tree cover. | | habitat for alvars. | vegetative cover are exotic sp.).<br>• The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. |
| Old Growth Forest | N/A | FOD FOC FOM<br>SWD SWC SWM | • Woodland area is >0.5ha<br>• Characterized by heavy mortality or turnover of overstorey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris. | No | • No old growth forests were identified.<br>• No candidate habitat for old growth forests. | • If dominant trees species of the area are >140 years old, then the area containing these trees is SWH.<br>• The forested area containing the old growth characteristics will have experienced no recognizable forestry activities.<br>• The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH.<br>• Determine ELC vegetation types for the forest area containing the old growth characteristics. |
| Savannah | N/A | TPS1 TPS2<br>TPW1 TPW2<br>CUS2 | • A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.<br>• No minimum size to site. | No | • No savannahs were identified. | • Field studies confirm one or more of the Savannah indicator species found in Appendix N, Ecoregion 7E of the SWHTG, OMNR (2000). |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | | | • Site must be restored or a natural site. *Remnant sites such as railway right of ways are not considered to be SWH.<br>• Remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). | | • No candidate habitat for savannahs. | • Entire area of the ELC Ecosite is SWH.<br>• Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic species). |
| Tallgrass Prairie | N/A | TPO1<br>TPO2 | • A Tallgrass Prairie has ground cover dominated by prairie grasses.<br>• An open Tallgrass Prairie habitat has <25% tree cover.<br>• No minimum size to site.<br>• Site must be restored or a natural site. *Remnant sites such as railway right of ways are not considered to be SWH. | No | • No tallgrass prairies were identified.<br>• No candidate habitat for tallgrass prairies. | • Field studies confirm one or more of the Prairie indicator species in Appendix N, Ecoregion 7E of the SWHTG, OMNR (2000).<br>• Area of the ELC Ecosite is the SWH.<br>• Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.) |
| Other Rare Vegetation Communities | N/A | Provincially Rare S1, S2 and S3 ELC Vegetation Types. | May include beaches, fens, forest, marsh, barrens, dunes, and swamps.<br>See OMNRF/NHIC for up-to-date list of rare vegetation communities. | No | • No rare vegetation communities identified. | • Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG, OMNR (2000).<br>• Area of the ELC Vegetation Type polygon is the SWH. |
| **Specialized Habitat for Wildlife** | | | | | | |
| Waterfowl Nesting Area | American Black Duck<br>Northern Pintail<br>Northern Shoveler<br>Gadwall<br>Blue-winged Teal<br>Green-winged Teal<br>Wood Duck<br>Hooded Merganser<br>Mallard | All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH:<br>MAS1 MAS2 MAS3<br>SAS1 SAM1 SAF1<br>MAM1 MAM2 MAM3<br>MAM4 MAM5 MAM6<br>SWT1 SWT2 SWD1<br>SWD2 SWD3 SWD4 | • A waterfowl nesting area extends 120m from a wetland (>0.5ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur.<br>• Wood Ducks and Hooded | No | • No wetland communities onsite.<br>• No candidate habitat for waterfowl nesting areas. | • Presence of 3 or more nesting pairs for listed species excluding Mallards OR presence of 10 or more nesting pairs for listed species including Mallards.<br>• Any active nesting site of an American Black Duck is considered significant.<br>• Nesting studies should be completed during the spring breeding season (April-June). |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | | Note: includes adjacency to PSWs | Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.<br>• Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. | | | • Specific evaluation methods required.<br>• A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m from the wetland and will provide enough habitat for waterfowl to successfully nest. |
| Bald Eagle and Osprey Nesting, Foraging and Perching Habitat | Osprey<br>Special Concern: Bald Eagle | ELC Forest Community Series:<br>FOD FOM FOC SWD SWM and SWC directly adjacent to riparian areas (rivers, lakes, ponds and wetlands) | • Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.<br>• Nests located on man-made objects are not to be included as SWH.<br>• Osprey nests are usually at the top of a tree, whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. | No | • No large stick nests were identified.<br>• No candidate habitat for Osprey or Bald Eagle habitat. | • One or more active Osprey or Bald Eagle nests in an area.<br>• Some species have more than one nest in a given area, and priority is given to the primary nest with alternate nests included within the area of the SWH.<br>• For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH with additional requirements.<br>• For a Bald Eagle, the active nest and a 400-800m radius around the nest is the SWH with additional requirements.<br>• To be significant, a site must be used annually.<br>• When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant.<br>• Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to mid-August.<br>• Specific evaluation methods required. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| Woodland Raptor Nesting Habitat | Northern Goshawk<br>Cooper's Hawk<br>Sharp-shinned Hawk<br>Red-shouldered Hawk<br>Barred Owl<br>Broad-winged Hawk | May be found in all forested ELC Ecosites. May also be found in:<br>SWC SWM SWD<br>CUP3 | • All natural or conifer plantation woodland/forest stands >30ha with >4ha of interior habitat.<br>• Interior habitat determined with a 200m buffer.<br>• Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges, sometimes on peninsulas or small off-shore islands.<br>• In disturbed sites, nests may be used again, or a new nest will be near old nest. | No | • No forest interior habitat was encountered in the Study Area.<br>• No candidate habitat for woodland raptor nesting. | • Presence of 1 or more active nests from species list is considered significant.<br>• Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28ha area of habitat is the SWH (the 28ha habitat area would be applied where optimal habitat is irregularly shaped around the nest).<br>• Barred Owl – A 200m radius around the nest is the SWH.<br>• Broad-winged Hawk and Coopers Hawk – A 100m radius around the nest is the SWH.<br>• Sharp-Shinned Hawk – A 50m radius around the nest is the SWH.<br>• Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. |
| Turtle Nesting Areas | Midland Painted Turtle Special Concern:<br>Northern Map Turtle<br>Snapping Turtle | Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites:<br>MAS1 MAS2 MAS3<br>SAS1 SAM1 SAF1<br>BOO1<br>FEO1 | • Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.<br>• For an area to function as a turtle nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. | **Yes** | • Snapping Turtles are known to occur in the nearby trails leading to Brook Conservation.<br>• Exposed mineral soil at several areas along cropland edges throughout the Property. | • Presence of 5 or more nesting Midland Painted Turtles.<br>• One or more Northern Map Turtle or Snapping Turtle nesting is a SWH.<br>• The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH.<br>• Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | | | • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. | | | • Field investigations should be conducted in prime nesting season, typically late spring to early summer.<br>• Observational studies observing the turtles nesting is a recommended method. |
| Seeps and Springs | Wild Turkey<br>Ruffed Grouse<br>Spruce Grouse<br>White-tailed Deer<br>Salamander spp. | • Where ground water comes to the surface. Often, they are found within headwater areas within forested habitats.<br>• Any forested Ecosite within the headwater areas of a stream could have seeps/springs. | • Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. | **Yes-potential** | • Some evidence of seepage observed within the deciduous woodland community within the Study Area. | • Presence of a site with 2 or more seeps/springs should be considered SWH.<br>• The area of an ELC forest ecosite or an eco-element within ecosite containing the seeps/springs is the SWH.<br>• The protection of the recharge area, considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. |
| Amphibian Breeding Habitat (Woodland) | Eastern Newt<br>Blue-spotted Salamander<br>Spotted Salamander<br>Gray Treefrog<br>Spring Peeper<br>Western Chorus Frog<br>Wood Frog | All Ecosites associated with these ELC Community Series:<br>FOC FOM FOD<br>SWC SWM SWD<br><br>• Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians. | • Presence of a wetland, pond or woodland pool (including vernal pools) >500m$^2$ (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size).<br>• Some small wetlands may not be mapped and may be important breeding pools for amphibians.<br>• Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. | No | • No woodland breeding amphibians were observed in the Study Area, as formal surveys were not proposed<br>• No candidate wildlife habitat for amphibian breeding habitat (woodlands) north of the study property. | • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3.<br>• A combo of observational and call count surveys required during the spring (March-June).<br>• The habitat is the wetland area plus a 230m radius of woodland area.<br>• If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
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| | | ELC Ecosite Codes | Habitat Criteria | | | |
| Amphibian Breeding Habitat (Wetlands) | Eastern Newt<br>American Toad<br>Spotted Salamander<br>Four-toed Salamander<br>Blue-spotted Salamander<br>Gray Treefrog<br>Western Chorus<br>Northern Leopard<br>Pickerel Frog<br>Green Frog<br>Mink Frog<br>Bullfrog | SW MA FE BO OA SA<br><br>• Typically, these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands. | • Wetlands >500m$^2$ (about 25m diameter), supporting high species diversity, are significant.<br>• Some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats.<br>• Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.<br>• Bullfrogs require permanent water bodies with abundant emergent vegetation. | No | • No wetland breeding amphibians were observed in the Study Area.<br>• No candidate wildlife habitat for amphibian breeding habitat (wetlands). | • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3 **or** Wetland with confirmed breeding Bullfrogs are significant.<br>• The ELC ecosite wetland area and the shoreline are the SWH.<br>• A combo of observational and call count surveys will be required during the spring (March-June).<br>• If a SWH is determined for Amphibian Breeding Habitat (Wetlands), then Movement Corridors are to be considered. |
| **Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)** | | | | | | |
| Woodland Area-Sensitive Bird Breeding Habitat | Yellow-bellied Sapsucker<br>Red-breasted Nuthatch<br>Veery<br>Blue-headed Vireo<br>Northern Parula<br>Black-throated Green Warbler<br>Blackburnian Warbler<br>Black-throated Blue Warbler<br>Ovenbird<br>Scarlet Tanager<br>Winter Wren<br>Pileated Woodpecker<br>Special Concern:<br>Cerulean Warbler<br>Canada warbler | FOC FOM FOD SWC SWM SWD | • Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30ha.<br>• Interior forest habitat is at least 200m from forest edge habitat. | No | • No forest interior habitat was identified in the Study Area.<br>• No candidate habitat for woodland area-sensitive breeding bird habitat. | • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. *Any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH.<br>• Conduct field investigations in spring and early summer.<br>• Specific evaluation methods required. |
| Marsh Bird Breeding Habitat | American Bittern<br>Virginia Rail<br>Sora | MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 | • Nesting occurs in wetlands.<br>• All wetland habitat is to be considered as long as there is | No | • No candidate habitat for | • Presence of 5 or more nesting pairs of Sedge Wren **or** Marsh Wren or breeding by any combination of |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
|---|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | Common Moorhen<br>American Coot<br>Pied-billed Grebe<br>Marsh Wren<br>Sedge Wren<br>Common Loon<br>Green Heron<br>Trumpeter Swan<br><br>Special Concern:<br>Black Tern<br>Yellow Rai | SAS1 SAM1 SAF1 FEO1 BOO1<br><br>For Green Heron:<br>All SW, MA and CUM1 sites | shallow water with emergent aquatic vegetation present.<br>• For Green Heron, habitat is at the edge of water, such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. | | marsh breeding birds. | 4 or more of the listed species.<br>• Any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH.<br>• Area of the ELC ecosite is the SWH.<br>• Breeding surveys should be done in May/June.<br>• Specific evaluation methods required. |
| Open Country Bird Breeding Habitat | Upland Sandpiper<br>Grasshopper Sparrow<br>Vesper Sparrow<br>Northern Harrier<br>Savannah Sparrow<br><br>Special Concern:<br>Short-eared Owl | CUM1<br>CUM2 | • Large grassland areas (includes natural and cultural fields and meadows) >30ha. • Grasslands not Class 1 or 2 agricultural lands and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years).<br>• Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.<br>• The Indicator bird species are area sensitive, requiring larger grassland areas than the common grassland species. | No | • No meadows >30ha was identified.<br>• No candidate habitat for open country breeding bird habitat. | • Presence of nesting or breeding of 2 or more of the listed species.<br>• A field with 1 or more breeding Short-eared Owls is to be considered SWH.<br>• The area of SWH is the contiguous ELC ecosite field areas.<br>• Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories.<br>• Specific evaluation methods required. |
| Shrub/Early Successional Bird Breeding Habitat | <u>Indicator Spp:</u><br>Brown Thrasher<br>Clay-coloured Sparrow<br><br><u>Common Spp:</u><br>Field Sparrow<br>Black-billed Cuckoo<br>Eastern Towhee | CUT1 CUT2 CUS1 CUS2 CUW1 CUW2<br><br>• Patches of shrub ecosites can be complexed into a larger habitat for some bird species. | • Large field areas succeeding to shrub and thicket habitats>10ha in size.<br>• Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no rowcropping, haying or | No | | • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.<br>• A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as SWH.<br>• The area of the SWH is the contiguous ELC ecosite field/thicket |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
|---|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | Willow Flycatcher<br><br><u>Special Concern:</u><br>Yellow breasted Chat<br>Golden-winged Warbler | | livestock pasturing in the last 5 years).<br>• Shrub thicket habitats (>10ha) are most likely to support and sustain a diversity of these species.<br>• Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. | | | area.<br>• Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories.<br>• Specific evaluation methods required |
| Terrestrial Crayfish | Chimney or Digger Crayfish; (*Fallicambarus fodiens*)<br>Devil Crayfish or Meadow Crayfish (*Cambarus diogenes*) | MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish. | • Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish.<br>• Usually, the soil is not too moist, so that the tunnel is well formed.<br>• Can often be found far from water. | No | • No terrestrial crayfish chimneys were recorded during field investigations.<br>• No candidate habitat for terrestrial crayfish. | • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites.<br>• Area of ELC ecosite or an eco-element area of meadow marsh or swamp within the larger ecosite area is the SWH.<br>• Surveys should be done April to August in temporary or permanent water.<br>• Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. |
| NHIC species element occurrences and field observations of Special Concern and rare wildlife species | All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. | All plant and animal element occurrences (EO) within a 1 or 10km grid. | Identified within a 1 or 10km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites. | **Yes** | See SAR section. Snapping turtle, eastern wood-pewee, barn swallow, butternut. | • Visual confirmation of foraging Barn Swallows during two breeding bird surveys.<br>• Singing male Eastern Wood-pewee detected in suitable breeding habitat. |
| **Animal Movement Corridors** | | | | | | |
| Amphibian Movement Corridors | Eastern Newt<br>American Toad<br>Spotted Salamander<br>Four-toed Salamander | Corridors may be found in all ecosites associated with water. | Movement corridors between breeding habitat and summer habitat. Movement corridors must be determined when | No | • No candidate amphibian breeding | • Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. |

| Wildlife Habitat | Wildlife Species | Candidate SWH | | Potential on Site | Rationale | Confirmed Defining Criteria |
|---|---|---|---|---|---|---|
| | | ELC Ecosite Codes | Habitat Criteria | | | |
| | Blue-spotted Salamander<br>Gray Treefrog<br>Western Chorus<br>Northern Leopard<br>Pickerel Frog<br>Green Frog<br>Mink Frog<br>Bullfrog | Corridors will be determined based on identifying the significant breeding habitat for these species. | Amphibian breeding habitat is confirmed as SWH from this Schedule. | | habitat (wetland) was identified in the Study Area.<br>• No candidate habitat fore amphibian movement corridors. | • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant.<br>• Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m.<br>• Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat. |
| **Exceptions for EcoRegion 7E** | | | | | | |
| Bat Migratory Stopover Area | N/A | No specific ELC types. | Long-distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas. | No | No habitat features on site. | Only confirmed site is Long Point. Confirmation criteria and habitat areas are still being determined. |

# Appendix E

## Snag Photoplate

*Table E1. Snag Photoplate*

| | |
|---|---|
| **Snag Tree Assessment – November 20, 2025<br>Tree # 363** |   |
| **Snag Tree Assessment – November 20, 2025<br>Tree #367** |   |

**Snag Tree Assessment – November 20, 2025**
**Tree #366**







**Snag Tree Assessment – November 20, 2025**
**Tree #368**






**Snag Tree Assessment – November 20, 2025**
**Tree #369**

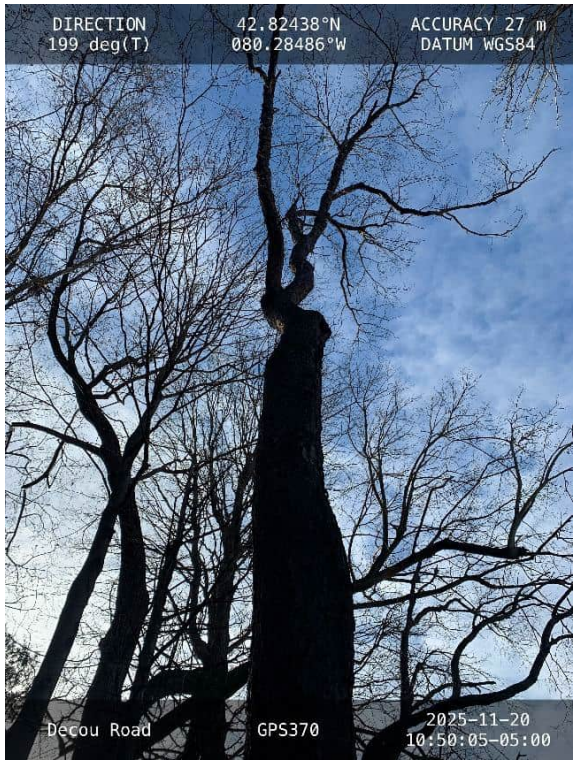






**Snag Tree Assessment – November 20, 2025**
**Tree #370**

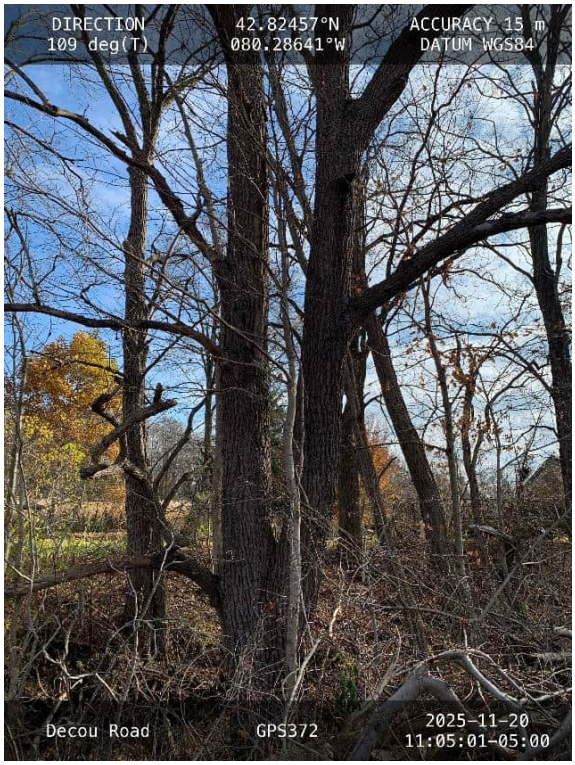


**Snag Tree Assessment – November 20, 2025**
**Tree #371**




**Snag Tree Assessment – November 20, 2025**
**Tree #372**





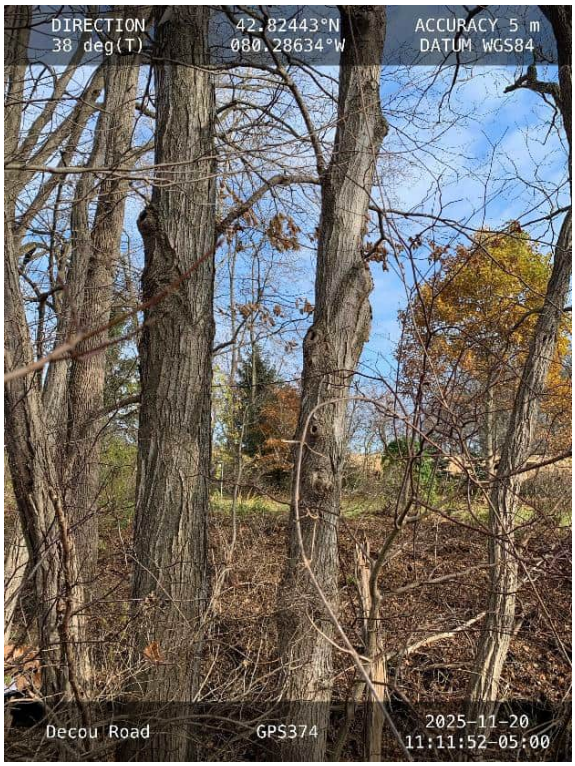

**Snag Tree Assessment – November 20, 2025**
**Tree #373**





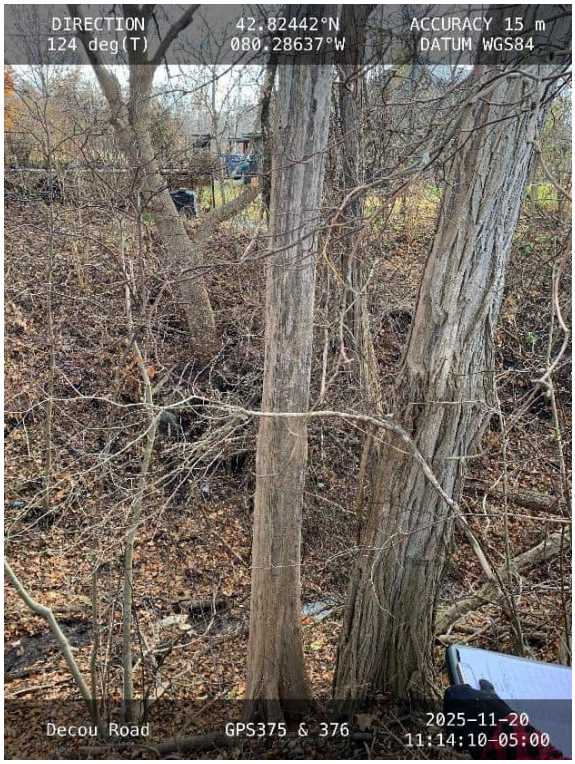


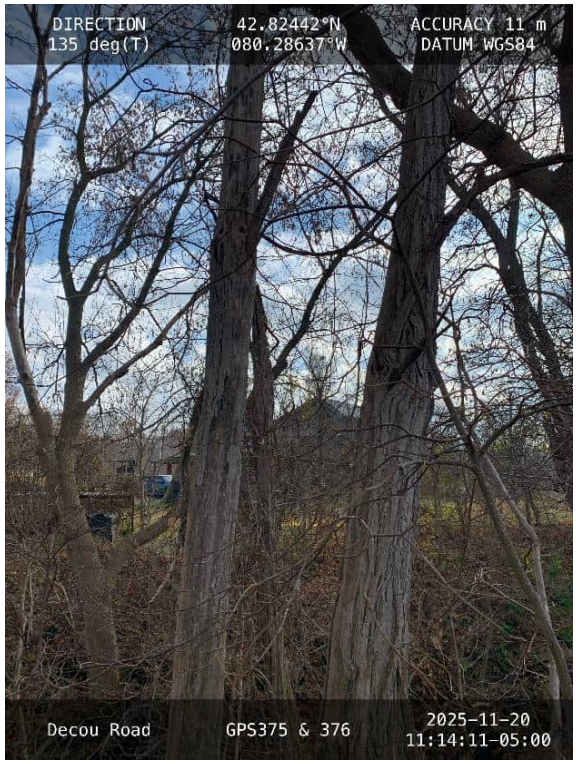
**Snag Tree Assessment – November 20, 2025**
**Tree #374**



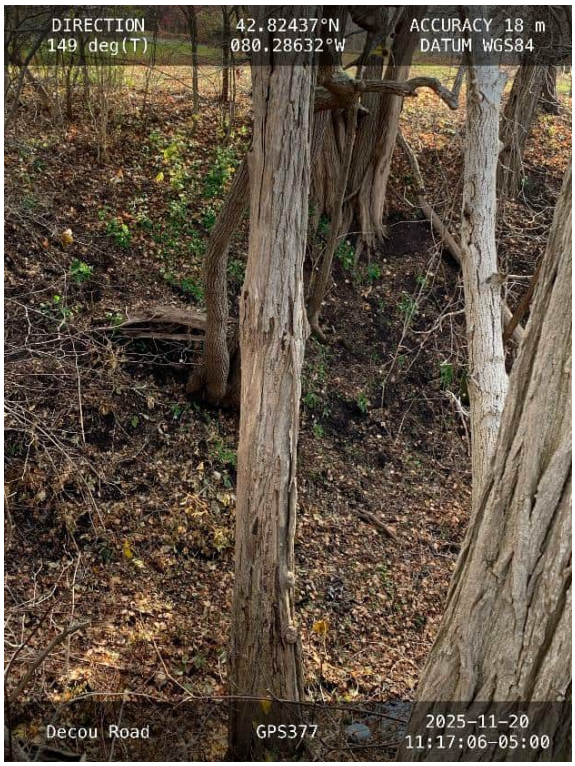


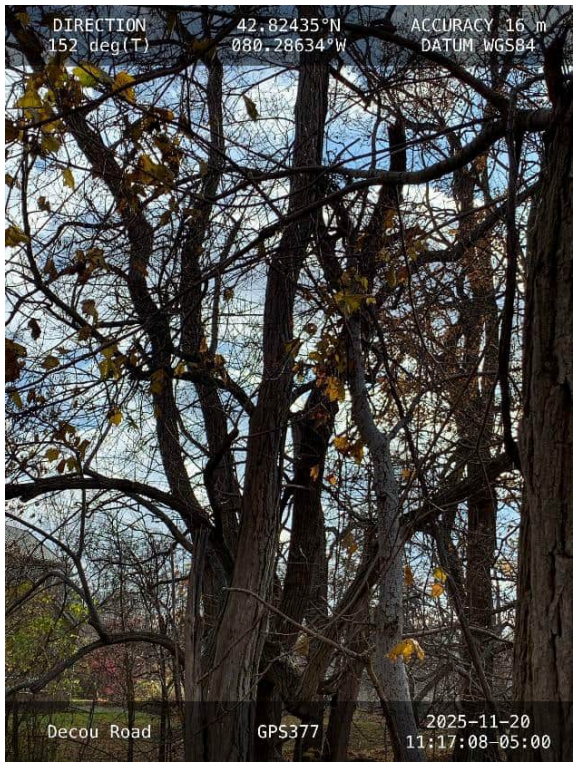

**Snag Tree Assessment – November 20, 2025**
**Tree #375 & Tree #376**



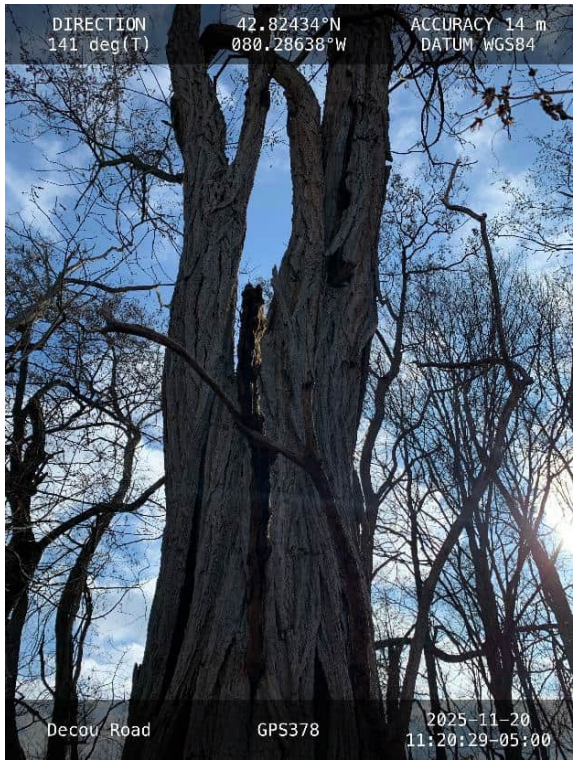

**Snag Tree Assessment – November 20, 2025**
**Tree #377**



**Snag Tree Assessment – November 20, 2025**
**Tree #378**




**Snag Tree Assessment – November 20, 2025**
**Tree #381**






**Snag Tree Assessment – November 20, 2025**
**Tree #379**







**Snag Tree Assessment – November 20, 2025**
**Tree #380**

**Snag Tree Assessment – November 20, 2025**
**Tree #382**







**Snag Tree Assessment – November 20, 2025**
**Tree #383**

**Snag Tree Assessment – November 20, 2025**
**Tree #384**







**Snag Tree Assessment – November 20, 2025**
**Tree #385**






**Snag Tree Assessment – November 20, 2025**
**Tree #386**







**Snag Tree Assessment – November 20, 2025**
**Tree #387**



# TRANSPORTATION IMPACT STUDY

## 227 DECOU ROAD

## COMMUNITY OF SIMCOE
## NORFOLK COUNTY

**PREPARED FOR:**

**LIV COMMUNITIES**

**PREPARED BY:**

**C.F. CROZIER & ASSOCIATES INC.**
**4900 PALLADIUM WAY, SUITE 202**
**BURLINGTON, ON L7M 0W7**

**FEBRUARY 2026**

**CFCA FILE NO. 1935-7678**

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

CROZIER
CONSULTING ENGINEERS

| Revision Number | Date | Comments |
|---|---|---|
| Rev.0 | February 2026 | First Submission |

## Executive Summary

LIV Communities (LIV) retained C.F. Crozier & Associates Inc. (Crozier) to complete a Transportation Impact Study to support the proposed residential block located in the Community of Simcoe, Norfolk County (County). The proposed development is located at 227 Decou Road (the site).

The Conceptual Site Plan prepared by Biglieri Group, dated February 17, 2026, the proposes 125 single detached units and 279 townhouse units. Two accesses to the site are proposed at Decou Road, through future public roadways with a 20m right-of-way. The analysis contained herein is based on a conservative maximum yield scenario of 509 townhouses to allow for flexibility in the number of single detached and townhouse units through further iterations of the plan.

Existing Conditions

Under 2025 existing conditions, the intersection of Ireland Road & Queensway East is operating well apart from the northbound left movement in the p.m. peak hour, which experiences a minute of delay. Due to the delays at the stop-controlled approach the intersection operates at an LOS "D" and "F" during the a.m. and p.am. peak hour periods, respectively. However, the intersection operates below capacity with a volume-to-capacity (v/c) ratio of 0.25 and 0.59 during the a.m. and p.m. peaks respectively.

The remaining intersections are not expected to experience any critical movements, and minimal delays, signifying that the intersections have reserve capacity to accommodate future increases in traffic volumes

Future Background Conditions

A growth rate of 2% per year was applied to the existing volumes in addition to the following background developments:

- Woodland Trails
- Calibrex Lands
- Donly Drive and Victora Street Condominiums

The following operations are forecasted for the 2044 horizon year:

The intersection of Ireland Road & Queensway East is expected to operate with significant delays at the stop-controlled northbound approach. Due to the delays at the stop-controlled approach the intersection operates at an LOS "F" during the a.m. and p.m. peak periods. It is noted that these operations are consistent with the findings of the Woodland Trail TIS Addendum (Paradigm, July 2025). The intersection does not warrant signalization, but monitoring of the intersection is recommended.

The Donly Drive South & Victoria Street intersection is expected to operate at a LOS "E" in the westbound direction during the a.m. peak hour and the eastbound movements during the p.m. peak period. The 95$^{th}$ percentile queue for the westbound left movement is forecasted to exceed the existing storage length. These operations are consistent with the findings of the Woodland Trail TIS Addendum (Paradigm, July 2025).

The remaining intersections are forecasted to operate at a LOS "C" or better during the a.m. and p.m. peak periods. The remaining intersections are forecasted to experience acceptable delays and have reserve capacity to accommodate existing growth on the road network.

Site Generated Traffic

For the purposes of a conservative trip generation assessment, the site was assessed with a conservative maximum number of 509 units (townhouses). The full build-out of the development is forecasted to generate 214 and 121 two-way trips in the a.m. and p.m. peak hours, respectively.

Future Total Conditions

Under the 2044 future total conditions, the Ireland Road & Queensway East intersection is expected to operate with significant delays at the stop-controlled northbound approach. These operations are consistent with Future Background operations and reflect the need for signalization. Under signalized conditions, the intersection is forecasted to operate well with less than 40 s of delay and capacity for future growth.

The signalized intersection of Norfolk Street and Victoria Street is expected to operate at an LOS "C" and "B" during the a.m. and p.m. peak hours, respectively. The westbound left turn is expected to operate critically, with a v/c ratio of 0.95 and 0.82 during the a.m. and p.m. peak hours, respectively. It is noted that the operations are expected to improve from future background to future total conditions as volumes are redistributed to the Decou Road accesses. Further operational improvement can also be achieved with optimization of the existing signal timings.

The Donly Drive & Victoria Street intersection is forecasted to operate with a LOS "E" and LOS "D" in the a.m. and p.m. peak hours respectively. Under signalized conditions the intersection is forecasted to operate well with 20 s or less of delay. Ongoing monitoring of the intersection is recommended to determine if and when signalization is required as it is not warranted.

The 95th percentile queuing at the intersection of Norfolk Street and Victoria Street is forecasted to exceed the available storage by three vehicles in the a.m. peak hour and less than one vehicle in the p.m. peak hour, which is a reduction over future background conditions. The westbound left 95$^{th}$ percentile queue at the intersection of Norfolk Street and Decou Road is anticipated to exceed the available storage by less than 2 vehicles in the a.m. peak hour. Extension of the left turn lanes could be considered at both intersection if geometrically beneficial.

The remaining study intersections, including the proposed site accesses, are expected to operate acceptably with acceptable delays and capacity for further growth.

Recommendations

As consistent with background development reports, signalization of study intersections is not warranted. Ongoing monitoring is recommended as growth in the area occurs to confirm the need and timeline for the following recommendations:

- The Signalization of Queensway East & Ireland Road is a key recommendation triggered by the background growth of the network.
- Signal timing optimization of Norfolk and Victoria Street.

The following recommendations are not required to support future network volumes but are flagged to be monitored as growth of road network volumes proceeds.

- Westbound turn lane extension at the intersection of Norfolk and Victoria Street and the intersection of Norfolk Street and Decou Drive.

- Signalization of Victoria Street and Donly Drive.

Site Access Review

The proposed site accesses of Street A and Street B are adequately spaced, with intersection angles within the acceptable range of 70 to 110 degrees and sufficient sight distance based on Norfolk County's Entrance By-Law. An amendment to the zoning provisions is being sought to reduce the daylighting triangles to 6 m by 6 m, which exceeds the requirements of neighbouring municipalities and is consistent with standards found throughout the province.

In conclusion, the proposed development can be supported from a transportation operations and safety perspective.

The analysis undertaken in this study considers a conservative trip generation and reflect the February 17, 2026, Conceptual Site Plan. Any minor changes in the plan are not anticipated to impact the findings and conclusions of this report.

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**APPENDIX H:** Sight Distance Assessment

**APPENDIX I:** On-Street Parking Plan

# 1.0 Introduction

LIV Communities (LIV) retained C.F. Crozier & Associates Inc. (Crozier) to complete a Transportation Impact Study (TIS) to support the proposed residential development located in the Community of Simcoe ('Simcoe'), Norfolk County (the 'County').

## 1.1 Developments Lands

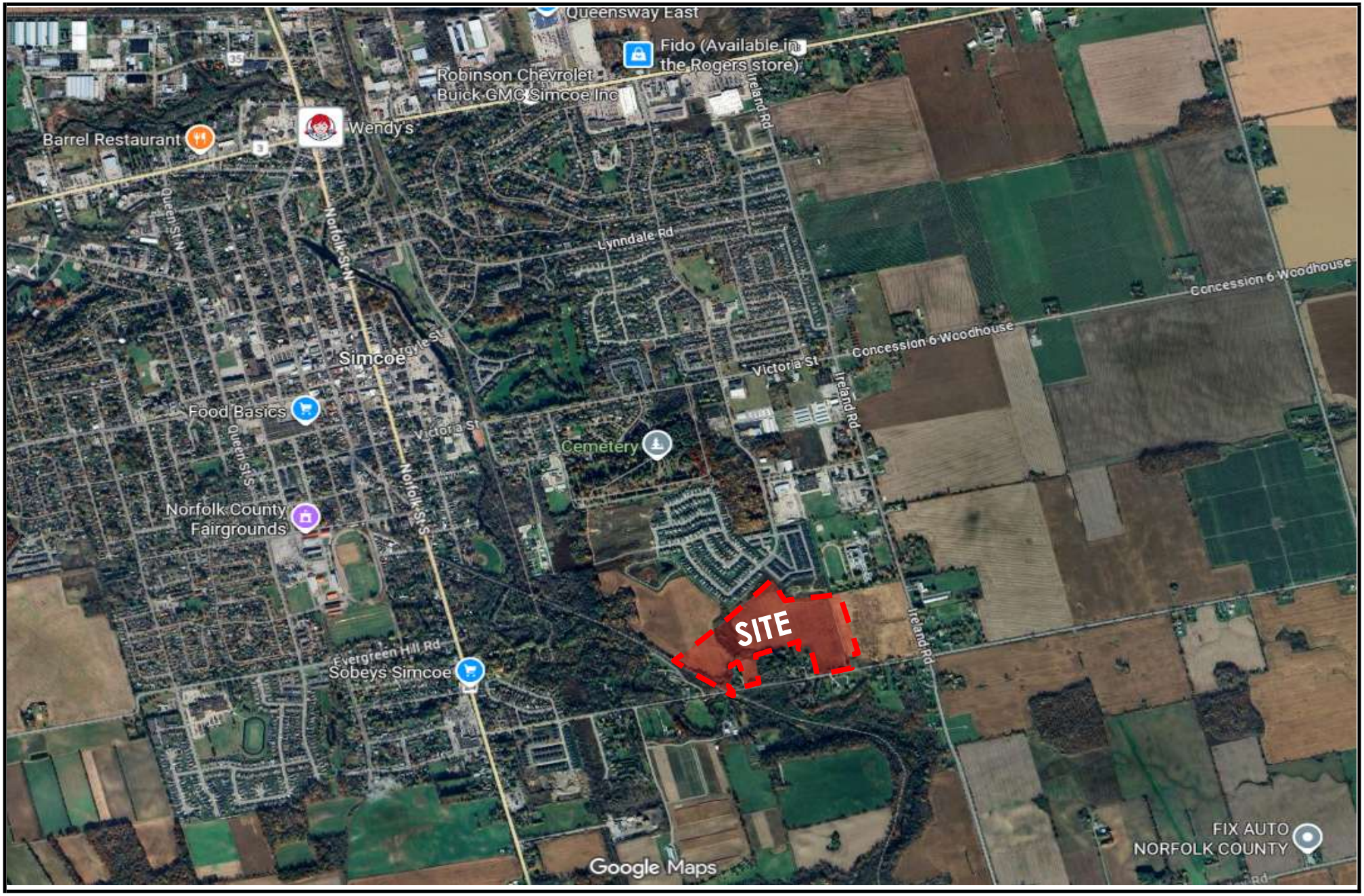
The subject lands are located at 227 Decou Road and cover an area of approximately 20.1 ha. The property, located in a mixed-use neighbourhood, is bounded by Decou Road and existing residential properties to the south, a residential subdivision to the north, the Lake Erie & Northern Electric Rail Trail to the west, as well as undeveloped lands to the west and east. Currently, the east and west undeveloped parcels are in the process of separate development approvals. **Figure 1** includes a Site Location Plan.

## 1.2 Development Proposal

Per the Conceptual Site Plan prepared by Biglieri Group, dated February 17, 2026, the proposed development includes the development of 125 single detached units and 279 townhouse units for a total residential unit count of 404. Two accesses to the site are proposed at Decou Road, through future public roadways with a 20m right-of-way.

The transportation analysis presented herein is based on a conservative maximum unit yield scenario, assuming an all-townhouse development totaling 509 units. The analysis contained herein is based on a conservative maximum yield scenario to allow for flexibility in the number of single detached and townhouse units through further iterations of the plan.

**Figure 2** illustrates the Conceptual Site Plan (Biglieri Group, February 17, 2026).




| Legend | 227 Decou Road, Simcoe | CROZIER CONSULTING ENGINEERS | Figure 1 |
|---|---|---|---|
| Site Boundary | Site Location | | Project No. 1935-7678<br>Date. 2026-02-19<br>Analyst. Ramy Kamal |

# CONCEPT SITE PLAN

ADDRESS:
227 Decou Road,
Simcoe

Project No:
25326

Scale:
1:2500

Drawing No:
CSP-02

February 17, 2026

Designed By:
EC

Biglieri

## Schedule of Land Use

| Description | Residential Units | Area (ha) | % |
|---|---|---|---|
| **Single Detached** | | | |
| Minimum Lot Width 11.00 (36') | 66 | 2.42 | 11.70% |
| Minimum Lot Width 12.20 (40') | 59 | 2.52 | 12.19% |
| **Total Single Detached** | **125** | **4.94** | |
| Townhouse 6.1m (20') | 279 | 6.41 | 31.00% |
| Parks and Walkway | | 1.24 | 6.00% |
| **Total Developable Area** | | **12.59** | |
| Stormwater Management Pond | | 1.16 | 5.61% |
| Open Space | | 1.44 | 6.96% |
| ROW | | 5.49 | 26.55% |
| **TOTAL** | **404** | **20.68** | |

**DESIGN NOTES:**

1. PLEASE NOTE THAT THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY.
2. ALL BUILDING DESIGNS TO BE VERIFIED BY A QUALIFIED PROFESSIONAL.
3. DESIGN SUBJECT TO CHANGE THROUGH PLANNING APPROVAL PROCESS.
4. DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.
5. PROPERTY LINES ARE BASED ON COMPILED SURVEY PLANS VERIFIED BY AN O.L.S.
6. MAXIMUM LENGTH OF DEAD END TO BE CONFIRMED WITH MUNICIPAL ENGINEERING STAFF.

C:\Users\ericc\The Biglieri Group\TBG_Project - 2025-2029\2025\25326\2 - TBG Design\1 - TBG Working Drawings\1 - AutoCAD\2026-02\25326_CSP_2026.02.17

## 1.3 Study Purpose and Scope

The purpose of the study is to evaluate the transportation-related impacts of the proposed development on the study road network and to recommend or confirm any required mitigation measures, if warranted. The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Impacts of development traffic on the study road network through analyzing existing, future background, and future total traffic operations;
- Need for internal and external roadway improvements to mitigate traffic impacts;
- Adequacy of the Conceptual Site Plan to allow for anticipated vehicle servicing internally;
- Safety requirements and feasibility of the proposed site accesses; and;
- Existing, future, and site-specific Transportation Demand Management opportunities.

The study has been completed in accordance with Norfolk County's TIS Guidelines, found within Appendix J of the County's *Integrated Sustainable Master Plan ISMP* (March 2016).

The Transportation Impact Study considers the following study intersections:

- Ireland Road & Queensway East/Highway 3
- Norfolk Street & Victoria Street/Stanley Street
- Donly Drive S & Victoria Street
- Ireland Road & Victoria Street/Concession 6 Woodhouse Road
- Ireland Road & Decou Road/Concession 5 Woodhouse Road
- Norfolk Street & Decou Road
- West Site Access (Street A) & Decou Road
- East Site Access (Street B) & Decou Road

For the purposes of this study and as consistent with the studies of the adjacent parcels, it has been conservatively estimated that the entirety of the site will be built out and fully occupied by 2034. The Norfolk TIS guidelines require analysis of the full build-out horizon and the five- and ten-year horizons from the estimated year of full build-out. Therefore, the 2034, 2039, and 2044 horizon years were analyzed, in addition to existing (2025) conditions.

# 2.0 Existing Conditions

This section outlines the current conditions of the transportation network in the vicinity of the site. Details of the study road network, including traffic controls, lane configurations, speed limits, transit routes and stops, active transportation infrastructure and other relevant transportation elements are identified. The existing traffic operations are also summarized.

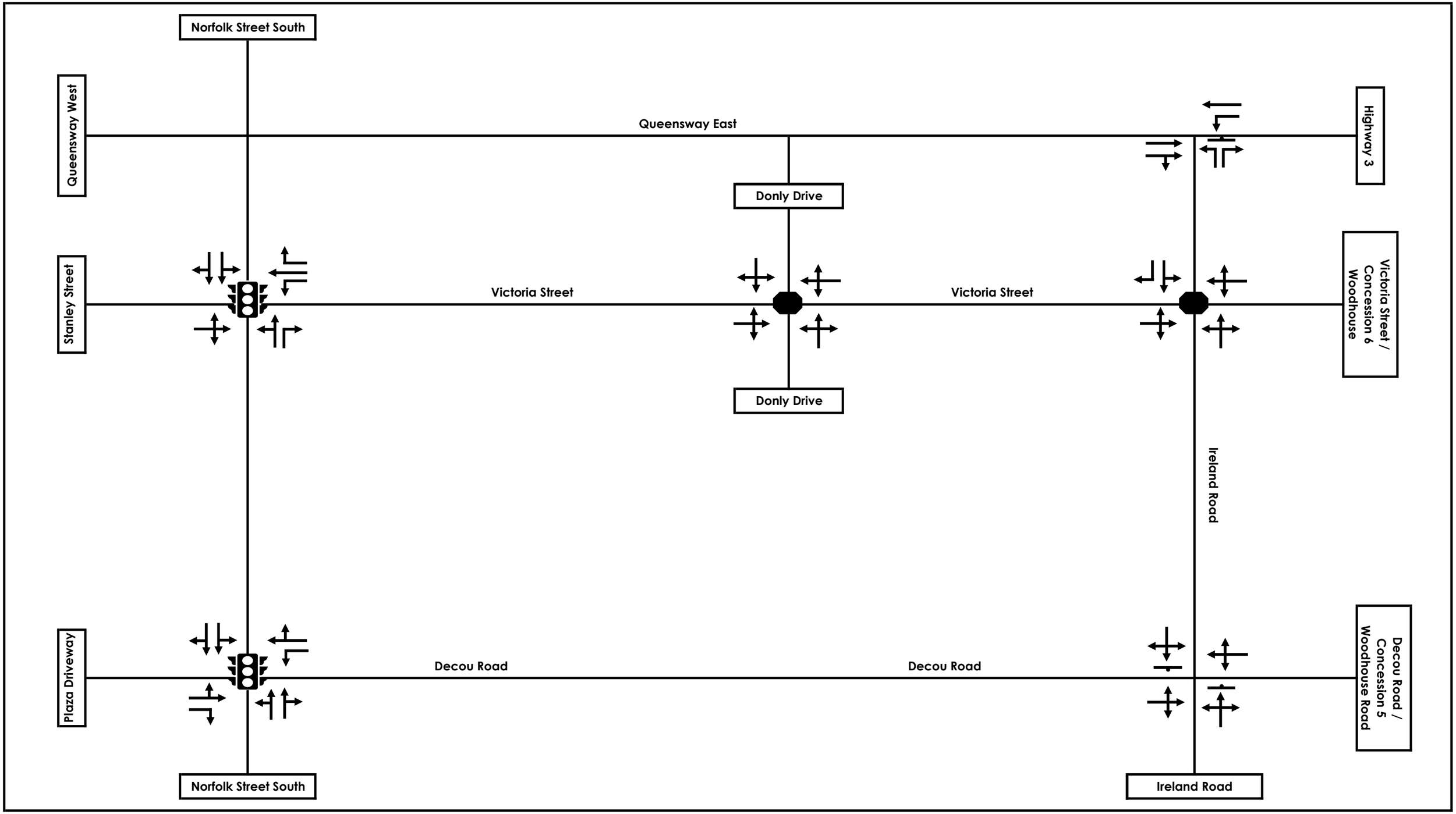
## 2.1 Study Road Network

The study road network consists of the existing road network near the site, which includes the study intersections and the adjoining roadway segments. **Table 1** delineates the study roadways. **Figure 3** illustrates the study road network, including the lane configurations and intersection control at the study intersections.

**Table 1: Study Roadways**

| Feature | Queensway East (Hwy 3) | Norfolk St (Hwy 24) | Victoria St/ Conc. 6 Woodhouse/ Stanley St | Decou Rd/ Conc. 5 | Ireland Rd | Donely Dr South |
|---|---|---|---|---|---|---|
| Direction | Two-way (east-west) | Two-way (north-south) | Two-way (east-west) | Two-way (east-west) | Two-way (north-south) | Two-way (north-south) |
| Classification[1] | Provencial Highway | County Highway | Urban Road | Urban Road | Rural Road | Urban Road |
| Jurisdiction | Norfolk County – West of Ireland Rd<br>MTO – East of Ireland Road | Norfolk County | | | | |
| Speed Limit | 60 km/h East of Northgate<br>80 km/h East of Ireland Rd<br>50 km/h for remainder of study area | 50 km/h | 50 km/h (assumed) | 50 km/h | 50 km/h | 50 km/h |
| Number of travel lanes | Four in study area | Two between Union St and Victoria St<br>Four for remainder of study area | Four west of Pond Street<br>Two east of Pond Street | Two | Two | Two |
| Median type | None | None | None | None | None | None |
| Active Transportation[2] | Sidewalk on south side – west of Ireland Drive | Sidewalks on both sides. No sidewalk on east side between Rail Trail and Decou Rd. | Sidewalks on both sides, west of Pond St. South side only until Donly Dr. | None | Sidewalk on west side along Walmart Plaza | Sidewalk on east side south of Victoria, both sides north of Victoria |

Note 1: Based on the Norfolk County Open Data Interactive Road Map
Note 2: Based on study area.




**Legend**

- Stop Bar
- All Way Stop-Control
- Traffic Signal

**227 Decou Road, Simcoe**

**Study Road Network**

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**Figure 3**

Project No. 1935-7678
Date. 2026-02-19
Analyst. Ramy Kamal

## 2.2 Transportation Data

A variety of transportation data was obtained and used to support the analysis in this study. **Table 2** summarizes the study intersections, date of data collection and signal timing plans, and the source of the information. Traffic data was collected during the hours of 6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM.

**Table 2: Traffic Data**

| Intersection | TMC Date | Source | Timing Plan | Source |
|---|---|---|---|---|
| Ireland Road & Queensway East/Highway 3 | Wednesday, November 26, 2025 | Accu-Traffic | Minor Approach Stop-Control | |
| Norfolk Street & Victoria Street/Stanley Street | | | Woodway Trail Background TIS[1] | Paradigm |
| Donly Drive S & Victoria Street | | | AWSC | |
| Ireland Road & Victoria Street/Concession 6 Woodhouse Road | | | TWSC | |
| Ireland Road & Decou Road/Concession 5 Woodhouse Road | | | TWSC | |
| Norfolk Street & Decou Road | | | Woodway Trail Background TIS[1] | Paradigm |

*Note 1: Details on the Woodway Trail Background TIS can be found in Section 3.2*

**APPENDIX A** contains the transportation data used in support of this study.

## 2.3 Traffic Modelling and Assumptions

Roadway geometrics were modelled based on the existing study road network description outlined in **Section 2.1**. The traffic volumes applied to the existing conditions model are the volumes established in **Section 2.2**, based on the turning movement count survey data. This survey data was also applied to the model for the heavy vehicle percentages and peak hour factors as calculated for each intersection during each time period.

The evaluation of intersections within this report is conducted based on the methodology outlined in the Highway Capacity Manual. Analysis was conducted using Synchro 12 modelling software. Intersections are assessed using a Level of Service (LOS) metric, with ranges of intersection delays assigned a letter from 'A' to 'F'. The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro), while the overall Level of Service of a two-way stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

**Table 3** outlines the calculated peak hour factors at each intersection during each peak hour.

**Table 3: Peak Hour Factors**

| Intersection | Peak Hour | Peak Hour Factor |
|---|---|---|
| Ireland Road & Queensway East/Highway 3 | 8:30 a.m. to 9:30 a.m. | 0.92 |
| | 3:15 p.m. – 4:15 p.m. | 0.94 |
| Norfolk Street & Victoria Street/Stanley Street | 8:00 a.m. to 9:00 a.m. | 0.89 |
| | 3:00 p.m. – 4:00 p.m. | 0.86 |
| Donly Drive S & Victoria Street | 8:00 a.m. to 9:00 a.m. | 0.82 |
| | 3:00 p.m. – 4:00 p.m. | 0.88 |
| Ireland Road & Victoria Street/Concession 6 Woodhouse Road | 8:15 a.m. to 9:15 a.m. | 0.88 |
| | 3:00 p.m. – 4:00 p.m. | 0.92 |
| Ireland Road & Decou Road/Concession 5 Woodhouse Road | 8:00 a.m. to 9:00 a.m. | 0.87 |
| | 3:00 p.m. – 4:00 p.m. | 0.89 |
| Norfolk Street & Decou Road | 8:15 a.m. to 9:15 a.m. | 0.83 |
| | 3:00 p.m. – 4:00 p.m. | 0.88 |

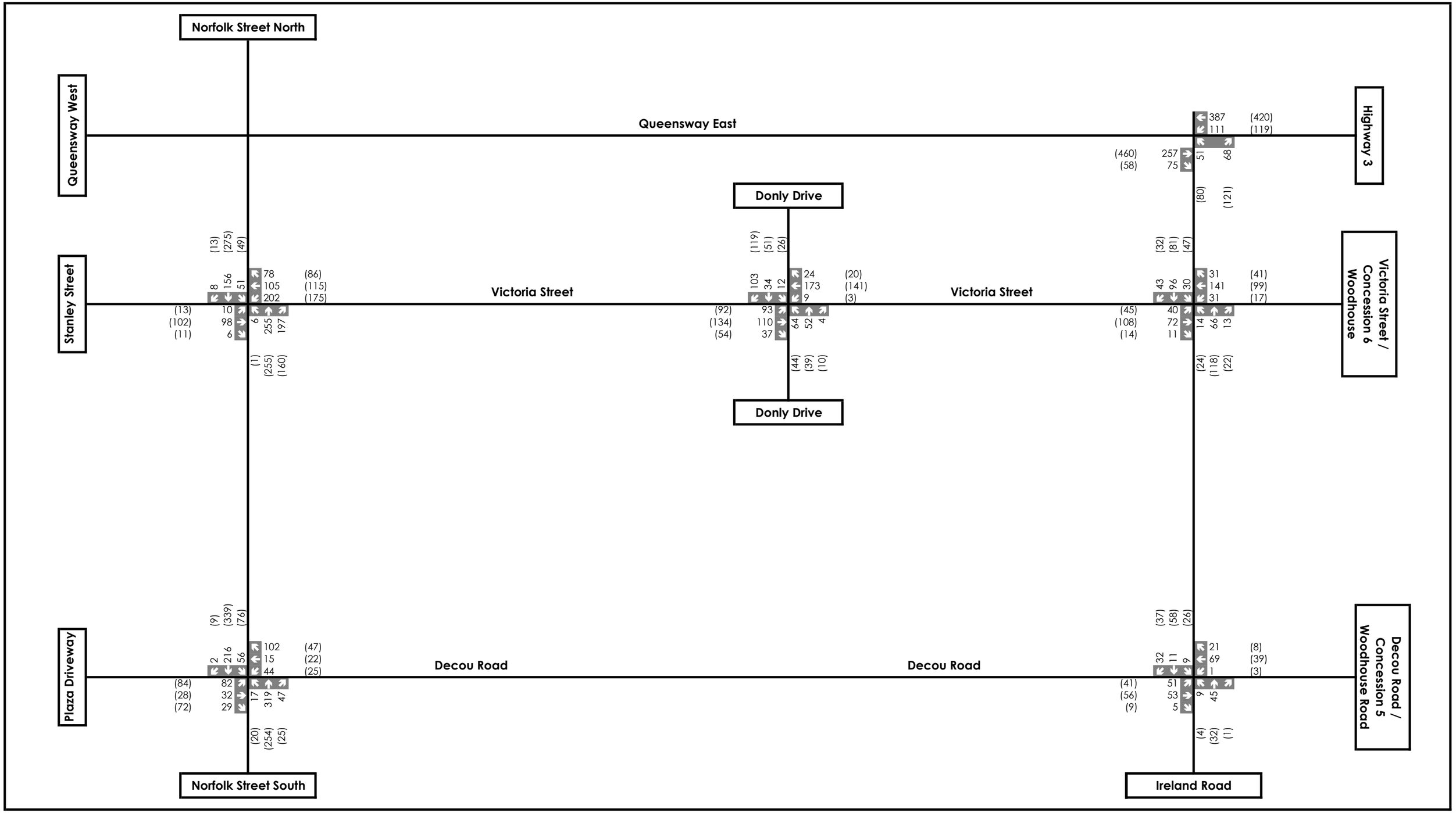
**APPENDIX B** contains the Level of Service definitions. Control delay is the additional time added per vehicle as a result of the intersection and its associated control (i.e.. Traffic Light / Stop Control) compared to the average speed on the adjoining roadway segments. Volume-to-capacity (v/c) ratio indicates the fraction of the capacity for a particular movement used by traffic volumes at an intersection. All v/c ratios above the critical threshold of 0.85 are bolded.

When modelling the all-way stop–controlled intersection of Ireland Road and Victoria Street/Concession 6 Woodhouse, a southbound right-turn slip lane was included to reflect the available width at the intersection from the south bound approach. Incorporating this slip lane provides a more realistic representation of existing operations, as it better captures the manner in which southbound right-turn movements are accommodated under current conditions and results in a more accurate assessment of intersection performance.

Queuing was analyzed in this study using Synchro 12.0. The 95$^{th}$ percentile queue length metric, which represents the 95$^{th}$ percentile queue length of the peak hour traffic was compared against the storage length of auxiliary lanes.

## 2.4 Intersection Operations

**Table 4** outlines the 2025 existing traffic operations at the study intersections. Synchro 12 was used to determine intersection operations at both the signalized and unsignalized study intersections. **Figure 4** illustrates the 2025 existing traffic volumes used in the operational analysis. **APPENDIX C** contains the detailed capacity analysis worksheets.




**Legend**

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

**227 Decou Road, Simcoe**

**2025 Existing Traffic Volumes Conditions**

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**Figure 4**

Project No. 1935-7678
Date. 2026-02-19
Analyst. Ramy Kamal

**Table 4: 2025 Existing Conditions Traffic Operations**

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Queensway East/Highway 3 **(TWSC)** | **Overall** | **D** | **F** | **27.0** | **60.3** | **0.25** | **0.59** |
| | EBTR | A | A | 0.0 | 0.0 | 0.11 | 0.19 |
| | WBL | A | A | 8.3 | 9.0 | 0.10 | 0.12 |
| | WBT | A | A | 0.0 | 0.0 | 0.25 | 0.26 |
| | NBL | D | **F** | 27.0 | 60.3 | 0.25 | 0.59 |
| | NBR | A | B | 9.8 | 11.0 | 0.09 | 0.18 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized)** | **Overall** | **B** | **B** | **15.4** | **14.5** | **0.67** | **0.57** |
| | EBLTR | D | D | 38.9 | 38.8 | 0.53 | 0.57 |
| | WBL | C | C | 33.3 | 27.6 | 0.67 | 0.57 |
| | WBT | C | C | 23.7 | 22.9 | 0.26 | 0.26 |
| | WBR | A | A | 6.2 | 5.5 | 0.21 | 0.20 |
| | NBLT | A | A | 7.4 | 8.3 | 0.27 | 0.28 |
| | NBR | A | A | 1.3 | 1.6 | 0.22 | 0.19 |
| | SBLTR | A | A | 7.8 | 8.8 | 0.14 | 0.23 |
| Donly Drive South & Victoria Street **(AWSC)** | **Overall** | **B** | **B** | **11.8** | **10.9** | **0.44** | **0.45** |
| | EBLTR | B | B | 12.7 | 12.1 | 0.44 | 0.45 |
| | WBLTR | B | B | 12.3 | 10.1 | 0.40 | 0.27 |
| | NBLTR | B | A | 11.1 | 9.9 | 0.25 | 0.17 |
| | SBLTR | B | B | 10.3 | 10.4 | 0.27 | 0.32 |
| Ireland Road & Victoria Street/Concession6 Woodhouse Road **(AWSC)** | **Overall** | **A** | **A** | **9.8** | **9.9** | **0.32** | **0.26** |
| | EBLTR | A | A | 9.6 | 10.0 | 0.21 | 0.26 |
| | WBLTR | B | A | 10.2 | 9.6 | 0.32 | 0.24 |
| | NBLTR | A | B | 9.5 | 10.2 | 0.16 | 0.26 |
| | SBLTR | B | B | 10.4 | 10.4 | 0.24 | 0.23 |
| Ireland Road & Decou Road/Concession6 Woodhouse Road **(TWSC)** | **Overall** | **B** | **B** | **11.8** | **11.0** | **0.10** | **0.18** |
| | EBLTR | A | A | 3.7 | 3.0 | 0.04 | 0.03 |
| | WBLTR | A | A | 0.1 | 0.4 | 0.00 | 0.00 |
| | NBLTR | B | B | 11.8 | 11.0 | 0.10 | 0.06 |
| | SBLTR | B | B | 10.2 | 11.0 | 0.08 | 0.18 |
| Norfolk Street & Decou Road/Plaza Driveway **(Signalized)** | **Overall** | **A** | **A** | **9.8** | **9.2** | **0.40** | **0.35** |
| | EBLT | C | C | 28.2 | 27.4 | 0.40 | 0.35 |
| | EBR | A | A | 7.9 | 6.9 | 0.08 | 0.18 |
| | WBL | C | C | 24.3 | 23.4 | 0.16 | 0.09 |
| | WBTR | A | B | 7.8 | 11.5 | 0.28 | 0.17 |
| | NBLTR | A | A | 6.7 | 6.5 | 0.22 | 0.16 |
| | SBLTR | A | A | 5.2 | 5.4 | 0.18 | 0.25 |

Under 2025 existing conditions, the Ireland Road & Queensway East intersection is operating well apart from the northbound left movement in the p.m. peak hour, which experiences a minute of delay. Due to the delays at the stop-controlled approach the intersection operates at an LOS "D" and "F" during the a.m. and p.am. peak hour periods, respectively. However, the intersection operates below capacity with a volume-to-capacity (v/c) ratio of 0.25 and 0.59 during the a.m. and p.m. peaks respectively.

The signalized intersection of Norfolk Street and Victoria Street is operating well with a LOS "B" during the a.m. and p.m. peak hour periods. The signalized intersection of Norfolk Street and Decou Road is also operating well with an LOS "A" during the a.m. and p.m. peak hour periods. Both intersections operate with available capacity for additional growth.

The remaining unsignalized intersection are operating at a LOS "B" or better during the a.m. and a.m. peak periods. The remaining intersections are not expected to experience any critical movements, and operate with v/c ratios under 0.5, signifying that the intersections have reserve capacity to accommodate future increases in traffic volumes.

### 2.5 Existing Queueing Assessment

Synchro modelling software was used to conduct a queuing assessment and estimate 95th percentile queues within the study road network. The a.m. and p.m. peak hour 95th percentile queues were compared against the auxiliary turn storage lane lengths at the study intersections to understand if there is potential for occasional queuing exceedances. **Table 5** outlines the results of the 2025 existing conditions queuing assessment.

**Table 5: 2025 Existing Conditions Queuing Assessment**

| Intersection | Performance Metrics | | | |
|---|---|---|---|---|
| | Movement | 95th Percentile Queue Length (m) | | Auxiliary Lane Storage Length (m) |
| | | AM | PM | |
| Ireland Road & Queensway East/Highway 3 | WBL | 5 | 5 | 175 |
| | NBL | 10 | 25 | 121 |
| Norfolk Street & Stanley Street/Victoria Street | WBL | 45 | 40 | 48 |
| | WBR | 10 | 10 | 231 |
| Norfolk Street & Decou Road | WBL | 15 | 10 | 35 |

Note 1: 95th percentile queue lengths exceeding the provided auxiliary lane storage length are bolded and highlighted.
Note 2: Queues are rounded up to the nearest 5m.

As outlined in **Table 5,** the 95th percentile queues for auxiliary turning movements do not exceed the available storage lengths under existing conditions.

## 3.0 Future Background Conditions

This section summarizes the future background conditions of the study road network and provides details relating to growth rates, future transportation network improvements, and background developments within the study area. As established in **Section 1.3** (per Norfolk's TIS guidelines), this study considers the 2034, 2039, and 2044 horizon years in the future background traffic analysis, the results of which are summarized in **Section 3.4**.

### 3.1 Growth Rates

As outlined further in **Section 3.2**, the adjacent background development were reviewed by Paradigm Transportation Solutions Ltd. (Paradigm) in a TIS Addendum and Access Review Letter in July 2025. While neither document referenced a growth rate applied. The change in volumes between the 2034, 3039 and 2044 horizon years was assessed. Depending on the roadway and horizon a growth rate between 2.13% and 1.69% was calculated.

For the purposes of this study, an industry standard growth rate of 2% as been applied to through and turning movements. At the intersection of Victoria Street and Donley Drive, the growth rate was only applied to the through movements on Victoria Street, as Donly Street, north of Victoria Street, is an established residential neighbourhood and south of Victoria Street

### 3.2 Background Developments

Several developments have been identified near the site, which are expected to generate trips throughout the study road network. The development details and respective traffic volume forecasts are discussed in the subsequent sections, and the forecasted volumes have been incorporated into the future background volumes for all horizon years.

**Table 6** summarizes the background developments included in the future background analysis. **APPENDIX D** contains the relevant excerpts from the background developments. **Figure 5** illustrates the location of background developments in relation to the subject lands.

**Table 6: Summary of Background Developments**

| Development | Land Use & Site Statistics | Background Report/Reference |
|---|---|---|
| Woodway Trail<br>(Western Adjacent Parcel) | • 112 single detached units<br>• 323 townhouse units<br>• 60 mid-rise units | TIS Addendum<br>(Paradigm, July 2025) |
| Calibrex Lands<br>(Eastern Adjacent Parcel) | • 61 single detached units<br>• 189 townhouse units<br>• 48 mid-rise units<br>• 10,000 ft$^2$ office building | Referenced by Woodway Trail Alternate Access Review<br>(Paradigm, July 2025)<br>(Trips manually distributed) |
| Donly Drive South & Victoria Street Condominium | • 5-storey condominium<br>• 45 residential units | Norfolk Development Applications Map<br>(Trip generation reviewed and manually distributed) |

It is noted that trip assignment figures for the site generated traffic of the Calibrex Lands and Donly Drive South & Victoria Street Condominium developments were not available. Accordingly, the trips were manually distributed using the trip distribution outlined in **Section 5.2.** As the Calibrex Lands and Donly Drive South & Victoria Street Condominium are both residential developments located within the study road network, it is expected that traffic generated from the developments will follow similar travel patterns to the proposed development.

**Figure 6** illustrates the future background trip assignment. It is noted that with the addition of the subject lands the Woodway Trail distribution is expected to change, as a connection to Decou Road is established. The redistribution of volumes is discussed further in **Section 6.1**.

### *3.2.1 Woodway Trail*

The Woodway Trail development is the adjacent parcel of land to the west of the proposed development, connected to the Woodway Trail subdivision. As stated in the TIS Addendum, the Woodway Trail development is planned to be built out and occupied by the 2034 horizon year. The trip generation forecast and trip assignment for the Woodway Trail lands were obtained from the Paradigm TIS. **Table 7** outlines the trip generation for Woodway Trail.

**Table 7: Woodway Trail Trip Generation**

| Dwelling Type | Units | Weekday A.M. | | Weekday P.M. | |
|---|---|---|---|---|---|
| | | Inbound | Outbound | Inbound | Outbound |
| Single Detached | 112 | 21 | 62 | 70 | 41 |
| Townhouse | 323 | 41 | 121 | 112 | 78 |
| Mid-Rise | 60 | 5 | 17 | 14 | 10 |
| **Total** | | **67** | **200** | **196** | **129** |

### *3.2.2 Calibrex Lands*

Similarly, the Calibrex Lands development is the adjacent parcel of land to the east of the proposed development. The Calibrex Lands have received Draft Plan approval by Norfolk County. Details on the Calibrex Lands have been obtained through the Access Review Letter prepared by Paradigm for Woodway Trail. The Calibrex Lands are planned to be built out and occupied by the 2034 horizon year. **Table 8** outlines the trip generation for the Calibrex Lands.

**Table 8: Calibrex Lands Trip Generation**

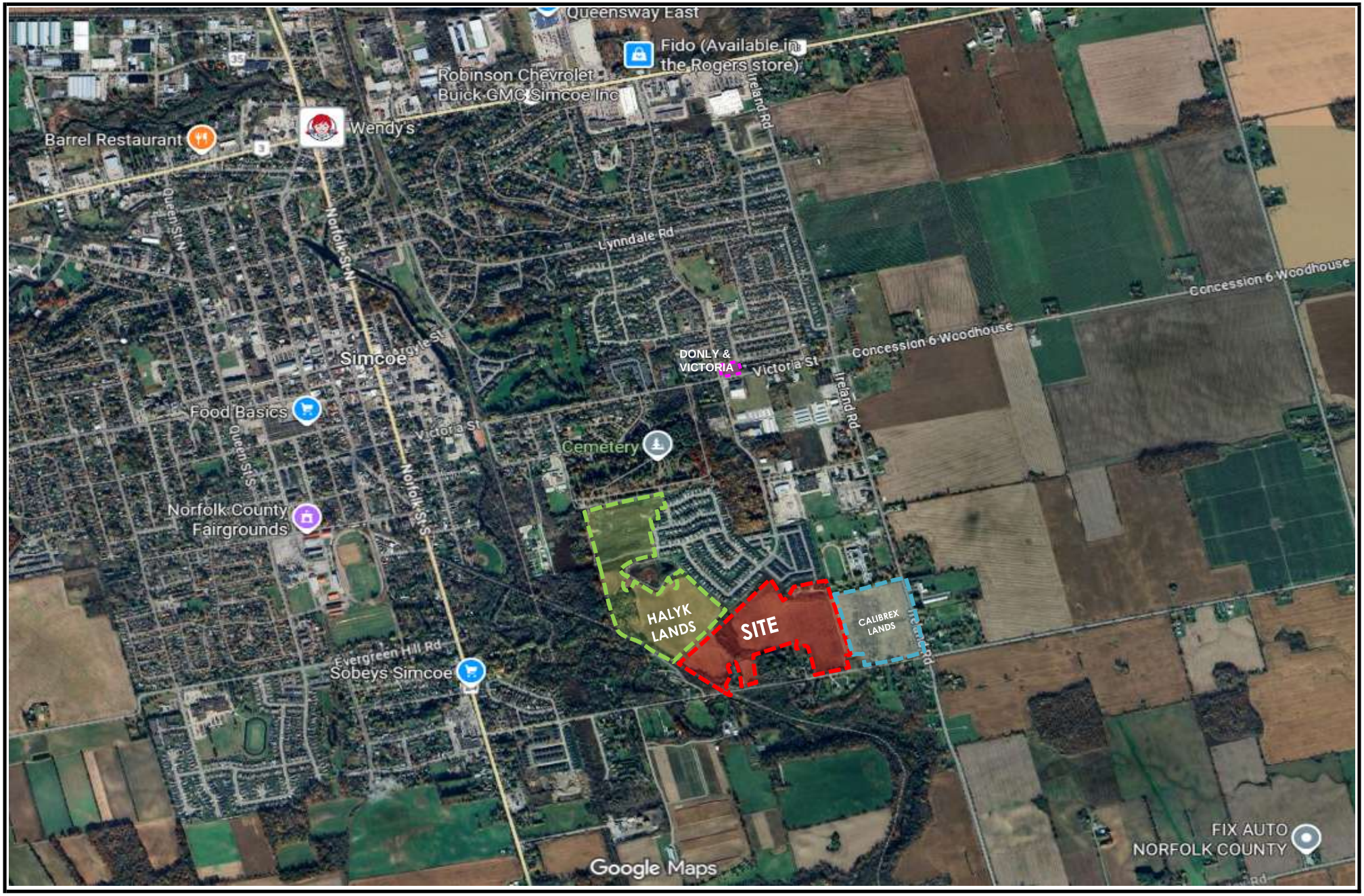
| Dwelling Type | Units/GFA | Weekday A.M. | | Weekday P.M. | |
|---|---|---|---|---|---|
| | | Inbound | Outbound | Inbound | Outbound |
| Single Detached | 61 | 12 | 36 | 39 | 23 |
| Townhouse | 189 | 23 | 70 | 65 | 44 |
| Mid-Rise | 48 | 2 | 8 | 12 | 7 |
| Office Building | 10,000 $ft^2$ | 14 | 3 | 7 | 15 |
| **Total** | | **51** | **117** | **123** | **89** |

### *3.2.3 Donly Drive South & Victoria Street Condominium*

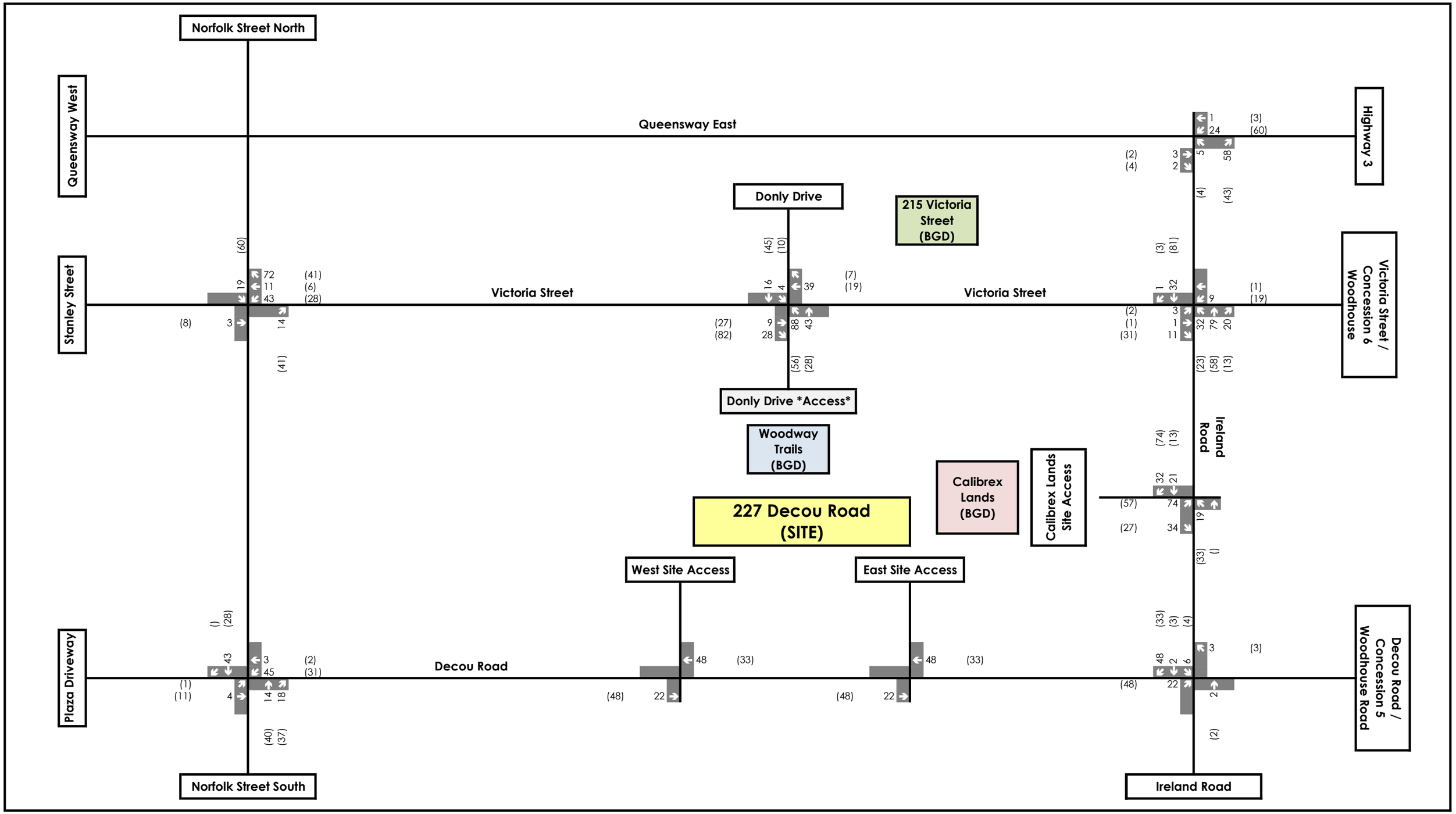
The Donly Drive South & Victoria Street Condominium is a proposed development consisting of a 5-storey condo, with 45 residential units proposed. Details on the development were taken from the Norfolk Development Applications Map, as a TIS was not readily available for review. It is assumed that the condominium will be fully built out and occupied by the 2034 horizon year. **Table 9** outlines the trip generation for the Donly and Victoria Condominiums.

**Table 9: Donly & Victoria Condominium Trip Generation**

| Dwelling Type | Units | Weekday A.M. | | Weekday P.M. | |
|---|---|---|---|---|---|
| | | Inbound | Outbound | Inbound | Outbound |
| Mid-Rise | 45 | 3 | 8 | 12 | 7 |




| Legend | 227 Decou Road, Simcoe | CROZIER CONSULTING ENGINEERS | Figure 5 |
|---|---|---|---|
| Site Boundary; Donly & Victoria; Halyk Lands; Calibrex Lands | Background Development Location Plan | | Project No. 1935-7678<br>Date. 2026-02-19<br>Analyst. Ramy Kamal |




| Legend | 227 Decou Road, Simcoe | CROZIER CONSULTING ENGINEERS | Figure 6 |
|---|---|---|---|
| xx A.M. Peak Hour Traffic Volumes<br>(xx) P.M. Peak Hour Traffic Volumes | Background Trips Assignment | | Project No. 1935-7678<br>Date. 2026-02-19<br>Analyst. Ramy Kamal |

### 3.3 Future Background Mitigations

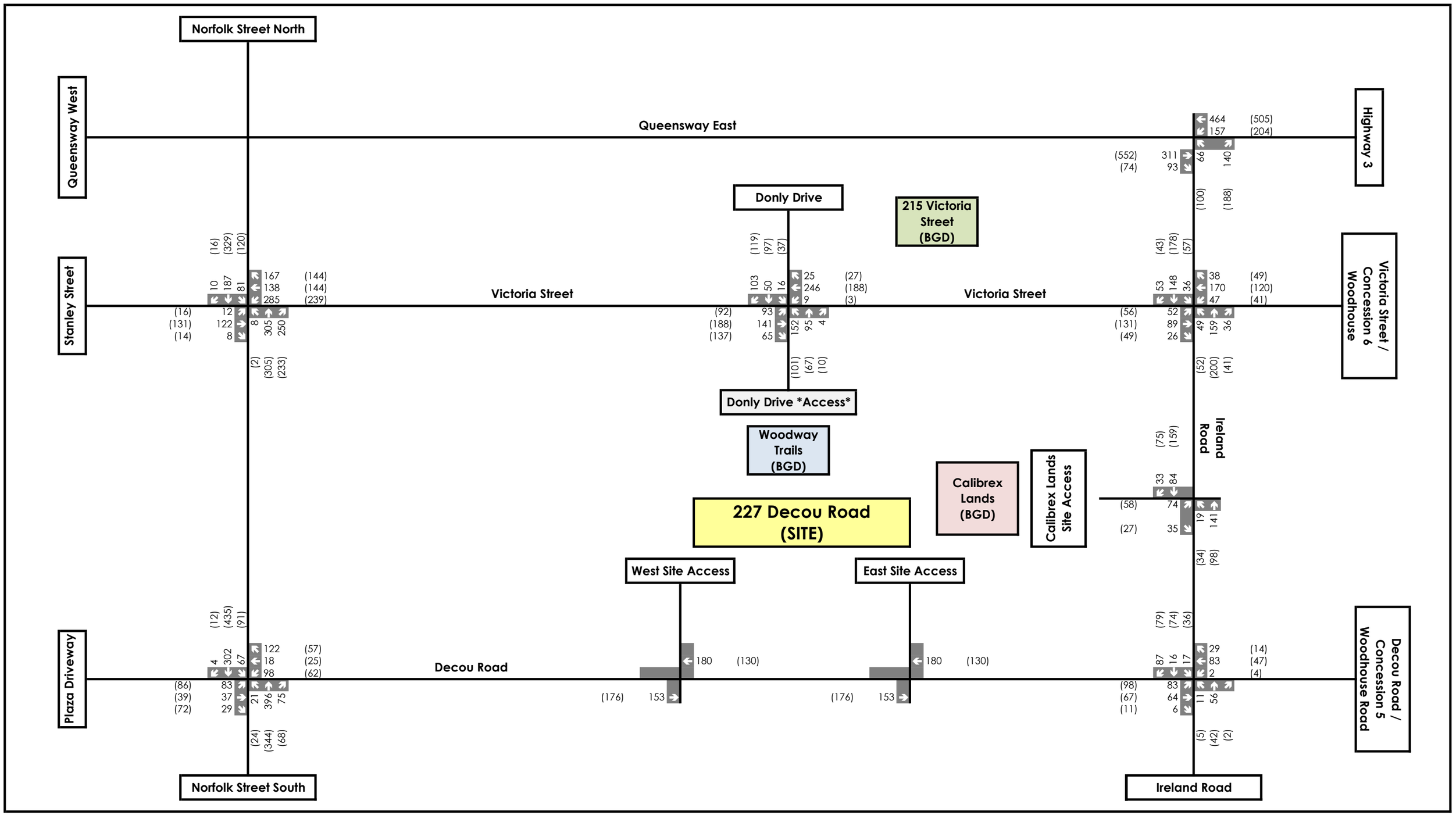
The Woodway Trail TIS Addendum reviewed left-turn lane warrants and signal warrants for the study intersections within the report. The study found that signalization of the intersection of Queensway East and Ireland Road as well as the intersection of Victoria Street and Donly Drive was not warranted under the 2034, 2039 or 2044 horizon years. The study also assessed two-way stop control conditions at the intersection of Victora Street and Donly Drive but ultimately found the existing all-way stop control operates at a better Level of Service.

The Ministry of Transportation often delays signalization until warrants are met. As such, no mitigation measures have been applied to the future background models.

### 3.4 Intersection Operations

**Table 10**, **Table 11**, and **Table 12** outline the 2034, 2039 and 2044 future background traffic operations, respectively. Synchro 12 was used to determine intersection operations at both the signalized and unsignalized study intersections. **Figure 7**, **Figure 8**, and **Figure 9** illustrate the 2034, 2039, and 2044 future background traffic volumes, respectively.

**APPENDIX C** contains the detailed capacity analysis worksheets.




**Legend**

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

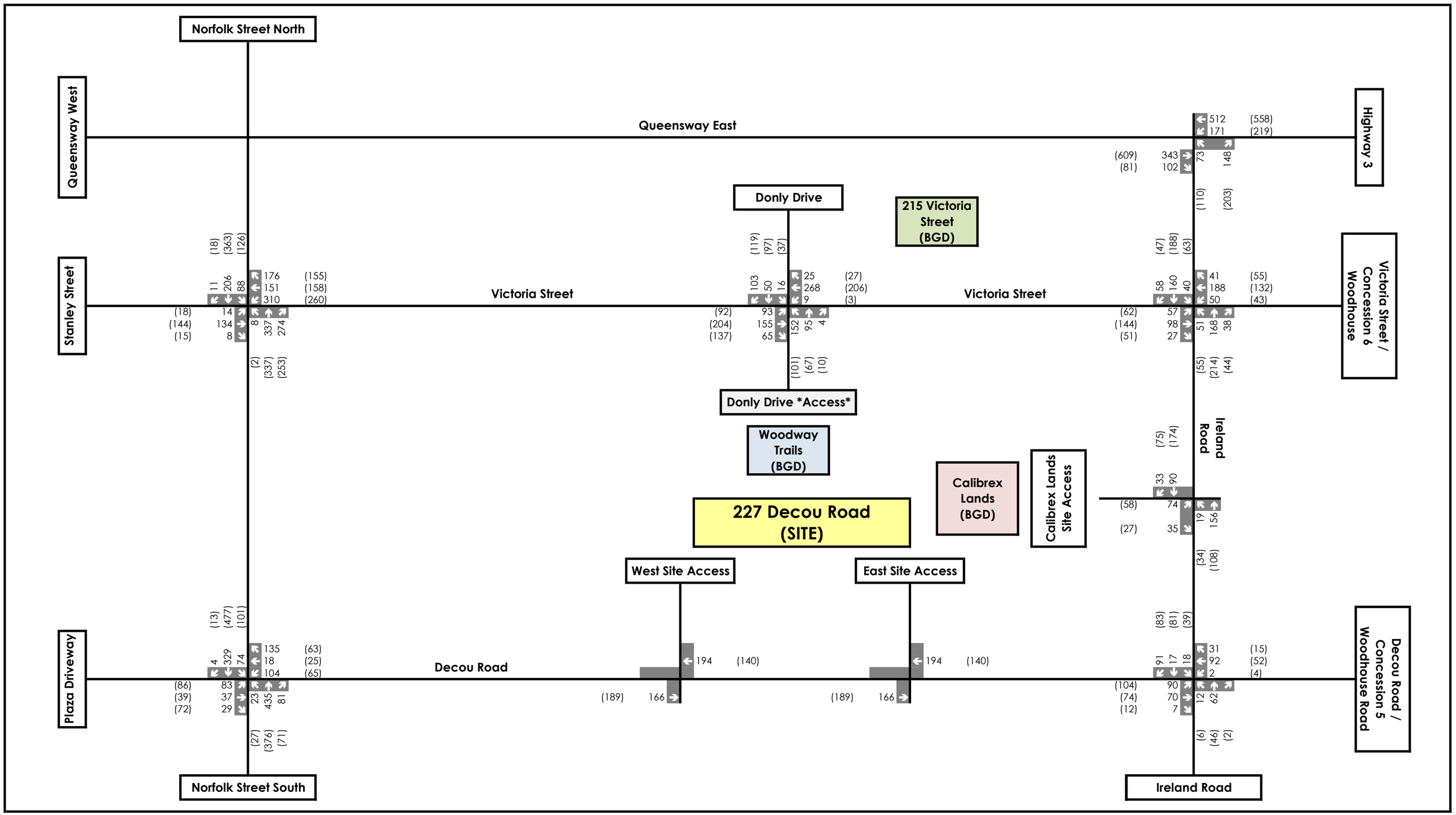
**227 Decou Road, Simcoe**

**2034 Future Background Traffic Volumes**

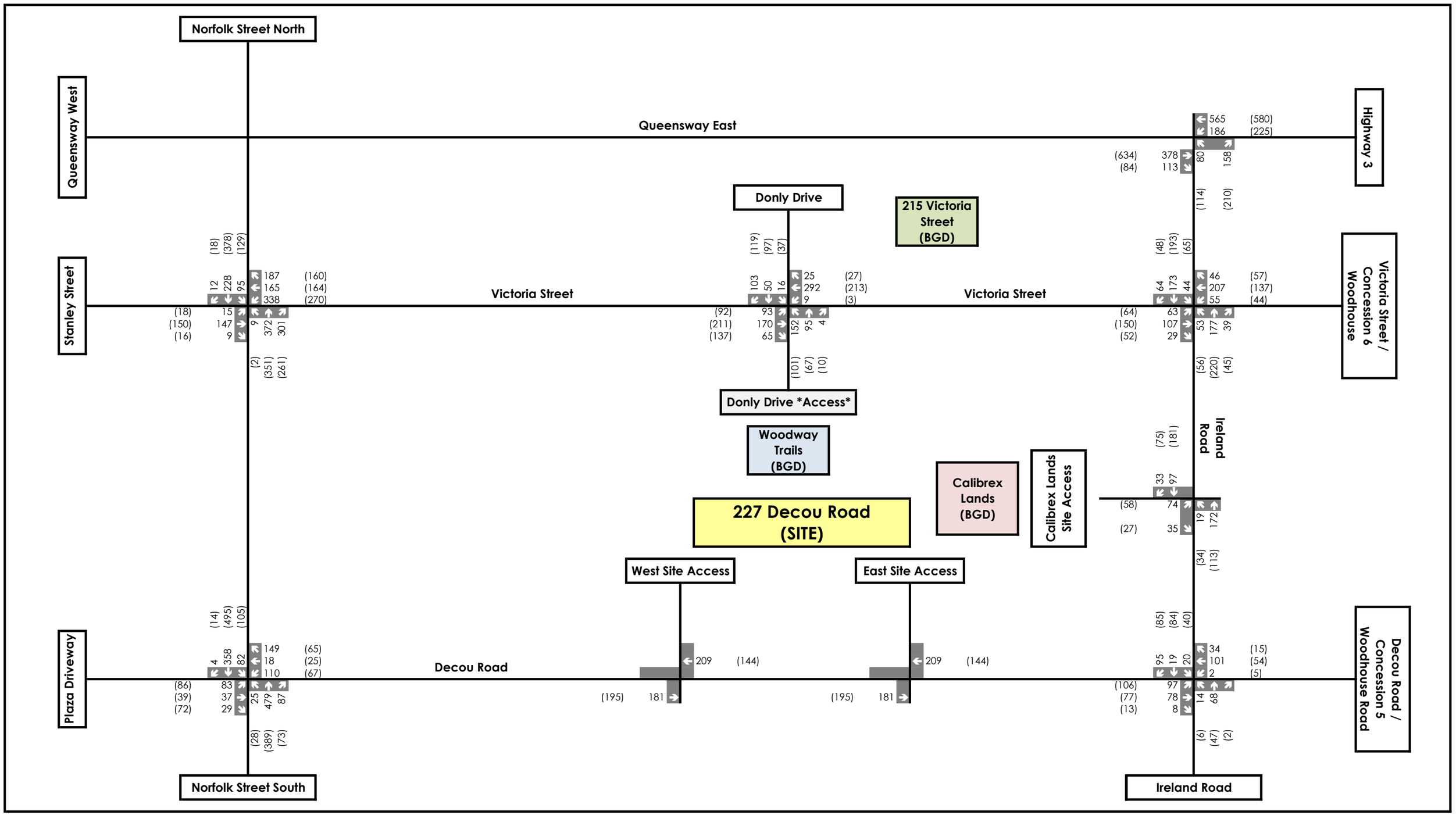
CROZIER CONSULTING ENGINEERS

**Figure 7**

Project No. 1935-7678
Date. 2026-02-19
Analyst. Ramy Kamal




| Legend | 227 Decou Road, Simcoe | CROZIER CONSULTING ENGINEERS | Figure 8 |
|---|---|---|---|
| xx A.M. Peak Hour Traffic Volumes<br>(xx) P.M. Peak Hour Traffic Volumes | 2039 Future Background Traffic Volumes | | Project No. 1935-7678<br>Date. 2026-02-19<br>Analyst. Ramy Kamal |




**Legend**

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

**227 Decou Road, Simcoe**

**2044 Future Background Traffic Volumes**

CROZIER CONSULTING ENGINEERS

**Figure 9**

Project No. 1935-7678
Date. 2026-02-19
Analyst. Ramy Kamal

**Table 10: 2034 Future Background Traffic Operations**

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Queensway East/Highway 3 **(TWSC)** | **Overall** | **F** | **F** | **54.7** | **384.5** | **0.51** | **1.50** |
| | EBTR | A | A | 0.0 | 0.0 | 0.13 | 0.23 |
| | WBL | A | B | 8.8 | 10.1 | 0.15 | 0.23 |
| | WBT | A | A | 0.0 | 0.0 | 0.30 | 0.32 |
| | NBL | **F** | **F** | 54.7 | 384.5 | 0.51 | **1.50** |
| | NBR | B | B | 10.8 | 12.7 | 0.20 | 0.30 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized)** | **Overall** | **B** | **B** | **19.4** | **16.7** | **0.90** | **0.79** |
| | EBLTR | D | D | 40.1 | 40.3 | 0.60 | 0.65 |
| | WBL | D | D | 53.3 | 38.8 | **0.90** | 0.79 |
| | WBT | C | C | 22.7 | 22.1 | 0.29 | 0.30 |
| | WBR | A | A | 5.0 | 4.6 | 0.34 | 0.29 |
| | NBLT | A | A | 8.8 | 9.4 | 0.34 | 0.35 |
| | NBR | A | A | 1.5 | 1.7 | 0.29 | 0.28 |
| | SBLTR | A | B | 9.3 | 11.4 | 0.22 | 0.39 |
| Donly Drive South & Victoria Street **(AWSC)** | **Overall** | **C** | **C** | **21.6** | **20.2** | **0.70** | **0.79** |
| | EBLTR | C | D | 23.8 | 27.9 | 0.70 | 0.79 |
| | WBLTR | C | B | 23.5 | 14.8 | 0.68 | 0.45 |
| | NBLTR | C | B | 21.7 | 14.7 | 0.63 | 0.40 |
| | SBLTR | B | C | 14.7 | 16.1 | 0.40 | 0.52 |
| Ireland Road & Victoria Street/Concession6 Woodhouse Road **(AWSC)** | **Overall** | **B** | **C** | **14.0** | **15.4** | **0.49** | **0.57** |
| | EBLTR | B | B | 12.7 | 14.9 | 0.34 | 0.46 |
| | WBLTR | B | B | 14.8 | 13.8 | 0.49 | 0.41 |
| | NBLTR | C | C | 15.2 | 17.4 | 0.49 | 0.57 |
| | SBLTR | B | C | 14.0 | 16.2 | 0.40 | 0.50 |
| Ireland Road & Decou Road/Concession6 Woodhouse Road **(TWSC)** | **Overall** | **B** | **B** | **13.9** | **13.5** | **0.19** | **0.33** |
| | EBLTR | A | A | 4.3 | 4.5 | 0.06 | 0.07 |
| | WBLTR | A | A | 0.1 | 0.4 | 0.00 | 0.00 |
| | NBLTR | B | B | 13.9 | 13.3 | 0.16 | 0.11 |
| | SBLTR | B | B | 11.3 | 13.5 | 0.19 | 0.33 |
| Norfolk Street & Decou Road/Plaza Driveway **(Signalized)** | **Overall** | **B** | **B** | **11.0** | **10.1** | **0.43** | **0.39** |
| | EBLT | C | C | 28.9 | 27.6 | 0.43 | 0.39 |
| | EBR | A | A | 7.8 | 6.7 | 0.08 | 0.17 |

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| | WBL | C | C | 27.6 | 25.2 | 0.37 | 0.23 |
| | WBTR | A | B | 7.6 | 10.7 | 0.32 | 0.20 |
| | NBLTR | A | A | 8.2 | 7.7 | 0.32 | 0.27 |
| | SBLTR | A | A | 6.0 | 6.5 | 0.30 | 0.37 |
| Ireland Road & Calibrex Lands Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.0** | **11.8** | **0.12** | **0.15** |
| | EBL | B | B | 11.0 | 11.8 | 0.12 | 0.11 |
| | EBR | A | A | 9.0 | 9.5 | 0.04 | 0.04 |
| | NBLT | A | A | 1.0 | 2.2 | 0.01 | 0.03 |
| | SBTR | A | A | 0.0 | 0.0 | 0.07 | 0.15 |

**Table 11: 2039 Future Background Traffic Operations**

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Queensway East/Highway 3 **(TWSC)** | **Overall** | **F** | **F** | **88.5** | **714.3** | **0.69** | **2.20** |
| | EBTR | A | A | 0.0 | 0.0 | 0.15 | 0.25 |
| | WBL | A | B | 9.0 | 10.6 | 0.17 | 0.27 |
| | WBT | A | A | 0.0 | 0.0 | 0.33 | 0.35 |
| | NBL | **F** | **F** | 88.5 | 714.3 | 0.69 | **2.20** |
| | NBR | B | B | 11.1 | 13.6 | 0.21 | 0.34 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized)** | **Overall** | **C** | **B** | **22.7** | **18.1** | **0.98** | **0.86** |
| | EBLTR | D | D | 40.9 | 40.7 | 0.64 | 0.67 |
| | WBL | **E** | D | 70.2 | 46.2 | **0.98** | **0.86** |
| | WBT | C | C | 22.4 | 21.8 | 0.31 | 0.32 |
| | WBR | A | A | 4.8 | 4.4 | 0.35 | 0.30 |
| | NBLT | A | B | 9.4 | 10.1 | 0.38 | 0.39 |
| | NBR | A | A | 1.5 | 1.7 | 0.32 | 0.30 |
| | SBLTR | A | B | 10.0 | 12.6 | 0.25 | 0.44 |
| Donly Drive South & Victoria Street **(AWSC)** | **Overall** | **C** | **C** | **24.7** | **22.9** | **0.74** | **0.84** |
| | EBLTR | D | D | 27.5 | 32.9 | 0.74 | 0.84 |
| | WBLTR | D | C | 28.2 | 16.4 | 0.74 | 0.51 |
| | NBLTR | C | C | 23.2 | 15.4 | 0.65 | 0.42 |
| | SBLTR | C | C | 15.5 | 17.2 | 0.42 | 0.54 |
| Ireland Road & Victoria Street/Concession6 Woodhouse Road **(AWSC)** | **Overall** | **C** | **C** | **15.8** | **17.9** | **0.56** | **0.64** |
| | EBLTR | B | C | 14.0 | 17.2 | 0.39 | 0.53 |
| | WBLTR | C | C | 17.1 | 15.7 | 0.56 | 0.47 |
| | NBLTR | C | C | 17.1 | 20.8 | 0.54 | 0.64 |
| | SBLTR | C | C | 15.6 | 18.6 | 0.45 | 0.55 |
| Ireland Road & Decou Road/Concession6 Woodhouse Road **(TWSC)** | **Overall** | **B** | **B** | **14.7** | **14.5** | **0.21** | **0.38** |
| | EBLTR | A | A | 4.4 | 4.4 | 0.07 | 0.08 |
| | WBLTR | A | A | 0.1 | 0.4 | 0.00 | 0.00 |
| | NBLTR | B | B | 14.7 | 13.9 | 0.19 | 0.13 |
| | SBLTR | B | B | 11.7 | 14.5 | 0.21 | 0.38 |
| Norfolk Street & Decou Road/Plaza Driveway **(Signalized)** | **Overall** | **B** | **B** | **11.1** | **10.1** | **0.45** | **0.42** |
| | EBLT | C | C | 29.4 | 27.6 | 0.45 | 0.39 |
| | EBR | A | A | 7.6 | 6.7 | 0.08 | 0.17 |

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| | WBL | C | C | 27.9 | 25.4 | 0.39 | 0.24 |
| | WBTR | A | B | 7.4 | 10.2 | 0.34 | 0.21 |
| | NBLTR | A | A | 8.7 | 8.0 | 0.35 | 0.29 |
| | SBLTR | A | A | 6.2 | 6.7 | 0.33 | 0.42 |
| Ireland Road & Calibrex Lands Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.2** | **12.1** | **0.12** | **0.16** |
| | EBL | B | B | 11.2 | 12.1 | 0.12 | 0.11 |
| | EBR | A | A | 9.0 | 9.6 | 0.04 | 0.04 |
| | NBLT | A | A | 0.9 | 2.1 | 0.01 | 0.03 |
| | SBTR | A | A | 0.0 | 0.0 | 0.08 | 0.16 |

**Table 12: 2044 Future Background Traffic Operations**

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Queensway East/Highway 3 **(TWSC)** | **Overall** | **F** | **F** | **168.0** | **887.6** | **0.96** | **2.55** |
| | EBTR | A | A | 0.0 | 0.0 | 0.16 | 0.26 |
| | WBL | A | B | 9.3 | 10.9 | 0.19 | 0.28 |
| | WBT | A | A | 0.0 | 0.0 | 0.36 | 0.36 |
| | NBL | **F** | **F** | 168.0 | 887.6 | **0.96** | **2.55** |
| | NBR | B | B | 11.5 | 14.0 | 0.24 | 0.36 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized)** | **Overall** | **C** | **B** | **27.8** | **19.2** | **1.08** | **0.90** |
| | EBLTR | D | D | 41.0 | 40.8 | 0.66 | 0.69 |
| | WBL | **F** | D | 96.9 | 51.8 | **1.08** | **0.90** |
| | WBT | C | C | 22.1 | 21.6 | 0.33 | 0.33 |
| | WBR | A | A | 4.7 | 4.3 | 0.36 | 0.30 |
| | NBLT | A | B | 10.0 | 10.5 | 0.43 | 0.41 |
| | NBR | A | A | 1.6 | 1.7 | 0.34 | 0.31 |
| | SBLTR | B | B | 10.8 | 13.2 | 0.29 | 0.47 |
| Donly Drive South & Victoria Street **(AWSC)** | **Overall** | **D** | **D** | **29.6** | **25.1** | **0.82** | **0.88** |
| | EBLTR | D | **E** | 33.2 | 37.7 | 0.80 | **0.88** |
| | WBLTR | **E** | C | 36.0 | 17.0 | 0.82 | 0.52 |
| | NBLTR | D | C | 25.2 | 15.8 | 0.67 | 0.42 |
| | SBLTR | C | C | 16.5 | 17.6 | 0.44 | 0.55 |
| Ireland Road & Victoria Street/Concession6 Woodhouse Road **(AWSC)** | **Overall** | **C** | **C** | **18.5** | **19.8** | **0.65** | **0.68** |
| | EBLTR | C | C | 15.8 | 18.9 | 0.45 | 0.57 |
| | WBLTR | C | C | 21.1 | 17.0 | 0.65 | 0.51 |
| | NBLTR | C | C | 19.9 | 23.4 | 0.60 | 0.68 |
| | SBLTR | C | C | 17.9 | 20.4 | 0.52 | 0.59 |
| Ireland Road & Decou Road/Concession6 Woodhouse Road **(TWSC)** | **Overall** | **C** | **B** | **15.8** | **15.0** | **0.24** | **0.40** |
| | EBLTR | A | A | 4.4 | 4.4 | 0.08 | 0.08 |
| | WBLTR | A | A | 0.1 | 0.6 | 0.00 | 0.00 |
| | NBLTR | C | B | 15.8 | 14.2 | 0.22 | 0.14 |
| | SBLTR | B | B | 12.3 | 15.0 | 0.24 | 0.40 |
| Norfolk Street & Decou Road/Plaza Driveway **(Signalized)** | **Overall** | **B** | **B** | **11.2** | **10.2** | **0.47** | **0.44** |
| | EBLT | C | C | 29.9 | 27.7 | 0.47 | 0.39 |
| | EBR | A | A | 7.5 | 6.7 | 0.08 | 0.17 |

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| | WBL | C | C | 28.2 | 25.5 | 0.41 | 0.25 |
| | WBTR | A | B | 7.1 | 10.2 | 0.37 | 0.21 |
| | NBLTR | A | A | 9.1 | 8.1 | 0.39 | 0.30 |
| | SBLTR | A | A | 6.6 | 7.1 | 0.38 | 0.44 |
| Ireland Road & Calibrex Lands Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.5** | **12.2** | **0.13** | **0.16** |
| | EBL | B | B | 11.5 | 12.2 | 0.13 | 0.11 |
| | EBR | A | A | 9.0 | 9.7 | 0.04 | 0.04 |
| | NBLT | A | A | 0.9 | 2.0 | 0.01 | 0.03 |
| | SBTR | A | A | 0.0 | 0.0 | 0.08 | 0.16 |

Under the future background's ultimate horizon year (2044), the intersection of Ireland Road & Queensway East is expected to operate with significant delays at the stop-controlled northbound approach. Due to the delays at the stop-controlled approach the intersection operates at an LOS "F" during the a.m. and p.m. peak periods. The intersection operates with a (v/c) ratio of 0.96 during the a.m. peak period, and a v/c ratio of 2.55 during the p.m. peak, due to the extended delays expected at the stop-controlled approach. It is noted that these operations are consistent with the findings of the Woodland Trail TIS Addendum (Paradigm, July 2025). As previously stated the intersection does not warrant signalization, but monitoring of the intersection is recommended.

The signalized intersection of Norfolk Street and Victoria Street is expected to operate at an LOS "C" and "B" during the a.m. and p.m. peak periods, respectively. The westbound left turn is expected to operate critically, with a v/c ratio of 1.08 and 0.90 during the a.m. and p.m. peak periods, respectively. Aside from the westbound left turn, the remaining movements are expected to continue to operate will with capacity under 2044 future background conditions. Monitoring for optimization of signal timings is recommended as growth of roadway volumes occurs.

The signalized intersection of Norfolk Street and Decou Road is expected to operate at an LOS "B" during the a.m. and p.m. peak periods. The intersection operates with a maximum v/c ratio of 0.47, occurring during the a.m. peak period, signifying that the intersection has available capacity to accommodate additional growth on the road network.

The Donly Drive South & Victoria Street intersection is expected to operate at a LOS "E" in the westbound direction during the a.m. peak hour and the eastbound movements during the p.m. peak period. Delays are forecasted to be less than 40 seconds and v/c ratios below 0.90. These operations are consistent with the findings of the Woodland Trail TIS Addendum (Paradigm, July 2025).

The remaining unsignalized intersections are forecasted to operate at a LOS "C" or better during the a.m. and p.m. peak periods. The remaining intersections are forecasted to experience acceptable delays and have reserve capacity to accommodate existing growth on the road network.

### 3.5 Future Background Queueing Assessment

Synchro was used to conduct a queuing assessment and estimate 95th percentile queues within the study road network. The a.m. and p.m. peak hour 95th percentile queues were compared against the auxiliary turn storage lane lengths at the study intersections to understand if there is at least the potential for occasional queuing exceedances. **Table 13**, **Table 14,** and **Table 15** outline the results of the 2034, 2039, and 2044 future background queuing assessments, respectively.

**Table 13: 2034 Future Total Conditions Queuing Assessment**

| Intersection | Performance Metrics | | | |
|---|---|---|---|---|
| | Movement | 95th Percentile Queue Length (m) | | Auxiliary Lane Storage Length (m) |
| | | AM | PM | |
| Ireland Road & Queensway East/Highway 3 | WBL | 5 | 10 | 175 |
| | NBL | 20 | 70 | 121 |
| Norfolk Street & Stanley Street/Victoria Street | WBL | **70** | **50** | 48 |
| | WBR | 15 | 15 | 231 |
| Norfolk Street & Decou Road | WBL | 30 | 20 | 35 |

Note 1: 95th percentile queue lengths exceeding the provided auxiliary lane storage length are bolded and highlighted.
Note 2: Queues are rounded up to the nearest 5m.

**Table 14: 2039 Future Total Conditions Queuing Assessment**

| Intersection | Performance Metrics | | | |
|---|---|---|---|---|
| | Movement | 95th Percentile Queue Length (m) | | Auxiliary Lane Storage Length (m) |
| | | AM | PM | |
| Ireland Road & Queensway East/Highway 3 | WBL | 5 | 10 | 175 |
| | NBL | 30 | 90 | 121 |
| Norfolk Street & Stanley Street/Victoria Street | WBL | **85** | **55** | 48 |
| | WBR | 15 | 15 | 231 |
| Norfolk Street & Decou Road | WBL | 30 | 20 | 35 |

Note 1: 95th percentile queue lengths exceeding the provided auxiliary lane storage length are bolded and highlighted.
Note 2: Queues are rounded up to the nearest 5m.

**Table 15: 2044 Future Total Conditions Queuing Assessment**

| Intersection | Performance Metrics | | | |
|---|---|---|---|---|
| | Movement | 95th Percentile Queue Length (m) | | Auxiliary Lane Storage Length (m) |
| | | AM | PM | |
| Ireland Road & Queensway East/Highway 3 | WBL | 10 | 10 | 175 |
| | NBL | 45 | 100 | 121 |
| Norfolk Street & Stanley Street/Victoria Street | WBL | **95** | **60** | 48 |
| | WBR | 15 | 15 | 231 |
| Norfolk Street & Decou Road | WBL | 30 | 20 | 35 |

Note 1: 95th percentile queue lengths exceeding the provided auxiliary lane storage length are bolded and highlighted.
Note 2: Queues are rounded up to the nearest 5m.

As summarized, the westbound left-turn at the Norfolk Street & Victoria Street intersection is expected to occasionally extend beyond its provided storage length. However, some additional queuing can be contained within the taper length and there are two adjacent parallel lanes to capture exceedance, should it occur and allow for through vehicles to pass around.

There are no queueing exceedances expected throughout the remainder of the study road network under future background conditions.

# 4.0 Internal Road Network

This section discusses the proposed internal road network to provide service between the proposed development and external roadways, as well as service between the adjacent developments to the east and northwest.

## 4.1 Proposed Site Access

To service the proposed development, two (2) full-moves site accesses have been proposed at Decou Road. The western access is noted as Street A on the Concept Plan and the eastern access is Street B. The site accesses are further reviewed in **Section 7.0** for safety and geometric requirements.

## 4.2 Proposed Public Roadways

To provide access throughout the residential subdivision, public roadways with a 20 meter right-of-way are proposed. The roadway of Woodway Trail is proposed to be extended south through the development northwest of the subject lands and through the subject lands (Street A) to Decou Road. Street B will extend north through the subject lands connecting to Woodway Trail at Donley Drive and Street F is planned to run east-west connecting to the Calibrex lands, and an access to Ireland Road. The Concept Plan is included as **Figure 2** for reference.

# 5.0 Site Generated Traffic

The proposed development will result in additional turning movements at the study intersections. The site generated traffic forecasting methodology for this study consists of two steps. The first step, trip generation, projects the number of trips that originate or are destined for the proposed development, while the second step, trip distribution and assignment, assigns trips to the study road network based on the expected distribution of trips to catchment areas and anticipated shortest paths for trips destined for particular locations.

## 5.1 Trip Generation

The fitted curve equations for Land Use Categories (LUC) within the ITE Trip Generation Manual, 12th Edition, were used to forecast the site-generated traffic for the proposed development. **APPENDIX E** includes relevant excerpts from the ITE Trip Generation Manual, 12th Edition.

As noted in **Section 1.2**, the trip generation assessment is based on a conservative maximum unit yield scenario assuming an all-townhouse development totaling 509 units. The current site plan, however, proposes 125 Single-detached units and 279 townhouse units. The forecasted site-generated trips for the proposed residential development, based on the conservative unit yield scenario and in comparison, to the current site plan, are summarized in **Table 16**.

**Table 16: Trip Generation**

| Dwelling Type | Units | Weekday AM | | Weekday PM | |
|---|---|---|---|---|---|
| | | Inbound | Outbound | Inbound | Outbound |
| **Concept Plan Division of Units** | | | | | |
| Single Detached LUC 210 | 125 | 24 | 65 | 73 | 45 |
| Townhouse LUC 215 | 279 | 37 | 112 | 86 | 65 |
| Total | | 61 | 177 | 159 | 110 |
| **Single Detached Units Only** | | | | | |
| Single Detached LUC 210 | 305 | 57 | 153 | 166 | 102 |
| **Townhouse Units Only** | | | | | |
| **Townhouse LUC 215** | **509** | **71** | **214** | **161** | **121** |

As noted, the conservative assessment of all townhouse units was reviewed resulting in 285 and 282 two-way trips during the a.m. and p.m. peak hours, respectively.

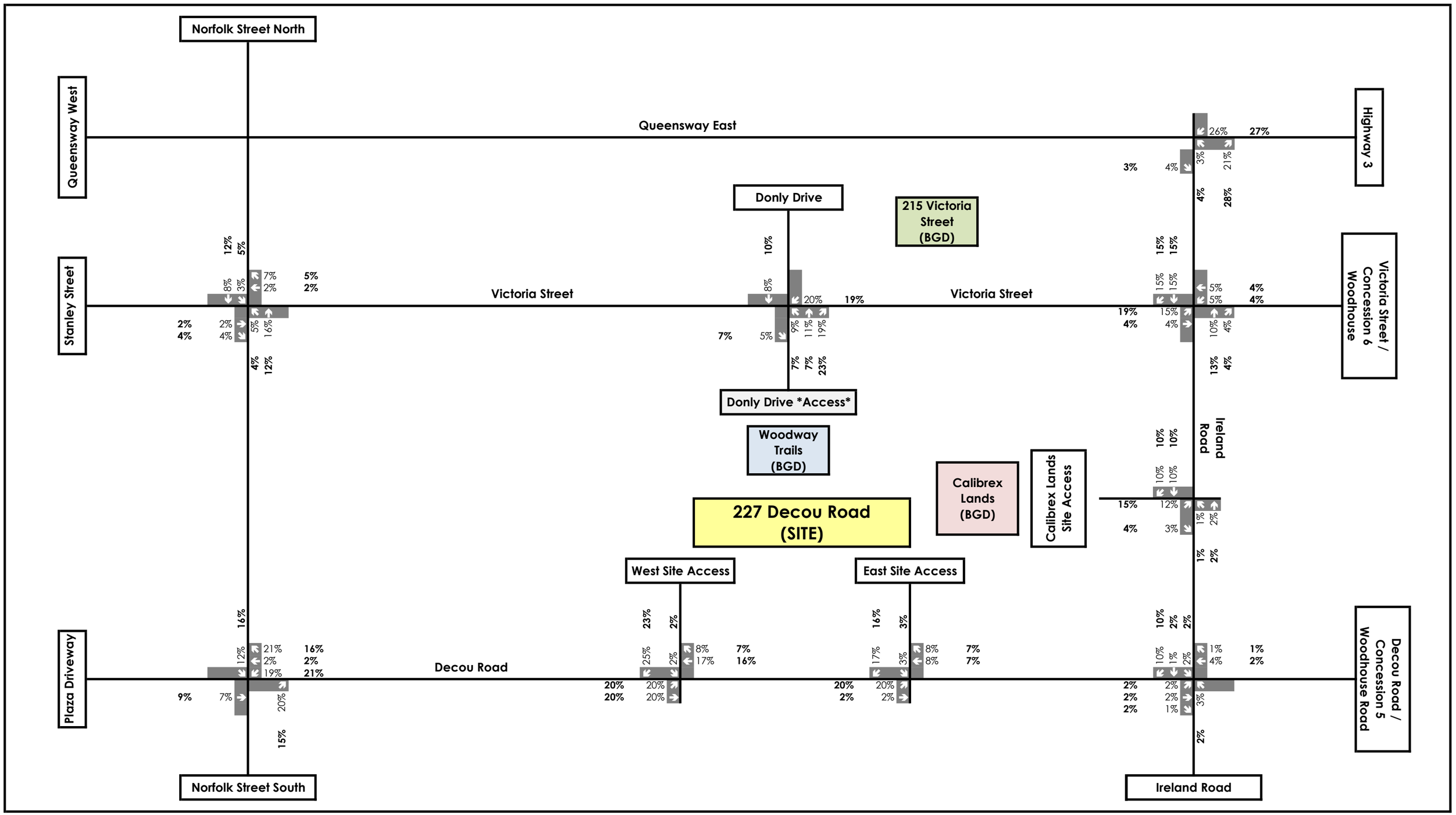
## 5.2 Trip Distribution and Assignment

Trips generated by the proposed development were distributed to the study road network using existing travel patterns obtained from the collected traffic data.

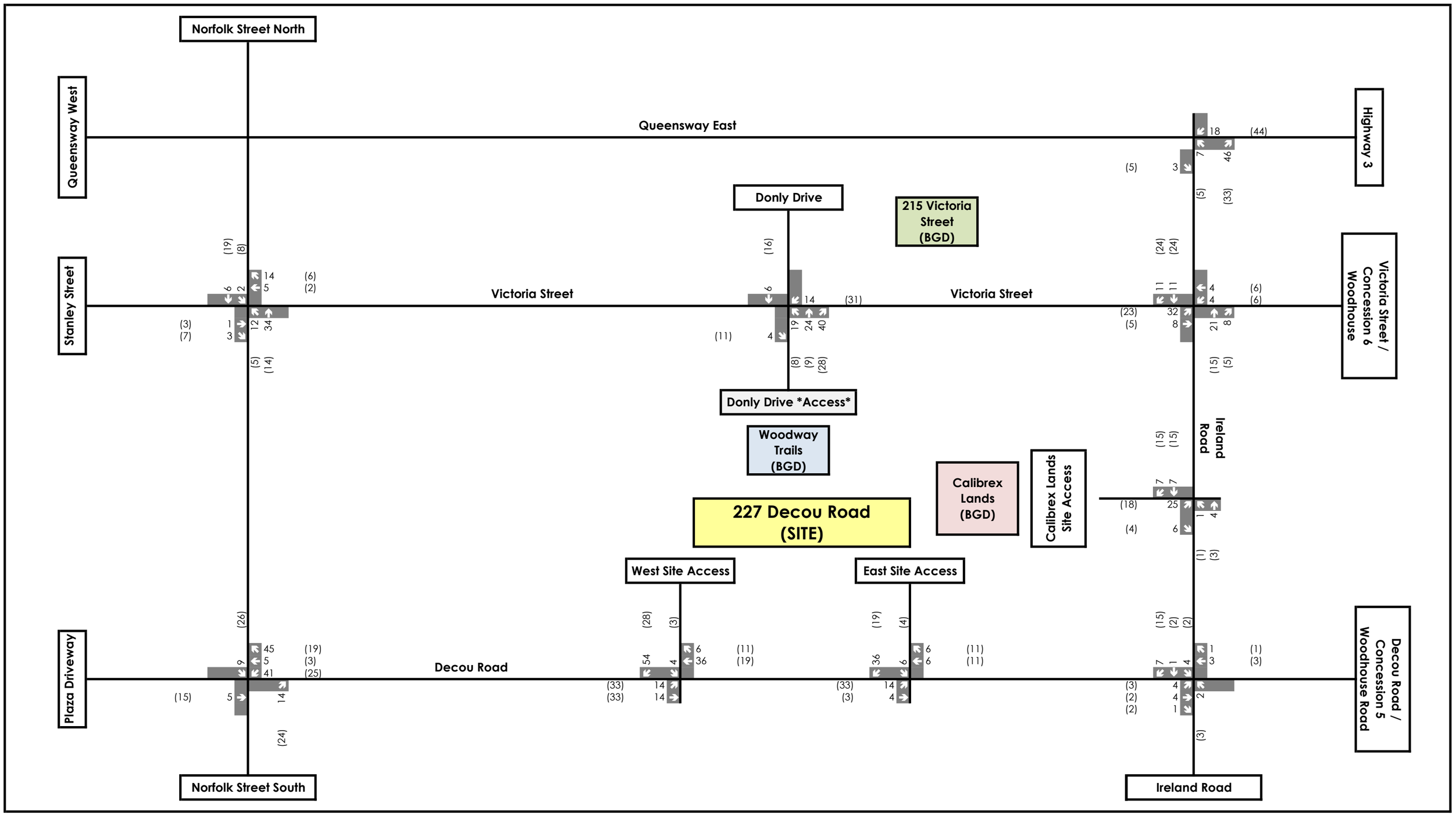
**Table 17** outlines the resulting trip distribution applied to the site generated trips. It was assumed that the trips generated to and from the site would generally use its nearest site access into the proposed subdivision. **Figure 10** and **Figure 11,** illustrate the trip distribution and trip assignment for the site, respectively.

**Table 17: Vehicle Trip Distribution**

| Direction | Weekday A.M. Peak Hour | | Weekday P.M. Peak Hour | |
|---|---|---|---|---|
| | Inbound | Outbound | Inbound | Outbound |
| Queensway E West | 4% | 3% | 3% | 4% |
| Queensway E East | 25% | 21% | 27% | 28% |
| Norfolk Street N North | 11% | 23% | 17% | 17% |
| Norfolk Street S South | 20% | 19% | 15% | 21% |
| Victoria Street West | 6% | 8% | 6% | 6% |
| Victoria Street East | 11% | 8% | 8% | 8% |
| Decou Road West | 7% | 2% | 9% | 2% |
| Decou Road East | 5% | 4% | 3% | 4% |
| Donly Drive S North | 8% | 11% | 10% | 7% |
| Ireland Road South | 3% | 1% | 2% | 3% |
| **Total** | **100%** | **100%** | **100%** | **100%** |




| Legend | 227 Decou Road, Simcoe | CROZIER CONSULTING ENGINEERS | Figure 10 |
|---|---|---|---|
| xx% A.M. Peak Hour Traffic Distribution<br>**xx%** P.M. Peak Hour Traffic Distribution | Trip Distribution | | Project No. 1935-7678<br>Date. 2026-02-19<br>Analyst. Ramy Kamal |




| Legend | 227 Decou Road, Simcoe | CROZIER CONSULTING ENGINEERS | Figure 11 |
|---|---|---|---|
| xx A.M. Peak Hour Traffic Volumes<br>(xx) P.M. Peak Hour Traffic Volumes | Trip Assignment | | Project No. 1935-7678<br>Date. 2026-02-19<br>Analyst. Ramy Kamal |

# 6.0 Future Total Conditions

This section summarize the future total conditions of the study road network. The future total traffic volumes for the horizon years consist of future background traffic volumes from the corresponding horizon year and the site generated traffic volumes from the proposed development.

## 6.1 Future Total Volume Conditions

The future total traffic modelling reflects a revised distribution of future background trips, whereby a portion of background traffic from the neighboring Woodway Trail and Calibrex Lands is reassigned to the two proposed site access points on Decou Road associated with the proposed development. This redistribution results in reduced traffic demands at other study accesses, and gives residents additional access points to their neighborhood, thereby improving overall network operations.

**Figure 12** outlines the future total distribution of the volumes from background developments with the addition of the connection to Decou Road.

## 6.2 Signal Warrant Assessment

The signal warrant followed the procedure outlined in Justification 7, Table 19 in Book 12 of the Ontario Traffic Manual (March 2012). The average hour volume was determined using the following formula from OTM Book 12:

$$AHV = (amPHV + pmPHV) / 4$$

*Where;*

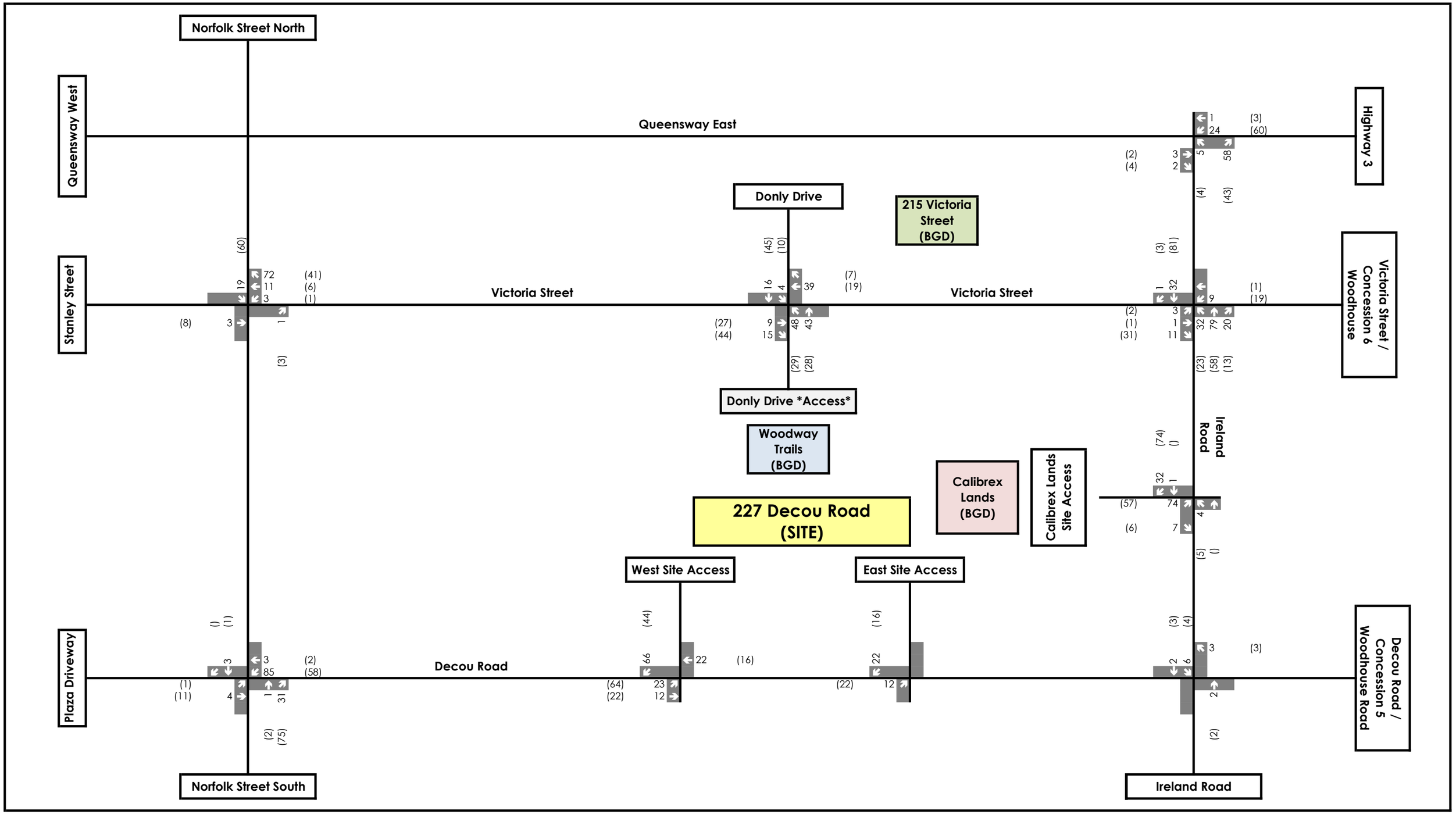
*AHV = average hour volume*
*PHV = peak hour volume*

**Table 18** outlines the justification satisfaction and summary for signal warrants. **APPENDIX F** includes the signal warrant analysis for reference.

**Table 18: Signal Warrants**

| Intersection | Justification | Satisfied | Overall Warrant | Threshold | Warranted/Not Warranted |
|---|---|---|---|---|---|
| Queensway East & Ireland Drive[1] | 1A | 91% | 104% | 120% | Not Warranted |
| | 1B | | | | |
| | 2A | 104% | | | |
| | 2B | | | | |
| Donley Drive & Victoria Street | 1A | 79% | 79% | 120% | Not Warranted |
| | 1B | | | | |
| | 2A | 47% | | | |
| | 2B | | | | |

Note 1: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.




| Legend | 227 Decou Road, Simcoe | CROZIER CONSULTING ENGINEERS | Figure 12 |
|---|---|---|---|
| xx A.M. Peak Hour Traffic Volumes<br>(xx) P.M. Peak Hour Traffic Volumes | Background Developments Re-Distributed Trip Assignment | | Project No. 1935-7678<br>Date. 2026-02-19<br>Analyst. Ramy Kamal |

### 1.1.1 Auxiliary Turn Lane Warrant

An auxiliary left-turn lane analysis was undertaken for the proposed site accesses to Decou Road. The warrant charts included in the MTO Design Supplement for Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) were used to determine a storage requirement for auxiliary turn lanes. **APPENDIX** includes the left-turn lane warrant analysis.

A review of the 2044 future total volumes found that turn lanes are not warranted for Decou Road at the Street A and Street B accesses.

## 6.3 Recommended Roadway Improvements

While no geometric or signal mitigations were found to be warranted, it is recommended that the County and MTO continue to monitored their intersections are development and growth in Simcoe proceeds. The 2044 future total conditions consider 18 years of compounded growth and the build-out of multiple developments. Accordingly, **Table 19** outlines the recommendations for consideration.

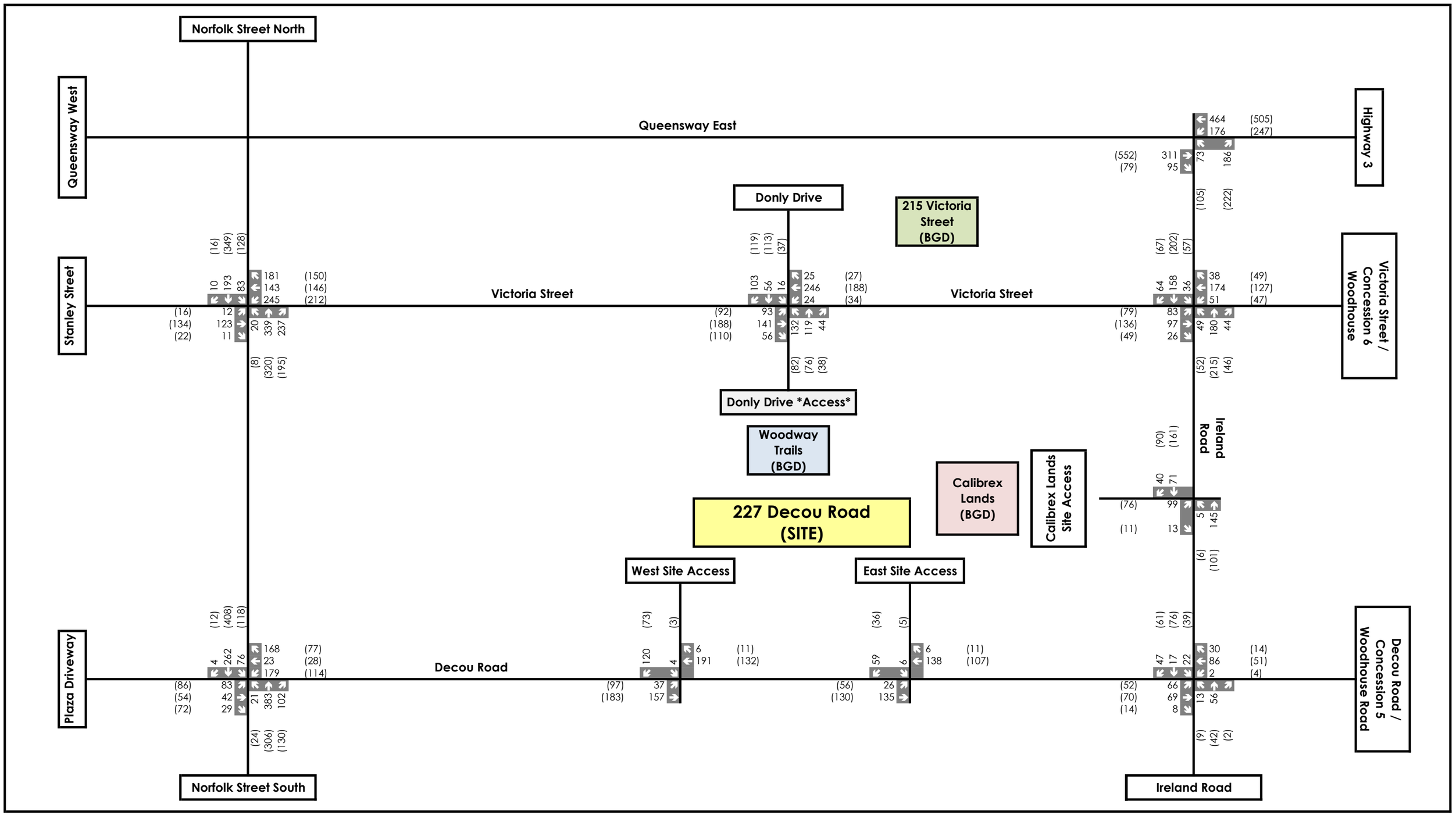
**Table 19: Future Recommendations**

| Intersection | Mitigation | Recommendation |
|---|---|---|
| Queensway East & Ireland Road | Signalization | Monitor Operations |
| Norfolk Street & Victoria Street | Signal Timing Optimization<br>Westbound Turn Lane Extension | |
| Donly Drive South & Victoria Street | Signalization | |
| Norfolk Street & Decou Drive | Westbound Turn Lane Extension | |

## 6.4 Intersection Operations

**Table 20, Table 21** and **Table 22** outline the 2034, 2039, and 2044 future total traffic operations, respectively. Synchro 12 was used to determine intersection operations at both the signalized and unsignalized study intersections. **Figure 13, Figure 14,** and **Figure 15** illustrate the 2034, 2039, and 2044 future total traffic volumes, respectively.

**APPENDIX C** contains the detailed capacity analysis worksheets.




**Legend**

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

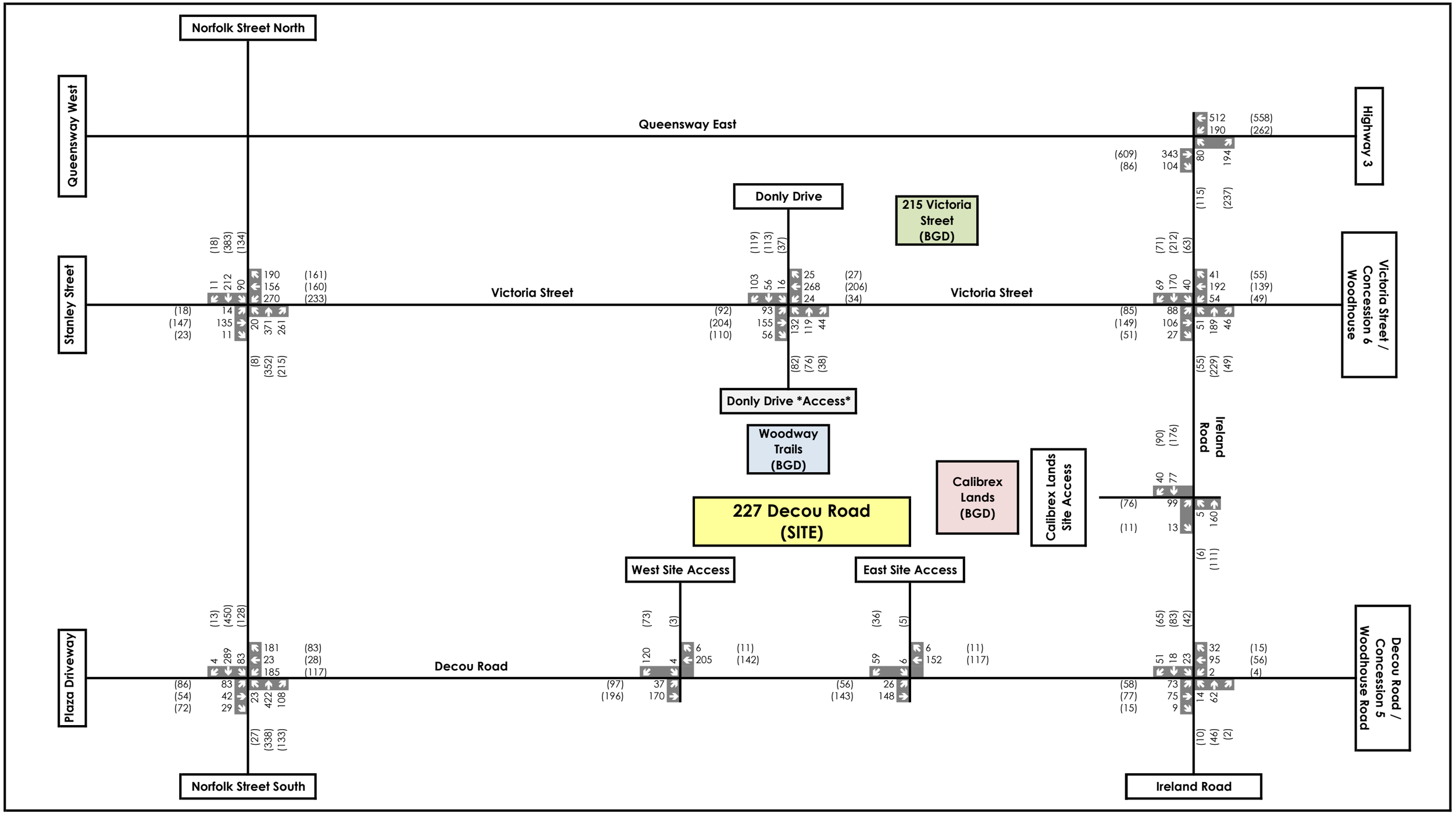
**227 Decou Road, Simcoe**

**2034 Future Total Traffic Volumes**

CROZIER CONSULTING ENGINEERS

**Figure 13**

Project No. 1935-7678
Date. 2026-02-19
Analyst. Ramy Kamal




**Legend**

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

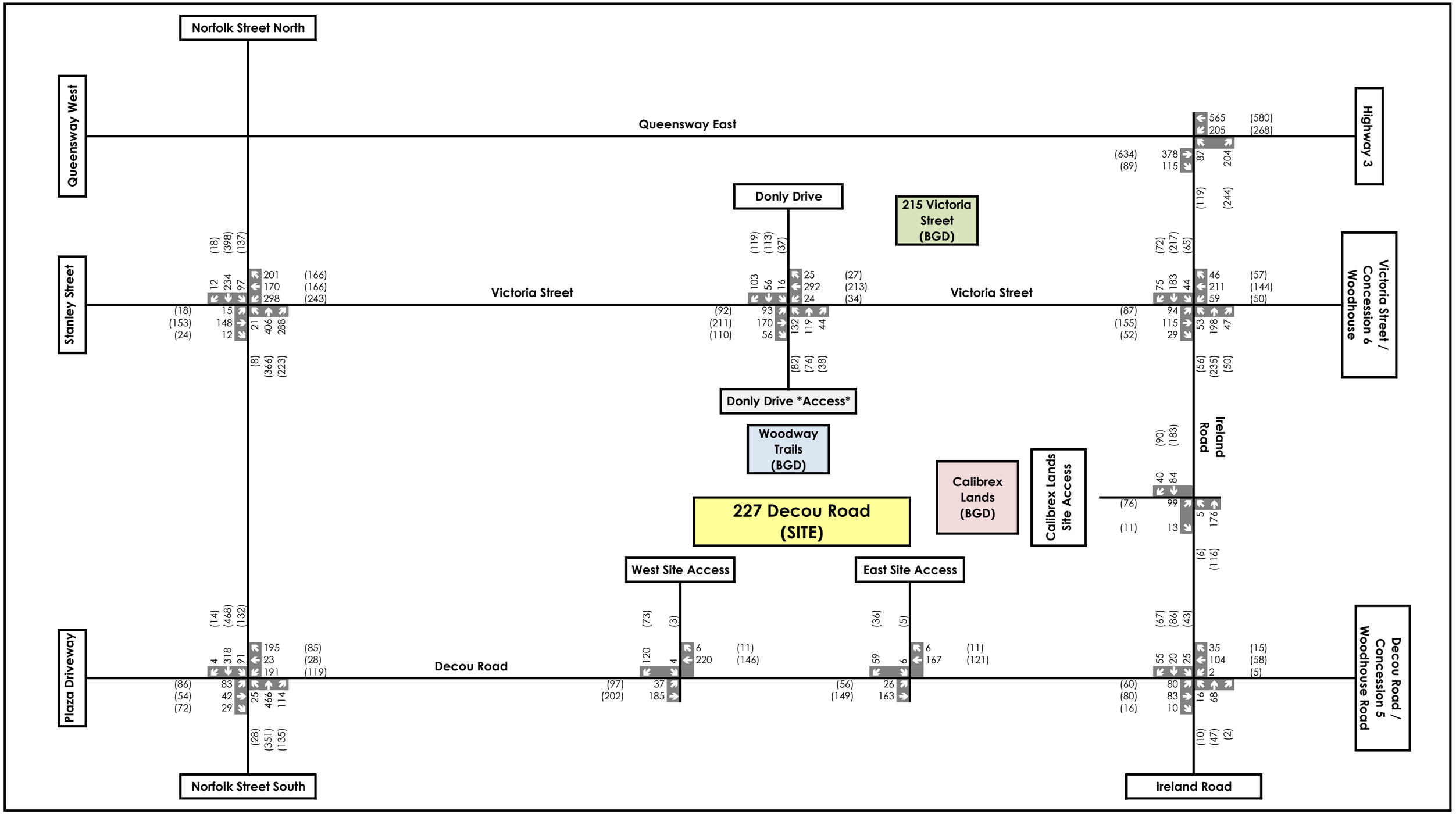
**227 Decou Road, Simcoe**

**2039 Future Total Traffic Volumes**

CROZIER CONSULTING ENGINEERS

**Figure 14**

Project No. 1935-7678
Date. 2026-02-19
Analyst. Ramy Kamal




**Legend**

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

**227 Decou Road, Simcoe**

**2044 Future Total Traffic Volumes**

CROZIER CONSULTING ENGINEERS

**Figure 15**

Project No. 1935-7678
Date. 2026-02-19
Analyst. Ramy Kamal

**Table 20: 2034 Future Total Traffic Operations**

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Queensway East/Highway 3 **(TWSC)** | **Overall** | **F** | **F** | **69.0** | **606.4** | **0.61** | **1.97** |
| | EBTR | A | A | 0.0 | 0.0 | 0.13 | 0.23 |
| | WBL | A | B | 8.9 | 10.5 | 0.17 | 0.29 |
| | WBT | A | A | 0.0 | 0.0 | 0.30 | 0.32 |
| | NBL | **F** | **F** | 69.0 | 606.4 | 0.61 | **1.97** |
| | NBR | B | B | 11.3 | 13.4 | 0.26 | 0.36 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized)** | **Overall** | **B** | **B** | **16.1** | **16.2** | **0.77** | **0.71** |
| | EBLTR | D | D | 40.1 | 40.0 | 0.61 | 0.67 |
| | WBL | D | C | 37.9 | 32.2 | 0.77 | 0.71 |
| | WBT | C | C | 22.8 | 21.7 | 0.30 | 0.30 |
| | WBR | A | A | 5.0 | 4.4 | 0.36 | 0.29 |
| | NBLT | A | B | 9.5 | 10.5 | 0.40 | 0.39 |
| | NBR | A | A | 1.4 | 1.8 | 0.28 | 0.24 |
| | SBLTR | A | B | 9.5 | 12.3 | 0.23 | 0.43 |
| Donly Drive South & Victoria Street **(AWSC)** | **Overall** | **D** | **C** | **26.4** | **21.8** | **0.75** | **0.80** |
| | EBLTR | D | D | 26.6 | 29.8 | 0.72 | 0.80 |
| | WBLTR | D | C | 29.5 | 17.6 | 0.75 | 0.54 |
| | NBLTR | D | C | 29.0 | 16.1 | 0.75 | 0.45 |
| | SBLTR | C | C | 16.3 | 18.4 | 0.44 | 0.58 |
| Ireland Road & Victoria Street/Concession6 Woodhouse Road **(AWSC)** | **Overall** | **C** | **C** | **16.3** | **18.3** | **0.58** | **0.65** |
| | EBLTR | C | C | 15.2 | 18.0 | 0.45 | 0.55 |
| | WBLTR | C | C | 16.9 | 15.9 | 0.54 | 0.47 |
| | NBLTR | C | C | 18.4 | 21.3 | 0.58 | 0.65 |
| | SBLTR | C | C | 15.6 | 19.3 | 0.45 | 0.57 |
| Ireland Road & Decou Road/Concession6 Woodhouse Road **(TWSC)** | **Overall** | **B** | **B** | **13.2** | **12.3** | **0.16** | **0.29** |
| | EBLTR | A | A | 3.7 | 3.0 | 0.05 | 0.04 |
| | WBLTR | A | A | 0.1 | 0.4 | 0.00 | 0.00 |
| | NBLTR | B | B | 13.2 | 12.1 | 0.15 | 0.10 |
| | SBLTR | B | B | 11.7 | 12.3 | 0.16 | 0.29 |
| Norfolk Street & Decou Road/Plaza Driveway **(Signalized)** | **Overall** | **B** | **B** | **13.1** | **11.0** | **0.60** | **0.43** |
| | EBLT | C | C | 26.4 | 27.9 | 0.44 | 0.42 |
| | EBR | A | A | 6.1 | 6.5 | 0.07 | 0.17 |
| | WBL | C | C | 30.9 | 29.1 | 0.60 | 0.43 |
| | WBTR | A | A | 6.1 | 9.6 | 0.38 | 0.24 |
| | NBLTR | A | A | 9.9 | 6.9 | 0.35 | 0.28 |
| | SBLTR | A | A | 8.3 | 7.0 | 0.30 | 0.41 |
| Decou Road & West Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.7** | **13.0** | **0.16** | **0.09** |
| | EBLT | A | A | 1.7 | 3.1 | 0.03 | 0.07 |
| | WBTR | A | A | 0.0 | 0.0 | 0.13 | 0.09 |

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| | SBL | B | B | 11.7 | 13.0 | 0.01 | 0.01 |
| | SBR | B | A | 10.2 | 9.4 | 0.16 | 0.09 |
| Decou Road & East Site Access **(TWSC)** | **Overall** | **B** | **B** | **10.8** | **11.1** | **0.09** | **0.08** |
| | EBLT | A | A | 1.4 | 2.5 | 0.02 | 0.04 |
| | WBTR | A | A | 0.0 | 0.0 | 0.09 | 0.08 |
| | SBL | B | B | 10.8 | 11.1 | 0.01 | 0.01 |
| | SBR | A | A | 9.3 | 9.0 | 0.07 | 0.04 |
| Ireland Road & Calibrex Lands Site Access **(TWSC)** | **Overall** | **B** | **B** | **10.9** | **11.4** | **0.15** | **0.16** |
| | EBL | B | B | 10.9 | 11.4 | 0.15 | 0.13 |
| | EBR | A | A | 8.8 | 9.5 | 0.01 | 0.01 |
| | NBLT | A | A | 0.3 | 0.5 | 0.00 | 0.01 |
| | SBTR | A | A | 0.0 | 0.0 | 0.07 | 0.16 |

**Table 21: 2039 Future Total Traffic Operations**

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Queensway East/Highway 3 **(TWSC)** | **Overall** | **F** | **F** | **122.3** | **1044.0** | **0.84** | **2.87** |
| | EBTR | A | A | 0.0 | 0.0 | 0.15 | 0.25 |
| | WBL | A | B | 9.1 | 11.1 | 0.19 | 0.32 |
| | WBT | A | A | 0.0 | 0.0 | 0.33 | 0.35 |
| | NBL | **F** | **F** | 122.3 | 1044.0 | 0.84 | **2.87** |
| | NBR | B | B | 11.7 | 14.5 | 0.28 | 0.40 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized)** | **Overall** | **B** | **B** | **17.9** | **17.3** | **0.86** | **0.78** |
| | EBLTR | D | D | 40.8 | 40.5 | 0.65 | 0.69 |
| | WBL | D | D | 46.7 | 36.7 | 0.86 | 0.78 |
| | WBT | C | C | 22.4 | 21.3 | 0.32 | 0.32 |
| | WBR | A | A | 4.8 | 4.3 | 0.37 | 0.30 |
| | NBLT | B | B | 10.1 | 11.3 | 0.44 | 0.43 |
| | NBR | A | A | 1.5 | 1.9 | 0.30 | 0.27 |
| | SBLTR | B | B | 10.3 | 13.6 | 0.26 | 0.48 |
| Donly Drive South & Victoria Street **(AWSC)** | **Overall** | **D** | **C** | **32.6** | **24.6** | **0.84** | **0.84** |
| | EBLTR | D | D | 33.1 | 35.0 | 0.79 | 0.84 |
| | WBLTR | E | C | 39.0 | 19.6 | 0.84 | 0.59 |
| | NBLTR | D | C | 34.0 | 16.9 | 0.79 | 0.47 |
| | SBLTR | C | C | 17.7 | 19.5 | 0.47 | 0.59 |
| Ireland Road & Victoria Street/Concession6 Woodhouse Road **(AWSC)** | **Overall** | **C** | **C** | **18.9** | **23.0** | **0.64** | **0.74** |
| | EBLTR | C | C | 17.2 | 22.5 | 0.50 | 0.64 |
| | WBLTR | C | C | 20.3 | 19.1 | 0.62 | 0.55 |
| | NBLTR | C | D | 21.6 | 28.1 | 0.64 | 0.74 |
| | SBLTR | C | C | 17.8 | 23.9 | 0.51 | 0.65 |
| Ireland Road & Decou Road/Concession6 Woodhouse Road **(TWSC)** | **Overall[3]** | **B** | **B** | **14.0** | **13.0** | **0.18** | **0.32** |
| | EBLTR | A | A | 3.8 | 3.1 | 0.06 | 0.04 |
| | WBLTR | A | A | 0.1 | 0.4 | 0.00 | 0.00 |
| | NBLTR | B | B | 14.0 | 12.6 | 0.18 | 0.12 |
| | SBLTR | B | B | 12.2 | 13.0 | 0.17 | 0.32 |
| Norfolk Street & Decou Road/Plaza Driveway **(Signalized)** | **Overall** | **B** | **B** | **13.2** | **11.2** | **0.61** | **0.46** |
| | EBLT | C | C | 26.2 | 27.9 | 0.45 | 0.42 |
| | EBR | A | A | 6.0 | 6.5 | 0.07 | 0.17 |
| | WBL | C | C | 30.7 | 29.2 | 0.61 | 0.44 |
| | WBTR | A | A | 5.9 | 9.4 | 0.39 | 0.26 |
| | NBLTR | B | A | 10.6 | 7.4 | 0.39 | 0.31 |
| | SBLTR | A | A | 8.7 | 7.8 | 0.35 | 0.46 |
| Decou Road & West Site Access **(TWSC)** | **Overall** | **B** | **B** | **12.0** | **13.3** | **0.16** | **0.10** |
| | EBLT | A | A | 1.6 | 3.0 | 0.03 | 0.07 |
| | WBTR | A | A | 0.0 | 0.0 | 0.14 | 0.10 |

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| | SBL | B | B | 12.0 | 13.3 | 0.01 | 0.01 |
| | SBR | B | A | 10.3 | 9.5 | 0.16 | 0.09 |
| Decou Road & East Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.0** | **11.3** | **0.10** | **0.08** |
| | EBLT | A | A | 1.3 | 2.4 | 0.02 | 0.04 |
| | WBTR | A | A | 0.0 | 0.0 | 0.10 | 0.08 |
| | SBL | B | B | 11.0 | 11.3 | 0.01 | 0.01 |
| | SBR | A | A | 9.4 | 9.1 | 0.07 | 0.04 |
| Ireland Road & Calibrex Lands Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.1** | **11.7** | **0.15** | **0.17** |
| | EBL | B | B | 11.1 | 11.7 | 0.15 | 0.13 |
| | EBR | A | A | 8.9 | 9.6 | 0.01 | 0.02 |
| | NBLT | A | A | 0.2 | 0.5 | 0.00 | 0.01 |
| | SBTR | A | A | 0.0 | 0.0 | 0.07 | 0.17 |

**Table 22: 2044 Future Total Traffic Operations**

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Queensway East/Highway 3 **(TWSC)** | **Overall** | **F** | **F** | **237.2** | **15.0** | **1.15** | **3.37** |
| | EBTR | A | A | 0.0 | 0.0 | 0.16 | 0.26 |
| | WBL | A | B | 9.4 | 11.4 | 0.22 | 0.34 |
| | WBT | A | A | 0.0 | 0.0 | 0.36 | 0.36 |
| | NBL | **F** | **F** | 237.2 | >1000 | **1.15** | **3.37** |
| | NBR | B | C | 12.2 | 15.0 | 0.31 | 0.42 |
| Ireland Road & Queensway East/Highway 3 **(Signalized)** | **Overall** | **B** | **B** | **17.0** | **15.0** | **0.73** | **0.85** |
| | EBTR | B | B | 12.3 | 10.2 | 0.35 | 0.39 |
| | WBL | C | D | 25.1 | 37.6 | 0.63 | 0.85 |
| | WBT | C | B | 24.0 | 14.1 | 0.73 | 0.58 |
| | NBL | B | C | 19.3 | 28.2 | 0.12 | 0.22 |
| | NBR | A | A | 0.2 | 0.2 | 0.14 | 0.16 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized)** | **Overall** | **C** | **B** | **20.7** | **18.0** | **0.95** | **0.82** |
| | EBLTR | D | D | 41.0 | 40.5 | 0.67 | 0.70 |
| | WBL | E | D | 62.9 | 40.2 | **0.95** | 0.82 |
| | WBT | C | C | 22.1 | 21.2 | 0.34 | 0.33 |
| | WBR | A | A | 4.6 | 4.2 | 0.38 | 0.31 |
| | NBLT | B | B | 10.8 | 11.7 | 0.49 | 0.45 |
| | NBR | A | A | 1.5 | 1.9 | 0.33 | 0.27 |
| | SBLTR | B | B | 11.1 | 14.2 | 0.31 | 0.51 |
| Norfolk Street & Victoria Street/Stanley Street **(Signalized – Optimized)** | **Overall** | **B** | **B** | **17.7** | **17.5** | **0.85** | **0.77** |
| | EBLTR | D | D | 41.1 | 40.7 | 0.67 | 0.70 |
| | WBL | D | C | 41.0 | 34.3 | 0.85 | 0.77 |
| | WBT | C | C | 20.3 | 20.3 | 0.31 | 0.31 |
| | WBR | A | A | 4.2 | 4.0 | 0.36 | 0.30 |
| | NBLT | B | B | 12.1 | 12.4 | 0.52 | 0.46 |
| | NBR | A | A | 1.6 | 1.9 | 0.34 | 0.28 |
| | SBLTR | B | B | 12.5 | 15.0 | 0.33 | 0.52 |
| Donly Drive South & Victoria Street **(AWSC)** | **Overall** | **E** | **D** | **41.4** | **26.3** | **0.93** | **0.87** |
| | EBLTR | E | E | 42.2 | 38.4 | **0.86** | 0.87 |
| | WBLTR | **F** | C | 54.5 | 20.6 | **0.93** | 0.61 |
| | NBLTR | E | C | 38.5 | 17.4 | 0.82 | 0.48 |
| | SBLTR | C | C | 19.5 | 20.1 | 0.50 | 0.60 |
| Donly Drive South & Victoria Street **(Signalized)** | **Overall** | **B** | **B** | **15.5** | **14.1** | **0.69** | **0.75** |
| | EBLTR | B | C | 19.3 | 20.6 | 0.69 | 0.75 |
| | WBLTR | B | B | 14.9 | 12.2 | 0.60 | 0.46 |
| | NBLTR | B | B | 17.9 | 10.9 | 0.66 | 0.40 |
| | SBLTR | A | A | 5.8 | 8.5 | 0.31 | 0.43 |

| Intersection | Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Movement | LOS | | Delay (s) | | v/c ratio | |
| | | AM | PM | AM | PM | AM | PM |
| Ireland Road & Victoria Street/Concession6 Woodhouse Road **(AWSC)** | **Overall** | **C** | **D** | **24.0** | **25.5** | **0.73** | **0.78** |
| | EBLTR | C | C | 21.0 | 25.0 | 0.58 | 0.68 |
| | WBLTR | D | C | 27.6 | 20.8 | 0.73 | 0.58 |
| | NBLTR | D | D | 27.7 | 31.9 | 0.72 | 0.78 |
| | SBLTR | C | D | 21.6 | 26.3 | 0.59 | 0.69 |
| Ireland Road & Decou Road/Concession6 Woodhouse Road **(TWSC)** | **Overall** | **B** | **B** | **14.9** | **13.4** | **0.21** | **0.34** |
| | EBLTR | A | A | 3.9 | 3.1 | 0.06 | 0.04 |
| | WBLTR | A | A | 0.1 | 0.5 | 0.00 | 0.00 |
| | NBLTR | B | B | 14.9 | 12.9 | 0.21 | 0.13 |
| | SBLTR | B | B | 12.9 | 13.4 | 0.20 | 0.34 |
| Norfolk Street & Decou Road/Plaza Driveway **(Signalized)** | **Overall** | **B** | **B** | **12.5** | **10.7** | **0.52** | **0.48** |
| | EBLT | C | C | 29.9 | 28.0 | 0.52 | 0.42 |
| | EBR | A | A | 6.4 | 6.5 | 0.07 | 0.17 |
| | WBL | C | C | 29.1 | 26.2 | 0.52 | 0.30 |
| | WBTR | A | A | 6.3 | 9.4 | 0.42 | 0.26 |
| | NBLTR | B | A | 10.3 | 7.6 | 0.41 | 0.32 |
| | SBLTR | A | A | 8.0 | 8.2 | 0.39 | 0.48 |
| Decou Road & West Site Access **(TWSC)** | **Overall** | **B** | **B** | **12.3** | **13.4** | **0.16** | **0.10** |
| | EBLT | A | A | 1.5 | 3.0 | 0.03 | 0.07 |
| | WBTR | A | A | 0.0 | 0.0 | 0.14 | 0.10 |
| | SBL | B | B | 12.3 | 13.4 | 0.01 | 0.01 |
| | SBR | B | A | 10.4 | 9.5 | 0.16 | 0.09 |
| Decou Road & East Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.3** | **11.4** | **0.11** | **0.08** |
| | EBLT | A | A | 1.2 | 2.3 | 0.02 | 0.04 |
| | WBTR | A | A | 0.0 | 0.0 | 0.11 | 0.08 |
| | SBL | B | B | 11.3 | 11.4 | 0.01 | 0.01 |
| | SBR | A | A | 9.5 | 9.1 | 0.07 | 0.04 |
| Ireland Road & Calibrex Lands Site Access **(TWSC)** | **Overall** | **B** | **B** | **11.3** | **11.8** | **0.16** | **0.17** |
| | EBL | B | B | 11.3 | 11.8 | 0.16 | 0.14 |
| | EBR | A | A | 8.9 | 9.6 | 0.01 | 0.02 |
| | NBLT | A | A | 0.2 | 0.5 | 0.00 | 0.01 |
| | SBTR | A | A | 0.0 | 0.0 | 0.08 | 0.17 |

Under the future total ultimate (2044) horizon year, the Ireland Road & Queensway East intersection is expected to operate with significant delays at the stop-controlled northbound approach. Due to the delays at the stop-controlled approach the intersection operates at an LOS "F" during the a.m. and p.m. peak periods. These operations are consistent with Future Background operations and reflect the need for signalization, even if not warranted. Under signalized conditions, the intersection is forecasted to operate well with less than 40 s of delay and capacity for future growth.

The signalized intersection of Norfolk Street and Victoria Street is expected to operate at an LOS "C" and "B" during the a.m. and p.m. peak hours, respectively. The westbound left turn is expected to operate critically, with a v/c ratio of 0.95 and 0.82 during the a.m. and p.m. peak hours, respectively. It is noted that the operations are expected to improve from future background to future total conditions as volumes are redistributed to the Decou Road accesses. Further operational improvement can also be achieved with optimization of the existing signal timings.

The signalized intersection of Norfolk Street and Decou Road is expected to operate at an LOS "B" during the a.m. and p.m. peak hours. The intersection is forecasted to operate will with acceptable delay and reserve capacity to accommodate future growth.

The Donly Drive & Victoria Street intersection is forecasted to operate with a LOS "E" and LOS "D" in the a.m. and p.m. peak hours respectively. The westbound movement of the all-way stop controlled intersection is expected to experience an increase in delay of 18.5 s and an increase in volume-to-capacity ratio of 0.11 over future background conditions in the a.m. peak hour. Under signalized conditions the intersection is forecasted to operate well with 20 s or less of delay. Ongoing monitoring of the intersection is recommended to determine if and when signalization is required as it is not warranted in the 2044 future total horizon.

The remaining unsignalized intersections, including the proposed site accesses, are expected to operate acceptably with acceptable delays and capacity for further growth.

### 6.5 Future Total Queueing Assessment

**Table 23**, **Table 24**, and **Table 25** outline the results of the 2034, 2039, and 2044 future total queuing assessments, respectively.

**Table 23: 2034 Future Total Conditions Queuing Assessment**

| Intersection | Performance Metrics | | | |
|---|---|---|---|---|
| | Movement | 95th Percentile Queue Length (m) | | Auxiliary Lane Storage Length (m) |
| | | AM | PM | |
| Ireland Road & Queensway East/Highway 3 | WBL | 5 | 15 | 175 |
| | NBL | 25 | 85 | 121 |
| Norfolk Street & Stanley Street/Victoria Street | WBL | **55** | 40 | 48 |
| | WBR | 15 | 15 | 231 |
| Norfolk Street & Decou Road | WBL | **40** | 30 | 35 |

Note 1: 95th percentile queue lengths exceeding the provided auxiliary lane storage length are bolded and highlighted.
Note 2: Queues are rounded up to the nearest 5m.

**Table 24: 2039 Future Total Conditions Queuing Assessment**

| Intersection | Performance Metrics | | | |
|---|---|---|---|---|
| | Movement | 95th Percentile Queue Length (m) | | Auxiliary Lane Storage Length (m) |
| | | AM | PM | |
| Ireland Road & Queensway East/Highway 3 | WBL | 10 | 15 | 175 |
| | NBL | 40 | 105 | 121 |
| Norfolk Street & Stanley Street/Victoria Street | WBL | **65** | 45 | 48 |
| | WBR | 15 | 15 | 231 |
| Norfolk Street & Decou Road | WBL | **45** | 35 | 35 |

Note 1: 95th percentile queue lengths exceeding the provided auxiliary lane storage length are bolded and highlighted.
Note 2: Queues are rounded up to the nearest 5m.

As outlined in **Table 23** and **Table 24**, the westbound left-turn movements at the intersection of Norfolk Street and Victoria Street as well as Norfolk Street and Decou Road are forecasted to occasionally extend beyond the provided storage length, during the a.m. peak period only. The 95th percentile queueing at Norfolk Street and Victoria Street is expected to be reduced with the development of the subject lands over background conditions, however the redistribution results in a forecasted increase to the queuing on Decou Road.

**Table 25: 2044 Future Total Conditions Queuing Assessment**

| Intersection | Performance Metrics | | | |
|---|---|---|---|---|
| | Movement | 95th Percentile Queue Length (m) | | Auxiliary Lane Storage Length (m) |
| | | AM | PM | |
| Ireland Road & Queensway East/Highway 3 | WBL | 10 | 15 | 175 |
| | NBL | 55 | **>175** | 121 |
| Norfolk Street & Stanley Street/Victoria Street | WBL | **75** | **50** | 48 |
| | WBR | 15 | 15 | 231 |
| Norfolk Street & Decou Road | WBL | **45** | 35 | 35 |

Note 1: 95th percentile queue lengths exceeding the provided auxiliary lane storage length are bolded and highlighted.
Note 2: Queues are rounded up to the nearest 5m.

As outlined in **Table 25**, the northbound left movement at the intersection of Ireland Road & Queensway East/Highway 3 is forecasted to exceed the available storage. With signalization of the intersection the 95th percentile queue is anticipated to be reduced. The 95th percentile queuing at the intersection of Norfolk Street and Victoria Street is forecasted to exceed the available storage by three vehicles in the a.m. peak hour and less than one vehicle in the p.m. peak hour, which is a reduction over future background conditions. The westbound left 95th percentile queue at the intersection of Norfolk Street and Decou Road is anticipated to exceed the available storage by less than 2 vehicles in the a.m. peak hour. Extension of the left turn lanes could be considered at both intersection if geometrically beneficial.

# 7.0 Site Access Review

The development proposal includes two site accesses at Decou Road that will provide transportation servicing to and from the site. This section evaluates the suitability of the site accesses from a transportation safety perspective and recommends mitigation measures, if warranted. The safety review of the accesses includes an assessment of whether turning maneuvers can be made safely at the site accesses without issues related to sight lines and intersection spacing.

## 7.1 Norfolk County By-Law

The Norfolk County Entrance By-Law 2016-32 provides entrance requirements for different speed limits. In general, Norfolk County does not permit new entrances under the following conditions:

- Along a lane which is identified for the purpose of an exclusive vehicular turning movement.
- In close proximity to intersections and bridges.
- On unimproved/non maintained unopened road allowances.
- Where the minimum sight distance requirements outlined in **Table 26** are not met.

**Table 26: Sight Distance Requirements**

| Speed Limit | Minimum Distance |
|---|---|
| 40 km/h | 100 meters |
| 50 km/h | 120 meters |
| 60 km/h | 140 meters |
| 70 km/h | 160 meters |
| 80 km/h | 180 meters |
| 90 km/h | 180 meters |

**Table 27** outlines the sight distance requirements and compares them to the available sight distance, which was measured in a field assessment. **APPENDIX** contains relevant ZBL excerpts.

**Table 27: Intersection Sight Distance Assessment**

| **Decou Road and Eastern Site Access<br>Posted Speed = 50 km/h** | | |
|---|---|---|
| **Movement** | **Left Turn** | **Right Turn** |
| Required Sight Distance | 120m | 120m |
| Available Sight Distance | ~125m (looking west) | >200m (looking east) |
| **Decou Road and Western Site Access<br>Posted Speed = 50 km/h** | | |
| **Movement** | **Left Turn** | **Right Turn** |
| Required Sight Distance | 120m | 120m |
| Available Sight Distance | >200m (looking west) | >200m (looking east) |

Due to the vertical curvature along Decou Road, a field observation of driver sightlines was undertaken to confirm adequacy of the driver sightlines. Excerpts of field observations are included in **APPENDIX** . It is recommended that foliage within the daylighting triangles at the site access intersections be trimmed and maintained to ensure the available sight distance is maintained.

## 7.2 Intersection Geometry

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) was used to review the locations of the recommended site accesses. For this analysis, Decou Road was considered a collector crossroad.

### *7.2.1 Intersection Spacing*

The TAC GDGCR Section 9.4.2 recommends the spacing of intersections along a roadway. As previously noted, we have assumed Decou Road to be a collector road. **Table 28** outlines the required intersection spacing as well as the approximate centreline-to-centreline measurements.

**Table 28: Intersection Spacing Assessment**

| Site Access | Nearest Intersecting Streets | Available Spacing | TAC Required Separation Distance | Satisfied? |
|---|---|---|---|---|
| Street A | Willow Wood Drive | 700 m | 60 m | Yes |
| Street B | Street A | 280 m | 60 m | Yes |
| | Ireland Road and Decou Road | 400 m | 60 m | Yes |

As the proposed site accesses meet the spacing requirements set out in the TAC GDGCR.

### *7.2.2 Intersection Angles*

The intersection of Street A (west access) and Decou Road meets at an angle of approximately 81 degrees. The intersection of Street B (east access) and Decou Road meets at an angle of approximately 86 degrees. This intersection angle is which the acceptable range of 70 degrees to 110 degrees outlines in Figure 9.2.1 of TAC GDGCR. All internal intersections are planned to meet at a 90 degree angle.

### *7.2.3 Daylighting Triangles*

Norfolk County's Zoning By-law requires sight triangles (otherwise known as daylighting triangles) to be measured at nine metres along street lines. An amendment to the zoning provisions is being sought to reduce the daylighting triangles to 6 m by 6 m, which exceeds the requirements of neighbouring municipalities and is consistent with standards found throughout the province.

## 8.0 Parking Review

While still in its conceptual stage, the following sections reviews the adequacy of the parking supply of the proposed development.

### 8.1 Off-Street Parking

The parking review includes an assessment of the proposed parking supply of the development against the requirements outlined in the Norfolk County Zoning By-Law 1-Z-2014 (ZBL) requirements. Section 4.9 of the ZBL was reviewed to determine the parking requirements of the proposed development**. Table 29** outlines the required parking supply for the development.

**Table 29: Zoning By-Law Total Parking Review**

| Land Use | Number of Dwelling Units | Minimum Vehicle Parking Rates | Parking Spaces Required |
|---|---|---|---|
| Detached Homes | 125 | 2 spaces per dwelling unit | 808 |
| Townhouse Homes | 279 | | |

As outlined in **Table 29,** Norfolk County requires the proposed development to provide a total of 808 vehicle parking spaces, which is two (2) spaces for each residential dwelling unit. The units will provide one garage parking space and one driveway parking space to meet the required parking supply.

### 8.2 On-Street Parking

An On-Street Parking Plan has been prepared by the Biglieri Group (February 5, 2026). The plan review the available on-street parking on one side of the proposed roadways. A total of 152 on-street parking spaces are effectively available based on the plan. The On-Street Parking Plan has been included in **APPENDIX I** for reference.

# 9.0 Conclusions

Existing Conditions

Under 2025 existing conditions, the intersection of Ireland Road & Queensway East is operating well apart from the northbound left movement in the p.m. peak hour, which experiences a minute of delay. Due to the delays at the stop-controlled approach the intersection operates at an LOS "D" and "F" during the a.m. and p.am. peak hour periods, respectively.

The remaining intersections are not expected to experience any critical movements, and minimal delays, signifying that the intersections have reserve capacity to accommodate future increases in traffic volumes

Future Background Conditions

With growth of existing volumes by 2% per year and the addition of three background developments, the following operations are forecasted for the 2044 horizon year:

The intersection of Ireland Road & Queensway East is expected to operate with significant delays at the stop-controlled northbound approach. Due to the delays at the stop-controlled approach the intersection operates at an LOS "F" during the a.m. and p.m. peak periods. The intersection does not warrant signalization, but monitoring of the intersection is recommended.

The Donly Drive South & Victoria Street intersection is expected to operate at a LOS "E" in the westbound direction during the a.m. peak hour and the eastbound movements during the p.m. peak period. The 95$^{th}$ percentile queue for the westbound left movement is forecasted to exceed the existing storage length.

The remaining intersections are forecasted to operate at a LOS "C" or better during the a.m. and p.m. peak periods. The remaining intersections are forecasted to experience acceptable delays and have reserve capacity to accommodate existing growth on the road network.

Site Generated Traffic

For the purposes of a conservative trip generation assessment, the site was assessed with a maximum number of townhouses at 509 units. The full build-out of the development is forecasted to generate 214 and 121 two-way trips in the a.m. and p.m. peak hours, respectively.

Future Total Conditions

Under the 2044 future total conditions, the Ireland Road & Queensway East intersection is expected to operate with significant delays at the stop-controlled northbound approach. These operations are consistent with Future Background operations and reflect the need for signalization.

The Donly Drive & Victoria Street intersection is forecasted to operate with a LOS "E" and LOS "D" in the a.m. and p.m. peak hours respectively. Under signalized conditions the intersection is forecasted to operate well with 20 s or less of delay. Ongoing monitoring of the intersection is recommended to determine if and when signalization is required as it is not warranted.

The 95th percentile queuing at the intersection of Norfolk Street and Victoria Street is forecasted to exceed the available storage by three vehicles in the a.m. peak hour and less than one vehicle in the p.m. peak hour, which is a reduction over future background conditions. The westbound left 95$^{th}$

percentile queue at the intersection of Norfolk Street and Decou Road is anticipated to exceed the available storage by less than 2 vehicles in the a.m. peak hour.

The remaining study intersections, including the proposed site accesses, are expected to operate acceptably with acceptable delays and capacity for further growth.

Recommendations

As consistent with background development reports, signalization of study intersections is not warranted. Ongoing monitoring is recommended as growth in the area occurs to confirm the need and timeline for the following recommendations:

- The Signalization of Queensway East & Ireland Road is a key recommendation triggered by the background growth of the network.
- Signal timing optimization of Norfolk and Victoria Street.

The following recommendations are not required to support future network volumes but are flagged to be monitored as growth of road network volumes proceeds.

- Westbound turn lane extension at the intersection of Norfolk and Victoria Street and the intersection of Norfolk Street and Decou Drive.
- Signalization of Victoria Street and Donly Drive.

In conclusion, the proposed development can be supported from a transportation operations and safety perspective.

The analysis undertaken in this study considers a conservative trip generation and reflect the February 17, 2026, Conceptual Site Plan. Any minor changes in the plan are not anticipated to impact the findings and conclusions of this report.

Respectfully submitted by,

**C.F. CROZIER & ASSOCIATES INC.**

Ramy Kamal
Engineering Intern, Transportation

**C.F. CROZIER & ASSOCIATES INC.**

Kerianne Hagan, P.Eng.
Project Engineer, Transportation

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# APPENDIX A

## Transportation Data

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

## Morning Peak Diagram

**Specified Period**
**From:** 6:00:00
**To:** 10:00:00

**One Hour Peak**
**From:** 8:30:00
**To:** 9:30:00

**Municipality:** Norfolk
**Site #:** 2518700001
**Intersection:** Queensway East & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

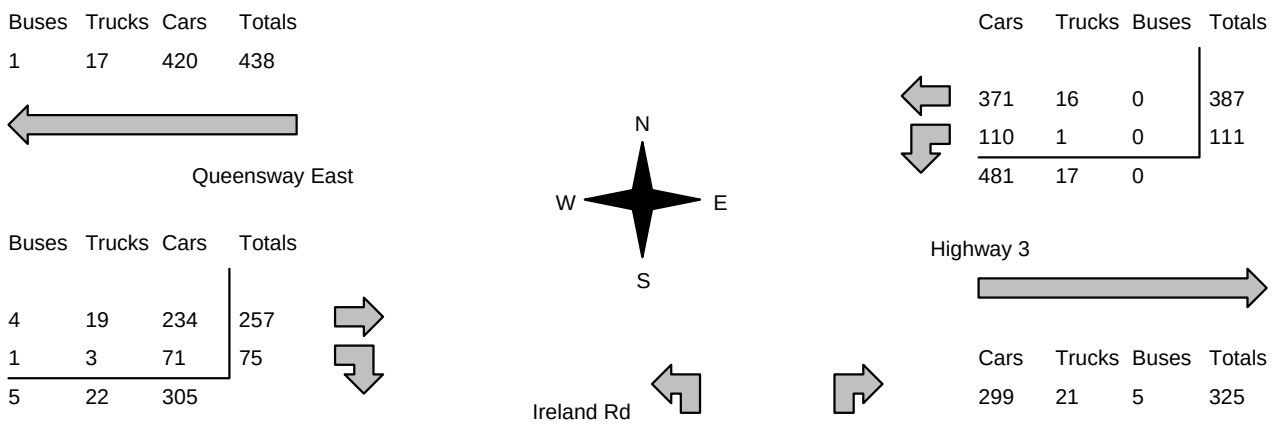
**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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

East Leg Total: 823
East Entering: 498
East Peds: 0
Peds Cross: ⧖




Peds Cross: ⧖
West Peds: 0
West Entering: 332
West Leg Total: 770

Cars 181
Trucks 4
Buses 1
Totals 186

Cars 49 65 114
Trucks 1 2 3
Buses 1 1 2
Totals 51 68

Peds Cross: ⋈
South Peds: 0
South Entering: 119
South Leg Total: 305

## Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 19:00:00

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

**Municipality:** Norfolk
**Site #:** 2518700001
**Intersection:** Queensway East & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

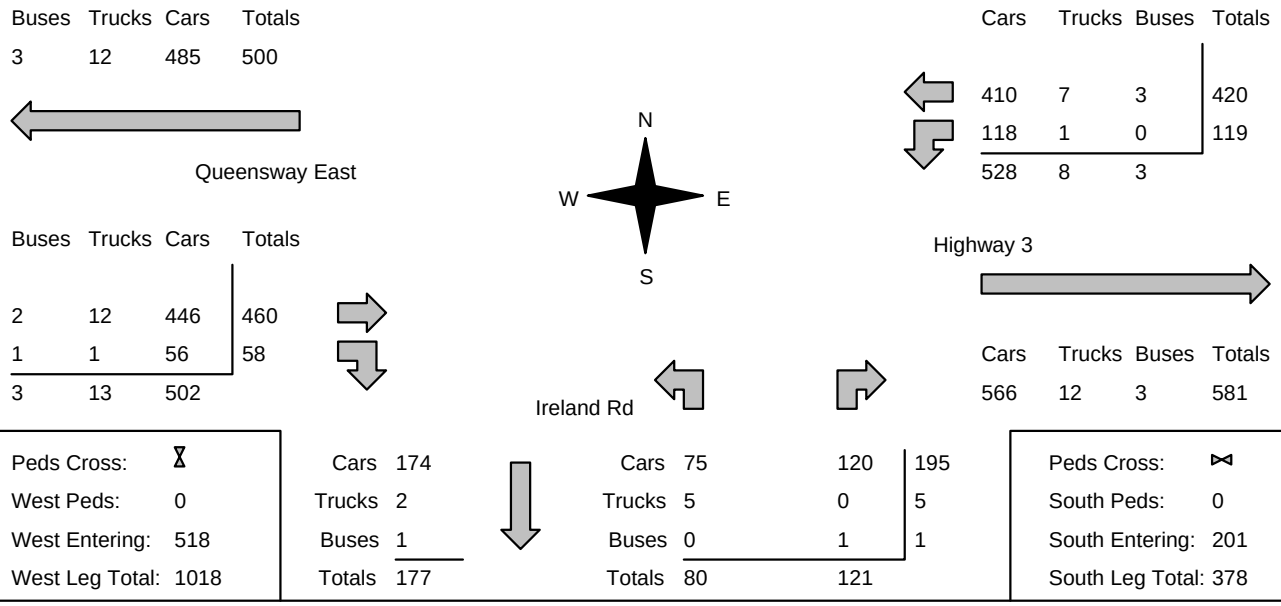
**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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

East Leg Total: 1120
East Entering: 539
East Peds: 0
Peds Cross: ⧖




Peds Cross: ⧖
West Peds: 0
West Entering: 518
West Leg Total: 1018

Cars 174
Trucks 2
Buses 1
Totals 177

Cars 75 120 195
Trucks 5 0 5
Buses 0 1 1
Totals 80 121

Peds Cross: ⋈
South Peds: 0
South Entering: 201
South Leg Total: 378

### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

## Total Count Diagram

**Municipality:** Norfolk
**Site #:** 2518700001
**Intersection:** Queensway East & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

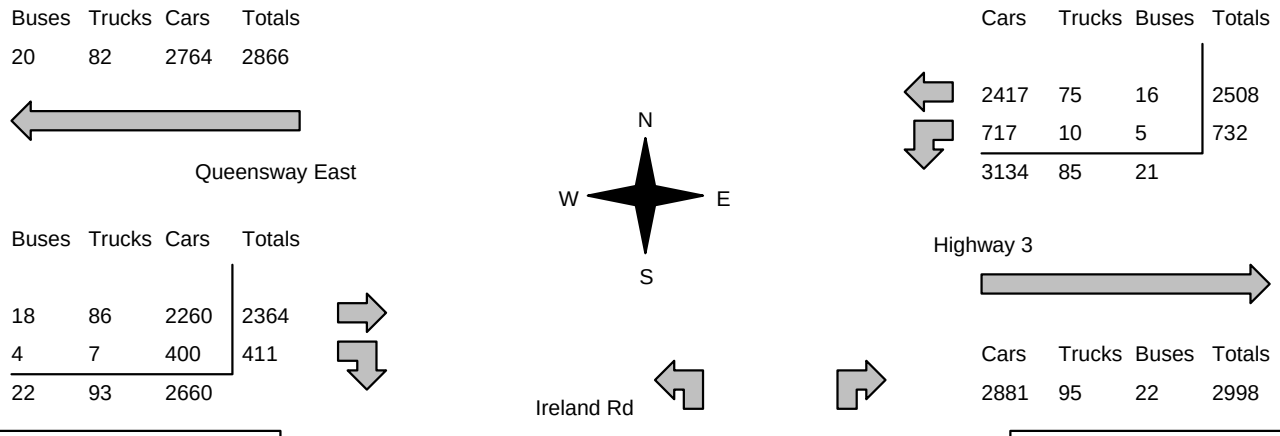
**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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

East Leg Total: 6238
East Entering: 3240
East Peds: 0
Peds Cross: ⧖




Peds Cross: ⧖
West Peds: 0
West Entering: 2775
West Leg Total: 5641

Cars 1117
Trucks 17
Buses 9
Totals 1143

Cars 347 621 968
Trucks 7 9 16
Buses 4 4 8
Totals 358 634

Peds Cross: ⋈
South Peds: 0
South Entering: 992
South Leg Total: 2135

### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

# Traffic Count Summary

**Intersection:** Queensway East & Ireland Rd | **Count Date:** 26-Nov-25 | **Municipality:** Norfolk

## North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *0* | *0* | *0* | *0* | *0* |
| *8:00:00* | *0* | *0* | *0* | *0* | *0* |
| *9:00:00* | *0* | *0* | *0* | *0* | *0* |
| *10:00:00* | *0* | *0* | *0* | *0* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *0* | *0* | *0* | *0* | *0* |
| *17:00:00* | *0* | *0* | *0* | *0* | *0* |
| *18:00:00* | *0* | *0* | *0* | *0* | *0* |
| *19:00:00* | *0* | *0* | *0* | *0* | *0* |
| Totals: | 0 | 0 | 0 | 0 | 0 |

North/South Total Approaches: 992

## South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *20* | *0* | *26* | *46* | *0* |
| *8:00:00* | *35* | *0* | *72* | *107* | *0* |
| *9:00:00* | *42* | *0* | *84* | *126* | *0* |
| *10:00:00* | *51* | *0* | *61* | *112* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *81* | *0* | *118* | *199* | *0* |
| *17:00:00* | *48* | *0* | *103* | *151* | *0* |
| *18:00:00* | *52* | *0* | *97* | *149* | *0* |
| *19:00:00* | *29* | *0* | *73* | *102* | *0* |
| S Totals: | 358 | 0 | 634 | 992 | 0 |

## East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *25* | *140* | *0* | *165* | *0* |
| *8:00:00* | *48* | *211* | *0* | *259* | *0* |
| *9:00:00* | *95* | *338* | *0* | *433* | *0* |
| *10:00:00* | *102* | *385* | *0* | *487* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *109* | *397* | *0* | *506* | *0* |
| *17:00:00* | *144* | *411* | *0* | *555* | *0* |
| *18:00:00* | *125* | *398* | *0* | *523* | *0* |
| *19:00:00* | *84* | *228* | *0* | *312* | *0* |
| Totals: | 732 | 2508 | 0 | 3240 | 0 |

East/West Total Approaches: 6015

## West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *0* | *178* | *32* | *210* | *0* |
| *8:00:00* | *0* | *187* | *31* | *218* | *0* |
| *9:00:00* | *0* | *227* | *69* | *296* | *0* |
| *10:00:00* | *0* | *282* | *64* | *346* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *0* | *439* | *59* | *498* | *0* |
| *17:00:00* | *0* | *449* | *56* | *505* | *0* |
| *18:00:00* | *0* | *356* | *57* | *413* | *0* |
| *19:00:00* | *0* | *246* | *43* | *289* | *0* |
| W Totals: | 0 | 2364 | 411 | 2775 | 0 |

## Calculated Values for Traffic Crossing Major Street

| Hours Ending: | *7:00* | *8:00* | *9:00* | *10:00* | *16:00* | *17:00* | *18:00* | *19:00* |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | *20* | *35* | *42* | *51* | *81* | *48* | *52* | *29* |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700001**

| Interval Time | Passenger Cars - North Approach | | | | | | Trucks - North Approach | | | | | | Buses - North Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | North Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19:15:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700001**

| Interval Time | Passenger Cars - East Approach | | | | | | Trucks - East Approach | | | | | | Buses - East Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | East Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 25 | 25 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 6 | 6 | 58 | 33 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 18 | 12 | 90 | 32 | 0 | 0 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 7:00:00 | 25 | 7 | 131 | 41 | 0 | 0 | 0 | 0 | 8 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 34 | 9 | 155 | 24 | 0 | 0 | 1 | 1 | 10 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 46 | 12 | 188 | 33 | 0 | 0 | 2 | 1 | 13 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 55 | 9 | 249 | 61 | 0 | 0 | 3 | 1 | 15 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 8:00:00 | 70 | 15 | 330 | 81 | 0 | 0 | 3 | 0 | 19 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 90 | 20 | 398 | 68 | 0 | 0 | 3 | 0 | 20 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 103 | 13 | 469 | 71 | 0 | 0 | 4 | 1 | 23 | 3 | 0 | 0 | 2 | 2 | 5 | 3 | 0 | 0 | 0 | 0 |
| 8:45:00 | 132 | 29 | 551 | 82 | 0 | 0 | 4 | 0 | 26 | 3 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 9:00:00 | 162 | 30 | 655 | 104 | 0 | 0 | 4 | 0 | 29 | 3 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 9:15:00 | 187 | 25 | 741 | 86 | 0 | 0 | 4 | 0 | 33 | 4 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 9:30:00 | 213 | 26 | 840 | 99 | 0 | 0 | 5 | 1 | 39 | 6 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 9:45:00 | 234 | 21 | 916 | 76 | 0 | 0 | 6 | 1 | 42 | 3 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 10:00:00 | 260 | 26 | 1022 | 106 | 0 | 0 | 7 | 1 | 47 | 5 | 0 | 0 | 3 | 1 | 5 | 0 | 0 | 0 | 0 | 0 |
| 10:15:00 | 260 | 0 | 1022 | 0 | 0 | 0 | 7 | 0 | 47 | 0 | 0 | 0 | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 15:00:00 | 260 | 0 | 1022 | 0 | 0 | 0 | 7 | 0 | 47 | 0 | 0 | 0 | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 15:15:00 | 282 | 22 | 1106 | 84 | 0 | 0 | 7 | 0 | 51 | 4 | 0 | 0 | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| 15:30:00 | 310 | 28 | 1212 | 106 | 0 | 0 | 7 | 0 | 55 | 4 | 0 | 0 | 3 | 0 | 6 | 1 | 0 | 0 | 0 | 0 |
| 15:45:00 | 340 | 30 | 1306 | 94 | 0 | 0 | 8 | 1 | 55 | 0 | 0 | 0 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 368 | 28 | 1406 | 100 | 0 | 0 | 8 | 0 | 57 | 2 | 0 | 0 | 3 | 0 | 8 | 2 | 0 | 0 | 0 | 0 |
| 16:15:00 | 400 | 32 | 1516 | 110 | 0 | 0 | 8 | 0 | 58 | 1 | 0 | 0 | 3 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| 16:30:00 | 434 | 34 | 1622 | 106 | 0 | 0 | 9 | 1 | 62 | 4 | 0 | 0 | 3 | 0 | 9 | 1 | 0 | 0 | 0 | 0 |
| 16:45:00 | 476 | 42 | 1722 | 100 | 0 | 0 | 9 | 0 | 62 | 0 | 0 | 0 | 3 | 0 | 11 | 2 | 0 | 0 | 0 | 0 |
| 17:00:00 | 511 | 35 | 1809 | 87 | 0 | 0 | 9 | 0 | 62 | 0 | 0 | 0 | 3 | 0 | 11 | 0 | 0 | 0 | 0 | 0 |
| 17:15:00 | 552 | 41 | 1911 | 102 | 0 | 0 | 9 | 0 | 63 | 1 | 0 | 0 | 3 | 0 | 11 | 0 | 0 | 0 | 0 | 0 |
| 17:30:00 | 584 | 32 | 2014 | 103 | 0 | 0 | 9 | 0 | 64 | 1 | 0 | 0 | 3 | 0 | 12 | 1 | 0 | 0 | 0 | 0 |
| 17:45:00 | 618 | 34 | 2121 | 107 | 0 | 0 | 9 | 0 | 67 | 3 | 0 | 0 | 3 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| 18:00:00 | 634 | 16 | 2198 | 77 | 0 | 0 | 9 | 0 | 68 | 1 | 0 | 0 | 5 | 2 | 14 | 2 | 0 | 0 | 0 | 0 |
| 18:15:00 | 665 | 31 | 2260 | 62 | 0 | 0 | 9 | 0 | 71 | 3 | 0 | 0 | 5 | 0 | 14 | 0 | 0 | 0 | 0 | 0 |
| 18:30:00 | 683 | 18 | 2313 | 53 | 0 | 0 | 9 | 0 | 72 | 1 | 0 | 0 | 5 | 0 | 15 | 1 | 0 | 0 | 0 | 0 |
| 18:45:00 | 704 | 21 | 2366 | 53 | 0 | 0 | 10 | 1 | 74 | 2 | 0 | 0 | 5 | 0 | 16 | 1 | 0 | 0 | 0 | 0 |
| 19:00:00 | 717 | 13 | 2417 | 51 | 0 | 0 | 10 | 0 | 75 | 1 | 0 | 0 | 5 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |
| 19:15:00 | 717 | 0 | 2417 | 0 | 0 | 0 | 10 | 0 | 75 | 0 | 0 | 0 | 5 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |
| 19:15:15 | 717 | 0 | 2417 | 0 | 0 | 0 | 10 | 0 | 75 | 0 | 0 | 0 | 5 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700001**

| Interval Time | Passenger Cars - South Approach | | | | | | Trucks - South Approach | | | | | | Buses - South Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | South Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 4 | 4 | 0 | 0 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 9 | 5 | 0 | 0 | 15 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 13 | 4 | 0 | 0 | 20 | 5 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 19 | 6 | 0 | 0 | 26 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 28 | 9 | 0 | 0 | 40 | 14 | 1 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 7:30:00 | 36 | 8 | 0 | 0 | 53 | 13 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 7:45:00 | 41 | 5 | 0 | 0 | 71 | 18 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8:00:00 | 53 | 12 | 0 | 0 | 94 | 23 | 1 | 0 | 0 | 0 | 3 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8:15:00 | 67 | 14 | 0 | 0 | 117 | 23 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8:30:00 | 69 | 2 | 0 | 0 | 133 | 16 | 1 | 0 | 0 | 0 | 4 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8:45:00 | 83 | 14 | 0 | 0 | 152 | 19 | 1 | 0 | 0 | 0 | 6 | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9:00:00 | 94 | 11 | 0 | 0 | 174 | 22 | 1 | 0 | 0 | 0 | 6 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 9:15:00 | 106 | 12 | 0 | 0 | 184 | 10 | 1 | 0 | 0 | 0 | 6 | 0 | 3 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 9:30:00 | 118 | 12 | 0 | 0 | 198 | 14 | 2 | 1 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 9:45:00 | 131 | 13 | 0 | 0 | 212 | 14 | 2 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 10:00:00 | 143 | 12 | 0 | 0 | 235 | 23 | 2 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 10:15:00 | 143 | 0 | 0 | 0 | 235 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 15:00:00 | 143 | 0 | 0 | 0 | 235 | 0 | 2 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 15:15:00 | 158 | 15 | 0 | 0 | 260 | 25 | 2 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 15:30:00 | 181 | 23 | 0 | 0 | 290 | 30 | 4 | 2 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 3 | 1 | 0 | 0 |
| 15:45:00 | 207 | 26 | 0 | 0 | 324 | 34 | 7 | 3 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 16:00:00 | 219 | 12 | 0 | 0 | 352 | 28 | 7 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 16:15:00 | 233 | 14 | 0 | 0 | 380 | 28 | 7 | 0 | 0 | 0 | 6 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 16:30:00 | 243 | 10 | 0 | 0 | 410 | 30 | 7 | 0 | 0 | 0 | 6 | 0 | 4 | 1 | 0 | 0 | 3 | 0 | 0 | 0 |
| 16:45:00 | 257 | 14 | 0 | 0 | 431 | 21 | 7 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 0 | 0 | 4 | 1 | 0 | 0 |
| 17:00:00 | 266 | 9 | 0 | 0 | 454 | 23 | 7 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 17:15:00 | 283 | 17 | 0 | 0 | 483 | 29 | 7 | 0 | 0 | 0 | 7 | 1 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 17:30:00 | 298 | 15 | 0 | 0 | 517 | 34 | 7 | 0 | 0 | 0 | 7 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 17:45:00 | 309 | 11 | 0 | 0 | 533 | 16 | 7 | 0 | 0 | 0 | 8 | 1 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 18:00:00 | 318 | 9 | 0 | 0 | 548 | 15 | 7 | 0 | 0 | 0 | 9 | 1 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 18:15:00 | 327 | 9 | 0 | 0 | 566 | 18 | 7 | 0 | 0 | 0 | 9 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 18:30:00 | 333 | 6 | 0 | 0 | 578 | 12 | 7 | 0 | 0 | 0 | 9 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 18:45:00 | 339 | 6 | 0 | 0 | 596 | 18 | 7 | 0 | 0 | 0 | 9 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 19:00:00 | 347 | 8 | 0 | 0 | 621 | 25 | 7 | 0 | 0 | 0 | 9 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 19:15:00 | 347 | 0 | 0 | 0 | 621 | 0 | 7 | 0 | 0 | 0 | 9 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| 19:15:15 | 347 | 0 | 0 | 0 | 621 | 0 | 7 | 0 | 0 | 0 | 9 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700001**

| Interval Time | Passenger Cars - West Approach | | | | | | Trucks - West Approach | | | | | | Buses - West Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | West Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 41 | 41 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 0 | 0 | 87 | 46 | 6 | 4 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 6:45:00 | 0 | 0 | 132 | 45 | 17 | 11 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 7:00:00 | 0 | 0 | 171 | 39 | 32 | 15 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 0 | 0 | 214 | 43 | 37 | 5 | 0 | 0 | 5 | 0 | 1 | 1 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 |
| 7:30:00 | 0 | 0 | 252 | 38 | 47 | 10 | 0 | 0 | 6 | 1 | 2 | 1 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 |
| 7:45:00 | 0 | 0 | 303 | 51 | 51 | 4 | 0 | 0 | 10 | 4 | 2 | 0 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 0 |
| 8:00:00 | 0 | 0 | 350 | 47 | 60 | 9 | 0 | 0 | 11 | 1 | 2 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 8:15:00 | 0 | 0 | 395 | 45 | 70 | 10 | 0 | 0 | 15 | 4 | 2 | 0 | 0 | 0 | 4 | 0 | 2 | 1 | 0 | 0 |
| 8:30:00 | 0 | 0 | 432 | 37 | 88 | 18 | 0 | 0 | 26 | 11 | 3 | 1 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |
| 8:45:00 | 0 | 0 | 485 | 53 | 109 | 21 | 0 | 0 | 32 | 6 | 3 | 0 | 0 | 0 | 5 | 1 | 2 | 0 | 0 | 0 |
| 9:00:00 | 0 | 0 | 550 | 65 | 127 | 18 | 0 | 0 | 37 | 5 | 3 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0 |
| 9:15:00 | 0 | 0 | 603 | 53 | 149 | 22 | 0 | 0 | 41 | 4 | 5 | 2 | 0 | 0 | 6 | 1 | 3 | 1 | 0 | 0 |
| 9:30:00 | 0 | 0 | 666 | 63 | 159 | 10 | 0 | 0 | 45 | 4 | 6 | 1 | 0 | 0 | 8 | 2 | 3 | 0 | 0 | 0 |
| 9:45:00 | 0 | 0 | 741 | 75 | 173 | 14 | 0 | 0 | 49 | 4 | 6 | 0 | 0 | 0 | 8 | 0 | 3 | 0 | 0 | 0 |
| 10:00:00 | 0 | 0 | 814 | 73 | 187 | 14 | 0 | 0 | 52 | 3 | 6 | 0 | 0 | 0 | 8 | 0 | 3 | 0 | 0 | 0 |
| 10:15:00 | 0 | 0 | 814 | 0 | 187 | 0 | 0 | 0 | 52 | 0 | 6 | 0 | 0 | 0 | 8 | 0 | 3 | 0 | 0 | 0 |
| 15:00:00 | 0 | 0 | 814 | 0 | 187 | 0 | 0 | 0 | 52 | 0 | 6 | 0 | 0 | 0 | 8 | 0 | 3 | 0 | 0 | 0 |
| 15:15:00 | 0 | 0 | 915 | 101 | 200 | 13 | 0 | 0 | 55 | 3 | 6 | 0 | 0 | 0 | 10 | 2 | 3 | 0 | 0 | 0 |
| 15:30:00 | 0 | 0 | 1031 | 116 | 218 | 18 | 0 | 0 | 58 | 3 | 6 | 0 | 0 | 0 | 12 | 2 | 3 | 0 | 0 | 0 |
| 15:45:00 | 0 | 0 | 1124 | 93 | 239 | 21 | 0 | 0 | 62 | 4 | 7 | 1 | 0 | 0 | 12 | 0 | 3 | 0 | 0 | 0 |
| 16:00:00 | 0 | 0 | 1237 | 113 | 245 | 6 | 0 | 0 | 64 | 2 | 7 | 0 | 0 | 0 | 12 | 0 | 3 | 0 | 0 | 0 |
| 16:15:00 | 0 | 0 | 1361 | 124 | 256 | 11 | 0 | 0 | 67 | 3 | 7 | 0 | 0 | 0 | 12 | 0 | 4 | 1 | 0 | 0 |
| 16:30:00 | 0 | 0 | 1468 | 107 | 269 | 13 | 0 | 0 | 69 | 2 | 7 | 0 | 0 | 0 | 12 | 0 | 4 | 0 | 0 | 0 |
| 16:45:00 | 0 | 0 | 1572 | 104 | 288 | 19 | 0 | 0 | 70 | 1 | 7 | 0 | 0 | 0 | 12 | 0 | 4 | 0 | 0 | 0 |
| 17:00:00 | 0 | 0 | 1677 | 105 | 300 | 12 | 0 | 0 | 73 | 3 | 7 | 0 | 0 | 0 | 12 | 0 | 4 | 0 | 0 | 0 |
| 17:15:00 | 0 | 0 | 1814 | 137 | 319 | 19 | 0 | 0 | 75 | 2 | 7 | 0 | 0 | 0 | 12 | 0 | 4 | 0 | 0 | 0 |
| 17:30:00 | 0 | 0 | 1886 | 72 | 337 | 18 | 0 | 0 | 79 | 4 | 7 | 0 | 0 | 0 | 12 | 0 | 4 | 0 | 0 | 0 |
| 17:45:00 | 0 | 0 | 1964 | 78 | 347 | 10 | 0 | 0 | 80 | 1 | 7 | 0 | 0 | 0 | 13 | 1 | 4 | 0 | 0 | 0 |
| 18:00:00 | 0 | 0 | 2022 | 58 | 357 | 10 | 0 | 0 | 83 | 3 | 7 | 0 | 0 | 0 | 13 | 0 | 4 | 0 | 0 | 0 |
| 18:15:00 | 0 | 0 | 2087 | 65 | 370 | 13 | 0 | 0 | 84 | 1 | 7 | 0 | 0 | 0 | 13 | 0 | 4 | 0 | 0 | 0 |
| 18:30:00 | 0 | 0 | 2139 | 52 | 386 | 16 | 0 | 0 | 84 | 0 | 7 | 0 | 0 | 0 | 13 | 0 | 4 | 0 | 0 | 0 |
| 18:45:00 | 0 | 0 | 2197 | 58 | 393 | 7 | 0 | 0 | 85 | 1 | 7 | 0 | 0 | 0 | 18 | 5 | 4 | 0 | 0 | 0 |
| 19:00:00 | 0 | 0 | 2260 | 63 | 400 | 7 | 0 | 0 | 86 | 1 | 7 | 0 | 0 | 0 | 18 | 0 | 4 | 0 | 0 | 0 |
| 19:15:00 | 0 | 0 | 2260 | 0 | 400 | 0 | 0 | 0 | 86 | 0 | 7 | 0 | 0 | 0 | 18 | 0 | 4 | 0 | 0 | 0 |
| 19:15:15 | 0 | 0 | 2260 | 0 | 400 | 0 | 0 | 0 | 86 | 0 | 7 | 0 | 0 | 0 | 18 | 0 | 4 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Morning Peak Diagram

**Specified Period**
**From:** 6:00:00
**To:** 10:00:00

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

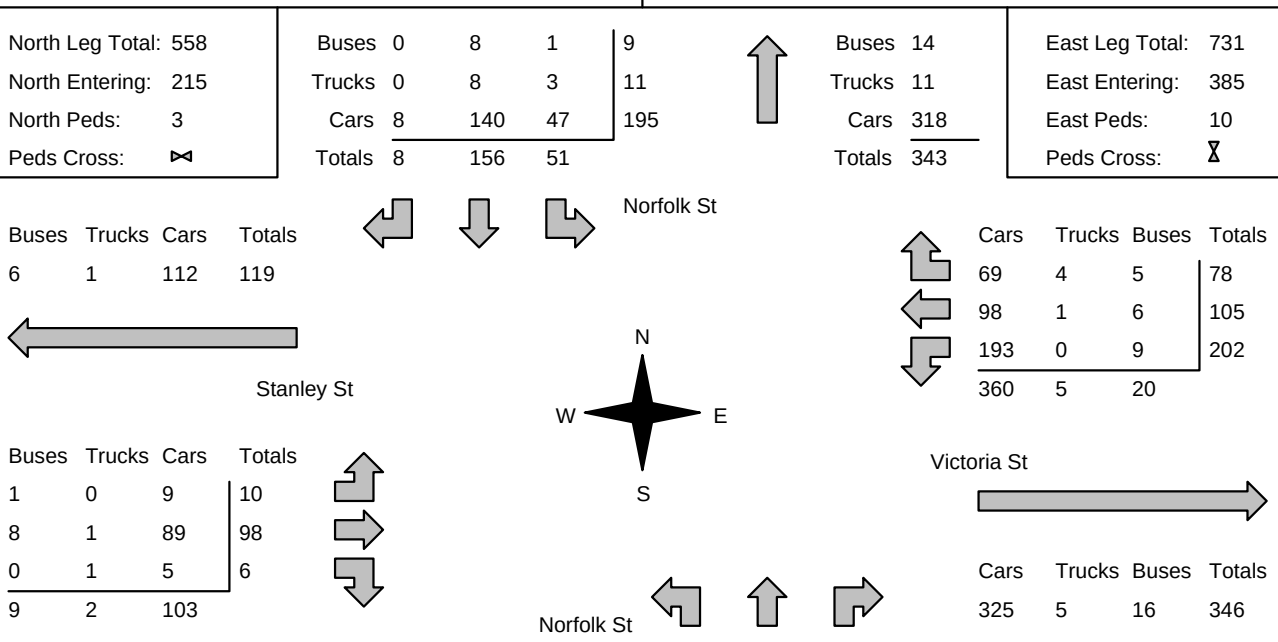
**Municipality:** Norfolk
**Site #:** 2518700002
**Intersection:** Norfolk St & Victoria St
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

**** Signalized Intersection ****

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 19:00:00

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

**Municipality:** Norfolk
**Site #:** 2518700002
**Intersection:** Norfolk St & Victoria St
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

**** Signalized Intersection ****

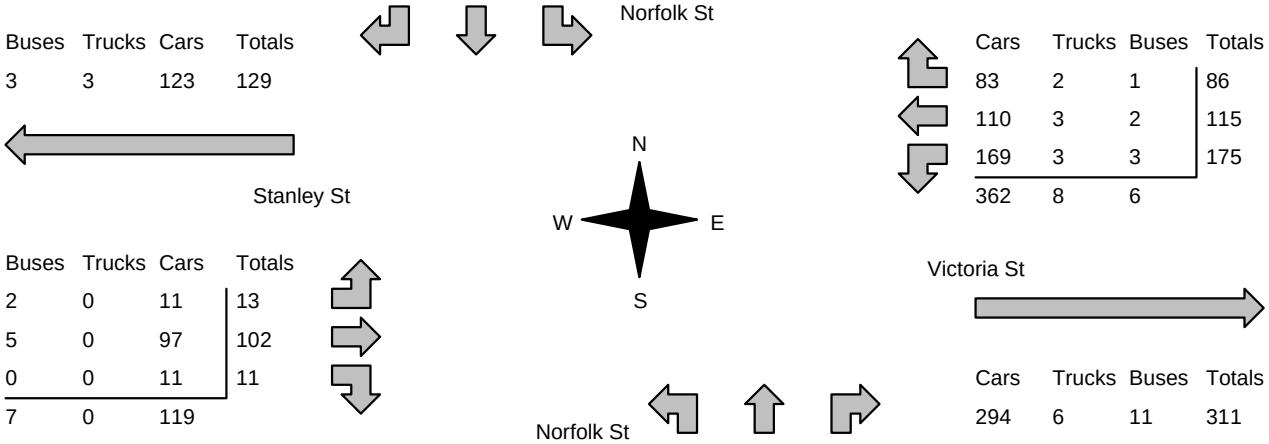
**Major Road:** Norfolk St runs N/S

North Leg Total: 691
North Entering: 337
North Peds: 5
Peds Cross: ⋈

| | | | | |
|---|---|---|---|---|
| Buses | 0 | 3 | 2 | 5 |
| Trucks | 0 | 3 | 5 | 8 |
| Cars | 13 | 269 | 42 | 324 |
| Totals | 13 | 275 | 49 | |

| | |
|---|---|
| Buses | 6 |
| Trucks | 8 |
| Cars | 340 |
| Totals | 354 |

East Leg Total: 687
East Entering: 376
East Peds: 6
Peds Cross: ⧖




| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 3 | 3 | 123 | 129 |

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 83 | 2 | 1 | 86 |
| 110 | 3 | 2 | 115 |
| 169 | 3 | 3 | 175 |
| 362 | 8 | 6 | |

| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 2 | 0 | 11 | 13 |
| 5 | 0 | 97 | 102 |
| 0 | 0 | 11 | 11 |
| 7 | 0 | 119 | |

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 294 | 6 | 11 | 311 |

Peds Cross: ⧖
West Peds: 2
West Entering: 126
West Leg Total: 255

| | |
|---|---|
| Cars | 449 |
| Trucks | 6 |
| Buses | 6 |
| Totals | 461 |

| | | | | |
|---|---|---|---|---|
| Cars | 0 | 246 | 155 | 401 |
| Trucks | 0 | 6 | 1 | 7 |
| Buses | 1 | 3 | 4 | 8 |
| Totals | 1 | 255 | 160 | |

Peds Cross: ⋈
South Peds: 7
South Entering: 416
South Leg Total: 877

## Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Total Count Diagram

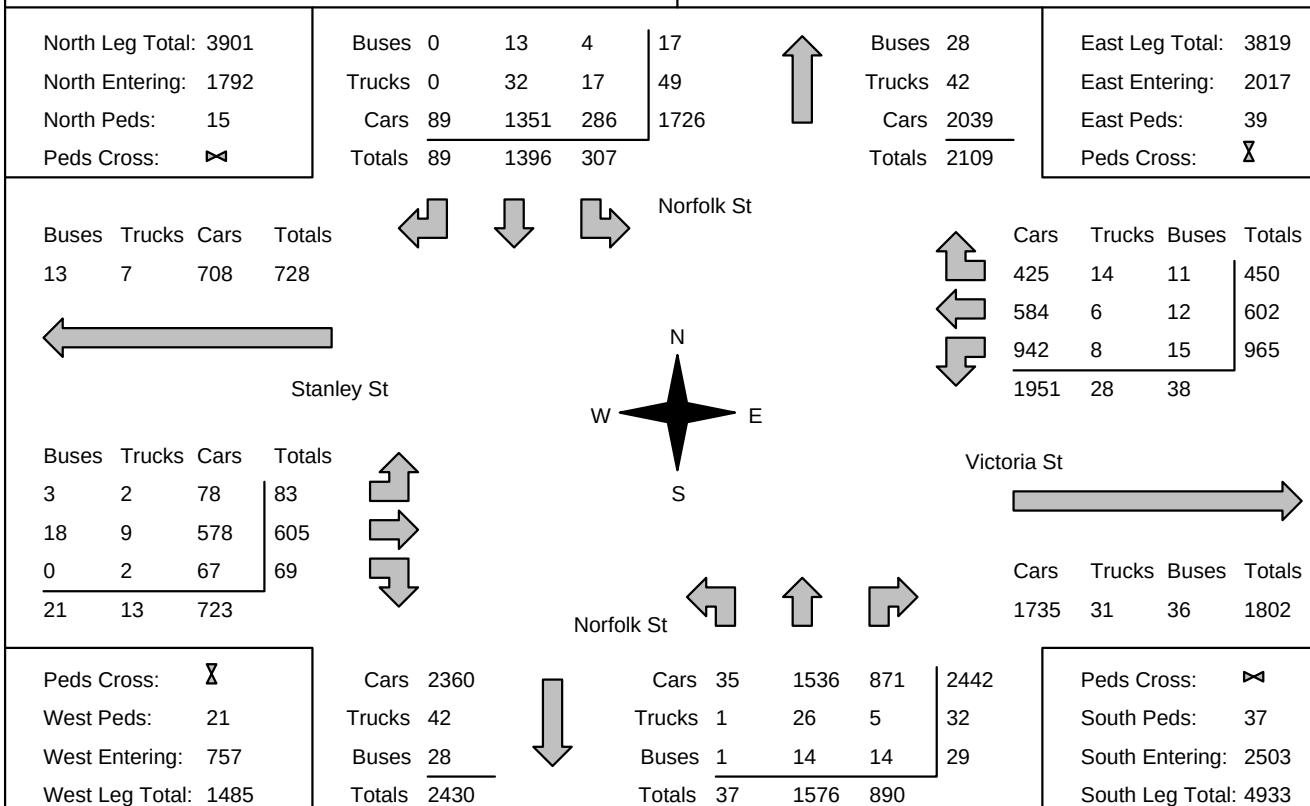
**Municipality:** Norfolk
**Site #:** 2518700002
**Intersection:** Norfolk St & Victoria St
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

**** Signalized Intersection ****

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Traffic Count Summary

**Intersection:** Norfolk St & Victoria St | **Count Date:** 26-Nov-25 | **Municipality:** Norfolk

### North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 25 | 42 | 3 | 70 | 0 |
| 8:00:00 | 26 | 91 | 7 | 124 | 0 |
| 9:00:00 | 51 | 156 | 8 | 215 | 3 |
| 10:00:00 | 32 | 154 | 14 | 200 | 4 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 49 | 275 | 13 | 337 | 5 |
| 17:00:00 | 48 | 246 | 10 | 304 | 2 |
| 18:00:00 | 40 | 251 | 20 | 311 | 0 |
| 19:00:00 | 36 | 181 | 14 | 231 | 1 |
| Totals: | 307 | 1396 | 89 | 1792 | 15 |

North/South Total Approaches: 4295

### South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 0 | 125 | 37 | 162 | 1 |
| 8:00:00 | 3 | 140 | 77 | 220 | 4 |
| 9:00:00 | 6 | 255 | 197 | 458 | 12 |
| 10:00:00 | 7 | 230 | 113 | 350 | 1 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 1 | 255 | 160 | 416 | 7 |
| 17:00:00 | 11 | 215 | 119 | 345 | 4 |
| 18:00:00 | 2 | 197 | 116 | 315 | 4 |
| 19:00:00 | 7 | 159 | 71 | 237 | 4 |
| S Totals: | 37 | 1576 | 890 | 2503 | 37 |

### East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 17 | 19 | 25 | 61 | 1 |
| 8:00:00 | 51 | 44 | 49 | 144 | 3 |
| 9:00:00 | 202 | 105 | 78 | 385 | 10 |
| 10:00:00 | 80 | 68 | 61 | 209 | 5 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 175 | 115 | 86 | 376 | 6 |
| 17:00:00 | 159 | 106 | 75 | 340 | 2 |
| 18:00:00 | 191 | 89 | 31 | 311 | 9 |
| 19:00:00 | 90 | 56 | 45 | 191 | 3 |
| Totals: | 965 | 602 | 450 | 2017 | 39 |

East/West Total Approaches: 2774

### West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 9 | 20 | 2 | 31 | 1 |
| 8:00:00 | 7 | 69 | 3 | 79 | 0 |
| 9:00:00 | 10 | 98 | 6 | 114 | 7 |
| 10:00:00 | 12 | 66 | 10 | 88 | 3 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 13 | 102 | 11 | 126 | 2 |
| 17:00:00 | 13 | 111 | 16 | 140 | 7 |
| 18:00:00 | 11 | 88 | 13 | 112 | 1 |
| 19:00:00 | 8 | 51 | 8 | 67 | 0 |
| W Totals: | 83 | 605 | 69 | 757 | 21 |

### Calculated Values for Traffic Crossing Major Street

| Hours Ending: | 7:00 | 8:00 | 9:00 | 10:00 | 16:00 | 17:00 | 18:00 | 19:00 |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | 47 | 131 | 332 | 165 | 315 | 289 | 295 | 159 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700002**

| Interval Time | Passenger Cars - North Approach | | | | | | Trucks - North Approach | | | | | | Buses - North Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | North Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 4 | 4 | 5 | 5 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 7 | 3 | 12 | 7 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 14 | 7 | 23 | 11 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 24 | 10 | 40 | 17 | 3 | 2 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 28 | 4 | 55 | 15 | 4 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 31 | 3 | 70 | 15 | 5 | 1 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 37 | 6 | 99 | 29 | 8 | 3 | 1 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 49 | 12 | 127 | 28 | 10 | 2 | 2 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8:15:00 | 63 | 14 | 162 | 35 | 12 | 2 | 2 | 0 | 7 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 8:30:00 | 77 | 14 | 195 | 33 | 14 | 2 | 3 | 1 | 9 | 2 | 0 | 0 | 1 | 0 | 3 | 2 | 0 | 0 | 2 | 1 |
| 8:45:00 | 88 | 11 | 228 | 33 | 16 | 2 | 4 | 1 | 9 | 0 | 0 | 0 | 1 | 0 | 9 | 6 | 0 | 0 | 2 | 0 |
| 9:00:00 | 96 | 8 | 267 | 39 | 18 | 2 | 5 | 1 | 13 | 4 | 0 | 0 | 1 | 0 | 9 | 0 | 0 | 0 | 3 | 1 |
| 9:15:00 | 105 | 9 | 307 | 40 | 24 | 6 | 6 | 1 | 17 | 4 | 0 | 0 | 1 | 0 | 9 | 0 | 0 | 0 | 3 | 0 |
| 9:30:00 | 110 | 5 | 348 | 41 | 24 | 0 | 6 | 0 | 17 | 0 | 0 | 0 | 1 | 0 | 9 | 0 | 0 | 0 | 4 | 1 |
| 9:45:00 | 115 | 5 | 375 | 27 | 28 | 4 | 9 | 3 | 19 | 2 | 0 | 0 | 1 | 0 | 9 | 0 | 0 | 0 | 5 | 1 |
| 10:00:00 | 124 | 9 | 411 | 36 | 32 | 4 | 9 | 0 | 22 | 3 | 0 | 0 | 1 | 0 | 10 | 1 | 0 | 0 | 7 | 2 |
| 10:15:00 | 124 | 0 | 411 | 0 | 32 | 0 | 9 | 0 | 22 | 0 | 0 | 0 | 1 | 0 | 10 | 0 | 0 | 0 | 7 | 0 |
| 15:00:00 | 124 | 0 | 411 | 0 | 32 | 0 | 9 | 0 | 22 | 0 | 0 | 0 | 1 | 0 | 10 | 0 | 0 | 0 | 7 | 0 |
| 15:15:00 | 139 | 15 | 494 | 83 | 33 | 1 | 12 | 3 | 24 | 2 | 0 | 0 | 1 | 0 | 10 | 0 | 0 | 0 | 9 | 2 |
| 15:30:00 | 147 | 8 | 560 | 66 | 38 | 5 | 13 | 1 | 24 | 0 | 0 | 0 | 3 | 2 | 12 | 2 | 0 | 0 | 12 | 3 |
| 15:45:00 | 151 | 4 | 620 | 60 | 40 | 2 | 13 | 0 | 25 | 1 | 0 | 0 | 3 | 0 | 13 | 1 | 0 | 0 | 12 | 0 |
| 16:00:00 | 166 | 15 | 680 | 60 | 45 | 5 | 14 | 1 | 25 | 0 | 0 | 0 | 3 | 0 | 13 | 0 | 0 | 0 | 12 | 0 |
| 16:15:00 | 179 | 13 | 732 | 52 | 46 | 1 | 14 | 0 | 25 | 0 | 0 | 0 | 3 | 0 | 13 | 0 | 0 | 0 | 12 | 0 |
| 16:30:00 | 185 | 6 | 793 | 61 | 49 | 3 | 14 | 0 | 28 | 3 | 0 | 0 | 4 | 1 | 13 | 0 | 0 | 0 | 14 | 2 |
| 16:45:00 | 192 | 7 | 854 | 61 | 53 | 4 | 14 | 0 | 28 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 14 | 0 |
| 17:00:00 | 212 | 20 | 923 | 69 | 55 | 2 | 15 | 1 | 28 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 14 | 0 |
| 17:15:00 | 225 | 13 | 979 | 56 | 59 | 4 | 16 | 1 | 28 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 14 | 0 |
| 17:30:00 | 234 | 9 | 1039 | 60 | 64 | 5 | 16 | 0 | 29 | 1 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 14 | 0 |
| 17:45:00 | 242 | 8 | 1110 | 71 | 69 | 5 | 16 | 0 | 30 | 1 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 14 | 0 |
| 18:00:00 | 250 | 8 | 1170 | 60 | 75 | 6 | 17 | 1 | 32 | 2 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 14 | 0 |
| 18:15:00 | 261 | 11 | 1223 | 53 | 80 | 5 | 17 | 0 | 32 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 15 | 1 |
| 18:30:00 | 269 | 8 | 1274 | 51 | 84 | 4 | 17 | 0 | 32 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 15 | 0 |
| 18:45:00 | 278 | 9 | 1320 | 46 | 86 | 2 | 17 | 0 | 32 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 15 | 0 |
| 19:00:00 | 286 | 8 | 1351 | 31 | 89 | 3 | 17 | 0 | 32 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 15 | 0 |
| 19:15:00 | 286 | 0 | 1351 | 0 | 89 | 0 | 17 | 0 | 32 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 15 | 0 |
| 19:15:15 | 286 | 0 | 1351 | 0 | 89 | 0 | 17 | 0 | 32 | 0 | 0 | 0 | 4 | 0 | 13 | 0 | 0 | 0 | 15 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700002**

| Interval Time | Passenger Cars - East Approach | | | | | | Trucks - East Approach | | | | | | Buses - East Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | East Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 2 | 2 | 2 | 2 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 6 | 4 | 4 | 2 | 16 | 7 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 10 | 4 | 13 | 9 | 20 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 16 | 6 | 19 | 6 | 24 | 4 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:15:00 | 26 | 10 | 25 | 6 | 29 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 |
| 7:30:00 | 35 | 9 | 32 | 7 | 39 | 10 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 |
| 7:45:00 | 52 | 17 | 40 | 8 | 49 | 10 | 1 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 0 |
| 8:00:00 | 67 | 15 | 61 | 21 | 69 | 20 | 1 | 0 | 1 | 1 | 4 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 4 | 0 |
| 8:15:00 | 90 | 23 | 79 | 18 | 80 | 11 | 1 | 0 | 1 | 0 | 4 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 6 | 2 |
| 8:30:00 | 137 | 47 | 115 | 36 | 104 | 24 | 1 | 0 | 1 | 0 | 4 | 0 | 3 | 2 | 3 | 1 | 5 | 4 | 10 | 4 |
| 8:45:00 | 207 | 70 | 134 | 19 | 132 | 28 | 1 | 0 | 1 | 0 | 7 | 3 | 9 | 6 | 7 | 4 | 6 | 1 | 12 | 2 |
| 9:00:00 | 260 | 53 | 159 | 25 | 138 | 6 | 1 | 0 | 2 | 1 | 8 | 1 | 9 | 0 | 7 | 0 | 6 | 0 | 14 | 2 |
| 9:15:00 | 281 | 21 | 176 | 17 | 146 | 8 | 1 | 0 | 2 | 0 | 8 | 0 | 10 | 1 | 9 | 2 | 6 | 0 | 14 | 0 |
| 9:30:00 | 300 | 19 | 200 | 24 | 160 | 14 | 1 | 0 | 2 | 0 | 10 | 2 | 10 | 0 | 9 | 0 | 6 | 0 | 16 | 2 |
| 9:45:00 | 317 | 17 | 213 | 13 | 177 | 17 | 2 | 1 | 3 | 1 | 11 | 1 | 10 | 0 | 9 | 0 | 6 | 0 | 17 | 1 |
| 10:00:00 | 337 | 20 | 224 | 11 | 196 | 19 | 3 | 1 | 3 | 0 | 11 | 0 | 10 | 0 | 9 | 0 | 6 | 0 | 19 | 2 |
| 10:15:00 | 337 | 0 | 224 | 0 | 196 | 0 | 3 | 0 | 3 | 0 | 11 | 0 | 10 | 0 | 9 | 0 | 6 | 0 | 19 | 0 |
| 15:00:00 | 337 | 0 | 224 | 0 | 196 | 0 | 3 | 0 | 3 | 0 | 11 | 0 | 10 | 0 | 9 | 0 | 6 | 0 | 19 | 0 |
| 15:15:00 | 384 | 47 | 247 | 23 | 216 | 20 | 3 | 0 | 3 | 0 | 11 | 0 | 13 | 3 | 9 | 0 | 6 | 0 | 25 | 6 |
| 15:30:00 | 417 | 33 | 278 | 31 | 234 | 18 | 5 | 2 | 3 | 0 | 11 | 0 | 13 | 0 | 10 | 1 | 7 | 1 | 25 | 0 |
| 15:45:00 | 457 | 40 | 308 | 30 | 252 | 18 | 6 | 1 | 4 | 1 | 13 | 2 | 13 | 0 | 10 | 0 | 7 | 0 | 25 | 0 |
| 16:00:00 | 506 | 49 | 334 | 26 | 279 | 27 | 6 | 0 | 6 | 2 | 13 | 0 | 13 | 0 | 11 | 1 | 7 | 0 | 25 | 0 |
| 16:15:00 | 545 | 39 | 353 | 19 | 296 | 17 | 6 | 0 | 6 | 0 | 14 | 1 | 13 | 0 | 12 | 1 | 8 | 1 | 26 | 1 |
| 16:30:00 | 590 | 45 | 383 | 30 | 314 | 18 | 7 | 1 | 6 | 0 | 14 | 0 | 13 | 0 | 12 | 0 | 9 | 1 | 27 | 1 |
| 16:45:00 | 638 | 48 | 416 | 33 | 343 | 29 | 7 | 0 | 6 | 0 | 14 | 0 | 13 | 0 | 12 | 0 | 9 | 0 | 27 | 0 |
| 17:00:00 | 664 | 26 | 439 | 23 | 351 | 8 | 7 | 0 | 6 | 0 | 14 | 0 | 13 | 0 | 12 | 0 | 9 | 0 | 27 | 0 |
| 17:15:00 | 701 | 37 | 472 | 33 | 355 | 4 | 7 | 0 | 6 | 0 | 14 | 0 | 13 | 0 | 12 | 0 | 10 | 1 | 31 | 4 |
| 17:30:00 | 742 | 41 | 493 | 21 | 363 | 8 | 7 | 0 | 6 | 0 | 14 | 0 | 13 | 0 | 12 | 0 | 10 | 0 | 35 | 4 |
| 17:45:00 | 807 | 65 | 514 | 21 | 370 | 7 | 7 | 0 | 6 | 0 | 14 | 0 | 13 | 0 | 12 | 0 | 10 | 0 | 36 | 1 |
| 18:00:00 | 854 | 47 | 528 | 14 | 381 | 11 | 7 | 0 | 6 | 0 | 14 | 0 | 14 | 1 | 12 | 0 | 10 | 0 | 36 | 0 |
| 18:15:00 | 891 | 37 | 541 | 13 | 388 | 7 | 8 | 1 | 6 | 0 | 14 | 0 | 14 | 0 | 12 | 0 | 10 | 0 | 39 | 3 |
| 18:30:00 | 911 | 20 | 559 | 18 | 405 | 17 | 8 | 0 | 6 | 0 | 14 | 0 | 15 | 1 | 12 | 0 | 11 | 1 | 39 | 0 |
| 18:45:00 | 926 | 15 | 570 | 11 | 413 | 8 | 8 | 0 | 6 | 0 | 14 | 0 | 15 | 0 | 12 | 0 | 11 | 0 | 39 | 0 |
| 19:00:00 | 942 | 16 | 584 | 14 | 425 | 12 | 8 | 0 | 6 | 0 | 14 | 0 | 15 | 0 | 12 | 0 | 11 | 0 | 39 | 0 |
| 19:15:00 | 942 | 0 | 584 | 0 | 425 | 0 | 8 | 0 | 6 | 0 | 14 | 0 | 15 | 0 | 12 | 0 | 11 | 0 | 39 | 0 |
| 19:15:15 | 942 | 0 | 584 | 0 | 425 | 0 | 8 | 0 | 6 | 0 | 14 | 0 | 15 | 0 | 12 | 0 | 11 | 0 | 39 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700002**

| Interval Time | Passenger Cars - South Approach | | | | | | Trucks - South Approach | | | | | | Buses - South Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | South Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 21 | 21 | 5 | 5 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 0 | 0 | 58 | 37 | 11 | 6 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 6:45:00 | 0 | 0 | 87 | 29 | 19 | 8 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:00:00 | 0 | 0 | 122 | 35 | 37 | 18 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:15:00 | 0 | 0 | 150 | 28 | 49 | 12 | 0 | 0 | 5 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 7:30:00 | 0 | 0 | 186 | 36 | 63 | 14 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 7:45:00 | 1 | 1 | 219 | 33 | 82 | 19 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 2 |
| 8:00:00 | 3 | 2 | 257 | 38 | 112 | 30 | 0 | 0 | 7 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 2 |
| 8:15:00 | 3 | 0 | 295 | 38 | 147 | 35 | 0 | 0 | 8 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 3 | 10 | 5 |
| 8:30:00 | 4 | 1 | 346 | 51 | 203 | 56 | 0 | 0 | 11 | 3 | 2 | 1 | 0 | 0 | 1 | 0 | 5 | 1 | 13 | 3 |
| 8:45:00 | 6 | 2 | 403 | 57 | 238 | 35 | 0 | 0 | 13 | 2 | 2 | 0 | 0 | 0 | 5 | 4 | 6 | 1 | 16 | 3 |
| 9:00:00 | 9 | 3 | 497 | 94 | 301 | 63 | 0 | 0 | 14 | 1 | 2 | 0 | 0 | 0 | 9 | 4 | 8 | 2 | 17 | 1 |
| 9:15:00 | 12 | 3 | 553 | 56 | 327 | 26 | 0 | 0 | 15 | 1 | 2 | 0 | 0 | 0 | 9 | 0 | 9 | 1 | 17 | 0 |
| 9:30:00 | 13 | 1 | 612 | 59 | 348 | 21 | 0 | 0 | 16 | 1 | 3 | 1 | 0 | 0 | 9 | 0 | 9 | 0 | 17 | 0 |
| 9:45:00 | 14 | 1 | 662 | 50 | 383 | 35 | 0 | 0 | 17 | 1 | 3 | 0 | 0 | 0 | 9 | 0 | 10 | 1 | 17 | 0 |
| 10:00:00 | 16 | 2 | 722 | 60 | 411 | 28 | 0 | 0 | 19 | 2 | 3 | 0 | 0 | 0 | 9 | 0 | 10 | 0 | 18 | 1 |
| 10:15:00 | 16 | 0 | 722 | 0 | 411 | 0 | 0 | 0 | 19 | 0 | 3 | 0 | 0 | 0 | 9 | 0 | 10 | 0 | 18 | 0 |
| 15:00:00 | 16 | 0 | 722 | 0 | 411 | 0 | 0 | 0 | 19 | 0 | 3 | 0 | 0 | 0 | 9 | 0 | 10 | 0 | 18 | 0 |
| 15:15:00 | 16 | 0 | 794 | 72 | 458 | 47 | 0 | 0 | 22 | 3 | 3 | 0 | 0 | 0 | 12 | 3 | 14 | 4 | 20 | 2 |
| 15:30:00 | 16 | 0 | 857 | 63 | 486 | 28 | 0 | 0 | 23 | 1 | 4 | 1 | 0 | 0 | 12 | 0 | 14 | 0 | 20 | 0 |
| 15:45:00 | 16 | 0 | 916 | 59 | 522 | 36 | 0 | 0 | 23 | 0 | 4 | 0 | 1 | 1 | 12 | 0 | 14 | 0 | 24 | 4 |
| 16:00:00 | 16 | 0 | 968 | 52 | 566 | 44 | 0 | 0 | 25 | 2 | 4 | 0 | 1 | 0 | 12 | 0 | 14 | 0 | 25 | 1 |
| 16:15:00 | 16 | 0 | 1034 | 66 | 603 | 37 | 0 | 0 | 25 | 0 | 5 | 1 | 1 | 0 | 12 | 0 | 14 | 0 | 26 | 1 |
| 16:30:00 | 23 | 7 | 1087 | 53 | 633 | 30 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 12 | 0 | 14 | 0 | 27 | 1 |
| 16:45:00 | 23 | 0 | 1142 | 55 | 660 | 27 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 13 | 1 | 14 | 0 | 27 | 0 |
| 17:00:00 | 27 | 4 | 1182 | 40 | 684 | 24 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 13 | 0 | 14 | 0 | 29 | 2 |
| 17:15:00 | 28 | 1 | 1222 | 40 | 723 | 39 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 13 | 0 | 14 | 0 | 31 | 2 |
| 17:30:00 | 28 | 0 | 1274 | 52 | 749 | 26 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 13 | 0 | 14 | 0 | 32 | 1 |
| 17:45:00 | 29 | 1 | 1334 | 60 | 774 | 25 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 13 | 0 | 14 | 0 | 32 | 0 |
| 18:00:00 | 29 | 0 | 1379 | 45 | 800 | 26 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 13 | 0 | 14 | 0 | 33 | 1 |
| 18:15:00 | 31 | 2 | 1415 | 36 | 818 | 18 | 0 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 13 | 0 | 14 | 0 | 35 | 2 |
| 18:30:00 | 32 | 1 | 1449 | 34 | 832 | 14 | 1 | 1 | 25 | 0 | 5 | 0 | 1 | 0 | 14 | 1 | 14 | 0 | 35 | 0 |
| 18:45:00 | 34 | 2 | 1494 | 45 | 855 | 23 | 1 | 0 | 25 | 0 | 5 | 0 | 1 | 0 | 14 | 0 | 14 | 0 | 37 | 2 |
| 19:00:00 | 35 | 1 | 1536 | 42 | 871 | 16 | 1 | 0 | 26 | 1 | 5 | 0 | 1 | 0 | 14 | 0 | 14 | 0 | 37 | 0 |
| 19:15:00 | 35 | 0 | 1536 | 0 | 871 | 0 | 1 | 0 | 26 | 0 | 5 | 0 | 1 | 0 | 14 | 0 | 14 | 0 | 37 | 0 |
| 19:15:15 | 35 | 0 | 1536 | 0 | 871 | 0 | 1 | 0 | 26 | 0 | 5 | 0 | 1 | 0 | 14 | 0 | 14 | 0 | 37 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700002**

| Interval Time | Passenger Cars - West Approach | | | | | | Trucks - West Approach | | | | | | Buses - West Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | West Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 2 | 2 | 3 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 4 | 2 | 7 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 6 | 2 | 9 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 9 | 3 | 20 | 11 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:15:00 | 11 | 2 | 36 | 16 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:30:00 | 14 | 3 | 49 | 13 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:45:00 | 14 | 0 | 65 | 16 | 3 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 0 |
| 8:00:00 | 15 | 1 | 86 | 21 | 5 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 8:15:00 | 18 | 3 | 110 | 24 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 5 | 3 | 0 | 0 | 4 | 3 |
| 8:30:00 | 20 | 2 | 143 | 33 | 7 | 2 | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 8 | 3 | 0 | 0 | 5 | 1 |
| 8:45:00 | 22 | 2 | 159 | 16 | 9 | 2 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 5 | 0 |
| 9:00:00 | 24 | 2 | 175 | 16 | 10 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 10 | 2 | 0 | 0 | 8 | 3 |
| 9:15:00 | 25 | 1 | 189 | 14 | 11 | 1 | 1 | 0 | 4 | 2 | 1 | 0 | 1 | 0 | 11 | 1 | 0 | 0 | 8 | 0 |
| 9:30:00 | 29 | 4 | 195 | 6 | 14 | 3 | 1 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 11 | 0 | 0 | 0 | 8 | 0 |
| 9:45:00 | 33 | 4 | 215 | 20 | 16 | 2 | 1 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 11 | 0 | 0 | 0 | 11 | 3 |
| 10:00:00 | 36 | 3 | 238 | 23 | 19 | 3 | 1 | 0 | 4 | 0 | 2 | 1 | 1 | 0 | 11 | 0 | 0 | 0 | 11 | 0 |
| 10:15:00 | 36 | 0 | 238 | 0 | 19 | 0 | 1 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 11 | 0 | 0 | 0 | 11 | 0 |
| 15:00:00 | 36 | 0 | 238 | 0 | 19 | 0 | 1 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 11 | 0 | 0 | 0 | 11 | 0 |
| 15:15:00 | 39 | 3 | 266 | 28 | 23 | 4 | 1 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 13 | 2 | 0 | 0 | 12 | 1 |
| 15:30:00 | 43 | 4 | 284 | 18 | 23 | 0 | 1 | 0 | 4 | 0 | 2 | 0 | 2 | 1 | 14 | 1 | 0 | 0 | 12 | 0 |
| 15:45:00 | 46 | 3 | 312 | 28 | 26 | 3 | 1 | 0 | 4 | 0 | 2 | 0 | 2 | 0 | 14 | 0 | 0 | 0 | 13 | 1 |
| 16:00:00 | 47 | 1 | 335 | 23 | 30 | 4 | 1 | 0 | 4 | 0 | 2 | 0 | 3 | 1 | 16 | 2 | 0 | 0 | 13 | 0 |
| 16:15:00 | 50 | 3 | 357 | 22 | 35 | 5 | 1 | 0 | 6 | 2 | 2 | 0 | 3 | 0 | 18 | 2 | 0 | 0 | 19 | 6 |
| 16:30:00 | 55 | 5 | 390 | 33 | 37 | 2 | 1 | 0 | 6 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 20 | 1 |
| 16:45:00 | 59 | 4 | 421 | 31 | 43 | 6 | 2 | 1 | 7 | 1 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 20 | 0 |
| 17:00:00 | 59 | 0 | 441 | 20 | 46 | 3 | 2 | 0 | 7 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 20 | 0 |
| 17:15:00 | 63 | 4 | 468 | 27 | 48 | 2 | 2 | 0 | 8 | 1 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 20 | 0 |
| 17:30:00 | 65 | 2 | 490 | 22 | 54 | 6 | 2 | 0 | 8 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 20 | 0 |
| 17:45:00 | 66 | 1 | 503 | 13 | 56 | 2 | 2 | 0 | 8 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 1 |
| 18:00:00 | 70 | 4 | 528 | 25 | 59 | 3 | 2 | 0 | 8 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 0 |
| 18:15:00 | 72 | 2 | 541 | 13 | 60 | 1 | 2 | 0 | 9 | 1 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 0 |
| 18:30:00 | 74 | 2 | 552 | 11 | 62 | 2 | 2 | 0 | 9 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 0 |
| 18:45:00 | 77 | 3 | 564 | 12 | 64 | 2 | 2 | 0 | 9 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 0 |
| 19:00:00 | 78 | 1 | 578 | 14 | 67 | 3 | 2 | 0 | 9 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 0 |
| 19:15:00 | 78 | 0 | 578 | 0 | 67 | 0 | 2 | 0 | 9 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 0 |
| 19:15:15 | 78 | 0 | 578 | 0 | 67 | 0 | 2 | 0 | 9 | 0 | 2 | 0 | 3 | 0 | 18 | 0 | 0 | 0 | 21 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Morning Peak Diagram

**Specified Period**
**From:** 6:00:00
**To:** 10:00:00

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

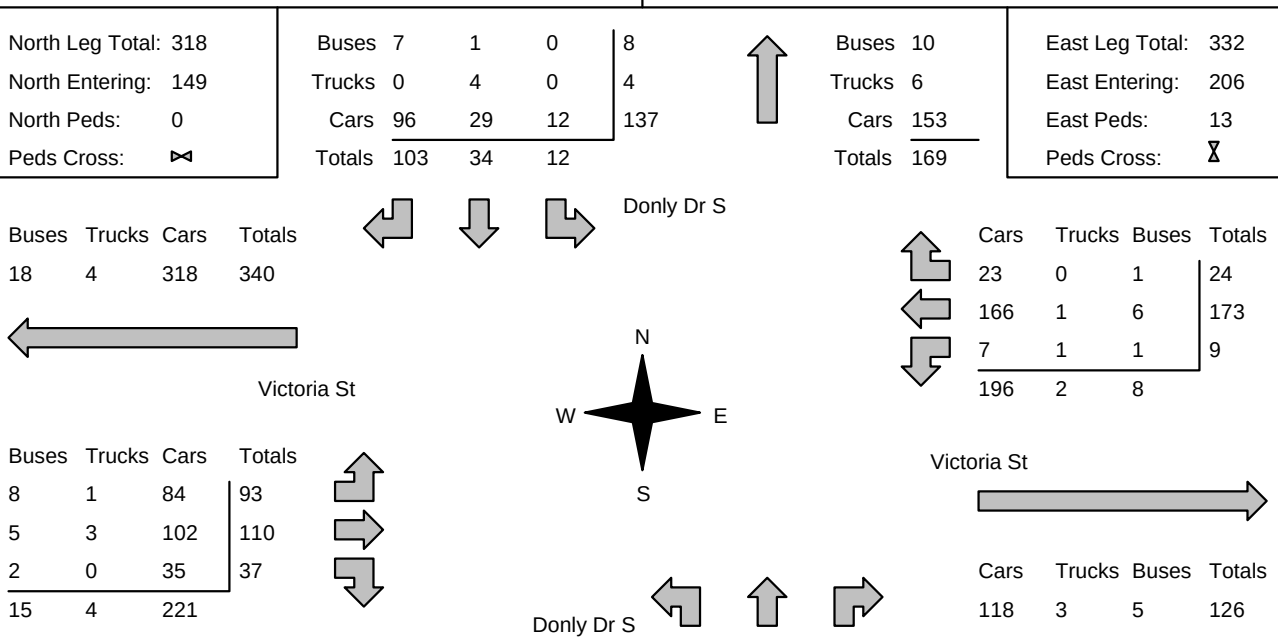
**Municipality:** Norfolk
**Site #:** 2518700003
**Intersection:** Victoria St & Donly Dr S
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 19:00:00

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

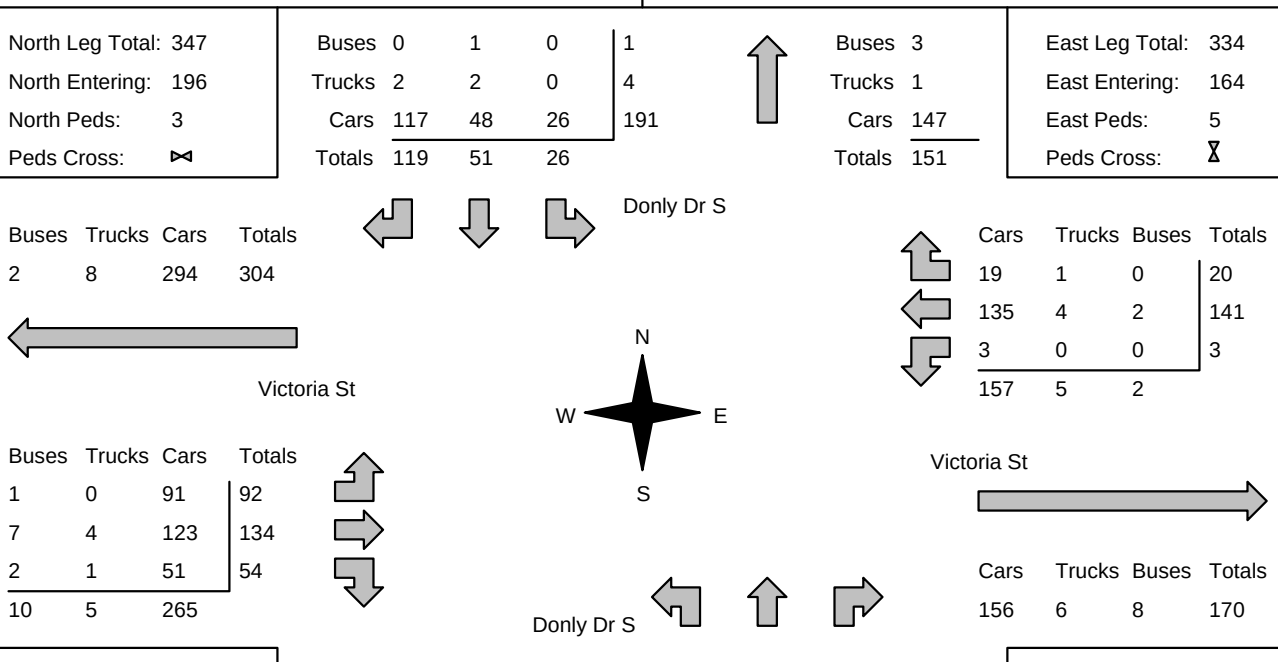
**Municipality:** Norfolk
**Site #:** 2518700003
**Intersection:** Victoria St & Donly Dr S
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Total Count Diagram

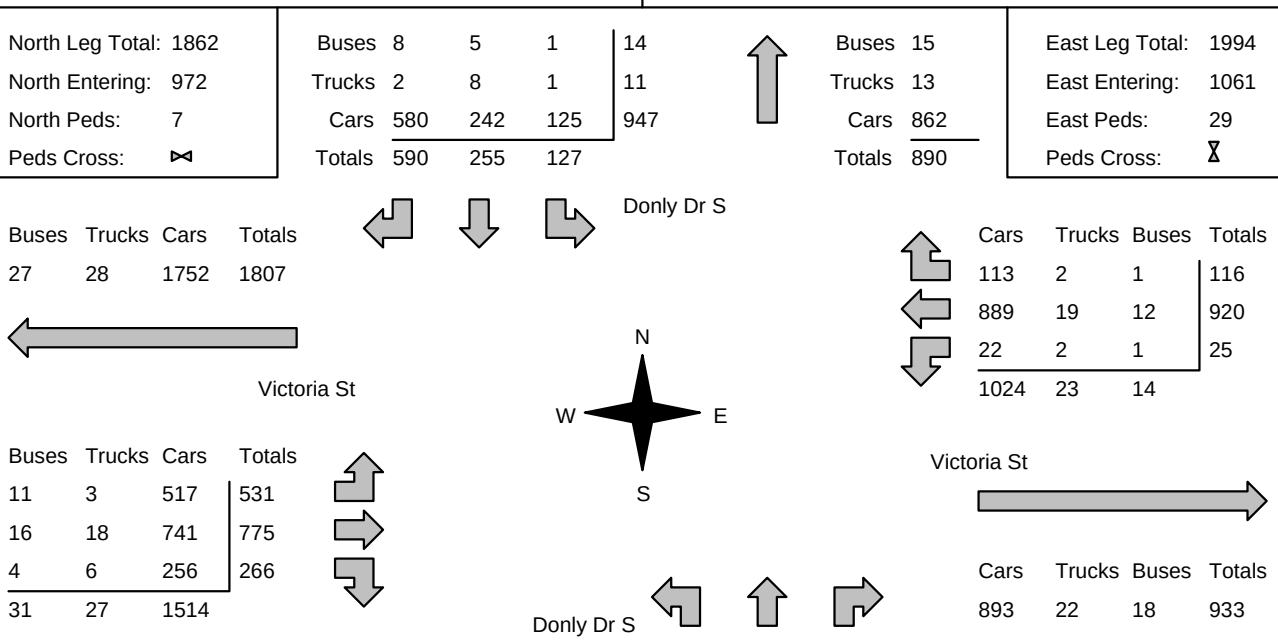
**Municipality:** Norfolk
**Site #:** 2518700003
**Intersection:** Victoria St & Donly Dr S
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

# Traffic Count Summary

**Intersection:** Victoria St & Donly Dr S | **Count Date:** 26-Nov-25 | **Municipality:** Norfolk

## North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *10* | *9* | *12* | *31* | *0* |
| *8:00:00* | *8* | *16* | *35* | *59* | *0* |
| *9:00:00* | *12* | *34* | *103* | *149* | *0* |
| *10:00:00* | *19* | *20* | *58* | *97* | *2* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *26* | *51* | *119* | *196* | *3* |
| *17:00:00* | *20* | *53* | *113* | *186* | *2* |
| *18:00:00* | *14* | *49* | *78* | *141* | *0* |
| *19:00:00* | *18* | *23* | *72* | *113* | *0* |
| Totals: | 127 | 255 | 590 | 972 | 7 |

North/South Total Approaches: 1543

## South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *22* | *16* | *2* | *40* | *1* |
| *8:00:00* | *32* | *30* | *2* | *64* | *3* |
| *9:00:00* | *64* | *52* | *4* | *120* | *10* |
| *10:00:00* | *35* | *24* | *4* | *63* | *10* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *44* | *39* | *10* | *93* | *3* |
| *17:00:00* | *49* | *38* | *7* | *94* | *1* |
| *18:00:00* | *37* | *27* | *1* | *65* | *2* |
| *19:00:00* | *14* | *17* | *1* | *32* | *0* |
| S Totals: | 297 | 243 | 31 | 571 | 30 |

## East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *2* | *24* | *3* | *29* | *1* |
| *8:00:00* | *0* | *74* | *3* | *77* | *1* |
| *9:00:00* | *9* | *173* | *24* | *206* | *13* |
| *10:00:00* | *6* | *104* | *10* | *120* | *4* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *3* | *141* | *20* | *164* | *5* |
| *17:00:00* | *0* | *137* | *21* | *158* | *2* |
| *18:00:00* | *2* | *191* | *24* | *217* | *2* |
| *19:00:00* | *3* | *76* | *11* | *90* | *1* |
| Totals: | 25 | 920 | 116 | 1061 | 29 |

East/West Total Approaches: 2633

## West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *6* | *52* | *16* | *74* | *2* |
| *8:00:00* | *35* | *83* | *18* | *136* | *0* |
| *9:00:00* | *93* | *110* | *37* | *240* | *12* |
| *10:00:00* | *71* | *99* | *28* | *198* | *4* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *92* | *134* | *54* | *280* | *5* |
| *17:00:00* | *90* | *127* | *50* | *267* | *4* |
| *18:00:00* | *91* | *99* | *38* | *228* | *2* |
| *19:00:00* | *53* | *71* | *25* | *149* | *1* |
| W Totals: | 531 | 775 | 266 | 1572 | 30 |

## Calculated Values for Traffic Crossing Major Street

| Hours Ending: | *7:00* | *8:00* | *9:00* | *10:00* | *16:00* | *17:00* | *18:00* | *19:00* |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | *51* | *71* | *153* | *86* | *131* | *128* | *104* | *57* |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700003**

| Interval Time | Passenger Cars - North Approach | | | | | | Trucks - North Approach | | | | | | Buses - North Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | North Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 2 | 2 | 1 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 5 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 7 | 2 | 1 | 0 | 8 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 10 | 3 | 9 | 8 | 12 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 10 | 0 | 12 | 3 | 18 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 12 | 2 | 16 | 4 | 22 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 13 | 1 | 20 | 4 | 31 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 17 | 4 | 24 | 4 | 47 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8:15:00 | 21 | 4 | 26 | 2 | 65 | 18 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 23 | 2 | 32 | 6 | 89 | 24 | 0 | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 2 | 0 | 0 |
| 8:45:00 | 27 | 4 | 44 | 12 | 123 | 34 | 0 | 0 | 4 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 6 | 4 | 0 | 0 |
| 9:00:00 | 29 | 2 | 53 | 9 | 143 | 20 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 7 | 1 | 0 | 0 |
| 9:15:00 | 33 | 4 | 57 | 4 | 156 | 13 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 8 | 1 | 0 | 0 |
| 9:30:00 | 37 | 4 | 63 | 6 | 170 | 14 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 8 | 0 | 0 | 0 |
| 9:45:00 | 42 | 5 | 68 | 5 | 183 | 13 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 8 | 0 | 0 | 0 |
| 10:00:00 | 48 | 6 | 72 | 4 | 200 | 17 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 8 | 0 | 2 | 2 |
| 10:15:00 | 48 | 0 | 72 | 0 | 200 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 8 | 0 | 2 | 0 |
| 15:00:00 | 48 | 0 | 72 | 0 | 200 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 8 | 0 | 2 | 0 |
| 15:15:00 | 53 | 5 | 92 | 20 | 232 | 32 | 0 | 0 | 6 | 1 | 0 | 0 | 1 | 0 | 3 | 1 | 8 | 0 | 3 | 1 |
| 15:30:00 | 61 | 8 | 100 | 8 | 255 | 23 | 0 | 0 | 7 | 1 | 2 | 2 | 1 | 0 | 3 | 0 | 8 | 0 | 3 | 0 |
| 15:45:00 | 69 | 8 | 110 | 10 | 286 | 31 | 0 | 0 | 7 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 8 | 0 | 3 | 0 |
| 16:00:00 | 74 | 5 | 120 | 10 | 317 | 31 | 0 | 0 | 7 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 8 | 0 | 5 | 2 |
| 16:15:00 | 80 | 6 | 130 | 10 | 350 | 33 | 0 | 0 | 7 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 8 | 0 | 5 | 0 |
| 16:30:00 | 83 | 3 | 150 | 20 | 376 | 26 | 0 | 0 | 8 | 1 | 2 | 0 | 1 | 0 | 3 | 0 | 8 | 0 | 5 | 0 |
| 16:45:00 | 85 | 2 | 163 | 13 | 406 | 30 | 0 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 8 | 0 | 5 | 0 |
| 17:00:00 | 94 | 9 | 172 | 9 | 430 | 24 | 0 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 8 | 0 | 7 | 2 |
| 17:15:00 | 97 | 3 | 184 | 12 | 453 | 23 | 0 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 4 | 1 | 8 | 0 | 7 | 0 |
| 17:30:00 | 102 | 5 | 197 | 13 | 472 | 19 | 0 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 8 | 0 | 7 | 0 |
| 17:45:00 | 104 | 2 | 204 | 7 | 494 | 22 | 0 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 4 | 0 | 8 | 0 | 7 | 0 |
| 18:00:00 | 107 | 3 | 219 | 15 | 508 | 14 | 1 | 1 | 8 | 0 | 2 | 0 | 1 | 0 | 5 | 1 | 8 | 0 | 7 | 0 |
| 18:15:00 | 111 | 4 | 224 | 5 | 535 | 27 | 1 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 8 | 0 | 7 | 0 |
| 18:30:00 | 116 | 5 | 227 | 3 | 551 | 16 | 1 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 8 | 0 | 7 | 0 |
| 18:45:00 | 119 | 3 | 234 | 7 | 562 | 11 | 1 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 8 | 0 | 7 | 0 |
| 19:00:00 | 125 | 6 | 242 | 8 | 580 | 18 | 1 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 8 | 0 | 7 | 0 |
| 19:15:00 | 125 | 0 | 242 | 0 | 580 | 0 | 1 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 8 | 0 | 7 | 0 |
| 19:15:15 | 125 | 0 | 242 | 0 | 580 | 0 | 1 | 0 | 8 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 8 | 0 | 7 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700003**

| Interval Time | Passenger Cars - East Approach | | | | | | Trucks - East Approach | | | | | | Buses - East Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | East Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 0 | 0 | 9 | 6 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:00:00 | 2 | 2 | 21 | 12 | 3 | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:15:00 | 2 | 0 | 31 | 10 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:30:00 | 2 | 0 | 46 | 15 | 4 | 1 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:45:00 | 2 | 0 | 64 | 18 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 8:00:00 | 2 | 0 | 94 | 30 | 6 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 8:15:00 | 3 | 1 | 126 | 32 | 12 | 6 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 |
| 8:30:00 | 5 | 2 | 170 | 44 | 18 | 6 | 1 | 1 | 4 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 0 | 0 | 10 | 7 |
| 8:45:00 | 7 | 2 | 218 | 48 | 23 | 5 | 1 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 5 | 3 | 0 | 0 | 15 | 5 |
| 9:00:00 | 9 | 2 | 260 | 42 | 29 | 6 | 1 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 6 | 1 | 1 | 1 | 15 | 0 |
| 9:15:00 | 10 | 1 | 282 | 22 | 33 | 4 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 15 | 0 |
| 9:30:00 | 12 | 2 | 306 | 24 | 34 | 1 | 2 | 1 | 6 | 1 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 18 | 3 |
| 9:45:00 | 12 | 0 | 332 | 26 | 38 | 4 | 2 | 0 | 9 | 3 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 19 | 1 |
| 10:00:00 | 14 | 2 | 359 | 27 | 39 | 1 | 2 | 0 | 10 | 1 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 19 | 0 |
| 10:15:00 | 14 | 0 | 359 | 0 | 39 | 0 | 2 | 0 | 10 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 19 | 0 |
| 15:00:00 | 14 | 0 | 359 | 0 | 39 | 0 | 2 | 0 | 10 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 19 | 0 |
| 15:15:00 | 16 | 2 | 390 | 31 | 45 | 6 | 2 | 0 | 10 | 0 | 0 | 0 | 1 | 0 | 8 | 2 | 1 | 0 | 24 | 5 |
| 15:30:00 | 16 | 0 | 430 | 40 | 52 | 7 | 2 | 0 | 12 | 2 | 0 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 24 | 0 |
| 15:45:00 | 16 | 0 | 464 | 34 | 56 | 4 | 2 | 0 | 12 | 0 | 0 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 24 | 0 |
| 16:00:00 | 17 | 1 | 494 | 30 | 58 | 2 | 2 | 0 | 14 | 2 | 1 | 1 | 1 | 0 | 8 | 0 | 1 | 0 | 24 | 0 |
| 16:15:00 | 17 | 0 | 528 | 34 | 65 | 7 | 2 | 0 | 16 | 2 | 1 | 0 | 1 | 0 | 10 | 2 | 1 | 0 | 24 | 0 |
| 16:30:00 | 17 | 0 | 568 | 40 | 71 | 6 | 2 | 0 | 16 | 0 | 1 | 0 | 1 | 0 | 11 | 1 | 1 | 0 | 24 | 0 |
| 16:45:00 | 17 | 0 | 600 | 32 | 76 | 5 | 2 | 0 | 16 | 0 | 1 | 0 | 1 | 0 | 11 | 0 | 1 | 0 | 26 | 2 |
| 17:00:00 | 17 | 0 | 626 | 26 | 79 | 3 | 2 | 0 | 16 | 0 | 1 | 0 | 1 | 0 | 11 | 0 | 1 | 0 | 26 | 0 |
| 17:15:00 | 18 | 1 | 669 | 43 | 87 | 8 | 2 | 0 | 16 | 0 | 2 | 1 | 1 | 0 | 11 | 0 | 1 | 0 | 27 | 1 |
| 17:30:00 | 18 | 0 | 720 | 51 | 93 | 6 | 2 | 0 | 16 | 0 | 2 | 0 | 1 | 0 | 11 | 0 | 1 | 0 | 28 | 1 |
| 17:45:00 | 18 | 0 | 771 | 51 | 101 | 8 | 2 | 0 | 16 | 0 | 2 | 0 | 1 | 0 | 11 | 0 | 1 | 0 | 28 | 0 |
| 18:00:00 | 19 | 1 | 815 | 44 | 102 | 1 | 2 | 0 | 17 | 1 | 2 | 0 | 1 | 0 | 12 | 1 | 1 | 0 | 28 | 0 |
| 18:15:00 | 19 | 0 | 839 | 24 | 103 | 1 | 2 | 0 | 17 | 0 | 2 | 0 | 1 | 0 | 12 | 0 | 1 | 0 | 28 | 0 |
| 18:30:00 | 20 | 1 | 862 | 23 | 107 | 4 | 2 | 0 | 18 | 1 | 2 | 0 | 1 | 0 | 12 | 0 | 1 | 0 | 29 | 1 |
| 18:45:00 | 22 | 2 | 873 | 11 | 108 | 1 | 2 | 0 | 19 | 1 | 2 | 0 | 1 | 0 | 12 | 0 | 1 | 0 | 29 | 0 |
| 19:00:00 | 22 | 0 | 889 | 16 | 113 | 5 | 2 | 0 | 19 | 0 | 2 | 0 | 1 | 0 | 12 | 0 | 1 | 0 | 29 | 0 |
| 19:15:00 | 22 | 0 | 889 | 0 | 113 | 0 | 2 | 0 | 19 | 0 | 2 | 0 | 1 | 0 | 12 | 0 | 1 | 0 | 29 | 0 |
| 19:15:15 | 22 | 0 | 889 | 0 | 113 | 0 | 2 | 0 | 19 | 0 | 2 | 0 | 1 | 0 | 12 | 0 | 1 | 0 | 29 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700003**

| Interval Time | Passenger Cars - South Approach | | | | | | Trucks - South Approach | | | | | | Buses - South Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | South Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 9 | 9 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 11 | 2 | 8 | 6 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 15 | 4 | 10 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:00:00 | 21 | 6 | 16 | 6 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:15:00 | 26 | 5 | 18 | 2 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:30:00 | 32 | 6 | 24 | 6 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 7:45:00 | 38 | 6 | 35 | 11 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 8:00:00 | 53 | 15 | 44 | 9 | 4 | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 |
| 8:15:00 | 65 | 12 | 49 | 5 | 5 | 1 | 1 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| 8:30:00 | 78 | 13 | 64 | 15 | 5 | 0 | 2 | 1 | 6 | 2 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 6 | 2 |
| 8:45:00 | 96 | 18 | 84 | 20 | 8 | 3 | 4 | 2 | 7 | 1 | 0 | 0 | 4 | 1 | 1 | 1 | 0 | 0 | 10 | 4 |
| 9:00:00 | 109 | 13 | 90 | 6 | 8 | 0 | 4 | 0 | 7 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 0 | 14 | 4 |
| 9:15:00 | 117 | 8 | 99 | 9 | 9 | 1 | 5 | 1 | 7 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 15 | 1 |
| 9:30:00 | 125 | 8 | 101 | 2 | 9 | 0 | 5 | 0 | 7 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 17 | 2 |
| 9:45:00 | 135 | 10 | 106 | 5 | 10 | 1 | 5 | 0 | 7 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 20 | 3 |
| 10:00:00 | 143 | 8 | 114 | 8 | 11 | 1 | 5 | 0 | 7 | 0 | 1 | 1 | 5 | 0 | 1 | 0 | 0 | 0 | 24 | 4 |
| 10:15:00 | 143 | 0 | 114 | 0 | 11 | 0 | 5 | 0 | 7 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 24 | 0 |
| 15:00:00 | 143 | 0 | 114 | 0 | 11 | 0 | 5 | 0 | 7 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 24 | 0 |
| 15:15:00 | 150 | 7 | 127 | 13 | 12 | 1 | 5 | 0 | 7 | 0 | 1 | 0 | 5 | 0 | 2 | 1 | 0 | 0 | 27 | 3 |
| 15:30:00 | 164 | 14 | 137 | 10 | 12 | 0 | 5 | 0 | 7 | 0 | 1 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 27 | 0 |
| 15:45:00 | 176 | 12 | 144 | 7 | 14 | 2 | 7 | 2 | 7 | 0 | 2 | 1 | 5 | 0 | 2 | 0 | 1 | 1 | 27 | 0 |
| 16:00:00 | 185 | 9 | 151 | 7 | 18 | 4 | 7 | 0 | 7 | 0 | 3 | 1 | 5 | 0 | 3 | 1 | 1 | 0 | 27 | 0 |
| 16:15:00 | 196 | 11 | 161 | 10 | 20 | 2 | 7 | 0 | 7 | 0 | 3 | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 27 | 0 |
| 16:30:00 | 208 | 12 | 168 | 7 | 21 | 1 | 7 | 0 | 7 | 0 | 3 | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 27 | 0 |
| 16:45:00 | 226 | 18 | 176 | 8 | 24 | 3 | 7 | 0 | 7 | 0 | 3 | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 28 | 1 |
| 17:00:00 | 234 | 8 | 188 | 12 | 25 | 1 | 7 | 0 | 8 | 1 | 3 | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 28 | 0 |
| 17:15:00 | 243 | 9 | 195 | 7 | 26 | 1 | 7 | 0 | 8 | 0 | 3 | 0 | 6 | 1 | 3 | 0 | 1 | 0 | 29 | 1 |
| 17:30:00 | 252 | 9 | 203 | 8 | 26 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 6 | 0 | 3 | 0 | 1 | 0 | 29 | 0 |
| 17:45:00 | 262 | 10 | 213 | 10 | 26 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 6 | 0 | 3 | 0 | 1 | 0 | 30 | 1 |
| 18:00:00 | 270 | 8 | 215 | 2 | 26 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 6 | 0 | 3 | 0 | 1 | 0 | 30 | 0 |
| 18:15:00 | 274 | 4 | 218 | 3 | 26 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 7 | 1 | 3 | 0 | 1 | 0 | 30 | 0 |
| 18:30:00 | 279 | 5 | 223 | 5 | 27 | 1 | 7 | 0 | 8 | 0 | 3 | 0 | 7 | 0 | 3 | 0 | 1 | 0 | 30 | 0 |
| 18:45:00 | 282 | 3 | 229 | 6 | 27 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 7 | 0 | 3 | 0 | 1 | 0 | 30 | 0 |
| 19:00:00 | 283 | 1 | 232 | 3 | 27 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 7 | 0 | 3 | 0 | 1 | 0 | 30 | 0 |
| 19:15:00 | 283 | 0 | 232 | 0 | 27 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 7 | 0 | 3 | 0 | 1 | 0 | 30 | 0 |
| 19:15:15 | 283 | 0 | 232 | 0 | 27 | 0 | 7 | 0 | 8 | 0 | 3 | 0 | 7 | 0 | 3 | 0 | 1 | 0 | 30 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700003**

| Interval Time | Passenger Cars - West Approach | | | | | | Trucks - West Approach | | | | | | Buses - West Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | West Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 12 | 12 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 6:30:00 | 1 | 1 | 24 | 12 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 6:45:00 | 4 | 3 | 33 | 9 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 7:00:00 | 6 | 2 | 51 | 18 | 16 | 6 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 7:15:00 | 17 | 11 | 68 | 17 | 18 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 |
| 7:30:00 | 23 | 6 | 78 | 10 | 23 | 5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| 7:45:00 | 29 | 6 | 105 | 27 | 26 | 3 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| 8:00:00 | 41 | 12 | 131 | 26 | 34 | 8 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 0 |
| 8:15:00 | 57 | 16 | 148 | 17 | 41 | 7 | 0 | 0 | 3 | 1 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 2 | 0 |
| 8:30:00 | 90 | 33 | 182 | 34 | 49 | 8 | 1 | 1 | 4 | 1 | 0 | 0 | 4 | 2 | 3 | 1 | 1 | 1 | 6 | 4 |
| 8:45:00 | 111 | 21 | 206 | 24 | 59 | 10 | 1 | 0 | 5 | 1 | 0 | 0 | 6 | 2 | 4 | 1 | 2 | 1 | 11 | 5 |
| 9:00:00 | 125 | 14 | 233 | 27 | 69 | 10 | 1 | 0 | 5 | 0 | 0 | 0 | 8 | 2 | 7 | 3 | 2 | 0 | 14 | 3 |
| 9:15:00 | 138 | 13 | 261 | 28 | 74 | 5 | 1 | 0 | 5 | 0 | 0 | 0 | 9 | 1 | 7 | 0 | 2 | 0 | 16 | 2 |
| 9:30:00 | 151 | 13 | 279 | 18 | 80 | 6 | 1 | 0 | 6 | 1 | 0 | 0 | 9 | 0 | 7 | 0 | 2 | 0 | 16 | 0 |
| 9:45:00 | 167 | 16 | 298 | 19 | 89 | 9 | 1 | 0 | 9 | 3 | 1 | 1 | 9 | 0 | 7 | 0 | 2 | 0 | 16 | 0 |
| 10:00:00 | 194 | 27 | 328 | 30 | 95 | 6 | 2 | 1 | 9 | 0 | 2 | 1 | 9 | 0 | 7 | 0 | 2 | 0 | 18 | 2 |
| 10:15:00 | 194 | 0 | 328 | 0 | 95 | 0 | 2 | 0 | 9 | 0 | 2 | 0 | 9 | 0 | 7 | 0 | 2 | 0 | 18 | 0 |
| 15:00:00 | 194 | 0 | 328 | 0 | 95 | 0 | 2 | 0 | 9 | 0 | 2 | 0 | 9 | 0 | 7 | 0 | 2 | 0 | 18 | 0 |
| 15:15:00 | 218 | 24 | 372 | 44 | 107 | 12 | 2 | 0 | 10 | 1 | 2 | 0 | 10 | 1 | 11 | 4 | 2 | 0 | 19 | 1 |
| 15:30:00 | 240 | 22 | 396 | 24 | 119 | 12 | 2 | 0 | 12 | 2 | 2 | 0 | 10 | 0 | 13 | 2 | 4 | 2 | 19 | 0 |
| 15:45:00 | 261 | 21 | 431 | 35 | 131 | 12 | 2 | 0 | 13 | 1 | 2 | 0 | 10 | 0 | 13 | 0 | 4 | 0 | 20 | 1 |
| 16:00:00 | 285 | 24 | 451 | 20 | 146 | 15 | 2 | 0 | 13 | 0 | 3 | 1 | 10 | 0 | 14 | 1 | 4 | 0 | 23 | 3 |
| 16:15:00 | 311 | 26 | 485 | 34 | 157 | 11 | 3 | 1 | 14 | 1 | 4 | 1 | 10 | 0 | 15 | 1 | 4 | 0 | 23 | 0 |
| 16:30:00 | 335 | 24 | 513 | 28 | 167 | 10 | 3 | 0 | 14 | 0 | 4 | 0 | 11 | 1 | 16 | 1 | 4 | 0 | 23 | 0 |
| 16:45:00 | 357 | 22 | 546 | 33 | 179 | 12 | 3 | 0 | 16 | 2 | 4 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 25 | 2 |
| 17:00:00 | 373 | 16 | 573 | 27 | 194 | 15 | 3 | 0 | 16 | 0 | 5 | 1 | 11 | 0 | 16 | 0 | 4 | 0 | 27 | 2 |
| 17:15:00 | 410 | 37 | 612 | 39 | 201 | 7 | 3 | 0 | 17 | 1 | 6 | 1 | 11 | 0 | 16 | 0 | 4 | 0 | 27 | 0 |
| 17:30:00 | 428 | 18 | 632 | 20 | 215 | 14 | 3 | 0 | 17 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 27 | 0 |
| 17:45:00 | 443 | 15 | 651 | 19 | 220 | 5 | 3 | 0 | 17 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 28 | 1 |
| 18:00:00 | 464 | 21 | 671 | 20 | 231 | 11 | 3 | 0 | 17 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 29 | 1 |
| 18:15:00 | 483 | 19 | 687 | 16 | 238 | 7 | 3 | 0 | 17 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 30 | 1 |
| 18:30:00 | 494 | 11 | 699 | 12 | 245 | 7 | 3 | 0 | 17 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 30 | 0 |
| 18:45:00 | 506 | 12 | 720 | 21 | 253 | 8 | 3 | 0 | 18 | 1 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 30 | 0 |
| 19:00:00 | 517 | 11 | 741 | 21 | 256 | 3 | 3 | 0 | 18 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 30 | 0 |
| 19:15:00 | 517 | 0 | 741 | 0 | 256 | 0 | 3 | 0 | 18 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 30 | 0 |
| 19:15:15 | 517 | 0 | 741 | 0 | 256 | 0 | 3 | 0 | 18 | 0 | 6 | 0 | 11 | 0 | 16 | 0 | 4 | 0 | 30 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Morning Peak Diagram

**Specified Period**
**From:** 6:00:00
**To:** 10:00:00

**One Hour Peak**
**From:** 8:15:00
**To:** 9:15:00

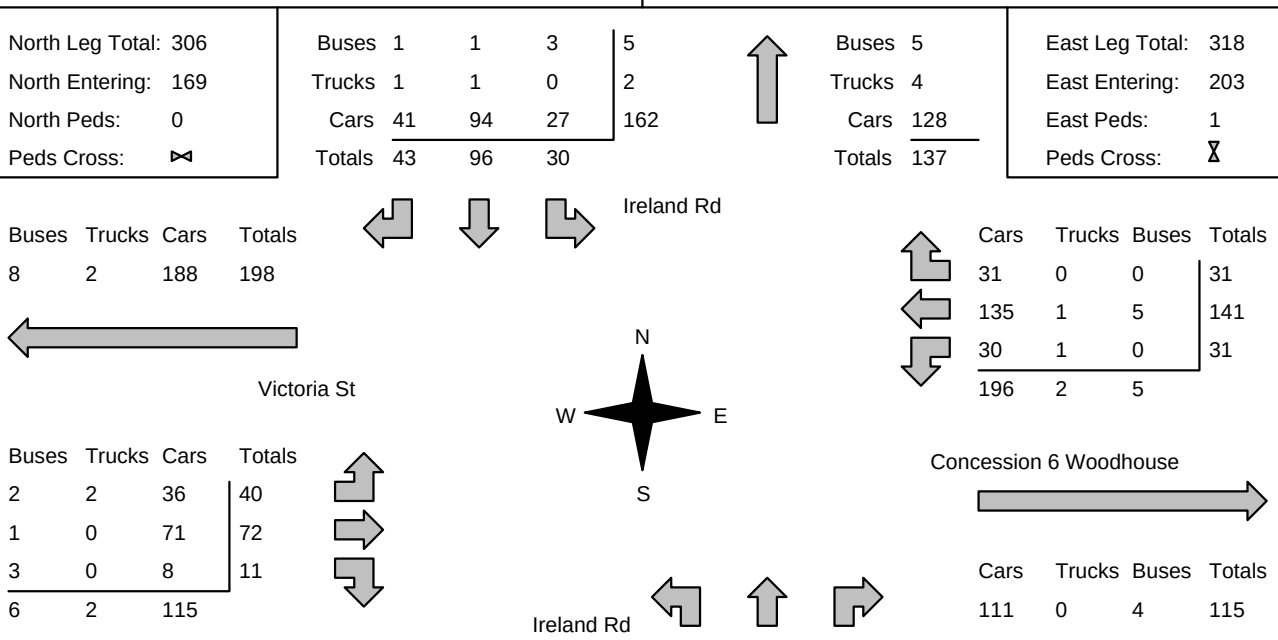
**Municipality:** Norfolk
**Site #:** 2518700004
**Intersection:** Victoria St & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 19:00:00

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

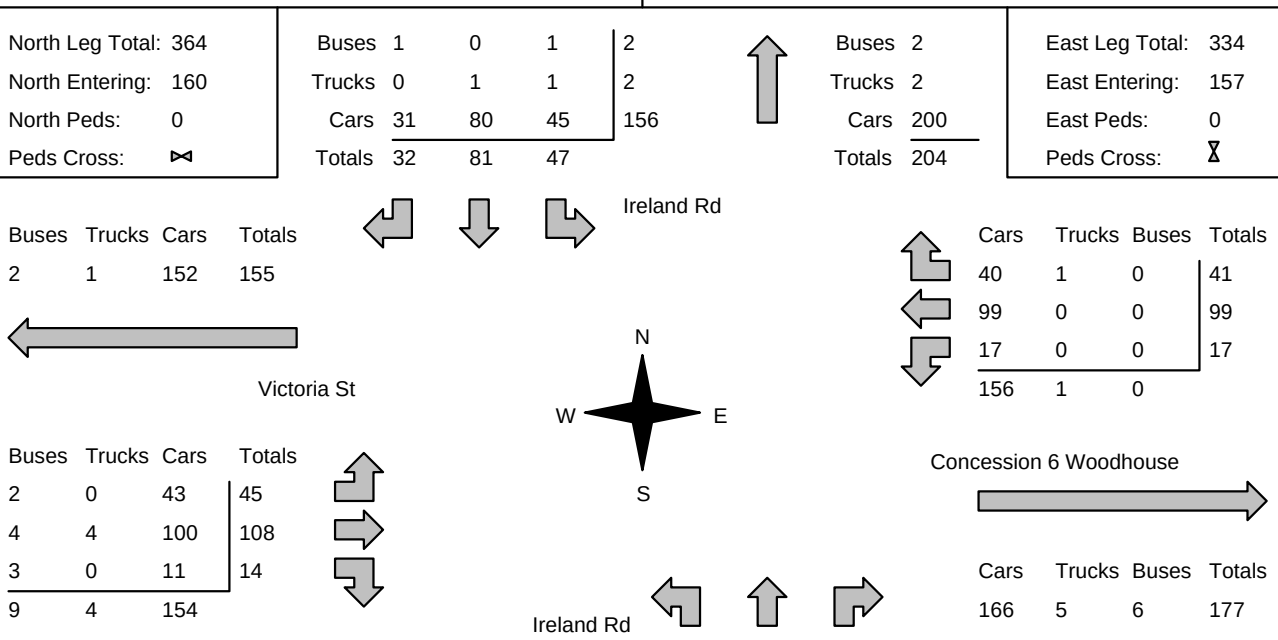
**Municipality:** Norfolk
**Site #:** 2518700004
**Intersection:** Victoria St & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Total Count Diagram

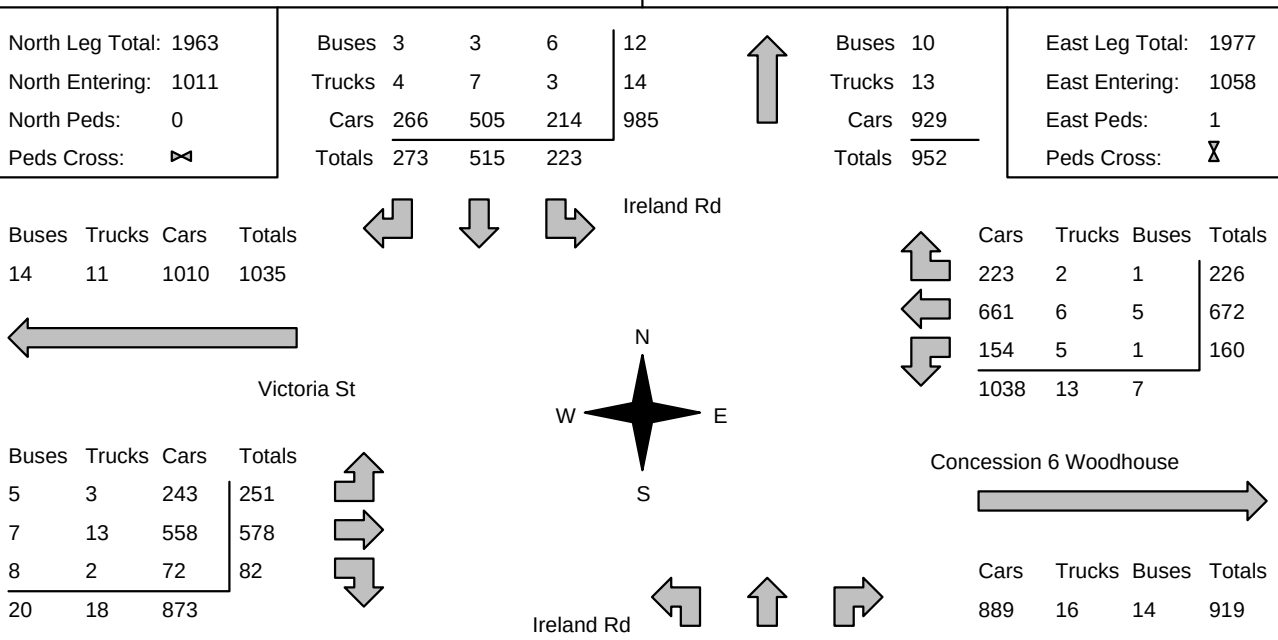
**Municipality:** Norfolk
**Site #:** 2518700004
**Intersection:** Victoria St & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

# Traffic Count Summary

**Intersection:** Victoria St & Ireland Rd | **Count Date:** 26-Nov-25 | **Municipality:** Norfolk

## North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *13* | *44* | *7* | *64* | *0* |
| *8:00:00* | *21* | *33* | *13* | *67* | *0* |
| *9:00:00* | *29* | *81* | *52* | *162* | *0* |
| *10:00:00* | *26* | *57* | *25* | *108* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *47* | *81* | *32* | *160* | *0* |
| *17:00:00* | *41* | *94* | *43* | *178* | *0* |
| *18:00:00* | *28* | *72* | *69* | *169* | *0* |
| *19:00:00* | *18* | *53* | *32* | *103* | *0* |
| Totals: | 223 | 515 | 273 | 1011 | 0 |

North/South Total Approaches: 1694

## South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *2* | *20* | *11* | *33* | *0* |
| *8:00:00* | *4* | *37* | *26* | *67* | *0* |
| *9:00:00* | *14* | *64* | *8* | *86* | *0* |
| *10:00:00* | *11* | *67* | *14* | *92* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *24* | *118* | *22* | *164* | *0* |
| *17:00:00* | *13* | *73* | *22* | *108* | *0* |
| *18:00:00* | *15* | *61* | *9* | *85* | *0* |
| *19:00:00* | *7* | *35* | *6* | *48* | *0* |
| S Totals: | 90 | 475 | 118 | 683 | 0 |

## East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *23* | *20* | *9* | *52* | *0* |
| *8:00:00* | *21* | *60* | *20* | *101* | *0* |
| *9:00:00* | *35* | *148* | *35* | *218* | *1* |
| *10:00:00* | *16* | *77* | *25* | *118* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *17* | *99* | *41* | *157* | *0* |
| *17:00:00* | *24* | *92* | *35* | *151* | *0* |
| *18:00:00* | *16* | *127* | *36* | *179* | *0* |
| *19:00:00* | *8* | *49* | *25* | *82* | *0* |
| Totals: | 160 | 672 | 226 | 1058 | 1 |

East/West Total Approaches: 1969

## West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *10* | *47* | *7* | *64* | *0* |
| *8:00:00* | *18* | *65* | *7* | *90* | *1* |
| *9:00:00* | *43* | *59* | *12* | *114* | *2* |
| *10:00:00* | *26* | *80* | *11* | *117* | *1* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *45* | *108* | *14* | *167* | *0* |
| *17:00:00* | *45* | *93* | *12* | *150* | *0* |
| *18:00:00* | *34* | *72* | *11* | *117* | *0* |
| *19:00:00* | *30* | *54* | *8* | *92* | *0* |
| W Totals: | 251 | 578 | 82 | 911 | 4 |

## Calculated Values for Traffic Crossing Major Street

| Hours Ending: | *7:00* | *8:00* | *9:00* | *10:00* | *16:00* | *17:00* | *18:00* | *19:00* |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | *59* | *63* | *127* | *105* | *189* | *148* | *115* | *78* |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700004**

| Interval Time | Passenger Cars - North Approach | | | | | | Trucks - North Approach | | | | | | Buses - North Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | North Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 5 | 5 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 10 | 5 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 12 | 2 | 21 | 16 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 13 | 1 | 43 | 22 | 7 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 17 | 4 | 49 | 6 | 10 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 20 | 3 | 58 | 9 | 13 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 28 | 8 | 65 | 7 | 16 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8:00:00 | 33 | 5 | 75 | 10 | 20 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 39 | 6 | 82 | 7 | 35 | 15 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 45 | 6 | 100 | 18 | 46 | 11 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8:45:00 | 50 | 5 | 125 | 25 | 59 | 13 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 9:00:00 | 59 | 9 | 156 | 31 | 70 | 11 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 9:15:00 | 66 | 7 | 176 | 20 | 76 | 6 | 0 | 0 | 2 | 1 | 1 | 0 | 4 | 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| 9:30:00 | 72 | 6 | 183 | 7 | 80 | 4 | 1 | 1 | 3 | 1 | 1 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 9:45:00 | 76 | 4 | 196 | 13 | 87 | 7 | 1 | 0 | 3 | 0 | 2 | 1 | 5 | 1 | 2 | 0 | 1 | 0 | 0 | 0 |
| 10:00:00 | 82 | 6 | 210 | 14 | 93 | 6 | 2 | 1 | 3 | 0 | 3 | 1 | 5 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 10:15:00 | 82 | 0 | 210 | 0 | 93 | 0 | 2 | 0 | 3 | 0 | 3 | 0 | 5 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 15:00:00 | 82 | 0 | 210 | 0 | 93 | 0 | 2 | 0 | 3 | 0 | 3 | 0 | 5 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 15:15:00 | 97 | 15 | 229 | 19 | 101 | 8 | 2 | 0 | 3 | 0 | 3 | 0 | 5 | 0 | 2 | 0 | 2 | 1 | 0 | 0 |
| 15:30:00 | 111 | 14 | 250 | 21 | 109 | 8 | 2 | 0 | 3 | 0 | 3 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 15:45:00 | 120 | 9 | 274 | 24 | 116 | 7 | 3 | 1 | 4 | 1 | 3 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 16:00:00 | 127 | 7 | 290 | 16 | 124 | 8 | 3 | 0 | 4 | 0 | 3 | 0 | 6 | 1 | 2 | 0 | 2 | 0 | 0 | 0 |
| 16:15:00 | 139 | 12 | 309 | 19 | 131 | 7 | 3 | 0 | 4 | 0 | 4 | 1 | 6 | 0 | 3 | 1 | 2 | 0 | 0 | 0 |
| 16:30:00 | 146 | 7 | 332 | 23 | 142 | 11 | 3 | 0 | 5 | 1 | 4 | 0 | 6 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 16:45:00 | 157 | 11 | 361 | 29 | 159 | 17 | 3 | 0 | 5 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:00:00 | 168 | 11 | 382 | 21 | 166 | 7 | 3 | 0 | 5 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:15:00 | 173 | 5 | 403 | 21 | 181 | 15 | 3 | 0 | 5 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:30:00 | 181 | 8 | 425 | 22 | 205 | 24 | 3 | 0 | 5 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:45:00 | 190 | 9 | 442 | 17 | 217 | 12 | 3 | 0 | 5 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 18:00:00 | 196 | 6 | 453 | 11 | 234 | 17 | 3 | 0 | 6 | 1 | 4 | 0 | 6 | 0 | 3 | 0 | 3 | 1 | 0 | 0 |
| 18:15:00 | 205 | 9 | 470 | 17 | 244 | 10 | 3 | 0 | 6 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |
| 18:30:00 | 208 | 3 | 483 | 13 | 251 | 7 | 3 | 0 | 7 | 1 | 4 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |
| 18:45:00 | 211 | 3 | 498 | 15 | 257 | 6 | 3 | 0 | 7 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |
| 19:00:00 | 214 | 3 | 505 | 7 | 266 | 9 | 3 | 0 | 7 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |
| 19:15:00 | 214 | 0 | 505 | 0 | 266 | 0 | 3 | 0 | 7 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |
| 19:15:15 | 214 | 0 | 505 | 0 | 266 | 0 | 3 | 0 | 7 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700004**

| Interval Time | Passenger Cars - East Approach | | | | | | Trucks - East Approach | | | | | | Buses - East Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | East Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 1 | 1 | 3 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 3 | 2 | 4 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 11 | 8 | 9 | 5 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 23 | 12 | 20 | 11 | 9 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 26 | 3 | 26 | 6 | 17 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 30 | 4 | 39 | 13 | 23 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 38 | 8 | 53 | 14 | 28 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 44 | 6 | 80 | 27 | 29 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 47 | 3 | 102 | 22 | 36 | 7 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 58 | 11 | 142 | 40 | 45 | 9 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 3 | 0 | 0 | 1 | 1 |
| 8:45:00 | 69 | 11 | 186 | 44 | 51 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 1 | 0 | 0 | 1 | 0 |
| 9:00:00 | 75 | 6 | 222 | 36 | 64 | 13 | 3 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 5 | 1 | 0 | 0 | 1 | 0 |
| 9:15:00 | 77 | 2 | 237 | 15 | 67 | 3 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 9:30:00 | 84 | 7 | 255 | 18 | 76 | 9 | 4 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 9:45:00 | 88 | 4 | 276 | 21 | 82 | 6 | 4 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 10:00:00 | 90 | 2 | 297 | 21 | 88 | 6 | 4 | 0 | 3 | 1 | 1 | 1 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 10:15:00 | 90 | 0 | 297 | 0 | 88 | 0 | 4 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 15:00:00 | 90 | 0 | 297 | 0 | 88 | 0 | 4 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 15:15:00 | 93 | 3 | 319 | 22 | 98 | 10 | 4 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 15:30:00 | 96 | 3 | 349 | 30 | 112 | 14 | 4 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 15:45:00 | 100 | 4 | 372 | 23 | 118 | 6 | 4 | 0 | 3 | 0 | 2 | 1 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 16:00:00 | 107 | 7 | 396 | 24 | 128 | 10 | 4 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 16:15:00 | 112 | 5 | 419 | 23 | 135 | 7 | 4 | 0 | 4 | 1 | 2 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 |
| 16:30:00 | 119 | 7 | 447 | 28 | 142 | 7 | 5 | 1 | 4 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 1 | 1 | 0 |
| 16:45:00 | 123 | 4 | 465 | 18 | 150 | 8 | 5 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 17:00:00 | 130 | 7 | 487 | 22 | 162 | 12 | 5 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 17:15:00 | 134 | 4 | 517 | 30 | 169 | 7 | 5 | 0 | 5 | 1 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 17:30:00 | 141 | 7 | 542 | 25 | 186 | 17 | 5 | 0 | 5 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 17:45:00 | 143 | 2 | 587 | 45 | 193 | 7 | 5 | 0 | 5 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 18:00:00 | 146 | 3 | 612 | 25 | 198 | 5 | 5 | 0 | 6 | 1 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 18:15:00 | 146 | 0 | 626 | 14 | 207 | 9 | 5 | 0 | 6 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 18:30:00 | 151 | 5 | 644 | 18 | 212 | 5 | 5 | 0 | 6 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 18:45:00 | 153 | 2 | 651 | 7 | 216 | 4 | 5 | 0 | 6 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 19:00:00 | 154 | 1 | 661 | 10 | 223 | 7 | 5 | 0 | 6 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 19:15:00 | 154 | 0 | 661 | 0 | 223 | 0 | 5 | 0 | 6 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |
| 19:15:15 | 154 | 0 | 661 | 0 | 223 | 0 | 5 | 0 | 6 | 0 | 2 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700004**

| Interval Time | Passenger Cars - South Approach | | | | | | Trucks - South Approach | | | | | | Buses - South Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | South Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 3 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 1 | 1 | 7 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 2 | 1 | 8 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 2 | 0 | 18 | 10 | 11 | 6 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 2 | 0 | 27 | 9 | 15 | 4 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 2 | 0 | 35 | 8 | 23 | 8 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 3 | 1 | 44 | 9 | 31 | 8 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 6 | 3 | 54 | 10 | 37 | 6 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 10 | 4 | 66 | 12 | 39 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 14 | 4 | 76 | 10 | 42 | 3 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8:45:00 | 15 | 1 | 92 | 16 | 45 | 3 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 9:00:00 | 18 | 3 | 114 | 22 | 45 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 |
| 9:15:00 | 22 | 4 | 127 | 13 | 52 | 7 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 3 | 1 | 0 | 0 | 0 | 0 |
| 9:30:00 | 23 | 1 | 146 | 19 | 55 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 9:45:00 | 27 | 4 | 163 | 17 | 57 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 10:00:00 | 29 | 2 | 180 | 17 | 59 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 10:15:00 | 29 | 0 | 180 | 0 | 59 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 15:00:00 | 29 | 0 | 180 | 0 | 59 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 15:15:00 | 36 | 7 | 205 | 25 | 67 | 8 | 0 | 0 | 5 | 0 | 0 | 0 | 3 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| 15:30:00 | 45 | 9 | 238 | 33 | 74 | 7 | 0 | 0 | 6 | 1 | 0 | 0 | 3 | 0 | 3 | 0 | 1 | 1 | 0 | 0 |
| 15:45:00 | 48 | 3 | 277 | 39 | 78 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| 16:00:00 | 51 | 3 | 297 | 20 | 80 | 2 | 1 | 1 | 6 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| 16:15:00 | 55 | 4 | 315 | 18 | 86 | 6 | 1 | 0 | 6 | 0 | 0 | 0 | 5 | 2 | 4 | 1 | 1 | 0 | 0 | 0 |
| 16:30:00 | 58 | 3 | 331 | 16 | 89 | 3 | 1 | 0 | 6 | 0 | 0 | 0 | 6 | 1 | 4 | 0 | 1 | 0 | 0 | 0 |
| 16:45:00 | 61 | 3 | 350 | 19 | 96 | 7 | 1 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 17:00:00 | 61 | 0 | 368 | 18 | 102 | 6 | 1 | 0 | 7 | 1 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 17:15:00 | 66 | 5 | 390 | 22 | 105 | 3 | 1 | 0 | 7 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 17:30:00 | 73 | 7 | 401 | 11 | 108 | 3 | 1 | 0 | 7 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 17:45:00 | 75 | 2 | 417 | 16 | 110 | 2 | 1 | 0 | 7 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 18:00:00 | 76 | 1 | 428 | 11 | 111 | 1 | 1 | 0 | 8 | 1 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 18:15:00 | 76 | 0 | 433 | 5 | 112 | 1 | 1 | 0 | 8 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 18:30:00 | 79 | 3 | 441 | 8 | 112 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 18:45:00 | 81 | 2 | 450 | 9 | 115 | 3 | 1 | 0 | 8 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 19:00:00 | 83 | 2 | 463 | 13 | 117 | 2 | 1 | 0 | 8 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 19:15:00 | 83 | 0 | 463 | 0 | 117 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |
| 19:15:15 | 83 | 0 | 463 | 0 | 117 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 1 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700004**

| Interval Time | Passenger Cars - West Approach | | | | | | Trucks - West Approach | | | | | | Buses - West Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | West Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 2 | 2 | 11 | 11 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 6 | 4 | 22 | 11 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 6 | 0 | 29 | 7 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 10 | 4 | 46 | 17 | 7 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 13 | 3 | 61 | 15 | 7 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 7:30:00 | 13 | 0 | 69 | 8 | 8 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 7:45:00 | 19 | 6 | 87 | 18 | 9 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 27 | 8 | 108 | 21 | 14 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 1 |
| 8:15:00 | 32 | 5 | 124 | 16 | 16 | 2 | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 8:30:00 | 47 | 15 | 137 | 13 | 19 | 3 | 1 | 1 | 2 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 1 | 0 |
| 8:45:00 | 53 | 6 | 152 | 15 | 21 | 2 | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 3 | 1 | 0 | 0 | 1 | 0 |
| 9:00:00 | 66 | 13 | 166 | 14 | 22 | 1 | 2 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 3 | 0 | 3 | 3 | 3 | 2 |
| 9:15:00 | 68 | 2 | 195 | 29 | 24 | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 3 | 0 |
| 9:30:00 | 73 | 5 | 209 | 14 | 26 | 2 | 2 | 0 | 3 | 1 | 1 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 3 | 0 |
| 9:45:00 | 78 | 5 | 224 | 15 | 30 | 4 | 3 | 1 | 4 | 1 | 1 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 3 | 0 |
| 10:00:00 | 91 | 13 | 244 | 20 | 33 | 3 | 3 | 0 | 4 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 4 | 1 |
| 10:15:00 | 91 | 0 | 244 | 0 | 33 | 0 | 3 | 0 | 4 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 4 | 0 |
| 15:00:00 | 91 | 0 | 244 | 0 | 33 | 0 | 3 | 0 | 4 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 3 | 0 | 4 | 0 |
| 15:15:00 | 104 | 13 | 275 | 31 | 37 | 4 | 3 | 0 | 4 | 0 | 1 | 0 | 3 | 0 | 5 | 2 | 5 | 2 | 4 | 0 |
| 15:30:00 | 113 | 9 | 298 | 23 | 38 | 1 | 3 | 0 | 5 | 1 | 1 | 0 | 4 | 1 | 6 | 1 | 5 | 0 | 4 | 0 |
| 15:45:00 | 124 | 11 | 328 | 30 | 40 | 2 | 3 | 0 | 7 | 2 | 1 | 0 | 4 | 0 | 7 | 1 | 5 | 0 | 4 | 0 |
| 16:00:00 | 134 | 10 | 344 | 16 | 44 | 4 | 3 | 0 | 8 | 1 | 1 | 0 | 5 | 1 | 7 | 0 | 6 | 1 | 4 | 0 |
| 16:15:00 | 149 | 15 | 368 | 24 | 45 | 1 | 3 | 0 | 9 | 1 | 1 | 0 | 5 | 0 | 7 | 0 | 7 | 1 | 4 | 0 |
| 16:30:00 | 161 | 12 | 384 | 16 | 48 | 3 | 3 | 0 | 9 | 0 | 1 | 0 | 5 | 0 | 7 | 0 | 8 | 1 | 4 | 0 |
| 16:45:00 | 170 | 9 | 411 | 27 | 50 | 2 | 3 | 0 | 11 | 2 | 1 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 17:00:00 | 179 | 9 | 434 | 23 | 54 | 4 | 3 | 0 | 11 | 0 | 1 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 17:15:00 | 192 | 13 | 463 | 29 | 57 | 3 | 3 | 0 | 11 | 0 | 2 | 1 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 17:30:00 | 198 | 6 | 478 | 15 | 60 | 3 | 3 | 0 | 11 | 0 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 17:45:00 | 204 | 6 | 493 | 15 | 60 | 0 | 3 | 0 | 11 | 0 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 18:00:00 | 213 | 9 | 505 | 12 | 64 | 4 | 3 | 0 | 12 | 1 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 18:15:00 | 221 | 8 | 516 | 11 | 66 | 2 | 3 | 0 | 12 | 0 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 18:30:00 | 224 | 3 | 528 | 12 | 68 | 2 | 3 | 0 | 12 | 0 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 18:45:00 | 233 | 9 | 542 | 14 | 70 | 2 | 3 | 0 | 13 | 1 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 19:00:00 | 243 | 10 | 558 | 16 | 72 | 2 | 3 | 0 | 13 | 0 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 19:15:00 | 243 | 0 | 558 | 0 | 72 | 0 | 3 | 0 | 13 | 0 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |
| 19:15:15 | 243 | 0 | 558 | 0 | 72 | 0 | 3 | 0 | 13 | 0 | 2 | 0 | 5 | 0 | 7 | 0 | 8 | 0 | 4 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Morning Peak Diagram

**Specified Period**
**From:** 6:00:00
**To:** 10:00:00

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

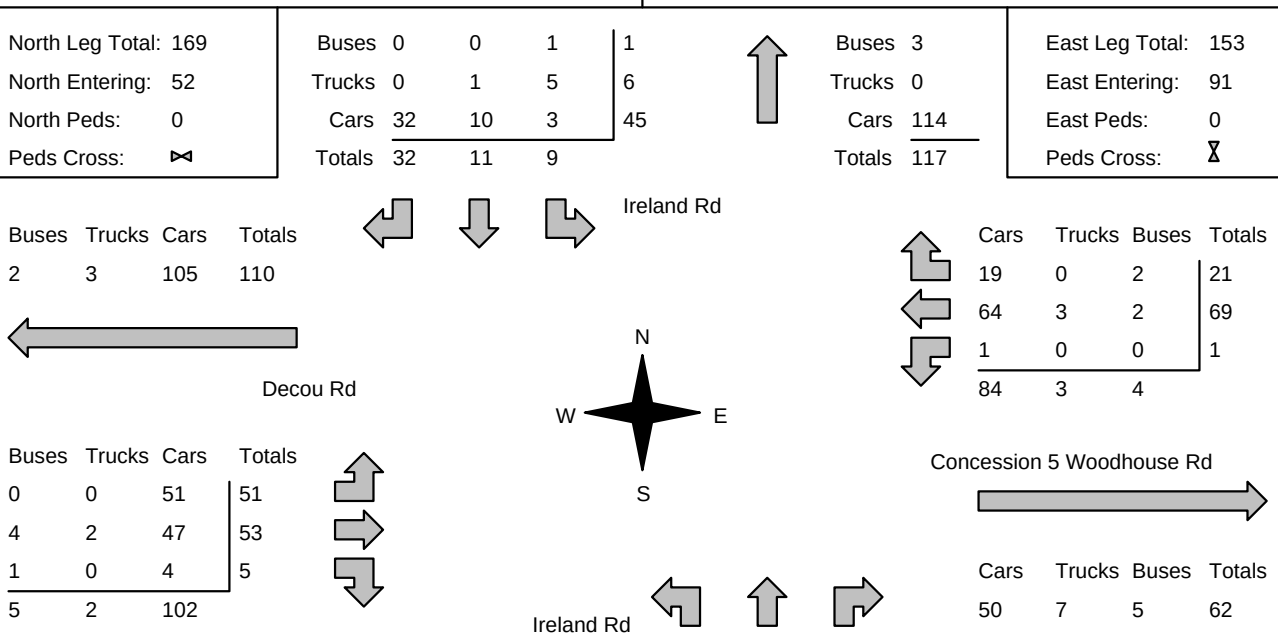
**Municipality:** Norfolk
**Site #:** 2518700005
**Intersection:** Decou Rd & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

**Major Road:** Decou Rd runs W/E




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 19:00:00

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

**Municipality:** Norfolk
**Site #:** 2518700005
**Intersection:** Decou Rd & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

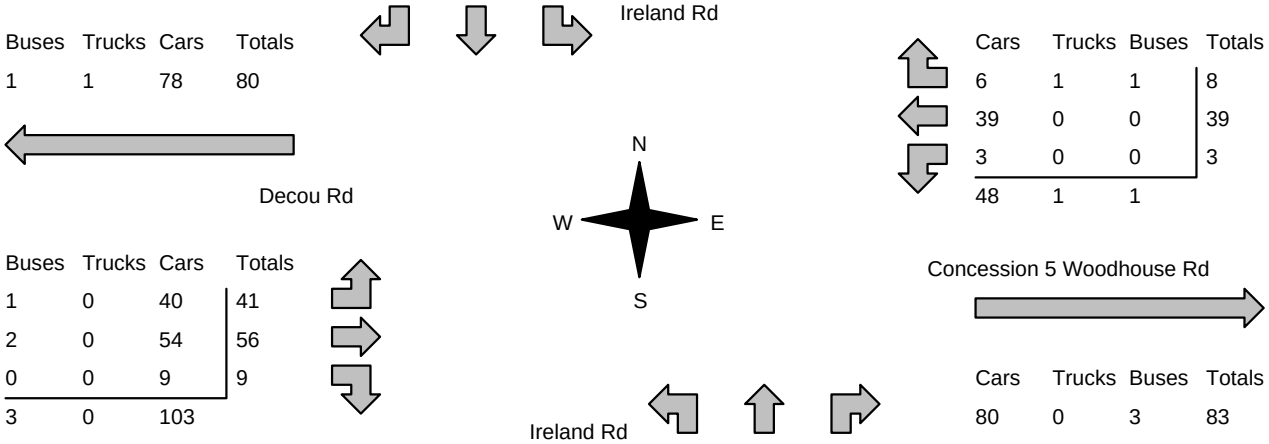
**Major Road:** Decou Rd runs W/E

North Leg Total: 202
North Entering: 121
North Peds: 0
Peds Cross: ⋈

| | | | | |
|---|---|---|---|---|
| Buses | 0 | 2 | 1 | 3 |
| Trucks | 1 | 1 | 0 | 2 |
| Cars | 36 | 55 | 25 | 116 |
| Totals | 37 | 58 | 26 | |

| | |
|---|---|
| Buses | 2 |
| Trucks | 2 |
| Cars | 77 |
| Totals | 81 |

East Leg Total: 133
East Entering: 50
East Peds: 0
Peds Cross: ⧖




| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 1 | 1 | 78 | 80 |

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 6 | 1 | 1 | 8 |
| 39 | 0 | 0 | 39 |
| 3 | 0 | 0 | 3 |
| 48 | 1 | 1 | |

| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 1 | 0 | 40 | 41 |
| 2 | 0 | 54 | 56 |
| 0 | 0 | 9 | 9 |
| 3 | 0 | 103 | |

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 80 | 0 | 3 | 83 |

Peds Cross: ⧖
West Peds: 0
West Entering: 106
West Leg Total: 186

| | |
|---|---|
| Cars | 67 |
| Trucks | 1 |
| Buses | 2 |
| Totals | 70 |

| | | | |
|---|---|---|---|
| Cars | 3 | 31 | 1 | 35 |
| Trucks | 0 | 1 | 0 | 1 |
| Buses | 1 | 0 | 0 | 1 |
| Totals | 4 | 32 | 1 | |

Peds Cross: ⋈
South Peds: 0
South Entering: 37
South Leg Total: 107

### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

## Total Count Diagram

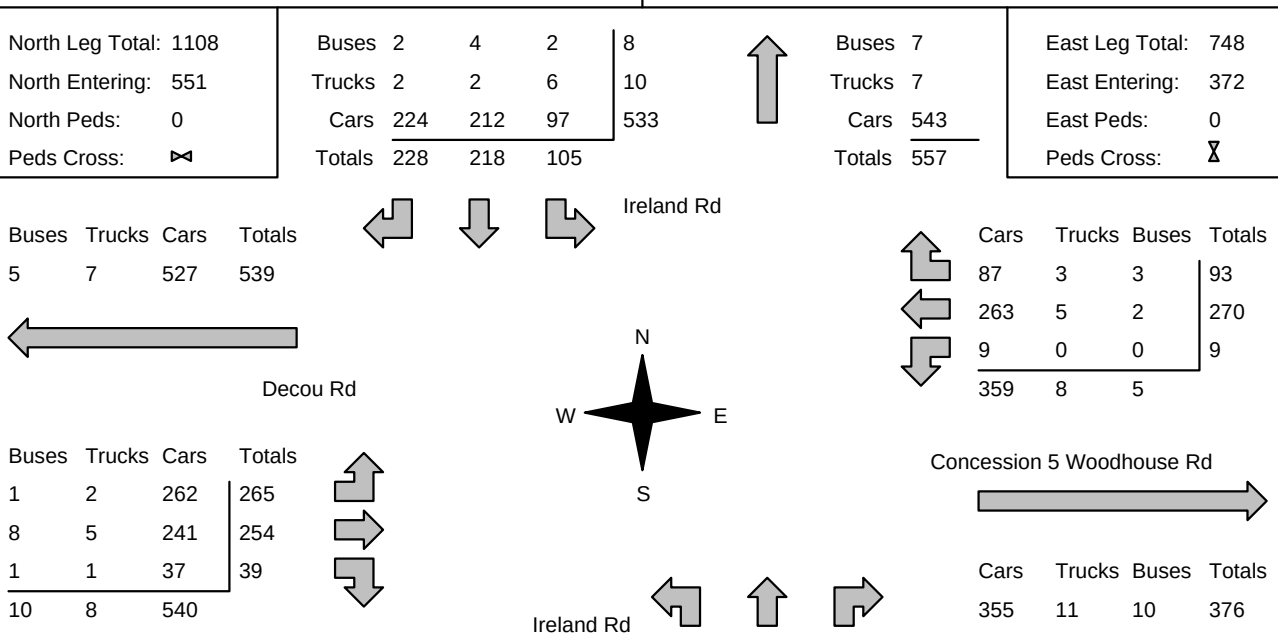
**Municipality:** Norfolk
**Site #:** 2518700005
**Intersection:** Decou Rd & Ireland Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

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

**Major Road:** Decou Rd runs W/E




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

# Traffic Count Summary

**Intersection:** Decou Rd & Ireland Rd | **Count Date:** 26-Nov-25 | **Municipality:** Norfolk

## North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *7* | *4* | *6* | *17* | *0* |
| *8:00:00* | *5* | *14* | *16* | *35* | *0* |
| *9:00:00* | *9* | *11* | *32* | *52* | *0* |
| *10:00:00* | *8* | *27* | *21* | *56* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *26* | *58* | *37* | *121* | *0* |
| *17:00:00* | *18* | *51* | *59* | *128* | *0* |
| *18:00:00* | *15* | *39* | *35* | *89* | *0* |
| *19:00:00* | *17* | *14* | *22* | *53* | *0* |
| Totals: | 105 | 218 | 228 | 551 | 0 |

North/South Total Approaches: 808

## South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *6* | *12* | *2* | *20* | *0* |
| *8:00:00* | *6* | *17* | *5* | *28* | *0* |
| *9:00:00* | *9* | *45* | *0* | *54* | *0* |
| *10:00:00* | *3* | *27* | *4* | *34* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *4* | *32* | *1* | *37* | *0* |
| *17:00:00* | *5* | *22* | *2* | *29* | *0* |
| *18:00:00* | *4* | *26* | *2* | *32* | *0* |
| *19:00:00* | *4* | *18* | *1* | *23* | *0* |
| S Totals: | 41 | 199 | 17 | 257 | 0 |

## East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *0* | *6* | *18* | *24* | *0* |
| *8:00:00* | *0* | *23* | *9* | *32* | *0* |
| *9:00:00* | *1* | *69* | *21* | *91* | *0* |
| *10:00:00* | *0* | *32* | *12* | *44* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *3* | *39* | *8* | *50* | *0* |
| *17:00:00* | *1* | *38* | *10* | *49* | *0* |
| *18:00:00* | *3* | *39* | *10* | *52* | *0* |
| *19:00:00* | *1* | *24* | *5* | *30* | *0* |
| Totals: | 9 | 270 | 93 | 372 | 0 |

East/West Total Approaches: 930

## West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *17* | *21* | *1* | *39* | *0* |
| *8:00:00* | *25* | *29* | *8* | *62* | *0* |
| *9:00:00* | *51* | *53* | *5* | *109* | *0* |
| *10:00:00* | *36* | *28* | *3* | *67* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *41* | *56* | *9* | *106* | *0* |
| *17:00:00* | *42* | *30* | *7* | *79* | *0* |
| *18:00:00* | *31* | *22* | *6* | *59* | *0* |
| *19:00:00* | *22* | *15* | *0* | *37* | *0* |
| W Totals: | 265 | 254 | 39 | 558 | 0 |

## Calculated Values for Traffic Crossing Major Street

| Hours Ending: | *7:00* | *8:00* | *9:00* | *10:00* | *16:00* | *17:00* | *18:00* | *19:00* |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | *25* | *28* | *63* | *38* | *88* | *74* | *58* | *39* |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700005**

| Interval Time | Passenger Cars - North Approach | | | | | | Trucks - North Approach | | | | | | Buses - North Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | North Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 3 | 3 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 3 | 0 | 1 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 5 | 2 | 2 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 7 | 2 | 4 | 2 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 7 | 0 | 5 | 1 | 7 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 10 | 3 | 9 | 4 | 10 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 10 | 0 | 14 | 5 | 18 | 8 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 12 | 2 | 18 | 4 | 20 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 8:15:00 | 13 | 1 | 19 | 1 | 26 | 6 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8:30:00 | 13 | 0 | 22 | 3 | 34 | 8 | 3 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8:45:00 | 14 | 1 | 26 | 4 | 41 | 7 | 4 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9:00:00 | 15 | 1 | 28 | 2 | 52 | 11 | 5 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9:15:00 | 17 | 2 | 32 | 4 | 57 | 5 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9:30:00 | 19 | 2 | 39 | 7 | 62 | 5 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 9:45:00 | 20 | 1 | 46 | 7 | 70 | 8 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 10:00:00 | 23 | 3 | 54 | 8 | 73 | 3 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 10:15:00 | 23 | 0 | 54 | 0 | 73 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 15:00:00 | 23 | 0 | 54 | 0 | 73 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 15:15:00 | 27 | 4 | 69 | 15 | 85 | 12 | 5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 15:30:00 | 32 | 5 | 86 | 17 | 93 | 8 | 5 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 2 | 1 | 0 | 0 | 0 |
| 15:45:00 | 40 | 8 | 99 | 13 | 103 | 10 | 5 | 0 | 2 | 1 | 2 | 1 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| 16:00:00 | 48 | 8 | 109 | 10 | 109 | 6 | 5 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| 16:15:00 | 50 | 2 | 117 | 8 | 120 | 11 | 5 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 1 | 0 | 0 |
| 16:30:00 | 54 | 4 | 128 | 11 | 136 | 16 | 5 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 16:45:00 | 63 | 9 | 145 | 17 | 155 | 19 | 6 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:00:00 | 65 | 2 | 160 | 15 | 167 | 12 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:15:00 | 68 | 3 | 177 | 17 | 176 | 9 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:30:00 | 70 | 2 | 188 | 11 | 187 | 11 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 17:45:00 | 73 | 3 | 193 | 5 | 195 | 8 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 18:00:00 | 80 | 7 | 198 | 5 | 202 | 7 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 4 | 1 | 2 | 0 | 0 | 0 |
| 18:15:00 | 85 | 5 | 201 | 3 | 213 | 11 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |
| 18:30:00 | 89 | 4 | 203 | 2 | 216 | 3 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |
| 18:45:00 | 93 | 4 | 207 | 4 | 221 | 5 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |
| 19:00:00 | 97 | 4 | 212 | 5 | 224 | 3 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |
| 19:15:00 | 97 | 0 | 212 | 0 | 224 | 0 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |
| 19:15:15 | 97 | 0 | 212 | 0 | 224 | 0 | 6 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700005**

| Interval Time | Passenger Cars - East Approach | | | | | | Trucks - East Approach | | | | | | Buses - East Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | East Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 0 | 0 | 2 | 2 | 7 | 5 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 0 | 0 | 5 | 3 | 16 | 9 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 0 | 0 | 8 | 3 | 18 | 2 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 0 | 0 | 10 | 2 | 19 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 0 | 0 | 15 | 5 | 20 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 0 | 0 | 28 | 13 | 25 | 5 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 0 | 0 | 44 | 16 | 29 | 4 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 1 | 1 | 59 | 15 | 35 | 6 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8:45:00 | 1 | 0 | 80 | 21 | 40 | 5 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 0 | 0 |
| 9:00:00 | 1 | 0 | 92 | 12 | 44 | 4 | 0 | 0 | 4 | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 |
| 9:15:00 | 1 | 0 | 102 | 10 | 50 | 6 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 9:30:00 | 1 | 0 | 110 | 8 | 50 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 9:45:00 | 1 | 0 | 115 | 5 | 52 | 2 | 0 | 0 | 5 | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 10:00:00 | 1 | 0 | 123 | 8 | 56 | 4 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 10:15:00 | 1 | 0 | 123 | 0 | 56 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 15:00:00 | 1 | 0 | 123 | 0 | 56 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 15:15:00 | 2 | 1 | 131 | 8 | 56 | 0 | 0 | 0 | 5 | 0 | 3 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 15:30:00 | 2 | 0 | 143 | 12 | 59 | 3 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 15:45:00 | 2 | 0 | 151 | 8 | 60 | 1 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 1 | 0 | 0 |
| 16:00:00 | 4 | 2 | 162 | 11 | 62 | 2 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 16:15:00 | 4 | 0 | 175 | 13 | 62 | 0 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 16:30:00 | 5 | 1 | 187 | 12 | 68 | 6 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 16:45:00 | 5 | 0 | 194 | 7 | 72 | 4 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 17:00:00 | 5 | 0 | 200 | 6 | 72 | 0 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 17:15:00 | 6 | 1 | 210 | 10 | 74 | 2 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 17:30:00 | 6 | 0 | 219 | 9 | 79 | 5 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 17:45:00 | 8 | 2 | 232 | 13 | 81 | 2 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 18:00:00 | 8 | 0 | 239 | 7 | 82 | 1 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 18:15:00 | 9 | 1 | 251 | 12 | 82 | 0 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 18:30:00 | 9 | 0 | 256 | 5 | 85 | 3 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 18:45:00 | 9 | 0 | 260 | 4 | 86 | 1 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 19:00:00 | 9 | 0 | 263 | 3 | 87 | 1 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 19:15:00 | 9 | 0 | 263 | 0 | 87 | 0 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |
| 19:15:15 | 9 | 0 | 263 | 0 | 87 | 0 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700005**

| Interval Time | Passenger Cars - South Approach | | | | | | Trucks - South Approach | | | | | | Buses - South Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | South Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 4 | 4 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 6 | 2 | 6 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 6 | 0 | 12 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 6 | 0 | 14 | 2 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 7 | 1 | 19 | 5 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 8 | 1 | 19 | 0 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 12 | 4 | 28 | 9 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8:15:00 | 12 | 0 | 36 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 14 | 2 | 47 | 11 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 8:45:00 | 17 | 3 | 59 | 12 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 9:00:00 | 21 | 4 | 72 | 13 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 9:15:00 | 21 | 0 | 75 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 9:30:00 | 22 | 1 | 84 | 9 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 9:45:00 | 23 | 1 | 91 | 7 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 10:00:00 | 24 | 1 | 99 | 8 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 10:15:00 | 24 | 0 | 99 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 15:00:00 | 24 | 0 | 99 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 15:15:00 | 25 | 1 | 106 | 7 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 15:30:00 | 27 | 2 | 115 | 9 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 15:45:00 | 27 | 0 | 123 | 8 | 12 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 27 | 0 | 130 | 7 | 12 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 16:15:00 | 29 | 2 | 135 | 5 | 12 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 |
| 16:30:00 | 29 | 0 | 143 | 8 | 14 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 16:45:00 | 31 | 2 | 148 | 5 | 14 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 17:00:00 | 32 | 1 | 150 | 2 | 14 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 17:15:00 | 33 | 1 | 159 | 9 | 14 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 17:30:00 | 34 | 1 | 169 | 10 | 15 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 17:45:00 | 34 | 0 | 175 | 6 | 16 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 18:00:00 | 36 | 2 | 176 | 1 | 16 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 18:15:00 | 38 | 2 | 179 | 3 | 16 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 18:30:00 | 38 | 0 | 185 | 6 | 16 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 18:45:00 | 39 | 1 | 192 | 7 | 17 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 19:00:00 | 40 | 1 | 194 | 2 | 17 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 19:15:00 | 40 | 0 | 194 | 0 | 17 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 19:15:15 | 40 | 0 | 194 | 0 | 17 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700005**

| Interval Time | Passenger Cars - West Approach | | | | | | Trucks - West Approach | | | | | | Buses - West Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | West Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 6 | 6 | 10 | 10 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 9 | 3 | 15 | 5 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 11 | 2 | 15 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 16 | 5 | 21 | 6 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 18 | 2 | 24 | 3 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 26 | 8 | 31 | 7 | 5 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 31 | 5 | 43 | 12 | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 41 | 10 | 50 | 7 | 9 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 49 | 8 | 62 | 12 | 10 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 59 | 10 | 78 | 16 | 12 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 8:45:00 | 76 | 17 | 93 | 15 | 12 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9:00:00 | 92 | 16 | 97 | 4 | 13 | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 4 | 4 | 1 | 0 | 0 | 0 |
| 9:15:00 | 101 | 9 | 104 | 7 | 14 | 1 | 1 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 0 |
| 9:30:00 | 109 | 8 | 110 | 6 | 15 | 1 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 1 | 0 | 0 | 0 |
| 9:45:00 | 118 | 9 | 115 | 5 | 15 | 0 | 1 | 0 | 4 | 0 | 1 | 1 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 |
| 10:00:00 | 128 | 10 | 120 | 5 | 15 | 0 | 1 | 0 | 5 | 1 | 1 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 |
| 10:15:00 | 128 | 0 | 120 | 0 | 15 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 |
| 15:00:00 | 128 | 0 | 120 | 0 | 15 | 0 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 |
| 15:15:00 | 138 | 10 | 138 | 18 | 17 | 2 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 8 | 2 | 1 | 0 | 0 | 0 |
| 15:30:00 | 149 | 11 | 152 | 14 | 20 | 3 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 15:45:00 | 163 | 14 | 162 | 10 | 22 | 2 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 1 | 8 | 0 | 1 | 0 | 0 | 0 |
| 16:00:00 | 168 | 5 | 174 | 12 | 24 | 2 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 16:15:00 | 177 | 9 | 180 | 6 | 26 | 2 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 16:30:00 | 184 | 7 | 187 | 7 | 27 | 1 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 16:45:00 | 191 | 7 | 196 | 9 | 29 | 2 | 1 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 17:00:00 | 209 | 18 | 204 | 8 | 31 | 2 | 2 | 1 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 17:15:00 | 215 | 6 | 209 | 5 | 32 | 1 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 17:30:00 | 226 | 11 | 218 | 9 | 33 | 1 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 17:45:00 | 233 | 7 | 223 | 5 | 35 | 2 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 18:00:00 | 240 | 7 | 226 | 3 | 37 | 2 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 18:15:00 | 243 | 3 | 234 | 8 | 37 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 18:30:00 | 248 | 5 | 239 | 5 | 37 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 18:45:00 | 258 | 10 | 239 | 0 | 37 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 19:00:00 | 262 | 4 | 241 | 2 | 37 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 19:15:00 | 262 | 0 | 241 | 0 | 37 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |
| 19:15:15 | 262 | 0 | 241 | 0 | 37 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Morning Peak Diagram

**Specified Period**
**From:** 6:00:00
**To:** 10:00:00

**One Hour Peak**
**From:** 8:15:00
**To:** 9:15:00

**Municipality:** Norfolk
**Site #:** 2518700006
**Intersection:** Norfolk St & Decou Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

**** Signalized Intersection ****

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

North Leg Total: 777
North Entering: 274
North Peds: 8
Peds Cross: ⋈

| | | | | |
|---|---|---|---|---|
| Buses | 0 | 4 | 5 | 9 |
| Trucks | 0 | 9 | 4 | 13 |
| Cars | 2 | 203 | 47 | 252 |
| Totals | 2 | 216 | 56 | |

| | |
|---|---|
| Buses | 13 |
| Trucks | 6 |
| Cars | 484 |
| Totals | 503 |

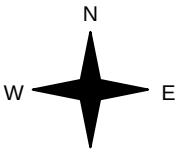
East Leg Total: 296
East Entering: 161
East Peds: 0
Peds Cross: ⧖




| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 1 | 1 | 32 | 34 |

Access to Plaza

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 98 | 1 | 3 | 102 |
| 14 | 1 | 0 | 15 |
| 42 | 1 | 1 | 44 |
| 154 | 3 | 4 | |




| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 0 | 0 | 82 | 82 |
| 1 | 0 | 31 | 32 |
| 0 | 0 | 29 | 29 |
| 1 | 0 | 142 | |

Decou Rd

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 119 | 8 | 8 | 135 |




Peds Cross: ⧖
West Peds: 23
West Entering: 143
West Leg Total: 177

| | | | | |
|---|---|---|---|---|
| Cars | 274 | | | |
| Trucks | 10 | | | |
| Buses | 5 | | | |
| Totals | 289 | | | |

| | | | | |
|---|---|---|---|---|
| Cars | 16 | 304 | 41 | 361 |
| Trucks | 0 | 5 | 4 | 9 |
| Buses | 1 | 10 | 2 | 13 |
| Totals | 17 | 319 | 47 | |

Peds Cross: ⋈
South Peds: 2
South Entering: 383
South Leg Total: 672

## Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

## Afternoon Peak Diagram

**Specified Period**
**From:** 15:00:00
**To:** 19:00:00

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

**Municipality:** Norfolk
**Site #:** 2518700006
**Intersection:** Norfolk St & Decou Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

**** Signalized Intersection ****

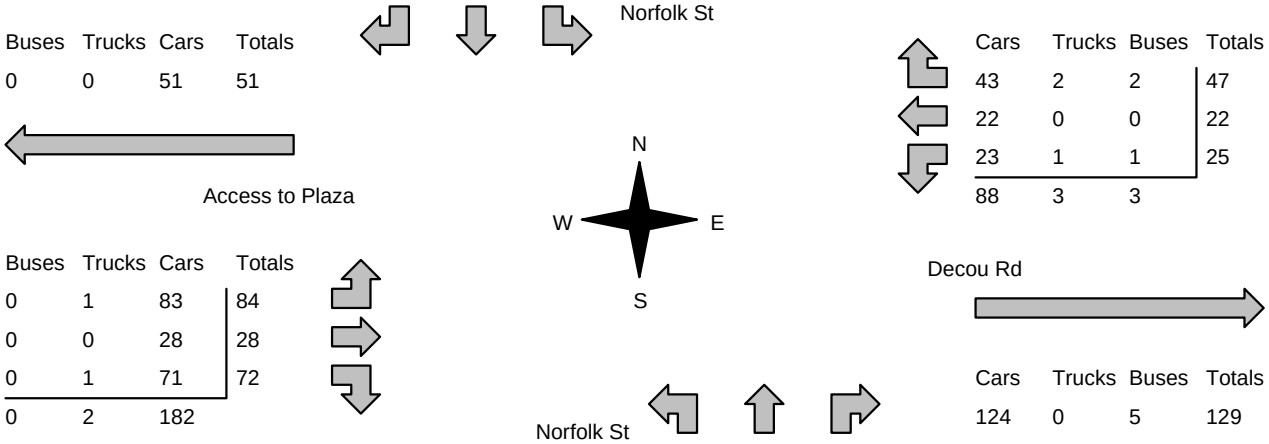
**Major Road:** Norfolk St runs N/S

North Leg Total: 809
North Entering: 424
North Peds: 5
Peds Cross: ⋈

| | | | | |
|---|---|---|---|---|
| Buses | 0 | 4 | 3 | 7 |
| Trucks | 0 | 5 | 0 | 5 |
| Cars | 9 | 330 | 73 | 412 |
| Totals | 9 | 339 | 76 | |

| | |
|---|---|
| Buses | 4 |
| Trucks | 8 |
| Cars | 373 |
| Totals | 385 |

East Leg Total: 223
East Entering: 94
East Peds: 0
Peds Cross: ⧖




| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 0 | 0 | 51 | 51 |

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 43 | 2 | 2 | 47 |
| 22 | 0 | 0 | 22 |
| 23 | 1 | 1 | 25 |
| 88 | 3 | 3 | |

| Buses | Trucks | Cars | Totals |
|---|---|---|---|
| 0 | 1 | 83 | 84 |
| 0 | 0 | 28 | 28 |
| 0 | 1 | 71 | 72 |
| 0 | 2 | 182 | |

| Cars | Trucks | Buses | Totals |
|---|---|---|---|
| 124 | 0 | 5 | 129 |

Peds Cross: ⧖
West Peds: 17
West Entering: 184
West Leg Total: 235

| | | | | |
|---|---|---|---|---|
| Cars | 424 | | | |
| Trucks | 7 | | | |
| Buses | 5 | | | |
| Totals | 436 | | | |

| | | | | |
|---|---|---|---|---|
| Cars | 20 | 247 | 23 | 290 |
| Trucks | 0 | 5 | 0 | 5 |
| Buses | 0 | 2 | 2 | 4 |
| Totals | 20 | 254 | 25 | |

Peds Cross: ⋈
South Peds: 22
South Entering: 299
South Leg Total: 735

## Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

## Total Count Diagram

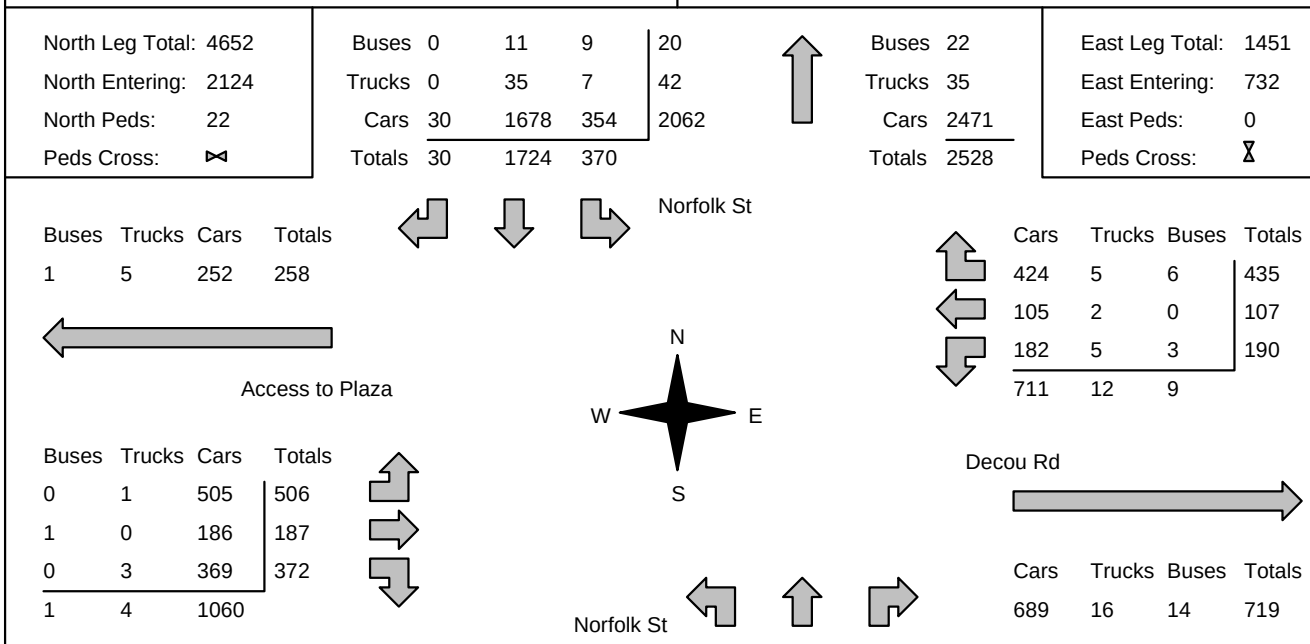
**Municipality:** Norfolk
**Site #:** 2518700006
**Intersection:** Norfolk St & Decou Rd
**TFR File #:** 1
**Count date:** 26-Nov-25

**Weather conditions:**

**Person counted:**
**Person prepared:**
**Person checked:**

**** Signalized Intersection ****

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




### Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# *Accu-Traffic Inc.*

# Traffic Count Summary

**Intersection:** Norfolk St & Decou Rd | **Count Date:** 26-Nov-25 | **Municipality:** Norfolk

## North Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds | North/South Total Approaches |
|---|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *8* | *89* | *0* | *97* | *2* | *198* |
| *8:00:00* | *31* | *138* | *0* | *169* | *4* | *337* |
| *9:00:00* | *55* | *224* | *4* | *283* | *8* | *649* |
| *10:00:00* | *32* | *198* | *3* | *233* | *0* | *499* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *76* | *339* | *9* | *424* | *5* | *723* |
| *17:00:00* | *70* | *299* | *7* | *376* | *1* | *617* |
| *18:00:00* | *67* | *253* | *4* | *324* | *1* | *571* |
| *19:00:00* | *31* | *184* | *3* | *218* | *1* | *400* |
| Totals: | 370 | 1724 | 30 | 2124 | 22 | 3994 |

## South Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *3* | *90* | *8* | *101* | *0* |
| *8:00:00* | *10* | *146* | *12* | *168* | *2* |
| *9:00:00* | *15* | *311* | *40* | *366* | *2* |
| *10:00:00* | *15* | *225* | *26* | *266* | *0* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *20* | *254* | *25* | *299* | *22* |
| *17:00:00* | *27* | *194* | *20* | *241* | *2* |
| *18:00:00* | *16* | *212* | *19* | *247* | *0* |
| *19:00:00* | *15* | *155* | *12* | *182* | *0* |
| S Totals: | 121 | 1587 | 162 | 1870 | 28 |

## East Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds | East/West Total Approaches |
|---|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *9* | *2* | *23* | *34* | *0* | *132* |
| *8:00:00* | *21* | *6* | *50* | *77* | *0* | *201* |
| *9:00:00* | *49* | *15* | *96* | *160* | *0* | *308* |
| *10:00:00* | *19* | *11* | *54* | *84* | *0* | *218* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *25* | *22* | *47* | *94* | *0* | *278* |
| *17:00:00* | *31* | *24* | *55* | *110* | *0* | *270* |
| *18:00:00* | *20* | *13* | *62* | *95* | *0* | *223* |
| *19:00:00* | *16* | *14* | *48* | *78* | *0* | *167* |
| Totals: | 190 | 107 | 435 | 732 | 0 | 1797 |

## West Approach Totals

| Hour Ending | Includes Cars, Trucks, & Buses | | | | Total Peds |
|---|---|---|---|---|---|
| | Left | Thru | Right | Grand Total | |
| *6:00:00* | *0* | *0* | *0* | *0* | *0* |
| *7:00:00* | *48* | *19* | *31* | *98* | *2* |
| *8:00:00* | *53* | *22* | *49* | *124* | *1* |
| *9:00:00* | *85* | *34* | *29* | *148* | *20* |
| *10:00:00* | *74* | *22* | *38* | *134* | *3* |
| *15:00:00* | *0* | *0* | *0* | *0* | *0* |
| *16:00:00* | *84* | *28* | *72* | *184* | *17* |
| *17:00:00* | *72* | *24* | *64* | *160* | *1* |
| *18:00:00* | *50* | *18* | *60* | *128* | *1* |
| *19:00:00* | *40* | *20* | *29* | *89* | *1* |
| W Totals: | 506 | 187 | 372 | 1065 | 46 |

## Calculated Values for Traffic Crossing Major Street

| Hours Ending: | *7:00* | *8:00* | *9:00* | *10:00* | *16:00* | *17:00* | *18:00* | *19:00* |
|---|---|---|---|---|---|---|---|---|
| Crossing Values: | *78* | *102* | *178* | *115* | *164* | *130* | *89* | *77* |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700006**

| Interval Time | Passenger Cars - North Approach | | | | | | Trucks - North Approach | | | | | | Buses - North Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | North Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 3 | 3 | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 4 | 1 | 38 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 5 | 1 | 61 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:00:00 | 8 | 3 | 88 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 |
| 7:15:00 | 11 | 3 | 115 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 1 |
| 7:30:00 | 21 | 10 | 147 | 32 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 1 |
| 7:45:00 | 32 | 11 | 183 | 36 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 |
| 8:00:00 | 39 | 7 | 224 | 41 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 2 |
| 8:15:00 | 48 | 9 | 267 | 43 | 2 | 2 | 0 | 0 | 7 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 0 |
| 8:30:00 | 61 | 13 | 307 | 40 | 3 | 1 | 1 | 1 | 9 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 12 | 6 |
| 8:45:00 | 72 | 11 | 387 | 80 | 3 | 0 | 4 | 3 | 10 | 1 | 0 | 0 | 3 | 2 | 3 | 2 | 0 | 0 | 14 | 2 |
| 9:00:00 | 85 | 13 | 434 | 47 | 4 | 1 | 4 | 0 | 13 | 3 | 0 | 0 | 5 | 2 | 4 | 1 | 0 | 0 | 14 | 0 |
| 9:15:00 | 95 | 10 | 470 | 36 | 4 | 0 | 4 | 0 | 16 | 3 | 0 | 0 | 5 | 0 | 5 | 1 | 0 | 0 | 14 | 0 |
| 9:30:00 | 103 | 8 | 517 | 47 | 6 | 2 | 5 | 1 | 16 | 0 | 0 | 0 | 6 | 1 | 5 | 0 | 0 | 0 | 14 | 0 |
| 9:45:00 | 107 | 4 | 567 | 50 | 7 | 1 | 6 | 1 | 18 | 2 | 0 | 0 | 6 | 0 | 5 | 0 | 0 | 0 | 14 | 0 |
| 10:00:00 | 114 | 7 | 620 | 53 | 7 | 0 | 6 | 0 | 23 | 5 | 0 | 0 | 6 | 0 | 6 | 1 | 0 | 0 | 14 | 0 |
| 10:15:00 | 114 | 0 | 620 | 0 | 7 | 0 | 6 | 0 | 23 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 14 | 0 |
| 15:00:00 | 114 | 0 | 620 | 0 | 7 | 0 | 6 | 0 | 23 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 14 | 0 |
| 15:15:00 | 142 | 28 | 736 | 116 | 8 | 1 | 6 | 0 | 25 | 2 | 0 | 0 | 8 | 2 | 10 | 4 | 0 | 0 | 14 | 0 |
| 15:30:00 | 160 | 18 | 809 | 73 | 9 | 1 | 6 | 0 | 27 | 2 | 0 | 0 | 9 | 1 | 10 | 0 | 0 | 0 | 19 | 5 |
| 15:45:00 | 176 | 16 | 889 | 80 | 11 | 2 | 6 | 0 | 28 | 1 | 0 | 0 | 9 | 0 | 10 | 0 | 0 | 0 | 19 | 0 |
| 16:00:00 | 187 | 11 | 950 | 61 | 16 | 5 | 6 | 0 | 28 | 0 | 0 | 0 | 9 | 0 | 10 | 0 | 0 | 0 | 19 | 0 |
| 16:15:00 | 198 | 11 | 1028 | 78 | 17 | 1 | 6 | 0 | 28 | 0 | 0 | 0 | 9 | 0 | 10 | 0 | 0 | 0 | 19 | 0 |
| 16:30:00 | 220 | 22 | 1088 | 60 | 18 | 1 | 6 | 0 | 30 | 2 | 0 | 0 | 9 | 0 | 11 | 1 | 0 | 0 | 19 | 0 |
| 16:45:00 | 238 | 18 | 1182 | 94 | 21 | 3 | 6 | 0 | 30 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 20 | 1 |
| 17:00:00 | 257 | 19 | 1246 | 64 | 23 | 2 | 6 | 0 | 30 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 20 | 0 |
| 17:15:00 | 281 | 24 | 1315 | 69 | 24 | 1 | 6 | 0 | 30 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 20 | 0 |
| 17:30:00 | 302 | 21 | 1378 | 63 | 26 | 2 | 6 | 0 | 31 | 1 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 21 | 1 |
| 17:45:00 | 308 | 6 | 1443 | 65 | 26 | 0 | 6 | 0 | 32 | 1 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 21 | 0 |
| 18:00:00 | 324 | 16 | 1494 | 51 | 27 | 1 | 6 | 0 | 35 | 3 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 21 | 0 |
| 18:15:00 | 333 | 9 | 1547 | 53 | 27 | 0 | 6 | 0 | 35 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 22 | 1 |
| 18:30:00 | 343 | 10 | 1594 | 47 | 27 | 0 | 6 | 0 | 35 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 22 | 0 |
| 18:45:00 | 348 | 5 | 1633 | 39 | 27 | 0 | 6 | 0 | 35 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 22 | 0 |
| 19:00:00 | 354 | 6 | 1678 | 45 | 30 | 3 | 7 | 1 | 35 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 22 | 0 |
| 19:15:00 | 354 | 0 | 1678 | 0 | 30 | 0 | 7 | 0 | 35 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 22 | 0 |
| 19:15:15 | 354 | 0 | 1678 | 0 | 30 | 0 | 7 | 0 | 35 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 22 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700006**

| Interval Time | Passenger Cars - East Approach | | | | | | Trucks - East Approach | | | | | | Buses - East Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | East Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 3 | 3 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 6 | 3 | 0 | 0 | 7 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 7 | 1 | 0 | 0 | 13 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 9 | 2 | 2 | 2 | 22 | 9 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 10 | 1 | 4 | 2 | 24 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 12 | 2 | 5 | 1 | 31 | 7 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45:00 | 20 | 8 | 6 | 1 | 48 | 17 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00:00 | 29 | 9 | 7 | 1 | 72 | 24 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15:00 | 38 | 9 | 9 | 2 | 85 | 13 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30:00 | 51 | 13 | 14 | 5 | 116 | 31 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 8:45:00 | 62 | 11 | 16 | 2 | 140 | 24 | 1 | 0 | 1 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 3 | 2 | 0 | 0 |
| 9:00:00 | 75 | 13 | 21 | 5 | 164 | 24 | 2 | 1 | 2 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 9:15:00 | 80 | 5 | 23 | 2 | 183 | 19 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 9:30:00 | 86 | 6 | 25 | 2 | 190 | 7 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 9:45:00 | 89 | 3 | 32 | 7 | 203 | 13 | 4 | 2 | 2 | 0 | 3 | 1 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 10:00:00 | 92 | 3 | 32 | 0 | 217 | 14 | 4 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 10:15:00 | 92 | 0 | 32 | 0 | 217 | 0 | 4 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 15:00:00 | 92 | 0 | 32 | 0 | 217 | 0 | 4 | 0 | 2 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 15:15:00 | 100 | 8 | 39 | 7 | 227 | 10 | 4 | 0 | 2 | 0 | 4 | 1 | 2 | 0 | 0 | 0 | 4 | 1 | 0 | 0 |
| 15:30:00 | 109 | 9 | 47 | 8 | 237 | 10 | 4 | 0 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 5 | 1 | 0 | 0 |
| 15:45:00 | 113 | 4 | 49 | 2 | 250 | 13 | 4 | 0 | 2 | 0 | 4 | 0 | 3 | 1 | 0 | 0 | 5 | 0 | 0 | 0 |
| 16:00:00 | 115 | 2 | 54 | 5 | 260 | 10 | 5 | 1 | 2 | 0 | 5 | 1 | 3 | 0 | 0 | 0 | 5 | 0 | 0 | 0 |
| 16:15:00 | 121 | 6 | 62 | 8 | 275 | 15 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 1 | 0 | 0 |
| 16:30:00 | 132 | 11 | 67 | 5 | 292 | 17 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 16:45:00 | 142 | 10 | 73 | 6 | 305 | 13 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 17:00:00 | 146 | 4 | 78 | 5 | 314 | 9 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 17:15:00 | 155 | 9 | 81 | 3 | 322 | 8 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 17:30:00 | 160 | 5 | 85 | 4 | 334 | 12 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 17:45:00 | 164 | 4 | 89 | 4 | 353 | 19 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 18:00:00 | 166 | 2 | 91 | 2 | 376 | 23 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 18:15:00 | 175 | 9 | 99 | 8 | 389 | 13 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 18:30:00 | 178 | 3 | 99 | 0 | 402 | 13 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 18:45:00 | 181 | 3 | 103 | 4 | 414 | 12 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 19:00:00 | 182 | 1 | 105 | 2 | 424 | 10 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 19:15:00 | 182 | 0 | 105 | 0 | 424 | 0 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| 19:15:15 | 182 | 0 | 105 | 0 | 424 | 0 | 5 | 0 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700006**

| Interval Time | Passenger Cars - South Approach | | | | | | Trucks - South Approach | | | | | | Buses - South Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | South Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 0 | 0 | 14 | 14 | 3 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 1 | 1 | 40 | 26 | 4 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 2 | 1 | 67 | 27 | 4 | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00:00 | 3 | 1 | 85 | 18 | 7 | 3 | 0 | 0 | 5 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15:00 | 4 | 1 | 109 | 24 | 7 | 0 | 0 | 0 | 7 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30:00 | 5 | 1 | 148 | 39 | 13 | 6 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:45:00 | 7 | 2 | 181 | 33 | 16 | 3 | 1 | 1 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 8:00:00 | 12 | 5 | 228 | 47 | 19 | 3 | 1 | 0 | 8 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 8:15:00 | 13 | 1 | 269 | 41 | 22 | 3 | 1 | 0 | 10 | 2 | 1 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 2 | 0 |
| 8:30:00 | 15 | 2 | 340 | 71 | 28 | 6 | 1 | 0 | 12 | 2 | 3 | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 1 |
| 8:45:00 | 21 | 6 | 432 | 92 | 42 | 14 | 1 | 0 | 13 | 1 | 3 | 0 | 0 | 0 | 10 | 7 | 0 | 0 | 4 | 1 |
| 9:00:00 | 26 | 5 | 521 | 89 | 56 | 14 | 1 | 0 | 14 | 1 | 3 | 0 | 1 | 1 | 12 | 2 | 1 | 1 | 4 | 0 |
| 9:15:00 | 29 | 3 | 573 | 52 | 63 | 7 | 1 | 0 | 15 | 1 | 5 | 2 | 1 | 0 | 12 | 0 | 2 | 1 | 4 | 0 |
| 9:30:00 | 31 | 2 | 628 | 55 | 67 | 4 | 1 | 0 | 18 | 3 | 5 | 0 | 1 | 0 | 12 | 0 | 2 | 0 | 4 | 0 |
| 9:45:00 | 35 | 4 | 678 | 50 | 72 | 5 | 2 | 1 | 18 | 0 | 5 | 0 | 1 | 0 | 13 | 1 | 2 | 0 | 4 | 0 |
| 10:00:00 | 40 | 5 | 739 | 61 | 77 | 5 | 2 | 0 | 20 | 2 | 7 | 2 | 1 | 0 | 13 | 0 | 2 | 0 | 4 | 0 |
| 10:15:00 | 40 | 0 | 739 | 0 | 77 | 0 | 2 | 0 | 20 | 0 | 7 | 0 | 1 | 0 | 13 | 0 | 2 | 0 | 4 | 0 |
| 15:00:00 | 40 | 0 | 739 | 0 | 77 | 0 | 2 | 0 | 20 | 0 | 7 | 0 | 1 | 0 | 13 | 0 | 2 | 0 | 4 | 0 |
| 15:15:00 | 45 | 5 | 785 | 46 | 77 | 0 | 2 | 0 | 23 | 3 | 7 | 0 | 1 | 0 | 13 | 0 | 3 | 1 | 9 | 5 |
| 15:30:00 | 52 | 7 | 873 | 88 | 92 | 15 | 2 | 0 | 25 | 2 | 7 | 0 | 1 | 0 | 14 | 1 | 4 | 1 | 21 | 12 |
| 15:45:00 | 56 | 4 | 930 | 57 | 98 | 6 | 2 | 0 | 25 | 0 | 7 | 0 | 1 | 0 | 15 | 1 | 4 | 0 | 24 | 3 |
| 16:00:00 | 60 | 4 | 986 | 56 | 100 | 2 | 2 | 0 | 25 | 0 | 7 | 0 | 1 | 0 | 15 | 0 | 4 | 0 | 26 | 2 |
| 16:15:00 | 64 | 4 | 1038 | 52 | 103 | 3 | 2 | 0 | 26 | 1 | 7 | 0 | 1 | 0 | 15 | 0 | 4 | 0 | 26 | 0 |
| 16:30:00 | 71 | 7 | 1092 | 54 | 106 | 3 | 3 | 1 | 26 | 0 | 7 | 0 | 1 | 0 | 15 | 0 | 4 | 0 | 28 | 2 |
| 16:45:00 | 79 | 8 | 1141 | 49 | 112 | 6 | 3 | 0 | 26 | 0 | 7 | 0 | 1 | 0 | 16 | 1 | 4 | 0 | 28 | 0 |
| 17:00:00 | 86 | 7 | 1178 | 37 | 119 | 7 | 3 | 0 | 26 | 0 | 8 | 1 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 17:15:00 | 87 | 1 | 1210 | 32 | 126 | 7 | 3 | 0 | 26 | 0 | 8 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 17:30:00 | 94 | 7 | 1291 | 81 | 130 | 4 | 3 | 0 | 26 | 0 | 9 | 1 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 17:45:00 | 99 | 5 | 1346 | 55 | 134 | 4 | 3 | 0 | 26 | 0 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 18:00:00 | 102 | 3 | 1390 | 44 | 137 | 3 | 3 | 0 | 26 | 0 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 18:15:00 | 104 | 2 | 1433 | 43 | 139 | 2 | 3 | 0 | 26 | 0 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 18:30:00 | 109 | 5 | 1476 | 43 | 143 | 4 | 3 | 0 | 27 | 1 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 18:45:00 | 112 | 3 | 1522 | 46 | 146 | 3 | 3 | 0 | 27 | 0 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 19:00:00 | 117 | 5 | 1542 | 20 | 149 | 3 | 3 | 0 | 29 | 2 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 19:15:00 | 117 | 0 | 1542 | 0 | 149 | 0 | 3 | 0 | 29 | 0 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |
| 19:15:15 | 117 | 0 | 1542 | 0 | 149 | 0 | 3 | 0 | 29 | 0 | 9 | 0 | 1 | 0 | 16 | 0 | 4 | 0 | 28 | 0 |

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

# Accu-Traffic Inc.

**Count Date: 26-Nov-25 Site #: 2518700006**

| Interval Time | Passenger Cars - West Approach | | | | | | Trucks - West Approach | | | | | | Buses - West Approach | | | | | | Pedestrians | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | | Thru | | Right | | Left | | Thru | | Right | | Left | | Thru | | Right | | West Cross | |
| | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr | Cum | Incr |
| 6:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15:00 | 9 | 9 | 8 | 8 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30:00 | 18 | 9 | 13 | 5 | 10 | 6 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45:00 | 32 | 14 | 14 | 1 | 22 | 12 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:00:00 | 48 | 16 | 19 | 5 | 30 | 8 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 7:15:00 | 57 | 9 | 21 | 2 | 38 | 8 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 7:30:00 | 72 | 15 | 28 | 7 | 50 | 12 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 7:45:00 | 88 | 16 | 32 | 4 | 66 | 16 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 8:00:00 | 101 | 13 | 41 | 9 | 79 | 13 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 |
| 8:15:00 | 123 | 22 | 49 | 8 | 91 | 12 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 8:30:00 | 143 | 20 | 60 | 11 | 98 | 7 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 3 |
| 8:45:00 | 161 | 18 | 69 | 9 | 102 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 14 |
| 9:00:00 | 186 | 25 | 74 | 5 | 108 | 6 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 23 | 3 |
| 9:15:00 | 205 | 19 | 80 | 6 | 120 | 12 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 3 |
| 9:30:00 | 223 | 18 | 83 | 3 | 125 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 0 |
| 9:45:00 | 242 | 19 | 92 | 9 | 137 | 12 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 0 |
| 10:00:00 | 260 | 18 | 96 | 4 | 145 | 8 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 0 |
| 10:15:00 | 260 | 0 | 96 | 0 | 145 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 0 |
| 15:00:00 | 260 | 0 | 96 | 0 | 145 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 0 |
| 15:15:00 | 282 | 22 | 104 | 8 | 166 | 21 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 26 | 0 |
| 15:30:00 | 306 | 24 | 110 | 6 | 179 | 13 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 42 | 16 |
| 15:45:00 | 329 | 23 | 118 | 8 | 193 | 14 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 43 | 1 |
| 16:00:00 | 343 | 14 | 124 | 6 | 216 | 23 | 1 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 43 | 0 |
| 16:15:00 | 362 | 19 | 134 | 10 | 227 | 11 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 43 | 0 |
| 16:30:00 | 378 | 16 | 139 | 5 | 249 | 22 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 44 | 1 |
| 16:45:00 | 398 | 20 | 141 | 2 | 267 | 18 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 44 | 0 |
| 17:00:00 | 415 | 17 | 148 | 7 | 280 | 13 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 44 | 0 |
| 17:15:00 | 429 | 14 | 149 | 1 | 298 | 18 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 44 | 0 |
| 17:30:00 | 442 | 13 | 154 | 5 | 313 | 15 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 44 | 0 |
| 17:45:00 | 459 | 17 | 164 | 10 | 325 | 12 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 45 | 1 |
| 18:00:00 | 465 | 6 | 166 | 2 | 340 | 15 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 45 | 0 |
| 18:15:00 | 474 | 9 | 170 | 4 | 345 | 5 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 45 | 0 |
| 18:30:00 | 482 | 8 | 175 | 5 | 353 | 8 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 45 | 0 |
| 18:45:00 | 493 | 11 | 182 | 7 | 360 | 7 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 45 | 0 |
| 19:00:00 | 505 | 12 | 186 | 4 | 369 | 9 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 46 | 1 |
| 19:15:00 | 505 | 0 | 186 | 0 | 369 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 46 | 0 |
| 19:15:15 | 505 | 0 | 186 | 0 | 369 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 46 | 0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 7.0 | 19.0 | | 7.0 | 19.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 10.0 | 25.0 | | 10.0 | 25.0 | |
| Total Split (s) | 32.0 | 32.0 | | 32.0 | 32.0 | | 10.0 | 38.0 | | 10.0 | 38.0 | |
| Total Split (%) | 40.0% | 40.0% | | 40.0% | 40.0% | | 12.5% | 47.5% | | 12.5% | 47.5% | |
| Maximum Green (s) | 26.5 | 26.5 | | 26.5 | 26.5 | | 7.0 | 32.7 | | 7.0 | 32.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.3 | | 3.0 | 3.3 | |
| All-Red Time (s) | 2.2 | 2.2 | | 2.2 | 2.2 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.5 | 5.5 | | 5.5 | 5.5 | | 3.0 | 5.3 | | 3.0 | 5.3 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 2.0 | 5.0 | | 2.0 | 5.0 | |
| Recall Mode | Max | Max | | Max | Max | | None | C-Max | | None | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Don't Walk (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | | 12.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 26.5 | 26.5 | | 26.5 | 26.5 | | 43.2 | 36.7 | | 42.6 | 34.7 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.33 | 0.33 | | 0.54 | 0.46 | | 0.53 | 0.43 | |
| v/c Ratio | 0.20 | 0.27 | | 0.09 | 0.27 | | 0.12 | 0.57 | | 0.10 | 0.41 | |
| Control Delay (s/veh) | 21.0 | 17.9 | | 19.3 | 18.8 | | 6.0 | 13.1 | | 8.5 | 17.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 21.0 | 17.9 | | 19.3 | 18.8 | | 6.0 | 13.1 | | 8.5 | 17.6 | |
| LOS | C | B | | B | B | | A | B | | A | B | |
| Approach Delay (s/veh) | | 18.9 | | | 18.8 | | | 12.2 | | | 16.3 | |
| Approach LOS | | B | | | B | | | B | | | B | |

**Intersection Summary**

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 3 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay (s/veh): 15.6 Intersection LOS: B
Intersection Capacity Utilization 81.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Norfolk St & Robinson St/Argyle St



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 27.0 | 27.0 | 27.0 | 27.0 | 27.0 | | 35.0 | 35.0 | | 35.0 | 35.0 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.0 | 21.0 | 21.0 | 21.0 | | | 47.8 | | | 47.8 | |
| Actuated g/C Ratio | | 0.26 | 0.26 | 0.26 | 0.26 | | | 0.60 | | | 0.60 | |
| v/c Ratio | | 0.37 | 0.10 | 0.21 | 0.32 | | | 0.28 | | | 0.25 | |
| Control Delay (s/veh) | | 28.1 | 8.4 | 25.1 | 7.4 | | | 8.0 | | | 3.8 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 28.1 | 8.4 | 25.1 | 7.4 | | | 8.0 | | | 3.8 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 23.1 | | | 12.8 | | | 8.0 | | | 3.8 | |
| Approach LOS | | C | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 65 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.37 | | | |
| Intersection Signal Delay (s/veh): 9.5 | | Intersection LOS: A | |
| Intersection Capacity Utilization 95.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 10: Norfolk St & Plaza Driveway/Decou Rd



# APPENDIX B

## Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

| Level of Service | Control Delay per Vehicle (seconds) | Interpretation |
|---|---|---|
| A | ≤ 10 | EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare. |
| B | > 10 and ≤ 15 | VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal. |
| C | > 15 and ≤ 25 | GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable. |
| D | > 25 and ≤ 35 | FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street. |
| E | > 35 and ≤ 50 | POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable. |
| F | > 50 | UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street. |

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Signalized Intersections

| Level of Service | Control Delay per Vehicle (seconds) | Interpretation |
|---|---|---|
| A | ≤ 10 | EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay. |
| B | > 10 and ≤ 20 | VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay. |
| C | > 20 and ≤ 35 | GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B". |
| D | > 35 and ≤ 55 | FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression. |
| E | > 55 and ≤ 80 | POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common. |
| F | > 80 | UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection. |

Adapted from Highway Capacity Manual 2000, Transportation Research Board

# APPENDIX C

## Detailed Capacity Analysis Reports

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 257 | 75 | 111 | 387 | 51 | 68 |
| Future Volume (Veh/h) | 257 | 75 | 111 | 387 | 51 | 68 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 279 | 82 | 121 | 421 | 55 | 74 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 361 | | 983 | 181 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 361 | | 983 | 181 |
| tC, single (s) | | | 4.1 | | 6.9 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.4 |
| p0 queue free % | | | 90 | | 75 | 91 |
| cM capacity (veh/h) | | | 1201 | | 218 | 822 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 186 | 175 | 121 | 421 | 55 | 74 |
| Volume Left | 0 | 0 | 121 | 0 | 55 | 0 |
| Volume Right | 0 | 82 | 0 | 0 | 0 | 74 |
| cSH | 1700 | 1700 | 1201 | 1700 | 218 | 822 |
| Volume to Capacity | 0.11 | 0.10 | 0.10 | 0.25 | 0.25 | 0.09 |
| Queue Length 95th (m) | 0.0 | 0.0 | 2.5 | 0.0 | 7.3 | 2.2 |
| Control Delay (s/veh) | 0.0 | 0.0 | 8.3 | 0.0 | 27.0 | 9.8 |
| Lane LOS | | | A | | D | A |
| Approach Delay (s/veh) | 0.0 | | 1.9 | | 17.1 | |
| Approach LOS | | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.1 | | | |
| Intersection Capacity Utilization | 30.4% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.1 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 257 | 75 | 111 | 387 | 51 | 68 |
| Future Vol, veh/h | 257 | 75 | 111 | 387 | 51 | 68 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 6 | 1 | 5 | 4 | 5 |
| Mvmt Flow | 279 | 82 | 121 | 421 | 55 | 74 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 361 | 0 | 983 | 181 |
| Stage 1 | - | - | - | - | 320 | - |
| Stage 2 | - | - | - | - | 663 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.66 | 6.975 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.86 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.46 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.538 | 3.3475 |
| Pot Cap-1 Maneuver | - | - | 1202 | - | 258 | 823 |
| Stage 1 | - | - | - | - | 704 | - |
| Stage 2 | - | - | - | - | 507 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1202 | - | 232 | 823 |
| Mov Cap-2 Maneuver | - | - | - | - | 232 | - |
| Stage 1 | - | - | - | - | 704 | - |
| Stage 2 | - | - | - | - | 456 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 1.9 | 16.4 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 232 | 823 | - | - | 1202 | - |
| HCM Lane V/C Ratio | 0.239 | 0.09 | - | - | 0.1 | - |
| HCM Ctrl Dly (s/v) | 25.3 | 9.8 | - | - | 8.3 | - |
| HCM Lane LOS | D | A | - | - | A | - |
| HCM 95th %tile Q(veh) | 0.9 | 0.3 | - | - | 0.3 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 10 | 98 | 6 | 202 | 105 | 78 | 6 | 255 | 197 | 51 | 156 | 8 |
| Future Volume (vph) | 10 | 98 | 6 | 202 | 105 | 78 | 6 | 255 | 197 | 51 | 156 | 8 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.96 | | 1.00 | |
| Frt | | 0.993 | | | | 0.850 | | | 0.850 | | 0.994 | |
| Flt Protected | | 0.996 | | 0.950 | | | | 0.999 | | | 0.988 | |
| Satd. Flow (prot) | 0 | 1719 | 0 | 1738 | 1795 | 1458 | 0 | 1813 | 1555 | 0 | 3259 | 0 |
| Flt Permitted | | 0.960 | | 0.466 | | | | 0.994 | | | 0.830 | |
| Satd. Flow (perm) | 0 | 1656 | 0 | 845 | 1795 | 1421 | 0 | 1804 | 1500 | 0 | 2731 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | | 88 | | | 221 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 3 | | 12 | 12 | | 3 | 7 | | 10 | 10 | | 7 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 10% | 10% | 17% | 5% | 7% | 12% | 0% | 6% | 5% | 8% | 11% | 0% |
| Adj. Flow (vph) | 11 | 110 | 7 | 227 | 118 | 88 | 7 | 287 | 221 | 57 | 175 | 9 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 128 | 0 | 227 | 118 | 88 | 0 | 294 | 221 | 0 | 241 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 11.5 | | 22.7 | 20.3 | 20.3 | | 48.8 | 48.8 | | 48.8 | |
| Actuated g/C Ratio | | 0.14 | | 0.28 | 0.25 | 0.25 | | 0.61 | 0.61 | | 0.61 | |
| v/c Ratio | | 0.53 | | 0.67 | 0.26 | 0.21 | | 0.27 | 0.22 | | 0.14 | |

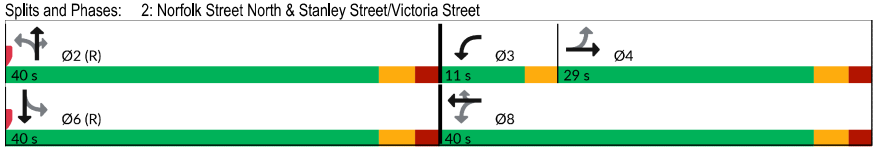


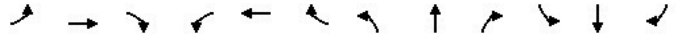


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 38.9 | | 33.3 | 23.7 | 6.2 | | 7.4 | 1.3 | | 7.8 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 38.9 | | 33.3 | 23.7 | 6.2 | | 7.4 | 1.3 | | 7.8 | |
| LOS | | D | | C | C | A | | A | A | | A | |
| Approach Delay (s/veh) | | 38.9 | | | 25.2 | | | 4.8 | | | 7.8 | |
| Approach LOS | | D | | | C | | | A | | | A | |
| Queue Length 50th (m) | | 18.1 | | 27.8 | 14.1 | 0.0 | | 17.9 | 1.2 | | 7.4 | |
| Queue Length 95th (m) | | 31.9 | | 42.3 | 24.4 | 8.9 | | 32.6 | 7.1 | | 14.2 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 491 | | 338 | 776 | 664 | | 1101 | 1001 | | 1669 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.26 | | 0.67 | 0.15 | 0.13 | | 0.27 | 0.22 | | 0.14 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.67 | | | |
| Intersection Signal Delay (s/veh): 15.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 70.1% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





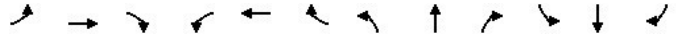
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 93 | 110 | 37 | 9 | 173 | 24 | 64 | 52 | 4 | 12 | 34 | 103 |
| Future Volume (vph) | 93 | 110 | 37 | 9 | 173 | 24 | 64 | 52 | 4 | 12 | 34 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 113 | 134 | 45 | 11 | 211 | 29 | 78 | 63 | 5 | 15 | 41 | 126 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 292 | 251 | 146 | 182 |
| Volume Left (vph) | 113 | 11 | 78 | 15 |
| Volume Right (vph) | 45 | 29 | 5 | 126 |
| Hadj (s) | 0.13 | 0.04 | 0.29 | -0.26 |
| Departure Headway (s) | 5.4 | 5.4 | 6.0 | 5.4 |
| Degree Utilization, x | 0.44 | 0.37 | 0.24 | 0.27 |
| Capacity (veh/h) | 625 | 623 | 530 | 593 |
| Control Delay (s/veh) | 12.5 | 11.6 | 11.0 | 10.5 |
| Approach Delay (s/veh) | 12.5 | 11.6 | 11.0 | 10.5 |
| Approach LOS | B | B | B | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 11.6 | |
| Level of Service | | | B | |
| Intersection Capacity Utilization | | | 57.5% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 40 | 72 | 11 | 31 | 141 | 31 | 14 | 66 | 13 | 30 | 96 | 43 |
| Future Volume (vph) | 40 | 72 | 11 | 31 | 141 | 31 | 14 | 66 | 13 | 30 | 96 | 43 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 45 | 82 | 12 | 35 | 160 | 35 | 16 | 75 | 15 | 34 | 109 | 49 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 139 | 230 | 106 | 143 | 49 |
| Volume Left (vph) | 45 | 35 | 16 | 34 | 0 |
| Volume Right (vph) | 12 | 35 | 15 | 0 | 49 |
| Hadj (s) | 0.13 | 0.01 | 0.08 | 0.20 | -0.62 |
| Departure Headway (s) | 5.1 | 4.9 | 5.3 | 5.8 | 5.0 |
| Degree Utilization, x | 0.20 | 0.31 | 0.16 | 0.23 | 0.07 |
| Capacity (veh/h) | 646 | 690 | 619 | 582 | 673 |
| Control Delay (s/veh) | 9.4 | 10.1 | 9.3 | 9.3 | 7.1 |
| Approach Delay (s/veh) | 9.4 | 10.1 | 9.3 | 8.7 | |
| Approach LOS | A | B | A | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 9.5 | |
| Level of Service | | | A | |
| Intersection Capacity Utilization | | | 31.0% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |

Description: SBR SLIP THROUGH FOR WIDE ROW

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 51 | 53 | 5 | 1 | 69 | 21 | 9 | 45 | 0 | 9 | 11 | 32 |
| Future Volume (Veh/h) | 51 | 53 | 5 | 1 | 69 | 21 | 9 | 45 | 0 | 9 | 11 | 32 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 59 | 61 | 6 | 1 | 79 | 24 | 10 | 52 | 0 | 10 | 13 | 37 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 103 | | | 67 | | | 319 | 287 | 64 | 301 | 278 | 91 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 103 | | | 67 | | | 319 | 287 | 64 | 301 | 278 | 91 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.8 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.1 | 4.1 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 98 | 91 | 100 | 98 | 98 | 96 |
| cM capacity (veh/h) | 1502 | | | 1547 | | | 585 | 596 | 1000 | 490 | 592 | 972 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 126 | 104 | 62 | 60 |
| Volume Left | 59 | 1 | 10 | 10 |
| Volume Right | 6 | 24 | 0 | 37 |
| cSH | 1502 | 1547 | 594 | 746 |
| Volume to Capacity | 0.04 | 0.00 | 0.10 | 0.08 |
| Queue Length 95th (m) | 0.9 | 0.0 | 2.6 | 2.0 |
| Control Delay (s/veh) | 3.7 | 0.1 | 11.8 | 10.2 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.7 | 0.1 | 11.8 | 10.2 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 5.2 | | | | |
| Intersection Capacity Utilization | 23.4% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 5.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 51 | 53 | 5 | 1 | 69 | 21 | 9 | 45 | 0 | 9 | 11 | 32 |
| Future Vol, veh/h | 51 | 53 | 5 | 1 | 69 | 21 | 9 | 45 | 0 | 9 | 11 | 32 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 0 | 12 | 20 | 0 | 8 | 10 | 0 | 3 | 2 | 67 | 10 | 0 |
| Mvmt Flow | 59 | 61 | 6 | 1 | 79 | 24 | 10 | 52 | 0 | 10 | 13 | 37 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 103 | 0 | 0 | 67 | 0 | 0 | 300 | 287 | 64 | 301 | 278 | 91 |
| Stage 1 | - | - | - | - | - | - | 182 | 182 | - | 93 | 93 | - |
| Stage 2 | - | - | - | - | - | - | 118 | 105 | - | 208 | 185 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.53 | 6.22 | 7.77 | 6.6 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4.027 | 3.318 | 4.103 | 4.09 | 3.3 |
| Pot Cap-1 Maneuver | 1502 | - | - | 1547 | - | - | 656 | 621 | 1000 | 541 | 617 | 972 |
| Stage 1 | - | - | - | - | - | - | 824 | 747 | - | 776 | 803 | - |
| Stage 2 | - | - | - | - | - | - | 891 | 806 | - | 666 | 732 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1502 | - | - | 1547 | - | - | 601 | 595 | 1000 | 489 | 591 | 972 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 601 | 595 | - | 489 | 591 | - |
| Stage 1 | - | - | - | - | - | - | 790 | 716 | - | 744 | 802 | - |
| Stage 2 | - | - | - | - | - | - | 843 | 805 | - | 593 | 702 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 3.5 | 0.1 | 11.7 | 10.3 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 596 | 1502 | - | - | 1547 | - | - | 744 |
| HCM Lane V/C Ratio | 0.104 | 0.039 | - | - | 0.001 | - | - | 0.08 |
| HCM Ctrl Dly (s/v) | 11.7 | 7.5 | 0 | - | 7.3 | 0 | - | 10.3 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.3 | 0.1 | - | - | 0 | - | - | 0.3 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 82 | 32 | 29 | 44 | 15 | 102 | 17 | 319 | 47 | 56 | 216 | 2 |
| Future Volume (vph) | 82 | 32 | 29 | 44 | 15 | 102 | 17 | 319 | 47 | 56 | 216 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 0.99 | 0.99 | 1.00 | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.869 | | | 0.981 | | | 0.999 | |
| Flt Protected | | 0.965 | | 0.950 | | | | 0.998 | | | 0.990 | |
| Satd. Flow (prot) | 0 | 1833 | 1633 | 1738 | 1570 | 0 | 0 | 3370 | 0 | 0 | 3311 | 0 |
| Flt Permitted | | 0.700 | | 0.669 | | | | 0.934 | | | 0.795 | |
| Satd. Flow (perm) | 0 | 1323 | 1610 | 1222 | 1570 | 0 | 0 | 3151 | 0 | 0 | 2659 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 38 | | 123 | | | 27 | | | 1 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 8 | | 2 | 2 | | 8 | 23 | | | | | 23 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 0% | 4% | 0% | 5% | 7% | 4% | 6% | 5% | 13% | 17% | 7% | 0% |
| Adj. Flow (vph) | 99 | 39 | 35 | 53 | 18 | 123 | 20 | 384 | 57 | 67 | 260 | 2 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 138 | 35 | 53 | 141 | 0 | 0 | 461 | 0 | 0 | 329 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.1 | 21.1 | 21.1 | 21.1 | | | 54.1 | | | 54.1 | |
| Actuated g/C Ratio | | 0.26 | 0.26 | 0.26 | 0.26 | | | 0.68 | | | 0.68 | |
| v/c Ratio | | 0.40 | 0.08 | 0.16 | 0.28 | | | 0.22 | | | 0.18 | |

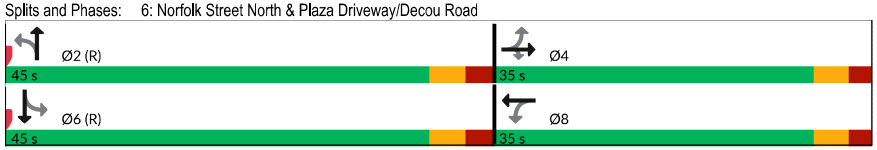




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 28.2 | 7.9 | 24.3 | 7.8 | | | 6.7 | | | 5.2 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 28.2 | 7.9 | 24.3 | 7.8 | | | 6.7 | | | 5.2 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 24.1 | | | 12.3 | | | 6.7 | | | 5.2 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 17.2 | 0.0 | 6.2 | 2.0 | | | 14.6 | | | 14.9 | |
| Queue Length 95th (m) | | 29.5 | 5.1 | 13.4 | 12.2 | | | 19.9 | | | 14.5 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 489 | 619 | 452 | 658 | | | 2140 | | | 1799 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.28 | 0.06 | 0.12 | 0.21 | | | 0.22 | | | 0.18 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.40 | | | |
| Intersection Signal Delay (s/veh): 9.8 | | Intersection LOS: A | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 117 | 52 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 0 | 117 | 52 | 0 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 0 | 0 | 127 | 57 | 0 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 184 | 57 | 57 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 184 | 57 | 57 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 100 | 100 | | | |
| cM capacity (veh/h) | 805 | 1009 | 1547 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 0 | 0 | 127 | 57 |
| Volume Left | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 0 |
| cSH | 1700 | 1700 | 1547 | 1700 |
| Volume to Capacity | 0.00 | 0.00 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s/veh) | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | A | | |
| Approach Delay (s/veh) | 0.0 | | 0.0 | 0.0 |
| Approach LOS | A | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 9.5% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 117 | 52 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 117 | 52 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 127 | 57 | 0 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 184 | 57 | 57 | 0 | - | 0 |
| Stage 1 | 57 | - | - | - | - | - |
| Stage 2 | 127 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 805 | 1009 | 1547 | - | - | - |
| Stage 1 | 966 | - | - | - | - | - |
| Stage 2 | 899 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 805 | 1009 | 1547 | - | - | - |
| Mov Cap-2 Maneuver | 805 | - | - | - | - | - |
| Stage 1 | 966 | - | - | - | - | - |
| Stage 2 | 899 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1547 | - | - | - | - | - |
| HCM Lane V/C Ratio | - | - | - | - | - | - |
| HCM Ctrl Dly (s/v) | 0 | - | 0 | 0 | - | - |
| HCM Lane LOS | A | - | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 460 | 58 | 119 | 420 | 80 | 121 |
| Future Volume (Veh/h) | 460 | 58 | 119 | 420 | 80 | 121 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 489 | 62 | 127 | 447 | 85 | 129 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 551 | | 1221 | 276 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 551 | | 1221 | 276 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.6 | 3.3 |
| p0 queue free % | | | 88 | | 41 | 82 |
| cM capacity (veh/h) | | | 1022 | | 145 | 725 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 326 | 225 | 127 | 447 | 85 | 129 |
| Volume Left | 0 | 0 | 127 | 0 | 85 | 0 |
| Volume Right | 0 | 62 | 0 | 0 | 0 | 129 |
| cSH | 1700 | 1700 | 1022 | 1700 | 145 | 725 |
| Volume to Capacity | 0.19 | 0.13 | 0.12 | 0.26 | 0.59 | 0.18 |
| Queue Length 95th (m) | 0.0 | 0.0 | 3.2 | 0.0 | 23.1 | 4.9 |
| Control Delay (s/veh) | 0.0 | 0.0 | 9.0 | 0.0 | 60.3 | 11.0 |
| Lane LOS | | | A | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.0 | | 30.6 | |
| Approach LOS | | | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.7 | | | |
| Intersection Capacity Utilization | 35.6% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 5.2 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 460 | 58 | 119 | 420 | 80 | 121 |
| Future Vol, veh/h | 460 | 58 | 119 | 420 | 80 | 121 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 4 | 4 | 1 | 3 | 7 | 1 |
| Mvmt Flow | 489 | 62 | 127 | 447 | 85 | 129 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 551 | 0 | 1221 | 276 |
| Stage 1 | - | - | - | - | 520 | - |
| Stage 2 | - | - | - | - | 701 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.705 | 6.915 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.905 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.505 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.5665 | 3.3095 |
| Pot Cap-1 Maneuver | - | - | 1023 | - | 179 | 725 |
| Stage 1 | - | - | - | - | 550 | - |
| Stage 2 | - | - | - | - | 479 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1023 | - | 157 | 725 |
| Mov Cap-2 Maneuver | - | - | - | - | 157 | - |
| Stage 1 | - | - | - | - | 550 | - |
| Stage 2 | - | - | - | - | 420 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 2 | 27.4 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 157 | 725 | - | - | 1023 | - |
| HCM Lane V/C Ratio | 0.542 | 0.178 | - | - | 0.124 | - |
| HCM Ctrl Dly (s/v) | 52.2 | 11 | - | - | 9 | - |
| HCM Lane LOS | F | B | - | - | A | - |
| HCM 95th %tile Q(veh) | 2.7 | 0.6 | - | - | 0.4 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 13 | 102 | 11 | 175 | 115 | 86 | 1 | 255 | 160 | 49 | 275 | 13 |
| Future Volume (vph) | 13 | 102 | 11 | 175 | 115 | 86 | 1 | 255 | 160 | 49 | 275 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.97 | | 1.00 | |
| Frt | | 0.988 | | | | 0.850 | | | 0.850 | | 0.994 | |
| Flt Protected | | 0.995 | | 0.950 | | | | | | | 0.993 | |
| Satd. Flow (prot) | 0 | 1784 | 0 | 1755 | 1830 | 1570 | 0 | 1842 | 1570 | 0 | 3440 | 0 |
| Flt Permitted | | 0.955 | | 0.469 | | | | 0.999 | | | 0.866 | |
| Satd. Flow (perm) | 0 | 1711 | 0 | 862 | 1830 | 1525 | 0 | 1840 | 1524 | 0 | 2998 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | | 100 | | | 186 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 2 | | 6 | 6 | | 2 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 16% | 5% | 0% | 4% | 5% | 4% | 100% | 4% | 4% | 15% | 3% | 0% |
| Adj. Flow (vph) | 15 | 119 | 13 | 203 | 134 | 100 | 1 | 297 | 186 | 57 | 320 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 147 | 0 | 203 | 134 | 100 | 0 | 298 | 186 | 0 | 392 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 11.9 | | 25.1 | 22.7 | 22.7 | | 46.4 | 46.4 | | 46.4 | |
| Actuated g/C Ratio | | 0.15 | | 0.31 | 0.28 | 0.28 | | 0.58 | 0.58 | | 0.58 | |
| v/c Ratio | | 0.57 | | 0.57 | 0.26 | 0.20 | | 0.28 | 0.19 | | 0.23 | |

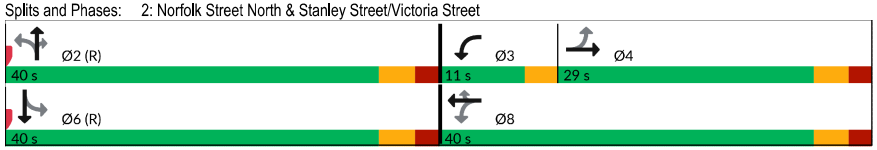


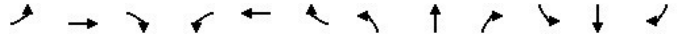


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 38.8 | | 27.6 | 22.9 | 5.5 | | 8.3 | 1.6 | | 8.8 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 38.8 | | 27.6 | 22.9 | 5.5 | | 8.3 | 1.6 | | 8.8 | |
| LOS | | D | | C | C | A | | A | A | | A | |
| Approach Delay (s/veh) | | 38.8 | | | 21.1 | | | 5.7 | | | 8.8 | |
| Approach LOS | | D | | | C | | | A | | | A | |
| Queue Length 50th (m) | | 20.5 | | 24.1 | 15.9 | 0.0 | | 20.7 | 0.0 | | 13.2 | |
| Queue Length 95th (m) | | 33.7 | | 35.7 | 25.6 | 8.5 | | 33.1 | 6.2 | | 22.0 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 508 | | 360 | 791 | 716 | | 1066 | 961 | | 1739 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.29 | | 0.56 | 0.17 | 0.14 | | 0.28 | 0.19 | | 0.23 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.57 | | | |
| Intersection Signal Delay (s/veh): 14.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 71.3% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





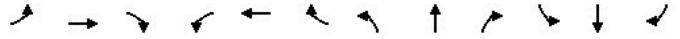
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 92 | 134 | 54 | 3 | 141 | 20 | 44 | 39 | 10 | 26 | 51 | 119 |
| Future Volume (vph) | 92 | 134 | 54 | 3 | 141 | 20 | 44 | 39 | 10 | 26 | 51 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 105 | 152 | 61 | 3 | 160 | 23 | 50 | 44 | 11 | 30 | 58 | 135 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 318 | 186 | 105 | 223 |
| Volume Left (vph) | 105 | 3 | 50 | 30 |
| Volume Right (vph) | 61 | 23 | 11 | 135 |
| Hadj (s) | 0.05 | 0.01 | 0.17 | -0.29 |
| Departure Headway (s) | 5.2 | 5.3 | 5.8 | 5.1 |
| Degree Utilization, x | 0.46 | 0.27 | 0.17 | 0.32 |
| Capacity (veh/h) | 658 | 624 | 546 | 638 |
| Control Delay (s/veh) | 12.4 | 10.3 | 10.0 | 10.5 |
| Approach Delay (s/veh) | 12.4 | 10.3 | 10.0 | 10.5 |
| Approach LOS | B | B | A | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Delay | | | 11.1 | | |
| Level of Service | | | B | | |
| Intersection Capacity Utilization | | | 48.3% | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 45 | 108 | 14 | 17 | 99 | 41 | 24 | 118 | 22 | 47 | 81 | 32 |
| Future Volume (vph) | 45 | 108 | 14 | 17 | 99 | 41 | 24 | 118 | 22 | 47 | 81 | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 49 | 117 | 15 | 18 | 108 | 45 | 26 | 128 | 24 | 51 | 88 | 35 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 181 | 171 | 178 | 139 | 35 |
| Volume Left (vph) | 49 | 18 | 26 | 51 | 0 |
| Volume Right (vph) | 15 | 45 | 24 | 0 | 35 |
| Hadj (s) | 0.15 | -0.12 | -0.01 | 0.24 | -0.63 |
| Departure Headway (s) | 5.2 | 5.0 | 5.2 | 5.9 | 5.0 |
| Degree Utilization, x | 0.26 | 0.24 | 0.26 | 0.23 | 0.05 |
| Capacity (veh/h) | 635 | 662 | 642 | 568 | 663 |
| Control Delay (s/veh) | 10.1 | 9.5 | 10.0 | 9.4 | 7.1 |
| Approach Delay (s/veh) | 10.1 | 9.5 | 10.0 | 8.9 | |
| Approach LOS | B | A | A | A | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Delay | | | 9.6 | | |
| Level of Service | | | A | | |
| Intersection Capacity Utilization | | | 40.0% | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | |

Description: SBR SLIP THROUGH FOR WIDE ROW

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 41 | 56 | 9 | 3 | 39 | 8 | 4 | 32 | 1 | 26 | 58 | 37 |
| Future Volume (Veh/h) | 41 | 56 | 9 | 3 | 39 | 8 | 4 | 32 | 1 | 26 | 58 | 37 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Hourly flow rate (vph) | 46 | 63 | 10 | 3 | 44 | 9 | 4 | 36 | 1 | 29 | 65 | 42 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 53 | | | 73 | | | 289 | 219 | 68 | 234 | 220 | 49 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 53 | | | 73 | | | 289 | 219 | 68 | 234 | 220 | 49 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.4 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 97 | | | 100 | | | 99 | 94 | 100 | 96 | 90 | 96 |
| cM capacity (veh/h) | 1546 | | | 1540 | | | 536 | 654 | 1001 | 670 | 651 | 1017 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 119 | 56 | 41 | 136 |
| Volume Left | 46 | 3 | 4 | 29 |
| Volume Right | 10 | 9 | 1 | 42 |
| cSH | 1546 | 1540 | 646 | 737 |
| Volume to Capacity | 0.03 | 0.00 | 0.06 | 0.18 |
| Queue Length 95th (m) | 0.7 | 0.0 | 1.5 | 5.1 |
| Control Delay (s/veh) | 3.0 | 0.4 | 11.0 | 11.0 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.0 | 0.4 | 11.0 | 11.0 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 6.6 | | | | |
| Intersection Capacity Utilization | 30.8% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 6.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 41 | 56 | 9 | 3 | 39 | 8 | 4 | 32 | 1 | 26 | 58 | 37 |
| Future Vol, veh/h | 41 | 56 | 9 | 3 | 39 | 8 | 4 | 32 | 1 | 26 | 58 | 37 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 3 | 4 | 0 | 0 | 0 | 25 | 25 | 4 | 0 | 4 | 6 | 3 |
| Mvmt Flow | 46 | 63 | 10 | 3 | 44 | 9 | 4 | 36 | 1 | 29 | 65 | 42 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 53 | 0 | 0 | 73 | 0 | 0 | 268 | 219 | 68 | 234 | 220 | 49 |
| Stage 1 | - | - | - | - | - | - | 160 | 160 | - | 55 | 55 | - |
| Stage 2 | - | - | - | - | - | - | 108 | 59 | - | 179 | 165 | - |
| Critical Hdwy | 4.13 | - | - | 4.1 | - | - | 7.35 | 6.54 | 6.2 | 7.14 | 6.56 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Follow-up Hdwy | 2.227 | - | - | 2.2 | - | - | 3.725 | 4.036 | 3.3 | 3.536 | 4.054 | 3.327 |
| Pot Cap-1 Maneuver | 1546 | - | - | 1540 | - | - | 640 | 676 | 1001 | 716 | 671 | 1017 |
| Stage 1 | - | - | - | - | - | - | 791 | 762 | - | 952 | 841 | - |
| Stage 2 | - | - | - | - | - | - | 844 | 842 | - | 818 | 754 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1546 | - | - | 1540 | - | - | 552 | 654 | 1001 | 668 | 649 | 1017 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 552 | 654 | - | 668 | 649 | - |
| Stage 1 | - | - | - | - | - | - | 766 | 738 | - | 922 | 839 | - |
| Stage 2 | - | - | - | - | - | - | 745 | 840 | - | 753 | 731 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 2.9 | 0.4 | 10.9 | 11 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 647 | 1546 | - | - | 1540 | - | - | 735 |
| HCM Lane V/C Ratio | 0.064 | 0.03 | - | - | 0.002 | - | - | 0.185 |
| HCM Ctrl Dly (s/v) | 10.9 | 7.4 | 0 | - | 7.3 | 0 | - | 11 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.2 | 0.1 | - | - | 0 | - | - | 0.7 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 84 | 28 | 72 | 25 | 22 | 47 | 20 | 254 | 25 | 76 | 339 | 9 |
| Future Volume (vph) | 84 | 28 | 72 | 25 | 22 | 47 | 20 | 254 | 25 | 76 | 339 | 9 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.96 | 0.98 | 0.99 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.898 | | | 0.988 | | | 0.997 | |
| Flt Protected | | 0.964 | | 0.950 | | | | 0.997 | | | 0.991 | |
| Satd. Flow (prot) | 0 | 1825 | 1601 | 1690 | 1606 | 0 | 0 | 3484 | 0 | 0 | 3494 | 0 |
| Flt Permitted | | 0.730 | | 0.676 | | | | 0.910 | | | 0.820 | |
| Satd. Flow (perm) | 0 | 1376 | 1542 | 1177 | 1606 | 0 | 0 | 3177 | 0 | 0 | 2891 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 53 | | | 16 | | | 4 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 5 | | 22 | 22 | | 5 | 17 | | | | | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 0% | 2% | 8% | 0% | 9% | 0% | 3% | 8% | 4% | 3% | 0% |
| Adj. Flow (vph) | 95 | 32 | 82 | 28 | 25 | 53 | 23 | 289 | 28 | 86 | 385 | 10 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 127 | 82 | 28 | 78 | 0 | 0 | 340 | 0 | 0 | 481 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.0 | 21.0 | 21.0 | 21.0 | | | 54.2 | | | 54.2 | |
| Actuated g/C Ratio | | 0.26 | 0.26 | 0.26 | 0.26 | | | 0.68 | | | 0.68 | |
| v/c Ratio | | 0.35 | 0.18 | 0.09 | 0.17 | | | 0.16 | | | 0.25 | |

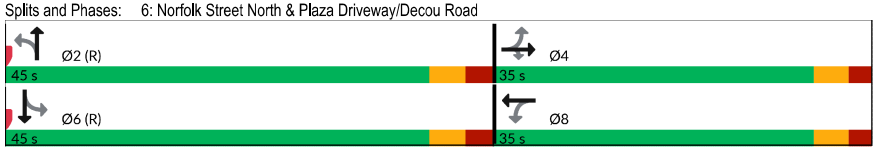




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 27.4 | 6.9 | 23.4 | 11.5 | | | 6.5 | | | 5.4 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 27.4 | 6.9 | 23.4 | 11.5 | | | 6.5 | | | 5.4 | |
| LOS | | C | A | C | B | | | A | | | A | |
| Approach Delay (s/veh) | | 19.3 | | | 14.6 | | | 6.5 | | | 5.4 | |
| Approach LOS | | B | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 15.6 | 0.0 | 3.2 | 2.9 | | | 10.4 | | | 18.6 | |
| Queue Length 95th (m) | | 29.5 | 9.2 | 9.1 | 12.1 | | | 15.7 | | | 19.7 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 509 | 622 | 435 | 627 | | | 2159 | | | 1961 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.25 | 0.13 | 0.06 | 0.12 | | | 0.16 | | | 0.25 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.35 | | | |
| Intersection Signal Delay (s/veh): 9.2 | | Intersection LOS: A | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 81 | 121 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 0 | 81 | 121 | 0 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 0 | 0 | 88 | 132 | 0 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 220 | 132 | 132 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 220 | 132 | 132 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 100 | 100 | | | |
| cM capacity (veh/h) | 768 | 917 | 1453 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 0 | 0 | 88 | 132 |
| Volume Left | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 0 |
| cSH | 1700 | 1700 | 1453 | 1700 |
| Volume to Capacity | 0.00 | 0.00 | 0.00 | 0.08 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s/veh) | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | A | | |
| Approach Delay (s/veh) | 0.0 | | 0.0 | 0.0 |
| Approach LOS | A | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 0.0 | |
| Intersection Capacity Utilization | | | 9.7% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 0 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 81 | 121 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 81 | 121 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 0 | 0 | 88 | 132 | 0 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 220 | 132 | 132 | 0 | - | 0 |
| Stage 1 | 132 | - | - | - | - | - |
| Stage 2 | 88 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 768 | 917 | 1453 | - | - | - |
| Stage 1 | 894 | - | - | - | - | - |
| Stage 2 | 935 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 768 | 917 | 1453 | - | - | - |
| Mov Cap-2 Maneuver | 768 | - | - | - | - | - |
| Stage 1 | 894 | - | - | - | - | - |
| Stage 2 | 935 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 0 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1453 | - | - | - | - | - |
| HCM Lane V/C Ratio | - | - | - | - | - | - |
| HCM Ctrl Dly (s/v) | 0 | - | 0 | 0 | - | - |
| HCM Lane LOS | A | - | A | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 311 | 93 | 157 | 464 | 66 | 140 |
| Future Volume (Veh/h) | 311 | 93 | 157 | 464 | 66 | 140 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 338 | 101 | 171 | 504 | 72 | 152 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 439 | | 1235 | 220 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 439 | | 1235 | 220 |
| tC, single (s) | | | 4.1 | | 6.9 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.4 |
| p0 queue free % | | | 85 | | 49 | 80 |
| cM capacity (veh/h) | | | 1124 | | 141 | 775 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 225 | 214 | 171 | 504 | 72 | 152 |
| Volume Left | 0 | 0 | 171 | 0 | 72 | 0 |
| Volume Right | 0 | 101 | 0 | 0 | 0 | 152 |
| cSH | 1700 | 1700 | 1124 | 1700 | 141 | 775 |
| Volume to Capacity | 0.13 | 0.13 | 0.15 | 0.30 | 0.51 | 0.20 |
| Queue Length 95th (m) | 0.0 | 0.0 | 4.1 | 0.0 | 18.6 | 5.5 |
| Control Delay (s/veh) | 0.0 | 0.0 | 8.8 | 0.0 | 54.7 | 10.8 |
| Lane LOS | | | A | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.2 | | 24.9 | |
| Approach LOS | | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.3 | | | |
| Intersection Capacity Utilization | 34.7% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 4.9 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 311 | 93 | 157 | 464 | 66 | 140 |
| Future Vol, veh/h | 311 | 93 | 157 | 464 | 66 | 140 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 6 | 1 | 5 | 4 | 5 |
| Mvmt Flow | 338 | 101 | 171 | 504 | 72 | 152 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 439 | 0 | 1235 | 220 |
| Stage 1 | - | - | - | - | 389 | - |
| Stage 2 | - | - | - | - | 846 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.66 | 6.975 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.86 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.46 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.538 | 3.3475 |
| Pot Cap-1 Maneuver | - | - | 1125 | - | 179 | 776 |
| Stage 1 | - | - | - | - | 650 | - |
| Stage 2 | - | - | - | - | 415 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1125 | - | 152 | 776 |
| Mov Cap-2 Maneuver | - | - | - | - | 152 | - |
| Stage 1 | - | - | - | - | 650 | - |
| Stage 2 | - | - | - | - | 352 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 2.2 | 22.8 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 152 | 776 | - | - | 1125 | - |
| HCM Lane V/C Ratio | 0.472 | 0.196 | - | - | 0.152 | - |
| HCM Ctrl Dly (s/v) | 48.2 | 10.8 | - | - | 8.8 | - |
| HCM Lane LOS | E | B | - | - | A | - |
| HCM 95th %tile Q(veh) | 2.2 | 0.7 | - | - | 0.5 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 12 | 122 | 8 | 285 | 138 | 167 | 8 | 305 | 250 | 81 | 187 | 10 |
| Future Volume (vph) | 12 | 122 | 8 | 285 | 138 | 167 | 8 | 305 | 250 | 81 | 187 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.96 | | 1.00 | |
| Frt | | 0.992 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.996 | | 0.950 | | | | 0.999 | | | 0.986 | |
| Satd. Flow (prot) | 0 | 1717 | 0 | 1738 | 1795 | 1458 | 0 | 1813 | 1555 | 0 | 3260 | 0 |
| Flt Permitted | | 0.963 | | 0.448 | | | | 0.991 | | | 0.768 | |
| Satd. Flow (perm) | 0 | 1660 | 0 | 813 | 1795 | 1421 | 0 | 1798 | 1500 | 0 | 2533 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | | 188 | | | 281 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 3 | | 12 | 12 | | 3 | 7 | | 10 | 10 | | 7 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 10% | 10% | 17% | 5% | 7% | 12% | 0% | 6% | 5% | 8% | 11% | 0% |
| Adj. Flow (vph) | 13 | 137 | 9 | 320 | 155 | 188 | 9 | 343 | 281 | 91 | 210 | 11 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 159 | 0 | 320 | 155 | 188 | 0 | 352 | 281 | 0 | 312 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 12.5 | | 25.9 | 23.5 | 23.5 | | 45.6 | 45.6 | | 45.6 | |
| Actuated g/C Ratio | | 0.16 | | 0.32 | 0.29 | 0.29 | | 0.57 | 0.57 | | 0.57 | |
| v/c Ratio | | 0.60 | | 0.90 | 0.29 | 0.34 | | 0.34 | 0.29 | | 0.22 | |

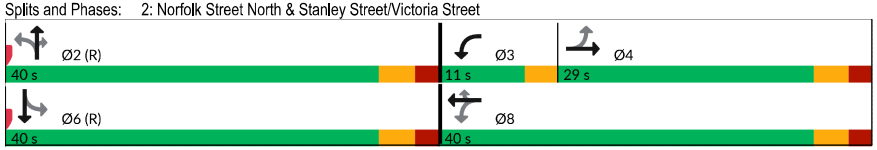


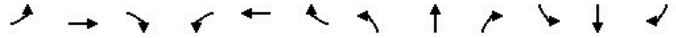


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.1 | | 53.3 | 22.7 | 5.0 | | 8.8 | 1.5 | | 9.3 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.1 | | 53.3 | 22.7 | 5.0 | | 8.8 | 1.5 | | 9.3 | |
| LOS | | D | | D | C | A | | A | A | | A | |
| Approach Delay (s/veh) | | 40.1 | | | 32.5 | | | 5.5 | | | 9.3 | |
| Approach LOS | | D | | | C | | | A | | | A | |
| Queue Length 50th (m) | | 22.5 | | 40.4 | 18.4 | 0.0 | | 22.7 | 1.5 | | 10.7 | |
| Queue Length 95th (m) | | 37.3 | | #69.5 | 29.6 | 12.1 | | 37.5 | 7.1 | | 19.7 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 492 | | 356 | 776 | 721 | | 1024 | 975 | | 1445 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.32 | | 0.90 | 0.20 | 0.26 | | 0.34 | 0.29 | | 0.22 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay (s/veh): 19.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 87.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





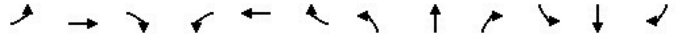
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 93 | 141 | 65 | 9 | 246 | 25 | 152 | 95 | 4 | 16 | 50 | 103 |
| Future Volume (vph) | 93 | 141 | 65 | 9 | 246 | 25 | 152 | 95 | 4 | 16 | 50 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 113 | 172 | 79 | 11 | 300 | 30 | 185 | 116 | 5 | 20 | 61 | 126 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 364 | 341 | 306 | 207 |
| Volume Left (vph) | 113 | 11 | 185 | 20 |
| Volume Right (vph) | 79 | 30 | 5 | 126 |
| Hadj (s) | 0.07 | 0.05 | 0.32 | -0.20 |
| Departure Headway (s) | 6.8 | 6.8 | 7.2 | 7.1 |
| Degree Utilization, x | 0.68 | 0.64 | 0.62 | 0.41 |
| Capacity (veh/h) | 494 | 490 | 449 | 432 |
| Control Delay (s/veh) | 23.1 | 21.2 | 21.2 | 14.9 |
| Approach Delay (s/veh) | 23.1 | 21.2 | 21.2 | 14.9 |
| Approach LOS | C | C | C | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 20.7 | |
| Level of Service | | | C | |
| Intersection Capacity Utilization | | | 70.2% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |



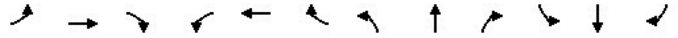




| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 52 | 89 | 26 | 47 | 170 | 38 | 49 | 159 | 36 | 36 | 148 | 53 |
| Future Volume (vph) | 52 | 89 | 26 | 47 | 170 | 38 | 49 | 159 | 36 | 36 | 148 | 53 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 59 | 101 | 30 | 53 | 193 | 43 | 56 | 181 | 41 | 41 | 168 | 60 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 190 | 289 | 278 | 209 | 60 |
| Volume Left (vph) | 59 | 53 | 56 | 41 | 0 |
| Volume Right (vph) | 30 | 43 | 41 | 0 | 60 |
| Hadj (s) | 0.11 | 0.02 | 0.09 | 0.17 | -0.62 |
| Departure Headway (s) | 6.3 | 6.0 | 6.1 | 6.7 | 5.9 |
| Degree Utilization, x | 0.33 | 0.48 | 0.47 | 0.39 | 0.10 |
| Capacity (veh/h) | 511 | 555 | 539 | 497 | 560 |
| Control Delay (s/veh) | 12.4 | 14.4 | 14.6 | 12.6 | 8.3 |
| Approach Delay (s/veh) | 12.4 | 14.4 | 14.6 | 11.7 | |
| Approach LOS | B | B | B | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 13.3 | |
| Level of Service | | | B | |
| Intersection Capacity Utilization | | | 49.2% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |
| Description: SBR SLIP THROUGH FOR WIDE ROW | | | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 83 | 64 | 6 | 2 | 83 | 29 | 11 | 56 | 0 | 17 | 16 | 87 |
| Future Volume (Veh/h) | 83 | 64 | 6 | 2 | 83 | 29 | 11 | 56 | 0 | 17 | 16 | 87 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 95 | 74 | 7 | 2 | 95 | 33 | 13 | 64 | 0 | 20 | 18 | 100 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 128 | | | 81 | | | 492 | 400 | 78 | 415 | 387 | 112 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 128 | | | 81 | | | 492 | 400 | 78 | 415 | 387 | 112 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.8 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.1 | 4.1 | 3.3 |
| p0 queue free % | 94 | | | 100 | | | 97 | 87 | 100 | 95 | 96 | 89 |
| cM capacity (veh/h) | 1470 | | | 1529 | | | 405 | 502 | 983 | 386 | 500 | 947 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 176 | 130 | 77 | 138 |
| Volume Left | 95 | 2 | 13 | 20 |
| Volume Right | 7 | 33 | 0 | 100 |
| cSH | 1470 | 1529 | 482 | 713 |
| Volume to Capacity | 0.06 | 0.00 | 0.16 | 0.19 |
| Queue Length 95th (m) | 1.6 | 0.0 | 4.3 | 5.4 |
| Control Delay (s/veh) | 4.3 | 0.1 | 13.9 | 11.3 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 4.3 | 0.1 | 13.9 | 11.3 |
| Approach LOS | | | B | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | | 6.5 |
| Intersection Capacity Utilization | | ICU Level of Service | 30.8% |
| Analysis Period (min) | | | A |
| | | | 15 |





| Intersection | |
|---|---|
| Int Delay, s/veh | 6.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 83 | 64 | 6 | 2 | 83 | 29 | 11 | 56 | 0 | 17 | 16 | 87 |
| Future Vol, veh/h | 83 | 64 | 6 | 2 | 83 | 29 | 11 | 56 | 0 | 17 | 16 | 87 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 0 | 12 | 20 | 0 | 8 | 10 | 0 | 3 | 2 | 67 | 10 | 0 |
| Mvmt Flow | 95 | 74 | 7 | 2 | 95 | 33 | 13 | 64 | 0 | 20 | 18 | 100 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 128 | 0 | 0 | 81 | 0 | 0 | 443 | 400 | 78 | 416 | 387 | 112 |
| Stage 1 | - | - | - | - | - | - | 268 | 268 | - | 116 | 116 | - |
| Stage 2 | - | - | - | - | - | - | 175 | 132 | - | 300 | 271 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.53 | 6.22 | 7.77 | 6.6 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4.027 | 3.318 | 4.103 | 4.09 | 3.3 |
| Pot Cap-1 Maneuver | 1470 | - | - | 1529 | - | - | 528 | 537 | 983 | 449 | 535 | 947 |
| Stage 1 | - | - | - | - | - | - | 742 | 685 | - | 753 | 784 | - |
| Stage 2 | - | - | - | - | - | - | 832 | 785 | - | 589 | 671 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1470 | - | - | 1529 | - | - | 435 | 500 | 983 | 384 | 498 | 947 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 435 | 500 | - | 384 | 498 | - |
| Stage 1 | - | - | - | - | - | - | 692 | 638 | - | 702 | 783 | - |
| Stage 2 | - | - | - | - | - | - | 726 | 784 | - | 494 | 625 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 4.1 | 0.1 | 13.8 | 11.3 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 488 | 1470 | - | - | 1529 | - | - | 713 |
| HCM Lane V/C Ratio | 0.158 | 0.065 | - | - | 0.002 | - | - | 0.193 |
| HCM Ctrl Dly (s/v) | 13.8 | 7.6 | 0 | - | 7.4 | 0 | - | 11.3 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.6 | 0.2 | - | - | 0 | - | - | 0.7 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 37 | 29 | 98 | 18 | 122 | 21 | 396 | 75 | 67 | 302 | 4 |
| Future Volume (vph) | 83 | 37 | 29 | 98 | 18 | 122 | 21 | 396 | 75 | 67 | 302 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.99 | 1.00 | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.870 | | | 0.977 | | | 0.998 | |
| Flt Protected | | 0.967 | | 0.950 | | | | 0.998 | | | 0.991 | |
| Satd. Flow (prot) | 0 | 1835 | 1633 | 1738 | 1572 | 0 | 0 | 3349 | 0 | 0 | 3318 | 0 |
| Flt Permitted | | 0.670 | | 0.665 | | | | 0.925 | | | 0.764 | |
| Satd. Flow (perm) | 0 | 1265 | 1610 | 1214 | 1572 | 0 | 0 | 3102 | 0 | 0 | 2558 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 38 | | 147 | | | 36 | | | 2 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 8 | | 2 | 2 | | 8 | 23 | | | | | 23 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 0% | 4% | 0% | 5% | 7% | 4% | 6% | 5% | 13% | 17% | 7% | 0% |
| Adj. Flow (vph) | 100 | 45 | 35 | 118 | 22 | 147 | 25 | 477 | 90 | 81 | 364 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 145 | 35 | 118 | 169 | 0 | 0 | 592 | 0 | 0 | 450 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.3 | 21.3 | 21.3 | 21.3 | | | 47.5 | | | 47.5 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.43 | 0.08 | 0.37 | 0.32 | | | 0.32 | | | 0.30 | |

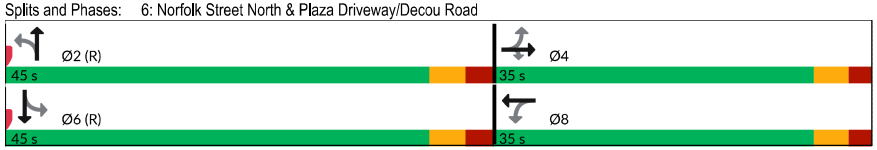




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 28.9 | 7.8 | 27.6 | 7.6 | | | 8.2 | | | 6.0 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 28.9 | 7.8 | 27.6 | 7.6 | | | 8.2 | | | 6.0 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 24.8 | | | 15.8 | | | 8.2 | | | 6.0 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 18.3 | 0.0 | 14.6 | 2.5 | | | 19.7 | | | 17.0 | |
| Queue Length 95th (m) | | 30.8 | 5.0 | 25.7 | 13.2 | | | 26.7 | | | m18.0 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 468 | 619 | 449 | 674 | | | 1856 | | | 1519 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.31 | 0.06 | 0.26 | 0.25 | | | 0.32 | | | 0.30 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.43 | | | |
| Intersection Signal Delay (s/veh): 11.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 95.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 74 | 35 | 19 | 141 | 84 | 33 |
| Future Volume (Veh/h) | 74 | 35 | 19 | 141 | 84 | 33 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 80 | 38 | 21 | 153 | 91 | 36 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 304 | 109 | 127 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 304 | 109 | 127 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 88 | 96 | 99 | | | |
| cM capacity (veh/h) | 678 | 945 | 1459 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 80 | 38 | 174 | 127 |
| Volume Left | 80 | 0 | 21 | 0 |
| Volume Right | 0 | 38 | 0 | 36 |
| cSH | 678 | 945 | 1459 | 1700 |
| Volume to Capacity | 0.12 | 0.04 | 0.01 | 0.07 |
| Queue Length 95th (m) | 3.0 | 1.0 | 0.3 | 0.0 |
| Control Delay (s/veh) | 11.0 | 9.0 | 1.0 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 10.4 | | 1.0 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 3.3 | |
| Intersection Capacity Utilization | | | 25.9% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 74 | 35 | 19 | 141 | 84 | 33 |
| Future Vol, veh/h | 74 | 35 | 19 | 141 | 84 | 33 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 80 | 38 | 21 | 153 | 91 | 36 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 304 | 109 | 127 | 0 | - | 0 |
| Stage 1 | 109 | - | - | - | - | - |
| Stage 2 | 195 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 688 | 945 | 1459 | - | - | - |
| Stage 1 | 916 | - | - | - | - | - |
| Stage 2 | 838 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 677 | 945 | 1459 | - | - | - |
| Mov Cap-2 Maneuver | 677 | - | - | - | - | - |
| Stage 1 | 901 | - | - | - | - | - |
| Stage 2 | 838 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 10.4 | 0.9 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1459 | - | 677 | 945 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | 0.119 | 0.04 | - | - |
| HCM Ctrl Dly (s/v) | 7.5 | 0 | 11 | 9 | - | - |
| HCM Lane LOS | A | A | B | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.4 | 0.1 | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 552 | 74 | 204 | 505 | 100 | 188 |
| Future Volume (Veh/h) | 552 | 74 | 204 | 505 | 100 | 188 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 587 | 79 | 217 | 537 | 106 | 200 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 666 | | 1598 | 333 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 666 | | 1598 | 333 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.6 | 3.3 |
| p0 queue free % | | | 77 | | 0 | 70 |
| cM capacity (veh/h) | | | 926 | | 71 | 666 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 391 | 275 | 217 | 537 | 106 | 200 |
| Volume Left | 0 | 0 | 217 | 0 | 106 | 0 |
| Volume Right | 0 | 79 | 0 | 0 | 0 | 200 |
| cSH | 1700 | 1700 | 926 | 1700 | 71 | 666 |
| Volume to Capacity | 0.23 | 0.16 | 0.23 | 0.32 | 1.50 | 0.30 |
| Queue Length 95th (m) | 0.0 | 0.0 | 6.9 | 0.0 | 67.5 | 9.6 |
| Control Delay (s/veh) | 0.0 | 0.0 | 10.1 | 0.0 | 384.5 | 12.7 |
| Lane LOS | | | B | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.9 | | 141.5 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 26.4 | | | |
| Intersection Capacity Utilization | 44.5% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 22 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 552 | 74 | 204 | 505 | 100 | 188 |
| Future Vol, veh/h | 552 | 74 | 204 | 505 | 100 | 188 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 4 | 4 | 1 | 3 | 7 | 1 |
| Mvmt Flow | 587 | 79 | 217 | 537 | 106 | 200 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 666 | 0 | 1598 | 333 |
| Stage 1 | - | - | - | - | 627 | - |
| Stage 2 | - | - | - | - | 971 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.705 | 6.915 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.905 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.505 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.5665 | 3.3095 |
| Pot Cap-1 Maneuver | - | - | 927 | - | ~ 103 | 666 |
| Stage 1 | - | - | - | - | 485 | - |
| Stage 2 | - | - | - | - | 356 | - |
| Platoon blocked, % | - | - | | | - | |
| Mov Cap-1 Maneuver | - | - | 927 | - | ~ 79 | 666 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 79 | - |
| Stage 1 | - | - | - | - | 485 | - |
| Stage 2 | - | - | - | - | 273 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 2.9 | 116.7 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 79 | 666 | - | - | 927 | - |
| HCM Lane V/C Ratio | 1.347 | 0.3 | - | - | 0.234 | - |
| HCM Ctrl Dly (s/v) | $ 312.1 | 12.7 | - | - | 10.1 | - |
| HCM Lane LOS | F | B | - | - | B | - |
| HCM 95th %tile Q(veh) | 8.3 | 1.3 | - | - | 0.9 | - |

| Notes | |
|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s |
| +: Computation Not Defined | *: All major volume in platoon |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 16 | 131 | 14 | 239 | 144 | 144 | 2 | 305 | 233 | 120 | 329 | 16 |
| Future Volume (vph) | 16 | 131 | 14 | 239 | 144 | 144 | 2 | 305 | 233 | 120 | 329 | 16 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 1.00 | | 0.97 | | 1.00 | 0.97 | | 1.00 | |
| Frt | | 0.988 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | | | | 0.987 | |
| Satd. Flow (prot) | 0 | 1784 | 0 | 1755 | 1830 | 1570 | 0 | 1838 | 1570 | 0 | 3379 | 0 |
| Flt Permitted | | 0.951 | | 0.409 | | | | 0.998 | | | 0.734 | |
| Satd. Flow (perm) | 0 | 1704 | 0 | 752 | 1830 | 1525 | 0 | 1834 | 1524 | 0 | 2510 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | | 167 | | | 271 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 2 | | 6 | 6 | | 2 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 16% | 5% | 0% | 4% | 5% | 4% | 100% | 4% | 4% | 15% | 3% | 0% |
| Adj. Flow (vph) | 19 | 152 | 16 | 278 | 167 | 167 | 2 | 355 | 271 | 140 | 383 | 19 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 187 | 0 | 278 | 167 | 167 | 0 | 357 | 271 | 0 | 542 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 13.3 | | 26.7 | 24.3 | 24.3 | | 44.8 | 44.8 | | 44.8 | |
| Actuated g/C Ratio | | 0.17 | | 0.33 | 0.30 | 0.30 | | 0.56 | 0.56 | | 0.56 | |
| v/c Ratio | | 0.65 | | 0.79 | 0.30 | 0.29 | | 0.35 | 0.28 | | 0.39 | |

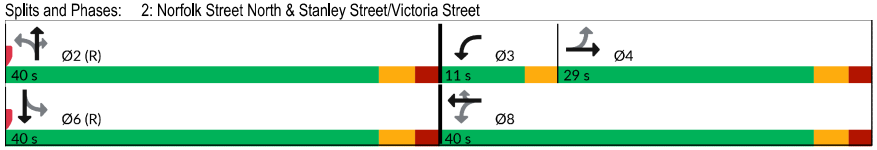


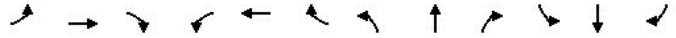


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.3 | | 38.8 | 22.1 | 4.6 | | 9.4 | 1.7 | | 11.4 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.3 | | 38.8 | 22.1 | 4.6 | | 9.4 | 1.7 | | 11.4 | |
| LOS | | D | | D | C | A | | A | A | | B | |
| Approach Delay (s/veh) | | 40.3 | | | 24.9 | | | 6.1 | | | 11.4 | |
| Approach LOS | | D | | | C | | | A | | | B | |
| Queue Length 50th (m) | | 26.2 | | 33.4 | 19.5 | 0.0 | | 24.4 | 1.6 | | 21.7 | |
| Queue Length 95th (m) | | 40.3 | | 45.9 | 29.5 | 10.1 | | 37.7 | 6.2 | | 35.6 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 506 | | 351 | 791 | 754 | | 1026 | 972 | | 1406 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.37 | | 0.79 | 0.21 | 0.22 | | 0.35 | 0.28 | | 0.39 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.79 | | | |
| Intersection Signal Delay (s/veh): 16.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 84.9% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





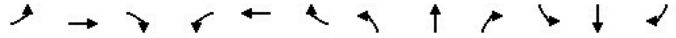
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 92 | 188 | 137 | 3 | 188 | 27 | 101 | 67 | 10 | 37 | 97 | 119 |
| Future Volume (vph) | 92 | 188 | 137 | 3 | 188 | 27 | 101 | 67 | 10 | 37 | 97 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 105 | 214 | 156 | 3 | 214 | 31 | 115 | 76 | 11 | 42 | 110 | 135 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 475 | 248 | 202 | 287 |
| Volume Left (vph) | 105 | 3 | 115 | 42 |
| Volume Right (vph) | 156 | 31 | 11 | 135 |
| Hadj (s) | -0.04 | 0.01 | 0.20 | -0.20 |
| Departure Headway (s) | 6.2 | 6.7 | 7.2 | 6.6 |
| Degree Utilization, x | 0.81 | 0.46 | 0.40 | 0.53 |
| Capacity (veh/h) | 475 | 472 | 443 | 487 |
| Control Delay (s/veh) | 30.5 | 15.4 | 15.0 | 16.7 |
| Approach Delay (s/veh) | 30.5 | 15.4 | 15.0 | 16.7 |
| Approach LOS | D | C | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | 21.6 | | | |
| Level of Service | C | | | |
| Intersection Capacity Utilization | 73.4% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |





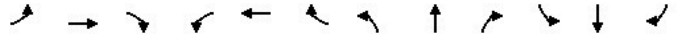


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 56 | 131 | 49 | 41 | 120 | 49 | 52 | 200 | 41 | 57 | 178 | 43 |
| Future Volume (vph) | 56 | 131 | 49 | 41 | 120 | 49 | 52 | 200 | 41 | 57 | 178 | 43 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 61 | 142 | 53 | 45 | 130 | 53 | 57 | 217 | 45 | 62 | 193 | 47 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 256 | 228 | 319 | 255 | 47 |
| Volume Left (vph) | 61 | 45 | 57 | 62 | 0 |
| Volume Right (vph) | 53 | 53 | 45 | 0 | 47 |
| Hadj (s) | 0.10 | -0.09 | 0.00 | 0.17 | -0.63 |
| Departure Headway (s) | 6.5 | 6.4 | 6.3 | 6.9 | 6.1 |
| Degree Utilization, x | 0.46 | 0.41 | 0.56 | 0.49 | 0.08 |
| Capacity (veh/h) | 495 | 495 | 533 | 477 | 543 |
| Control Delay (s/veh) | 15.0 | 13.7 | 16.9 | 15.1 | 8.4 |
| Approach Delay (s/veh) | 15.0 | 13.7 | 16.9 | 14.1 | |
| Approach LOS | B | B | C | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | 15.0 | | | |
| Level of Service | C | | | |
| Intersection Capacity Utilization | 57.1% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

Description: SBR SLIP THROUGH FOR WIDE ROW



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 98 | 67 | 11 | 4 | 47 | 14 | 5 | 42 | 2 | 36 | 74 | 79 |
| Future Volume (Veh/h) | 98 | 67 | 11 | 4 | 47 | 14 | 5 | 42 | 2 | 36 | 74 | 79 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Hourly flow rate (vph) | 110 | 75 | 12 | 4 | 53 | 16 | 6 | 47 | 2 | 40 | 83 | 89 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 69 | | | 87 | | | 501 | 378 | 81 | 396 | 376 | 61 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 69 | | | 87 | | | 501 | 378 | 81 | 396 | 376 | 61 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.4 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 93 | | | 100 | | | 98 | 91 | 100 | 92 | 84 | 91 |
| cM capacity (veh/h) | 1526 | | | 1522 | | | 335 | 510 | 985 | 491 | 508 | 1001 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 197 | 73 | 55 | 212 |
| Volume Left | 110 | 4 | 6 | 40 |
| Volume Right | 12 | 16 | 2 | 89 |
| cSH | 1526 | 1522 | 490 | 635 |
| Volume to Capacity | 0.07 | 0.00 | 0.11 | 0.33 |
| Queue Length 95th (m) | 1.8 | 0.1 | 2.9 | 11.1 |
| Control Delay (s/veh) | 4.5 | 0.4 | 13.3 | 13.5 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 4.5 | 0.4 | 13.3 | 13.5 |
| Approach LOS | | | B | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | | 8.4 |
| Intersection Capacity Utilization | | | 40.3% |
| Analysis Period (min) | | | 15 |
| | ICU Level of Service | | A |





| Intersection | |
|---|---|
| Int Delay, s/veh | 8.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 98 | 67 | 11 | 4 | 47 | 14 | 5 | 42 | 2 | 36 | 74 | 79 |
| Future Vol, veh/h | 98 | 67 | 11 | 4 | 47 | 14 | 5 | 42 | 2 | 36 | 74 | 79 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 3 | 4 | 0 | 0 | 0 | 25 | 25 | 4 | 0 | 4 | 6 | 3 |
| Mvmt Flow | 110 | 75 | 12 | 4 | 53 | 16 | 6 | 47 | 2 | 40 | 83 | 89 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 69 | 0 | 0 | 87 | 0 | 0 | 456 | 378 | 81 | 395 | 376 | 61 |
| Stage 1 | - | - | - | - | - | - | 301 | 301 | - | 69 | 69 | - |
| Stage 2 | - | - | - | - | - | - | 155 | 77 | - | 326 | 307 | - |
| Critical Hdwy | 4.13 | - | - | 4.1 | - | - | 7.35 | 6.54 | 6.2 | 7.14 | 6.56 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Follow-up Hdwy | 2.227 | - | - | 2.2 | - | - | 3.725 | 4.036 | 3.3 | 3.536 | 4.054 | 3.327 |
| Pot Cap-1 Maneuver | 1526 | - | - | 1522 | - | - | 478 | 551 | 985 | 561 | 549 | 1001 |
| Stage 1 | - | - | - | - | - | - | 661 | 661 | - | 936 | 830 | - |
| Stage 2 | - | - | - | - | - | - | 796 | 827 | - | 682 | 654 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1526 | - | - | 1522 | - | - | 359 | 507 | 985 | 489 | 506 | 1001 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 359 | 507 | - | 489 | 506 | - |
| Stage 1 | - | - | - | - | - | - | 611 | 611 | - | 865 | 828 | - |
| Stage 2 | - | - | - | - | - | - | 651 | 825 | - | 580 | 604 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 4.2 | 0.5 | 13.2 | 13.5 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 496 | 1526 | - | - | 1522 | - | - | 633 |
| HCM Lane V/C Ratio | 0.111 | 0.072 | - | - | 0.003 | - | - | 0.335 |
| HCM Ctrl Dly (s/v) | 13.2 | 7.5 | 0 | - | 7.4 | 0 | - | 13.5 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.4 | 0.2 | - | - | 0 | - | - | 1.5 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 39 | 72 | 62 | 25 | 57 | 24 | 344 | 68 | 91 | 435 | 12 |
| Future Volume (vph) | 86 | 39 | 72 | 62 | 25 | 57 | 24 | 344 | 68 | 91 | 435 | 12 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.96 | 0.98 | 0.99 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.895 | | | 0.977 | | | 0.997 | |
| Flt Protected | | 0.967 | | 0.950 | | | | 0.997 | | | 0.992 | |
| Satd. Flow (prot) | 0 | 1832 | 1601 | 1690 | 1598 | 0 | 0 | 3431 | 0 | 0 | 3498 | 0 |
| Flt Permitted | | 0.736 | | 0.666 | | | | 0.904 | | | 0.777 | |
| Satd. Flow (perm) | 0 | 1390 | 1542 | 1160 | 1598 | 0 | 0 | 3110 | 0 | 0 | 2740 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 65 | | | 37 | | | 4 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 5 | | 22 | 22 | | 5 | 17 | | | | | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 0% | 2% | 8% | 0% | 9% | 0% | 3% | 8% | 4% | 3% | 0% |
| Adj. Flow (vph) | 98 | 44 | 82 | 70 | 28 | 65 | 27 | 391 | 77 | 103 | 494 | 14 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 142 | 82 | 70 | 93 | 0 | 0 | 495 | 0 | 0 | 611 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.2 | 21.2 | 21.2 | 21.2 | | | 47.6 | | | 47.6 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.60 | | | 0.60 | |
| v/c Ratio | | 0.39 | 0.17 | 0.23 | 0.20 | | | 0.27 | | | 0.37 | |

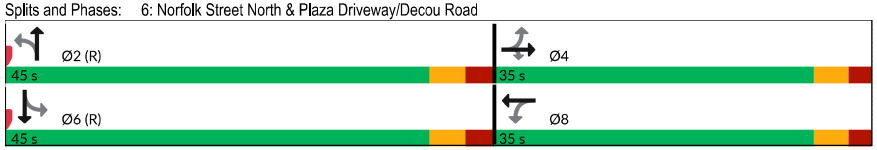




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 27.6 | 6.7 | 25.2 | 10.7 | | | 7.7 | | | 6.5 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 27.6 | 6.7 | 25.2 | 10.7 | | | 7.7 | | | 6.5 | |
| LOS | | C | A | C | B | | | A | | | A | |
| Approach Delay (s/veh) | | 20.0 | | | 16.9 | | | 7.7 | | | 6.5 | |
| Approach LOS | | B | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 17.7 | 0.0 | 8.3 | 3.2 | | | 15.6 | | | 22.6 | |
| Queue Length 95th (m) | | 31.8 | 9.0 | 17.9 | 12.9 | | | 23.3 | | | m23.8 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 514 | 622 | 429 | 632 | | | 1864 | | | 1630 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.28 | 0.13 | 0.16 | 0.15 | | | 0.27 | | | 0.37 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.39 | | | |
| Intersection Signal Delay (s/veh): 10.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 58 | 27 | 34 | 98 | 159 | 75 |
| Future Volume (Veh/h) | 58 | 27 | 34 | 98 | 159 | 75 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 63 | 29 | 37 | 107 | 173 | 82 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 395 | 214 | 255 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 395 | 214 | 255 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 89 | 96 | 97 | | | |
| cM capacity (veh/h) | 593 | 826 | 1310 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 63 | 29 | 144 | 255 |
| Volume Left | 63 | 0 | 37 | 0 |
| Volume Right | 0 | 29 | 0 | 82 |
| cSH | 593 | 826 | 1310 | 1700 |
| Volume to Capacity | 0.11 | 0.04 | 0.03 | 0.15 |
| Queue Length 95th (m) | 2.7 | 0.8 | 0.7 | 0.0 |
| Control Delay (s/veh) | 11.8 | 9.5 | 2.2 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 11.1 | | 2.2 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 2.7 | |
| Intersection Capacity Utilization | | | 33.3% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 58 | 27 | 34 | 98 | 159 | 75 |
| Future Vol, veh/h | 58 | 27 | 34 | 98 | 159 | 75 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 63 | 29 | 37 | 107 | 173 | 82 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 395 | 214 | 255 | 0 | - | 0 |
| Stage 1 | 214 | - | - | - | - | - |
| Stage 2 | 181 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 610 | 826 | 1310 | - | - | - |
| Stage 1 | 822 | - | - | - | - | - |
| Stage 2 | 850 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 592 | 826 | 1310 | - | - | - |
| Mov Cap-2 Maneuver | 592 | - | - | - | - | - |
| Stage 1 | 797 | - | - | - | - | - |
| Stage 2 | 850 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 11.1 | 2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1310 | - | 592 | 826 | - | - |
| HCM Lane V/C Ratio | 0.028 | - | 0.106 | 0.036 | - | - |
| HCM Ctrl Dly (s/v) | 7.8 | 0 | 11.8 | 9.5 | - | - |
| HCM Lane LOS | A | A | B | A | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.4 | 0.1 | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 343 | 102 | 171 | 512 | 73 | 148 |
| Future Volume (Veh/h) | 343 | 102 | 171 | 512 | 73 | 148 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 373 | 111 | 186 | 557 | 79 | 161 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 484 | | 1358 | 242 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 484 | | 1358 | 242 |
| tC, single (s) | | | 4.1 | | 6.9 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.4 |
| p0 queue free % | | | 83 | | 31 | 79 |
| cM capacity (veh/h) | | | 1082 | | 114 | 750 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 249 | 235 | 186 | 557 | 79 | 161 |
| Volume Left | 0 | 0 | 186 | 0 | 79 | 0 |
| Volume Right | 0 | 111 | 0 | 0 | 0 | 161 |
| cSH | 1700 | 1700 | 1082 | 1700 | 114 | 750 |
| Volume to Capacity | 0.15 | 0.14 | 0.17 | 0.33 | 0.69 | 0.21 |
| Queue Length 95th (m) | 0.0 | 0.0 | 4.7 | 0.0 | 28.0 | 6.2 |
| Control Delay (s/veh) | 0.0 | 0.0 | 9.0 | 0.0 | 88.5 | 11.1 |
| Lane LOS | | | A | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.3 | | 36.6 | |
| Approach LOS | | | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 7.1 | | | |
| Intersection Capacity Utilization | 37.7% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 6.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 343 | 102 | 171 | 512 | 73 | 148 |
| Future Vol, veh/h | 343 | 102 | 171 | 512 | 73 | 148 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 6 | 1 | 5 | 4 | 5 |
| Mvmt Flow | 373 | 111 | 186 | 557 | 79 | 161 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 484 | 0 | 1358 | 242 |
| Stage 1 | - | - | - | - | 429 | - |
| Stage 2 | - | - | - | - | 929 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.66 | 6.975 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.86 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.46 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.538 | 3.3475 |
| Pot Cap-1 Maneuver | - | - | 1083 | - | 149 | 751 |
| Stage 1 | - | - | - | - | 620 | - |
| Stage 2 | - | - | - | - | 379 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1083 | - | 123 | 751 |
| Mov Cap-2 Maneuver | - | - | - | - | 123 | - |
| Stage 1 | - | - | - | - | 620 | - |
| Stage 2 | - | - | - | - | 314 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 2.3 | 32.7 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 123 | 751 | - | - | 1083 | - |
| HCM Lane V/C Ratio | 0.645 | 0.214 | - | - | 0.172 | - |
| HCM Ctrl Dly (s/v) | 76.4 | 11.1 | - | - | 9 | - |
| HCM Lane LOS | F | B | - | - | A | - |
| HCM 95th %tile Q(veh) | 3.4 | 0.8 | - | - | 0.6 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 14 | 134 | 8 | 310 | 151 | 176 | 8 | 337 | 274 | 88 | 206 | 11 |
| Future Volume (vph) | 14 | 134 | 8 | 310 | 151 | 176 | 8 | 337 | 274 | 88 | 206 | 11 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.96 | | 1.00 | |
| Frt | | 0.993 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | 0.999 | | | 0.986 | |
| Satd. Flow (prot) | 0 | 1718 | 0 | 1738 | 1795 | 1458 | 0 | 1813 | 1555 | 0 | 3259 | 0 |
| Flt Permitted | | 0.957 | | 0.427 | | | | 0.991 | | | 0.752 | |
| Satd. Flow (perm) | 0 | 1652 | 0 | 775 | 1795 | 1421 | 0 | 1798 | 1500 | 0 | 2480 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 3 | | | | 198 | | | 308 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 3 | | 12 | 12 | | 3 | 7 | | 10 | 10 | | 7 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 10% | 10% | 17% | 5% | 7% | 12% | 0% | 6% | 5% | 8% | 11% | 0% |
| Adj. Flow (vph) | 16 | 151 | 9 | 348 | 170 | 198 | 9 | 379 | 308 | 99 | 231 | 12 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 176 | 0 | 348 | 170 | 198 | 0 | 388 | 308 | 0 | 342 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 13.2 | | 26.6 | 24.2 | 24.2 | | 44.9 | 44.9 | | 44.9 | |
| Actuated g/C Ratio | | 0.17 | | 0.33 | 0.30 | 0.30 | | 0.56 | 0.56 | | 0.56 | |
| v/c Ratio | | 0.64 | | 0.98 | 0.31 | 0.35 | | 0.38 | 0.32 | | 0.25 | |

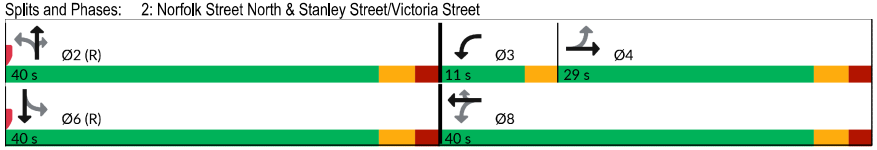


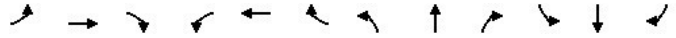


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.9 | | 70.2 | 22.4 | 4.8 | | 9.4 | 1.5 | | 10.0 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.9 | | 70.2 | 22.4 | 4.8 | | 9.4 | 1.5 | | 10.0 | |
| LOS | | D | | E | C | A | | A | A | | A | |
| Approach Delay (s/veh) | | 40.9 | | | 40.7 | | | 5.9 | | | 10.0 | |
| Approach LOS | | D | | | D | | | A | | | A | |
| Queue Length 50th (m) | | 25.0 | | 44.0 | 19.9 | 0.0 | | 24.9 | 1.4 | | 12.3 | |
| Queue Length 95th (m) | | 40.5 | | #80.6 | 31.3 | 12.0 | | 40.4 | 6.8 | | 22.5 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 489 | | 354 | 776 | 726 | | 1008 | 976 | | 1393 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.36 | | 0.98 | 0.22 | 0.27 | | 0.38 | 0.32 | | 0.25 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.98 | | | |
| Intersection Signal Delay (s/veh): 22.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 89.1% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





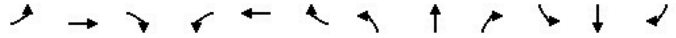
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 93 | 155 | 65 | 9 | 268 | 25 | 152 | 95 | 4 | 16 | 50 | 103 |
| Future Volume (vph) | 93 | 155 | 65 | 9 | 268 | 25 | 152 | 95 | 4 | 16 | 50 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 113 | 189 | 79 | 11 | 327 | 30 | 185 | 116 | 5 | 20 | 61 | 126 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 381 | 368 | 306 | 207 |
| Volume Left (vph) | 113 | 11 | 185 | 20 |
| Volume Right (vph) | 79 | 30 | 5 | 126 |
| Hadj (s) | 0.07 | 0.05 | 0.32 | -0.20 |
| Departure Headway (s) | 6.9 | 7.0 | 7.5 | 7.4 |
| Degree Utilization, x | 0.73 | 0.71 | 0.64 | 0.42 |
| Capacity (veh/h) | 485 | 485 | 437 | 409 |
| Control Delay (s/veh) | 26.8 | 25.2 | 22.8 | 15.7 |
| Approach Delay (s/veh) | 26.8 | 25.2 | 22.8 | 15.7 |
| Approach LOS | D | D | C | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Delay | | | 23.5 | | |
| Level of Service | | | C | | |
| Intersection Capacity Utilization | | | 72.1% | ICU Level of Service | C |
| Analysis Period (min) | | | 15 | | |





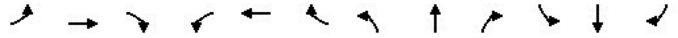


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 57 | 98 | 27 | 50 | 188 | 41 | 51 | 168 | 38 | 40 | 160 | 58 |
| Future Volume (vph) | 57 | 98 | 27 | 50 | 188 | 41 | 51 | 168 | 38 | 40 | 160 | 58 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 65 | 111 | 31 | 57 | 214 | 47 | 58 | 191 | 43 | 45 | 182 | 66 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 207 | 318 | 292 | 227 | 66 |
| Volume Left (vph) | 65 | 57 | 58 | 45 | 0 |
| Volume Right (vph) | 31 | 47 | 43 | 0 | 66 |
| Hadj (s) | 0.12 | 0.02 | 0.09 | 0.17 | -0.62 |
| Departure Headway (s) | 6.6 | 6.3 | 6.5 | 7.0 | 6.2 |
| Degree Utilization, x | 0.38 | 0.55 | 0.53 | 0.44 | 0.11 |
| Capacity (veh/h) | 476 | 533 | 513 | 475 | 529 |
| Control Delay (s/veh) | 13.7 | 16.8 | 16.5 | 14.3 | 8.8 |
| Approach Delay (s/veh) | 13.7 | 16.8 | 16.5 | 13.0 | |
| Approach LOS | B | C | C | B | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Delay | | | 15.2 | | |
| Level of Service | | | C | | |
| Intersection Capacity Utilization | | | 52.1% | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | |

Description: SBR SLIP THROUGH FOR WIDE ROW



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 90 | 70 | 7 | 2 | 92 | 31 | 12 | 62 | 0 | 18 | 17 | 91 |
| Future Volume (Veh/h) | 90 | 70 | 7 | 2 | 92 | 31 | 12 | 62 | 0 | 18 | 17 | 91 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 103 | 80 | 8 | 2 | 106 | 36 | 14 | 71 | 0 | 21 | 20 | 105 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 142 | | | 88 | | | 533 | 436 | 84 | 454 | 422 | 124 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 142 | | | 88 | | | 533 | 436 | 84 | 454 | 422 | 124 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.8 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.1 | 4.1 | 3.3 |
| p0 queue free % | 93 | | | 100 | | | 96 | 85 | 100 | 94 | 96 | 89 |
| cM capacity (veh/h) | 1453 | | | 1520 | | | 374 | 475 | 975 | 354 | 474 | 932 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 191 | 144 | 85 | 146 |
| Volume Left | 103 | 2 | 14 | 21 |
| Volume Right | 8 | 36 | 0 | 105 |
| cSH | 1453 | 1520 | 455 | 682 |
| Volume to Capacity | 0.07 | 0.00 | 0.19 | 0.21 |
| Queue Length 95th (m) | 1.7 | 0.0 | 5.2 | 6.1 |
| Control Delay (s/veh) | 4.4 | 0.1 | 14.7 | 11.7 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 4.4 | 0.1 | 14.7 | 11.7 |
| Approach LOS | | | B | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | | 6.7 |
| Intersection Capacity Utilization | | ICU Level of Service | 35.6% |
| Analysis Period (min) | | A | 15 |





| Intersection | |
|---|---|
| Int Delay, s/veh | 6.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 90 | 70 | 7 | 2 | 92 | 31 | 12 | 62 | 0 | 18 | 17 | 91 |
| Future Vol, veh/h | 90 | 70 | 7 | 2 | 92 | 31 | 12 | 62 | 0 | 18 | 17 | 91 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 0 | 12 | 20 | 0 | 8 | 10 | 0 | 3 | 2 | 67 | 10 | 0 |
| Mvmt Flow | 103 | 80 | 8 | 2 | 106 | 36 | 14 | 71 | 0 | 21 | 20 | 105 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 142 | 0 | 0 | 88 | 0 | 0 | 481 | 436 | 84 | 454 | 422 | 124 |
| Stage 1 | - | - | - | - | - | - | 290 | 290 | - | 128 | 128 | - |
| Stage 2 | - | - | - | - | - | - | 191 | 146 | - | 326 | 294 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.53 | 6.22 | 7.77 | 6.6 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4.027 | 3.318 | 4.103 | 4.09 | 3.3 |
| Pot Cap-1 Maneuver | 1453 | - | - | 1520 | - | - | 499 | 512 | 975 | 422 | 511 | 932 |
| Stage 1 | - | - | - | - | - | - | 722 | 670 | - | 741 | 775 | - |
| Stage 2 | - | - | - | - | - | - | 815 | 774 | - | 569 | 655 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1453 | - | - | 1520 | - | - | 404 | 473 | 975 | 352 | 472 | 932 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 404 | 473 | - | 352 | 472 | - |
| Stage 1 | - | - | - | - | - | - | 668 | 620 | - | 685 | 774 | - |
| Stage 2 | - | - | - | - | - | - | 705 | 773 | - | 466 | 606 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 4.1 | 0.1 | 14.6 | 11.7 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 460 | 1453 | - | - | 1520 | - | - | 682 |
| HCM Lane V/C Ratio | 0.185 | 0.071 | - | - | 0.002 | - | - | 0.212 |
| HCM Ctrl Dly (s/v) | 14.6 | 7.7 | 0 | - | 7.4 | 0 | - | 11.7 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.7 | 0.2 | - | - | 0 | - | - | 0.8 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 37 | 29 | 104 | 18 | 135 | 23 | 435 | 81 | 74 | 329 | 4 |
| Future Volume (vph) | 83 | 37 | 29 | 104 | 18 | 135 | 23 | 435 | 81 | 74 | 329 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.99 | 1.00 | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.868 | | | 0.977 | | | 0.998 | |
| Flt Protected | | 0.967 | | 0.950 | | | | 0.998 | | | 0.991 | |
| Satd. Flow (prot) | 0 | 1835 | 1633 | 1738 | 1568 | 0 | 0 | 3350 | 0 | 0 | 3318 | 0 |
| Flt Permitted | | 0.641 | | 0.665 | | | | 0.920 | | | 0.742 | |
| Satd. Flow (perm) | 0 | 1210 | 1610 | 1214 | 1568 | 0 | 0 | 3085 | 0 | 0 | 2484 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 38 | | 163 | | | 35 | | | 2 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 8 | | 2 | 2 | | 8 | 23 | | | | | 23 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 0% | 4% | 0% | 5% | 7% | 4% | 6% | 5% | 13% | 17% | 7% | 0% |
| Adj. Flow (vph) | 100 | 45 | 35 | 125 | 22 | 163 | 28 | 524 | 98 | 89 | 396 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 145 | 35 | 125 | 185 | 0 | 0 | 650 | 0 | 0 | 490 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.4 | 21.4 | 21.4 | 21.4 | | | 47.4 | | | 47.4 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.45 | 0.08 | 0.39 | 0.34 | | | 0.35 | | | 0.33 | |

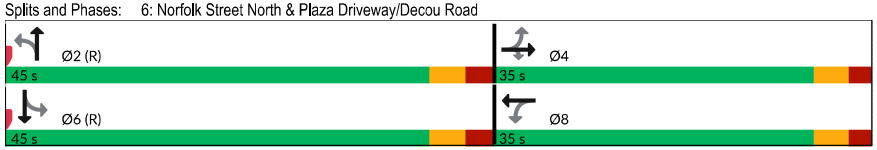




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 29.4 | 7.6 | 27.9 | 7.4 | | | 8.7 | | | 6.2 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 29.4 | 7.6 | 27.9 | 7.4 | | | 8.7 | | | 6.2 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 25.2 | | | 15.6 | | | 8.7 | | | 6.2 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 18.5 | 0.0 | 15.6 | 2.5 | | | 22.4 | | | 17.5 | |
| Queue Length 95th (m) | | 30.7 | 5.0 | 26.7 | 13.3 | | | 30.6 | | | m19.3 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 447 | 619 | 449 | 682 | | | 1841 | | | 1471 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.32 | 0.06 | 0.28 | 0.27 | | | 0.35 | | | 0.33 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.45 | | | |
| Intersection Signal Delay (s/veh): 11.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 95.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 74 | 35 | 19 | 156 | 90 | 33 |
| Future Volume (Veh/h) | 74 | 35 | 19 | 156 | 90 | 33 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 80 | 38 | 21 | 170 | 98 | 36 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 328 | 116 | 134 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 328 | 116 | 134 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 88 | 96 | 99 | | | |
| cM capacity (veh/h) | 657 | 936 | 1451 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 80 | 38 | 191 | 134 |
| Volume Left | 80 | 0 | 21 | 0 |
| Volume Right | 0 | 38 | 0 | 36 |
| cSH | 657 | 936 | 1451 | 1700 |
| Volume to Capacity | 0.12 | 0.04 | 0.01 | 0.08 |
| Queue Length 95th (m) | 3.1 | 1.0 | 0.3 | 0.0 |
| Control Delay (s/veh) | 11.2 | 9.0 | 0.9 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 10.5 | | 0.9 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 3.2 | |
| Intersection Capacity Utilization | | 30.1% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3.2 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 74 | 35 | 19 | 156 | 90 | 33 |
| Future Vol, veh/h | 74 | 35 | 19 | 156 | 90 | 33 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 80 | 38 | 21 | 170 | 98 | 36 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 328 | 116 | 134 | 0 | - | 0 |
| Stage 1 | 116 | - | - | - | - | - |
| Stage 2 | 212 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 666 | 936 | 1451 | - | - | - |
| Stage 1 | 909 | - | - | - | - | - |
| Stage 2 | 823 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 655 | 936 | 1451 | - | - | - |
| Mov Cap-2 Maneuver | 655 | - | - | - | - | - |
| Stage 1 | 894 | - | - | - | - | - |
| Stage 2 | 823 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 10.6 | 0.8 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1451 | - | 655 | 936 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | 0.123 | 0.041 | - | - |
| HCM Ctrl Dly (s/v) | 7.5 | 0 | 11.3 | 9 | - | - |
| HCM Lane LOS | A | A | B | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.4 | 0.1 | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 609 | 81 | 219 | 558 | 110 | 203 |
| Future Volume (Veh/h) | 609 | 81 | 219 | 558 | 110 | 203 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 648 | 86 | 233 | 594 | 117 | 216 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 734 | | 1751 | 367 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 734 | | 1751 | 367 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.6 | 3.3 |
| p0 queue free % | | | 73 | | 0 | 66 |
| cM capacity (veh/h) | | | 874 | | 53 | 633 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 432 | 302 | 233 | 594 | 117 | 216 |
| Volume Left | 0 | 0 | 233 | 0 | 117 | 0 |
| Volume Right | 0 | 86 | 0 | 0 | 0 | 216 |
| cSH | 1700 | 1700 | 874 | 1700 | 53 | 633 |
| Volume to Capacity | 0.25 | 0.18 | 0.27 | 0.35 | 2.20 | 0.34 |
| Queue Length 95th (m) | 0.0 | 0.0 | 8.2 | 0.0 | 89.0 | 11.5 |
| Control Delay (s/veh) | 0.0 | 0.0 | 10.6 | 0.0 | 714.3 | 13.6 |
| Lane LOS | | | B | | F | B |
| Approach Delay (s/veh) | 0.0 | | 3.0 | | 259.8 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 47.0 | | | |
| Intersection Capacity Utilization | 47.6% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 39.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 609 | 81 | 219 | 558 | 110 | 203 |
| Future Vol, veh/h | 609 | 81 | 219 | 558 | 110 | 203 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 4 | 4 | 1 | 3 | 7 | 1 |
| Mvmt Flow | 648 | 86 | 233 | 594 | 117 | 216 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 734 | 0 | 1751 | 367 |
| Stage 1 | - | - | - | - | 691 | - |
| Stage 2 | - | - | - | - | 1060 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.705 | 6.915 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.905 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.505 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.5665 | 3.3095 |
| Pot Cap-1 Maneuver | - | - | 875 | - | ~ 82 | 633 |
| Stage 1 | - | - | - | - | 449 | - |
| Stage 2 | - | - | - | - | 322 | - |
| Platoon blocked, % | - | - | | | - | |
| Mov Cap-1 Maneuver | - | - | 875 | - | ~ 60 | 633 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 60 | - |
| Stage 1 | - | - | - | - | 449 | - |
| Stage 2 | - | - | - | - | 236 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 3 | 217 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 60 | 633 | - | - | 875 | - |
| HCM Lane V/C Ratio | 1.95 | 0.341 | - | - | 0.266 | - |
| HCM Ctrl Dly (s/v) | $ 592.5 | 13.6 | - | - | 10.6 | - |
| HCM Lane LOS | F | B | - | - | B | - |
| HCM 95th %tile Q(veh) | 11.1 | 1.5 | - | - | 1.1 | - |

| Notes | |
|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s |
| +: Computation Not Defined | *: All major volume in platoon |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 144 | 15 | 260 | 158 | 155 | 2 | 337 | 253 | 126 | 363 | 18 |
| Future Volume (vph) | 18 | 144 | 15 | 260 | 158 | 155 | 2 | 337 | 253 | 126 | 363 | 18 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 1.00 | | 0.97 | | 1.00 | 0.97 | | 1.00 | |
| Frt | | 0.989 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | | | | 0.988 | |
| Satd. Flow (prot) | 0 | 1785 | 0 | 1755 | 1830 | 1570 | 0 | 1839 | 1570 | 0 | 3386 | 0 |
| Flt Permitted | | 0.949 | | 0.392 | | | | 0.998 | | | 0.710 | |
| Satd. Flow (perm) | 0 | 1702 | 0 | 721 | 1830 | 1525 | 0 | 1835 | 1524 | 0 | 2430 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | | 180 | | | 294 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 2 | | 6 | 6 | | 2 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 16% | 5% | 0% | 4% | 5% | 4% | 100% | 4% | 4% | 15% | 3% | 0% |
| Adj. Flow (vph) | 21 | 167 | 17 | 302 | 184 | 180 | 2 | 392 | 294 | 147 | 422 | 21 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 205 | 0 | 302 | 184 | 180 | 0 | 394 | 294 | 0 | 590 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 14.1 | | 27.5 | 25.1 | 25.1 | | 44.0 | 44.0 | | 44.0 | |
| Actuated g/C Ratio | | 0.18 | | 0.34 | 0.31 | 0.31 | | 0.55 | 0.55 | | 0.55 | |
| v/c Ratio | | 0.67 | | 0.86 | 0.32 | 0.30 | | 0.39 | 0.30 | | 0.44 | |

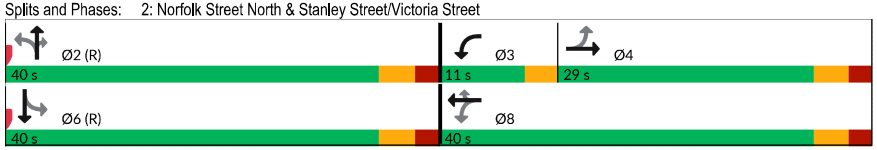


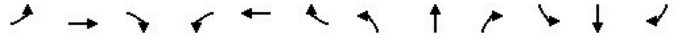


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.7 | | 46.2 | 21.8 | 4.4 | | 10.1 | 1.7 | | 12.6 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.7 | | 46.2 | 21.8 | 4.4 | | 10.1 | 1.7 | | 12.6 | |
| LOS | | D | | D | C | A | | B | A | | B | |
| Approach Delay (s/veh) | | 40.7 | | | 28.1 | | | 6.5 | | | 12.6 | |
| Approach LOS | | D | | | C | | | A | | | B | |
| Queue Length 50th (m) | | 28.7 | | 36.1 | 21.3 | 0.0 | | 27.0 | 1.6 | | 25.3 | |
| Queue Length 95th (m) | | 43.2 | | #54.2 | 31.4 | 10.1 | | 41.2 | 5.9 | | 41.1 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 506 | | 351 | 791 | 761 | | 1010 | 971 | | 1340 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.41 | | 0.86 | 0.23 | 0.24 | | 0.39 | 0.30 | | 0.44 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.86 | | | |
| Intersection Signal Delay (s/veh): 18.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 86.5% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





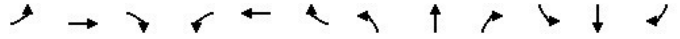
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 92 | 204 | 137 | 3 | 206 | 27 | 101 | 67 | 10 | 37 | 97 | 119 |
| Future Volume (vph) | 92 | 204 | 137 | 3 | 206 | 27 | 101 | 67 | 10 | 37 | 97 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 105 | 232 | 156 | 3 | 234 | 31 | 115 | 76 | 11 | 42 | 110 | 135 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 493 | 268 | 202 | 287 |
| Volume Left (vph) | 105 | 3 | 115 | 42 |
| Volume Right (vph) | 156 | 31 | 11 | 135 |
| Hadj (s) | -0.04 | 0.02 | 0.20 | -0.20 |
| Departure Headway (s) | 6.3 | 6.9 | 7.5 | 6.8 |
| Degree Utilization, x | 0.87 | 0.51 | 0.42 | 0.55 |
| Capacity (veh/h) | 548 | 482 | 436 | 486 |
| Control Delay (s/veh) | 37.3 | 17.0 | 15.8 | 17.8 |
| Approach Delay (s/veh) | 37.3 | 17.0 | 15.8 | 17.8 |
| Approach LOS | E | C | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 25.0 | |
| Level of Service | | | C | |
| Intersection Capacity Utilization | | | 75.1% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 62 | 144 | 51 | 43 | 132 | 55 | 55 | 214 | 44 | 63 | 188 | 47 |
| Future Volume (vph) | 62 | 144 | 51 | 43 | 132 | 55 | 55 | 214 | 44 | 63 | 188 | 47 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 67 | 157 | 55 | 47 | 143 | 60 | 60 | 233 | 48 | 68 | 204 | 51 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 279 | 250 | 341 | 272 | 51 |
| Volume Left (vph) | 67 | 47 | 60 | 68 | 0 |
| Volume Right (vph) | 55 | 60 | 48 | 0 | 51 |
| Hadj (s) | 0.10 | -0.09 | 0.00 | 0.17 | -0.63 |
| Departure Headway (s) | 6.9 | 6.8 | 6.7 | 7.3 | 6.4 |
| Degree Utilization, x | 0.53 | 0.47 | 0.63 | 0.55 | 0.09 |
| Capacity (veh/h) | 472 | 471 | 506 | 454 | 511 |
| Control Delay (s/veh) | 17.4 | 15.7 | 20.3 | 17.6 | 8.9 |
| Approach Delay (s/veh) | 17.4 | 15.7 | 20.3 | 16.2 | |
| Approach LOS | C | C | C | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 17.5 | |
| Level of Service | | | C | |
| Intersection Capacity Utilization | | | 61.1% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |

Description: SBR SLIP THROUGH FOR WIDE ROW

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 104 | 74 | 12 | 4 | 52 | 15 | 6 | 46 | 2 | 39 | 81 | 83 |
| Future Volume (Veh/h) | 104 | 74 | 12 | 4 | 52 | 15 | 6 | 46 | 2 | 39 | 81 | 83 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Hourly flow rate (vph) | 117 | 83 | 13 | 4 | 58 | 17 | 7 | 52 | 2 | 44 | 91 | 93 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 75 | | | 96 | | | 537 | 407 | 90 | 426 | 405 | 67 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 75 | | | 96 | | | 537 | 407 | 90 | 426 | 405 | 67 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.4 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 92 | | | 100 | | | 98 | 89 | 100 | 90 | 81 | 91 |
| cM capacity (veh/h) | 1518 | | | 1510 | | | 308 | 488 | 974 | 461 | 487 | 994 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 213 | 79 | 61 | 228 |
| Volume Left | 117 | 4 | 7 | 44 |
| Volume Right | 13 | 17 | 2 | 93 |
| cSH | 1518 | 1510 | 465 | 607 |
| Volume to Capacity | 0.08 | 0.00 | 0.13 | 0.38 |
| Queue Length 95th (m) | 1.9 | 0.1 | 3.4 | 13.2 |
| Control Delay (s/veh) | 4.4 | 0.4 | 13.9 | 14.5 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 4.4 | 0.4 | 13.9 | 14.5 |
| Approach LOS | | | B | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 8.8 | | |
| Intersection Capacity Utilization | 41.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 8.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 104 | 74 | 12 | 4 | 52 | 15 | 6 | 46 | 2 | 39 | 81 | 83 |
| Future Vol, veh/h | 104 | 74 | 12 | 4 | 52 | 15 | 6 | 46 | 2 | 39 | 81 | 83 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 3 | 4 | 0 | 0 | 0 | 25 | 25 | 4 | 0 | 4 | 6 | 3 |
| Mvmt Flow | 117 | 83 | 13 | 4 | 58 | 17 | 7 | 52 | 2 | 44 | 91 | 93 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 75 | 0 | 0 | 96 | 0 | 0 | 491 | 407 | 90 | 426 | 405 | 67 |
| Stage 1 | - | - | - | - | - | - | 324 | 324 | - | 75 | 75 | - |
| Stage 2 | - | - | - | - | - | - | 167 | 83 | - | 351 | 330 | - |
| Critical Hdwy | 4.13 | - | - | 4.1 | - | - | 7.35 | 6.54 | 6.2 | 7.14 | 6.56 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Follow-up Hdwy | 2.227 | - | - | 2.2 | - | - | 3.725 | 4.036 | 3.3 | 3.536 | 4.054 | 3.327 |
| Pot Cap-1 Maneuver | 1518 | - | - | 1510 | - | - | 452 | 530 | 973 | 535 | 529 | 994 |
| Stage 1 | - | - | - | - | - | - | 642 | 646 | - | 929 | 825 | - |
| Stage 2 | - | - | - | - | - | - | 784 | 822 | - | 661 | 639 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1518 | - | - | 1510 | - | - | 329 | 485 | 973 | 459 | 484 | 994 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 329 | 485 | - | 459 | 484 | - |
| Stage 1 | - | - | - | - | - | - | 589 | 593 | - | 853 | 823 | - |
| Stage 2 | - | - | - | - | - | - | 630 | 820 | - | 553 | 587 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 4.1 | 0.4 | 13.8 | 14.5 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 469 | 1518 | - | - | 1510 | - | - | 604 |
| HCM Lane V/C Ratio | 0.129 | 0.077 | - | - | 0.003 | - | - | 0.378 |
| HCM Ctrl Dly (s/v) | 13.8 | 7.6 | 0 | - | 7.4 | 0 | - | 14.5 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.4 | 0.3 | - | - | 0 | - | - | 1.8 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 39 | 72 | 65 | 25 | 63 | 27 | 376 | 71 | 101 | 477 | 13 |
| Future Volume (vph) | 86 | 39 | 72 | 65 | 25 | 63 | 27 | 376 | 71 | 101 | 477 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.96 | 0.98 | 0.99 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.892 | | | 0.977 | | | 0.997 | |
| Flt Protected | | 0.967 | | 0.950 | | | | 0.997 | | | 0.992 | |
| Satd. Flow (prot) | 0 | 1832 | 1601 | 1690 | 1589 | 0 | 0 | 3433 | 0 | 0 | 3498 | 0 |
| Flt Permitted | | 0.732 | | 0.666 | | | | 0.893 | | | 0.757 | |
| Satd. Flow (perm) | 0 | 1382 | 1542 | 1160 | 1589 | 0 | 0 | 3073 | 0 | 0 | 2669 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 72 | | | 35 | | | 4 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 5 | | 22 | 22 | | 5 | 17 | | | | | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 0% | 2% | 8% | 0% | 9% | 0% | 3% | 8% | 4% | 3% | 0% |
| Adj. Flow (vph) | 98 | 44 | 82 | 74 | 28 | 72 | 31 | 427 | 81 | 115 | 542 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 142 | 82 | 74 | 100 | 0 | 0 | 539 | 0 | 0 | 672 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.3 | 21.3 | 21.3 | 21.3 | | | 47.5 | | | 47.5 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.39 | 0.17 | 0.24 | 0.21 | | | 0.29 | | | 0.42 | |

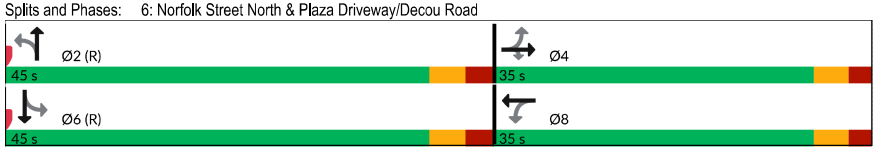




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 27.6 | 6.7 | 25.4 | 10.2 | | | 8.0 | | | 6.7 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 27.6 | 6.7 | 25.4 | 10.2 | | | 8.0 | | | 6.7 | |
| LOS | | C | A | C | B | | | A | | | A | |
| Approach Delay (s/veh) | | 20.0 | | | 16.7 | | | 8.0 | | | 6.7 | |
| Approach LOS | | B | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 17.7 | 0.0 | 8.9 | 3.2 | | | 17.5 | | | 23.8 | |
| Queue Length 95th (m) | | 31.8 | 9.0 | 18.7 | 13.3 | | | 26.0 | | | m25.6 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 511 | 622 | 429 | 633 | | | 1840 | | | 1587 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.28 | 0.13 | 0.17 | 0.16 | | | 0.29 | | | 0.42 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.42 | | | |
| Intersection Signal Delay (s/veh): 10.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 58 | 27 | 34 | 108 | 174 | 75 |
| Future Volume (Veh/h) | 58 | 27 | 34 | 108 | 174 | 75 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 63 | 29 | 37 | 117 | 189 | 82 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 421 | 230 | 271 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 421 | 230 | 271 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 89 | 96 | 97 | | | |
| cM capacity (veh/h) | 572 | 809 | 1292 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 63 | 29 | 154 | 271 |
| Volume Left | 63 | 0 | 37 | 0 |
| Volume Right | 0 | 29 | 0 | 82 |
| cSH | 572 | 809 | 1292 | 1700 |
| Volume to Capacity | 0.11 | 0.04 | 0.03 | 0.16 |
| Queue Length 95th (m) | 2.8 | 0.8 | 0.7 | 0.0 |
| Control Delay (s/veh) | 12.1 | 9.6 | 2.1 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 11.3 | | 2.1 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 2.6 | |
| Intersection Capacity Utilization | | | 34.6% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.6 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 58 | 27 | 34 | 108 | 174 | 75 |
| Future Vol, veh/h | 58 | 27 | 34 | 108 | 174 | 75 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 63 | 29 | 37 | 117 | 189 | 82 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 421 | 230 | 271 | 0 | - | 0 |
| Stage 1 | 230 | - | - | - | - | - |
| Stage 2 | 191 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 589 | 809 | 1292 | - | - | - |
| Stage 1 | 808 | - | - | - | - | - |
| Stage 2 | 841 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 571 | 809 | 1292 | - | - | - |
| Mov Cap-2 Maneuver | 571 | - | - | - | - | - |
| Stage 1 | 783 | - | - | - | - | - |
| Stage 2 | 841 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 11.3 | 1.9 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1292 | - | 571 | 809 | - | - |
| HCM Lane V/C Ratio | 0.029 | - | 0.11 | 0.036 | - | - |
| HCM Ctrl Dly (s/v) | 7.9 | 0 | 12.1 | 9.6 | - | - |
| HCM Lane LOS | A | A | B | A | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.4 | 0.1 | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 378 | 113 | 186 | 565 | 80 | 158 |
| Future Volume (Veh/h) | 378 | 113 | 186 | 565 | 80 | 158 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 411 | 123 | 202 | 614 | 87 | 172 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 534 | | 1491 | 267 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 534 | | 1491 | 267 |
| tC, single (s) | | | 4.1 | | 6.9 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.4 |
| p0 queue free % | | | 81 | | 4 | 76 |
| cM capacity (veh/h) | | | 1037 | | 90 | 722 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 274 | 260 | 202 | 614 | 87 | 172 |
| Volume Left | 0 | 0 | 202 | 0 | 87 | 0 |
| Volume Right | 0 | 123 | 0 | 0 | 0 | 172 |
| cSH | 1700 | 1700 | 1037 | 1700 | 90 | 722 |
| Volume to Capacity | 0.16 | 0.15 | 0.19 | 0.36 | 0.96 | 0.24 |
| Queue Length 95th (m) | 0.0 | 0.0 | 5.5 | 0.0 | 41.8 | 7.0 |
| Control Delay (s/veh) | 0.0 | 0.0 | 9.3 | 0.0 | 168.0 | 11.5 |
| Lane LOS | | | A | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.3 | | 64.1 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 11.5 | | | |
| Intersection Capacity Utilization | 40.8% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 9.8 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 378 | 113 | 186 | 565 | 80 | 158 |
| Future Vol, veh/h | 378 | 113 | 186 | 565 | 80 | 158 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 9 | 6 | 1 | 5 | 4 | 5 |
| Mvmt Flow | 411 | 123 | 202 | 614 | 87 | 172 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 534 | 0 | 1491 | 267 |
| Stage 1 | - | - | - | - | 473 | - |
| Stage 2 | - | - | - | - | 1018 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.66 | 6.975 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.86 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.46 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.538 | 3.3475 |
| Pot Cap-1 Maneuver | - | - | 1038 | - | 123 | 724 |
| Stage 1 | - | - | - | - | 589 | - |
| Stage 2 | - | - | - | - | 344 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1038 | - | 99 | 724 |
| Mov Cap-2 Maneuver | - | - | - | - | 99 | - |
| Stage 1 | - | - | - | - | 589 | - |
| Stage 2 | - | - | - | - | 277 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 2.3 | 53.7 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 99 | 724 | - | - | 1038 | - |
| HCM Lane V/C Ratio | 0.878 | 0.237 | - | - | 0.195 | - |
| HCM Ctrl Dly (s/v) | 137 | 11.5 | - | - | 9.3 | - |
| HCM Lane LOS | F | B | - | - | A | - |
| HCM 95th %tile Q(veh) | 5 | 0.9 | - | - | 0.7 | - |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 147 | 9 | 338 | 165 | 187 | 9 | 372 | 301 | 95 | 228 | 12 |
| Future Volume (vph) | 15 | 147 | 9 | 338 | 165 | 187 | 9 | 372 | 301 | 95 | 228 | 12 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.96 | | 1.00 | |
| Frt | | 0.993 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.996 | | 0.950 | | | | 0.999 | | | 0.986 | |
| Satd. Flow (prot) | 0 | 1719 | 0 | 1738 | 1795 | 1458 | 0 | 1813 | 1555 | 0 | 3259 | 0 |
| Flt Permitted | | 0.957 | | 0.408 | | | | 0.990 | | | 0.720 | |
| Satd. Flow (perm) | 0 | 1652 | 0 | 741 | 1795 | 1421 | 0 | 1796 | 1500 | 0 | 2375 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | | 210 | | | 338 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 3 | | 12 | 12 | | 3 | 7 | | 10 | 10 | | 7 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 10% | 10% | 17% | 5% | 7% | 12% | 0% | 6% | 5% | 8% | 11% | 0% |
| Adj. Flow (vph) | 17 | 165 | 10 | 380 | 185 | 210 | 10 | 418 | 338 | 107 | 256 | 13 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 192 | 0 | 380 | 185 | 210 | 0 | 428 | 338 | 0 | 376 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 13.9 | | 27.3 | 24.9 | 24.9 | | 44.2 | 44.2 | | 44.2 | |
| Actuated g/C Ratio | | 0.17 | | 0.34 | 0.31 | 0.31 | | 0.55 | 0.55 | | 0.55 | |
| v/c Ratio | | 0.66 | | 1.08 | 0.33 | 0.36 | | 0.43 | 0.34 | | 0.29 | |



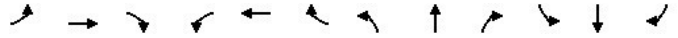


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 41.0 | | 96.9 | 22.1 | 4.7 | | 10.0 | 1.6 | | 10.8 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 41.0 | | 96.9 | 22.1 | 4.7 | | 10.0 | 1.6 | | 10.8 | |
| LOS | | D | | F | C | A | | A | A | | B | |
| Approach Delay (s/veh) | | 41.0 | | | 54.0 | | | 6.3 | | | 10.8 | |
| Approach LOS | | D | | | D | | | A | | | B | |
| Queue Length 50th (m) | | 27.2 | | ~54.6 | 21.6 | 0.0 | | 27.3 | 1.3 | | 14.3 | |
| Queue Length 95th (m) | | 43.1 | | #94.3 | 33.1 | 12.1 | | 43.8 | 6.2 | | 25.8 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 490 | | 352 | 776 | 733 | | 992 | 980 | | 1315 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.39 | | 1.08 | 0.24 | 0.29 | | 0.43 | 0.34 | | 0.29 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |
| Cycle Length: 80 | |
| Actuated Cycle Length: 80 | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.08 | |
| Intersection Signal Delay (s/veh): 27.8 | Intersection LOS: C |
| Intersection Capacity Utilization 91.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |
| ~ Volume exceeds capacity, queue is theoretically infinite. | |
| Queue shown is maximum after two cycles. | |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





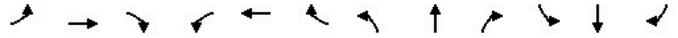
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 93 | 170 | 65 | 9 | 292 | 25 | 152 | 95 | 4 | 16 | 50 | 103 |
| Future Volume (vph) | 93 | 170 | 65 | 9 | 292 | 25 | 152 | 95 | 4 | 16 | 50 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 113 | 207 | 79 | 11 | 356 | 30 | 185 | 116 | 5 | 20 | 61 | 126 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 399 | 397 | 306 | 207 |
| Volume Left (vph) | 113 | 11 | 185 | 20 |
| Volume Right (vph) | 79 | 30 | 5 | 126 |
| Hadj (s) | 0.08 | 0.05 | 0.32 | -0.20 |
| Departure Headway (s) | 7.2 | 7.1 | 7.8 | 7.7 |
| Degree Utilization, x | 0.79 | 0.79 | 0.66 | 0.44 |
| Capacity (veh/h) | 399 | 397 | 423 | 399 |
| Control Delay (s/veh) | 32.3 | 31.7 | 24.8 | 16.7 |
| Approach Delay (s/veh) | 32.3 | 31.7 | 24.8 | 16.7 |
| Approach LOS | D | D | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 27.9 | |
| Level of Service | | | D | |
| Intersection Capacity Utilization | | | 74.1% | ICU Level of Service |
| Analysis Period (min) | | | 15 | D |





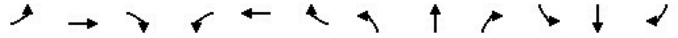


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 63 | 107 | 29 | 55 | 207 | 46 | 53 | 177 | 39 | 44 | 173 | 64 |
| Future Volume (vph) | 63 | 107 | 29 | 55 | 207 | 46 | 53 | 177 | 39 | 44 | 173 | 64 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 72 | 122 | 33 | 62 | 235 | 52 | 60 | 201 | 44 | 50 | 197 | 73 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 227 | 349 | 305 | 247 | 73 |
| Volume Left (vph) | 72 | 62 | 60 | 50 | 0 |
| Volume Right (vph) | 33 | 52 | 44 | 0 | 73 |
| Hadj (s) | 0.12 | 0.02 | 0.09 | 0.18 | -0.62 |
| Departure Headway (s) | 7.0 | 6.6 | 6.9 | 7.4 | 6.6 |
| Degree Utilization, x | 0.44 | 0.64 | 0.58 | 0.51 | 0.13 |
| Capacity (veh/h) | 451 | 501 | 481 | 443 | 498 |
| Control Delay (s/veh) | 15.6 | 20.7 | 19.2 | 16.5 | 9.4 |
| Approach Delay (s/veh) | 15.6 | 20.7 | 19.2 | 14.9 | |
| Approach LOS | C | C | C | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 17.8 | |
| Level of Service | | | C | |
| Intersection Capacity Utilization | | | 55.3% | ICU Level of Service |
| Analysis Period (min) | | | 15 | B |

Description: SBR SLIP THROUGH FOR WIDE ROW



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 97 | 78 | 8 | 2 | 101 | 34 | 14 | 68 | 0 | 20 | 19 | 95 |
| Future Volume (Veh/h) | 97 | 78 | 8 | 2 | 101 | 34 | 14 | 68 | 0 | 20 | 19 | 95 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 111 | 90 | 9 | 2 | 116 | 39 | 16 | 78 | 0 | 23 | 22 | 109 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 155 | | | 99 | | | 576 | 476 | 95 | 495 | 461 | 136 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 155 | | | 99 | | | 576 | 476 | 95 | 495 | 461 | 136 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.8 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.1 | 4.1 | 3.3 |
| p0 queue free % | 92 | | | 100 | | | 95 | 83 | 100 | 93 | 95 | 88 |
| cM capacity (veh/h) | 1438 | | | 1507 | | | 344 | 448 | 962 | 322 | 448 | 919 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 210 | 157 | 94 | 154 |
| Volume Left | 111 | 2 | 16 | 23 |
| Volume Right | 9 | 39 | 0 | 109 |
| cSH | 1438 | 1507 | 426 | 644 |
| Volume to Capacity | 0.08 | 0.00 | 0.22 | 0.24 |
| Queue Length 95th (m) | 1.9 | 0.0 | 6.3 | 7.1 |
| Control Delay (s/veh) | 4.4 | 0.1 | 15.8 | 12.3 |
| Lane LOS | A | A | C | B |
| Approach Delay (s/veh) | 4.4 | 0.1 | 15.8 | 12.3 |
| Approach LOS | | | C | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 7.0 | | | | |
| Intersection Capacity Utilization | 37.7% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 6.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 97 | 78 | 8 | 2 | 101 | 34 | 14 | 68 | 0 | 20 | 19 | 95 |
| Future Vol, veh/h | 97 | 78 | 8 | 2 | 101 | 34 | 14 | 68 | 0 | 20 | 19 | 95 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 0 | 12 | 20 | 0 | 8 | 10 | 0 | 3 | 2 | 67 | 10 | 0 |
| Mvmt Flow | 111 | 90 | 9 | 2 | 116 | 39 | 16 | 78 | 0 | 23 | 22 | 109 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 155 | 0 | 0 | 99 | 0 | 0 | 522 | 476 | 95 | 496 | 461 | 136 |
| Stage 1 | - | - | - | - | - | - | 317 | 317 | - | 140 | 140 | - |
| Stage 2 | - | - | - | - | - | - | 205 | 159 | - | 356 | 321 | - |
| Critical Hdwy | 4.1 | - | - | 4.1 | - | - | 7.1 | 6.53 | 6.22 | 7.77 | 6.6 | 6.2 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.1 | 5.53 | - | 6.77 | 5.6 | - |
| Follow-up Hdwy | 2.2 | - | - | 2.2 | - | - | 3.5 | 4.027 | 3.318 | 4.103 | 4.09 | 3.3 |
| Pot Cap-1 Maneuver | 1438 | - | - | 1507 | - | - | 468 | 486 | 962 | 394 | 486 | 918 |
| Stage 1 | - | - | - | - | - | - | 698 | 652 | - | 730 | 766 | - |
| Stage 2 | - | - | - | - | - | - | 802 | 764 | - | 546 | 638 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1438 | - | - | 1507 | - | - | 372 | 446 | 962 | 320 | 446 | 918 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 372 | 446 | - | 320 | 446 | - |
| Stage 1 | - | - | - | - | - | - | 641 | 599 | - | 670 | 765 | - |
| Stage 2 | - | - | - | - | - | - | 686 | 763 | - | 436 | 586 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 4.1 | 0.1 | 15.7 | 12.4 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 431 | 1438 | - | - | 1507 | - | - | 642 |
| HCM Lane V/C Ratio | 0.219 | 0.078 | - | - | 0.002 | - | - | 0.24 |
| HCM Ctrl Dly (s/v) | 15.7 | 7.7 | 0 | - | 7.4 | 0 | - | 12.4 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.8 | 0.3 | - | - | 0 | - | - | 0.9 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 37 | 29 | 110 | 18 | 149 | 25 | 479 | 87 | 82 | 358 | 4 |
| Future Volume (vph) | 83 | 37 | 29 | 110 | 18 | 149 | 25 | 479 | 87 | 82 | 358 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.99 | 1.00 | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.866 | | | 0.978 | | | 0.999 | |
| Flt Protected | | 0.967 | | 0.950 | | | | 0.998 | | | 0.991 | |
| Satd. Flow (prot) | 0 | 1835 | 1633 | 1738 | 1565 | 0 | 0 | 3354 | 0 | 0 | 3320 | 0 |
| Flt Permitted | | 0.612 | | 0.665 | | | | 0.917 | | | 0.717 | |
| Satd. Flow (perm) | 0 | 1156 | 1610 | 1214 | 1565 | 0 | 0 | 3080 | 0 | 0 | 2402 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 38 | | 180 | | | 34 | | | 2 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 8 | | 2 | 2 | | 8 | 23 | | | | | 23 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 0% | 4% | 0% | 5% | 7% | 4% | 6% | 5% | 13% | 17% | 7% | 0% |
| Adj. Flow (vph) | 100 | 45 | 35 | 133 | 22 | 180 | 30 | 577 | 105 | 99 | 431 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 145 | 35 | 133 | 202 | 0 | 0 | 712 | 0 | 0 | 535 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.6 | 21.6 | 21.6 | 21.6 | | | 47.2 | | | 47.2 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.47 | 0.08 | 0.41 | 0.37 | | | 0.39 | | | 0.38 | |

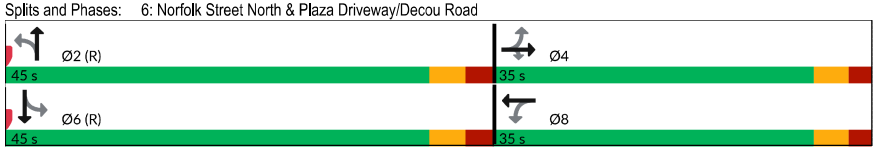




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 29.9 | 7.5 | 28.2 | 7.1 | | | 9.1 | | | 6.6 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 29.9 | 7.5 | 28.2 | 7.1 | | | 9.1 | | | 6.6 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 25.6 | | | 15.5 | | | 9.1 | | | 6.6 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 18.6 | 0.0 | 16.7 | 2.5 | | | 25.4 | | | 19.9 | |
| Queue Length 95th (m) | | 30.6 | 4.9 | 27.8 | 13.6 | | | 35.1 | | | m21.0 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 427 | 619 | 449 | 692 | | | 1832 | | | 1419 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.34 | 0.06 | 0.30 | 0.29 | | | 0.39 | | | 0.38 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.47 | | | |
| Intersection Signal Delay (s/veh): 11.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 95.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 74 | 35 | 19 | 172 | 97 | 33 |
| Future Volume (Veh/h) | 74 | 35 | 19 | 172 | 97 | 33 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 80 | 38 | 21 | 187 | 105 | 36 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 352 | 123 | 141 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 352 | 123 | 141 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 87 | 96 | 99 | | | |
| cM capacity (veh/h) | 636 | 928 | 1442 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 80 | 38 | 208 | 141 |
| Volume Left | 80 | 0 | 21 | 0 |
| Volume Right | 0 | 38 | 0 | 36 |
| cSH | 636 | 928 | 1442 | 1700 |
| Volume to Capacity | 0.13 | 0.04 | 0.01 | 0.08 |
| Queue Length 95th (m) | 3.3 | 1.0 | 0.3 | 0.0 |
| Control Delay (s/veh) | 11.5 | 9.0 | 0.9 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 10.7 | | 0.9 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 3.1 | |
| Intersection Capacity Utilization | 31.3% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 74 | 35 | 19 | 172 | 97 | 33 |
| Future Vol, veh/h | 74 | 35 | 19 | 172 | 97 | 33 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 80 | 38 | 21 | 187 | 105 | 36 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 352 | 123 | 141 | 0 | - | 0 |
| Stage 1 | 123 | - | - | - | - | - |
| Stage 2 | 229 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 646 | 928 | 1442 | - | - | - |
| Stage 1 | 902 | - | - | - | - | - |
| Stage 2 | 809 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 636 | 928 | 1442 | - | - | - |
| Mov Cap-2 Maneuver | 636 | - | - | - | - | - |
| Stage 1 | 888 | - | - | - | - | - |
| Stage 2 | 809 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 10.7 | 0.7 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1442 | - | 636 | 928 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | 0.126 | 0.041 | - | - |
| HCM Ctrl Dly (s/v) | 7.5 | 0 | 11.5 | 9 | - | - |
| HCM Lane LOS | A | A | B | A | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.4 | 0.1 | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 634 | 84 | 225 | 580 | 114 | 210 |
| Future Volume (Veh/h) | 634 | 84 | 225 | 580 | 114 | 210 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 674 | 89 | 239 | 617 | 121 | 223 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 763 | | 1814 | 382 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 763 | | 1814 | 382 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.6 | 3.3 |
| p0 queue free % | | | 72 | | 0 | 64 |
| cM capacity (veh/h) | | | 852 | | 47 | 619 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 449 | 314 | 239 | 617 | 121 | 223 |
| Volume Left | 0 | 0 | 239 | 0 | 121 | 0 |
| Volume Right | 0 | 89 | 0 | 0 | 0 | 223 |
| cSH | 1700 | 1700 | 852 | 1700 | 47 | 619 |
| Volume to Capacity | 0.26 | 0.18 | 0.28 | 0.36 | 2.55 | 0.36 |
| Queue Length 95th (m) | 0.0 | 0.0 | 8.8 | 0.0 | 96.9 | 12.4 |
| Control Delay (s/veh) | 0.0 | 0.0 | 10.9 | 0.0 | 887.6 | 14.0 |
| Lane LOS | | | B | | F | B |
| Approach Delay (s/veh) | 0.0 | | 3.0 | | 321.3 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 57.6 | | | |
| Intersection Capacity Utilization | 49.0% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 49.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 634 | 84 | 225 | 580 | 114 | 210 |
| Future Vol, veh/h | 634 | 84 | 225 | 580 | 114 | 210 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | 175 | - | 121 | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 4 | 4 | 1 | 3 | 7 | 1 |
| Mvmt Flow | 674 | 89 | 239 | 617 | 121 | 223 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 763 | 0 | 1814 | 382 |
| Stage 1 | - | - | - | - | 719 | - |
| Stage 2 | - | - | - | - | 1095 | - |
| Critical Hdwy | - | - | 4.115 | - | 6.705 | 6.915 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.905 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.505 | - |
| Follow-up Hdwy | - | - | 2.2095 | - | 3.5665 | 3.3095 |
| Pot Cap-1 Maneuver | - | - | 853 | - | ~ 74 | 619 |
| Stage 1 | - | - | - | - | 434 | - |
| Stage 2 | - | - | - | - | 310 | - |
| Platoon blocked, % | - | - | | | - | |
| Mov Cap-1 Maneuver | - | - | 853 | - | ~ 53 | 619 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 53 | - |
| Stage 1 | - | - | - | - | 434 | - |
| Stage 2 | - | - | - | - | 223 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 0 | 3 | 274.9 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 53 | 619 | - | - | 853 | - |
| HCM Lane V/C Ratio | 2.288 | 0.361 | - | - | 0.281 | - |
| HCM Ctrl Dly (s/v) | $ 755.2 | 14.1 | - | - | 10.9 | - |
| HCM Lane LOS | F | B | - | - | B | - |
| HCM 95th %tile Q(veh) | 12.2 | 1.6 | - | - | 1.2 | - |

| Notes | |
|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s |
| +: Computation Not Defined | *: All major volume in platoon |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 150 | 16 | 270 | 164 | 160 | 2 | 351 | 261 | 129 | 378 | 18 |
| Future Volume (vph) | 18 | 150 | 16 | 270 | 164 | 160 | 2 | 351 | 261 | 129 | 378 | 18 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 1.00 | | 0.97 | | 1.00 | 0.97 | | 1.00 | |
| Frt | | 0.988 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | | | | 0.988 | |
| Satd. Flow (prot) | 0 | 1785 | 0 | 1755 | 1830 | 1570 | 0 | 1839 | 1570 | 0 | 3387 | 0 |
| Flt Permitted | | 0.951 | | 0.381 | | | | 0.998 | | | 0.700 | |
| Satd. Flow (perm) | 0 | 1705 | 0 | 701 | 1830 | 1525 | 0 | 1835 | 1524 | 0 | 2397 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 6 | | | | 186 | | | 303 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 2 | | 6 | 6 | | 2 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 16% | 5% | 0% | 4% | 5% | 4% | 100% | 4% | 4% | 15% | 3% | 0% |
| Adj. Flow (vph) | 21 | 174 | 19 | 314 | 191 | 186 | 2 | 408 | 303 | 150 | 440 | 21 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 214 | 0 | 314 | 191 | 186 | 0 | 410 | 303 | 0 | 611 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 14.4 | | 27.8 | 25.4 | 25.4 | | 43.7 | 43.7 | | 43.7 | |
| Actuated g/C Ratio | | 0.18 | | 0.35 | 0.32 | 0.32 | | 0.55 | 0.55 | | 0.55 | |
| v/c Ratio | | 0.69 | | 0.90 | 0.33 | 0.30 | | 0.41 | 0.31 | | 0.47 | |

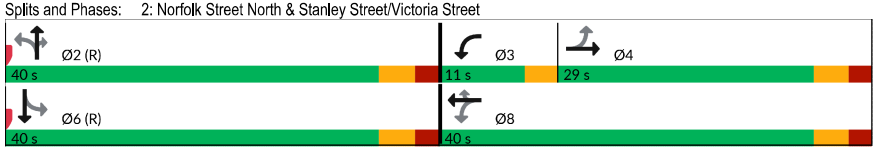


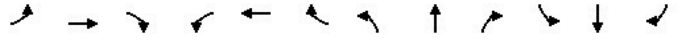


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.8 | | 51.8 | 21.6 | 4.3 | | 10.5 | 1.7 | | 13.2 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.8 | | 51.8 | 21.6 | 4.3 | | 10.5 | 1.7 | | 13.2 | |
| LOS | | D | | D | C | A | | B | A | | B | |
| Approach Delay (s/veh) | | 40.8 | | | 30.6 | | | 6.8 | | | 13.2 | |
| Approach LOS | | D | | | C | | | A | | | B | |
| Queue Length 50th (m) | | 30.0 | | 37.6 | 22.0 | 0.0 | | 28.3 | 1.6 | | 27.0 | |
| Queue Length 95th (m) | | 44.6 | | #58.6 | 32.2 | 10.1 | | 42.8 | 5.8 | | 43.9 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 507 | | 349 | 791 | 765 | | 1001 | 969 | | 1310 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.42 | | 0.90 | 0.24 | 0.24 | | 0.41 | 0.31 | | 0.47 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay (s/veh): 19.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 87.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





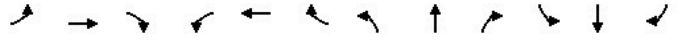
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 92 | 211 | 137 | 3 | 213 | 27 | 101 | 67 | 10 | 37 | 97 | 119 |
| Future Volume (vph) | 92 | 211 | 137 | 3 | 213 | 27 | 101 | 67 | 10 | 37 | 97 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 105 | 240 | 156 | 3 | 242 | 31 | 115 | 76 | 11 | 42 | 110 | 135 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 501 | 276 | 202 | 287 |
| Volume Left (vph) | 105 | 3 | 115 | 42 |
| Volume Right (vph) | 156 | 31 | 11 | 135 |
| Hadj (s) | -0.03 | 0.02 | 0.20 | -0.20 |
| Departure Headway (s) | 6.4 | 7.0 | 7.6 | 6.9 |
| Degree Utilization, x | 0.89 | 0.53 | 0.43 | 0.55 |
| Capacity (veh/h) | 545 | 477 | 433 | 484 |
| Control Delay (s/veh) | 40.7 | 17.7 | 16.1 | 18.2 |
| Approach Delay (s/veh) | 40.7 | 17.7 | 16.1 | 18.2 |
| Approach LOS | E | C | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 26.6 | |
| Level of Service | | | D | |
| Intersection Capacity Utilization | | | 75.8% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |





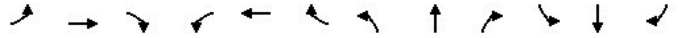


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 64 | 150 | 52 | 44 | 137 | 57 | 56 | 220 | 45 | 65 | 193 | 48 |
| Future Volume (vph) | 64 | 150 | 52 | 44 | 137 | 57 | 56 | 220 | 45 | 65 | 193 | 48 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 70 | 163 | 57 | 48 | 149 | 62 | 61 | 239 | 49 | 71 | 210 | 52 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 290 | 259 | 349 | 281 | 52 |
| Volume Left (vph) | 70 | 48 | 61 | 71 | 0 |
| Volume Right (vph) | 57 | 62 | 49 | 0 | 52 |
| Hadj (s) | 0.10 | -0.09 | 0.00 | 0.17 | -0.63 |
| Departure Headway (s) | 7.1 | 7.0 | 6.9 | 7.5 | 6.7 |
| Degree Utilization, x | 0.57 | 0.50 | 0.67 | 0.58 | 0.10 |
| Capacity (veh/h) | 461 | 457 | 491 | 445 | 497 |
| Control Delay (s/veh) | 19.1 | 16.9 | 22.6 | 19.3 | 9.2 |
| Approach Delay (s/veh) | 19.1 | 16.9 | 22.6 | 17.7 | |
| Approach LOS | C | C | C | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 19.3 | |
| Level of Service | | | C | |
| Intersection Capacity Utilization | | | 62.7% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |

Description: SBR SLIP THROUGH FOR WIDE ROW



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 106 | 77 | 13 | 5 | 54 | 15 | 6 | 47 | 2 | 40 | 84 | 85 |
| Future Volume (Veh/h) | 106 | 77 | 13 | 5 | 54 | 15 | 6 | 47 | 2 | 40 | 84 | 85 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Hourly flow rate (vph) | 119 | 87 | 15 | 6 | 61 | 17 | 7 | 53 | 2 | 45 | 94 | 96 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 78 | | | 102 | | | 557 | 423 | 95 | 443 | 422 | 70 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 78 | | | 102 | | | 557 | 423 | 95 | 443 | 422 | 70 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.4 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 92 | | | 100 | | | 98 | 89 | 100 | 90 | 80 | 90 |
| cM capacity (veh/h) | 1514 | | | 1503 | | | 293 | 477 | 968 | 447 | 475 | 991 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 221 | 84 | 62 | 235 |
| Volume Left | 119 | 6 | 7 | 45 |
| Volume Right | 15 | 17 | 2 | 96 |
| cSH | 1514 | 1503 | 452 | 594 |
| Volume to Capacity | 0.08 | 0.00 | 0.14 | 0.40 |
| Queue Length 95th (m) | 1.9 | 0.1 | 3.6 | 14.3 |
| Control Delay (s/veh) | 4.4 | 0.6 | 14.2 | 15.0 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 4.4 | 0.6 | 14.2 | 15.0 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 9.0 | | | |
| Intersection Capacity Utilization | 42.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 8.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 106 | 77 | 13 | 5 | 54 | 15 | 6 | 47 | 2 | 40 | 84 | 85 |
| Future Vol, veh/h | 106 | 77 | 13 | 5 | 54 | 15 | 6 | 47 | 2 | 40 | 84 | 85 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 3 | 4 | 0 | 0 | 0 | 25 | 25 | 4 | 0 | 4 | 6 | 3 |
| Mvmt Flow | 119 | 87 | 15 | 6 | 61 | 17 | 7 | 53 | 2 | 45 | 94 | 96 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 78 | 0 | 0 | 102 | 0 | 0 | 510 | 423 | 95 | 442 | 422 | 70 |
| Stage 1 | - | - | - | - | - | - | 333 | 333 | - | 82 | 82 | - |
| Stage 2 | - | - | - | - | - | - | 177 | 90 | - | 360 | 340 | - |
| Critical Hdwy | 4.13 | - | - | 4.1 | - | - | 7.35 | 6.54 | 6.2 | 7.14 | 6.56 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.35 | 5.54 | - | 6.14 | 5.56 | - |
| Follow-up Hdwy | 2.227 | - | - | 2.2 | - | - | 3.725 | 4.036 | 3.3 | 3.536 | 4.054 | 3.327 |
| Pot Cap-1 Maneuver | 1514 | - | - | 1503 | - | - | 439 | 519 | 967 | 522 | 517 | 990 |
| Stage 1 | - | - | - | - | - | - | 635 | 640 | - | 921 | 819 | - |
| Stage 2 | - | - | - | - | - | - | 774 | 816 | - | 654 | 632 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1514 | - | - | 1503 | - | - | 314 | 474 | 967 | 445 | 472 | 990 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 314 | 474 | - | 445 | 472 | - |
| Stage 1 | - | - | - | - | - | - | 582 | 587 | - | 845 | 816 | - |
| Stage 2 | - | - | - | - | - | - | 616 | 813 | - | 544 | 580 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Ctrl Dly, s/v | 4.1 | 0.5 | 14.1 | 15.1 |
| HCM LOS | | | B | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 457 | 1514 | - | - | 1503 | - | - | 591 |
| HCM Lane V/C Ratio | 0.135 | 0.079 | - | - | 0.004 | - | - | 0.397 |
| HCM Ctrl Dly (s/v) | 14.1 | 7.6 | 0 | - | 7.4 | 0 | - | 15.1 |
| HCM Lane LOS | B | A | A | - | A | A | - | C |
| HCM 95th %tile Q(veh) | 0.5 | 0.3 | - | - | 0 | - | - | 1.9 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 39 | 72 | 67 | 25 | 65 | 28 | 389 | 73 | 105 | 495 | 14 |
| Future Volume (vph) | 86 | 39 | 72 | 67 | 25 | 65 | 28 | 389 | 73 | 105 | 495 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.96 | 0.98 | 0.99 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.891 | | | 0.978 | | | 0.997 | |
| Flt Protected | | 0.967 | | 0.950 | | | | 0.997 | | | 0.992 | |
| Satd. Flow (prot) | 0 | 1832 | 1601 | 1690 | 1586 | 0 | 0 | 3436 | 0 | 0 | 3498 | 0 |
| Flt Permitted | | 0.731 | | 0.666 | | | | 0.889 | | | 0.751 | |
| Satd. Flow (perm) | 0 | 1380 | 1542 | 1160 | 1586 | 0 | 0 | 3062 | 0 | 0 | 2648 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 74 | | | 35 | | | 4 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 5 | | 22 | 22 | | 5 | 17 | | | | | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 0% | 2% | 8% | 0% | 9% | 0% | 3% | 8% | 4% | 3% | 0% |
| Adj. Flow (vph) | 98 | 44 | 82 | 76 | 28 | 74 | 32 | 442 | 83 | 119 | 563 | 16 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 142 | 82 | 76 | 102 | 0 | 0 | 557 | 0 | 0 | 698 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.3 | 21.3 | 21.3 | 21.3 | | | 47.5 | | | 47.5 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.39 | 0.17 | 0.25 | 0.21 | | | 0.30 | | | 0.44 | |

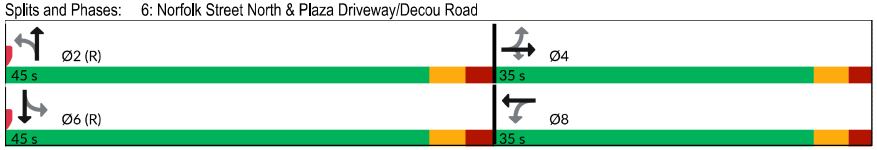




| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 27.7 | 6.7 | 25.5 | 10.2 | | | 8.1 | | | 7.1 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 27.7 | 6.7 | 25.5 | 10.2 | | | 8.1 | | | 7.1 | |
| LOS | | C | A | C | B | | | A | | | A | |
| Approach Delay (s/veh) | | 20.0 | | | 16.7 | | | 8.1 | | | 7.1 | |
| Approach LOS | | B | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 17.7 | 0.0 | 9.1 | 3.2 | | | 18.3 | | | 24.1 | |
| Queue Length 95th (m) | | 31.8 | 9.0 | 19.0 | 13.3 | | | 27.0 | | | m28.2 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 510 | 622 | 429 | 633 | | | 1833 | | | 1574 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.28 | 0.13 | 0.18 | 0.16 | | | 0.30 | | | 0.44 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.44 | | | |
| Intersection Signal Delay (s/veh): 10.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 58 | 27 | 34 | 113 | 181 | 75 |
| Future Volume (Veh/h) | 58 | 27 | 34 | 113 | 181 | 75 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 63 | 29 | 37 | 123 | 197 | 82 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 435 | 238 | 279 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 435 | 238 | 279 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 89 | 96 | 97 | | | |
| cM capacity (veh/h) | 562 | 801 | 1284 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 63 | 29 | 160 | 279 |
| Volume Left | 63 | 0 | 37 | 0 |
| Volume Right | 0 | 29 | 0 | 82 |
| cSH | 562 | 801 | 1284 | 1700 |
| Volume to Capacity | 0.11 | 0.04 | 0.03 | 0.16 |
| Queue Length 95th (m) | 2.9 | 0.9 | 0.7 | 0.0 |
| Control Delay (s/veh) | 12.2 | 9.7 | 2.0 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 11.4 | | 2.0 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 2.6 | |
| Intersection Capacity Utilization | | | 35.3% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |





| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 58 | 27 | 34 | 113 | 181 | 75 |
| Future Vol, veh/h | 58 | 27 | 34 | 113 | 181 | 75 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | 0 | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 63 | 29 | 37 | 123 | 197 | 82 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 435 | 238 | 279 | 0 | - | 0 |
| Stage 1 | 238 | - | - | - | - | - |
| Stage 2 | 197 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 578 | 801 | 1284 | - | - | - |
| Stage 1 | 802 | - | - | - | - | - |
| Stage 2 | 836 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 560 | 801 | 1284 | - | - | - |
| Mov Cap-2 Maneuver | 560 | - | - | - | - | - |
| Stage 1 | 777 | - | - | - | - | - |
| Stage 2 | 836 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Ctrl Dly, s/v | 11.4 | 1.8 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | EBLn2 | SBT | SBR |
|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1284 | - | 560 | 801 | - | - |
| HCM Lane V/C Ratio | 0.029 | - | 0.113 | 0.037 | - | - |
| HCM Ctrl Dly (s/v) | 7.9 | 0 | 12.2 | 9.7 | - | - |
| HCM Lane LOS | A | A | B | A | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.4 | 0.1 | - | - |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 311 | 95 | 176 | 464 | 73 | 186 |
| Future Volume (Veh/h) | 311 | 95 | 176 | 464 | 73 | 186 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 338 | 103 | 191 | 504 | 79 | 202 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 441 | | 1276 | 221 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 441 | | 1276 | 221 |
| tC, single (s) | | | 4.1 | | 6.9 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.4 |
| p0 queue free % | | | 83 | | 39 | 74 |
| cM capacity (veh/h) | | | 1122 | | 129 | 774 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 225 | 216 | 191 | 504 | 79 | 202 |
| Volume Left | 0 | 0 | 191 | 0 | 79 | 0 |
| Volume Right | 0 | 103 | 0 | 0 | 0 | 202 |
| cSH | 1700 | 1700 | 1122 | 1700 | 129 | 774 |
| Volume to Capacity | 0.13 | 0.13 | 0.17 | 0.30 | 0.61 | 0.26 |
| Queue Length 95th (m) | 0.0 | 0.0 | 4.7 | 0.0 | 23.9 | 7.9 |
| Control Delay (s/veh) | 0.0 | 0.0 | 8.9 | 0.0 | 69.0 | 11.3 |
| Lane LOS | | | A | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.4 | | 27.5 | |
| Approach LOS | | | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 6.6 | | | |
| Intersection Capacity Utilization | 35.4% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |



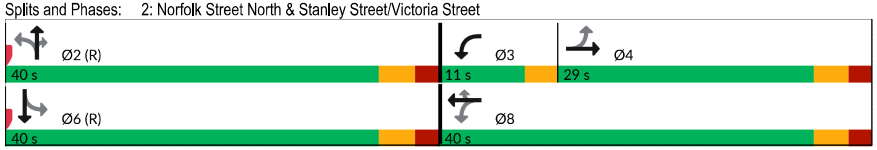


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 12 | 123 | 11 | 245 | 143 | 181 | 20 | 339 | 237 | 83 | 193 | 10 |
| Future Volume (vph) | 12 | 123 | 11 | 245 | 143 | 181 | 20 | 339 | 237 | 83 | 193 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.96 | | 1.00 | |
| Frt | | 0.990 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.996 | | 0.950 | | | | 0.997 | | | 0.986 | |
| Satd. Flow (prot) | 0 | 1711 | 0 | 1738 | 1795 | 1458 | 0 | 1813 | 1555 | 0 | 3259 | 0 |
| Flt Permitted | | 0.964 | | 0.442 | | | | 0.973 | | | 0.754 | |
| Satd. Flow (perm) | 0 | 1655 | 0 | 802 | 1795 | 1421 | 0 | 1768 | 1500 | 0 | 2487 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 5 | | | | 203 | | | 266 | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 3 | | 12 | 12 | | 3 | 7 | | 10 | 10 | | 7 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 10% | 10% | 17% | 5% | 7% | 12% | 0% | 6% | 5% | 8% | 11% | 0% |
| Adj. Flow (vph) | 13 | 138 | 12 | 275 | 161 | 203 | 22 | 381 | 266 | 93 | 217 | 11 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 163 | 0 | 275 | 161 | 203 | 0 | 403 | 266 | 0 | 321 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 12.7 | | 26.1 | 23.7 | 23.7 | | 45.4 | 45.4 | | 45.4 | |
| Actuated g/C Ratio | | 0.16 | | 0.33 | 0.30 | 0.30 | | 0.57 | 0.57 | | 0.57 | |
| v/c Ratio | | 0.61 | | 0.77 | 0.30 | 0.36 | | 0.40 | 0.28 | | 0.23 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.1 | | 37.9 | 22.8 | 5.0 | | 9.4 | 1.4 | | 9.5 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.1 | | 37.9 | 22.8 | 5.0 | | 9.4 | 1.4 | | 9.5 | |
| LOS | | D | | D | C | A | | A | A | | A | |
| Approach Delay (s/veh) | | 40.1 | | | 23.7 | | | 6.2 | | | 9.5 | |
| Approach LOS | | D | | | C | | | A | | | A | |
| Queue Length 50th (m) | | 22.9 | | 33.5 | 19.1 | 0.0 | | 27.2 | 1.6 | | 11.2 | |
| Queue Length 95th (m) | | 38.0 | | #50.1 | 30.4 | 12.3 | | 43.2 | 6.8 | | 20.6 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 491 | | 355 | 776 | 729 | | 1003 | 966 | | 1414 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.33 | | 0.77 | 0.21 | 0.28 | | 0.40 | 0.28 | | 0.23 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay (s/veh): 16.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 85.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street








| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 93 | 141 | 56 | 24 | 246 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Future Volume (vph) | 93 | 141 | 56 | 24 | 246 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 113 | 172 | 68 | 29 | 300 | 30 | 161 | 145 | 54 | 20 | 68 | 126 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 353 | 359 | 360 | 214 |
| Volume Left (vph) | 113 | 29 | 161 | 20 |
| Volume Right (vph) | 68 | 30 | 54 | 126 |
| Hadj (s) | 0.09 | 0.08 | 0.18 | -0.18 |
| Departure Headway (s) | 7.2 | 7.2 | 7.4 | 7.5 |
| Degree Utilization, x | 0.71 | 0.72 | 0.74 | 0.45 |
| Capacity (veh/h) | 463 | 466 | 457 | 399 |
| Control Delay (s/veh) | 26.0 | 26.5 | 28.2 | 16.5 |
| Approach Delay (s/veh) | 26.0 | 26.5 | 28.2 | 16.5 |
| Approach LOS | D | D | D | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | 25.2 | | |
| Level of Service | | D | | |
| Intersection Capacity Utilization | | 73.4% | ICU Level of Service | D |
| Analysis Period (min) | | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 26.4 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 93 | 141 | 56 | 24 | 246 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Future Vol, veh/h | 93 | 141 | 56 | 24 | 246 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 10 | 8 | 6 | 23 | 5 | 5 | 13 | 12 | 0 | 0 | 15 | 7 |
| Mvmt Flow | 113 | 172 | 68 | 29 | 300 | 30 | 161 | 145 | 54 | 20 | 68 | 126 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 26.6 | 29.5 | 29 | 16.3 |
| HCM LOS | D | D | D | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 32% | 8% | 9% |
| Vol Thru, % | 40% | 49% | 83% | 32% |
| Vol Right, % | 15% | 19% | 8% | 59% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 295 | 290 | 295 | 175 |
| LT Vol | 132 | 93 | 24 | 16 |
| Through Vol | 119 | 141 | 246 | 56 |
| RT Vol | 44 | 56 | 25 | 103 |
| Lane Flow Rate | 360 | 354 | 360 | 213 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.741 | 0.714 | 0.746 | 0.44 |
| Departure Headway (Hd) | 7.418 | 7.272 | 7.465 | 7.423 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 486 | 495 | 482 | 482 |
| Service Time | 5.493 | 5.35 | 5.542 | 5.514 |
| HCM Lane V/C Ratio | 0.741 | 0.715 | 0.747 | 0.442 |
| HCM Control Delay, s/veh | 29 | 26.6 | 29.5 | 16.3 |
| HCM Lane LOS | D | D | D | C |
| HCM 95th-tile Q | 6.2 | 5.7 | 6.2 | 2.2 |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 83 | 97 | 26 | 51 | 174 | 38 | 49 | 180 | 44 | 36 | 158 | 64 |
| Future Volume (vph) | 83 | 97 | 26 | 51 | 174 | 38 | 49 | 180 | 44 | 36 | 158 | 64 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 94 | 110 | 30 | 58 | 198 | 43 | 56 | 205 | 50 | 41 | 180 | 73 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 234 | 299 | 311 | 221 | 73 |
| Volume Left (vph) | 94 | 58 | 56 | 41 | 0 |
| Volume Right (vph) | 30 | 43 | 50 | 0 | 73 |
| Hadj (s) | 0.15 | 0.02 | 0.08 | 0.17 | -0.62 |
| Departure Headway (s) | 6.7 | 6.5 | 6.6 | 7.1 | 6.3 |
| Degree Utilization, x | 0.44 | 0.54 | 0.57 | 0.44 | 0.13 |
| Capacity (veh/h) | 474 | 515 | 510 | 456 | 517 |
| Control Delay (s/veh) | 14.9 | 16.7 | 17.8 | 14.4 | 9.1 |
| Approach Delay (s/veh) | 14.9 | 16.7 | 17.8 | 13.0 | |
| Approach LOS | B | C | C | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | 15.7 | | | |
| Level of Service | C | | | |
| Intersection Capacity Utilization | 56.7% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |
| Description: SBR SLIP THROUGH FOR WIDE ROW | | | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 16.3 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 83 | 97 | 26 | 51 | 174 | 38 | 49 | 180 | 44 | 36 | 158 | 64 |
| Future Vol, veh/h | 83 | 97 | 26 | 51 | 174 | 38 | 49 | 180 | 44 | 36 | 158 | 64 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 10 | 2 | 28 | 4 | 5 | 0 | 15 | 8 | 0 | 10 | 3 | 5 |
| Mvmt Flow | 94 | 110 | 30 | 58 | 198 | 43 | 56 | 205 | 50 | 41 | 180 | 73 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 2 | 1 | 1 |
| HCM Control Delay, s/veh | 15.2 | 16.9 | 18.4 | 14.2 |
| HCM LOS | C | C | C | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 18% | 40% | 19% | 19% | 0% |
| Vol Thru, % | 66% | 47% | 66% | 81% | 0% |
| Vol Right, % | 16% | 13% | 14% | 0% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 273 | 206 | 263 | 194 | 64 |
| LT Vol | 49 | 83 | 51 | 36 | 0 |
| Through Vol | 180 | 97 | 174 | 158 | 0 |
| RT Vol | 44 | 26 | 38 | 0 | 64 |
| Lane Flow Rate | 310 | 234 | 299 | 220 | 73 |
| Geometry Grp | 4a | 2 | 2 | 5 | 5 |
| Degree of Util (X) | 0.575 | 0.442 | 0.538 | 0.442 | 0.127 |
| Departure Headway (Hd) | 6.673 | 6.794 | 6.486 | 7.221 | 6.287 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 540 | 529 | 556 | 498 | 568 |
| Service Time | 4.734 | 4.858 | 4.546 | 4.983 | 4.049 |
| HCM Lane V/C Ratio | 0.574 | 0.442 | 0.538 | 0.442 | 0.129 |
| HCM Control Delay, s/veh | 18.4 | 15.2 | 16.9 | 15.6 | 10 |
| HCM Lane LOS | C | C | C | C | A |
| HCM 95th-tile Q | 3.6 | 2.2 | 3.2 | 2.2 | 0.4 |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 66 | 69 | 8 | 2 | 86 | 30 | 13 | 56 | 0 | 22 | 17 | 47 |
| Future Volume (Veh/h) | 66 | 69 | 8 | 2 | 86 | 30 | 13 | 56 | 0 | 22 | 17 | 47 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 76 | 79 | 9 | 2 | 99 | 34 | 15 | 64 | 0 | 25 | 20 | 54 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 133 | | | 88 | | | 420 | 373 | 84 | 388 | 360 | 116 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 133 | | | 88 | | | 420 | 373 | 84 | 388 | 360 | 116 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.8 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.1 | 4.1 | 3.3 |
| p0 queue free % | 95 | | | 100 | | | 97 | 88 | 100 | 94 | 96 | 94 |
| cM capacity (veh/h) | 1464 | | | 1520 | | | 481 | 527 | 976 | 410 | 525 | 942 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 164 | 135 | 79 | 99 |
| Volume Left | 76 | 2 | 15 | 25 |
| Volume Right | 9 | 34 | 0 | 54 |
| cSH | 1464 | 1520 | 517 | 633 |
| Volume to Capacity | 0.05 | 0.00 | 0.15 | 0.16 |
| Queue Length 95th (m) | 1.2 | 0.0 | 4.1 | 4.2 |
| Control Delay (s/veh) | 3.7 | 0.1 | 13.2 | 11.7 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.7 | 0.1 | 13.2 | 11.7 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 5.9 | |
| Intersection Capacity Utilization | | | 28.6% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 42 | 29 | 179 | 23 | 168 | 21 | 383 | 102 | 76 | 262 | 4 |
| Future Volume (vph) | 83 | 42 | 29 | 179 | 23 | 168 | 21 | 383 | 102 | 76 | 262 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.99 | 1.00 | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.868 | | | 0.970 | | | 0.998 | |
| Flt Protected | | 0.968 | | 0.950 | | | | 0.998 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1835 | 1633 | 1738 | 1568 | 0 | 0 | 3313 | 0 | 0 | 3299 | 0 |
| Flt Permitted | | 0.604 | | 0.661 | | | | 0.927 | | | 0.725 | |
| Satd. Flow (perm) | 0 | 1140 | 1610 | 1207 | 1568 | 0 | 0 | 3075 | 0 | 0 | 2418 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 38 | | 202 | | | 55 | | | 2 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 8 | | 2 | 2 | | 8 | 23 | | | | | 23 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 0% | 4% | 0% | 5% | 7% | 4% | 6% | 5% | 13% | 17% | 7% | 0% |
| Adj. Flow (vph) | 100 | 51 | 35 | 216 | 28 | 202 | 25 | 461 | 123 | 92 | 316 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 151 | 35 | 216 | 230 | 0 | 0 | 609 | 0 | 0 | 413 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 23.9 | 23.9 | 23.9 | 23.9 | | | 44.9 | | | 44.9 | |
| Actuated g/C Ratio | | 0.30 | 0.30 | 0.30 | 0.30 | | | 0.56 | | | 0.56 | |
| v/c Ratio | | 0.44 | 0.07 | 0.60 | 0.38 | | | 0.35 | | | 0.30 | |

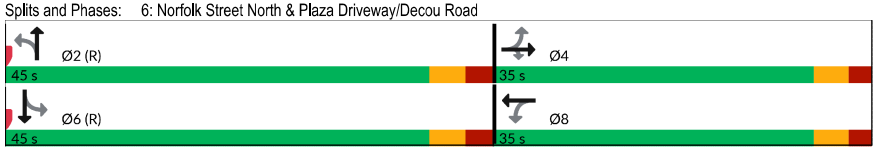


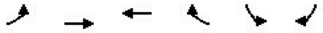


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 26.4 | 6.1 | 30.9 | 6.1 | | | 9.9 | | | 8.3 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 26.4 | 6.1 | 30.9 | 6.1 | | | 9.9 | | | 8.3 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 22.6 | | | 18.1 | | | 9.9 | | | 8.3 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 19.1 | 0.0 | 28.9 | 3.1 | | | 20.3 | | | 17.8 | |
| Queue Length 95th (m) | | 28.2 | 4.4 | 39.8 | 13.1 | | | 33.8 | | | 24.5 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 421 | 619 | 446 | 707 | | | 1749 | | | 1357 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.36 | 0.06 | 0.48 | 0.33 | | | 0.35 | | | 0.30 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.60 | | | |
| Intersection Signal Delay (s/veh): 13.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 95.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





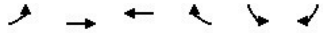
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 37 | 157 | 191 | 6 | 4 | 120 |
| Future Volume (Veh/h) | 37 | 157 | 191 | 6 | 4 | 120 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 40 | 171 | 208 | 7 | 4 | 130 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 215 | | | | 463 | 212 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 215 | | | | 463 | 212 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 99 | 84 |
| cM capacity (veh/h) | 1355 | | | | 541 | 829 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 211 | 215 | 4 | 130 |
| Volume Left | 40 | 0 | 4 | 0 |
| Volume Right | 0 | 7 | 0 | 130 |
| cSH | 1355 | 1700 | 541 | 829 |
| Volume to Capacity | 0.03 | 0.13 | 0.01 | 0.16 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.2 | 4.2 |
| Control Delay (s/veh) | 1.7 | 0.0 | 11.7 | 10.2 |
| Lane LOS | A | | B | B |
| Approach Delay (s/veh) | 1.7 | 0.0 | 10.2 | |
| Approach LOS | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.1 | | | |
| Intersection Capacity Utilization | 34.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 135 | 138 | 6 | 6 | 59 |
| Future Volume (Veh/h) | 26 | 135 | 138 | 6 | 6 | 59 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 28 | 147 | 150 | 7 | 7 | 64 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 157 | | | | 357 | 154 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 157 | | | | 357 | 154 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 99 | 93 |
| cM capacity (veh/h) | 1423 | | | | 629 | 892 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 175 | 157 | 7 | 64 |
| Volume Left | 28 | 0 | 7 | 0 |
| Volume Right | 0 | 7 | 0 | 64 |
| cSH | 1423 | 1700 | 629 | 892 |
| Volume to Capacity | 0.02 | 0.09 | 0.01 | 0.07 |
| Queue Length 95th (m) | 0.5 | 0.0 | 0.3 | 1.8 |
| Control Delay (s/veh) | 1.4 | 0.0 | 10.8 | 9.3 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 1.4 | 0.0 | 9.5 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.3 | | | |
| Intersection Capacity Utilization | 29.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



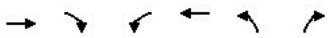
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 99 | 13 | 5 | 145 | 71 | 40 |
| Future Volume (Veh/h) | 99 | 13 | 5 | 145 | 71 | 40 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 108 | 14 | 5 | 158 | 77 | 43 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 267 | 99 | 120 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 267 | 99 | 120 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 85 | 99 | 100 | | | |
| cM capacity (veh/h) | 720 | 957 | 1468 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 108 | 14 | 163 | 120 |
| Volume Left | 108 | 0 | 5 | 0 |
| Volume Right | 0 | 14 | 0 | 43 |
| cSH | 720 | 957 | 1468 | 1700 |
| Volume to Capacity | 0.15 | 0.01 | 0.00 | 0.07 |
| Queue Length 95th (m) | 4.0 | 0.3 | 0.1 | 0.0 |
| Control Delay (s/veh) | 10.9 | 8.8 | 0.3 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 10.6 | | 0.3 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.3 | | | |
| Intersection Capacity Utilization | 23.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 552 | 79 | 247 | 505 | 105 | 222 |
| Future Volume (Veh/h) | 552 | 79 | 247 | 505 | 105 | 222 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 587 | 84 | 263 | 537 | 112 | 236 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 671 | | 1692 | 336 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 671 | | 1692 | 336 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.6 | 3.3 |
| p0 queue free % | | | 71 | | 0 | 64 |
| cM capacity (veh/h) | | | 922 | | 57 | 663 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 391 | 280 | 263 | 537 | 112 | 236 |
| Volume Left | 0 | 0 | 263 | 0 | 112 | 0 |
| Volume Right | 0 | 84 | 0 | 0 | 0 | 236 |
| cSH | 1700 | 1700 | 922 | 1700 | 57 | 663 |
| Volume to Capacity | 0.23 | 0.16 | 0.29 | 0.32 | 1.97 | 0.36 |
| Queue Length 95th (m) | 0.0 | 0.0 | 9.0 | 0.0 | 81.9 | 12.2 |
| Control Delay (s/veh) | 0.0 | 0.0 | 10.5 | 0.0 | 606.4 | 13.4 |
| Lane LOS | | | B | | F | B |
| Approach Delay (s/veh) | 0.0 | | 3.4 | | 204.2 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 40.6 | | | |
| Intersection Capacity Utilization | 47.3% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 16 | 134 | 22 | 212 | 146 | 150 | 8 | 320 | 195 | 128 | 349 | 16 |
| Future Volume (vph) | 16 | 134 | 22 | 212 | 146 | 150 | 8 | 320 | 195 | 128 | 349 | 16 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 1.00 | | 0.97 | | 1.00 | 0.97 | | 1.00 | |
| Frt | | 0.983 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | 0.999 | | | 0.987 | |
| Satd. Flow (prot) | 0 | 1778 | 0 | 1755 | 1830 | 1570 | 0 | 1806 | 1570 | 0 | 3379 | 0 |
| Flt Permitted | | 0.955 | | 0.391 | | | | 0.986 | | | 0.712 | |
| Satd. Flow (perm) | 0 | 1706 | 0 | 719 | 1830 | 1525 | 0 | 1782 | 1524 | 0 | 2434 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 9 | | | | 174 | | | 227 | | 5 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 2 | | 6 | 6 | | 2 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 16% | 5% | 0% | 4% | 5% | 4% | 100% | 4% | 4% | 15% | 3% | 0% |
| Adj. Flow (vph) | 19 | 156 | 26 | 247 | 170 | 174 | 9 | 372 | 227 | 149 | 406 | 19 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 201 | 0 | 247 | 170 | 174 | 0 | 381 | 227 | 0 | 574 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 13.8 | | 27.2 | 24.8 | 24.8 | | 44.3 | 44.3 | | 44.3 | |
| Actuated g/C Ratio | | 0.17 | | 0.34 | 0.31 | 0.31 | | 0.55 | 0.55 | | 0.55 | |
| v/c Ratio | | 0.67 | | 0.71 | 0.30 | 0.29 | | 0.39 | 0.24 | | 0.43 | |

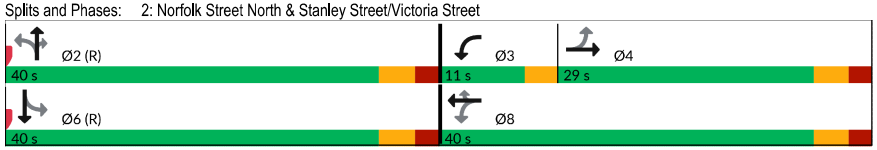


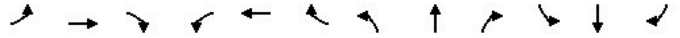


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.0 | | 32.2 | 21.7 | 4.4 | | 10.5 | 1.8 | | 12.3 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.0 | | 32.2 | 21.7 | 4.4 | | 10.5 | 1.8 | | 12.3 | |
| LOS | | D | | C | C | A | | B | A | | B | |
| Approach Delay (s/veh) | | 40.0 | | | 21.0 | | | 7.3 | | | 12.3 | |
| Approach LOS | | D | | | C | | | A | | | B | |
| Queue Length 50th (m) | | 27.7 | | 28.7 | 19.6 | 0.0 | | 28.7 | 1.9 | | 24.2 | |
| Queue Length 95th (m) | | 42.0 | | 40.0 | 29.5 | 10.1 | | 44.4 | 7.0 | | 39.3 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 509 | | 348 | 791 | 758 | | 986 | 944 | | 1349 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.39 | | 0.71 | 0.21 | 0.23 | | 0.39 | 0.24 | | 0.43 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.71 | | | |
| Intersection Signal Delay (s/veh): 16.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 84.1% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 92 | 188 | 110 | 34 | 188 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Future Volume (vph) | 92 | 188 | 110 | 34 | 188 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 105 | 214 | 125 | 39 | 214 | 31 | 93 | 86 | 43 | 42 | 128 | 135 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 444 | 284 | 222 | 305 |
| Volume Left (vph) | 105 | 39 | 93 | 42 |
| Volume Right (vph) | 125 | 31 | 43 | 135 |
| Hadj (s) | -0.01 | 0.04 | 0.14 | -0.18 |
| Departure Headway (s) | 6.6 | 7.0 | 7.5 | 6.9 |
| Degree Utilization, x | 0.81 | 0.55 | 0.46 | 0.58 |
| Capacity (veh/h) | 444 | 461 | 428 | 470 |
| Control Delay (s/veh) | 31.9 | 18.4 | 16.7 | 19.1 |
| Approach Delay (s/veh) | 31.9 | 18.4 | 16.7 | 19.1 |
| Approach LOS | D | C | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 23.0 | |
| Level of Service | | | C | |
| Intersection Capacity Utilization | | | 68.3% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |



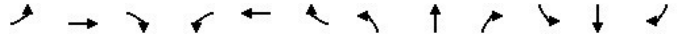


| Intersection | |
|---|---|
| Intersection Delay, s/veh | 21.8 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 92 | 188 | 110 | 34 | 188 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Future Vol, veh/h | 92 | 188 | 110 | 34 | 188 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 9 | 6 | 0 | 5 | 5 | 5 | 6 | 30 | 0 | 6 | 2 |
| Mvmt Flow | 105 | 214 | 125 | 39 | 214 | 31 | 93 | 86 | 43 | 42 | 128 | 135 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 29.8 | 17.6 | 16.1 | 18.4 |
| HCM LOS | D | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 24% | 14% | 14% |
| Vol Thru, % | 39% | 48% | 76% | 42% |
| Vol Right, % | 19% | 28% | 11% | 44% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 196 | 390 | 249 | 269 |
| LT Vol | 82 | 92 | 34 | 37 |
| Through Vol | 76 | 188 | 188 | 113 |
| RT Vol | 38 | 110 | 27 | 119 |
| Lane Flow Rate | 223 | 443 | 283 | 306 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.448 | 0.794 | 0.537 | 0.571 |
| Departure Headway (Hd) | 7.237 | 6.448 | 6.828 | 6.722 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 497 | 563 | 526 | 535 |
| Service Time | 5.309 | 4.448 | 4.891 | 4.786 |
| HCM Lane V/C Ratio | 0.449 | 0.787 | 0.538 | 0.572 |
| HCM Control Delay, s/veh | 16.1 | 29.8 | 17.6 | 18.4 |
| HCM Lane LOS | C | D | C | C |
| HCM 95th-tile Q | 2.3 | 7.6 | 3.2 | 3.6 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 79 | 136 | 49 | 47 | 127 | 49 | 52 | 215 | 46 | 57 | 202 | 67 |
| Future Volume (vph) | 79 | 136 | 49 | 47 | 127 | 49 | 52 | 215 | 46 | 57 | 202 | 67 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 86 | 148 | 53 | 51 | 138 | 53 | 57 | 234 | 50 | 62 | 220 | 73 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 287 | 242 | 341 | 282 | 73 |
| Volume Left (vph) | 86 | 51 | 57 | 62 | 0 |
| Volume Right (vph) | 53 | 53 | 50 | 0 | 73 |
| Hadj (s) | 0.11 | -0.08 | 0.00 | 0.16 | -0.63 |
| Departure Headway (s) | 7.0 | 6.9 | 6.7 | 7.3 | 6.5 |
| Degree Utilization, x | 0.56 | 0.47 | 0.64 | 0.57 | 0.13 |
| Capacity (veh/h) | 468 | 457 | 500 | 455 | 510 |
| Control Delay (s/veh) | 18.3 | 15.8 | 20.9 | 18.4 | 9.3 |
| Approach Delay (s/veh) | 18.3 | 15.8 | 20.9 | 16.5 | |
| Approach LOS | C | C | C | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | 18.0 | | |
| Level of Service | | C | | |
| Intersection Capacity Utilization | | 63.1% | ICU Level of Service | B |
| Analysis Period (min) | | 15 | | |
| Description: SBR SLIP THROUGH FOR WIDE ROW | | | | |





| Intersection | |
|---|---|
| Intersection Delay, s/veh | 18.3 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 79 | 136 | 49 | 47 | 127 | 49 | 52 | 215 | 46 | 57 | 202 | 67 |
| Future Vol, veh/h | 79 | 136 | 49 | 47 | 127 | 49 | 52 | 215 | 46 | 57 | 202 | 67 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 5 | 8 | 22 | 0 | 0 | 3 | 9 | 1 | 5 | 5 | 2 | 4 |
| Mvmt Flow | 86 | 148 | 53 | 51 | 138 | 53 | 57 | 234 | 50 | 62 | 220 | 73 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 2 | 1 | 1 |
| HCM Control Delay, s/veh | 18 | 15.9 | 21.3 | 17.4 |
| HCM LOS | C | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 17% | 30% | 21% | 22% | 0% |
| Vol Thru, % | 69% | 52% | 57% | 78% | 0% |
| Vol Right, % | 15% | 19% | 22% | 0% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 313 | 264 | 223 | 259 | 67 |
| LT Vol | 52 | 79 | 47 | 57 | 0 |
| Through Vol | 215 | 136 | 127 | 202 | 0 |
| RT Vol | 46 | 49 | 49 | 0 | 67 |
| Lane Flow Rate | 340 | 287 | 242 | 282 | 73 |
| Geometry Grp | 4a | 2 | 2 | 5 | 5 |
| Degree of Util (X) | 0.641 | 0.547 | 0.464 | 0.569 | 0.129 |
| Departure Headway (Hd) | 6.786 | 6.868 | 6.885 | 7.281 | 6.399 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 531 | 522 | 519 | 493 | 556 |
| Service Time | 4.87 | 4.954 | 4.975 | 5.066 | 4.182 |
| HCM Lane V/C Ratio | 0.64 | 0.55 | 0.466 | 0.572 | 0.131 |
| HCM Control Delay, s/veh | 21.3 | 18 | 15.9 | 19.3 | 10.1 |
| HCM Lane LOS | C | C | C | C | B |
| HCM 95th-tile Q | 4.5 | 3.3 | 2.4 | 3.5 | 0.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 52 | 70 | 14 | 4 | 51 | 14 | 9 | 42 | 2 | 39 | 76 | 61 |
| Future Volume (Veh/h) | 52 | 70 | 14 | 4 | 51 | 14 | 9 | 42 | 2 | 39 | 76 | 61 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Hourly flow rate (vph) | 58 | 79 | 16 | 4 | 57 | 16 | 10 | 47 | 2 | 44 | 85 | 69 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 73 | | | 95 | | | 388 | 284 | 87 | 302 | 284 | 65 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 73 | | | 95 | | | 388 | 284 | 87 | 302 | 284 | 65 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.4 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 98 | 92 | 100 | 93 | 86 | 93 |
| cM capacity (veh/h) | 1520 | | | 1512 | | | 427 | 596 | 977 | 588 | 593 | 996 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 153 | 77 | 59 | 198 |
| Volume Left | 58 | 4 | 10 | 44 |
| Volume Right | 16 | 16 | 2 | 69 |
| cSH | 1520 | 1512 | 566 | 689 |
| Volume to Capacity | 0.04 | 0.00 | 0.10 | 0.29 |
| Queue Length 95th (m) | 0.9 | 0.1 | 2.6 | 9.0 |
| Control Delay (s/veh) | 3.0 | 0.4 | 12.1 | 12.3 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.0 | 0.4 | 12.1 | 12.3 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | | | 7.5 | | |
| Intersection Capacity Utilization | | | 35.3% | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | |



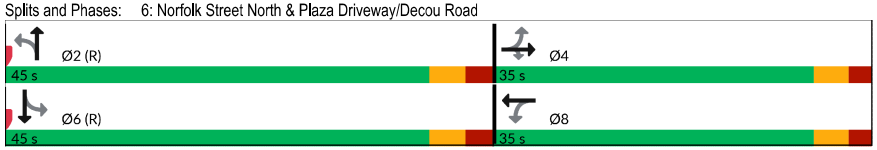


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 54 | 72 | 114 | 28 | 77 | 24 | 306 | 130 | 118 | 408 | 12 |
| Future Volume (vph) | 86 | 54 | 72 | 114 | 28 | 77 | 24 | 306 | 130 | 118 | 408 | 12 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.96 | 0.98 | 0.99 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.890 | | | 0.958 | | | 0.997 | |
| Flt Protected | | 0.970 | | 0.950 | | | | 0.997 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1841 | 1601 | 1690 | 1583 | 0 | 0 | 3344 | 0 | 0 | 3485 | 0 |
| Flt Permitted | | 0.743 | | 0.648 | | | | 0.906 | | | 0.722 | |
| Satd. Flow (perm) | 0 | 1406 | 1542 | 1129 | 1583 | 0 | 0 | 3037 | 0 | 0 | 2545 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 88 | | | 103 | | | 4 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 5 | | 22 | 22 | | 5 | 17 | | | | | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 0% | 2% | 8% | 0% | 9% | 0% | 3% | 8% | 4% | 3% | 0% |
| Adj. Flow (vph) | 98 | 61 | 82 | 130 | 32 | 88 | 27 | 348 | 148 | 134 | 464 | 14 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 159 | 82 | 130 | 120 | 0 | 0 | 523 | 0 | 0 | 612 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.5 | 21.5 | 21.5 | 21.5 | | | 47.3 | | | 47.3 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.42 | 0.17 | 0.43 | 0.24 | | | 0.28 | | | 0.41 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 27.9 | 6.5 | 29.1 | 9.6 | | | 6.9 | | | 7.0 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 27.9 | 6.5 | 29.1 | 9.6 | | | 6.9 | | | 7.0 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 20.6 | | | 19.7 | | | 6.9 | | | 7.0 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 20.1 | 0.0 | 16.4 | 3.7 | | | 14.2 | | | 23.2 | |
| Queue Length 95th (m) | | 34.3 | 8.8 | 29.9 | 14.3 | | | 23.0 | | | 25.1 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 520 | 622 | 417 | 641 | | | 1837 | | | 1505 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.31 | 0.13 | 0.31 | 0.19 | | | 0.28 | | | 0.41 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.43 | | | |
| Intersection Signal Delay (s/veh): 11.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road



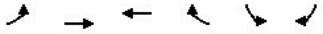





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 97 | 183 | 132 | 11 | 3 | 73 |
| Future Volume (Veh/h) | 97 | 183 | 132 | 11 | 3 | 73 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 105 | 199 | 143 | 12 | 3 | 79 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 155 | | | | 558 | 149 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 155 | | | | 558 | 149 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 93 | | | | 99 | 91 |
| cM capacity (veh/h) | 1425 | | | | 455 | 898 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 304 | 155 | 3 | 79 |
| Volume Left | 105 | 0 | 3 | 0 |
| Volume Right | 0 | 12 | 0 | 79 |
| cSH | 1425 | 1700 | 455 | 898 |
| Volume to Capacity | 0.07 | 0.09 | 0.01 | 0.09 |
| Queue Length 95th (m) | 1.8 | 0.0 | 0.2 | 2.2 |
| Control Delay (s/veh) | 3.1 | 0.0 | 13.0 | 9.4 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 3.1 | 0.0 | 9.5 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 3.2 | | |
| Intersection Capacity Utilization | | 35.9% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 56 | 130 | 107 | 11 | 5 | 36 |
| Future Volume (Veh/h) | 56 | 130 | 107 | 11 | 5 | 36 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 61 | 141 | 116 | 12 | 5 | 39 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 128 | | | | 385 | 122 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 128 | | | | 385 | 122 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 99 | 96 |
| cM capacity (veh/h) | 1458 | | | | 592 | 929 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 202 | 128 | 5 | 39 |
| Volume Left | 61 | 0 | 5 | 0 |
| Volume Right | 0 | 12 | 0 | 39 |
| cSH | 1458 | 1700 | 592 | 929 |
| Volume to Capacity | 0.04 | 0.08 | 0.01 | 0.04 |
| Queue Length 95th (m) | 1.0 | 0.0 | 0.2 | 1.0 |
| Control Delay (s/veh) | 2.5 | 0.0 | 11.1 | 9.0 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 2.5 | 0.0 | 9.3 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.5 | | | |
| Intersection Capacity Utilization | 26.6% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 76 | 11 | 6 | 101 | 161 | 90 |
| Future Volume (Veh/h) | 76 | 11 | 6 | 101 | 161 | 90 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 83 | 12 | 7 | 110 | 175 | 98 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 348 | 224 | 273 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 348 | 224 | 273 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 87 | 99 | 99 | | | |
| cM capacity (veh/h) | 645 | 815 | 1290 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 83 | 12 | 117 | 273 |
| Volume Left | 83 | 0 | 7 | 0 |
| Volume Right | 0 | 12 | 0 | 98 |
| cSH | 645 | 815 | 1290 | 1700 |
| Volume to Capacity | 0.13 | 0.01 | 0.01 | 0.16 |
| Queue Length 95th (m) | 3.3 | 0.3 | 0.1 | 0.0 |
| Control Delay (s/veh) | 11.4 | 9.5 | 0.5 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 11.2 | | 0.5 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.3 | | | |
| Intersection Capacity Utilization | 24.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 343 | 104 | 190 | 512 | 80 | 194 |
| Future Volume (Veh/h) | 343 | 104 | 190 | 512 | 80 | 194 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 373 | 113 | 207 | 557 | 87 | 211 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 486 | | 1401 | 243 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 486 | | 1401 | 243 |
| tC, single (s) | | | 4.1 | | 6.9 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.4 |
| p0 queue free % | | | 81 | | 16 | 72 |
| cM capacity (veh/h) | | | 1080 | | 104 | 749 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 249 | 237 | 207 | 557 | 87 | 211 |
| Volume Left | 0 | 0 | 207 | 0 | 87 | 0 |
| Volume Right | 0 | 113 | 0 | 0 | 0 | 211 |
| cSH | 1700 | 1700 | 1080 | 1700 | 104 | 749 |
| Volume to Capacity | 0.15 | 0.14 | 0.19 | 0.33 | 0.84 | 0.28 |
| Queue Length 95th (m) | 0.0 | 0.0 | 5.4 | 0.0 | 36.0 | 8.8 |
| Control Delay (s/veh) | 0.0 | 0.0 | 9.1 | 0.0 | 122.3 | 11.7 |
| Lane LOS | | | A | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.5 | | 44.0 | |
| Approach LOS | | | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 9.7 | | | |
| Intersection Capacity Utilization | 38.0% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |



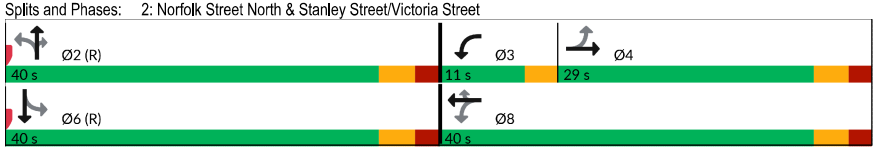


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 14 | 135 | 11 | 270 | 156 | 190 | 20 | 371 | 261 | 90 | 212 | 11 |
| Future Volume (vph) | 14 | 135 | 11 | 270 | 156 | 190 | 20 | 371 | 261 | 90 | 212 | 11 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.96 | | 1.00 | |
| Frt | | 0.991 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.996 | | 0.950 | | | | 0.998 | | | 0.986 | |
| Satd. Flow (prot) | 0 | 1714 | 0 | 1738 | 1795 | 1458 | 0 | 1814 | 1555 | 0 | 3259 | 0 |
| Flt Permitted | | 0.958 | | 0.420 | | | | 0.974 | | | 0.724 | |
| Satd. Flow (perm) | 0 | 1648 | 0 | 762 | 1795 | 1421 | 0 | 1770 | 1500 | 0 | 2388 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 5 | | | | 213 | | | 293 | | 5 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 3 | | 12 | 12 | | 3 | 7 | | 10 | 10 | | 7 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 10% | 10% | 17% | 5% | 7% | 12% | 0% | 6% | 5% | 8% | 11% | 0% |
| Adj. Flow (vph) | 16 | 152 | 12 | 303 | 175 | 213 | 22 | 417 | 293 | 101 | 238 | 12 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 180 | 0 | 303 | 175 | 213 | 0 | 439 | 293 | 0 | 351 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 13.3 | | 26.7 | 24.3 | 24.3 | | 44.8 | 44.8 | | 44.8 | |
| Actuated g/C Ratio | | 0.17 | | 0.33 | 0.30 | 0.30 | | 0.56 | 0.56 | | 0.56 | |
| v/c Ratio | | 0.65 | | 0.86 | 0.32 | 0.37 | | 0.44 | 0.30 | | 0.26 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.8 | | 46.7 | 22.4 | 4.8 | | 10.0 | 1.5 | | 10.3 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.8 | | 46.7 | 22.4 | 4.8 | | 10.0 | 1.5 | | 10.3 | |
| LOS | | D | | D | C | A | | B | A | | B | |
| Approach Delay (s/veh) | | 40.8 | | | 27.6 | | | 6.6 | | | 10.3 | |
| Approach LOS | | D | | | C | | | A | | | B | |
| Queue Length 50th (m) | | 25.4 | | 37.1 | 20.6 | 0.0 | | 29.3 | 1.5 | | 12.8 | |
| Queue Length 95th (m) | | 40.9 | | #61.0 | 32.2 | 12.4 | | 46.3 | 6.6 | | 23.5 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 489 | | 352 | 776 | 735 | | 990 | 968 | | 1338 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.37 | | 0.86 | 0.23 | 0.29 | | 0.44 | 0.30 | | 0.26 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.86 | | | |
| Intersection Signal Delay (s/veh): 17.8 | | Intersection LOS: B | |
| Intersection Capacity Utilization 87.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street








| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 93 | 155 | 56 | 24 | 268 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Future Volume (vph) | 93 | 155 | 56 | 24 | 268 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 113 | 189 | 68 | 29 | 327 | 30 | 161 | 145 | 54 | 20 | 68 | 126 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 370 | 386 | 360 | 214 |
| Volume Left (vph) | 113 | 29 | 161 | 20 |
| Volume Right (vph) | 68 | 30 | 54 | 126 |
| Hadj (s) | 0.09 | 0.08 | 0.18 | -0.18 |
| Departure Headway (s) | 7.5 | 7.5 | 7.7 | 8.0 |
| Degree Utilization, x | 0.77 | 0.80 | 0.77 | 0.47 |
| Capacity (veh/h) | 370 | 457 | 440 | 382 |
| Control Delay (s/veh) | 31.8 | 34.2 | 32.2 | 17.9 |
| Approach Delay (s/veh) | 31.8 | 34.2 | 32.2 | 17.9 |
| Approach LOS | D | D | D | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | 30.4 | | |
| Level of Service | | D | | |
| Intersection Capacity Utilization | | 75.3% | ICU Level of Service | D |
| Analysis Period (min) | | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 32.6 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 93 | 155 | 56 | 24 | 268 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Future Vol, veh/h | 93 | 155 | 56 | 24 | 268 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 10 | 8 | 6 | 23 | 5 | 5 | 13 | 12 | 0 | 0 | 15 | 7 |
| Mvmt Flow | 113 | 189 | 68 | 29 | 327 | 30 | 161 | 145 | 54 | 20 | 68 | 126 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 33.1 | 39 | 34 | 17.7 |
| HCM LOS | D | E | D | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 31% | 8% | 9% |
| Vol Thru, % | 40% | 51% | 85% | 32% |
| Vol Right, % | 15% | 18% | 8% | 59% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 295 | 304 | 317 | 175 |
| LT Vol | 132 | 93 | 24 | 16 |
| Through Vol | 119 | 155 | 268 | 56 |
| RT Vol | 44 | 56 | 25 | 103 |
| Lane Flow Rate | 360 | 371 | 387 | 213 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.785 | 0.782 | 0.832 | 0.467 |
| Departure Headway (Hd) | 7.851 | 7.593 | 7.752 | 7.879 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 464 | 475 | 468 | 455 |
| Service Time | 5.851 | 5.665 | 5.824 | 5.962 |
| HCM Lane V/C Ratio | 0.776 | 0.781 | 0.827 | 0.468 |
| HCM Control Delay, s/veh | 34 | 33.1 | 39 | 17.7 |
| HCM Lane LOS | D | D | E | C |
| HCM 95th-tile Q | 7 | 7 | 8.1 | 2.4 |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 88 | 106 | 27 | 54 | 192 | 41 | 51 | 189 | 46 | 40 | 170 | 69 |
| Future Volume (vph) | 88 | 106 | 27 | 54 | 192 | 41 | 51 | 189 | 46 | 40 | 170 | 69 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 100 | 120 | 31 | 61 | 218 | 47 | 58 | 215 | 52 | 45 | 193 | 78 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 251 | 326 | 325 | 238 | 78 |
| Volume Left (vph) | 100 | 61 | 58 | 45 | 0 |
| Volume Right (vph) | 31 | 47 | 52 | 0 | 78 |
| Hadj (s) | 0.15 | 0.02 | 0.08 | 0.17 | -0.62 |
| Departure Headway (s) | 7.1 | 6.8 | 6.9 | 7.5 | 6.7 |
| Degree Utilization, x | 0.49 | 0.61 | 0.62 | 0.49 | 0.14 |
| Capacity (veh/h) | 452 | 487 | 483 | 437 | 489 |
| Control Delay (s/veh) | 16.9 | 19.9 | 20.7 | 16.4 | 9.6 |
| Approach Delay (s/veh) | 16.9 | 19.9 | 20.7 | 14.7 | |
| Approach LOS | C | C | C | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | 18.1 | | | |
| Level of Service | C | | | |
| Intersection Capacity Utilization | 60.0% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |
| Description: SBR SLIP THROUGH FOR WIDE ROW | | | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 18.9 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 88 | 106 | 27 | 54 | 192 | 41 | 51 | 189 | 46 | 40 | 170 | 69 |
| Future Vol, veh/h | 88 | 106 | 27 | 54 | 192 | 41 | 51 | 189 | 46 | 40 | 170 | 69 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 10 | 2 | 28 | 4 | 5 | 0 | 15 | 8 | 0 | 10 | 3 | 5 |
| Mvmt Flow | 100 | 120 | 31 | 61 | 218 | 47 | 58 | 215 | 52 | 45 | 193 | 78 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 2 | 1 | 1 |
| HCM Control Delay, s/veh | 17.2 | 20.3 | 21.6 | 16 |
| HCM LOS | C | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 18% | 40% | 19% | 19% | 0% |
| Vol Thru, % | 66% | 48% | 67% | 81% | 0% |
| Vol Right, % | 16% | 12% | 14% | 0% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 286 | 221 | 287 | 210 | 69 |
| LT Vol | 51 | 88 | 54 | 40 | 0 |
| Through Vol | 189 | 106 | 192 | 170 | 0 |
| RT Vol | 46 | 27 | 41 | 0 | 69 |
| Lane Flow Rate | 325 | 251 | 326 | 239 | 78 |
| Geometry Grp | 4a | 2 | 2 | 5 | 5 |
| Degree of Util (X) | 0.634 | 0.499 | 0.616 | 0.501 | 0.144 |
| Departure Headway (Hd) | 7.023 | 7.148 | 6.795 | 7.557 | 6.618 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 510 | 500 | 528 | 475 | 538 |
| Service Time | 5.115 | 5.245 | 4.882 | 5.351 | 4.411 |
| HCM Lane V/C Ratio | 0.637 | 0.502 | 0.617 | 0.503 | 0.145 |
| HCM Control Delay, s/veh | 21.6 | 17.2 | 20.3 | 17.8 | 10.5 |
| HCM Lane LOS | C | C | C | C | B |
| HCM 95th-tile Q | 4.4 | 2.7 | 4.1 | 2.8 | 0.5 |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 73 | 75 | 9 | 2 | 95 | 32 | 14 | 62 | 0 | 23 | 18 | 51 |
| Future Volume (Veh/h) | 73 | 75 | 9 | 2 | 95 | 32 | 14 | 62 | 0 | 23 | 18 | 51 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 84 | 86 | 10 | 2 | 109 | 37 | 16 | 71 | 0 | 26 | 21 | 59 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 146 | | | 96 | | | 460 | 409 | 91 | 426 | 396 | 128 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 146 | | | 96 | | | 460 | 409 | 91 | 426 | 396 | 128 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.8 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.1 | 4.1 | 3.3 |
| p0 queue free % | 94 | | | 100 | | | 96 | 86 | 100 | 93 | 96 | 94 |
| cM capacity (veh/h) | 1448 | | | 1510 | | | 446 | 499 | 967 | 376 | 498 | 928 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 180 | 148 | 87 | 106 |
| Volume Left | 84 | 2 | 16 | 26 |
| Volume Right | 10 | 37 | 0 | 59 |
| cSH | 1448 | 1510 | 488 | 606 |
| Volume to Capacity | 0.06 | 0.00 | 0.18 | 0.17 |
| Queue Length 95th (m) | 1.4 | 0.0 | 4.9 | 4.8 |
| Control Delay (s/veh) | 3.8 | 0.1 | 14.0 | 12.2 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.8 | 0.1 | 14.0 | 12.2 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 6.2 | |
| Intersection Capacity Utilization | | | 33.6% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 42 | 29 | 185 | 23 | 181 | 23 | 422 | 108 | 83 | 289 | 4 |
| Future Volume (vph) | 83 | 42 | 29 | 185 | 23 | 181 | 23 | 422 | 108 | 83 | 289 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.99 | 1.00 | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.867 | | | 0.971 | | | 0.998 | |
| Flt Protected | | 0.968 | | 0.950 | | | | 0.998 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1835 | 1633 | 1738 | 1567 | 0 | 0 | 3318 | 0 | 0 | 3299 | 0 |
| Flt Permitted | | 0.587 | | 0.661 | | | | 0.923 | | | 0.705 | |
| Satd. Flow (perm) | 0 | 1108 | 1610 | 1207 | 1567 | 0 | 0 | 3066 | 0 | 0 | 2352 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 38 | | 218 | | | 52 | | | 2 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 8 | | 2 | 2 | | 8 | 23 | | | | | 23 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 0% | 4% | 0% | 5% | 7% | 4% | 6% | 5% | 13% | 17% | 7% | 0% |
| Adj. Flow (vph) | 100 | 51 | 35 | 223 | 28 | 218 | 28 | 508 | 130 | 100 | 348 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 151 | 35 | 223 | 246 | 0 | 0 | 666 | 0 | 0 | 453 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 24.4 | 24.4 | 24.4 | 24.4 | | | 44.4 | | | 44.4 | |
| Actuated g/C Ratio | | 0.31 | 0.31 | 0.31 | 0.31 | | | 0.56 | | | 0.56 | |
| v/c Ratio | | 0.45 | 0.07 | 0.61 | 0.39 | | | 0.39 | | | 0.35 | |

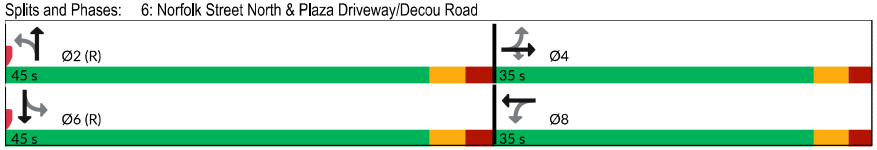


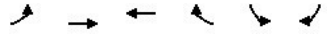


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 26.2 | 6.0 | 30.7 | 5.9 | | | 10.6 | | | 8.7 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 26.2 | 6.0 | 30.7 | 5.9 | | | 10.6 | | | 8.7 | |
| LOS | | C | A | C | A | | | B | | | A | |
| Approach Delay (s/veh) | | 22.4 | | | 17.7 | | | 10.6 | | | 8.7 | |
| Approach LOS | | C | | | B | | | B | | | A | |
| Queue Length 50th (m) | | 18.7 | 0.0 | 29.3 | 3.1 | | | 24.4 | | | 20.1 | |
| Queue Length 95th (m) | | 28.4 | 4.4 | 41.2 | 13.3 | | | 37.9 | | | m25.2 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 409 | 619 | 446 | 717 | | | 1723 | | | 1305 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.37 | 0.06 | 0.50 | 0.34 | | | 0.39 | | | 0.35 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.61 | | | |
| Intersection Signal Delay (s/veh): 13.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 95.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





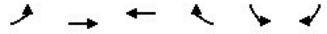
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 37 | 170 | 205 | 6 | 4 | 120 |
| Future Volume (Veh/h) | 37 | 170 | 205 | 6 | 4 | 120 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 40 | 185 | 223 | 7 | 4 | 130 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 230 | | | | 492 | 227 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 230 | | | | 492 | 227 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 99 | 84 |
| cM capacity (veh/h) | 1338 | | | | 520 | 813 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 225 | 230 | 4 | 130 |
| Volume Left | 40 | 0 | 4 | 0 |
| Volume Right | 0 | 7 | 0 | 130 |
| cSH | 1338 | 1700 | 520 | 813 |
| Volume to Capacity | 0.03 | 0.14 | 0.01 | 0.16 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.2 | 4.3 |
| Control Delay (s/veh) | 1.6 | 0.0 | 12.0 | 10.3 |
| Lane LOS | A | | B | B |
| Approach Delay (s/veh) | 1.6 | 0.0 | 10.3 | |
| Approach LOS | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.0 | | | |
| Intersection Capacity Utilization | 35.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 148 | 152 | 6 | 6 | 59 |
| Future Volume (Veh/h) | 26 | 148 | 152 | 6 | 6 | 59 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 28 | 161 | 165 | 7 | 7 | 64 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 172 | | | | 386 | 169 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 172 | | | | 386 | 169 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 99 | 93 |
| cM capacity (veh/h) | 1405 | | | | 605 | 876 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 189 | 172 | 7 | 64 |
| Volume Left | 28 | 0 | 7 | 0 |
| Volume Right | 0 | 7 | 0 | 64 |
| cSH | 1405 | 1700 | 605 | 876 |
| Volume to Capacity | 0.02 | 0.10 | 0.01 | 0.07 |
| Queue Length 95th (m) | 0.5 | 0.0 | 0.3 | 1.8 |
| Control Delay (s/veh) | 1.3 | 0.0 | 11.0 | 9.4 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 1.3 | 0.0 | 9.6 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 30.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 99 | 13 | 5 | 160 | 77 | 40 |
| Future Volume (Veh/h) | 99 | 13 | 5 | 160 | 77 | 40 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 108 | 14 | 5 | 174 | 84 | 43 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 290 | 106 | 127 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 290 | 106 | 127 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 85 | 99 | 100 | | | |
| cM capacity (veh/h) | 699 | 949 | 1459 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 108 | 14 | 179 | 127 |
| Volume Left | 108 | 0 | 5 | 0 |
| Volume Right | 0 | 14 | 0 | 43 |
| cSH | 699 | 949 | 1459 | 1700 |
| Volume to Capacity | 0.15 | 0.01 | 0.00 | 0.07 |
| Queue Length 95th (m) | 4.1 | 0.3 | 0.1 | 0.0 |
| Control Delay (s/veh) | 11.1 | 8.9 | 0.2 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 10.8 | | 0.2 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 3.2 | |
| Intersection Capacity Utilization | | | 24.6% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |







| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 609 | 86 | 262 | 558 | 115 | 237 |
| Future Volume (Veh/h) | 609 | 86 | 262 | 558 | 115 | 237 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 648 | 91 | 279 | 594 | 122 | 252 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 739 | | 1846 | 370 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 739 | | 1846 | 370 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.6 | 3.3 |
| p0 queue free % | | | 68 | | 0 | 60 |
| cM capacity (veh/h) | | | 870 | | 43 | 631 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 432 | 307 | 279 | 594 | 122 | 252 |
| Volume Left | 0 | 0 | 279 | 0 | 122 | 0 |
| Volume Right | 0 | 91 | 0 | 0 | 0 | 252 |
| cSH | 1700 | 1700 | 870 | 1700 | 43 | 631 |
| Volume to Capacity | 0.25 | 0.18 | 0.32 | 0.35 | 2.87 | 0.40 |
| Queue Length 95th (m) | 0.0 | 0.0 | 10.6 | 0.0 | 101.5 | 14.6 |
| Control Delay (s/veh) | 0.0 | 0.0 | 11.1 | 0.0 | 1044.0 | 14.5 |
| Lane LOS | | | B | | F | B |
| Approach Delay (s/veh) | 0.0 | | 3.5 | | 350.3 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 67.5 | |
| Intersection Capacity Utilization | | | 50.5% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 147 | 23 | 233 | 160 | 161 | 8 | 352 | 215 | 134 | 383 | 18 |
| Future Volume (vph) | 18 | 147 | 23 | 233 | 160 | 161 | 8 | 352 | 215 | 134 | 383 | 18 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 1.00 | | 0.97 | | 1.00 | 0.97 | | 1.00 | |
| Frt | | 0.983 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | 0.999 | | | 0.988 | |
| Satd. Flow (prot) | 0 | 1778 | 0 | 1755 | 1830 | 1570 | 0 | 1809 | 1570 | 0 | 3385 | 0 |
| Flt Permitted | | 0.952 | | 0.376 | | | | 0.986 | | | 0.693 | |
| Satd. Flow (perm) | 0 | 1700 | 0 | 692 | 1830 | 1525 | 0 | 1786 | 1524 | 0 | 2372 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 9 | | | | 187 | | | 250 | | 5 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 2 | | 6 | 6 | | 2 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 16% | 5% | 0% | 4% | 5% | 4% | 100% | 4% | 4% | 15% | 3% | 0% |
| Adj. Flow (vph) | 21 | 171 | 27 | 271 | 186 | 187 | 9 | 409 | 250 | 156 | 445 | 21 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 219 | 0 | 271 | 186 | 187 | 0 | 418 | 250 | 0 | 622 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 14.6 | | 28.0 | 25.6 | 25.6 | | 43.5 | 43.5 | | 43.5 | |
| Actuated g/C Ratio | | 0.18 | | 0.35 | 0.32 | 0.32 | | 0.54 | 0.54 | | 0.54 | |
| v/c Ratio | | 0.69 | | 0.78 | 0.32 | 0.30 | | 0.43 | 0.27 | | 0.48 | |

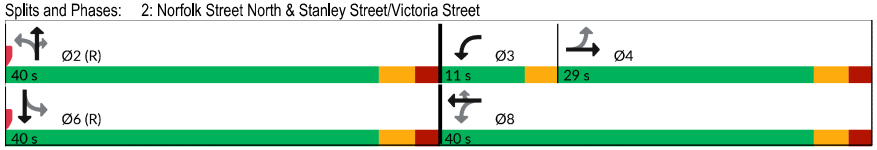


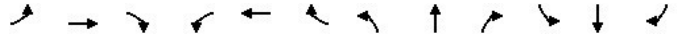


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.5 | | 36.7 | 21.3 | 4.3 | | 11.3 | 1.9 | | 13.6 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.5 | | 36.7 | 21.3 | 4.3 | | 11.3 | 1.9 | | 13.6 | |
| LOS | | D | | D | C | A | | B | A | | B | |
| Approach Delay (s/veh) | | 40.5 | | | 22.8 | | | 7.8 | | | 13.6 | |
| Approach LOS | | D | | | C | | | A | | | B | |
| Queue Length 50th (m) | | 30.3 | | 31.4 | 21.3 | 0.0 | | 31.4 | 1.9 | | 27.9 | |
| Queue Length 95th (m) | | 45.0 | | 42.9 | 31.1 | 10.1 | | 47.8 | 6.6 | | 45.3 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 507 | | 348 | 791 | 765 | | 972 | 943 | | 1293 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.43 | | 0.78 | 0.24 | 0.24 | | 0.43 | 0.27 | | 0.48 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay (s/veh): 17.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 85.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 92 | 204 | 110 | 34 | 206 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Future Volume (vph) | 92 | 204 | 110 | 34 | 206 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 105 | 232 | 125 | 39 | 234 | 31 | 93 | 86 | 43 | 42 | 128 | 135 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 462 | 304 | 222 | 305 |
| Volume Left (vph) | 105 | 39 | 93 | 42 |
| Volume Right (vph) | 125 | 31 | 43 | 135 |
| Hadj (s) | 0.00 | 0.04 | 0.14 | -0.18 |
| Departure Headway (s) | 6.7 | 7.2 | 7.7 | 7.1 |
| Degree Utilization, x | 0.86 | 0.61 | 0.48 | 0.60 |
| Capacity (veh/h) | 462 | 455 | 421 | 466 |
| Control Delay (s/veh) | 38.8 | 20.6 | 17.5 | 20.4 |
| Approach Delay (s/veh) | 38.8 | 20.6 | 17.5 | 20.4 |
| Approach LOS | E | C | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 26.5 | |
| Level of Service | | | D | |
| Intersection Capacity Utilization | | | 70.0% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |



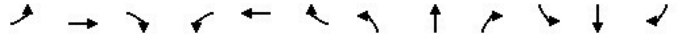


| Intersection | |
|---|---|
| Intersection Delay, s/veh | 24.6 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 92 | 204 | 110 | 34 | 206 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Future Vol, veh/h | 92 | 204 | 110 | 34 | 206 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 9 | 6 | 0 | 5 | 5 | 5 | 6 | 30 | 0 | 6 | 2 |
| Mvmt Flow | 105 | 232 | 125 | 39 | 234 | 31 | 93 | 86 | 43 | 42 | 128 | 135 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 35 | 19.6 | 16.9 | 19.5 |
| HCM LOS | D | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 23% | 13% | 14% |
| Vol Thru, % | 39% | 50% | 77% | 42% |
| Vol Right, % | 19% | 27% | 10% | 44% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 196 | 406 | 267 | 269 |
| LT Vol | 82 | 92 | 34 | 37 |
| Through Vol | 76 | 204 | 206 | 113 |
| RT Vol | 38 | 110 | 27 | 119 |
| Lane Flow Rate | 223 | 461 | 303 | 306 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.462 | 0.839 | 0.588 | 0.589 |
| Departure Headway (Hd) | 7.474 | 6.544 | 6.974 | 6.937 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 481 | 554 | 516 | 520 |
| Service Time | 5.546 | 4.599 | 5.038 | 5.002 |
| HCM Lane V/C Ratio | 0.464 | 0.832 | 0.587 | 0.588 |
| HCM Control Delay, s/veh | 16.9 | 35 | 19.6 | 19.5 |
| HCM Lane LOS | C | D | C | C |
| HCM 95th-tile Q | 2.4 | 8.7 | 3.7 | 3.8 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 85 | 149 | 51 | 49 | 139 | 55 | 55 | 229 | 49 | 63 | 212 | 71 |
| Future Volume (vph) | 85 | 149 | 51 | 49 | 139 | 55 | 55 | 229 | 49 | 63 | 212 | 71 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 92 | 162 | 55 | 53 | 151 | 60 | 60 | 249 | 53 | 68 | 230 | 77 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 309 | 264 | 362 | 298 | 77 |
| Volume Left (vph) | 92 | 53 | 60 | 68 | 0 |
| Volume Right (vph) | 55 | 60 | 53 | 0 | 77 |
| Hadj (s) | 0.12 | -0.08 | -0.01 | 0.16 | -0.63 |
| Departure Headway (s) | 7.4 | 7.4 | 7.2 | 7.8 | 7.0 |
| Degree Utilization, x | 0.64 | 0.54 | 0.73 | 0.64 | 0.15 |
| Capacity (veh/h) | 444 | 433 | 464 | 430 | 479 |
| Control Delay (s/veh) | 22.7 | 18.9 | 27.1 | 22.6 | 10.0 |
| Approach Delay (s/veh) | 22.7 | 18.9 | 27.1 | 20.0 | |
| Approach LOS | C | C | D | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | 22.4 | | |
| Level of Service | | C | | |
| Intersection Capacity Utilization | 67.3% | ICU Level of Service | C | |
| Analysis Period (min) | | 15 | | |
| Description: SBR SLIP THROUGH FOR WIDE ROW | | | | |



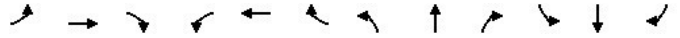


| Intersection | |
|---|---|
| Intersection Delay, s/veh | 23 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 85 | 149 | 51 | 49 | 139 | 55 | 55 | 229 | 49 | 63 | 212 | 71 |
| Future Vol, veh/h | 85 | 149 | 51 | 49 | 139 | 55 | 55 | 229 | 49 | 63 | 212 | 71 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 5 | 8 | 22 | 0 | 0 | 3 | 9 | 1 | 5 | 5 | 2 | 4 |
| Mvmt Flow | 92 | 162 | 55 | 53 | 151 | 60 | 60 | 249 | 53 | 68 | 230 | 77 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 2 | 1 | 1 |
| HCM Control Delay, s/veh | 22.5 | 19.1 | 28.1 | 21.2 |
| HCM LOS | C | C | D | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 17% | 30% | 20% | 23% | 0% |
| Vol Thru, % | 69% | 52% | 57% | 77% | 0% |
| Vol Right, % | 15% | 18% | 23% | 0% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 333 | 285 | 243 | 275 | 71 |
| LT Vol | 55 | 85 | 49 | 63 | 0 |
| Through Vol | 229 | 149 | 139 | 212 | 0 |
| RT Vol | 49 | 51 | 55 | 0 | 71 |
| Lane Flow Rate | 362 | 310 | 264 | 299 | 77 |
| Geometry Grp | 4a | 2 | 2 | 5 | 5 |
| Degree of Util (X) | 0.734 | 0.635 | 0.545 | 0.648 | 0.148 |
| Departure Headway (Hd) | 7.302 | 7.385 | 7.422 | 7.799 | 6.908 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 492 | 486 | 483 | 463 | 517 |
| Service Time | 5.37 | 5.455 | 5.495 | 5.566 | 4.674 |
| HCM Lane V/C Ratio | 0.736 | 0.638 | 0.547 | 0.646 | 0.149 |
| HCM Control Delay, s/veh | 28.1 | 22.5 | 19.1 | 23.9 | 10.9 |
| HCM Lane LOS | D | C | C | C | B |
| HCM 95th-tile Q | 6 | 4.4 | 3.2 | 4.5 | 0.5 |



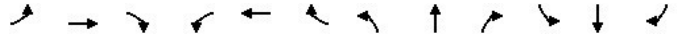
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 58 | 77 | 15 | 4 | 56 | 15 | 10 | 46 | 2 | 42 | 83 | 65 |
| Future Volume (Veh/h) | 58 | 77 | 15 | 4 | 56 | 15 | 10 | 46 | 2 | 42 | 83 | 65 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Hourly flow rate (vph) | 65 | 87 | 17 | 4 | 63 | 17 | 11 | 52 | 2 | 47 | 93 | 73 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 80 | | | 104 | | | 425 | 314 | 96 | 333 | 314 | 72 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 80 | | | 104 | | | 425 | 314 | 96 | 333 | 314 | 72 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.4 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 97 | 91 | 100 | 91 | 84 | 93 |
| cM capacity (veh/h) | 1512 | | | 1500 | | | 393 | 571 | 967 | 553 | 568 | 988 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 169 | 84 | 65 | 213 |
| Volume Left | 65 | 4 | 11 | 47 |
| Volume Right | 17 | 17 | 2 | 73 |
| cSH | 1512 | 1500 | 537 | 660 |
| Volume to Capacity | 0.04 | 0.00 | 0.12 | 0.32 |
| Queue Length 95th (m) | 1.0 | 0.1 | 3.1 | 10.6 |
| Control Delay (s/veh) | 3.1 | 0.4 | 12.6 | 13.0 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.1 | 0.4 | 12.6 | 13.0 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | | | 7.8 | | |
| Intersection Capacity Utilization | | | 37.1% | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | |





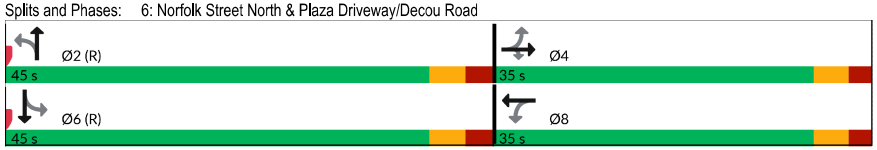


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 54 | 72 | 117 | 28 | 83 | 27 | 338 | 133 | 128 | 450 | 13 |
| Future Volume (vph) | 86 | 54 | 72 | 117 | 28 | 83 | 27 | 338 | 133 | 128 | 450 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.96 | 0.98 | 0.99 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.888 | | | 0.960 | | | 0.997 | |
| Flt Protected | | 0.970 | | 0.950 | | | | 0.997 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1841 | 1601 | 1690 | 1578 | 0 | 0 | 3354 | 0 | 0 | 3486 | 0 |
| Flt Permitted | | 0.739 | | 0.648 | | | | 0.895 | | | 0.704 | |
| Satd. Flow (perm) | 0 | 1398 | 1542 | 1129 | 1578 | 0 | 0 | 3009 | 0 | 0 | 2481 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 94 | | | 91 | | | 4 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 5 | | 22 | 22 | | 5 | 17 | | | | | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 0% | 2% | 8% | 0% | 9% | 0% | 3% | 8% | 4% | 3% | 0% |
| Adj. Flow (vph) | 98 | 61 | 82 | 133 | 32 | 94 | 31 | 384 | 151 | 145 | 511 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 159 | 82 | 133 | 126 | 0 | 0 | 566 | 0 | 0 | 671 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.6 | 21.6 | 21.6 | 21.6 | | | 47.2 | | | 47.2 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.42 | 0.17 | 0.44 | 0.26 | | | 0.31 | | | 0.46 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 27.9 | 6.5 | 29.2 | 9.4 | | | 7.4 | | | 7.8 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 27.9 | 6.5 | 29.2 | 9.4 | | | 7.4 | | | 7.8 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 20.6 | | | 19.6 | | | 7.4 | | | 7.8 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 20.1 | 0.0 | 16.9 | 3.7 | | | 16.4 | | | 24.9 | |
| Queue Length 95th (m) | | 34.1 | 8.7 | 30.4 | 14.5 | | | 26.5 | | | 31.3 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 517 | 622 | 417 | 643 | | | 1813 | | | 1466 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.31 | 0.13 | 0.32 | 0.20 | | | 0.31 | | | 0.46 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.46 | | | |
| Intersection Signal Delay (s/veh): 11.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road



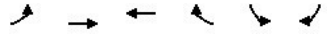





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 97 | 196 | 142 | 11 | 3 | 73 |
| Future Volume (Veh/h) | 97 | 196 | 142 | 11 | 3 | 73 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 105 | 213 | 154 | 12 | 3 | 79 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 166 | | | | 583 | 160 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 166 | | | | 583 | 160 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 93 | | | | 99 | 91 |
| cM capacity (veh/h) | 1412 | | | | 439 | 885 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 318 | 166 | 3 | 79 |
| Volume Left | 105 | 0 | 3 | 0 |
| Volume Right | 0 | 12 | 0 | 79 |
| cSH | 1412 | 1700 | 439 | 885 |
| Volume to Capacity | 0.07 | 0.10 | 0.01 | 0.09 |
| Queue Length 95th (m) | 1.8 | 0.0 | 0.2 | 2.2 |
| Control Delay (s/veh) | 3.0 | 0.0 | 13.3 | 9.5 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 3.0 | 0.0 | 9.6 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 3.1 | | |
| Intersection Capacity Utilization | | 37.2% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 56 | 143 | 117 | 11 | 5 | 36 |
| Future Volume (Veh/h) | 56 | 143 | 117 | 11 | 5 | 36 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 61 | 155 | 127 | 12 | 5 | 39 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 139 | | | | 410 | 133 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 139 | | | | 410 | 133 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 99 | 96 |
| cM capacity (veh/h) | 1445 | | | | 573 | 916 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 216 | 139 | 5 | 39 |
| Volume Left | 61 | 0 | 5 | 0 |
| Volume Right | 0 | 12 | 0 | 39 |
| cSH | 1445 | 1700 | 573 | 916 |
| Volume to Capacity | 0.04 | 0.08 | 0.01 | 0.04 |
| Queue Length 95th (m) | 1.0 | 0.0 | 0.2 | 1.0 |
| Control Delay (s/veh) | 2.4 | 0.0 | 11.3 | 9.1 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 2.4 | 0.0 | 9.4 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.3 | | | |
| Intersection Capacity Utilization | 30.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 76 | 11 | 6 | 111 | 176 | 90 |
| Future Volume (Veh/h) | 76 | 11 | 6 | 111 | 176 | 90 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 83 | 12 | 7 | 121 | 191 | 98 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 375 | 240 | 289 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 375 | 240 | 289 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 87 | 98 | 99 | | | |
| cM capacity (veh/h) | 623 | 799 | 1273 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 83 | 12 | 128 | 289 |
| Volume Left | 83 | 0 | 7 | 0 |
| Volume Right | 0 | 12 | 0 | 98 |
| cSH | 623 | 799 | 1273 | 1700 |
| Volume to Capacity | 0.13 | 0.02 | 0.01 | 0.17 |
| Queue Length 95th (m) | 3.5 | 0.3 | 0.1 | 0.0 |
| Control Delay (s/veh) | 11.7 | 9.6 | 0.5 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 11.4 | | 0.5 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.2 | | | |
| Intersection Capacity Utilization | 25.6% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 378 | 115 | 205 | 565 | 87 | 204 |
| Future Volume (Veh/h) | 378 | 115 | 205 | 565 | 87 | 204 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 411 | 125 | 223 | 614 | 95 | 222 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 536 | | 1534 | 268 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 536 | | 1534 | 268 |
| tC, single (s) | | | 4.1 | | 6.9 | 7.0 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.4 |
| p0 queue free % | | | 78 | | 0 | 69 |
| cM capacity (veh/h) | | | 1035 | | 82 | 721 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 274 | 262 | 223 | 614 | 95 | 222 |
| Volume Left | 0 | 0 | 223 | 0 | 95 | 0 |
| Volume Right | 0 | 125 | 0 | 0 | 0 | 222 |
| cSH | 1700 | 1700 | 1035 | 1700 | 82 | 721 |
| Volume to Capacity | 0.16 | 0.15 | 0.22 | 0.36 | 1.15 | 0.31 |
| Queue Length 95th (m) | 0.0 | 0.0 | 6.2 | 0.0 | 51.7 | 9.9 |
| Control Delay (s/veh) | 0.0 | 0.0 | 9.4 | 0.0 | 237.2 | 12.2 |
| Lane LOS | | | A | | F | B |
| Approach Delay (s/veh) | 0.0 | | 2.5 | | 79.6 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 16.2 | | | |
| Intersection Capacity Utilization | 41.2% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |



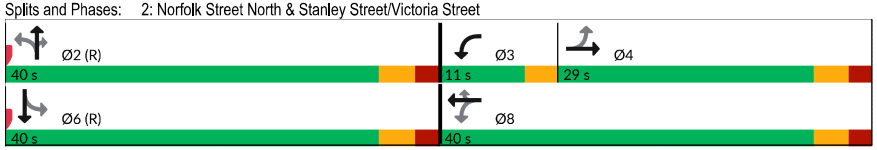


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 148 | 12 | 298 | 170 | 201 | 21 | 406 | 288 | 97 | 234 | 12 |
| Future Volume (vph) | 15 | 148 | 12 | 298 | 170 | 201 | 21 | 406 | 288 | 97 | 234 | 12 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 0.99 | | 0.97 | | 1.00 | 0.96 | | 1.00 | |
| Frt | | 0.991 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.996 | | 0.950 | | | | 0.998 | | | 0.986 | |
| Satd. Flow (prot) | 0 | 1714 | 0 | 1738 | 1795 | 1458 | 0 | 1814 | 1555 | 0 | 3259 | 0 |
| Flt Permitted | | 0.958 | | 0.402 | | | | 0.971 | | | 0.692 | |
| Satd. Flow (perm) | 0 | 1648 | 0 | 730 | 1795 | 1421 | 0 | 1764 | 1500 | 0 | 2283 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 5 | | | | 226 | | | 324 | | 5 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 3 | | 12 | 12 | | 3 | 7 | | 10 | 10 | | 7 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles (%) | 10% | 10% | 17% | 5% | 7% | 12% | 0% | 6% | 5% | 8% | 11% | 0% |
| Adj. Flow (vph) | 17 | 166 | 13 | 335 | 191 | 226 | 24 | 456 | 324 | 109 | 263 | 13 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 196 | 0 | 335 | 191 | 226 | 0 | 480 | 324 | 0 | 385 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 14.0 | | 27.4 | 25.0 | 25.0 | | 44.1 | 44.1 | | 44.1 | |
| Actuated g/C Ratio | | 0.18 | | 0.34 | 0.31 | 0.31 | | 0.55 | 0.55 | | 0.55 | |
| v/c Ratio | | 0.67 | | 0.95 | 0.34 | 0.38 | | 0.49 | 0.33 | | 0.31 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 41.0 | | 62.9 | 22.1 | 4.6 | | 10.8 | 1.5 | | 11.1 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 41.0 | | 62.9 | 22.1 | 4.6 | | 10.8 | 1.5 | | 11.1 | |
| LOS | | D | | E | C | A | | B | A | | B | |
| Approach Delay (s/veh) | | 41.0 | | | 35.0 | | | 7.0 | | | 11.1 | |
| Approach LOS | | D | | | D | | | A | | | B | |
| Queue Length 50th (m) | | 27.6 | | 41.2 | 22.3 | 0.0 | | 32.0 | 1.3 | | 14.9 | |
| Queue Length 95th (m) | | 43.7 | | #73.6 | 34.1 | 12.4 | | 50.2 | 6.1 | | 27.1 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 489 | | 351 | 776 | 742 | | 972 | 972 | | 1260 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.40 | | 0.95 | 0.25 | 0.30 | | 0.49 | 0.33 | | 0.31 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.95 | | | |
| Intersection Signal Delay (s/veh): 20.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 90.9% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street








| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 93 | 170 | 56 | 24 | 292 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Future Volume (vph) | 93 | 170 | 56 | 24 | 292 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 113 | 207 | 68 | 29 | 356 | 30 | 161 | 145 | 54 | 20 | 68 | 126 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 388 | 415 | 360 | 214 |
| Volume Left (vph) | 113 | 29 | 161 | 20 |
| Volume Right (vph) | 68 | 30 | 54 | 126 |
| Hadj (s) | 0.09 | 0.08 | 0.18 | -0.18 |
| Departure Headway (s) | 7.8 | 7.7 | 8.1 | 8.4 |
| Degree Utilization, x | 0.84 | 0.89 | 0.81 | 0.50 |
| Capacity (veh/h) | 388 | 452 | 425 | 379 |
| Control Delay (s/veh) | 40.4 | 46.9 | 37.1 | 19.5 |
| Approach Delay (s/veh) | 40.4 | 46.9 | 37.1 | 19.5 |
| Approach LOS | E | E | E | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | 38.2 | | |
| Level of Service | | E | | |
| Intersection Capacity Utilization | | 77.3% | ICU Level of Service | D |
| Analysis Period (min) | | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 41.4 |
| Intersection LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 93 | 170 | 56 | 24 | 292 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Future Vol, veh/h | 93 | 170 | 56 | 24 | 292 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 10 | 8 | 6 | 23 | 5 | 5 | 13 | 12 | 0 | 0 | 15 | 7 |
| Mvmt Flow | 113 | 207 | 68 | 29 | 356 | 30 | 161 | 145 | 54 | 20 | 68 | 126 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 42.2 | 54.5 | 38.5 | 19.5 |
| HCM LOS | E | F | E | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 29% | 7% | 9% |
| Vol Thru, % | 40% | 53% | 86% | 32% |
| Vol Right, % | 15% | 18% | 7% | 59% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 295 | 319 | 341 | 175 |
| LT Vol | 132 | 93 | 24 | 16 |
| Through Vol | 119 | 170 | 292 | 56 |
| RT Vol | 44 | 56 | 25 | 103 |
| Lane Flow Rate | 360 | 389 | 416 | 213 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.814 | 0.852 | 0.924 | 0.499 |
| Departure Headway (Hd) | 8.148 | 7.88 | 7.999 | 8.411 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 443 | 455 | 449 | 431 |
| Service Time | 6.245 | 5.979 | 6.096 | 6.411 |
| HCM Lane V/C Ratio | 0.813 | 0.855 | 0.927 | 0.494 |
| HCM Control Delay, s/veh | 38.5 | 42.2 | 54.5 | 19.5 |
| HCM Lane LOS | E | E | F | C |
| HCM 95th-tile Q | 7.5 | 8.5 | 10.5 | 2.7 |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 94 | 115 | 29 | 59 | 211 | 46 | 53 | 198 | 47 | 44 | 183 | 75 |
| Future Volume (vph) | 94 | 115 | 29 | 59 | 211 | 46 | 53 | 198 | 47 | 44 | 183 | 75 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 107 | 131 | 33 | 67 | 240 | 52 | 60 | 225 | 53 | 50 | 208 | 85 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 271 | 359 | 338 | 258 | 85 |
| Volume Left (vph) | 107 | 67 | 60 | 50 | 0 |
| Volume Right (vph) | 33 | 52 | 53 | 0 | 85 |
| Hadj (s) | 0.15 | 0.02 | 0.08 | 0.17 | -0.62 |
| Departure Headway (s) | 7.6 | 7.2 | 7.5 | 8.0 | 7.2 |
| Degree Utilization, x | 0.58 | 0.72 | 0.70 | 0.57 | 0.17 |
| Capacity (veh/h) | 424 | 466 | 446 | 412 | 454 |
| Control Delay (s/veh) | 20.5 | 26.9 | 26.2 | 20.0 | 10.5 |
| Approach Delay (s/veh) | 20.5 | 26.9 | 26.2 | 17.7 | |
| Approach LOS | C | D | D | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | 23.0 | | | |
| Level of Service | C | | | |
| Intersection Capacity Utilization | 63.2% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |
| Description: SBR SLIP THROUGH FOR WIDE ROW | | | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 24 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 94 | 115 | 29 | 59 | 211 | 46 | 53 | 198 | 47 | 44 | 183 | 75 |
| Future Vol, veh/h | 94 | 115 | 29 | 59 | 211 | 46 | 53 | 198 | 47 | 44 | 183 | 75 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 10 | 2 | 28 | 4 | 5 | 0 | 15 | 8 | 0 | 10 | 3 | 5 |
| Mvmt Flow | 107 | 131 | 33 | 67 | 240 | 52 | 60 | 225 | 53 | 50 | 208 | 85 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 2 | 1 | 1 |
| HCM Control Delay, s/veh | 21 | 27.6 | 27.7 | 19.1 |
| HCM LOS | C | D | D | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 18% | 39% | 19% | 19% | 0% |
| Vol Thru, % | 66% | 48% | 67% | 81% | 0% |
| Vol Right, % | 16% | 12% | 15% | 0% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 298 | 238 | 316 | 227 | 75 |
| LT Vol | 53 | 94 | 59 | 44 | 0 |
| Through Vol | 198 | 115 | 211 | 183 | 0 |
| RT Vol | 47 | 29 | 46 | 0 | 75 |
| Lane Flow Rate | 339 | 270 | 359 | 258 | 85 |
| Geometry Grp | 4a | 2 | 2 | 5 | 5 |
| Degree of Util (X) | 0.715 | 0.58 | 0.727 | 0.581 | 0.17 |
| Departure Headway (Hd) | 7.602 | 7.726 | 7.292 | 8.11 | 7.165 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 474 | 465 | 496 | 444 | 499 |
| Service Time | 5.674 | 5.803 | 5.362 | 5.881 | 4.936 |
| HCM Lane V/C Ratio | 0.715 | 0.581 | 0.724 | 0.581 | 0.17 |
| HCM Control Delay, s/veh | 27.7 | 21 | 27.6 | 21.6 | 11.4 |
| HCM Lane LOS | D | C | D | C | B |
| HCM 95th-tile Q | 5.6 | 3.6 | 5.9 | 3.6 | 0.6 |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 80 | 83 | 10 | 2 | 104 | 35 | 16 | 68 | 0 | 25 | 20 | 55 |
| Future Volume (Veh/h) | 80 | 83 | 10 | 2 | 104 | 35 | 16 | 68 | 0 | 25 | 20 | 55 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 92 | 95 | 11 | 2 | 120 | 40 | 18 | 78 | 0 | 29 | 23 | 63 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 160 | | | 106 | | | 503 | 449 | 101 | 468 | 434 | 140 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 160 | | | 106 | | | 503 | 449 | 101 | 468 | 434 | 140 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.8 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.1 | 4.1 | 3.3 |
| p0 queue free % | 94 | | | 100 | | | 96 | 83 | 100 | 92 | 95 | 93 |
| cM capacity (veh/h) | 1432 | | | 1498 | | | 411 | 471 | 955 | 343 | 470 | 913 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 198 | 162 | 96 | 115 |
| Volume Left | 92 | 2 | 18 | 29 |
| Volume Right | 11 | 40 | 0 | 63 |
| cSH | 1432 | 1498 | 458 | 568 |
| Volume to Capacity | 0.06 | 0.00 | 0.21 | 0.20 |
| Queue Length 95th (m) | 1.6 | 0.0 | 5.9 | 5.7 |
| Control Delay (s/veh) | 3.9 | 0.1 | 14.9 | 12.9 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.9 | 0.1 | 14.9 | 12.9 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 6.5 | | | |
| Intersection Capacity Utilization | 35.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 42 | 29 | 191 | 23 | 195 | 25 | 466 | 114 | 91 | 318 | 4 |
| Future Volume (vph) | 83 | 42 | 29 | 191 | 23 | 195 | 25 | 466 | 114 | 91 | 318 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.99 | 1.00 | 0.98 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.866 | | | 0.972 | | | 0.998 | |
| Flt Protected | | 0.968 | | 0.950 | | | | 0.998 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1835 | 1633 | 1738 | 1565 | 0 | 0 | 3323 | 0 | 0 | 3299 | 0 |
| Flt Permitted | | 0.564 | | 0.661 | | | | 0.919 | | | 0.674 | |
| Satd. Flow (perm) | 0 | 1065 | 1610 | 1207 | 1565 | 0 | 0 | 3058 | 0 | 0 | 2248 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 38 | | 235 | | | 49 | | | 2 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 8 | | 2 | 2 | | 8 | 23 | | | | | 23 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 0% | 4% | 0% | 5% | 7% | 4% | 6% | 5% | 13% | 17% | 7% | 0% |
| Adj. Flow (vph) | 100 | 51 | 35 | 230 | 28 | 235 | 30 | 561 | 137 | 110 | 383 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 151 | 35 | 230 | 263 | 0 | 0 | 728 | 0 | 0 | 498 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 24.6 | 24.6 | 24.6 | 24.6 | | | 44.2 | | | 44.2 | |
| Actuated g/C Ratio | | 0.31 | 0.31 | 0.31 | 0.31 | | | 0.55 | | | 0.55 | |
| v/c Ratio | | 0.46 | 0.07 | 0.62 | 0.41 | | | 0.43 | | | 0.40 | |

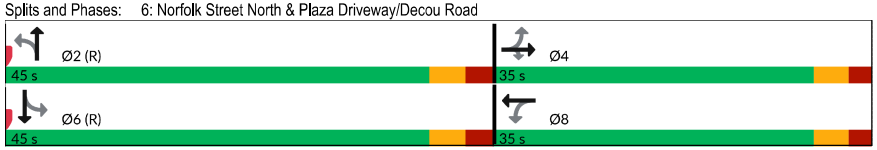


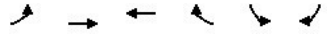


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 26.6 | 6.0 | 31.1 | 5.8 | | | 11.2 | | | 9.1 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 26.6 | 6.0 | 31.1 | 5.8 | | | 11.2 | | | 9.1 | |
| LOS | | C | A | C | A | | | B | | | A | |
| Approach Delay (s/veh) | | 22.7 | | | 17.6 | | | 11.2 | | | 9.1 | |
| Approach LOS | | C | | | B | | | B | | | A | |
| Queue Length 50th (m) | | 18.7 | 0.0 | 30.2 | 3.0 | | | 28.2 | | | 21.1 | |
| Queue Length 95th (m) | | 28.8 | 4.4 | 42.6 | 13.5 | | | 42.6 | | | m26.3 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 394 | 619 | 446 | 727 | | | 1712 | | | 1243 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.38 | 0.06 | 0.52 | 0.36 | | | 0.43 | | | 0.40 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.62 | | | |
| Intersection Signal Delay (s/veh): 13.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 95.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road





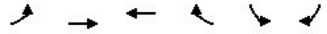
| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 37 | 185 | 220 | 6 | 4 | 120 |
| Future Volume (Veh/h) | 37 | 185 | 220 | 6 | 4 | 120 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 40 | 201 | 239 | 7 | 4 | 130 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 246 | | | | 524 | 243 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 246 | | | | 524 | 243 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 99 | 84 |
| cM capacity (veh/h) | 1320 | | | | 498 | 796 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 241 | 246 | 4 | 130 |
| Volume Left | 40 | 0 | 4 | 0 |
| Volume Right | 0 | 7 | 0 | 130 |
| cSH | 1320 | 1700 | 498 | 796 |
| Volume to Capacity | 0.03 | 0.14 | 0.01 | 0.16 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.2 | 4.4 |
| Control Delay (s/veh) | 1.5 | 0.0 | 12.3 | 10.4 |
| Lane LOS | A | | B | B |
| Approach Delay (s/veh) | 1.5 | 0.0 | 10.5 | |
| Approach LOS | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.8 | | | |
| Intersection Capacity Utilization | 37.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 163 | 167 | 6 | 6 | 59 |
| Future Volume (Veh/h) | 26 | 163 | 167 | 6 | 6 | 59 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 28 | 177 | 182 | 7 | 7 | 64 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 189 | | | | 419 | 186 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 189 | | | | 419 | 186 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 99 | 93 |
| cM capacity (veh/h) | 1385 | | | | 579 | 857 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 205 | 189 | 7 | 64 |
| Volume Left | 28 | 0 | 7 | 0 |
| Volume Right | 0 | 7 | 0 | 64 |
| cSH | 1385 | 1700 | 579 | 857 |
| Volume to Capacity | 0.02 | 0.11 | 0.01 | 0.07 |
| Queue Length 95th (m) | 0.5 | 0.0 | 0.3 | 1.8 |
| Control Delay (s/veh) | 1.2 | 0.0 | 11.3 | 9.5 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 1.2 | 0.0 | 9.7 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.0 | | | |
| Intersection Capacity Utilization | 32.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



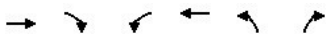
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 99 | 13 | 5 | 176 | 84 | 40 |
| Future Volume (Veh/h) | 99 | 13 | 5 | 176 | 84 | 40 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 108 | 14 | 5 | 191 | 91 | 43 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 314 | 113 | 134 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 314 | 113 | 134 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 84 | 99 | 100 | | | |
| cM capacity (veh/h) | 677 | 940 | 1451 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 108 | 14 | 196 | 134 |
| Volume Left | 108 | 0 | 5 | 0 |
| Volume Right | 0 | 14 | 0 | 43 |
| cSH | 677 | 940 | 1451 | 1700 |
| Volume to Capacity | 0.16 | 0.01 | 0.00 | 0.08 |
| Queue Length 95th (m) | 4.3 | 0.3 | 0.1 | 0.0 |
| Control Delay (s/veh) | 11.3 | 8.9 | 0.2 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 11.0 | | 0.2 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 3.1 | |
| Intersection Capacity Utilization | | | 25.4% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |







| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 634 | 89 | 268 | 580 | 119 | 244 |
| Future Volume (Veh/h) | 634 | 89 | 268 | 580 | 119 | 244 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 674 | 95 | 285 | 617 | 127 | 260 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 769 | | 1909 | 385 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 769 | | 1909 | 385 |
| tC, single (s) | | | 4.1 | | 6.9 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.6 | 3.3 |
| p0 queue free % | | | 66 | | 0 | 58 |
| cM capacity (veh/h) | | | 848 | | 38 | 617 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 449 | 320 | 285 | 617 | 127 | 260 |
| Volume Left | 0 | 0 | 285 | 0 | 127 | 0 |
| Volume Right | 0 | 95 | 0 | 0 | 0 | 260 |
| cSH | 1700 | 1700 | 848 | 1700 | 38 | 617 |
| Volume to Capacity | 0.26 | 0.19 | 0.34 | 0.36 | 3.37 | 0.42 |
| Queue Length 95th (m) | 0.0 | 0.0 | 11.3 | 0.0 | Err | 15.9 |
| Control Delay (s/veh) | 0.0 | 0.0 | 11.4 | 0.0 | Err | 15.0 |
| Lane LOS | | | B | | F | C |
| Approach Delay (s/veh) | 0.0 | | 3.6 | | 3291.4 | |
| Approach LOS | | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 620.5 | |
| Intersection Capacity Utilization | | | 51.8% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 153 | 24 | 243 | 166 | 166 | 8 | 366 | 223 | 137 | 398 | 18 |
| Future Volume (vph) | 18 | 153 | 24 | 243 | 166 | 166 | 8 | 366 | 223 | 137 | 398 | 18 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 48.0 | | 231.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 32.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | | 1.00 | | 0.97 | | 1.00 | 0.97 | | 1.00 | |
| Frt | | 0.983 | | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | 0.999 | | | 0.988 | |
| Satd. Flow (prot) | 0 | 1779 | 0 | 1755 | 1830 | 1570 | 0 | 1811 | 1570 | 0 | 3387 | 0 |
| Flt Permitted | | 0.954 | | 0.368 | | | | 0.986 | | | 0.685 | |
| Satd. Flow (perm) | 0 | 1704 | 0 | 677 | 1830 | 1525 | 0 | 1787 | 1524 | 0 | 2346 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 9 | | | | 193 | | | 259 | | 5 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 219.3 | | | 1336.4 | | | 1371.0 | | | 290.8 | |
| Travel Time (s) | | 15.8 | | | 96.2 | | | 98.7 | | | 20.9 | |
| Confl. Peds. (#/hr) | 5 | | 7 | 7 | | 5 | 2 | | 6 | 6 | | 2 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 16% | 5% | 0% | 4% | 5% | 4% | 100% | 4% | 4% | 15% | 3% | 0% |
| Adj. Flow (vph) | 21 | 178 | 28 | 283 | 193 | 193 | 9 | 426 | 259 | 159 | 463 | 21 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 227 | 0 | 283 | 193 | 193 | 0 | 435 | 259 | 0 | 643 | 0 |
| Turn Type | Perm | NA | | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 4 | 4 | | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 25.0 | 25.0 | 25.0 | 25.0 | 25.0 | |
| Minimum Split (s) | 28.4 | 28.4 | | 9.5 | 28.4 | 28.4 | 30.5 | 30.5 | 30.5 | 30.5 | 30.5 | |
| Total Split (s) | 29.0 | 29.0 | | 11.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 36.3% | 36.3% | | 13.8% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | |
| Maximum Green (s) | 23.6 | 23.6 | | 8.0 | 34.6 | 34.6 | 34.5 | 34.5 | 34.5 | 34.5 | 34.5 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.0 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | | 0.0 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 5.4 | | 3.0 | 5.4 | 5.4 | | 5.5 | 5.5 | | 5.5 | |
| Lead/Lag | Lag | Lag | | Lead | | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | | | | | | | | |
| Vehicle Extension (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Recall Mode | None | None | | None | None | None | C-Max | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 16.0 | 16.0 | | | 16.0 | 16.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Act Effct Green (s) | | 14.9 | | 28.3 | 25.9 | 25.9 | | 43.2 | 43.2 | | 43.2 | |
| Actuated g/C Ratio | | 0.19 | | 0.35 | 0.32 | 0.32 | | 0.54 | 0.54 | | 0.54 | |
| v/c Ratio | | 0.70 | | 0.82 | 0.33 | 0.31 | | 0.45 | 0.27 | | 0.51 | |

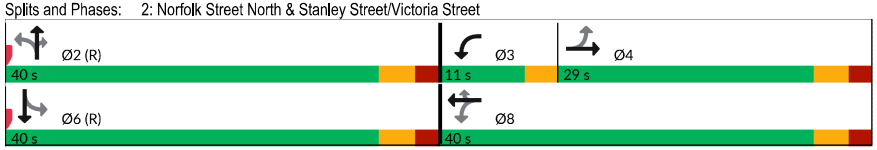


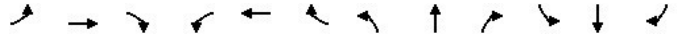


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 40.5 | | 40.2 | 21.2 | 4.2 | | 11.6 | 1.9 | | 14.2 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 40.5 | | 40.2 | 21.2 | 4.2 | | 11.6 | 1.9 | | 14.2 | |
| LOS | | D | | D | C | A | | B | A | | B | |
| Approach Delay (s/veh) | | 40.5 | | | 24.3 | | | 8.0 | | | 14.2 | |
| Approach LOS | | D | | | C | | | A | | | B | |
| Queue Length 50th (m) | | 31.4 | | 32.8 | 22.1 | 0.0 | | 32.7 | 1.9 | | 29.7 | |
| Queue Length 95th (m) | | 46.2 | | #45.6 | 31.9 | 10.1 | | 49.4 | 6.4 | | 48.4 | |
| Internal Link Dist (m) | | 195.3 | | | 1312.4 | | | 1347.0 | | | 266.8 | |
| Turn Bay Length (m) | | | | 48.0 | | 231.0 | | | | | | |
| Base Capacity (vph) | | 509 | | 346 | 791 | 769 | | 965 | 942 | | 1269 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | 0.45 | | 0.82 | 0.24 | 0.25 | | 0.45 | 0.27 | | 0.51 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 72 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.82 | | | |
| Intersection Signal Delay (s/veh): 18.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 86.6% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 2: Norfolk Street North & Stanley Street/Victoria Street





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 92 | 211 | 110 | 34 | 213 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Future Volume (vph) | 92 | 211 | 110 | 34 | 213 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 105 | 240 | 125 | 39 | 242 | 31 | 93 | 86 | 43 | 42 | 128 | 135 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 470 | 312 | 222 | 305 |
| Volume Left (vph) | 105 | 39 | 93 | 42 |
| Volume Right (vph) | 125 | 31 | 43 | 135 |
| Hadj (s) | 0.00 | 0.04 | 0.14 | -0.18 |
| Departure Headway (s) | 6.8 | 7.3 | 7.8 | 7.2 |
| Degree Utilization, x | 0.89 | 0.63 | 0.48 | 0.61 |
| Capacity (veh/h) | 513 | 460 | 418 | 463 |
| Control Delay (s/veh) | 42.5 | 21.8 | 17.9 | 21.0 |
| Approach Delay (s/veh) | 42.5 | 21.8 | 17.9 | 21.0 |
| Approach LOS | E | C | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | | 28.4 | |
| Level of Service | | | D | |
| Intersection Capacity Utilization | | | 70.7% | ICU Level of Service |
| Analysis Period (min) | | | 15 | |
| | | | | C |



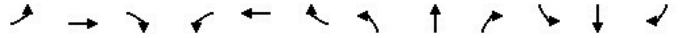


| Intersection | |
|---|---|
| Intersection Delay, s/veh | 26.1 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 92 | 211 | 110 | 34 | 213 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Future Vol, veh/h | 92 | 211 | 110 | 34 | 213 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 9 | 6 | 0 | 5 | 5 | 5 | 6 | 30 | 0 | 6 | 2 |
| Mvmt Flow | 105 | 240 | 125 | 39 | 242 | 31 | 93 | 86 | 43 | 42 | 128 | 135 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 37.9 | 20.5 | 17.2 | 20.1 |
| HCM LOS | E | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 22% | 12% | 14% |
| Vol Thru, % | 39% | 51% | 78% | 42% |
| Vol Right, % | 19% | 27% | 10% | 44% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 196 | 413 | 274 | 269 |
| LT Vol | 82 | 92 | 34 | 37 |
| Through Vol | 76 | 211 | 213 | 113 |
| RT Vol | 38 | 110 | 27 | 119 |
| Lane Flow Rate | 223 | 469 | 311 | 306 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.468 | 0.86 | 0.608 | 0.597 |
| Departure Headway (Hd) | 7.57 | 6.6 | 7.032 | 7.026 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 474 | 549 | 511 | 510 |
| Service Time | 5.649 | 4.663 | 5.105 | 5.095 |
| HCM Lane V/C Ratio | 0.47 | 0.854 | 0.609 | 0.6 |
| HCM Control Delay, s/veh | 17.2 | 37.9 | 20.5 | 20.1 |
| HCM Lane LOS | C | E | C | C |
| HCM 95th-tile Q | 2.4 | 9.3 | 4 | 3.9 |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 87 | 155 | 52 | 50 | 144 | 57 | 56 | 235 | 50 | 65 | 217 | 72 |
| Future Volume (vph) | 87 | 155 | 52 | 50 | 144 | 57 | 56 | 235 | 50 | 65 | 217 | 72 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 95 | 168 | 57 | 54 | 157 | 62 | 61 | 255 | 54 | 71 | 236 | 78 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total (vph) | 320 | 273 | 370 | 307 | 78 |
| Volume Left (vph) | 95 | 54 | 61 | 71 | 0 |
| Volume Right (vph) | 57 | 62 | 54 | 0 | 78 |
| Hadj (s) | 0.12 | -0.09 | -0.01 | 0.16 | -0.63 |
| Departure Headway (s) | 7.7 | 7.7 | 7.5 | 8.0 | 7.2 |
| Degree Utilization, x | 0.68 | 0.58 | 0.77 | 0.68 | 0.16 |
| Capacity (veh/h) | 434 | 419 | 455 | 420 | 462 |
| Control Delay (s/veh) | 25.5 | 20.7 | 30.9 | 25.4 | 10.3 |
| Approach Delay (s/veh) | 25.5 | 20.7 | 30.9 | 22.3 | |
| Approach LOS | D | C | D | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Delay | | 25.1 | | |
| Level of Service | | D | | |
| Intersection Capacity Utilization | 68.9% | ICU Level of Service | C | |
| Analysis Period (min) | | 15 | | |
| Description: SBR SLIP THROUGH FOR WIDE ROW | | | | |





| Intersection | |
|---|---|
| Intersection Delay, s/veh | 25.5 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 87 | 155 | 52 | 50 | 144 | 57 | 56 | 235 | 50 | 65 | 217 | 72 |
| Future Vol, veh/h | 87 | 155 | 52 | 50 | 144 | 57 | 56 | 235 | 50 | 65 | 217 | 72 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 5 | 8 | 22 | 0 | 0 | 3 | 9 | 1 | 5 | 5 | 2 | 4 |
| Mvmt Flow | 95 | 168 | 57 | 54 | 157 | 62 | 61 | 255 | 54 | 71 | 236 | 78 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 2 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 2 | 1 | 1 |
| HCM Control Delay, s/veh | 25 | 20.8 | 31.9 | 23.2 |
| HCM LOS | C | C | D | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|
| Vol Left, % | 16% | 30% | 20% | 23% | 0% |
| Vol Thru, % | 69% | 53% | 57% | 77% | 0% |
| Vol Right, % | 15% | 18% | 23% | 0% | 100% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 341 | 294 | 251 | 282 | 72 |
| LT Vol | 56 | 87 | 50 | 65 | 0 |
| Through Vol | 235 | 155 | 144 | 217 | 0 |
| RT Vol | 50 | 52 | 57 | 0 | 72 |
| Lane Flow Rate | 371 | 320 | 273 | 307 | 78 |
| Geometry Grp | 4a | 2 | 2 | 5 | 5 |
| Degree of Util (X) | 0.773 | 0.673 | 0.578 | 0.681 | 0.154 |
| Departure Headway (Hd) | 7.504 | 7.584 | 7.632 | 7.999 | 7.105 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 482 | 473 | 469 | 451 | 502 |
| Service Time | 5.585 | 5.667 | 5.723 | 5.78 | 4.886 |
| HCM Lane V/C Ratio | 0.77 | 0.677 | 0.582 | 0.681 | 0.155 |
| HCM Control Delay, s/veh | 31.9 | 25 | 20.8 | 26.3 | 11.2 |
| HCM Lane LOS | D | C | C | D | B |
| HCM 95th-tile Q | 6.8 | 4.9 | 3.6 | 5 | 0.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 60 | 80 | 16 | 5 | 58 | 15 | 10 | 47 | 2 | 43 | 86 | 67 |
| Future Volume (Veh/h) | 60 | 80 | 16 | 5 | 58 | 15 | 10 | 47 | 2 | 43 | 86 | 67 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Hourly flow rate (vph) | 67 | 90 | 18 | 6 | 65 | 17 | 11 | 53 | 2 | 48 | 97 | 75 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 82 | | | 108 | | | 442 | 327 | 99 | 347 | 328 | 74 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 82 | | | 108 | | | 442 | 327 | 99 | 347 | 328 | 74 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.4 | 6.5 | 6.2 | 7.1 | 6.6 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | 3.3 | 3.5 | 4.1 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 97 | 91 | 100 | 91 | 83 | 92 |
| cM capacity (veh/h) | 1509 | | | 1495 | | | 377 | 560 | 962 | 539 | 556 | 986 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 175 | 88 | 66 | 220 |
| Volume Left | 67 | 6 | 11 | 48 |
| Volume Right | 18 | 17 | 2 | 75 |
| cSH | 1509 | 1495 | 524 | 648 |
| Volume to Capacity | 0.04 | 0.00 | 0.13 | 0.34 |
| Queue Length 95th (m) | 1.1 | 0.1 | 3.3 | 11.4 |
| Control Delay (s/veh) | 3.1 | 0.5 | 12.9 | 13.4 |
| Lane LOS | A | A | B | B |
| Approach Delay (s/veh) | 3.1 | 0.5 | 12.9 | 13.4 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | | | 8.0 | | |
| Intersection Capacity Utilization | | | 38.0% | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | |



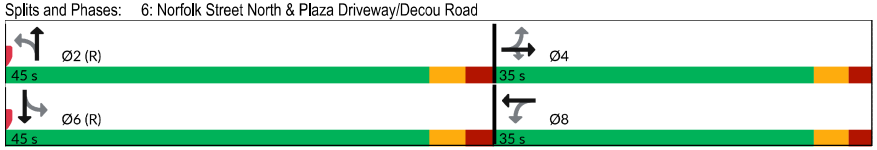


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 54 | 72 | 119 | 28 | 85 | 28 | 351 | 135 | 132 | 468 | 14 |
| Future Volume (vph) | 86 | 54 | 72 | 119 | 28 | 85 | 28 | 351 | 135 | 132 | 468 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 35.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 2.5 | | | 20.0 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Ped Bike Factor | | 1.00 | 0.96 | 0.98 | 0.99 | | | 1.00 | | | 1.00 | |
| Frt | | | 0.850 | | 0.887 | | | 0.961 | | | 0.997 | |
| Flt Protected | | 0.970 | | 0.950 | | | | 0.997 | | | 0.989 | |
| Satd. Flow (prot) | 0 | 1841 | 1601 | 1690 | 1575 | 0 | 0 | 3358 | 0 | 0 | 3486 | 0 |
| Flt Permitted | | 0.738 | | 0.649 | | | | 0.892 | | | 0.693 | |
| Satd. Flow (perm) | 0 | 1396 | 1542 | 1131 | 1575 | 0 | 0 | 3003 | 0 | 0 | 2442 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 82 | | 97 | | | 88 | | | 4 | |
| Link Speed (k/h) | | 30 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 92.3 | | | 1133.9 | | | 211.2 | | | 1371.0 | |
| Travel Time (s) | | 11.1 | | | 81.6 | | | 15.2 | | | 98.7 | |
| Confl. Peds. (#/hr) | 5 | | 22 | 22 | | 5 | 17 | | | | | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 0% | 2% | 8% | 0% | 9% | 0% | 3% | 8% | 4% | 3% | 0% |
| Adj. Flow (vph) | 98 | 61 | 82 | 135 | 32 | 97 | 32 | 399 | 153 | 150 | 532 | 16 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 159 | 82 | 135 | 129 | 0 | 0 | 584 | 0 | 0 | 698 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 21.0 | 21.0 | 21.0 | 21.0 | 21.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Minimum Split (s) | 26.4 | 26.4 | 26.4 | 26.4 | 26.4 | | 30.8 | 30.8 | | 30.8 | 30.8 | |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 43.8% | 43.8% | 43.8% | 43.8% | 43.8% | | 56.3% | 56.3% | | 56.3% | 56.3% | |
| Maximum Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | | 39.2 | 39.2 | | 39.2 | 39.2 | |
| Yellow Time (s) | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 5.4 | 5.4 | 5.4 | 5.4 | | | 5.8 | | | 5.8 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Recall Mode | None | None | None | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.8 | 21.8 | 21.8 | 21.8 | | | 47.0 | | | 47.0 | |
| Actuated g/C Ratio | | 0.27 | 0.27 | 0.27 | 0.27 | | | 0.59 | | | 0.59 | |
| v/c Ratio | | 0.42 | 0.17 | 0.44 | 0.26 | | | 0.32 | | | 0.49 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Delay (s/veh) | | 27.6 | 6.3 | 29.0 | 9.1 | | | 7.8 | | | 8.4 | |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 27.6 | 6.3 | 29.0 | 9.1 | | | 7.8 | | | 8.4 | |
| LOS | | C | A | C | A | | | A | | | A | |
| Approach Delay (s/veh) | | 20.3 | | | 19.3 | | | 7.8 | | | 8.4 | |
| Approach LOS | | C | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 20.1 | 0.0 | 17.1 | 3.7 | | | 17.3 | | | 25.5 | |
| Queue Length 95th (m) | | 33.5 | 8.6 | 30.2 | 14.3 | | | 28.5 | | | m36.4 | |
| Internal Link Dist (m) | | 68.3 | | | 1109.9 | | | 187.2 | | | 1347.0 | |
| Turn Bay Length (m) | | | | 35.0 | | | | | | | | |
| Base Capacity (vph) | | 516 | 622 | 418 | 643 | | | 1801 | | | 1437 | |
| Starvation Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | 0 | 0 | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.31 | 0.13 | 0.32 | 0.20 | | | 0.32 | | | 0.49 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 68 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.49 | | | |
| Intersection Signal Delay (s/veh): 11.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 6: Norfolk Street North & Plaza Driveway/Decou Road



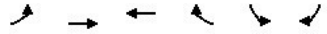





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 97 | 202 | 146 | 11 | 3 | 73 |
| Future Volume (Veh/h) | 97 | 202 | 146 | 11 | 3 | 73 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 105 | 220 | 159 | 12 | 3 | 79 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 171 | | | | 595 | 165 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 171 | | | | 595 | 165 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 93 | | | | 99 | 91 |
| cM capacity (veh/h) | 1406 | | | | 432 | 879 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 325 | 171 | 3 | 79 |
| Volume Left | 105 | 0 | 3 | 0 |
| Volume Right | 0 | 12 | 0 | 79 |
| cSH | 1406 | 1700 | 432 | 879 |
| Volume to Capacity | 0.07 | 0.10 | 0.01 | 0.09 |
| Queue Length 95th (m) | 1.8 | 0.0 | 0.2 | 2.2 |
| Control Delay (s/veh) | 3.0 | 0.0 | 13.4 | 9.5 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 3.0 | 0.0 | 9.6 | |
| Approach LOS | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 3.0 | |
| Intersection Capacity Utilization | | 37.7% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 56 | 149 | 121 | 11 | 5 | 36 |
| Future Volume (Veh/h) | 56 | 149 | 121 | 11 | 5 | 36 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 61 | 162 | 132 | 12 | 5 | 39 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 144 | | | | 422 | 138 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 144 | | | | 422 | 138 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 99 | 96 |
| cM capacity (veh/h) | 1438 | | | | 563 | 910 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 | SB 2 |
|---|---|---|---|---|
| Volume Total | 223 | 144 | 5 | 39 |
| Volume Left | 61 | 0 | 5 | 0 |
| Volume Right | 0 | 12 | 0 | 39 |
| cSH | 1438 | 1700 | 563 | 910 |
| Volume to Capacity | 0.04 | 0.08 | 0.01 | 0.04 |
| Queue Length 95th (m) | 1.0 | 0.0 | 0.2 | 1.0 |
| Control Delay (s/veh) | 2.3 | 0.0 | 11.4 | 9.1 |
| Lane LOS | A | | B | A |
| Approach Delay (s/veh) | 2.3 | 0.0 | 9.4 | |
| Approach LOS | | | A | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 2.3 | |
| Intersection Capacity Utilization | | | 31.3% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |







| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 76 | 11 | 6 | 116 | 183 | 90 |
| Future Volume (Veh/h) | 76 | 11 | 6 | 116 | 183 | 90 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 83 | 12 | 7 | 126 | 199 | 98 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 388 | 248 | 297 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 388 | 248 | 297 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 86 | 98 | 99 | | | |
| cM capacity (veh/h) | 612 | 791 | 1264 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 83 | 12 | 133 | 297 |
| Volume Left | 83 | 0 | 7 | 0 |
| Volume Right | 0 | 12 | 0 | 98 |
| cSH | 612 | 791 | 1264 | 1700 |
| Volume to Capacity | 0.14 | 0.02 | 0.01 | 0.17 |
| Queue Length 95th (m) | 3.6 | 0.4 | 0.1 | 0.0 |
| Control Delay (s/veh) | 11.8 | 9.6 | 0.5 | 0.0 |
| Lane LOS | B | A | A | |
| Approach Delay (s/veh) | 11.5 | | 0.5 | 0.0 |
| Approach LOS | B | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | | 2.2 | |
| Intersection Capacity Utilization | | | 26.0% | ICU Level of Service A |
| Analysis Period (min) | | | 15 | |

# OPTIMIZED DETAILED CAPACITY ANALYSIS HCM REPORTS

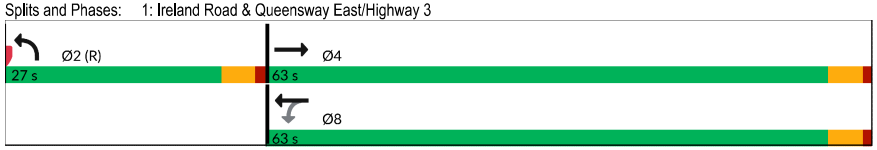


| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 378 | 115 | 205 | 565 | 87 | 204 |
| Future Volume (vph) | 378 | 115 | 205 | 565 | 87 | 204 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | | 0.0 | 175.0 | | 121.0 | 0.0 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (m) | | | 70.0 | | 50.0 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.965 | | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 3252 | 0 | 1807 | 1830 | 1755 | 1555 |
| Flt Permitted | | | 0.404 | | 0.950 | |
| Satd. Flow (perm) | 3252 | 0 | 768 | 1830 | 1755 | 1555 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 91 | | | | | 222 |
| Link Speed (k/h) | 50 | | | 60 | 50 | |
| Link Distance (m) | 283.5 | | | 233.9 | 1391.8 | |
| Travel Time (s) | 20.4 | | | 14.0 | 100.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 9% | 6% | 1% | 5% | 4% | 5% |
| Adj. Flow (vph) | 411 | 125 | 223 | 614 | 95 | 222 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 536 | 0 | 223 | 614 | 95 | 222 |
| Turn Type | NA | | Perm | NA | Prot | Free |
| Protected Phases | 4 | | | 8 | 2 | |
| Permitted Phases | | | 8 | | | Free |
| Detector Phase | 4 | | 8 | 8 | 2 | |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 22.5 | | 22.5 | 22.5 | 22.5 | |
| Total Split (s) | 63.0 | | 63.0 | 63.0 | 27.0 | |
| Total Split (%) | 70.0% | | 70.0% | 70.0% | 30.0% | |
| Maximum Green (s) | 58.5 | | 58.5 | 58.5 | 22.5 | |
| Yellow Time (s) | 3.5 | | 3.5 | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | | None | None | C-Max | |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 11.0 | | 11.0 | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | | 0 | 0 | 0 | |
| Act Effct Green (s) | 41.6 | | 41.6 | 41.6 | 39.4 | 90.0 |
| Actuated g/C Ratio | 0.46 | | 0.46 | 0.46 | 0.44 | 1.00 |
| v/c Ratio | 0.35 | | 0.63 | 0.73 | 0.12 | 0.14 |
| Control Delay (s/veh) | 12.3 | | 25.1 | 24.0 | 19.3 | 0.2 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Total Delay (s/veh) | 12.3 | | 25.1 | 24.0 | 19.3 | 0.2 |
| LOS | B | | C | C | B | A |
| Approach Delay (s/veh) | 12.3 | | | 24.3 | 5.9 | |
| Approach LOS | B | | | C | A | |
| Queue Length 50th (m) | 24.3 | | 28.1 | 82.5 | 9.5 | 0.0 |
| Queue Length 95th (m) | 24.7 | | 38.2 | 85.9 | 23.7 | 0.0 |
| Internal Link Dist (m) | 259.5 | | | 209.9 | 1367.8 | |
| Turn Bay Length (m) | | | 175.0 | | 121.0 | |
| Base Capacity (vph) | 2145 | | 499 | 1189 | 769 | 1555 |
| Starvation Cap Reductn | 0 | | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.25 | | 0.45 | 0.52 | 0.12 | 0.14 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green | | | |
| Natural Cycle: 55 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.73 | | | |
| Intersection Signal Delay (s/veh): 17.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 42.1% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Ireland Road & Queensway East/Highway 3





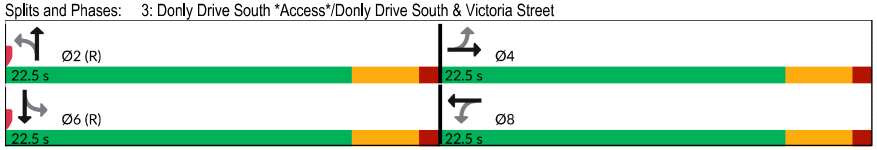



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 93 | 170 | 56 | 24 | 292 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Future Volume (vph) | 93 | 170 | 56 | 24 | 292 | 25 | 132 | 119 | 44 | 16 | 56 | 103 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.99 | | | 1.00 | | | 0.99 | | | 0.98 | |
| Frt | | 0.976 | | | 0.990 | | | 0.980 | | | 0.921 | |
| Flt Protected | | 0.986 | | | 0.997 | | | 0.978 | | | 0.995 | |
| Satd. Flow (prot) | 0 | 1698 | 0 | 0 | 1785 | 0 | 0 | 1655 | 0 | 0 | 1584 | 0 |
| Flt Permitted | | 0.787 | | | 0.958 | | | 0.789 | | | 0.953 | |
| Satd. Flow (perm) | 0 | 1356 | 0 | 0 | 1714 | 0 | 0 | 1329 | 0 | 0 | 1516 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 28 | | | 10 | | | 24 | | | 126 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1336.4 | | | 479.2 | | | 253.0 | | | 246.2 | |
| Travel Time (s) | | 96.2 | | | 34.5 | | | 18.2 | | | 17.7 | |
| Confl. Peds. (#/hr) | | | 10 | 10 | | | 12 | | 13 | 13 | | 12 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles (%) | 10% | 8% | 6% | 23% | 5% | 5% | 13% | 12% | 0% | 0% | 15% | 7% |
| Adj. Flow (vph) | 113 | 207 | 68 | 29 | 356 | 30 | 161 | 145 | 54 | 20 | 68 | 126 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 388 | 0 | 0 | 415 | 0 | 0 | 360 | 0 | 0 | 214 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 18.0 | | | 18.0 | | | 18.0 | | | 18.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | | 0.40 | | | 0.40 | |
| v/c Ratio | | 0.69 | | | 0.60 | | | 0.66 | | | 0.31 | |
| Control Delay (s/veh) | | 19.3 | | | 14.9 | | | 17.9 | | | 5.8 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 19.3 | | | 14.9 | | | 17.9 | | | 5.8 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | | B | | | B | | | B | | | A | |
| Approach Delay (s/veh) | | 19.3 | | | 14.9 | | | 17.9 | | | 5.8 | |
| Approach LOS | | B | | | B | | | B | | | A | |
| Queue Length 50th (m) | | 21.9 | | | 23.6 | | | 20.0 | | | 4.2 | |
| Queue Length 95th (m) | | 39.2 | | | 38.6 | | | 36.1 | | | 11.8 | |
| Internal Link Dist (m) | | 1312.4 | | | 455.2 | | | 229.0 | | | 222.2 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 559 | | | 691 | | | 546 | | | 682 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.69 | | | 0.60 | | | 0.66 | | | 0.31 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 45 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.69 | | | |
| Intersection Signal Delay (s/veh): 15.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 82.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Donly Drive South *Access*/Donly Drive South & Victoria Street





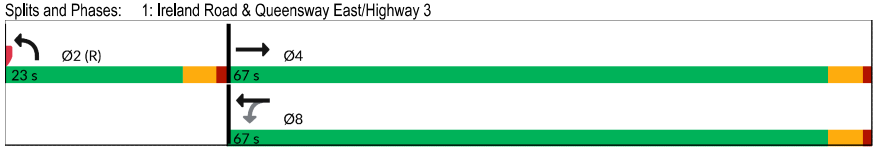



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 634 | 89 | 268 | 580 | 119 | 244 |
| Future Volume (vph) | 634 | 89 | 268 | 580 | 119 | 244 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | | 0.0 | 175.0 | | 121.0 | 0.0 |
| Storage Lanes | | 0 | 1 | | 1 | 1 |
| Taper Length (m) | | | 70.0 | | 50.0 | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.981 | | | | | 0.850 |
| Flt Protected | | | 0.950 | | 0.950 | |
| Satd. Flow (prot) | 3443 | 0 | 1807 | 1865 | 1706 | 1617 |
| Flt Permitted | | | 0.312 | | 0.950 | |
| Satd. Flow (perm) | 3443 | 0 | 593 | 1865 | 1706 | 1617 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 40 | | | | | 260 |
| Link Speed (k/h) | 50 | | | 60 | 50 | |
| Link Distance (m) | 283.5 | | | 233.9 | 1391.8 | |
| Travel Time (s) | 20.4 | | | 14.0 | 100.2 | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 4% | 4% | 1% | 3% | 7% | 1% |
| Adj. Flow (vph) | 674 | 95 | 285 | 617 | 127 | 260 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 769 | 0 | 285 | 617 | 127 | 260 |
| Turn Type | NA | | Perm | NA | Prot | Free |
| Protected Phases | 4 | | | 8 | 2 | |
| Permitted Phases | | | 8 | | | Free |
| Detector Phase | 4 | | 8 | 8 | 2 | |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 22.5 | | 22.5 | 22.5 | 22.5 | |
| Total Split (s) | 67.0 | | 67.0 | 67.0 | 23.0 | |
| Total Split (%) | 74.4% | | 74.4% | 74.4% | 25.6% | |
| Maximum Green (s) | 62.5 | | 62.5 | 62.5 | 18.5 | |
| Yellow Time (s) | 3.5 | | 3.5 | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | | 1.0 | 1.0 | 1.0 | |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | | None | None | C-Max | |
| Walk Time (s) | 7.0 | | 7.0 | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 11.0 | | 11.0 | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | | 0 | 0 | 0 | |
| Act Effct Green (s) | 51.1 | | 51.1 | 51.1 | 29.9 | 90.0 |
| Actuated g/C Ratio | 0.57 | | 0.57 | 0.57 | 0.33 | 1.00 |
| v/c Ratio | 0.39 | | 0.85 | 0.58 | 0.22 | 0.16 |
| Control Delay (s/veh) | 10.2 | | 37.6 | 14.1 | 28.2 | 0.2 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Total Delay (s/veh) | 10.2 | | 37.6 | 14.1 | 28.2 | 0.2 |
| LOS | B | | D | B | C | A |
| Approach Delay (s/veh) | 10.2 | | | 21.5 | 9.4 | |
| Approach LOS | B | | | C | A | |
| Queue Length 50th (m) | 28.8 | | 32.5 | 54.6 | 17.1 | 0.0 |
| Queue Length 95th (m) | 29.7 | | #64.6 | 62.1 | 34.9 | 0.0 |
| Internal Link Dist (m) | 259.5 | | | 209.9 | 1367.8 | |
| Turn Bay Length (m) | | | 175.0 | | 121.0 | |
| Base Capacity (vph) | 2403 | | 411 | 1295 | 567 | 1617 |
| Starvation Cap Reductn | 0 | | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.32 | | 0.69 | 0.48 | 0.22 | 0.16 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green | | | |
| Natural Cycle: 65 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.85 | | | |
| Intersection Signal Delay (s/veh): 15.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 53.1% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 1: Ireland Road & Queensway East/Highway 3








| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 92 | 211 | 110 | 34 | 213 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Future Volume (vph) | 92 | 211 | 110 | 34 | 213 | 27 | 82 | 76 | 38 | 37 | 113 | 119 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | 0.99 | | | 1.00 | | | 0.99 | | | 0.99 | |
| Frt | | 0.964 | | | 0.987 | | | 0.974 | | | 0.940 | |
| Flt Protected | | 0.989 | | | 0.994 | | | 0.979 | | | 0.993 | |
| Satd. Flow (prot) | 0 | 1707 | 0 | 0 | 1802 | 0 | 0 | 1653 | 0 | 0 | 1714 | 0 |
| Flt Permitted | | 0.869 | | | 0.919 | | | 0.795 | | | 0.937 | |
| Satd. Flow (perm) | 0 | 1499 | 0 | 0 | 1665 | 0 | 0 | 1341 | 0 | 0 | 1616 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 48 | | | 15 | | | 32 | | | 106 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 1336.4 | | | 479.2 | | | 253.0 | | | 246.2 | |
| Travel Time (s) | | 96.2 | | | 34.5 | | | 18.2 | | | 17.7 | |
| Confl. Peds. (#/hr) | 3 | | 3 | 3 | | 3 | 5 | | 5 | 5 | | 5 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 9% | 6% | 0% | 5% | 5% | 5% | 6% | 30% | 0% | 6% | 2% |
| Adj. Flow (vph) | 105 | 240 | 125 | 39 | 242 | 31 | 93 | 86 | 43 | 42 | 128 | 135 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 470 | 0 | 0 | 312 | 0 | 0 | 222 | 0 | 0 | 305 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | Max | | Max | Max | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Don't Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 18.0 | | | 18.0 | | | 18.0 | | | 18.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | | 0.40 | | | 0.40 | |
| v/c Ratio | | 0.75 | | | 0.46 | | | 0.40 | | | 0.43 | |
| Control Delay (s/veh) | | 20.6 | | | 12.2 | | | 10.9 | | | 8.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 20.6 | | | 12.2 | | | 10.9 | | | 8.5 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | | C | | | B | | | B | | | A | |
| Approach Delay (s/veh) | | 20.6 | | | 12.2 | | | 10.9 | | | 8.5 | |
| Approach LOS | | C | | | B | | | B | | | A | |
| Queue Length 50th (m) | | 26.4 | | | 16.1 | | | 9.8 | | | 10.1 | |
| Queue Length 95th (m) | | #63.6 | | | 30.9 | | | 21.7 | | | 23.0 | |
| Internal Link Dist (m) | | 1312.4 | | | 455.2 | | | 229.0 | | | 222.2 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 628 | | | 675 | | | 555 | | | 710 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.75 | | | 0.46 | | | 0.40 | | | 0.43 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 50 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.75 | | | |
| Intersection Signal Delay (s/veh): 14.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 71.5% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 3: Donly Drive South *Access*/Donly Drive South & Victoria Street



# APPENDIX D

## Background Development Report Excepts

5A-150 Pinebush Road
Cambridge ON N1R 8J8
p: 519.896.3163
905.381.2229
416.479.9684

www.ptsl.com

2025-07-14
Project: 230703

Paul Halyk
2177545 Ontario Ltd.

Dear Mr. Halyk:

## RE: WOODWAY TRAIL RESIDENTIAL SUBDIVISION, SIMCOE UPDATED ALTERNATE ACCESSES REVIEW

Paradigm previously completed an Alternate Accesses Review[1] for the Woodway Trail residential subdivision located in southeast Simcoe, which is accessible via Donly Drive, south of Boswell Street.

The previous letter assessed four potential access scenarios using the density of the proposed development, which reflect a portion of the original 2008 Draft Plan of Subdivision. Since the submission of the previous letter, Norfolk County requested the review be updated to reflect the remainder of the entire draft plan beyond the Woodway Trail development as well as include an access to Ireland Road as part of the potential access scenarios.

The following letter provides the updated traffic forecasts completed for the following scenarios:

- **Scenario 1**: The subject lands (Woodway Trail) access the road network entirely via Donly Drive – This scenario is what was analyzed in the original August 2024 TIS[2] and has been updated in the July 2025 TIS Addendum[3] to reflect the latest development plan;
- **Scenario 2**: Full buildout of the area beyond Woodway Trail (referred to as the Labiris and Calibrex lands), assuming the same density as in the current Woodway Trail subdivision plan. This scenario includes additional access to Decou Road and Ireland Road through the remainder of the site; and

[1] Paradigm Transportation Solutions Limited, *Woodway Trail Residential Subdivision, Simcoe Alternate Accesses Review,* May 2025.
[2] Paradigm Transportation Solutions Limited, *Donly Drive Subdivision Simcoe, Transportation Impact Study*, August 2024.
[3] Paradigm Transportation Solutions Limited, *Woodway Trail Residential Subdivision, Simcoe Transportation Impact Study Addendum*, July 2025.

### TABLE 1: ENTIRE DRAFT PLAN AREA TRIP GENERATION

| Land Use | Number of Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| **Subject Lands** | | | | | | | | | |
| LUC 210 - Single-Family Detached Housing | 112 | Eqn[1] | 21 | 62 | **83** | Eqn[1] | 70 | 41 | **111** |
| LUC 215 - Single-Family Attached Housing | 323 | Eqn[2] | 41 | 121 | **162** | Eqn[2] | 112 | 78 | **190** |
| LUC 221 - Multifamily Housing (Mid-Rise) | 60 | Eqn[3] | 3 | 12 | **15** | Eqn[3] | 14 | 10 | **24** |
| **Subtotal Trip Generation** | **495** | | **65** | **195** | **260** | | **196** | **129** | **325** |
| **Labiris Lands** | | | | | | | | | |
| **Subtotal Trip Generation** | **495** | 1.00 | **65** | **195** | **260** | 1.00 | **196** | **129** | **325** |
| **Calibrex Lands** | | | | | | | | | |
| LUC 210 - Single-Family Detached Housing | 61 | Eqn[1] | 12 | 36 | **48** | Eqn[1] | 39 | 23 | **62** |
| LUC 215 - Single-Family Attached Housing | 189 | Eqn[2] | 23 | 70 | **93** | Eqn[2] | 65 | 44 | **109** |
| LUC 221 - Multifamily Housing (Mid-Rise) | 48 | Eqn[3] | 2 | 8 | **10** | Eqn[3] | 12 | 7 | **19** |
| LUC 712 - Small Office Building (1,000 sq.ft.) | 10 | 1.67 | 14 | 3 | **17** | 2.16 | 7 | 15 | **22** |
| **Subtotal Trip Generation** | **298** | | **51** | **117** | **168** | | **123** | **89** | **212** |
| **Total Trip Generation** | **1,288** | | **181** | **507** | **688** | | **515** | **347** | **862** |

[1] *LUC 210 - AM: Ln(T) = 0.91Ln(X) + 0.12 | PM: Ln(T) = 0.94Ln(X) + 0.27*

[2] *LUC 215 - AM: T = 0.52(X) - 5.70 | PM: T = 0.60(X) - 3.93*

[3] *LUC 221 - AM: T - 0.44(X) - 11.61 | PM: T = 0.39(X) + 0.34*

## Access Scenarios

### Scenario 1: No Additional Connection with Density of the Subject Lands

Scenario 1 includes the traffic forecasts for the subject lands according to the proposed draft plan with a single access via Donly Drive. This forecast was originally completed in the August 2024 TIS and has been updated in the July 2025 TIS Addendum to reflect the latest development plan.

**Figure 4** illustrates the site-generated traffic volumes along Donly Drive, south of Victoria Street and at the access intersection in the AM and PM peak hours under Scenario 1.

The total traffic volumes were determined by summing the background traffic from the August 2024 TIS with the development traffic volumes. Consistent with the previous TIS, the total traffic volumes were calculated for three horizon years. **Figure 5**, **Figure 6** and **Figure 7** illustrate the 2034, 2039 and 2044 total traffic volumes, respectively under Scenario 1.

### Scenario 2: Additional Connections to Decou Road and Ireland Road with Density of the Entire Draft Plan Area

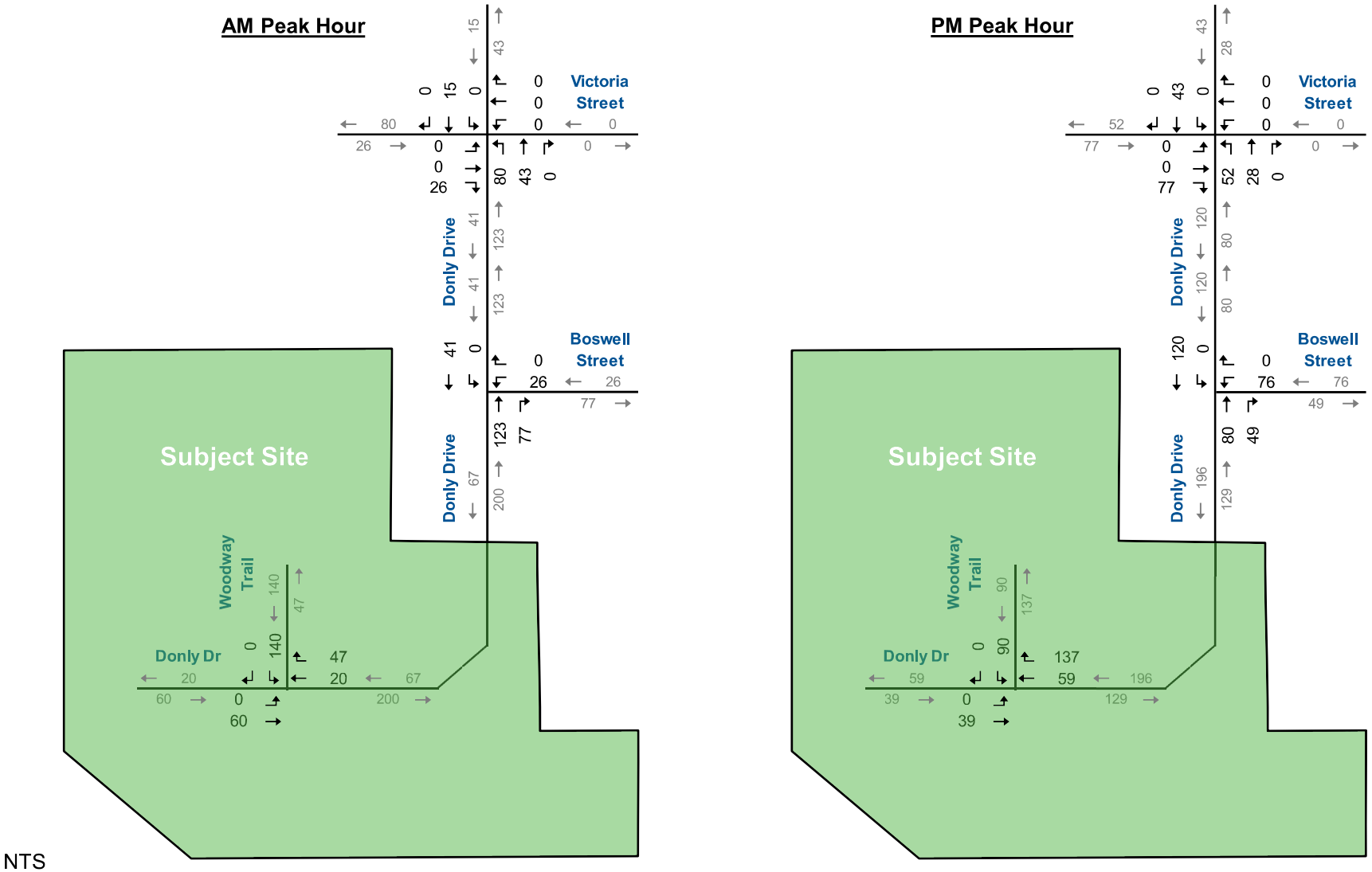
Scenario 2 includes the traffic forecasts for the entire draft plan area with three accesses via Donly Drive, Decou Road and Ireland Road. The site traffic was distributed similarly to the

The analysis for daily traffic has been redone to account for the scenarios proposed in this letter. It is noted that the forecasted traffic presented in this letter represent the AM and PM peak hourly traffic rather than the daily traffic. To determine a rough approximation of the daily traffic volumes, the PM peak hour traffic can be multiplied by a factor of 10, which was done in the 2025-02-06 letter. The daily traffic, using the PM peak hour forecasts from the three access scenarios, for Donly Drive, south of Victoria Street is summarized in **Table 2**.

**TABLE 2: ESTIMATED TWO-WAY DAILY TRAFFIC FOR DONLY DRIVE**

| Scenario | Horizon | PM Peak Hour | Daily Estimate |
|---|---|---|---|
| - | Existing | 204 | 2040 |
| | 2034 Background | 262 | 2620 |
| | 2039 Background | 290 | 2900 |
| | 2044 Background | 317 | 3170 |
| Scenario 1 | 2034 Total | 462 | 4620 |
| | 2039 Total | 490 | 4900 |
| | 2044 Total | 517 | 5170 |
| Scenario 2 | 2034 Total | 532 | 5320 |
| | 2039 Total | 560 | 5600 |
| | 2044 Total | 587 | 5870 |
| Scenario 3 | 2034 Total | 417 | 4170 |
| | 2039 Total | 445 | 4450 |
| | 2044 Total | 472 | 4720 |

Additionally to being with in the range defined by the TAC Guide, the section of Donly Drive drive south of Victoria Street is mainly an industrial / commercial area with few driveways. Therefore, Donly Drive is expected to be able to accommodate the traffic being forecast from the future developments noted in this letter.

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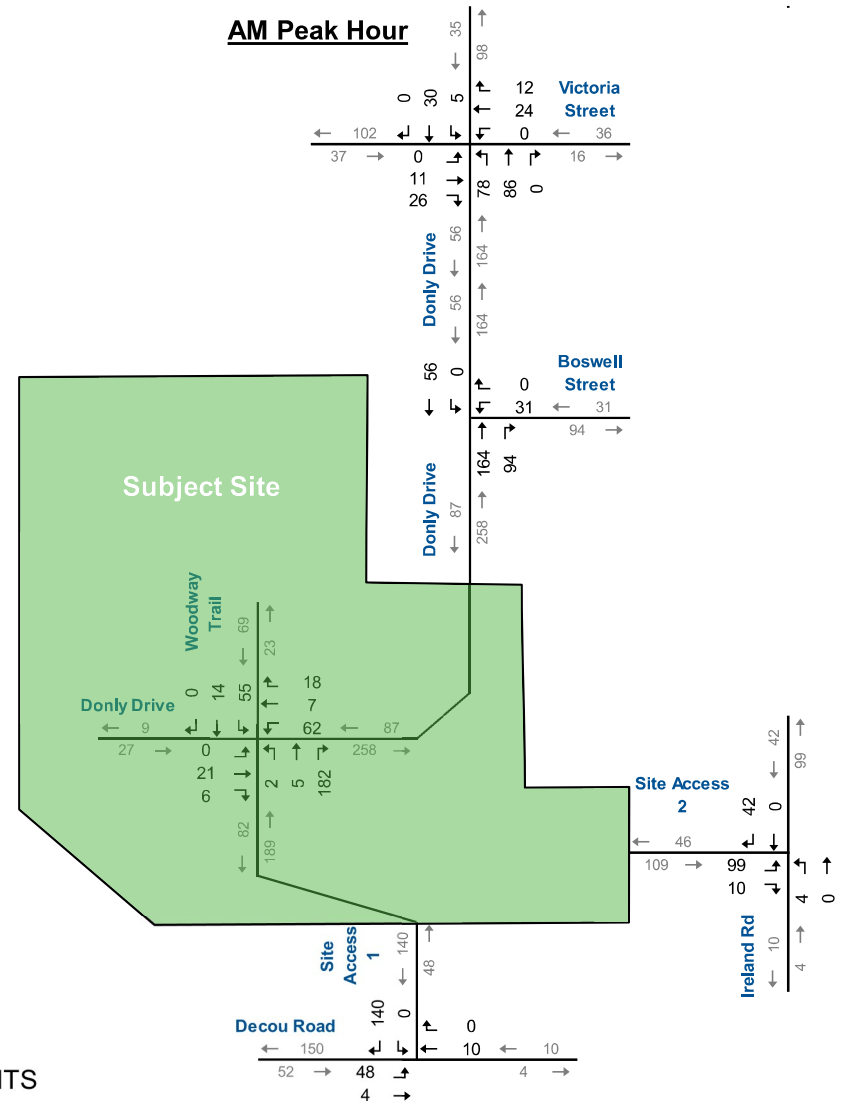
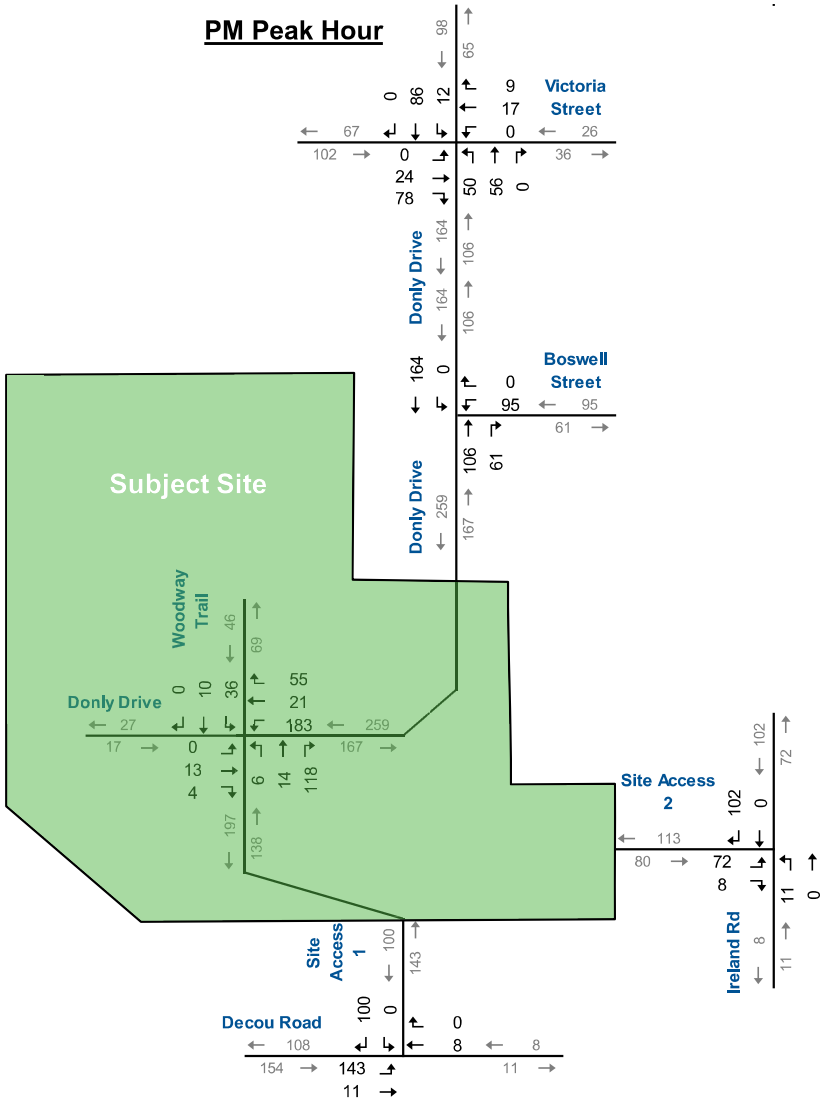
# Scenario 1
# Site Generated Traffic Volumes

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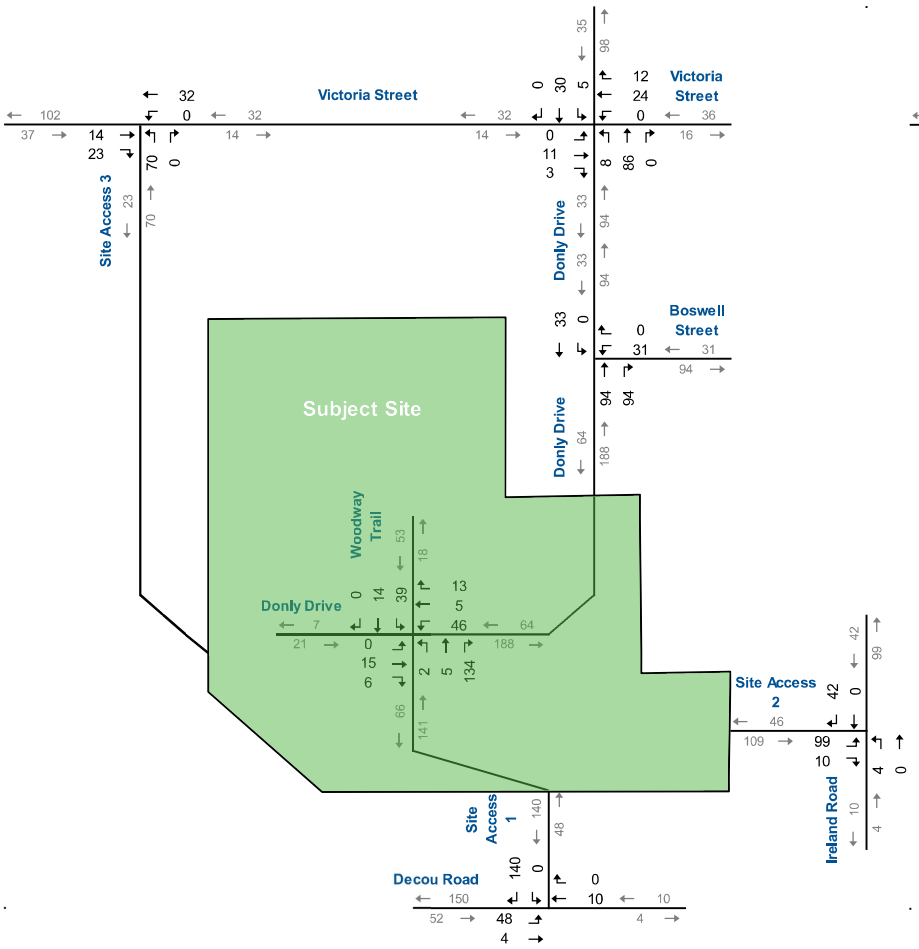
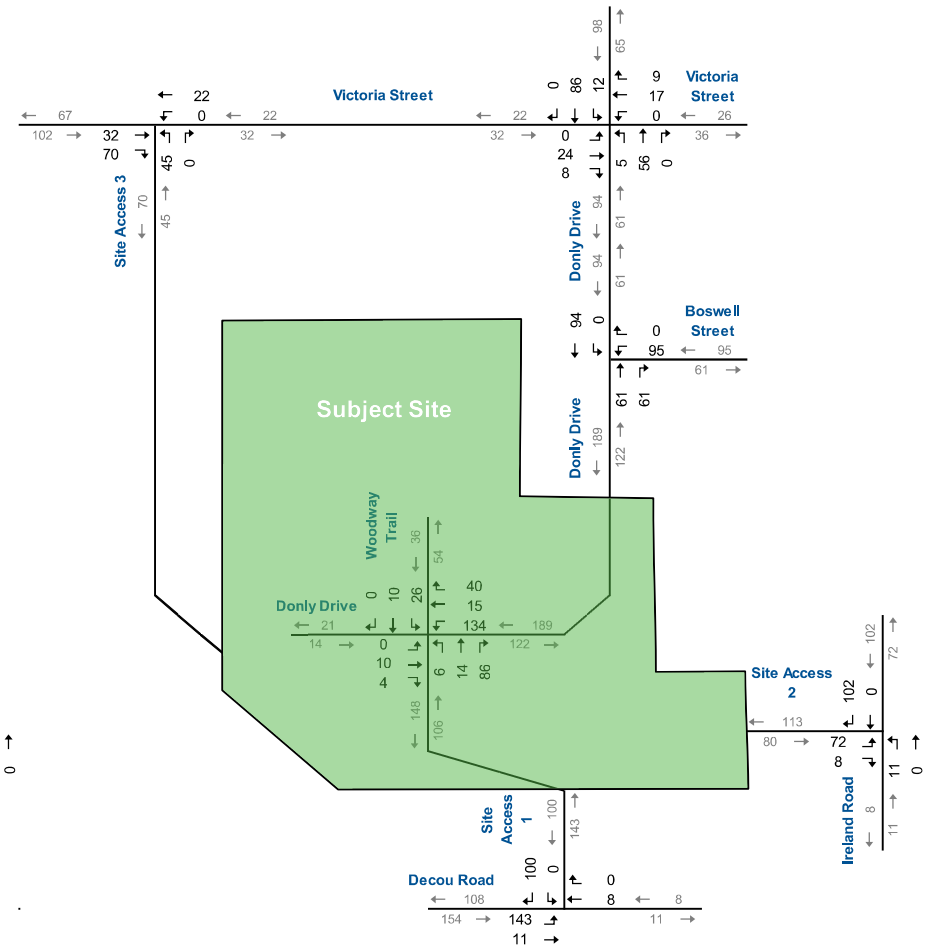
# Scenario 2
# Site Generated Traffic Volumes

**AM Peak Hour**




**PM Peak Hour**

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# Scenario 3
# Site Generated Traffic Volumes

5A-150 Pinebush Road
Cambridge ON N1R 8J8
p: 519.896.3163
905.381.2229
416.479.9684

www.ptsl.com

2025-07-14
Project: 230703

Paul Halyk
2177545 Ontario Ltd.

Dear Mr. Halyk:

**RE: WOODWAY TRAIL RESIDENTIAL SUBDIVISION, SIMCOE**
**TRANSPORTATION IMPACT STUDY ADDENDUM**

Paradigm Transportation Solutions Limited previously completed a Transportation Impact Study (TIS) in August 2024[1] for the proposed residential subdivision located on the west side of Donly Drive south of Oakwood Cemetery, along Trillium Way. Since the initial submission, the proposed draft plan has been updated. The following addendum letter provides the updated analyses to reflect changes to the development plan.

## Revised Development Plan

The development plan has since been revised to include 112 single-family detached units, 323 townhouse units and 60 mid-rise units, totaling 495 residential units. Compared to the initial development proposal, this results in a decrease of 99 residential units.

**Figure 1** illustrates the proposed concept plan.

## Trip Generation and Distribution

The August 2024 TIS estimated that the development is forecast to generate 305 AM peak hour trips and 385 PM peak hour trips.

Using the same methodology as the initial study, the peak hour traffic volumes generated by the proposed development was estimated using the following Land Use Codes (LUCs):

- LUC 210 (Single-Family Detached Housing);
- LUC 215 (Single-Family Attached Housing); and
- LUC 221 (Multifamily Housing (Mid-Rise)).

[1] Paradigm Transportation Solutions Limited, *Donly Drive Subdivision Simcoe Transportation Impact Study*, August 2024.

**Table 1** summarizes the forecast number of net new trips generated by the proposed development based on the latest draft plan. Compared to the initial proposal, the proposed development is forecast to generate 38 less trips in the AM peak hour and 60 less trips in the PM peak hour.

**TABLE 1: TRIP GENERATION**

| Land Use | Number of Units | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Total | Rate | In | Out | Total |
| LUC 210 - Single-Family Detached Housing | 112 | Eqn[1] | 21 | 62 | **83** | Eqn[1] | 70 | 41 | **111** |
| LUC 215 - Single-Family Attached Housing | 323 | Eqn[2] | 41 | 121 | **162** | Eqn[2] | 112 | 78 | **190** |
| LUC 221 - Multifamily Housing (Mid-Rise) | 60 | 0.37 | 5 | 17 | **22** | Eqn[3] | 14 | 10 | **24** |
| **Total Trip Generation** | | | **67** | **200** | **267** | | **196** | **129** | **325** |

[1] *LUC 210 - AM: Ln(T) = 0.91Ln(X) + 0.12 | PM: Ln(T) = 0.94Ln(X) + 0.27*

[2] *LUC 215 - AM: T = 0.52(X) - 5.70 | PM: T = 0.60(X) - 3.93*

[3] *LUC 221 - PM: T = 0.39(X) + 0.34*

The site trips were distributed following the same distribution used in the August 2024 TIS. **Figure 2** and **Figure 3** illustrate the site generated traffic volumes for the AM and PM peak hours, respectively.

## Evaluation of Total Traffic Conditions

The total traffic volumes were determined by summing the development traffic volumes with the background traffic volumes from the August 2024 TIS. Synchro analysis was completed for the 2034, 2039 and 2044 horizons, consistent with the previous study.

Full Build-Out Horizon – Year 2034

**Figure 4** and **Figure 5** illustrate the 2034 total traffic volumes for the AM and PM peak hours, respectively.

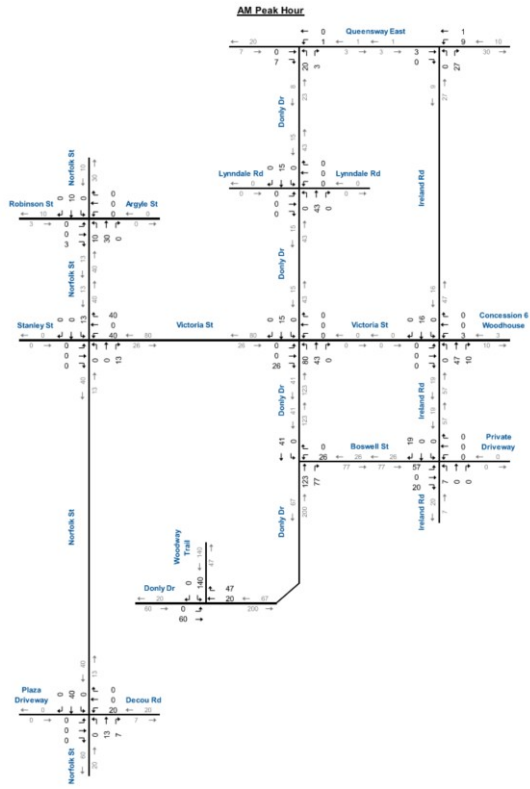
**Table 2a** and **Table 2b** summarize the results of the 2034 total traffic operations. The results indicate that the study area intersections are forecast to operate with acceptable levels of service during the AM and PM peak hours, except for the following:

**Donly Drive and Queensway East**

- The northbound left-turn movement is forecast to operate with LOS F in the AM and PM peak hours. During the PM peak hour, this movement is forecast to operate with a v/c ratio of 1.29 and a 95$^{th}$ percentile queue exceeding the available storage.

**Ireland Road and Queensway East/Highway 3**

- The northbound left-turn movement is forecast to operate with LOS F in the AM and PM peak hours. During the PM peak hour, this movement is forecast to operate with a v/c ratio of 1.79.

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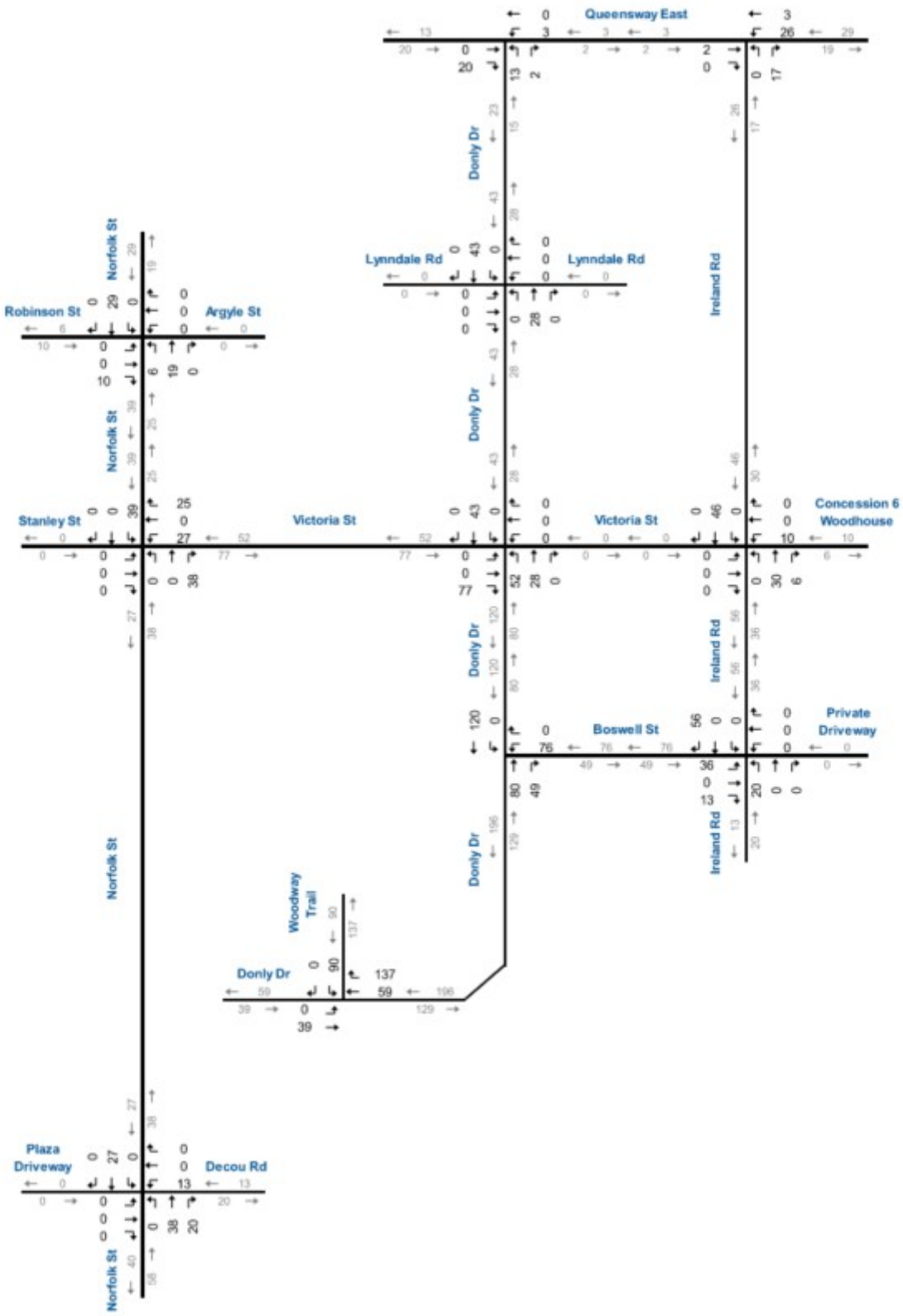
# Site Generated Traffic Volumes
# AM Peak Hour

**PM Peak Hour**

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# Site Generated Traffic Volumes
# PM Peak Hour

# APPENDIX E

## ITE Trip Generation Manual Excerpts

# Land Use: 210
# Single-Family Detached Housing

## Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

## Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates, based on a small sample of sites, are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 215), and higher than those for senior adult housing—single-family (Land Use 251). (Source 1008)

## Additional Data

The sites were surveyed in the 1990s, the 2000s, the 2010s, and the 2020s in Alabama, Arizona, British Columbia (CAN), California, Delaware, Illinois, Kentucky, Massachusetts, Minnesota, Montana, New Jersey, New York, North Carolina, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Vermont, and West Virginia.

## Source Numbers

356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077, 1078, 1079, 1204, 1221, 1225, 1236, 1251, 1265, 1267

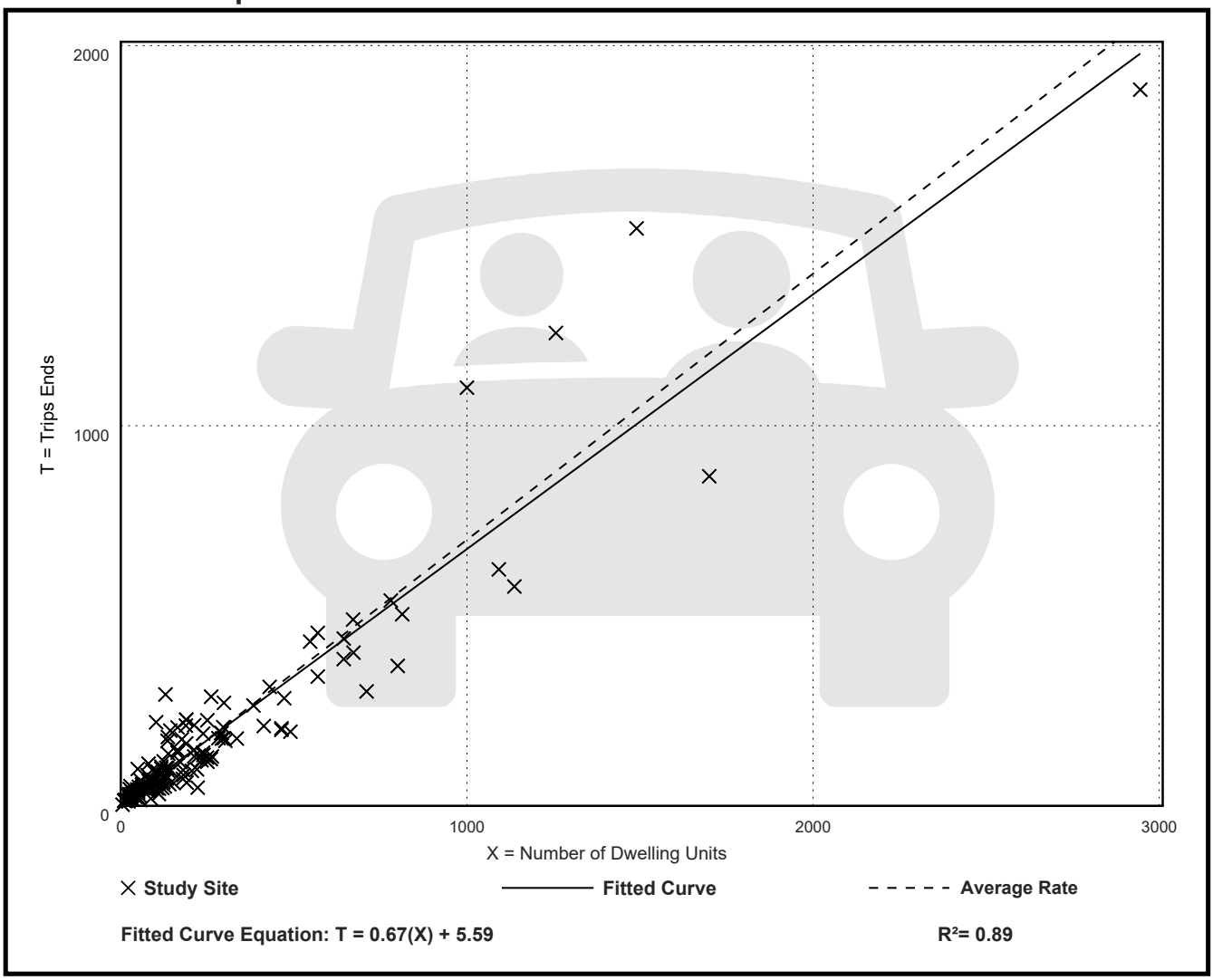
# Single-Family Detached Housing
# (210)

| | |
|---|---|
| **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: | 153 |
| Avg. Num. of Dwelling Units: | 239 |
| Directional Distribution: | 27% entering, 73% exiting |

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.70 | 0.22 - 2.27 | 0.26 |

## Data Plot and Equation




**Fitted Curve Equation: T = 0.67(X) + 5.59**

**$R^2$= 0.89**

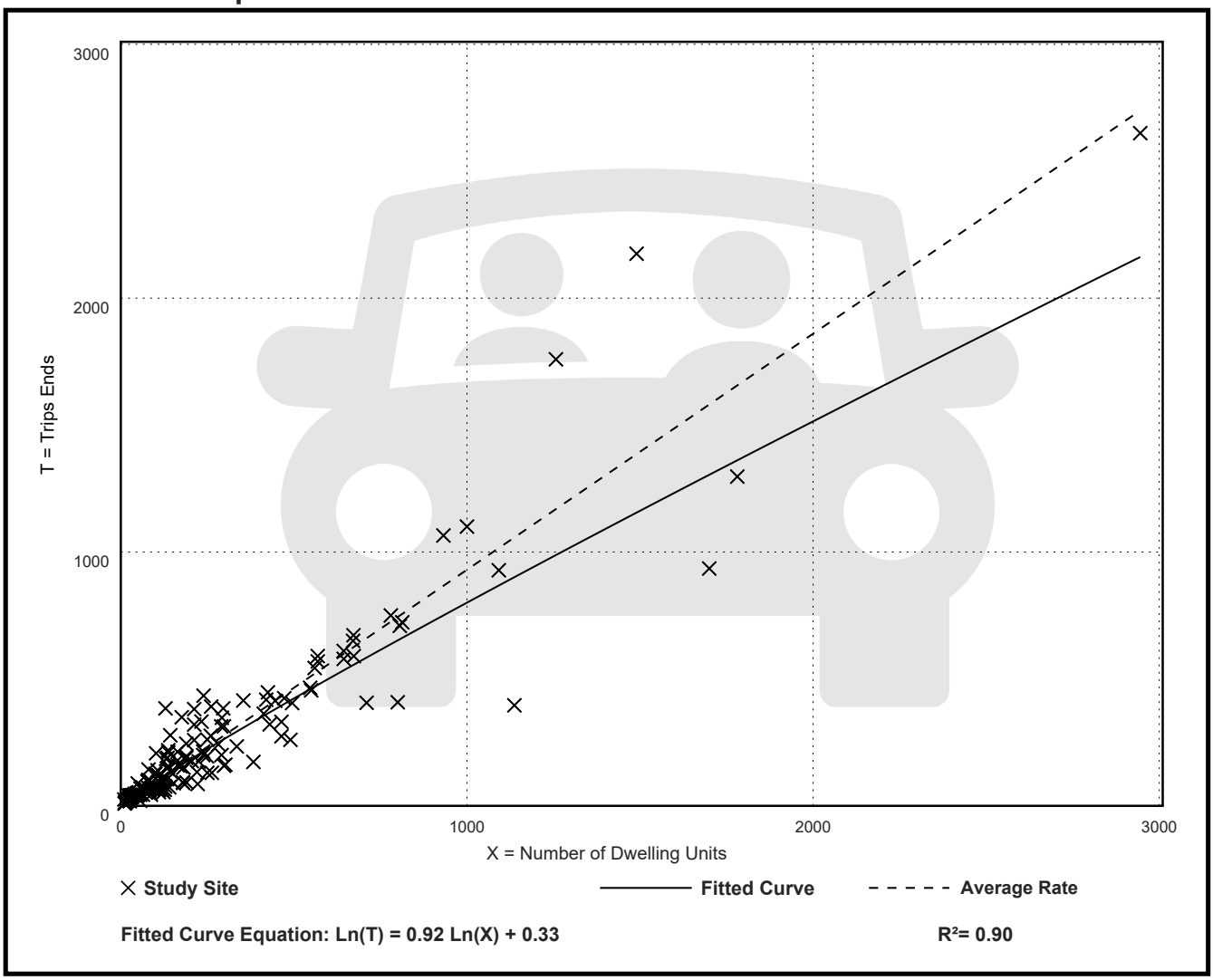
# Single-Family Detached Housing
# (210)

| | |
|---|---|
| **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: | 166 |
| Avg. Num. of Dwelling Units: | 266 |
| Directional Distribution: | 62% entering, 38% exiting |

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.93 | 0.35 - 2.98 | 0.33 |

## Data Plot and Equation



# Land Use: 215
# Single-Family Attached Housing

## Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space. This land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

## Additional Data

The sites were surveyed in the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, Georgia, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, and Wisconsin.

## Source Numbers

357, 390, 418, 525, 571, 583, 638, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077

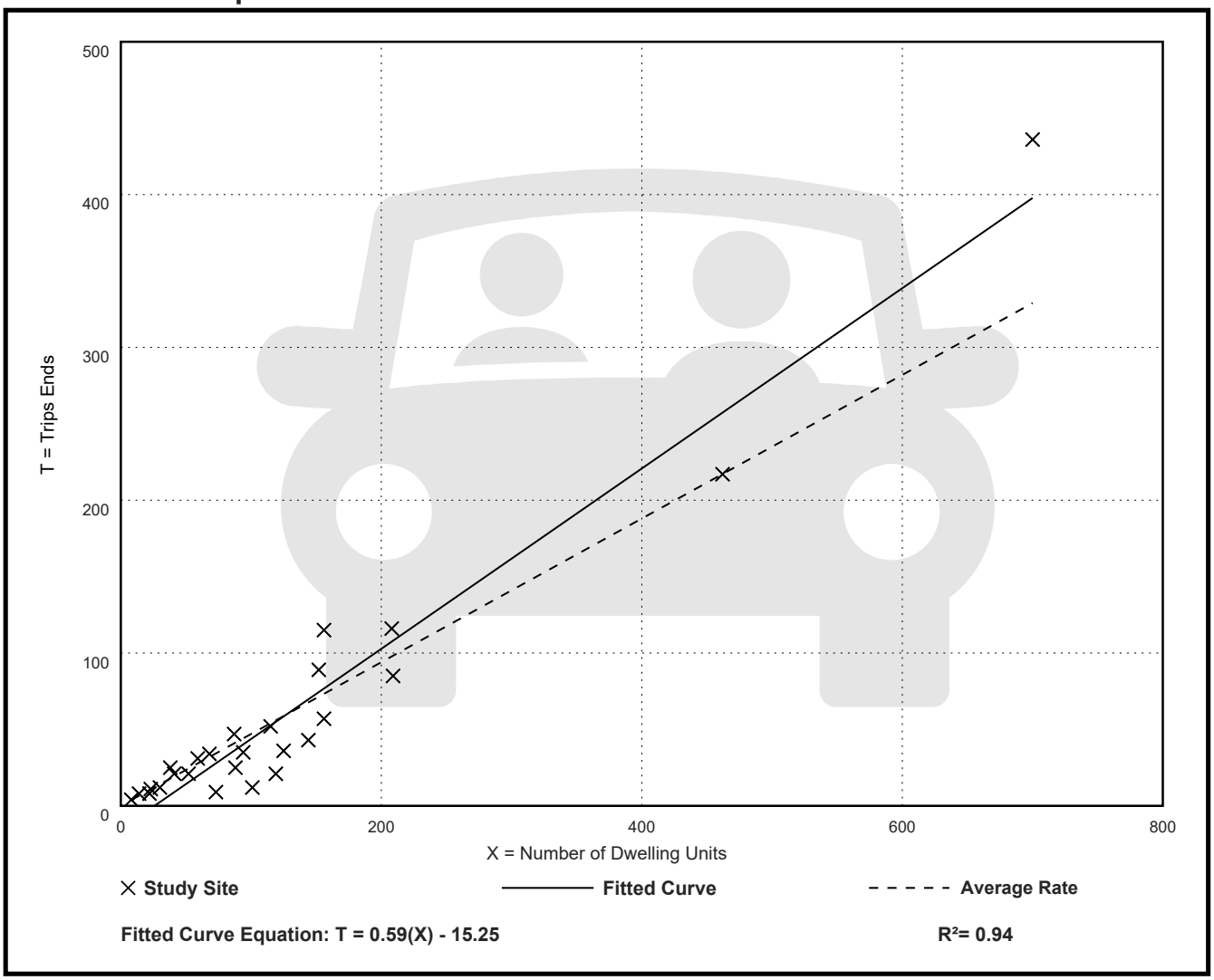
# Single-Family Attached Housing
# (215)

| | |
|---|---|
| **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: | 26 |
| Avg. Num. of Dwelling Units: | 129 |
| Directional Distribution: | 25% entering, 75% exiting |

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.47 | 0.12 - 0.74 | 0.16 |

## Data Plot and Equation




**Fitted Curve Equation: T = 0.59(X) - 15.25**

**$R^2$= 0.94**

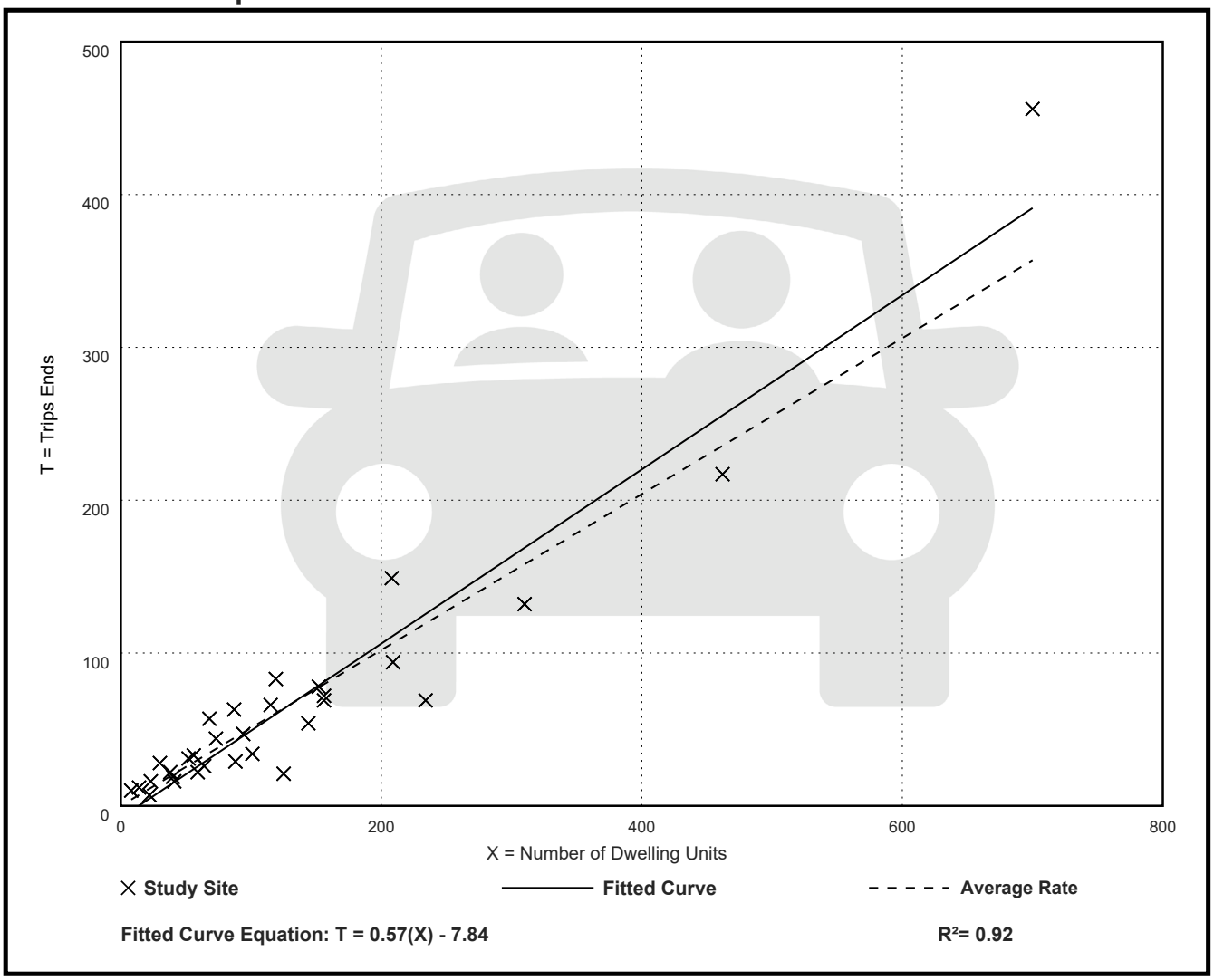
# Single-Family Attached Housing
# (215)

| | |
|---|---|
| **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: | 31 |
| Avg. Num. of Dwelling Units: | 131 |
| Directional Distribution: | 57% entering, 43% exiting |

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.51 | 0.17 - 1.25 | 0.16 |

## Data Plot and Equation




**Fitted Curve Equation: T = 0.57(X) - 7.84**

**$R^2$= 0.92**

# APPENDIX F

## Signal Warrant Analysis

CROZIER

# TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
## PER OTM BOOK 12

### Project and Scenario Summary

| | | | |
|---|---|---|---|
| **Project** | 227 Decou Road | **Project Number** | 1935-7678 |
| | | **Date** | 2026-02-17 |
| **Horizon** | 2044 Future Total | **Analyst** | Ramy Kamal |

### Study Intersection Summary

| | | | |
|---|---|---|---|
| **Major Street** | Queensway East/Highway 3 | **Direction** | East/West |
| **Minor Street** | Ireland Road | **Direction** | North/South |

### Intersection Details for Warrant Parameters

| | | | |
|---|---|---|---|
| **Flow Conditions** | Free Flow (Rural) | **Number of Lanes** | 2+ |
| **T-Intersection?** | Yes | **Intersection Type** | Existing |

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

### Input Volumes and Average Hourly Volume Determination

| Peak Hour | Major: Queensway East/Highway 3 | | | | | | Minor: Ireland Road | | | | | | Pedestrians Crossing Major Street |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| AM | 0 | 378 | 115 | 205 | 565 | 0 | 87 | 0 | 204 | 0 | 0 | 0 | 0 |
| PM | 0 | 634 | 89 | 268 | 580 | 0 | 119 | 0 | 244 | 0 | 0 | 0 | 0 |
| AHV | 0 | 253 | 51 | 118 | 286 | 0 | 52 | 0 | 112 | 0 | 0 | 0 | 0 |

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

### Justification 7 - OTM Book 12

| JUSTIFICATION | DESCRIPTION | MINIMUM REQUIREMENT 1 LANE HIGHWAYS | | MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS | | COMPLIANCE | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Sectional | | Entire Percentage |
| | | Free Flow | Restricted Flow | Free Flow | Restricted Flow | Numerical | Percentage | |
| 1. Minimum Vehicular Volume | A. Vehicle Volume, All Approaches (Avg. Hour) | 480 | 720 | 600 | 900 | 872 | 145.3% | 91.1% |
| | B. Vehicle Volume, Along Minor Streets (Avg. Hour) | 180 | 255 | 180 | 255 | 164 | 91.1% | |
| 2. Delay to Cross Traffic | A. Vehicle Volume, Major Street (Avg. Hour) | 480 | 720 | 600 | 900 | 708 | 118.0% | 104.0% |
| | B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour) | 50 | 75 | 50 | 75 | 52 | 104.0% | |
| Applicable Threshold | | | | X | | | | |

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 104.0%
Percentage Required to be Justified: 120%

**Signal Justification 7 Met:** [ ] **Yes** [X] **No**

# TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
## PER OTM BOOK 12

### Project and Scenario Summary

| | | | |
|---|---|---|---|
| **Project** | 227 Decou Road | **Project Number** | 1935-7678 |
| | | **Date** | 2026-02-17 |
| **Horizon** | 2044 Future Total | **Analyst** | Ramy Kamal |

### Study Intersection Summary

| | | | |
|---|---|---|---|
| **Major Street** | Victoria Street | **Direction** | East/West |
| **Minor Street** | Donly Drive South | **Direction** | North/South |

### Intersection Details for Warrant Parameters

| | | | |
|---|---|---|---|
| **Flow Conditions** | Restricted Flow (Urban) | **Number of Lanes** | 1 |
| **T-Intersection?** | No | **Intersection Type** | Existing |

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

### Input Volumes and Average Hourly Volume Determination

| Peak Hour | Major: Victoria Street | | | | | | Minor: Donly Drive South | | | | | | Pedestrians Crossing Major Street |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| AM | 93 | 170 | 56 | 24 | 292 | 25 | 132 | 119 | 44 | 16 | 56 | 103 | 0 |
| PM | 92 | 211 | 110 | 34 | 213 | 27 | 84 | 76 | 38 | 37 | 113 | 119 | 0 |
| AHV | 46 | 95 | 42 | 15 | 126 | 13 | 54 | 49 | 21 | 13 | 42 | 56 | 0 |

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

### Justification 7 - OTM Book 12

| JUSTIFICATION | DESCRIPTION | MINIMUM REQUIREMENT 1 LANE HIGHWAYS | | MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS | | COMPLIANCE | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Sectional | | Entire Percentage |
| | | Free Flow | Restricted Flow | Free Flow | Restricted Flow | Numerical | Percentage | |
| 1. Minimum Vehicular Volume | A. Vehicle Volume, All Approaches (Avg. Hour) | 480 | 720 | 600 | 900 | 572 | 79.4% | 79.4% |
| | B. Vehicle Volume, Along Minor Streets (Avg. Hour) | 120 | 170 | 120 | 170 | 235 | 138.2% | |
| 2. Delay to Cross Traffic | A. Vehicle Volume, Major Street (Avg. Hour) | 480 | 720 | 600 | 900 | 337 | 46.8% | 46.8% |
| | B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour) | 50 | 75 | 50 | 75 | 116 | 154.7% | |
| Applicable Threshold | | | X | | | | | |

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 79.4%
Percentage Required to be Justified: 120%

**Signal Justification 7 Met:** [ ] **Yes** [X] **No**

# APPENDIX G

## Left-Turn Lane Warrant Analysis

# FT 2044 AM - Decou Road & East Site Access

TAC GDG for Canadian Roads, June 2017 — MTO Design Supplement, October 2023

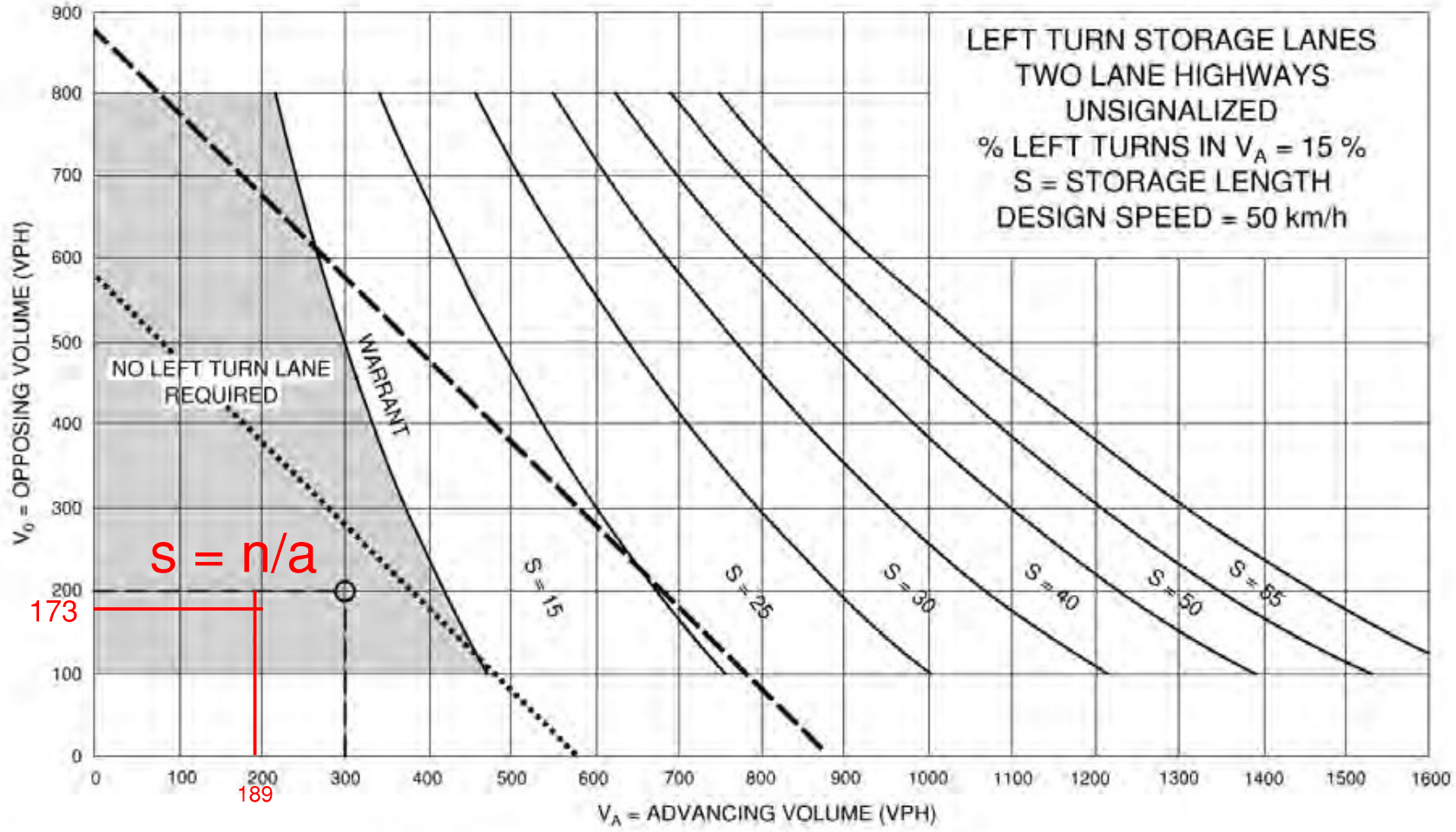
**Exhibit-9A-4**

v=50km/h
$v_a$ = 189 vph
$v_o$ = 173 vph
$v_L$ = 26 vph

Percentage of Left-Turning Traffic:

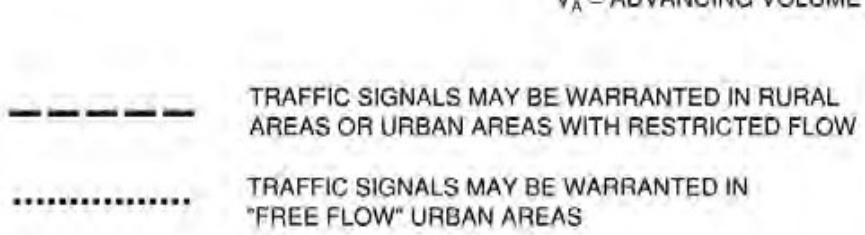
(26*100)/189
**= 13.75%**
**~ 15%**

***Rounded to maintain conservative analysis**




TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS



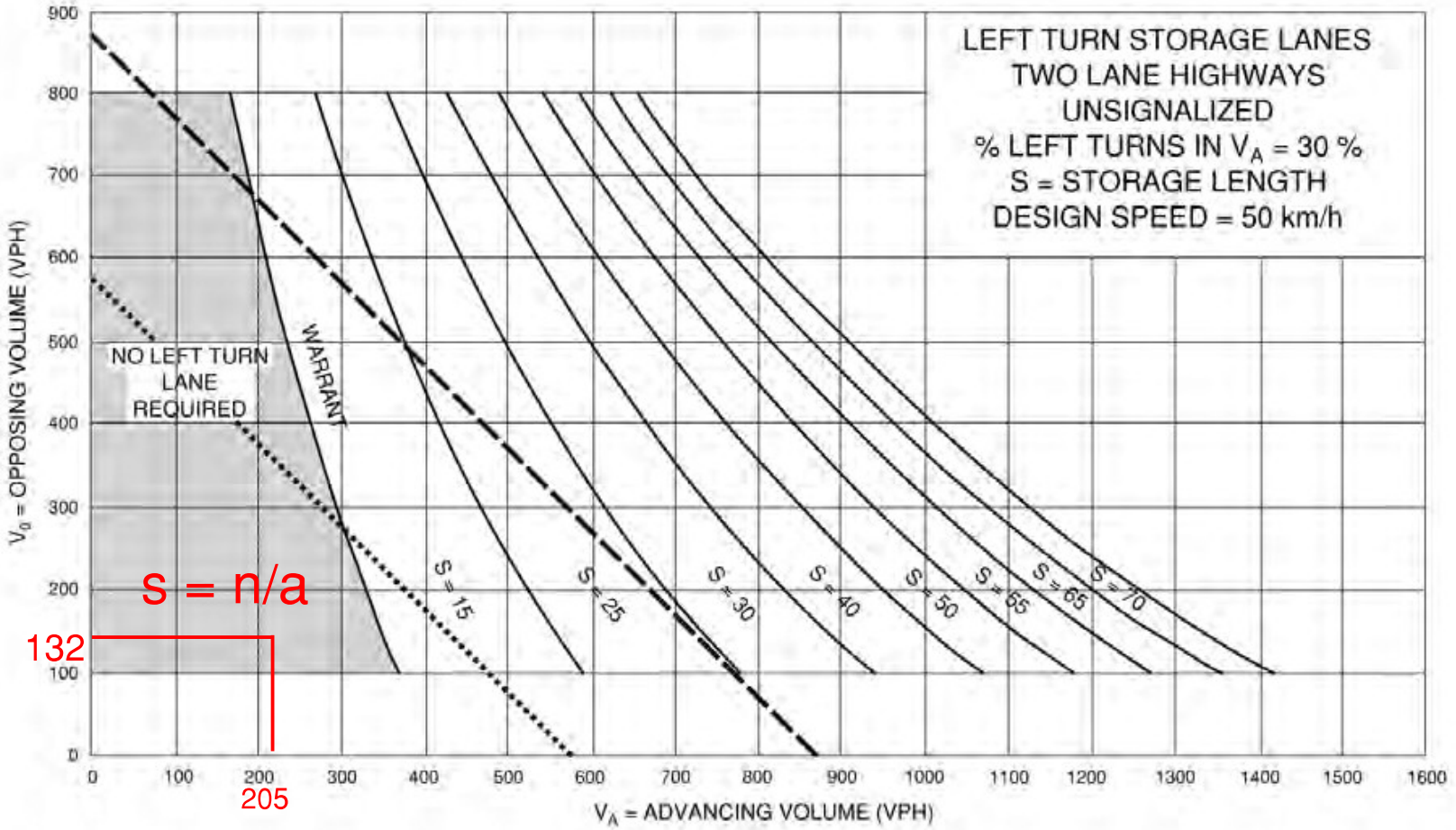

## FT 2044 PM - Decou Road & East Site Access

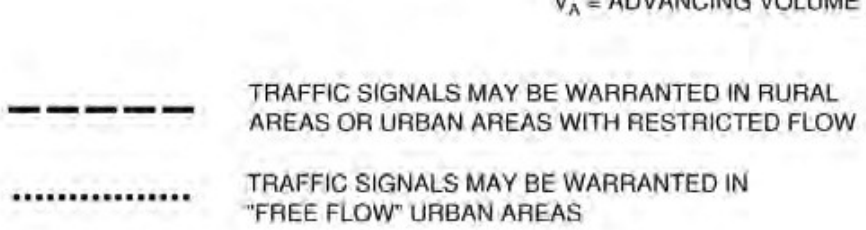
v=50km/h
$v_a$ = 205 vph
$v_o$ = 132 vph
$v_L$ = 56 vph

Percentage of Left-Turning Traffic:

(56*100)/205
**= 27.3%**
**~ 30%**

***Rounded to maintain conservative analysis**





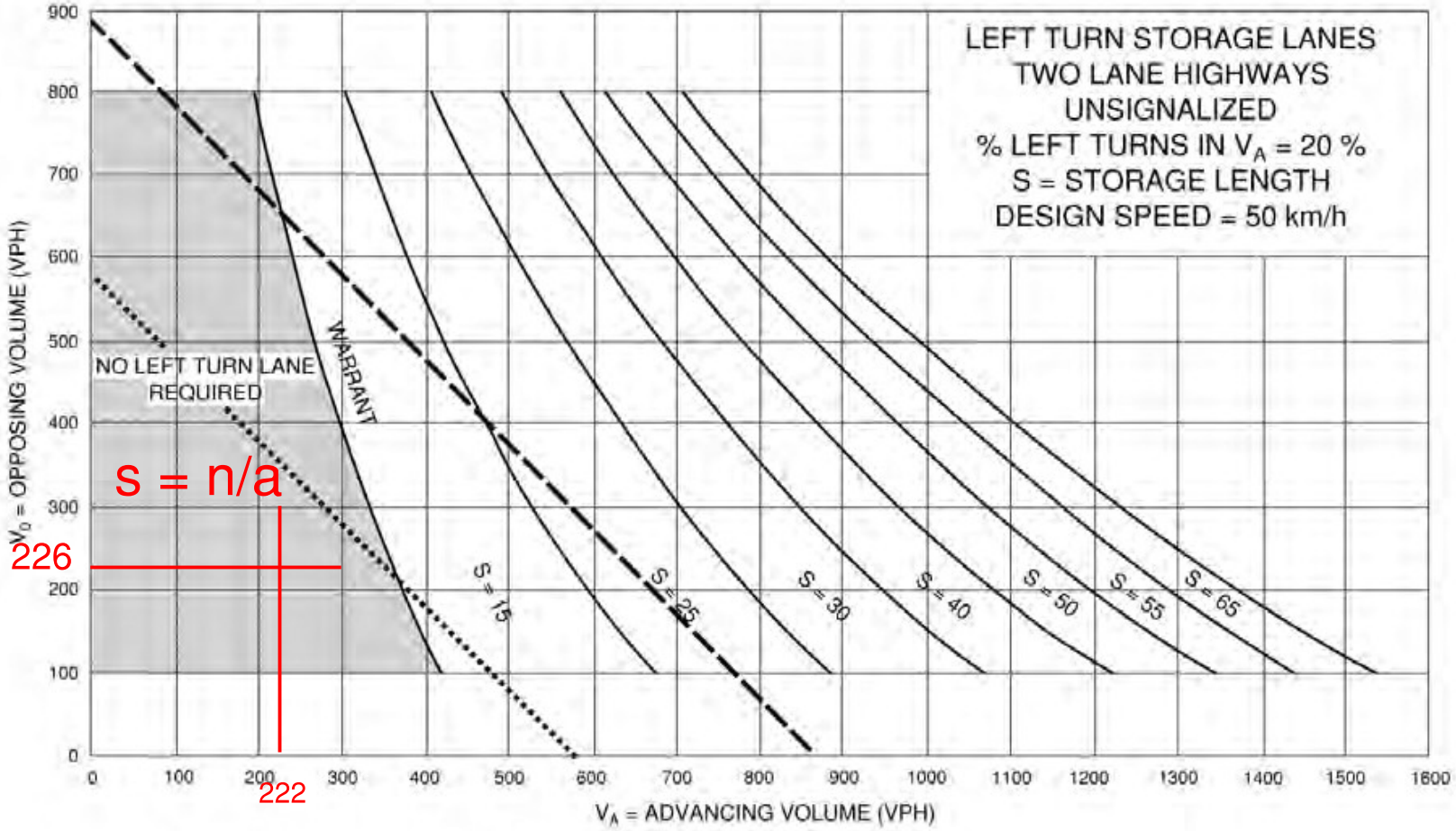

## FT 2044 AM - Decou Road & West Site Access

v=50km/h
$v_a$ = 222 vph
$v_o$ = 226 vph
$v_L$ = 37 vph

Percentage of Left-Turning Traffic:

(37*100)/222
**= 16.67%**
**~ 20%**

***Rounded to maintain conservative analysis**



# FT 2044 PM - Decou Road & West Site Access

TAC GDG for Canadian Roads, June 2017 — MTO Design Supplement, October 2023

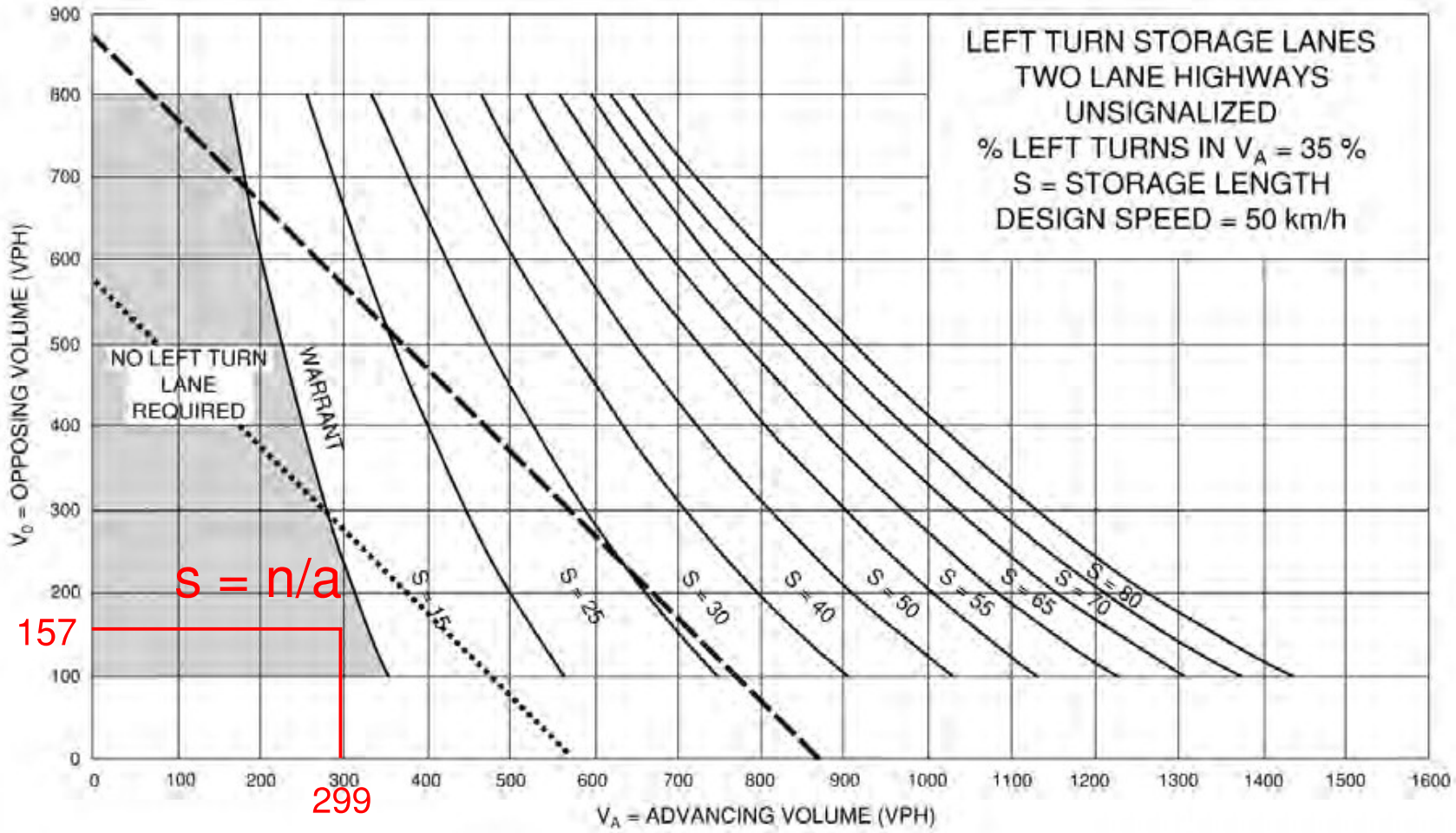
**Exhibit-9A-6**

v=50km/h
$v_a$ = 299 vph
$v_o$ = 157 vph
$v_L$ = 97 vph

Percentage of Left-Turning Traffic:

(97*100)/299
**= 32.4%**
**~ 35%**

***Rounded to maintain conservative analysis**



# APPENDIX H

## Sight Distance Assessment

# 4.0 Restoration

4.1. Where any person constructs or alters or permits the construction or alteration of an entrance without a permit or fails to comply with the terms and conditions of the permit, the altered portion of the highway may be restored by the municipality at the owner s expense.

# 5.0 Obstruction of ditch or culvert

5.1. No person shall obstruct or permit the obstruction of any ditch or culvert upon a highway.

# 6.0 Penalty

Any person who contravenes any provision of this By-Law is guilty of an offence and upon conviction is liable to any penalty as provided for in The Provincial Offences Act, R.S.O. 1990, as amended.

# 7.0 Short title

The short title of this By-Law shall be the  Norfolk County Entrance By-Law .

# 8.0 Force and effect

That the effective date of this By-Law shall be the date of passage thereof.

Enacted and passed this 22nd day of March, 2016.

---

# Schedule  A - Entrance permit procedure

## Procedure:

1. Process consists of 2 parts application and permit.
2. Applicant must complete a permit application.
3. Applicant may print the application from the County s website and bring the completed documentation to along with permit fee or send by mail.
4. The Roads Supervisor will contact the applicant and conduct a site visit.
5. Once the application has been reviewed, the permit will be issued and mailed to the applicant.

---

# Schedule B - Norfolk County property entrance guidelines

The Corporation of Norfolk County, Public Works and Environmental Services Department shall consider the following criteria when reviewing all applications for new entrances or alterations to entrances:

a) Protection of the public through the orderly control of traffic movements onto and from municipal roads, including possible requirements for left and/or right turn lanes.
b) Protection of the public investment in municipal road facilities.
c) Minimizing municipal expenditures on maintenance of private entrance ways.
d) Providing legal access onto municipal roads from adjacent private property.

## Location of entrances

The proposed entrance location is to be clearly illustrated on a sketch or site plan which is to accompany the application for an entrance permit.

The sketch or site plan must provide enough information to enable staff to locate it in the field, i.e. dimensions to buildings and/or landmarks like fences, hedgerows and tree lines, etc. Additionally the applicant shall visibly stake on site the proposed location.

Norfolk County may restrict the placement of an entrance onto the municipal road in the interest of public safety. New entrances must be located so as to provide:

a) No undue interference with the sage movement of public traffic, pedestrians, or other users of the highway.
b) Favorable vision, grade and alignment conditions for all traffic using the proposed access to the municipal road.

In general, new entrances will not be permitted at the following locations:

a) Along a lane which is identified for the purpose of an exclusive vehicular turning movement.
b) In close proximity to intersections and bridges.
c) On unimproved/non maintained unopened road allowances.
d) Where the following minimum sight distance requirements are not met:

| **Speed limit** | **minimum distance** |
|---|---|
| 40 km/hr | 100 metres |
| 50 km/hr | 120 metres |
| 60 km/hr | 140 metres |
| 70 km/hr | 160 metres |
| 80 km/hr | 180 metres |
| 90 km/hr | 180 metres |

**Note:**

a) Sight distance shall be measured from eye height of 1.05 metres measured 3.0 metres from outer edge of the traffic lane to an object height of 1.3 metres above the roadway surface.

An entrance adjacent to a bridge or other structure which may interfere with the clear vision of traffic using the entrance must be located as follows:

a) A commercial entrance in an area where the speed limit is 80 km/hr or more must be located at least 145 metres from the end of the deck of the bridge or from the nearest part of the structure which actually interferes with the clear vision of traffic using that entrance.
b) A residential, farm or field entrance in an area where the speed limit is 80 km/hr more must be located at least 30 metres from the end of the deck of the bridge or from the nearest part of the structure which actually interferes with the clear vision of the traffic using that entrance.
c) In areas where the speed limit is less than 80 km/hr, the Public Works and Environmental Services General Manager (or designate) may restrict the location of an entrance to that distance from the bridge or other structure which isdeemed advisable.

# Design standards

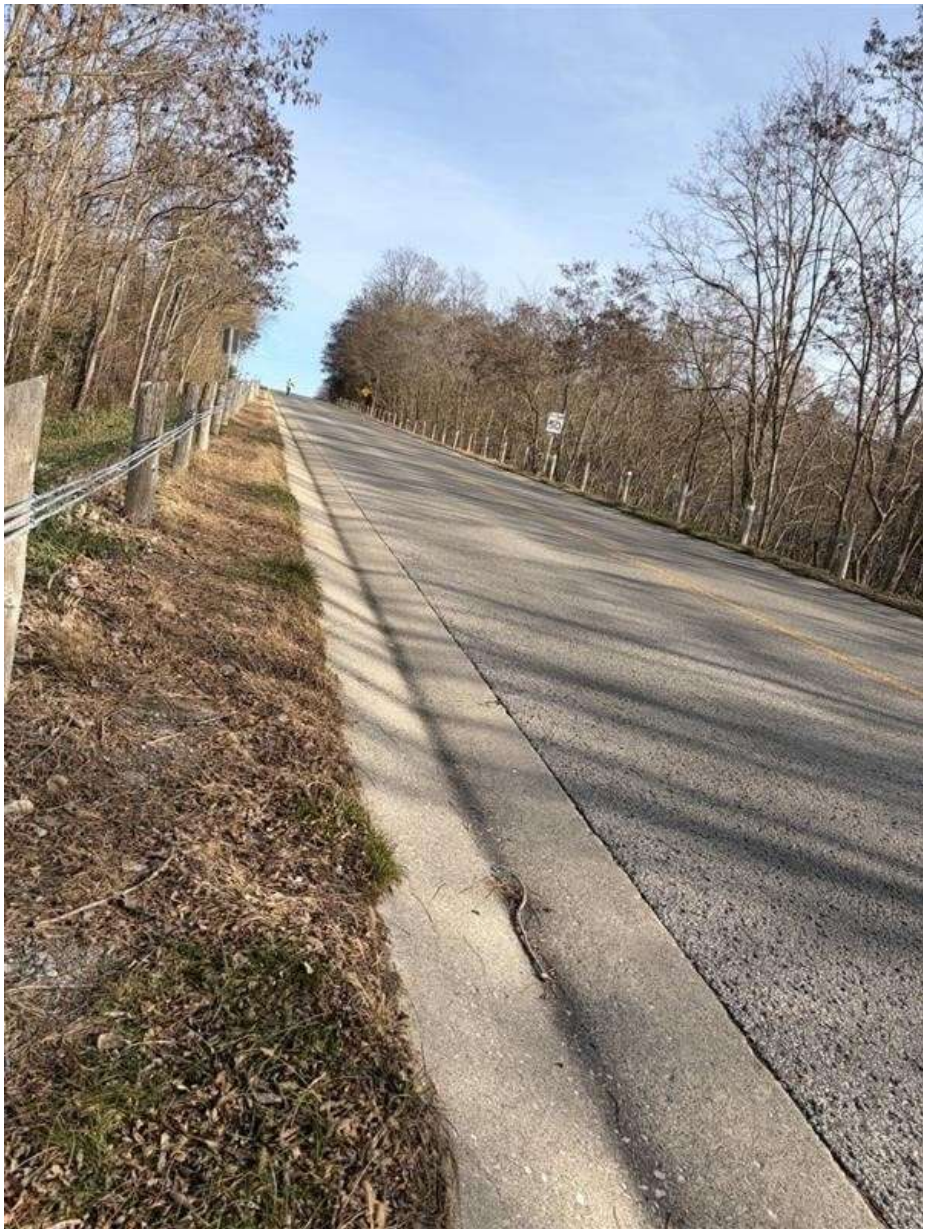

EASTERN SITE ACCESS (Left-Turn, Looking West)
220


EASTERN SITE ACCESS (Right-Turn, Looking East)

WESTERN SITE ACCESS (Left-Turn, Looking West)



WESTERN SITE ACCESS (Right-Turn, Looking East)



# APPENDIX I

## On-Street Parking Plan

# ON-STREET PARKING PLAN

ADDRESS:
227 Decou Road,
Simcoe

Project No:
25326

Scale:
1:2500

Drawing No:
OS-1

February 19, 2026

Designed By:
EC

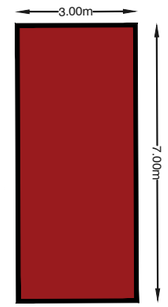
BIGLIERI GROUP

**LEGEND**

- SINGLES
- TOWNHOUSES
- PARKLAND AND OPEN SPACE
- SWM
- ROADS

N

**PARKING SPACE SIZE:**




**PARKING INFORMATION:**

Parking requirement:
- Distance to Driveway: 1.2 metre
- Distance to Intersection: 9.0 metres
- Distance to Fire Hydrant/Community Mailbox: 3.0 metres

Driveway Width:
- Singles 11.00m (36'): 3.0 metres
- Singles 12.20m (40'): 6.0 metres
- Townhouses: 3.0 metres

On-Street Parking Provided: 152 Spaces

Residential (Off-Street) Parking Provided: 808 Spaces
(1 Driveway, 1 Garage)

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

# 227 Decou Road

Preliminary

## Functional Servicing & Stormwater Management Report

**Project Location:**

227 Decou Road, Simcoe

**Prepared For:**

LIV (Simcoe) GP Inc.

**Date:** February 2026

**SLA File No:** 25054

3228 South Service Road, Suite 105, East Wing Burlington, Ontario L7N 3H8
Tel: 905-631-6978 www.sla.on.ca

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# 1.0 INTRODUCTION AND BACKGROUND

## 1.1 Overview

S. Llewellyn & Associates Limited has been retained by LIV (Simcoe) GP Inc. to provide Consulting Engineering services for the proposed residential subdivision at 227 Decou Road in Simcoe within Norfolk County. Refer to Figure 1.0 for the location plan.

The property is currently comprised of agricultural lands, with a portion of wooded areas located at the southwest portion of the site. The proposed development is bound by the existing Woodway Trails Phase 1 Subdivision and future Woodway Trails Phase 2 Subdivision to the north, the future 682 Ireland Road (Calibrex) development to the east, existing residential dwellings, Decou Road and Lynn River to the south, and the existing Lake Erie & Northern Railway Trail to the west.

The proposed residential subdivision will consist of 125 two-storey single detached units with basements, 279 two-storey townhouse units with basements, a public Stormwater Management facility (wet pond) and a central public park area. It will also include natural system areas along the southwest portion of the development, as well as a new municipal road network.

This Preliminary Functional Servicing & Stormwater Management Report provides information on the proposed servicing, grading and stormwater management scheme for the development, submitted in support of an official plan amendment and rezoning application filed with Norfolk County.

Please refer to the preliminary engineering plans prepared by S. Llewellyn & Associates Limited and the Concept plan prepared by the Biglieri Group for additional information.

## 1.2 Background Information

The following documents were referenced in the preparation of this report:

Ref. 1: MOE Stormwater Management Practices Planning and Design Manual, Ministry of Environment (March 2003).

Ref. 2: Erosion & Sediment Control Guidelines for Urban Construction (December 2006).

Ref. 3: Norfolk County Design Criteria, Norfolk County (February 2019).

Ref. 4: Flood Hazard Map – Lynn River Black Creek – Long Point Region Conservation Authority, Wood (March 2020).

Ref. 5: Geotechnical Investigation Residential Subdivision – Decou Road and Ireland Road, Simcoe, Ontario, LVM Naylor (December 2009).

Ref. 6: Functional Servicing Report – Woodway Trails Subdivision, G. Douglas Vallee Limited (June 25, 2025).

Ref. 7: Stormwater Management Report – Woodway Trails Subdivision, G. Douglas Vallee Limited (June 25, 2025).

Ref. 8: Functional Servicing Report – Donly Drive Condominiums, Development Engineering (London) (December 21, 2016).

Ref. 9: SWM Servicing Brief – Donly Drive, Woodway Trails Subdivision, Development Engineering (London) (December 16, 2016).

Ref.10: Stormwater Management Clarification Letter – Proposed Donly Drive Condominiums, Development Engineering (London) (March 27, 2017).

Ref.11: Civil Engineering Drawings – 682 Ireland Road, Counterpoint Engineering (June 2023).

Ref.12: Low Impact Development Stormwater Management Guidance Manual – Draft for Consultation, Ministry of Environment, Conservation & Parks (January 2022).

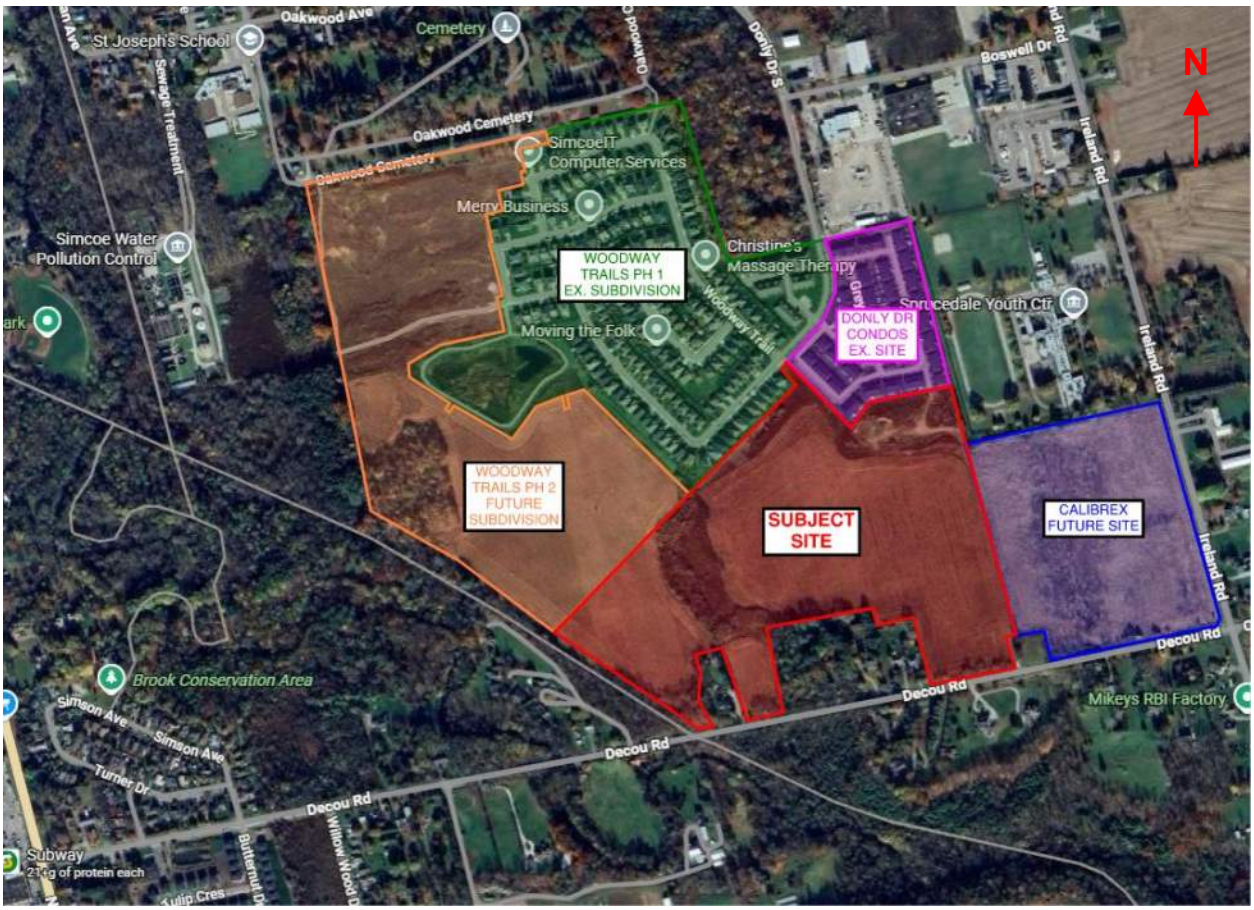



**Figure 1.0 – Location Plan**

## 1.3 Geotechnical and Hydrogeological Information

A geotechnical report (Ref. 5) for the property indicates that the soils are comprised of 200mm to 450mm of topsoil. In Boreholes #16, 17 and 20, the topsoil layer is underlain with approximately 0.8m to 2.0m of silt, 0.6m to 2.6m of sand and another layer of 1.23m to 3.95m of silt. In Boreholes #18 and 19, the topsoil layer is underlain with approximately 6.25m to 9.2m of sand. In Boreholes #21 and 22, the topsoil layer is underlain with approximately 0.5m to 1.3m of sand, 1.5m to 1.8m

of silt/silt till and another layer of 1.0m to 2.73m of sand. Borehole #22 also has one additional layer of approximately 0.73m of silt beneath the last layer of sand.

Groundwater was observed in Boreholes #17 and 18 at approximate elevations of 209.54m and 216.03m (sub-artesian conditions) respectively. Refer to the geotechnical report (Ref. 5) in Appendix D for details.

# 2.0 STORM DRAINAGE & STORMWATER MANAGEMENT

The following stormwater management (SWM) criteria will be applied to the site, in accordance with the Norfolk County and Long Point Region Conservation Authority requirements:

## 2.1 Stormwater Management Criteria

### Quantity Control

The post-development discharge rates from the proposed development directed south towards the existing Lynn River are to be controlled to the pre-development discharge rates for all storm events up to and including the 100-year storm event.

### Quality Control

The stormwater runoff from the proposed development shall meet Level 1 (Enhanced) stormwater quality control (80% TSS removal, 90% average runoff treatment).

### Infiltration/Volume Control

Low Impact Development (LID) measures will be implemented on-site, where appropriate, and in accordance with the Ministry of Environment, Conservation and Parks (MECP) and Norfolk County requirements.

### Erosion Control

It is required to provide a minimum 24-to-48-hour drawdown time for the 25mm storm event for erosion control measures. Additional erosion and sediment control measures will be implemented in accordance with the standards of Norfolk County and Long Point Region Conservation Authority.

## 2.2 Existing Conditions

Under existing conditions, the property is currently comprised of agricultural lands, with a portion of wooded areas located at the southwest portion of the site. The proposed development is bound by the existing Woodway Trails Phase 1 Subdivision and future Woodway Trails Phase 2 Subdivision to the north, the future 682 Ireland Road (Calibrex) development to the east, existing residential dwellings, Decou Road and Lynn River to the south, and the existing Lake Erie & Northern Railway Trail to the west.

Drainage from the site currently drains south via sheet flow to various existing culverts, which convey drainage across Decou Road towards the existing Lynn River. Two existing culverts are located at the southwest corner of the site, an existing 1050mmø culvert and an existing 600mmø culvert. An existing 600mmø culvert is located at the southeast corner of the site. Additionally,

there is an existing 600mmø culvert located east of the site, on the future Calibrex development lands, which currently drains a small portion of the east side of the site towards the existing Lynn River.

Based on the SWM Servicing Brief for the existing Donly Condominium development (Ref. 9), the emergency overland flows from the majority of the existing Donly Condominium development currently are conveyed south through the proposed development to the existing 600mmø culvert located east on the future Calibrex development lands.

A small portion of drainage from the future Woodway Trails Phase 1 Subdivision drains south, traversing the proposed development lands, towards the existing 1050mmø and 600mmø culverts at the southwest corner of proposed development. Additionally, a portion of the drainage from the existing residential lots (179 to 207 Decou Road) traverse the proposed development lands to the existing 600mmø culvert located at the southwest corner of the proposed development.

Six (6) catchments, Catchments 101, 102, 103, 201, 202 and 203, have been identified in the existing condition.

Catchment 101 represents the existing condition sheet drainage from the subject lands towards the existing 1050mmø and 600mmø culvert at the southwest corner of the subject lands. Catchment 102 represents the existing condition sheet drainage from the subject lands towards the existing 600mmø culvert at the southeast corner of the subject lands. Catchment 103 represents the existing condition sheet drainage from the subject lands towards the existing 600mmø culvert on the Calibrex development lands.

Catchment 201 represents the external drainage from the future Woodway Trails Phase 2 Subdivision, traversing the proposed development lands, towards the existing 1050mmø and 600mmø culverts at the southwest corner of proposed development. Catchment 202 represents the external drainage from the existing residential lots (179 to 207 Decou Road) traversing the proposed development lands to the existing 600mmø culvert located at the southwest corner of the proposed development. Catchment 203 represents the major flows from the majority of the existing Donly Condominium development traversing the proposed development to the existing 600mmø culvert located east on the Calibrex development lands.

Refer to Table 2.1 below and the Pre-Development Storm Drainage Area Plan in Appendix A for details.

**Table 2.1 – Existing Condition Catchment Areas**

| Catchment ID | Description | Area (ha) | % Impervious | Runoff Coeff. (C) |
|---|---|---|---|---|
| 101 | Ex. Drainage from subject lands to the Ex. 1050mmø and 600mmø culvert (southwest) | 14.23 | 0% | 0.20 |
| 102 | Ex. Drainage from subject lands to the Ex. 600mmø culvert (southeast) | 2.43 | 1% | 0.21 |
| 103 | Ex. Drainage from subject lands to the Ex. 600mmø culvert (Calibrex development lands) | 4.03 | 2% | 0.22 |
| 201 | External drainage from future Woodway Trails Ph. 2 Subdivision to the Ex. 1050mmø and 600mmø culvert (southwest) | 1.78 | 0% | 0.20 |
| 202 | External drainage from Ex. Residential lots to the Ex. 600mmø culvert (southwest) | 1.02 | 9% | 0.26 |
| **Total CA 101-103 & 201-202** | | **23.49** | **1%** | **0.21** |
| | | | | |
| 203 [A] | Emergency Overland Flows from Ex. Donly Condominium development to the Ex. 600mmø culvert (Calibrex) | 3.87 | 62% | 0.64 |
| | | | | |
| **Grand Total to Ex. Culverts & Lynn River** | | **27.36** | **10%** | **0.27** |

[A] Catchment 203 is separated from the other catchments, as the major flows were already determined in the SWM Brief completed for the Donly Condominium development (Ref. 9)

As per discussions with the Norfolk County, the Ministry of Transportation (MTO) Intensity-Duration-Frequency (IDF) lookup tool was used to determine the IDF parameters for the proposed development.

Catchments 101, 102, 103, 201 and 202 were assessed using the SWMHYMO hydrologic modeling program developed by J.F. Sabourin & Associates using the MTO IDF parameters for the 2-year to 100-year, 24-hour Chicago design storm events. Catchment 203 has not been modelled, since the major flows (10-year to 100-year storm events) from the catchment, which are conveyed through to the proposed development, were determined in the SWM Brief for the Donly Condominium development (Ref. 9).

Detailed hydrologic modeling parameter and input/output printouts for the existing conditions have been included and can be found in Appendix A. Table 2.2 summarizes the existing condition discharge rates for all existing catchment areas except for Catchment 203. Table 2.3 summarizes the major flows from the existing Donly Condominium development (Catchment 203) added to the total existing flows in Table 2.2 (Catchment 101-103, 201 & 202).

**Table 2.2 – Existing Condition Flows (Catchment 101-103 & 201-202)**

| Storm Event | Catchment 101 ($m^3/s$) | Catchment 102 ($m^3/s$) | Catchment 103 ($m^3/s$) | Catchment 201 ($m^3/s$) | Catchment 202 ($m^3/s$) | Total CA 101-103 & 201-202 ($m^3/s$) [A] |
|---|---|---|---|---|---|---|
| 2-year | 0.160 | 0.030 | 0.036 | 0.027 | 0.022 | **0.253** |
| 5-year | 0.308 | 0.057 | 0.069 | 0.053 | 0.042 | **0.487** |
| 10-year | 0.424 | 0.079 | 0.094 | 0.073 | 0.059 | **0.671** |
| 25-year | 0.583 | 0.108 | 0.129 | 0.100 | 0.081 | **0.923** |
| 50-year | 0.712 | 0.132 | 0.158 | 0.122 | 0.099 | **1.128** |
| 100-year | 0.845 | 0.157 | 0.187 | 0.145 | 0.117 | **1.338** |

[A] Based on SWMHYMO "Add Hyd" command, since time to peak for each catchment is different. Therefore, total discharge does not equal sum of the discharges, but the resulting discharge specified in the SWMHYMO output sheet

**Table 2.3 – Existing Condition Flows (Total)**

| Storm Event | Total CA 101-103 & 201-202 ($m^3/s$) [A] | Catchment 203 ($m^3/s$) | Total to Ex. Culverts ($m^3/s$) [B] |
|---|---|---|---|
| 2-year | 0.253 | - | **0.253** |
| 5-year | 0.487 | - | **0.487** |
| 10-year | 0.671 | 0.046 | **0.717** |
| 25-year | 0.923 | 0.091 | **1.014** |
| 50-year | 1.128 | 0.121 | **1.249** |
| 100-year | 1.338 | 0.148 | **1.486** |

[A] From Table 2.2
[B] Total = CA 101-103 & 201-202 + Catchment 203

Based on the calculations, the post-development discharge rates for the proposed development are to be controlled to the pre-development discharge rates listed in Table 2.3.

It is important to note that there is an existing floodplain associated with the existing Lynn River, described within the Flood Hazard Map for Lynn River/Black Creek (Ref. 4). Based on the Flood Hazard Map and the outfall location for the proposed development (southwest corner of the site), the existing 100-year flood elevation is 200.44m and the regional flood elevation is 202.40m. Refer to Appendix A for the Flood Hazard Map associated with the proposed development.

Additionally, there is an existing dripline located along the Natural Heritage System (NHS) areas at the southwest corner of the proposed development. As per coordination with GeoProcess Research Associates, a setback of 10.0m from the existing dripline is established for the proposed development.

## 2.3 Proposed Conditions

Under proposed conditions, the proposed residential subdivision will consist of 125 two-storey single detached units with basements, 279 two-storey townhouse units with basements, a public Stormwater Management facility (wet pond) and a central public park area. It will also include natural system areas along the southwest portion of the development, as well as a new municipal road network.

Six (6) catchment areas, Catchment 202, 203, 301, 302, 303 and 401 have been identified in the proposed condition.

Catchments 202 and 203 have the same drainage characteristics under proposed conditions as under existing conditions, with the only exception being the drainage is redirected through the proposed development to the proposed Stormwater Management (SWM) facility on-site.

Catchment 301 represents the proposed condition drainage from the proposed development conveyed to and controlled by the proposed SWM facility. Catchment 302 represents the proposed condition drainage (controlled) from the proposed SWM facility block. Catchment 303 represents the proposed uncontrolled drainage from the proposed development directed south towards the existing 1050mmø culvert at the southwest corner of the proposed development.

Catchment 401 represents the future condition drainage from the future Woodway Trails Phase 2 Subdivision conveyed to and controlled by the proposed SWM facility. The drainage area for Catchment 401 was determined based on the high point on the Plan and Profile drawing included within the Woodway Trails Subdivision Functional Servicing Report (Ref. 6). It should be noted that this catchment has been included to be conservative, as the Woodway Trails Subdivision Functional Servicing Report mentions that the drainage from this catchment is to be directed to the existing SWM facility within the Woodway Trails Phase 1 Subdivision, even though the Plan and Profile drawings suggest otherwise. Confirmation of the drainage characteristics for Catchment 401 will be confirmed during detailed design.

All proposed and future condition drainage from the catchments listed above will be conveyed to the existing 1050mmø culvert at the southwest corner of the proposed development and the outlet at the south side of Decou Road, into the existing Lynn River. Table 2.4 summarizes the proposed condition catchments. See the Post-Development Storm Drainage Area Plan in Appendix A for details.

**Table 2.4 – Proposed Condition Catchment Areas**

| Catchment ID | Description | Area (ha) | % Impervious | Runoff Coeff. (C) |
|---|---|---|---|---|
| 301 | Proposed condition drainage from proposed development to the proposed SWM facility | 18.63 | 55% | 0.61 |
| 302 | Proposed condition drainage from proposed SWM facility block | 1.31 | 39% | 0.49 |
| 401 | Future condition drainage from Woodway Trails Ph. 2 to the proposed SWM facility | 0.31 | 55% | 0.61 |
| 202 | External drainage from Ex. residential lots to the proposed SWM facility | 1.02 | 9% | 0.26 |
| **Total CA 301, 302, 401 & 202** | | **21.27** | **51%** | **0.59** |
| | | | | |
| 203 [A] | Emergency Overland Flows from Ex. Donly Condominium development to the Ex. 600mmø culvert (Calibrex) | 3.87 | 62% | 0.64 |
| | | | | |
| **Total to Prop. SWM facility** | | **25.14** | **53%** | **0.60** |
| | | | | |
| 303 | Proposed uncontrolled drainage from the proposed development to Ex. Culverts | 0.72 | 0% | 0.20 |
| | | | | |
| **Grand Total to Ex. Culverts & Lynn River** | | **25.86** | **51%** | **0.59** |

[A] Catchment 203 is separated from the other catchments, as the major flows were already determined in the SWM Brief completed for the Donly Condominium development (Ref. 9)

It is proposed to regrade within the 10.0m existing dripline setback to ensure the proposed condition drainage is conveyed adequately to the either the proposed SWM facility or existing 1050mmø culvert. Additionally, in order to the facilitate the storm outlet for the proposed SWM facility, minor grading works have been proposed within the dripline in close proximity to the existing 1050mmø culvert.

## Minor Flows

It is proposed to service the proposed development with a municipal storm sewer system, all designed and constructed in accordance with Norfolk County standards. The municipal storm sewer network has been designed to convey the 5-year minor storm event from the development lands to the proposed SWM facility. The proposed SWM facility controls all minor flows before outletting to a proposed 1050mmø culvert at the southwest corner of the site and ultimately south to the existing Lynn River.

A preliminary Servicing Plan, Storm Drainage Area plan and storm sewer design sheet have been completed to demonstrate adequate capacity within the municipal storm sewer network to convey

post development storm flows to the proposed SWM facility. Refer to Appendix B for the Storm Drainage Area Plan and storm sewer design sheet.

### Major Flows

The major flows represent all storm runoff greater than the 5-year storm event up to and including the 100-year storm event.

The major flows through the majority of the proposed development are conveyed via the municipal road network to an overland spillway into the proposed SWM facility. Several rear lot catchbasins and ditch inlets within the proposed development have been designed to capture and convey the 100-year storm even via the corresponding storm leads, in absence of an adequate major overland flow route. All corresponding downstream storm sewers are designed to convey the 100-year flows from these areas. The rear lot catchbasins, road catchbasins and ditch inlets have been designed for 50 percent blockage to be conservative. Inlet capacity calculations will be provided during detailed design.

The proposed SWM facility controls all major flows before outletting to the existing 1050mmø culvert and ultimately south to the existing Lynn River.

An emergency overland spillway is provided at the southwest corner of the proposed SWM facility, which provides a conveyance route for all flow during an emergency scenario (blockage or storm events in exceed of the 100-year event).

### External Flows

The external flows (conservatively includes minor and major flows) from the future Woodway Trails Phase 2 Subdivision are conveyed via the proposed municipal road network to the proposed SWM facility (Catchment 401).

Additionally, the major flows from the majority of the existing Donly Condominium development are proposed to be captured within proposed catchbasins in the rear yard of the townhouse blocks abutting the existing development. As mentioned above, the catchbasins have been designed to capture and convey the 100-year storm even via the corresponding storm leads. All corresponding downstream storm sewers are designed to convey the 100-year flows from these areas.

## 2.4 Water Quantity Control

Under proposed conditions, the post-development discharge rates from the proposed development directed towards the existing 1050mmø culvert are to be controlled to the pre-development discharge rates for all storm events up to and including the 100-year storm event.

To provide adequate quantity control, it is proposed to construct a SWM facility (wet pond) located at the southwest corner of the development lands. It is proposed to apply quantity control measures to Catchment 202, 301, 302 and 401, by installing a multi-stage orifice control system within the proposed SWM pond block (Catchment 302).

The first stage of the orifice control system is a 155mmø orifice plate at an elevation of 208.45 on the west invert of MH1 (permanent pool elevation). The first stage is a low flow orifice which is connected to a reverse sloped pipe and headwall within the SWM facility. The low flow orifice provides the required attenuation to the 25mm storm event for the drawdown time of the extended detention.

The second stage of the orifice control system is a 350mmØ orifice plate at an elevation of 208.45m, which becomes active at an elevation of 208.95m (double ditch inlet DDI1.1). The third stage of the orifice control system is a 525mmØ orifice plate at an elevation of 208.80m, which becomes active at an elevation of 209.40m (double ditch inlet DDI1.2). The second and third stage orifices provide the required attenuation for all storm events up to an including the 100-year storm event.

With the installation of quantity control measures for Catchments 202, 301, 302 and 401, it is required to provide 7,646m$^3$ of stormwater storage during the 100-year event. The proposed SWM facility at the southwest corner of the proposed development will provide 10,101m$^3$ of stormwater storage. Refer to Table 2.5 for a summary of the stage-storage-discharge relationship and Appendix A for more detailed calculations.

**Table 2.5 – Stage-Storage-Discharge Summary**

| Elevation (m) | Cumulative Volume (m$^3$) | Active Storage Volume (m$^3$) | Discharge (m$^3$/s) |
|---|---|---|---|
| 207.20 (Bottom of Pond) | 0 | 0 | 0 |
| 207.65 (Bottom of Planting Shelf) | 877 | 0 | 0 |
| 207.85 (Top of Planting Shelf) | 1,370 | 0 | 0 |
| 208.45 (Permanent Pool/ Orifice #1 Active) | 3,393 | 0 | 0 |
| 208.93 (Extended Detention) | 5,546 | 2,153 | 0.0329 |
| 208.95 (Orifice #2 Active) | 5,647 | 2,254 | 0.1843 |
| 209.40 (Orifice #3 Active) | 8,112 | 4,719 | 0.6264 |
| 209.86 (100-yr ponding) | 11,039 | **7,646** | 0.8844 |
| 210.20 (Spill elevation) | 13,494 | 10,101 | 1.0327 |
| 210.50 (Top of Pond) | 15,872 | 12,479 | 1.1474 |

Catchments 202, 301, 302, 303 and 401 were assessed using the SWMHYMO hydrologic modeling program developed by J.F. Sabourin & Associates using the MTO IDF parameters for the 2-year to 100-year, 24-hour Chicago design storm events.

The proposed condition discharge rates from Catchment 203, although conveyed to the SWM facility, have not been included in the modelling since the major flows (10-year to 100-year storm events) from the catchment, which are conveyed through to the proposed development, were determined in the SWM Brief for the Donly Condominium development (Ref. 9).

Detailed hydrologic modeling parameter and input/output printouts for the proposed conditions have been included and can be found in Appendix A. Table 2.6 summarizes the proposed condition discharge rates for all proposed catchment areas except for Catchment 203. Table 2.7 summarizes the major flows from the existing Donly Condominium development (Catchment 203) added to the total controlled and uncontrolled flow rates in Table 2.6 (Catchment 202, 301, 302, 303 & 401) and compared to pre-development conditions discharge rates.

**Table 2.6 – Proposed Condition Flows (Catchment 202, 301-303 & 401)**

| Storm Event | Total Controlled Flow from SWM facility (CA 202, 301, 302 & 401) ($m^3/s$) | Uncontrolled Flows (CA 303) ($m^3/s$) | Total Controlled & Uncontrolled Flows to Ex. Culvert (CA 202, 301-303 & 401) ($m^3/s$) [A] |
|---|---|---|---|
| 2-year | 0.222 | 0.018 | **0.226** |
| 5-year | 0.276 | 0.035 | **0.282** |
| 10-year | 0.647 | 0.048 | **0.663** |
| 25-year | 0.742 | 0.066 | **0.763** |
| 50-year | 0.818 | 0.081 | **0.845** |
| 100-year | 0.879 | 0.096 | **0.910** |

[A] Based on SWMHYMO "Add Hyd" command, since time to peak for each catchment is different. Therefore, total discharge does not equal sum of the discharges, but the resulting discharge specified in the SWMHYMO output sheet. Excludes Catchment 203.

**Table 2.7 – Proposed Condition Flows (Total)**

| Storm Event | Total CA 202, 301-303 & 401 ($m^3/s$) [A] | Catchment 203 ($m^3/s$) | Total Proposed to Ex. Culvert ($m^3/s$) [B] | Total to Ex. Culvert ($m^3/s$) [C] | Difference |
|---|---|---|---|---|---|
| 2-year | 0.226 | - | **0.226** | 0.253 | **- 0.027** |
| 5-year | 0.282 | - | **0.282** | 0.487 | **- 0.205** |
| 10-year | 0.663 | 0.046 | **0.709** | 0.717 | **- 0.008** |
| 25-year | 0.763 | 0.091 | **0.854** | 1.014 | **- 0.160** |
| 50-year | 0.845 | 0.121 | **0.966** | 1.249 | **- 0.283** |
| 100-year | 0.910 | 0.148 | **1.058** | 1.486 | **- 0.428** |

[A] Values from Table 2.6
[B] Total = Total from Catchments 202, 301-303 & 401 + Catchment 203
[C] Values from Table 2.3

A summary of the storage volume required and ponding elevations for the proposed SWM facility under proposed conditions, during the 2-year to 100-year storm events, is provided in Table 2.8.

**Table 2.8 – Proposed Condition Discharge and Volume Summary (SWM Facility)**

| Storm Event | Total Controlled Flows SWM Facility ($m^3/s$) [A] | Required Storage Volume ($m^3$) | Ponding Elevation (m) |
|---|---|---|---|
| 2-year | 0.222 | 3,095 | 209.10 |
| 5-year | 0.276 | 4,550 | 209.37 |
| 10-year | 0.647 | 4,937 | 209.44 |
| 25-year | 0.742 | 5,930 | 209.58 |
| 50-year | 0.818 | 6,775 | 209.73 |
| 100-year | 0.879 | **7,646** | 209.86 |

[A] Values from Table 2.6 for Catchments 202, 301, 302 & 401

It is important to note that the proposed storm sewer outlet from the proposed SWM facility has been set an elevation of 206.78m, which sits well above the regional flood elevation of 202.40m from Lynn River. Therefore, it was determined that floodplain modelling is not required.

The analysis determined the following:

- The post-development discharge rates conveyed to the existing 1050mmø culvert, and the existing Lynn River do not exceed the pre-development discharge rates during all storm events up to and including the 100-year storm.
- Through the installation of a multi-stage orifice control system within the proposed MH1, DDI1.1 and DDI1.2 within the proposed SWM facility, adequate stormwater quantity control is provided.
- 10,101$m^3$ of stormwater storage is provided via the proposed SWM facility, while only 7,646$m^3$ of stormwater storage is required during the 100-year storm event.

## 2.5 Water Quality Control & Low Impact Development (LID)

As per the draft Low Impact Development (LID) Stormwater Management Guidance Manual from the MECP (Ref. 12), a hierarchical approach to LID implementation on-site is to be followed, which includes retention (priority 1), filtration (priority 2) and detention (priority 3).

### *2.5.1 Retention (Priority 1) and Filtration (Priority 2)*

In accordance with the the treatment train approach to water quality treatment, a review of potential Low Impact Development (LID) features has been completed for retention and filtration. A summary of each potential LID feature is included in Table 2.9.

**Table 2.9 – Low Impact Development Features**

| LID Feature | Implemented on Site | Retention (Yes/No) | Filtration (Yes/No) | Discussion |
|---|---|---|---|---|
| Green Roofs | No | Yes | No | Not applicable to single family and townhouse units. |
| Rainwater Harvesting | TBD | Yes | No | The possibility of rainwater harvesting for the development will be reviewed at the detailed design stage. |
| Downspout Disconnections | Yes | Yes | Yes | Will be applied to all proposed single family and townhouse units. |
| Pervious Pipes | TBD | Yes | Yes | The possibility of pervious pipes for the development will be reviewed at the detailed design stage. |
| Permeable Pavement | TBD | Yes | Yes | The possibility of permeable pavement for the development will be reviewed at the detailed design stage. |
| Soakaway Pit, Infiltration Trench or Chamber | TBD | Yes | Yes | The possibility of soakaway pits, infiltration trenches or chambers for the development will be reviewed at the detailed design stage. Most applicable area would be in the central park area. |
| Enhanced Grassed Swales | No | No | Yes | Enhanced grass swales are not applicable for single family lots and townhouse blocks, as drainage is the primary objective for lot level drainage. |
| Biofilters | TBD | Yes | Yes | The possibility of biofilters for the development will be reviewed at the detailed design stage. Most applicable area would be in the central park area. |

### *2.5.2 Detention (Priority 3)*

The stormwater runoff from the proposed development will meet Level 1 (Enhanced) stormwater quality control (80% TSS removal, 90% average runoff treatment), establishing detention requirements.

The treatment area is 21.27 ha (Catchment 202, 301, 302 & 401) with a percent imperviousness of 51%. In order to meet the quality control requirements for the proposed development, a permanent pool component has been provided within the proposed SWM facility. As per the Ministry of Environment guidelines, wet ponds can provide up to 80% TSS removal and will be used as the primary method of water quality control for Catchment 202, 301, 302 and 401.

Catchment 203 does not require quality control measures, as only the major flows are conveyed from the existing Donly Condominium development through to the proposed development, which

are not used as a basis for quality control. Catchment 303 does not require quality control measures, as the catchment contains landscaped areas, which is considered clean runoff.

Table 2.10 summarizes the water quality and erosion control requirements for the proposed SWM Facility, as per the MECP guidelines.

**Table 2.10 – SWM Facility Water Quality & ESC Requirements**

| Component | Required | Proposed |
|---|---|---|
| **Quality Control:** | | |
| Protection Level | Enhanced | |
| Drainage Area for Quality Control | 21.27 ha | |
| Imperviousness (%) | 51% | |
| MECP Water Quality Requirements [A] | 180 $m^3$/ha | |
| Permanent Pool Volume<br>= (180 $m^3$/ha – 40 $m^3$/ha) x 21.27 ha | 2,978 $m^3$ | 3,393 $m^3$ |
| **Erosion Control:** | | |
| Extended Detention Volume (25mm storm event) [B] | 2,120 $m^3$ | 2,153 $m^3$ |
| Drawdown Time (Extended Detention) | 24 – 48 hrs | 31.4 hrs |

[A] Water quality requirements were determined based on MECP Stormwater Management Planning and Design Manual
[B] Volume determined using SWMHYMO. Refer to the Input/Output files in Appendix A for details.

## 2.6 Sediment and Erosion Control

In order to minimize erosion during the grading and site servicing period of construction, the following measures will be implemented:

- Install silt fencing along the outer boundary of the site to ensure that sediment does not migrate to the adjacent properties.
- Installation of a mud mat at the construction entrances to the site to minimize the amount of sediment transported off the site on construction vehicle tires.
- Locating stockpiled topsoil in an area that will not impact adjacent lands.
- Stabilizing all disturbed or landscaped areas with hydro seeding/sodding to minimize the opportunity for erosion.
- Install sediment control (silt sacks) in the existing and proposed catchbasins to ensure that no untreated runoff enters the existing conveyance system.

To ensure and document the effectiveness of the erosion and sediment control structures, an appropriate inspection and maintenance program is necessary. The program will include the following activities:

- Inspection of the erosion and sediment controls (e.g., silt fences, sediment traps, outlets, vegetation, etc.) with follow up reports to the governing municipality.
- The developer and/or his contractor shall be responsible for any costs incurred during the remediation of problem areas.

Details of the proposed erosion & sediment control measures will be provided on the Erosion and Sediment Control Plans during detailed design.

# 3.0 SANITARY SEWER SERVICING

## 3.1 Existing Conditions

Under existing conditions, there is an existing 300mmø and 375mmø sanitary sewer located on the Trillium Way extension (installed as part of the Woodway Trails Phase 1 Subdivision), north of the proposed development. The existing 300mmø and 375mmø sanitary sewer connects to a 900mmø trunk sanitary sewer before ultimately outletting into the existing Simcoe Water Pollution Control Plant. Refer to the Woodway Trails Phase 1 Subdivision Plan and Profiles for the Sanitary Outlet, completed by G. Douglas Vallee Limited (November 2011) in Appendix C for details.

## 3.2 Proposed Sanitary Servicing and Demand

It is proposed to service the proposed development with a municipal 200mmø to 300mmø sanitary sewer designed and constructed in accordance with Norfolk County standards. The proposed sanitary sewer system will connect to a future 375mmø sanitary sewer system within the future Woodway Trails Phase 2 Subdivision to the north. Additionally, the proposed sanitary sewer system is proposed to receive the future sanitary flows from the future Calibrex development located east of the site.

As part of the future Woodway Trails Phase 2 Subdivision, it will be required to replace the existing 300mmø sanitary sewer between FUTMH33A to Ex. SAMH34 within the Trillium Way extension with a new 375mmø sanitary sewer.

Each single family and townhouse unit will be serviced with a proposed 125mmø sanitary service. Details of the locations will be provided during detailed design.

Sanitary discharge from the proposed development was estimated using Norfolk County design criteria. Based on the Concept Plan, the proposed residential subdivision will consist of 125 two-storey single detached units with basements, 279 two-storey townhouse units with basements, a public Stormwater Management facility (wet pond) and a central public park area. Refer to the Concept Plan prepared by the Biglieri Group for details.

The estimated sanitary demand for the proposed development is summarized in Table 3.1.

**Table 3.1 – Sanitary Demand Calculations**

| Component | Proposed Singles & Townhouses |
|---|---|
| Drainage Area [A] | 18.10 ha |
| Number of Units | 404 |
| Population Density [B] | 2.75 persons/unit |
| Population | 1,111 persons |
| Average Dry Weather Flow [C] | 5.79 l/s |
| Peaking Factor [D] | 3.77 |
| Infiltration [E] | 5.07 l/s |
| **Peak Flow [F]** | **21.83 l/s** |
| **Total Flow [G]** | **26.90 l/s** |

[A] Drainage Area does not encompass proposed SWM facility block & surrounding Natural Heritage System area
[B] Population density of 2.75 persons/unit from the Norfolk County standards
[C] Average dry weather flow of 0.45 $m^3$/person/day x 1,111 persons converted to l/s and from the Norfolk County standards
[D] Peaking Factor = 1 + ((14 / 4 + $P^{0.5}$)) with P expressed in thousands, Min = 2.0 and Max = 5.0
[E] Infiltration flow based on 0.28 l/s/ha and determined from the Norfolk County standards
[F] Peak Flow = Average Dry Weather Flow x Peaking Factor
[G] Total Flow = Peak Flow + Infiltration

It is important to note that the draft plan and zoning application allows for flexibility in the total number of units through providing a range for the number of units proposed within the development lands. It is understood that the high end of the range is a total of 509 units.

Therefore, sanitary demand calculations have been provided for the larger unit count of 509 units for information purposes, and should the larger unit count be explored, an analysis of the downstream sanitary sewer system will be reviewed. The resulting sanitary demand for 509 units is 32.05 l/s (determined using the same calculations as in Table 3.1).

### 3.3 Sanitary Sewer Capacity Analysis

A Preliminary Sanitary Drainage Area Plan and sanitary sewer design sheet have been completed to demonstrate there is adequate capacity within the municipal sanitary sewer system within the proposed development to convey the proposed sanitary demand and sanitary flows from the future Calibrex development north through the future Woodway Trails Phase 2 Subdivision to the existing 375mmø sanitary sewer on the Trillium Way extension.

The Sanitary Drainage Area Plan for the future Calibrex development (Ref. 11), completed by Counterpoint Engineering (June 2023) and the Functional Servicing Report (FSR) for the Woodway Trails Phase 2 Subdivision (Ref. 6), completed by G. Douglas Vallee Limited (June 25, 2025), were referenced to determine the external sanitary discharge conveyed through the proposed development and to the Trillium Way extension. Refer to Appendix C for details.

As per the pre-consultation comments, a Sanitary Servicing Assessment completed by Norfolk County's consultant will be completed at detailed design.

Through discussions with Norfolk County, it is understood that the preference is to convey all sanitary flows from the proposed development and Calibrex development north through the future Woodway Trails Phase 2 development. However, the sanitary design included within the FSR for the future Woodway Trails Phase 2 Subdivision did not encompass Norfolk County's preference.

Therefore, a preliminary sanitary design has been completed from the northwest limit of the proposed development through the future Woodway Trails Phase 2 Subdivision. Refer to the Preliminary Servicing Plan for details.

As per the sanitary analysis, it is determined that the municipal sanitary sewer through the proposed development and future sanitary sewer within the Woodway Trails Phase 2 Subdivision, and downstream sanitary sewer within the Trillium Way extension has sufficient capacity to service the proposed development, future Calibrex development and future Woodway Trails Phase 2 Subdivision. Refer to Appendix C for details.

### 3.4 Sanitary Servicing Alternative

An alternative sanitary servicing strategy was assessed for the scenario where access is not granted on the future Woodway Trails Phase 2 Subdivision to service the municipal sanitary sewer from the proposed development and future Calibrex development to the existing downstream sanitary sewer within the Trillium Way extension.

The alternative sanitary servicing strategy involves extending the municipal sanitary sewer within the proposed development through an easement located within the future SWM facility block and along the existing Lake Erie & Northern Railway (LENR) Trail to the existing downstream sanitary sewer within the Trillium Way extension. To facilitate the sanitary works, the existing LENR Trail will need to be reconstructed as an embankment to ensure adequate cover is provided over the sanitary sewer system.

Further design details on the sanitary servicing alternative will be provided should the alternative sanitary servicing strategy be pursued or at the request of Norfolk County.

## 4.0 DOMESTIC AND FIRE WATER SUPPLY SERVICING

### 4.1 Existing Conditions

Under existing conditions, there is an existing 200mmø watermain located on the Trillium Way extension (installed as part of the Woodway Trails Phase 1 Subdivision), north of the proposed development. Additionally, there is an existing 200mmø watermain located on Woodway Trail (installed as part of the Woodway Trails Phase 1 Subdivision), northeast of the proposed development. Both existing 200mmø watermains loop through the Woodway Trails Phase 1 Subdivision and ultimately connect to the existing 300mmø watermain on Boswell Street.

Additionally, there is an existing 200mmø watermain located on Decou Road, approximately 400m west of the proposed development lands.

## 4.2 Domestic Water Demand

The domestic water demand for the proposed development was estimated using Norfolk County design criteria. Based on the Concept Plan, the proposed residential subdivision will consist of 125 two-storey single detached units with basements, 279 two-storey townhouse units with basements, a public Stormwater Management facility (wet pond) and a central public park area. Refer to the Concept Plan prepared by the Biglieri Group for details.

The estimated domestic water demand for the proposed development is summarized in Table 4.1.

**Table 4.1 – Domestic Water Demand Calculations**

| Component | Private Townhouse Development Block Future Mid to High Rise Blocks |
|---|---|
| Drainage Area [A] | 18.10 ha |
| Number of Units | 404 |
| Population Density [B] | 2.75 persons/unit |
| Population | 1,111 persons |
| Average Daily Demand [C] | 5.79 l/s |
| Max. Daily Peaking Factor [D] | 2.25 |
| Max. Hourly Peaking Factor [D] | 4.00 |
| **Max. Daily Demand [E]** | **13.03 l/s** |
| **Max. Hourly Demand [F]** | **23.16 l/s** |

[A] Drainage Area does not encompass proposed SWM facility block & surrounding Natural Heritage System area
[B] Population density of 2.75 persons/unit from the Norfolk County standards
[C] Average dry weather flow of 0.45 $m^3$/person/day x 1,111 persons converted to l/s and from the Norfolk County standards
[D] Peaking Factors determined from the Norfolk County standards
[E] Max. Daily Demand = Max daily factor (2.25) x Average daily demand, from the Norfolk County Standards
[F] Max. Hourly Demand = Max hourly factor (4.00) x Average daily demand, from the Norfolk County Standards

Similar to the sanitary demand section of the report, domestic water demand calculations have been provided for the larger unit count of 509 units for information purposes. The resulting maximum daily water demand for 509 units is 16.40 l/s and the maximum hourly water demand for 509 units is 29.16 l/s (determined using the same calculations as in Table 4.1).

## 4.3 Fire Flow Demand

Fire flow demands for development are governed by a number of guidelines and criteria, such as the Water Supply for Public Fire Protection (Fire Underwriters Survey, 1999), the Ontario Building Code (OBC), and various codes and standards published by the National Fire Protection

Association (NFPA). The FUS method will be used to determine the fire flow demands for the proposed development, as specified in the Norfolk County guidelines.

Since the unit layout for the proposed development is currently unavailable, details regarding the fire flow requirements for the proposed development will be provided during detailed design.

It is proposed to install twenty (20) municipal hydrants within the proposed development, which are designed to supply fire flow for the proposed development. All proposed hydrants have been proposed with a minimum 150m separation per Norfolk County requirements.

As per the pre-consultation comments, a Watermain Hydraulic Analysis completed by Norfolk County's consultant will be completed at detailed design. It is recommended that hydrant flow testing on the existing hydrants within close proximity to the proposed development be completed as part of the Watermain Hydraulic Analysis.

A Watermain Hydraulic Analysis and hydrant flow testing will be completed at a later date to determine the adequacy of the fire flow and pressure characteristics of the watermain system.

### 4.4 Proposed Water Servicing

It is proposed to service the proposed development with a municipal 200mmø municipal watermain designed and constructed in accordance with Norfolk County standards. The proposed watermain will connect to the future 200mmø watermain within the future Woodway Trails Phase 2 Subdivision to the north, to the future 200mmø watermain within the future Calibrex development to the east and to the existing 200mmø watermain on Woodway Trail to the northeast.

As part of the future Woodway Trails Phase 2 Subdivision, it will be required to extend the proposed 200mmø watermain north to the existing 200mmø watermain on the Trillium Way extension. The proposed and future watermain system will loop through the Woodway Trails Phase 1 Subdivision and ultimately connect to the existing 300mmø watermain on Boswell Street.

Each single family and townhouse unit will be serviced with a proposed 25mmø water service and curb stop. Details of the locations will be provided during detailed design.

### 4.5 Water Servicing Alternatives

Alternative water servicing strategies were assessed for the scenario where access is not granted on the future Woodway Trails Phase 2 Subdivision to service the municipal watermain system from the proposed development. It is important to note that all alternative water servicing strategies are dependent on the water supply and adequacy of the fire flow and pressure characteristics of both the receiving watermain and proposed watermain systems, which will be confirmed as part of the Watermain Hydraulic Analysis.

One of the alternative water servicing strategies is to connect the proposed 200mmø watermain system to only the existing 200mmø watermain on Woodway Trail to the northeast and to the future 200mm watermain within the future Calibrex development.

Another alternative water servicing strategy is to install a new 200mmø municipal watermain west on Decou Road to connect to the existing 200mmø watermain, approximately 400m west of the proposed development lands.

If adequate water supply, fire flow and pressure characteristics are not obtained using either of the alternative water servicing strategies, a scenario where both are combined or an external loop on Decou Road between the two proposed entrances could be explored.

Further design details on the water servicing alternative will be provided should the alternative water servicing strategy be pursued or at the request of Norfolk County.

# 5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information provided herein, it is concluded that the proposed development at 227 Decou Road can be constructed to meet the requirements of the Norfolk County and Long Point Conservation Authority.

Therefore, it is recommended that:

- The development be graded and serviced in accordance with the Preliminary Grading Plan and the Servicing Plan prepared by S. Llewellyn & Associates Limited;
- Through the installation of a multi-stage orifice control system within the proposed MH1, DDI1.1 and DDI1.2 within the proposed SWM facility, adequate stormwater quantity control is provided.
- 10,101m$^3$ of stormwater storage is provided via the proposed SWM facility, while only 7,646m$^3$ of stormwater storage is required during the 100-year storm event.
- The permanent pool component within the proposed stormwater management facility will provide the required Enhanced level of water quality control (detention) for the proposed development;
- The proposed sanitary and water servicing system be installed as per the Preliminary Servicing Plans and this report to adequately service the proposed development;
- Each single family and townhouse unit will be serviced with a proposed 125mmø sanitary service.
- Each single family and townhouse unit will be serviced with a proposed 25mmø water service and curb stop.
- Erosion and sediment controls to be installed as described in this report to meet Norfolk County and Long Point Conservation Authority requirements;

We trust the information enclosed herein is satisfactory. Should you have any questions pleased do not hesitate to contact our office.

Prepared by:

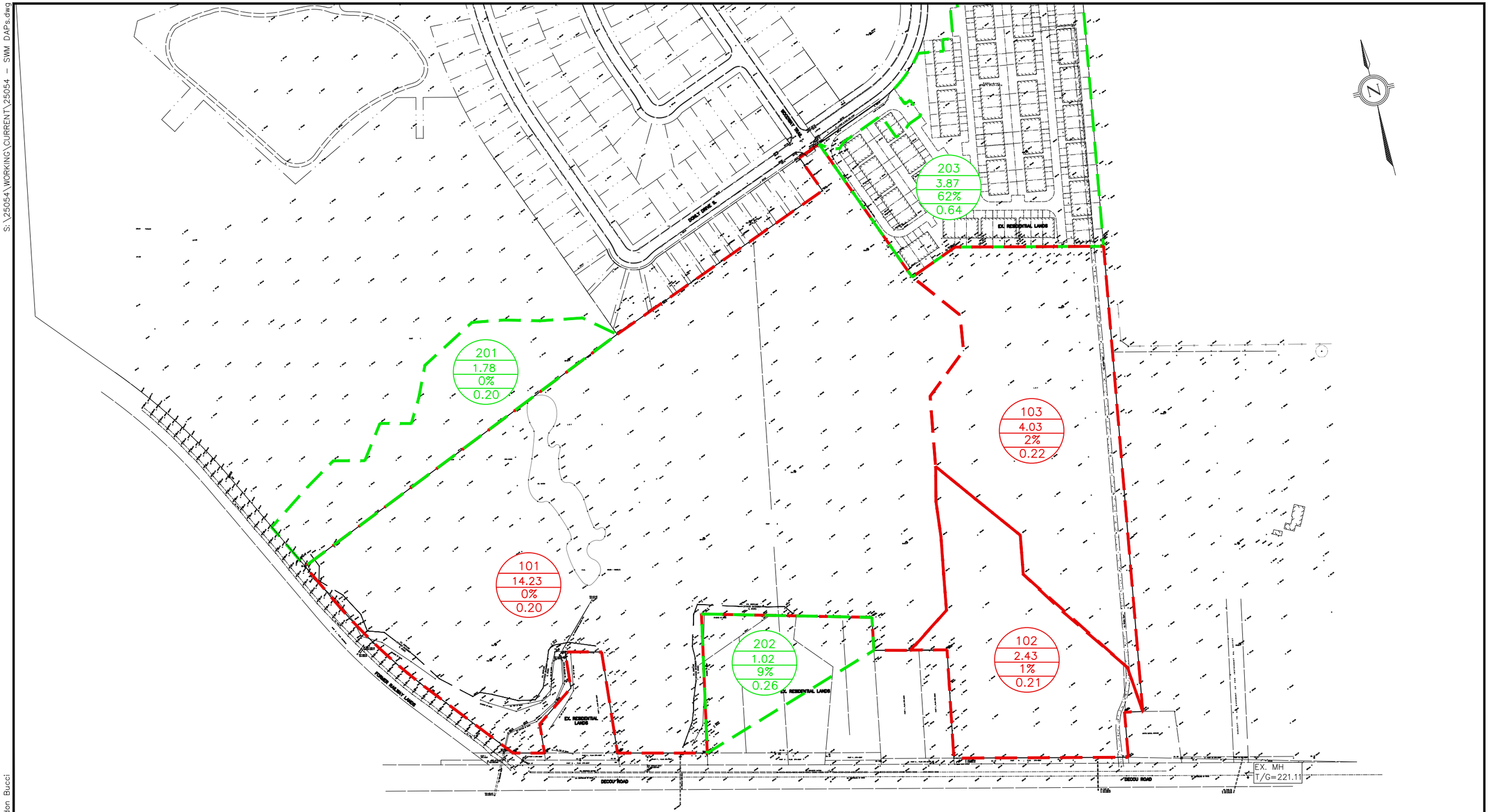
**S. LLEWELLYN & ASSOCIATES LIMITED**

B. Bucci, P. Eng.

# APPENDIX A

# STORMWATER MANAGEMENT INFORMATION

S:\25054\WORKING\CURRENT\25054 - SWM DAPs.dwg




LEGEND

PROPOSED DRAINAGE BOUNDARY

EXTERNAL DRAINAGE BOUNDARY

101 — DRAINAGE AREA I.D.

14.23 — DRAINAGE AREA (ha)

0% — PERCENT IMPERVIOUS

0.20 — RUNOFF COEFFICENT

# FIGURE 2.0
# PRE-DEVELOPMENT STORM DRAINAGE AREA PLAN

SCALE: 1:3000

PROJECT: 227 DECOU ROAD
SIMCOE, ON
PROJECT No.: 25054


S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca

3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8


2/19/2026 11:57:46 AM - Brandon Bucci

227 Decou Rd
Simcoe, ON

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

# EXISTING RUNOFF COEFFICIENT CALCULATIONS

| **Catchment 101 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 101 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 0 | 0.95 | 100% |
| Gravel Area (m²): | 0 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 142250 | 0.20 | 0% |
| Total Area (m²): | 142250 | 0.20 | |

| **Total** | | |
|---|---|---|
| Impervious | 0 | **0.00** |
| Pervious | 142250 | **1.00** |
| Site | 142250 | |

| **Catchment 102 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 102 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 0 | 0.95 | 100% |
| Gravel Area (m²): | 232 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 24025 | 0.20 | 0% |
| Total Area (m²): | 24257 | 0.21 | |

| **Total** | | |
|---|---|---|
| Impervious | 232 | **0.01** |
| Pervious | 24025 | **0.99** |
| Site | 24257 | |

| **Catchment 103 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 103 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 0 | 0.95 | 100% |
| Gravel Area (m²): | 1055 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 39275 | 0.20 | 0% |
| Total Area (m²): | 40330 | 0.22 | |

| **Total** | | |
|---|---|---|
| Impervious | 1055 | **0.02** |
| Pervious | 39275 | **0.98** |
| Site | 40330 | |

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| **Catchment 201 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 201 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 0 | 0.95 | 100% |
| Gravel Area (m²): | 0 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 17829 | 0.20 | 0% |
| Total Area (m²): | 17829 | 0.20 | |

| **Total** | | |
|---|---|---|
| Impervious | 0 | **0.00** |
| Pervious | 17829 | **1.00** |
| Site | 17829 | |

| **Catchment 202 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 202 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 0 | 0.95 | 100% |
| Gravel Area (m²): | 1055 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 9158 | 0.20 | 0% |
| Total Area (m²): | 10213 | 0.26 | |

| **Total** | | |
|---|---|---|
| Impervious | 1055 | **0.09** |
| Pervious | 9158 | **0.91** |
| Site | 10213 | |

| **TOTAL EXCLUDING CA 203** | | |
|---|---|---|
| Impervious | 2342 | **0.01** |
| Pervious | 232537 | **0.99** |
| Site | 234879 | |

| **Catchment 203 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 203 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 24100 | 0.95 | 100% |
| Gravel Area (m²): | 0 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 14650 | 0.20 | 0% |
| Total Area (m²): | 38750 | 0.67 | |

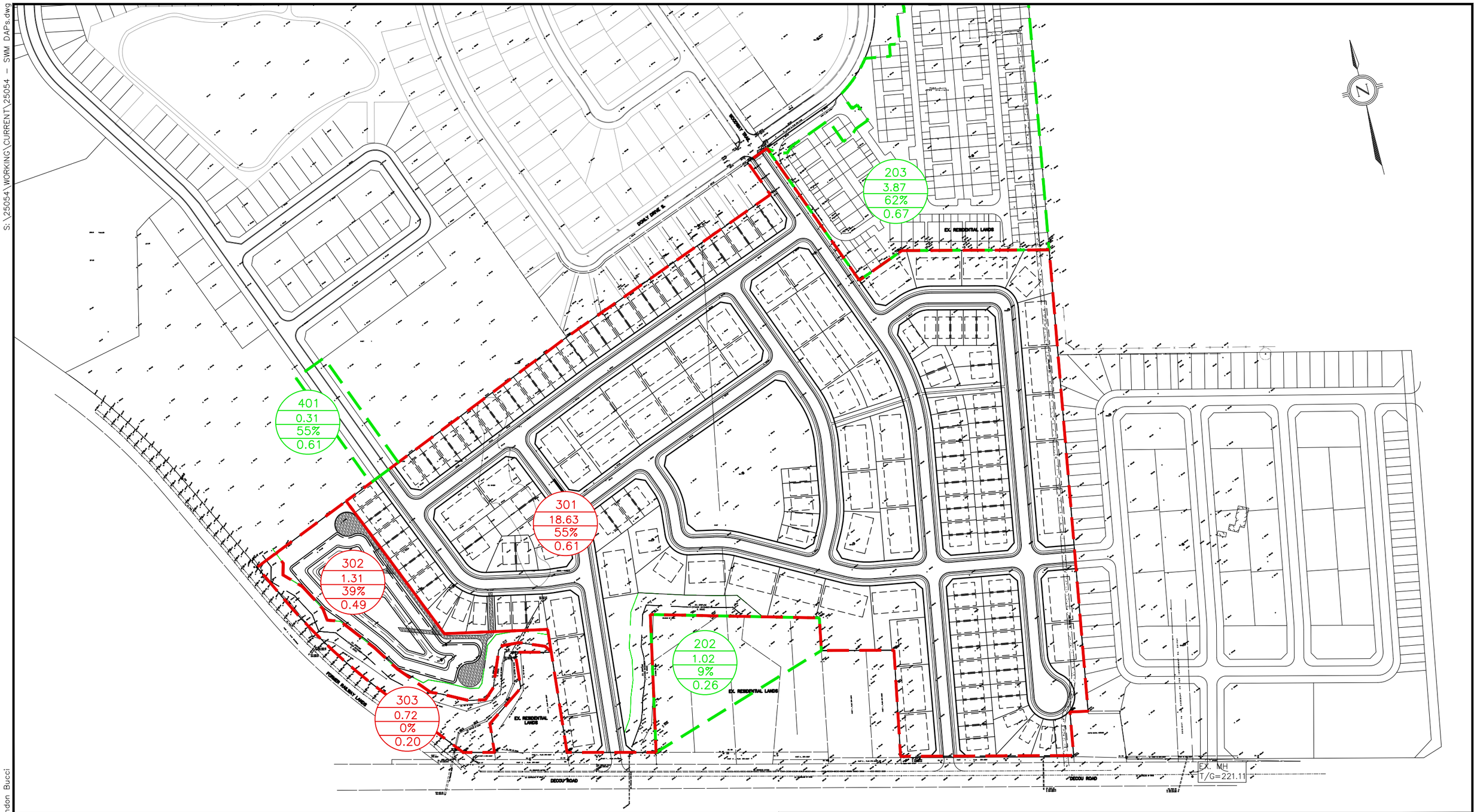
**MAJOR ONLY**

Flows are obtained from SWM Servicing Brief for the existing condo development (Development Engineering (London) Ltd.) (Dec 2016)

| **Total** | | |
|---|---|---|
| Impervious | 24100 | **0.62** |
| Pervious | 14650 | **0.38** |
| Site | 38750 | |

| **GRAND TOTAL TO LYNN RIVER** | | |
|---|---|---|
| Impervious | 26442 | **0.10** |
| Pervious | 247187 | **0.90** |
| Site | 273629 | |

Project: 25054




LEGEND

PROPOSED DRAINAGE BOUNDARY

EXTERNAL DRAINAGE BOUNDARY

| | |
|---|---|
| 101 | DRAINAGE AREA I.D. |
| 14.23 | DRAINAGE AREA (ha) |
| 0% | PERCENT IMPERVIOUS |
| 0.20 | RUNOFF COEFFICENT |

# FIGURE 3.0
# POST-DEVELOPMENT STORM DRAINAGE AREA PLAN

SCALE: 1:3000

PROJECT: 227 DECOU ROAD
SIMCOE, ON
PROJECT No.: 25054

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca

3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

S:\25054\WORKING\CURRENT\25054 - SWM DAPs.dwg
2/19/2026 11:58:38 AM - Brandon Bucci

227 Decou Rd
Simcoe, ON

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

# PROPOSED RUNOFF COEFFICIENT CALCULATIONS

## CONTROLLED

### Catchment 301 Drainage

| | | C-Value | % IMP | |
|---|---|---|---|---|
| Drainage Area #: | 301 | | | |
| Roof/Building Area (m²): | 52327 | 0.95 | 100% | |
| Asphalt/Conc. Area (m²): | 50251 | 0.95 | 100% | Assume 40% of park is impervious and 3m of backyards are impervious to be conservative |
| Gravel Area (m²): | 0 | 0.80 | 85% | |
| Grass Area - Pervious (m²): | 83700 | 0.20 | 0% | |
| Total Area (m²): | 186278 | 0.61 | | |

**Total**

| | | |
|---|---|---|
| Impervious | 102578 | **0.55** |
| Pervious | 83700 | **0.45** |
| Site | 186278 | |

### Catchment 302 Drainage

| | | C-Value | % IMP | |
|---|---|---|---|---|
| Drainage Area #: | 302 | | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% | |
| Asphalt/Conc. Area (m²): | 4920 | 0.95 | 100% | Permanent Pool & Maintenance Road |
| Gravel Area (m²): | 0 | 0.80 | 85% | |
| Grass Area - Pervious (m²): | 8188 | 0.20 | 0% | |
| Total Area (m²): | 13108 | 0.48 | | |

**Total**

| | | |
|---|---|---|
| Impervious | 4920 | **0.38** |
| Pervious | 8188 | **0.62** |
| Site | 13108 | |

### Catchment 202 Drainage

| | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 202 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 0 | 0.95 | 100% |
| Gravel Area (m²): | 1055 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 9158 | 0.20 | 0% |
| Total Area (m²): | 10213 | 0.26 | |

**Total**

| | | |
|---|---|---|
| Impervious | 1055 | **0.09** |
| Pervious | 9158 | **0.91** |
| Site | 10213 | |

### Catchment 401 Drainage

| | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 401 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 1700 | 0.95 | 100% |
| Gravel Area (m²): | | 0.80 | 85% |
| Grass Area - Pervious (m²): | 1400 | 0.20 | 0% |
| Total Area (m²): | 3100 | 0.61 | |

**Total**

| | | |
|---|---|---|
| Impervious | 1700 | **0.55** |
| Pervious | 1400 | **0.45** |
| Site | 3100 | |

### TOTAL EXCLUDING CA 203 & 303

| | | |
|---|---|---|
| Impervious | 110253 | **0.51** |
| Pervious | 102446 | **0.49** |
| Site | 212699 | |

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| **Catchment 203 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 203 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 24100 | 0.95 | 100% |
| Gravel Area (m²): | 0 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 14650 | 0.20 | 0% |
| Total Area (m²): | 38750 | 0.67 | |

**MAJOR ONLY**

Flows are obtained from SWM Servicing Brief for the existing condo development (Development Engineering (London) Ltd. (Dec 2016)

| **Total** | | |
|---|---|---|
| Impervious | 24100 | **0.62** |
| Pervious | 14650 | **0.38** |
| Site | 38750 | |

**TOTAL TO SWM FACILITY & CONTROLLED TO LYNN RIVER**

| | | |
|---|---|---|
| Impervious | 134353 | **0.53** |
| Pervious | 117096 | **0.47** |
| Site | 251449 | |

**UNCONTROLLED**

| **Catchment 303 Drainage** | | C-Value | % IMP |
|---|---|---|---|
| Drainage Area #: | 303 | | |
| Roof/Building Area (m²): | 0 | 0.95 | 100% |
| Asphalt/Conc. Area (m²): | 0 | 0.95 | 100% |
| Gravel Area (m²): | 0 | 0.80 | 85% |
| Grass Area - Pervious (m²): | 7200 | 0.20 | 0% |
| Total Area (m²): | 7200 | 0.20 | |

**TOTAL TO LYNN RIVER (UNCONTROLLED)**

| | | |
|---|---|---|
| Impervious | 0 | **0.00** |
| Pervious | 7200 | **1.00** |
| Site | 7200 | |

**GRAND TOTAL TO LYNN RIVER**

| | | |
|---|---|---|
| Impervious | 134353 | **0.51** |
| Pervious | 124296 | **0.49** |
| Site | 258649 | |

Ontario IDF CURVE LOOKUP

# Active coordinate

42° 49' 45" N, 80° 17' 14" W (42.829167,-80.287500)

Retrieved: Wed, 10 Dec 2025 20:04:33 GMT




## Location summary

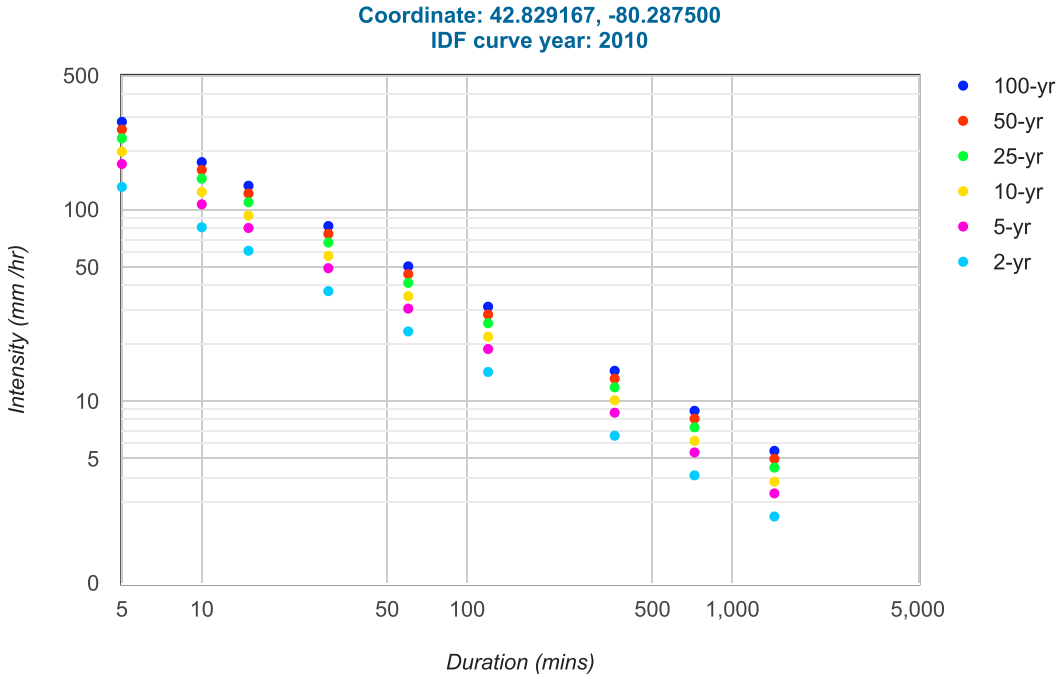
These are the locations in the selection.

**IDF Curve:** 42° 49' 45" N, 80° 17' 14" W (42.829167,-80.287500)

| Location | Coordinates |
|---|---|
| 1 | 42.825174,-80.289026 |
| 2 | 42.826621,-80.289863 |
| 3 | 42.82648,-80.287352 |
| 4 | 42.826952,-80.284219 |
| 5 | 42.826684,-80.282074 |
| 6 | 42.825063,-80.281795 |
| 7 | 42.824749,-80.28394 |

## Results

An IDF curve was found.



## Coefficient summary

**IDF Curve:** 42° 49' 45" N, 80° 17' 14" W (42.829167,-80.287500)

Retrieved: Wed, 10 Dec 2025 20:04:33 GMT

**Data year:** 2010
**IDF curve year:** 2010

| Return period | 2-yr | 5-yr | 10-yr | 25-yr | 50-yr | 100-yr |
|---|---|---|---|---|---|---|
| **A** | 23.1 | 30.4 | 35.3 | 41.4 | 46.0 | 50.5 |
| **B** | -0.699 | -0.699 | -0.699 | -0.699 | -0.699 | -0.699 |

## Statistics

### Rainfall intensity (mm $hr^{-1}$)

| Duration | 5-min | 10-min | 15-min | 30-min | 1-hr | 2-hr | 6-hr | 12-hr | 24-hr |
|---|---|---|---|---|---|---|---|---|---|
| **2-yr** | 131.2 | 80.8 | 60.9 | 37.5 | 23.1 | 14.2 | 6.6 | 4.1 | 2.5 |
| **5-yr** | 172.7 | 106.4 | 80.1 | 49.4 | 30.4 | 18.7 | 8.7 | 5.4 | 3.3 |
| **10-yr** | 200.5 | 123.5 | 93.0 | 57.3 | 35.3 | 21.7 | 10.1 | 6.2 | 3.8 |
| **25-yr** | 235.2 | 144.9 | 109.1 | 67.2 | 41.4 | 25.5 | 11.8 | 7.3 | 4.5 |
| **50-yr** | 261.3 | 160.9 | 121.2 | 74.7 | 46.0 | 28.3 | 13.1 | 8.1 | 5.0 |
| **100-yr** | 286.8 | 176.7 | 133.1 | 82.0 | 50.5 | 31.1 | 14.4 | 8.9 | 5.5 |

### Rainfall depth (mm)

| Duration | 5-min | 10-min | 15-min | 30-min | 1-hr | 2-hr | 6-hr | 12-hr | 24-hr |
|---|---|---|---|---|---|---|---|---|---|
| **2-yr** | 10.9 | 13.5 | 15.2 | 18.8 | 23.1 | 28.5 | 39.6 | 48.8 | 60.1 |
| **5-yr** | 14.4 | 17.7 | 20.0 | 24.7 | 30.4 | 37.5 | 52.1 | 64.2 | 79.1 |
| **10-yr** | 16.7 | 20.6 | 23.3 | 28.7 | 35.3 | 43.5 | 60.5 | 74.6 | 91.9 |
| **25-yr** | 19.6 | 24.1 | 27.3 | 33.6 | 41.4 | 51.0 | 71.0 | 87.5 | 107.8 |
| **50-yr** | 21.8 | 26.8 | 30.3 | 37.3 | 46.0 | 56.7 | 78.9 | 97.2 | 119.7 |
| **100-yr** | 23.9 | 29.4 | 33.3 | 41.0 | 50.5 | 62.2 | 86.6 | 106.7 | 131.4 |

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Last Modified: September 2016

227 Decou Road
Simcoe, Ontario

# STAGE-STORAGE-DISCHARGE CALCULATIONS FOR SWM FACILITY

| Outlet Device No. 1 (Quantity) | | Outlet Device No. 2 (Quantity) | | Outlet Device No. 3 (Quantity) | |
|---|---|---|---|---|---|
| Type: | Circular Orifice Plate | Type: | Circular Orifice Plate | Type: | Circular Orifice Plate |
| Diameter (mm) | 155 | Diameter (mm) | 350 | Diameter (mm) | 525 |
| Area ($m^2$) | 0.01887 | Area ($m^2$) | 0.09621 | Area ($m^2$) | 0.21648 |
| Invert Elev. (m) | 208.45 | Invert Elev. (m) | 208.45 | Invert Elev. (m) | 208.80 |
| C/L Elev. (m) | 208.53 | C/L Elev. (m) | 208.63 | C/L Elev. (m) | 209.06 |
| Disch. Coeff. ($C_d$) | 0.62 | Disch. Coeff. ($C_d$) | 0.62 | Disch. Coeff. ($C_d$) | 0.62 |
| Discharge (Q) = | $C_d$ A ( 2 g H )$^{0.5}$ | Discharge (Q) = | $C_d$ A ( 2 g H )$^{0.5}$ | Discharge (Q) = | $C_d$ A ( 2 g H )$^{0.5}$ |
| Number of Orifices: | 1 | Number of Orifices: | 1 | Number of Orifices: | 1 |
| | | Spill into structure at elev. (m) | 208.95 | Spill into structure at elev. ( | 209.40 |

| | | SWM Pond Volumes | | | | Outlet No. 1 | | Outlet No. 2 | | Outlet No. 3 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Elevation | Area | Incremental Volume | Cumulative Volume | Active Storage Volume | H | Discharge | H | Discharge | H | Discharge | Total Discharge |
| | m | $m^2$ | $m^3$ | $m^3$ | $m^3$ | m | $m^3/s$ | m | $m^3/s$ | m | $m^3/s$ | $m^3/s$ |
| Bottom of Pond | 207.20 | 1765 | 0 | 0 | 0 | | | | | | | 0.0000 |
| Bottom of Planting Shelf | 207.65 | 2139 | 877 | 877 | 0 | | | | | | | 0.0000 |
| Top of Planting Shelf | 207.85 | 2823 | 493 | 1370 | 0 | | | | | | | 0.0000 |
| Orifice 1 Active/ Permanent Pool | 208.45 | 3953 | 2023 | 3393 | 0 | 0.000 | 0.0000 | | | | | 0.0000 |
| | 208.75 | 4586 | 1278 | 4671 | 1278 | 0.223 | 0.0244 | | | | | 0.0244 |
| Extended Detention | 208.93 | 5022 | 875 | 5546 | 2153 | 0.403 | 0.0329 | | | | | 0.0329 |
| | 208.94 | 5058 | 51 | 5597 | 2204 | 0.413 | 0.0333 | | | | | 0.0333 |
| Orifice 2 Active | 208.95 | 5058 | 50 | 5647 | 2254 | 0.423 | 0.0337 | 0.325 | 0.1506 | | | 0.1843 |
| | 209.00 | 5149 | 255 | 5902 | 2509 | 0.473 | 0.0356 | 0.375 | 0.1618 | | | 0.1974 |
| | 209.20 | 5521 | 1067 | 6969 | 3576 | 0.673 | 0.0425 | 0.575 | 0.2004 | | | 0.2429 |
| | 209.39 | 5887 | 1084 | 8053 | 4660 | 0.863 | 0.0481 | 0.765 | 0.2311 | | | 0.2792 |
| Orifice 3 Active | 209.40 | 5907 | 59 | 8112 | 4719 | 0.873 | 0.0484 | 0.775 | 0.2326 | 0.338 | 0.3454 | 0.6264 |
| | 209.70 | 6511 | 1862 | 9974 | 6581 | 1.173 | 0.0561 | 1.075 | 0.2740 | 0.637 | 0.4747 | 0.8047 |
| 100-year ponding elev | 209.86 | 6845 | 1065 | 11039 | 7646 | 1.333 | 0.0598 | 1.235 | 0.2936 | 0.798 | 0.5309 | 0.8844 |
| | 210.00 | 7145 | 982 | 12021 | 8628 | 1.473 | 0.0629 | 1.375 | 0.3098 | 0.938 | 0.5756 | 0.9483 |
| Spill Elevation | 210.20 | 7585 | 1473 | 13494 | **10101** | 1.673 | 0.0670 | 1.575 | 0.3316 | 1.137 | 0.6341 | 1.0327 |
| | 210.35 | 7924 | 1163 | 14657 | 11264 | 1.823 | 0.0700 | 1.725 | 0.3470 | 1.287 | 0.6746 | 1.0915 |
| Top of Pond | 210.50 | 8271 | 1215 | 15872 | 12479 | 1.973 | 0.0728 | 1.875 | 0.3618 | 1.438 | 0.7128 | 1.1474 |

## SWM Facility Drawdown Calculations of Extended Detention Volume (Full Build)

Pond drawdown time can be estimated using Equation 4.10
(MOEE SWMP Planning & Design Manual)

$$t = \frac{2A_p}{C A_o (2g)^{0.5}} (h_1^{0.5} - h_2^{0.5})$$

| | | | | |
|---|---|---|---|---|
| t | = drawdown time in seconds | = | to be calculated | |
| Ap | = surface area of the pond ($m^2$) | = | **4506** | (Avg. Surface Area between $h_1$ & $h_2$) |
| C | = discharge coefficient | = | 0.62 | |
| D | = diameter of controlling orifice (m) | = | **0.155** | |
| Ao | = cross-sectional area of orifice ($m^2$) | = | 0.01887 | |
| g | = acceleration due to gravity ($m/s^2$) | = | 9.81 | |
| | *Orifice invert elevation (m)* | = | ***208.450*** | (Permanent Pool Elev.) |
| | *Orifice centreline elevation (m)* | = | ***208.528*** | |
| | *Extended detention elevation (m)* | = | ***208.950*** | |
| $h_1$ | = starting water level above orifice (m) | = | 0.4225 | |
| $h_2$ | = ending water level above orifice (m) | = | 0.00 | |

**t = 113030 seconds =**

| |
|---|
| **31.4 hours** |
| **1.3 days** |

## SWM Facility - Sediment Forebay Sizing

---

### Length Based on Settling Velocity

$$L = \sqrt{\frac{r\,Q_p}{v_s}}$$

**L = 10.33 m**

r : 1 = length to width ratio — r = 1

$Q_p$ = peak SWM outflow during quality storm (25mm storm) — $Q_p$ = 0.032

$v_s$ = settling velocity for 0.15 mm particles (m/s) — $v_s$ = 0.0003

---

### Dispersion Length

$$L_D = \frac{8\,Q}{d\,v_f}$$

**$L_D$ = 33.75 m**

Q = Inlet pipe to SWMF - 5-yr Inflow per SWMHYMO ($m^3/s$) — Q = 2.637

d = depth of perm pool in forebay (m) — d = 1.25

$v_f$ = desired vel in forebay (m/s) — $v_f$ = 0.5

---

### Check Scour Velocity

v = Q/A

v = **0.06 m/s**

b = bottom width (avg) of forebay (m) — b = 31.7

Q = inlet flow ($m^3/s$) — Q = 2.637

A = cross-sectional area ($m^2$) — A = 44.313

Target velocity = 0.15 m/s — $V_{targ}$ = 0.15

Therefore, **Velocity Target Satisfied**

---

**Required Forebay Length = 33.75 m**

**Proposed Forebay Length = 43.20 m**

```
2     Metric units
*#************************************************************************|
*#  Project Name: 227 DECOU ROAD
*#                     SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#************************************************************************|
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    SC_24002.stm
*
READ STORM          STORM_FILENAME "STORM.001"
*
*#************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#************************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
CALIB NASHYD        ID=[1], NHYD=["101"], DT=[1]min, AREA=[14.23](ha),
                    DWF=[0](cms), CN/C=[70], IA=[10.89](mm),
                    N=[3], TP=[0.51]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[1]min, AREA=[2.43](ha),
                    DWF=[0](cms), CN/C=[70], IA=[10.89](mm),
                    N=[3], TP=[0.45]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
CALIB NASHYD        ID=[3], NHYD=["103"], DT=[1]min, AREA=[4.03](ha),
                    DWF=[0](cms), CN/C=[70], IA=[10.89](mm),
                    N=[3], TP=[0.73]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
CALIB NASHYD        ID=[4], NHYD=["201"], DT=[1]min, AREA=[1.78](ha),
                    DWF=[0](cms), CN/C=[70], IA=[10.89](mm),
                    N=[3], TP=[0.32]hrs,
```

```
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
CALIB NASHYD        ID=[5], NHYD=["202"], DT=[1]min, AREA=[1.02](ha),
                    DWF=[0](cms), CN/C=[70], IA=[10.89](mm),
                    N=[3], TP=[0.19]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*%-----------------|-------------------------------------------------------|
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
ADD HYD             IDsum=[6], NHYD=["EX"], IDs to add=[1 2 3 4 5]
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*************************************************************************|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
CALIB STANDHYD      ID=[1], NHYD=["301"], DT=[1](min), AREA=[18.63](ha),
                    XIMP=[0.44], TIMP=[0.55], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[70],
                    Pervious   surfaces: IAper=[10.89](mm), SLPP=[2.0](%),
                                         LGP=[30](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[3.0](%),
                                         LGI=[400](m), MNI=[0.015], SCI=[0](min)
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
CALIB STANDHYD      ID=[2], NHYD=["302"], DT=[1](min), AREA=[1.31](ha),
                    XIMP=[0.39], TIMP=[0.39], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[70],
                    Pervious   surfaces: IAper=[10.89](mm), SLPP=[20.0](%),
                                         LGP=[20](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[20](m), MNI=[0.015], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
CALIB NASHYD        ID=[3], NHYD=["202"], DT=[1]min, AREA=[1.02](ha),
                    DWF=[0](cms), CN/C=[70], IA=[10.89](mm),
                    N=[3], TP=[0.19]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
```

```
*%-----------------|---------------------------------------------------------|
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
CALIB STANDHYD      ID=[4], NHYD=["401"], DT=[1](min), AREA=[0.31](ha),
                    XIMP=[0.55], TIMP=[0.55], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[70],
                    Pervious   surfaces: IAper=[10.89](mm), SLPP=[20.0](%),
                                         LGP=[10](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[25](m), MNI=[0.015], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|---------------------------------------------------------|
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*#
ADD HYD             IDsum=[5], NHYD=["SWM"], IDs to add=[1 2 3 4]
*%-----------------|---------------------------------------------------------|
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
ROUTE RESERVOIR     IDout=[1],   NHYD=["SWM"],  IDin=[5],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                         0          0
                                         0.0244  0.1278
                                         0.0333  0.2204
                                         0.1843  0.2254
                                         0.1974  0.2509
                                         0.2429  0.3576
                                         0.2792  0.4660
                                         0.6264  0.4719
                                         0.8047  0.6581
                                    0.9483        0.8628
                                    1.0327      1.0101
                                    -1         -1   (max twenty pts)
                          IDovf=[2], NHYDovf=["OFL"]
*%-----------------|---------------------------------------------------------|
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
CALIB NASHYD        ID=[3], NHYD=["303"], DT=[1]min, AREA=[0.72](ha),
                    DWF=[0](cms), CN/C=[70], IA=[10.89](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
ADD HYD             IDsum=[4], NHYD=["PROP"], IDs to add=[1 2 3]
*#*************************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*%-----------------|---------------------------------------------------------|
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
```

```
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                     SC_24005.stm
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                     SC_24010.stm
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                     SC_24025.stm
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                     SC_24050.stm
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                     SC_24100.stm
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[125]
                     MTHP25MM.stm
*
*%-----------------|-------------------------------------------------------|
FINISH
```

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

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS  W W W  M   M  H   H    Y    M   M   OOO            9      9   =========
                                                         9   9  9   9   # 3902680
        StormWater Management HYdrologic Model            999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.com                   *********
 ********************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: S. Llewellyn & Associates Ltd                +++++++++
 +++++++++                Burlington            SERIAL#:3902680       +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********          Maximum value for ID numbers  :     10            *********
 *********          Max. number of rainfall points: 105408            *********
 *********          Max. number of flow points    : 105408            *********
 ********************************************************************************


 **********************   D E T A I L E D   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2026-02-16     TIME: 11:29:44     RUN COUNTER: 001353          *
 ********************************************************************************
 * Input   filename: T:\projects\25054\SWM\25054_1.dat                           *
 * Output  filename: T:\projects\25054\SWM\25054_1.out                           *
 * Summary filename: T:\projects\25054\SWM\25054_1.sum                           *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
 ********************************************************************************

--------------------------------------------------------------------------------
001:0001----------------------------------------------------------------------|
*#*****************************************************************************|
*#  Project Name: 227 DECOU ROAD
*#               SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#*****************************************************************************|
*
  ** END OF RUN :   1

********************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\25054\SWM\
--------------------  Rainfall dir.: T:\projects\25054\SWM\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 002
    NSTORM=   1
          #  1=SC_24002.stm
--------------------------------------------------------------------------------
002:0002----------------------------------------------------------------------|
*#*****************************************************************************|
*#  Project Name: 227 DECOU ROAD
*#               SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#*****************************************************************************|
*
--------------------------------------------------------------------------------
002:0002----------------------------------------------------------------------|
*
--------------------
| READ STORM       |    Filename: SIMCOE 2-YR 24-HR CHICAGO STORM
| Ptotal=  60.12 mm|    Comments: SIMCOE 2-YR 24-HR CHICAGO STORM
--------------------
```

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| .17 | .767 | 6.17 | 2.134 | 12.17 | 1.923 | 18.17 | 1.034 |
| .33 | .778 | 6.33 | 2.284 | 12.33 | 1.872 | 18.33 | 1.022 |
| .50 | .790 | 6.50 | 2.462 | 12.50 | 1.823 | 18.50 | 1.011 |
| .67 | .803 | 6.67 | 2.678 | 12.67 | 1.778 | 18.67 | 1.000 |
| .83 | .816 | 6.83 | 2.947 | 12.83 | 1.735 | 18.83 | .989 |
| 1.00 | .830 | 7.00 | 3.293 | 13.00 | 1.694 | 19.00 | .978 |
| 1.17 | .844 | 7.17 | 3.758 | 13.17 | 1.656 | 19.17 | .968 |
| 1.33 | .859 | 7.33 | 4.425 | 13.33 | 1.620 | 19.33 | .958 |
| 1.50 | .874 | 7.50 | 5.481 | 13.50 | 1.586 | 19.50 | .949 |
| 1.67 | .890 | 7.67 | 7.498 | 13.67 | 1.553 | 19.67 | .939 |
| 1.83 | .907 | 7.83 | 13.947 | 13.83 | 1.522 | 19.83 | .930 |
| 2.00 | .924 | 8.00 | 80.819 | 14.00 | 1.493 | 20.00 | .921 |
| 2.17 | .943 | 8.17 | 17.117 | 14.17 | 1.464 | 20.17 | .912 |
| 2.33 | .962 | 8.33 | 10.792 | 14.33 | 1.437 | 20.33 | .903 |
| 2.50 | .983 | 8.50 | 8.230 | 14.50 | 1.412 | 20.50 | .895 |
| 2.67 | 1.004 | 8.67 | 6.779 | 14.67 | 1.387 | 20.67 | .887 |
| 2.83 | 1.027 | 8.83 | 5.827 | 14.83 | 1.363 | 20.83 | .879 |
| 3.00 | 1.051 | 9.00 | 5.146 | 15.00 | 1.341 | 21.00 | .871 |
| 3.17 | 1.076 | 9.17 | 4.631 | 15.17 | 1.319 | 21.17 | .863 |
| 3.33 | 1.103 | 9.33 | 4.226 | 15.33 | 1.298 | 21.33 | .856 |
| 3.50 | 1.132 | 9.50 | 3.898 | 15.50 | 1.278 | 21.50 | .848 |
| 3.67 | 1.162 | 9.67 | 3.625 | 15.67 | 1.258 | 21.67 | .841 |
| 3.83 | 1.195 | 9.83 | 3.395 | 15.83 | 1.240 | 21.83 | .834 |
| 4.00 | 1.229 | 10.00 | 3.197 | 16.00 | 1.222 | 22.00 | .827 |
| 4.17 | 1.267 | 10.17 | 3.025 | 16.17 | 1.204 | 22.17 | .820 |
| 4.33 | 1.307 | 10.33 | 2.874 | 16.33 | 1.187 | 22.33 | .814 |
| 4.50 | 1.351 | 10.50 | 2.740 | 16.50 | 1.171 | 22.50 | .807 |
| 4.67 | 1.398 | 10.67 | 2.621 | 16.67 | 1.155 | 22.67 | .801 |
| 4.83 | 1.449 | 10.83 | 2.513 | 16.83 | 1.140 | 22.83 | .794 |
| 5.00 | 1.506 | 11.00 | 2.415 | 17.00 | 1.125 | 23.00 | .788 |
| 5.17 | 1.568 | 11.17 | 2.327 | 17.17 | 1.111 | 23.17 | .782 |
| 5.33 | 1.636 | 11.33 | 2.245 | 17.33 | 1.097 | 23.33 | .776 |
| 5.50 | 1.713 | 11.50 | 2.171 | 17.50 | 1.084 | 23.50 | .770 |
| 5.67 | 1.798 | 11.67 | 2.102 | 17.67 | 1.071 | 23.67 | .765 |
| 5.83 | 1.895 | 11.83 | 2.038 | 17.83 | 1.058 | 23.83 | .759 |
| 6.00 | 2.006 | 12.00 | 1.979 | 18.00 | 1.046 | 24.00 | .753 |

```
--------------------------------------------------------------------------------
002:0003----------------------------------------------------------------------|
*
*#*****************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*****************************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=   14.23   Curve Number    (CN)=70.00
| 01:101    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.066

     PEAK FLOW       (cms)=     .160 (i)
     TIME TO PEAK    (hrs)=    8.633
     RUNOFF VOLUME    (mm)=  15.333
     TOTAL RAINFALL   (mm)=  60.125
     RUNOFF COEFFICIENT   =     .255

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

--------------------------------------------------------------------------------
002:0004----------------------------------------------------------------------|
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.43   Curve Number    (CN)=70.00
| 02:102    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=     .206

     PEAK FLOW       (cms)=     .030 (i)
     TIME TO PEAK    (hrs)=    8.533
     RUNOFF VOLUME    (mm)=  15.333
     TOTAL RAINFALL   (mm)=  60.125
     RUNOFF COEFFICIENT   =     .255

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

--------------------------------------------------------------------------------
002:0005----------------------------------------------------------------------|
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.03   Curve Number    (CN)=70.00
| 03:103    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .730

     Unit Hyd Qpeak  (cms)=     .211

     PEAK FLOW       (cms)=     .036 (i)
     TIME TO PEAK    (hrs)=    8.950
     RUNOFF VOLUME    (mm)=  15.333
     TOTAL RAINFALL   (mm)=  60.125
     RUNOFF COEFFICIENT   =     .255

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

--------------------------------------------------------------------------------
002:0006----------------------------------------------------------------------|
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.78   Curve Number    (CN)=70.00
| 04:201    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .212

     PEAK FLOW       (cms)=     .027 (i)
     TIME TO PEAK    (hrs)=    8.350
     RUNOFF VOLUME    (mm)=  15.333
     TOTAL RAINFALL   (mm)=  60.125
     RUNOFF COEFFICIENT   =     .255

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

--------------------------------------------------------------------------------
002:0007----------------------------------------------------------------------|
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number    (CN)=70.00
| 05:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190
```

```
     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .022 (i)
     TIME TO PEAK    (hrs)=    8.167
     RUNOFF VOLUME    (mm)=   15.333
     TOTAL RAINFALL   (mm)=   60.125
     RUNOFF COEFFICIENT   =     .255

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

------------------------------------------------------------------------------
002:0008----------------------------------------------------------------------
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (EX        ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 01:101           14.23     .160    8.63  15.33    .000
                    +ID2 02:102            2.43     .030    8.53  15.33    .000
                    +ID3 03:103            4.03     .036    8.95  15.33    .000
                    +ID4 04:201            1.78     .027    8.35  15.33    .000
                    +ID5 05:202            1.02     .022    8.17  15.33    .000
                     ==========================================================
                     SUM 06:EX            23.49     .253    8.58  15.33    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
002:0009----------------------------------------------------------------------
*#############################################################################|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#############################################################################|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=   18.63
| 01:301    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   44.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.25         8.38
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     400.00        30.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=      80.82        17.60
               over (min)        5.00        17.00
     Storage Coeff.  (min)=       5.01 (ii)   16.91 (ii)
     Unit Hyd. Tpeak (min)=       5.00        17.00
     Unit Hyd. peak  (cms)=        .23          .07
                                                    *TOTALS*
     PEAK FLOW       (cms)=       1.52          .25     1.621 (iii)
     TIME TO PEAK    (hrs)=       8.02         8.25      8.017
     RUNOFF VOLUME    (mm)=      59.12        19.00     36.660
     TOTAL RAINFALL   (mm)=      60.13        60.13     60.125
     RUNOFF COEFFICIENT   =        .98          .32       .610

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
002:0010----------------------------------------------------------------------
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.31
| 02:302    DT= 1.00 |   Total Imp(%)=   39.00   Dir. Conn.(%)=   39.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .51          .80
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      20.00        20.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=      80.82        17.30
               over (min)        1.00         6.00
     Storage Coeff.  (min)=       1.15 (ii)    5.86 (ii)
     Unit Hyd. Tpeak (min)=       1.00         6.00
     Unit Hyd. peak  (cms)=        .98          .19
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .11          .03        .136 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.05       8.000
     RUNOFF VOLUME    (mm)=      59.12        15.33      32.412
     TOTAL RAINFALL   (mm)=      60.13        60.13      60.125
     RUNOFF COEFFICIENT   =        .98          .25        .539

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
002:0011----------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number    (CN)=70.00
| 03:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .022 (i)
     TIME TO PEAK    (hrs)=    8.167
     RUNOFF VOLUME    (mm)=   15.333
     TOTAL RAINFALL   (mm)=   60.125
     RUNOFF COEFFICIENT   =     .255

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

------------------------------------------------------------------------------
002:0012----------------------------------------------------------------------
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .31
| 04:401    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .17          .14
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      25.00        10.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=      80.82        18.71
               over (min)        1.00         4.00
     Storage Coeff.  (min)=       1.32 (ii)    4.33 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=        .90          .27
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .04          .01          .043 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.02         8.000
     RUNOFF VOLUME    (mm)=      59.12        15.33        39.419
     TOTAL RAINFALL   (mm)=      60.13        60.13        60.125
     RUNOFF COEFFICIENT   =        .98          .26          .656

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
002:0013----------------------------------------------------------------------
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*#
------------------------
| ADD HYD (SWM       ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 01:301           18.63    1.621    8.02  36.66    .000
                    +ID2 02:302            1.31     .136    8.00  32.41    .000
                    +ID3 03:202            1.02     .022    8.17  15.33    .000
                    +ID4 04:401             .31     .043    8.00  39.42    .000
                     ==========================================================
                     SUM 05:SWM           21.27    1.774    8.00  35.42    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
002:0014----------------------------------------------------------------------
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
----------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>05:(SWM   )    |
| OUT<01:(SWM   )    |    =========  OUTFLOW STORAGE TABLE  =========
----------------------   OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)  |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .279  .4660E+00
                            .024  .1278E+00   |     .626  .4719E+00
                            .033  .2204E+00   |     .805  .6581E+00
                            .184  .2254E+00   |     .948  .8628E+00
                            .197  .2509E+00   |    1.033  .1010E+01
                            .243  .3576E+00   |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------        (ha)     (cms)     (hrs)        (mm)
     INFLOW >05: (SWM   )       21.27     1.774     8.000      35.416
     OUTFLOW<01: (SWM   )       21.27      .222     9.067      35.414
    OVERFLOW<02: (OFL   )         .00      .000      .000        .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    12.538
                    TIME SHIFT OF PEAK FLOW          (min)=    64.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.3095E+00

------------------------------------------------------------------------------
002:0015----------------------------------------------------------------------
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=     .72   Curve Number    (CN)=70.00
| 03:303    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .150

     Unit Hyd Qpeak  (cms)=     .183

     PEAK FLOW       (cms)=     .018 (i)
     TIME TO PEAK    (hrs)=    8.117
     RUNOFF VOLUME    (mm)=   15.333
     TOTAL RAINFALL   (mm)=   60.125
     RUNOFF COEFFICIENT   =     .255

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

------------------------------------------------------------------------------
002:0016----------------------------------------------------------------------
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (PROP      ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 01:SWM           21.27     .222    9.07  35.41    .000
```

```
                +ID2 02:OFL            .00     .000     .00    .00    .000
                +ID3 03:303            .72     .018    8.12  15.33    .000
                 ==========================================================
                 SUM 04:PROP         21.99     .226    8.98  34.76    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
002:0017----------------------------------------------------------------------
*#*********************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
*
  ** END OF RUN :   4

*******************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\25054\SWM\
--------------------  Rainfall dir.: T:\projects\25054\SWM\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 005
    NSTORM=   1
           #  1=SC_24005.stm
------------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: 227 DECOU ROAD
*#               SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#*********************************************************************|
*
------------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: SIMCOE 5-YR 24-HR CHICAGO STORM
| Ptotal=  79.12 mm|    Comments: SIMCOE 5-YR 24-HR CHICAGO STORM
--------------------
               TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .17   1.009 |  6.17   2.808 | 12.17   2.531 | 18.17   1.360
                .33   1.024 |  6.33   3.005 | 12.33   2.463 | 18.33   1.345
                .50   1.040 |  6.50   3.240 | 12.50   2.399 | 18.50   1.330
                .67   1.057 |  6.67   3.524 | 12.67   2.339 | 18.67   1.316
                .83   1.074 |  6.83   3.878 | 12.83   2.283 | 18.83   1.301
               1.00   1.092 |  7.00   4.333 | 13.00   2.230 | 19.00   1.288
               1.17   1.110 |  7.17   4.946 | 13.17   2.180 | 19.17   1.274
               1.33   1.130 |  7.33   5.823 | 13.33   2.132 | 19.33   1.261
               1.50   1.150 |  7.50   7.214 | 13.50   2.087 | 19.50   1.248
               1.67   1.171 |  7.67   9.868 | 13.67   2.044 | 19.67   1.236
               1.83   1.193 |  7.83  18.355 | 13.83   2.003 | 19.83   1.224
               2.00   1.217 |  8.00 106.357 | 14.00   1.964 | 20.00   1.212
               2.17   1.241 |  8.17  22.525 | 14.17   1.927 | 20.17   1.200
               2.33   1.266 |  8.33  14.202 | 14.33   1.892 | 20.33   1.189
               2.50   1.293 |  8.50  10.831 | 14.50   1.858 | 20.50   1.178
               2.67   1.321 |  8.67   8.921 | 14.67   1.825 | 20.67   1.167
               2.83   1.351 |  8.83   7.668 | 14.83   1.794 | 20.83   1.156
               3.00   1.383 |  9.00   6.772 | 15.00   1.764 | 21.00   1.146
               3.17   1.416 |  9.17   6.095 | 15.17   1.736 | 21.17   1.136
               3.33   1.452 |  9.33   5.562 | 15.33   1.708 | 21.33   1.126
               3.50   1.489 |  9.50   5.130 | 15.50   1.682 | 21.50   1.116
               3.67   1.529 |  9.67   4.771 | 15.67   1.656 | 21.67   1.107
               3.83   1.572 |  9.83   4.468 | 15.83   1.631 | 21.83   1.097
               4.00   1.618 | 10.00   4.208 | 16.00   1.608 | 22.00   1.088
               4.17   1.667 | 10.17   3.981 | 16.17   1.585 | 22.17   1.079
               4.33   1.720 | 10.33   3.783 | 16.33   1.563 | 22.33   1.071
               4.50   1.777 | 10.50   3.606 | 16.50   1.541 | 22.50   1.062
               4.67   1.840 | 10.67   3.449 | 16.67   1.520 | 22.67   1.054
               4.83   1.907 | 10.83   3.307 | 16.83   1.500 | 22.83   1.045
               5.00   1.982 | 11.00   3.179 | 17.00   1.481 | 23.00   1.037
               5.17   2.063 | 11.17   3.062 | 17.17   1.462 | 23.17   1.029
               5.33   2.154 | 11.33   2.955 | 17.33   1.444 | 23.33   1.021
               5.50   2.254 | 11.50   2.857 | 17.50   1.426 | 23.50   1.014
               5.67   2.367 | 11.67   2.766 | 17.67   1.409 | 23.67   1.006
               5.83   2.494 | 11.83   2.682 | 17.83   1.392 | 23.83    .999
               6.00   2.640 | 12.00   2.604 | 18.00   1.376 | 24.00    .992

------------------------------------------------------------------------------
005:0003----------------------------------------------------------------------
*
*#*********************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*********************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=   14.23   Curve Number   (CN)=70.00
| 01:101    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.066

     PEAK FLOW       (cms)=     .308 (i)
     TIME TO PEAK    (hrs)=    8.583
     RUNOFF VOLUME    (mm)=   26.291
     TOTAL RAINFALL   (mm)=   79.124
     RUNOFF COEFFICIENT   =     .332

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

------------------------------------------------------------------------------
005:0004----------------------------------------------------------------------
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.43   Curve Number   (CN)=70.00
| 02:102    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=     .206

     PEAK FLOW       (cms)=     .057 (i)
     TIME TO PEAK    (hrs)=    8.500
     RUNOFF VOLUME    (mm)=   26.291
     TOTAL RAINFALL   (mm)=   79.124
     RUNOFF COEFFICIENT   =     .332

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

------------------------------------------------------------------------------
005:0005----------------------------------------------------------------------
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.03   Curve Number   (CN)=70.00
| 03:103    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .730

     Unit Hyd Qpeak  (cms)=     .211

     PEAK FLOW       (cms)=     .069 (i)
     TIME TO PEAK    (hrs)=    8.900
     RUNOFF VOLUME    (mm)=   26.291
     TOTAL RAINFALL   (mm)=   79.124
     RUNOFF COEFFICIENT   =     .332

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

------------------------------------------------------------------------------
005:0006----------------------------------------------------------------------
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.78   Curve Number   (CN)=70.00
| 04:201    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .212

     PEAK FLOW       (cms)=     .053 (i)
     TIME TO PEAK    (hrs)=    8.333
     RUNOFF VOLUME    (mm)=   26.291
     TOTAL RAINFALL   (mm)=   79.124
     RUNOFF COEFFICIENT   =     .332

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

------------------------------------------------------------------------------
005:0007----------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 05:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .042 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   26.291
     TOTAL RAINFALL   (mm)=   79.124
     RUNOFF COEFFICIENT   =     .332

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

------------------------------------------------------------------------------
005:0008----------------------------------------------------------------------
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
--------------------------
| ADD HYD (EX        ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
--------------------------                (ha)     (cms)   (hrs)    (mm)   (cms)
                      ID1 01:101          14.23     .308    8.58  26.29    .000
                     +ID2 02:102           2.43     .057    8.50  26.29    .000
                     +ID3 03:103           4.03     .069    8.90  26.29    .000
                     +ID4 04:201           1.78     .053    8.33  26.29    .000
                     +ID5 05:202           1.02     .042    8.15  26.29    .000
```

```
                    ========================================================
                    SUM 06:EX            23.49     .487    8.55  26.29    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
005:0009----------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*************************************************************************|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=   18.63
| 01:301    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   44.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.25         8.38
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     400.00        30.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     106.36        37.36
               over (min)        4.00        13.00
     Storage Coeff.  (min)=       4.49 (ii)   13.29 (ii)
     Unit Hyd. Tpeak (min)=       4.00        13.00
     Unit Hyd. peak  (cms)=        .26          .09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.09          .52      2.383 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.17      8.017
     RUNOFF VOLUME    (mm)=      78.12        31.37     51.944
     TOTAL RAINFALL   (mm)=      79.12        79.12     79.124
     RUNOFF COEFFICIENT   =        .99          .40       .656

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
005:0010----------------------------------------------------------------------
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=    1.31
| 02:302    DT= 1.00 |   Total Imp(%)=   39.00   Dir. Conn.(%)=   39.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .51          .80
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      20.00        20.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     106.36        33.51
               over (min)        1.00         5.00
     Storage Coeff.  (min)=       1.03 (ii)    4.65 (ii)
     Unit Hyd. Tpeak (min)=       1.00         5.00
     Unit Hyd. peak  (cms)=       1.05          .24
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .15          .06       .202 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.03      8.000
     RUNOFF VOLUME    (mm)=      78.12        26.29     46.506
     TOTAL RAINFALL   (mm)=      79.12        79.12     79.124
     RUNOFF COEFFICIENT   =        .99          .33       .588

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
005:0011----------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
---------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number    (CN)=70.00
| 03:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------  U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .042 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   26.291
     TOTAL RAINFALL   (mm)=   79.124
     RUNOFF COEFFICIENT   =     .332

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

--------------------------------------------------------------------------------
005:0012----------------------------------------------------------------------
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=     .31
| 04:401    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .17          .14
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      25.00        10.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     106.36        34.51
               over (min)        1.00         4.00
     Storage Coeff.  (min)=       1.18 (ii)    3.54 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=        .97          .31
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .05          .01       .061 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.02      8.000
     RUNOFF VOLUME    (mm)=      78.12        26.29     54.799
     TOTAL RAINFALL   (mm)=      79.12        79.12     79.124
     RUNOFF COEFFICIENT   =        .99          .33       .693

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
005:0013----------------------------------------------------------------------
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*
------------------------
| ADD HYD (SWM       ) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                         ID1 01:301          18.63    2.383    8.02  51.94    .000
                        +ID2 02:302           1.31     .202    8.00  46.51    .000
                        +ID3 03:202           1.02     .042    8.15  26.29    .000
                        +ID4 04:401            .31     .061    8.00  54.80    .000
                         ==========================================================
                         SUM 05:SWM          21.27    2.637    8.00  50.42    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
005:0014----------------------------------------------------------------------
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>05:(SWM   )    |
| OUT<01:(SWM   )    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |    (cms)     (ha.m.)
                            .000  .0000E+00    |     .279  .4660E+00
                            .024  .1278E+00    |     .626  .4719E+00
                            .033  .2204E+00    |     .805  .6581E+00
                            .184  .2254E+00    |     .948  .8628E+00
                            .197  .2509E+00    |    1.033  .1010E+01
                            .243  .3576E+00    |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------            (ha)     (cms)     (hrs)       (mm)
     INFLOW >05: (SWM   )      21.27     2.637     8.000     50.421
     OUTFLOW<01: (SWM   )      21.27      .276     9.233     50.420
    OVERFLOW<02: (OFL   )        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   10.447
                  TIME SHIFT OF PEAK FLOW          (min)=    74.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.4550E+00

--------------------------------------------------------------------------------
005:0015----------------------------------------------------------------------
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD       |   Area    (ha)=     .72   Curve Number    (CN)=70.00
| 03:303    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------  U.H. Tp(hrs)=    .150

     Unit Hyd Qpeak  (cms)=     .183

     PEAK FLOW       (cms)=     .035 (i)
     TIME TO PEAK    (hrs)=    8.100
     RUNOFF VOLUME    (mm)=   26.291
     TOTAL RAINFALL   (mm)=   79.124
     RUNOFF COEFFICIENT   =     .332

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

--------------------------------------------------------------------------------
005:0016----------------------------------------------------------------------
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (PROP      ) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                         ID1 01:SWM          21.27     .276    9.23  50.42    .000
                        +ID2 02:OFL            .00     .000     .00    .00    .000
                        +ID3 03:303            .72     .035    8.10  26.29    .000
                         ==========================================================
                         SUM 04:PROP         21.99     .282    9.05  49.63    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
005:0017----------------------------------------------------------------------
*#*************************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
*
--------------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*
  ** END OF RUN :   9

*************************************************************************
```

```
--------------------
| START            |  Project  dir.: T:\projects\25054\SWM\
--------------------  Rainfall dir.: T:\projects\25054\SWM\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 010
    NSTORM=   1
           #  1=SC_24010.stm
-------------------------------------------------------------------------------
010:0002-------------------------------------------------------------------------
*#*************************************************************************|
*#  Project Name: 227 DECOU ROAD
*#               SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#*************************************************************************|
*
-------------------------------------------------------------------------------
010:0002-------------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: SIMCOE 10-YR 24-HR CHICAGO STORM
| Ptotal=  91.88 mm|    Comments: SIMCOE 10-YR 24-HR CHICAGO STORM
--------------------
```

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| .17 | 1.172 | 6.17 | 3.261 | 12.17 | 2.939 | 18.17 | 1.580 |
| .33 | 1.189 | 6.33 | 3.490 | 12.33 | 2.860 | 18.33 | 1.562 |
| .50 | 1.208 | 6.50 | 3.762 | 12.50 | 2.786 | 18.50 | 1.545 |
| .67 | 1.227 | 6.67 | 4.092 | 12.67 | 2.716 | 18.67 | 1.528 |
| .83 | 1.247 | 6.83 | 4.503 | 12.83 | 2.651 | 18.83 | 1.511 |
| 1.00 | 1.268 | 7.00 | 5.032 | 13.00 | 2.589 | 19.00 | 1.495 |
| 1.17 | 1.289 | 7.17 | 5.743 | 13.17 | 2.531 | 19.17 | 1.480 |
| 1.33 | 1.312 | 7.33 | 6.761 | 13.33 | 2.476 | 19.33 | 1.464 |
| 1.50 | 1.335 | 7.50 | 8.376 | 13.50 | 2.423 | 19.50 | 1.450 |
| 1.67 | 1.360 | 7.67 | 11.458 | 13.67 | 2.373 | 19.67 | 1.435 |
| 1.83 | 1.386 | 7.83 | 21.313 | 13.83 | 2.326 | 19.83 | 1.421 |
| 2.00 | 1.413 | 8.00 | 123.501 | 14.00 | 2.281 | 20.00 | 1.407 |
| 2.17 | 1.441 | 8.17 | 26.156 | 14.17 | 2.238 | 20.17 | 1.394 |
| 2.33 | 1.470 | 8.33 | 16.492 | 14.33 | 2.197 | 20.33 | 1.381 |
| 2.50 | 1.502 | 8.50 | 12.576 | 14.50 | 2.157 | 20.50 | 1.368 |
| 2.67 | 1.535 | 8.67 | 10.359 | 14.67 | 2.120 | 20.67 | 1.355 |
| 2.83 | 1.569 | 8.83 | 8.904 | 14.83 | 2.083 | 20.83 | 1.343 |
| 3.00 | 1.606 | 9.00 | 7.864 | 15.00 | 2.049 | 21.00 | 1.331 |
| 3.17 | 1.644 | 9.17 | 7.077 | 15.17 | 2.015 | 21.17 | 1.319 |
| 3.33 | 1.686 | 9.33 | 6.458 | 15.33 | 1.983 | 21.33 | 1.307 |
| 3.50 | 1.729 | 9.50 | 5.957 | 15.50 | 1.953 | 21.50 | 1.296 |
| 3.67 | 1.776 | 9.67 | 5.540 | 15.67 | 1.923 | 21.67 | 1.285 |
| 3.83 | 1.825 | 9.83 | 5.188 | 15.83 | 1.894 | 21.83 | 1.274 |
| 4.00 | 1.879 | 10.00 | 4.886 | 16.00 | 1.867 | 22.00 | 1.264 |
| 4.17 | 1.936 | 10.17 | 4.623 | 16.17 | 1.840 | 22.17 | 1.253 |
| 4.33 | 1.997 | 10.33 | 4.392 | 16.33 | 1.814 | 22.33 | 1.243 |
| 4.50 | 2.064 | 10.50 | 4.188 | 16.50 | 1.790 | 22.50 | 1.233 |
| 4.67 | 2.136 | 10.67 | 4.005 | 16.67 | 1.766 | 22.67 | 1.223 |
| 4.83 | 2.215 | 10.83 | 3.840 | 16.83 | 1.742 | 22.83 | 1.214 |
| 5.00 | 2.301 | 11.00 | 3.691 | 17.00 | 1.720 | 23.00 | 1.204 |
| 5.17 | 2.396 | 11.17 | 3.555 | 17.17 | 1.698 | 23.17 | 1.195 |
| 5.33 | 2.501 | 11.33 | 3.431 | 17.33 | 1.677 | 23.33 | 1.186 |
| 5.50 | 2.617 | 11.50 | 3.317 | 17.50 | 1.656 | 23.50 | 1.177 |
| 5.67 | 2.748 | 11.67 | 3.212 | 17.67 | 1.636 | 23.67 | 1.168 |
| 5.83 | 2.896 | 11.83 | 3.114 | 17.83 | 1.617 | 23.83 | 1.160 |
| 6.00 | 3.066 | 12.00 | 3.023 | 18.00 | 1.598 | 24.00 | 1.151 |

```
-------------------------------------------------------------------------------
010:0003-------------------------------------------------------------------------
*
*#*************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*************************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=   14.23   Curve Number   (CN)=70.00
| 01:101    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.066

     PEAK FLOW       (cms)=     .424 (i)
     TIME TO PEAK    (hrs)=    8.567
     RUNOFF VOLUME    (mm)=   34.550
     TOTAL RAINFALL   (mm)=   91.878
     RUNOFF COEFFICIENT   =     .376

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

-------------------------------------------------------------------------------
010:0004-------------------------------------------------------------------------
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.43   Curve Number   (CN)=70.00
| 02:102    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=     .206

     PEAK FLOW       (cms)=     .079 (i)
     TIME TO PEAK    (hrs)=    8.500
     RUNOFF VOLUME    (mm)=   34.550
     TOTAL RAINFALL   (mm)=   91.878
     RUNOFF COEFFICIENT   =     .376

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

-------------------------------------------------------------------------------
010:0005-------------------------------------------------------------------------
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.03   Curve Number   (CN)=70.00
| 03:103    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .730

     Unit Hyd Qpeak  (cms)=     .211

     PEAK FLOW       (cms)=     .094 (i)
     TIME TO PEAK    (hrs)=    8.883
     RUNOFF VOLUME    (mm)=   34.550
     TOTAL RAINFALL   (mm)=   91.878
     RUNOFF COEFFICIENT   =     .376

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

-------------------------------------------------------------------------------
010:0006-------------------------------------------------------------------------
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.78   Curve Number   (CN)=70.00
| 04:201    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .212

     PEAK FLOW       (cms)=     .073 (i)
     TIME TO PEAK    (hrs)=    8.317
     RUNOFF VOLUME    (mm)=   34.550
     TOTAL RAINFALL   (mm)=   91.878
     RUNOFF COEFFICIENT   =     .376

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

-------------------------------------------------------------------------------
010:0007-------------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 05:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .059 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   34.549
     TOTAL RAINFALL   (mm)=   91.878
     RUNOFF COEFFICIENT   =     .376

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

-------------------------------------------------------------------------------
010:0008-------------------------------------------------------------------------
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
--------------------------
| ADD HYD (EX        ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
--------------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:101          14.23     .424    8.57  34.55    .000
                     +ID2 02:102           2.43     .079    8.50  34.55    .000
                     +ID3 03:103           4.03     .094    8.88  34.55    .000
                     +ID4 04:201           1.78     .073    8.32  34.55    .000
                     +ID5 05:202           1.02     .059    8.15  34.55    .000
                      ==========================================================
                      SUM 06:EX           23.49     .671    8.53  34.55    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
010:0009-------------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*************************************************************************|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=   18.63
| 01:301    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   44.00
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       10.25          8.38
     Dep. Storage     (mm)=        1.00         10.89
     Average Slope     (%)=        3.00          2.00
     Length            (m)=      400.00         30.00
     Mannings n            =        .015          .250

     Max.eff.Inten.(mm/hr)=      123.50         52.88
               over (min)          4.00         12.00
     Storage Coeff.  (min)=        4.23 (ii)   11.89 (ii)
     Unit Hyd. Tpeak (min)=        4.00         12.00
     Unit Hyd. peak  (cms)=         .27           .09
                                                      *TOTALS*
```

```
     PEAK FLOW       (cms)=       2.47          .75          2.926 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.15          8.017
     RUNOFF VOLUME    (mm)=      90.87        40.49         62.669
     TOTAL RAINFALL   (mm)=      91.88        91.88         91.878
     RUNOFF COEFFICIENT   =        .99          .44           .682

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
010:0010----------------------------------------------------------------------
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.31
| 02:302    DT= 1.00 |   Total Imp(%)=   39.00   Dir. Conn.(%)=   39.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .51          .80
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      20.00        20.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     123.50        46.65
               over (min)        1.00         4.00
     Storage Coeff.  (min)=        .97 (ii)    4.14 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.09          .28
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .18          .08          .253 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.02         8.000
     RUNOFF VOLUME    (mm)=      90.88        34.55        56.518
     TOTAL RAINFALL   (mm)=      91.88        91.88        91.878
     RUNOFF COEFFICIENT   =        .99          .38           .615

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
010:0011----------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 03:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .059 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   34.549
     TOTAL RAINFALL   (mm)=   91.878
     RUNOFF COEFFICIENT   =     .376

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

------------------------------------------------------------------------------
010:0012----------------------------------------------------------------------
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .31
| 04:401    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .17          .14
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      25.00        10.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     123.50        47.81
               over (min)        1.00         3.00
     Storage Coeff.  (min)=       1.11 (ii)    3.18 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.01          .36
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .06          .02          .074 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.00         8.000
     RUNOFF VOLUME    (mm)=      90.88        34.55        65.530
     TOTAL RAINFALL   (mm)=      91.88        91.88        91.878
     RUNOFF COEFFICIENT   =        .99          .38           .713

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
010:0013----------------------------------------------------------------------
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*#
------------------------
| ADD HYD (SWM       ) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                    (ha)     (cms)   (hrs)   (mm)    (cms)
                     ID1 01:301            18.63    2.926    8.02  62.67    .000
                    +ID2 02:302             1.31     .253    8.00  56.52    .000
                    +ID3 03:202             1.02     .059    8.15  34.55    .000
                    +ID4 04:401              .31     .074    8.00  65.53    .000
                     ==========================================================
                     SUM 05:SWM            21.27    3.242    8.00  60.98    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
010:0014----------------------------------------------------------------------
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
----------------------
| ROUTE RESERVOIR    |   Requested routing time step =  1.0 min.
| IN>05:(SWM   )     |
| OUT<01:(SWM   )    |   =========  OUTFLOW STORAGE TABLE  =========
----------------------   OUTFLOW    STORAGE  |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)  |    (cms)     (ha.m.)
                           .000  .0000E+00    |     .279  .4660E+00
                           .024  .1278E+00    |     .626  .4719E+00
                           .033  .2204E+00    |     .805  .6581E+00
                           .184  .2254E+00    |     .948  .8628E+00
                           .197  .2509E+00    |    1.033  .1010E+01
                           .243  .3576E+00    |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------             (ha)     (cms)     (hrs)       (mm)
     INFLOW >05: (SWM   )      21.27     3.242     8.000     60.983
     OUTFLOW<01: (SWM   )      21.27      .647     8.567     60.982
    OVERFLOW<02: (OFL   )        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   19.966
                  TIME SHIFT OF PEAK FLOW          (min)=    34.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.4937E+00

------------------------------------------------------------------------------
010:0015----------------------------------------------------------------------
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=     .72   Curve Number   (CN)=70.00
| 03:303    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .150

     Unit Hyd Qpeak  (cms)=     .183

     PEAK FLOW       (cms)=     .048 (i)
     TIME TO PEAK    (hrs)=    8.100
     RUNOFF VOLUME    (mm)=   34.549
     TOTAL RAINFALL   (mm)=   91.878
     RUNOFF COEFFICIENT   =     .376

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

------------------------------------------------------------------------------
010:0016----------------------------------------------------------------------
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (PROP      ) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                    (ha)     (cms)   (hrs)   (mm)    (cms)
                     ID1 01:SWM            21.27     .647    8.57  60.98    .000
                    +ID2 02:OFL              .00     .000     .00    .00    .000
                    +ID3 03:303              .72     .048    8.10  34.55    .000
                     ==========================================================
                     SUM 04:PROP           21.99     .663    8.45  60.12    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
010:0017----------------------------------------------------------------------
*#*********************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
*
------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*
  ** END OF RUN :  24

**********************************************************************




--------------------
| START            |  Project  dir.: T:\projects\25054\SWM\
--------------------  Rainfall dir.: T:\projects\25054\SWM\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 025
    NSTORM=   1
           #  1=SC_24025.stm
------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: 227 DECOU ROAD
*#                SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#*********************************************************************|
*
------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: SIMCOE 25-YR 24-HR CHICAGO STORM
| Ptotal= 107.76 mm|    Comments: SIMCOE 25-YR 24-HR CHICAGO STORM
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
```

| hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr |
|---|---|---|---|---|---|---|---|
| .17 | 1.374 | 6.17 | 3.825 | 12.17 | 3.447 | 18.17 | 1.853 |
| .33 | 1.395 | 6.33 | 4.093 | 12.33 | 3.354 | 18.33 | 1.832 |
| .50 | 1.417 | 6.50 | 4.412 | 12.50 | 3.267 | 18.50 | 1.811 |
| .67 | 1.439 | 6.67 | 4.799 | 12.67 | 3.186 | 18.67 | 1.792 |
| .83 | 1.462 | 6.83 | 5.281 | 12.83 | 3.109 | 18.83 | 1.772 |
| 1.00 | 1.487 | 7.00 | 5.902 | 13.00 | 3.037 | 19.00 | 1.754 |
| 1.17 | 1.512 | 7.17 | 6.735 | 13.17 | 2.968 | 19.17 | 1.735 |
| 1.33 | 1.539 | 7.33 | 7.930 | 13.33 | 2.903 | 19.33 | 1.718 |
| 1.50 | 1.566 | 7.50 | 9.824 | 13.50 | 2.842 | 19.50 | 1.700 |
| 1.67 | 1.595 | 7.67 | 13.438 | 13.67 | 2.783 | 19.67 | 1.683 |
| 1.83 | 1.625 | 7.83 | 24.996 | 13.83 | 2.728 | 19.83 | 1.667 |
| 2.00 | 1.657 | 8.00 | 144.844 | 14.00 | 2.675 | 20.00 | 1.650 |
| 2.17 | 1.690 | 8.17 | 30.676 | 14.17 | 2.624 | 20.17 | 1.635 |
| 2.33 | 1.725 | 8.33 | 19.342 | 14.33 | 2.576 | 20.33 | 1.619 |
| 2.50 | 1.761 | 8.50 | 14.750 | 14.50 | 2.530 | 20.50 | 1.604 |
| 2.67 | 1.800 | 8.67 | 12.150 | 14.67 | 2.486 | 20.67 | 1.589 |
| 2.83 | 1.840 | 8.83 | 10.443 | 14.83 | 2.443 | 20.83 | 1.575 |
| 3.00 | 1.883 | 9.00 | 9.223 | 15.00 | 2.403 | 21.00 | 1.561 |
| 3.17 | 1.929 | 9.17 | 8.301 | 15.17 | 2.364 | 21.17 | 1.547 |
| 3.33 | 1.977 | 9.33 | 7.575 | 15.33 | 2.326 | 21.33 | 1.533 |
| 3.50 | 2.028 | 9.50 | 6.986 | 15.50 | 2.290 | 21.50 | 1.520 |
| 3.67 | 2.083 | 9.67 | 6.497 | 15.67 | 2.255 | 21.67 | 1.507 |
| 3.83 | 2.141 | 9.83 | 6.085 | 15.83 | 2.222 | 21.83 | 1.495 |
| 4.00 | 2.203 | 10.00 | 5.730 | 16.00 | 2.189 | 22.00 | 1.482 |
| 4.17 | 2.270 | 10.17 | 5.422 | 16.17 | 2.158 | 22.17 | 1.470 |
| 4.33 | 2.343 | 10.33 | 5.151 | 16.33 | 2.128 | 22.33 | 1.458 |
| 4.50 | 2.421 | 10.50 | 4.911 | 16.50 | 2.099 | 22.50 | 1.446 |
| 4.67 | 2.505 | 10.67 | 4.697 | 16.67 | 2.071 | 22.67 | 1.435 |
| 4.83 | 2.598 | 10.83 | 4.504 | 16.83 | 2.043 | 22.83 | 1.424 |
| 5.00 | 2.699 | 11.00 | 4.329 | 17.00 | 2.017 | 23.00 | 1.412 |
| 5.17 | 2.810 | 11.17 | 4.170 | 17.17 | 1.991 | 23.17 | 1.402 |
| 5.33 | 2.933 | 11.33 | 4.024 | 17.33 | 1.966 | 23.33 | 1.391 |
| 5.50 | 3.070 | 11.50 | 3.890 | 17.50 | 1.942 | 23.50 | 1.381 |
| 5.67 | 3.223 | 11.67 | 3.767 | 17.67 | 1.919 | 23.67 | 1.370 |
| 5.83 | 3.397 | 11.83 | 3.652 | 17.83 | 1.896 | 23.83 | 1.360 |
| 6.00 | 3.595 | 12.00 | 3.546 | 18.00 | 1.874 | 24.00 | 1.350 |

```
------------------------------------------------------------------------------
025:0003----------------------------------------------------------------------
*
*#*************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*************************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=   14.23   Curve Number   (CN)=70.00
| 01:101    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.066

     PEAK FLOW       (cms)=     .583 (i)
     TIME TO PEAK    (hrs)=    8.567
     RUNOFF VOLUME    (mm)=   45.610
     TOTAL RAINFALL   (mm)=  107.756
     RUNOFF COEFFICIENT   =     .423

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

------------------------------------------------------------------------------
025:0004----------------------------------------------------------------------
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    2.43   Curve Number   (CN)=70.00
| 02:102    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=     .206

     PEAK FLOW       (cms)=     .108 (i)
     TIME TO PEAK    (hrs)=    8.483
     RUNOFF VOLUME    (mm)=   45.610
     TOTAL RAINFALL   (mm)=  107.756
     RUNOFF COEFFICIENT   =     .423

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

------------------------------------------------------------------------------
025:0005----------------------------------------------------------------------
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.03   Curve Number   (CN)=70.00
| 03:103    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .730

     Unit Hyd Qpeak  (cms)=     .211

     PEAK FLOW       (cms)=     .129 (i)
     TIME TO PEAK    (hrs)=    8.850
     RUNOFF VOLUME    (mm)=   45.610
     TOTAL RAINFALL   (mm)=  107.756
     RUNOFF COEFFICIENT   =     .423

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

------------------------------------------------------------------------------
025:0006----------------------------------------------------------------------
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.78   Curve Number   (CN)=70.00
| 04:201    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .212

     PEAK FLOW       (cms)=     .100 (i)
     TIME TO PEAK    (hrs)=    8.317
     RUNOFF VOLUME    (mm)=   45.610
     TOTAL RAINFALL   (mm)=  107.756
     RUNOFF COEFFICIENT   =     .423

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

------------------------------------------------------------------------------
025:0007----------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 05:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .081 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   45.610
     TOTAL RAINFALL   (mm)=  107.756
     RUNOFF COEFFICIENT   =     .423

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

------------------------------------------------------------------------------
025:0008----------------------------------------------------------------------
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (EX        ) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                    (ha)     (cms)   (hrs)   (mm)    (cms)
                     ID1 01:101            14.23     .583    8.57  45.61    .000
                    +ID2 02:102             2.43     .108    8.48  45.61    .000
                    +ID3 03:103             4.03     .129    8.85  45.61    .000
                    +ID4 04:201             1.78     .100    8.32  45.61    .000
                    +ID5 05:202             1.02     .081    8.15  45.61    .000
                     ==========================================================
                     SUM 06:EX             23.49     .923    8.52  45.61    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
025:0009----------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*************************************************************************|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=   18.63
| 01:301    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   44.00
----------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.25         8.38
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     400.00        30.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     144.84        75.55
               over (min)          4.00        11.00
     Storage Coeff.  (min)=       3.97 (ii)   10.61 (ii)
     Unit Hyd. Tpeak (min)=       4.00        11.00
     Unit Hyd. peak  (cms)=        .28          .11
                                                      *TOTALS*
     PEAK FLOW       (cms)=       2.95         1.07         3.669 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.13         8.017
     RUNOFF VOLUME    (mm)=     106.75        52.55        76.408
     TOTAL RAINFALL   (mm)=     107.76       107.76       107.756
     RUNOFF COEFFICIENT   =        .99          .49          .709

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
025:0010----------------------------------------------------------------------
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.31
| 02:302    DT= 1.00 |   Total Imp(%)=   39.00   Dir. Conn.(%)=   39.00
----------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .51          .80
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      20.00        20.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     144.84        63.10
               over (min)          1.00         4.00
```

```
     Storage Coeff.  (min)=       .91 (ii)    3.72 (ii)
     Unit Hyd. Tpeak (min)=      1.00         4.00
     Unit Hyd. peak  (cms)=      1.13          .30
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .21          .11          .317 (iii)
     TIME TO PEAK    (hrs)=      8.00         8.02         8.000
     RUNOFF VOLUME    (mm)=    106.75        45.61        69.457
     TOTAL RAINFALL   (mm)=    107.76       107.76       107.756
     RUNOFF COEFFICIENT   =       .99          .42          .645

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
025:0011----------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 03:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .081 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   45.610
     TOTAL RAINFALL   (mm)=  107.756
     RUNOFF COEFFICIENT   =     .423

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

------------------------------------------------------------------------------
025:0012----------------------------------------------------------------------
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .31
| 04:401    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
----------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .17          .14
     Dep. Storage     (mm)=      1.00        10.89
     Average Slope     (%)=      1.00        20.00
     Length            (m)=     25.00        10.00
     Mannings n           =      .015         .250

     Max.eff.Inten.(mm/hr)=    144.84        64.48
               over (min)          1.00         3.00
     Storage Coeff.  (min)=      1.04 (ii)    2.88 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.05          .39
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .07          .02          .090 (iii)
     TIME TO PEAK    (hrs)=      8.00         8.00         8.000
     RUNOFF VOLUME    (mm)=    106.75        45.61        79.240
     TOTAL RAINFALL   (mm)=    107.76       107.76       107.756
     RUNOFF COEFFICIENT   =       .99          .42          .735

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
025:0013----------------------------------------------------------------------
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*#
------------------------
| ADD HYD (SWM       ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)    (cms)
                        ID1 01:301         18.63    3.669    8.02  76.41    .000
                       +ID2 02:302          1.31     .317    8.00  69.46    .000
                       +ID3 03:202          1.02     .081    8.15  45.61    .000
                       +ID4 04:401           .31     .090    8.00  79.24    .000
                        ========================================================
                        SUM 05:SWM         21.27    4.055    8.00  74.54    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
025:0014----------------------------------------------------------------------
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
----------------------
| ROUTE RESERVOIR    |     Requested routing time step =  1.0 min.
|   IN>05:(SWM   )   |
| OUT<01:(SWM   )    |     =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE  |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)  |    (cms)     (ha.m.)
                            .000  .0000E+00   |     .279  .4660E+00
                            .024  .1278E+00   |     .626  .4719E+00
                            .033  .2204E+00   |     .805  .6581E+00
                            .184  .2254E+00   |     .948  .8628E+00
                            .197  .2509E+00   |    1.033  .1010E+01
                            .243  .3576E+00   |    .000   .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------         (ha)     (cms)     (hrs)       (mm)
     INFLOW >05: (SWM   )      21.27     4.055     8.000     74.544
     OUTFLOW<01: (SWM   )      21.27      .742     8.583     74.542
    OVERFLOW<02: (OFL   )        .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   18.308
                    TIME SHIFT OF PEAK FLOW          (min)=    35.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.5930E+00

------------------------------------------------------------------------------
025:0015----------------------------------------------------------------------
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=     .72   Curve Number   (CN)=70.00
| 03:303    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .150

     Unit Hyd Qpeak  (cms)=     .183

     PEAK FLOW       (cms)=     .066 (i)
     TIME TO PEAK    (hrs)=    8.100
     RUNOFF VOLUME    (mm)=   45.610
     TOTAL RAINFALL   (mm)=  107.756
     RUNOFF COEFFICIENT   =     .423

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

------------------------------------------------------------------------------
025:0016----------------------------------------------------------------------
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (PROP      ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)    (cms)
                        ID1 01:SWM         21.27     .742    8.58  74.54    .000
                       +ID2 02:OFL           .00     .000     .00    .00    .000
                       +ID3 03:303           .72     .066    8.10  45.61    .000
                        ========================================================
                        SUM 04:PROP        21.99     .763    8.47  73.59    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
025:0017----------------------------------------------------------------------
*#*****************************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
*
------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
  ** END OF RUN :  49

*******************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\25054\SWM\
--------------------  Rainfall dir.: T:\projects\25054\SWM\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 050
    NSTORM=   1
            #  1=SC_24050.stm
------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: 227 DECOU ROAD
*#               SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#*****************************************************************************|
*
------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: SIMCOE 50-YR 24-HR CHICAGO STORM
| Ptotal= 119.73 mm|    Comments: SIMCOE 50-YR 24-HR CHICAGO STORM
--------------------
            TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
             hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
             .17   1.527 |  6.17   4.250 | 12.17   3.830 | 18.17   2.058
             .33   1.550 |  6.33   4.548 | 12.33   3.727 | 18.33   2.035
             .50   1.574 |  6.50   4.902 | 12.50   3.630 | 18.50   2.013
             .67   1.599 |  6.67   5.333 | 12.67   3.540 | 18.67   1.991
             .83   1.625 |  6.83   5.868 | 12.83   3.454 | 18.83   1.969
            1.00   1.652 |  7.00   6.557 | 13.00   3.374 | 19.00   1.948
            1.17   1.680 |  7.17   7.483 | 13.17   3.298 | 19.17   1.928
            1.33   1.710 |  7.33   8.811 | 13.33   3.226 | 19.33   1.908
            1.50   1.740 |  7.50  10.915 | 13.50   3.158 | 19.50   1.889
            1.67   1.772 |  7.67  14.931 | 13.67   3.093 | 19.67   1.870
            1.83   1.806 |  7.83  27.774 | 13.83   3.031 | 19.83   1.852
            2.00   1.841 |  8.00 160.938 | 14.00   2.972 | 20.00   1.834
            2.17   1.878 |  8.17  34.085 | 14.17   2.916 | 20.17   1.816
            2.33   1.916 |  8.33  21.491 | 14.33   2.862 | 20.33   1.799
            2.50   1.957 |  8.50  16.389 | 14.50   2.811 | 20.50   1.782
            2.67   2.000 |  8.67  13.500 | 14.67   2.762 | 20.67   1.766
            2.83   2.045 |  8.83  11.603 | 14.83   2.715 | 20.83   1.750
            3.00   2.092 |  9.00  10.248 | 15.00   2.670 | 21.00   1.734
            3.17   2.143 |  9.17   9.223 | 15.17   2.626 | 21.17   1.719
            3.33   2.196 |  9.33   8.416 | 15.33   2.585 | 21.33   1.704
            3.50   2.253 |  9.50   7.762 | 15.50   2.545 | 21.50   1.689
            3.67   2.314 |  9.67   7.219 | 15.67   2.506 | 21.67   1.675
            3.83   2.379 |  9.83   6.761 | 15.83   2.469 | 21.83   1.661
            4.00   2.448 | 10.00   6.367 | 16.00   2.433 | 22.00   1.647
            4.17   2.523 | 10.17   6.025 | 16.17   2.398 | 22.17   1.633
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4.33 | 2.603 | 10.33 | 5.724 | 16.33 | 2.364 | 22.33 | 1.620 |
| 4.50 | 2.690 | 10.50 | 5.457 | 16.50 | 2.332 | 22.50 | 1.607 |
| 4.67 | 2.784 | 10.67 | 5.219 | 16.67 | 2.301 | 22.67 | 1.594 |
| 4.83 | 2.886 | 10.83 | 5.004 | 16.83 | 2.270 | 22.83 | 1.582 |
| 5.00 | 2.999 | 11.00 | 4.810 | 17.00 | 2.241 | 23.00 | 1.569 |
| 5.17 | 3.122 | 11.17 | 4.633 | 17.17 | 2.213 | 23.17 | 1.557 |
| 5.33 | 3.259 | 11.33 | 4.471 | 17.33 | 2.185 | 23.33 | 1.546 |
| 5.50 | 3.411 | 11.50 | 4.322 | 17.50 | 2.158 | 23.50 | 1.534 |
| 5.67 | 3.581 | 11.67 | 4.185 | 17.67 | 2.132 | 23.67 | 1.523 |
| 5.83 | 3.774 | 11.83 | 4.058 | 17.83 | 2.107 | 23.83 | 1.511 |
| 6.00 | 3.995 | 12.00 | 3.940 | 18.00 | 2.082 | 24.00 | 1.500 |

```
050:0003----------------------------------------------------------------------------
*
*#*************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*************************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD      |   Area    (ha)=   14.23   Curve Number   (CN)=70.00
| 01:101    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.066

     PEAK FLOW       (cms)=     .712 (i)
     TIME TO PEAK    (hrs)=    8.550
     RUNOFF VOLUME    (mm)=   54.415
     TOTAL RAINFALL   (mm)=  119.729
     RUNOFF COEFFICIENT   =     .454

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

----------------------------------------------------------------------------------
050:0004----------------------------------------------------------------------------
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    2.43   Curve Number   (CN)=70.00
| 02:102    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=     .206

     PEAK FLOW       (cms)=     .132 (i)
     TIME TO PEAK    (hrs)=    8.483
     RUNOFF VOLUME    (mm)=   54.415
     TOTAL RAINFALL   (mm)=  119.729
     RUNOFF COEFFICIENT   =     .454

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

----------------------------------------------------------------------------------
050:0005----------------------------------------------------------------------------
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    4.03   Curve Number   (CN)=70.00
| 03:103    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .730

     Unit Hyd Qpeak  (cms)=     .211

     PEAK FLOW       (cms)=     .158 (i)
     TIME TO PEAK    (hrs)=    8.850
     RUNOFF VOLUME    (mm)=   54.415
     TOTAL RAINFALL   (mm)=  119.729
     RUNOFF COEFFICIENT   =     .454

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

----------------------------------------------------------------------------------
050:0006----------------------------------------------------------------------------
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    1.78   Curve Number   (CN)=70.00
| 04:201    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .212

     PEAK FLOW       (cms)=     .122 (i)
     TIME TO PEAK    (hrs)=    8.300
     RUNOFF VOLUME    (mm)=   54.415
     TOTAL RAINFALL   (mm)=  119.729
     RUNOFF COEFFICIENT   =     .454

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

----------------------------------------------------------------------------------
050:0007----------------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 05:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .099 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   54.415
     TOTAL RAINFALL   (mm)=  119.729
     RUNOFF COEFFICIENT   =     .454

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

----------------------------------------------------------------------------------
050:0008----------------------------------------------------------------------------
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (EX        ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)    (cms)
                        ID1 01:101         14.23     .712    8.55  54.42    .000
                       +ID2 02:102          2.43     .132    8.48  54.41    .000
                       +ID3 03:103          4.03     .158    8.85  54.41    .000
                       +ID4 04:201          1.78     .122    8.30  54.41    .000
                       +ID5 05:202          1.02     .099    8.15  54.41    .000
                        ==========================================================
                        SUM 06:EX          23.49    1.128    8.52  54.42    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

----------------------------------------------------------------------------------
050:0009----------------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*************************************************************************|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=   18.63
| 01:301    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   44.00
---------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.25         8.38
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     400.00        30.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     160.94        97.63
               over (min)          4.00        10.00
     Storage Coeff.  (min)=       3.80 (ii)    9.80 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .29          .11
                                                    *TOTALS*
     PEAK FLOW       (cms)=       3.30         1.35      4.305 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.10      8.017
     RUNOFF VOLUME    (mm)=     118.72        62.05      86.995
     TOTAL RAINFALL   (mm)=     119.73       119.73      119.729
     RUNOFF COEFFICIENT   =        .99          .52         .727

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

----------------------------------------------------------------------------------
050:0010----------------------------------------------------------------------------
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=    1.31
| 02:302    DT= 1.00 |   Total Imp(%)=   39.00   Dir. Conn.(%)=   39.00
---------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .51          .80
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      20.00        20.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     160.94        77.84
               over (min)          1.00         3.00
     Storage Coeff.  (min)=        .88 (ii)    3.46 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.16          .34
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .23          .14       .373 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.00      8.000
     RUNOFF VOLUME    (mm)=     118.73        54.41      79.498
     TOTAL RAINFALL   (mm)=     119.73       119.73      119.729
     RUNOFF COEFFICIENT   =        .99          .45         .664

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

----------------------------------------------------------------------------------
050:0011----------------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 03:202    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .190
```

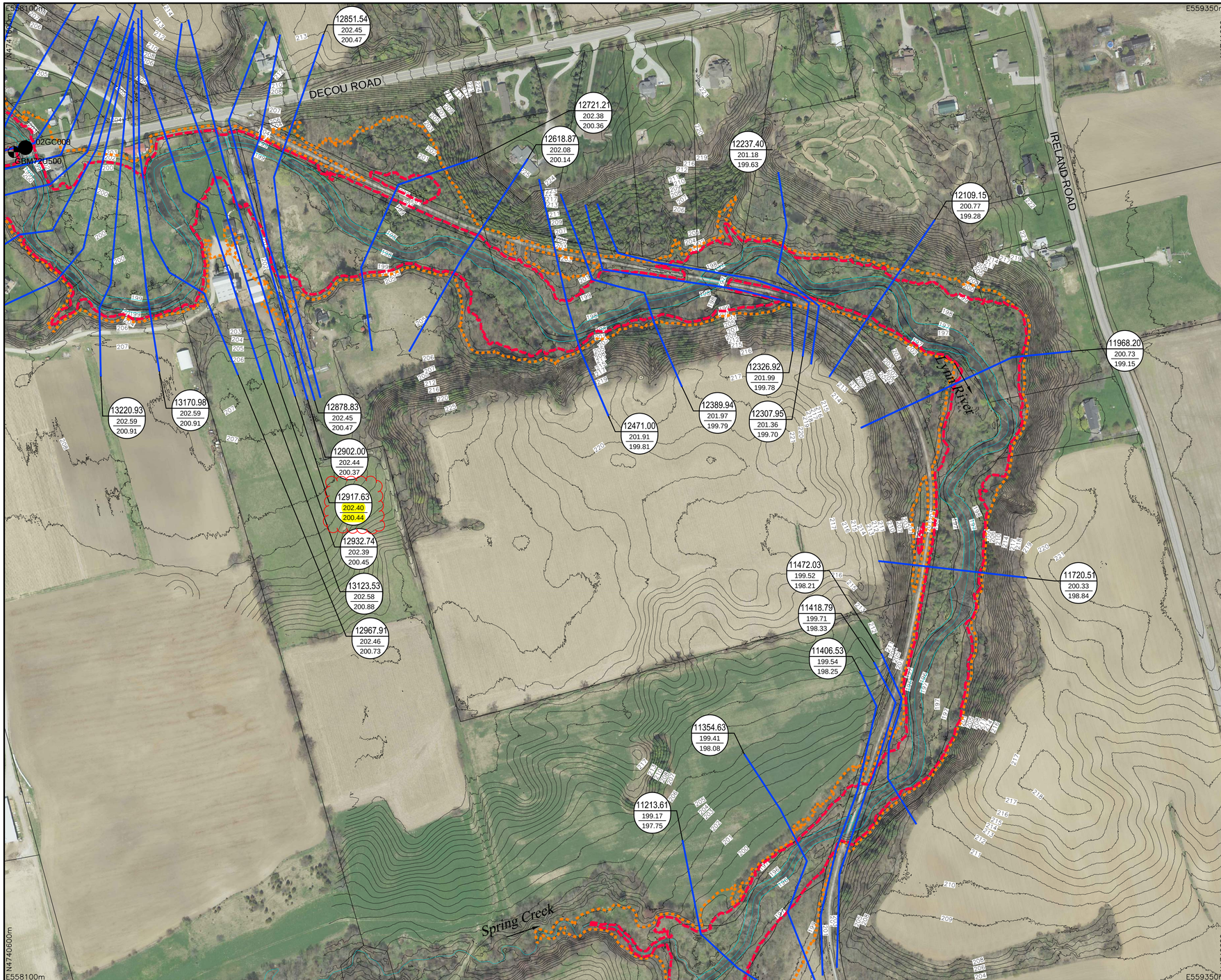
```
     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .099 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   54.415
     TOTAL RAINFALL   (mm)=  119.729
     RUNOFF COEFFICIENT   =     .454

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

------------------------------------------------------------------------------
050:0012----------------------------------------------------------------------
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=     .31
| 04:401    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
----------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .17          .14
     Dep. Storage     (mm)=      1.00        10.89
     Average Slope     (%)=      1.00        20.00
     Length            (m)=     25.00        10.00
     Mannings n           =      .015         .250

     Max.eff.Inten.(mm/hr)=    160.94        77.84
               over (min)        1.00         3.00
     Storage Coeff.  (min)=      1.00 (ii)    2.70 (ii)
     Unit Hyd. Tpeak (min)=      1.00         3.00
     Unit Hyd. peak  (cms)=      1.07          .40
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .08          .03          .103 (iii)
     TIME TO PEAK    (hrs)=      8.00         8.00         8.000
     RUNOFF VOLUME    (mm)=    118.73        54.41        89.788
     TOTAL RAINFALL   (mm)=    119.73       119.73       119.729
     RUNOFF COEFFICIENT   =       .99          .45          .750

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
050:0013----------------------------------------------------------------------
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*#
------------------------
| ADD HYD (SWM       ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 01:301          18.63    4.305    8.02  87.00    .000
                       +ID2 02:302           1.31     .373    8.00  79.50    .000
                       +ID3 03:202           1.02     .099    8.15  54.41    .000
                       +ID4 04:401            .31     .103    8.00  89.79    .000
                        ==========================================================
                        SUM 05:SWM          21.27    4.759    8.00  85.01    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
050:0014----------------------------------------------------------------------
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
--------------------
| ROUTE RESERVOIR  |     Requested routing time step =  1.0 min.
|  IN>05:(SWM   )  |
| OUT<01:(SWM   )  |     =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
                          .000  .0000E+00    |     .279  .4660E+00
                          .024  .1278E+00    |     .626  .4719E+00
                          .033  .2204E+00    |     .805  .6581E+00
                          .184  .2254E+00    |     .948  .8628E+00
                          .197  .2509E+00    |    1.033  .1010E+01
                          .243  .3576E+00    |    .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >05: (SWM   )       21.27     4.759     8.000     85.012
     OUTFLOW<01: (SWM   )       21.27      .818     8.600     85.010
    OVERFLOW<02: (OFL   )         .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   17.194
                  TIME SHIFT OF PEAK FLOW          (min)=    36.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.6775E+00

------------------------------------------------------------------------------
050:0015----------------------------------------------------------------------
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=     .72   Curve Number   (CN)=70.00
| 03:303    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .150

     Unit Hyd Qpeak  (cms)=     .183

     PEAK FLOW       (cms)=     .081 (i)
     TIME TO PEAK    (hrs)=    8.100
     RUNOFF VOLUME    (mm)=   54.415
     TOTAL RAINFALL   (mm)=  119.729
     RUNOFF COEFFICIENT   =     .454

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

------------------------------------------------------------------------------
050:0016----------------------------------------------------------------------
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (PROP      ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 01:SWM          21.27     .818    8.60  85.01    .000
                       +ID2 02:OFL            .00     .000     .00    .00    .000
                       +ID3 03:303            .72     .081    8.10  54.41    .000
                        ==========================================================
                        SUM 04:PROP         21.99     .845    8.37  84.01    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
050:0017----------------------------------------------------------------------
*#*****************************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
*
------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
  ** END OF RUN :  99

********************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\25054\SWM\
--------------------  Rainfall dir.: T:\projects\25054\SWM\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 100
    NSTORM=   1
           #  1=SC_24100.stm
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: 227 DECOU ROAD
*#                SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#    Revised   :
*#    Company   : S. LLEWELLYN AND ASSOCIATES LTD.
*#       File   : 25054_1.DAT
*#*****************************************************************************|
*
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: SIMCOE 100-YR 24-HR CHICAGO STORM
| Ptotal= 131.44 mm|    Comments: SIMCOE 100-YR 24-HR CHICAGO STORM
--------------------
              TIME    RAIN  |   TIME    RAIN  |   TIME    RAIN  |   TIME    RAIN
               hrs   mm/hr  |    hrs   mm/hr  |    hrs   mm/hr  |    hrs   mm/hr
               .17   1.676  |   6.17   4.665  |  12.17   4.204  |  18.17   2.260
               .33   1.701  |   6.33   4.992  |  12.33   4.091  |  18.33   2.234
               .50   1.728  |   6.50   5.382  |  12.50   3.986  |  18.50   2.210
               .67   1.755  |   6.67   5.854  |  12.67   3.886  |  18.67   2.185
               .83   1.784  |   6.83   6.442  |  12.83   3.792  |  18.83   2.162
              1.00   1.814  |   7.00   7.199  |  13.00   3.704  |  19.00   2.139
              1.17   1.845  |   7.17   8.216  |  13.17   3.621  |  19.17   2.117
              1.33   1.877  |   7.33   9.673  |  13.33   3.542  |  19.33   2.095
              1.50   1.910  |   7.50  11.983  |  13.50   3.467  |  19.50   2.074
              1.67   1.946  |   7.67  16.392  |  13.67   3.395  |  19.67   2.053
              1.83   1.982  |   7.83  30.491  |  13.83   3.328  |  19.83   2.033
              2.00   2.021  |   8.00 176.682  |  14.00   3.263  |  20.00   2.013
              2.17   2.061  |   8.17  37.419  |  14.17   3.201  |  20.17   1.994
              2.33   2.104  |   8.33  23.593  |  14.33   3.142  |  20.33   1.975
              2.50   2.148  |   8.50  17.992  |  14.50   3.086  |  20.50   1.957
              2.67   2.195  |   8.67  14.820  |  14.67   3.032  |  20.67   1.939
              2.83   2.245  |   8.83  12.738  |  14.83   2.981  |  20.83   1.921
              3.00   2.297  |   9.00  11.250  |  15.00   2.931  |  21.00   1.904
              3.17   2.353  |   9.17  10.125  |  15.17   2.883  |  21.17   1.887
              3.33   2.411  |   9.33   9.240  |  15.33   2.838  |  21.33   1.871
              3.50   2.474  |   9.50   8.521  |  15.50   2.793  |  21.50   1.854
              3.67   2.540  |   9.67   7.926  |  15.67   2.751  |  21.67   1.839
              3.83   2.611  |   9.83   7.422  |  15.83   2.710  |  21.83   1.823
              4.00   2.688  |  10.00   6.990  |  16.00   2.671  |  22.00   1.808
              4.17   2.769  |  10.17   6.614  |  16.17   2.633  |  22.17   1.793
              4.33   2.857  |  10.33   6.284  |  16.33   2.596  |  22.33   1.778
              4.50   2.953  |  10.50   5.991  |  16.50   2.560  |  22.50   1.764
              4.67   3.056  |  10.67   5.729  |  16.67   2.526  |  22.67   1.750
              4.83   3.169  |  10.83   5.494  |  16.83   2.492  |  22.83   1.736
              5.00   3.292  |  11.00   5.281  |  17.00   2.460  |  23.00   1.723
              5.17   3.427  |  11.17   5.086  |  17.17   2.429  |  23.17   1.710
              5.33   3.577  |  11.33   4.909  |  17.33   2.399  |  23.33   1.697
              5.50   3.744  |  11.50   4.745  |  17.50   2.369  |  23.50   1.684
              5.67   3.932  |  11.67   4.595  |  17.67   2.341  |  23.67   1.671
              5.83   4.144  |  11.83   4.455  |  17.83   2.313  |  23.83   1.659
              6.00   4.386  |  12.00   4.325  |  18.00   2.286  |  24.00   1.647

------------------------------------------------------------------------------
100:0003----------------------------------------------------------------------
*
*#*****************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*****************************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
```

```
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=   14.23   Curve Number   (CN)=70.00
| 01:101    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.066

     PEAK FLOW       (cms)=     .845 (i)
     TIME TO PEAK    (hrs)=    8.550
     RUNOFF VOLUME    (mm)=   63.349
     TOTAL RAINFALL   (mm)=  131.442
     RUNOFF COEFFICIENT   =     .482

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

------------------------------------------------------------------------------
100:0004--------------------------------------------------------------------
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=    2.43   Curve Number   (CN)=70.00
| 02:102    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=     .206

     PEAK FLOW       (cms)=     .157 (i)
     TIME TO PEAK    (hrs)=    8.467
     RUNOFF VOLUME    (mm)=   63.349
     TOTAL RAINFALL   (mm)=  131.442
     RUNOFF COEFFICIENT   =     .482

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

------------------------------------------------------------------------------
100:0005--------------------------------------------------------------------
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=    4.03   Curve Number   (CN)=70.00
| 03:103    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .730

     Unit Hyd Qpeak  (cms)=     .211

     PEAK FLOW       (cms)=     .187 (i)
     TIME TO PEAK    (hrs)=    8.833
     RUNOFF VOLUME    (mm)=   63.349
     TOTAL RAINFALL   (mm)=  131.442
     RUNOFF COEFFICIENT   =     .482

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

------------------------------------------------------------------------------
100:0006--------------------------------------------------------------------
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=    1.78   Curve Number   (CN)=70.00
| 04:201    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .212

     PEAK FLOW       (cms)=     .145 (i)
     TIME TO PEAK    (hrs)=    8.300
     RUNOFF VOLUME    (mm)=   63.349
     TOTAL RAINFALL   (mm)=  131.442
     RUNOFF COEFFICIENT   =     .482

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

------------------------------------------------------------------------------
100:0007--------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=    1.02   Curve Number   (CN)=70.00
| 05:202    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .117 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   63.349
     TOTAL RAINFALL   (mm)=  131.442
     RUNOFF COEFFICIENT   =     .482

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

------------------------------------------------------------------------------
100:0008--------------------------------------------------------------------
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (EX        ) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                    (ha)     (cms)   (hrs)   (mm)    (cms)
                        ID1 01:101          14.23     .845   8.55  63.35    .000
                       +ID2 02:102           2.43     .157   8.47  63.35    .000
                       +ID3 03:103           4.03     .187   8.83  63.35    .000
                       +ID4 04:201           1.78     .145   8.30  63.35    .000
                       +ID5 05:202           1.02     .117   8.15  63.35    .000
                        ==========================================================
                        SUM 06:EX           23.49    1.338   8.50  63.35    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
100:0009--------------------------------------------------------------------
*#*****************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*****************************************************************************|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB STANDHYD     |   Area     (ha)=   18.63
| 01:301    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   44.00
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.25         8.38
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     400.00        30.00
     Mannings n            =       .015         .250

     Max.eff.Inten.(mm/hr)=     176.68       117.23
               over (min)          4.00         9.00
     Storage Coeff.  (min)=       3.66 (ii)    9.24 (ii)
     Unit Hyd. Tpeak (min)=       4.00         9.00
     Unit Hyd. peak  (cms)=        .30          .12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       3.66         1.65         4.972 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.08         8.017
     RUNOFF VOLUME    (mm)=     130.43        71.61        97.504
     TOTAL RAINFALL   (mm)=     131.44       131.44       131.442
     RUNOFF COEFFICIENT   =        .99          .54          .742

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
100:0010--------------------------------------------------------------------
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
----------------------
| CALIB STANDHYD     |   Area     (ha)=    1.31
| 02:302    DT= 1.00 |   Total Imp(%)=   39.00   Dir. Conn.(%)=   39.00
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .51          .80
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      20.00        20.00
     Mannings n            =       .015         .250

     Max.eff.Inten.(mm/hr)=     176.68        91.45
               over (min)          1.00         3.00
     Storage Coeff.  (min)=        .84 (ii)    3.26 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.18          .35
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .25          .17          .424 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.00         8.000
     RUNOFF VOLUME    (mm)=     130.44        63.34        89.515
     TOTAL RAINFALL   (mm)=     131.44       131.44       131.442
     RUNOFF COEFFICIENT   =        .99          .48          .681

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
100:0011--------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
----------------------
| CALIB NASHYD       |   Area     (ha)=    1.02   Curve Number   (CN)=70.00
| 03:202    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .117 (i)
     TIME TO PEAK    (hrs)=    8.150
     RUNOFF VOLUME    (mm)=   63.349
     TOTAL RAINFALL   (mm)=  131.442
     RUNOFF COEFFICIENT   =     .482

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

------------------------------------------------------------------------------
100:0012--------------------------------------------------------------------
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
----------------------
| CALIB STANDHYD     |   Area     (ha)=     .31
| 04:401    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .17          .14
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      25.00        10.00
```

```
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     176.68        91.45
           over (min)     =       1.00         3.00
     Storage Coeff.  (min)=        .96 (ii)    2.56 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.10          .42
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .08          .03          .115 (iii)
     TIME TO PEAK    (hrs)=       8.00         8.00         8.000
     RUNOFF VOLUME    (mm)=     130.44        63.35        100.250
     TOTAL RAINFALL   (mm)=     131.44       131.44        131.442
     RUNOFF COEFFICIENT   =        .99          .48           .763

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
100:0013------------------------------------------------------------------------
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*#
------------------------
| ADD HYD (SWM      ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 01:301          18.63    4.972    8.02  97.50    .000
                      +ID2 02:302           1.31     .424    8.00  89.52    .000
                      +ID3 03:202           1.02     .117    8.15  63.35    .000
                      +ID4 04:401            .31     .115    8.00 100.25    .000
                       ============================================================
                       SUM 05:SWM          21.27    5.496    8.00  95.41    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
100:0014------------------------------------------------------------------------
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
----------------------
| ROUTE RESERVOIR    |     Requested routing time step =  1.0 min.
|  IN>05:(SWM   )    |
| OUT<01:(SWM   )    |     =========  OUTLFOW STORAGE TABLE  =========
---------------------      OUTFLOW    STORAGE    OUTFLOW    STORAGE
                             (cms)    (ha.m.)      (cms)    (ha.m.)
                              .000  .0000E+00        .279  .4660E+00
                              .024  .1278E+00        .626  .4719E+00
                              .033  .2204E+00        .805  .6581E+00
                              .184  .2254E+00        .948  .8628E+00
                              .197  .2509E+00       1.033  .1010E+01
                              .243  .3576E+00        .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------            (ha)     (cms)     (hrs)       (mm)
     INFLOW >05: (SWM   )      21.27     5.496     8.000     95.414
     OUTFLOW<01: (SWM   )      21.27      .879     8.617     95.412
    OVERFLOW<02: (OFL   )        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   16.002
                  TIME SHIFT OF PEAK FLOW          (min)=    37.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.7646E+00

------------------------------------------------------------------------------
100:0015------------------------------------------------------------------------
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=     .72   Curve Number   (CN)=70.00
| 03:303    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .150

     Unit Hyd Qpeak  (cms)=     .183

     PEAK FLOW       (cms)=     .096 (i)
     TIME TO PEAK    (hrs)=    8.100
     RUNOFF VOLUME    (mm)=   63.349
     TOTAL RAINFALL   (mm)=  131.442
     RUNOFF COEFFICIENT   =     .482

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

------------------------------------------------------------------------------
100:0016------------------------------------------------------------------------
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (PROP      ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 01:SWM          21.27     .879    8.62  95.41    .000
                      +ID2 02:OFL            .00     .000     .00    .00    .000
                      +ID3 03:303            .72     .096    8.10  63.35    .000
                       ============================================================
                       SUM 04:PROP         21.99     .910    8.35  94.36    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
100:0017------------------------------------------------------------------------
*#*********************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*
  ** END OF RUN : 124

*************************************************************************




--------------------
| START            |  Project  dir.: T:\projects\25054\SWM\
--------------------  Rainfall dir.: T:\projects\25054\SWM\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 125
    NSTORM=   1
           #  1=MTHP25MM.stm
------------------------------------------------------------------------------
125:0002------------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: 227 DECOU ROAD
*#                SIMCOE, ONTARIO
*#  JOB NUMBER  : 25054
*#       Date   : FEBRUARY 2026
*#     Revised  :
*#     Company  : S. LLEWELLYN AND ASSOCIATES LTD.
*#        File  : 25054_1.DAT
*#*********************************************************************|
*
------------------------------------------------------------------------------
125:0002------------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: 25mm 4-HOUR (A=555 B=5.89 C=0.813)
| Ptotal=  25.27 mm|    Comments: 25mm 4-HOUR (A=555 B=5.89 C=0.813)
--------------------
             TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
              hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              .17   1.491 |   1.17  13.390 |   2.17   3.748 |   3.17   1.810
              .33   1.720 |   1.33  58.584 |   2.33   3.156 |   3.33   1.675
              .50   2.045 |   1.50  17.849 |   2.50   2.734 |   3.50   1.560
              .67   2.542 |   1.67   9.118 |   2.67   2.417 |   3.67   1.460
              .83   3.408 |   1.83   6.129 |   2.83   2.170 |   3.83   1.374
             1.00   5.319 |   2.00   4.638 |   3.00   1.973 |   4.00   1.299

------------------------------------------------------------------------------
125:0003------------------------------------------------------------------------
*
*#*********************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*********************************************************************|
*#
*# THE EXISTING CONDITION DRAINAGE AREAS FROM THE DEVELOPMENT LANDS & EXTERNAL
*# LANDS ARE CONVEYED THROUGH VARIOUS CULVERTS CROSSING DECOU ROAD TO THE
*# EXISTING LYNN RIVER WATERCOURSE. THE TOTAL FLOW UNDER EXISTING CONDITIONS
*# TO THE EXISTING LYNN RIVER IS ANALYZED TO DETERMINE THE POST DEVELOPMENT
*# FLOWS TO THE EXISTING LYNN RIVER
*#
*# TOTAL EXISTING DRAINAGE AREA TO LYNN RIVER = 27.36 ha
*#
*# CATCHMENT 101 - EXISTING CONDITION FLOW FROM WEST & CENTRAL PORTION OF SITE
*# TO EXISTING 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=   14.23   Curve Number   (CN)=70.00
| 01:101    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .510

     Unit Hyd Qpeak  (cms)=    1.066

     PEAK FLOW       (cms)=     .032 (i)
     TIME TO PEAK    (hrs)=    2.267
     RUNOFF VOLUME    (mm)=    1.677
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT   =     .066

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

------------------------------------------------------------------------------
125:0004------------------------------------------------------------------------
*# CATCHMENT 102 - EXISTING CONDITION FLOW FROM SOUTHEAST PORTION OF SITE TO
*# EXISTING 600mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area     (ha)=    2.43   Curve Number   (CN)=70.00
| 02:102    DT= 1.00 |   Ia       (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=     .206

     PEAK FLOW       (cms)=     .006 (i)
     TIME TO PEAK    (hrs)=    2.167
     RUNOFF VOLUME    (mm)=    1.677
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT   =     .066

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

------------------------------------------------------------------------------
125:0005------------------------------------------------------------------------
*# CATCHMENT 103 - EXISTING CONDITION FLOW FROM EAST PORTION OF SITE TRAVERSE
*# CALIBREX PROPERTY TO EXISTING 600mm CULVERT & LYNN RIVER
*
```

```
---------------------
| CALIB NASHYD      |   Area    (ha)=    4.03   Curve Number   (CN)=70.00
| 03:103    DT= 1.00|   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .730

     Unit Hyd Qpeak  (cms)=     .211

     PEAK FLOW       (cms)=     .008 (i)
     TIME TO PEAK    (hrs)=    2.633
     RUNOFF VOLUME    (mm)=    1.677
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT   =     .066

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

------------------------------------------------------------------------------
125:0006--------------------------------------------------------------------
*# CATCHMENT 201 - EXTERNAL DRAINAGE FROM NORTHWEST PROPERTY TRAVERSING THE
*# THE SITE TO EXISTING 1050mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    1.78   Curve Number   (CN)=70.00
| 04:201    DT= 1.00|   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .212

     PEAK FLOW       (cms)=     .005 (i)
     TIME TO PEAK    (hrs)=    1.933
     RUNOFF VOLUME    (mm)=    1.677
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT   =     .066

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

------------------------------------------------------------------------------
125:0007--------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO EXISTING 600mm CULVERT & LYNN RIVER
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 05:202    DT= 1.00|   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .004 (i)
     TIME TO PEAK    (hrs)=    1.717
     RUNOFF VOLUME    (mm)=    1.677
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT   =     .066

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

------------------------------------------------------------------------------
125:0008--------------------------------------------------------------------
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL PRE-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
*# TOTAL EXISTING DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (EX        ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:101          14.23     .032    2.27   1.68    .000
                     +ID2 02:102           2.43     .006    2.17   1.68    .000
                     +ID3 03:103           4.03     .008    2.63   1.68    .000
                     +ID4 04:201           1.78     .005    1.93   1.68    .000
                     +ID5 05:202           1.02     .004    1.72   1.68    .000
                      ==========================================================
                      SUM 06:EX           23.49     .051    2.23   1.68    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
125:0009--------------------------------------------------------------------
*#############################################################################|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#############################################################################|
*# CATCHMENT 301 - PROPOSED SITE DRAINAGE TO PROPOSED SWM FACILITY
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=   18.63
| 01:301    DT= 1.00|   Total Imp(%)=   55.00   Dir. Conn.(%)=   44.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      10.25         8.38
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     400.00        30.00
     Mannings n            =       .015         .250

     Max.eff.Inten.(mm/hr)=      58.58         3.03
               over (min)        6.00        30.00
     Storage Coeff.  (min)=       5.70 (ii)   29.76 (ii)
     Unit Hyd. Tpeak (min)=       6.00        30.00
     Unit Hyd. peak  (cms)=        .20          .04
                                                      *TOTALS*
     PEAK FLOW       (cms)=       1.06          .04         1.062 (iii)
     TIME TO PEAK    (hrs)=       1.37         2.02         1.367
     RUNOFF VOLUME    (mm)=      24.27         2.62        12.147
     TOTAL RAINFALL   (mm)=      25.27        25.27        25.268
     RUNOFF COEFFICIENT   =        .96          .10          .481

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
125:0010--------------------------------------------------------------------
*# CATCHMENT 302 - PROPOSED SWM FACILITY BLOCK
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=    1.31
| 02:302    DT= 1.00|   Total Imp(%)=   39.00   Dir. Conn.(%)=   39.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .51          .80
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      20.00        20.00
     Mannings n            =       .015         .250

     Max.eff.Inten.(mm/hr)=      58.58         1.83
               over (min)        1.00        13.00
     Storage Coeff.  (min)=       1.31 (ii)   12.88 (ii)
     Unit Hyd. Tpeak (min)=       1.00        13.00
     Unit Hyd. peak  (cms)=        .91          .09
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .08          .00          .083 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.70         1.333
     RUNOFF VOLUME    (mm)=      24.27         1.68        10.488
     TOTAL RAINFALL   (mm)=      25.27        25.27        25.268
     RUNOFF COEFFICIENT   =        .96          .07          .415

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
125:0011--------------------------------------------------------------------
*# CATCHMENT 202 - EXTERNAL DRAINAGE FROM 179-201 DECOU RD TRAVERSING THE
*# THE SITE TO PROPOSED SWM FACILITY
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    1.02   Curve Number   (CN)=70.00
| 03:202    DT= 1.00|   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .205

     PEAK FLOW       (cms)=     .004 (i)
     TIME TO PEAK    (hrs)=    1.717
     RUNOFF VOLUME    (mm)=    1.677
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT   =     .066

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

------------------------------------------------------------------------------
125:0012--------------------------------------------------------------------
*# CATCHMENT 401 - EXTERNAL DRAINAGE FROM FUTURE WOODWAY TRAILS PH 2
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=     .31
| 04:401    DT= 1.00|   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .17          .14
     Dep. Storage     (mm)=       1.00        10.89
     Average Slope     (%)=       1.00        20.00
     Length            (m)=      25.00        10.00
     Mannings n            =       .015         .250

     Max.eff.Inten.(mm/hr)=      58.58         1.83
               over (min)        2.00         9.00
     Storage Coeff.  (min)=       1.50 (ii)    9.13 (ii)
     Unit Hyd. Tpeak (min)=       2.00         9.00
     Unit Hyd. peak  (cms)=        .66          .12
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .03          .00          .028 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.62         1.333
     RUNOFF VOLUME    (mm)=      24.27         1.68        14.102
     TOTAL RAINFALL   (mm)=      25.27        25.27        25.268
     RUNOFF COEFFICIENT   =        .96          .07          .558

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
125:0013--------------------------------------------------------------------
*# TOTAL DRAINAGE TO PROPOSED SWM FACILITY
*#
------------------------
| ADD HYD (SWM       ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:301          18.63    1.062    1.37  12.15    .000
                     +ID2 02:302           1.31     .083    1.33  10.49    .000
                     +ID3 03:202           1.02     .004    1.72   1.68    .000
                     +ID4 04:401            .31     .028    1.33  14.10    .000
                      ==========================================================
                      SUM 05:SWM          21.27    1.132    1.33  11.57    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
125:0014--------------------------------------------------------------------
*# ROUTE FLOWS THROUGH SWM FACILITY WITH ORIFICE CONTROLS
*
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>05:(SWM   )   |
| OUT<01:(SWM   )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------   OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)     (ha.m.)  |    (cms)     (ha.m.)
                           .000  .0000E+00   |     .279  .4660E+00
                           .024  .1278E+00   |     .626  .4719E+00
                           .033  .2204E+00   |     .805  .6581E+00
                           .184  .2254E+00   |     .948  .8628E+00
```

```
                          .197  .2509E+00   |     1.033  .1010E+01
                          .243  .3576E+00   |      .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >05: (SWM   )       21.27     1.132     1.333     11.571
     OUTFLOW<01: (SWM   )       21.27      .032     4.100     11.571
    OVERFLOW<02: (OFL   )         .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    2.872
                    TIME SHIFT OF PEAK FLOW         (min)=   166.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.2120E+00

--------------------------------------------------------------------------------
125:0015----------------------------------------------------------------------
*# CATCHMENT 303 - UNCONTROLLED DRAINAGE TO EX. 1050mm CULVERT & LYNN RIVER
*
----------------------
| CALIB NASHYD       |   Area    (ha)=     .72   Curve Number   (CN)=70.00
| 03:303    DT= 1.00 |   Ia      (mm)=  10.890   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .150

     Unit Hyd Qpeak  (cms)=     .183

     PEAK FLOW       (cms)=     .003 (i)
     TIME TO PEAK    (hrs)=    1.633
     RUNOFF VOLUME    (mm)=    1.677
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT   =     .066

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

--------------------------------------------------------------------------------
125:0016----------------------------------------------------------------------
*# TOTAL PROPOSED DRAINAGE THROUGH TO LYNN RIVER
*#
------------------------
| ADD HYD (PROP      ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                        ID1 01:SWM        21.27     .032    4.10  11.57    .000
                       +ID2 02:OFL          .00     .000     .00    .00    .000
                       +ID3 03:303          .72     .003    1.63   1.68    .000
                        ==========================================================
                        SUM 04:PROP       21.99     .033    4.02  11.25    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
125:0017----------------------------------------------------------------------
*#*************************************************************************|
*# CATCHMENT 203 HAS NOT BEEN MODELLED AS THE FLOW RATES FROM THE MAJOR FLOWS
*# FROM THE EXISTING NORTHEAST CONDO HAVE BEEN DETERMINED BY DEVELOPMENT
*# ENGINEERING (LONDON) LTD. IN THE SWM REPORT (DEC 2016)
*# OVERLAND FLOW RATES:
*# 2-5YR STM = 0 cms
*# 10-YR STM = 0.046 cms
*# 25-YR STM = 0.091 cms
*# 50-YR STM = 0.121 cms
*# 100-YR STM = 0.148 cms
*#
*# THESE FLOWS ARE ADDED TO THE TOTAL POST-DEVELOPMENT FLOWS FOR EACH
*# CORRESPONDING EVENT AFTER THE ADD HYD
*#
* RUN REMAINING DESIGN STORMS (SIMCOE 5 TO 100-YR)
*
--------------------------------------------------------------------------------
125:0002----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
125:0002----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
125:0002----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
125:0002----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
125:0002----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
125:0002----------------------------------------------------------------------
*
      FINISH
--------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2026-02-16     at 11:29:49
===============================================================================
```

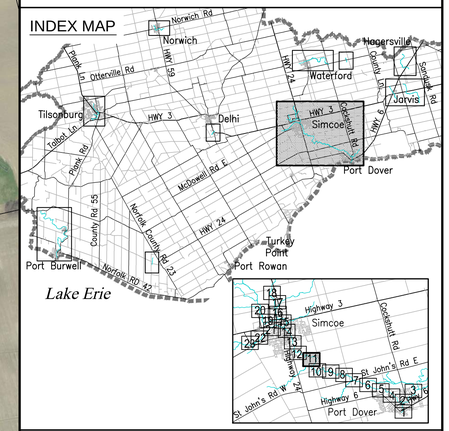



Long Point Region Conservation Authority

# Flood Hazard Map

## Lynn River
## Black Creek

INDEX MAP




LEGEND

- PARCEL FABRIC
- WATERCOURSE
- CONTOUR (1m)
- 1425.15 / 100.00 / 99.00 — CROSS SECTION NUMBER; REGIONAL STORM FLOOD ELEVATION (m); CROSS SECTION LOCATION; 100-YEAR FLOOD LINE ELEVATION (m)
- REGIONAL STORM FLOOD LINE
- 100-YEAR FLOOD LINE
- SUTTON DAM — DAM LOCATION AND NAME/ID#
- 02GC026 — STREAM FLOW GAUGE AND REFERENCE ID#
- GBM72U330 — SURVEYED BENCHMARK AND REFERENCE ID#

wood.

Please note that the Professional Engineer's stamp verifies the flood line and associated data, not the map unless otherwise noted.

LICENSED PROFESSIONAL ENGINEER M. J. SENIOR 100118537 3/19/2020 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER P.S.HUNUKUMBURA 100230595 03/19/2020 PROVINCE OF ONTARIO

REVISIONS

| No. | Description | BY | DATE |
|---|---|---|---|
| | | | |

HORIZONTAL PROJECTION: UTM NAD83 ZONE 17

VERTICAL DATUM: CVGD-2013

Scale 1:2000 (Valid for 24x36 only)

Metres 100 0 100 200 Metres

Feet 200 0 200 400 600 800 1000 Feet

Aerial photography from Southwestern Ontario Orthophotography Project 2015 (Spring 2015)
DTM\Contours generated from Lake Erie LiDAR (LIO Dataset, by MNRF), Spring 2016 through Spring 2018

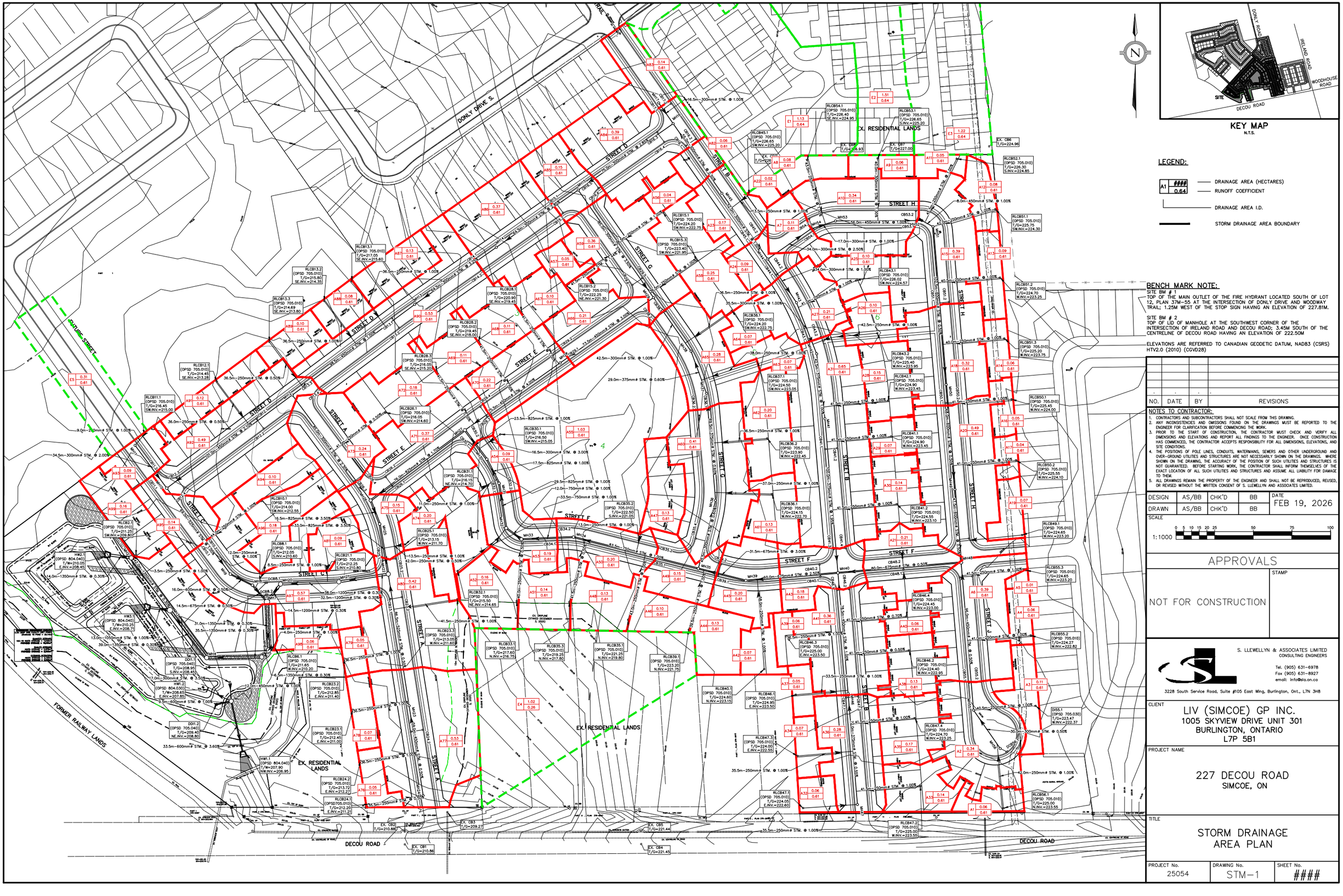
Sheet 11 of 23

Path: I:\LPRCA\FRM-LynnRiver1.dwg
Plotted By: richard.bartolo
Last Saved By: richard.bartolo
Plotted: 2020-03-30
Last Saved: 2020-03-24

# APPENDIX B

# STORM SEWER ANALYSIS

-STM-1
####







KEY MAP
N.T.S.

LEGEND:

A1 #### / 0.64 — DRAINAGE AREA (HECTARES) / RUNOFF COEFFICIENT

DRAINAGE AREA I.D.

STORM DRAINAGE AREA BOUNDARY

BENCH MARK NOTE:

SITE BM # 1
TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M-55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| . | . | . | . |

NOTES TO CONTRACTOR:

1. CONTRACTORS AND SUBCONTRACTORS SHALL NOT SCALE FROM THIS DRAWING.
2. ANY INCONSISTENCIES AND OMISSIONS FOUND ON THE DRAWINGS MUST BE REPORTED TO THE ENGINEER FOR CLARIFICATION BEFORE COMMENCING THE WORK.
3. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND ELEVATIONS AND REPORT ALL FINDINGS TO THE ENGINEER. ONCE CONSTRUCTION HAS COMMENCED, THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL DIMENSIONS, ELEVATIONS, AND SITE CONDITIONS.
4. THE POSITIONS OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVER-GROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN ON THE DRAWING, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
5. ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED, REUSED, OR REVISED WITHOUT THE WRITTEN CONSENT OF S. LLEWELLYN AND ASSOCIATES LIMITED.

| | | | | |
|---|---|---|---|---|
| DESIGN | AS/BB | CHK'D | BB | DATE: FEB 19, 2026 |
| DRAWN | AS/BB | CHK'D | BB | |

SCALE 1:1000 (0 5 10 15 20 25 50 75 100)

APPROVALS

NOT FOR CONSTRUCTION

STAMP


S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8


CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
STORM DRAINAGE AREA PLAN

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | STM-1 | #### |

Project No. 25054
Sheet No. 1
Checked by: BB
Computed by: BB
Date: February 15, 2026

NORFOLK COUNTY

# STORM SEWER DESIGN - 5 YEAR

Project: 227 DECOU ROAD

*100-year flows highlighted in red

$$i = \frac{A}{(T+B)^C}$$

Vmin=0.75m/s
Vmax=4.60m/s

| | 100-year | | 5-year | |
|---|---|---|---|---|
| A= | 801.041 | A= | 583.017 | |
| B= | 1.501 | B= | 3.007 | |
| C= | 0.657 | C= | 0.703 | |
| | | n= | 0.013 | |

| Area No. | Street Name | From MH | To MH | 5-yr Flow Characteristics Only | | | | | | | 100-yr Flow Characteristics Only | | | | | | | TOTAL | Pipe Characteristcs | | | | | Travel | Fraction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{5yr}$ [m³/s] | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{100yr}$ [m³/s] | Qpeak [m³/s] | Diameter [mm] | Slope [%] | Length [m] | Capacity [m³/s] | Velocity [m/s] | Time [min] | Full [%] | |
| **FLOWS FROM PROPOSED DEVELOPMENT TO PROPOSED SWM FACILITY** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A1 | Street J | RLCB56.1 | MH56 | 0.06 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.008 | | | | | | | | **0.008** | 250 | 1.00% | 42.0 | 0.062 | 1.22 | 0.57 | 13% | |
| | | | | | | | | 15.57 | | | | | | | | | | | | | | | | | | |
| A2 | Street J | MH56 | MH55 | 0.34 | 0.61 | 0.21 | 0.24 | 15.57 | 74.74 | 0.051 | | | | | | | | **0.051** | 300 | 0.50% | 30.0 | 0.071 | 0.98 | 0.51 | 71% | |
| | | | | | | | | 16.08 | | | | | | | | | | | | | | | | | | |
| A3 | Street J | DDI55.1 | MH55 | | | | | | | | 0.11 | 0.61 | 0.07 | **0.07** | 15.00 | 126.98 | 0.024 | **0.024** | 250 | 1.00% | 40.5 | 0.062 | 1.22 | 0.55 | 38% | |
| | | | | | | | | | | | | | | | 15.55 | | | | | | | | | | | |
| A4 | Street J | RLCB55.2 | MH55 | | | | | | | | 0.06 | 0.61 | 0.04 | **0.04** | 15.00 | 126.98 | 0.013 | **0.013** | 250 | 1.00% | 41.0 | 0.062 | 1.22 | 0.56 | 21% | |
| | | | | | | | | | | | | | | | 15.56 | | | | | | | | | | | |
| A5 | Street J | RLCB55.3 | MH55 | 0.01 | 0.61 | 0.01 | 0.01 | 15.00 | 76.40 | 0.001 | | | | | | | | **0.001** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 2% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A6 | Street J | MH55 | MH48 | 0.39 | 0.61 | 0.24 | 0.49 | 16.08 | 73.33 | 0.099 | 0.00 | 0.61 | 0.00 | **0.10** | 16.08 | 121.79 | 0.035 | **0.134** | 450 | 0.50% | 96.0 | 0.210 | 1.28 | 1.25 | 64% | |
| | | | | | | | | 17.33 | | | | | | | 17.33 | | | | | | | | | | | |
| A7 | Street H | MH44 | MH54 | 0.11 | 0.61 | 0.07 | 0.07 | 15.00 | 76.40 | 0.014 | | | | | | | | **0.014** | 300 | 2.50% | 34.0 | 0.160 | 2.19 | 0.26 | 9% | |
| | | | | | | | | 15.26 | | | | | | | | | | | | | | | | | | |
| E1 | Donly Condos | - | RLCB54.1 | | | | | | | | 1.13 | 0.64 | 0.72 | **0.12** | 15.00 | 126.98 | 0.043 | **0.043** | | | | | | | | |
| **Adjusted A*C to obtain % of 100-year flow from Donly Condos (29% of total area, total flow = 0.148 m3/s)** | | | | | | | | | | | | | | | 15.00 | | | | | | | | | | | |
| A8 | Street H | RLCB54.1 | MH54 | 0.08 | 0.61 | 0.05 | 0.05 | 15.00 | 76.40 | 0.010 | 0.00 | 0.61 | 0.00 | **0.12** | 15.00 | 126.98 | 0.043 | **0.054** | 250 | 1.00% | 43.0 | 0.062 | 1.22 | 0.59 | 87% | Convey flow from Donly Condos |
| | | | | | | | | 15.59 | | | | | | | 15.59 | | | | | | | | | | | |
| - | Street H | MH54 | MH53 | 0.00 | 0.61 | 0.00 | 0.12 | 15.59 | 74.70 | 0.024 | 0.00 | 0.61 | 0.00 | **0.12** | 15.59 | 124.11 | 0.042 | **0.066** | 300 | 1.00% | 17.0 | 0.101 | 1.38 | 0.20 | 66% | |
| | | | | | | | | 15.79 | | | | | | | 15.79 | | | | | | | | | | | |
| E2 | Donly Condos | - | RLCB53.1 | | | | | | | | 1.51 | 0.64 | 0.97 | **0.16** | 15.00 | 126.98 | 0.057 | **0.057** | | | | | | | | |
| **Adjusted A*C to obtain % of 100-year flow from Donly Condos (39% of total area, total flow = 0.148 m3/s)** | | | | | | | | | | | | | | | 15.00 | | | | | | | | | | | |
| A9 | Street H | RLCB53.1 | MH53 | 0.06 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.008 | 0.00 | 0.61 | 0.00 | **0.16** | 15.00 | 126.98 | 0.057 | **0.065** | 300 | 1.00% | 40.0 | 0.101 | 1.38 | 0.48 | 65% | Convey flow from Donly Condos |
| | | | | | | | | 15.48 | | | | | | | 15.48 | | | | | | | | | | | |
| A10 | Street H | MH53 | MH52 | 0.34 | 0.61 | 0.21 | 0.36 | 15.79 | 74.13 | 0.074 | 0.00 | 0.61 | 0.00 | **0.29** | 15.79 | 123.14 | 0.098 | **0.172** | 450 | 1.00% | 56.0 | 0.297 | 1.81 | 0.52 | 58% | |
| | | | | | | | | 16.31 | | | | | | | 16.31 | | | | | | | | | | | |
| E3 | Donly Condos | - | RLCB52.1 | | | | | | | | 1.22 | 0.64 | 0.78 | **0.14** | 15.00 | 126.98 | 0.048 | **0.048** | | | | | | | | |
| **Adjusted A*C to obtain % of 100-year flow from Donly Condos (32% of total area, total flow = 0.148 m3/s)** | | | | | | | | | | | | | | | 15.00 | | | | | | | | | | | |
| A11 | Street H | RLCB52.1 | MH52 | 0.05 | 0.61 | 0.03 | 0.03 | 15.00 | 76.40 | 0.006 | 0.00 | 0.61 | 0.00 | **0.14** | 15.00 | 126.98 | 0.048 | **0.054** | 250 | 1.00% | 45.5 | 0.062 | 1.22 | 0.62 | 87% | Convey flow from Donly Condos |
| | | | | | | | | 15.62 | | | | | | | 15.62 | | | | | | | | | | | |
| - | Street H | MH52 | MH51 | 0.00 | 0.61 | 0.00 | 0.39 | 16.31 | 72.73 | 0.079 | 0.00 | 0.61 | 0.00 | **0.42** | 16.31 | 120.79 | 0.141 | **0.220** | 450 | 1.00% | 8.0 | 0.297 | 1.81 | 0.07 | 74% | |
| | | | | | | | | 16.38 | | | | | | | 16.38 | | | | | | | | | | | |
| A12 | Street H | RLCB51.1 | MH51 | 0.08 | 0.61 | 0.05 | 0.05 | 15.00 | 76.40 | 0.010 | | | | | | | | **0.010** | 250 | 1.00% | 42.0 | 0.062 | 1.22 | 0.57 | 17% | |
| | | | | | | | | 15.57 | | | | | | | | | | | | | | | | | | |
| A13 | Street H | RLCB51.2 | MH51 | 0.09 | 0.61 | 0.05 | 0.05 | 15.00 | 76.40 | 0.012 | | | | | | | | **0.012** | 250 | 1.00% | 40.5 | 0.062 | 1.22 | 0.55 | 19% | |
| | | | | | | | | 15.55 | | | | | | | | | | | | | | | | | | |
| A14 | Street H | RLCB51.3 | MH51 | 0.06 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.008 | | | | | | | | **0.008** | 250 | 1.00% | 40.0 | 0.062 | 1.22 | 0.54 | 13% | |
| | | | | | | | | 15.54 | | | | | | | | | | | | | | | | | | |
| A15 | Street H | MH51 | MH50 | 0.39 | 0.61 | 0.24 | 0.77 | 16.38 | 72.54 | 0.155 | 0.00 | 0.61 | 0.00 | **0.42** | 16.38 | 120.46 | 0.141 | **0.296** | 600 | 0.50% | 45.5 | 0.454 | 1.55 | 0.49 | 65% | |
| | | | | | | | | 16.87 | | | | | | | 16.87 | | | | | | | | | | | |

Project No. 25054
Sheet No. 1
Checked by: BB
Computed by: BB
Date: February 15, 2026

NORFOLK COUNTY

# STORM SEWER DESIGN - 5 YEAR

Project: 227 DECOU ROAD

*100-year flows highlighted in red

$$i = \frac{A}{(T+B)^C}$$

Vmin=0.75m/s
Vmax=4.60m/s

| | 100-year | 5-year |
|---|---|---|
| A= | 801.041 | 583.017 |
| B= | 1.501 | 3.007 |
| C= | 0.657 | 0.703 |
| n= | | 0.013 |

| Area No. | Street Name | From MH | To MH | 5-yr Flow Characteristics Only | | | | | | | 100-yr Flow Characteristics Only | | | | | | | TOTAL | Pipe Characteristcs | | | | | Travel Time | Fraction Full | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{5yr}$ [m³/s] | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{100yr}$ [m³/s] | Qpeak [m³/s] | Diameter [mm] | Slope [%] | Length [m] | Capacity [m³/s] | Velocity [m/s] | [min] | [%] | |
| A16 | Street H | RLCB50.1 | MH50 | 0.05 | 0.61 | 0.03 | 0.03 | 15.00 | 76.40 | 0.006 | | | | | | | | **0.006** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 10% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A17 | Street H | RLCB50.2 | MH50 | 0.04 | 0.61 | 0.02 | 0.02 | 15.00 | 76.40 | 0.005 | | | | | | | | **0.005** | 250 | 1.00% | 41.0 | 0.062 | 1.22 | 0.56 | 8% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A18 | Street H | MH50 | MH49 | 0.32 | 0.61 | 0.20 | 1.02 | 16.87 | 71.28 | 0.202 | 0.00 | 0.61 | 0.00 | **0.42** | 16.87 | 118.35 | 0.138 | **0.340** | 600 | 0.50% | 68.0 | 0.454 | 1.55 | 0.73 | 75% | |
| | | | | | | | | 17.60 | | | | | | | 17.60 | | | | | | | | | | | |
| A19 | Street H | RLCB49.1 | MH49 | 0.07 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.009 | | | | | | | | **0.009** | 250 | 1.00% | 41.0 | 0.062 | 1.22 | 0.56 | 15% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A20 | Street H | MH49 | MH48 | 0.49 | 0.61 | 0.30 | 1.36 | 17.60 | 69.50 | 0.263 | 0.00 | 0.61 | 0.00 | **0.42** | 17.60 | 115.36 | 0.135 | **0.398** | 600 | 0.50% | 47.5 | 0.454 | 1.55 | 0.51 | 88% | |
| | | | | | | | | 18.11 | | | | | | | 18.11 | | | | | | | | | | | |
| A21 | Street F | MH48 | MH40 | 0.21 | 0.61 | 0.13 | 1.98 | 18.11 | 68.31 | 0.375 | 0.00 | 0.61 | 0.00 | **0.52** | 18.11 | 113.38 | 0.165 | **0.540** | 675 | 0.50% | 80.0 | 0.621 | 1.68 | 0.79 | 87% | |
| | | | | | | | | 18.90 | | | | | | | 18.90 | | | | | | | | | | | |
| A22 | Street B | RLCB45.1 | MH45 | 0.02 | 0.61 | 0.01 | 0.01 | 15.00 | 76.40 | 0.003 | | | | | | | | **0.003** | 250 | 1.00% | 13.5 | 0.062 | 1.22 | 0.18 | 4% | |
| | | | | | | | | 15.18 | | | | | | | | | | | | | | | | | | |
| A23 | Street B | MH45 | MH44 | 0.17 | 0.61 | 0.10 | 0.12 | 15.18 | 75.86 | 0.024 | | | | | | | | **0.024** | 300 | 1.00% | 52.0 | 0.101 | 1.38 | 0.63 | 24% | |
| | | | | | | | | 15.81 | | | | | | | | | | | | | | | | | | |
| A24 | Street B | MH44 | MH43 | 0.09 | 0.61 | 0.05 | 0.17 | 15.81 | 74.07 | 0.035 | | | | | | | | **0.035** | 300 | 1.00% | 34.0 | 0.101 | 1.38 | 0.41 | 35% | |
| | | | | | | | | 16.22 | | | | | | | | | | | | | | | | | | |
| A25 | Street B | RLCB43.1 | MH43 | 0.10 | 0.61 | 0.06 | 0.06 | 15.00 | 76.40 | 0.013 | | | | | | | | **0.013** | 250 | 1.00% | 41.0 | 0.062 | 1.22 | 0.56 | 21% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A26 | Street B | RLCB43.2 | MH43 | 0.10 | 0.61 | 0.06 | 0.06 | 15.00 | 76.40 | 0.013 | | | | | | | | **0.013** | 250 | 1.00% | 42.5 | 0.062 | 1.22 | 0.58 | 21% | |
| | | | | | | | | 15.58 | | | | | | | | | | | | | | | | | | |
| A27 | Street B | MH43 | MH42 | 0.21 | 0.61 | 0.13 | 0.42 | 16.22 | 72.96 | 0.085 | | | | | | | | **0.085** | 300 | 1.00% | 35.5 | 0.101 | 1.38 | 0.43 | 84% | |
| | | | | | | | | 16.65 | | | | | | | | | | | | | | | | | | |
| A28 | Street B | RLCB42.1 | MH42 | 0.15 | 0.61 | 0.09 | 0.09 | 15.00 | 76.40 | 0.019 | | | | | | | | **0.019** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 31% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| - | Street B | MH42 | MH41 | 0.00 | 0.61 | 0.00 | 0.51 | 16.65 | 71.84 | 0.102 | | | | | | | | **0.102** | 375 | 1.00% | 42.5 | 0.183 | 1.60 | 0.44 | 56% | |
| | | | | | | | | 17.09 | | | | | | | | | | | | | | | | | | |
| A29 | Street B | RLCB41.1 | MH41 | 0.07 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.009 | | | | | | | | **0.009** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 15% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A30 | Street B | RLCB41.2 | MH41 | 0.14 | 0.61 | 0.09 | 0.09 | 15.00 | 76.40 | 0.018 | | | | | | | | **0.018** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 29% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A31 | Street B | MH41 | MH40 | 0.65 | 0.61 | 0.40 | 1.04 | 17.09 | 70.73 | 0.204 | | | | | | | | **0.204** | 375 | 1.95% | 100.0 | 0.255 | 2.24 | 0.74 | 80% | |
| | | | | | | | | 17.83 | | | | | | | | | | | | | | | | | | |
| A32 | Street B | RLCB47.1 | MH47 | | | | | | | | 0.06 | 0.61 | 0.04 | **0.04** | 15.00 | 126.98 | 0.013 | **0.013** | 250 | 1.00% | 35.5 | 0.062 | 1.22 | 0.48 | 21% | |
| | | | | | | | | | | | | | | | 15.48 | | | | | | | | | | | |
| A33 | Street B | RLCB47.2 | MH47 | 0.14 | 0.61 | 0.09 | 0.09 | 15.00 | 76.40 | 0.018 | | | | | | | | **0.018** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 29% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A34 | Street B | RLCB47.3 | MH47 | | | | | | | | 0.07 | 0.61 | 0.04 | **0.04** | 15.00 | 126.98 | 0.015 | **0.015** | 250 | 1.00% | 35.5 | 0.062 | 1.22 | 0.48 | 24% | |
| | | | | | | | | | | | | | | | 15.48 | | | | | | | | | | | |
| A35 | Street B | RLCB47.4 | MH47 | 0.17 | 0.61 | 0.10 | 0.10 | 15.00 | 76.40 | 0.022 | | | | | | | | **0.022** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 35% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |

Project No. 25054
Sheet No. 1
Checked by: BB
Computed by: BB
Date: February 15, 2026

NORFOLK COUNTY

# STORM SEWER DESIGN - 5 YEAR

Project: 227 DECOU ROAD

*100-year flows highlighted in red

$$i = \frac{A}{(T+B)^C}$$

Vmin=0.75m/s
Vmax=4.60m/s

| 100-year | | 5-year | |
|---|---|---|---|
| A= | 801.041 | A= | 583.017 |
| B= | 1.501 | B= | 3.007 |
| C= | 0.657 | C= | 0.703 |
| | | n= | 0.013 |

| Area No. | Street Name | From MH | To MH | 5-yr Flow Characteristics Only | | | | | | | 100-yr Flow Characteristics Only | | | | | | | TOTAL | Pipe Characteristcs | | | | | Travel Time | Fraction Full | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{5yr}$ [m³/s] | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{100yr}$ [m³/s] | Qpeak [m³/s] | Diameter [mm] | Slope [%] | Length [m] | Capacity [m³/s] | Velocity [m/s] | [min] | [%] | |
| A36 | Street B | MH47 | MH46 | 0.28 | 0.61 | 0.17 | 0.36 | 15.56 | 74.76 | 0.075 | 0.00 | 0.61 | 0.00 | **0.08** | 15.56 | 124.21 | 0.027 | **0.102** | 375 | 0.55% | 72.0 | 0.136 | 1.19 | 1.01 | 75% | |
| | | | | | | | | 16.57 | | | | | | | 16.57 | | | | | | | | | | | |
| A37 | Street B | RLCB46.1 | MH46 | | | | | | | | 0.05 | 0.61 | 0.03 | **0.11** | 15.00 | 126.98 | 0.039 | **0.039** | 250 | 1.00% | 33.5 | 0.062 | 1.22 | 0.46 | 62% | |
| | | | | | | | | | | | | | | | 15.46 | | | | | | | | | | | |
| C | Street B | RLCB46.2 | MH46 | 0.13 | 0.61 | 0.08 | 0.08 | 15.00 | 76.40 | 0.017 | | | | | | | | **0.017** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 27% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A39 | Street B | RLCB46.3 | MH46 | 0.06 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.008 | | | | | | | | **0.008** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 13% | |
| | | | | | | | | 15.50 | | | | | | | | | | | | | | | | | | |
| A40 | Street B | RLCB46.4 | MH46 | 0.06 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.008 | | | | | | | | **0.008** | 250 | 0.70% | 41.5 | 0.052 | 1.02 | 0.68 | 15% | |
| | | | | | | | | 15.68 | | | | | | | | | | | | | | | | | | |
| A41 | Street B | MH46 | MH40 | 0.36 | 0.61 | 0.22 | 0.73 | 16.57 | 72.03 | 0.146 | 0.00 | 0.61 | 0.00 | **0.19** | 16.57 | 119.61 | 0.063 | **0.209** | 450 | 1.00% | 78.5 | 0.297 | 1.81 | 0.72 | 70% | |
| | | | | | | | | 17.30 | | | | | | | 17.30 | | | | | | | | | | | |
| A42 | Street F | RLCB40.1 | MH40 | | | | | | | | 0.07 | 0.61 | 0.04 | **0.04** | 15.00 | 126.98 | 0.015 | **0.015** | 250 | 1.00% | 58.0 | 0.062 | 1.22 | 0.79 | 24% | |
| | | | | | | | | | | | | | | | 15.79 | | | | | | | | | | | |
| A43 | Street F | MH40 | MH39 | 0.18 | 0.61 | 0.11 | 3.86 | 18.90 | 66.56 | 0.713 | 0.00 | 0.61 | 0.00 | **0.76** | 18.90 | 110.46 | 0.232 | **0.945** | 675 | 2.50% | 60.0 | 1.388 | 3.75 | 0.27 | 68% | |
| | | | | | | | | 19.17 | | | | | | | 19.17 | | | | | | | | | | | |
| A44 | Street F | RLCB39.1 | MH39 | 0.13 | 0.61 | 0.08 | 0.08 | 15.00 | 76.40 | 0.017 | | | | | | | | **0.017** | 250 | 1.00% | 39.5 | 0.062 | 1.22 | 0.54 | 27% | |
| | | | | | | | | 15.54 | | | | | | | | | | | | | | | | | | |
| A45 | Street F | MH39 | MH35 | 0.20 | 0.61 | 0.12 | 4.06 | 19.17 | 66.00 | 0.744 | 0.00 | 0.61 | 0.00 | **0.76** | 19.17 | 109.52 | 0.230 | **0.974** | 675 | 3.00% | 31.5 | 1.520 | 4.11 | 0.13 | 64% | |
| | | | | | | | | 19.30 | | | | | | | 19.30 | | | | | | | | | | | |
| A46 | Street F | RLCB35.1 | MH35 | 0.10 | 0.61 | 0.06 | 0.06 | 15.00 | 76.40 | 0.013 | | | | | | | | **0.013** | 250 | 1.00% | 39.5 | 0.062 | 1.22 | 0.54 | 21% | |
| | | | | | | | | 15.54 | | | | | | | | | | | | | | | | | | |
| A47 | Street B | RLCB35.2 | MH35 | 0.13 | 0.61 | 0.08 | 0.08 | 15.00 | 76.40 | 0.017 | | | | | | | | **0.017** | 250 | 1.00% | 13.0 | 0.062 | 1.22 | 0.18 | 27% | |
| | | | | | | | | 15.18 | | | | | | | | | | | | | | | | | | |
| A48 | Street F | RLCB35.3 | MH35 | 0.13 | 0.61 | 0.08 | 0.08 | 15.00 | 76.40 | 0.017 | | | | | | | | **0.017** | 250 | 0.50% | 41.5 | 0.044 | 0.87 | 0.80 | 38% | |
| | | | | | | | | 15.80 | | | | | | | | | | | | | | | | | | |
| A49 | Street F | MH35 | MH34 | 0.15 | 0.61 | 0.09 | 4.37 | 19.30 | 65.73 | 0.797 | 0.00 | 0.61 | 0.00 | **0.76** | 19.30 | 109.08 | 0.229 | **1.027** | 750 | 1.00% | 83.5 | 1.161 | 2.55 | 0.55 | 88% | |
| | | | | | | | | 19.84 | | | | | | | 19.84 | | | | | | | | | | | |
| A50 | Street F | MH34 | MH33 | 0.20 | 0.61 | 0.12 | 4.49 | 19.84 | 64.62 | 0.806 | 0.00 | 0.61 | 0.00 | **0.76** | 19.84 | 107.23 | 0.225 | **1.031** | 750 | 1.00% | 33.5 | 1.161 | 2.55 | 0.22 | 89% | |
| | | | | | | | | 20.06 | | | | | | | 20.06 | | | | | | | | | | | |
| A51 | Street F | RLCB33.1 | MH33 | 0.14 | 0.61 | 0.09 | 0.09 | 15.00 | 76.40 | 0.018 | | | | | | | | **0.018** | 250 | 0.50% | 40.0 | 0.044 | 0.87 | 0.77 | 41% | |
| | | | | | | | | 15.77 | | | | | | | | | | | | | | | | | | |
| - | Street F | MH33 | MH32 | 0.00 | 0.61 | 0.00 | 4.58 | 20.06 | 64.19 | 0.816 | 0.00 | 0.61 | 0.00 | **0.76** | 20.06 | 106.52 | 0.224 | **1.040** | 750 | 1.00% | 12.0 | 1.161 | 2.55 | 0.08 | 90% | |
| | | | | | | | | 20.14 | | | | | | | 20.14 | | | | | | | | | | | |
| A52 | Street F | RLCB32.1 | MH32 | 0.16 | 0.61 | 0.10 | 0.10 | 15.00 | 76.40 | 0.021 | | | | | | | | **0.021** | 250 | 0.50% | 42.0 | 0.044 | 0.87 | 0.81 | 47% | |
| | | | | | | | | 15.81 | | | | | | | | | | | | | | | | | | |
| A53 | Street F | MH32 | MH31 | 0.19 | 0.61 | 0.12 | 4.79 | 20.14 | 64.04 | 0.852 | 0.00 | 0.61 | 0.00 | **0.76** | 20.14 | 106.26 | 0.223 | **1.075** | 825 | 1.00% | 29.5 | 1.497 | 2.71 | 0.18 | 72% | |
| | | | | | | | | 20.32 | | | | | | | 20.32 | | | | | | | | | | | |
| A54 | Street F | MH31 | MH30 | 0.09 | 0.61 | 0.05 | 4.84 | 20.32 | 63.69 | 0.857 | 0.00 | 0.61 | 0.00 | **0.76** | 20.32 | 105.68 | 0.222 | **1.079** | 825 | 1.00% | 17.5 | 1.497 | 2.71 | 0.11 | 72% | |
| | | | | | | | | 20.43 | | | | | | | 20.43 | | | | | | | | | | | |
| A55 | Street F | RLCB30.1 | MH30 | 1.03 | 0.61 | 0.63 | 0.63 | 15.00 | 76.40 | 0.133 | | | | | | | | **0.133** | 300 | 3.00% | 16.5 | 0.175 | 2.40 | 0.11 | 76% | |
| | | | | | | | | 15.11 | | | | | | | | | | | | | | | | | | |

Project No. 25054
Sheet No. 1
Checked by: BB
Computed by: BB
Date: February 15, 2026

NORFOLK COUNTY

# STORM SEWER DESIGN - 5 YEAR

Project: 227 DECOU ROAD

*100-year flows highlighted in red

$$i = \frac{A}{(T+B)^C}$$

Vmin=0.75m/s
Vmax=4.60m/s

| | 100-year | | 5-year | |
|---|---|---|---|---|
| A= | 801.041 | A= | 583.017 | |
| B= | 1.501 | B= | 3.007 | |
| C= | 0.657 | C= | 0.703 | |
| | | n= | 0.013 | |

| Area No. | Street Name | From MH | To MH | 5-yr Flow Characteristics Only | | | | | | | 100-yr Flow Characteristics Only | | | | | | | TOTAL | Pipe Characteristcs | | | | | Travel | Fraction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{5yr}$ [m³/s] | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{100yr}$ [m³/s] | Qpeak [m³/s] | Diameter [mm] | Slope [%] | Length [m] | Capacity [m³/s] | Velocity [m/s] | Time [min] | Full [%] | |
| - | Street F | MH30 | MH27 | 0.00 | 0.61 | 0.00 | 5.47 | 20.43 | 63.48 | 0.965 | 0.00 | 0.61 | 0.00 | **0.76** | 20.43 | 105.34 | 0.221 | **1.186** | 825 | 1.00% | 17.5 | 1.497 | 2.71 | 0.11 | 79% | |
| | | | | | | | | 20.54 | | | | | | | 20.54 | | | | | | | | | | | |
| A56 | Street G | RLCB15.1 | MH15 | 0.04 | 0.61 | 0.02 | 0.02 | 15.00 | 76.40 | 0.005 | | | | | | | | **0.005** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 8% | |
| | | | | | | | | 15.50 | | | | | | | | | | | | | | | | | | |
| A57 | Street G | RLCB15.2 | MH15 | 0.05 | 0.61 | 0.03 | 0.03 | 15.00 | 76.40 | 0.006 | | | | | | | | **0.006** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 10% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A58 | Street G | RLCB15.3 | MH15 | 0.25 | 0.61 | 0.15 | 0.15 | 15.00 | 76.40 | 0.032 | | | | | | | | **0.032** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 52% | |
| | | | | | | | | 15.50 | | | | | | | | | | | | | | | | | | |
| A59 | Street G | MH15 | MH29 | 0.36 | 0.61 | 0.22 | 0.43 | 15.56 | 74.76 | 0.089 | | | | | | | | **0.089** | 300 | 3.50% | 85.0 | 0.189 | 2.59 | 0.55 | 47% | |
| | | | | | | | | 16.11 | | | | | | | | | | | | | | | | | | |
| A60 | Street G | MH35 | MH36 | 0.41 | 0.61 | 0.25 | 0.25 | 15.00 | 76.40 | 0.053 | | | | | | | | **0.053** | 300 | 0.60% | 45.5 | 0.078 | 1.07 | 0.71 | 68% | |
| | | | | | | | | 15.71 | | | | | | | | | | | | | | | | | | |
| A61 | Street G | RLCB36.1 | MH36 | 0.13 | 0.61 | 0.08 | 0.08 | 15.00 | 76.40 | 0.017 | | | | | | | | **0.017** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 27% | |
| | | | | | | | | 15.50 | | | | | | | | | | | | | | | | | | |
| A62 | Street G | RLCB36.2 | MH36 | 0.20 | 0.61 | 0.12 | 0.12 | 15.00 | 76.40 | 0.026 | | | | | | | | **0.026** | 250 | 1.00% | 37.0 | 0.062 | 1.22 | 0.50 | 42% | |
| | | | | | | | | 15.50 | | | | | | | | | | | | | | | | | | |
| - | Street G | MH36 | MH37 | 0.00 | 0.61 | 0.00 | 0.45 | 15.71 | 74.36 | 0.093 | | | | | | | | **0.093** | 375 | 0.60% | 69.5 | 0.142 | 1.24 | 0.93 | 66% | |
| | | | | | | | | 16.64 | | | | | | | | | | | | | | | | | | |
| A63 | Street G | RLCB37.1 | MH37 | 0.07 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.009 | | | | | | | | **0.009** | 250 | 1.00% | 38.0 | 0.062 | 1.22 | 0.52 | 15% | |
| | | | | | | | | 15.52 | | | | | | | | | | | | | | | | | | |
| - | Street G | MH37 | MH38 | 0.00 | 0.61 | 0.00 | 0.49 | 15.52 | 74.90 | 0.103 | | | | | | | | **0.103** | 375 | 0.60% | 29.0 | 0.142 | 1.24 | 0.39 | 73% | |
| | | | | | | | | 15.91 | | | | | | | | | | | | | | | | | | |
| A64 | Street G | RLCB38.1 | MH38 | 0.07 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.009 | | | | | | | | **0.009** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 15% | |
| | | | | | | | | 15.50 | | | | | | | | | | | | | | | | | | |
| A65 | Street G | MH38 | MH29 | 0.28 | 0.61 | 0.17 | 0.71 | 15.91 | 73.81 | 0.145 | | | | | | | | **0.145** | 375 | 1.00% | 42.5 | 0.183 | 1.60 | 0.44 | 79% | |
| | | | | | | | | 16.35 | | | | | | | | | | | | | | | | | | |
| A66 | Street E | MH29 | MH28 | 0.21 | 0.61 | 0.13 | 1.26 | 16.35 | 72.62 | 0.255 | | | | | | | | **0.255** | 450 | 3.00% | 73.5 | 0.515 | 3.14 | 0.39 | 50% | |
| | | | | | | | | 16.74 | | | | | | | | | | | | | | | | | | |
| A67 | Street E | RLCB28.1 | MH28 | 0.10 | 0.61 | 0.06 | 0.06 | 15.00 | 76.40 | 0.013 | | | | | | | | **0.013** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 21% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A68 | Street E | RLCB28.2 | MH28 | 0.11 | 0.61 | 0.07 | 0.07 | 15.00 | 76.40 | 0.014 | | | | | | | | **0.014** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 23% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A69 | Street E | RLCB28.3 | MH28 | 0.11 | 0.61 | 0.07 | 0.07 | 15.00 | 76.40 | 0.014 | | | | | | | | **0.014** | 250 | 1.00% | 41.5 | 0.062 | 1.22 | 0.56 | 23% | |
| | | | | | | | | 15.56 | | | | | | | | | | | | | | | | | | |
| A70 | Street E | MH28 | MH27 | 0.22 | 0.61 | 0.13 | 1.59 | 16.74 | 71.61 | 0.317 | | | | | | | | **0.317** | 450 | 4.00% | 75.5 | 0.594 | 3.62 | 0.35 | 53% | |
| | | | | | | | | 17.09 | | | | | | | | | | | | | | | | | | |
| A71 | Street E | MH27 | MH26 | 0.37 | 0.61 | 0.23 | 7.29 | 20.54 | 63.28 | 1.281 | 0.00 | 0.61 | 0.00 | **0.76** | 20.54 | 105.00 | 0.221 | **1.502** | 825 | 1.70% | 76.0 | 1.951 | 3.54 | 0.36 | 77% | |
| | | | | | | | | 20.89 | | | | | | | 20.89 | | | | | | | | | | | |
| A72 | Street A | RLCB26.1 | MH12 | 0.18 | 0.61 | 0.11 | 0.11 | 15.00 | 76.40 | 0.023 | | | | | | | | **0.023** | 250 | 0.50% | 41.5 | 0.044 | 0.87 | 0.80 | 53% | |
| | | | | | | | | 15.80 | | | | | | | | | | | | | | | | | | |
| A73 | Street A | MH12 | MH26 | 0.24 | 0.61 | 0.15 | 0.26 | 15.80 | 74.11 | 0.053 | | | | | | | | **0.053** | 300 | 2.30% | 85.0 | 0.153 | 2.10 | 0.68 | 34% | |
| | | | | | | | | 16.47 | | | | | | | | | | | | | | | | | | |

Project No. 25054
Sheet No. 1
Checked by: BB
Computed by: BB
Date: February 15, 2026

NORFOLK COUNTY

# STORM SEWER DESIGN - 5 YEAR

Project: 227 DECOU ROAD

*100-year flows highlighted in red

$$i = \frac{A}{(T+B)^C}$$

Vmin=0.75m/s
Vmax=4.60m/s

| | 100-year | | 5-year | |
|---|---|---|---|---|
| A= | 801.041 | A= | 583.017 | |
| B= | 1.501 | B= | 3.007 | |
| C= | 0.657 | C= | 0.703 | |
| | | n= | 0.013 | |

| Area No. | Street Name | From MH | To MH | 5-yr Flow Characteristics Only | | | | | | | 100-yr Flow Characteristics Only | | | | | | | TOTAL | Pipe Characteristcs | | | | | Travel | Fraction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{5yr}$ [m³/s] | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{100yr}$ [m³/s] | **Qpeak [m³/s]** | Diameter [mm] | Slope [%] | Length [m] | Capacity [m³/s] | Velocity [m/s] | Time [min] | Full [%] | |
| - | Street A | MH26 | MH25 | 0.00 | 0.61 | 0.00 | 7.55 | 20.89 | 62.61 | 1.312 | 0.00 | 0.61 | 0.00 | **0.76** | 20.89 | 103.90 | 0.218 | **1.531** | 825 | 3.50% | 85.0 | 2.800 | 5.08 | 0.28 | 55% | |
| | | | | | | | | 21.17 | | | | | | | 21.17 | | | | | | | | | | | |
| A74 | Street A | RLCB25.1 | MH25 | 0.20 | 0.61 | 0.12 | 0.12 | 15.00 | 76.40 | 0.026 | | | | | | | | **0.026** | 250 | 0.50% | 13.5 | 0.044 | 0.87 | 0.26 | 59% | |
| | | | | | | | | 15.26 | | | | | | | | | | | | | | | | | | |
| A75 | Street A | MH25 | MH22 | 0.15 | 0.61 | 0.09 | 7.76 | 21.17 | 62.10 | 1.339 | 0.00 | 0.61 | 0.00 | **0.76** | 21.17 | 103.06 | 0.217 | **1.555** | 825 | 3.50% | 33.0 | 2.800 | 5.08 | 0.11 | 56% | |
| | | | | | | | | 21.28 | | | | | | | 21.28 | | | | | | | | | | | |
| A76 | Street A | RLCB24.1 | MH24 | | | | | | | | 0.05 | 0.61 | 0.03 | **0.03** | 15.00 | 126.98 | 0.011 | **0.011** | 250 | 0.50% | 35.5 | 0.044 | 0.87 | 0.68 | 25% | |
| | | | | | | | | | | | | | | | 15.68 | | | | | | | | | | | |
| E4 | External | - | MH24 | 1.02 | 0.26 | 0.27 | 0.27 | 15.00 | 76.40 | 0.056 | | | | | | | | **0.056** | | | | | | | | |
| | | | | | | | | 15.00 | | | | | | | | | | | | | | | | | | |
| A77 | Street A | MH24 | MH23 | 0.53 | 0.61 | 0.32 | 0.59 | 15.68 | 74.43 | 0.122 | 0.00 | 0.61 | 0.00 | **0.03** | 15.68 | 123.64 | 0.010 | **0.132** | 450 | 0.50% | 59.0 | 0.210 | 1.28 | 0.77 | 63% | |
| | | | | | | | | 16.45 | | | | | | | 16.45 | | | | | | | | | | | |
| A78 | Street A | RLCB23.1 | MH23 | | | | | | | | 0.07 | 0.61 | 0.04 | **0.04** | 15.00 | 126.98 | 0.015 | **0.015** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 24% | |
| | | | | | | | | | | | | | | | 15.50 | | | | | | | | | | | |
| A79 | Street A | RLCB23.2 | MH23 | | | | | | | | 0.05 | 0.61 | 0.03 | **0.06** | 15.00 | 126.98 | 0.022 | **0.022** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 35% | |
| | | | | | | | | | | | | | | | 15.50 | | | | | | | | | | | |
| A80 | Street A | MH23 | MH22 | 0.42 | 0.61 | 0.26 | 0.84 | 16.45 | 72.35 | 0.170 | 0.00 | 0.61 | 0.00 | **0.13** | 16.45 | 120.14 | 0.045 | **0.215** | 525 | 0.50% | 59.0 | 0.317 | 1.42 | 0.69 | 68% | |
| | | | | | | | | 17.14 | | | | | | | 17.14 | | | | | | | | | | | |
| - | Street C | MH22 | MH21 | 0.00 | 0.61 | 0.00 | 8.60 | 21.28 | 61.91 | 1.480 | 0.00 | 0.61 | 0.00 | **0.89** | 21.28 | 102.73 | 0.254 | **1.734** | 1200 | 0.30% | 32.5 | 2.227 | 1.91 | 0.28 | 78% | |
| | | | | | | | | 21.57 | | | | | | | 21.57 | | | | | | | | | | | |
| A81 | Street C | RLCB21.1 | MH21 | 0.09 | 0.61 | 0.05 | 0.05 | 15.00 | 76.40 | 0.012 | | | | | | | | **0.012** | 250 | 1.00% | 8.5 | 0.062 | 1.22 | 0.12 | 19% | |
| | | | | | | | | 15.12 | | | | | | | | | | | | | | | | | | |
| - | Street C | MH21 | MH20 | 0.00 | 0.61 | 0.00 | 8.66 | 21.57 | 61.40 | 1.477 | 0.00 | 0.61 | 0.00 | **0.89** | 21.57 | 101.90 | 0.252 | **1.729** | 1200 | 0.30% | 38.0 | 2.227 | 1.91 | 0.33 | 78% | |
| | | | | | | | | 21.90 | | | | | | | 21.90 | | | | | | | | | | | |
| - | Street C | MH20 | MH7 | 0.00 | 0.61 | 0.00 | 8.66 | 21.90 | 60.83 | 1.463 | 0.00 | 0.61 | 0.00 | **0.89** | 21.90 | 100.95 | 0.250 | **1.713** | 1200 | 0.30% | 14.5 | 2.227 | 1.91 | 0.13 | 77% | **Connect to SWM block** |
| | | | | | | | | 22.02 | | | | | | | 22.02 | | | | | | | | | | | |

Project No. 25054
Sheet No. 1
Checked by: BB
Computed by: BB
Date: February 15, 2026

NORFOLK COUNTY

# STORM SEWER DESIGN - 5 YEAR

Project: 227 DECOU ROAD

*100-year flows highlighted in red

$$i = \frac{A}{(T+B)^C}$$

Vmin=0.75m/s
Vmax=4.60m/s

| | 100-year | | 5-year | |
|---|---|---|---|---|
| A= | 801.041 | A= | 583.017 | |
| B= | 1.501 | B= | 3.007 | |
| C= | 0.657 | C= | 0.703 | |
| | | n= | 0.013 | |

| Area No. | Street Name | From MH | To MH | 5-yr Flow Characteristics Only | | | | | | | 100-yr Flow Characteristics Only | | | | | | | TOTAL | Pipe Characteristcs | | | | | Travel | Fraction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{5yr}$ [m³/s] | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{100yr}$ [m³/s] | Qpeak [m³/s] | Diameter [mm] | Slope [%] | Length [m] | Capacity [m³/s] | Velocity [m/s] | Time [min] | Full [%] | |
| A82 | Street B | MH45 | MH16 | 0.06 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.008 | | | | | | | | **0.008** | 300 | 0.50% | 55.0 | 0.071 | 0.98 | 0.94 | 11% | |
| | | | | | | | | 15.94 | | | | | | | | | | | | | | | | | | |
| A83 | Street B | MH17 | MH16 | 0.14 | 0.61 | 0.09 | 0.09 | 15.00 | 76.40 | 0.018 | | | | | | | | **0.018** | 300 | 1.00% | 16.5 | 0.101 | 1.38 | 0.20 | 18% | |
| | | | | | | | | 15.20 | | | | | | | | | | | | | | | | | | |
| A84 | Street D | MH16 | MH15 | 0.39 | 0.61 | 0.24 | 0.36 | 15.94 | 73.73 | 0.074 | | | | | | | | **0.074** | 300 | 2.85% | 75.0 | 0.171 | 2.34 | 0.54 | 43% | |
| | | | | | | | | 16.47 | | | | | | | | | | | | | | | | | | |
| A85 | Street D | MH15 | MH14 | 0.15 | 0.61 | 0.09 | 0.45 | 16.47 | 72.29 | 0.091 | | | | | | | | **0.091** | 300 | 2.85% | 64.5 | 0.171 | 2.34 | 0.46 | 53% | |
| | | | | | | | | 16.93 | | | | | | | | | | | | | | | | | | |
| A86 | Street D | MH14 | MH13 | 0.37 | 0.61 | 0.23 | 0.68 | 16.93 | 71.12 | 0.134 | | | | | | | | **0.134** | 300 | 3.25% | 64.5 | 0.182 | 2.49 | 0.43 | 73% | |
| | | | | | | | | 17.36 | | | | | | | | | | | | | | | | | | |
| A87 | Street D | RLCB13.1 | MH13 | | | | | | | | 0.13 | 0.61 | 0.08 | **0.08** | 15.00 | 126.98 | 0.028 | **0.028** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 45% | |
| | | | | | | | | | | | | | | | 15.50 | | | | | | | | | | | |
| A88 | Street D | RLCB13.2 | MH13 | | | | | | | | 0.08 | 0.61 | 0.05 | **0.05** | 15.00 | 126.98 | 0.017 | **0.017** | 250 | 1.00% | 36.5 | 0.062 | 1.22 | 0.50 | 28% | |
| | | | | | | | | | | | | | | | 15.50 | | | | | | | | | | | |
| A89 | Street D | RLCB13.3 | MH13 | | | | | | | | 0.10 | 0.61 | 0.06 | **0.06** | 15.00 | 126.98 | 0.022 | **0.022** | 250 | 0.50% | 36.5 | 0.044 | 0.87 | 0.70 | 49% | |
| | | | | | | | | | | | | | | | 15.70 | | | | | | | | | | | |
| A90 | Street D | MH13 | MH12 | 0.53 | 0.61 | 0.32 | 1.00 | 17.36 | 70.06 | 0.195 | 0.00 | 0.61 | 0.00 | **0.19** | 17.36 | 116.29 | 0.061 | **0.256** | 450 | 1.00% | 98.5 | 0.297 | 1.81 | 0.91 | 86% | |
| | | | | | | | | 18.27 | | | | | | | 18.27 | | | | | | | | | | | |
| A91 | Street D | RLCB12.1 | MH12 | | | | | | | | 0.12 | 0.61 | 0.07 | **0.07** | 15.00 | 126.98 | 0.026 | **0.026** | 250 | 0.50% | 36.0 | 0.044 | 0.87 | 0.69 | 59% | |
| | | | | | | | | | | | | | | | 15.69 | | | | | | | | | | | |
| A92 | Street D | MH12 | MH10 | 0.49 | 0.61 | 0.30 | 1.30 | 18.27 | 67.94 | 0.245 | 0.00 | 0.61 | 0.00 | **0.26** | 18.27 | 112.76 | 0.082 | **0.327** | 450 | 2.10% | 101.0 | 0.431 | 2.62 | 0.64 | 76% | |
| | | | | | | | | 18.91 | | | | | | | 18.91 | | | | | | | | | | | |
| E5 | Woodway Ph 2 | - | MH11 | 0.31 | 0.61 | 0.19 | 0.19 | 15.00 | 76.40 | 0.040 | | | | | | | | **0.040** | | | | | | | | |
| | | | | | | | | 15.00 | | | | | | | | | | | | | | | | | | |
| A93 | Street C | MH11 | MH10 | 0.09 | 0.61 | 0.05 | 0.24 | 15.00 | 76.40 | 0.052 | | | | | | | | **0.052** | 300 | 2.00% | 34.5 | 0.143 | 1.96 | 0.29 | 36% | |
| | | | | | | | | 15.29 | | | | | | | | | | | | | | | | | | |
| A94 | Street C | RLCB10.1 | MH10 | 0.10 | 0.61 | 0.06 | 0.06 | 15.00 | 76.40 | 0.013 | | | | | | | | **0.013** | 250 | 1.00% | 44.0 | 0.062 | 1.22 | 0.60 | 21% | |
| | | | | | | | | 15.60 | | | | | | | | | | | | | | | | | | |
| A95 | Street C | MH10 | MH9 | 0.14 | 0.61 | 0.09 | 1.69 | 18.91 | 66.54 | 0.312 | 0.00 | 0.61 | 0.00 | **0.26** | 18.91 | 110.42 | 0.080 | **0.393** | 525 | 1.00% | 69.0 | 0.448 | 2.01 | 0.57 | 88% | |
| | | | | | | | | 19.48 | | | | | | | 19.48 | | | | | | | | | | | |
| - | Street C | MH9 | MH8 | 0.00 | 0.61 | 0.00 | 1.69 | 19.48 | 65.34 | 0.307 | 0.00 | 0.61 | 0.00 | **0.26** | 19.48 | 108.43 | 0.079 | **0.386** | 600 | 0.50% | 16.0 | 0.454 | 1.55 | 0.17 | 85% | |
| | | | | | | | | 19.66 | | | | | | | 19.66 | | | | | | | | | | | |
| A96 | Street C | RLCB8.1 | MH8 | 0.18 | 0.61 | 0.11 | 0.11 | 15.00 | 76.40 | 0.023 | | | | | | | | **0.023** | 250 | 1.00% | 12.0 | 0.062 | 1.22 | 0.16 | 38% | |
| | | | | | | | | 15.16 | | | | | | | | | | | | | | | | | | |
| A97 | Street C | MH8 | MH7 | 0.57 | 0.61 | 0.35 | 2.15 | 19.66 | 65.00 | 0.388 | 0.00 | 0.61 | 0.00 | **0.26** | 19.66 | 107.85 | 0.079 | **0.466** | 675 | 0.50% | 14.5 | 0.621 | 1.68 | 0.14 | 75% | **Connect to SWM block** |
| | | | | | | | | 19.80 | | | | | | | 19.80 | | | | | | | | | | | |

Project No. 25054
Sheet No. 1
Checked by: BB
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Date: February 15, 2026

NORFOLK COUNTY

# STORM SEWER DESIGN - 5 YEAR

Project: 227 DECOU ROAD

*100-year flows highlighted in red

$$i = \frac{A}{(T+B)^C}$$

Vmin=0.75m/s
Vmax=4.60m/s

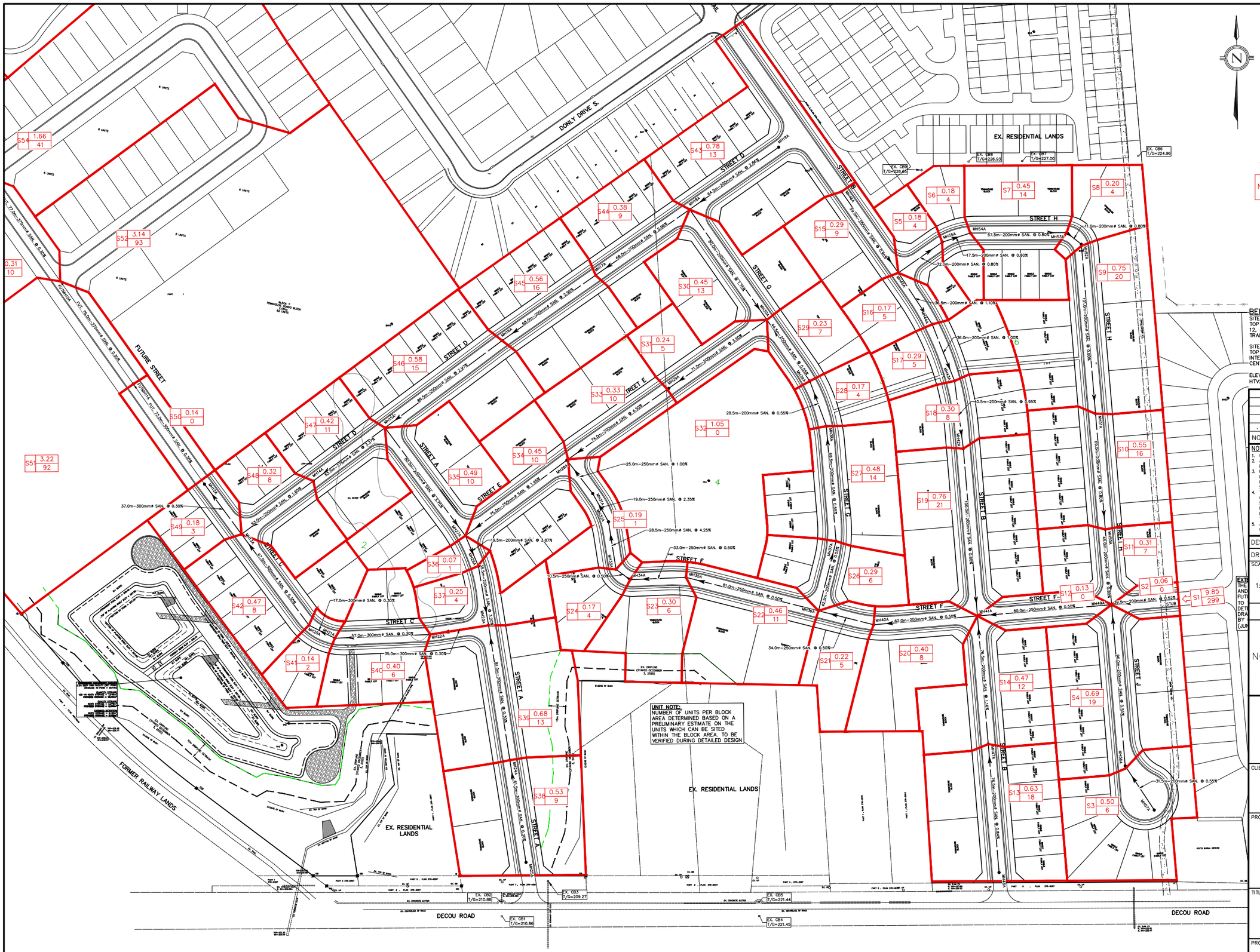
| | 100-year | | 5-year | |
|---|---|---|---|---|
| A= | 801.041 | A= | 583.017 | |
| B= | 1.501 | B= | 3.007 | |
| C= | 0.657 | C= | 0.703 | |
| | | n= | 0.013 | |

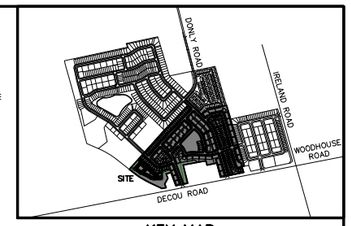
| Area No. | Street Name | From MH | To MH | 5-yr Flow Characteristics Only | | | | | | | 100-yr Flow Characteristics Only | | | | | | | TOTAL | Pipe Characteristcs | | | | | Travel | Fraction | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{5yr}$ [m³/s] | Area [ha] | C | A*C | Cumulative A*C | tc [min] | Intensity [mm/hr] | $Q_{100yr}$ [m³/s] | **Qpeak [m³/s]** | Diameter [mm] | Slope [%] | Length [m] | Capacity [m³/s] | Velocity [m/s] | Time [min] | Full [%] | |
| - | SWM Block | MH7 | MH6 | 0.00 | 0.61 | 0.00 | 10.81 | 22.02 | 60.61 | 1.819 | 0.00 | 0.61 | 0.00 | **1.15** | 22.02 | 100.59 | 0.322 | **2.142** | 1350 | 0.30% | 31.0 | 3.052 | 2.06 | 0.25 | 70% | |
| | | | | | | | | 22.27 | | | | | | | 22.27 | | | | | | | | | | | |
| A98 | SWM Block | RLCB6.1 | MH6 | 0.06 | 0.61 | 0.04 | 0.04 | 15.00 | 76.40 | 0.008 | | | | | | | | **0.008** | 250 | 1.00% | 4.0 | 0.062 | 1.22 | 0.05 | 13% | |
| | | | | | | | | 15.05 | | | | | | | | | | | | | | | | | | |
| - | SWM Block | MH6 | MH5 | 0.00 | 0.61 | 0.00 | 10.84 | 22.27 | 60.19 | 1.813 | 0.00 | 0.61 | 0.00 | **1.15** | 22.27 | 99.89 | 0.320 | **2.133** | 1350 | 0.30% | 5.5 | 3.052 | 2.06 | 0.04 | 70% | |
| | | | | | | | | 22.32 | | | | | | | 22.32 | | | | | | | | | | | |
| - | SWM Block | MH5 | MH4 | 0.00 | 0.61 | 0.00 | 10.84 | 22.32 | 60.11 | 1.811 | 0.00 | 0.61 | 0.00 | **1.15** | 22.32 | 99.77 | 0.320 | **2.130** | 1350 | 0.30% | 35.5 | 3.052 | 2.06 | 0.29 | 70% | |
| | | | | | | | | 22.61 | | | | | | | 22.61 | | | | | | | | | | | |
| - | SWM Block | MH4 | MH3 | 0.00 | 0.61 | 0.00 | 10.84 | 22.61 | 59.64 | 1.796 | 0.00 | 0.61 | 0.00 | **1.15** | 22.61 | 98.99 | 0.317 | **2.113** | 1350 | 0.30% | 39.0 | 3.052 | 2.06 | 0.31 | 69% | |
| | | | | | | | | 22.92 | | | | | | | 22.92 | | | | | | | | | | | |
| - | SWM Block | MH3 | MH2 | 0.00 | 0.61 | 0.00 | 10.84 | 22.92 | 59.13 | 1.781 | 0.00 | 0.61 | 0.00 | **1.15** | 22.92 | 98.15 | 0.314 | **2.095** | 1350 | 0.30% | 42.0 | 3.052 | 2.06 | 0.34 | 69% | |
| | | | | | | | | 23.26 | | | | | | | 23.26 | | | | | | | | | | | |
| A99 | SWM Block | RLCB2.1 | MH2 | 0.16 | 0.61 | 0.10 | 0.10 | 15.00 | 76.40 | 0.021 | | | | | | | | **0.021** | 250 | 1.00% | 3.5 | 0.062 | 1.22 | 0.05 | 33% | |
| | | | | | | | | 15.05 | | | | | | | | | | | | | | | | | | |
| - | SWM Block | MH2 | HW2.1 | 0.00 | 0.61 | 0.00 | 10.94 | 23.26 | 58.59 | 1.781 | 0.00 | 0.61 | 0.00 | **1.15** | 23.26 | 97.27 | 0.312 | **2.092** | 1350 | 0.30% | 14.0 | 3.052 | 2.06 | 0.11 | 69% | **Outlet to SWM Facility** |
| | | | | | | | | 23.37 | | | | | | | 23.37 | | | | | | | | | | | |

# APPENDIX C

# SANITARY SEWER ANALYSIS

SAN-1
####




KEY MAP
N.T.S.

LEGEND:

NO. AREA
PPHA

- DRAINAGE AREA (HECTARES)
- POPULATION DENSITY (PERSONS PER HECTARE)
- DRAINAGE AREA I.D.
- PROPOSED DRAINAGE BOUNDARY

BENCH MARK NOTE:

SITE BM # 1
TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M-55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| | | | |

NOTES TO CONTRACTOR:

1. CONTRACTORS AND SUBCONTRACTORS SHALL NOT SCALE FROM THIS DRAWING.
2. ANY INCONSISTENCIES AND OMISSIONS FOUND ON THE DRAWINGS MUST BE REPORTED TO THE ENGINEER FOR CLARIFICATION BEFORE COMMENCING THE WORK.
3. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND ELEVATIONS AND REPORT ALL FINDINGS TO THE ENGINEER. ONCE CONSTRUCTION HAS COMMENCED, THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL DIMENSIONS, ELEVATIONS, AND SITE CONDITIONS.
4. THE POSITIONS OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVER-GROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN ON THE DRAWING, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
5. ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED, REUSED, OR REVISED WITHOUT THE WRITTEN CONSENT OF S. LLEWELLYN AND ASSOCIATES LIMITED.

| DESIGN | AS/BB | CHK'D | BB | DATE |
|---|---|---|---|---|
| DRAWN | AS/BB | CHK'D | BB | FEB 19, 2026 |

SCALE 1:1000 (0 5 10 15 20 25 50 75 100)

APPROVALS

NOT FOR CONSTRUCTION

STAMP

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

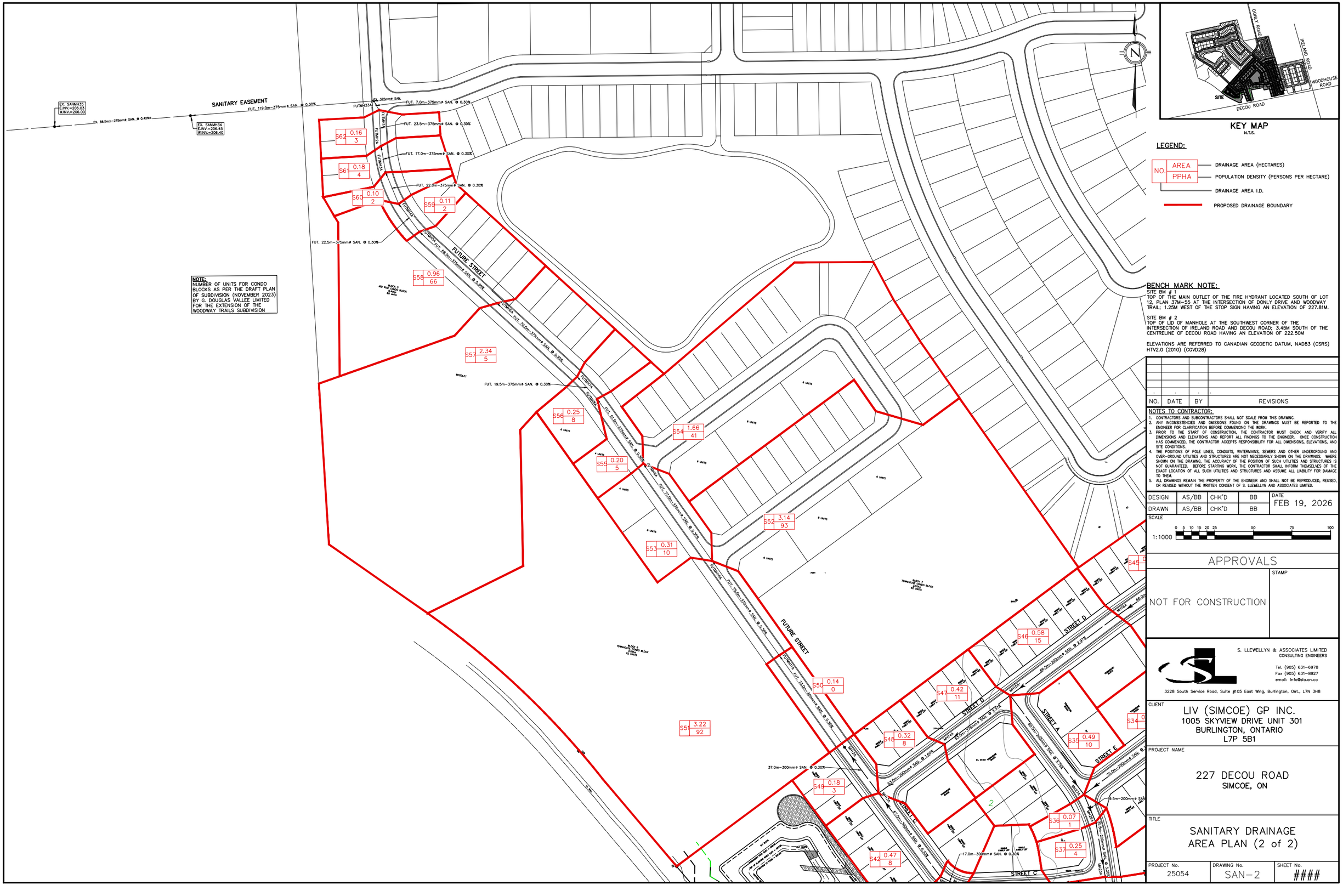
CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
SANITARY DRAINAGE AREA PLAN (1 of 2)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | SAN-1 | #### |

-SAN-2
####




KEY MAP
N.T.S.

LEGEND:

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- POPULATION DENSITY (PERSONS PER HECTARE)
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TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| | | | |

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| DESIGN | AS/BB | CHK'D | BB | DATE |
|---|---|---|---|---|
| DRAWN | AS/BB | CHK'D | BB | FEB 19, 2026 |

SCALE
1:1000
0 5 10 15 20 25 50 75 100

APPROVALS

NOT FOR CONSTRUCTION

STAMP

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
SANITARY DRAINAGE AREA PLAN (2 of 2)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | SAN-2 | #### |

Project No. 25054
Checked by: BB
Computed by: AS
Date: Feb-26

Norfolk County

# SANITARY SEWER DESIGN

Project: Decou Road

Design flow factor = 450 l per person per day
P is in thousands
Infiltration factor = 0.28 l/s/ha

Vmin = 0.75m/s
Vmax = 4.6m/s
n=0.013 (>600mm)
n=0.013 (<600mm)

| Area No. | Street Name | From MH | To MH | Pop. Density [per/unit] | Units [#] | Incremental Area [ha] | Cumulative Area [ha] | Population Increment [per] | Cumulative Population [per] | Peaking Factor M | Average Flow l/s | Peak Flow l/s | Infil-tration l/s | Total Flow l/s | Proposed Sewer Design | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Diameter [mm] | Material | Grade % | Capacity l/s | Velocity m/s | % Full | |
| **SANITARY FLOWS THROUGH PROPOSED DEVELOPMENT TO FUTURE WOODWAY TRAILS PHASE 2 SUBDIVISION** | | | | | | | | | | | | | | | | | | | | | |
| S1 | Calibrex Site | - | STUB | 2.75 | 299 | 9.85 | 9.85 | 822 | 822 | 3.85 | 4.28 | 16.50 | 2.76 | 19.26 | | | | | | | External flows routed through subject site |
| S2 | Street F | STUB | MH49A | 2.75 | 0 | 0.06 | 9.91 | 0 | 822 | 3.85 | 4.28 | 16.50 | 2.77 | 19.28 | 200 | PVC | 0.52% | 24.02 | 0.76 | 80.3 | |
| | | | | | | | | | | | | | | | | | | | | | |
| S3 | Street J | MH57A | MH56A | 2.75 | 6 | 0.50 | 0.50 | 17 | 17 | 4.39 | 0.09 | 0.38 | 0.14 | 0.52 | 200 | PVC | 0.55% | 24.70 | 0.78 | 2.1 | |
| S4 | Street J | MH56A | MH49A | 2.75 | 19 | 0.69 | 1.19 | 52 | 69 | 4.28 | 0.36 | 1.53 | 0.33 | 1.87 | 200 | PVC | 0.55% | 24.70 | 0.78 | 7.6 | |
| | | | | | | | | | | | | | | | | | | | | | |
| S5 | Street H | MH45A | MH55A | 2.75 | 4 | 0.18 | 0.18 | 11 | 11 | 4.41 | 0.06 | 0.25 | 0.05 | 0.30 | 200 | PVC | 0.80% | 29.79 | 0.94 | 1.0 | |
| S6 | Street H | MH55A | MH54A | 2.75 | 4 | 0.18 | 0.36 | 11 | 22 | 4.37 | 0.11 | 0.50 | 0.10 | 0.60 | 200 | PVC | 0.80% | 29.79 | 0.94 | 2.0 | |
| S7 | Street H | MH54A | MH53A | 2.75 | 14 | 0.45 | 0.81 | 39 | 61 | 4.30 | 0.32 | 1.35 | 0.23 | 1.58 | 200 | PVC | 0.80% | 29.79 | 0.94 | 5.3 | |
| S8 | Street H | MH53A | MH52A | 2.75 | 4 | 0.20 | 1.01 | 11 | 72 | 4.28 | 0.37 | 1.59 | 0.28 | 1.88 | 200 | PVC | 0.80% | 29.79 | 0.94 | 6.3 | |
| S9 | Street H | MH52A | MH51A | 2.75 | 20 | 0.75 | 1.76 | 55 | 127 | 4.21 | 0.66 | 2.78 | 0.49 | 3.27 | 200 | PVC | 0.80% | 29.79 | 0.94 | 11.0 | |
| S10 | Street H | MH51A | MH50A | 2.75 | 16 | 0.55 | 2.31 | 44 | 171 | 4.17 | 0.89 | 3.71 | 0.65 | 4.35 | 200 | PVC | 0.80% | 29.79 | 0.94 | 14.6 | |
| S11 | Street H | MH50A | MH49A | 2.75 | 7 | 0.31 | 2.62 | 19 | 190 | 4.16 | 0.99 | 4.11 | 0.73 | 4.84 | 200 | PVC | 0.80% | 29.79 | 0.94 | 16.3 | |
| | | | | | | | | | | | | | | | | | | | | | |
| S12 | Street F | MH49A | MH41A | 2.75 | 0 | 0.13 | 13.85 | 0 | 1081 | 3.78 | 5.63 | 21.27 | 3.88 | 25.14 | 250 | PVC | 0.50% | 42.71 | 0.86 | 58.9 | |
| | | | | | | | | | | | | | | | | | | | | | |
| S13 | Street B | MH48A | MH47A | 2.75 | 18 | 0.63 | 0.63 | 50 | 50 | 4.32 | 0.26 | 1.11 | 0.18 | 1.29 | 200 | PVC | 0.84% | 30.53 | 0.96 | 4.2 | |
| S14 | Street B | MH47A | MH41A | 2.75 | 12 | 0.47 | 1.10 | 33 | 83 | 4.27 | 0.43 | 1.83 | 0.31 | 2.14 | 200 | PVC | 1.16% | 35.87 | 1.13 | 6.0 | |
| | | | | | | | | | | | | | | | | | | | | | |
| S15 | Street B | MH46A | MH45A | 2.75 | 9 | 0.29 | 0.29 | 25 | 25 | 4.37 | 0.13 | 0.56 | 0.08 | 0.64 | 200 | PVC | 0.95% | 32.46 | 1.02 | 2.0 | |
| S16 | Street B | MH45A | MH44A | 2.75 | 5 | 0.17 | 0.46 | 14 | 39 | 4.34 | 0.20 | 0.87 | 0.13 | 1.00 | 200 | PVC | 1.10% | 34.93 | 1.10 | 2.9 | |
| S17 | Street B | MH44A | MH43A | 2.75 | 5 | 0.29 | 0.75 | 14 | 52 | 4.31 | 0.27 | 1.17 | 0.21 | 1.38 | 200 | PVC | 1.00% | 33.31 | 1.05 | 4.2 | |
| S18 | Street B | MH43A | MH42A | 2.75 | 5 | 0.29 | 1.04 | 14 | 66 | 4.29 | 0.34 | 1.47 | 0.29 | 1.77 | 200 | PVC | 0.95% | 32.46 | 1.02 | 5.4 | |
| S19 | Street B | MH42A | MH41A | 2.75 | 21 | 0.76 | 1.80 | 58 | 124 | 4.22 | 0.64 | 2.72 | 0.50 | 3.22 | 200 | PVC | 0.80% | 29.79 | 0.94 | 10.8 | |
| | | | | | | | | | | | | | | | | | | | | | |
| S20 | Street F | MH41A | MH40A | 2.75 | 8 | 0.40 | 17.15 | 22 | 1309 | 3.72 | 6.82 | 25.37 | 4.80 | 30.17 | 250 | PVC | 0.50% | 42.71 | 0.86 | 70.7 | |
| S21 | Street F | MH40A | MH36A | 2.75 | 5 | 0.22 | 17.37 | 14 | 1323 | 3.72 | 6.89 | 25.62 | 4.86 | 30.48 | 250 | PVC | 0.50% | 42.71 | 0.86 | 71.4 | |
| S22 | Street F | MH36A | MH35A | 2.75 | 11 | 0.46 | 17.83 | 30 | 1353 | 3.71 | 7.05 | 26.15 | 4.99 | 31.15 | 250 | PVC | 0.50% | 42.71 | 0.86 | 72.9 | |
| S23 | Street F | MH35A | MH34A | 2.75 | 6 | 0.30 | 18.13 | 17 | 1370 | 3.71 | 7.13 | 26.45 | 5.08 | 31.52 | 250 | PVC | 0.50% | 42.71 | 0.86 | 73.8 | |
| S24 | Street F | MH34A | MH33A | 2.75 | 4 | 0.17 | 18.30 | 11 | 1381 | 3.71 | 7.19 | 26.64 | 5.12 | 31.77 | 250 | PVC | 0.50% | 42.71 | 0.86 | 74.4 | |
| S25 | Street F | MH33A | MH32A | 2.75 | 1 | 0.19 | 18.49 | 3 | 1383 | 3.70 | 7.20 | 26.69 | 5.18 | 31.87 | 250 | PVC | 4.25% | 124.51 | 2.51 | 25.6 | |
| - | Street F | MH32A | MH31A | 2.75 | 0 | 0.00 | 18.49 | 0 | 1383 | 3.70 | 7.20 | 26.69 | 5.18 | 31.87 | 250 | PVC | 2.35% | 92.59 | 1.86 | 34.4 | |
| - | Street F | MH31A | MH28A | 2.75 | 0 | 0.00 | 18.49 | 0 | 1383 | 3.70 | 7.20 | 26.69 | 5.18 | 31.87 | 250 | PVC | 1.00% | 60.40 | 1.22 | 52.8 | |
| | | | | | | | | | | | | | | | | | | | | | |

Project No. 25054
Checked by: BB
Computed by: AS
Date: Feb-26

Norfolk County
# SANITARY SEWER DESIGN
Project: Decou Road

Design flow factor = 450 l per person per day
P is in thousands
Infiltration factor = 0.28 l/s/ha

Vmin = 0.75m/s
Vmax = 4.6m/s
n=0.013 (>600mm)
n=0.013 (<600mm)

| Area No. | Street Name | From MH | To MH | Pop. Density [per/unit] | Units [#] | Incremental Area [ha] | Cumulative Area [ha] | Population Increment [per] | Cumulative Population [per] | Peaking Factor M | Average Flow l/s | Peak Flow l/s | Infil-tration l/s | Total Flow l/s | Proposed Sewer Design | | | | | % Full | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Diameter [mm] | Material | Grade % | Capacity l/s | Velocity m/s | | |
| S26 | Street G | MH36A | MH37A | 2.75 | 6 | 0.29 | 0.29 | 17 | 17 | 4.39 | 0.09 | 0.38 | 0.08 | 0.46 | 200 | PVC | 0.55% | 24.70 | 0.78 | 1.9 | |
| S27 | Street G | MH37A | MH38A | 2.75 | 14 | 0.48 | 0.77 | 39 | 55 | 4.31 | 0.29 | 1.23 | 0.22 | 1.45 | 200 | PVC | 0.55% | 24.70 | 0.78 | 5.9 | |
| S28 | Street G | MH38A | MH39A | 2.75 | 4 | 0.17 | 0.94 | 11 | 66 | 4.29 | 0.34 | 1.47 | 0.26 | 1.74 | 200 | PVC | 0.55% | 24.70 | 0.78 | 7.0 | |
| S29 | Street G | MH39A | MH30A | 2.75 | 7 | 0.23 | 1.17 | 19 | 85 | 4.26 | 0.44 | 1.89 | 0.33 | 2.22 | 200 | PVC | 0.55% | 24.70 | 0.78 | 9.0 | |
| S30 | Street G | MH18A | MH30A | 2.75 | 13 | 0.45 | 0.45 | 36 | 36 | 4.34 | 0.19 | 0.81 | 0.13 | 0.93 | 200 | PVC | 1.70% | 43.43 | 1.37 | 2.2 | |
| S31 | Street E | MH30A | MH29A | 2.75 | 5 | 0.24 | 1.86 | 14 | 135 | 4.21 | 0.70 | 2.95 | 0.52 | 3.47 | 200 | PVC | 3.90% | 65.78 | 2.07 | 5.3 | |
| S32 | Park | - | MH29A | 2.75 | 0 | 1.05 | 1.05 | 0 | 0 | 4.50 | 0.00 | 0.00 | 0.29 | 0.29 | | | | | | | |
| S33 | Street E | MH29A | MH28A | 2.75 | 10 | 0.33 | 3.24 | 28 | 162 | 4.18 | 0.85 | 3.53 | 0.91 | 4.44 | 200 | PVC | 4.50% | 70.66 | 2.22 | 6.3 | |
| S34 | Street E | MH28A | MH27A | 2.75 | 10 | 0.45 | 22.18 | 28 | 1573 | 3.66 | 8.19 | 30.02 | 6.21 | 36.23 | 250 | PVC | 1.95% | 84.34 | 1.70 | 43.0 | |
| S35 | Street A | MH15A | MH27A | 2.75 | 10 | 0.49 | 0.49 | 28 | 28 | 4.36 | 0.14 | 0.62 | 0.14 | 0.76 | 200 | PVC | 3.75% | 64.50 | 2.03 | 1.2 | |
| S36 | Street A | MH27A | MH26A | 2.75 | 1 | 0.07 | 22.74 | 3 | 1603 | 3.66 | 8.35 | 30.55 | 6.37 | 36.92 | 250 | PVC | 3.87% | 118.82 | 2.39 | 31.1 | |
| S37 | Street A | MH26A | MH23A | 2.75 | 4 | 0.25 | 22.99 | 11 | 1614 | 3.66 | 8.41 | 30.74 | 6.44 | 37.18 | 250 | PVC | 3.20% | 108.04 | 2.18 | 34.4 | |
| S38 | Street A | MH25A | MH24A | 2.75 | 9 | 0.53 | 0.53 | 25 | 25 | 4.37 | 0.13 | 0.56 | 0.15 | 0.71 | 300 | PVC | 0.30% | 52.66 | 0.75 | 1.4 | |
| S39 | Street A | MH24A | MH23A | 2.75 | 13 | 0.68 | 1.21 | 36 | 61 | 4.30 | 0.32 | 1.35 | 0.34 | 1.69 | 300 | PVC | 0.30% | 52.66 | 0.75 | 3.2 | |
| - | Street C | MH23A | MH22A | 2.75 | 0 | 0.00 | 24.20 | 0 | 1675 | 3.64 | 8.72 | 31.79 | 6.78 | 38.57 | 300 | PVC | 0.30% | 52.66 | 0.75 | 73.2 | |
| S40 | Street C | MH22A | MH21A | 2.75 | 6 | 0.40 | 24.60 | 17 | 1691 | 3.64 | 8.81 | 32.07 | 6.89 | 38.96 | 300 | PVC | 0.30% | 52.66 | 0.75 | 74.0 | |
| S41 | Street C | MH21A | MH20A | 2.75 | 2 | 0.14 | 24.74 | 6 | 1697 | 3.64 | 8.84 | 32.17 | 6.93 | 39.10 | 300 | PVC | 0.30% | 52.66 | 0.75 | 74.2 | |
| S42 | Street C | MH21A | MH13A | 2.75 | 8 | 0.47 | 25.21 | 22 | 1719 | 3.64 | 8.95 | 32.55 | 7.06 | 39.61 | 300 | PVC | 0.30% | 52.66 | 0.75 | 75.2 | |
| S43 | Street D | MH19A | MH18A | 2.75 | 13 | 0.78 | 0.78 | 36 | 36 | 4.34 | 0.19 | 0.81 | 0.22 | 1.03 | 200 | PVC | 2.86% | 56.33 | 1.77 | 1.8 | |
| S44 | Street D | MH18A | MH17A | 2.75 | 9 | 0.38 | 1.16 | 25 | 61 | 4.30 | 0.32 | 1.35 | 0.32 | 1.68 | 200 | PVC | 2.96% | 57.31 | 1.80 | 2.9 | |
| S45 | Street D | MH17A | MH16A | 2.75 | 16 | 0.56 | 1.72 | 44 | 105 | 4.24 | 0.54 | 2.31 | 0.48 | 2.79 | 200 | PVC | 2.96% | 57.31 | 1.80 | 4.9 | |
| S46 | Street D | MH16A | MH15A | 2.75 | 15 | 0.58 | 2.30 | 41 | 146 | 4.20 | 0.76 | 3.18 | 0.64 | 3.83 | 200 | PVC | 2.97% | 57.40 | 1.81 | 6.7 | |
| S47 | Street D | MH15A | MH14A | 2.75 | 11 | 0.42 | 2.72 | 30 | 176 | 4.17 | 0.92 | 3.82 | 0.76 | 4.58 | 200 | PVC | 3.37% | 61.15 | 1.92 | 7.5 | |
| S48 | Street D | MH14A | MH13A | 2.75 | 8 | 0.32 | 3.04 | 22 | 198 | 4.15 | 1.03 | 4.28 | 0.85 | 5.13 | 200 | PVC | 1.60% | 42.13 | 1.33 | 12.2 | |
| S49 | Street C | MH13A | MH12A | 2.75 | 3 | 0.18 | 28.43 | 8 | 1925 | 3.60 | 10.03 | 36.08 | 7.96 | 44.04 | 300 | PVC | 0.30% | 52.66 | 0.75 | **83.6** | **Connect to Woodway Trails Ph 2** |

Project No. 25054
Checked by: BB
Computed by: AS
Date: Feb-26

Norfolk County

# SANITARY SEWER DESIGN

Project: Decou Road

Design flow factor = 450 l per person per day
P is in thousands
Infiltration factor = 0.28 l/s/ha

Vmin = 0.75m/s
Vmax = 4.6m/s
n=0.013 (>600mm)
n=0.013 (<600mm)

| Area No. | Street Name | From MH | To MH | Pop. Density [per/unit] | Units [#] | Incremental Area [ha] | Cumulative Area [ha] | Population Increment [per] | Cumulative Population [per] | Peaking Factor M | Average Flow l/s | Peak Flow l/s | Infil-tration l/s | Total Flow l/s | Proposed Sewer Design | | | | | % Full | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Diameter [mm] | Material | Grade % | Capacity l/s | Velocity m/s | | |
| **SANITARY FLOWS THROUGH FUTURE WOODWAY TRAILS PHASE 2 SUBDIVISION TO EX. SANITARY SEWER ON TRILLIUM WAY EXTENSION** | | | | | | | | | | | | | | | | | | | | | |
| S50 | Woodway Ph 2 | MH12A | FUTMH11A | 2.75 | 0 | 0.14 | 28.57 | 0 | 1925 | 3.60 | 10.03 | 36.08 | 8.00 | 44.08 | 300 | PVC | 0.30% | 52.66 | 0.75 | 83.7 | |
| S51 | Woodway Ph 2 | FUTMH11A | FUTMH10A | 2.75 | 92 | 3.22 | 31.79 | 253 | 2178 | 3.56 | 11.34 | 40.35 | 8.90 | 49.25 | 375 | PVC | 0.30% | 90.28 | 0.86 | 54.5 | |
| S52 | Woodway Ph 2 | - | FUTMH10A | 2.75 | 93 | 3.14 | 3.14 | 256 | 256 | 4.11 | 1.33 | 5.47 | 0.88 | 6.35 | | | | | | | |
| S53 | Woodway Ph 2 | FUTMH10A | FUTMH9A | 2.75 | 10 | 0.31 | 35.24 | 28 | 2461 | 3.51 | 12.82 | 45.05 | 9.87 | 54.91 | 375 | PVC | 0.30% | 90.28 | 0.86 | 60.8 | |
| S54 | Woodway Ph 2 | - | FUTMH9A | 2.75 | 41 | 1.66 | 1.66 | 113 | 113 | 4.23 | 0.59 | 2.48 | 0.46 | 2.95 | | | | | | | |
| S55 | Woodway Ph 2 | FUTMH9A | FUTMH8A | 2.75 | 5 | 0.20 | 37.10 | 14 | 2588 | 3.50 | 13.48 | 47.12 | 10.39 | 57.51 | 375 | PVC | 0.30% | 90.28 | 0.86 | 63.7 | |
| S56 | Woodway Ph 2 | FUTMH8A | FUTMH7A | 2.75 | 8 | 0.25 | 37.35 | 22 | 2610 | 3.49 | 13.59 | 47.48 | 10.46 | 57.94 | 375 | PVC | 0.30% | 90.28 | 0.86 | 64.2 | |
| S57 | Woodway Ph 2 | FUTMH7A | FUTMH6A | 2.75 | 5 | 2.34 | 39.69 | 14 | 2624 | 3.49 | 13.66 | 47.70 | 11.11 | 58.82 | 375 | PVC | 0.30% | 90.28 | 0.86 | 65.1 | |
| S58 | Woodway Ph 2 | FUTMH6A | FUTMH5A | 2.75 | 66 | 0.96 | 40.65 | 182 | 2805 | 3.47 | 14.61 | 50.65 | 11.38 | 62.03 | 375 | PVC | 0.30% | 90.28 | 0.86 | 68.7 | |
| S59 | Woodway Ph 2 | FUTMH5A | FUTMH4A | 2.75 | 2 | 0.11 | 40.76 | 6 | 2811 | 3.47 | 14.64 | 50.74 | 11.41 | 62.15 | 375 | PVC | 0.30% | 90.28 | 0.86 | 68.8 | |
| S60 | Woodway Ph 2 | FUTMH4A | FUTMH3A | 2.75 | 2 | 0.10 | 40.86 | 6 | 2816 | 3.47 | 14.67 | 50.83 | 11.44 | 62.27 | 375 | PVC | 0.30% | 90.28 | 0.86 | 69.0 | |
| S61 | Woodway Ph 2 | FUTMH3A | FUTMH2A | 2.75 | 4 | 0.18 | 41.04 | 11 | 2827 | 3.46 | 14.72 | 51.01 | 11.49 | 62.50 | 375 | PVC | 0.30% | 90.28 | 0.86 | 69.2 | |
| S62 | Woodway Ph 2 | FUTMH2A | FUTMH1A | 2.75 | 3 | 0.16 | 41.20 | 8 | 2835 | 3.46 | 14.77 | 51.14 | 11.54 | 62.68 | 375 | PVC | 0.30% | 90.28 | 0.86 | 69.4 | |
| - | Trillium Way | FUTMH1A | FUTMH33A | 2.75 | 0 | 0.00 | 41.20 | 0 | 2835 | 3.46 | 14.77 | 51.14 | 11.54 | 62.68 | 375 | PVC | 0.30% | 90.28 | 0.86 | 69.4 | |
| | Woodway Ph 1 | - | FUTMH33A | | | | | | | | | | | **20.31** | | | | | | | |
| | | | | | **Flow obtained from Functional Servicing Report for Woodway Trails Phase 2, completed by G. Douglas Vallee Limited (June 2025)** | | | | | | | | | | | | | | | | |
| - | Trillium Way | FUTMH33A | EX.SANMH34 | 2.75 | 0 | 0.00 | 41.20 | 0 | 2835 | 3.46 | 14.77 | 51.14 | 11.54 | 82.98 | 375 | PVC | 0.35% | 97.52 | 0.92 | **85.1** | **Add Woodway Trails Ph 1 Flow** |
| **Number of units for condo blocks on the Future Street as per the Draft Plan of Subdivision (November 2023) by G. Douglas Vallee Limited for the Extension of the Woodway Trails Subdivision** | | | | | | | | | | | | | | | | | | | | | |

NOTE:
AT ALL CB LEADS CROSSING WATERMAIN TO MAINTAIN 0.5m MIN CLEAR SEPERATION.

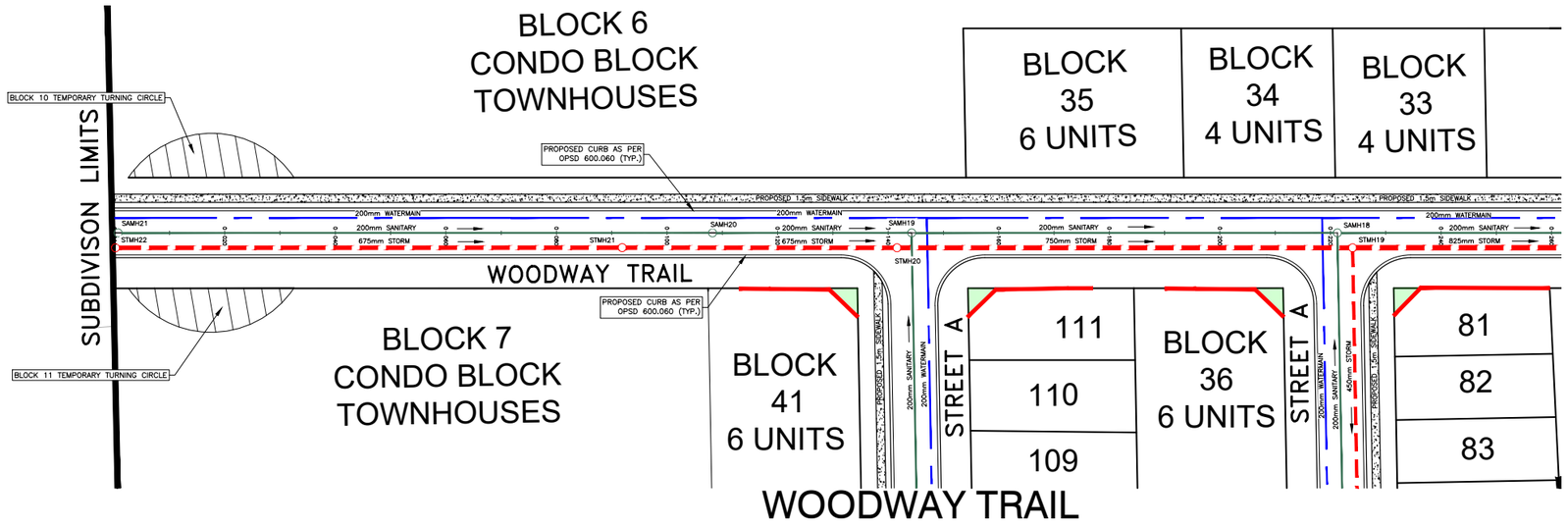
## DRIVEWAY LOCATIONS

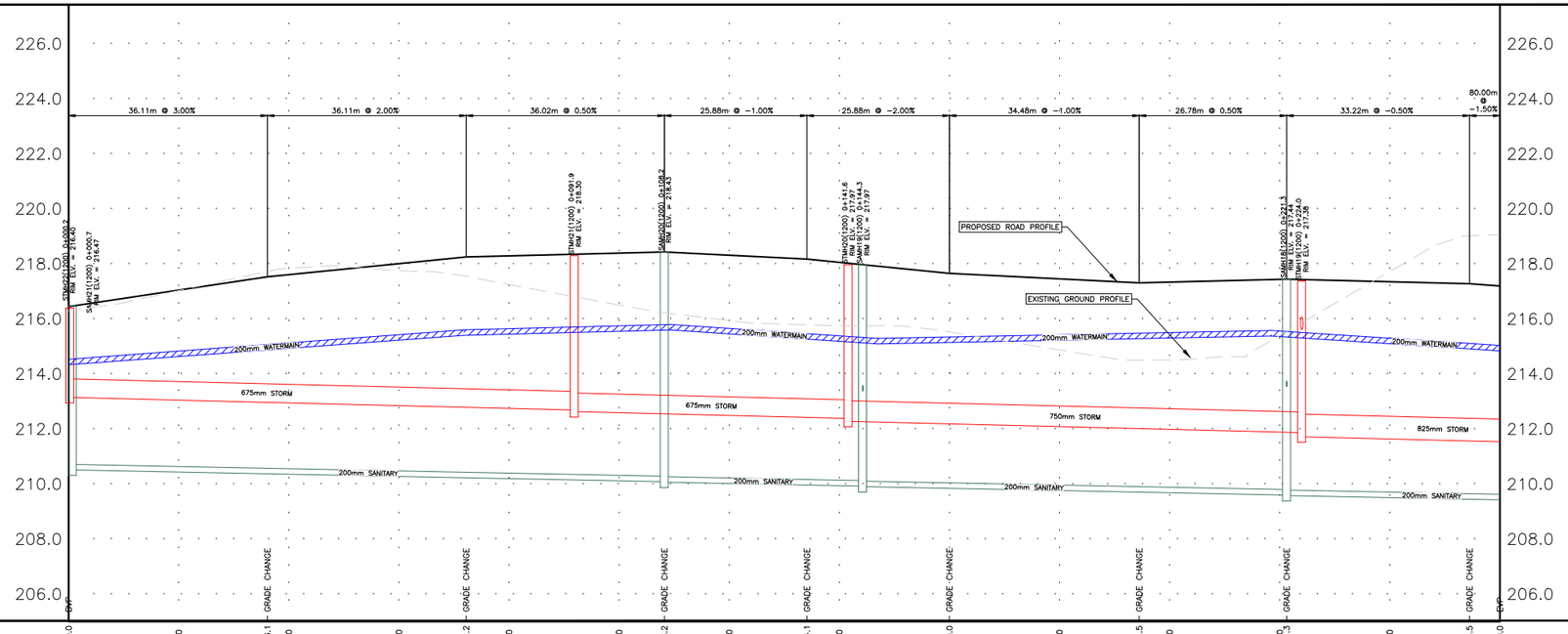
DRIVEWAY LOCATIONS TO BE LOCATED ON THE SIDE OF LOT AS SHOWN. FINAL WIDTH AND ALIGNMENT OF DRIVEWAY TO BE DETERMINED BASED ON HOUSE PLACEMENT ON LOT.

DRIVEWAY LOCATION

## LEGEND

- PROPOSED STORM MANHOLE (STMH5)
- PROPOSED SANITARY MANHOLE (SAMH3)
- PROPOSED WATER VALVE (WV)
- PROPOSED FIRE HYDRANT (FH)
- PROPOSED WATERMAIN
- LIMIT OF DRAFT PLAN
- PROPOSED LIGHT STANDARD (LS)
- PROPOSED LIGHTING PEDESTAL (P)
- PROPOSED HYDRO TRANSFORMER (T)
- PROPOSED TREE PLANTING
- PROPOSED BELL "GRADE LEVEL BOX" (BELL)
- PROPOSED BELL PEDESTAL
- PROPOSED CATV PEDESTAL
- BOREHOLE LOCATION
- 0.3m RESERVE
- 9mx9m SIGHT TRIANGLE




| CHAINAGE | 0+000.0 | 0+020 | 0+036.1 | 0+040 | 0+060 | 0+072.2 | 0+080 | 0+100 | 0+108.2 | 0+120 | 0+134.1 | 0+140 | 0+160.0 | 0+180 | 0+194.5 | 0+200 | 0+220 | 0+221.3 | 0+240 | 0+254.5 | 0+260.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FINAL CENTRE LINE ROAD GRADES | 216.45 | 217.05 | 217.53 | 217.61 | 218.01 | 218.25 | 218.29 | 218.39 | 218.43 | 218.31 | 218.17 | 218.05 | 217.65 | 217.45 | 217.31 | 217.34 | 217.44 | 217.44 | 217.35 | 217.28 | 217.19 |
| STORM SEWER | 213.15NW | | 91.7m OF 675mm CLASS 65-D CONCRETE STORM CLASS B BEDDING @ 0.50% | | | 215.69SE 215.40NW | | | 49.7m OF 675mm CLASS 65-D CONCRETE STORM CLASS B BEDDING @ 0.50% | | | 213.29SE 212.28NW | | 82.4m OF 750mm CLASS 65-D CONCRETE STORM CLASS B BEDDING @ 0.50% | | | 211.86SE 211.77NW 215.62NE | | 51.3m OF 825mm CLASS 65-D CONCRETE STORM CLASS B BEDDING @ 0.50% | | |
| SANITARY SEWER | 210.51NW | | 107.5m OF 200mm PVC SDR 35 SANITARY WITH CLASS B BEDDING @ 0.40% | | | | | 210.08SE 210.06NW | 36.0m OF 200mm PVC SDR 35 SANITARY WITH CLASS B BEDDING @ 0.40% | | | 209.92SE 213.37NE 209.90NW | | 77.0m OF 200mm PVC SDR 35 SANITARY WITH CLASS B BEDDING @ 0.40% | | | 213.54NE 209.60SE 209.58NW | | 52.7m OF 200mm PVC SDR 35 SANITARY WITH CLASS B BEDDING @ 0.40% | | |

| REV. No. | DATE | REVISION |
|---|---|---|
| 0 | 08/29/2024 | ISSUED FOR COUNTY REVIEW |
| 1 | 06/09/2025 | ISSUED FOR COUNTY REVIEW |

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

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

SCALE:
HORIZONTAL : 1 : 500 (5 15 25)
VERTICAL : 1 : 100 (1 2 3 4 5)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Consulting Engineers, Architects & Planners
G. DOUGLAS VALLEE LIMITED
2 TALBOT STREET NORTH
SIMCOE, ONTARIO N3Y 3W4
(519) 426-6270


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SIMCOE
NORFOLK COUNTY

Drawing Title
PLAN AND PROFILE WOODWAY TRAIL
0+000 TO 0+260

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|---|---|
| JTI/NBN | NBN |
| Checked by : | Date Started : |
| JTI/SLF | 08/20/2024 |
| Drawing Scale : | Drawing No. |
| AS SHOWN | 03 |
| Project No. | |
| 23-190 | |

DATE LAST PLOTTED : June 17, 2025

# APPENDIX D

# GEOTECHNICAL INVESTIGATION

LVM
NAYLOR

# ZITIA GROUP

## Residential Subdivision
## Decou Road and Ireland Road
## Simcoe, Ontario

Geotechnical Investigation

**Report**

December 2009
**Ref. No.: 7780G2.R01**
**(161-P030592-0100-GE-R001)**

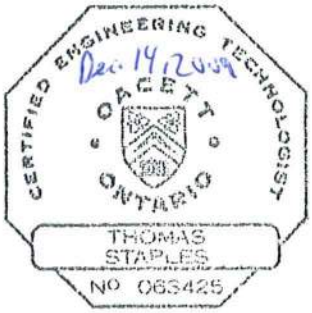
LVM
NAYLOR



Zitia Group

Geotechnical Investigation
Proposed Residential Subdivision
Decou Road and Ireland Road
Simcoe, Ontario

Prepared by:




Thom Staples, C.E.T.
Brantford Team Leader

Reviewed by:




Dennis Kelly, B.Sc., P.Eng.
Senior Consulting Engineer
jp/cs

**LVM-Naylor**
Division of Naylor Engineering Associates Ltd.
440 Hardy Road, Unit 3
Brantford (Ontario) Canada N3T 5L8
Telephone: 519.720.0078
Fax: 519.720.0976
Web site: www.lvmnaylor.com

LVM NAYLOR





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Test results mentioned herein are only valid for the sample(s) stated in this report.

LVM-Naylor's subcontractors who may have accomplished work either on site or in laboratory are duly qualified as stated in our Quality Manual's procurement procedure. Should you require any further information, please contact your Project Manager.

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# 1 INTRODUCTION

LVM-Naylor, Division of Naylor Engineering Associates Ltd. was retained by the Zitia Group to carry out a geotechnical investigation at the site of a proposed residential development in the southeast end of Simcoe, Ontario. This work was authorized by Mr. Peter Labiris on October 22, 2009.

The project involves the proposed construction of a residential subdivision to be situated on a 75 ha parcel of land located in Simcoe, Ontario at the location shown on Drawing 1, in Appendix 4. The development plans include six hundred and twenty-nine single detached lots, sixteen multi-unit blocks, a school block and twenty new streets. Access to the subdivision will be via Decou Road, Ireland Road, and Donly Drive. The house lots will be serviced with municipal sewer and water. A new stormwater management facility will be constructed in the north central part of the site.

The purpose of the investigation was to determine the subsurface soil and groundwater conditions at the site and, based on that information, prepare this engineering report with geotechnical recommendations pertaining to development including site grading, site servicing, pavement construction, house construction, excavations and dewatering, stormwater infiltration and stormwater management. The report does not address site environmental issues or concerns.

# 2 INVESTIGATION PROCEDURE

## 2.1 Previous Work

In July 2008, Naylor Engineering Associates Ltd. carried out a preliminary geotechnical investigation at the site. The fieldwork involved the excavating of seven test pits (Test Pits 1 to 7) to a depth of 3.1 m below ground surface. The results of this investigation were provided in our Preliminary Geotechnical Engineering Report No. 7780G1.R01, and the test pits logs are provided in Appendix 2.

In October 2008, Naylor Engineering Associates Ltd. carried out a geotechnical investigation for a new outfall sewer along the Lynn Valley Trail at the west side of the property from Decou Road to the Simcoe Water Pollution Control Plant. The fieldwork for this investigation comprised the drilling of five boreholes to a depth of 5.0 m. The results of this investigation were provided in our Geotechnical Engineering Report No. 7807G2.R01.

The relevant geotechnical information from the above noted reports has been incorporated into this report.

## 2.2 Field Program

The fieldwork for this investigation was carried out on November 4, 5, 6, 9 and 10, 2009, and involved the drilling of thirty-one boreholes (Boreholes 1 to 30 and 12A) to depths of 4.1 to 11.9 m, and the excavation of eleven test pits (Test Pits 101 to 111) to depths of 1.9 to 4.9 m. The fieldwork also included thirty-eight handholes to determine topsoil thicknesses across the site. The locations of the boreholes, test pits, and handholes are shown on the Site Plan, Drawing 2 in Appendix 4.

The boreholes were advanced with a CME-55 track mounted drillrig equipped with continuous flight solid stem augers supplied and operated by a specialist drilling contractor. The test pits were excavated with a tracked hydraulic backhoe supplied by an excavating contractor.

In the boreholes and test pits, representative samples of the overburden were recovered at regular intervals throughout the depths explored. Standard Penetration Tests (SPT) were carried out during sampling operations in the boreholes using conventional split spoon equipment. The SPT N-values recorded are plotted on the borehole logs in Appendix 2.

Thirty-eight topsoil thickness holes were dug throughout the property to expose the underlying subgrade. Where thick topsoil was encountered in the low lying areas, an excavator was used to dig the holes. The topsoil thicknesses noted at the handholes are summarized in Table 1.

Samples of the cohesive soils were tested using a hand-held pocket penetrometer to determine approximate shear strengths. The pocket penetrometer test results are plotted on the borehole logs.

Standpipes were installed in sixteen boreholes to allow measurement of the stabilized groundwater levels. The standpipe installations comprised 19 mm diameter pipes with slotted and filtered screens, as well as a bentonite seals near the ground surface. Details of the installations and groundwater observations and measurements are provided on the borehole logs, and the measurements are summarized in Table 2.

Monitoring wells were installed in Boreholes 27 and 30 to allow measurement of groundwater levels. The monitoring wells were constructed using flush-threaded 50 mm diameter Trilock pipe with 1.5 m long 10-slot well screens, delivered to the site pre-cleaned in individually sealed plastic bags. The screen and riser pipes were not allowed to come into contact with the ground or any drilling equipment prior to installation.

Groundwater observations were carried out in the test pits during and upon completion of excavating. The observations are summarized on the test pit logs in Appendix 2.

All boreholes without standpipes or monitoring wells were backfilled with bentonite in accordance with Ontario Regulation 372/07 (formerly Ontario Reg. 903). The standpipes and monitoring wells were tagged and a complete well record was submitted to the Ministry of Environment. A licensed well technician must properly decommission all standpipes and monitoring wells within six months of last use (water level measurements) and certainly before construction.

The fieldwork was monitored throughout by a member of our geotechnical engineering staff, who directed the drilling and excavating procedures; conducted SPT and pocket penetrometer tests, documented the soil stratigraphies, monitored the groundwater conditions, installed the standpipes and monitoring wells, and cared for the recovered soil samples.

The borehole and test pit locations and ground surface elevations were surveyed by B.A. Jacobs Surveying and supplied to us in AutoCAD format. It is understood that the elevations are related to a geodetic datum. The topsoil thickness hole locations were not surveyed and should be considered as approximate.

Groundwater levels were measured by LVM-Naylor on November 10 and December 10, 2009 and the groundwater measurements are provided on the borehole logs and in Table 2.

### 2.3 Laboratory Testing

All soil samples secured during this investigation were returned to our laboratory for visual examination, as well as moisture content tests. The moisture content test results are plotted on the borehole and test pit logs in Appendix 2.

The geotechnical laboratory tests carried out on selected samples of the major subsurface soils from the investigation comprised the following:

- seven particle size distribution analyses with the results plotted on Figures 1 and 2 in Appendix 3; and,
- two standard Proctor moisture density tests with results plotted on Figures 3 and 4 in Appendix 3.

The soil samples will be stored for a period of three months from the date of sampling. After this time, they will be discarded unless prior arrangements have been made for longer storage.

## 3 SUMMARIZED CONDITIONS

### 3.1 Site Description

The subject property covers approximately 75 ha and is located in the southeast part of Simcoe, Ontario. The property is bordered on the west by the Lynn Valley Trail and the Simcoe Sewage Treatment Plant, on the east by East Lynn Industrial Park, Fanshawe College and Ireland Road, on the south by Decou Road, and on the north by Oakwood Cemetery.

The property is currently used for agricultural purposes and was most recently planted with soy bean and clover crops. Bush areas are located at the west and south parts of the site. A small area at the west central part of the site has been stripped and the topsoil has been pushed into piles surrounding the area.

A gravel driveway extends north from Decou Road to a communication tower at the north end of the site.

An abandoned house and barn that was located at the east side of the site was removed prior to the site work.

The ground surface at the site generally slopes down from the northeast to the southwest with a topographical relief of approximately 22 m. A valley is located in the north central part of the property and a few smaller swales are located at the south. Photographs of the site are provided in Appendix 5.

## 3.2 Pleistocene Geology

The site is located within the physiographic region of Southern Ontario known as the Norfolk Sand Plain. The region is generally composed of broad plains of sand and silt which were deposited as a delta in Glacial Lakes Whittlesey and Warren. Small rivers and streams have cut deep valleys across the plains.

The region is underlain by Silurian bedrock of the Paleozoic system. The predominant rock types are dolomite, shale and gypsum of the Salina Formation. The bedrock is approximately 400 million years old and was formed in a shallow inland sea.

## 3.3 Subsoil Conditions

We refer to the appended test pit and borehole logs for detailed soil descriptions and stratigraphies; results of SPT and pocket penetrometer testing; moisture content profiles; details of standpipe and monitoring well installations; and, groundwater observations and measurements. We also refer to Drawings 3 and 4, in Appendix 4 for simplified cross-sections of the soil stratigraphy along Streets B and H.

In general, the subsurface stratigraphy contacted at the site comprise topsoil, overlying complex layered deposits of silt and sand, with localized deposits of sand and gravel, clay, and glacial till. Descriptions of the various soil deposits encountered are provided in the following subsections.

### 3.3.1 Topsoil

Topsoil was encountered surfically across the site. The topsoil is typically 100 to 650 mm thick. Thicker topsoil was encountered in a valley at the northeast corner of Phase 1 (see Test Pit 11 and Handholes 22 and 23) where the topsoil was 900 to 1800 mm thick and within swales at the southeast corner of the site where the topsoil thicknesses range between 1500 and 1600 mm (see Handholes 5, 6 and 8).

A summary of the topsoil thicknesses at the handhole locations is provided in the following table.

**TABLE 1: SUMMARY OF TOPSOIL THICKNESSES**

| Handhole Number | Thickness (mm) | Handhole Number | Thickness (mm) |
|---|---|---|---|
| 1 | 350 | 20 | 120 |
| 2 | 350 | 21 | 350 |
| 3 | 350 | 22 | 170 (1700) * |
| 4 | 650 | 23 | 100 (1000) * |
| 5 | 150 (1500) * | 24 | 110 |
| 6 | 160 (1600) * | 25 | 300 |
| 7 | 400 | 26 | 400 |
| 8 | 155 (1550) * | 27 | 400 |
| 9 | 650 | 28 | 350 |
| 10 | 500 | 29 | 650 |
| 11 | 500 | 30 | 300 |
| 12 | 550 | 31 | 550 |
| 13 | 350 | 32 | 350 |
| 14 | 400 | 33 | 300 |
| 15 | 600 | 34 | 300 |
| 16 | 400 | 35 | 350 |
| 17 | 450 | 36 | 350 |
| 18 | 500 | 37 | 300 |
| 19 | 100 | 38 | 300 |

* Second Buried Layer of Topsoil

It is noteworthy that a second buried layer of topsoil was encountered below the silt or sand in Test Pit 1 and Handholes 5, 6, 8, 22 and 23.

The topsoil typically comprises dark brown silt and was moist to very moist at the time of the fieldwork.

### 3.3.2 Silt

Silt deposits were contacted beneath the topsoil or layered with the sand in most of the boreholes and test pits drilled and excavated across the site. The silt deposits range from 0.3 to 7.2 m thick and extend below the termination depths of Boreholes 10, 11, 12, 14, 16, 17, 20, 21, 22, 24, 26, 29 and 30, and Test Pits 105, 108 and 109.

The texture of the silt ranges from silt with some sand to clayey silt with trace sand. The results of three grain size distribution analyses carried out on the samples of silt are provided on Figures 1 and 2 in Appendix 3, and show the samples contain 1 to 10% sand, 63 to 76% silt, and 20 to 34% clay.

The non-cohesive silt typically has a loose to very loose relative density in the upper 2.0 m, and compact to dense relative density below 2.0 m. The cohesive silt deposits typically have low plasticity and stiff consistency.

The silt is very moist to wet or about the plastic limit to wetter than the plastic limit based on natural moisture contents that range from 18 to 30%. The results of a standard Proctor moisture density test performed on a sample of clayey silt are plotted on Figure 3 in Appendix 3, and show a maximum dry density of 1.865 t/m$^3$ at an optimum moisture content of 12.9%.

### 3.3.3 Sand

Sand deposits were encountered throughout the site with the thickest strata noted at the northeast and south centre parts of the property. The sand deposits were contacted below the topsoil in Boreholes 2, 4, 5, 8, 18, 19, 21, 22 and 26, and Test Pits 101, 103, 4, 6, 7, and below thick layers of silt in Boreholes 1, 3, 6, 7, 9, 13, 15, 17, 23, 25 and 30, and Test Pits 102, 104, 106, 3 and 5. Thin seams of sand were also encountered within the silt in Boreholes 11, 12A, 16, 20 and 29.

The native sand has a compact to very dense relative density based on SPT N-values of 10 to 88 blows per 300 mm penetration of the split spoon sampler.

The sand generally ranged in gradation from sand and silt to sand with some gravel and trace silt. The results of five grain size distribution analyses carried out on samples of the sand are provided on Figures 1 and 2 in Appendix 3, and show the samples contain 0 to 15% gravel, 66 to 96% sand, 4 to 10% silt, and 0 to 8% clay.

The natural water content of the sand deposits typically ranged from 2 to 14% above the groundwater table indicating damp to moist conditions. Water bearing saturated sand deposits were encountered in Boreholes 3, 8, 13, 15, 16, 18, 26, 27, 29 and 30, and Test Pits 102 and 3. The results of a standard Proctor moisture density test performed on a sample of the sand are plotted on Figure 4 in Appendix 3, and show a maximum dry density of 2.05 t/m$^3$ at an optimum moisture content of 8.4%.

### 3.3.4 Sand and Gravel

Sand and gravel deposits were encountered in Boreholes 14, 24 and 38, and Test Pits 106, 107 and 1, and range in thickness from 0.6 to 2.4 m. The sand and gravel extends below the termination depth of Test Pit 106.

The sand and gravel has a compact to very dense relative density based on SPT N-values of 13 to 78 blows. The sand and gravel is generally damp to moist based on insitu moisture contents of 5 to 10%. The sand and gravel is saturated at Borehole 14.

A very large boulder erratic was encountered in Test Pit 105 at Block E. The boulder is more than 7 m long (north to south) and was encountered at a depth of 1.9 m.

### 3.3.5 Glacial Till

Glacial till was encountered in Boreholes 3 and 22, and Test Pit 103. The glacial till extends below the termination depth of Borehole 3 and Test Pit 103, and is 1.9 m thick in Borehole 22. The texture of the till ranges from silt with some gravel to silt with some clay with trace sand and gravel.

SPT N-values recorded in the non-cohesive till typically ranges from 36 to 51 blows per 300 mm indicating a dense to very dense relative density. Shear strengths determined with a pocket penetrometer in the cohesive till indicate a very stiff consistency.

Insitu moisture contents of the glacial till typically range from 10 to 20% indicating that the deposit is generally moist or drier than the plastic limit to about the plastic limit

### 3.3.6 Clay

Clay was encountered at the northwest end of the site at approximately Elevation 212 m in Borehole 28 and Test Pits 107 and 110, and extends below the termination depths of the borehole and test pits.

The silty clay is about the plastic limit to wetter than the plastic limit based on moisture contents of 25 to 27%. The clay has low plasticity and is over consolidated.

## 3.4 Groundwater

Groundwater observations and measurements carried out in the open boreholes and test pits, and in standpipes and monitoring wells installed in the boreholes and test pits, are provided on the appended borehole and test pit logs, and are summarized in the following table.

**TABLE 2: GROUNDWATER DEPTHS AND ELEVATIONS**

| Borehole Number | Groundwater Depth (m) | Groundwater Elevation (m) | Notes |
|---|---|---|---|
| 3 | 0.11 | 216.37 | Subartesian |
| 8 | 2.98 | 216.92 | Unconfined |
| 10 | 3.91 | 223.83 | Perched |
| 11 | 3.32 | 224.74 | Perched |
| 12 | 4.63 | 213.91 | Dilatant Silt |
| 13 | 0.53 | 216.87 | Subartesian |
| 14 | 2.55 | 215.45 | Subartesian |
| 15 | 8.44 | 207.28 | Subartesian |
| 16 | 0.64 | 215.55 | Subartesian |
| 17 | 3.88 | 209.54 | Perched |
| 18 | 3.28 | 216.03 | Unconfined |
| 20 | Dry | n/a | No Free Groundwater |
| 24 | 7.53 | 209.06 | Dilatant Silt |
| 26 | 1.99 | 217.95 | Perched |
| 27(MW) | 0.92 | 216.69 | Subartesian |
| 28 | 7.76 | 209.76 | Clay |
| 29 | 0.20* | 216.32 | Artesian |
| 30 (MW) | 0.14 | 216.26 | Subartesian |

Groundwater measurements taken on November 10, 2009

*Groundwater level at 0.20 m above ground surface

The groundwater observations indicate that the stabilized unconfined groundwater table typically occurs between Elevations 215 and 217 m throughout the centre and east half of the site. The groundwater table drops off along the southwest boundary ranging from Elevation 207 to 209 m. Sub-artesian and artesian conditions were encountered in the north central part of the property at Boreholes 3, 13 to 16, 27, 29 and 30. The horizontal hydraulic gradient is towards the southwest (Lynn River).

Groundwater seepage was noted from the sand deposits and the hydraulic conductivity would be in the order of $10^{-3}$ cm/sec for the sand and in the order of $10^{-5}$ cm/sec for the silt. Local variations and seasonal fluctuations in the groundwater levels would be expected.

# 4 DISCUSSIONS AND RECOMMENDATIONS

## 4.1 General

The project involves the proposed construction of a residential subdivision to be situated on a 75 ha parcel of land located in Simcoe, Ontario at the location shown on Drawing 1, in Appendix 4. The development plans include six hundred and twenty-nine single detached lots, sixteen multi-unit blocks, a school block and twenty new streets. Access to the subdivision will be via Decou Road, Ireland Road, and Donly Drive. The house lots will be serviced with municipal sewer and water. A new stormwater management facility will be constructed in the north central part of the site.

Based on the results of the geotechnical investigation, the subsurface stratigraphy comprises topsoil overlying major deposits of silt and sand.

The stabilized unconfined groundwater table generally occurs between Elevation 215 and 217 m except at the southwest boundary where the groundwater level is between 207 and 209 m. The horizontal hydraulic gradient is from the northeast to the southwest towards the Lynn River. Perched groundwater was encountered in the silt at the northwest corner of the site. Subartesian and artesian groundwater pressure was noted in the sand deposits at the north central area (see Boreholes 3, 13, 27, 29 and 30).

Based on the results of this geotechnical investigation the site is well suited for the proposed residential development; however, the presence of sub-artesian groundwater and shallow groundwater in the low-lying areas will affect design and construction. The following subsections of this report contain geotechnical recommendations pertaining to development of the property including site grading, site servicing, pavements, residential buildings, excavations and dewatering, and stormwater management.

## 4.2 Site Grading

Significant area grading of the property will be required to prepare the land for the construction of the proposed residential subdivision. It is planned to cut material from the high area at the northwest corner and in Block A (Stormwater Management Pond No. 1), and use it to raise grades in the lower sections of the site particularly at the southwest.

Prior to carrying out any cutting and engineered fill placement, the surficial topsoil should be removed from cuts and critical fill areas. In calculating the approximate quantity of topsoil to be stripped, we recommend that the topsoil thicknesses provided on Table 1 as well as the individual borehole and test pit logs be increased by 50 mm to account for variations and some stripping of the mineral soil below. The topsoil material could be used for landscaping fill to raise grades in the rear yards of the house lots or in park areas.

The topsoil typically is 100 to 650 mm thick; however, it is important to note that thicker topsoil and buried topsoil (900 to 1800 mm) was encountered in the low lying areas of the site.

Within the low-lying areas of the site where thick topsoil was encountered, and where the groundwater table is close to the existing ground surface, it will likely be necessary to remove the organic deposits with a tracked hydraulic excavator. Also, an enlarged excavation will be required to facilitate fill placement and groundwater control. Sump pumping with large capacity pumps from pits and trenches in the excavation subgrade should be sufficient to control the inflow. The groundwater control measures must be maintained until the engineered fills are placed and compacted to above the original water level.

In order to minimize the effects of groundwater on the site grading operations, it is recommended that the work be carried out during the normally drier summer months.

Following removal of the organic deposits, the exposed subgrade should be inspected by LVM-Naylor. Several metres of fill may be required to raise grades in the low-lying areas. The fill should be placed in maximum 300 mm thick lifts and compacted to the following minimum percentages of standard Proctor maximum dry density (SPMDD):

**TABLE 3: COMPACTION SPECIFICATIONS**

| Fill Use | Minimum Compaction Required |
|---|---|
| Structural fill to support houses | 98% SPMDD |
| Subgrade fill beneath streets or beneath services | 95% SPMDD |
| Bulk fill in landscaped areas | 90% SPMDD |

Major soils likely to be generated from the site are silt and sand. Based on the results of insitu moisture content and standard Proctor moisture density tests the majority of the on-site sand soils will be well suited for reuse for road subgrade fill and structural fill. If work is carried out during very dry weather then water may have to be added to the sand, to improve compaction.

The silt soils are suitable for reuse as road subgrade fill and engineered structural fill if the work is carried out during the normally drier summer months. If work is carried out during wet weather then the silt will only be suitable for reuse as road subgrade fill.

The native mineral soils are expected to undergo volume shrinkage during cut and fill operations. The estimated shrinkage factors are 0 to 5% for the glacial till, 5 to 10% for topsoil and silt, and 10 to 15% for sand/sand and gravel.

Where structural fill is placed on a wet subgrade in the low-lying areas, we suggest that only the sand or sand and gravel material be used for the bottom few lifts. Also, the initial lift may be up to 750 mm thick in order to ensure trafficability and minimize compaction problems associated with instability of the subgrade caused by vibratory equipment.

The structural fill pads should extend at least 1.0 m beyond the footing edge of any building and down to the subgrade level at a slope of 45° to the horizontal. A typical detail for structural fill placement beneath building foundations is shown on Drawing 5, in Appendix 4.

Full-time testing by experienced geotechnical personnel should be carried out during fill placement and compaction to examine and approve potential sources of fill material, and to carefully monitor the placement and verify the compaction by insitu density testing (ASTM D2167 or ASTM 2922).

Dust control measures may be required during periods of dry weather due to the fine nature of the soils. Work shall be in accordance with OPSS 506.

## 4.3 Site Servicing

### 4.3.1 Excavations and Dewatering

Following site grading operations, the subdivision will be serviced to provide the individual lots and blocks with full municipal services. It is understood that the invert levels for the watermain, storm, and sanitary sewers will be at conventional depths, some 2 to 5 m below finished grade through most of the site. The sanitary sewer will extend to depths of 7 to 11 m below road grade along the west side of the site with the deepest section at the outlet at Streets B and H. We recommend that LVM-Naylor be allowed to check the final site grading and servicing plans for the subdivision to ensure that the exploratory boreholes extend below the design sewer invert elevations.

Temporary excavations to conventional depths for installation of underground pipes at this site must comply with the Ontario Occupational Health and Safety Act and Regulations for Construction Projects. The predominant soils encountered in the boreholes would be classified as Type 3 soils (O.Reg. 213/91, s. 226(4)). Temporary side slopes must be cut at an inclination of 1 horizontal to 1 vertical or less from the base of the excavation for open cut pipe installation (exclusive of groundwater effects) as per O.Reg. 213/91, s. 234(2).

The trench sides slopes will have to be cut back at a shallower angle (3 horizontal to 1 vertical or less) where water bearing sand or sand and gravel deposits are encountered (see Boreholes 3, 8, 13, 14, 15, 16, 18, 26, 27 and 30).

The volume and rate of groundwater seepage is expected to be highly variable with moderate to high flow from the sand deposits, and low flow from the silt deposits.

Based on the invert levels of the sanitary sewer, the excavations for the sewer will extend into water bearing sand deposits on Street H, west of Street T (see Borehole 3 and 30), the north leg of Street Q (see Borehole 13), and the south intersection of Streets Q and B (see Borehole 18). A positive dewatering system installed by a specialist dewatering contractor will likely be required to lower the groundwater table in the deposit. The hydraulic conductivity of the sand is estimated to vary depending on the texture between $10^{-3}$ to $10^{-4}$ cm/sec.

The design of the dewatering system should be left to the contractor's discretion, and the system should meet a performance specification to maintain and control the groundwater at least 0.30 m below the invert level in order to provide a stable excavation base. Successful dewatering operations will depend on the contractor's own experience, construction techniques, sequencing, and efficiency of work force and plant. Also the dewatering must be in compliance with the Ontario Water Resources Act (OWRA) and the Water Taking and Transfer Regulation (O.Reg. 387/04).

It is recommended that several test pits be dug during the tendering stage of the project in order that prospective contractors may familiarize themselves with the soil and groundwater conditions to be contacted.

### 4.3.2 Pipe Bedding

The subgrade soils beneath the watermain and sewer pipes will comprise native mineral soils or compacted fill placed during the site grading operations. No support problems are anticipated for flexible or rigid pipes founded in the native deposits or compacted on-site soils.

The native sand is geotechnically suitable for use as pipe bedding (see Figures 1 and 2) but the sand must meet the specifications of Norfolk County, otherwise, the pipe bedding for water and sewer services should be conventional Class 'B' pipe bedding comprising a minimum of 150 mm thick layer of OPSS Granular 'a' below the pipe invert. Pipe bedding should be provided around the pipe to at least 300 mm above the pipe. The bedding aggregate should be compacted to a minimum of 95% standard Proctor maximum dry density.

A well-graded clear stone such as Coarse Aggregate for HL4 Asphaltic Concrete (OPSS 1003) could be used in the sewer trenches as bedding below the spring line of the pipe to facilitate sump pump dewatering, if necessary. The clear stone should be compacted with a plate tamper.

Basal heave and piping in the bottom of the excavations may occur on Street H and Street Q due to the artesian and subartesian groundwater pressure noted in the sand layers underlying the silt. The sand should be depressurized/dewatered prior to excavation in order to prevent potential basal heave instability.

The proposed sewers could create hydraulic connections between groundwater regimes that are not presently connected. To stop the movement of groundwater along the pipe bedding, it is recommended that concrete or clay collars be installed around the pipes. The collars should be at least 1.0 m long and in place of the standard bedding material. We would be pleased to provide specific recommendations for locations of the cut-off collars during final design.

### 4.3.3 Trench Backfilling

The trenches above the specified pipe bedding should be backfilled with inorganic on-site soils placed in 300 mm thick lifts and compacted to at least 95% SPMDD.

Based on the results of insitu moisture content and standard Proctor moisture density tests carried out on the native overburden deposits, the on-site excavated sand above the groundwater table will be compactable to the required density, but with the silt it may be difficult to achieve the specified density on all the trench backfill. Nevertheless, it is recommended that the native soils be used as backfill in the trenches to prevent problems with differential frost heaving of imported subgrade materials. Non conventional compaction equipment, such as a hoe pack, may be necessary.

If necessary, compensation for wet trench backfill conditions can be made with additional Granular 'B' in the pavement structure. It should be noted, however, that the wet backfill material must be compacted to at least 90% standard Proctor maximum dry density (SPMDD) or post-construction settlements could occur.

To minimize potential problems, backfilling operations should follow closely after excavation so that only a minimal length of trench is exposed. Care should be taken to protect side slopes of excavations by diverting surface run-off away from the excavations. If construction extends into the Winter, then the backfilling operations should be planned so that exposure of the backfill material to frost is kept to a minimum and to ensure that frozen material is not used as backfill.

Frequent compaction testing by experienced geotechnical personnel should be carried out to examine and approve backfill materials, and to verify that the specified degree of compaction has been achieved.

## 4.4 Pavements

### 4.4.1 Pavement Design

Following site grading and servicing operations, the pavement subgrade will comprise native and recompacted silt and sand soils. The following pavement component thicknesses are recommended based on the proposed pavement usage, and the frost-susceptibility and strength of the subgrade soils:

**TABLE 4: PAVEMENT COMPONENT THICKNESSES**

| Pavement Component | Residential Collector Street * (Sand Subgrade) | Residential Crescent or Cul-de-Sac (Sand Subgrade) | Residential Collector Street * (Silt Subgrade) | Residential Crescent or Cul-de-Sac (Silt Subgrade) |
|---|---|---|---|---|
| Asphaltic Concrete | 100 mm | 80 mm | 100 mm | 80 mm |
| Granular 'A' Base | 150 mm | 150 mm | 150 mm | 150 mm |
| Granular 'B' Subbase | 350 mm | 300 mm | 450 mm | 400 mm |

* Collector Streets include Streets A, B, C and E

The pavement designs are based on the assumption that construction will be carried out during the drier time of the year and that the subgrade soil is stable as determined by proof-rolling inspected by a Geotechnical Engineer. If the subgrade is wet and unstable additional granular subbase will be required particularly in areas where the subgrade comprises silt.

Samples of both the Granular 'A' and Granular 'B' aggregates should be checked for conformance to OPSS 1010 prior to utilization on site and during construction. The Granular 'B' subbase and Granular 'A' base courses must be compacted to 100% standard Proctor maximum dry density (SPMDD), as verified by insitu density testing.

The asphaltic concrete should comprise a binder layer of HL4 and a surface layer of HL3. It is recommended that the compacted thicknesses be 60 mm of HL4 binder and 40 mm of HL3 surface for the residential collector streets, and 45 mm of HL4 binder and 35 mm of HL3 surface for the crescents and cul-de-sacs.

The asphaltic concrete paving materials should conform to the requirements of OPSS 1150. The asphalt should be placed and compacted in accordance with OPSS 310. The Performance Graded Asphalt Cement designation for the asphaltic concrete is 58-28.

### 4.4.2 Subdrains

The sand soils have fair to good natural drainage and therefore subdrains will not be required where sand is encountered at subgrade. This should be confirmed by a Geotechnical Engineer at the time of subgrade preparation.

The silt subgrade soils have poor natural drainage and therefore we recommend that subdrains be installed beneath the low areas of the pavement and connected to the catch basins. The purpose of the subdrains is to remove excess subsurface water in order to improve pavement serviceability and increase the pavement life. A detail for a typical pavement subdrain is provided on Drawing 6, in Appendix 4.

The work of subdrain installation shall be in accordance with OPSS 405 and OPSD 216.021. The subdrain shall be 100 or 150 mm diameter perforated pipe conforming to OPSS 1801 or 1840, and wrapped with geotextile conforming to OPSS 1860.

### 4.4.3 Curbs and Sidewalks

The concrete for curbs and sidewalks should be proportioned, mixed, placed, and cured in accordance with the requirements of OPSS 353 and OPSS 1350, and shall meet the following specific requirements (OPSS 353.05.01):

- minimum 28-day compressive strength = 30 MPa
- coarse aggregate = 19.0 mm nominal max. size
- maximum slump = 60 mm for curbs and 90 mm for sidewalks
- air entrainment = 7.0 ± 1.5%

During cold weather (when the air temperature is at or is likely to fall below 5°C within 96 hours of concrete placement) the freshly placed concrete must be covered with insulating blankets to protect against freezing, as per OPSS 904. Ice and snow must be removed from the area where concrete is to be placed and the concrete must not be placed against frozen ground. All cold weather protection material shall be on site prior to each concrete placement.

The subgrade for the concrete sidewalks should comprise undisturbed native mineral soil or well-compacted fill. A minimum 150 mm thick layer of compacted Granular 'A' type aggregate should be placed beneath the sidewalk slabs. The subgrade and granular base should be prepared in accordance with the requirements of OPSS 315.

## 4.5 Residential Buildings

### 4.5.1 Foundations

In general, the undisturbed native mineral soils are considered suitable to support residential house foundations. Where the footing levels will be above existing native mineral soil grade, structural fill will probably be used. House footings constructed on the compact native mineral soil or approved structural fill may be designed using the minimum footing sizes provided in the Ontario Building Code.

All founding surfaces for residential dwellings on structural fill or native soils should be inspected by LVM-Naylor personnel prior to placing concrete. The purpose of the inspection is to ensure that the subgrade soils are capable of supporting the house foundations, and to confirm that the house envelope does not extend beyond the limits of the structural fill pad.

Further geotechnical investigation will be necessary for large structures such as schools, plazas or apartment buildings to provide specific recommendations for design of these structures.

The subgrade soils are considered to be frost susceptible and must be protected from freezing at all times including during construction. The exterior footings or footings in unheated areas should be provided with a minimum 1.20 m of earth cover upon final grading for frost protection.

### 4.5.2 Basements

The basement floors should be designed at least 0.6 m above the seasonally high groundwater levels. We recommend that the site grading plans be reviewed by LVM-Naylor to ensure that the basements meet this condition.

House basements at this site must be provided with perimeter weeping tile systems as per the Ontario Building Code (Section 9.14). The drain tile or pipe should be laid on undisturbed or well-compacted soil so that the top of the tile or pipe (minimum 100 mm diameter) is below the bottom of the basement floor slab. The top and sides of the drain tile or pipe shall be covered with not less than 150 mm of crushed stone or other clean coarse granular material containing no more than 10% of material that will pass the 4 mm sieve. The weeping tile must drain to a suitable frost-free outlet or sump. The sump shall be equipped with an automatic pump that will discharge the water into a sewer, drainage ditch or dry well.

The portion of the exterior basement wall below finished ground level must be damp-proofed as per Section 9.13.2 of the Ontario Building Code (2006). The basement wall backfill should be graded to prevent drainage towards the foundation after settling as per OBC 9.12.3.

The basement walls should be designed to resist the lateral earth pressure. For calculating the lateral earth pressure, the coefficient of earth pressure (K) may be assumed as 0.50 for cohesionless sandy soils and 1.0 for silt. The bulk unit weight of the retained backfill may be taken as 21 kN/m$^3$ for well-compacted soil. An appropriate factor of safety should be employed.

The subgrade for the basement floor slabs should comprise undisturbed native soil or well-compacted fill. A minimum 100 mm thick layer of coarse clean granular material containing not more than 10% material that will pass a 4 mm sieve shall be placed beneath slabs in houses as per Section 9.16.2 of the Ontario Building Code. If the subgrade soil is wet, we recommend that subfloor weeping tiles be placed and connected to the sump pit.

## 4.6 At-Source Infiltration

At-source infiltration of water from house leaders in the northeast and south central parts of the subdivision will be feasible provided the native soils are sand or sand and gravel and the natural groundwater level is below the bottom of the pit or gallery. The factored infiltration rate for the sand is in the order of 30 mm/h. The soak-away pits should be more than 5 m from the building foundations and located so that drainage is away from the houses as per the Ontario Building Code.

The native silt deposits are not free draining and are not suitable for at-source stormwater infiltration.

The soak-away pits must be checked by LVM-Naylor at the time of construction to confirm satisfactory soil conditions, and to check that the pits are being constructed in accordance with the specifications

## 4.7 Stormwater Management Facilities

Stormwater management facilities are to be constructed at Block A in the north central part of the site and Blocks E and T at the south. The main facility at Block A will consist of a dry pond and a forebay. It is understood that the bottom of the dry pond is to be constructed at Elevation 214.50 m, and the bottom of the forebay is to be constructed at Elevation 213.25 m.

The finished grades at Block A will be at Elevation 216.0 m and the permanent pool level of the forebay will be at Elevation 214.5 m. The existing grades in this area generally range from Elevation 221.5 m in the west to Elevation 214.0 m at the east.

The subsoils generally comprise thick topsoil overlying silt and sand. Groundwater occurs in the sand deposits.

### 4.7.1 Excavations

Excavations for the ponds will likely encounter flowing sand in the bottom of the excavations due to high groundwater levels including sub-artisian groundwater pressure noted in the sand layers underlying the silt at Block A (see Borehole 3). The sand should be depressurized/dewatered prior to excavation in order to prevent basal heave instability. The situation should be assessed by a specialist dewatering contractor and additional test holes are recommended.

Slope subdrains will likely have to be installed to control seepage from the pond sides. The subdrains should be set into the pond banks at the seepage areas and connected to solid tiles that will convey the flow to the bottom of the pond. If seepage leads to slumping of the soil, then a loose revetement shall be placed on the slopes.

The finished side slopes of the ponds should be constructed with an inclination of 5 horizontal to 1 vertical because of the wet deposits. The finished slopes and pond bases should be topsoiled and vegetated as soon as possible after construction to minimize surface erosion except in the forebay where only the finished slopes above the permanent pool level should be topsoiled and vegetated.

It is recommended that several test pits be dug during the tendering stage of the project in order that prospective contractors may familiarize themselves with the soil and groundwater conditions to be contacted. The design drawings for the stormwater management ponds should be checked by LVM-Naylor.

### 4.7.2 Berms

It is anticipated that low berms may be constructed around the perimeter of the pond. Prior to construction of the berms, the existing topsoil layer should be removed from beneath the plan area of the berms. Following removal of the topsoil, the subgrade should be inspected by LVM-Naylor.

If permeable sand soil is exposed at the berm subgrade a cut-off trench should be excavated down to the level of the underlying silt. The cut-off trench should be a minimum 1.2 m wide and should be backfilled with relatively impermeable till or clayey silt soil, compacted to at least 95% SPMDD. This will reduce under-seepage and the risk of erosion at the downstream toe of the berm. Dewatering will likely be required for construction of the cut-off trench.

After preparing the subgrade and cut-off trench (if necessary), the berms may be constructed as a homogeneous-type earth fill structure using on-site clayey silt or glacial till soils. Native silt and sand should not be used. The berm fill should be placed in 300 mm thick lifts and compacted with a pegfoot roller to minimum 95% SPMDD. We recommend that the berm slopes be constructed with an inclination of 3 horizontal to 1 vertical or less. The finished slopes should be topsoiled and vegetated as soon as possible after construction to minimize surface erosion. The minimum topsoil thickness should be 100 mm.

Erosion protection of slopes should be placed in accordance with OPSS Section 572. Erosion control blanket Type W secured with staples should be placed, as required.

The foundation for the earth berm will comprise native mineral soil. The native soil is adequate to support 2 to 3 m high berms without undergoing settlement. The factor of safety against sliding for the low berms constructed on the native soils is 1.5. Also, since the resultant force acts within the middle third of the embankment adequate safety against overturning is ensured.

Some routine maintenance of the slope surfaces will likely be required to address minor long-term weathering and erosion, and to check for the presence of burrowing animals in the face of the slopes.

### 4.7.3 Subdrains

The slope drains should comprise a 150 mm diameter perforated PVC subdrain tile in geotextile sock and bedded in filter sand (OPSS 1002 Fine Aggregate for Concrete). The filter sand must extend at least 150 mm below the pipe invert and to 150 mm on each side of the pipe. Sand must extend above the pipe to a minimum 300 mm from the surface. The filter sand must be compacted to 95% standard Proctor maximum dry density (SPMDD). All works should be as per OPSS 410, OPSS 314 and OPSS 1004. A typical detail for a slope subdrain is provided on Drawing 7, in Appendix 4.

If the bank seepage is too extensive (i.e. spread over the entire face of the bank) then loose revetments and 5 horizontal to 1 vertical slopes should be used.

### 4.7.4 Inlet / Outlet Structures

The outlet pipes should be carefully backfilled with excavated glacial till or clayey silt soils. The backfill should be in intimate contact with complete circumference of the pipe. In places where proper compaction may be difficult to achieve, lean concrete backfill should be used. We also recommend seepage collars be provided on the pipes to reduce the risk of internal piping erosion along the pipe/soil interface.

If headwall structures are proposed, then the support for these structures must be derived from the native mineral soil deposits. An allowable bearing pressure of 150 kPa is available in the undisturbed native soil. The founding soil must be inspected by a Geotechnical Engineer at the time of the construction in order to confirm the bearing capacity. The headwalls and wingwalls should be backfilled using free-draining granular material and may be designed using an active earth pressure coefficient of 0.35 and a unit weight of 21 kN/m$^3$. Any footings must be protected with a minimum 1.2 m of earth cover or equivalent insulation to provide protection against potential frost damage (concrete headwall as per OPSD 804.030).

Geotechnical inspections and insitu density testing should be conducted during stormwater management facility construction in order to verify that all organic deposits have been properly stripped and to ensure that all fill materials are being adequately compacted.

## 5. STATEMENT OF LIMITATIONS

The geotechnical recommendations provided in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known at the time of report preparation, we recommend that we be retained during the final design stage to verify that the geotechnical recommendations have been correctly interpreted in the design. We also recommend that we be retained during construction to confirm that the subsurface conditions do not deviate materially from those encountered in the boreholes and to ensure that our recommendations are properly understood.

The geotechnical recommendations provided in this report are intended for the use of the project designer. They are not intended as specifications or instructions to contractors. Any use which a contractor makes of this report, or decisions made based on it, are the responsibility of the contractor. The contractor must also accept the responsibility for means and methods of construction, seek additional information if required, and draw their own conclusions as to how the subsurface conditions may affect them.

It is important to note that the geotechnical investigation involves a limited sampling of the site gathered at specific test hole locations and the conclusions in this report are based on this information gathered. The subsurface conditions between and beyond the test holes will differ from those encountered at the test holes. Should subsurface conditions be encountered which differ materially from those indicated at the test holes, we request that we be notified in order to assess the additional information and determine whether or not changes should be made as a result of the conditions.

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# Appendix 1 List of Abbreviations

**(1 page)**

# LIST OF ABBREVIATIONS

The abbreviations commonly employed on the borehole logs, on the figures, and in the text of the report, are as follows:

| Sample Types | | Soil Tests and Properties | |
|---|---|---|---|
| AS | auger sample | SPT | Standard Penetration Test |
| CS | chunk sample | UC | unconfined compression |
| RC | rock core | FV | field vane test |
| SS | split spoon | ø | angle of internal friction |
| TW | thin-walled, open | $\gamma$ | unit weight |
| WS | wash sample | $w_p$ | plastic limit |
| | | w | water content |
| | | $w_l$ | liquid limit |
| | | $I_L$ | liquidity index |
| | | $I_p$ | plasticity index |
| | | PP | pocket penetrometer |

## Penetration Resistances

| | |
|---|---|
| Dynamic Penetration Resistance | The number of blows by a 63.5 kg (140 lb.) hammer dropped 0.76 m (30 in.) required to drive a 50 mm (2 in.) diameter 60 ° cone a distance 0.30 m (12 in.). The cone is attached to 'A' size drill rods and casing is not used. |
| Standard Penetration Resistance, N (ASTM D1586) | The number of blows by a 63.5 kg (140 lb.) hammer dropped 0.76 m (30 in.) required to drive a standard split spoon sampler 0.30 m (12 in.) |
| WH | sampler advanced by static weight of hammer |
| PH | sampler advanced by hydraulic pressure |
| PM | sampler advanced by manual pressure |

## Soil Description

| **Cohesionless Soils** | **SPT 'N' Value** | **$D_r$ (%)** |
|---|---|---|
| **Relative Density ($D_r$)** | (blows per 0.30 m) | |
| Very Loose | 0 to 4 | 0 to 20 |
| Loose | 4 to 10 | 20 to 40 |
| Compact | 10 to 30 | 40 to 60 |
| Dense | 30 to 50 | 60 to 80 |
| Very Dense | over 50 | 80 to 100 |

| **Cohesive Soils** | Undrained Shear Strength ($C_u$) | |
|---|---|---|
| **Consistency** | **kPa** | **psf** |
| Very Soft | less than 12 | less than 250 |
| Soft | 12 to 25 | 250 to 500 |
| Firm | 25 to 50 | 500 to 1000 |
| Stiff | 50 to 100 | 1000 to 2000 |
| Very Stiff | 100 to 200 | 2000 to 4000 |
| Hard | over 200 | over 4000 |

| | |
|---|---|
| DTPL | Drier than plastic limit |
| APL | About plastic limit |
| WTPL | Wetter than plastic limit |

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# Appendix 2 Borehole and Test Pit Logs

**(42 pages)**

Boreholes 1 to 30 and 12A
Test Pit Logs – Test Pits 101 to 111
Test Pits 1 to 7

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 1**

**Ground Elevation:** *226.84 m*

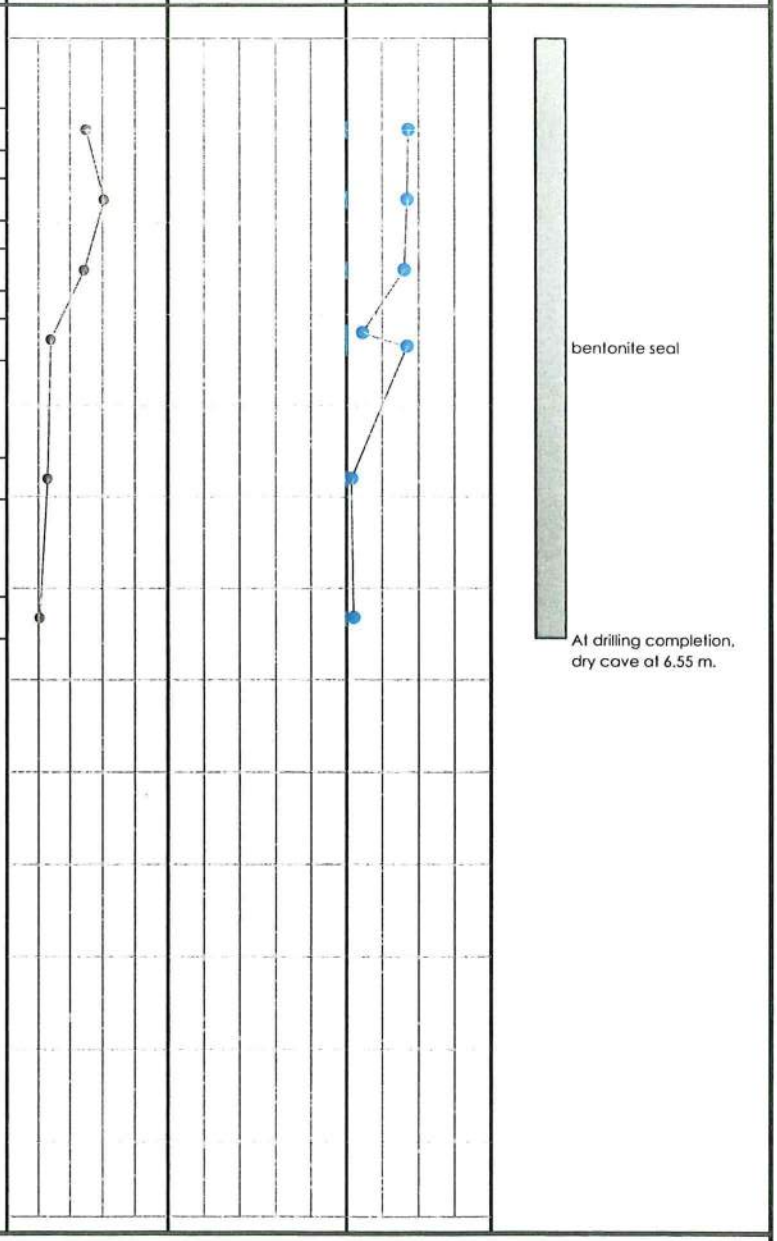
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 226.84 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** dense to very dense brown silt, trace fine sand, very moist | | 226.00 | 1 | SS | 50 |
| 2.00 | | | 225.00 | 2 | SS | 61 |
| | | | | 3 | SS | 49 |
| 3.00 | ***SAND:*** compact brown silty fine to medium sand, very moist; some brown fine to medium sand layers, damp | | 224.00 | 4 | SS | 28 |
| 4.00 | | | 223.00 | | | |
| | compact light brown fine to medium sand, trace silt, damp | | | | | |
| 5.00 | | | 222.00 | 5 | SS | 26 |
| 6.00 | | | 221.00 | 6 | SS | 21 |
| | Borehole terminated at 6.55 m. | | | | | |
| 7.00 | | | 220.00 | | | |
| 8.00 | | | 219.00 | | | |
| 9.00 | | | 218.00 | | | |
| 10.00 | | | 217.00 | | | |
| 11.00 | | | 216.00 | | | |
| 12.00 | | | 215.00 | | | |
| | | | 214.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 2**

**Ground Elevation:** *222.13 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 222.13 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** loose rusty brown silty sand, moist | 221.00 | 1 | SS | 5 |
| 2.00 | loose to compact brown fine to coarse sand, trace silt and fine gravel, moist | 220.00 | 2 | SS | 10 |
| 3.00 | compact brown fine to coarse sand, trace silt, damp | 219.00 | 3 | SS | 12 |
| 4.00 | | 218.00 | 4 | SS | 14 |
| | dense, some fine gravel, damp | | 5 | SS | 44 |
| 5.00 | Borehole terminated at 5.03 m. | 217.00 | | | |
| 6.00 | | 216.00 | | | |
| 7.00 | | 215.00 | | | |
| 8.00 | | 214.00 | | | |
| 9.00 | | 213.00 | | | |
| 10.00 | | 212.00 | | | |
| 11.00 | | 211.00 | | | |
| 12.00 | | 210.00 | | | |

SOIL PROFILE | SAMPLE

Dynamic Cone (X) 20 40 60 80
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

At drilling completion, dry cave at 5.03 m.

No free groundwater encountered during drilling.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 3**

**Ground Elevation:** *216.48 m*

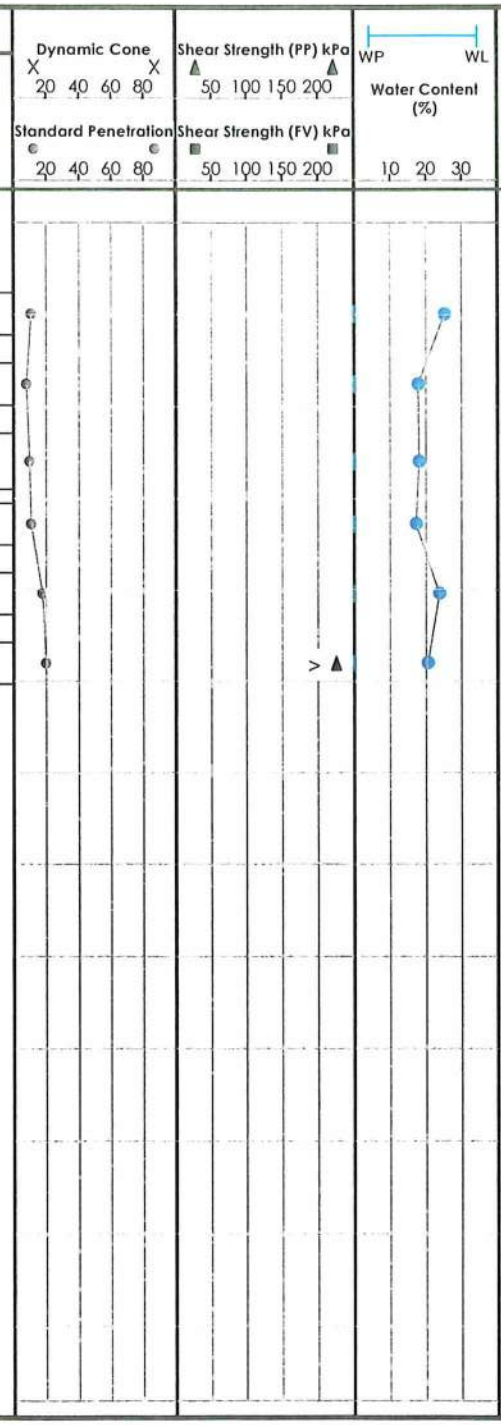
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

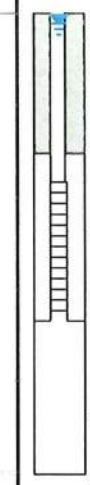
**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 216.48 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** loose to compact brown silt, trace fine sand, very moist to wet | | 1 | SS | 11 |
| | | 215.00 | 2 | SS | 8 |
| 2.00 | ***SAND:*** compact brown fine to coarse sand, some fine gravel, saturated (subartesian) | 214.00 | 3 | SS | 10 |
| 3.00 | | | 4 | SS | 11 |
| | ***SILT:*** compact brown silt, wet | 213.00 | | | |
| 4.00 | ***SILT TILL:*** very stiff grey silt, some clay and sand, trace fine gravel, APL | | 5 | SS | 18 |
| | | 212.00 | 6 | SS | 20 |
| 5.00 | Borehole terminated at 5.03 m. | | | | |
| | | 211.00 | | | |
| 6.00 | | | | | |
| | | 210.00 | | | |
| 7.00 | | | | | |
| | | 209.00 | | | |
| 8.00 | | | | | |
| | | 208.00 | | | |
| 9.00 | | | | | |
| | | 207.00 | | | |
| 10.00 | | | | | |
| | | 206.00 | | | |
| 11.00 | | | | | |
| | | 205.00 | | | |
| 12.00 | | | | | |
| | | 204.00 | | | |




**Groundwater Observations and Standpipe Details**



Nov. 10, 2009
Water level at 0.11 m (Elev. 216.37 m)

19 mm pipe

bentonite seal

1.5 m slotted filter

native cave

At drilling completion, wet cave at 1.52 m.

Upon completion of excavation, water level at 0.61 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 4**

**Ground Elevation:** *228.23 m*

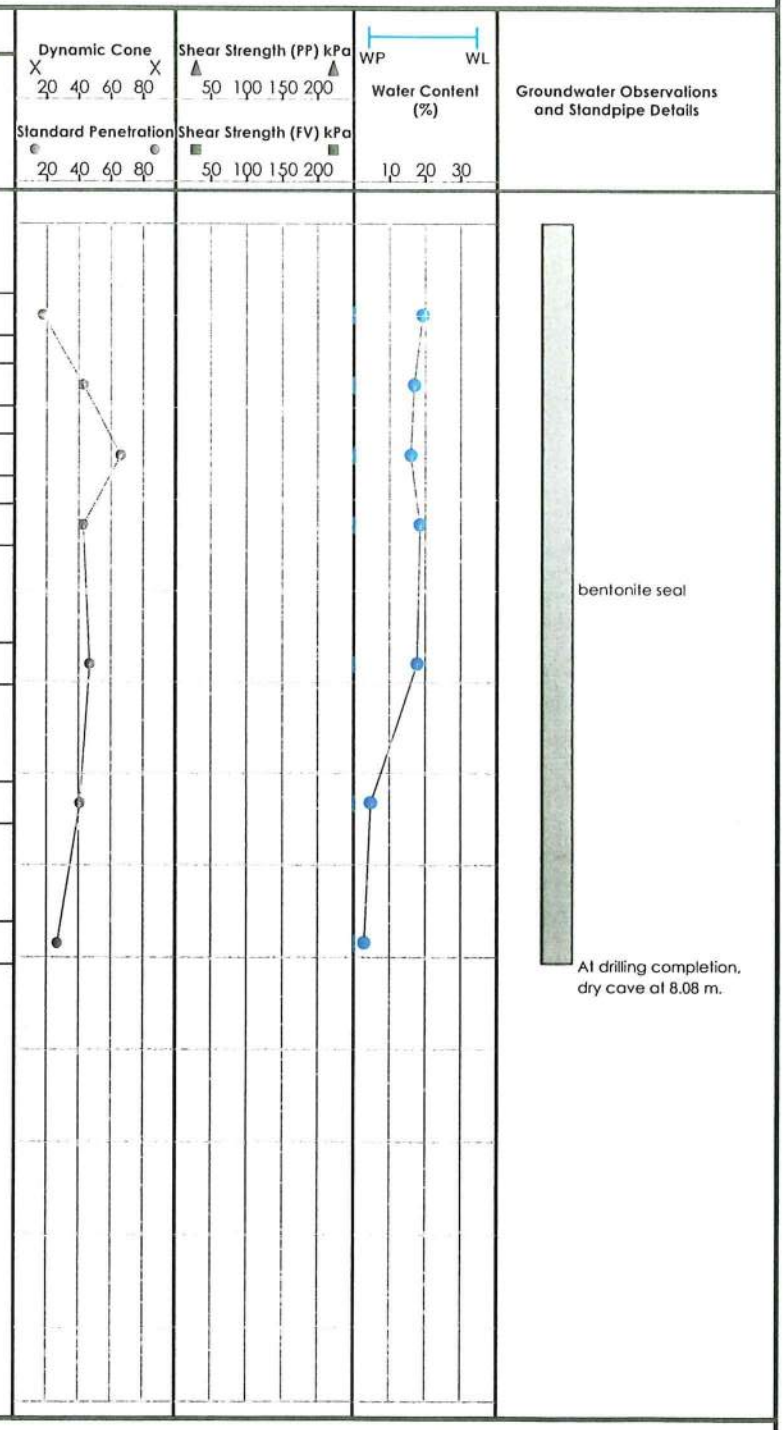
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 228.23 | | | |
| 0.00 | **TOPSOIL:** dark brown silt, moist | | | | |
| 1.00 | **SAND:** compact brown to rusty brown fine to medium sand, some silt, very moist | 227.00 | 1 | SS | 18 |
| | brown silt layer | | 2 | SS | 43 |
| 2.00 | **SILT:** dense brown silt, trace fine sand, moist to very moist | 226.00 | 3 | SS | 66 |
| 3.00 | | 225.00 | 4 | SS | 43 |
| 4.00 | | 224.00 | | | |
| 5.00 | | 223.00 | 5 | SS | 47 |
| 6.00 | **SAND:** dense brown fine to medium sand, trace silt, moist | 222.00 | 6 | SS | 41 |
| 7.00 | | 221.00 | | | |
| | compact | | 7 | SS | 27 |
| 8.00 | Borehole terminated at 8.08 m. | 220.00 | | | |
| 9.00 | | 219.00 | | | |
| 10.00 | | 218.00 | | | |
| 11.00 | | 217.00 | | | |
| 12.00 | | 216.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 2.44 to 3.66 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number:** 5

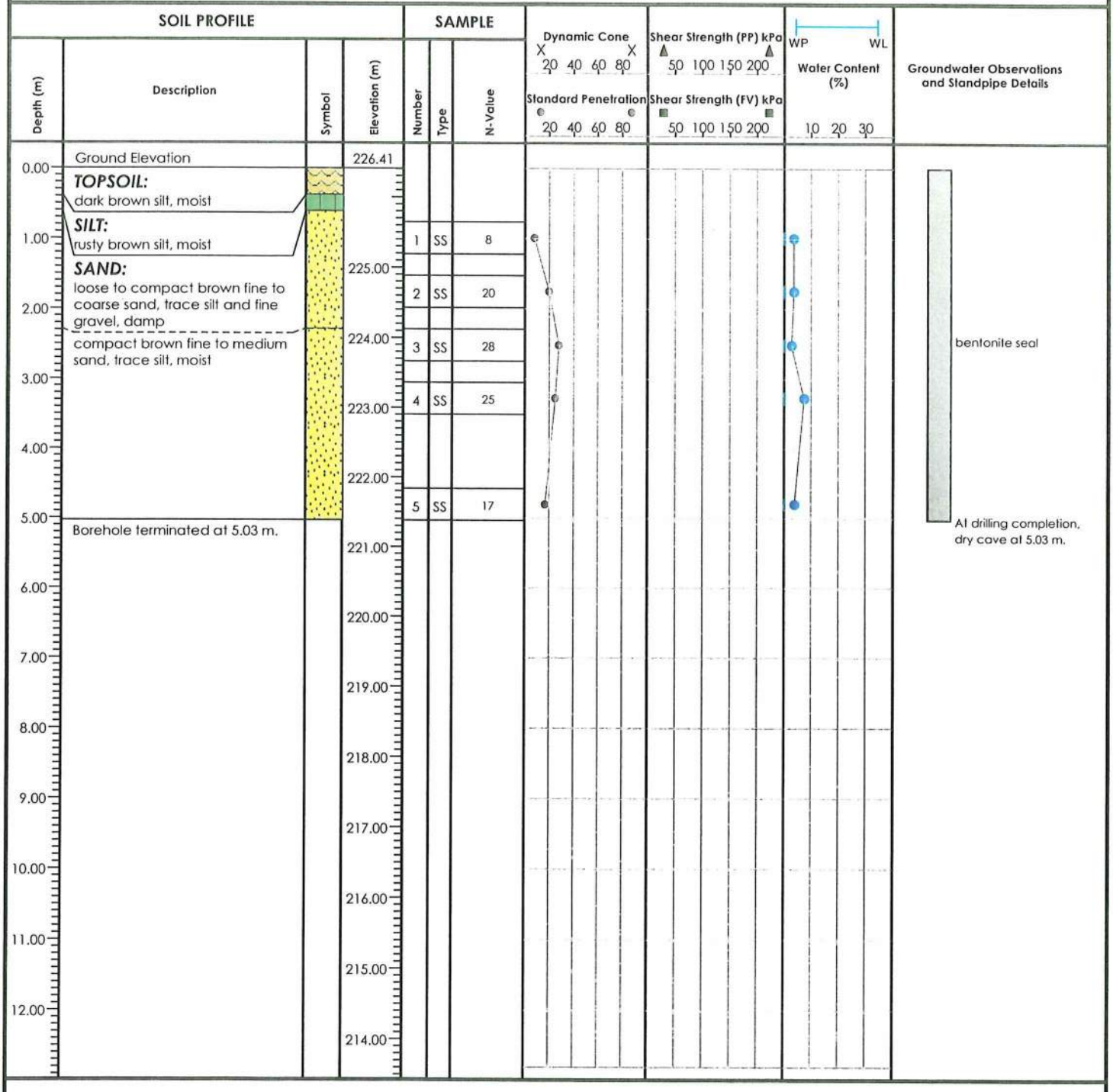
**Ground Elevation:** 226.41 m

**Project:** Residential Subdivision

**Job No.:** P030592

**Location:** Decou Road and Ireland Road, Simcoe, Ontario

**Drill Date:** November 5, 2009




**Reviewed by:** TS

**Drill Method:** Solid Stem Auger

**Notes:**

**Field Tech.:** RM

**Sheet:** 1 of 1

**Drafted by:** KS

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 6**

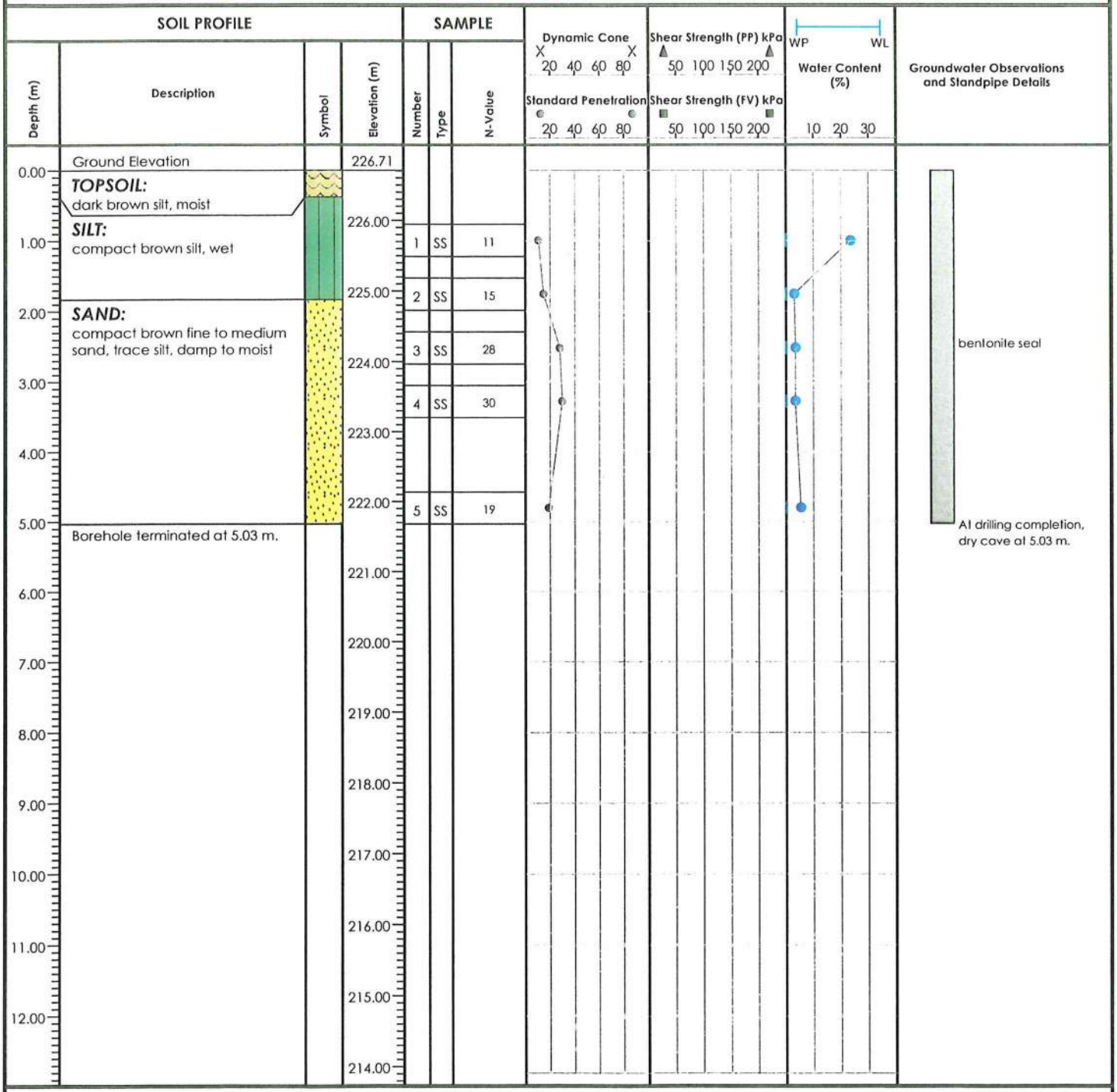
**Ground Elevation: 226.71 m**

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 7**

**Ground Elevation:** *226.70 m*

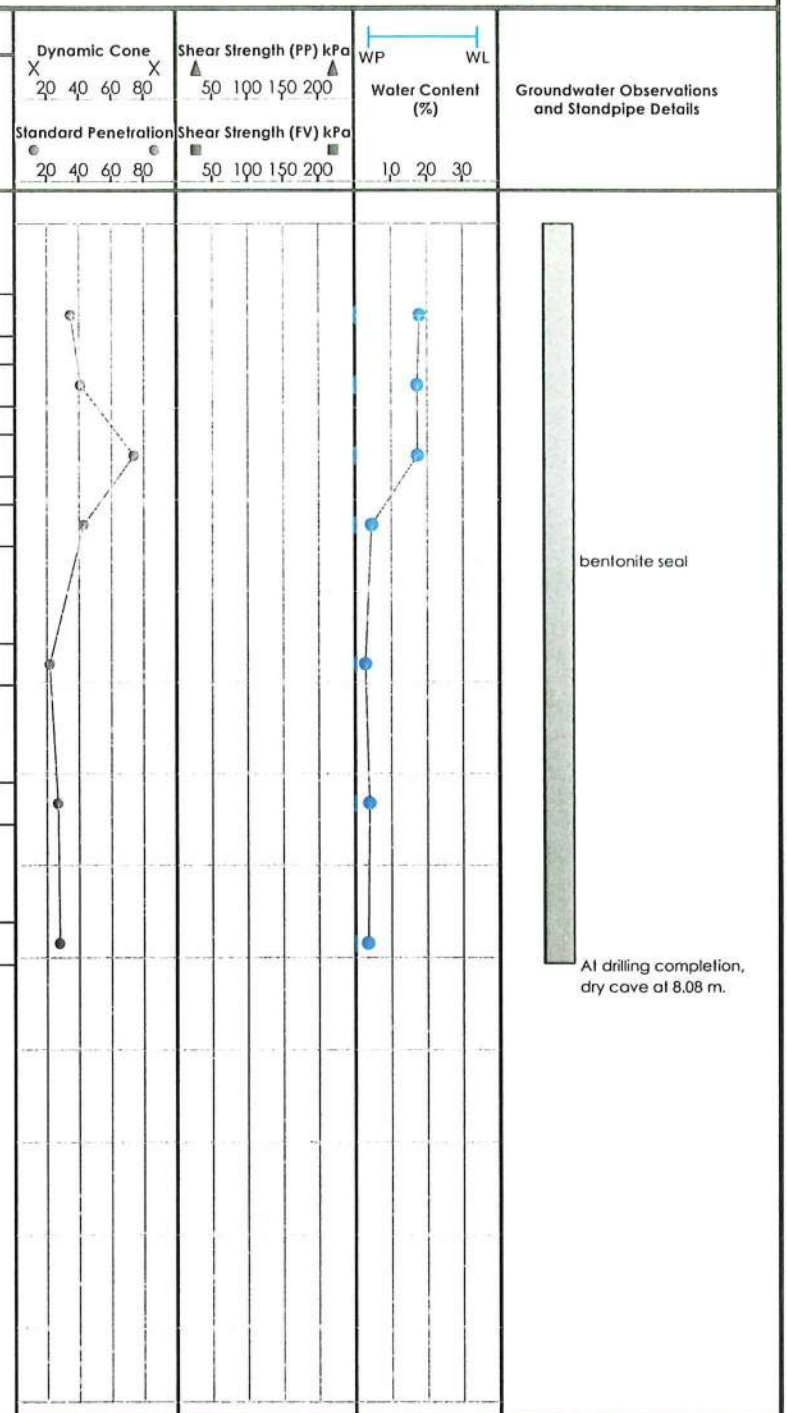
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 226.70 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SILT:*** dense brown silt, trace fine sand, very moist | 226.00 | 1 | SS | 35 |
| 1.00 | | 225.00 | 2 | SS | 41 |
| 2.00 | very dense | 224.00 | 3 | SS | 74 |
| 3.00 | ***SAND:*** dense brown fine to coarse sand, trace silt, moist | 223.00 | 4 | SS | 43 |
| 4.00 | compact fine to medium sand, trace silt, damp | 222.00 | 5 | SS | 22 |
| 5.00 | | 221.00 | | | |
| 6.00 | | 220.00 | 6 | SS | 27 |
| 7.00 | | 219.00 | 7 | SS | 28 |
| 8.00 | Borehole terminated at 8.08 m. | 218.00 | | | |
| 9.00 | | 217.00 | | | |
| 10.00 | | 216.00 | | | |
| 11.00 | | 215.00 | | | |
| 12.00 | | 214.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 8**

**Ground Elevation:** *219.90 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

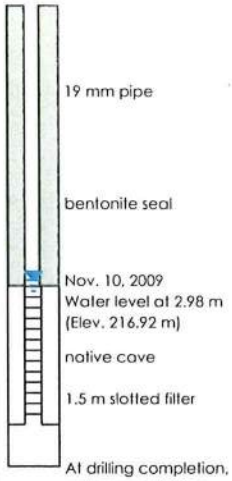
**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 219.90 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SAND:*** compact brown fine to coarse sand, trace silt and fine gravel, moist | | 219.00 | 1 | SS | 11 |
| 2.00 | | | 218.00 | 2 | SS | 17 |
| 3.00 | saturated | | 217.00 | 3 | SS | 30 |
| 4.00 | | | 216.00 | 4 | SS | 14 |
| 5.00 | | | 215.00 | 5 | SS | 10 |
| | Borehole terminated at 5.03 m. | | | | | |
| 6.00 | | | 214.00 | | | |
| 7.00 | | | 213.00 | | | |
| 8.00 | | | 212.00 | | | |
| 9.00 | | | 211.00 | | | |
| 10.00 | | | 210.00 | | | |
| 11.00 | | | 209.00 | | | |
| 12.00 | | | 208.00 | | | |

Dynamic Cone (X) 20 40 60 80 X
Standard Penetration (●) 20 40 60 80 ●

Shear Strength (PP) kPa ▲ 50 100 150 200 ▲
Shear Strength (FV) kPa ■ 50 100 150 200 ■

WP WL
Water Content (%) 10 20 30




Groundwater Observations and Standpipe Details

**Reviewed by:** *TS*
**Drill Method:** *Solid Stem Auger*
**Notes:**

**Field Tech.:** *RM*
**Sheet:** *1 of 1*
**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 9**

**Ground Elevation:** *223.30 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 223.30 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** very loose brown to rusty brown silt, wet | 222.00 | 1 | SS | 2 |
| | brown | | 2 | SS | 3 |
| 2.00 | | 221.00 | | | |
| | ***SAND:*** compact brown fine to coarse sand, trace silt, moist | | 3 | SS | 13 |
| 3.00 | | 220.00 | 4 | SS | 29 |
| 4.00 | | 219.00 | | | |
| | | | 5 | SS | 24 |
| 5.00 | Borehole terminated at 5.03 m. | 218.00 | | | |
| 6.00 | | 217.00 | | | |
| 7.00 | | 216.00 | | | |
| 8.00 | | 215.00 | | | |
| 9.00 | | 214.00 | | | |
| 10.00 | | 213.00 | | | |
| 11.00 | | 212.00 | | | |
| 12.00 | | 211.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

At drilling completion, dry cave at 5.03 m

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 10**

**Ground Elevation:** *227.74 m*

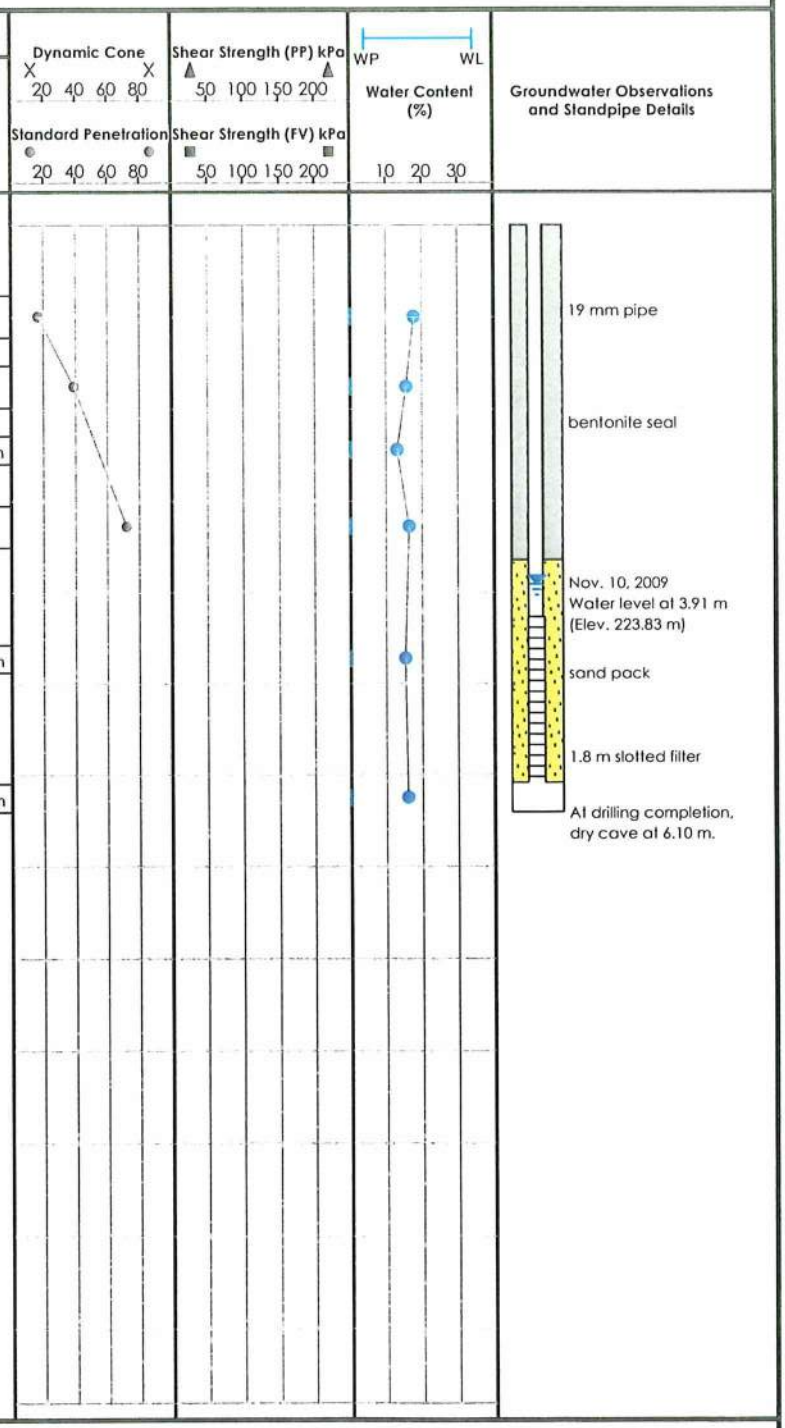
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 227.74 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SILT:*** compact to dense brown clayey silt, trace fine sand, very moist | 227.00 | 1 | SS | 17 |
| 1.00 | | 226.00 | 2 | SS | 39 |
| 2.00 | very dense, moist; occasional fine sand seams to 2.59 m, damp | 225.00 | 3 | SS | 48\150mm |
| 3.00 | moist | 224.00 | 4 | SS | 72 |
| 4.00 | | 223.00 | 5 | SS | 60\150mm |
| 5.00 | | 222.00 | 6 | SS | 52\150mm |
| 6.00 | Borehole terminated at 6.40 m. | 221.00 | | | |
| 7.00 | | 220.00 | | | |
| 8.00 | | 219.00 | | | |
| 9.00 | | 218.00 | | | |
| 10.00 | | 217.00 | | | |
| 11.00 | | 216.00 | | | |
| 12.00 | | 215.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 1.22 to 2.44 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 11**

**Ground Elevation:** *228.06 m*

**Project:** *Residential Subdivision*

**Job No.:** *7780G2*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

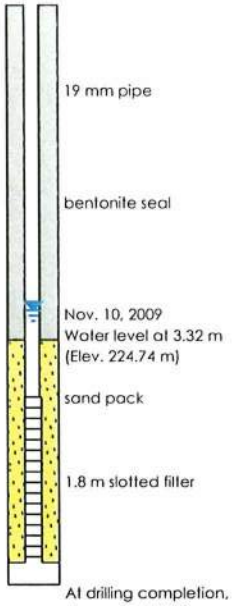
**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 228.06 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** very loose rusty brown fine sandy silt, very moist | 227.00 | 1 | SS | 4 |
| | ***SAND:*** compact brown fine sand, some silt, very moist | | 2 | SS | 28 |
| 2.00 | | 226.00 | | | |
| | ***SILT:*** compact to dense brown silt, trace fine sand, moist; some fine sand layers, very moist | | 3 | SS | 48 |
| 3.00 | | 225.00 | 4 | SS | 69 |
| | very dense | | | | |
| 4.00 | | 224.00 | | | |
| | occasional brown clayey silt layers, DTPL | | 5 | SS | 40\150mm |
| 5.00 | | 223.00 | | | |
| 6.00 | | 222.00 | 6 | SS | 50\75mm |
| | Borehole terminated at 6.32 m. | | | | |
| 7.00 | | 221.00 | | | |
| 8.00 | | 220.00 | | | |
| 9.00 | | 219.00 | | | |
| 10.00 | | 218.00 | | | |
| 11.00 | | 217.00 | | | |
| 12.00 | | 216.00 | | | |

Dynamic Cone (X) 20 40 60 80 X
Standard Penetration 20 40 60 80

Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200

WP WL
Water Content (%) 10 20 30




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 12**

**Ground Elevation:** *218.54 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 218.54 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** loose to compact brown silt, trace fine sand, very moist to wet | | 1 | SS | 8 |
| | dilatant, saturated | 217.00 | 2 | SS | 18 |
| 2.00 | | | | | |
| | | 216.00 | 3 | SS | 13 |
| 3.00 | | | | | |
| | | 215.00 | 4 | SS | 16 |
| 4.00 | | | | | |
| | | 214.00 | 5 | SS | 15 |
| 5.00 | | | | | |
| | grey clayey silt, trace sand, APL | 213.00 | 6 | SS | 14 |
| 6.00 | | | | | |
| | | 212.00 | 7 | SS | 8 |
| 7.00 | Borehole terminated at 6.71 m. | | | | |
| | | 211.00 | | | |
| 8.00 | | | | | |
| | | 210.00 | | | |
| 9.00 | | | | | |
| | | 209.00 | | | |
| 10.00 | | | | | |
| | | 208.00 | | | |
| 11.00 | | | | | |
| | | 207.00 | | | |
| 12.00 | | | | | |
| | | 206.00 | | | |

Dynamic Cone (X): 20 40 60 80
Standard Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details:
- 19 mm pipe
- bentonite seal
- sand pack
- Nov. 10, 2009 Water level at 4.63 m (Elev. 213.91 m)
- 1.8 m slotted filter
- At drilling completion, wet cave at 6.10 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 12A**

**Ground Elevation:** *218.84 m*

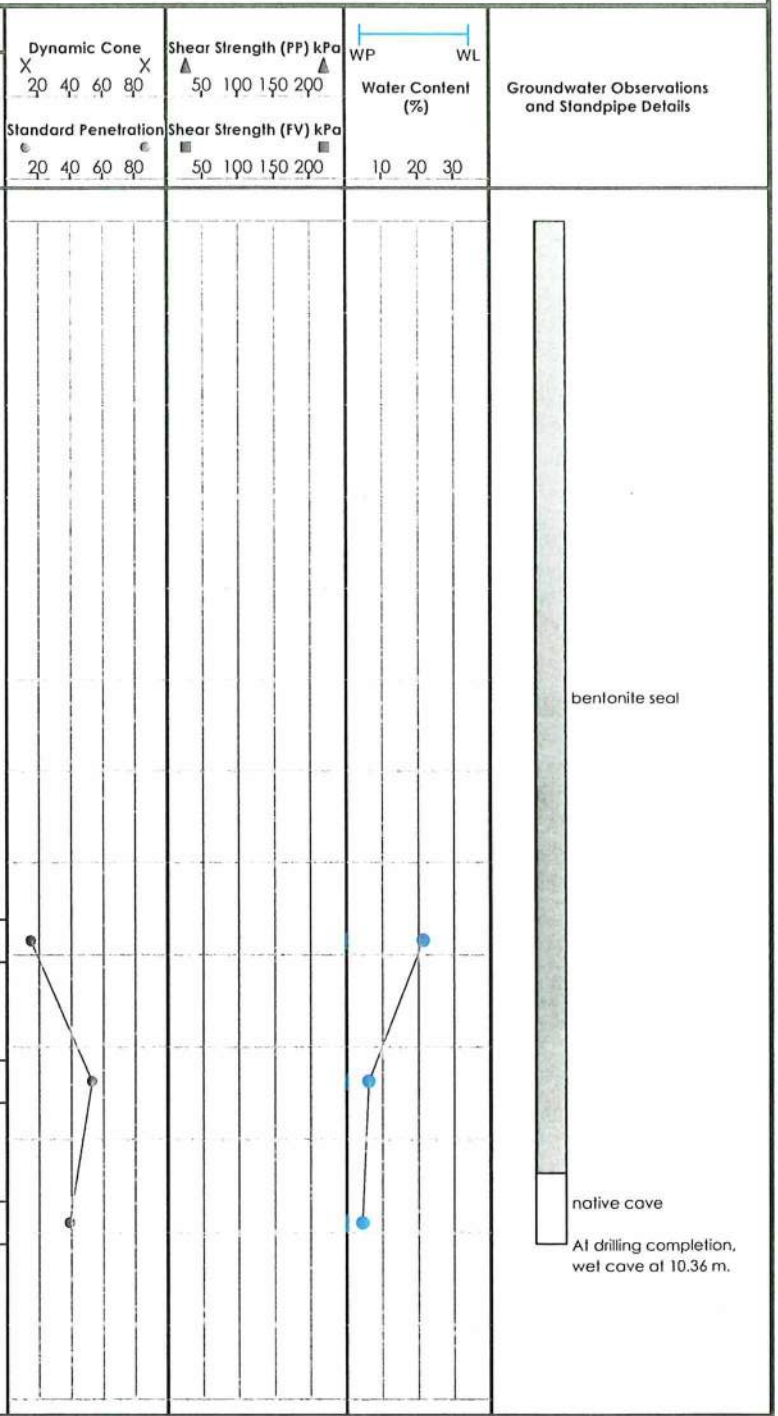
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 218.84 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** loose to compact brown silt, trace fine sand, very moist to wet | 218.00 | | | |
| | dilatant, saturated | | | | |
| 2.00 | | 217.00 | | | |
| 3.00 | | 216.00 | | | |
| 4.00 | | 215.00 | | | |
| 5.00 | | 214.00 | | | |
| | grey clayey silt, trace sand, APL | | | | |
| 6.00 | | 213.00 | | | |
| | compact grey silt, some fine sand, saturated, dilatant | | | | |
| 7.00 | | 212.00 | | | |
| 8.00 | | 211.00 | 1 | SS | 15 |
| 9.00 | | 210.00 | | | |
| | ***SAND:*** very dense brown fine to medium sand, trace silt, moist | | 2 | SS | 53 |
| 10.00 | | 209.00 | | | |
| 11.00 | ***SILT:*** dense grey silt, some sand, saturated | 208.00 | 3 | SS | 39 |
| | ***SAND:*** dense brown fine to medium sand, moist | | | | |
| 12.00 | Borehole terminated at 11.13 m. | 207.00 | | | |
| | | 206.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Stratigraphy from 0.00 to 6.10 m is inferred from Borehole 12.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 13**

**Ground Elevation:** *217.40 m*

**Project:** *Residential Subdivision*

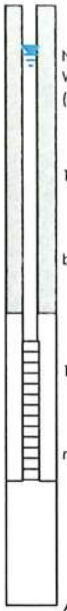
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 217.40 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** loose brown silt, trace fine sand and clay, saturated | | | 1 | SS | 8 |
| | compact | | 216.00 | 2 | SS | 16 |
| 2.00 | | | | | | |
| | | | 215.00 | 3 | SS | 29 |
| 3.00 | ***SAND:*** loose to compact brown fine to coarse sand, trace gravel to 3.05 m, saturated | | | 4 | SS | 5 |
| 4.00 | | | 214.00 | | | |
| | | | 213.00 | 5 | SS | 18 |
| 5.00 | ***SILT:*** compact brown silt, trace fine sand, saturated, dilatant | | | | | |
| 6.00 | | | 212.00 | 6 | SS | 26 |
| | Borehole terminated at 6.55 m. | | 211.00 | | | |
| 7.00 | | | 210.00 | | | |
| 8.00 | | | 209.00 | | | |
| 9.00 | | | 208.00 | | | |
| 10.00 | | | 207.00 | | | |
| 11.00 | | | 206.00 | | | |
| 12.00 | | | 205.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number:** 14

**Ground Elevation:** *218.00 m*

**Project:** *Residential Subdivision*

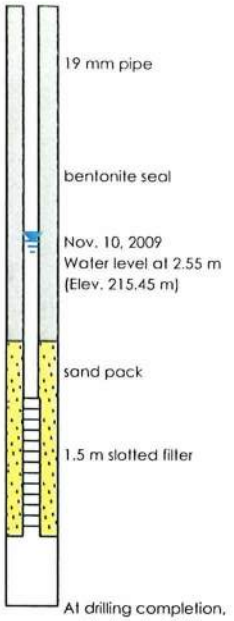
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 218.00 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** compact to dense brown silt, trace fine sand, very moist | 217.00 | 1 | SS | 14 |
| 2.00 | | 216.00 | 2 | SS | 37 |
| 3.00 | | 215.00 | 3 | SS | 42 |
| 3.00 | very dense | | 4 | SS | 35\150mm |
| 4.00 | grey, moist | 214.00 | | | |
| 4.00 | ***SAND AND GRAVEL:*** compact brown medium to coarse sand and fine gravel, saturated | | 5 | SS | 25 |
| 5.00 | ***SILT:*** compact brown silt, saturated, dilatant | 213.00 | | | |
| 6.00 | grey | 212.00 | 6 | SS | 10 |
| 6.55 | Borehole terminated at 6.55 m. | 211.00 | | | |
| 7.00 | | | | | |
| 8.00 | | 210.00 | | | |
| 9.00 | | 209.00 | | | |
| 10.00 | | 208.00 | | | |
| 11.00 | | 207.00 | | | |
| 12.00 | | 206.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 1.52 to 3.05 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 15**

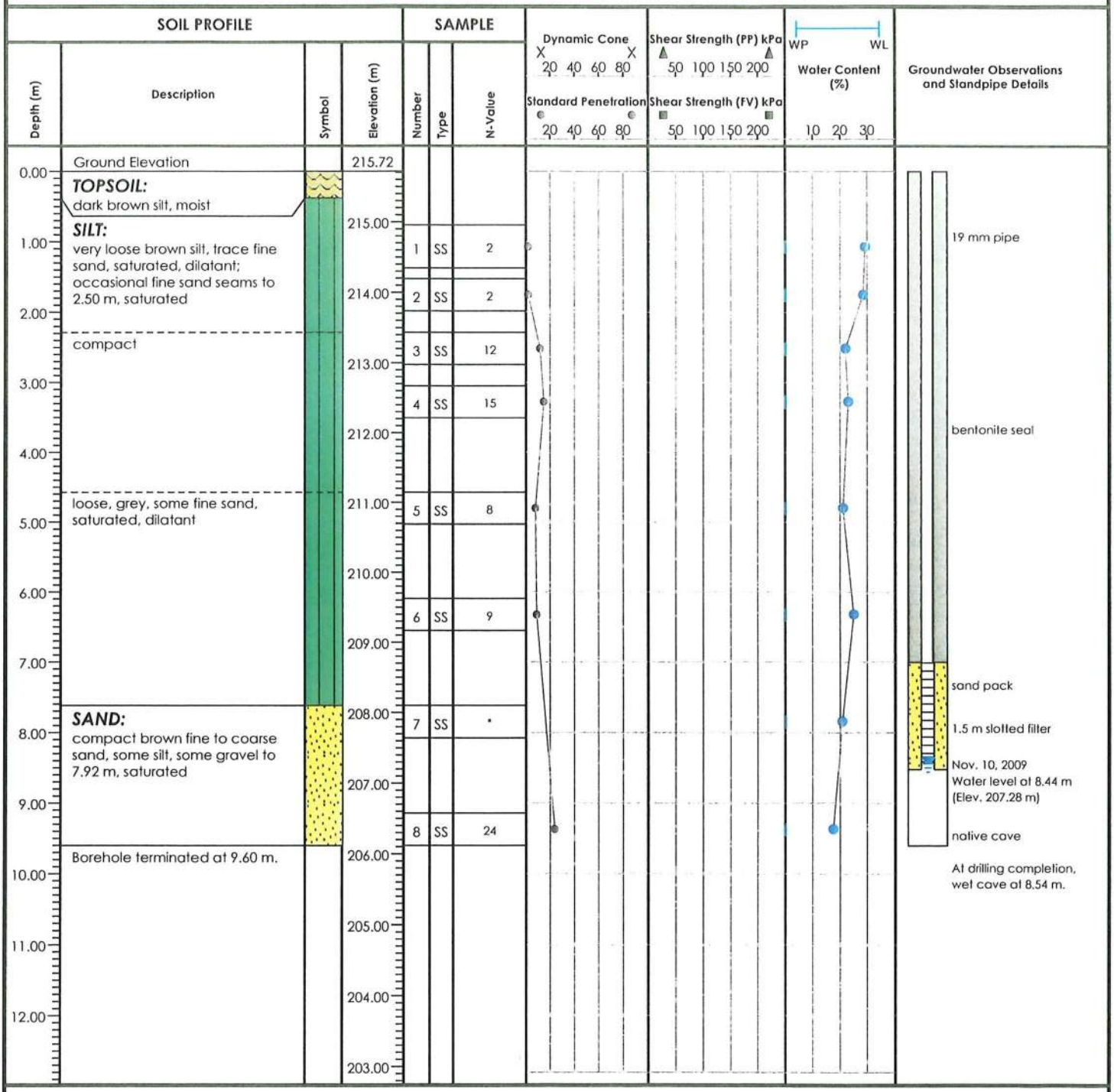
**Ground Elevation:** *215.72 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 0.61 to 2.13 m. * Sampler bouncing*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 16**

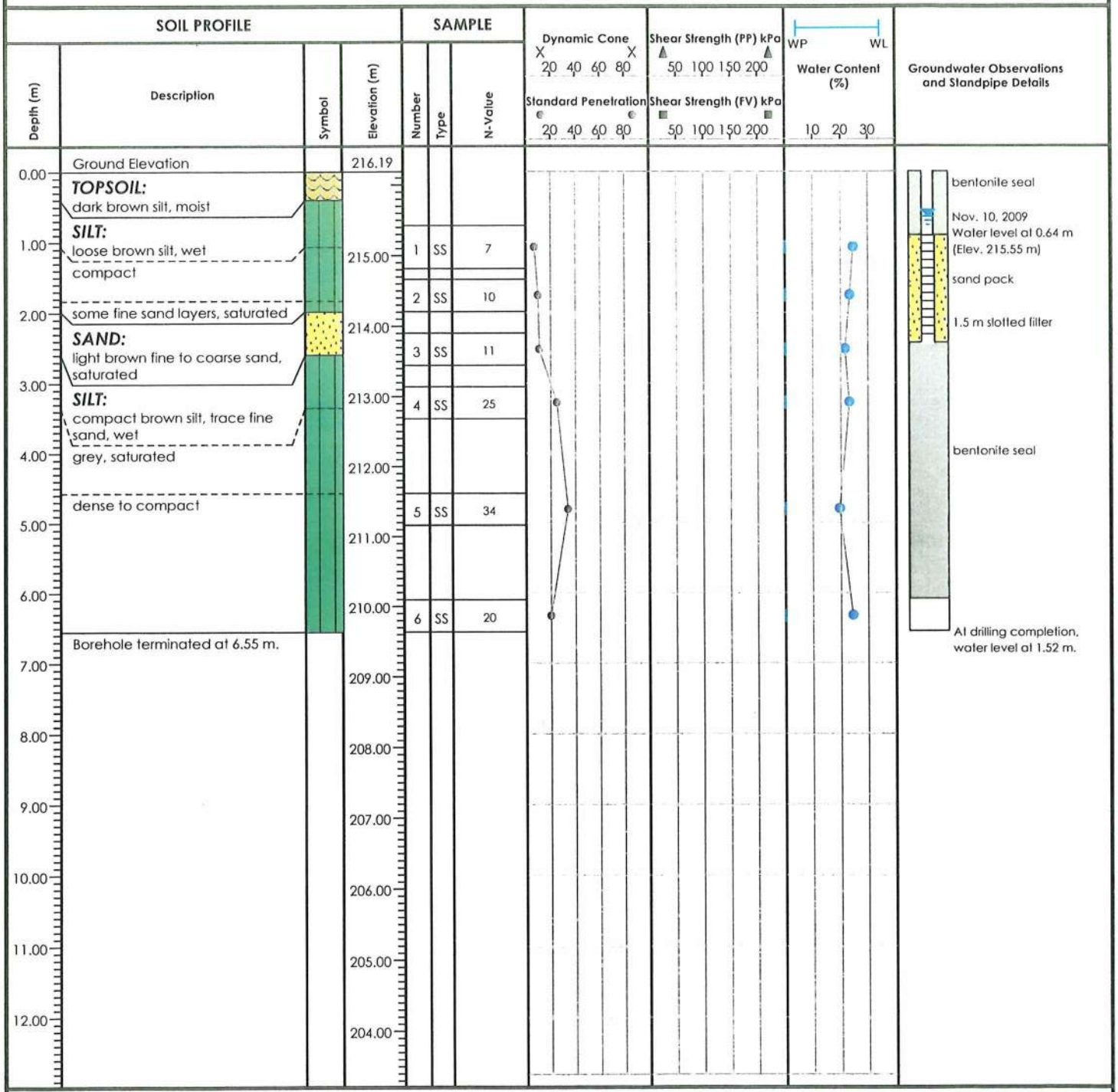
**Ground Elevation: 216.19 m**

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 17**

**Ground Elevation:** *213.42 m*

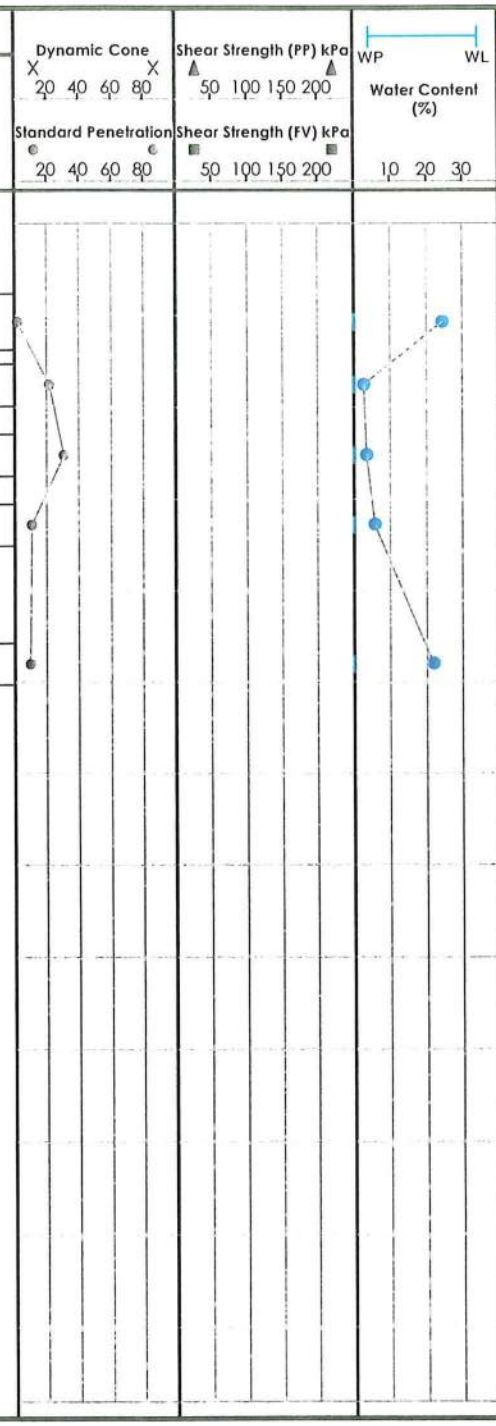
**Project:** *Residential Subdivision*

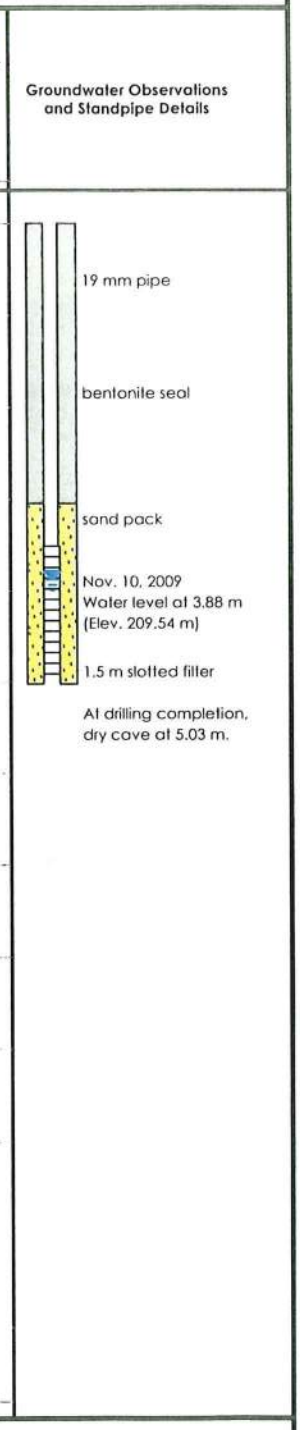
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 213.42 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** very loose brown silt, trace sand, wet; some silty sand layers, wet | | 1 | SS | 2 |
| | ***SAND:*** compact brown fine to coarse sand, some gravel, trace silt and clay, damp | 212.00 | 2 | SS | 22 |
| 2.00 | | 211.00 | 3 | SS | 31 |
| 3.00 | trace fine gravel, moist | 210.00 | 4 | SS | 11 |
| 4.00 | ***SILT:*** stiff grey clayey silt, APL to WTPL | 209.00 | 5 | SS | 10 |
| 5.00 | Borehole terminated at 5.03 m. | 208.00 | | | |
| 6.00 | | 207.00 | | | |
| 7.00 | | 206.00 | | | |
| 8.00 | | 205.00 | | | |
| 9.00 | | 204.00 | | | |
| 10.00 | | 203.00 | | | |
| 11.00 | | 202.00 | | | |
| 12.00 | | 201.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 18**

**Ground Elevation:** *219.31 m*

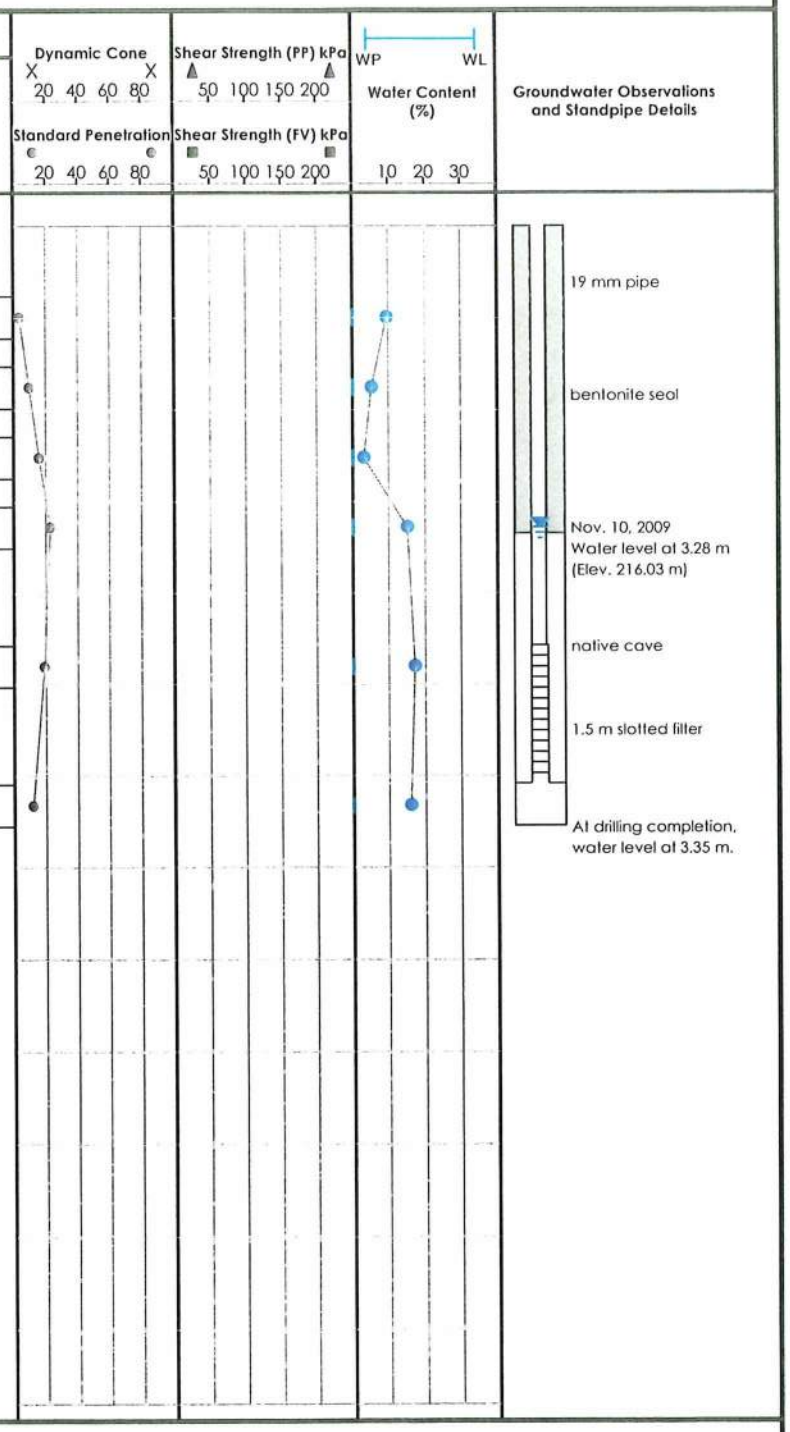
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 219.31 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SAND:*** loose rusty brown fine to medium sand, some silt, moist | | 1 | SS | 4 |
| 1.00 | brown, trace silt, damp | 218.00 | | | |
| | compact | | 2 | SS | 10 |
| 2.00 | compact brown fine to coarse sand, trace silt, damp | 217.00 | 3 | SS | 16 |
| 3.00 | saturated | 216.00 | 4 | SS | 23 |
| 4.00 | | 215.00 | | | |
| | trace fine gravel | | 5 | SS | 19 |
| 5.00 | | 214.00 | | | |
| 6.00 | | 213.00 | 6 | SS | 12 |
| | Borehole terminated at 6.55 m. | | | | |
| 7.00 | | 212.00 | | | |
| 8.00 | | 211.00 | | | |
| 9.00 | | 210.00 | | | |
| 10.00 | | 209.00 | | | |
| 11.00 | | 208.00 | | | |
| 12.00 | | 207.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 19**

**Ground Elevation:** *225.63 m*

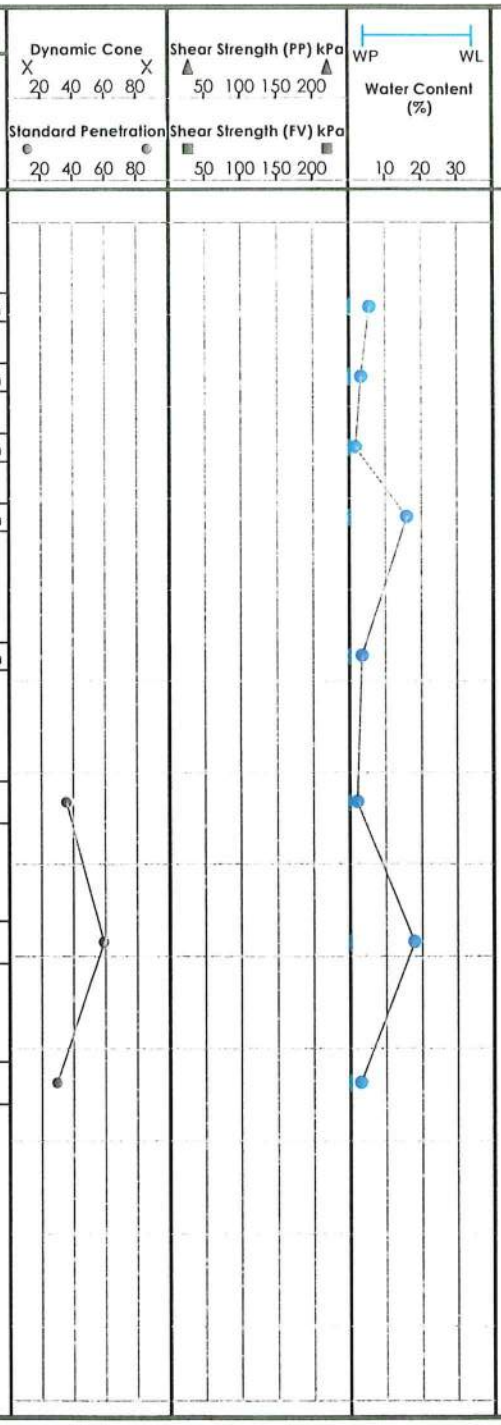
**Project:** *Residential Subdivision*

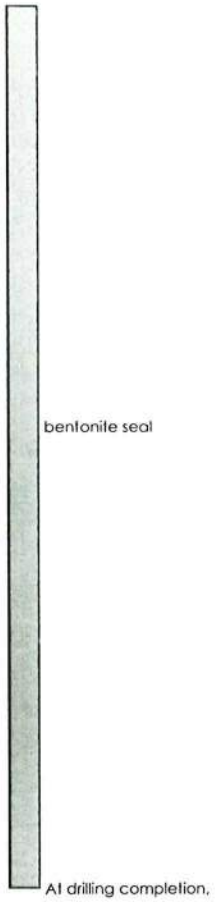
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 225.63 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** rusty brown silty sand, moist | 225.00 | 1 | SS | 25\150mm |
| | dense to very dense brown fine to medium sand, trace silt, damp | 224.00 | 2 | SS | 30\150mm |
| 2.00 | very dense silty fine sand, damp | | | | |
| | very dense fine to coarse sand, trace fine gravel, damp | 223.00 | 3 | SS | 50\150mm |
| 3.00 | occasional silt layers, very moist | | 4 | SS | 35\150mm |
| 4.00 | | 222.00 | | | |
| 5.00 | | 221.00 | 5 | SS | 40\150mm |
| | | 220.00 | | | |
| 6.00 | dense brown fine to medium sand, damp | | 6 | SS | 36 |
| 7.00 | | 219.00 | | | |
| | some sandy silt layers, very moist | 218.00 | 7 | SS | 59 |
| 8.00 | | | | | |
| 9.00 | damp | 217.00 | 8 | SS | 30 |
| | Borehole terminated at 9.60 m. | 216.00 | | | |
| 10.00 | | | | | |
| | | 215.00 | | | |
| 11.00 | | | | | |
| | | 214.00 | | | |
| 12.00 | | | | | |
| | | 213.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 2.44 to 4.27 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 20**

**Ground Elevation:** *225.80 m*

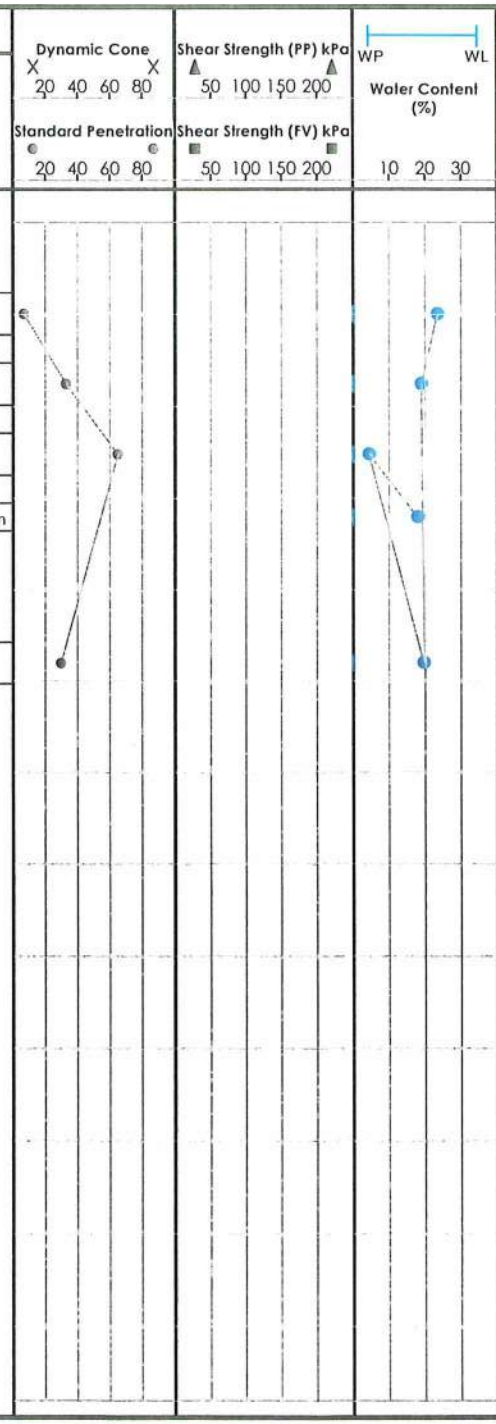
**Project:** *Residential Subdivision*

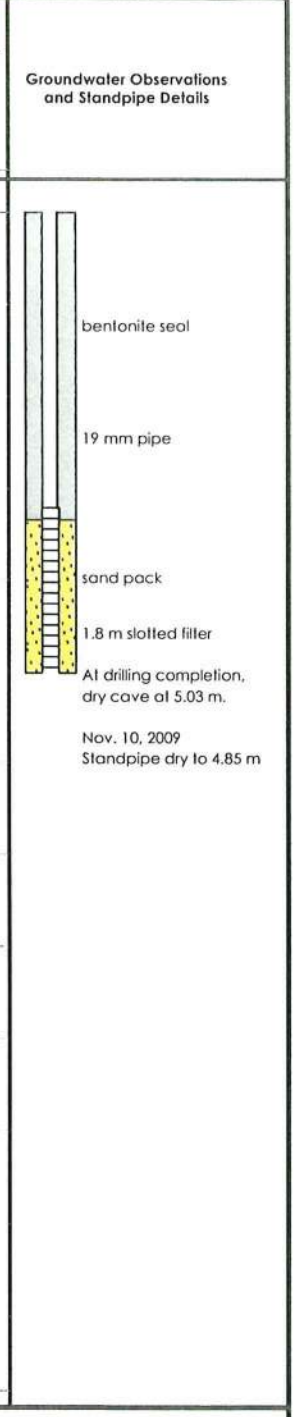
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 225.80 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SILT:*** loose brown silt, very moist | 225.00 | 1 | SS | 7 |
| 1.00 | compact | | | | |
| | | 224.00 | 2 | SS | 33 |
| 2.00 | ***SAND:*** very dense brown fine to coarse sand, some gravel, trace silt, moist | | 3 | SS | 65 |
| | | 223.00 | 4 | SS | 46\150mm |
| 3.00 | ***SILT:*** very dense brown silt, very moist | 222.00 | | | |
| 4.00 | | | | | |
| | | 221.00 | 5 | SS | 30 |
| 5.00 | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 220.00 | | | |
| 7.00 | | 219.00 | | | |
| 8.00 | | 218.00 | | | |
| 9.00 | | 217.00 | | | |
| 10.00 | | 216.00 | | | |
| 11.00 | | 215.00 | | | |
| 12.00 | | 214.00 | | | |
| | | 213.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 21**

**Ground Elevation:** *226.59 m*

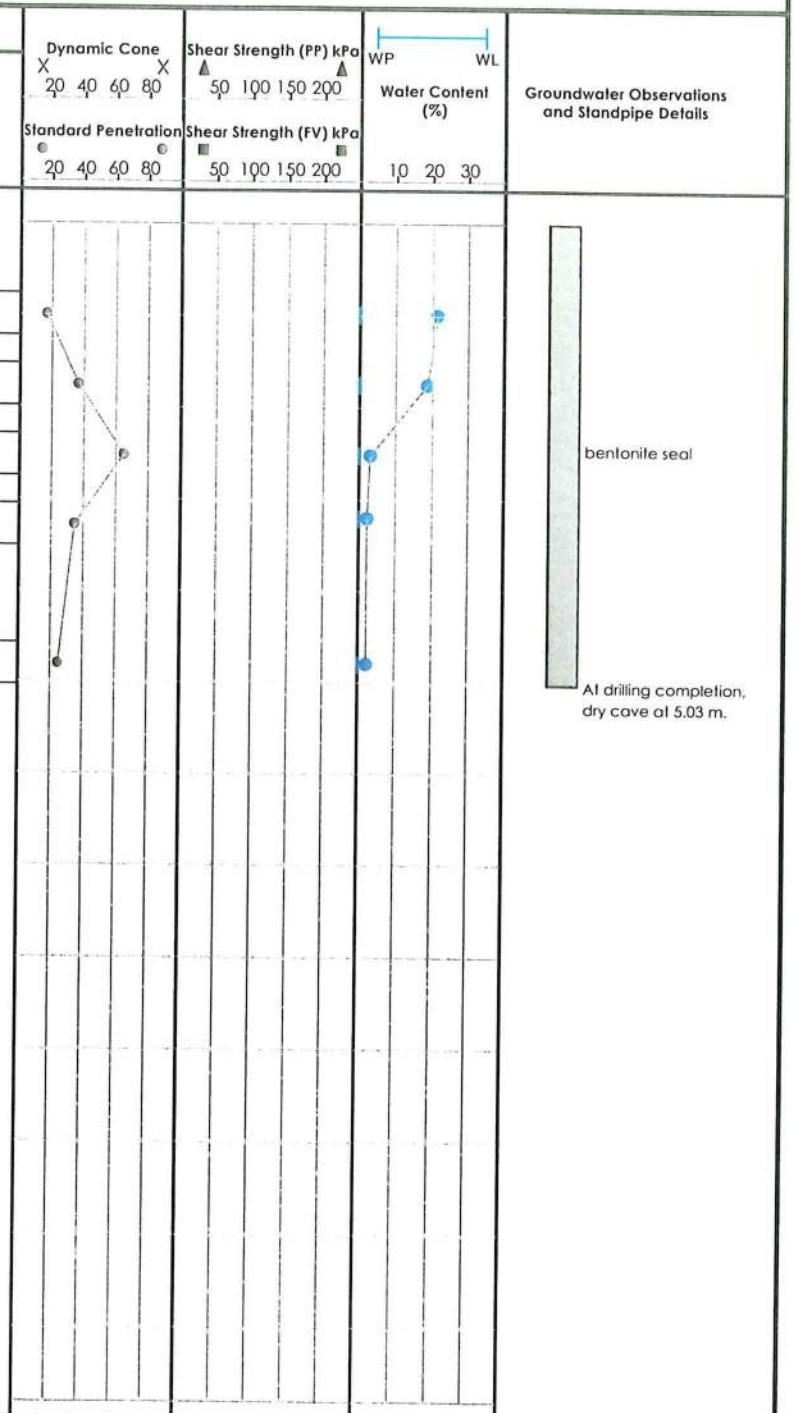
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 226.59 | | | |
| 0.00 | **TOPSOIL:** dark brown silt, moist | | | | |
| | **SAND:** brown silty sand, very moist | 226.00 | 1 | SS | 17 |
| 1.00 | **SILT:** compact to dense brown silt, trace fine sand, very moist | 225.00 | 2 | SS | 37 |
| 2.00 | **SAND:** dense to very dense brown fine to coarse sand, trace silt, trace gravel to 3.05 m, damp | 224.00 | 3 | SS | 65 |
| 3.00 | | 223.00 | 4 | SS | 35 |
| 4.00 | compact brown fine to medium sand, trace silt, damp | 222.00 | 5 | SS | 25 |
| 5.00 | Borehole terminated at 5.03 m. | | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 22**

**Project:** *Residential Subdivision*

**Ground Elevation:** *225.94 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 225.94 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** compact brown fine to medium sand, some silt, moist | 225.00 | 1 | SS | 24 |
| | ***SILT TILL:*** dense to very dense brown silt, some sand, trace gravel, moist | | 2 | SS | 36 |
| 2.00 | | 224.00 | | | |
| | | | 3 | SS | 35\150mm |
| 3.00 | some sand layers, damp | 223.00 | | | |
| | | | 4 | SS | 51 |
| 4.00 | ***SAND:*** dense to very dense brown fine to medium sand, trace silt, damp | 222.00 | | | |
| | | | 5 | SS | 66 |
| 5.00 | ***SILT:*** very dense brown silt, very moist; some sand layers, very moist | 221.00 | | | |
| | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 220.00 | | | |
| 7.00 | | 219.00 | | | |
| 8.00 | | 218.00 | | | |
| 9.00 | | 217.00 | | | |
| 10.00 | | 216.00 | | | |
| 11.00 | | 215.00 | | | |
| 12.00 | | 214.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration (●) 20 40 60 80
Shear Strength (PP) kPa (▲) 50 100 150 200
Shear Strength (FV) kPa (■) 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

At drilling completion, dry cave at 5.03 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 1.83 to 3.05 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 23**

**Ground Elevation:** *224.70 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 224.70 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** dense brown silt, trace sand, moist | | 224.00 | 1 | SS | 35 |
| 2.00 | ***SAND:*** dense to very dense brown fine to coarse sand, trace silt and fine gravel, damp | | 223.00 | 2 | SS | 51 |
| 3.00 | ***SILT:*** dense brown silt, trace fine sand, very moist | | 222.00 | 3 | SS | 48 |
| 4.00 | ***SAND:*** very dense brown sand, trace fine gravel, damp | | 221.00 | 4 | SS | 38 |
| 5.00 | Borehole terminated at 5.03 m. | | 220.00 | 5 | SS | 88 |
| 6.00 | | | 219.00 | | | |
| 7.00 | | | 218.00 | | | |
| 8.00 | | | 217.00 | | | |
| 9.00 | | | 216.00 | | | |
| 10.00 | | | 215.00 | | | |
| 11.00 | | | 214.00 | | | |
| 12.00 | | | 213.00 | | | |
| | | | 212.00 | | | |

Dynamic Cone (X) 20 40 60 80 X
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

At drilling completion, dry cave at 5.03 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 24**

**Ground Elevation:** *216.59 m*

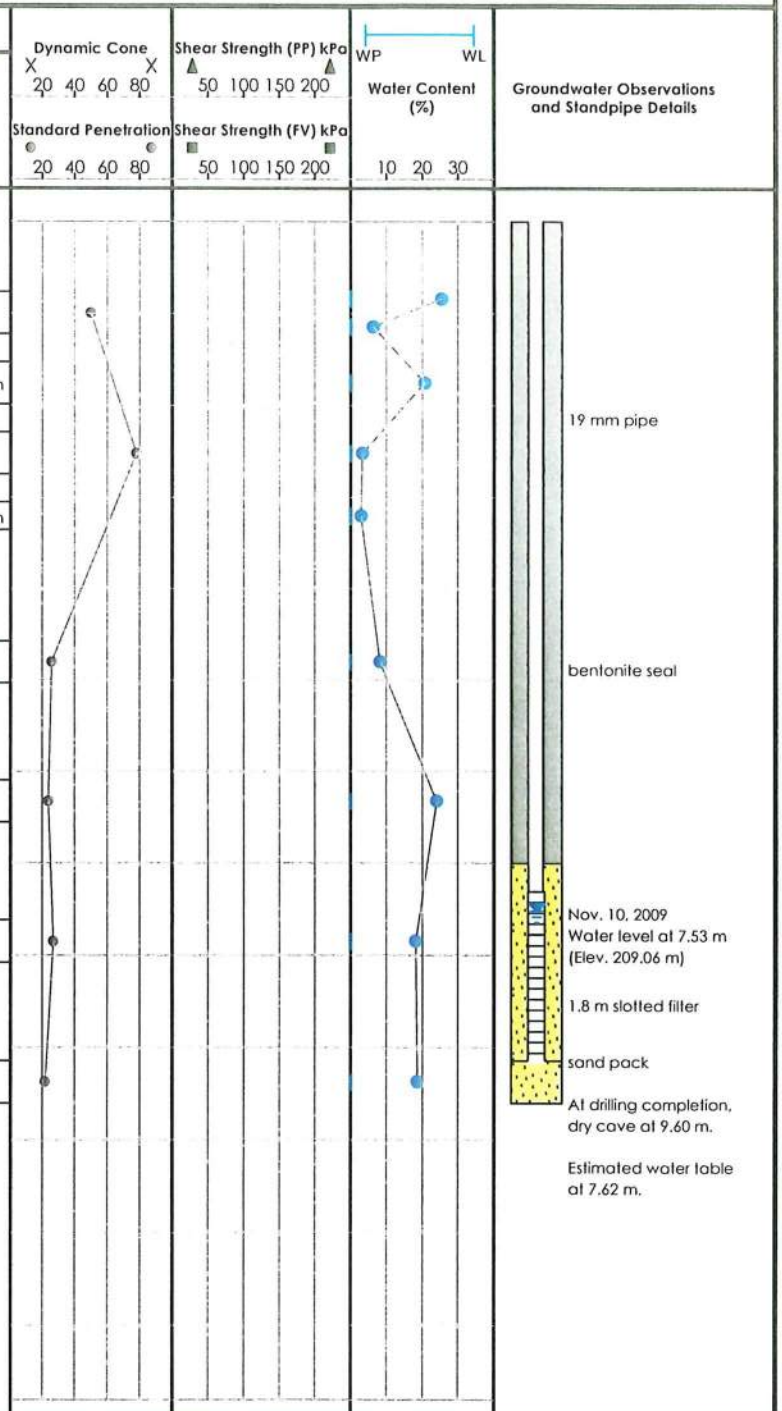
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 216.59 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SILT:*** brown fine sandy silt, wet, dilatant | 216.00 | 1 | SS | 50 |
| 1.00 | ***SAND AND GRAVEL:*** dense brown sand and gravel, trace silt, moist | 215.00 | 2 | SS | 30\150mm |
| 2.00 | ***SILT:*** loose brown fine sandy silt, wet | 214.00 | 3 | SS | 78 |
| 3.00 | ***SAND AND GRAVEL:*** very dense brown sand and gravel, trace silt, moist | 213.00 | 4 | SS | 33\150mm |
| 4.00 | ***SAND:*** compact brown fine to medium sand, trace silt, moist | 212.00 | 5 | SS | 26 |
| 5.00 | ***SILT:*** compact brown silt, trace sand, clay and fine gravel, very moist | 211.00 | 6 | SS | 24 |
| 6.00 | | 210.00 | | | |
| 7.00 | compact grey silt, trace fine sand, saturated, dilatant | 209.00 | 7 | SS | 27 |
| 8.00 | | 208.00 | | | |
| 9.00 | | 207.00 | 8 | SS | 22 |
| | Borehole terminated at 9.60 m. | | | | |
| 10.00 | | 206.00 | | | |
| 11.00 | | 205.00 | | | |
| 12.00 | | 204.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 25**

**Ground Elevation:** *223.69 m*

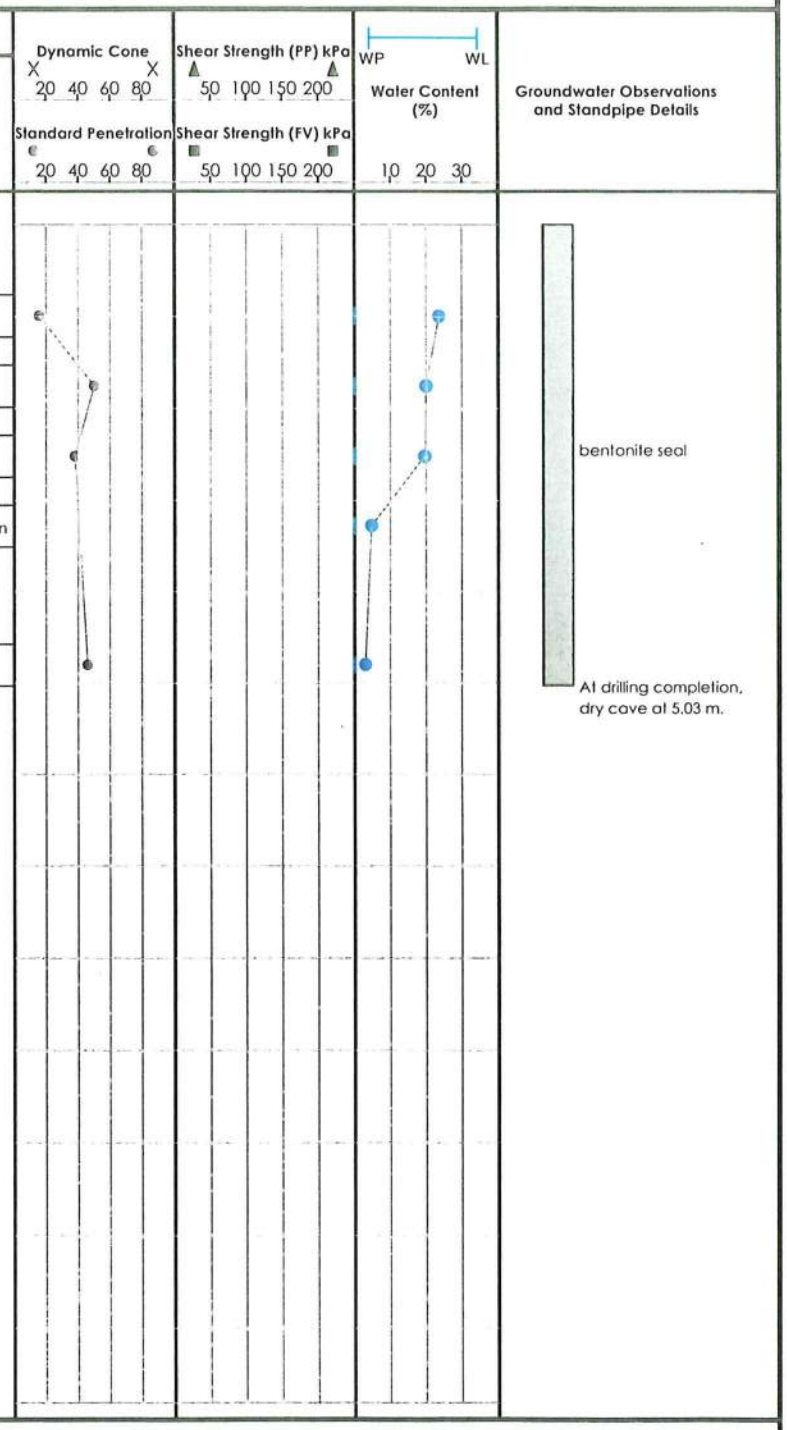
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 223.69 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SILT:*** compact brown silt, wet | 223.00 | 1 | SS | 16 |
| 1.00 | | | | | |
| | dense, trace clay | 222.00 | 2 | SS | 50 |
| 2.00 | | | | | |
| | | 221.00 | 3 | SS | 38 |
| 3.00 | ***SAND:*** very dense brown fine to medium sand, damp; some silt layers to 3.80 m, moist | | 4 | SS | 55\150mm |
| 4.00 | | 220.00 | | | |
| | dense, damp | 219.00 | 5 | SS | 46 |
| 5.00 | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 218.00 | | | |
| 7.00 | | 217.00 | | | |
| 8.00 | | 216.00 | | | |
| 9.00 | | 215.00 | | | |
| 10.00 | | 214.00 | | | |
| 11.00 | | 213.00 | | | |
| 12.00 | | 212.00 | | | |
| | | 211.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 26**

**Ground Elevation:** *219.94 m*

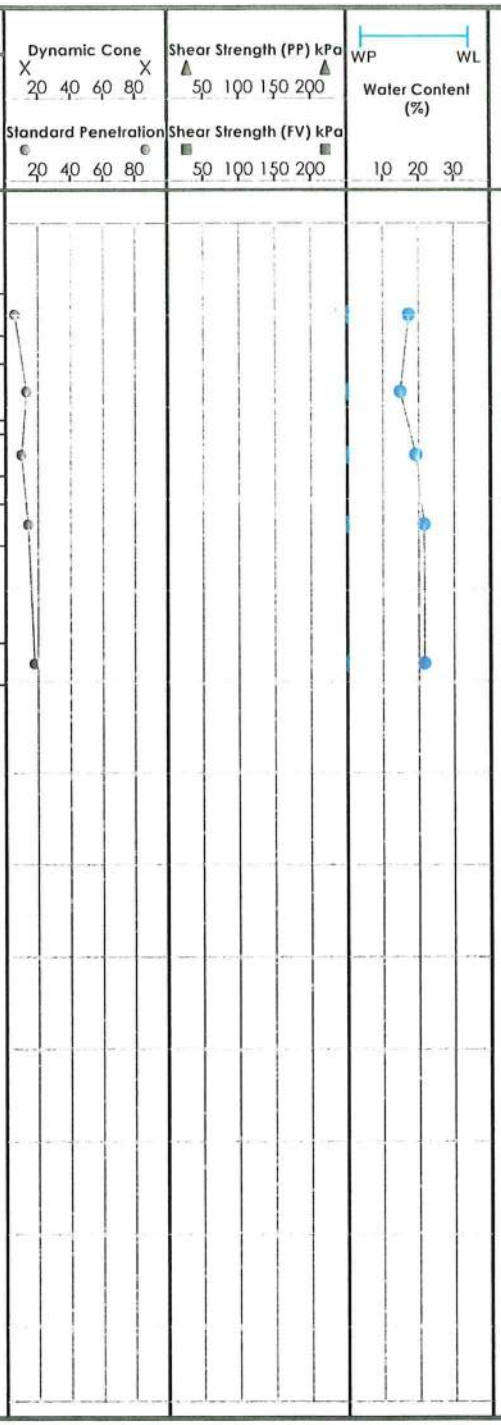
**Project:** *Residential Subdivision*

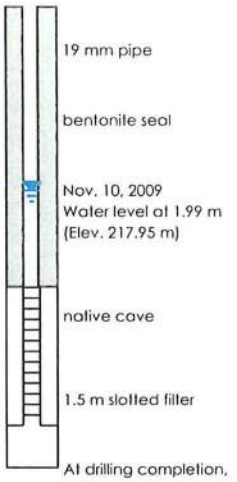
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 219.94 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SAND:*** loose brown to rusty brown silty fine to medium sand, very moist | | 219.00 | 1 | SS | 6 |
| 2.00 | | | 218.00 | 2 | SS | 13 |
| | saturated | | | | | |
| | ***SILT:*** compact brown silt, some sand layers, saturated | | | 3 | SS | 10 |
| 3.00 | | | 217.00 | | | |
| | | | | 4 | SS | 14 |
| 4.00 | | | 216.00 | | | |
| | compact grey silt, trace fine sand, saturated, dilatant | | | | | |
| 5.00 | | | 215.00 | 5 | SS | 18 |
| | Borehole terminated at 5.03 m. | | | | | |
| 6.00 | | | 214.00 | | | |
| 7.00 | | | 213.00 | | | |
| 8.00 | | | 212.00 | | | |
| 9.00 | | | 211.00 | | | |
| 10.00 | | | 210.00 | | | |
| 11.00 | | | 209.00 | | | |
| 12.00 | | | 208.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 27**

**Ground Elevation:** *217.61 m*

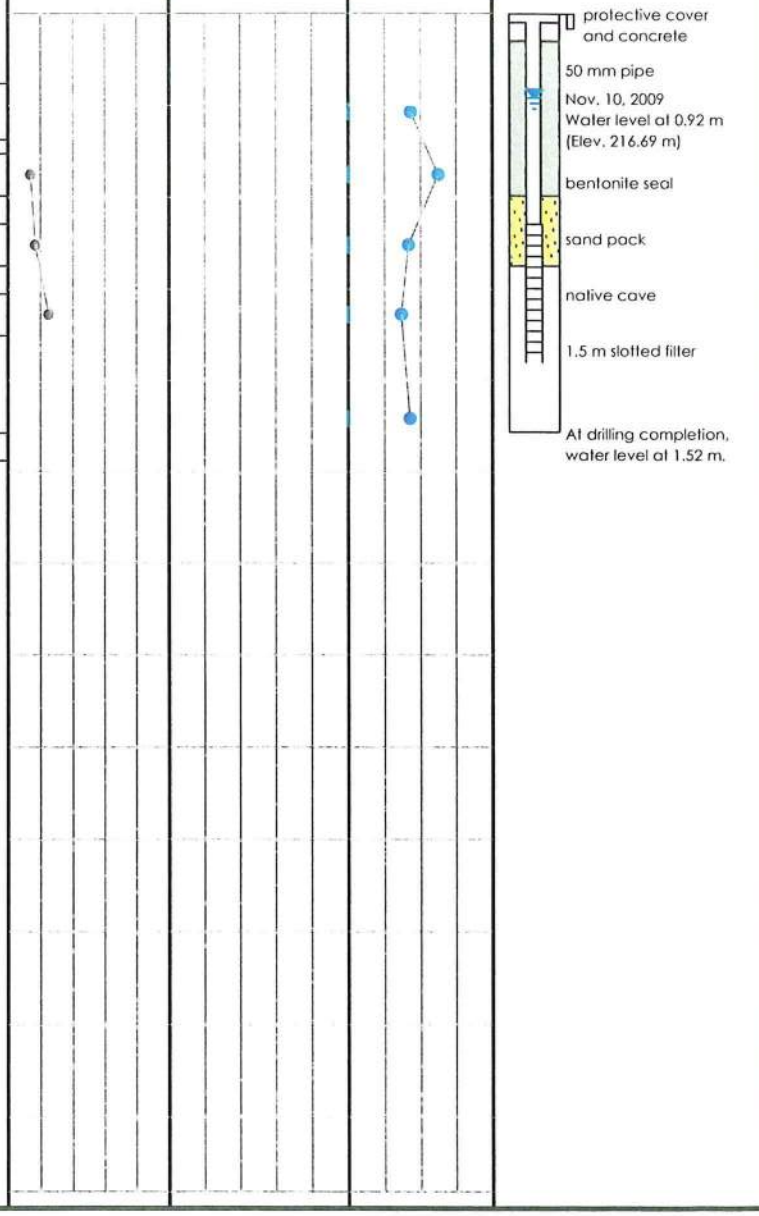
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 217.61 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** very loose rusty brown silt, some sand, very moist to wet | | 217.00 | 1 | SS | <1 |
| | | | 216.00 | 2 | SS | 14 |
| 2.00 | ***SAND:*** compact brown fine to coarse sand, trace silt, saturated | | | | | |
| 3.00 | | | 215.00 | 3 | SS | 17 |
| | | | | 4 | SS | 25 |
| 4.00 | | | 214.00 | | | |
| | Borehole terminated at 4.57 m. | | 213.00 | 5 | AS | |
| 5.00 | | | | | | |
| 6.00 | | | 212.00 | | | |
| 7.00 | | | 211.00 | | | |
| 8.00 | | | 210.00 | | | |
| 9.00 | | | 209.00 | | | |
| 10.00 | | | 208.00 | | | |
| 11.00 | | | 207.00 | | | |
| 12.00 | | | 206.00 | | | |
| | | | 205.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Auger sample taken from 4.27 to 4.57 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 28**

**Ground Elevation:** *217.52 m*

**Project:** *Residential Subdivision*

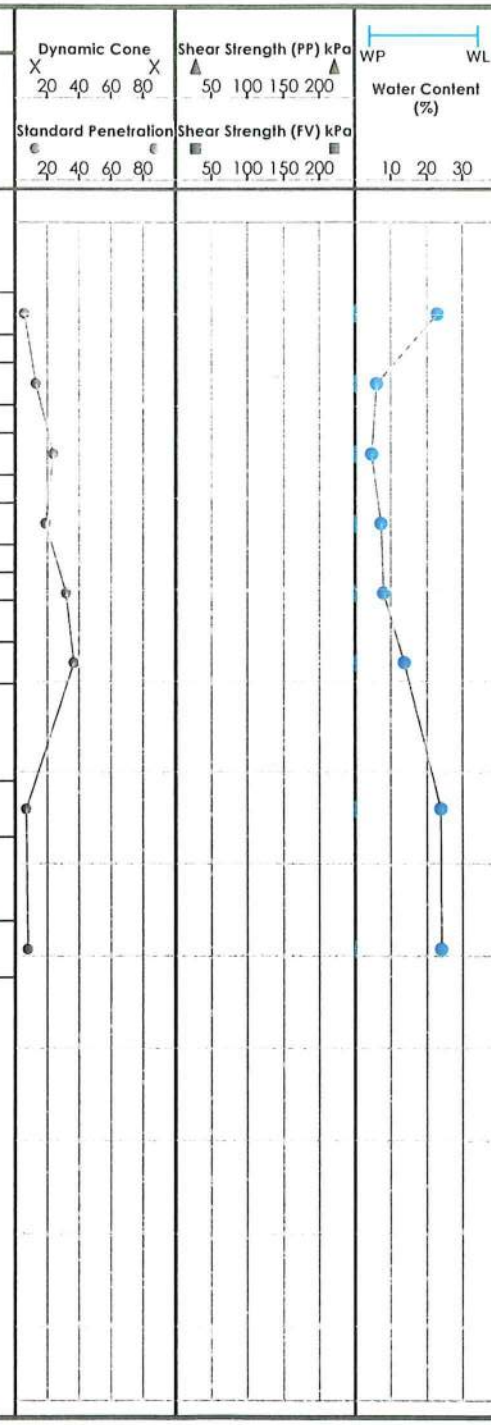
**Job No.:** *P030592*

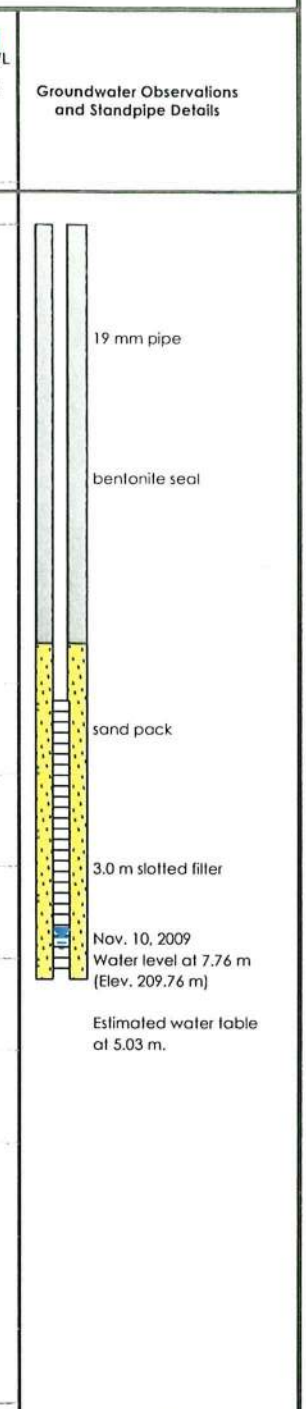
**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Elevation (m) |
|---|---|---|
| | Ground Elevation | 217.52 |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | |
| 1.00 | ***SILT:*** loose brown silt, trace fine sand and clay, very moist | 216.00 |
| 2.00 | ***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt, moist | 215.00 |
| 3.00 | | 214.00 |
| 4.00 | ***SAND:*** dense brown fine to coarse sand, trace gravel and silt, moist | 213.00 |
| 5.00 | fine to medium sand, moist | |
| 6.00 | ***CLAY:*** firm to stiff grey silty clay, WTPL | 212.00 |
| 7.00 | | 211.00 |
| 8.00 | | 210.00 |
| | Borehole terminated at 8.23 m. | 209.00 |
| 9.00 | | 208.00 |
| 10.00 | | 207.00 |
| 11.00 | | 206.00 |
| 12.00 | | 205.00 |

| Sample Number | Type | N-Value |
|---|---|---|
| 1 | SS | 6 |
| 2 | SS | 13 |
| 3 | SS | 24 |
| 4 | SS | 19 |
| 5 | SS | 32 |
| 6 | SS | 37 |
| 7 | SS | 7 |
| 8 | SS | 8 |




**Reviewed by:** *TS*

**Drill Method:** *Hollow Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 29**

**Ground Elevation:** *216.12 m*

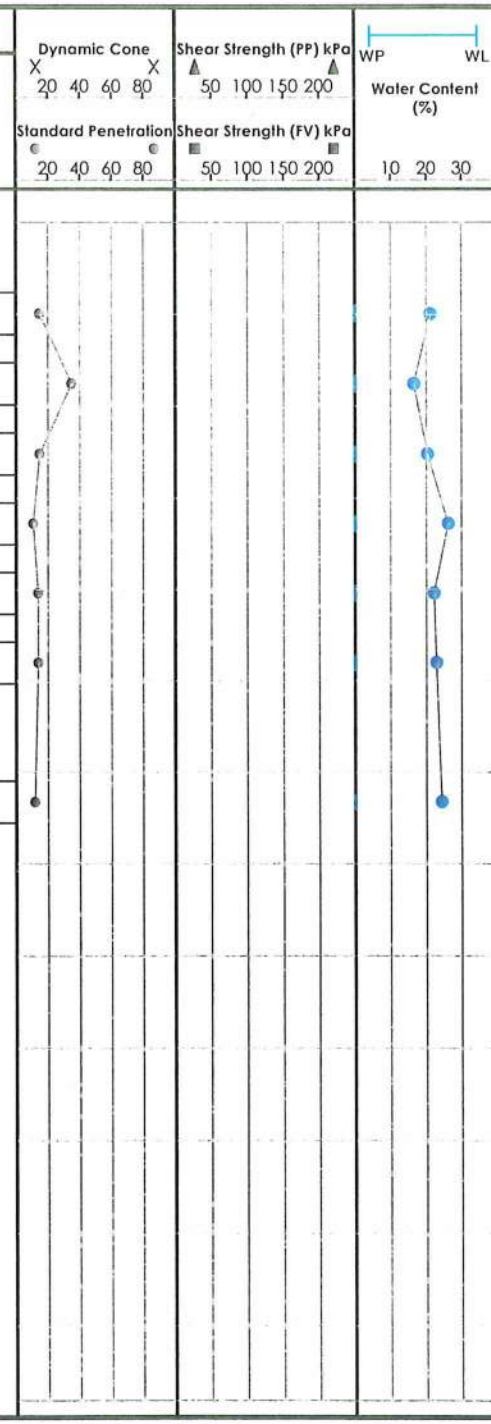
**Project:** *Residential Subdivision*

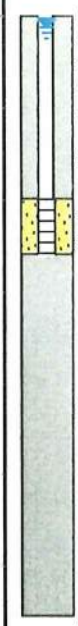
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 216.12 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** compact brown silt, trace fine sand, wet | 215.00 | 1 | SS | 15 |
| | | | 2 | SS | 35 |
| 2.00 | ***SAND:*** compact brown fine to coarse sand, some fine gravel, saturated | 214.00 | 3 | SS | 15 |
| 3.00 | ***SILT:*** stiff grey clayey silt, WTPL; some grey silt layers, saturated | 213.00 | 4 | SS | 11 |
| 4.00 | | 212.00 | 5 | SS | 14 |
| 5.00 | | 211.00 | 6 | SS | 14 |
| 6.00 | | 210.00 | 7 | SS | 12 |
| | Borehole terminated at 6.55 m. | | | | |
| 7.00 | | 209.00 | | | |
| 8.00 | | 208.00 | | | |
| 9.00 | | 207.00 | | | |
| 10.00 | | 206.00 | | | |
| 11.00 | | 205.00 | | | |
| 12.00 | | 204.00 | | | |



**Groundwater Observations and Standpipe Details**

Nov. 10, 2009
Water level 0.20 m above ground surface (artesian) Elev. 216.32 m

19 mm pipe

bentonite seal

sand pack

0.6 m slotted filter

bentonite seal

At drilling completion, water level at 1.52 m.

Water rose to 0.91 m after SS3.

**Reviewed by:** *TS*

**Drill Method:** *Hollow Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 30**

**Ground Elevation:** *216.40 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

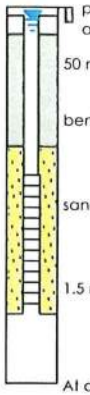
**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 216.40 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** brown silt, some fine sand, wet | | | 1 | AS | |
| | | | 215.00 | | | |
| 2.00 | ***SAND:*** compact brown fine to coarse sand and fine gravel, saturated | | | 2 | SS | 18 |
| | | | 214.00 | 3 | SS | 18 |
| 3.00 | | | | | | |
| | | | 213.00 | | | |
| | ***SILT:*** stiff grey clayey silt, WTPL | | | 4 | SS | 16 |
| 4.00 | Borehole terminated at 4.11 m. | | 212.00 | | | |
| 5.00 | | | | | | |
| | | | 211.00 | | | |
| 6.00 | | | | | | |
| | | | 210.00 | | | |
| 7.00 | | | | | | |
| | | | 209.00 | | | |
| 8.00 | | | | | | |
| | | | 208.00 | | | |
| 9.00 | | | | | | |
| | | | 207.00 | | | |
| 10.00 | | | | | | |
| | | | 206.00 | | | |
| 11.00 | | | | | | |
| | | | 205.00 | | | |
| 12.00 | | | | | | |
| | | | 204.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): WP WL; 10 20 30




Groundwater Observations and Standpipe Details

At drilling completion, water level at 0.76 m.

Water rose to 0.76 m after SS2.

Nov. 10, 2009
Water level at 0.14 m
(Elev. 216.26 m)

**Reviewed by:** *TS*

**Drill Method:** *Hollow Stem Auger*

**Notes:** *Auger sample taken from 0.60 to 1.22 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 101**

**Ground Elevation:** *220.93 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | WP — Water Content (%) — WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| 0.00 | Ground Elevation | | 220.93 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | 220.50 | | | |
| 1.00 | ***SAND:*** brown silty fine to medium sand, moist | | 220.00 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | 219.50 | | | |
| 2.00 | ***SAND:*** brown silty sand, moist | | 219.00 | | | |
| | some gravel | | 218.50 | | | |
| | ***SILT:*** brown silt, trace fine sand, wet, dilatant | | 218.00 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | | | | Test pit sidewalls vertically stable during excavation. No free groundwater encountered. |
| | | | 217.50 | | | |
| 4.00 | | | 217.00 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 102**

**Ground Elevation:** *224.55 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| | Ground Elevation | | 224.55 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SILT:*** brown sandy silt, very moist | | 224.00 | | | |
| 1.00 | ***SAND:*** brown fine to medium sand, trace silt, damp | | 223.50 | | | |
| | | | 223.00 | | | |
| | brown fine to coarse sand, some gravel, occasional cobbles, damp | | | | | |
| 2.00 | | | 222.50 | | | |
| | ***SILT:*** brown silt, some fine sand, very moist | | 222.00 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | 221.50 | | | Test pit sidewalls vertically stable during excavation. No free groundwater encountered. |
| | | | 221.00 | | | |
| 4.00 | | | 220.50 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 103**

**Project:** *Residential Subdivision*

**Ground Elevation:** *223.66 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP, WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 223.66 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SAND:*** yellowish brown fine to medium sand, some silt, wet | | 223.00 | | | |
| 1.00 | | | | | | |
| | ***SILT TILL:*** (hard) brown clayey silt, trace sand and gravel, DTPL | | 222.50 | | | |
| | | | 222.00 | | | |
| 2.00 | | | | | | |
| | | | 221.50 | | | |
| | | | 221.00 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | | | | Test pit sidewalls vertically stable during excavation. No free groundwater encountered. |
| | | | 220.50 | | | |
| | | | 220.00 | | | |
| 4.00 | | | 219.50 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 104**

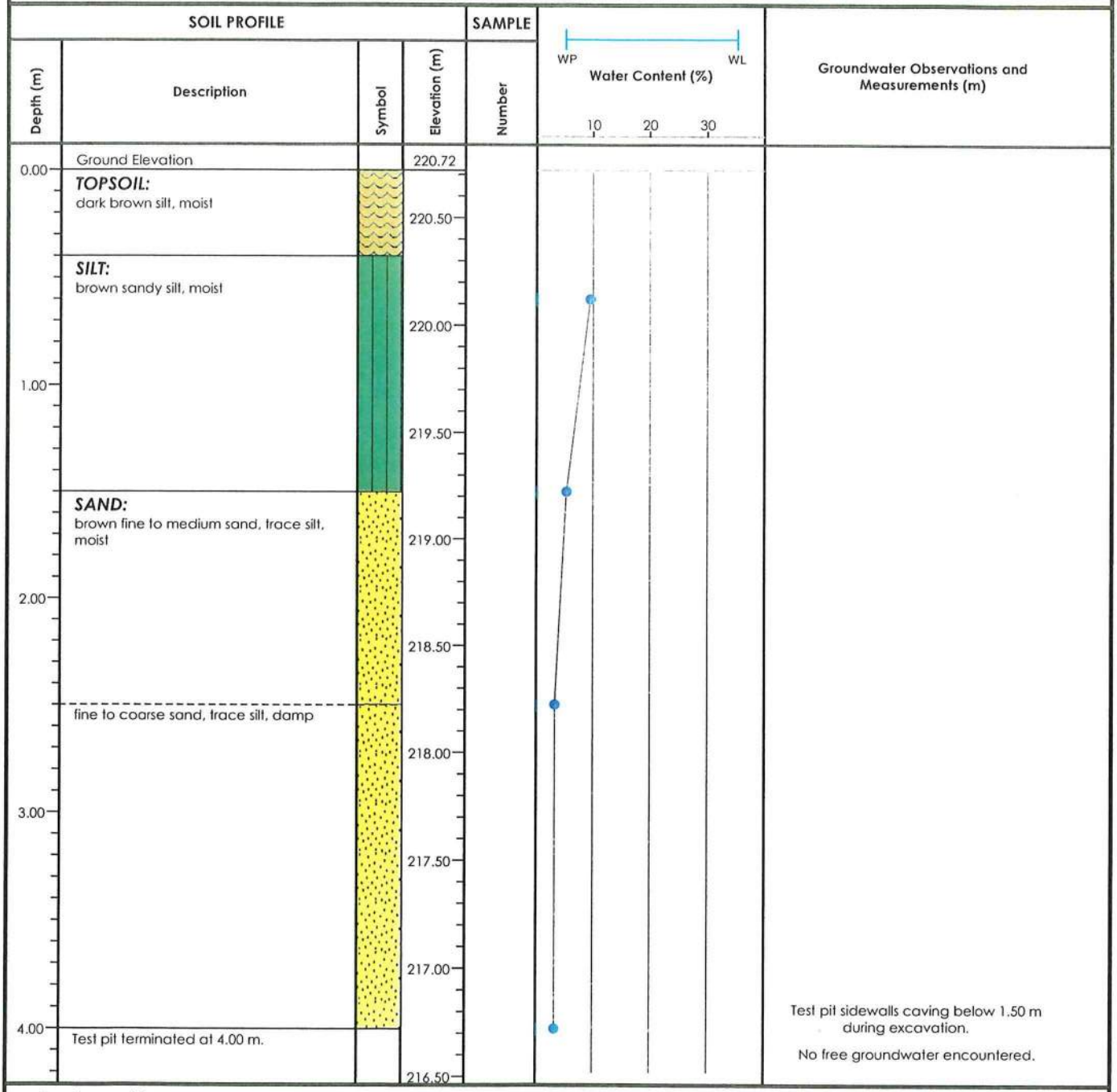
**Project:** *Residential Subdivision*

**Ground Elevation:** *220.72 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*




**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 105**

**Ground Elevation:** *214.06 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | WP — Water Content (%) — WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| 0.00 | Ground Elevation | | 214.06 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SILT:*** brown silt, trace fine sand, very moist; some thin brown clayey silt layers, APL | | 213.50 | | | |
| 1.00 | | | 213.00 | | | |
| | | | 212.50 | | | |
| 2.00 | Test pit terminated at 1.90 m on large boulder. | | 212.00 | | | Test pit sidewalls vertically stable during excavation.<br>No free groundwater encountered. |
| | | | 211.50 | | | |
| 3.00 | | | 211.00 | | | |
| | | | 210.50 | | | |
| 4.00 | | | 210.00 | | | |

**Reviewed by:** *TS*

**Field Tech:** *RM*

**Notes:**

**Drafted by:** *KS*

**Sheet:** *1 of 1*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 106**

**Project:** *Residential Subdivision*

**Ground Elevation:** *214.50 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | WP — Water Content (%) — WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| 0.00 | Ground Elevation | | 214.50 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SILT:*** brown silt, trace fine sand, occasional thin brown clayey silt layers, very moist to wet | | 214.00 | | | |
| 1.00 | | | 213.50 | | | |
| | | | 213.00 | | | |
| 2.00 | | | 212.50 | | | |
| | ***SAND:*** brown fine to coarse sand, trace silt and gravel, damp | | 212.00 | | | |
| | ***SAND and GRAVEL:*** brown sand and gravel, trace silt, damp | | | | | |
| 3.00 | | | 211.50 | | | |
| | Test pit terminated at 3.10 m. | | | | | Test pit sidewalls vertically stable during excavation. |
| | | | 211.00 | | | |
| 4.00 | | | 210.50 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 107**

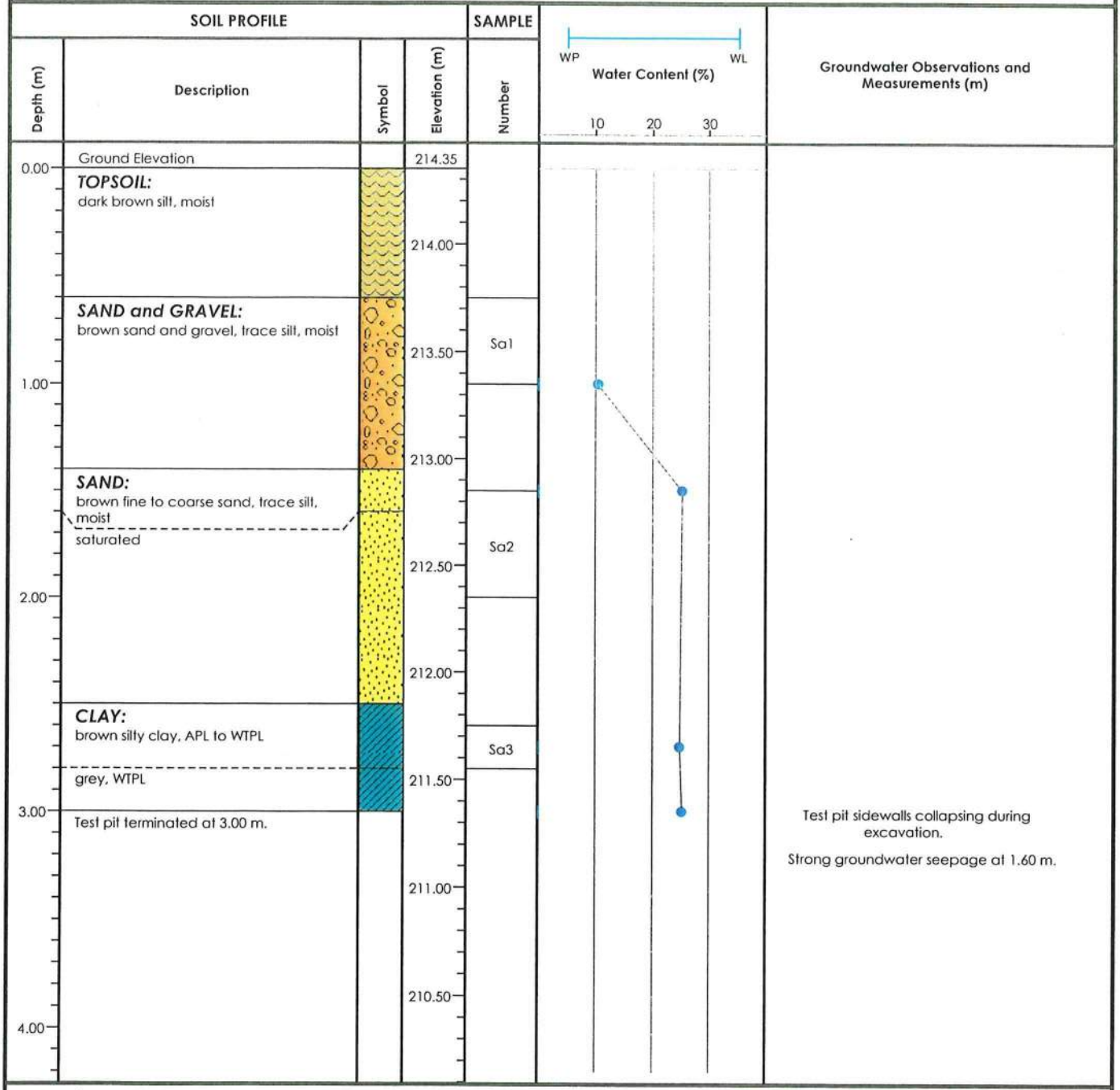
**Project:** *Residential Subdivision*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Ground Elevation:** *214.35 m*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*




**Reviewed by:** *TS*

**Field Tech:** *RM*

**Notes:**

**Drafted by:** *KS*

**Sheet:** *1 of 1*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 108**

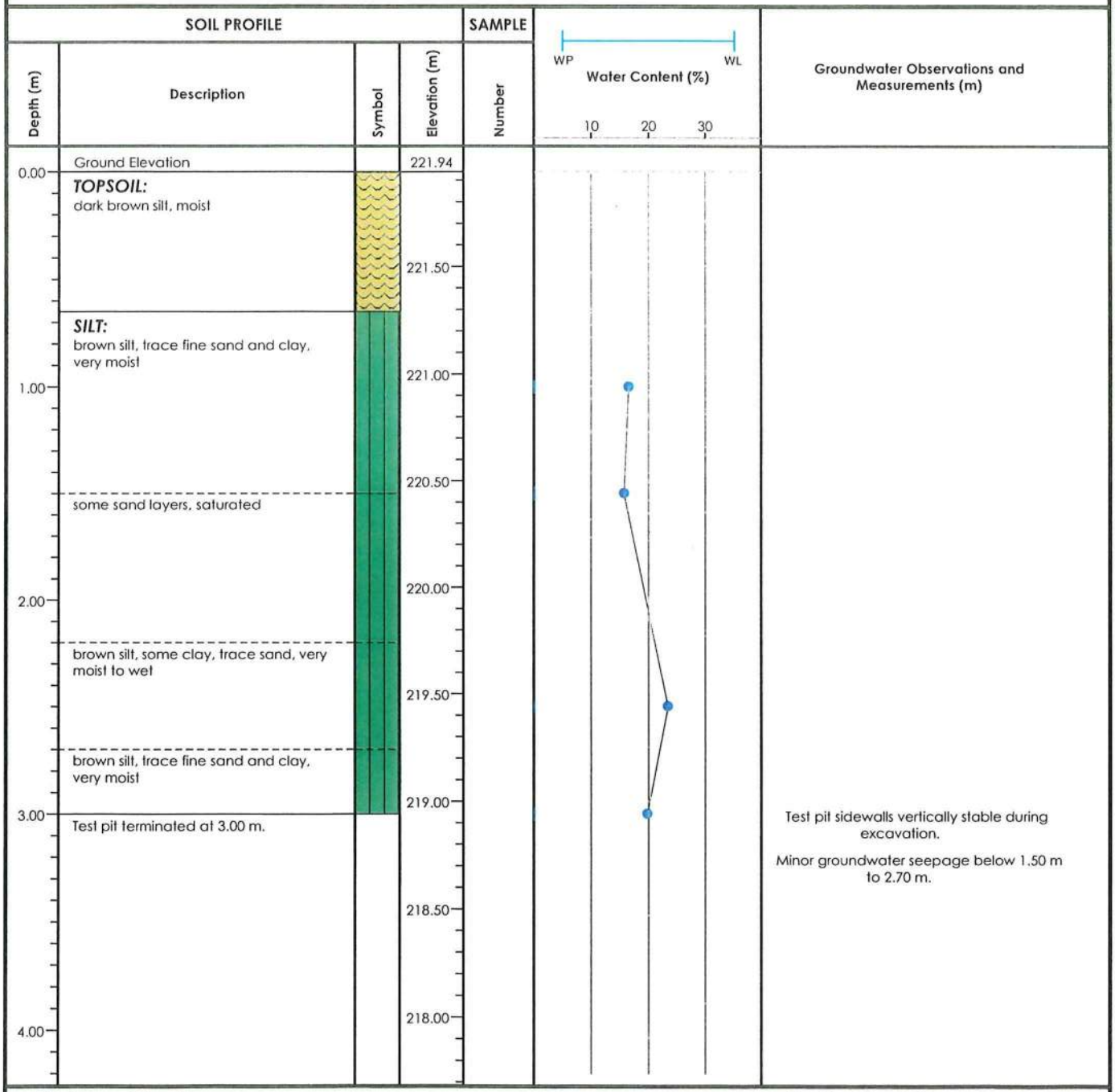
**Project:** *Residential Subdivision*

**Ground Elevation:** *221.94 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*




**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 109**

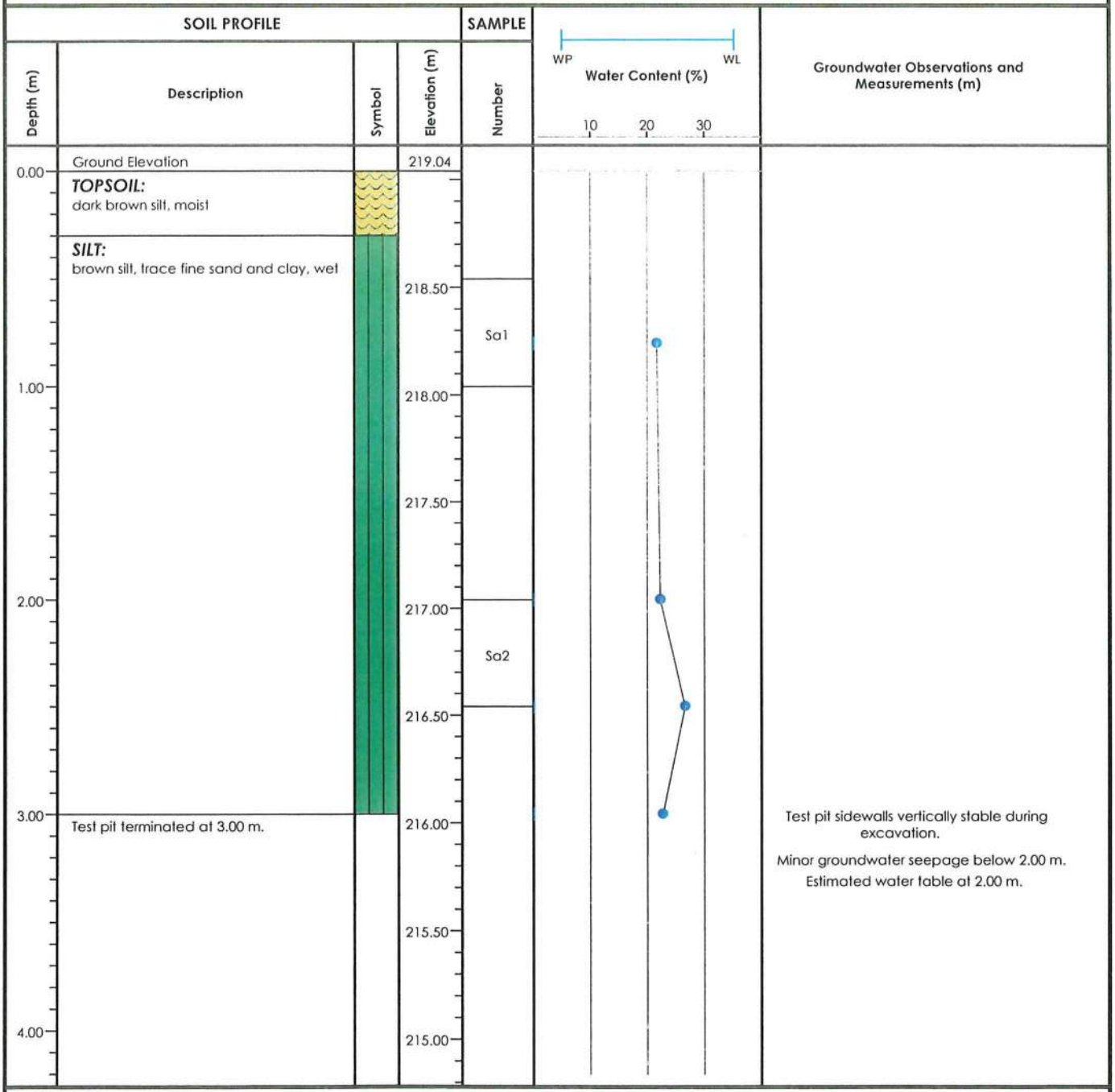
**Ground Elevation:** *219.04 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*




**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 110**

**Ground Elevation:** *215.45 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 215.45 | | | |
| | ***TOPSOIL:*** dark brown silt, very moist | | 215.00 | | | |
| | ***SILT:*** brown silt, trace fine sand and clay, wet | | | | | |
| 1.00 | | | 214.50 | Sa1 | | |
| | | | 214.00 | | | |
| 2.00 | | | 213.50 | Sa2 | | |
| | some brown sand layers, saturated | | | | | |
| | brown silt, some clay, DTPL | | 213.00 | Sa3 | | |
| | ***CLAY:*** grey silty clay, WTPL | | 212.50 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | | | | Test pit sidewalls vertically stable during excavation. Minor groundwater seepage at 2.30 m. |
| | | | 212.00 | | | |
| 4.00 | | | 211.50 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 111**

**Project:** *Residential Subdivision*

**Ground Elevation:** *221.85 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | WP — Water Content (%) — WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| 0.00 | Ground Elevation | | 221.85 | | | |
| | ***TOPSOIL:*** dark brown silt, very moist | | 221.50 | | | |
| 1.00 | | | 221.00 | | | |
| | | | 220.50 | | | |
| | ***SAND:*** rusty brown fine to medium sand, some silt, moist | | 220.00 | | | |
| 2.00 | | | 219.50 | | | |
| | brown fine to coarse sand, trace silt and gravel, moist | | | | | |
| | some gravel | | 219.00 | | | |
| 3.00 | | | | | | |
| | Test pit terminated at 3.30 m. | | 218.50 | | | Test pit sidewalls vertically stable during excavation. No free groundwater encountered during excavation. |
| | | | 218.00 | | | |
| 4.00 | | | | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

Naylor Engineering Associates Ltd.

**Test Pit Number: 1**

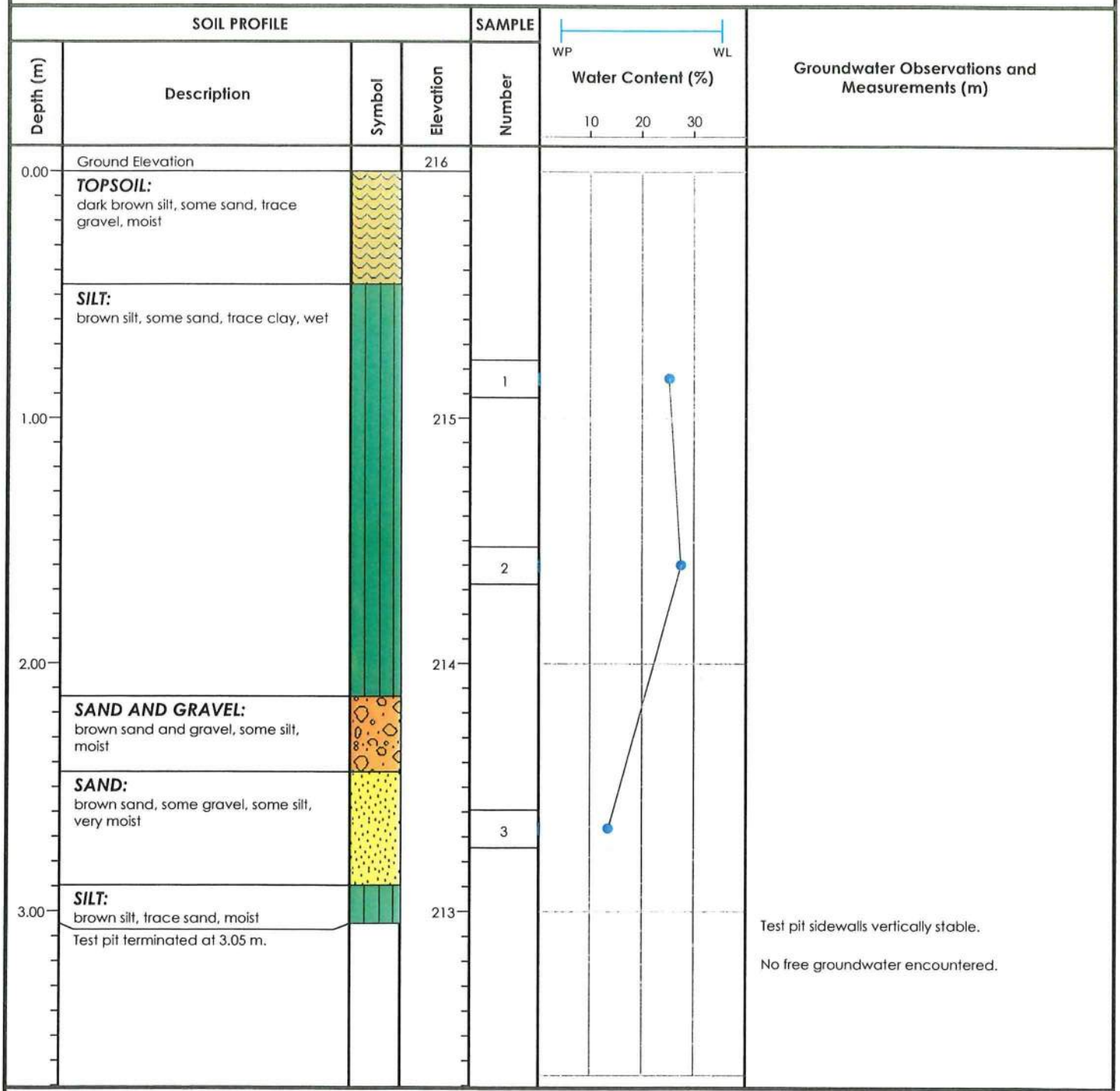
**Ground Elevation:** *216 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*




**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 2**

**Ground Elevation:** *220 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| SOIL PROFILE | | | | SAMPLE | | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation | Number | Water Content (%) WP — WL; 10 20 30 | |
| 0.00 | Ground Elevation | | 220 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, trace gravel, moist | | | | | |
| | ***SILT:*** brown silt, trace sand, trace clay, wet | | | 1 | | |
| 1.00 | | | 219 | | | |
| 2.00 | | | 218 | 2 | | |
| 3.00 | | | 217 | | | Test pit sidewalls vertically stable. No free groundwater encountered. |
| | Test pit terminated at 3.05 m. | | | | | |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 3**

**Ground Elevation:** *223 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 223 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SILT:*** light brown sandy silt, trace clay, moist | | | | | |
| 1.00 | | | 222 | 1 | | |
| | brown silt, trace sand, wet | | | | | |
| 2.00 | | | 221 | 2 | | |
| | ***SAND:*** brown sand, some gravel, trace silt, saturated | | | | | |
| 3.00 | | | 220 | 3 | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls caving below 2.74 m. Groundwater encountered at 2.74 m. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 4**

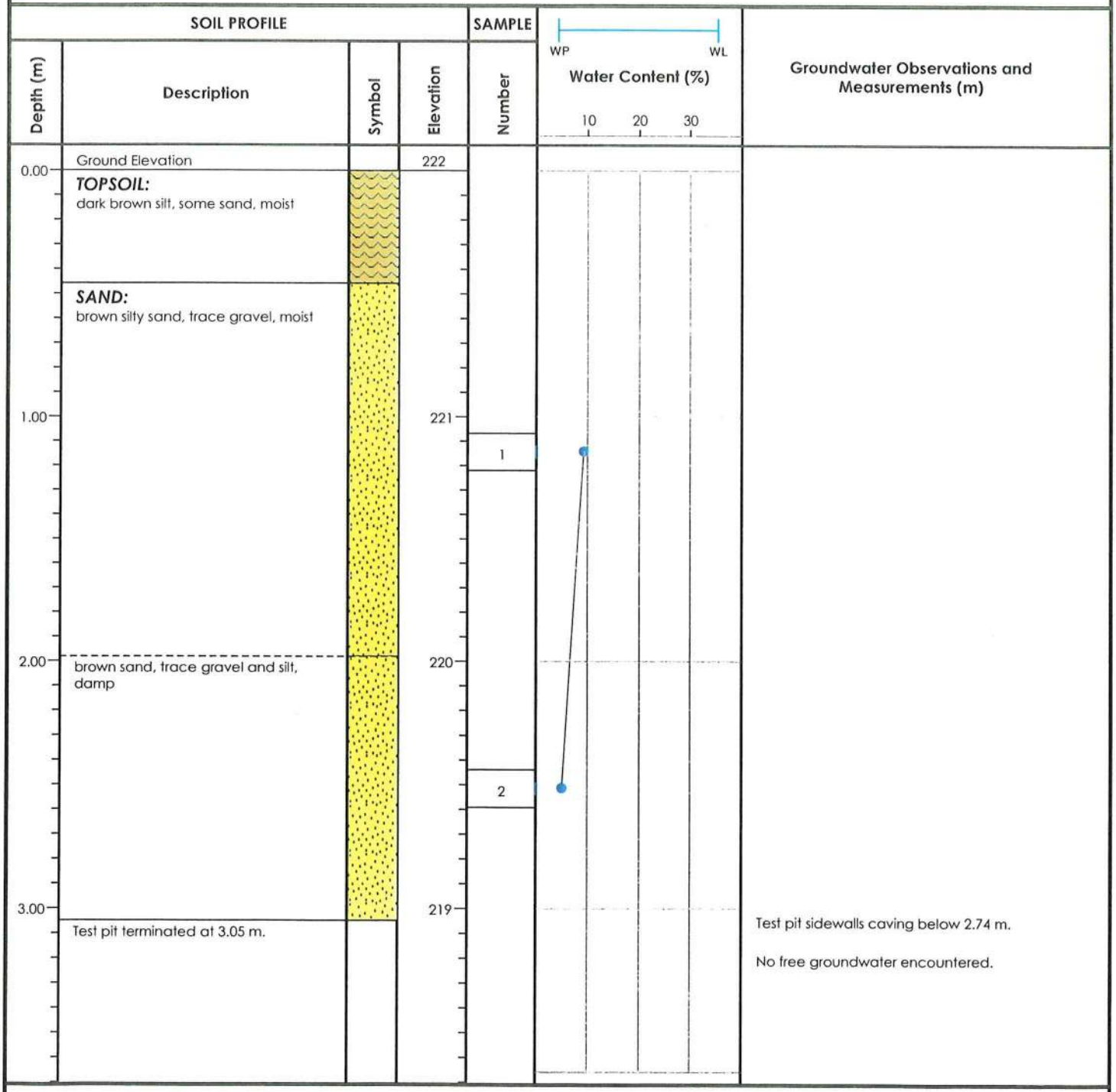
**Ground Elevation:** *222 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*




**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 5**

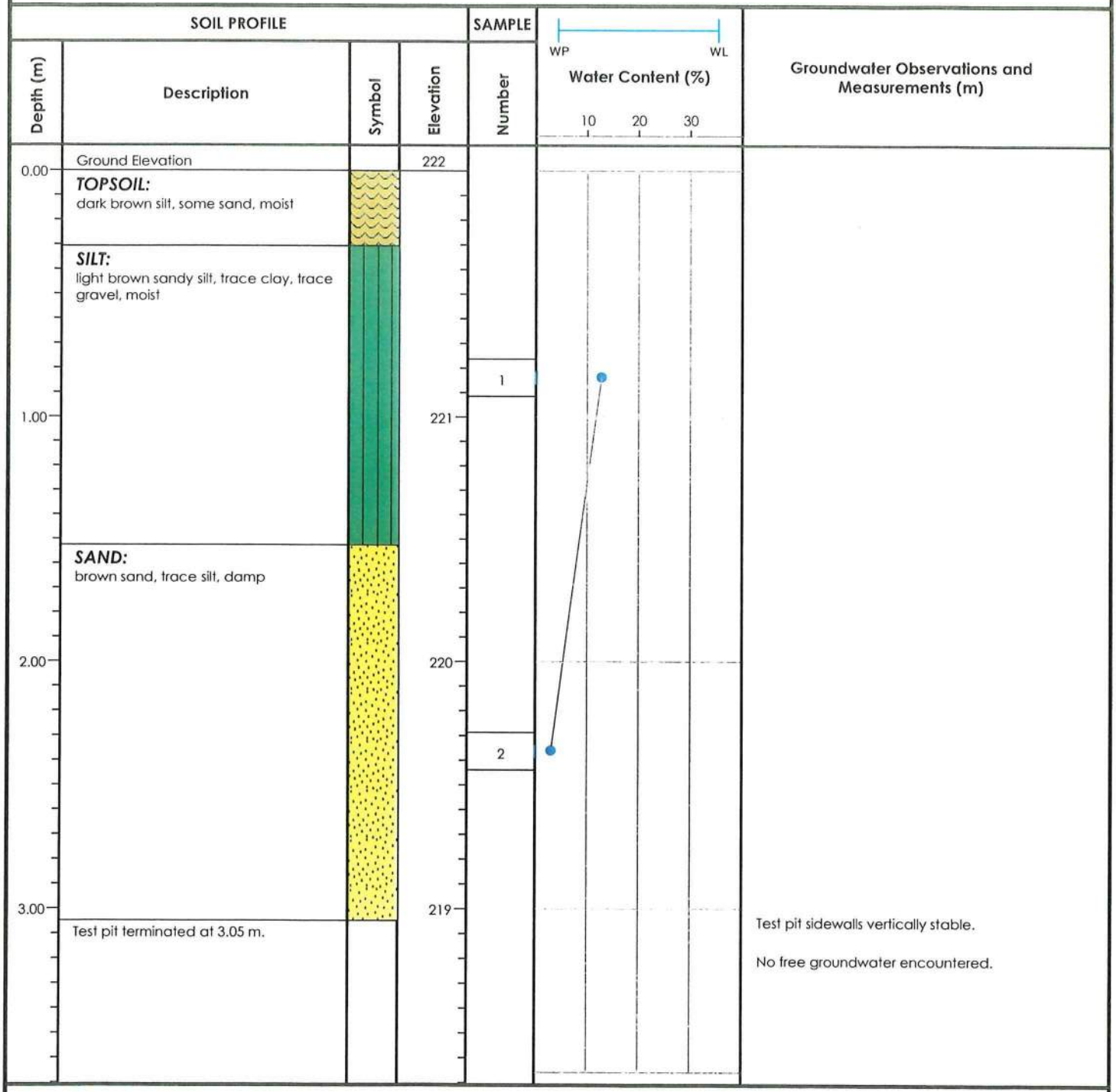
**Ground Elevation:** *222 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*




**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 6**

**Ground Elevation:** *225 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 225 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SAND:*** brown silty sand, trace gravel, moist | | | 1 | | |
| 1.00 | | | 224 | | | |
| | brown sand, some gravel, trace silt, damp | | | 2 | | |
| 2.00 | | | 223 | | | |
| | brown sand, trace gravel and silt, damp | | | 3 | | |
| 3.00 | | | 222 | | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls caving below 2.44 m. No free groundwater encountered. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 7**

**Ground Elevation:** *229 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 229 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SAND:*** light brown silty sand, damp | | | 1 | | |
| 1.00 | | | 228 | | | |
| | ***SILT:*** light brown silt, trace sand, very moist | | | 2 | | |
| 2.00 | | | 227 | | | |
| 3.00 | | | 226 | 3 | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls vertically stable.<br>No free groundwater encountered. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

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NAYLOR

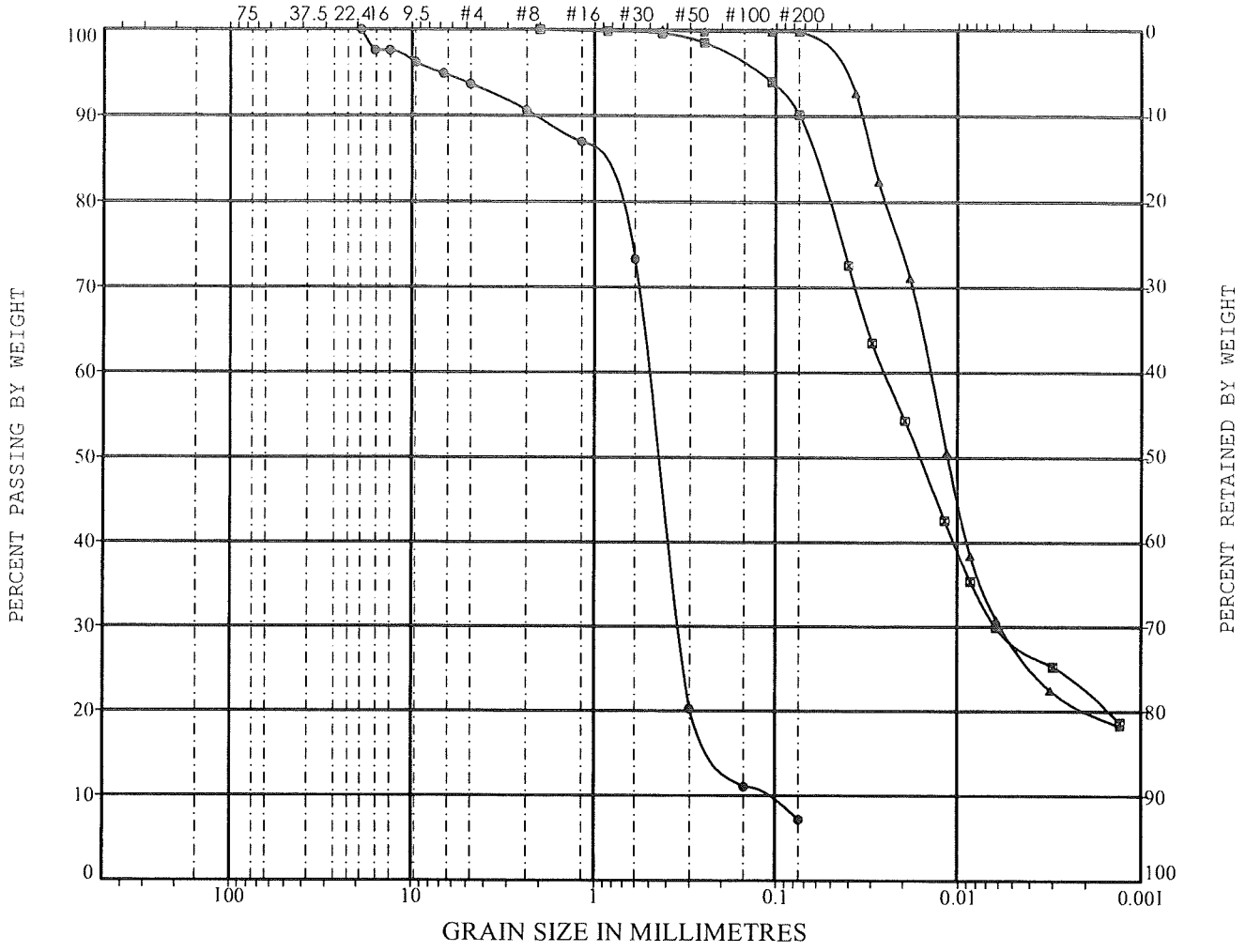


# Appendix 3 Figures
**(4 pages)**

Figures 1 and 2: Particle Size Distribution Analyses
Figures 3 and 4: Standard Proctor Moisture-Density Test Results

## UNIFIED SOIL CLASSIFICATION

| *COBBLES* | *GRAVEL* | | *SAND* | | | *SILT OR CLAY* |
|---|---|---|---|---|---|---|
| | COARSE | FINE | COARSE | MEDIUM | FINE | |
| U.S. SIEVE SIZE IN MILLIMETRES | | | U.S. STANDARD SIEVE No. | | | HYDROMETER |




PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

| CURVE ID | BOREHOLE/ TEST PIT | SAMPLE NO. | DEPTH (m) | SOIL DESCRIPTION |
|---|---|---|---|---|
| ● | BH8 | 4 | 3.05-3.51 | SAND, trace Silt and Gravel |
| ⊠ | BH10 | BS | 1.22-2.44 | Clayey SILT, trace Sand |
| ▲ | BH12 | 7 | 6.40-6.71 | Clayey SILT, trace Sand |

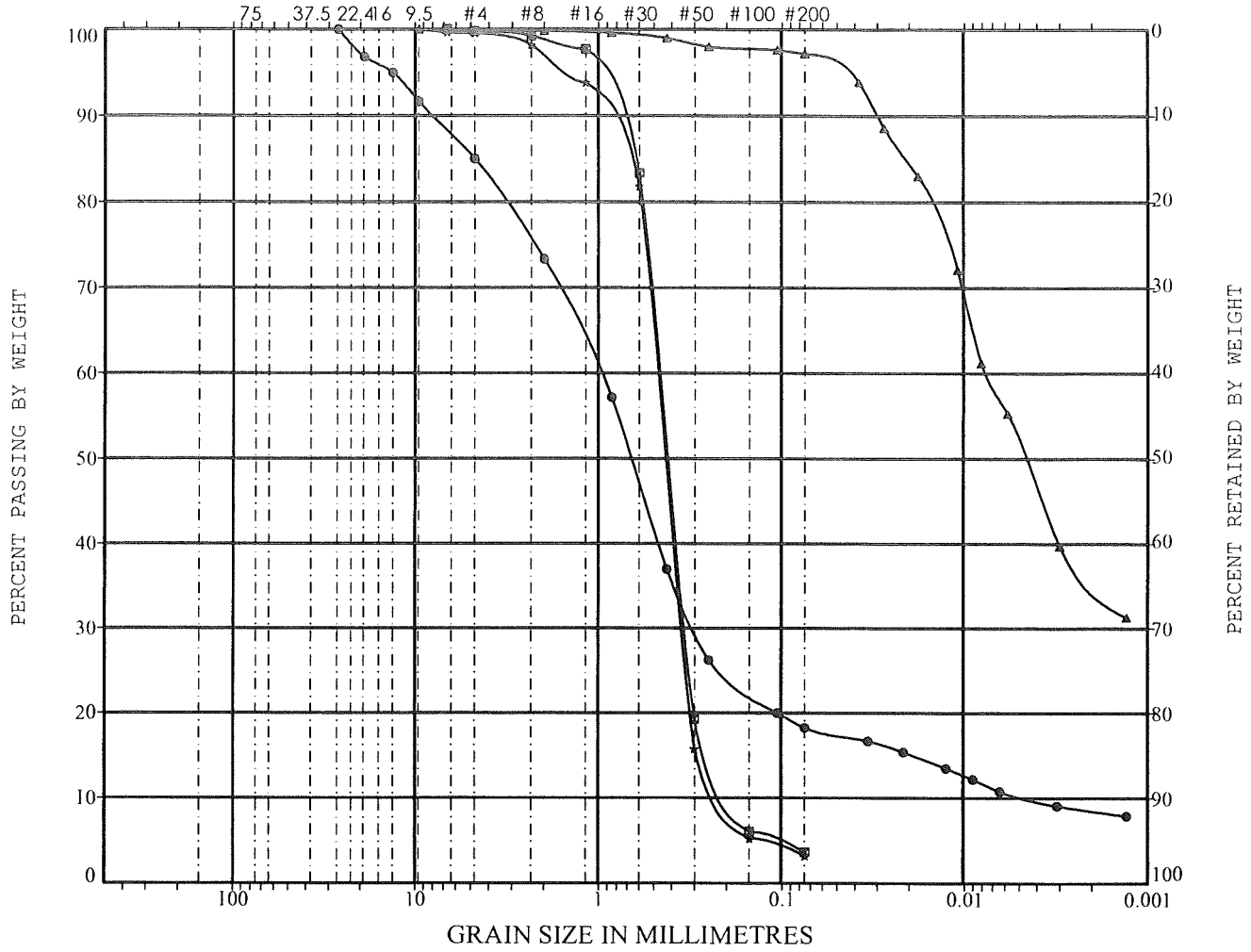
REMARKS

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

Figure No. 1

## UNIFIED SOIL CLASSIFICATION

| *COBBLES* | *GRAVEL* | | *SAND* | | | *SILT OR CLAY* |
|---|---|---|---|---|---|---|
| | COARSE | FINE | COARSE | MEDIUM | FINE | |
| U.S. SIEVE SIZE IN MILLIMETRES | | | U.S. STANDARD SIEVE No. | | | HYDROMETER |




PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

| CURVE ID | BOREHOLE/ TEST PIT | SAMPLE NO. | DEPTH (m) | SOIL DESCRIPTION |
|---|---|---|---|---|
| ● | BH17 | 3 | 2.29-2.74 | SAND, some Gravel, trace Silt and Clay |
| ⊠ | BH27 | 4 | 1.22-3.05 | SAND, trace Silt |
| ▲ | BH29 | 4 | 3.05-3.51 | Clayey SILT, trace Sand |
| ★ | BH30 | 3 | 2.29-2.74 | SAND, trace Silt and Gravel |

REMARKS

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

Figure No. 2

LVM NAYLOR

FIGURE NO. 3

# LABORATORY PROCTOR MOISTURE–DENSITY TEST

PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

BOREHOLE NO. 10 DATE TESTED November 10, 2009

SAMPLE DEPTH 1.22 – 2.44 m TESTED BY LR

SOIL TYPE Clayey SILT, trace Sand MOISTURE CONTENT 16.2%

REMARKS Particle Size Analysis provided on Figure 1.

METHOD LS – 706

PROCEDURE: 1☑ 2☐ 3☐

Procedure 1 (Mold ø – 101.6 mm)
Procedure 2 (Mold ø – 101.6 mm)
Procedure 3 (Mold ø – 152.4 mm)

MAXIMUM DRY DENSITY 1.865 t/m³

OPTIMUM MOISTURE 12.9%

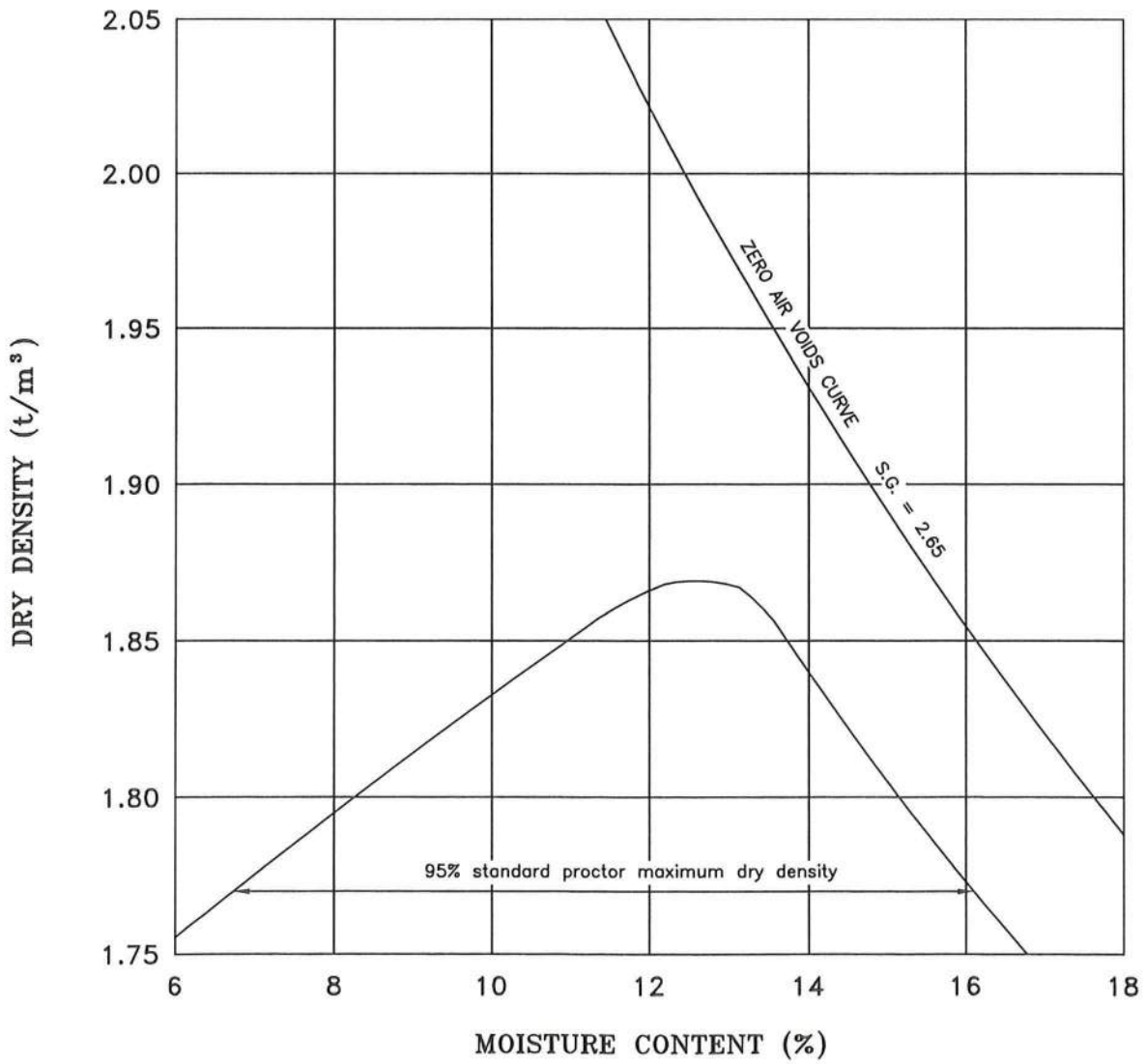


FIGURE NO. 4

LVM NAYLOR

# LABORATORY PROCTOR MOISTURE–DENSITY TEST

PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

BOREHOLE NO. 19 DATE TESTED November 16, 2009

SAMPLE DEPTH 2.44 – 4.27 m TESTED BY LR

SOIL TYPE SAND MOISTURE CONTENT 4.5%

REMARKS

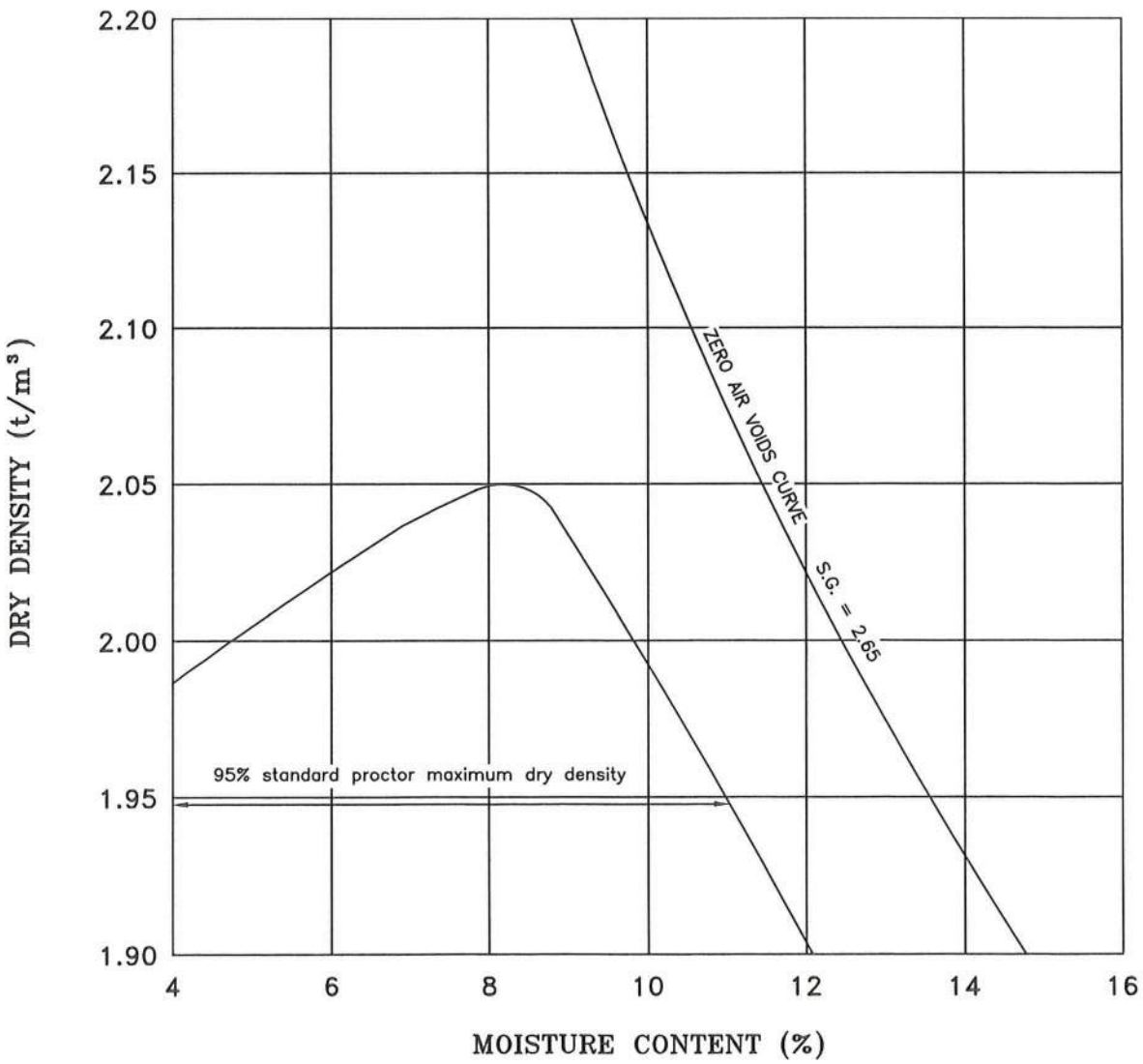
METHOD LS – 706

PROCEDURE: 1☑ 2☐ 3☐

Procedure 1 (Mold ø – 101.6 mm)
Procedure 2 (Mold ø – 101.6 mm)
Procedure 3 (Mold ø – 152.4 mm)

MAXIMUM DRY DENSITY 2.05 t/m³

OPTIMUM MOISTURE 8.4%



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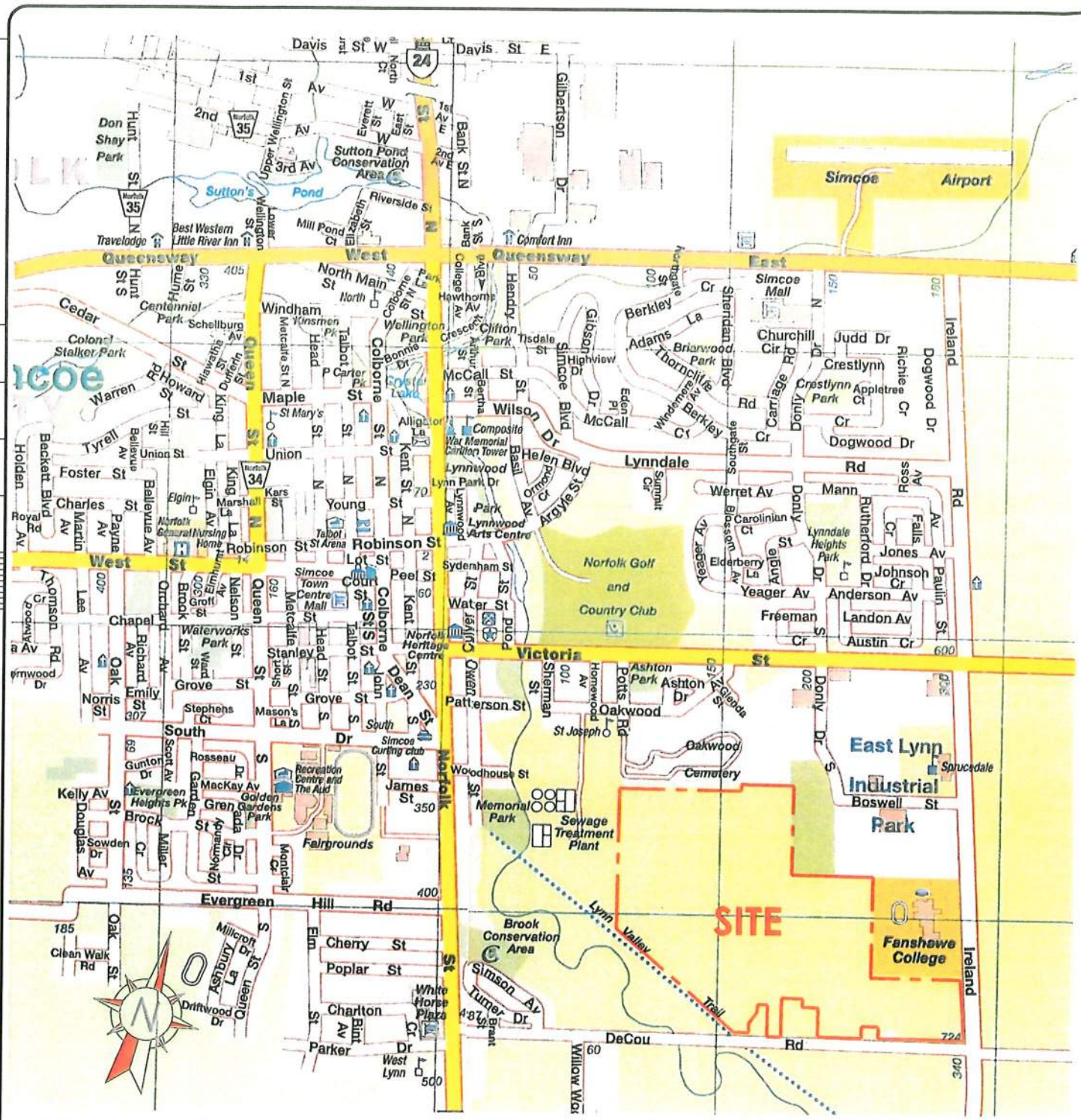
NAYLOR

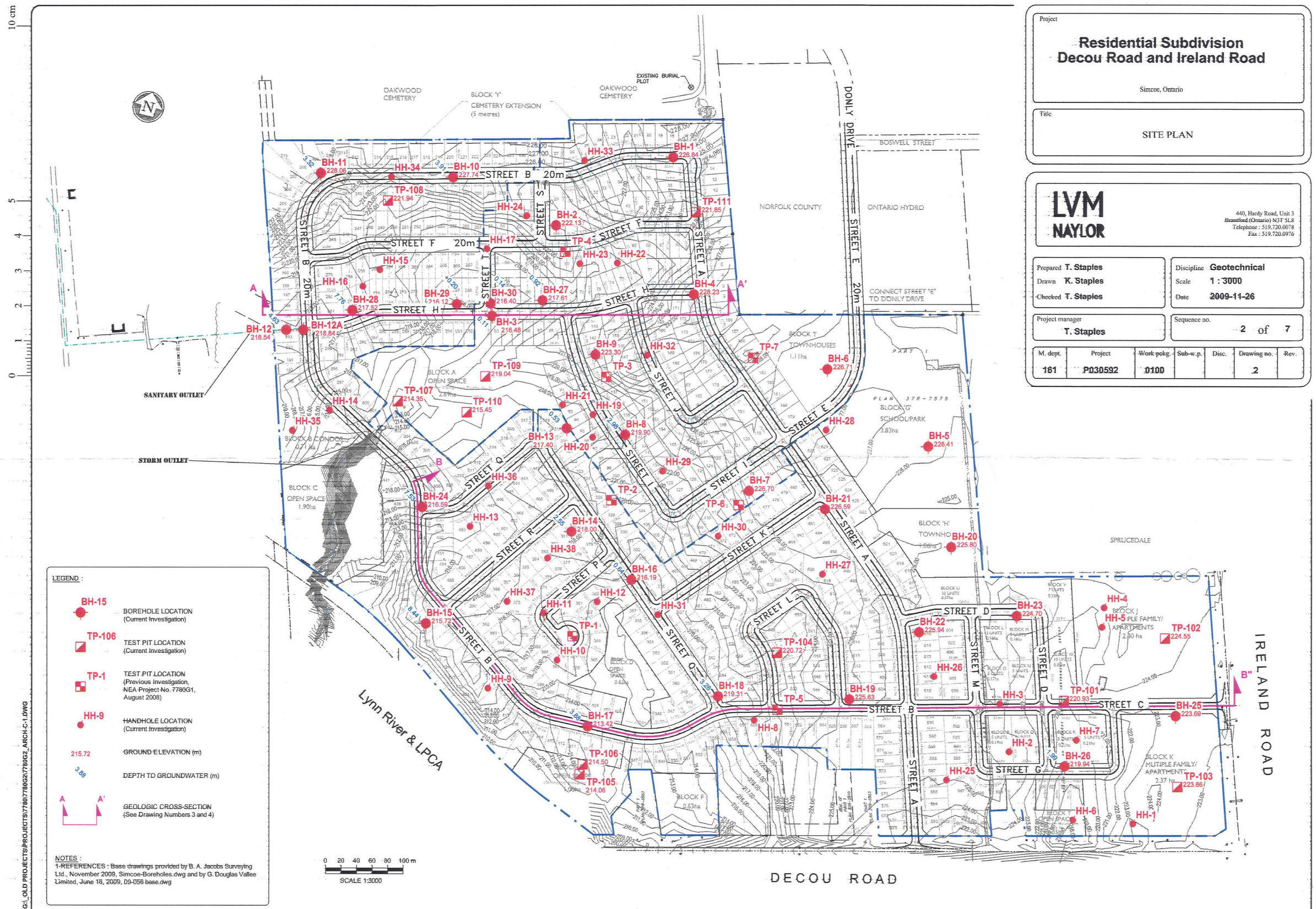


# Appendix 4 Drawings

**(6 pages)**

Drawing 1: Location Plan
Drawing 2: Site Plan
Drawings 3 and 4: Cross-Sections
Drawing 5: Structural Fill Pad Detail
Drawing 6: Typical Pavement Subdrain Detail
Drawing 7: Typical Pond Subdrain Detail


Davis St W
Davis St E
Queensway West
Queensway East
Simcoe Airport
Sutton's Pond
Sutton Pond Conservation Area
Best Western Little River Inn
Travelodge
Comfort Inn
Simcoe Mall
Windham
Centennial Park
Colonel Stalker Park
Maple
Union
Robinson St
Victoria St
Norfolk Golf and Country Club
Lynnwood Arts Centre
Lynndale
Werret Av
Mann
Rutherford Rd
Jones Av
Johnson Cr
Anderson Av
Landon Av
Austin Cr
Freeman
Yeager Av
Elderberry
Carolinian Ct
Lynndale Heights Park
Ashton Park
Ashton Dr
Oakwood
St Joseph
Oakwood Cemetery
East Lynn Industrial Park
Sprucedale
Boswell St
Memorial Park
Sewage Treatment Plant
Fairgrounds
Recreation Centre and The Aud
Simcoe Curling Club
Waterworks Park
Norfolk Heritage Centre
Simcoe Town Centre Mall
Colborne
Norfolk
Queen
Wellington
Bank St N
Gilbertson Dr
Ireland
Evergreen Hill Rd
Brook Conservation Area
Lynn Valley Trail
Fanshawe College
SITE
DeCou Rd
Simson Av
Turner Dr
White Horse Plaza
West Lynn
Parker Dr
Charlton Av
Poplar St
Cherry St
Elm
Oak
Millcroft Dr
Ashbury La
Driftwood Dr
Clean Walk Rd
Kelly Av
Douglas Av
Brock St
Sowden Dr
Gunton Dr
Rosseau Dr
MacKay Av
Golden Gardens Park
Evergreen Heights Pk
Stephens Ct
Mason's La
Grove St
Norris St
Emily St
Chapel St
Richard Av
Orchard Av
Brook St
Thomson Cr
Lee Av
Holden Rd
Becket Blvd
Foster St
Charles St
Royal Rd
Marlin Av
Payne Av
Bellevue Av
Elgin St
Marshall La
Kars St
Young St
Talbot St
Arena
Norfolk General Nursing Home
Cedar St
Warren Rd
Howard St
Hunt St S
Hunt Park
Don Shay Park
Schellburg Av
Hiawatha St
Dufferin St
King St
Tyrell St
Hill St
Union St
Bellevue Av
Wilson Dr
Helen Blvd
Basil Rd
Ormond Cr
Argyle St
Lynn Park Dr
Lynnwood Av
Summit Cr
Sydenham St
Water St
Peel St
Court St
Lot St
Nelson St
Elmira St
Groff St
Metcalfe St
Head St
Talbot St
Dean St
John St
Jones St
Ward St
Stanley St
Owen St
Patterson St
Sherman St
Potts Av
Homewood Av
Glenda St
Donly Dr
Woodhouse St
James St
Scott Av
Garden St
Miller Dr
Monticlair Dr
Queen St
Ashbury La
Millcroft Dr
Driftwood Dr
Oak St
Elm
Cherry St
Poplar St
Charlton Av
Bint Cr
Parker Dr
Brant St
Simson Av
Turner Dr
DeCou Rd
Willow Wa
Berkley La
Sheridan Cr
Churchill Cir
Judd Dr
Crestlynn Cr
Crestlynn Park
Appletree Ct
Dogwood Dr
Richie Cr
Briarwood Park
Thorncliffe Blvd
Windermere Av
Eden Pl
Carriage Rd
Donly Dr
Gibson Dr
Highview Dr
Tisdale St
Hawthorne Av
College Ave
Clifton Park
Bonnie Dr
Colborne St
Wellington St
North Main St
Cedar St
Windham St
Queen St
Metcalfe St N
Head
P Carter Pk
Talbot St
Crystal Lake
Alligator La
Composite War Memorial Carillon Tower
Lynnwood
Park
Kent St
Young St
Marshall La
Elgin St
Kars St
Talbot St Arena
Norfolk General Nursing Home
Robinson St
Lot St
Peel St
Sydenham St
Water St
Simcoe Town Centre Mall
Court St
Colborne St
Kent St
Queen St
Metcalfe St
Head St
Talbot St
Dean St
John St
Jones St
Ward St
Stanley St
Owen St
Norfolk Heritage Centre
Waterworks Park
Patterson St
Sherman St
Potts Av
Homewood Av
Glenda St
Donly Dr
Ashton Park
Ashton Dr
Oakwood
St Joseph
Oakwood Cemetery
East Lynn Industrial Park
Sprucedale
Boswell St
Memorial Park
Sewage Treatment Plant
Fairgrounds
Recreation Centre and The Aud
Simcoe Curting Club




LEGEND :

- BH-15 — BOREHOLE LOCATION (Current Investigation)
- TP-106 — TEST PIT LOCATION (Current Investigation)
- TP-1 — TEST PIT LOCATION (Previous Investigation, NEA Project No. 7780G1, August 2008)
- HH-9 — HANDHOLE LOCATION (Current Investigation)
- 215.72 — GROUND ELEVATION (m)
- 3.88 — DEPTH TO GROUNDWATER (m)
- A A' — GEOLOGIC CROSS-SECTION (See Drawing Numbers 3 and 4)

NOTES :

1. REFERENCES : Base drawings provided by B. A. Jacobs Surveying Ltd., November 2009, Simcoe-Boreholes.dwg and by G. Douglas Vallee Limited, June 16, 2009, 09-056 base.dwg

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

SITE PLAN

LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | |
|---|---|
| Prepared T. Staples | Discipline Geotechnical |
| Drawn K. Staples | Scale 1 : 3000 |
| Checked T. Staples | Date 2009-11-26 |
| Project manager T. Staples | Sequence no. 2 of 7 |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 2 | |

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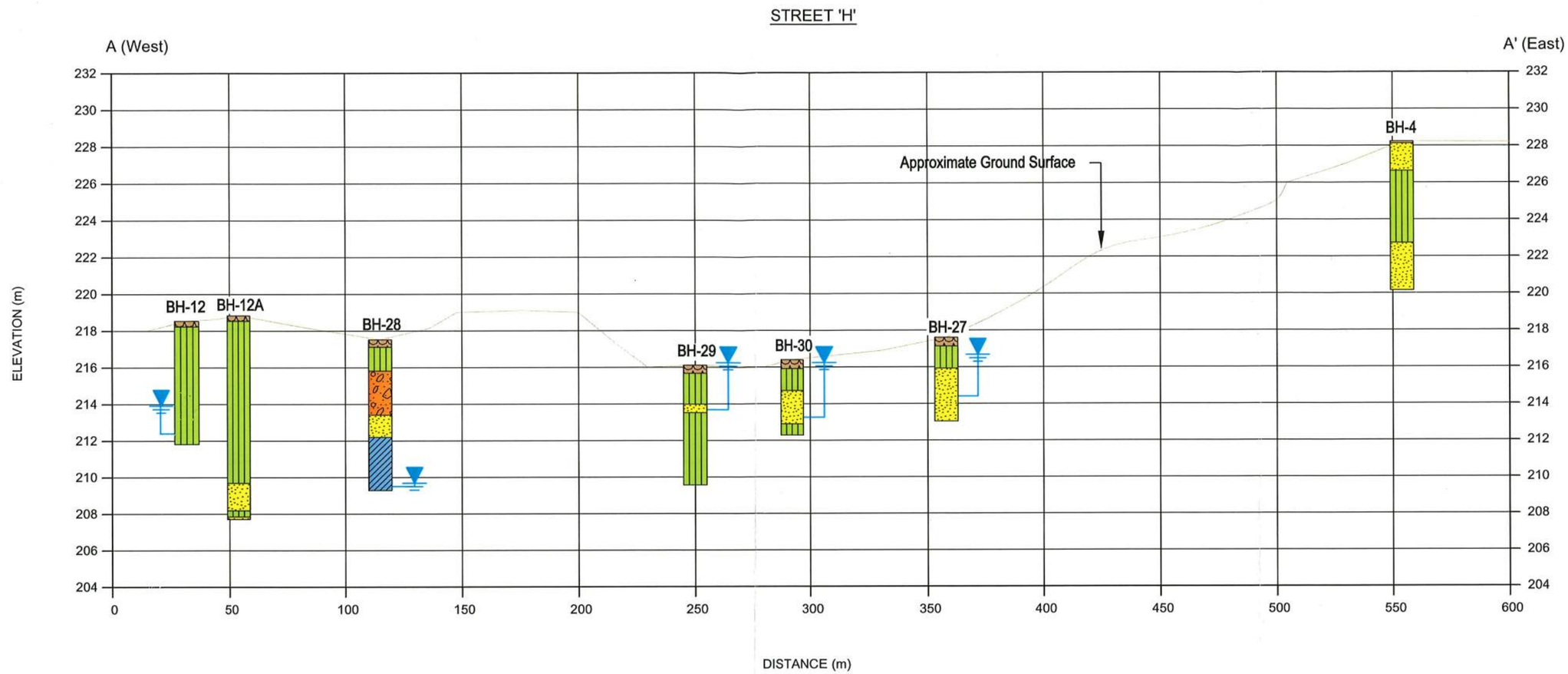


LEGEND :

- TOPSOIL
- CLAY
- SILT
- SAND
- SAND AND GRAVEL
- GROUNDWATER LEVEL

NOTES :

1-REFERENCES : B. A. Jacobs Surveying Ltd., November 2009, Simcoe-Boreholes.dwg and G. Douglas Vallee Limited, June 16, 2009, 09-056 base.dwg

2-Groundwater measurements taken on November 10, 2009. Seasonal fluctuations in groundwater levels would be expected.

3- The inferred stratigraphy shown on this cross-section is based on the subsurface stratigraphy contacted at the Boreholes. The subsurface conditions between the Boreholes will vary.

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

**GEOLOGIC CROSS-SECTION A - A'**
**STREET 'H'**

LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | | | |
|---|---|---|---|
| Prepared D. Kelly | Discipline GEOTECHNICAL | Project manager T. Staples | |
| Drawn K. Staples | Scale Vertical : 1:250 Horizontal : 1:2000 | Sequence no. 03 of 07 | |
| Checked T. Staples | Date 2009-12-10 | | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 3 | |

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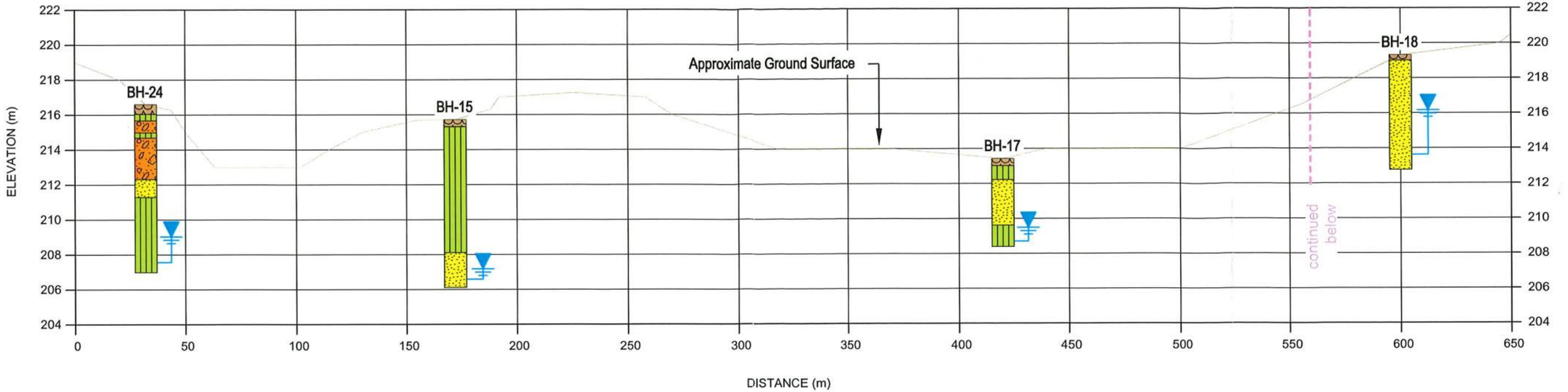
## STREET 'B'

B (West)

B' (East)

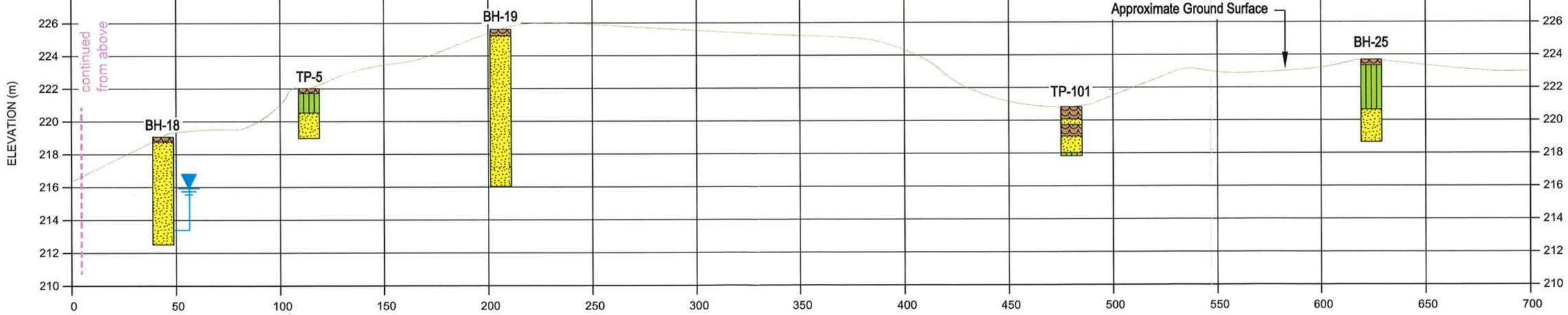



DISTANCE (m)

## STREET 'B' AND STREET 'C'

B' (West)

B" (East)




DISTANCE (m)

LEGEND :

TOPSOIL
CLAY
SILT
SAND
SAND AND GRAVEL
GROUNDWATER LEVEL

NOTES :

1-REFERENCES : B. A. Jacobs Surveying Ltd., November 2009, Simcoe-Boreholes.dwg and G. Douglas Vallee Limited, June 16, 2009, 09-056 base.dwg

2-Groundwater measurements taken on November 10, 2009. Seasonal fluctuations in groundwater levels would be expected.

3- The inferred stratigraphy shown on this cross-section is based on the subsurface stratigraphy contacted at the Boreholes. The subsurface conditions between the Boreholes will vary.

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

**GEOLOGIC CROSS-SECTION B - B"**
**STREET 'B'**


LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976


| | | | | | |
|---|---|---|---|---|---|
| Prepared D. Kelly | Discipline GEOTECHNICAL | Project manager T. Staples |
| Drawn K. Staples | Scale Vertical : 1:250 Horizontal : 1:2000 | Sequence no. 04 of 07 |
| Checked T. Staples | Date 2009-12-10 | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
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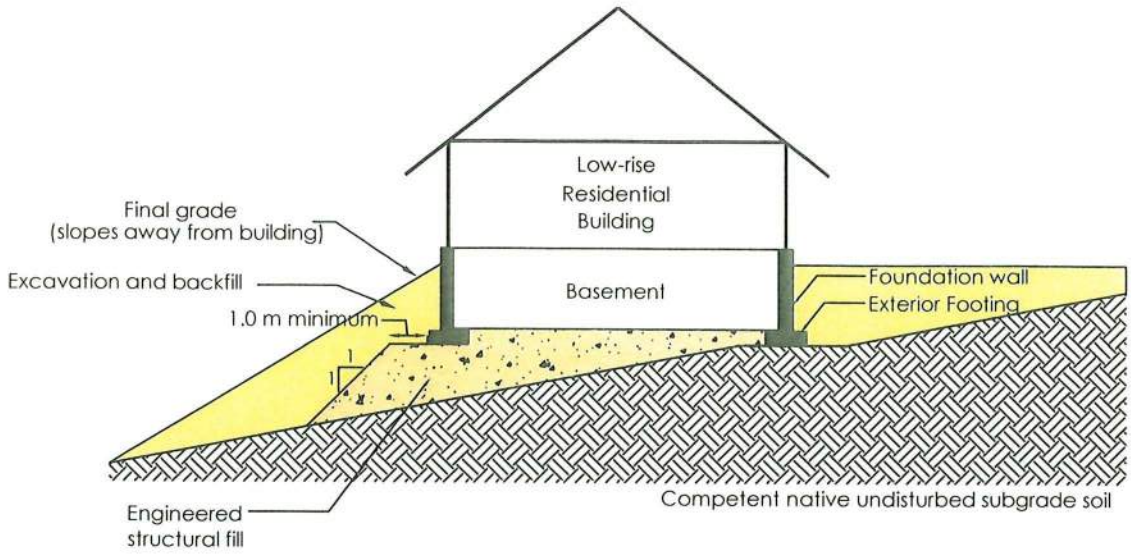


## GENERAL REQUIREMENTS FOR ENGINEERED STRUCTURAL FILL

1. The area must be excavated of all pre-existing loose fill, topsoil, and/or organic soil until competent native undisturbed soil is reached.

2. The excavation should allow for the structural fill to extend 1.0 m beyond the outside edge of the building footings and down to the approved subgrade soil at a slope of 1 horizontal to 1 vertical (45 ).

3. The subgrade below the engineered fill should be inspected and approved by a geotechnical engineer prior to fill construction. Fill placement and compaction operations to be carried out under full-time geotechnical supervision.

4. The structural fill should comprise sand and gravel aggregate placed in 300 mm thick lifts and compacted to at least 98 % Standard Proctor Maximum Dry Density (SPMDD). The exterior backfill should consist of approved inorganic soil also placed in 300 mm thick lifts and compacted to minimum 95 % SPMDD.

5. Exterior footings should be provided with minimum 1.2 m of soil cover for frost protection.

6. All excavations must be carried out in conformance with the current Ontario Occupational Health and Safety Act and Regulations 213/91 for construction projects.

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Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

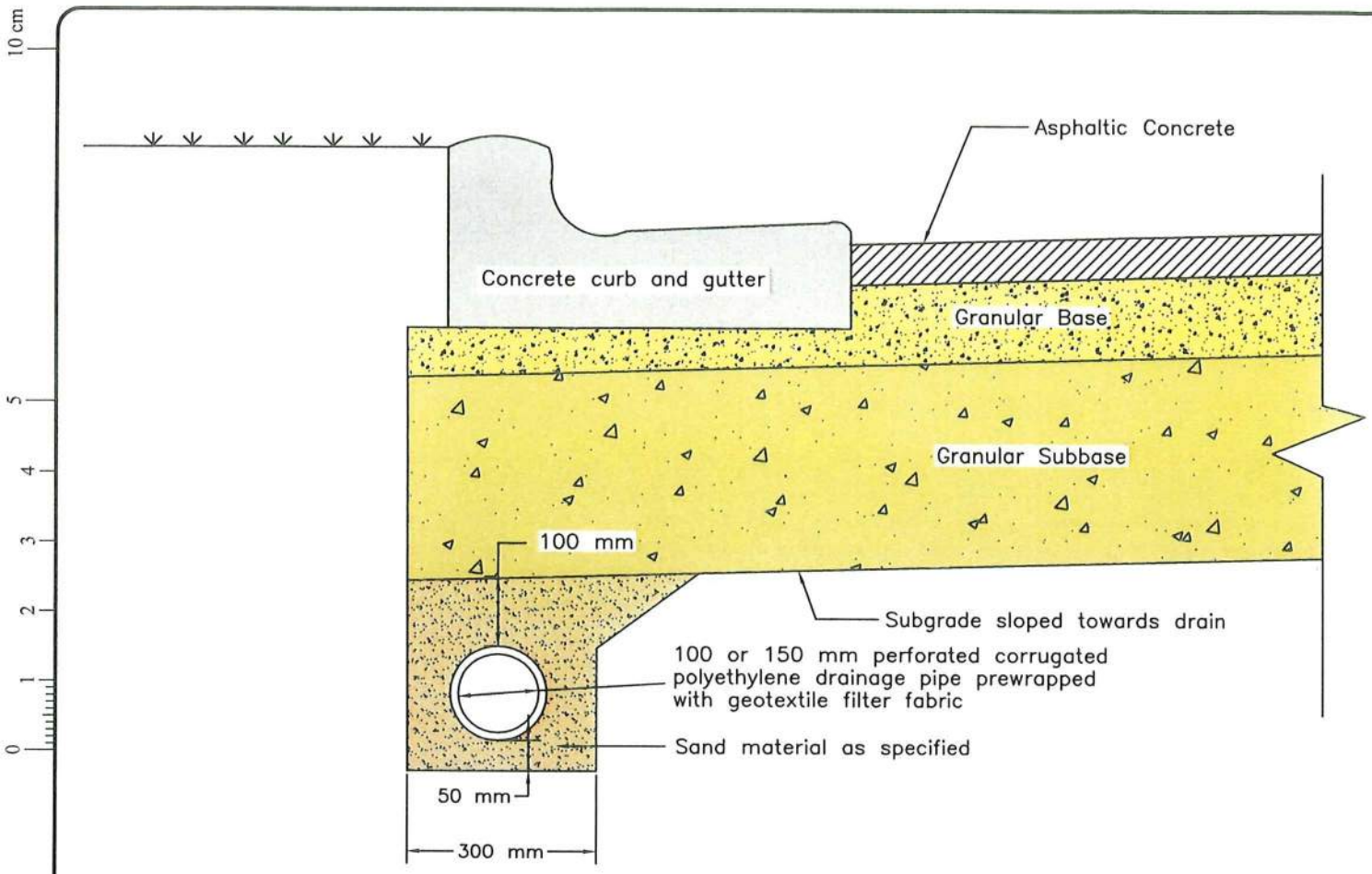
**STRUCTURAL FILL PAD DETAIL**

LVM NAYLOR

440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | | | | | |
|---|---|---|---|---|---|
| Prepared | T. Staples | Discipline | GEOTECHNICAL | Project manager | T. Staples |
| Drawn | K. Staples | Scale | NTS | Sequence no. | 05 of 07 |
| Checked | T. Staples | Date | 2009-12-04 | | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 5 | |




## GENERAL REQUIREMENTS FOR PAVEMENT SUBDRAINS

1. Perforated corrugated polyethylene drainage pipe shall meet the requirements of OPSS 1840.
2. Pipe filter fabric conforming to OPSS 1860 for geotextile Class 1 with a filtration opening size of 150 to 450 microns shall be supplied on all sections of perforated pipe.
3. The open upstream ends of pipes should be capped.
4. Subdrain pipes to be set on at least 1% grade draining to a positive frost-free outlet. If the subdrains are outletted to a ditch then the last 1.5 m of the outlet pipe should consist of a corrugated galvanized steel pipe equipped with a rodent gate.
5. Bedding and backfill material shall be concrete sand meeting the gradation requirements of OPSS 1002 (Fine Aggregate for Concrete).

G:_OLD PROJECTS\PROJECTS\7780\7780G2\7780G2_06.DWG

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

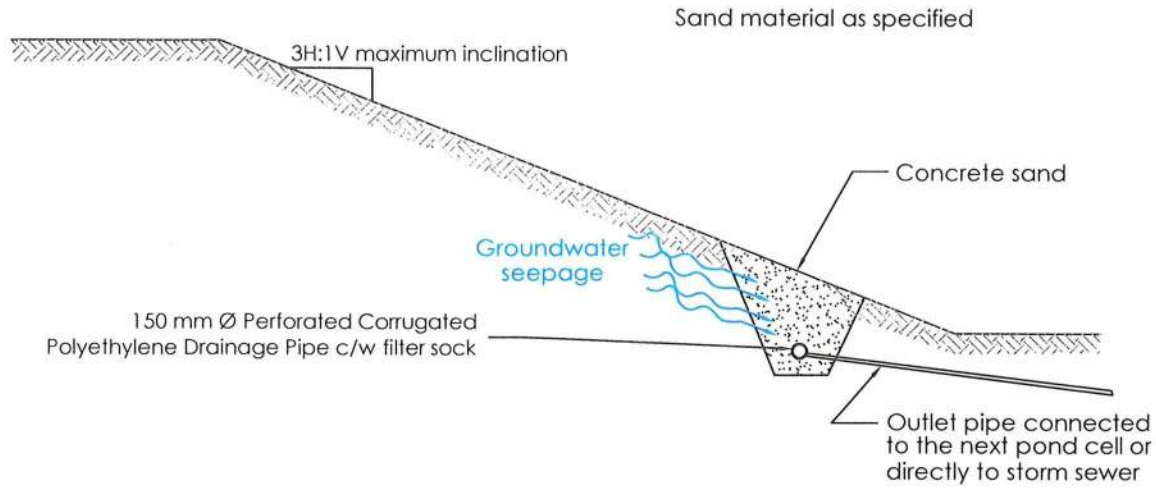
**TYPICAL PAVEMENT SUBDRAIN DETAIL**

LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | | | | | |
|---|---|---|---|---|---|
| Prepared | T. Staples | Discipline | GEOTECHNICAL | Project manager | T. Staples |
| Drawn | K. Staples | Scale | NTS | Sequence no. | 06 of 07 |
| Checked | T. Staples | Date | 2009-12-07 | | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 6 | |

# STORMWATER MANAGEMENT POND SLOPE SUBDRAIN INSTALLATION




## GENERAL REQUIREMENTS

1. Perforated corrugated polyethylene drainage pipe shall meet the requirements of OPSS 1840.
2. Pipe filter fabric conforming to OPSS 1860 for geotextile Class 1 with a filtration opening size of 150 to 450 microns shall be supplied on all sections of perforated pipe.
3. Subdrain pipes to be set on at least 1% grade and draining to a positive outlet. If the pipe is outletted to the pond, then the last 1.5 m should comprise a corrugated steel pipe equipped with a rodent gate.
4. Bedding and backfill material shall be concrete sand meeting the gradation requirements of OPSS 1002 (Fine Aggregate for Concrete).
5. The open upstream ends of pipes should be capped.
6. The subgrade on the original slope should be inspected and approved by Naylor Engineering Associates Ltd. prior to fill construction. Fill placement and compaction operations to be carried out under engineering supervision.

G:_OLD PROJECTS\PROJECTS\7780\7780G2\7780G2_07.DWG

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

**TYPICAL POND SUBDRAIN DETAIL**

LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | | | | |
|---|---|---|---|---|
| Prepared | T. Staples | Discipline | GEOTECHNICAL | Project manager: T. Staples |
| Drawn | K. Staples | Scale | NTS | Sequence no.: 07 of 07 |
| Checked | T. Staples | Date | 2001-12-07 | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 7 | |

LVM
NAYLOR



# Appendix 5 Site Photographs

**(6 pages)**

Site Photos 1 to 11

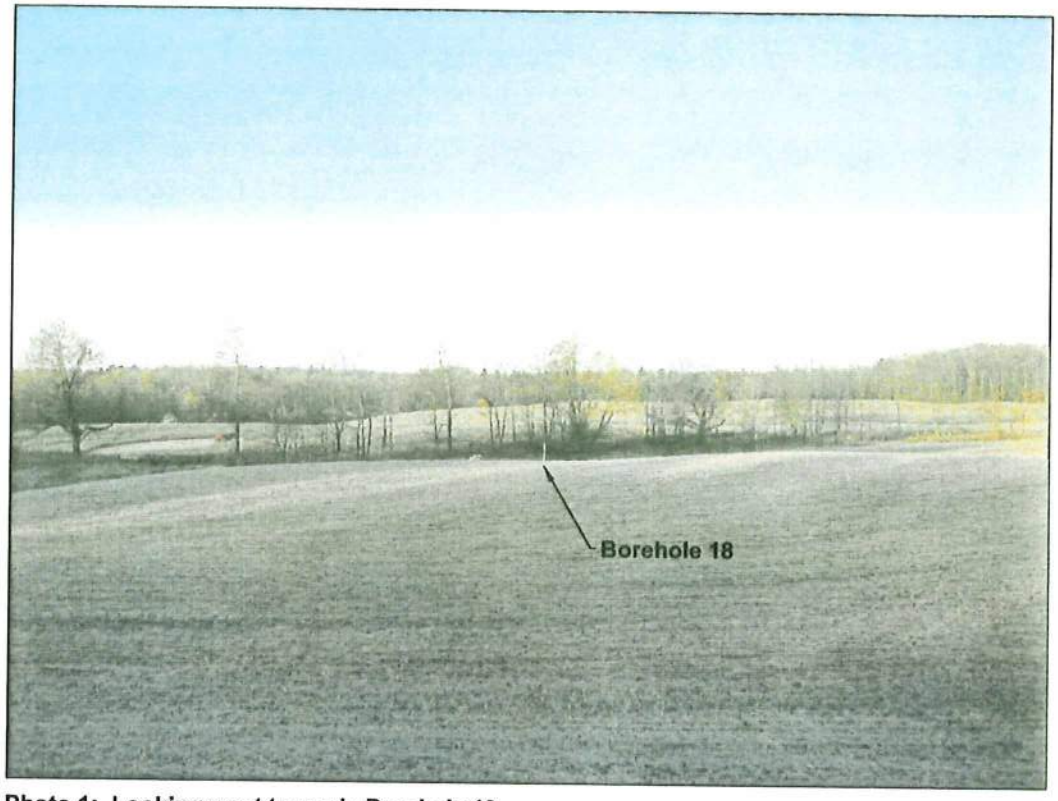



**Photo 1: Looking west towards Borehole 18.**




**Photo 2: Looking northwest towards Borehole 16.**

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November 18, 2009

LVM NAYLOR



**Photo 3: Looking west from Borehole 7.**



**Photo 4: Looking north from Borehole 7.**

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November 18, 2009

LVM
NAYLOR



**Photo 5: Looking west from Borehole 4.**



**Photo 6: Looking northwest from Borehole 4.**

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November 18, 2009

LVM
NAYLOR




**Photo 7: Looking north from near Borehole 4.**




**Photo 8: Looking northwest from Borehole 5.**

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November 18, 2009

LVM
NAYLOR



**Photo 9: Looking south from Borehole 5.**



**Photo 10: Looking southeast towards Ireland Road and Decou Road intersection.**

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November 18, 2009

LVM
NAYLOR

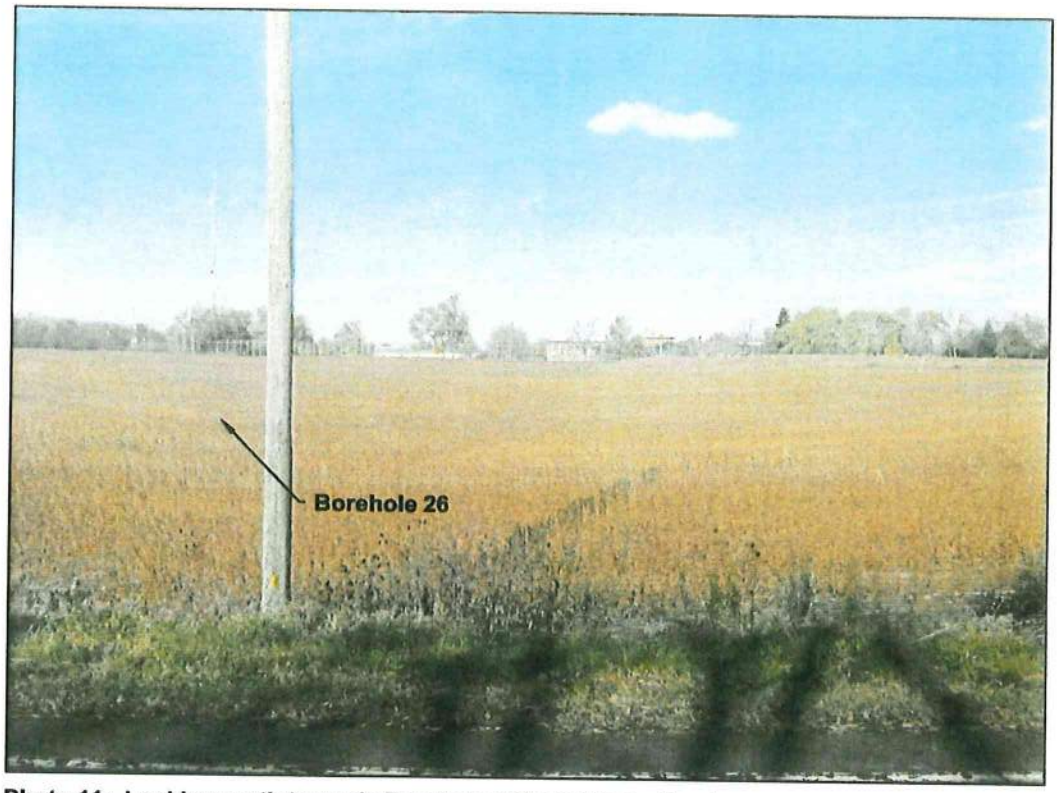


**Photo 11: Looking north towards Borehole 26 from Decou Road.**

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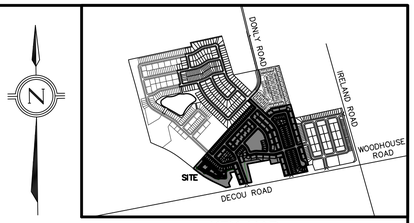
November 18, 2009

LVM
NAYLOR

–GRD–1
####




KEY MAP
N.T.S.

LEGEND:

| | |
|---|---|
| | EXISTING GROUND ELEVATION |
| (100.00) | PROPOSED GROUND ELEVATION |
| (100.00)EX | PROPOSED ELEVATION TO MATCH EXISTING |
| (100.00)SW | PROPOSED SWALE ELEVATION |
| (100.00)TW | PROPOSED TOP OF RETAINING WALL ELEVATION |
| (100.00)BW | PROPOSED BOTTOM OF RETAINING WALL ELEVATION |
| [100.00] | FUTURE GRADES |
| | PROPOSED CATCHBASIN/DITCH INLET |
| DDI | PROPOSED DOUBLE DITCH INLET |
| | PROPOSED DOUBLE CATCHBASIN |
| HYD | PROPOSED HYDRANT |
| WV | PROPOSED CURB STOP/GATE VALVE |
| 2.0% | PROPOSED DIRECTION OF SHEET FLOW |
| | MAJOR OVERLAND FLOW ROUTE |
| (100.00)SW | PROPOSED SWALE W/ GRADE & DIRECTION |

**BENCH MARK NOTE:**

SITE BM # 1
TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M–55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| | | | |

NOTES TO CONTRACTOR:

1. CONTRACTORS AND SUBCONTRACTORS SHALL NOT SCALE FROM THIS DRAWING.
2. ANY INCONSISTENCIES AND OMISSIONS FOUND ON THE DRAWINGS MUST BE REPORTED TO THE ENGINEER FOR CLARIFICATION BEFORE COMMENCING THE WORK.
3. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND ELEVATIONS AND REPORT ALL FINDINGS TO THE ENGINEER. ONCE CONSTRUCTION HAS COMMENCED, THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL DIMENSIONS, ELEVATIONS, AND SITE CONDITIONS.
4. THE POSITIONS OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVER–GROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. WHERE SHOWN ON THE DRAWING, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
5. ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED, REUSED, OR REVISED WITHOUT THE WRITTEN CONSENT OF S. LLEWELLYN AND ASSOCIATES LIMITED.

| | | | | |
|---|---|---|---|---|
| DESIGN | AS/BB | CHK'D | BB | DATE FEB 19, 2026 |
| DRAWN | AS/BB | CHK'D | BB | |

SCALE 1:500 (0, 5, 10, 25, 50)

APPROVALS

NOT FOR CONSTRUCTION

STAMP


S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631–6978
Fax (905) 631–8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8


CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
PRELIMINARY GRADING PLAN
(SHEET 1 OF 4)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | GRD–1 | #### |

SEE GRD-1

SEE GRD-2 ####

SEE GRD-3

SEE GRD-4


EX. RESIDENTIAL LANDS
TOWNHOUSE BLOCK
SINGLE FAMILY LOT
PART 1 , PLAN 37R-2610
PART 1 , PLAN 37R-5563
PART 2 , PLAN 37R-2610
PART 4 , 37R-3397
PART 9 , PLAN 37R-6397
PART 11 , PLAN 37R-6397
EX. 0.46 CV
N. INV=224.99
S. INV=224.22
EX. 0.6ø CV
N. INV=220.81
S. INV=220.47
EX. CB5
T/G=221.44
EX. CB4
T/G=221.45
EX. CONCRETE GUTTER
EX. CENTRELINE OF ROAD
EX. DRIPLINE (STAKED DECEMBER 3, 2025)
MAX 3:1 SLOPE
RLCB30.1 T/G=216.50
RLCB35.1 T/G=219.25
RLCB35.2 T/G=222.50
RLCB36.1 T/G=224.15
RLCB36.2 T/G=223.90
RLCB39.1 T/G=223.20
RLCB40.1 T/G=224.60
RLCB41.1 T/G=224.90
RLCB46.1 T/G=224.95
RLCB46.2 T/G=224.40
RLCB46.3 T/G=225.00
RLCB46.4 T/G=224.45
RLCB47.1 T/G=224.05
RLCB47.2 T/G=225.00
RLCB47.3 T/G=224.00
RLCB47.4 T/G=224.70
RLCB49.1 T/G=224.65
RLCB50.2 T/G=225.55
RLCB55.1 T/G=224.65
RLCB55.2 T/G=224.27
RLCB56.1 T/G=225.00
DI55.1 T/G=223.47
CB34.1
CB34.2
CB35.1
CB35.2
CB39.1
CB40.1
CB41.1
CB46.1
CB46.2
CB46.3
CB46.4
CB47.1
CB47.2
CB47.3
CB47.4
CB48.1
CB48.2
CB49.1
CB55.1
CB55.2
BH19
TP4
20.01m @ 4.80%
48.41m @ 0.66%
26.02m @ 0.50%
25.96m @ 0.50%
28.00m @ 0.50%
80.00m @ 0.50%
LVC=53.09 K=8.00
LVC=12.84 K=4.00
LVC=19.84 K=4.00
LVC=14.14 K=4.00
LVC=14.14 K=4.00
LVC=14.14

-GRD-3
####







KEY MAP
N.T.S.

LEGEND:

| | |
|---|---|
| 000.00 | EXISTING GROUND ELEVATION |
| (100.00) | PROPOSED GROUND ELEVATION |
| (100.00)EX | PROPOSED ELEVATION TO MATCH EXISTING |
| (100.00)SW | PROPOSED SWALE ELEVATION |
| (100.00)TW | PROPOSED TOP OF RETAINING WALL ELEVATION |
| (100.00)BW | PROPOSED BOTTOM OF RETAINING WALL ELEVATION |
| [100.00] | FUTURE GRADES |
| | PROPOSED CATCHBASIN/DITCH INLET |
| DDI | PROPOSED DOUBLE DITCH INLET |
| | PROPOSED DOUBLE CATCHBASIN |
| HYD | PROPOSED HYDRANT |
| WV | PROPOSED CURB STOP/GATE VALVE |
| 2.0% | PROPOSED DIRECTION OF SHEET FLOW |
| | MAJOR OVERLAND FLOW ROUTE |
| (100.00)SW | PROPOSED SWALE W/ GRADE & DIRECTION |

BENCH MARK NOTE:

SITE BM # 1
TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M-55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| | | | |

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| | | | | |
|---|---|---|---|---|
| DESIGN | AS/BB | CHK'D | BB | DATE FEB 19, 2026 |
| DRAWN | AS/BB | CHK'D | BB | |

SCALE
1:500 (0, 5, 10, 25, 50)

APPROVALS

NOT FOR CONSTRUCTION

STAMP


S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8


CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
PRELIMINARY GRADING PLAN
(SHEET 3 OF 4)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | GRD-3 | #### |

SEE GRD-3

-GRD-4
####

SEE GRD-2


STORMWATER MANAGEMENT FACILITY:
3.3m DEEP SWM FACILITY (WET POND)
DRAINAGE TO POND = 25.14ha
QUANTITY STORAGE:
100-YR REQ'D STORAGE = 7,646m³
PROVIDED STORAGE = 10,101m³
QUALITY STORAGE:
REQ'D STORAGE = 2,978m³
PROVIDED STORAGE = 3,393m³
EXTENDED DETENTION:
REQ'D STORAGE = 2,120m³
PROVIDED STORAGE = 2,153m³
PERMANENT POOL ELEV = 208.45
TOP OF PLANTING SHELF ELEV = 207.85
BOTTOM OF POND = 207.20
FOREBAY BERM ELEV = 208.75
TEMPORARY POOL ELEV = 209.45
TOP OF PLANTING SHELF ELEV = 209.05
BOTTOM OF POND = 208.20
FORMER RAILWAY LANDS
EX. RESIDENTIAL LANDS
DECOU ROAD
SINGLE FAMILY LOT
TOWNHOUSE BLOCK
EX. WATER TOWNHOUSE BLOCK
EX. DRIPLINE (STAKED DECEMBER 3, 2025)
10m DRIPLINE SETBACK
PROP. FLEXAMAT CABLE CONCRETE EMERGENCY OVERLAND CHANNEL
MATCH INTO EXISTING GRADES WITH 3:1 MAX SLOPING
OUTLET PROP. 1200mmø STM TO PROP. MH INV=206.78
PROP. FLEXAMAT CABLE CONCRETE OUTLET
EX. 375mmø CULVERT INV=202.89±
EX. 1650mmø CULVERT
TOP=201.25
INV=200.19
EX. 250mmø CULVERT INV=209.42±
EX. 600mmø CSP CULVERT
EX. CB1 T/G=210.86
EX. CB2 T/G=210.88
EX. CB3 T/G=209.27
EX. CONCRETE GUTTER
EX. CENTRELINE OF ROAD
EX. TOP OF BANK
EX. BOTTOM OF BANK
EX. EDGE OF BUSH
EX. TREES
EX. EDGE OF BRUSH
EX. UP
EX. BB
SIB
TOS=211.65
INV=211.24
DCB8.1
DCB8.2
DCB8.3
DCB8.4
DCB8.5
DCB8.6
DCB8.7
DCB8.8
DCB8.9
DCB8.10
DCB8.11
DCB8.12
DCB8.13
DCB8.14
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DCB8.38
DCB8.39
DCB8.40
DCB8.41
DCB8.42
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DCB8.48
DCB8.49

-GSP-1
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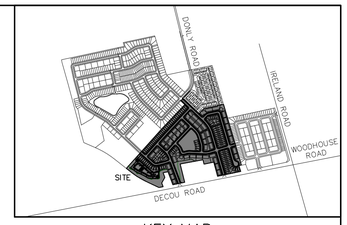


KEY MAP
N.T.S.

LEGEND:

- EXISTING CATCHBASIN
- EXISTING STORM/SANITARY MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED STORM/SANITARY MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED DOUBLE CATCHBASIN MANHOLE
- PROPOSED DOUBLE DITCH INLET MANHOLE
- PROPOSED DOUBLE DITCH INLET
- PROPOSED SEWER INSULATION
- EX. WV ⊗ WV — EXISTING/PROPOSED WATER VALVE
- PROP. HYD — PROPOSED HYDRANT
- CV — PROPOSED CHECK VALVE CHAMBER

## BENCH MARK NOTE:

SITE BM # 1
TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M–55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| | | | |

## NOTES TO CONTRACTOR:

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| | | | | |
|---|---|---|---|---|
| DESIGN | AS/BB | CHK'D | BB | DATE FEB 19, 2026 |
| DRAWN | AS/BB | CHK'D | BB | |

SCALE 1:500 (0, 5, 10, 25, 50)

APPROVALS

NOT FOR CONSTRUCTION

STAMP


S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

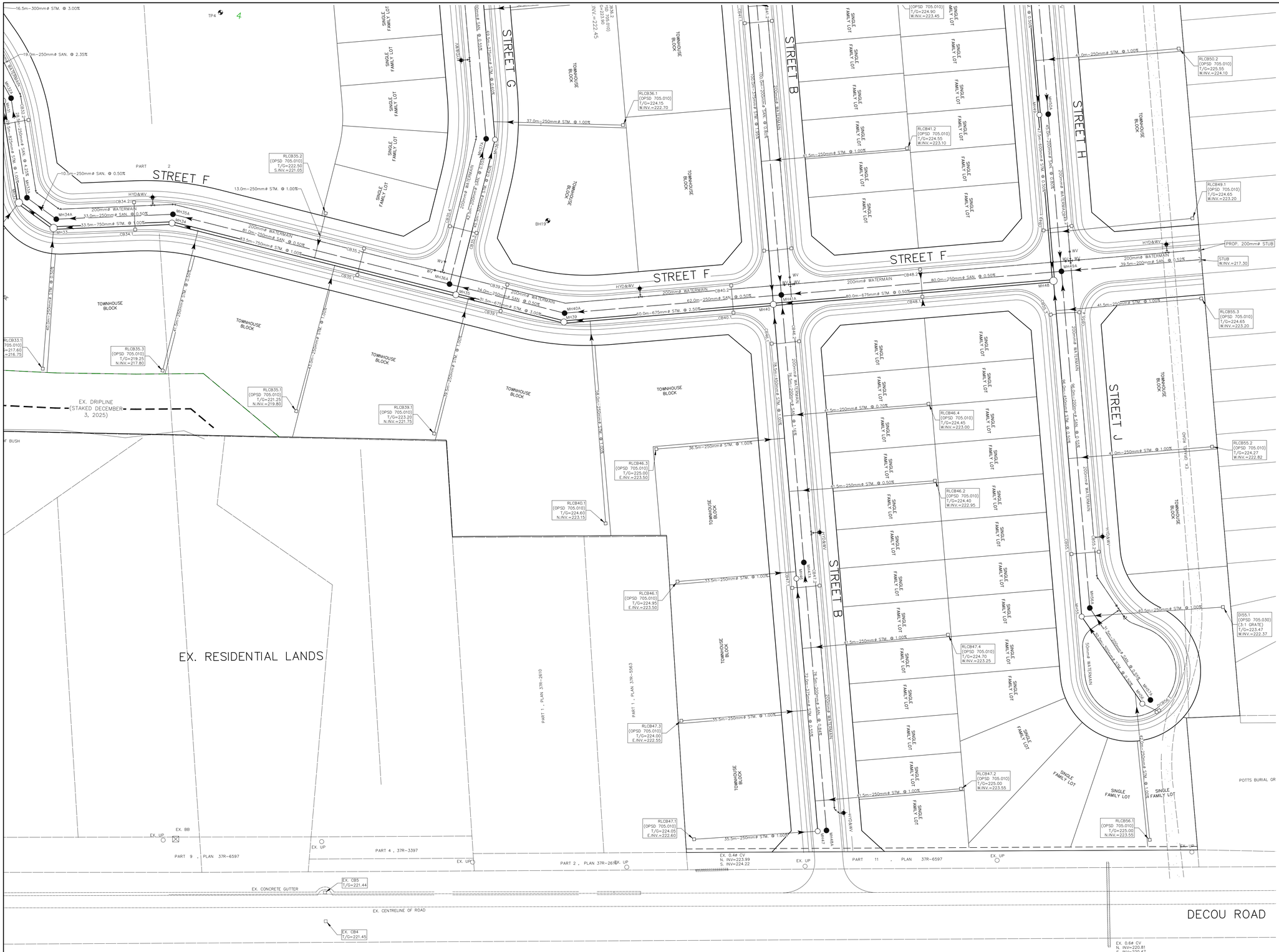

CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
GENERAL PLAN OF SERVICING
(SHEET 1 OF 5)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | GSP–1 | #### |

-GSP-2
###







KEY MAP
N.T.S.

LEGEND:

- EXISTING CATCHBASIN
- EXISTING STORM/SANITARY MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED STORM/SANITARY MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED DOUBLE CATCHBASIN MANHOLE
- PROPOSED DOUBLE DITCH INLET MANHOLE
- PROPOSED DOUBLE DITCH INLET
- PROPOSED SEWER INSULATION
- EX. WV ⊗ ⊗WV EXISTING/PROPOSED WATER VALVE
- PROP. HYD PROPOSED HYDRANT
- CV PROPOSED CHECK VALVE CHAMBER

## BENCH MARK NOTE:

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TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M-55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| | | | |

## NOTES TO CONTRACTOR:

1. CONTRACTORS AND SUBCONTRACTORS SHALL NOT SCALE FROM THIS DRAWING.
2. ANY INCONSISTENCIES AND OMISSIONS FOUND ON THE DRAWINGS MUST BE REPORTED TO THE ENGINEER FOR CLARIFICATION BEFORE COMMENCING THE WORK.
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| DESIGN | AS/BB | CHK'D | BB | DATE |
|---|---|---|---|---|
| DRAWN | AS/BB | CHK'D | BB | FEB 19, 2026 |

SCALE
1:500 (0, 5, 10, 25, 50)

APPROVALS

NOT FOR CONSTRUCTION

STAMP

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

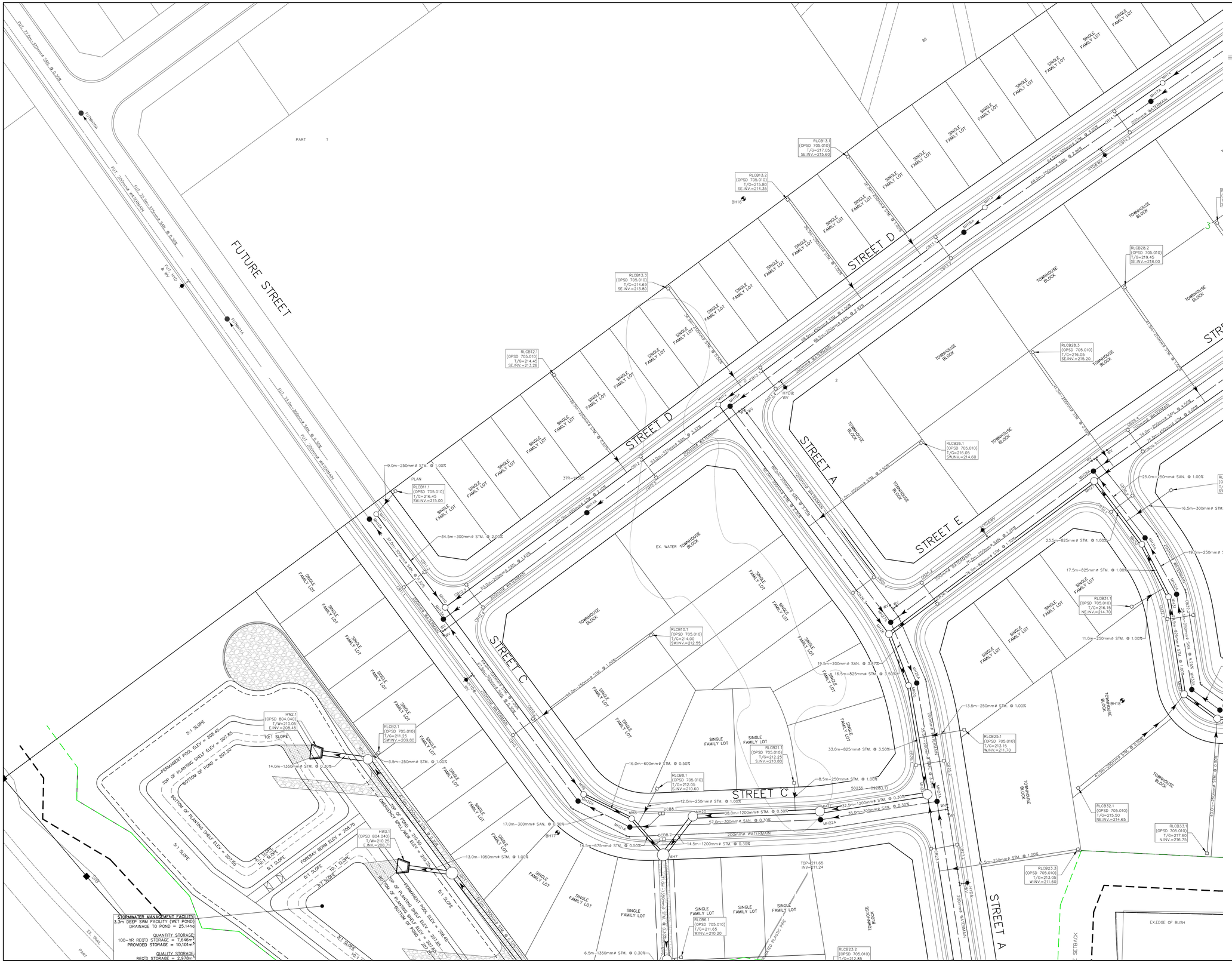
CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
GENERAL PLAN OF SERVICING
(SHEET 2 OF 5)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | GSP-2 | #### |

-GSP-3
####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STREET D
STREET C
STREET A
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PART 1
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PART 3
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PART 6
PART 7
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PART 15
PART 16
PART 17
PART 18
PART 19
PART 20
PART

-GSP-4
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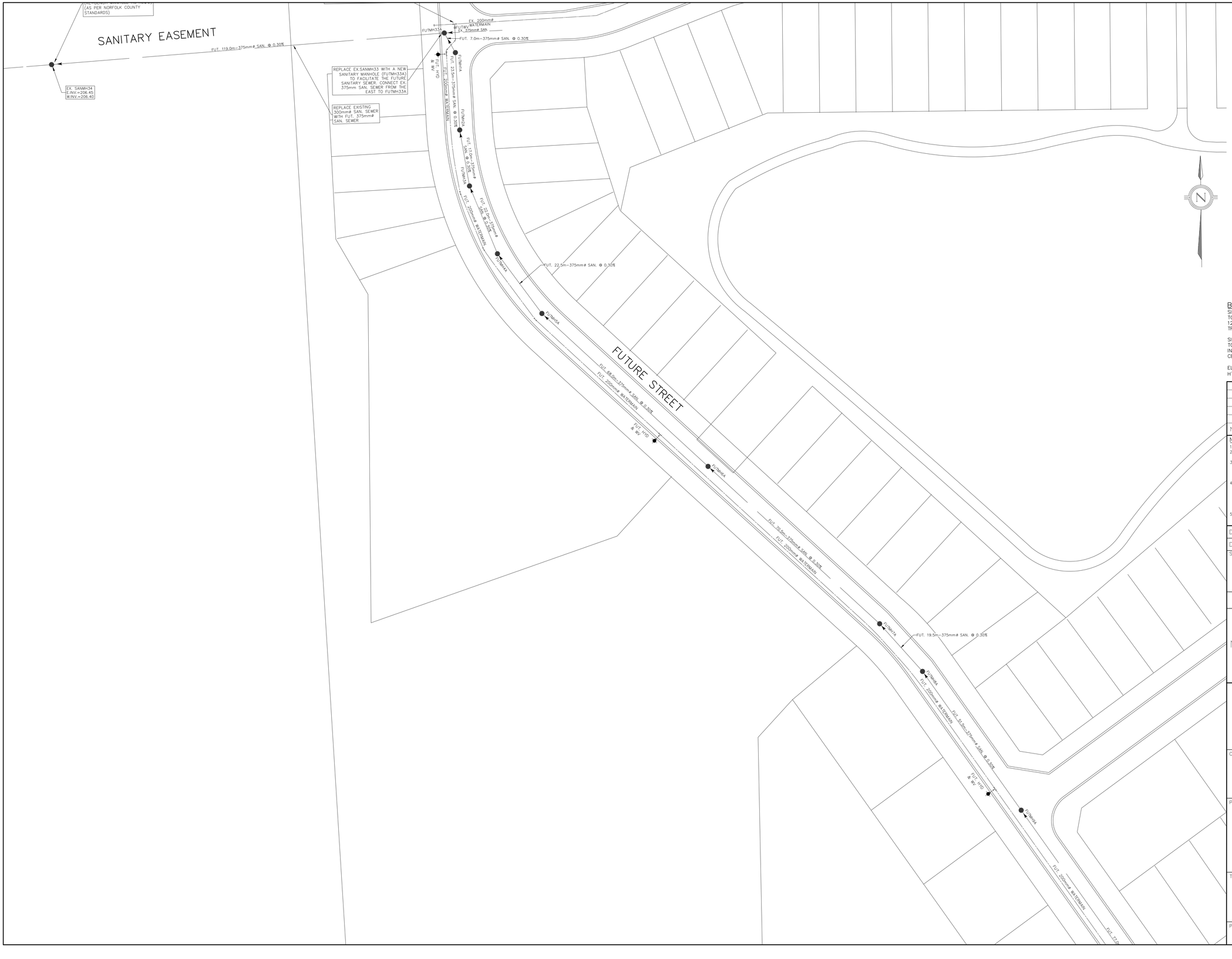


KEY MAP
N.T.S.

LEGEND:

- EXISTING CATCHBASIN
- EXISTING STORM/SANITARY MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED STORM/SANITARY MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED DOUBLE CATCHBASIN MANHOLE
- PROPOSED DOUBLE DITCH INLET MANHOLE
- PROPOSED DOUBLE DITCH INLET
- PROPOSED SEWER INSULATION
- EX. WV ⊠ WV EXISTING/PROPOSED WATER VALVE
- PROP. HYD PROPOSED HYDRANT
- CV PROPOSED CHECK VALVE CHAMBER

## BENCH MARK NOTE:

SITE BM # 1
TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M-55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
|---|---|---|---|
| | | | |

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| | | | | |
|---|---|---|---|---|
| DESIGN | AS/BB | CHK'D | BB | DATE: FEB 19, 2026 |
| DRAWN | AS/BB | CHK'D | BB | |

SCALE
1:500
0 5 10 25 50

APPROVALS

STAMP

NOT FOR CONSTRUCTION


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CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

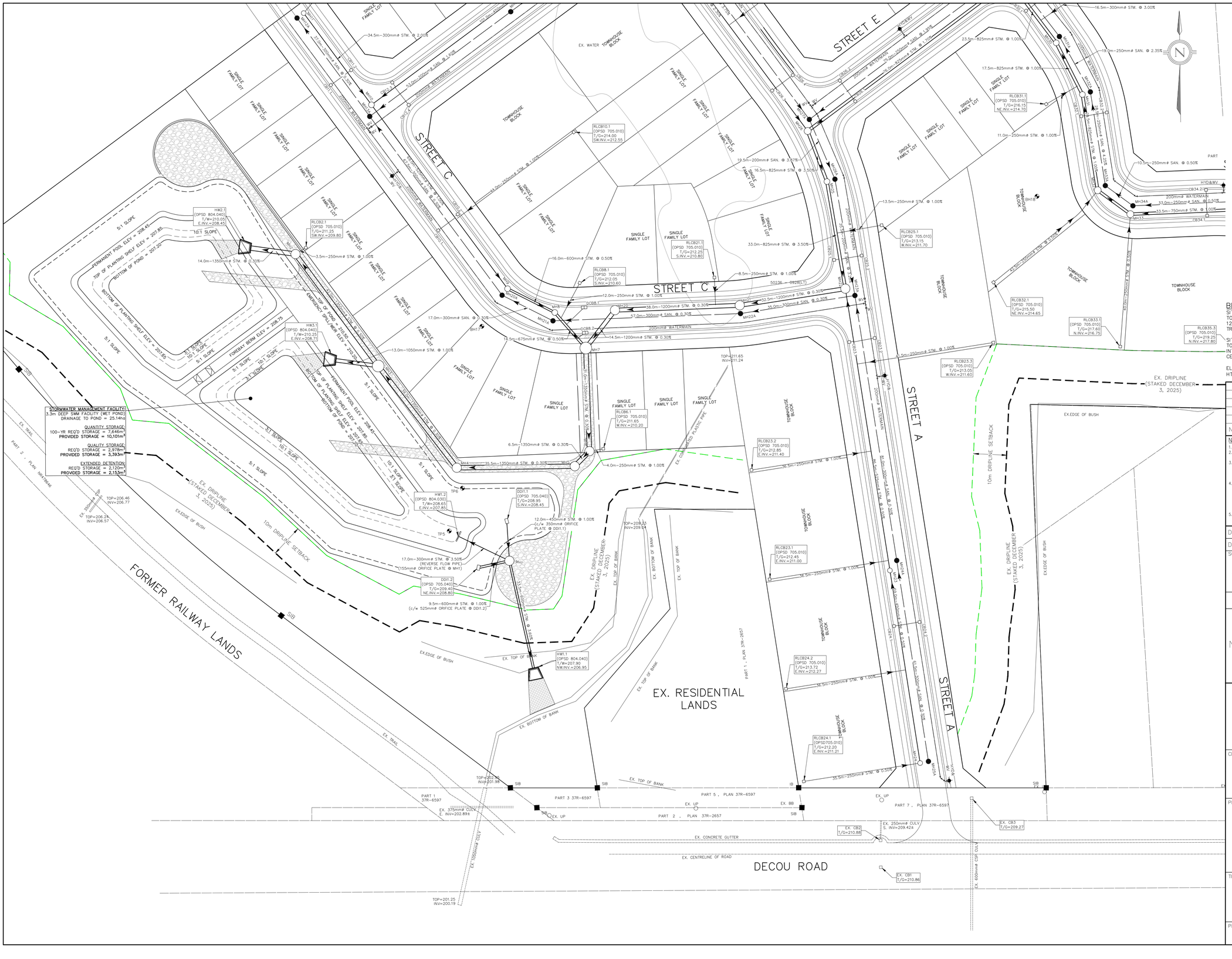

CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
GENERAL PLAN OF SERVICING
(SHEET 4 OF 5)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | GSP-4 | #### |

-GSP-5
####




LEGEND:

KEY MAP
N.T.S.

- EXISTING CATCHBASIN
- EXISTING STORM/SANITARY MANHOLE
- PROPOSED DOUBLE CATCHBASIN
- PROPOSED CATCHBASIN
- PROPOSED STORM/SANITARY MANHOLE
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ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

| NO. | DATE | BY | REVISIONS |
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| DESIGN | AS/BB | CHK'D | BB | DATE: FEB 19, 2026 |
| DRAWN | AS/BB | CHK'D | BB | |

SCALE 1:500 (0, 5, 10, 25, 50)

APPROVALS

NOT FOR CONSTRUCTION

STAMP


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CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
GENERAL PLAN OF SERVICING
(SHEET 5 OF 5)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | GSP-5 | #### |

| SANITARY SEWER TABLE | | | |
|---|---|---|---|
| STRUCTURE NAME | STRUCTURE TYPE | TOP OF GRATE | PIPE INVERT |
| FUTMH1A | OPSD 701.010 (1200mm Dia.) | 211.36 | NW. INV=206.91<br>S. INV=206.96 |
| FUTMH2A | OPSD 701.010 (1200mm Dia.) | 211.03 | N. INV=207.03<br>S. INV=207.08 |
| FUTMH3A | OPSD 701.010 (1200mm Dia.) | 210.76 | N. INV=207.13<br>SE. INV=207.18 |
| FUTMH4A | OPSD 701.010 (1200mm Dia.) | 210.44 | NW. INV=207.25<br>SE. INV=207.30 |
| FUTMH5A | OPSD 701.010 (1200mm Dia.) | 210.11 | NW. INV=207.37<br>SE. INV=207.42 |
| FUTMH6A | OPSD 701.010 (1200mm Dia.) | 209.94 | NW. INV=207.62<br>SE. INV=207.65 |
| FUTMH7A | OPSD 701.010 (1200mm Dia.) | 210.34 | NW. INV=207.86<br>SE. INV=207.91 |
| FUTMH8A | OPSD 701.010 (1200mm Dia.) | 210.49 | NW. INV=207.97<br>SE. INV=208.02 |
| FUTMH9A | OPSD 701.010 (1200mm Dia.) | 210.80 | NW. INV=208.17<br>SE. INV=208.19 |
| FUTMH10A | OPSD 701.010 (1200mm Dia.) | 211.28 | NW. INV=208.42<br>SE. INV=208.44 |
| FUTMH11A | OPSD 701.010 (1200mm Dia.) | 211.75 | NW. INV=208.66<br>SE. INV=208.69 |
| FUTMH33A | OPSD 701.010 (1200mm Dia.) | 214.84 | W. INV=206.81<br>SE. INV=206.89<br>E. INV=210.70 |
| MH12A | OPSD 701.010 (1200mm Dia.) | 216.35 | NW. INV=208.91<br>SE. INV=208.93 |
| MH13A | OPSD 701.010 (1200mm Dia.) | 215.03 | NW. INV=209.04<br>SE. INV=209.06<br>NE. INV=212.03 |
| MH14A | OPSD 701.010 (1200mm Dia.) | 215.90 | SW. INV=212.88<br>NE. INV=212.90 |
| MH15A | OPSD 701.010 (1200mm Dia.) | 217.71 | SW. INV=214.69<br>NE. INV=214.71<br>SE. INV=214.71 |
| MH16A | OPSD 701.010 (1200mm Dia.) | 220.30 | SW. INV=217.28<br>NE. INV=217.30 |
| MH17A | OPSD 701.010 (1200mm Dia.) | 222.33 | SW. INV=219.31<br>NE. INV=219.33 |
| MH18A | OPSD 701.010 (1200mm Dia.) | 224.37 | SW. INV=221.35<br>NE. INV=221.37<br>SE. INV=221.37 |
| MH19A | OPSD 701.010 (1200mm Dia.) | 226.22 | SW. INV=223.22 |
| MH20A | OPSD 701.010 (1200mm Dia.) | 212.34 | NW. INV=209.26<br>E. INV=209.31 |
| MH21A | OPSD 701.010 (1200mm Dia.) | 212.13 | W. INV=209.36<br>E. INV=209.41 |

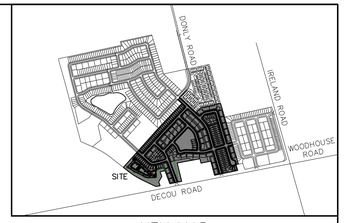
| SANITARY SEWER TABLE | | | |
|---|---|---|---|
| STRUCTURE NAME | STRUCTURE TYPE | TOP OF GRATE | PIPE INVERT |
| MH22A | OPSD 701.010 (1200mm Dia.) | 212.27 | W. INV=209.58<br>E. INV=209.63 |
| MH23A | OPSD 701.010 (1200mm Dia.) | 212.50 | W. INV=209.74<br>S. INV=209.82<br>N. INV=209.71 |
| MH24A | OPSD 701.010 (1200mm Dia.) | 212.50 | N. INV=210.06<br>S. INV=210.08 |
| MH25A | OPSD 701.010 (1200mm Dia.) | 212.61 | N. INV=210.26 |
| MH26A | OPSD 701.010 (1200mm Dia.) | 213.88 | S. INV=210.85<br>NW. INV=210.90 |
| MH27A | OPSD 701.010 (1200mm Dia.) | 214.64 | SE. INV=211.66<br>NW. INV=211.71<br>NE. INV=211.74 |
| MH28A | OPSD 701.010 (1200mm Dia.) | 214.24 | SW. INV=213.20<br>NE. INV=213.57<br>SE. INV=213.28 |
| MH29A | OPSD 701.010 (1200mm Dia.) | 219.96 | SW. INV=216.90<br>NE. INV=216.92 |
| MH30A | OPSD 701.010 (1200mm Dia.) | 223.00 | SW. INV=219.70<br>NW. INV=220.00<br>SE. INV=219.80 |
| MH31A | OPSD 701.010 (1200mm Dia.) | 216.58 | NW. INV=213.53<br>SE. INV=213.58 |
| MH32A | OPSD 701.010 (1200mm Dia.) | 217.08 | NW. INV=214.03<br>S. INV=214.08 |
| MH33A | OPSD 701.010 (1200mm Dia.) | 218.41 | N. INV=215.30<br>SE. INV=215.35 |
| MH34A | OPSD 701.010 (1200mm Dia.) | 218.91 | NW. INV=215.40<br>E. INV=215.45 |
| MH35A | OPSD 701.010 (1200mm Dia.) | 220.49 | W. INV=215.62<br>E. INV=215.67 |
| MH36A | OPSD 701.010 (1200mm Dia.) | 223.97 | W. INV=216.07<br>E. INV=216.09<br>N. INV=220.97 |
| MH37A | OPSD 701.010 (1200mm Dia.) | 223.70 | S. INV=220.73<br>N. INV=220.68 |
| MH38A | OPSD 701.010 (1200mm Dia.) | 223.37 | S. INV=220.30<br>NW. INV=220.25 |
| MH39A | OPSD 701.010 (1200mm Dia.) | 223.23 | SE. INV=220.09<br>NW. INV=220.04 |
| MH40A | OPSD 701.010 (1200mm Dia.) | 224.20 | W. INV=216.26<br>E. INV=216.31 |
| MH41A | OPSD 701.010 (1200mm Dia.) | 224.31 | W. INV=216.62<br>S. INV=217.39<br>N. INV=221.30<br>E. INV=216.64 |
| MH42A | OPSD 701.010 (1200mm Dia.) | 225.12 | S. INV=222.10<br>N. INV=222.12 |
| MH43A | OPSD 701.010 (1200mm Dia.) | 225.55 | S. INV=222.50<br>NW. INV=222.55 |

| SANITARY SEWER TABLE | | | |
|---|---|---|---|
| STRUCTURE NAME | STRUCTURE TYPE | TOP OF GRATE | PIPE INVERT |
| MH44A | OPSD 701.010 (1200mm Dia.) | 225.97 | SE. INV=222.91<br>NW. INV=222.96 |
| MH45A | OPSD 701.010 (1200mm Dia.) | 226.38 | NW. INV=223.38<br>NE. INV=223.38<br>SE. INV=223.36 |
| MH46A | OPSD 701.010 (1200mm Dia.) | 226.95 | SE. INV=223.94 |
| MH47A | OPSD 701.010 (1200mm Dia.) | 224.95 | N. INV=216.50<br>S. INV=218.05 |
| MH48A | OPSD 701.010 (1200mm Dia.) | 225.99 | N. INV=217.41 |
| MH49A | OPSD 701.010 (1200mm Dia.) | 224.45 | N. INV=220.49<br>S. INV=221.13<br>W. INV=217.04<br>E. INV=217.09 |
| MH50A | OPSD 701.010 (1200mm Dia.) | 224.53 | N. INV=220.87<br>S. INV=220.85 |
| MH51A | OPSD 701.010 (1200mm Dia.) | 224.96 | N. INV=221.44<br>S. INV=221.42 |
| MH52A | OPSD 701.010 (1200mm Dia.) | 225.60 | NW. INV=222.29<br>S. INV=222.24 |
| MH53A | OPSD 701.010 (1200mm Dia.) | 225.66 | W. INV=222.43<br>SE. INV=222.38 |
| MH54A | OPSD 701.010 (1200mm Dia.) | 226.02 | SW. INV=222.94<br>E. INV=222.89 |
| MH55A | OPSD 701.010 (1200mm Dia.) | 226.13 | SW. INV=223.13<br>NE. INV=223.08 |
| MH56A | OPSD 701.010 (1200mm Dia.) | 224.83 | N. INV=221.66<br>SE. INV=221.71 |
| MH57A | OPSD 701.010 (1200mm Dia.) | 224.82 | NW. INV=221.88 |
| SANMH34 | OPSD 701.010 (1200mm Dia.) | 207.23 | E. INV=206.45<br>W. INV=206.40 |
| SANMH35 | OPSD 701.010 (1200mm Dia.) | 206.91 | E. INV=206.03<br>W. INV=206.00 |
| SANMH36 | OPSD 701.010 (1200mm Dia.) | 206.28 | E. INV=205.45<br>N. INV=205.40 |
| STUB | OPSD 701.010 (1200mm Dia.) | 217.96 | W. INV=217.30 |

| STORM SEWER TABLE | | | | |
|---|---|---|---|---|
| STRUCTURE NAME | STRUCTURE TYPE | TOP OF GRATE | PIPES IN | PIPES OUT |
| MH1 | OPSD 701.013 (2400mm Dia.) | 210.55 | N.INV.=208.33<br>SW.INV.=208.70 | SE.INV.=208.15<br>W.INV.=208.45 |
| MH2 | OPSD 701.013 (2400mm Dia.) | 211.00 | SE.INV.=208.54<br>NE.INV.=209.76 | W.INV.=208.49 |
| MH3 | OPSD 701.014 (3000mm Dia) | 221.20 | SE.INV.=208.69 | NW.INV.=208.67<br>W.INV.=208.84 |
| MH4 | OPSD 701.013 (2400mm Dia.) | 211.50 | E.INV.=208.86 | NW.INV.=208.81 |
| MH5 | OPSD 701.013 (2400mm Dia.) | 211.70 | NE.INV.=209.02 | W.INV.=208.97 |
| MH6 | OPSD 701.013 (2400mm Dia.) | 211.80 | N.INV.=209.09<br>E.INV.=210.16 | SW.INV.=209.04 |
| MH7 | OPSD 701.014 (3000mm Dia) | 212.12 | NE.INV.=209.48<br>NW.INV.=209.99 | S.INV.=209.18 |
| MH8 | OPSD 701.011 (1500mm Dia.) | 212.09 | W.INV.=210.11 | SE.INV.=210.06 |
| MH9 | OPSD 701.011 (1500mm Dia.) | 213.02 | NW.INV.=210.34 | E.INV.=210.19 |
| MH10 | OPSD 701.011 (1500mm Dia.) | 213.14 | NW.INV.=212.38<br>NE.INV.=211.11 | SE.INV.=211.04 |
| MH11 | OPSD 701.010 (1200mm Dia.) | 216.30 | NE.INV.=214.91 | SE.INV.=211.69 |
| MH12 | OPSD 701.010 (1200mm Dia.) | 217.58 | NE.INV.=213.25 | SW.INV.=213.23<br>SE.INV.=215.10 |
| MH13 | OPSD 701.010 (1200mm Dia.) | 220.52 | NE.INV.=218.66 | SW.INV.=214.24 |
| MH14 | OPSD 701.010 (1200mm Dia.) | 222.45 | NE.INV.=220.77 | SW.INV.=220.75 |
| MH15 | OPSD 701.010 (1200mm Dia.) | 224.39 | NE.INV.=222.70 | SW.INV.=222.62<br>SE.INV.=222.72 |
| MH16 | OPSD 701.010 (1200mm Dia.) | 226.59 | SE.INV.=224.92<br>NW.INV.=224.92 | SW.INV.=224.84 |
| MH17 | OPSD 701.010 (1200mm Dia.) | 226.67 | | SE.INV.=225.08 |
| MH20 | OPSD 701.013 (2400mm Dia.) | 212.03 | E.INV.=209.60 | SW.INV.=209.52 |

| STORM SEWER TABLE | | | | |
|---|---|---|---|---|
| STRUCTURE NAME | STRUCTURE TYPE | TOP OF GRATE | PIPES IN | PIPES OUT |
| MH21 | OPSD 701.013 (2400mm Dia.) | 212.22 | E.INV.=209.73 | W.INV.=209.71 |
| MH22 | OPSD 701.013 (2400mm Dia.) | 212.60 | N.INV.=209.91<br>S.INV.=210.20 | W.INV.=209.83 |
| MH23 | OPSD 701.010 (1200mm Dia.) | 212.43 | S.INV.=210.65 | N.INV.=210.63 |
| MH24 | OPSD 701.010 (1200mm Dia.) | 211.81 | W.INV.=211.03 | N.INV.=210.94 |
| MH25 | OPSD 701.011 (1500mm Dia.) | 213.86 | NW.INV.=211.11 | S.INV.=211.06 |
| MH26 | OPSD 701.012 (1800mm Dia.) | 214.52 | NW.INV.=213.14<br>NE.INV.=212.15 | SE.INV.=211.68 |
| MH27 | OPSD 701.012 (1800mm Dia.) | 216.40 | NE.INV.=214.43<br>SE.INV.=213.54 | SW.INV.=213.44 |
| MH28 | OPSD 701.010 (1200mm Dia.) | 219.90 | NE.INV.=217.46 | SW.INV.=217.44 |
| MH29 | OPSD 701.010 (1200mm Dia.) | 222.95 | SE.INV.=220.95<br>NW.INV.=219.74 | SW.INV.=219.67 |
| MH30 | OPSD 701.011 (1500mm Dia.) | 216.53 | SE.INV.=213.82 | NW.INV.=213.78 |
| MH31 | OPSD 701.011 (1500mm Dia.) | 217.04 | S.INV.=214.06 | NW.INV.=214.00 |
| MH32 | OPSD 701.012 (1800mm Dia.) | 218.38 | SE.INV.=216.35<br>SW.INV.=214.44 | N.INV.=214.35 |
| MH33 | OPSD 701.012 (1800mm Dia.) | 218.86 | E.INV.=216.87<br>S.INV.=216.55 | NW.INV.=216.47 |
| MH34 | OPSD 701.011 (1500mm Dia.) | 220.46 | E.INV.=217.26 | W.INV.=217.21 |
| MH35 | OPSD 701.011 (1500mm Dia.) | 223.96 | E.INV.=218.30 | W.INV.=218.09<br>N.INV.=222.40 |
| MH36 | OPSD 701.010 (1200mm Dia.) | 223.64 | S.INV.=222.12 | N.INV.=222.06 |
| MH37 | OPSD 701.010 (1200mm Dia.) | 223.32 | S.INV.=221.65 | NW.INV.=221.60 |
| MH38 | OPSD 701.010 (1200mm Dia.) | 223.18 | SE.INV.=221.42 | NW.INV.=221.37 |

| STORM SEWER TABLE | | | | |
|---|---|---|---|---|
| STRUCTURE NAME | STRUCTURE TYPE | TOP OF GRATE | PIPES IN | PIPES OUT |
| MH39 | OPSD 701.011 (1500mm Dia.) | 224.15 | E.INV.=219.35 | W.INV.=219.25 |
| MH40 | OPSD 701.011 (1500mm Dia.) | 224.25 | E.INV.=220.93<br>S.INV.=220.93<br>N.INV.=220.93 | W.INV.=220.85 |
| MH41 | OPSD 701.010 (1200mm Dia.) | 225.04 | N.INV.=222.94 | S.INV.=222.88 |
| MH42 | OPSD 701.010 (1200mm Dia.) | 225.53 | NW.INV.=223.41 | S.INV.=223.36 |
| MH43 | OPSD 701.010 (1200mm Dia.) | 225.92 | NW.INV.=223.82 | SE.INV.=223.77 |
| MH44 | OPSD 701.010 (1200mm Dia.) | 226.30 | NW.INV.=224.18 | SE.INV.=224.16<br>NE.INV.=224.49 |
| MH45 | OPSD 701.010 (1200mm Dia.) | 226.81 | | SE.INV.=224.70<br>NW.INV.=225.20 |
| MH46 | OPSD 701.010 (1200mm Dia.) | 224.96 | S.INV.=221.76 | N.INV.=221.71 |
| MH47 | OPSD 701.010 (1200mm Dia.) | 225.94 | W.INV.=222.25 | N.INV.=222.16 |
| MH48 | OPSD 701.012 (1800mm Dia.) | 224.39 | N.INV.=221.41<br>S.INV.=221.41 | W.INV.=221.33 |
| MH49 | OPSD 701.010 (1200mm Dia.) | 224.48 | N.INV.=221.67 | S.INV.=221.65 |
| MH50 | OPSD 701.010 (1200mm Dia.) | 224.91 | N.INV.=222.09 | S.INV.=222.01 |
| MH51 | OPSD 701.010 (1200mm Dia.) | 224.59 | W.INV.=222.68<br>NE.INV.=223.88 | S.INV.=222.60 |
| MH52 | OPSD 701.010 (1200mm Dia.) | 225.61 | W.INV.=222.81 | E.INV.=222.76 |
| MH53 | OPSD 701.010 (1200mm Dia.) | 225.97 | SW.INV.=223.42 | E.INV.=223.37 |
| MH54 | OPSD 701.010 (1200mm Dia.) | 226.08 | SW.INV.=223.64 | NE.INV.=223.59 |
| MH55 | OPSD 701.010 (1200mm Dia.) | 224.79 | SE.INV.=221.94<br>E.INV.=221.97 | N.INV.=221.89 |
| MH56 | OPSD 701.010 (1200mm Dia.) | 224.77 | E.INV.=223.24 | NW.INV.=222.09 |




KEY MAP
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SITE BM # 2
TOP OF LID OF MANHOLE AT THE SOUTHWEST CORNER OF THE INTERSECTION OF IRELAND ROAD AND DECOU ROAD; 3.45M SOUTH OF THE CENTRELINE OF DECOU ROAD HAVING AN ELEVATION OF 222.50M

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HTV2.0 (2010) (CGVD28)

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| DRAWN | AS/BB | CHK'D | BB | |

SCALE

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NOT FOR CONSTRUCTION

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S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
SEWER INVERT TABLES

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-STM-1
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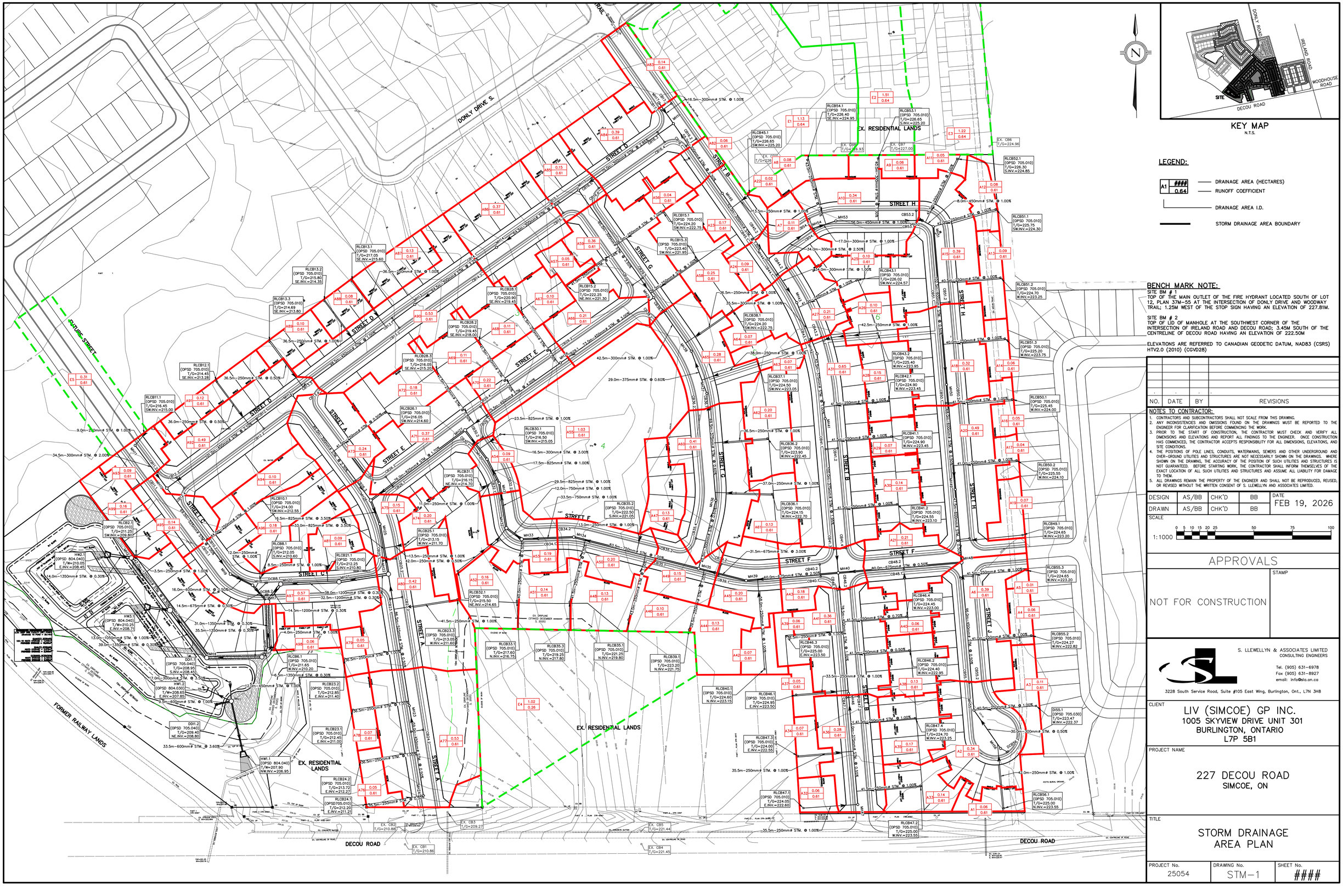
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FORMER RAILWAY LANDS
STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
STREET J
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EX. RESIDENTIAL LANDS
DECOU ROAD
DECOU ROAD
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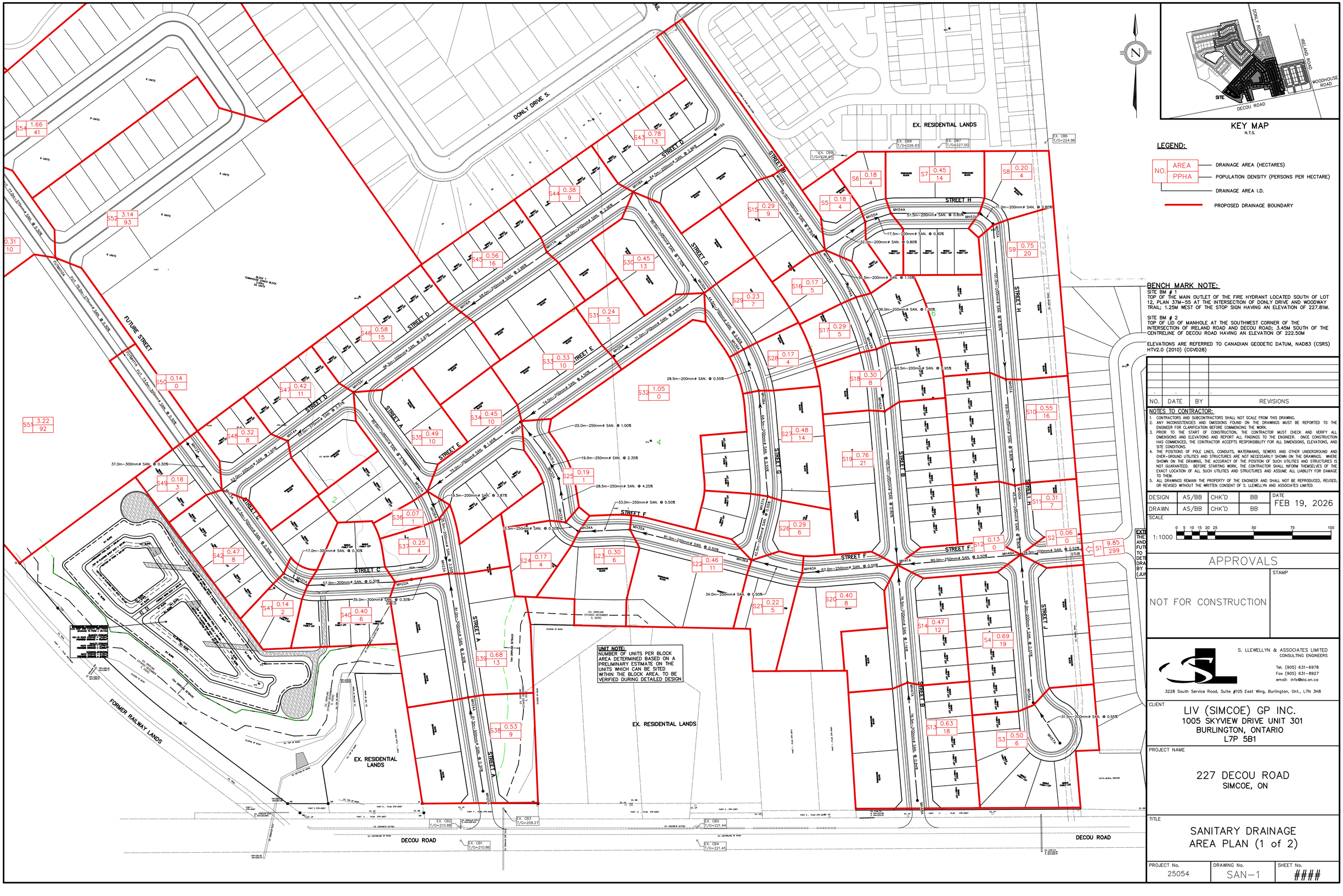





KEY MAP
N.T.S.

LEGEND:

NO. AREA
PPHA

- DRAINAGE AREA (HECTARES)
- POPULATION DENSITY (PERSONS PER HECTARE)
- DRAINAGE AREA I.D.
- PROPOSED DRAINAGE BOUNDARY

BENCH MARK NOTE:

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TOP OF THE MAIN OUTLET OF THE FIRE HYDRANT LOCATED SOUTH OF LOT 12, PLAN 37M-55 AT THE INTERSECTION OF DONLY DRIVE AND WOODWAY TRAIL; 1.25M WEST OF THE STOP SIGN HAVING AN ELEVATION OF 227.81M.

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| DRAWN | AS/BB | CHK'D | BB |

DATE: FEB 19, 2026

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S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS
Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca
3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8


CLIENT
LIV (SIMCOE) GP INC.
1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
SANITARY DRAINAGE AREA PLAN (1 of 2)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | SAN-1 | #### |

-SAN-2
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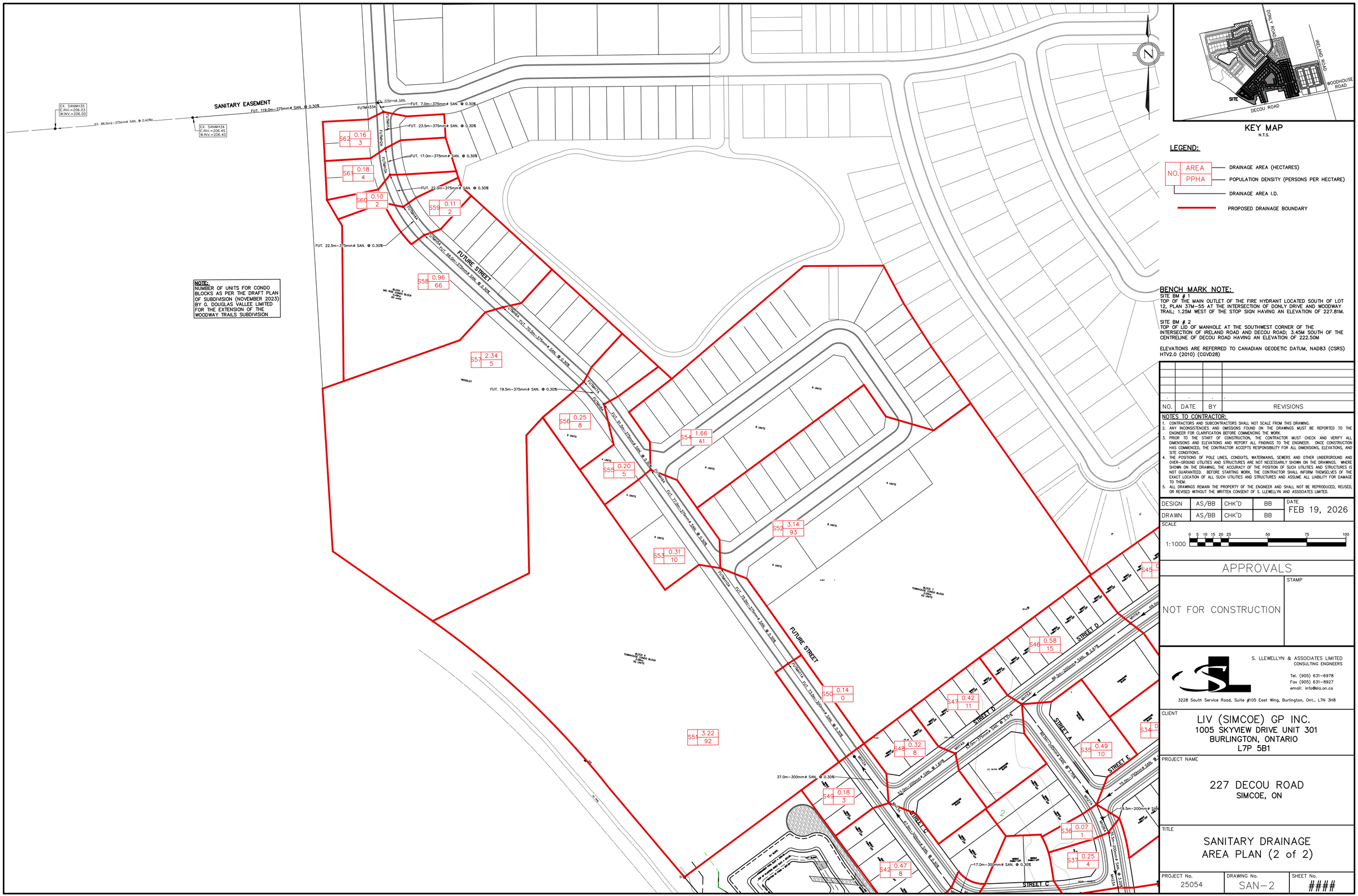


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CLIENT
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1005 SKYVIEW DRIVE UNIT 301
BURLINGTON, ONTARIO
L7P 5B1

PROJECT NAME
227 DECOU ROAD
SIMCOE, ON

TITLE
SANITARY DRAINAGE AREA PLAN (2 of 2)

| PROJECT No. | DRAWING No. | SHEET No. |
|---|---|---|
| 25054 | SAN-2 | #### |

LANDTEK LIMITED
Consulting Engineers

205 Nebo Road, Unit 4B
Hamilton, Ontario
L8W 2E1

Phone: 905-383-3733
engineering@landtek.ca
www.landtek.ca

# Phase 1 Environmental Site Assessment

227 Decou Road
Simcoe, Ontario
N3Y 4K2

Prepared for:

Mr. Mohamad Al Ashkar, B.Eng
LIV (Simcoe) LP
1005 Skyview Drive Unit 301
Burlington, Ontario
L7P 5B1

File: 25181

September 2025

## EXECUTIVE SUMMARY

Landtek Limited (Landtek) is pleased to submit this Phase 1 Environmental Site Assessment (ESA) report for the property located at 227 Decou Road in Simcoe, Ontario (the Site). The work was initiated following authorization to proceed from Mr. Mohamad Al Ashkar (the Client) in June of 2025.

The Phase 1 ESA was completed in accordance with the requirements described in CSA Standard Z768-01. Sampling and chemical analysis of soil, groundwater, and/or other materials was not carried out as part of this Phase 1 ESA. This assessment was completed with the understanding that a Record of Site Condition (RSC) is **not** required and therefore the requirements of Ontario Regulation 153/04 (as amended) (O. Reg. 153/04) were not performed.

### FINDINGS

The following summary outlines the findings of the Phase 1 ESA:

- The Site consists of an irregular shaped parcel of land with agricultural crop cover. No structures are present, and the Site area is comprised of residential and agricultural uses. The Site is located in rural Simcoe, Ontario, and is 20.83 hectares (51.47 acres). The Site is bounded by residential properties to the north, agricultural lands to the east followed by Ireland Road and residential properties, agricultural and residential to the west, and residential dwellings to the south followed by Decou Road;

- Based on published geological information for the area, native subsurface soil conditions in the area of the site consist of glaciolacustrine deposits of sand, gravely sand and gravel, nearshore and beach deposits. Underneath the soil lay limestone, shale, and dolostone, of the Dundee Bedrock Formation and Detroit River group of the Onondaga Formation. There is no indication that there are significant depths of fill on the property associated with old landforms such as ravines or significant watercourses;

- A small southern portion of the site is within the regulatory limits of the Long Point Region Conservation Authority watershed boundary. These limits are shown in **Figure 2.**

- Based on a review of historical information sources (i.e., aerial photographs, environmental database searches, physical setting sources, and a Site reconnaissance), fill of unknown quality was identified on the northern portion of the site during site reconnaissance. No Site listings or adjacent properties are anticipated to be a potential environmental concern for the Site;

- Based on a review of aerial photographs, the Site appears to have historically been agricultural/ estate land. In the 1960s, one residential dwelling or farmhouse is vaguely identifiable on the southern portion of the site, while the remainder of the property was undeveloped and/or agricultural in nature. The Site has remained rural residential and undeveloped/ agricultural lot until present. The surrounding properties are agricultural in nature, newer residential development to the north commenced from 2010-2020;

- At the time of Landtek's Site visit, the Site consisted of agricultural land, while the surrounding properties were undeveloped and/or agricultural and residential; and,

- At the time of Landtek's Site visit, there was no evidence of chemical manufacturing/storage, above ground storage tanks (ASTs), and/or underground storage tanks (USTs) on the Site.

## CONCLUSIONS

Based on Landtek's findings, current and historical use of the Site property for agricultural purposes indicates that pesticides may be present in shallow soils. In addition, fill of unknown quality was identified on the Site during the Site visit and from aerial photographs. Potential pesticide use and fill of unknown quality may be an environmental concern for the Site.

## RECOMMENDATIONS

Based on the results of the Phase 1 ESA completed for the Site, Historical and current use of the site for agricultural purposes poses the potential of there being pesticides in shallow soils. In addition, fill of unknown quality located on the site may be of environmental concern. A limited phase 2 maybe prudent to confirm the quality of the soil on site for due diligence and removal purposes.

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## 1.0 INTRODUCTION

Landtek Limited (Landtek) is pleased to submit this Phase 1 Environmental Site Assessment (ESA) report for the property located at 227 Decou Road in Simcoe, Ontario (the Site). The work was initiated following authorization to proceed from Mr. Mohamad Al Ashkar (the Client) in June of 2025.

The Phase 1 ESA was completed in accordance with the requirements described in CSA Standard Z768-01. Sampling and chemical analysis of soil, groundwater, and/or other materials was not carried out as part of this Phase 1 ESA. This assessment was completed with the understanding that a Record of Site Condition (RSC) is **not** required and therefore the requirements of Ontario Regulation 153/04 (as amended) (O. Reg. 153/04) were not performed.

## 2.0 SITE DESCRIPTION

The Site consists of an irregular shaped parcel of land with agricultural crop cover. No structures are present, and the Site area is comprised of residential and agricultural uses. The Site is located in rural Simcoe, Ontario, and is 20.83 hectares (51.47 acres). The Site is bound by residential properties to the north, agricultural lands to the east followed by Ireland Road and residential properties, agricultural and residential lands to the west, and residential dwellings to the south followed by Decou Road.

A small portion of the Site is regulated by the Long Point Region Conservation Authority. The site is depicted on **Figure 1** below and the regulated area is illustrated on **Figure 2.**

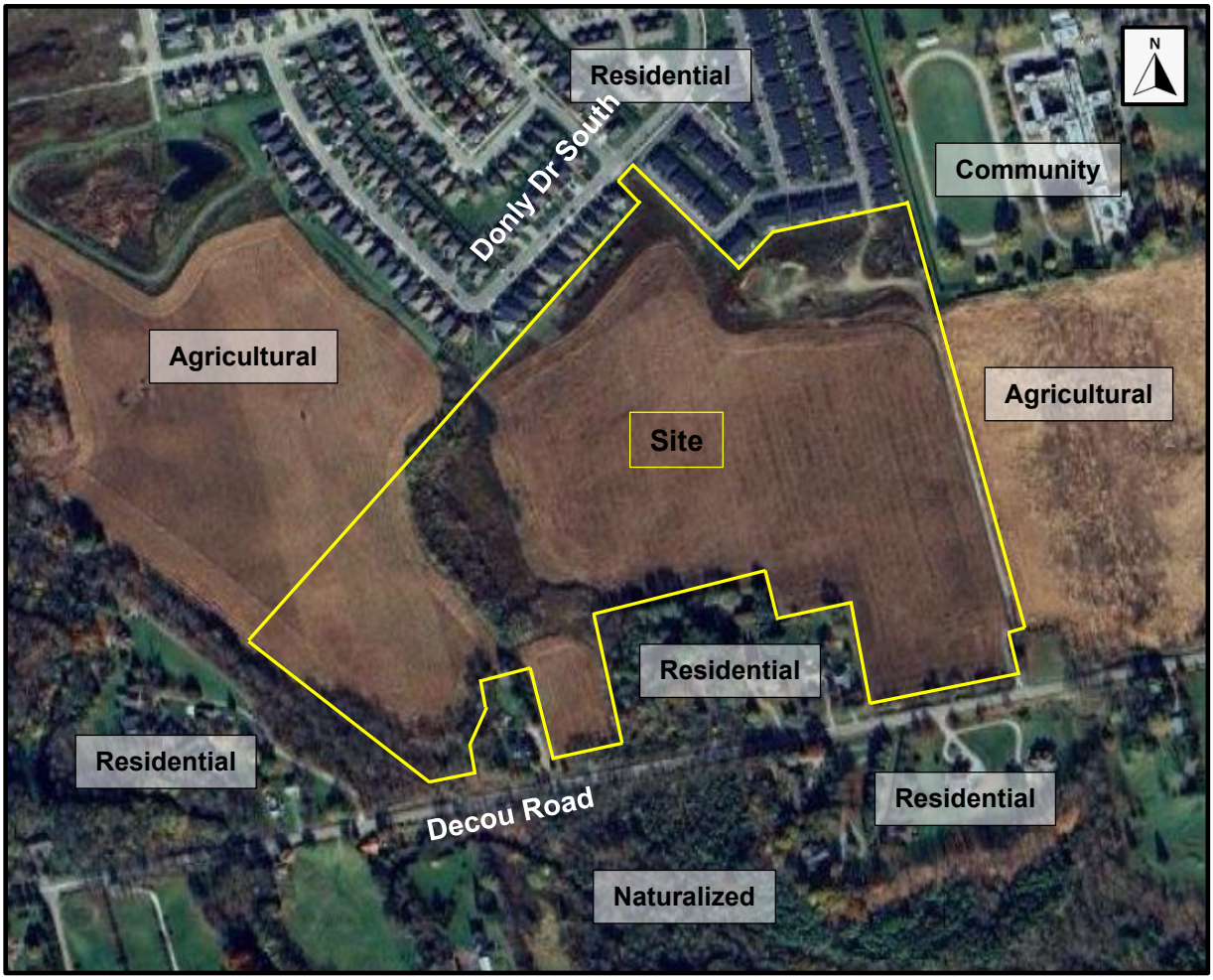



**FIGURE 1**
Location of Site




**FIGURE 2**
Long Point Region Conservation Authority 178/06

## 3.0 RECORDS REVIEW

### 3.1 Historical Maps

A historical map of the Township of Woodhouse dated 1875 was reviewed and the relevant portion is presented in **Appendix B**. Information from this map indicates that the Site was owned by Geo Potts and appears to be used as agricultural/estate land.

### 3.2 Aerial Photographs

Aerial photographs of the Site were obtained from EcoLog ERIS, Norfolk County Air Photo Index interactive mapping. The photographs are presented in **Appendix B** and the findings are summarized as follows:

*Table 1: Aerial Photograph Descriptions*

| Year | Study Site | Surrounding Lands |
|---|---|---|
| 1945 | The site appears to be used for agricultural practices, with very minimal residential use. | Predominantly agricultural lands with minimal residence. |
| 1964 | Consistent with the 1945 aerial image. A dwelling of sorts can be seen on the site, however due to poor image resolution, details cannot be distinguished. | Some rural residential development has occurred around the Site. |
| 1975 | The site appears to be used for agricultural practices, with very minimal residential use. | Increased rural residential development around the Site. |
| 1989 | Consistent with above. | The surrounding lands are predominantly agricultural and residential in use. The area is quite rural. |
| 2002 | The site has remained consistent with previous aerial photographs. | Consistent with the 1989 aerial image. |
| 2010 | Consistent with above. | The construction of a new residential development has commenced to the immediate north of the site. |
| 2015 | Consistent with above. | More expansive development to the residential community to the North is visible in this aerial. |
| 2020 | Consistent with the 2015 aerial image. | Consistent with above. |
| 2025 | The Site appears to have a small amount of fill residue from the residential development that has been completed to the immediate north. | The residential community to the north has been completed. Other surrounding land uses have remained consistent. |

Based on the reviewed aerial images for the Site, fill of unknown quality was identified on the northern portion of the site. Fill may need to be assessed further to identify soil quality. In addition, the sites' historical and prolonged agricultural use may pose as a risk to pesticide presence in shallow soils.

### 3.3 Fire Insurance Plans and Underwriter's Reports

A request was placed with Ecolog ERIS for available fire insurance plans (FIPs) and/or underwriter's reports for the Phase 1 Property and/or the adjacent / neighbouring properties. The search indicated that no records were available for neither the Site and/or for the surrounding properties.

## 3.4 Site Occupancy Records

A City Directory search was completed historically the Site and surrounding properties have been residential and agricultural circa the 1800s.

## 3.5 Regulatory Information

### *3.5.1 Environmental Risk Information Service (ERIS)*

An Ecolog ERIS search provides information from federal, provincial, and private source databases and was searched for information relating to the Site, and the adjoining and neighboring properties within the Study Area (250 m from the Site boundaries). The Ecolog ERIS report is presented in **Appendix C**. The available databases were searched to determine if the Site, adjoining and/or neighboring properties were listed and if the listing(s) relate to actual or potential environmental contamination to the Site.

One Provincial, Federal, and/or Private Records were available for the Site and a total of fifteen (2) records were listed for the 0.25 km search radius from ERIS. Based on the nature of the listing and the distance to the Site the environmentally significant database records are summarized as follows:

| Property Address | Approximate Distance (m) /Direction to Site | Database / Source of Information | Details | Concerns |
|---|---|---|---|---|
| **265 Donly Drive South** | 245 m northwest of the Site | Pipeline Incident | In November of 2016, a pipeline was hit. No other information was reported with this incident | Not anticipated to be of concern. |
| Various Unplottable | Various | Water Well Information System | Various unplottable wells are located within the site study area and are used for domestic water supply. | None. |

Based on the Ecolog ERIS records review, no Site listings and/or adjacent properties were anticipated to represent environmental concerns to the Site.

### *3.5.2 Ministry of the Environment Conservation and Parks (MECP)*

A request was sent to the MECP Freedom of Information (FOI) and Protection of Privacy Office, in order to determine if there were any recorded environmental issues or violations associated with the Site and/or have issued any approvals, licenses, or permits for the locations, including registration as a PCB storage facility, and/or if a waste generator number ever been assigned to any of the properties, issued control orders or violation notices, and/or if the MOE has knowledge or record that the Site has ever been used or is currently being used for waste disposal.

A response to the above noted request was not received at the time of report preparation. If the response contains relevant environmental information relating to the Site, an addendum to this report will be issued.

### 3.6 Geological Data and Groundwater

The following information sources were reviewed to determine the nature of the subsurface strata and local topography: 1) Quaternary Geology Ontario, Southern Sheet, Map 2556, Ontario Geological Survey, 1991 2). Bedrock Geology of Ontario, Southern Sheet; May 2544, Ontario Geological Survey, 1991 3); and 4) 2009 Topographic Map by the Ontario Ministry of Natural Resources.

Based on published geological information for the area, native subsurface soil conditions in the area of the site consist of glaciolacustrine deposits of sand, gravely sand and gravel, nearshore and beach deposits. Underneath the soil lay limestone, shale, and dolostone, of the Dundee Bedrock Formation and Detroit River group of the Onondaga Formation.

There is no indication that there are significant depths of fill on the property associated with old landforms such as ravines or significant watercourses.

Geologic map data and regional ground surface topography indicates that the predominant inferred regional groundwater flow direction is anticipated to be in a northeasterly direction towards Spring Creek, a tributary of Lake Erie which is located approximately 7.0 km Southeast of the Site.

### 3.7 Previous Environmental Reports and Additional Information

No environmental reports were provided to Landtek for review during the preparation of this report.

## 4.0 OBSERVED SITE CONDITIONS

Landtek conducted a visual assessment of the Site on July 26, 2025. The following sections summarize the observed Site conditions.

The Site visit consisted of a visual reconnaissance of the Site and neighbouring properties from publicly accessible areas. Landtek was unaccompanied during the walkover. Photographs of typical Site conditions are shown in **Appendix D**.

### 4.1 Site Uses and Structures

The Site is located in a rural residential and agricultural area of Simcoe, Ontario. At the time of Landtek's Site visit, the Site consisted of agricultural lands.

### 4.2 Site Specific Observations

Observations of Site conditions were made during the Site reconnaissance and are summarized in the table below.

| Description | Reported and/or Observed On-Site | Comments |
|---|---|---|
| Air Emissions | No | None reported. |
| Storage Tanks: ASTs | No | None reported or observed during the Site visit. |
| Storage Tanks: USTs | No | None reported. |
| Hazardous Substances and Petroleum Products | No | None observed during the Site visit. |
| Hazardous Waste Management | No | None reported. |
| Unidentified Substance Containers | No | None observed during the Site visit. |
| Drums | No | None observed during the Site visit. |
| Hydraulic Equipment | No | None observed during the Site visit. |
| Fill Material | Yes | Potential fill of unknown quality was identified near the northern portion of the site. |
| Wells | No | Not identified during the Site visit. |
| Drains, Sumps, Oil/Water Separators/Sand Traps | No | No Sumps, Drains or Oil/Water Separators/Sand Traps were identified during the Site visit. |
| Stained Soil, Stained Pavement, Corrosion to Pavement | No | Not identified during the Site visit. |
| Strong, Pungent, or Noxious Odors | No | Not identified during the Site visit. |
| Stressed Vegetation | No | None observed during the Site visit. |
| Utilities (Electricity/ Natural Gas) | No | No buildings on the site. Therefore, no utility services were identified |

| Description | Reported and/or Observed On-Site | Comments |
|---|---|---|
| Water Supply | No | Ontario Map well records show that The Study Area is supplied with municipal water and domestic water wells. |
| Wastewater | No | No wastewater generation identified during Site visit. |
| Septic | No | Not identified during the site visit. |
| Storm Water | Yes | Storm water drains via overland flow to the adjacent properties, or via infiltration. |
| Pits, Ponds, Lagoons | No | Not identified during the Site visit. |

### *4.3 Hazardous Materials*

The following sections summarize substances that are more likely to be found in construction materials and building equipment.

#### *4.3.1 Asbestos Containing Materials (ACM's)*

No structures were located on the Site, ACM's are not expected to be present.

#### *4.3.2 Lead-Based Materials (LBM's)*

No structures were located on the Site, LBM's are not expected to be present.

#### *4.3.3 Ozone Depleting Substances (ODS's)*

No structures were located on the Site. No items suspected of containing ODS's were observed or reported on the Site.

#### *4.3.4 Polychlorinated biphenyls (PCBs)*

No structures were located on the Site. No transformers or fluorescent lights were reported or observed on the Site.

#### *4.3.5 Urea Formaldehyde Foam Insulation (UFFI)*

No UFFI was not identified during the Site visit.

#### *4.3.6 Microbial Contamination (Mould)*

Microbial Contamination is not anticipated to be a concern.

#### *4.3.7 Radon Gas*

Radon (Rn222) is a naturally occurring inert, colorless, odorless radioactive gas derived from the decay of radium (R226). Radium occurs in geologic formations containing uranium, granite, shale, phosphate, or pitchblende and was commercially used in luminescent products. Radium decays into reactive, radioactive daughter particles that attach themselves to other particles such as dust and are a lung cancer risk. Radon can move through permeable rocks and soils and can

eventually seep into buildings. The movement of radon into buildings is controlled largely by the soil permeability under a foundation and access to the interior of buildings through openings in the foundation. Radon is heavier than air and is more likely to be present in sub-grade areas (including basements).

According to the Cross-Canada Survey of Radon Concentrations (March 2012) conducted by Health Canada, the site is located in the City of Haldimand-Norfolk Health Unit, where 97.4 % of the tests conducted revealed radon levels below the Canadian Radon Guideline of 200 Bq/m3 (Health Canada). As such, the Site is located in an area of low radon potential.

### 4.4 Adjacent Site Conditions / Uses

| Direction to Site | Details |
|---|---|
| North | Rural residential and agricultural. |
| East | Agricultural and/or minimal rural residential, followed by Ireland Road. |
| South | Decou Road followed by rural residential and undeveloped natural vegetated land. |
| West | Agricultural lands followed by Lynn Valley Trail and naturalized lands. |

No concerns are anticipated.

## 5.0 SUMMARY OF FINDINGS

The following summary outlines the findings of the Phase 1 ESA:

- The Site consists of an irregular shaped parcel of land with agricultural crop cover. No structures are present, and the Site area is comprised of residential and agricultural uses. The Site is located in rural Simcoe, Ontario, and is 20.83 hectares (51.47 acres). The Site is bounded by residential properties to the north, agricultural lands to the east followed by Ireland Road and residential properties, agricultural and residential to the west, and residential dwellings to the south followed by Decou Road;

- Based on published geological information for the area, native subsurface soil conditions in the area of the site consist of glaciolacustrine deposits of sand, gravely sand and gravel, nearshore and beach deposits. Underneath the soil lay limestone, shale, and dolostone, of the Dundee Bedrock Formation and Detroit River group of the Onondaga Formation. There is no indication that there are significant depths of fill on the property associated with old landforms such as ravines or significant watercourses;

- A small southern portion of the site is within the regulatory limits of the Long Point Region Conservation Authority watershed boundary. These limits are shown in **Figure 2.**

- Based on a review of historical information sources (i.e., aerial photographs, environmental database searches, physical setting sources, and a Site reconnaissance), fill of unknown quality was identified on the northern portion of the site during site reconnaissance. No Site listings or adjacent properties are anticipated to be a potential environmental concern for the Site;

- Based on a review of aerial photographs, the Site appears to have historically been agricultural/ estate land. In the 1960s, one residential dwelling or farmhouse is vaguely identifiable on the southern portion of the site, while the remainder of the property was undeveloped and/or agricultural in nature. The Site has remained rural residential and undeveloped/ agricultural lot until present. The surrounding properties are agricultural in nature, newer residential development to the north commenced from 2010-2020;

- At the time of Landtek's Site visit, the Site consisted of agricultural land, while the surrounding properties were undeveloped and/or agricultural and residential; and,

- At the time of Landtek's Site visit, there was no evidence of chemical manufacturing/storage, above ground storage tanks (ASTs), and/or underground storage tanks (USTs) on the Site.

## 6.0 CONCLUSIONS

Based on Landtek's findings, current and historical use of the Site property for agricultural purposes indicates that pesticides may be present in shallow soils. In addition, fill of unknown quality was identified on the Site during the Site visit and from aerial photographs. Potential pesticide use and fill of unknown quality may be an environmental concern for the Site.

## 7.0 RECOMMENDATIONS

Based on the results of the Phase 1 ESA completed for the Site, Historical and current use of the site for agricultural purposes poses the potential of there being pesticides in shallow soils. In addition, fill of unknown quality located on the site may be of environmental concern. A limited phase 2 maybe prudent to confirm the quality of the soil on site for due diligence and removal purposes.

## 8.0 QUALIFICATIONS OF ASSESSOR(S) AND CLOSURE

### Qualifications

Completion of the assessment was conducted by Ms. Rachel Hlywka, who has over seven years of related environmental experience including completion of numerous Phase One and Two ESA's and Site remediation activities on a variety of agricultural, residential, industrial, commercial, and industrial properties.

Senior review of the assessment was conducted by Mr. Paul J Blunt, P.Eng. who has conducted and supervised Environmental Site Assessments for more than 25 years. Mr. Blunt obtained a B.Sc. in Chemical Engineering from University of Windsor in 1987 and is a licensed Professional Engineer in the Province of Ontario. Mr. Blunt has conducted and supervised Phase 1 Environmental Site Assessments over 1500 environmental site assessments on a variety of agricultural, residential, industrial, commercial, and industrial properties. Mr. Blunt also has extensive experience in conducting Phase 2 Environmental Site Assessments and is therefore familiar with how to assess potential concerns identified during the Phase 1 ESA. Mr. Blunt has conducted and supervised environmental projects throughout Canada, the United States and Australia.

We trust that this report is satisfactory for your purposes at this time. If you have any questions, please do not hesitate to contact our office.

Yours truly,

LANDTEK LIMITED

Rachel Hlywka

Paul Blunt, P.Eng., $QP_{ESA}$

# APPENDIX A

## LIMITATION OF THE REPORT

## Limitations of the Report

This report was prepared for the sole use of the Client, their legal counsel, and Client designated and authorized financial and mortgage institutions. It is intended to provide an evaluation of the current environmental conditions at the subject Site. Any use of this report, or decisions made based on it, by an unauthorized party is the responsibility of the unauthorized party. Landtek Limited accepts no responsibility for damages of any type suffered by the unauthorized party as a result of actions or decisions made based on this report.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. The findings within this ESA utilized information that was practically reviewable per O. Reg. 153/04, meaning that only relevant data relating to the Site has been incorporated into the findings, disregarding extraordinary analysis of irrelevant data. The investigation conducted for this ESA was limited to data that was reasonably ascertainable, meaning that the information was publicly available, obtainable within the cost and time constraints under the scope of services for this project, and practically available.

It should be noted that all surficial environmental assessments are inherently limited in the sense that conclusions are drawn and recommendations developed from information obtained from limited research and Site evaluation. Subsurface conditions were not field investigated as part of this study and may differ from the conditions implied by the surficial observations. Additionally, the passage of time may result in a change in the environmental characteristics at this Site and surrounding properties. Landtek does not warrant against future operations or conditions, or against operations or conditions present of a type or at a location not investigated.

The conclusions and recommendations given in this report are based on information obtained from various sources noted and a visual examination of the Site. It is based on the conditions of the subject property at the time of the field investigation supplemented by a review of historical information to assess environmental conditions at the Site reported. Landtek Limited assumes that information provided by others is factual and accurate, and accepts no responsibility for any deficiency, misstatement, of inaccuracy in this report from information provided by others.

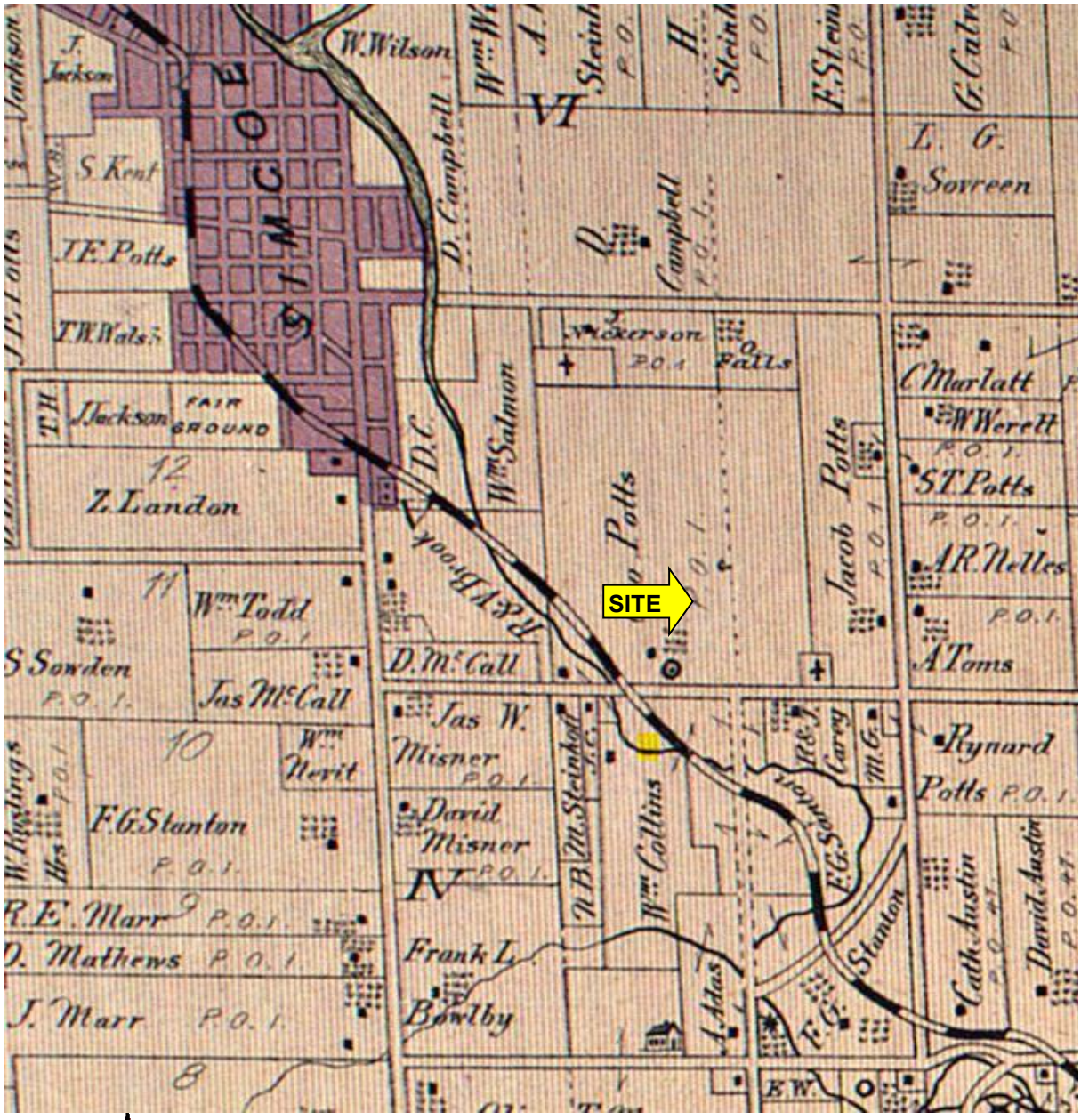
The primary direction of groundwater flow is assumed to follow topography, unless otherwise indicated by measurement of potentiometric surface or other quantifiable data.

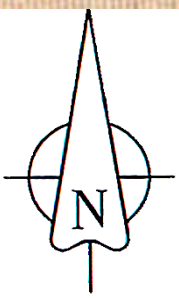
Sampling and analysis of soil, groundwater, or other materials was not carried out as part of the scope of work. The findings of the assessment cannot be extended to reflect portions of the Site that were unavailable for direct observation by Landtek Limited.

This assessment should not be considered a comprehensive audit that eliminates all risks of encountering environmental problems. There is no warranty expressed or implied by this report concerning the status of the study Site.

# APPENDIX B

## HISTORICAL MAP AND AERIAL PHOTOGRAPHS

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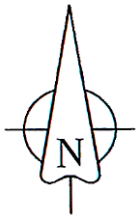
| Title: | Historical Map - 1880 | |
| Project No. | 25181 | |




LANDTEK LIMITED

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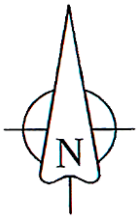
| Project No. | 25181 | |




LANDTEK LIMITED

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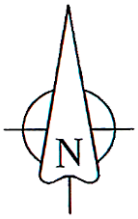


LANDTEK LIMITED

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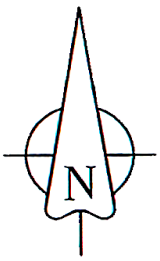
| Project No. | 25181 | |




LANDTEK LIMITED

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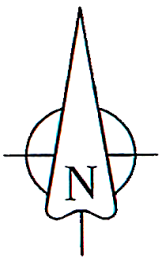
| Project No. | 25181 | |

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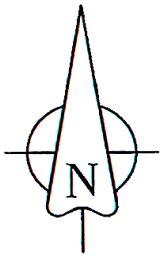


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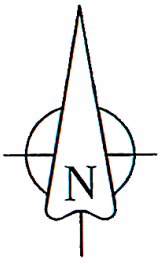


LANDTEK LIMITED

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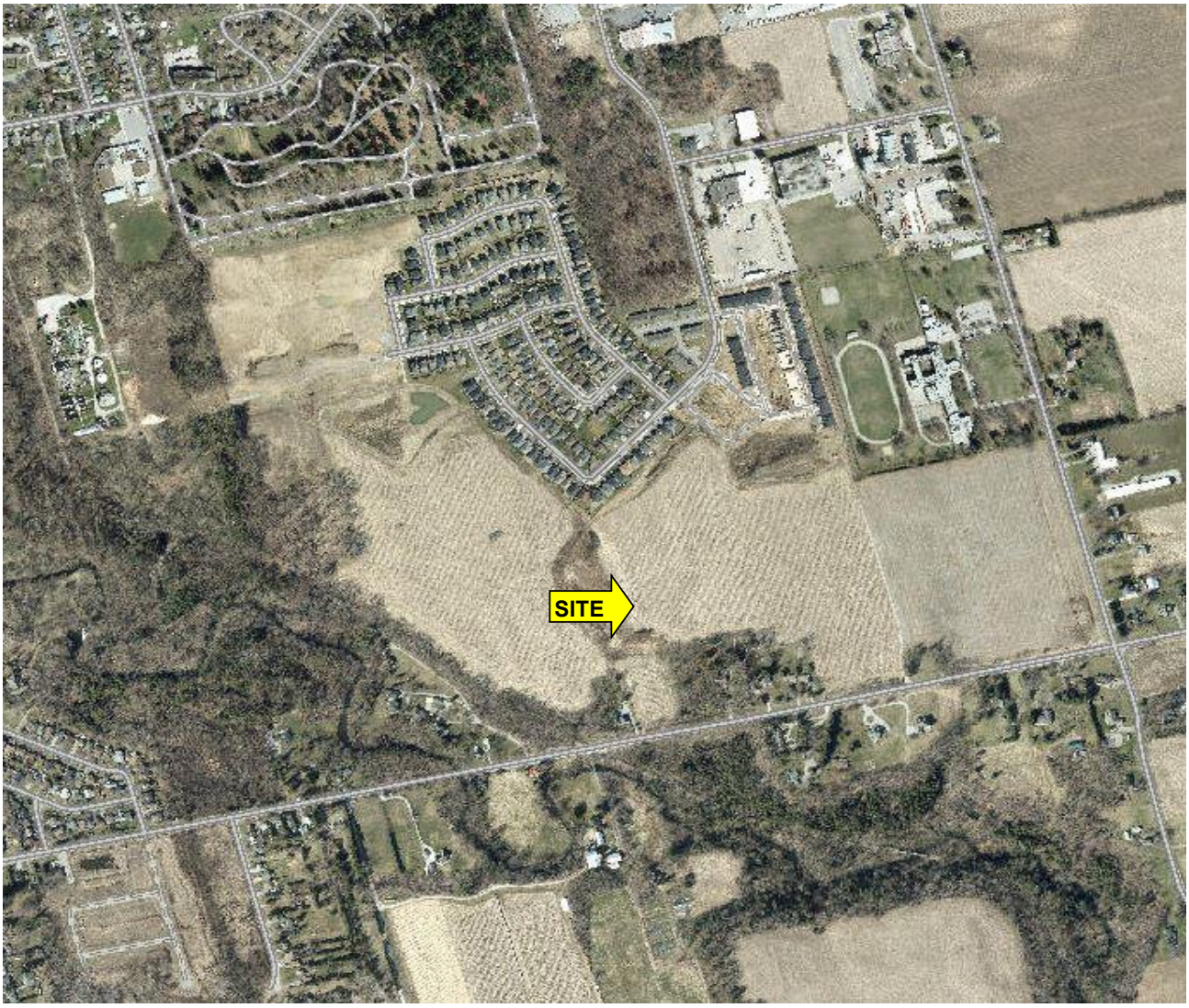


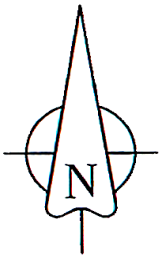


LANDTEK LIMITED

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| Scale: | NTS | Date: July 2025 |
| Project: | Phase 1 ESA<br>227 Decou Road<br>Simcoe, Ontario | |
| Title: | Aerial Photograph - 2020 | |
| Project No. | 25181 | |

# APPENDIX C

## ENVIRONMENTAL RISK INFORMATION SYSTEM (ERIS) DATA

# DATABASE REPORT

| | |
|---|---|
| **Project Property:** | *227 Decou Road, Simcoe, ON*<br>*227 Decou Road*<br>*Simcoe ON N3Y 4K2* |
| **Project No:** | *25181* |
| **Report Type:** | *Standard Report* |
| **Order No:** | *25062300651* |
| **Requested by:** | *Landtek Limited* |
| **Date Completed:** | *June 23, 2025* |

**Environmental Risk Information Services**
*A division of Glacier Media Inc.*
1.866.517.5204 | info@erisinfo.com | erisinfo.com

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**Notice: IMPORTANT LIMITATIONS and YOUR LIABILITY**

**Reliance on information in Report:** This report DOES NOT replace a full Phase I Environmental Site Assessment but is solely intended to be used as a database review of environmental records.

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# Executive Summary

***Property Information:***

| | |
|---|---|
| **Project Property:** | *227 Decou Road, Simcoe, ON*<br>*227 Decou Road  Simcoe ON N3Y 4K2* |
| **Project No:** | *25181* |

**Coordinates:**

| | |
|---|---|
| **Latitude:** | *42.825538* |
| **Longitude:** | *-80.285385* |
| **UTM Northing:** | *4,741,689.01* |
| **UTM Easting:** | *558,411.73* |
| **UTM Zone:** | *17T* |

| | |
|---|---|
| **Elevation:** | *722 FT*<br>*220.22 M* |

***Order Information:***

| | |
|---|---|
| **Order No:** | *25062300651* |
| **Date Requested:** | *June 23, 2025* |
| **Requested by:** | *Landtek Limited* |
| **Report Type:** | *Standard Report* |

***Historical/Products:***

| | |
|---|---|
| **ERIS Xplorer** | *ERIS Xplorer* |

# Executive Summary: Report Summary

| Database | Name | Searched | Project Property | Within 0.25 km | Total |
|---|---|---|---|---|---|
| AAGR | *Abandoned Aggregate Inventory* | Y | 0 | 0 | 0 |
| AGR | *Aggregate Inventory* | Y | 0 | 0 | 0 |
| AMIS | *Abandoned Mine Information System* | Y | 0 | 0 | 0 |
| ANDR | *Anderson's Waste Disposal Sites* | Y | 0 | 0 | 0 |
| AST | *Aboveground Storage Tanks* | Y | 0 | 0 | 0 |
| AUWR | *Automobile Wrecking & Supplies* | Y | 0 | 0 | 0 |
| BORE | *Borehole* | Y | 0 | 0 | 0 |
| CA | *Certificates of Approval* | Y | 0 | 0 | 0 |
| CDRY | *Dry Cleaning Facilities* | Y | 0 | 0 | 0 |
| CFOT | *Commercial Fuel Oil Tanks* | Y | 0 | 0 | 0 |
| CHEM | *Chemical Manufacturers and Distributors* | Y | 0 | 0 | 0 |
| CHM | *Chemical Register* | Y | 0 | 0 | 0 |
| CNG | *Compressed Natural Gas Stations* | Y | 0 | 0 | 0 |
| COAL | *Inventory of Coal Gasification Plants and Coal Tar Sites* | Y | 0 | 0 | 0 |
| CONV | *Compliance and Convictions* | Y | 0 | 0 | 0 |
| CPU | *Certificates of Property Use* | Y | 0 | 0 | 0 |
| DRL | *Drill Hole Database* | Y | 0 | 0 | 0 |
| DTNK | *Delisted Fuel Tanks* | Y | 0 | 0 | 0 |
| EASR | *Environmental Activity and Sector Registry* | Y | 0 | 0 | 0 |
| EBR | *Environmental Registry* | Y | 0 | 0 | 0 |
| ECA | *Environmental Compliance Approval* | Y | 0 | 0 | 0 |
| EEM | *Environmental Effects Monitoring* | Y | 0 | 0 | 0 |
| EHS | *ERIS Historical Searches* | Y | 1 | 0 | 1 |
| EIIS | *Environmental Issues Inventory System* | Y | 0 | 0 | 0 |
| EMHE | *Emergency Management Historical Event* | Y | 0 | 0 | 0 |
| EPAR | *Environmental Penalty Annual Report* | Y | 0 | 0 | 0 |
| EXP | *List of Expired Fuels Safety Facilities* | Y | 0 | 0 | 0 |
| FCON | *Federal Convictions* | Y | 0 | 0 | 0 |
| FCS | *Contaminated Sites on Federal Land* | Y | 0 | 0 | 0 |
| FOFT | *Fisheries & Oceans Fuel Tanks* | Y | 0 | 0 | 0 |
| FRST | *Federal Identification Registry for Storage Tank Systems (FIRSTS)* | Y | 0 | 0 | 0 |
| FST | *Fuel Storage Tank* | Y | 0 | 0 | 0 |
| FSTH | *Fuel Storage Tank - Historic* | Y | 0 | 0 | 0 |
| GEN | *Ontario Regulation 347 Waste Generators Summary* | Y | 0 | 0 | 0 |
| GHG | *Greenhouse Gas Emissions from Large Facilities* | Y | 0 | 0 | 0 |
| HINC | *TSSA Historic Incidents* | Y | 0 | 0 | 0 |
| IAFT | *Indian & Northern Affairs Fuel Tanks* | Y | 0 | 0 | 0 |

| Database | Name | Searched | Project Property | Within 0.25 km | Total |
|---|---|---|---|---|---|
| INC | Fuel Oil Spills and Leaks | Y | 0 | 0 | 0 |
| LIMO | Landfill Inventory Management Ontario | Y | 0 | 0 | 0 |
| MINE | Canadian Mine Locations | Y | 0 | 0 | 0 |
| MNR | Mineral Occurrences | Y | 0 | 0 | 0 |
| NATE | National Analysis of Trends in Emergencies System (NATES) | Y | 0 | 0 | 0 |
| NCPL | Non-Compliance Reports | Y | 0 | 0 | 0 |
| NDFT | National Defense & Canadian Forces Fuel Tanks | Y | 0 | 0 | 0 |
| NDSP | National Defense & Canadian Forces Spills | Y | 0 | 0 | 0 |
| NDWD | National Defence & Canadian Forces Waste Disposal Sites | Y | 0 | 0 | 0 |
| NEBI | National Energy Board Pipeline Incidents | Y | 0 | 0 | 0 |
| NEBP | National Energy Board Wells | Y | 0 | 0 | 0 |
| NEES | National Environmental Emergencies System (NEES) | Y | 0 | 0 | 0 |
| NPCB | National PCB Inventory | Y | 0 | 0 | 0 |
| NPR2 | National Pollutant Release Inventory | Y | 0 | 0 | 0 |
| NPRI | National Pollutant Release Inventory - Historic | Y | 0 | 0 | 0 |
| OGWE | Oil and Gas Wells | Y | 0 | 0 | 0 |
| OOGW | Ontario Oil and Gas Wells | Y | 0 | 0 | 0 |
| OPCB | Inventory of PCB Storage Sites | Y | 0 | 0 | 0 |
| ORD | Orders | Y | 0 | 0 | 0 |
| PAP | Canadian Pulp and Paper | Y | 0 | 0 | 0 |
| PCFT | Parks Canada Fuel Storage Tanks | Y | 0 | 0 | 0 |
| PES | Pesticide Register | Y | 0 | 0 | 0 |
| PFAS | Ontario PFAS Spills | Y | 0 | 0 | 0 |
| PFCH | NPRI Reporters - PFAS Substances | Y | 0 | 0 | 0 |
| PFHA | Potential PFAS Handlers from NPRI | Y | 0 | 0 | 0 |
| PINC | Pipeline Incidents | Y | 0 | 1 | 1 |
| PPHA | Potential PFAS Handlers from EASR | Y | 0 | 0 | 0 |
| PRT | Private and Retail Fuel Storage Tanks | Y | 0 | 0 | 0 |
| PTTW | Permit to Take Water | Y | 0 | 0 | 0 |
| REC | Ontario Regulation 347 Waste Receivers Summary | Y | 0 | 0 | 0 |
| RSC | Record of Site Condition | Y | 0 | 0 | 0 |
| RST | Retail Fuel Storage Tanks | Y | 0 | 0 | 0 |
| SCT | Scott's Manufacturing Directory | Y | 0 | 0 | 0 |
| SPL | Ontario Spills | Y | 0 | 0 | 0 |
| SRDS | Wastewater Discharger Registration Database | Y | 0 | 0 | 0 |
| TANK | Anderson's Storage Tanks | Y | 0 | 0 | 0 |
| TCFT | Transport Canada Fuel Storage Tanks | Y | 0 | 0 | 0 |
| VAR | Variances for Abandonment of Underground Storage Tanks | Y | 0 | 0 | 0 |
| WDS | Waste Disposal Sites - MOE CA Inventory | Y | 0 | 0 | 0 |
| WDSH | Waste Disposal Sites - MOE 1991 Historical Approval Inventory | Y | 0 | 0 | 0 |
| WWIS | Water Well Information System | Y | 0 | 0 | 0 |

| Database | Name | Searched | Project Property | Within 0.25 km | Total |
|---|---|---|---|---|---|
| **Total:** | | 1 | | 1 | 2 |

# Executive Summary: Site Report Summary - Project Property

| Map Key | DB | Company/Site Name | Address | Dir/Dist (m) | Elev diff (m) | Page Number |
|---|---|---|---|---|---|---|
| 1 | EHS | | 227 Decou Rd<br>Simcoe ON N3Y 4K2 | -/0.0 | -0.47 | 13 |

# Executive Summary: Site Report Summary - Surrounding Properties

| Map Key | DB | Company/Site Name | Address | Dir/Dist (m) | Elev Diff (m) | Page Number |
|---|---|---|---|---|---|---|
| 2 | PINC | PIPELINE HIT - 1/2" | 265 DONLY DR S,,SIMCOE,ON,N3Y 0C8, CA<br>ON | NNW/244.9 | 4.62 | 13 |

# Executive Summary: Summary By Data Source

### EHS - ERIS Historical Searches

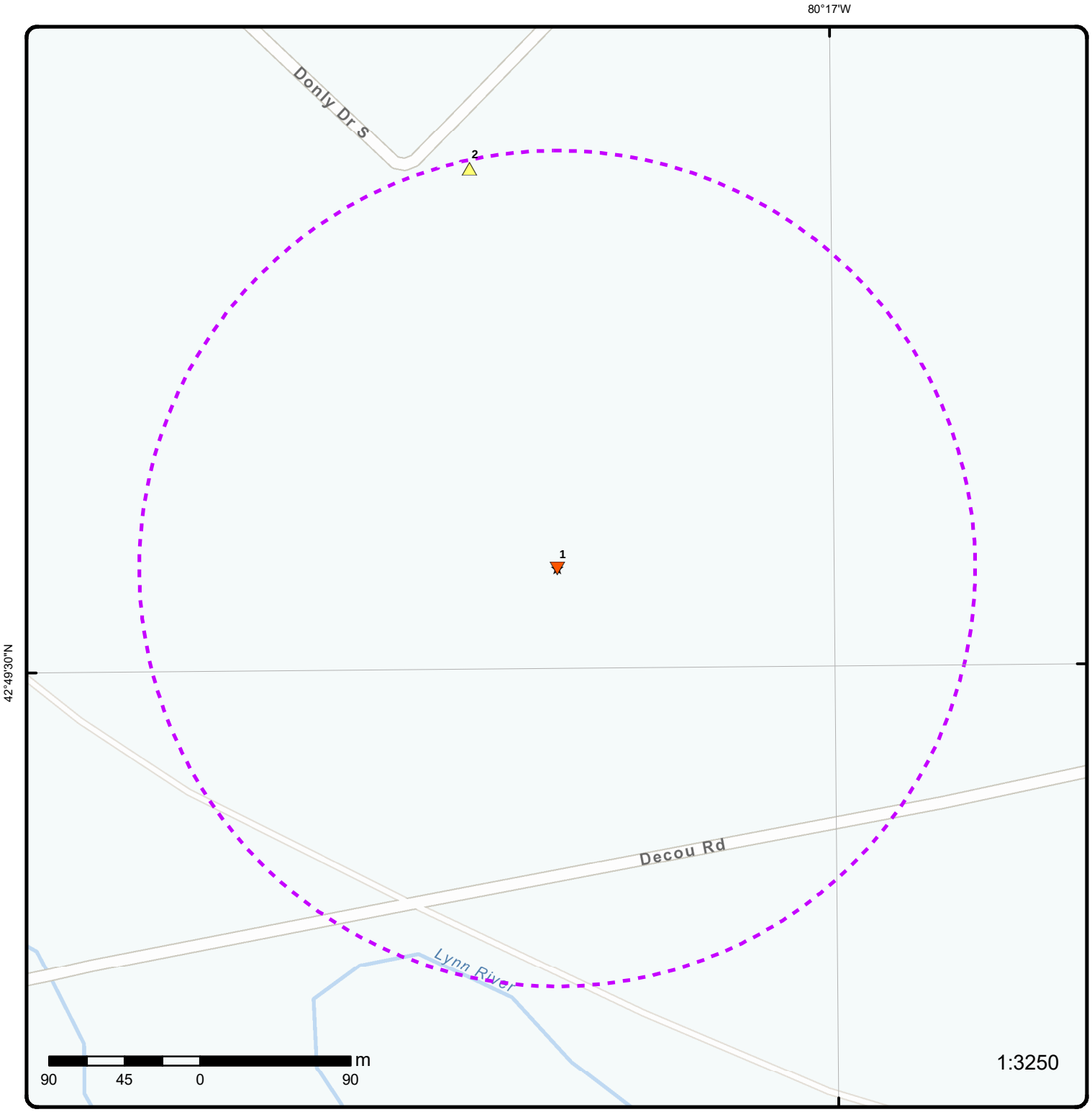
A search of the EHS database, dated 1999-Aug 31, 2024 has found that there are 1 EHS site(s) within approximately 0.25 kilometers of the project property.

| Lower Elevation | Address | Direction | Distance (m) | Map Key |
|---|---|---|---|---|
| | 227 Decou Rd<br>Simcoe ON N3Y 4K2 | - | 0.00 | 1 |

### PINC - Pipeline Incidents

A search of the PINC database, dated Feb 28, 2021 has found that there are 1 PINC site(s) within approximately 0.25 kilometers of the project property.

| Equal/Higher Elevation | Address | Direction | Distance (m) | Map Key |
|---|---|---|---|---|
| PIPELINE HIT - 1/2" | 265 DONLY DR S,,SIMCOE,ON,N3Y 0C8,CA<br>ON | NNW | 244.88 | 2 |




# Map: 0.25 Kilometer Radius

Order Number: 25062300651

Address: 227 Decou Road, Simcoe, ON

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major Arterial; Minor Arterial
- Local Road
- Service Road; Traffic Circle; Ramp
- Rail
- Beach
- Airport
- Industrial Area
- Military Base
- Aircraft Roads
- Native Reservation
- Hospital
- Shopping & Sports Area
- University/College
- Cemetery; Golf Course
- Parkt (National)
- Park (City/County)

**Source:** © 2021 ESRI StreetMap Premium.

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80°16'30"W

42°49'30"N




42°49'30"N

# Aerial

**Year: 2024**

Order Number: 25062300651

**Address: 227 Decou Road, Simcoe, ON**

**Source:** ESRI World Imagery

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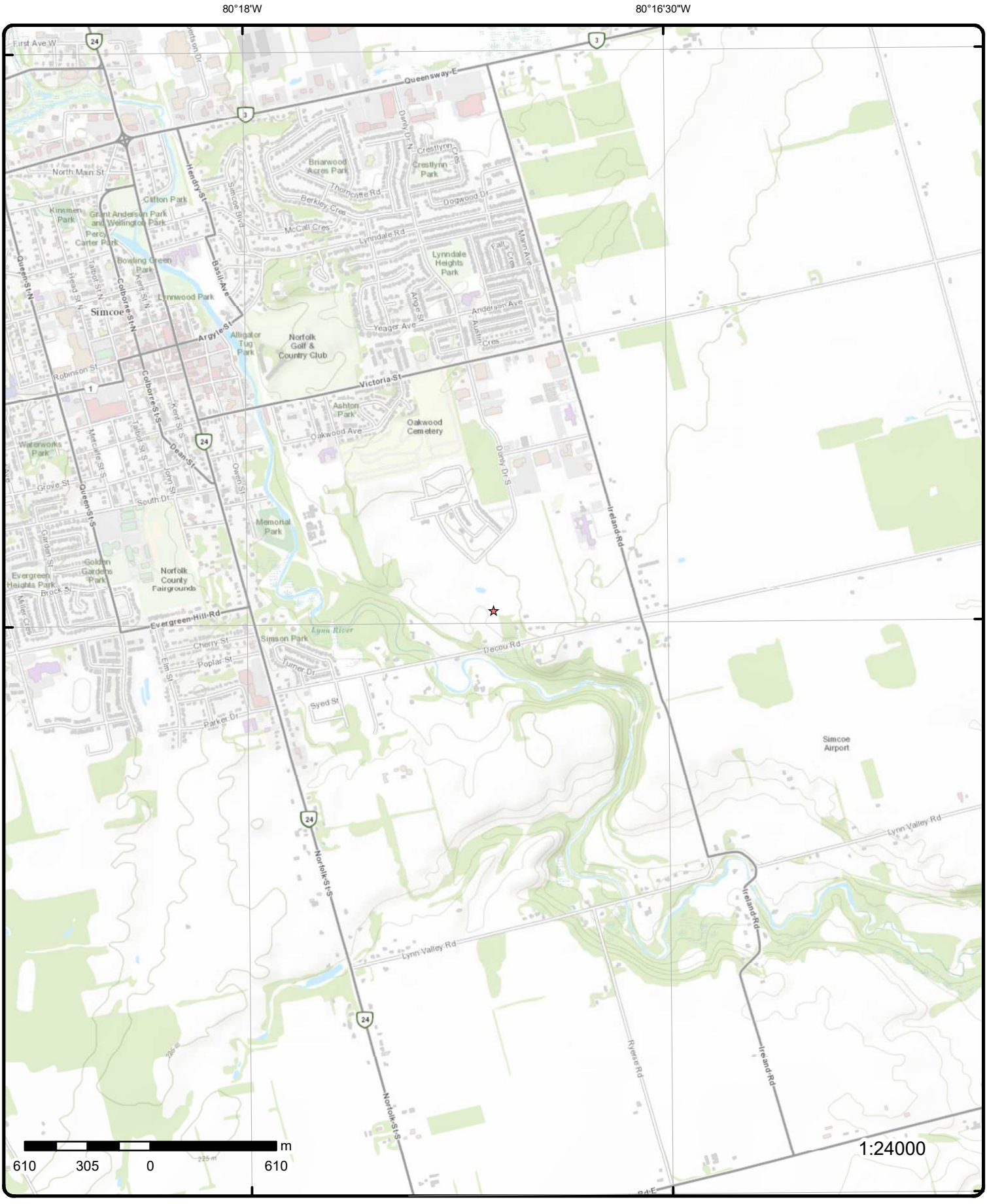


# Topographic Map

**Address: 227 Decou Road, ON**

**Source:** ESRI World Topographic Map

Order Number: 25062300651

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# Detail Report

| Map Key | Number of Records | Direction/ Distance (m) | Elev/Diff (m) | Site | DB |
|---|---|---|---|---|---|
| 1 | 1 of 1 | -/0.0 | 219.8 / -0.47 | 227 Decou Rd<br>Simcoe ON N3Y 4K2 | EHS |

| | | | |
|---|---|---|---|
| **Order No:** | 20101025001 | **Nearest Intersection:** | |
| **Status:** | C | **Municipality:** | |
| **Report Type:** | Custom Report | **Client Prov/State:** | ON |
| **Report Date:** | 11/2/2010 | **Search Radius (km):** | 0.25 |
| **Date Received:** | 10/25/2010 8:46:38 AM | **X:** | -80.285218 |
| **Previous Site Name:** | | **Y:** | 42.824332 |
| **Lot/Building Size:** | | | |
| **Additional Info Ordered:** | Aerial Photos; City Directory | | |

| Map Key | Number of Records | Direction/ Distance (m) | Elev/Diff (m) | Site | DB |
|---|---|---|---|---|---|
| 2 | 1 of 1 | NNW/244.9 | 224.8 / 4.62 | PIPELINE HIT - 1/2"<br>265 DONLY DR S,,SIMCOE,ON,N3Y 0C8,CA<br>ON | PINC |

| | | | |
|---|---|---|---|
| **Incident Id:** | | **Pipe Material:** | |
| **Incident No:** | 1861774 | **Fuel Category:** | |
| **Incident Reported Dt:** | 5/11/2016 | **Health Impact:** | |
| **Type:** | FS-Pipeline Incident | **Environment Impact:** | |
| **Status Code:** | | **Property Damage:** | |
| **Tank Status:** | Pipeline Damage Reason Est | **Service Interrupt:** | |
| **Task No:** | | **Enforce Policy:** | |
| **Spills Action Centre:** | | **Public Relation:** | |
| **Fuel Type:** | | **Pipeline System:** | |
| **Fuel Occurrence Tp:** | | **PSIG:** | |
| **Date of Occurrence:** | | **Attribute Category:** | |
| **Occurrence Start Dt:** | | **Regulator Location:** | |
| **Depth:** | | **Method Details:** | |
| **Customer Acct Name:** | PIPELINE HIT - 1/2" | | |
| **Incident Address:** | 265 DONLY DR S,,SIMCOE,ON,N3Y 0C8,CA | | |
| **Operation Type:** | | | |
| **Pipeline Type:** | | | |
| **Regulator Type:** | | | |
| **Summary:** | | | |
| **Reported By:** | | | |
| **Affiliation:** | | | |
| **Occurrence Desc:** | | | |
| **Damage Reason:** | | | |
| **Notes:** | | | |

# Unplottable Summary

**Total: 13 Unplottable sites**

| DB | Company Name/Site Name | Address | City | Postal |
|---|---|---|---|---|
| CA | 2177545 Ontario Inc. | Southerly end of Donly Drive in Simcoe Ontario | Norfolk ON | |
| CA | NORFOLK VILLAGE DEVELOPMENT - LYNN COURT | PRIV. PROP. DONLY DRIVE | SIMCOE TOWN ON | |
| CA | NORFOLK VILLAGE DEVELOPMENTS -LYNN COURT | DRIVEWAY DONLY DRIVE | SIMCOE TOWN ON | |
| CA | JACK VANDENBERG | UNIT APART. BLDG. DONLY DR. | SIMCOE TOWN ON | |
| CA | JACK VANDENBERG | UNIT APART. BLDG. DONLY DR. | SIMCOE TOWN ON | |
| ECA | 2156555 Ontario Inc. | DeCou Rd Simcoe | Norfolk ON | L4T 0A1 |
| FST | MINISTRY OF TRANSPORTATION | LOT 2 CON 4 | NORFOLK ON | |
| FST | MINISTRY OF TRANSPORTATION | LOT 2 CON 4 | NORFOLK ON | |
| FSTH | MINISTRY OF TRANSPORTATION | LOT 2 CON 4 | NORFOLK ON | |
| FSTH | MINISTRY OF TRANSPORTATION | LOT 2 CON 4 | NORFOLK ON | |
| PRT | MINISTRY OF TRANSPORTATION | LOT 2 CON 4 | NORFOLK ON | |
| WWIS | | lot 3 | ON | |
| WWIS | | lot 3 | ON | |

# Unplottable Report

***Site:*** ***2177545 Ontario Inc.***
***Southerly end of Donly Drive in Simcoe Ontario  Norfolk ON***

***Database:*** ***CA***

***Certificate #:*** 2247-8J2QFB
***Application Year:*** 2011
***Issue Date:*** 6/30/2011
***Approval Type:*** Municipal and Private Sewage Works
***Status:*** Approved
***Application Type:***
***Client Name:***
***Client Address:***
***Client City:***
***Client Postal Code:***
***Project Description:***
***Contaminants:***
***Emission Control:***

---

***Site:*** ***NORFOLK VILLAGE DEVELOPMENT - LYNN COURT***
***PRIV. PROP. DONLY DRIVE  SIMCOE TOWN ON***

***Database:*** ***CA***

***Certificate #:*** 3-2371-89-
***Application Year:*** 89
***Issue Date:*** 11/30/1989
***Approval Type:*** Municipal sewage
***Status:*** Approved
***Application Type:***
***Client Name:***
***Client Address:***
***Client City:***
***Client Postal Code:***
***Project Description:***
***Contaminants:***
***Emission Control:***

---

***Site:*** ***NORFOLK VILLAGE DEVELOPMENTS -LYNN COURT***
***DRIVEWAY DONLY DRIVE  SIMCOE TOWN ON***

***Database:*** ***CA***

***Certificate #:*** 7-1959-89-
***Application Year:*** 89
***Issue Date:*** 11/30/1989
***Approval Type:*** Municipal water
***Status:*** Approved
***Application Type:***
***Client Name:***
***Client Address:***
***Client City:***
***Client Postal Code:***
***Project Description:***
***Contaminants:***
***Emission Control:***

---

***Site:*** ***JACK VANDENBERG***
***UNIT APART. BLDG. DONLY DR.  SIMCOE TOWN ON***

***Database:*** ***CA***

***Certificate #:*** 3-0244-89-
***Application Year:*** 89

***Issue Date:*** 3/7/1989
***Approval Type:*** Municipal sewage
***Status:*** Approved
***Application Type:***
***Client Name:***
***Client Address:***
***Client City:***
***Client Postal Code:***
***Project Description:***
***Contaminants:***
***Emission Control:***

---

***Site:*** ***JACK VANDENBERG***
***UNIT APART. BLDG. DONLY DR. SIMCOE TOWN ON***

***Database:*** ***CA***

***Certificate #:*** 7-0216-89-
***Application Year:*** 89
***Issue Date:*** 3/7/1989
***Approval Type:*** Municipal water
***Status:*** Approved
***Application Type:***
***Client Name:***
***Client Address:***
***Client City:***
***Client Postal Code:***
***Project Description:***
***Contaminants:***
***Emission Control:***

---

***Site:*** ***2156555 Ontario Inc.***
***DeCou Rd Simcoe Norfolk ON L4T 0A1***

***Database:*** ***ECA***

***Approval No:*** 5991-9CBPTF
***Approval Date:*** 2013-10-30
***Status:*** Revoked and/or Replaced
***Record Type:*** ECA
***Link Source:*** IDS
***SWP Area Name:***
***MOE District:***
***City:***
***Longitude:***
***Latitude:***
***Geometry X:***
***Geometry Y:***
***Approval Type:*** ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
***Project Type:*** MUNICIPAL AND PRIVATE SEWAGE WORKS
***Business Name:*** 2156555 Ontario Inc.
***Address:*** DeCou Rd Simcoe
***Full Address:***
***Full PDF Link:*** https://www.accessenvironment.ene.gov.on.ca/instruments/1340-9CAPGS-14.pdf
***PDF Site Location:***

---

***Site:*** ***MINISTRY OF TRANSPORTATION***
***LOT 2 CON 4 NORFOLK ON***

***Database:*** ***FST***

***Inventory No:*** 10878092
***Inventory Status:*** Active
***Installation Year:***
***Capacity:***
***Capacity Unit:***
***Tank Type:***
***Manufacturer:***
***Model:***
***Description:*** UNDERGROUND TANK
***Tank Material:*** Fiberglass (FRP)
***Corrosion Protect:*** Fiberglass
***Overfill Protection:***
***Inventory Context:*** FS Liquid Fuel Tank
***Inventory Item:*** FS LIQUID FUEL TANK

---

***Site:*** ***MINISTRY OF TRANSPORTATION***
***LOT 2 CON 4 NORFOLK ON***

***Database:*** ***FST***

***Inventory No:*** 10878110
***Tank Material:*** Steel

***Inventory Status:*** Active
***Installation Year:***
***Capacity:***
***Capacity Unit:***
***Tank Type:***
***Manufacturer:***
***Model:***
***Description:*** UNDERGROUND TANK

***Corrosion Protect:*** Impressed Current
***Overfill Protection:***
***Inventory Context:*** FS Liquid Fuel Tank
***Inventory Item:*** FS LIQUID FUEL TANK

---

***Site:*** ***MINISTRY OF TRANSPORTATION***
***LOT 2 CON 4 NORFOLK ON***

***Database:*** ***FSTH***

***License Issue Date:*** 7/9/1990
***Tank Status:*** Licensed
***Tank Status As Of:*** December 2008
***Operation Type:*** Private Fuel Outlet
***Facility Type:*** Gasoline Station - Self Serve

***--Details--***
***Status:*** Active
***Year of Installation:*** 1988
***Corrosion Protection:***
***Capacity:*** 4550
***Tank Fuel Type:*** Liquid Fuel Single Wall UST - Gasoline

***Status:*** Active
***Year of Installation:*** 1980
***Corrosion Protection:***
***Capacity:*** 9000
***Tank Fuel Type:*** Liquid Fuel Single Wall UST - Diesel

---

***Site:*** ***MINISTRY OF TRANSPORTATION***
***LOT 2 CON 4 NORFOLK ON***

***Database:*** ***FSTH***

***License Issue Date:*** 7/9/1990
***Tank Status:*** Licensed
***Tank Status As Of:*** August 2007
***Operation Type:*** Private Fuel Outlet
***Facility Type:*** Gasoline Station - Self Serve

***--Details--***
***Status:*** Active
***Year of Installation:*** 1988
***Corrosion Protection:***
***Capacity:*** 4550
***Tank Fuel Type:*** Liquid Fuel Single Wall UST - Gasoline

***Status:*** Active
***Year of Installation:*** 1980
***Corrosion Protection:***
***Capacity:*** 9000
***Tank Fuel Type:*** Liquid Fuel Single Wall UST - Diesel

---

***Site:*** ***MINISTRY OF TRANSPORTATION***
***LOT 2 CON 4 NORFOLK ON***

***Database:*** ***PRT***

***Location ID:*** 9985
***Type:*** private
***Expiry Date:***
***Capacity (L):*** 13550.00
***Licence #:*** 0001025663

---

***Site:***
***lot 3 ON***

***Database:***
***WWIS***

| | | | |
|---|---|---|---|
| ***Well ID:*** | 5740364 | ***Flowing (Y/N):*** | |
| ***Construction Date:*** | | ***Flow Rate:*** | |
| ***Use 1st:*** | Domestic | ***Data Entry Status:*** | |
| ***Use 2nd:*** | | ***Data Src:*** | |
| ***Final Well Status:*** | Water Supply | ***Date Received:*** | 12/09/2005 |
| ***Water Type:*** | | ***Selected Flag:*** | TRUE |
| ***Casing Material:*** | | ***Abandonment Rec:*** | |
| ***Audit No:*** | Z32423 | ***Contractor:*** | 7075 |
| ***Tag:*** | A027103 | ***Form Version:*** | 3 |
| ***Constructn Method:*** | | ***Owner:*** | |
| ***Elevation (m):*** | | ***County:*** | SIMCOE |
| ***Elevatn Reliabilty:*** | | ***Lot:*** | 003 |
| ***Depth to Bedrock:*** | | ***Concession:*** | |
| ***Well Depth:*** | | ***Concession Name:*** | |
| ***Overburden/Bedrock:*** | | ***Easting NAD83:*** | |
| ***Pump Rate:*** | | ***Northing NAD83:*** | |
| ***Static Water Level:*** | | ***Zone:*** | |
| ***Clear/Cloudy:*** | | ***UTM Reliability:*** | |
| ***Municipality:*** | 57000 | | |
| ***Site Info:*** | | | |

***Bore Hole Information***

| | | | |
|---|---|---|---|
| ***Bore Hole ID:*** | 11325860 | ***Elevation:*** | |
| ***DP2BR:*** | | ***Elevrc:*** | |
| ***Spatial Status:*** | | ***Zone:*** | |
| ***Code OB:*** | | ***East83:*** | |
| ***Code OB Desc:*** | | ***North83:*** | |
| ***Open Hole:*** | | ***Org CS:*** | |
| ***Cluster Kind:*** | | ***UTMRC:*** | |
| ***Date Completed:*** | 09/02/2005 | ***UTMRC Desc:*** | |
| ***Remarks:*** | | ***Location Method:*** | na |
| ***Location Method Desc:*** | Not Applicable i.e. no UTM | | |
| ***Elevrc Desc:*** | | | |
| ***Location Source Date:*** | | | |
| ***Improvement Location Source:*** | | | |
| ***Improvement Location Method:*** | | | |
| ***Source Revision Comment:*** | | | |
| ***Supplier Comment:*** | | | |

***Overburden and Bedrock Materials Interval***

| | |
|---|---|
| ***Formation ID:*** | 933030740 |
| ***Layer:*** | 4 |
| ***Color:*** | 6 |
| ***General Color:*** | BROWN |
| ***Material 1:*** | 28 |
| ***Material 1 Desc:*** | SAND |
| ***Material 2:*** | |
| ***Material 2 Desc:*** | |
| ***Material 3:*** | |
| ***Material 3 Desc:*** | |
| ***Formation Top Depth:*** | 180.0 |
| ***Formation End Depth:*** | 185.0 |
| ***Formation End Depth UOM:*** | ft |

***Overburden and Bedrock Materials Interval***

| | |
|---|---|
| ***Formation ID:*** | 933030739 |
| ***Layer:*** | 3 |
| ***Color:*** | 2 |
| ***General Color:*** | GREY |

***Material 1:*** 05
***Material 1 Desc:*** CLAY
***Material 2:*** 06
***Material 2 Desc:*** SILT
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 9.0
***Formation End Depth:*** 180.0
***Formation End Depth UOM:*** ft

***Overburden and Bedrock Materials Interval***

***Formation ID:*** 933030737
***Layer:*** 1
***Color:***
***General Color:***
***Material 1:*** 02
***Material 1 Desc:*** TOPSOIL
***Material 2:***
***Material 2 Desc:***
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 0.0
***Formation End Depth:*** 1.0
***Formation End Depth UOM:*** ft

***Overburden and Bedrock Materials Interval***

***Formation ID:*** 933030738
***Layer:*** 2
***Color:*** 6
***General Color:*** BROWN
***Material 1:*** 28
***Material 1 Desc:*** SAND
***Material 2:***
***Material 2 Desc:***
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 1.0
***Formation End Depth:*** 9.0
***Formation End Depth UOM:*** ft

***Annular Space/Abandonment Sealing Record***

***Plug ID:*** 933282989
***Layer:*** 1
***Plug From:*** 0.0
***Plug To:*** 23.0
***Plug Depth UOM:*** ft

***Method of Construction & Well Use***

***Method Construction ID:*** 965740364
***Method Construction Code:*** 2
***Method Construction:*** Rotary (Convent.)
***Other Method Construction:***

***Pipe Information***

***Pipe ID:*** 11340715
***Casing No:*** 1
***Comment:***

***Alt Name:***

***Construction Record - Casing***

| | |
|---|---|
| ***Casing ID:*** | 930870070 |
| ***Layer:*** | 2 |
| ***Material:*** | 1 |
| ***Open Hole or Material:*** | STEEL |
| ***Depth From:*** | 179.0 |
| ***Depth To:*** | 181.0 |
| ***Casing Diameter:*** | 5.0 |
| ***Casing Diameter UOM:*** | inch |
| ***Casing Depth UOM:*** | ft |

***Construction Record - Casing***

| | |
|---|---|
| ***Casing ID:*** | 930870069 |
| ***Layer:*** | 1 |
| ***Material:*** | 1 |
| ***Open Hole or Material:*** | STEEL |
| ***Depth From:*** | -2.0 |
| ***Depth To:*** | 181.0 |
| ***Casing Diameter:*** | 6.625 |
| ***Casing Diameter UOM:*** | inch |
| ***Casing Depth UOM:*** | ft |

***Construction Record - Screen***

| | |
|---|---|
| ***Screen ID:*** | 933415981 |
| ***Layer:*** | 1 |
| ***Slot:*** | 18 |
| ***Screen Top Depth:*** | 181.0 |
| ***Screen End Depth:*** | 185.0 |
| ***Screen Material:*** | 1 |
| ***Screen Depth UOM:*** | ft |
| ***Screen Diameter UOM:*** | inch |
| ***Screen Diameter:*** | 5.0 |

***Results of Well Yield Testing***

| | |
|---|---|
| ***Pumping Test Method Desc:*** | |
| ***Pump Test ID:*** | 11352303 |
| ***Pump Set At:*** | |
| ***Static Level:*** | 3.5 |
| ***Final Level After Pumping:*** | |
| ***Recommended Pump Depth:*** | |
| ***Pumping Rate:*** | |
| ***Flowing Rate:*** | |
| ***Recommended Pump Rate:*** | |
| ***Levels UOM:*** | ft |
| ***Rate UOM:*** | GPM |
| ***Water State After Test Code:*** | |
| ***Water State After Test:*** | |
| ***Pumping Test Method:*** | |
| ***Pumping Duration HR:*** | |
| ***Pumping Duration MIN:*** | |
| ***Flowing:*** | |

***Draw Down & Recovery***

| | |
|---|---|
| ***Pump Test Detail ID:*** | 11506844 |
| ***Test Type:*** | Draw Down |
| ***Test Duration:*** | 30 |
| ***Test Level:*** | 55.29999923706055 |
| ***Test Level UOM:*** | ft |

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506850
***Test Type:*** Recovery
***Test Duration:*** 3
***Test Level:*** 37.599998474121094
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506836
***Test Type:*** Recovery
***Test Duration:*** 1
***Test Level:*** 48.70000076293945
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506838
***Test Type:*** Recovery
***Test Duration:*** 4
***Test Level:*** 33.20000076293945
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506845
***Test Type:*** Draw Down
***Test Duration:*** 15
***Test Level:*** 50.0
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506846
***Test Type:*** Recovery
***Test Duration:*** 15
***Test Level:*** 12.300000190734863
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506853
***Test Type:*** Draw Down
***Test Duration:*** 60
***Test Level:*** 58.0
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506833
***Test Type:*** Draw Down
***Test Duration:*** 3
***Test Level:*** 24.700000762939453
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506839
***Test Type:*** Draw Down
***Test Duration:*** 5
***Test Level:*** 33.20000076293945
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506840
***Test Type:*** Draw Down
***Test Duration:*** 50
***Test Level:*** 57.599998474121094
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506841
***Test Type:*** Recovery
***Test Duration:*** 5
***Test Level:*** 29.5
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506842
***Test Type:*** Draw Down
***Test Duration:*** 10
***Test Level:*** 44.79999923706055
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506843
***Test Type:*** Recovery
***Test Duration:*** 10
***Test Level:*** 17.200000762939453
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506851
***Test Type:*** Draw Down
***Test Duration:*** 40
***Test Level:*** 56.900001525878906
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506852
***Test Type:*** Recovery
***Test Duration:*** 25
***Test Level:*** 6.400000095367432
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506837
***Test Type:*** Draw Down
***Test Duration:*** 4
***Test Level:*** 29.399999618530273
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506848
***Test Type:*** Draw Down
***Test Duration:*** 25
***Test Level:*** 54.0

***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506835
***Test Type:*** Draw Down
***Test Duration:*** 2
***Test Level:*** 19.0
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506847
***Test Type:*** Draw Down
***Test Duration:*** 20
***Test Level:*** 52.5
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506832
***Test Type:*** Draw Down
***Test Duration:*** 1
***Test Level:*** 12.199999809265137
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506834
***Test Type:*** Recovery
***Test Duration:*** 2
***Test Level:*** 42.70000076293945
***Test Level UOM:*** ft

***Draw Down & Recovery***

***Pump Test Detail ID:*** 11506849
***Test Type:*** Recovery
***Test Duration:*** 20
***Test Level:*** 8.199999809265137
***Test Level UOM:*** ft

***Water Details***

***Water ID:*** 934068797
***Layer:*** 1
***Kind Code:***
***Kind:***
***Water Found Depth:*** 185.0
***Water Found Depth UOM:*** ft

***Hole Diameter***

***Hole ID:*** 11546295
***Diameter:*** 6.5
***Depth From:*** 0.0
***Depth To:*** 185.0
***Hole Depth UOM:*** ft
***Hole Diameter UOM:*** inch

---

***Site:***
***lot 3 ON***

***Database:***
***WWIS***

***Well ID:*** 4404848
***Construction Date:***
***Use 1st:*** Domestic
***Use 2nd:***
***Final Well Status:*** Water Supply
***Water Type:***
***Casing Material:***
***Audit No:***
***Tag:***
***Constructn Method:***
***Elevation (m):***
***Elevatn Reliabilty:***
***Depth to Bedrock:***
***Well Depth:***
***Overburden/Bedrock:***
***Pump Rate:***
***Static Water Level:***
***Clear/Cloudy:***
***Municipality:*** SIMCOE TOWN
***Site Info:***

***Flowing (Y/N):***
***Flow Rate:***
***Data Entry Status:***
***Data Src:*** 1
***Date Received:*** 02/21/1985
***Selected Flag:*** TRUE
***Abandonment Rec:***
***Contractor:*** 3030
***Form Version:*** 1
***Owner:***
***County:*** NORFOLK
***Lot:*** 003
***Concession:***
***Concession Name:***
***Easting NAD83:***
***Northing NAD83:***
***Zone:***
***UTM Reliability:***

***Bore Hole Information***

***Bore Hole ID:*** 10276786
***DP2BR:***
***Spatial Status:***
***Code OB:***
***Code OB Desc:***
***Open Hole:***
***Cluster Kind:***
***Date Completed:*** 11/30/1984
***Remarks:***
***Location Method Desc:*** Not Applicable i.e. no UTM
***Elevrc Desc:***
***Location Source Date:***
***Improvement Location Source:***
***Improvement Location Method:***
***Source Revision Comment:***
***Supplier Comment:***

***Elevation:***
***Elevrc:***
***Zone:*** 17
***East83:***
***North83:***
***Org CS:***
***UTMRC:*** 9
***UTMRC Desc:*** unknown UTM
***Location Method:*** na

***Overburden and Bedrock Materials Interval***

***Formation ID:*** 931882975
***Layer:*** 2
***Color:*** 6
***General Color:*** BROWN
***Material 1:*** 05
***Material 1 Desc:*** CLAY
***Material 2:***
***Material 2 Desc:***
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 1.0
***Formation End Depth:*** 15.0
***Formation End Depth UOM:*** ft

***Overburden and Bedrock Materials Interval***

***Formation ID:*** 931882976
***Layer:*** 3
***Color:*** 3
***General Color:*** BLUE
***Material 1:*** 05
***Material 1 Desc:*** CLAY
***Material 2:***

***Material 2 Desc:***
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 15.0
***Formation End Depth:*** 40.0
***Formation End Depth UOM:*** ft

***Overburden and Bedrock Materials Interval***

***Formation ID:*** 931882977
***Layer:*** 4
***Color:*** 2
***General Color:*** GREY
***Material 1:*** 06
***Material 1 Desc:*** SILT
***Material 2:***
***Material 2 Desc:***
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 40.0
***Formation End Depth:*** 55.0
***Formation End Depth UOM:*** ft

***Overburden and Bedrock Materials Interval***

***Formation ID:*** 931882974
***Layer:*** 1
***Color:*** 6
***General Color:*** BROWN
***Material 1:*** 02
***Material 1 Desc:*** TOPSOIL
***Material 2:***
***Material 2 Desc:***
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 0.0
***Formation End Depth:*** 1.0
***Formation End Depth UOM:*** ft

***Overburden and Bedrock Materials Interval***

***Formation ID:*** 931882978
***Layer:*** 5
***Color:*** 3
***General Color:*** BLUE
***Material 1:*** 05
***Material 1 Desc:*** CLAY
***Material 2:***
***Material 2 Desc:***
***Material 3:***
***Material 3 Desc:***
***Formation Top Depth:*** 55.0
***Formation End Depth:*** 55.0
***Formation End Depth UOM:*** ft

***Method of Construction & Well Use***

***Method Construction ID:*** 964404848
***Method Construction Code:*** 6
***Method Construction:*** Boring
***Other Method Construction:***

***Pipe Information***

| | |
|---|---|
| ***Pipe ID:*** | 10825356 |
| ***Casing No:*** | 1 |
| ***Comment:*** | |
| ***Alt Name:*** | |

***Results of Well Yield Testing***

| | |
|---|---|
| ***Pumping Test Method Desc:*** | |
| ***Pump Test ID:*** | 994404848 |
| ***Pump Set At:*** | |
| ***Static Level:*** | 15.0 |
| ***Final Level After Pumping:*** | |
| ***Recommended Pump Depth:*** | 158.0 |
| ***Pumping Rate:*** | |
| ***Flowing Rate:*** | |
| ***Recommended Pump Rate:*** | 2.0 |
| ***Levels UOM:*** | ft |
| ***Rate UOM:*** | GPM |
| ***Water State After Test Code:*** | |
| ***Water State After Test:*** | |
| ***Pumping Test Method:*** | |
| ***Pumping Duration HR:*** | |
| ***Pumping Duration MIN:*** | |
| ***Flowing:*** | No |

***Water Details***

| | |
|---|---|
| ***Water ID:*** | 933746921 |
| ***Layer:*** | 1 |
| ***Kind Code:*** | 5 |
| ***Kind:*** | Not stated |
| ***Water Found Depth:*** | 15.0 |
| ***Water Found Depth UOM:*** | ft |

***Water Details***

| | |
|---|---|
| ***Water ID:*** | 933746922 |
| ***Layer:*** | 2 |
| ***Kind Code:*** | 5 |
| ***Kind:*** | Not stated |
| ***Water Found Depth:*** | 40.0 |
| ***Water Found Depth UOM:*** | ft |

***Water Details***

| | |
|---|---|
| ***Water ID:*** | 933746923 |
| ***Layer:*** | 3 |
| ***Kind Code:*** | 5 |
| ***Kind:*** | Not stated |
| ***Water Found Depth:*** | 55.0 |
| ***Water Found Depth UOM:*** | ft |

# Appendix: Database Descriptions

*Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update.* ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

***Abandoned Aggregate Inventory:*** Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

***Government Publication Date: Sept 2002****

***Aggregate Inventory:*** Provincial AGR

This database of licensed and permitted pits and quarries is maintained by the Ontario Ministry of Natural Resources and Forestry (MNRF), as regulated under the Aggregate Resources Act, R.S.O. 1990. Aggregate site data has been divided into active and inactive sites. Active sites may be further subdivided into partial surrenders. In partial surrenders, defined areas of a site are inactive while the rest of the site remains active.

***Government Publication Date: Up to Nov 2024***

***Abandoned Mine Information System:*** Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

***Government Publication Date: 1800-Apr 2024***

***Anderson's Waste Disposal Sites:*** Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

***Government Publication Date: 1860s-Present***

***Aboveground Storage Tanks:*** Provincial AST

Historical listing of aboveground storage tanks made available by the Department of Natural Resources and Forestry. Includes tanks used to hold water or petroleum. This dataset has been retired as of September 25, 2014 and will no longer be updated.

***Government Publication Date: May 31, 2014***

***Automobile Wrecking & Supplies:*** Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

***Government Publication Date: 1999-Apr 30, 2025***

***Borehole:*** Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

***Government Publication Date: 1875-Jul 2018***

***Certificates of Approval:*** Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

***Government Publication Date: 1985-Oct 30, 2011****

***Dry Cleaning Facilities:*** Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

***Government Publication Date: Jan 2004-Dec 2023***

***Commercial Fuel Oil Tanks:*** Provincial CFOT

Locations of commercial underground fuel oil tanks. This is not a comprehensive or complete inventory of commercial fuel tanks in the province; this listing is a copy of records of registered commercial underground fuel oil tanks obtained under Access to Public Information.
Note that the following types of tanks do not require registration: waste oil tanks in apartments, office buildings, residences, etc.; aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

***Government Publication Date: Oct 2023***

***Chemical Manufacturers and Distributors:*** Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

***Government Publication Date: 1999-Jan 31, 2020***

***Chemical Register:*** Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

***Government Publication Date: 1999-Apr 30, 2025***

***Compressed Natural Gas Stations:*** Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

***Government Publication Date: Dec 2012 -Apr 2025***

***Inventory of Coal Gasification Plants and Coal Tar Sites:*** Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

***Government Publication Date: Apr 1987 and Nov 1988****

***Compliance and Convictions:*** Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

***Government Publication Date: 1989-Apr 2025***

***Certificates of Property Use:*** Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

***Government Publication Date: 1994 - May 31, 2025***

***Drill Hole Database:*** Provincial DRL

The Ontario Drill Hole Database (ODHD) is offered by the Province of Ontario's Ministry of Mines. The dataset contains information for over 164,000 percussion, overburden, sonic and diamond-drill holes. The presence of assay results with cutoff values for gold, silver, copper, zinc, lead, nickel and platinum group elements is noted. Drill hole data are compiled from assessment files that have been submitted to the ministry in accordance with the Ontario Mining Act (OMA). Source assessment file numbers are captured for cross reference with the Ontario Assessment File Database (OAFD). Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

***Government Publication Date: 1886 - Aug 2024***

***Delisted Fuel Tanks:*** Provincial DTNK

List of fuel storage tank sites that were once found in - and have since been removed from - the list of fuel storage tanks made available by the regulatory agency under Access to Public Information.

***Government Publication Date: Oct 2023***

***Environmental Activity and Sector Registry:*** Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

***Government Publication Date: Oct 2011 - May 31, 2025***

***Environmental Registry:*** Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

***Government Publication Date: 1994 - May 31, 2025***

***Environmental Compliance Approval:*** Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

***Government Publication Date: Oct 2011 - May 31, 2025***

***Environmental Effects Monitoring:*** Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

***Government Publication Date: 1992-2007****

***ERIS Historical Searches:*** Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

***Government Publication Date: 1999-Aug 31, 2024***

***Environmental Issues Inventory System:*** Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

***Government Publication Date: 1992-2001****

***Emergency Management Historical Event:*** Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

***Government Publication Date: Apr 30, 2022***

***Environmental Penalty Annual Report:*** Provincial EPAR

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment, Conservation and Parks (MECP). These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

***Government Publication Date: Jan 1, 2011 - Dec 31, 2024***

***List of Expired Fuels Safety Facilities:*** Provincial EXP

List of facilities and tanks for which there was once a fuel registration. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province; this listing is a copy of previously registered tanks and facilities obtained under Access to Public Information. Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc; includes tanks which have been removed from the ground.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

***Government Publication Date: Oct 2023***

***Federal Convictions:*** Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

***Government Publication Date: 1988-Jun 2007****

***Contaminated Sites on Federal Land:*** Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

***Government Publication Date: Jun 2000-Jan 2025***

***Fisheries & Oceans Fuel Tanks:*** Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

***Government Publication Date: 1964-Sep 2019***

***Federal Identification Registry for Storage Tank Systems (FIRSTS):*** Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

***Government Publication Date: Oct 31, 2021***

***Fuel Storage Tank:*** Provincial FST

List of registered private and retail fuel storage tanks. This is not a comprehensive or complete inventory of private and retail fuel storage tanks in the province; this listing is a copy of registered private and retail fuel storage tanks, obtained under Access to Public Information.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

***Government Publication Date: Oct 2023***

***Fuel Storage Tank - Historic:*** Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

***Government Publication Date: Pre-Jan 2010****

***Ontario Regulation 347 Waste Generators Summary:*** Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. As of January 1, 2023, businesses and institutions subject to the amended Reg. 347: General – Waste Management are required to report their activities and pay fees through Resource Productivity & Recovery Authority (RPRA) online Hazardous Waste Program Registry (HWPR) rather than the Hazardous Waste Information Network (HWIN) system previously operated by the Ministry of the Environment, Conservation and Parks (MECP). Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

***Government Publication Date: 1986-Dec 31, 2024***

***Greenhouse Gas Emissions from Large Facilities:*** Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

***Government Publication Date: 2013-Apr 2024***

***TSSA Historic Incidents:*** Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

***Government Publication Date: 2006-June 2009****

***Indian & Northern Affairs Fuel Tanks:*** Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

***Government Publication Date: 1950-Aug 2003****

***Fuel Oil Spills and Leaks:*** Provincial INC

Listing of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC). This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province; this listing in a copy of incidents reported to the SAC, obtained under Access to Public Information. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness.

***Government Publication Date: 31 Oct, 2023***

***Landfill Inventory Management Ontario:*** Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the Ministry of the Environment, Conservation and Parks compiles new and updated information. Includes small and large landfills currently operating as well as those which are closed and historic. Operators of larger landfills provide landfill information for the previous operating year to the ministry for LIMO including: estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills include information such as site owner, site location and certificate of approval # and status.

***Government Publication Date: Mar 31, 2022***

***Canadian Mine Locations:*** Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

***Government Publication Date: 1998-2009****

***Mineral Occurrences:*** Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

***Government Publication Date: 1846-Feb 2025***

***National Analysis of Trends in Emergencies System (NATES):*** Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

***Government Publication Date: 1974-1994****

***Non-Compliance Reports:*** Provincial NCPL

The Ministry of the Environment Conservation and Parks (MECP) provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act. MECP publicly releases the Environmental Compliance Report (ECR) on the Ontario Data Catalogue. In Ontario, all facilities with regulated wastewater discharges or air emissions under the Ontario Water Resources Act and the Environmental Protection Act must monitor and report any cases where approved operating limits have been exceeded.

***Government Publication Date: Dec 31, 2023***

***National Defense & Canadian Forces Fuel Tanks:*** Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

***Government Publication Date: Up to May 2001****

***National Defense & Canadian Forces Spills:*** Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

***Government Publication Date: Mar 1999-Nov 2023***

***National Defence & Canadian Forces Waste Disposal Sites:*** Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

***Government Publication Date: 2001-Apr 2007****

***National Energy Board Pipeline Incidents:*** Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

***Government Publication Date: 2008-May 31, 2025***

***National Energy Board Wells:*** Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

***Government Publication Date: 1920-Feb 2003****

***National Environmental Emergencies System (NEES):*** Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

***Government Publication Date: 1974-2003****

***National PCB Inventory:*** Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

***Government Publication Date: 1988-2008****

***National Pollutant Release Inventory:*** Federal NPR2

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of pollutant releases (to air, water and land), disposals, and transfers for recycling. The inventory, managed by Environment and Climate Change Canada, tracks over 300 substances. Under the authority of the Canadian Environmental Protection Act (CEPA), owners or operators of facilities that meet published reporting requirements are required to report to the NPRI.

***Government Publication Date: Feb 2024***

***National Pollutant Release Inventory - Historic:*** Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances. This data holds historic records; current records are found in NPR2.

***Government Publication Date: 1993-May 2017***

***Oil and Gas Wells:*** Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

***Government Publication Date: 1988-Feb 28, 2025***

***Ontario Oil and Gas Wells:*** Provincial OOGW

In 1998, the Ministry of Natural Resources (MNR) handed over to the Ontario Oil, Gas and Salt Resources (OGSR) Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database includes well owner/operator, location, permit issue date, and well cap date, license number, status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provided for each well record.

***Government Publication Date: 1800-Aug 2024***

***Inventory of PCB Storage Sites:*** Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

***Government Publication Date: 1987-Oct 2004; 2012-Dec 2013***

***Orders:*** Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

***Government Publication Date: 1994 - May 31, 2025***

***Canadian Pulp and Paper:*** Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

***Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014***

***Parks Canada Fuel Storage Tanks:*** Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

***Government Publication Date: 1920-Jan 2005****

***Pesticide Register:*** Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

***Government Publication Date: Oct 2011 - May 31, 2025***

***Ontario PFAS Spills:*** Provincial PFAS

This specific list of spills includes those incidents where one or more of the listed contaminants are identified in the PFAS Structure List and/or PFAS Chemicals Without Explicit Structure List made available by the United States Environmental Protection Agency (US EPA), is originally sourced from the Ministry of the Environment, Conservation and Parks spills related data. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

***Government Publication Date: 1988-Jun 2024; Aug 2024; Oct-Nov 2024***

***NPRI Reporters - PFAS Substances:*** Federal PFCH

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals, and transfers, tracking over 320 pollutants. Per - and polyfluoroalkyl substances (PFAS) are a group of over 4,700 human-made substances for which adverse environmental and health effects have been observed. This listing of PFAS substance reporters includes those NPRI facilities that reported substances that are found in either: a) the Comprehensive Global Database of PFASs compiled by the Organisation for Economic Co-operation and Development (OECD), b) the US Environmental Protection Agency (US EPA) Master List of PFAS Substances, c) the US EPA list of PFAS chemicals without explicit structures, or d) the US EPA list of PFAS structures (encompassing the largest set of structures having sufficient levels of fluorination to potentially impart PFAS-type properties).

***Government Publication Date: Feb 2024***

***Potential PFAS Handlers from NPRI:*** Federal PFHA

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals, and transfers, tracking over 320 pollutants. Per - and polyfluoroalkyl substances (PFAS) are a group of over 4,700 human-made substances for which adverse environmental and health effects have been observed. This list of potential PFAS handlers includes those NPRI facilities that reported business activity (NAICS code) included in the US Environmental Protection Agency (US EPA) list of Potential PFAS-Handling Industry Sectors, further described as operating in industry sectors where literature reviews indicate that PFAS may be handled and/or released. Inclusion of a facility in this listing does not indicate that PFAS are being manufactured, processed, used, or released by the facility - these are facilities that potentially handle PFAS based on their industrial profile.

***Government Publication Date: Feb 2024***

***Pipeline Incidents:*** Provincial PINC

List of pipeline incidents (strikes, leaks, spills). This is not a comprehensive or complete inventory of pipeline incidents in the province; this listing in an historical copy of records previously obtained under Access to Public Information. Records are not verified for accuracy or completeness.

***Government Publication Date: Feb 28, 2021***

***Potential PFAS Handlers from EASR:*** Provincial PPHA

The Ontario Environmental Activity and Sector Registry (EASR), described in Ontario Regulation 245/11, allows businesses with less complex operations - and hence not requiring an Environmental Compliance Approval - to register their activities with the Ontario Ministry of the Environment, Conservation and Parks (MECP). This list of potential PFAS handlers includes those EASR facilities that reported business activity (NAICS code) included in the US Environmental Protection Agency (US EPA) list of Potential PFAS-Handling Industry Sectors, further described as operating in industry sectors where literature reviews indicate that PFAS may be handled and/or released. Inclusion of a facility in this listing does not indicate that PFAS are being manufactured, processed, used.

***Government Publication Date: Jun 30, 2024***

***Private and Retail Fuel Storage Tanks:*** Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

***Government Publication Date: 1989-1996****

***Permit to Take Water:*** Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include PTTW's on the registry such as OWRA s. 34 - Permit to take water.

***Government Publication Date: 1994 - May 31, 2025***

***Ontario Regulation 347 Waste Receivers Summary:*** Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

***Government Publication Date: 1986-1990, 1992-2021***

***Record of Site Condition:*** Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up. RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09). The Government of Ontario states that it is not responsible for the accuracy of the information in this Registry.

***Government Publication Date: 1997-Sept 2001, Oct 2004-May 2025***

***Retail Fuel Storage Tanks:*** Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

***Government Publication Date: 1999-Apr 30, 2025***

***Scott's Manufacturing Directory:*** Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

***Government Publication Date: 1992-Mar 2011****

***Ontario Spills:*** Provincial SPL

List of spills and incidents made available by the Ministry of the Environment, Conservation and Parks. This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

***Government Publication Date: 1988-Jun 2024; Aug-Feb 2025***

***Wastewater Discharger Registration Database:*** Provincial SRDS

Facilities that report either municipal treated wastewater effluent or industrial wastewater discharges under the Effluent Monitoring and Effluent Limits (EMEL) and Municipal/Industrial Strategy for Abatement Regulations. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment keeps record of direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation, Mining, Petroleum Refining, Organic Chemicals, Inorganic Chemicals, Pulp & Paper, Metal Casting, Iron & Steel, and Quarries.

***Government Publication Date: 1990-Dec 31, 2021***

***Anderson's Storage Tanks:*** Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

***Government Publication Date: 1915-1953****

***Transport Canada Fuel Storage Tanks:*** Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

***Government Publication Date: 1970 - Apr 2024***

***Variances for Abandonment of Underground Storage Tanks:*** Provincial VAR

Listing of variances granted for storage tank abandonment. This is not a comprehensive or complete inventory of tank abandonment variances in the province; this listing is a copy of tank abandonment variance records previously obtained under Access to Public Information. In Ontario, registered underground storage tanks must be removed within two years of disuse; if removal of a tank is not feasible, an application may be sought for a variance from this code requirement.
Records are not verified for accuracy or completeness.

***Government Publication Date: Feb 28, 2022***

***Waste Disposal Sites - MOE CA Inventory:*** Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

***Government Publication Date: Oct 2011 - May 31, 2025***

***Waste Disposal Sites - MOE 1991 Historical Approval Inventory:*** Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

***Government Publication Date: Up to Oct 1990****

***Water Well Information System:*** Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

***Government Publication Date: Dec 31 2023***

# Definitions

***Database Descriptions:*** This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

***Detail Report***: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

***Distance:*** The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

***Direction:*** The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

***Elevation:*** The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

***Executive Summary:*** This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

***Map Key:*** The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

***Unplottables:*** These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

# APPENDIX D

## PHOTOGRAPHS OF TYPICAL SITE CONDITIONS

| Photograph 1 | |
|---|---|
| Site Access Road and Crop<br><br>(*Northern View*) |  |

| Photograph 2 | |
|---|---|
| Site Access Road and Crop<br><br>(*Southern View*) |  |

| Photograph 3 | |
|---|---|
| Debris and Fill of Unknown Quality<br><br>(*Northeast Corner*) |  |

LANDTEK LIMITED

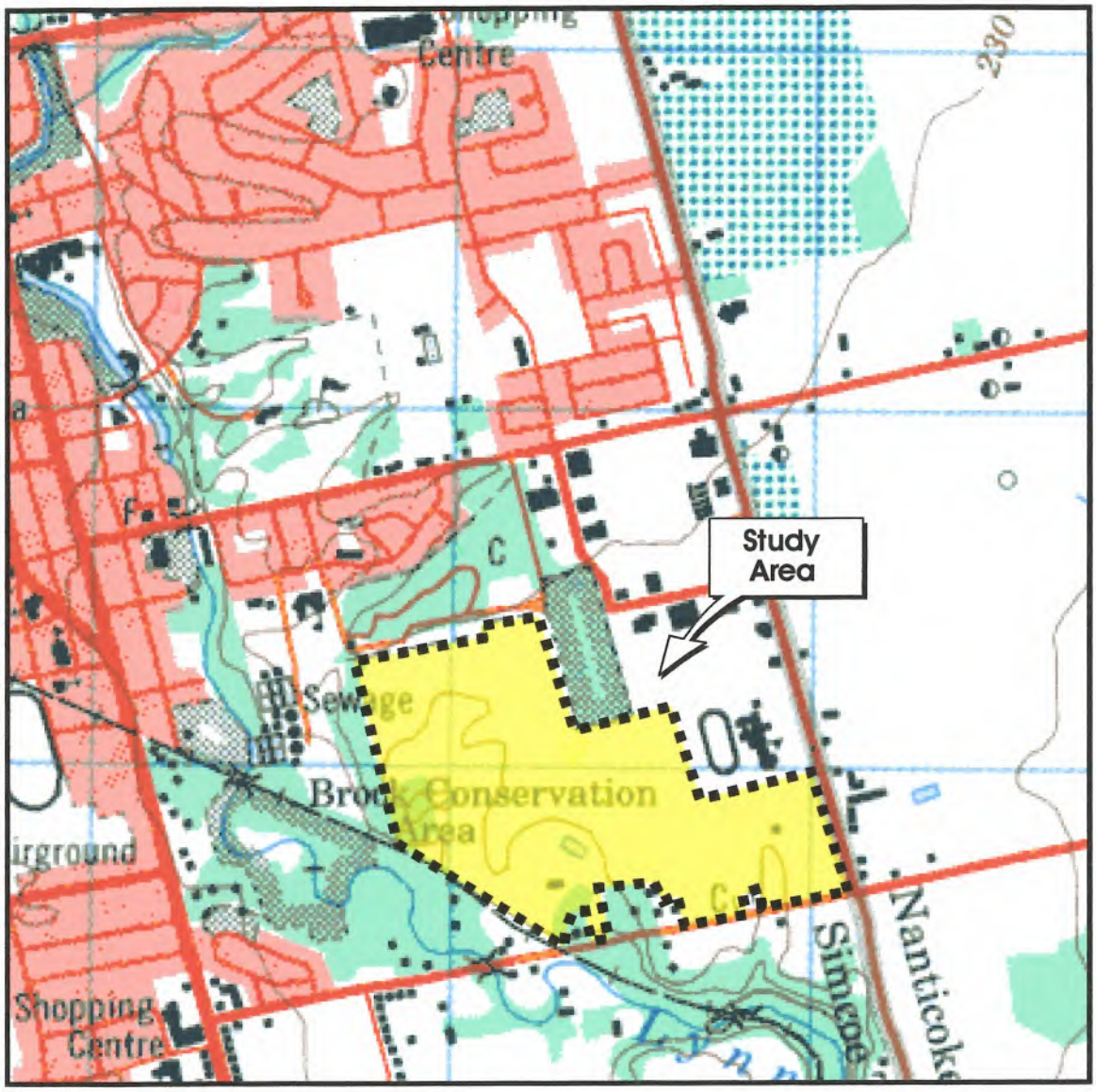
| Project No. 25181 | Date: July 26, 2025 |
|---|---|
| Phase 1 Environmental Site Assessment<br>227 Decou Road, Simcoe, Ontario | |
| Title: | Current Site Conditions |

| Photograph 4 | |
|---|---|
| Site Crop Coverage<br><br>(*Western View*) |  |

| Photograph 5 | |
|---|---|
| Site Crop Coverage<br><br>(*Central Portion Southern View)* |  |

| | |
|---|---|
| LANDTEK LIMITED | |
| Project No. 25181 | Date: July 26, 2025 |
| Phase 1 Environmental Site Assessment<br>227 Decou Road, Simcoe, Ontario | |
| Title: | Current Site Conditions |

# Archaeological Assessment (Stages 1 to 3)
# Proposed Development, Lots 1 to 3,
# Concession 5, Simcoe, Ontario




Mayer
Heritage
Consultants Inc.

*Cultural Heritage Assessments and Archaeological Mitigative Excavations*

# Archaeological Assessment (Stages 1 to 3) Proposed Development, Lots 1 to 3, Concession 5, Simcoe, Ontario

submitted to

**Planning Solutions**
**2 Irongate Drive**
**Paris, Ontario**
**N3L 484**

**Fax: 519-442-1774**

and

**The Ontario Ministry of Culture**

Prepared by
Mayer Heritage Consultants Inc.
2509 Main Street, P. O. Box 456 Lambeth Station,
London, Ontario, N6P 1R1
Office: (519) 652-1818 Fax: (519) 651-1820
Toll Free: (800) 465-9990
E-Mail: mayerheritage@bellnet.ca
Web Page: www.archaeologicalconsultants.com

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## Project Personnel

| | |
|---|---|
| Project Manager | Paul J. C. O'Neal |
| Report Preparation | Becky Jones |
| Field Director | Paul J. C. O'Neal |
| Assistant Field Director | Becky Jones |
| Field Assistants | Ashley Bailey<br>Jordana Gonser<br>Kyle Greenwood<br>Lisa Gunther<br>Danielle Quinney<br>Mike Ross<br>Shelena Schmidt<br>Diane Servos<br>Katie Singer<br>Don Snarey<br>Kristy Snarey |

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- ***Catherine Cooper, Planning Solutions***
- ***Robert von Bitter***, Archaeological Data Co-ordinator, Ontario Ministry of Culture

# Archaeological Assessment (Stages 1 to 3)
# Proposed Development of Lots 1 to 3
# Simcoe, Ontario

## Introduction

Among other matters, the *Planning Act R.S.O. 1990*, establishes that the protection of features of archaeological interest is a matter of provincial concern. As such, an archaeological resource assessment (Stage 1 background research and Stage 2 general survey) was conducted as a standard condition of approval for the proposed development of Lots 1, 2, and 3, located on Concession 5 (Decoe Road) in the town of Simcoe, Regional Municipality of Norfolk, Ontario (Figure 1).

This assessment was conducted in order to determine if any direct and/or indirect impacts would occur by proposed construction activities on archaeological resources that might be present. Archaeological resources consist of artifacts (Aboriginal stone tools, pottery and subsistence remains as well as Euro-Canadian objects), subsurface settlement patterns and cultural features (post moulds, trash pits, privies, and wells), and sites (temporary camps and special purpose activity areas, plus more permanent settlements such as villages, homesteads, grist mills and industrial structures).

## Stage 1 Background Research

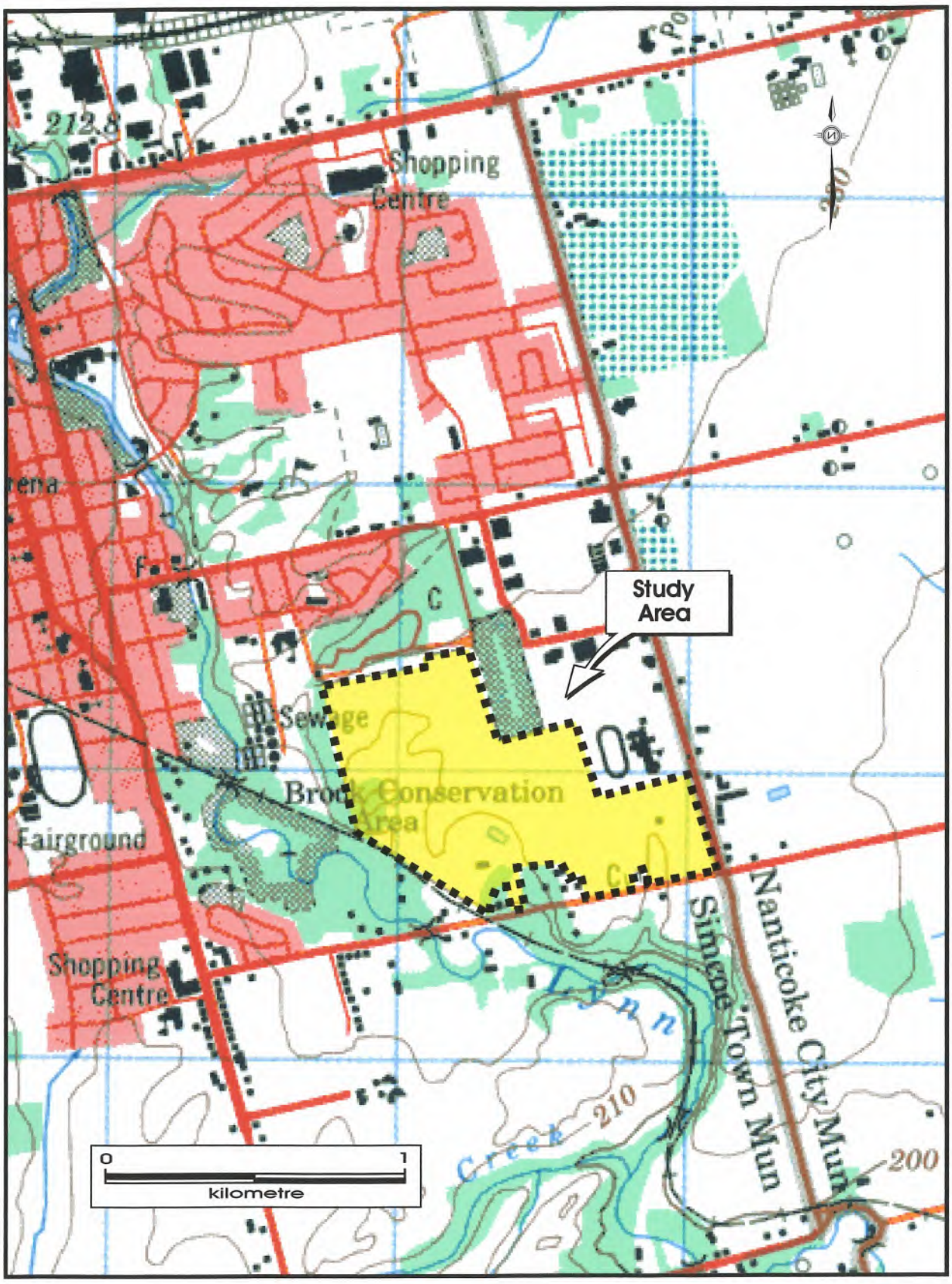
Stage 1 background research was conducted in order to complete the following tasks:

- amass all of the readily available information on any previous archaeological surveys in the area;
- determine the locations of any registered and unregistered sites; and
- develop an historical framework for assigning levels of potential significance to any new sites discovered during fieldwork.

The framework for assigning levels of potential archaeological significance is drawn from provincial guidelines (Weiler 1980). The necessary information includes the identification and evaluation of any feature that has one or more of the following attributes:

- *it has the potential through archaeological exploration, survey or fieldwork to provide answers to substantive questions (i.e. relate to particular times and places) about events and processes that occurred in the past and therefore add to our knowledge and appreciation of history;*
- *it has the potential through archaeological exploration, survey and fieldwork to contribute to testing the validity of general anthropological principles, cultural change and ecological adaptation, and therefore to the understanding and appreciation of our man-made heritage; or*
- *it is probable that various technical, methodological, and theoretical advances are likely to occur during archaeological investigation of a feature, alone or in association with other features, and therefore contribute to the development of better scientific means of understanding and appreciating our man-made heritage (Weiler 1980:8);*

**Figure 1: Location of the Study Area.**



## Natural Environment

The study area is within the Norfolk Sand Plain (Chapman and Putnam 1984). The *Soils of the Regional Municipality of Haldimand-Norfolk* (Acton and Presant, 1984) indicates the dominant surface soil type of the subject area as mainly lacustrine silty clay, 15-40 cm sandy textures over lacustrine silty clay, with imperfect to poor drainage. The topography is smooth basin to level. The study area is located south of Kent Creek.

## Potential for Archaeological Resources

Archaeological potential is defined as the likelihood of finding archaeological sites within a study area. For planning purposes, determining archaeological potential provides a preliminary indication that significant sites might be found within the study area, and consequently, that it may be necessary to allocate time and resources for archaeological survey and mitigation. In predicting the locations of archaeological sites, the *Primer on Archaeology, Land Use Planning and Development in Ontario* (Ministry of Culture 1997:12-13) states that undisturbed lands, or those with minimal disturbance, such as cultivated fields, within 300 metres of a primary water source or 200 metres of a secondary or tertiary water source are considered to have archaeological potential. Other criteria can include location on elevated ground or near distinctive or unusual landforms, and the presence of well-drained sandy soils.

Based upon a published synthesis of Aboriginal cultural occupations (Wright 1968), Table 1 is a general outline of the cultural history of southwestern Ontario that is applicable to the study area. Ellis and Ferris (1990) provide greater detail of the distinctive characteristics of each time period and cultural group. The Ministry of Culture archaeological database coordinator (von Bitter 2006) indicated that there are three previously registered archaeological sites within 2,000 metres of the study area (Table 2).

**Table 1: General Cultural Chronology for Southwestern Ontario.**

| *PERIOD* | *GROUP* | *TIME RANGE* | *COMMENTS* |
|---|---|---|---|
| Early Paleo-Indian | Fluted Projectiles | 9500 - 8500 B.C. | big game hunters |
| Late Paleo-Indian | Hi-Lo Projectiles | 8500 - 7500 B.C. | small nomadic groups |
| Early Archaic | --- | 7800 - 6000 B.C. | nomadic hunters and gatherers |
| Middle Archaic | Laurentian | 6000 - 2000 B.C. | territorial settlements |
| Late Archaic | Lamoka | 2500 - 1700 B.C. | polished ground stone tools |
| " | Broadpoint | 1800 - 1400 B.C. | --- |
| " | Crawford Knoll | 1500 - 500 B.C. | --- |
| " | Glacial Kame | *circa* 1000 B.C. | burial ceremonialism |
| Early Woodland | Meadowood | 1000 - 400 B.C. | introduction of pottery |
| " | Red Ochre | 1000 - 500 B.C. | --- |
| Middle Woodland | Western Basin/Saugeen | 400 B.C. - A.D. 500 | long distance trade networks |
| " | Princess Point | A.D. 500 - 800 | incipient agriculture |
| Late Woodland | Glen Meyer | A.D. 800 - 1300 | transition to village life |
| " | Uren | A.D. 1300 - 1350 | large villages with palisades |
| " | Middleport | A.D. 1300 - 1400 | wide distribution of ceramic styles |
| " | Neutral/Huron | A.D. 1400 - 1650 | tribal warfare |
| Early Contact | Mississauga plus others | A.D. 1700 - 1875 | tribal displacement |
| Late Contact | Euro-Canadian | A.D. 1800 - present | European settlement |

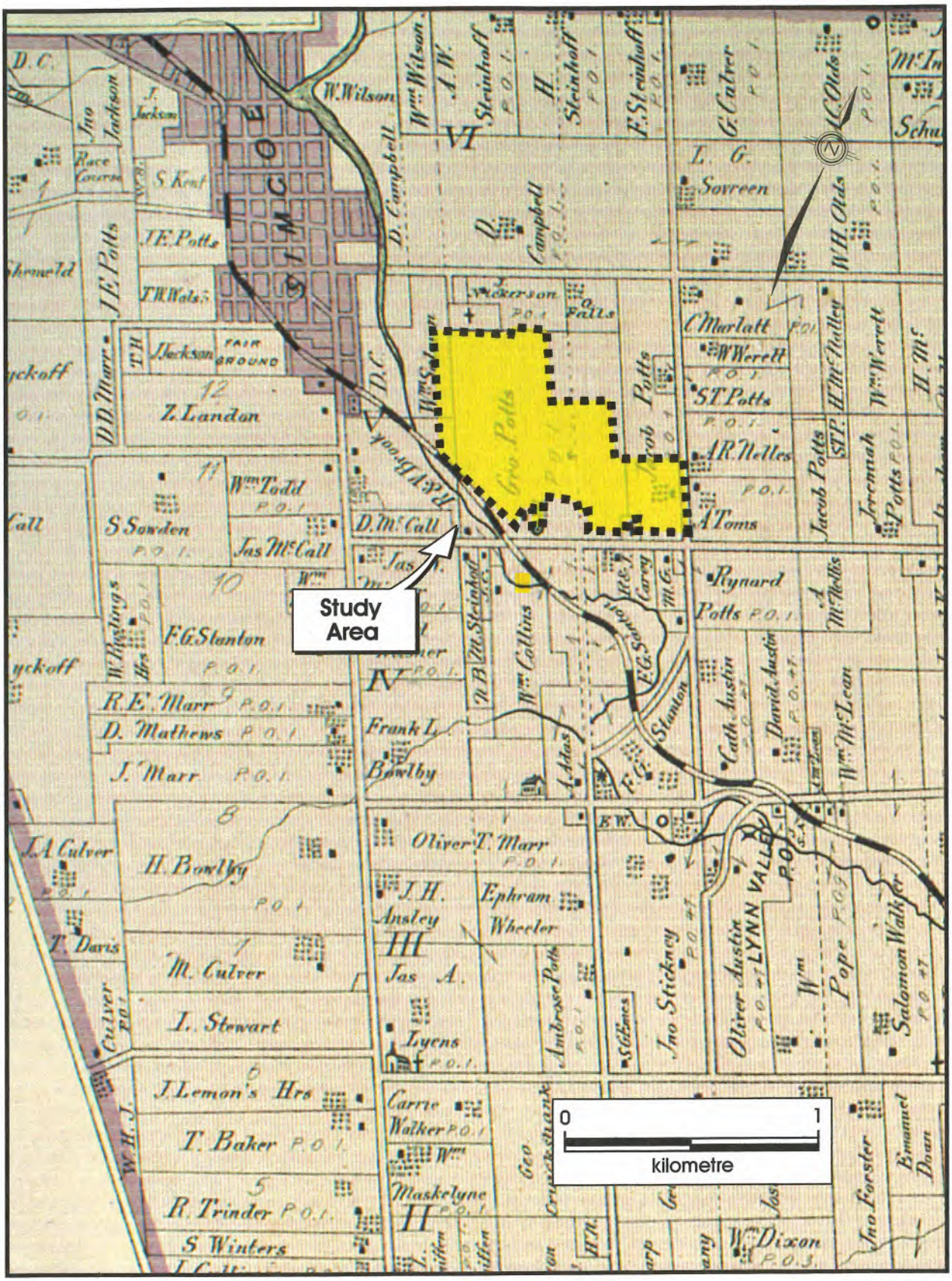
**Figure 2: Crew at Work and General View of Study Area, Facing East**



**Figure 3: Ground Visibility Conditions**



**Figure 4: Site Location on Historic Atlas.**



Over their thousands of years of occupation in the general region, Aboriginal people, have left behind, to a greater or lesser degree, physical evidence of their lifeway activities and settlements at many locations. The earliest possible human occupation was during the Paleo-Indian period (*circa* 9000 to 7000 B.C.) wherein small groups of nomadic peoples hunted big game along the shorelines of glacial lakes. These people were few in number and their small, temporary campsites are relatively rare.

People during the Archaic period (*circa* 7000 to 1000 B.C.) were still primarily nomadic hunters but also established territorial settlements, gathered seasonally available resources, and introduced burial ceremonialism. Late Archaic period sites are more numerous and can be quite large due to repeated annual visits.

Sites of the Woodland period (*circa* 1000 B.C. to A.D. 1650) are usually the most numerous because the population levels in southwestern Ontario had significantly increased. The manufacture of ceramic pottery vessels for storage and cooking was introduced along with the establishment of long distance trading networks, horticulture, warfare and large palisaded villages.

**Table 2: Registered Archaeological Sites within 2,000 metres of the Study Area.**

| *REGISTRATION #* | *NAME* | *TYPE* | *CULTURAL AFFILIATION* |
|---|---|---|---|
| AeHb-20 | Nordix 1 | Campsite | Late Archaic |
| AeHb-21 | Nordix 2 | Homestead | Euro-Canadian |
| AeHb-22 | Nordix 3 | Campsite | Prehistoric |

Sites of the Contact period (*circa* A.D. 1650 to 1900) include Aboriginal and Euro-Canadian residences and industries. H.R. Page and Co.'s 1877 Historical Atlas of Norfolk County, Ontario indicates that "J.E. Potts" owned the north and west portions of that property and "T.W. Walsh owned the south portion. No structures are indicated on the lot within the current study area. The absence of other structures on this map, however, does not necessarily mean that one or more structures were not present at that time, earlier or later.

Based upon the soil and topography suitable for human habitation, the proximity to water, and the historic significance of the geographic region, the study area exhibits a moderate to high potential for the discovery of pre-contact Aboriginal and Euro-Canadian archaeological resources.

**Figure 5: Site Map Showing Stage 2 Results**



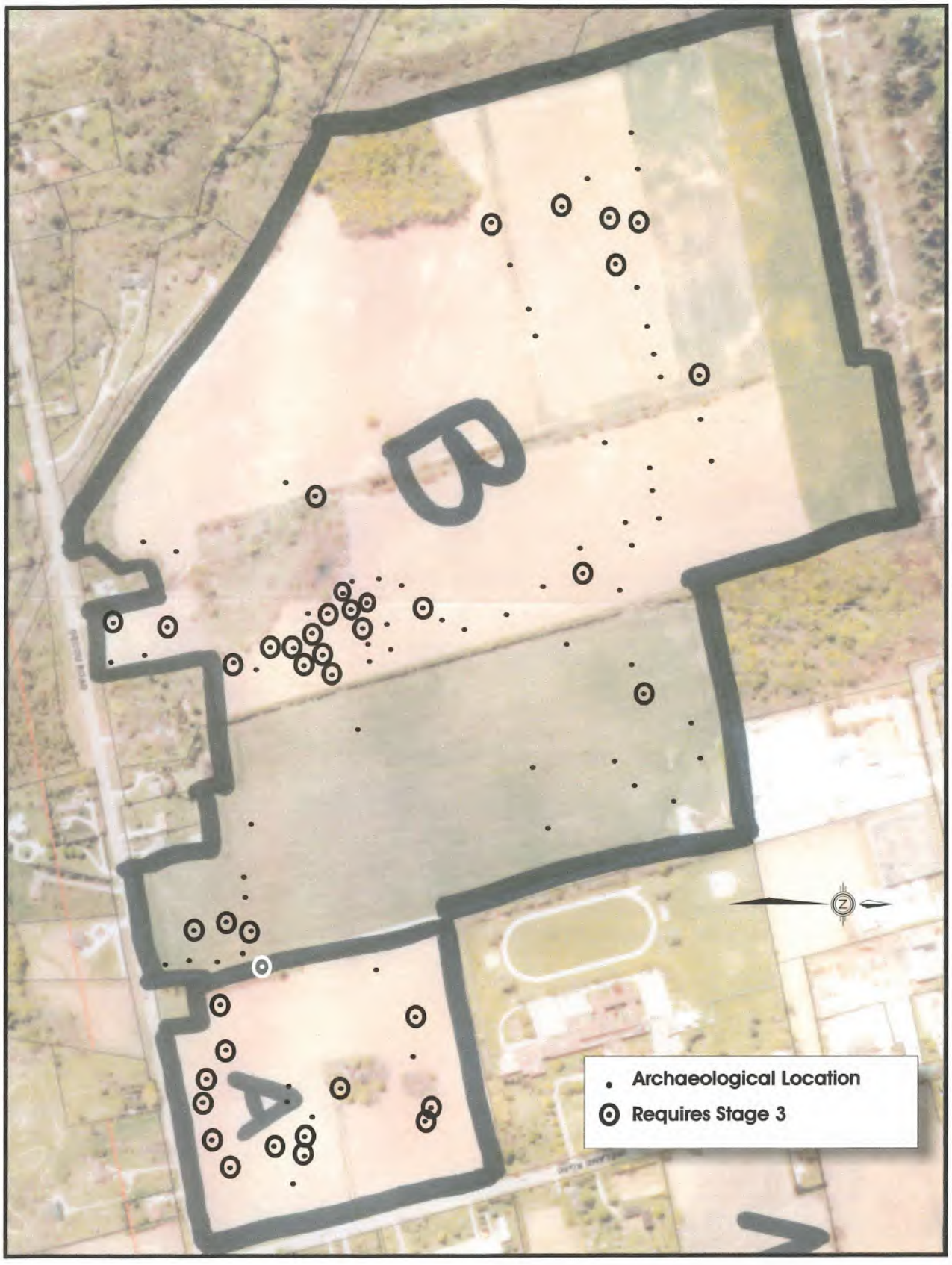


**Figure 6: Crew at Work in Woodlot**



**Figure 7: Disturbed Area with Ravine, Facing North**



## Stage 2 General Survey

The study area is 180 acres in size, which was divided into two parcels. One hundred and seventy acres were located in an agricultural field, which was assessed using the standard pedestrian transect method at a five-metre interval (see Figure 2). The field was ploughed and well weathered with excellent visibility (see Figure 3). Any artifacts recovered triggered an intensified survey in the immediate surrounding area. This intensified survey was conducted at a one-metre interval in a 15-metre radius around the findspot. In order to facilitate relocation and mapping, surface artifact locations were marked using orange flags and all locations were mapped using GPS coordinates.

Additional to the ploughed fields, the study area also approximately ten acres of woodlot and treed areas, including one area that contained a house and demolished barn. These areas were test-pitted at 5-metre intervals. Each test pit was 30 centimetres in diameter and was dug to subsoil, which varied from 35-45 centimetres below the surface. All soil was screened through 6-millimetre mesh to maximize the potential for artifact recovery. Any artifacts recovered triggered an intensified survey through additional test pits excavated at the cardinal positions around the original test pit. Appropriate photographic documentation was taken and all test pits were backfilled upon completion. Mayer Heritage received permission to enter the subject property and to remove artifacts as necessary during the survey conducted on May 22nd, 26th to 29th, and June 9th. Weather conditions at the time of the survey were sunny and warm with no conditions detrimental to the recovery of artifacts.

Two areas located within the woodlots of Parcel B, approximately one acre in size, located in the southeast corner of the property and along the west edge of the property were not assessed because both were steeply sloped with low-lying wet areas that had low archaeological potential (see Figure 7).

### Results

The Stage 2 general survey recovered Euro-Canadian and pre-Contact Aboriginal artifacts from 102 locations, with eighteen of these locations located in Parcel A and the remaining in Parcel B. Each of these locations was mapped and recorded using a Global Positioning System. Figure 5 shows the locations of each site within the study area. All non-diagnostic artifacts were flagged and left in the field for proper *in situ* mapping during future fieldwork. A catalogue of the recovered artifacts is presented in Appendix A.

**Location 1**

Location 1 is situated along Concession 5 at the south edge of the field marked Parcel A. It consists of three pieces of chipping detritus in an area measuring five metres by five metres. Additional assessment or mitigative measures are warranted because Location 1 represents a potentially significant archaeological resource.

**Location 2**

Location 2 is located 20-metres west of Location 1. It consists of three pieces of chipping detritus in a five metre by five-metre area. Because Location 2 represents a potentially significant archaeological resource, a Stage 3 assessment is recommended.

**Location 3**

Location 3 is located between Locations 1 and 2. It consists of three pieces of chipping detritus and a ten by 5-metre area. Because Location 3 represents a potentially significant archaeological resource, a Stage 3 assessment is recommended.

**Location 4**

Location 4 is located to the north of Decou Road and consists of over 30 pieces of chipping detritus and a biface in a 20 metre by 30-metre area. Additional assessment and mitigative measures are warranted because this location exhibits high potential by provincial standards and precedents.

**Location 5**

Location 5 is located approximately 10-metres east of Location 4 and may, in fact, represent a separate locus of Location 4. The location consists of four findspots, which are all pieces of chipping detritus, in a 10 metre by 5-metre area. Because Location 5 represents a potentially significant archaeological resource, it was recommended for further Stage 3 study.

**Location 6**

Location 6 is located 15 metres north of Location 4 and also may represent a separate locus. It consists of eight pieces of chipping detritus in a 5 metre by 10-metre area. A further Stage 3 assessment is recommended for this location.

**Location 7**

Location 7 is located to the north of Location 4 and may also represent a separate locus of Location 4. It consists of eight findspots, which are all pieces of chipping detritus, in a 5 by 10 metre area. Further assessment and mitigative procedures are recommended for this location as it exhibits high archaeological potential.

**Location 8**

Location 8 is located to the northeast of Location 7 and consists of one piece of Onondaga chipping detritus. Additional assessment or mitigative procedures are not warranted for Location 8 because the location exhibits low information potential by provincial standards and precedents.

**Location 9**

Location 9 consists of four findspots totalling seven pieces of chipping detritus in a 5 by 5 metre area. Additional assessment is warranted as this location exhibits high archaeological potential.

**Location 10**

Location 10 consists of two findspots with one piece of chipping detritus and one biface, in a 5 by 5 metre area. No further work is recommended as Location 10 exhibits low archaeological potential.

**Location 11**

Location 11 is located in the southwest corner of Parcel A. It consists of seven findspots totalling ten pieces of chipping detritus in a 10 by 10 metre area. Because Location 11 represents a potentially significant archaeological resource, it was recommended for further Stage 3 study.

**Location 12**

Location 12 consists of an isolated biface. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative procedures are not warranted for Location 12 because the location exhibits low information potential by provincial standards and precedents.

**Location 13**

Location 13 consists of two pieces of chipping detritus. Additional assessment or mitigative procedures are not warranted for Location 13 because the location exhibits low information potential by provincial standards and precedents.

**Location 14**

Location 14 is situated in the northwest corner of Parcel A and consists of one isolated scraper, which was collected. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. No further assessment is recommended because Location 14 exhibits low information potential by provincial standards and precedents.

**Location 15**

Location 15 is located at the north edge of the study area and consists of three pieces of chipping detritus in a 5 metre by 5-metre area. A further Stage 3 is recommended for this location as it represents a potentially significant archaeological resource.

**Location 16**

Location 16 is situated to the northwest of the house and consists of one piece of Onondaga chert chipping detritus. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. No further work is recommended as this location exhibits low information potential by provincial standards and precedents.

**Location 17**

Location 17 consists of three pieces of chipping detritus and one projectile point in a 5 metre by 5-metre area. A further Stage 3 is recommended for this location as it represents a potentially significant archaeological resource.

**Location 18**

Location 18 is located 30 metres east of Location 17 and consists of three pieces of chipping detritus in a 5 by 5-metre area. A further Stage 3 is recommended for this location as it represents a potentially significant archaeological resource.

**Location 19**

Location is located in Parcel B adjacent to the Pott's Cemetery located on the property and consists of two pieces of chipping detritus. A further Stage 3 is not warranted for this location, as it does not represent a potentially significant archaeological resource.

**Location 20**

Location 20 is an isolated piece of Onondaga chipping detritus located 30-metres west of Location 19. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. No further work is required on this location.

**Location 21**

Location 21 consisted of one piece of chipping detritus and one biface and is located just east of a gravel access road. No further work is recommended as this location exhibits low information potential by provincial standards and precedents.

**Location 22**

Location 22 is located next to the access road and consists of one piece of Onondaga chipping detritus and one scraper. No further work is recommended for this

location because it exhibits low information potential by provincial standards and precedents.

**Location 23**

Location 23 consists of four findspots, all pieces of chipping detritus, in a 5 by 5-metre area, situated northwest of Location 20. A Stage 3 assessment is recommended for this location as it represents a potentially significant archaeological resource.

**Location 24**

Location 24 is located twenty metres west of the gravel access road and is comprised of seven pieces of chipping detritus in a 10 by 5-metre area. A Stage 3 assessment is recommended for this location as it represents a potentially significant archaeological resource.

**Location 25**

Location 25 is located 20-metres west of Location 24 is made up of five pieces of chipping detritus and one biface. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 26**

Location 26 is located to the northwest of Location 25 and is comprised of two pieces of Onondaga chipping detritus. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 27**

Location 27, located west of Location 26, consists of one isolated Onondaga flake. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 28**

Location 28 is an isolated piece of chipping detritus, situated to 40 metres west of Location 27. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 28 because the location exhibits low information potential by provincial standards and precedents.

**Location 29**

Location 29 consists of an isolated Onondaga flake and is located 20 metres east of a windbreak. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 29 because the location exhibits low information potential by provincial standards and precedents.

**Location 30**

Location 30 is located on the east edge of Parcel B and consists of an isolated piece of Onondaga chipping detritus. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 30 because the location exhibits low information potential by provincial standards and precedents.

**Location 31**

Location 31 consists of an isolated Onondaga flake, located at the north edge of the property. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 31 because the location exhibits low information potential by provincial standards and precedents.

**Location 32**

Location 32 consists of one biface, and is located to the northeast of Location 31. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 32 because the location exhibits low information potential by provincial standards and precedents.

**Location 33**

Location 33, located 50 metres west of Location 32, consists of one biface. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 33 because the location exhibits low information potential by provincial standards and precedents.

**Location 34**

Location 34 is located northeast of Location 34. It consists of an isolated flake. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 34 because the location exhibits low information potential by provincial standards and precedents.

**Location 35**

Location 35 consists of an isolated scraper and is located 15-metres east of the windbreak. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 35 because the location exhibits low information potential by provincial standards and precedents.

**Location 36**

Location 36 is located in the northeast corner of Parcel B. It is comprised of three findspots totalling three pieces of chipping detritus and one biface. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 37**

Location 37 consists of one piece of Onondaga chipping detritus and is located approximately 85 metres west of Location 36. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 37 because the location exhibits low information potential by provincial standards and precedents.

**Location 38**

Location 38 is located in the northeast corner of Parcel A and consists of an isolated scraper. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 38 because the location exhibits low information potential by provincial standards and precedents.

**Location 39**

Location 39 is situated in the northeast corner of Parcel B and consists of an isolated scraper. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 39 because the location exhibits low information potential by provincial standards and precedents.

**Location 40**

Location 40 consists of an isolated Onondaga flake, and is situated along the north edge of Parcel B. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 41**

Location 41 consists of an isolated scraper and is located 60 metres east of Location 40. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 41 because the location exhibits low information potential by provincial standards and precedents.

**Location 42**

Location 42 is located southwest of Location 41 and is made up of an isolated Onondaga flake. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 43**

Location 43, located east of Location 42, consists of two pieces of chipping detritus. Additional assessment or mitigative measures are not warranted for Location 43 because the location exhibits low information potential by provincial standards and precedents.

**Location 44**

Location 44, located in the northeast corner of Parcel B, consists of an isolated biface. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Additional assessment or mitigative measures are not warranted for Location 43 because the location exhibits low information potential by provincial standards and precedents.

**Location 45**

Location 45 is located 10 metres south of Location 43 and consists of two pieces of chipping detritus. Additional assessment or mitigative measures are not warranted for Location 45 because the location exhibits low information potential by provincial standards and precedents.

**Location 46**

Location 46 consists of an isolated Onondaga flake and is located to the southwest of Location 45. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 47**

Location 47 is located 55 metres east of Location 46 and is comprised of three findspots, which were all pieces of chipping detritus in a 5 by 5 metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 48**

Location 48 is located 40 metres northeast of Location 47 and is an isolated piece of Onondaga chipping detritus. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 49**

Location 49 consists of an isolated projectile point base, and is located 10 metres southwest of Location 47. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 50**

Location 50 is situated 25 metres west of Location 49 and consists of an isolated Onondaga flake. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 51**

Location 51 is an isolated piece of Onondaga chipping detritus and is situated 15 metres south of Location 49. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 52**

Location 52 is located 50 metres southeast of Location 51 and consists of two pieces of chipping detritus. Additional assessment or mitigative measures are not warranted for Location 52 because the location exhibits low information potential by provincial standards and precedents.

**Location 53**

Location 53 is an isolated scraper and is located 100 metres west of a treeline (windbreak). Additional assessment or mitigative measures are not warranted for Location 41 because the location exhibits low information potential by provincial standards and precedents.

**Location 54**

Location 54 is located 120 metres southwest of Location 53 and consists of four findspots with six pieces of chipping detritus. Further assessment and mitigative procedures are recommended for this location as it exhibits high archaeological potential.

**Location 55**

Location 55 is an isolated Onondaga flake and is situated 40 metres west of Location 54. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 56**

Location 56 is located between two swales and consists of one piece of chipping detritus and one biface. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 57**

Location 57 is an isolated Onondaga flake. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 58**

Location 58 is made of five pieces of chipping detritus and two bifaces in a 15 by 10-metre area. The site is located 85 metres east of Location 56. Further assessment and mitigative procedures are recommended for this location as it exhibits high archaeological potential.

**Location 59**

Location 59 is an isolated Onondaga flake located 65 metres northeast of Location 58. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 60**

Location 60 is one piece of Onondaga chipping detritus located 15 metres west of a windbreak along the south edge of the study area. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 61**

Location 61 is an isolated Onondaga flake located 30 metres west of the windbreak. Despite intensification of a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 62**

Location 62 is made up of four pieces of chipping detritus in a 5 by 5-metre area. The site is located 40 metres southeast of Location 58. Further assessment and mitigative procedures are recommended for this location as it exhibits high archaeological potential.

**Location 63**

Location 63 is an isolated Onondaga flake located at the bottom of a hill, 15 metres south of Location 56. Despite intensification of a 10-metre area around the find, no further artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 64**

Location 64 consists of three pieces of chipping detritus and one projectile point. The site is located 40 metres south of Location 62. Further assessment and mitigative procedures are recommended for this location as it exhibits high archaeological potential.

**Location 65**

Location 65 consists of three pieces of chipping detritus in a 5 by 5 metre area and is located 20 metres east of Location 64. Further assessment and mitigative procedures are recommended for this location as it exhibits high archaeological potential.

**Location 66**

Location 66 consists of three pieces of chipping detritus in a 5 by 5 metre area. The site is located southwest of Location 64. Further assessment and mitigative procedures are recommended for this location as it exhibits high archaeological potential.

**Location 67**

Location 67 is located 15-metres southeast of Location 66 and consists of seven findspots, totalling six pieces of chipping detritus and one biface. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 68**

Location 68 has six findspots consisting of five pieces of chipping detritus and one scraper. The site is located 10 metres east of Location 67. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 69**

Location 69 is located 30 metres northeast of Location 68 and consists of four pieces of chipping detritus and one projectile point, in a 10 by 5-metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 70**

Location 70 consists of two pieces of chipping detritus and one projectile point and is located 10 metres southeast of Location 68. A Stage 3 is warranted for this location as it exhibits potential for a significant archaeological resource.

**Location 71**

Location 71 contains nine pieces of chipping detritus and one biface in a 5 by 10-metre area. The site is located south of Location 68 at the south edge of the study area. Because Location 71 represents a potentially significant archaeological resource, it was recommended for further Stage 3 study.

**Location 72**

Location 72 is an isolated Onondaga flake located 15 metres north of Location 71. Despite an intensive survey in a 10-metre area surrounding the find, no additional artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 73**

Location 73 consists of three pieces of chipping detritus in a 5 by 10-metre area located 15 metres west of Location 72. A Stage 3 is warranted for this location as it indicates potential for a significant archaeological resource.

**Location 74**

Location 74 is an isolated piece of Onondaga chipping detritus and is located approximately 200 metres west of Location 73. Despite an intensive survey in a 10-metre area surrounding the find, no additional artifacts were recovered. Because this location does not exhibit a potentially significant archaeological resource, no further work is recommended.

**Location 75**

Location 75 is located in the southwest edge of the field and consists of five pieces of chipping detritus in a 5 by 5-metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 76**

Location 76 is located at the south edge of Parcel B. It is a 20 by 20-metre Euro-Canadian scatter consisting of blue and black transfer print, stoneware and brick fragments, and red and white earthenware fragments. Colour and design would indicate a probable date of between 1840 and 1870. Because of the probability of archaeological and historical information, further investigation in the form of a Stage 3 archaeological excavation is warranted and recommended.

**Location 77**

Location 77 is located 20-metres north of Concession 5 and consists of three pieces of chipping detritus in a 5 by 5-metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 78**

Location 78 is an isolated Onondaga flake located 10 metres west of the east edge of the study area. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 79**

Location 79 is an isolated Onondaga flake located 40 metres north of Location 78. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 80**

Location 80 is an isolated projectile point located 5 metres west of a creek in the southeast corner of the study area. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 81**

Location 81 is an isolated piece of green scalloped white earthenware located 50 metres north of Location 80. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 82**

Location 82 is located on top of a hill, 85 metres north of a woodlot and is made up of three pieces of chipping detritus in a 5 by 5-metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 83**

Location 83 consists of three pieces of chipping detritus in a 5 by 5-metre area and is located 200 metres south of the north edge of the property. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 84**

Location 84 is an isolated projectile point located southwest of Location 83. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 85**

Location 85 is an isolated biface located 20 metres west of Location 83. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 86**

Location 86 is an isolated flake located 15 metres west of Location 85. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 87**

Location 87 consists of two pieces of chipping detritus. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 88**

Location 88 is located 45 metres north of Location 87 and is made up of four pieces of chipping detritus in a 5 by 5-metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 89**

Location 89 is located 30 metres north of Location 88 and is made up of four pieces of chipping detritus in a 5 by 5-metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 90**

Location 90 is located 25 metres northeast of Location 89 and consists of six pieces of chipping detritus and one projectile point and I 5 by 5-metre area. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 91**

Location 91 is an isolated projectile point located 40 metres north of Location 90. Despite intensification in a 10-metre area around the find, no further artifacts were recovered. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 92**

Location 92 is located 40 metres north of Location 91 and consists of two pieces of chipping detritus. A Stage 3 is not warranted for this location as it exhibits low information potential by provincial standards and precedents.

**Location 93**

Location 93 is an isolated Onondaga flake located 25 metres northwest of Location 92. Despite an intensive survey in a 10-metre area surrounding the find, no additional artifacts were recovered. Because this location does not represent a potentially significant archaeological resource, no further work is recommended.

**Location 94**

Location 94 is an isolated Onondaga flake located 100 metres south of Location 93. Despite an intensive survey in a 10-metre area surrounding the find, no additional

artifacts were recovered. Because this location does not represent a potentially significant archaeological resource, no further work is recommended.

**Location 95**

Location 95 is an isolated Onondaga flake located 40 metres west of Location 94. Despite an intensive survey in a 10-metre area surrounding the find, no additional artifacts were recovered. Because this location does not represent a potentially significant archaeological resource, no further work is recommended.

**Location 96**

Location 96 is an isolated Onondaga flake located northwest of Location 95. Despite an intensive survey in a 10-metre area surrounding the find, no additional artifacts were recovered. Because this location does not represent a potentially significant archaeological resource, no further work is recommended.

**Location 97**

Location 97 is an isolated Onondaga flake located northeast of Location 82. Despite an intensive survey in a 10-metre area surrounding the find, no additional artifacts were recovered. Because this location does not represent a potentially significant archaeological resource, no further work is recommended.

**Location 98**

Location 98 consists of four pieces of chipping detritus in a 5 by 5-metre area and is situated 25 metres north of Location 82. A Stage 3 is warranted for this location as it exhibits a potentially significant archaeological resource.

**Location 99**

Location 99 is located adjacent to a gravel drive that runs next to a house. It consists of one positive test pit and three positive cardinal test pits excavated around the primary. Artifacts recovered include three pieces of chipping detritus, one pipe stem fragment, and brick fragments. Because Location 99 represents a potentially significant archaeological resource, it was recommended for further Stage 3 study.

**Location 100**

Location 100 is located within a wooded area in Parcel B, adjacent to an access road that runs between the cornfields in Parcel B. It consists of one positive test pit that contained two pieces of chipping detritus. Because Location 100 represents a potentially significant archaeological resource, it was recommended for further Stage 3 study.

**Location 101**

Location 101 is located in a windbreak that runs between Parcels A and B. It consists of one positive test pit and six positive cardinal test pits excavated around the primary. Artifacts recovered were nine pieces of chipping detritus. Because Location 101 represents a potentially significant archaeological resource, it was recommended for further Stage 3 study.

**Location 102**

Location 102 is an isolated projectile point located southeast of Location 99. Despite an intensive survey in a 10-metre area surrounding the find, no additional artifacts were recovered. Because this location does not represent a potentially significant archaeological resource, no further work is recommended.

## Stage 3 Investigations

### Methodology

A total of 102 sites were recovered during the Stage 2 survey. Of these 102 sites, forty-one sites were recommended for further Stage 3 investigations. These are Locations 1-7, 9, 11, 15, 17, and 18 on Parcel A and Locations 23-25, 36, 47, 54, 58, 62, 64-71, 73, 75-77, 82, 83, 88-90, 98-101 on Parcel B. During the Stage 3 investigations some sites overlapped and converged to become part of larger locations. The locations that converged will be further explained in the Methodology portion of this report. The Stage 3 investigations at each of the 40 Aboriginal sites and one historic site began with an intensified pedestrian survey (at a one-metre interval) to relocate the artifacts that had been left *in situ* during the Stage 2 survey and to identify any new artifact findspots within each site. A datum location and site grid were established and the location of each surface artifact was recorded and mapped using a transit and stadia rod, and all surface artifacts were collected at this time.

Following the controlled surface collection, hand excavation of units (each one-metre square) at an approximate five- to ten-metre interval was completed. The units were strategically laced to cover the extent of the positive test pits or surface artifact scatter at each site. All units were excavated to subsoil and all soil was screened through a six-millimetre wire mesh in order to maximize the potential for artifact recovery. Once hand excavation of the plough zone was complete, the floor of each unit was trowelled to expose any possible sub-surface cultural features. All test units were backfilled upon completion. The Stage 3 investigations were completed between July 9$^{th}$ and August 28$^{th}$, 2008. Weather conditions were generally warm and sunny, with no conditions detrimental to artifact recovery.

### Location 4

The first part of the Stage 3 investigation on Location 4 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. One hundred and eight surface locations were recorded. In addition to the controlled surface collection, 91 test units were hand excavated. The test units ranged from 19 to 48 centimetres in depth and consisted of hard clay to a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from zero to sixty artifacts per unit. No subsurface features were recovered. During the Stage 3 excavation, Locations 1, 2, 3, 5, 6, 7, and 9 united with and became part of the larger Location 4 (see Figure 8).

The Stage 3 investigation recovered 1,423 artifacts, including 153 from the surface and 1,270 from the test units. Table 3 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but 37 formal tools were recovered from the site.

**Table 3: Location 4 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| biface | 8 | **0.56** |
| blade | 1 | **0.07** |
| chipping detritus | 1,386 | **97.4** |
| drill | 1 | **0.07** |
| projectile point | 6 | **0.42** |
| scraper | 21 | **1.48** |
| **Totals** | **1,423** | **100%** |

A total of 1,386 pieces of chipping detritus were recovered from Location 4. Chipping detritus is the waste by-product of stone tool manufacture. The analysis of these waste flakes provides information about techniques used by knappers. Certain flakes have a characteristic appearance and indicate the tolls that were made or prepared at a site even when the tools themselves are absent. The debitage was analyzed for raw material type and flake morphology (Table 4). The majority of the material 99% is Onondaga chert, most of it high quality. The rest of the flakes are manufactured on what appears to be a local glacial till. The flakes are largely biface thinning and finishing flakes, flakes that are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site. A total of seven flakes are utilised and show signs of usewear on one or more edges. All are biface thinning flakes manufactured on Onondaga chert. A total of 191 pieces show evidence of heating.

**Table 4: Location 4 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 3 | 0 | 0 | 3 |
| secondary | 19 | 1 | 1 | 21 |
| biface thinning | 591 | 55 | 5 | 651 |
| biface finishing | 54 | 0 | 0 | 54 |
| shatter | 2 | 2 | 0 | 4 |
| fragment | 513 | 133 | 7 | 652 |
| **Totals** | **1,182** | **191** | **13** | **1,386** |

Six projectile points were recovered from Location 4. Projectile points are tools such as arrow or spear heads. Because point styles change over time, the shape of a point is useful in determining the date of a site's occupation. The first point is a base fragment and shows evidence of heating. It measures 20 mm in length and has an overall thickness of 6 mm. It is manufactured on Onondaga chert.

The second point is also a base, manufactured on Onondaga chert with evidence of heating. It is a Normanskill point of the Late Archaic Period (*ca.* 4,500-2,500 B.P.) and has a base width of 20 mm, a neck width of 15 mm, a shoulder width of 25 mm, and an overall thickness of 8 mm.

The third point is also a heated fragment manufactured on Onondaga chert. It measures 5 mm in width.

The remaining points are all side-notched Brewerton points of the Middle Archaic Period (*ca.* 8,000-4,500 B.P.) All are manufactured on Onondaga chert. The first point measures 42 mm in length, and has an overall thickness of 8 mm. The shoulder width is 21 mm, the neck width is 21 mm and the basal width is 25 mm.

The second Brewerton has an overall length of 37 mm and an overall thickness of 12 mm. The shoulder measures 25 mm, the neck measures 18 mm and the base measures 19 mm.

The final Brewerton measures 40 mm in length, 9 mm in thickness and has a shoulder width of 25 mm, a neck width of 17 mm, and a base width of 20 mm.

A total of 21 scrapers were recovered from Location 4. Scrapers are tools used for preparation of hides or wood. They are most often made on unificially worked flakes,

**Figure 8: Results of Stage 3 Excavations at Location 4**

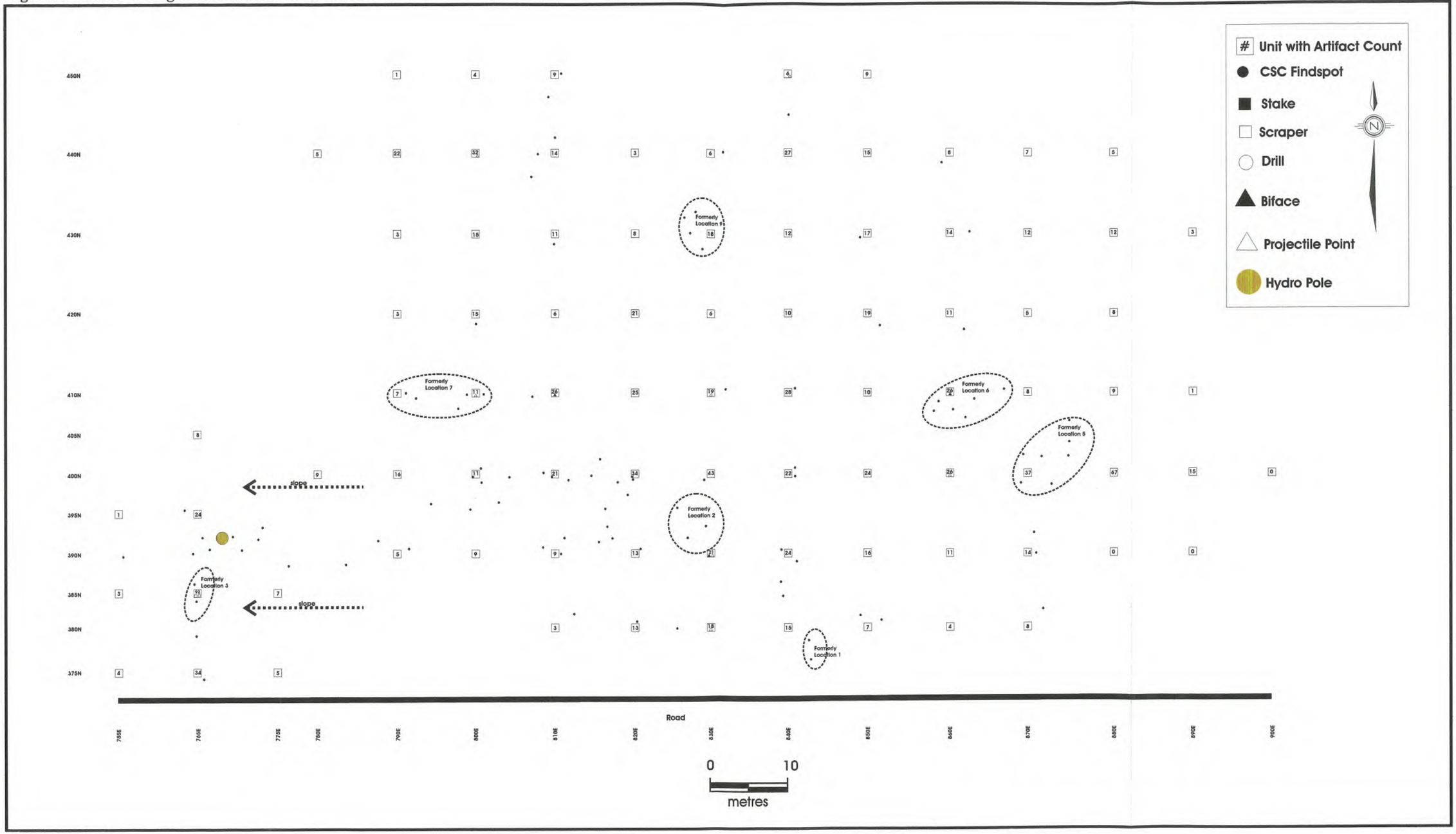


**Figure 9: Results of Stage 3 Excavations at Location 11**

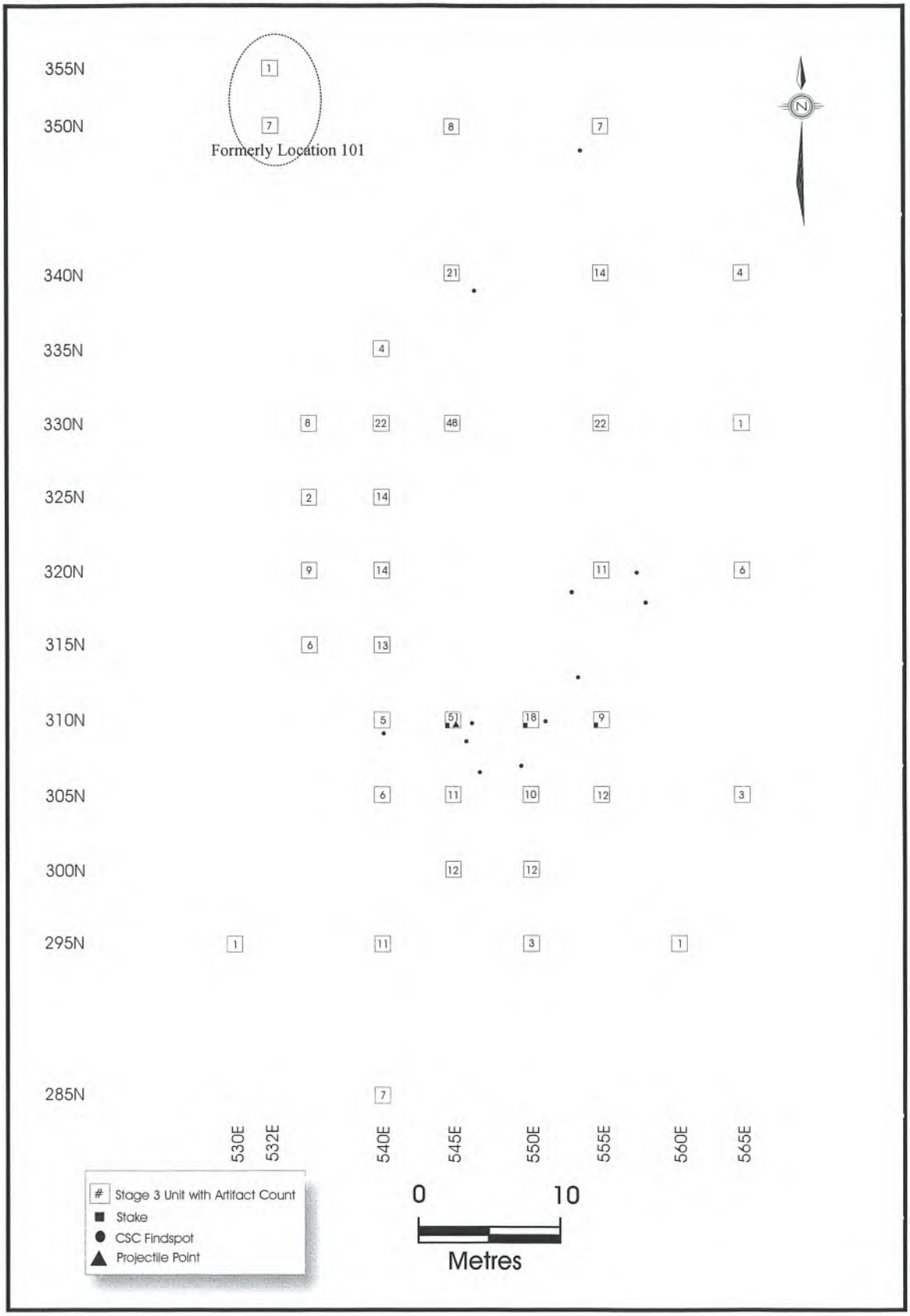


**Figure 10: Location 4, Unit 860E 410N, South Wall Profile**



**Figure 11: Crew at Work**



although some bifaces are worked or reworked into scrapers. The majority of the scrapers (85%) were side scrapers with the remaining two scrapers showing usewear on the distal end of the flake. One scraper is a reworked projectile point. Metrics for each of the scrapers are presented in Table 5.

**Table 5: Scraper Metrics for Location 4. All measurements in mm**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *TYPE* | *BIT LENGTH* | *BIT HEIGHT* | *COMMENTS* |
|---|---|---|---|---|---|---|---|
| 2330 | 38 | 27 | 5 | side | 17 | 2 | |
| 2176 | 38 | 30 | 10 | end | 16 | 4 | |
| 2327 | 30 | 35 | 8 | end | 34 | 4 | reworked projectile point |
| 2196 | 40 | 30 | 7 | end | 15 | 3 | |
| 2343 | 23 | 26 | 11 | side | 17 | 3 | |
| 2250 | 22 | 12 | 3 | side | 14 | 1 | |
| 2256 | 27 | 22 | 4 | side | 15 | 2 | |
| 2283 | 37 | 15 | 7 | side | 26 | 4 | |
| 2355 | 29 | 25 | 5 | side | 12 | 2 | |
| 2313 | 38 | 17 | 6 | side | 31 | 2 | |
| 2178 | 17 | 21 | 4 | side | 14 | 3 | |
| 2220 | 18 | 15 | 6 | side | 17 | 3 | |
| 2164 | 40 | 32 | 12 | side | 22 | 4 | |
| 2206 | 41 | 22 | 7 | side | 20 | 3 | |
| 2237 | 27 | 32 | 6 | side | 13 | 2 | ventral |
| 2238 | 14 | 13 | 4 | side | 8 | 2 | fragment |
| 2166 | 29 | 20 | 6 | side | 18 | 3 | |
| 2222 | 37 | 28 | 8 | side | 26 | 4 | ventral |
| 2276 | 30 | 9 | 9 | side | 15 | 2 | heated |
| 2297 | 38 | 30 | 11 | side | 13 | 2 | ventral |
| 2366 | 21 | 15 | 3 | side | 11 | 2 | ventral |

A total of seven bifaces were recovered from Location 4. Bifaces are tools that have been worked on two sides and are often used as knives. All are manufactured on Onondaga chert. Table 6 represents the metrics for bifaces recovered.

**Table 6: Metrics for Bifaces for Location 4. All measurements in mm**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *COMMENTS* |
|---|---|---|---|---|
| 2225 | 27 | N/a | 7 | fragment |
| 2347 | 40 | 36 | 10 | fragment |
| 2213 | 35 | 27 | 10 | fragment |
| 2201 | 52 | 28 | 12 | |
| 2240 | 41 | 27 | 8 | |
| 2358 | 55 | 40 | 18 | fragment |
| 2357 | 45 | 48 | 13 | fragment |

One Meadowood cache blade dating to the Meadowood phase of the Early Woodland Period (ca. 900-400 B.P.) was also recovered from Location 4. It is manufactured on Onondaga chert and measures 54 mm in length, 25 mm in width, and has an overall thickness of 7 mm.

One drill was also recovered from Location 4. It is a reworked Meadowood blade manufactured on Onondaga chert. It has an overall length of 55 mm, an overall width of 13 mm, and an overall thickness of 7 mm. The bit length is 43 mm.

Location 4 represents a multi-component campsite with artifacts ranging from the Middle Archaic Woodland time period. Because Location 4 represents a significant archaeological resource, a Stage 4 excavation is recommended for this site if it cannot be avoided during future development.

## Location 11

The first part of the Stage 3 investigation on Location 11 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Thirteen surface locations were recorded. In addition to the controlled surface collection, 35 test units were hand excavated. The test units ranged from 13 to 65 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from one to fifty-one artifacts per unit (see Figure 9). No subsurface features were recovered.

The Stage 3 investigation recovered 345 artifacts, including 17 from the surface and 428 from the test units. Table 7 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, although five formal tools were recovered from the site.

**Table 7: Location 11 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| biface | 1 | 0.28% |
| chipping detritus | 337 | 97.7% |
| projectile point | 1 | 0.28% |
| scraper | 4 | 1.15% |
| utilized flakes | 2 | 0.58% |
| **Total** | **345** | **100%** |

A total of 337 pieces of chipping detritus were recovered from Location 11. The debitage was analyzed for raw material type and flake morphology (Table 8). The majority of the flakes (97.3 %) are manufactured on high quality Onondaga chert although nine pieces (2.6 %) were manufactured on what appears to be a local glacial till variety of chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, although the presence of a primary flake indicates that at least some initial core preparation took place on the site. Two flakes show usewear on one edge. Both of these are Onondaga chert biface thinning flakes. Forty-one flakes show evidence of heating.

**Table 8: Location 11 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 1 | 0 | 0 | **1** |
| secondary | 8 | 1 | 3 | **12** |
| biface thinning | 128 | 17 | 3 | **148** |
| biface finishing | 31 | 0 | 0 | **31** |

| | | | | |
|---|---|---|---|---|
| shatter | 1 | 0 | 0 | **1** |
| fragment | 118 | 23 | 3 | **144** |
| **Totals** | **287** | **41** | **9** | **337** |

One projectile point was recovered from Unit 500E 200N on Location 11. It is a Brewerton side notched point dating to the Middle Archaic Period (*ca.* 8,000 - 4,500 B.P.). It is manufactured on Haldimand chert and measures 29 mm in length and 8 mm in thickness. The width of the shoulder measures 18 mm, the width of the neck measures 8 mm, and the base width is 20 mm.

One biface was recovered from Unit 490E 205N on Location 11. It is manufactured on Onondaga chert and has an overall length of 54 mm, an overall width of 37 mm, and an overall thickness of 9 mm.

Three scrapers were recovered from Location 11. All are manufactured on Onondaga chert. Metrics for each of the scrapers are presented in Table 9.

**Table 9: Scraper Metrics for Location 11. All measurements in mm**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *TYPE* | *BIT LENGTH* | *BIT HEIGHT* | *COMMENTS* |
|---|---|---|---|---|---|---|---|
| 1163 | 29 | 31 | 12 | end | 21 | 2 | |
| 1166 | 22 | 11 | 5 | side | 14 | 2 | fragment, heated |
| 1175 | 36 | 24 | 7 | side | 13/15 | 3/3 | dorsal/ventral |

Location 11 represents a Middle Archaic campsite and a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 15

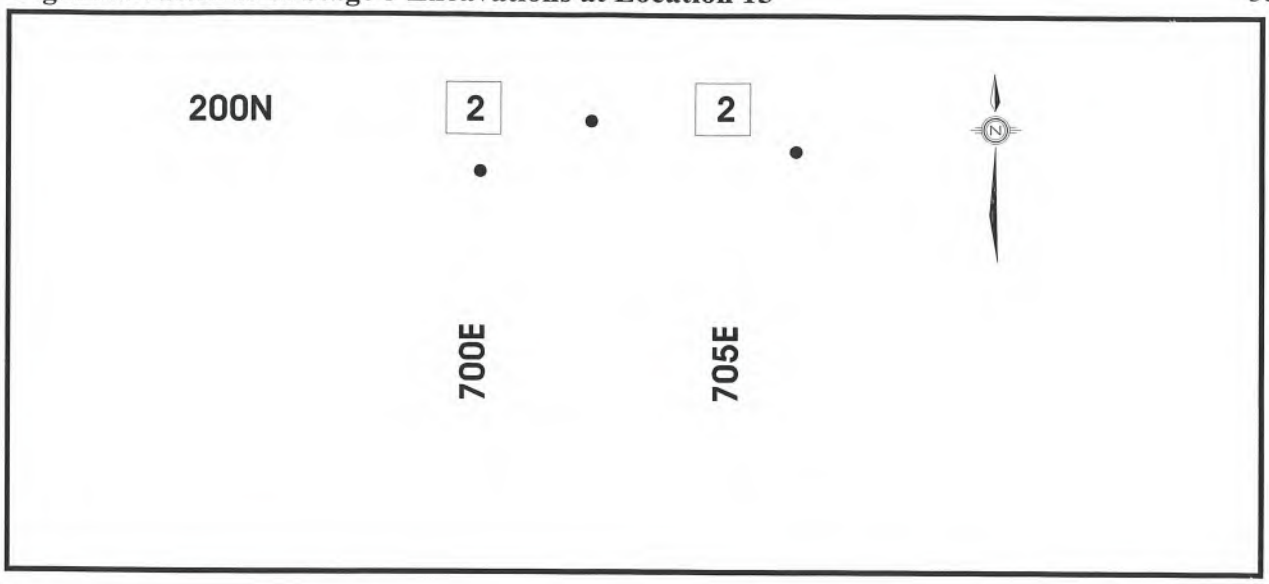
The first part of the Stage 3 investigation on Location 15 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Three surface locations were recorded. In addition to the controlled surface collection, two test units were hand excavated. The test units were 41 and 54 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil.

A total of 5 pieces of chipping detritus were recovered from Location 15, including two flakes collected from the surface (see Figure 12). The debitage was analyzed for raw material type and flake morphology. Three were biface thinning flakes and two were fragmentary flakes. All were manufactured on high quality Onondaga chert. No subsurface features were recovered.

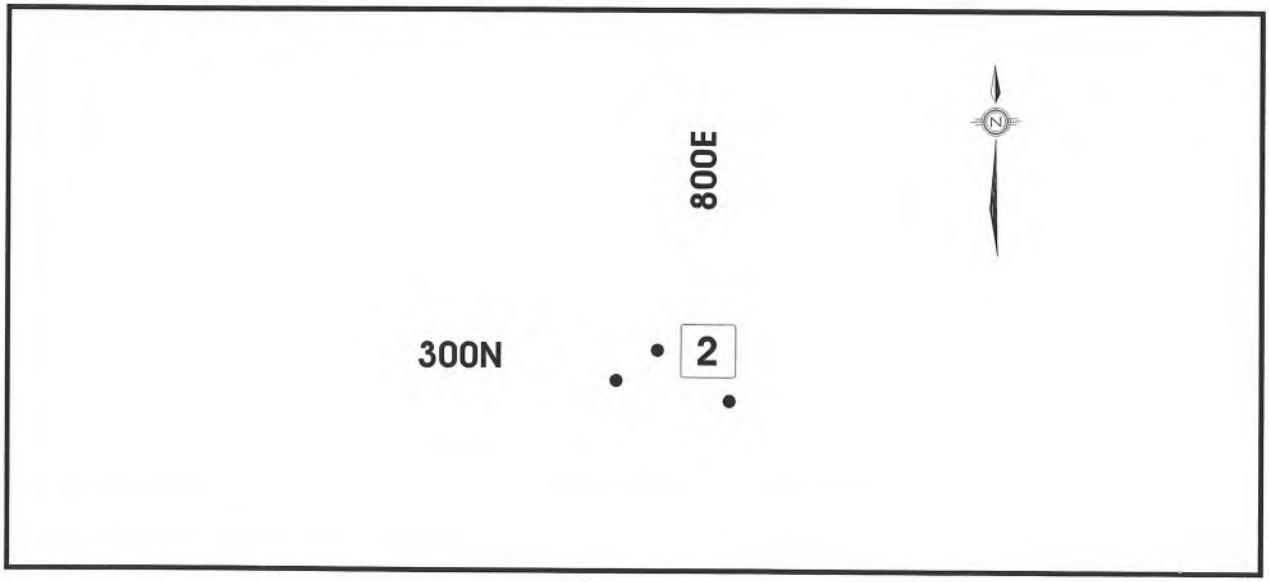
Because of the low artifact counts in the units at Location 15, the site has little information value. As such, no further fieldwork is warranted for Location 15.

**Figure 12: Results of Stage 3 Excavations at Location 15**






**Results of Stage 3 Investigations at Location 36**



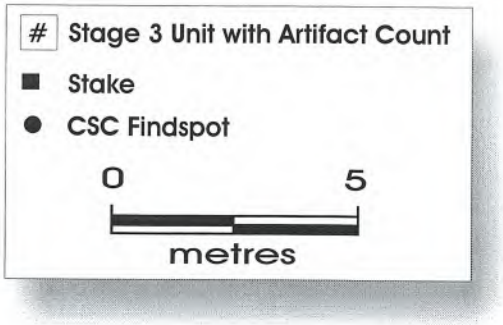



**Figure 13: Results of Stage 3 Excavations at Location 17**



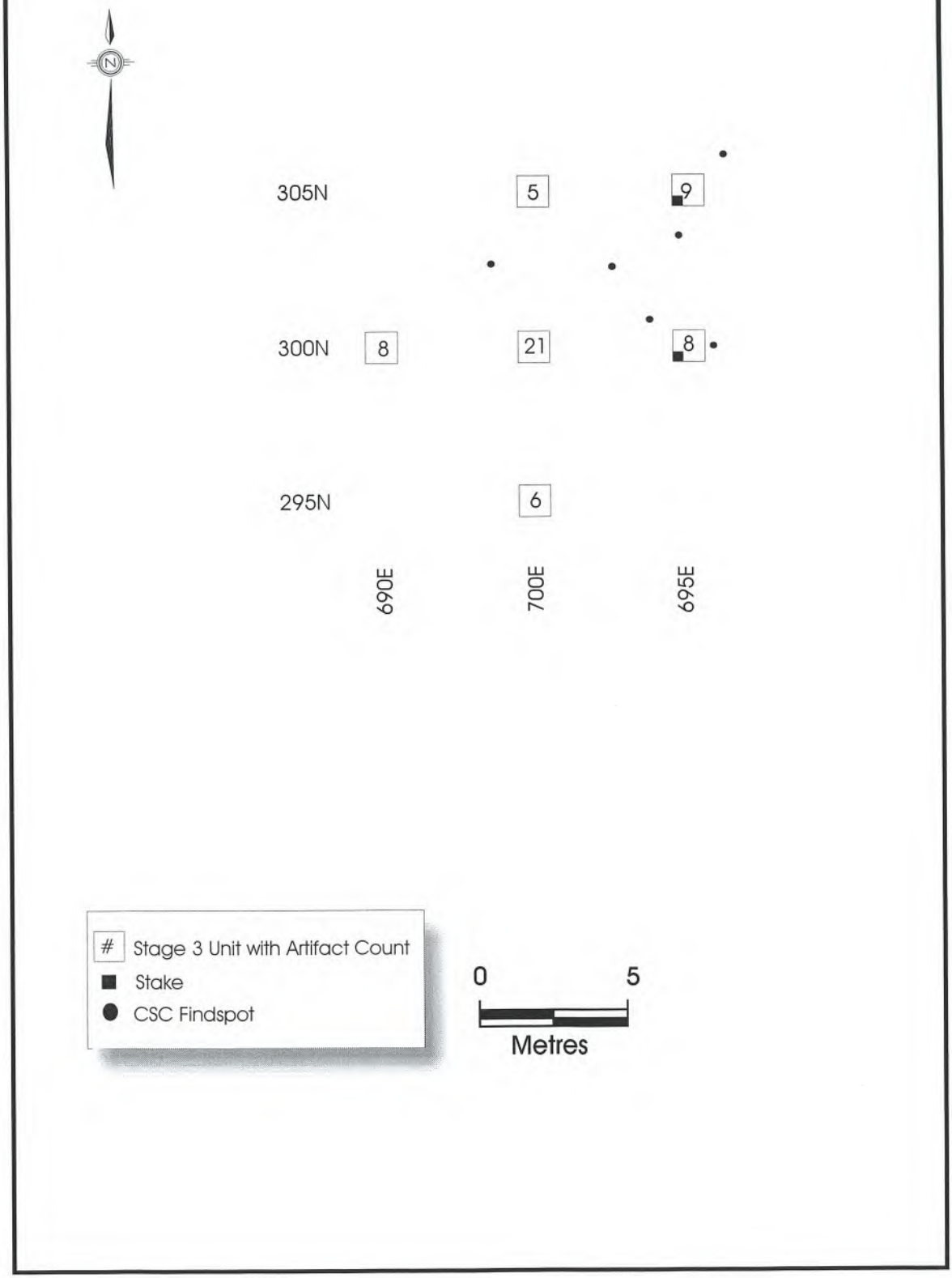
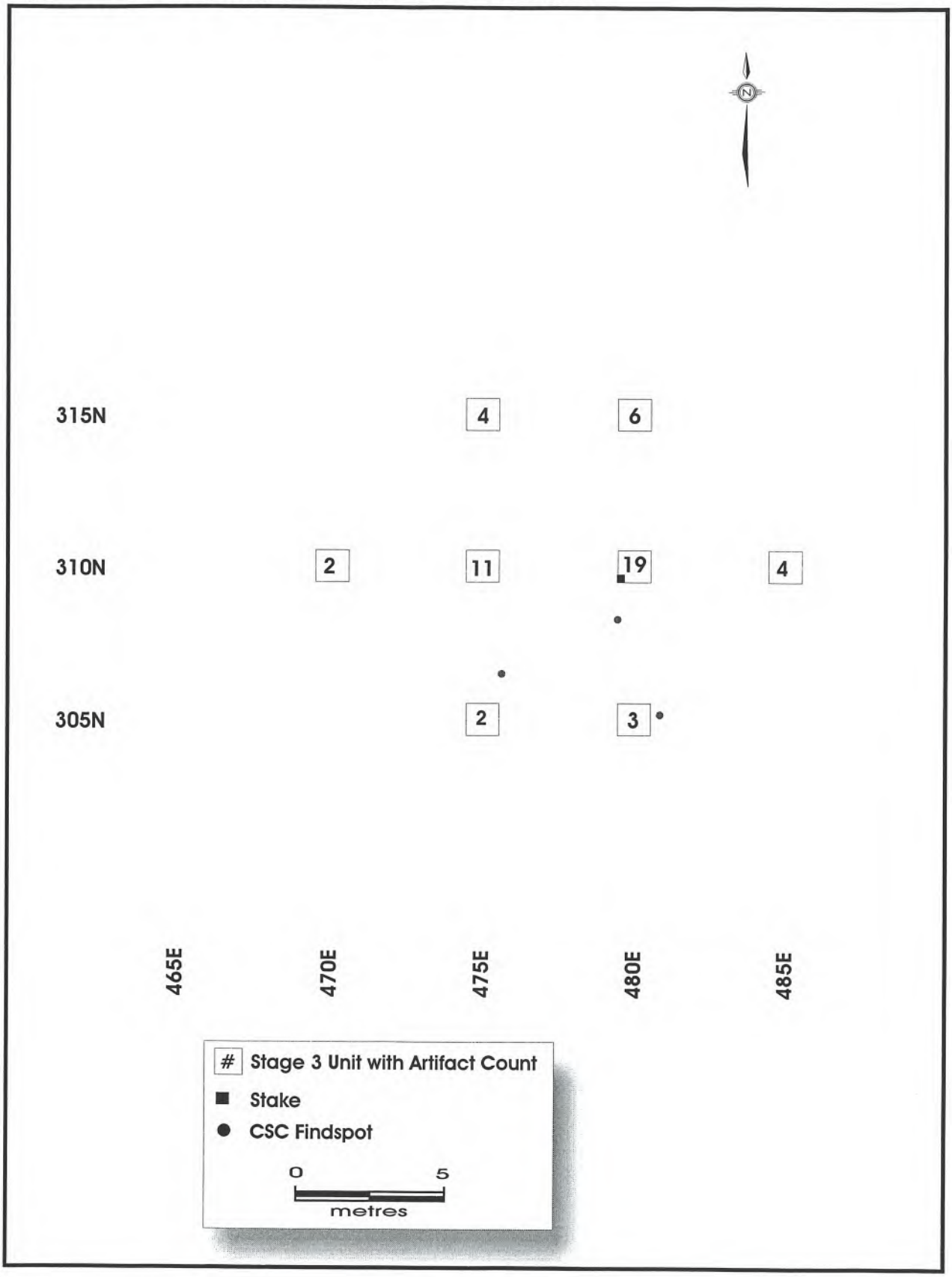


**Figure 14: Results of Stage 3 Investigations at Location 18**





## Location 17

The first part of the Stage 3 investigation on Location 17 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Six surface locations were recorded. In addition to the controlled surface collection, six test units were hand excavated. The test units ranged from 18 and 35 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from five to twenty-one artifacts per unit (see Figure 13). No subsurface features were recovered. Table 10 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, although two formal tools were recovered from the site.

**Table 10: Location 17 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 55 | 96.5% |
| scraper | 2 | 3.5% |
| **Total** | **57** | **100%** |

A total of 55 pieces of chipping detritus were recovered from Location 17. The debitage was analyzed for raw material type and flake morphology (Table 11). All of the flakes (100 %) are manufactured on high quality Onondaga chert. The flakes are largely biface thinning flakes, flakes that are produced in the later stages of stone tool manufacture, and fragmentary flakes.

**Table 11: Location 17 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 0 | 0 | 0 | 0 |
| biface thinning | 28 | 0 | 0 | 28 |
| biface finishing | 3 | 0 | 0 | 3 |
| shatter | 0 | 1 | 0 | 1 |
| fragment | 23 | 0 | 0 | 23 |
| **Totals** | 54 | 1 | 0 | 55 |

Two scrapers were recovered from Location 11. One, a reworked Middle Archaic Point (*ca.* 8,000-4,500 B.P.), was recovered during Stage 2 investigations. The other is an end scraper measuring 26 mm in length, 22 mm in width, and has an overall thickness of 7 mm. The bit measures 15 mm in length and 3 mm in height.

Because Location 17 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 18

The first part of the Stage 3 investigation on Location 18 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Three surface locations were recorded. In addition to the controlled surface collection, eight test units were hand excavated. The test units ranged from 22 and 35 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from two to nineteen artifacts per unit (see Figure

14). No subsurface features were recovered. Table 12 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, although two formal tools were recovered from the site.

**Table 12: Location 18 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 51 | 98.0 |
| scraper | 1 | 2.0 |
| **Totals** | **52** | **100%** |

The Stage 3 investigation recovered 52 artifacts, including 2 from the surface and 50 from the test units. Table 13 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, and one scraper was recovered from the site.

**Table 13: Location 18 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 0 | 0 | 0 | 0 |
| biface thinning | 26 | 2 | 1 | 29 |
| biface finishing | 1 | 1 | 0 | 2 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 17 | 2 | 1 | 20 |
| **Totals** | **44** | **5** | **2** | **51** |

One scraper was recovered from investigations at Location 18. It is a side scraper manufactured on Onondaga chert and measures 38 mm in length, 25 mm in width, and has an overall thickness of 5 mm. The bit measures 14 mm in length and 4 mm in height. The scraper shows usewear on the ventral surface of the flake.

Although the age and cultural affiliation is unknown, Location 18 likely represents a campsite whose occupants exploited the nearby river sources. Because Location 18 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 23

The first part of the Stage 3 investigation on Location 23 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Thirteen surface locations were recorded. In addition to the controlled surface collection, eight test units were hand excavated. The test units ranged from 16 and 35 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from one to thirteen artifacts per unit (see Figure 15). No subsurface features were recovered. The Stage 3 investigation recovered 76 artifacts, including 15 from the surface and 61 from the test units. Table 14 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, although two formal tools were recovered from the site.

**Table 14: Location 23 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 74 | 97.4 |
| projectile point | 1 | 1.3 |
| scraper | 1 | 1.3 |
| **Totals** | **76** | **100%** |

A total of 74 pieces of chipping detritus were recovered from Location 23. The debitage was analyzed for raw material type and flake morphology (Table 15). All of the flakes (100%) are manufactured on high quality Onondaga chert. The flakes are largely biface thinning and finishing flakes, flakes that are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site. Ten flakes show evidence of heating.

**Table 15: Location 23 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 0 | 0 | 0 | 0 |
| biface thinning | 37 | 1 | 0 | 38 |
| biface finishing | 3 | 0 | 0 | 3 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 24 | 9 | 0 | 33 |
| **Totals** | **64** | **10** | **0** | **74** |

One projectile point was recovered from Location 23. It is a Lamoka point of the Middle Archaic Period (*ca.* 8,000-4,500 B.P.) and is manufactured on Onondaga chert. The tip is missing and the base has been partially broken. The point measures 30 mm in height and 6 mm in thickness. It has a shoulder width of 19 mm, a neck width of 12 mm, and a base width of 14 mm.

One scraper was also recovered from Location 23. It is a side scraper measuring 39 mm in overall length, 36 mm in overall width, and has an overall thickness of 9 mm. The bit is located on the ventral surface and measures 20 mm in length and 4 mm in height. It is manufactured on Onondaga chert.

Because Location 23 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 24

The first part of the Stage 3 investigation on Location 24 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. During the subsequent excavation of Location 25 it was determined that it was a locus of Location 24 and is therefore represented as Locus 2.

### *Locus 1*

Twenty-one surface locations were recorded. In addition to the controlled surface collection, twenty-eight test units were hand excavated. The test units ranged from 25 and 38 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from one to

sixty-one artifacts per unit (see Figure 18). No subsurface features were recovered. The Stage 3 investigation recovered 377 artifacts, including 31 from the surface and 346 from the test units of Locus 1. Table 16 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but ten formal tools were recovered from the site.

**Table 16: Location 24 Artifact Recovery (Locus 1)**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| biface | 3 | **0.79** |
| chipping detritus | 366 | **97.1** |
| core | 1 | **0.26** |
| projectile point | 2 | **0.53** |
| scraper | 5 | **1.33** |
| **Totals** | **377** | **100%** |

A total of 366 pieces of chipping detritus were recovered from Locus 1 on Location 24. The debitage was analyzed for raw material type and flake morphology (Table 17). The majority of the flakes (97.8 %) are manufactured on high quality Onondaga chert although eight pieces (2.2 %) were manufactured on what appears to be a local glacial till variety of chert. One biface thinning flake shows usewear along one edge. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site.

**Table 17: Location 24 Debitage Analysis (Locus 1)**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 4 | 0 | 2 | 6 |
| biface thinning | 164 | 23 | 4 | 191 |
| biface finishing | 15 | 1 | 0 | 16 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 117 | 34 | 2 | 153 |
| **Totals** | **300** | **58** | **8** | **366** |

Two projectile points were recovered from Locus 1. The first is a reworked Meadowood (*ca.* 900-400 B.P.) manufactured on Onondaga chert. It measures 32 mm in length and has a shoulder width of 21 mm, a neck width of 16 mm, and a base width of 23 mm.

The second projectile point is has been reworked extensively making classification impossible. It is manufactured on Onondaga chert and measures 17 mm in length. It has a shoulder width of 20 mm, a neck width of 12 mm, and a base width of 15 mm.

Six scrapers were recovered from Location 24, Locus 1. The following table outlines the type and metrics of each scraper.

**Figure 15: Results of Stage 3 Investigations at Location 23**

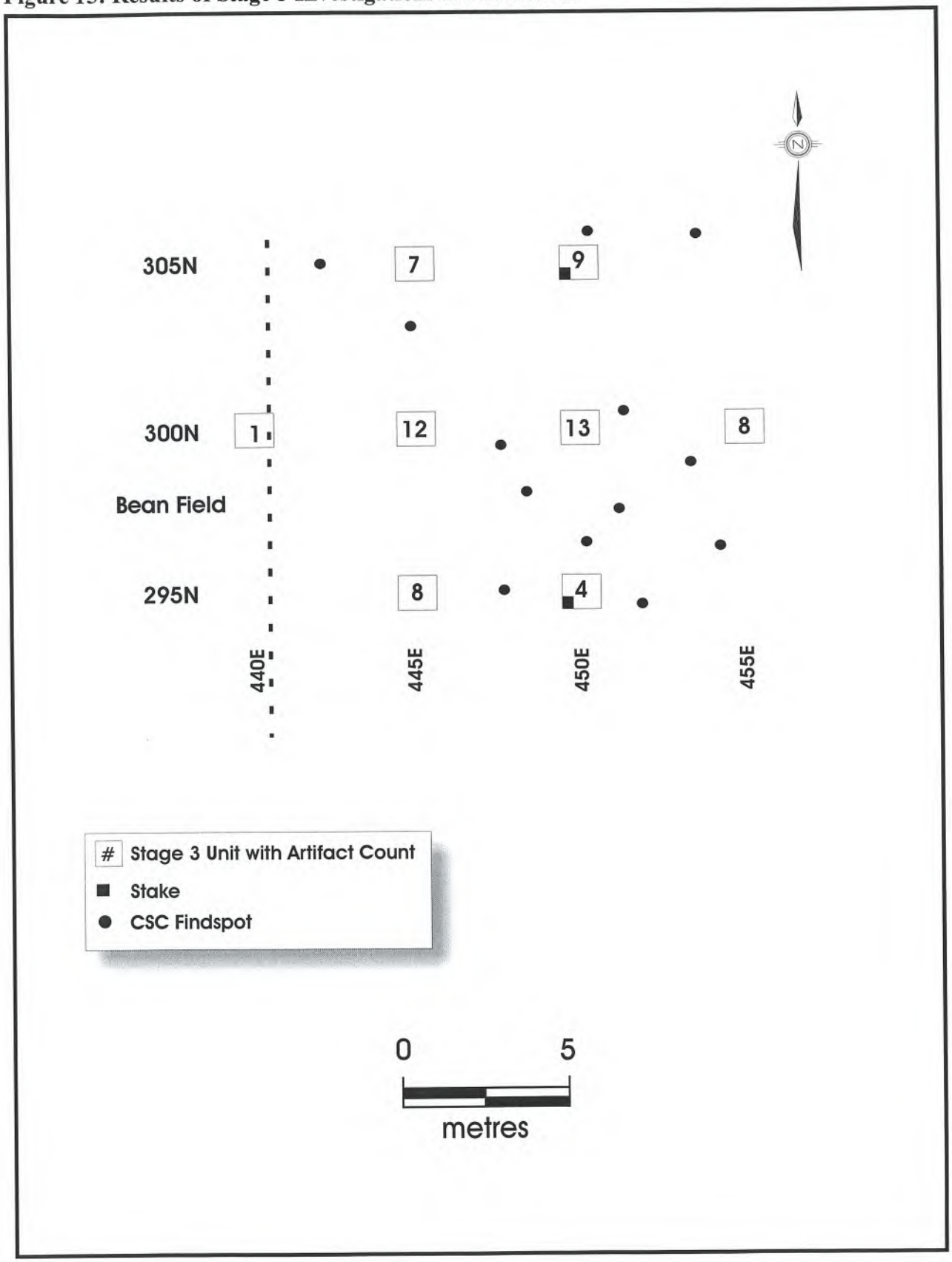


**Figure 16: Location 18, Unit 600E 300N, North Wall Profile**





**Figure 17: Crew at Work on Location 23, Facing Southwest**



**Table 18: Scraper Metrics for Location 24, Locus 1. All measurements in mm**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *TYPE* | *BIT LENGTH* | *BIT HEIGHT* | *COMMENTS* |
|---|---|---|---|---|---|---|---|
| 2043 | 35 | 36 | 5 | side | 20 | 3 | |
| 2044 | 39 | 23 | 5 | side | 22 | 3 | |
| 2057 | 19 | 25 | 3 | end | 23 | 3 | fragment |
| 2068 | 28 | 29 | 8 | side | 17 | 4 | ventral side worked |
| 2071 | 32 | 34 | 6 | side | 27 | 5 | ventral side worked |

Three bifaces were recovered from Location 24, Locus 1. Table 19 outlines the metrics of each biface.

**Table 19: Biface Metrics for Location 24, Locus 1. All measurements in mm**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *COMMENTS* |
|---|---|---|---|---|
| 2041 | 62 | 37 | 15 | |
| 2069 | 48 | 44 | 11 | base |
| 2086 | 45 | 35 | 8 | |

One core was recovered from Location 24, Locus 1. It is a single random block core, 46 mm by 31 mm by 15 mm with flakes removed from several surfaces. Cores are by-products of stone tool manufacture, what is discarded after flakes have been removed.

### *Locus 2*

Twelve surface locations were recorded in Locus 2. In addition to the controlled surface collection, fourteen test units were hand excavated. The test units ranged from 26 to 36 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from three to forty-seven artifacts per unit (see Figure 19). No subsurface features were recovered.

The Stage 3 investigation recovered 176 artifacts, including 14 from the surface and 162 from the test units. Table 20 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but three formal tools were recovered from the site.

**Table 20: Location 24 Artifact Recovery (Locus 2)**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 173 | **98%** |
| scraper | 3 | **2%** |
| **Totals** | **176** | **100%** |

A total of 173 pieces of chipping detritus were recovered from Locus 2 on Location 24. The debitage was analyzed for raw material type and flake morphology (Table 21). All of the flakes are manufactured on high quality Onondaga chert. Fourteen pieces show evidence of heating.

**Table 21: Location 24 Debitage Analysis (Locus 2)**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | **0** |

| | | | | |
|---|---|---|---|---|
| secondary | 3 | 0 | 0 | **3** |
| biface thinning | 84 | 5 | 0 | **89** |
| biface finishing | 7 | 0 | 0 | **7** |
| shatter | 0 | 0 | 0 | **0** |
| fragment | 65 | 9 | 0 | **74** |
| **Totals** | **159** | **14** | **0** | **173** |

Three scrapers were recovered from Locus 2. Table 22 outlines the type and metric for each scraper.

**Table 22: Scraper Metrics for Location 24, Locus 2. All measurements in mm**

| *CAT#* | *CHERT* | *LENGTH* | *WIDTH* | *THICK* | *TYPE* | *BIT LENGTH* | *BIT HEIGHT* | *COMMENTS* |
|---|---|---|---|---|---|---|---|---|
| 2107 | Onondaga | 22 | 28 | 4 | side | 19 | 4 | ventral side worked |
| 2111 | Haldimand | 15 | 10 | 3 | side | 12 | 2 | fragment |
| 2112 | Onondaga | 17 | 15 | 3 | side | 11 | 2 | fragment |

Location 24 represents a Early to Middle Woodland compsite and a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 36

The first part of the Stage 3 investigation on Location 36 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Three surface locations were recorded, all within one-metre of each other. In addition to the controlled surface collection, one test unit was hand excavated. The test unit was 29 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil.

Two pieces of chipping detritus, manufactured on Onondaga chert, were recovered from the unit (see Figure 12). Both were biface thinning flakes.

Because of the low artifact count in the unit at Location 36, the site has little information value. As such, no further fieldwork is warranted for Location 36.

## Location 47

The first part of the Stage 3 investigation on Location 47 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Despite a 20-metre intensification of the area, the previous three findspots located during the Stage 2 investigations could not be relocated. Between the Stage 2 and 3 investigations, the property had been planted with corn, which may have contributed to the failure to relocate the original findspots. Therefore, the location was relocated using the GPS coordinates recorded during the Stage 2 survey and a test unit was excavated at those coordinates (see Figure 19).

The test unit was 30 centimeters in depth and contained one biface thinning flake, manufactured on Onondaga chert. No subsurface features were recovered.

Because of the low artifact count in the unit at Location 47, the site has little information value. As such, no further fieldwork is warranted for Location 47.

## Location 54

The first part of the Stage 3 investigation on Location 54 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Three surface locations were recorded. In addition to the controlled surface collection, four test units were hand excavated (see Figure 20). The test units ranged from 18 to 28 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil.

A total of two pieces of chipping detritus were recovered from Location 15. The debitage was analyzed for raw material type and flake morphology. All were biface thinning flakes manufactured on high quality Onondaga chert. No subsurface features were recovered.

Because of the low artifact counts in the units at Location 54, the site has little information value. As such, no further fieldwork is warranted for Location 54.

## Location 58

The first part of the Stage 3 investigation on Location 58 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Eight surface locations were recorded. In addition to the controlled surface collection, five test units were hand excavated. The test units ranged from 20 to 34 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from three to nine artifacts per unit (see Figure 23). No subsurface features were recovered.

The Stage 3 investigation recovered 21 artifacts, including five from the surface and 16 from the test units. Table 23 provides a breakdown of the assemblage by artifact type. The assemblage includes only chipping detritus, although one biface and one scraper were recovered from the Stage 2 investigations.

**Table 23: Location 58 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 21 | **100%** |

A total of 27 pieces of chipping detritus were recovered from Location 58. The debitage was analyzed for raw material type and flake morphology (Table 24). The majority of the flakes (99 %) are manufactured on high quality Onondaga chert although one piece (1 %) was manufactured on what appears to be a local glacial till variety of chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site. Two flakes show evidence of heating.

**Table 24: Location 58 Debitage Analysis**

| | *RAW MATERIAL* | |
|---|---|---|

| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
|---|---|---|---|---|
| primary | 0 | 0 | 0 | 0 |
| secondary | 2 | 0 | 1 | 3 |
| biface thinning | 16 | 0 | 0 | 16 |
| biface finishing | 3 | 0 | 0 | 3 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 3 | 2 | 0 | 5 |
| **Totals** | **24** | **2** | **1** | **27** |

Because of the low artifact counts in the units at Location 58, the site has little information value. As such, no further fieldwork is warranted for Location 58.

**Location 62**

The first part of the Stage 3 investigation on Location 62 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Five surface locations were recorded. In addition to the controlled surface collection, six test units were hand excavated. The test units ranged from 17 and 26 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from zero to ten artifacts per unit (see Figure 24). No subsurface features were recovered.

The Stage 3 investigation recovered 36 artifacts, including two from the surface and 60 from the test units. Table 25 provides a breakdown of the assemblage by artifact type. All of the assemblage is chipping detritus, and no formal tools were recovered from the site.

**Table 25: Location 62 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 36 | **100%** |

A total of 36 pieces of chipping detritus were recovered from Location 58. The debitage was analyzed for raw material type and flake morphology (Table 26). All of the flakes are manufactured on high quality Onondaga chert. The flakes are largely biface thinning and finishing flakes, flakes that are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site. Three pieces show evidence of heating.

**Table 26: Location 62 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 0 | 0 | 0 | 0 |
| biface thinning | 17 | 2 | 0 | 19 |
| biface finishing | 6 | 0 | 0 | 6 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 10 | 1 | 0 | 11 |
| **Totals** | 33 | 3 | 0 | 36 |

Because Location 62 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

**Figure 18: Results of Stage 3 Investigations at Location 24**

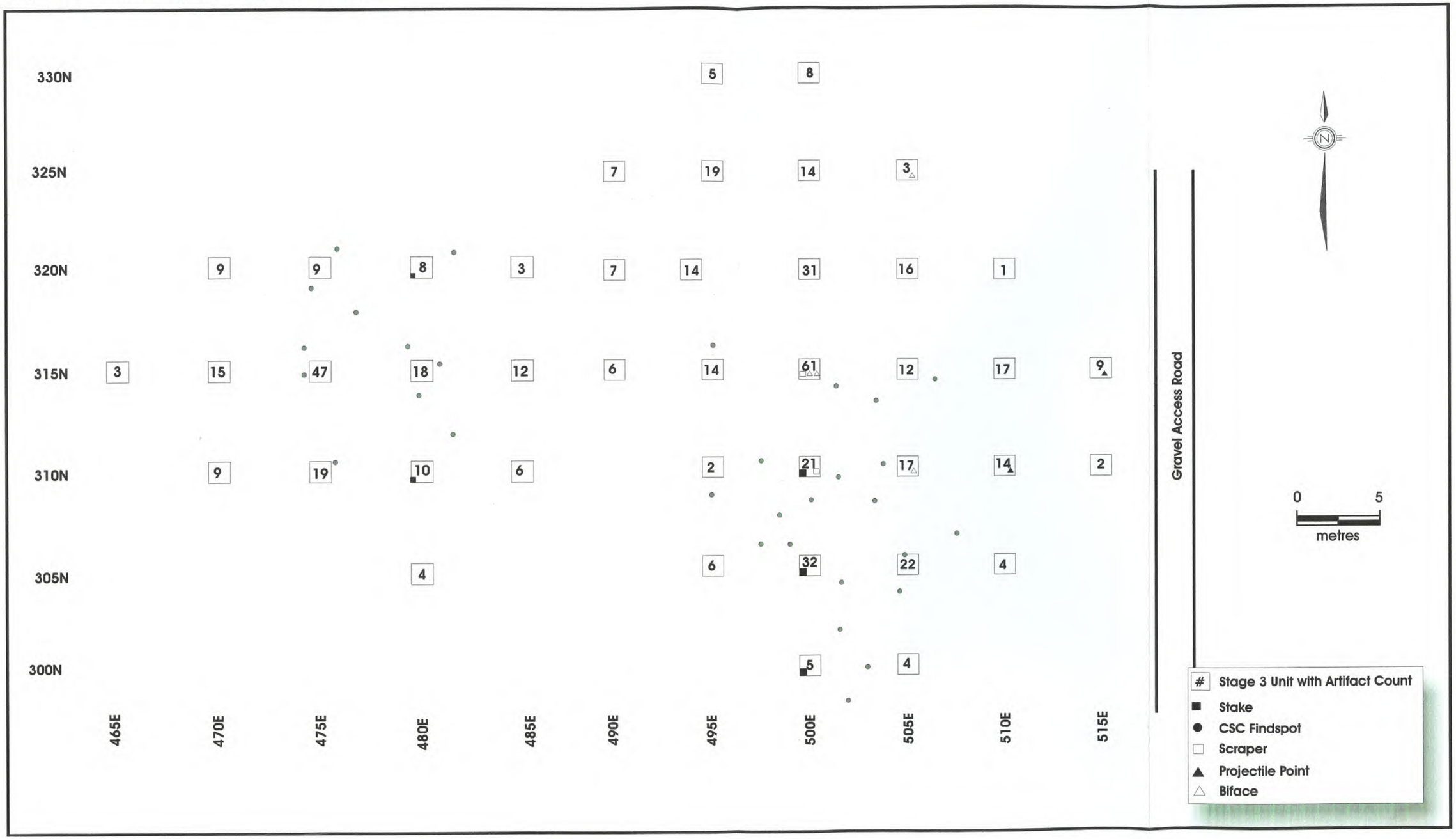


**Figure 19: Artifacts Recovered During Stage 2 Excavations**



Location 80
Snyder Point
(Flint Ridge Chert)



Location 69
Projectile Point



Location 21
Biface



Location 68
End Scraper

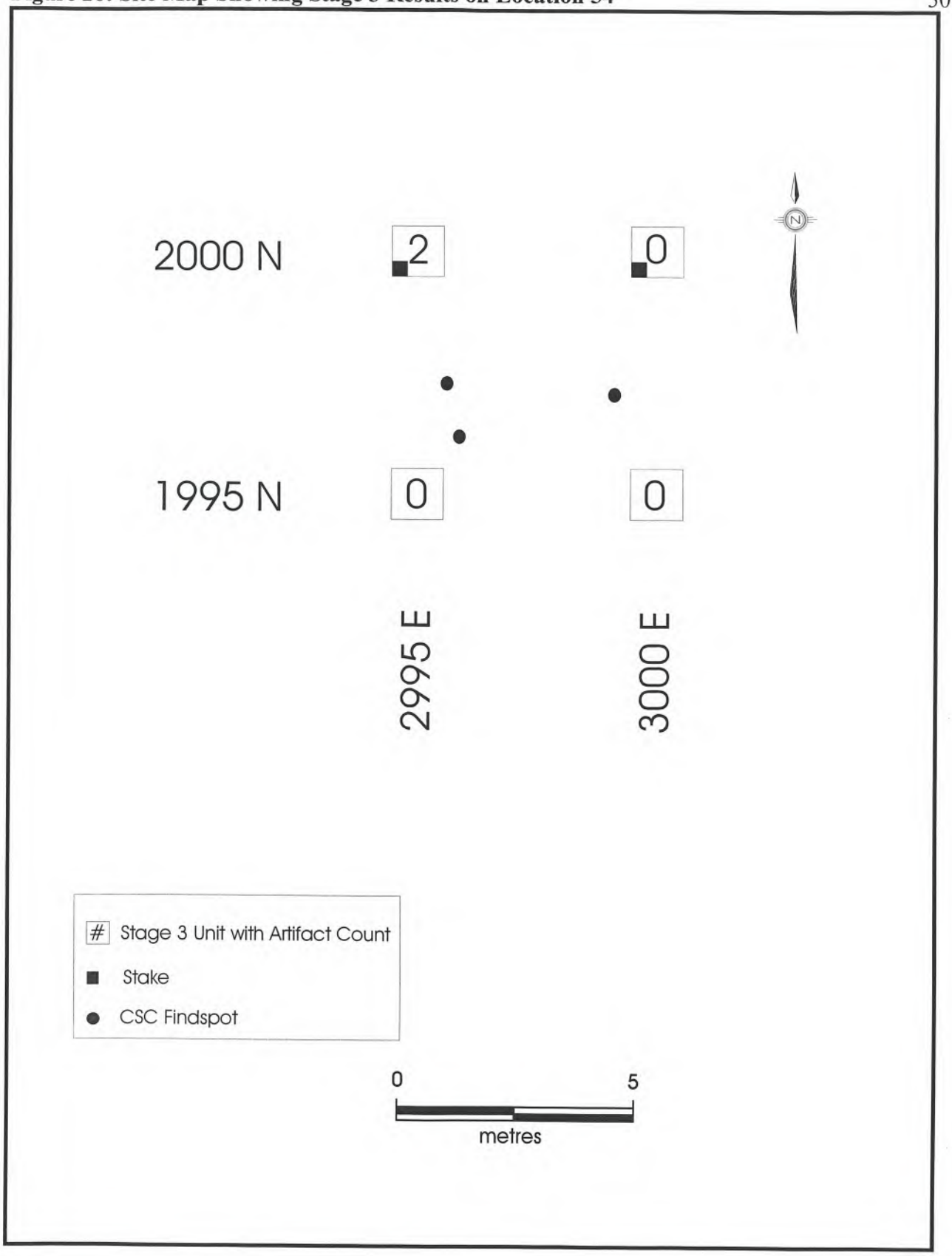


Location 91
Crawford Knoll Point



**Figure 20: Site Map Showing Stage 3 Results on Location 54**





## Location 64

The first part of the Stage 3 investigation on Location 64 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Seven surface locations were recorded. In addition to the controlled surface collection, four test units were hand excavated. The test units ranged from nine and forty-two centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from six to nine artifacts per unit (see Figure 27). No subsurface features were recovered.

The Stage 3 investigation recovered 35 artifacts, including five from the surface and 30 from the test units. Table 27 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but one biface was recovered from the site.

**Table 27: Location 62 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 32 | **91%** |
| bifaces | 2 | **6%** |
| modified groundstone | 1 | **3%** |
| **Totals** | **35** | **100%** |

A total of 32 pieces of chipping detritus were recovered from Location 64. The debitage was analyzed for raw material type and flake morphology (Table 28). All of the flakes are manufactured on high quality Onondaga chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site. Three pieces show evidence of heating.

**Table 28: Location 64 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 1 | 0 | 0 | 1 |
| biface thinning | 14 | 0 | 0 | 14 |
| biface finishing | 2 | 0 | 0 | 2 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 12 | 3 | 0 | 15 |
| **Totals** | 29 | 3 | 0 | 32 |

Two bifaces were recovered from Location 64. The first is a fragment manufactured on Onondaga chert. It measures 27 mm in overall length, 26 mm in overall width, and has an overall thickness of 5 mm.

The second biface is complete and is manufactured on Selkirk chert. It measures 51 mm in length, 33 mm in width, and has an overall thickness of 7 mm.

A fragment of groundstone was recovered. Ground tools are tools that are manufactured by grinding, pecking, and/or polishing rock into a desired shape. It is made

from siltstone and shows smoothing and usewear on one edge. It is too fragmentary to determine a tool type.

Because of the low artifact counts in the units at Location 64, the site has little information value. As such, no further fieldwork is warranted for Location 64.

## Location 65

The first part of the Stage 3 investigation on Location 65 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Two surface locations were recorded. In addition to the controlled surface collection, six test units were hand excavated. The test units ranged from twenty and thirty-four centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from five to sixteen artifacts per unit (see Figure 28). No subsurface features were recovered.

**Table 29: Location 65 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 43 | **97.7%** |
| utilized flakes | 1 | **2.3%** |
| **Totals** | **44** | **100%** |

The Stage 3 investigation recovered 44 artifacts, including one from the surface and 43 from the test units. Table 29 provides a breakdown of the assemblage by artifact type. All of the assemblage is chipping detritus, and no formal tools were recovered from the site.

A total of 44 pieces of chipping detritus were recovered from Location 65. The debitage was analyzed for raw material type and flake morphology (Table 30). The majority of the debitage (93 %) was manufactured on Onondaga chert with the remaining three flakes manufactured on local glacial till. The flakes are largely biface thinning and finishing flakes, flakes that are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site. One biface thinning flake shows usewear on one edge. Five pieces show evidence of heating.

**Table 30: Location 65 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 2 | 0 | 1 | 3 |
| biface thinning | 17 | 3 | 2 | 22 |
| biface finishing | 4 | 0 | 0 | 4 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 13 | 2 | 0 | 15 |
| **Totals** | 36 | 5 | 3 | 44 |

Because Location 65 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

**Figure 21: Crew at Work on Location 54, Facing Southeast**

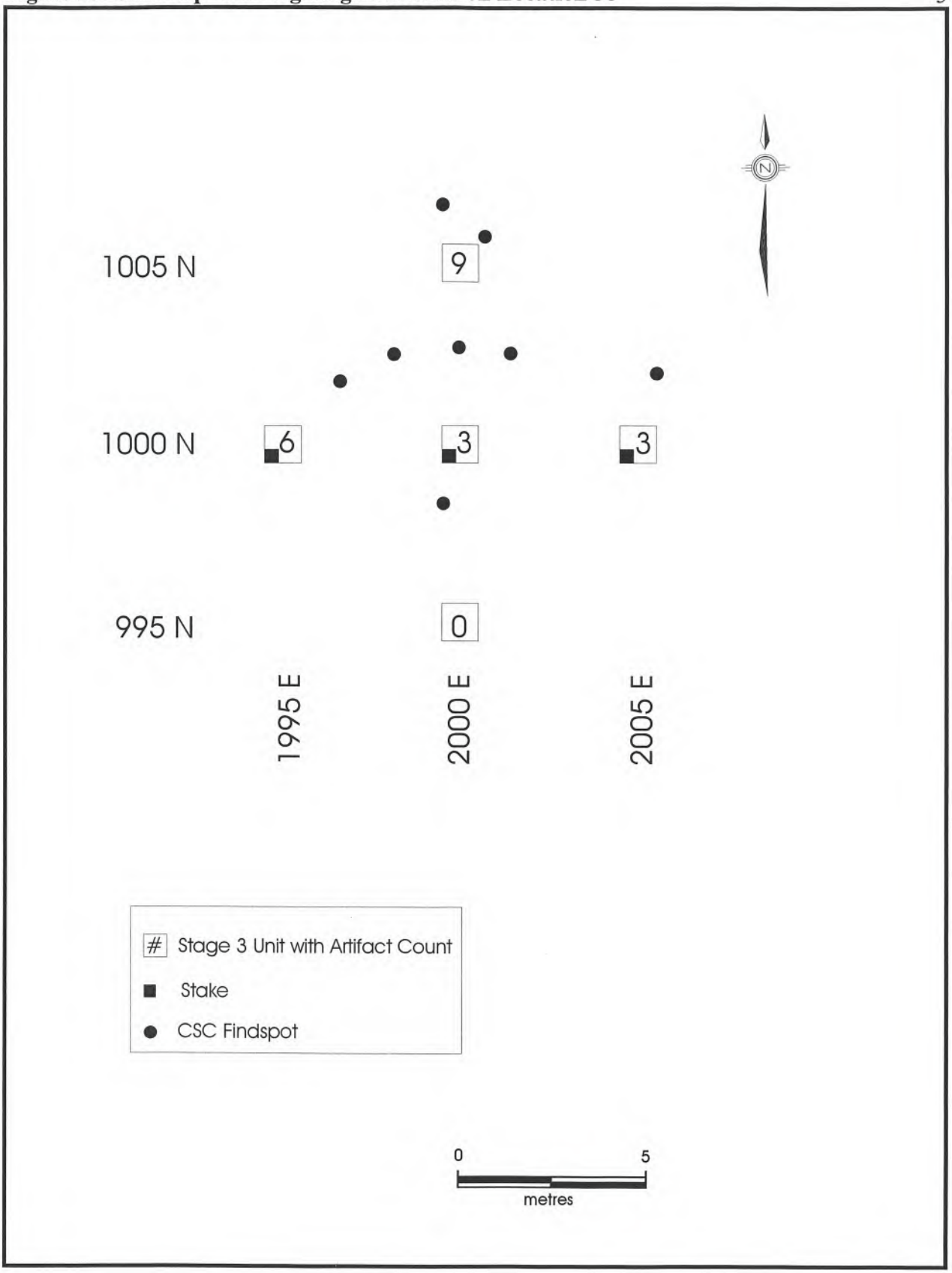


**Figure 22: Location 54, Unit 2995E 2000N, East Wall Profile**



**Figure 23: Site Map Showing Stage 3 Results on Location 58**





## Location 66

The first part of the Stage 3 investigation on Location 66 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Twenty-six surface locations were recorded. In addition to the controlled surface collection, sixty-two test units were hand excavated. The test units ranged from twenty to fifty-two centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from five to sixteen artifacts per unit (see Figure 31). No subsurface features were recovered. During the course of the Stage 3 excavations, Locations 67, 68, 70, 71, and 73 all combined to become part of the larger site of Location 66.

**Table 31: Location 66 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 829 | **96.7%** |
| biface | 2 | **0.23%** |
| bone fragment | 1 | **0.12%** |
| core | 1 | **0.12%** |
| fragmentary sherds | 11 | **1.28%** |
| projectile points | 5 | **0.58%** |
| scraper | 7 | **0.82%** |
| utilized flakes | 1 | **0.12%** |
| Totals | **857** | **100%** |

The Stage 3 investigation recovered 857 artifacts, including 28 from the surface and 829 from the test units. Table 31 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but 14 formal tools were recovered from the site.

A total of 830 pieces of chipping detritus were recovered Location 66. The debitage was analyzed for raw material type and flake morphology (Table 32). The majority of the flakes (96.0 %) are manufactured on high quality Onondaga chert although eight pieces (4.0 %) were manufactured on what appears to be a local glacial till variety of chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, although the presence of primary and secondary flakes indicate that at least some core preparation took place on the site. One biface thinning flake shows usewear along one edge.

**Table 32: Location 66 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 2 | 0 | 1 | 3 |
| secondary | 16 | 1 | 2 | 19 |
| biface thinning | 370 | 27 | 20 | 417 |
| biface finishing | 70 | 8 | 0 | 78 |
| shatter | 7 | 2 | 0 | 9 |
| fragment | 263 | 31 | 10 | 304 |
| **Totals** | **728** | **69** | **33** | **830** |

Two bifaces were recovered from Location 66. The first is manufactured on Onondaga chert. It measures 63 mm in length, 32 mm in length, and has an overall

thickness of 15 mm. It has been thinned significantly at the proximal end and is otherwise complete but for a mass of cortex at the distal end that may have hindered its completion.

The second is a partial base and lateral edge of a biface. It has an overall length of 40 mm, an overall width of 26 mm, and an overall thickness of 6 mm.

One core was recovered from Location 66. It is a single random block core, 71 mm by 27 mm by 15 mm with flakes removed from several surfaces.

Eleven clay pottery fragments were recovered from Location 66. In Ontario, pottery is only found on Woodland period sites, from 900 B.P. to the historic period. All fragments recovered are very small and have been heavily delaminated with no decoration or body treatment still visible.

Seven scrapers were recovered from the location. Table 33 outlines the type and metrics of each scraper. All are manufactured on Onondaga chert.

**Table 33: Scraper Metrics for Location 66. All measurements in millimetres**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *TYPE* | *BIT LENGTH* | *BIT HEIGHT* | *COMMENTS* |
|---|---|---|---|---|---|---|---|
| 1745 | 32 | 18 | 6 | side | 13 | 2 | ventral side worked |
| 1777 | 20 | 17 | 5 | side | 10 | 2 | fragment |
| 1785 | 43 | 23 | 10 | side | 19 | 4 | ventral side worked |
| 1788 | 40 | 34 | 16 | side | 16 | 3 | |
| 1231 | 42 | 31 | 6 | side | 39 | 3 | |
| 1234 | 26 | 12 | 4 | side | 11 | 1 | |
| 1242 | 25 | 17 | 4 | side | 21 | 2 | |

Five projectile points were recovered from the location. All are manufactured on Onondaga chert. The first is a base with a neck width of 10 mm, and a base width of 13 mm.

The second is a Normanskill and has an overall length of 44 mm and an overall thickness of 8 mm. The shoulder width measures 23 mm, the neck width is 14 mm, and it has a base width of 16 mm.

The third is the base of an Adder Orchard projectile point. It has a neck width of 21 mm, and a base width of 20 mm.

The fourth is a reworked Brewerton point. It measures 39 mm in overall length and 8 mm in overall thickness. It has a shoulder width of 26 mm, a neck width of 18 mm, and a base width of 25 mm.

The fifth is a Hind point of the end of the Late Archaic Period (*ca.* 900 B.C.) These points are believed to be the predecessors of the Meadowood culture (Ellis *et al.* 1990). It is corner-notched and the tip has been broken. It measures 34 mm in overall width and 9 mm in overall thickness. The shoulder width measures 34 mm, the neck width measures 23 mm, and the base width measures 27 mm.

One piece of faunal bone was recovered. It is from a small mammal.

Location 66 represents a multi-component campsite of the Late Archaic to Woodland period and is a significant archaeological resource. A Stage 4 is recommended for this site if it cannot be avoided during future development.

**Figure 24: Site Map Showing Stage 3 Results on Location 62**



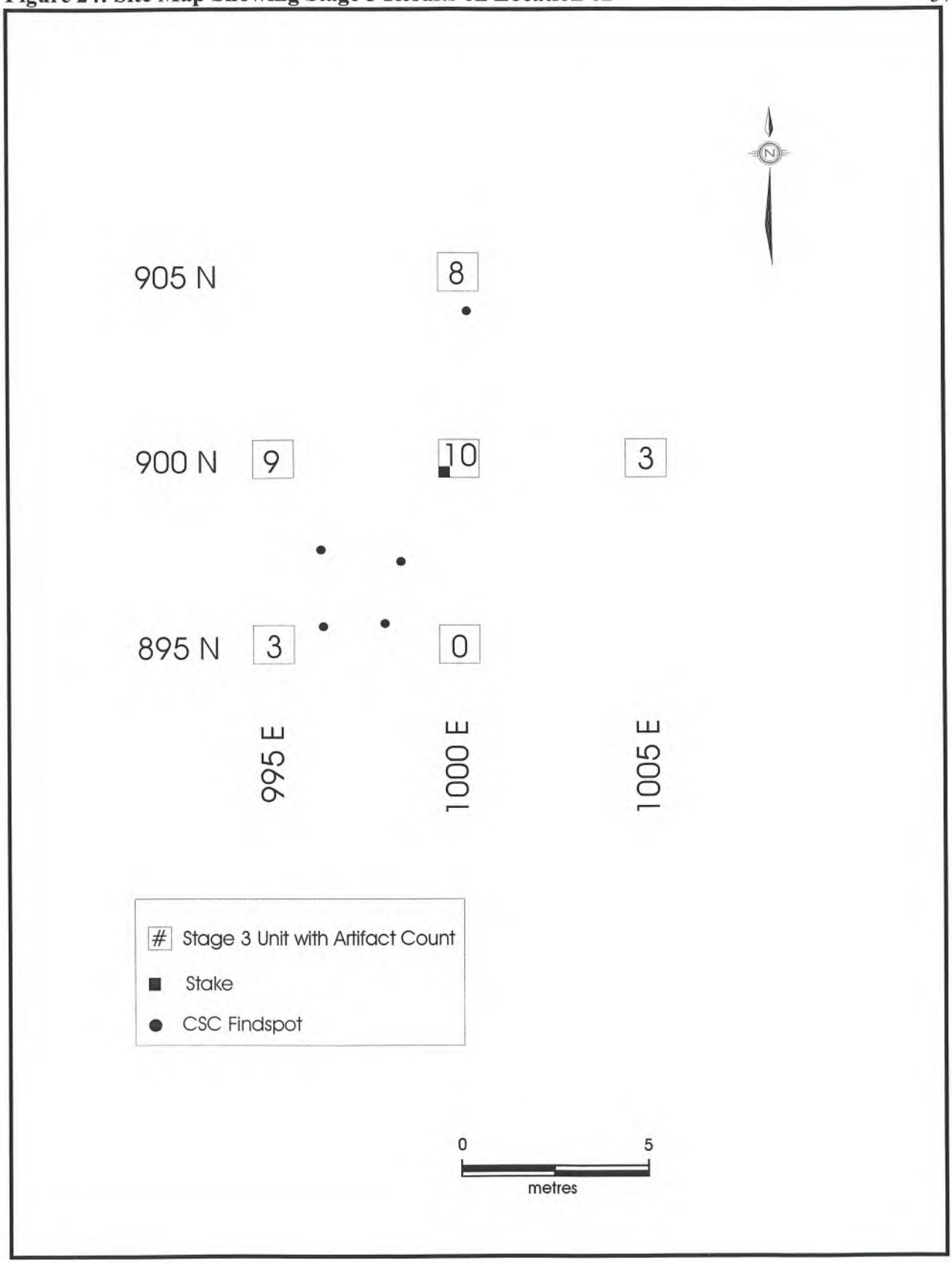


**Figure 25: Crew at Work on Location 58, Facing East**





**Figure 26: Crew at Work on Location 62, Facing West**



## Location 69

The first part of the Stage 3 investigation on Location 69 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Five surface locations were recorded. In addition to the controlled surface collection, eight test units were hand excavated. The test units ranged from twenty-seven and thirty-six centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from three to twenty-eight artifacts per unit (see Figure 32). No subsurface features were recovered.

**Table 34: Location 69 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 73 | **97.3%** |
| scraper | 1 | **1.3%** |
| utilized flakes | 1 | **1.3%** |
| **Totals** | **75** | **100%** |

The Stage 3 investigation recovered 75 artifacts, including three from the surface and 72 from the test units. Table 34 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but two formal tools were recovered from the site.

A total of 74 pieces of chipping detritus were recovered from Location 23. The debitage was analyzed for raw material type and flake morphology (Table 15). All of the flakes (100%) are manufactured on high quality Onondaga chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site. One biface thinning flake shows usewear on one edge.

**Table 35: Location 69 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 0 | 0 | 0 | 0 |
| biface thinning | 47 | 0 | 0 | 47 |
| biface finishing | 2 | 0 | 0 | 2 |
| shatter | 2 | 0 | 0 | 2 |
| fragment | 23 | 0 | 0 | 23 |
| **Totals** | 74 | 0 | 0 | 74 |

One scraper was recovered from this location. It is a fragment and is manufactured on Onondaga chert. It has an overall length of 19 mm, an overall width of 15mm, and an overall thickness of 3 mm. The bit measures 10 mm and has a height of 2 mm. It has been worked on the ventral side.

Although its age and cultural affiliations are unknown, a Stage 4 is recommended for Location 69 if it cannot be avoided during future development.

## Location 75

The first part of the Stage 3 investigation on Location 75 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Seven surface locations were recorded. In addition to the controlled surface collection, twelve test units were hand excavated. The test units ranged from seventeen and twenty-eight centimeters in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from three to fifty artifacts per unit (see Figure 35). No subsurface features were recovered.

The Stage 3 investigation recovered 131 artifacts, including twenty from the surface and 111 from the test units. Table 36 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but two formal tools were recovered from the site.

**Table 36: Location 75 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 125 | **95.5%** |
| core | 2 | **1.5%** |
| scraper | 2 | **1.5%** |
| utilized flake | 2 | **1.5%** |
| **Totals** | **131** | **100%** |

A total of 127 pieces of chipping detritus were recovered from Location 75. The debitage was analyzed for raw material type and flake morphology (Table 37). All of the flakes (100%) are manufactured on high quality Onondaga chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, although the presence of secondary flakes indicate that at least some core preparation took place on the site. Two of the biface thinning flakes show usewear on one edge.

**Table 37: Location 75 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| *FLAKE TYPE* | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 6 | 0 | 0 | 6 |
| biface thinning | 75 | 0 | 0 | 75 |
| biface finishing | 12 | 0 | 0 | 12 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 34 | 0 | 0 | 0 |
| **Totals** | **127** | **0** | **0** | **127** |

Two scrapers were recovered from this location. The first is manufactured on Onondaga chert. It has an overall length of 26 mm, an overall width of 17 mm, and an overall thickness of 4 mm. The bit measures 12 mm and has a height of 2 mm.

The second scraper is also manufactured on Onondaga chert. It has an overall length of 22 mm, an overall width of 18 mm, and an overall thickness of 3 mm. The bit measures 10 mm and has a height of 2 mm.

Two cores, made on Onondaga chert, were recovered from Location 75. Both are single random block cores, the first measuring 59 mm by 45 mm by 20 mm with flakes removed from several surfaces.

The second measures 50 mm by 32 mm by 26 mm with flakes removed from several surfaces.

Although its age and cultural affiliations are unknown, Location 75 indicates a significant archaeological resource, and a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 76

A total of 24 artifact stations were recorded during the controlled surface collection at Location 76. A total of 36 units were excavated as part of the Stage 3 investigation (see Figure 36), with the excavated ploughzone ranging in depth from 14 to 31 centimeters in thickness. Artifact recovery rates ranged from a low of seven to a high of ninety-six artifacts per unit.

In total, over twelve hundred artifacts were recovered from the Stage 3 excavations at Location 76. A brief discussion of each artifact class is presented below. The majority of the artifacts were kitchen wares, such as glass and ceramic, although architectural materials such as brick and window glass were also quite prevalent.

**Table 38: Artifact Totals by Functional Class, Location 76**

| *ARTIFACT TYPE* | *FREQUENCY* | *PERCENTAGE* |
|---|---|---|
| Aboriginal | 16 | *1.27* |
| Architectural | 330 | *26.40* |
| Organic | 100 | *7.97* |
| Personal | 12 | *0.96* |
| Household | 8 | *0.63* |
| Kitchen | 789 | *62.87* |
| **TOTAL** | **1255** | ***100.0%*** |

### Aboriginal Artifacts

Fifteen flakes and an end scraper were recovered during the Stage 3 excavations at Location 76. The Aboriginal artifacts were found in ten different units, with no more than three found in a single unit. All of the flakes are made of Onondaga chert. The end scraper is fragmentary, and is made on heated Onondaga chert.

### Architectural Artifacts

The architectural class is comprised of various building materials, including nails, brick, and window glass. Table 39 provides a breakdown of each of the artifact types included in the architectural class. These artifacts represent more than one-quarter of the total artifact assemblage at Location 76.

A total of 33 nails were recovered during excavations. Twenty-five of these are machine cut nails, which are commonly manufactured between 1830 and 1860. Seven wire nails

**Figure 27: Site Map Showing Stage 3 Results on Location 64**



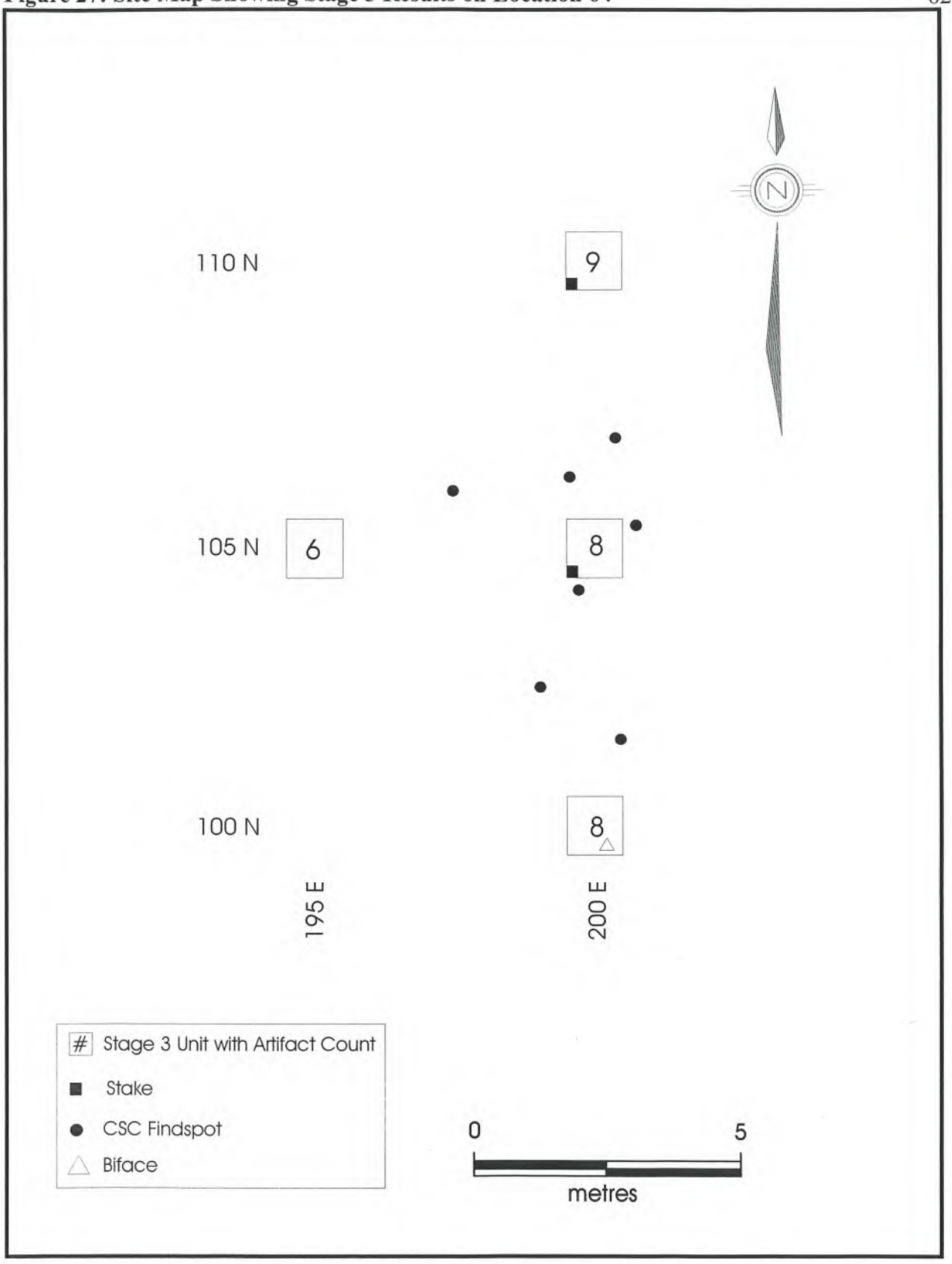
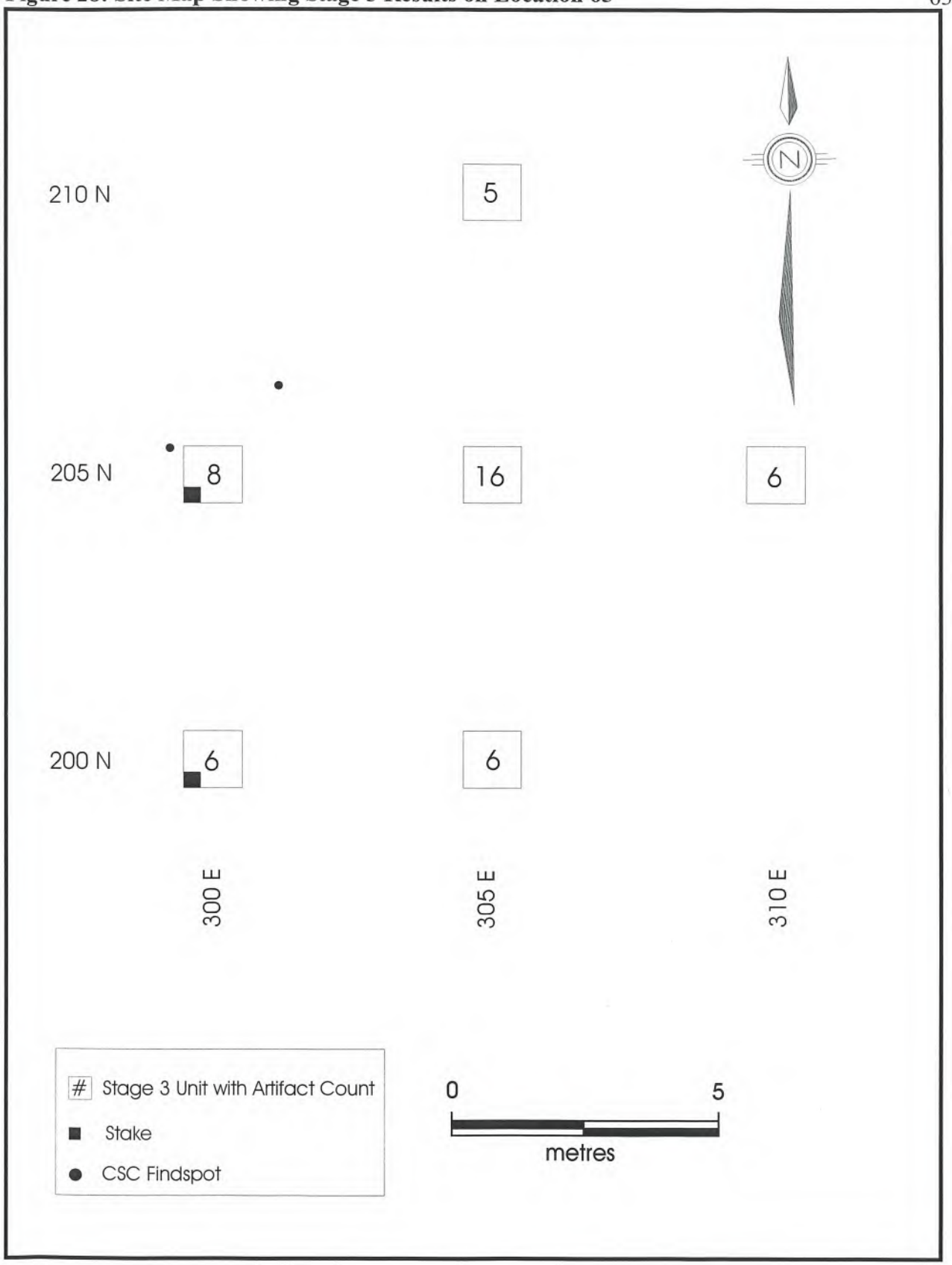


**Figure 28: Site Map Showing Stage 3 Results on Location 65**





were recovered: these nails are most common in the last half of the nineteenth century. Of the 134 fragments of brick that were collected, three different kinds of brick were evident. The majority of the fragments were red brick, but a small amount of yellow brick was also collected. Nine fragments of a recently manufactured black and red mottled brick were also recovered. Small amounts of mortar and cement were recovered.

**Table 39: Architectural Class Artifact Types, Location 76**

| *ARTIFACT TYPE* | *FREQUENCY* |
|---|---|
| nail, wire | 7 |
| nail, machine cut | 25 |
| nail, indeterminate | 1 |
| screw | 1 |
| brick | 134 |
| mortar | 8 |
| cement | 3 |
| window glass < 1.6 mm | 33 |
| window glass > 1.6 mm | 107 |
| wire | 1 |
| miscellaneous metal | 10 |
| **TOTAL** | **330** |

A total of 140 pieces of window glass were recovered from Location 76. Kenyon (1980) has observed that through time there is a trend toward thicker glass and that pane glass with a thickness of 1.6 mm or greater generally indicates a post-1850 date. At Location 76, only 33 pieces, 23 percent of the glass, is less than 1.6 mm in thickness and 107 pieces, 77 percent, of the window glass is thicker than 1.6 mm, suggesting that most of the window glass used for the house was manufactured after 1850.

A number of miscellaneous metal pieces were recovered, including hinges, nuts and bolts, wire, and other indeterminate flat strapping that were all likely used in the construction or maintenance of the house and possible outbuildings.

## Organic Artifacts

This category includes faunal bone, and plant remains, including charcoal and seeds. A total of 100 organic artifacts were recovered, all of which are faunal material. In total, 98 pieces of bone and 2 pieces of clam shell were recovered. The bone is largely made up of mammal bone fragments, most of which showed evidence of butchering. One piece was calcined. Three pieces of bird bone were recovered.

**Table 40: Organic Class Artifact Types, Location 76**

| *ARTIFACT TYPE* | *FREQUENCY* |
|---|---|
| bone | 98 |
| shell | 2 |
| **TOTAL** | **100** |

## Personal Artifacts

Artifacts in this category include items related to clothing, and leisure and recreation activities. In total, eleven artifacts were recovered from this class, the majority of which are buttons. Five buttons were recovered, four of which are four-holed buttons. Two are made of glass, one of bone and one of shell. The remaining button is metal and has a hunting scene embossed on the front. The back reads "EXTRA RICH QUALITY".

Two artifacts likely relating to horses were recovered. They are both harness ring bits. The remaining personal artifacts consist of an opaque blue glass bead, two slate blackboard fragments, and a plain white clay pipe bowl fragment, and a porcelain figurine leg fragment.

**Table 41: Personal Class Artifact Types, Location 76**

| *ARTIFACT TYPE* | *FREQUENCY* |
|---|---|
| button | 5 |
| bead | 1 |
| equestrian | 2 |
| figurine | 1 |
| white clay pipe | 1 |
| slate blackboard | 2 |
| **TOTAL** | **12** |

## Household Artifacts

This category includes household accessories and decorative artifacts as well as objects used to keep the household functioning. A total of 8 artifacts were found, including three pieces of coal, and a clear glass chimney lamp fragment. The remaining four artifacts are decorative handles and knobs for furniture and cabinetry.

## Kitchen Wares

These artifacts are kitchen items, used for the storage, preparation and consumption of food. There are 789 kitchen artifacts from the Location 76, representing nearly two thirds of the total artifact assemblage. One spoon was recovered, and the remainder of the artifacts from this class are made up of glass and ceramic wares.

### GLASS

Glass bottle, cup, and jar fragments are common, with 91 pieces recovered. Thirteen glass dish fragments and a drinking glass fragment were collected. Some of the glass dish fragments are moulded, and one piece of opaque white "milk" glass was recovered. The glass bottles and jars come in a variety of colours, including clear, frosted, aqua, turquoise, blue, and green. One green bottle glass fragment has a screw top, indicating it is recent.

No complete or nearly complete bottles were recovered. Few bottle glass fragments give any indication about the manufacturer or the manufacturing method used, however small bottle neck fragments indicate that both two-piece and three-piece moulds were used.

**Figure 29: Location 64, Unit 200E 110N, East Wall Profile**



**Figure 30: Location 65, Unit 300E 200N, West Wall Profile**



Only one bottle fragment has embossed writing on it, and only the letter "...B..." is legible.

CERAMICS

A total of 697 ceramic artifacts were recovered from the Location 76 excavations. Nearly all of these are small fragments less than an inch in size. Table 42 presents the ceramic artifacts by body type and decorative motif. Refined white earthenware was the most abundant type of ceramic found on the site, with 387 pieces recovered from excavations. The next most abundant types of ceramic were ironstone (n=161) and red earthenware (n=109). Yellow earthenware was also quite prevalent on the site (n=24), including a number of Rockingham glazed fragments and banded fragments. A small amount of creamware, an early ceramic ware was also recovered. Very little porcelain was present at the site, and stoneware was even less abundant.

**Table 42: Ceramic Types Recovered from Location 76**

| *ARTIFACT TYPE* | *DECORATION* | *DATE RANGE* | *FREQUENCY* |
|---|---|---|---|
| Red earthenware | --- | 1796-1920 | 109 |
| White earthenware | Plain/fragment | 1820-present | 164 |
| | Painted, blue | 1820-1835 | 5 |
| | Painted, late palette | 1835-1875 | 23 |
| | Transfer printed, brown | 1835-1860 | 4 |
| | Transfer printed, blue | 1800-present | 92 |
| | Transfer printed, black | 1800-1880 | 9 |
| | Transfer printed, green | 1829-1850 | 1 |
| | Transfer printed, turquoise | 1820-1860 | 1 |
| | Transfer printed, red | 1830-1850 | 13 |
| | Transfer printed, mulberry | 1835-1845 | 7 |
| | Flow transfer printed, blue | 1844-1880 | 29 |
| | Dipt/annular/banded | 1820-1850 | 21 |
| | Stamped | 1840-1860 | 4 |
| | Edged, blue scalloped | 1830-1845 | 2 |
| | Edged, green scalloped | 1830-1845 | 1 |
| | Edged, blue unscalloped | 1845-1870 | 1 |
| | Edged, blue | 1830-1875 | 10 |
| Creamware | Plain/fragment | 1762-1830 | 3 |
| Yellowware | Plain/fragment | 1830-1920 | 8 |
| | Rockingham glazed | 1830-1920 | 11 |
| | Dipt/banded | 1830-1850 | 5 |
| Stoneware | Plain/fragment | --- | 2 |
| | Salt-glazed | --- | 2 |
| Porcelain | Plain/fragment | 1745-present | 9 |
| Ironstone | Plain/fragment | 1875-1920 | 161 |
| **TOTAL** | | | **697** |

Predominant in the decorated white earthenware assemblage are transfer printed wares. Although many of these are blue, a wide variety of colours are seen including brown, black, green, turquoise, red, mulberry, and purple. Several of the blue transfer printed wares depict the "blue willow" pattern. Blue willow is one of the best-known

transfer print designs. It is a European imitation of a Chinese design, which depicts a bridge over a river with willow tress along its bank, along with two flying birds. Blue willow was first produced in 1780 and is still being manufactured today (Barclay 1976). Blue flow transfer printed wares are also common on the site. Edged wares are quite prevalent, especially the blue varieties. Painted, sponged and banded pieces are present, but in very small amounts.

Two printed maker's marks are visible on the underside of ironstone flatware vessels recovered from the site; however none are compete enough to determine the manufacturer. One mark depicts a bow, and the other reads "STONE WARE".

**Conclusions**

Location 76 represents a significant single-family homestead dwelling, primarily in use mid- to late nineteenth century. Historical documents indicate that this homestead was owned by the Potts family, who established a family cemetery just outside the current study area (see Figure 5).

Based on the material culture, the site at Location 76 has a potential date range of 1762 to the present. A more careful analysis reveals that a narrower, more definitive date can be determined for the site. Ceramics from the site indicate that the main occupation represented by the site is probably between 1850 and 1900 based upon the mean average date of the ceramic sherds and the characteristic trends found in the assemblage typical of a site from this period, such as the wide variety of transfer printed colours and the variety of decorative techniques, as well as the predominance of ironstone in the assemblage. Other artifacts recovered from the site including architectural materials such as nails and window glass further support this date. Because of the significance of this site, Location 76 is recommended for further Stage 4 archaeological fieldwork.

## Location 77

The first part of the Stage 3 investigation on Location 77 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Five surface locations were recorded. In addition to the controlled surface collection, six test units were hand excavated. The test units ranged from eighteen and twenty-eight centimeters in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from three to twenty-eight artifacts per unit (see Figure 39). No subsurface features were recovered.

**Table 43: Location 77 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| chipping detritus | 48 | **94.1%** |
| scraper | 1 | **2.0%** |
| utilized flake | 2 | **3.9%** |
| **Totals** | **51** | **100%** |

The Stage 3 investigation recovered 51 artifacts, including six from the surface and 45 from the test units. Table 43 provides a breakdown of the assemblage by artifact

type. The assemblage is dominated by chipping detritus, but one formal tool was recovered from the site.

A total of 50 pieces of chipping detritus were recovered from Location 77. The debitage was analyzed for raw material type and flake morphology (Table 44). All of the flakes (100%) are manufactured on high quality Onondaga chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, although the presence of secondary flakes indicate that at least some core preparation took place on the site. Two of the biface thinning flakes show usewear on one edge.

**Table 44: Location 77 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 3 | 0 | 0 | 3 |
| biface thinning | 29 | 0 | 0 | 29 |
| biface finishing | 1 | 0 | 0 | 1 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 14 | 3 | 0 | 17 |
| **Totals** | **47** | **3** | **0** | **50** |

One scraper was recovered from Location 77. It is manufactured on Onondaga chert and measures 36 mm in length, 24 mm in width and 5 mm in thickness. The bit is located on the ventral side and measures 20 mm in length and 3 mm in height.

Because Location 77 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 82

The first part of the Stage 3 investigation on Location 82 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Three surface locations were recorded. In addition to the controlled surface collection, five test units were hand excavated. The test units ranged from eighteen and twenty-eight centimeters in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from three to twelve artifacts per unit (see Figure 40). No subsurface features were recovered.

**Table 45: Location 82 Artifact Recovery**

| ***ARTIFACT TYPE*** | ***FREQUENCY*** | ***%*** |
|---|---|---|
| chipping detritus | 32 | **97%** |
| scraper | 1 | **3%** |
| **Totals** | **33** | **100%** |

The Stage 3 investigation recovered 33 artifacts, including four from the surface and 29 from the test units. Table 45 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but one formal tool was recovered from the site.

**Figure 31: Site Map Showing Stage 3 Results on Location 66**

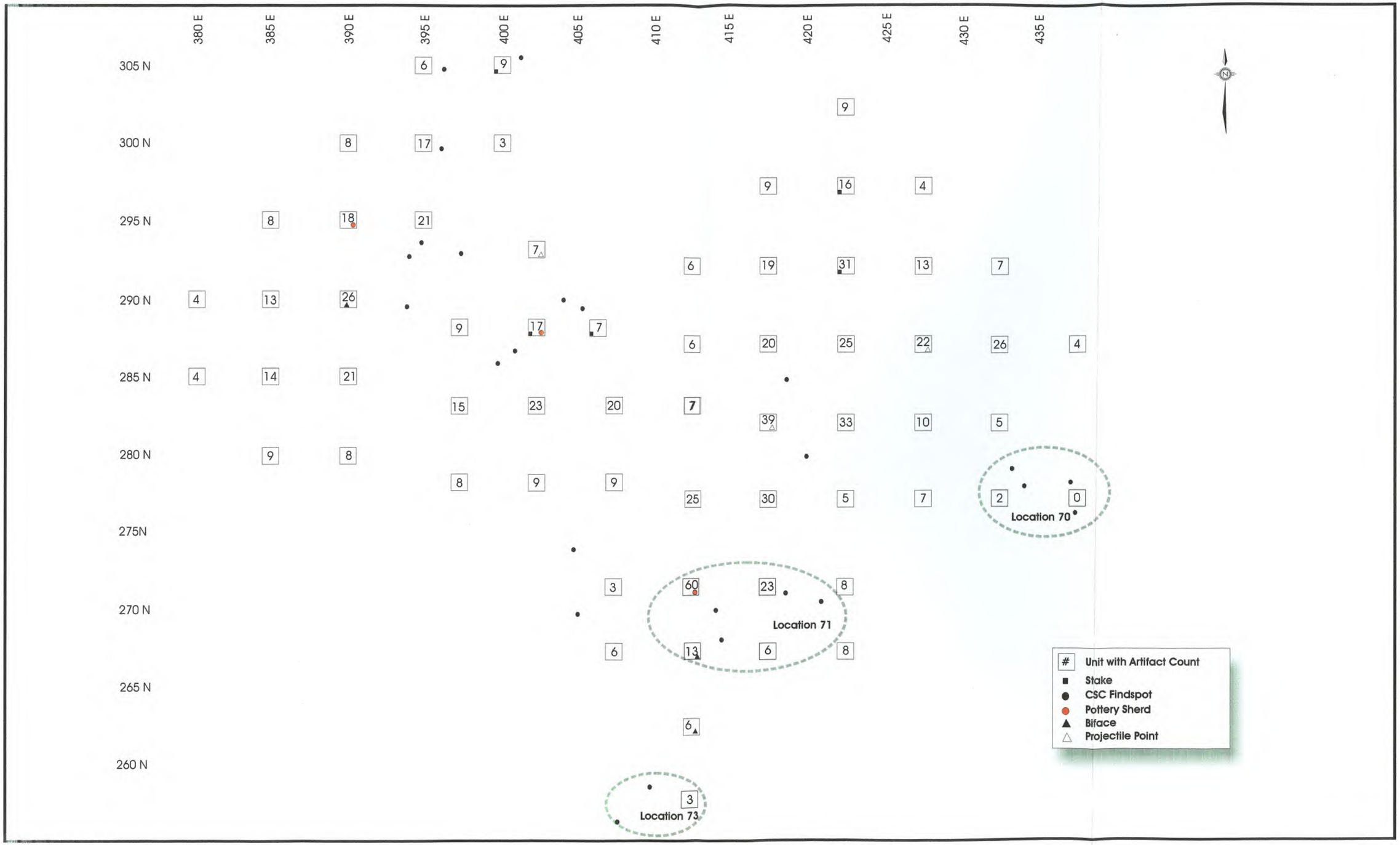


**Figure 32: Site Map Showing Stage 3 Results on Location 69**



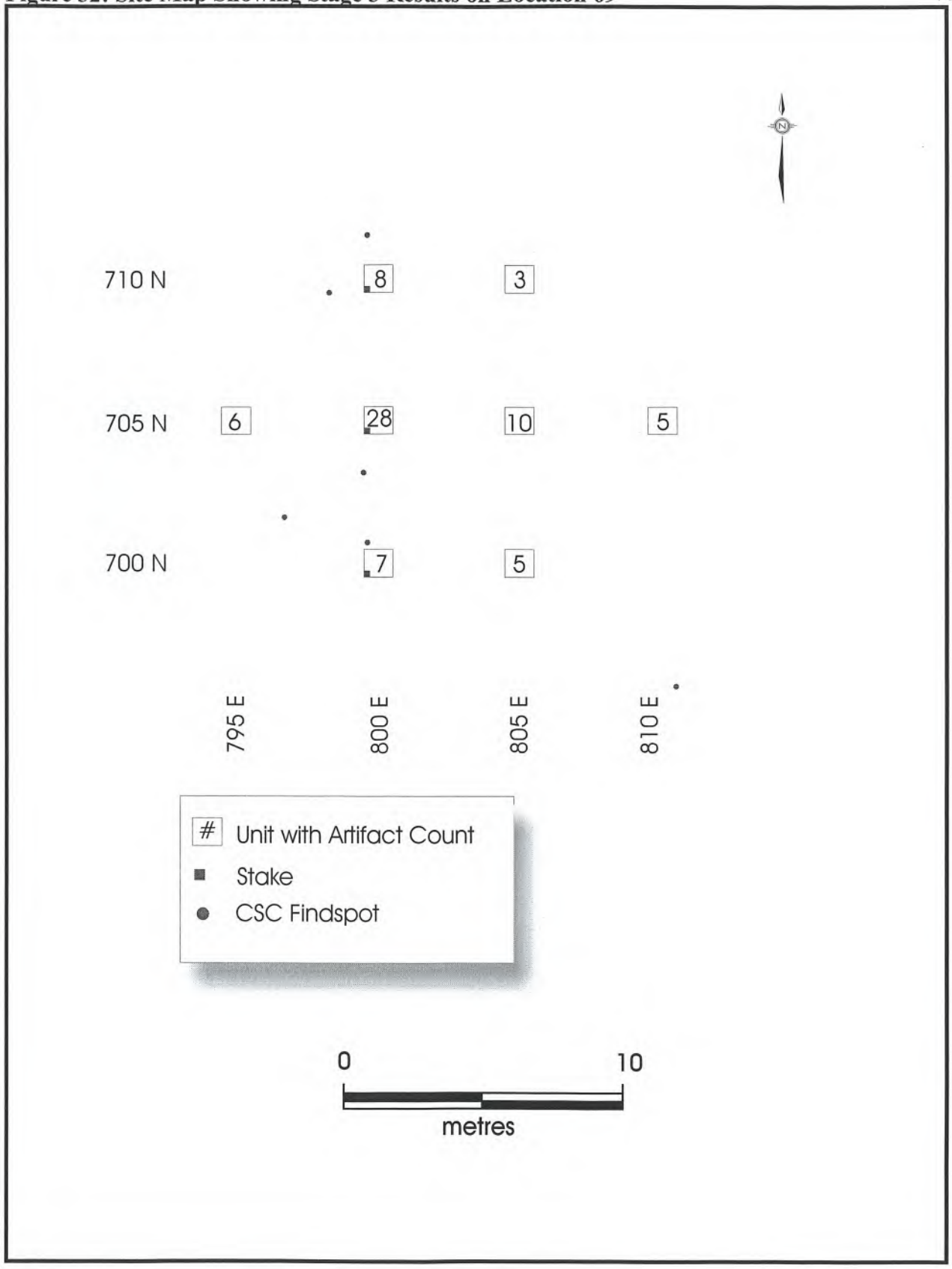


**Figure 33: Location 66, Unit 400E 305, East Wall Profile**



**Figure 34: Crew at Work on Location 69, Facing West**



A total of 32 pieces of chipping detritus were recovered from Location 82. The debitage was analyzed for raw material type and flake morphology (Table 46). All of the flakes (100%) are manufactured on high quality Onondaga chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, although the presence of secondary flakes indicate that at least some core preparation took place on the site.

**Table 46: Location 82 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 2 | 0 | 0 | 2 |
| biface thinning | 20 | 0 | 0 | 20 |
| biface finishing | 6 | 0 | 0 | 6 |
| shatter | 0 | 0 | 0 | 0 |
| fragment | 2 | 2 | 0 | 4 |
| **Totals** | 30 | 2 | 0 | 32 |

One scraper was recovered from Location 82. It is manufactured on Onondaga chert and measures 25 mm in length, 11 mm in width and 3 mm in thickness. The bit is located on the ventral side and measures 10 mm in length and 3 mm in height.

Because Location 82 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 83

The first part of the Stage 3 investigation on Location 83 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Two surface locations were recorded. In addition to the controlled surface collection, two test units were hand excavated. The test units ranged were 30 and 31 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from two to three artifacts per unit (see Figure 43). No subsurface features were recovered.

**Table 47: Location 83 Artifact Recovery**

| ***ARTIFACT TYPE*** | ***FREQUENCY*** | ***%*** |
|---|---|---|
| chipping detritus | 5 | **100%** |

The Stage 3 investigation recovered five artifacts all from the test units. Table 47 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus.

**Table 48: Location 83 Debitage Analysis**

| ***FLAKE TYPE*** | Onondaga | **Totals** |
|---|---|---|
| primary | 0 | 0 |
| secondary | 0 | 0 |
| biface thinning | 5 | 5 |
| biface finishing | 0 | 0 |
| shatter | 0 | 0 |
| fragment | 0 | 0 |
| **Totals** | 5 | 5 |

A total of five pieces of chipping detritus were recovered from Location 83. The debitage was analyzed for raw material type and flake morphology (Table 48). All of the debitage (100 %) was manufactured on Onondaga chert and all are biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, rather than during initial core reduction and preparation. This indicates that biface manufacture was an important activity on this site.

Because Location 83 does not indicate a significant archaeological resource, no further work is required for this location.

## Location 88

The first part of the Stage 3 investigation on Location 88 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. During the Stage 3 excavation, Locations 89 and 90 merged to become part of Location 88. Seventeen surface locations were recorded. In addition to the controlled surface collection, ninety-eight test units were hand excavated. The test units ranged from 23 and 49 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from one to thirty-seven artifacts per unit (see Figure 44). No subsurface features were recovered.

**Table 49: Location 88 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| biface | 3 | 0.27% |
| body sherd | 1 | 0.09% |
| chipping detritus | 1093 | 97.9% |
| drill | 1 | 0.09% |
| modified groundstone | 1 | 0.09% |
| projectile point | 7 | 0.63% |
| scraper | 9 | 0.8% |
| utilized flake | 2 | 0.18% |
| **Totals** | **1,117** | **100%** |

The Stage 3 investigation recovered 1,117 artifacts, including 19 from the surface and 1,098 from the test units. Table 49 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but 20 formal tools were recovered from the site.

**Table 50: Location 88 Debitage Analysis**

| | *RAW MATERIAL* | | | | |
|---|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Haldimand | Local Till | **Totals** |
| primary | 3 | 0 | 0 | 0 | 3 |
| secondary | 18 | 1 | 1 | 2 | 22 |
| biface thinning | 487 | 48 | 2 | 23 | 560 |
| biface finishing | 83 | 3 | 0 | 0 | 86 |
| shatter | 7 | 2 | 0 | 1 | 10 |
| fragment | 327 | 77 | 0 | 8 | 412 |
| **Totals** | 925 | 131 | 3 | 34 | **1,093** |

**Figure 35: Results of Stage 3 Excavations at Location 75** 75

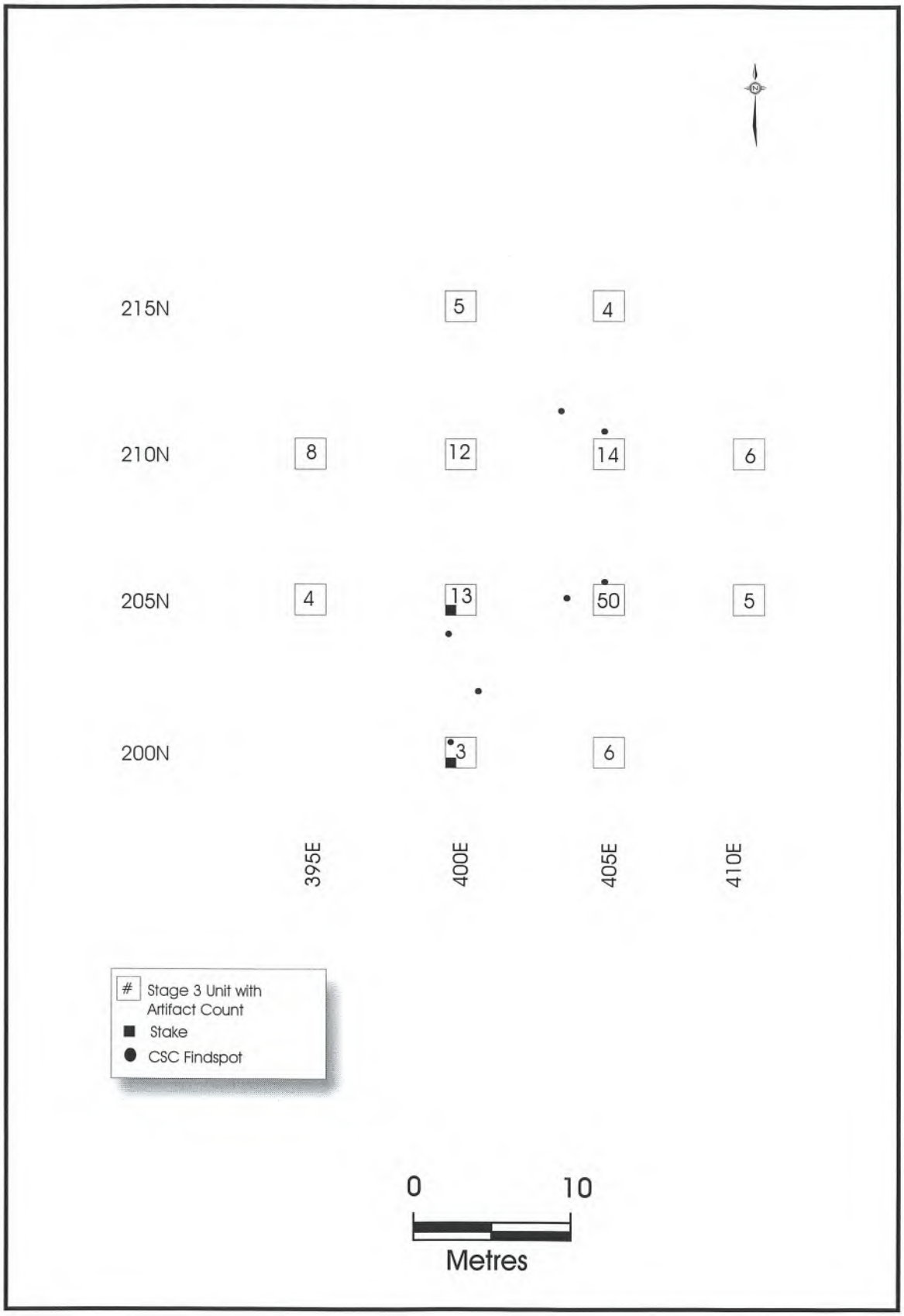


**Figure 36: Site Map Showing Stage 3 Results on Location 76**



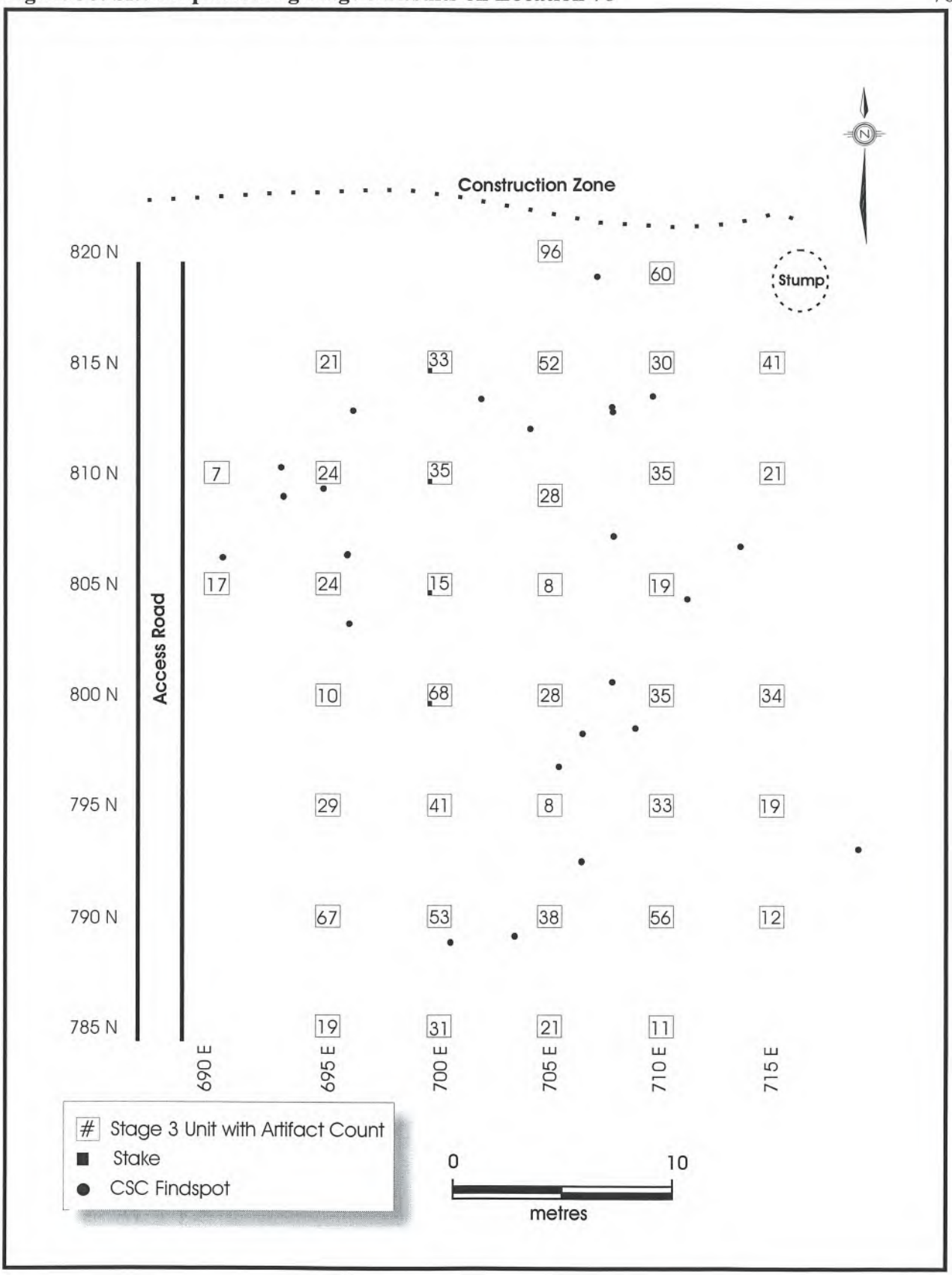


**Figure 37: Crew at Work on Location 75, Facing North**



**Figure 38: Crew at Work on Location 76, Facing Northwest**



A total of 1,093 pieces of chipping detritus were recovered Location 88. The debitage was analyzed for raw material type and flake morphology (Table 50). The majority of the flakes (96.6 %) are manufactured on high quality Onondaga chert although thirty-four pieces (3.1 %) were manufactured on what appears to be a local glacial till variety of chert, and three pieces (0.2%) have been manufactured on Haldimand chert. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, although the presence of primary and secondary flakes indicate that at least some core preparation took place on the site. Two biface thinning flakes show usewear along one edge.

A total of seven projectile points were recovered from the site. Three of the points are base fragments. Evidence of heating and retouching/reworking of the point bases precludes a classification. The first base has a shoulder width of 21 mm, a neck width of 15 mm, a base width of 15 mm, and an overall thickness of 6 mm. It has been manufactured on Onondaga chert.

The second base is also manufactured on Onondaga chert. It has been broken at the shoulder and the base has been significantly thinned. It has a neck width of 23 mm, a base width of 27 mm, and an overall thickness of 5 mm.

The third base, also manufactured on Onondaga chert, shows evidence of heating. It has a shoulder width of 23 mm, a neck width of 14 mm, a base width of 15 mm, and an overall thickness of 4 mm.

The fourth point is a reworked Meadowood (*ca.* 2,500 –1,000 B.P.) manufactured on Onondaga chert. It has an overall length of 50 mm and an overall thickness of 7 mm. The base of the point has been broken on one end and a second notch has been made on one side. The shoulder measures 20 mm and the neck measures 12 mm.

The fifth projectile point has an incomplete base and has been manufactured on Haldimand chert. It has an overall length of 45 mm, and an overall thickness of 12 mm.

The sixth point is a Normanskill point of the Late Archaic Period (*ca.* 4,500-2,500 B.P.) It has an overall length of 42 mm and an overall thickness of 8 mm. The shoulder measures 22 mm and the neck and base measure 14 mm and 25 mm, respectively. It has been manufactured on Onondaga chert.

The final point is incomplete, with only one tang completed and no base. Overall, it measures 40 mm in length and 6 mm in thickness.

Nine scrapers were also recovered from Location 88. The metrics for these scrapers are presented in Table 51. All have been manufactured on Onondaga chert.

**Table 51: Scraper Metrics for Location 88. All measurements in millimetres**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *TYPE* | *BIT LENGTH* | *BIT HEIGHT* | *COMMENTS* |
|---|---|---|---|---|---|---|---|
| 1251 | n/a | n/a | 9 | end | 38 | 6 | reworked projectile point |
| 1265 | 20 | 20 | 5 | side | 14 | 2 | heated |
| 1266 | 34 | 23 | 6 | side | 16 | 3 | |
| 1282 | 19 | 16 | 4 | side | 10 | 3 | |
| 1311 | 38 | 23 | 12 | side | 13 | 2 | ventral side worked |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1503 | 35 | 17 | 6 | end | 10 | 2 | |
| 1711 | 25 | 24 | 5 | end | 21 | 4 | |
| 1723 | 20 | 11 | 3 | side | 11 | 2 | ventral side worked |
| 1731 | 21 | 22 | 5 | end | 12 | 2 | ventral side worked |

Three bifaces were also recovered. All are manufactured on Onondaga chert. The first is a tip measuring 10 mm in width and 5 mm in thickness. It has been heated. The second biface measures 41 mm in length, 33mm in width and 8 mm in thickness. The third is a base that has been broken at the midsection. It measures 5 mm in width and has an overall thickness of 6 mm.

One drill was recovered from location 88. It is a bit fragment and shows evidence of heating. It measures 24 mm in length, 11 mm in width, and has a thickness of 11 mm. It has been manufactured on Onondaga chert.

A modified groundstone was also recovered. It shows significant smoothing along both surfaces, the top, and along one side. It has been heated and is made from siltstone. It looks to have been used as a grinding or polishing tool.

One body sherd was also recovered. It is a coil break with carbon encrustation on the interior and evidence of a cord-wrapped paddle body treatment.

Location 88 represents a multi-component campsite with artifacts ranging from the Late Archaic to Woodland periods. Because Location 88 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 98

The first part of the Stage 3 investigation on Location 98 involved recording and collecting the surface artifacts flagged during the Stage 2 investigation. Nine surface locations were recorded. In addition to the controlled surface collection, thirty-six test units were hand excavated. The test units ranged from 21 to 37 centimetres in depth and consisted of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from zero to fifty-five artifacts per unit (see Figure 47). No subsurface features were recovered.

**Table 52: Location 98 Artifact Recovery**

| *ARTIFACT TYPE* | *FREQUENCY* | *%* |
|---|---|---|
| biface | 1 | 0.2% |
| chipping detritus | 475 | 98.5% |
| projectile point | 1 | 0.2% |
| scraper | 5 | 1.1% |
| **Totals** | **482** | **100%** |

The Stage 3 investigation recovered 482 artifacts, including 21 from the surface and 461 from the test units. Table 52 provides a breakdown of the assemblage by artifact type. The assemblage is dominated by chipping detritus, but 6 formal tools were recovered from the site.

**Figure 39: Site Map Showing Stage 3 Results on Location 77**

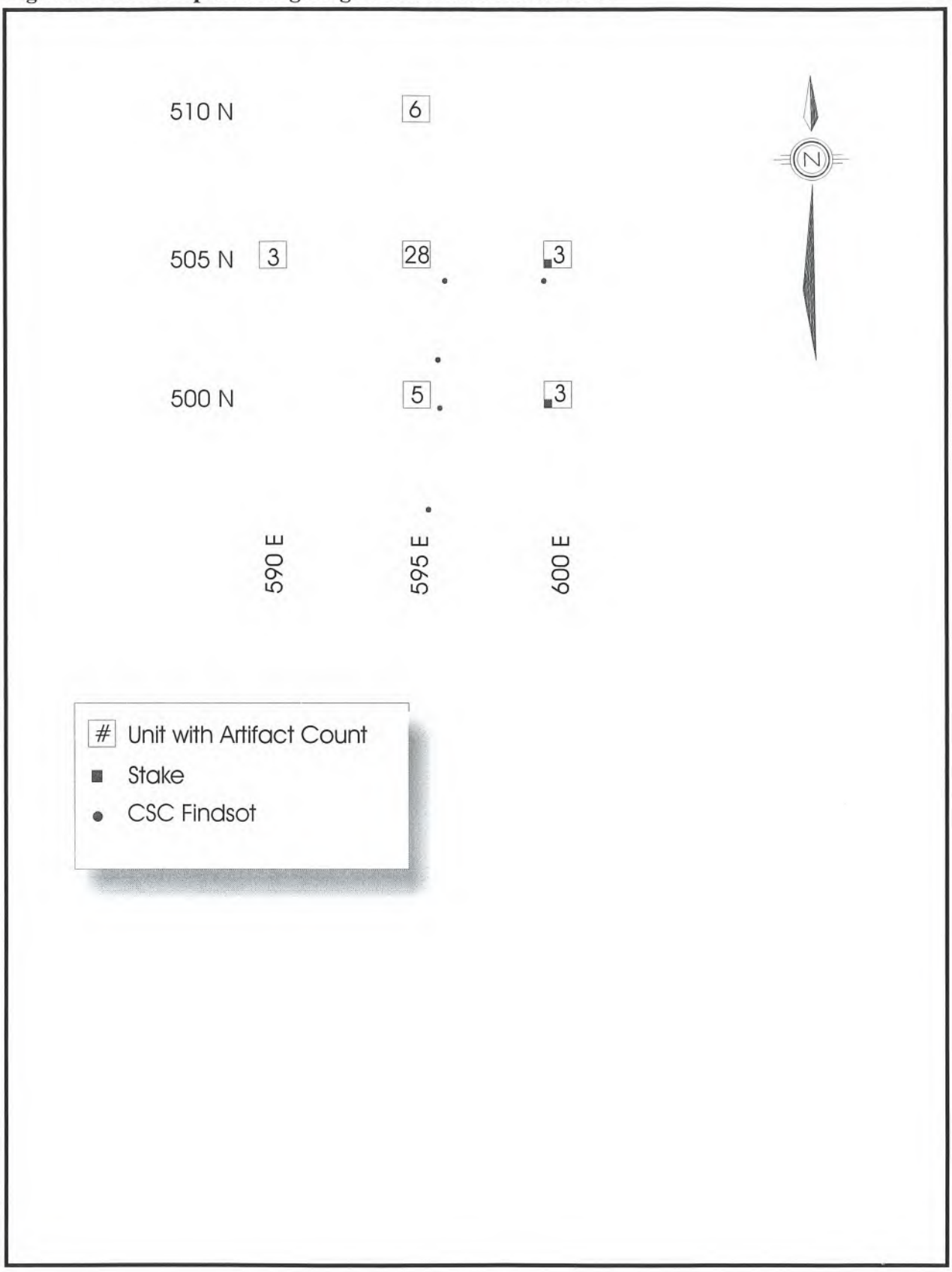


**Figure 40: Site Map Showing Stage 3 Results on Location 82**



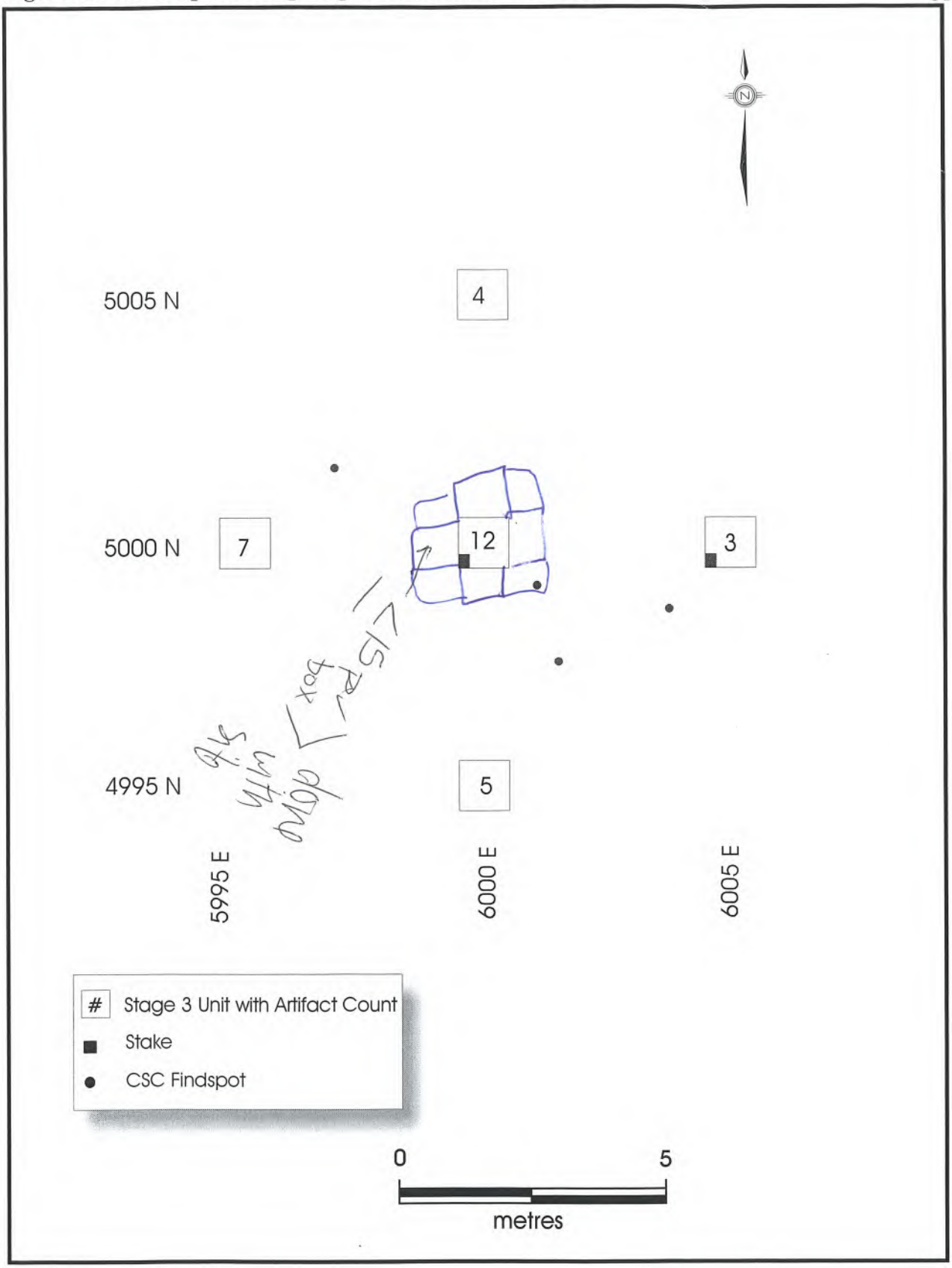


**Figure 41: Crew at Work on Location 77, Facing South**



**Figure 42: Location 82, Unit 6000E 4995N, South Wall Profile**



**Table 53: Location 98 Debitage Analysis**

| | *RAW MATERIAL* | | | |
|---|---|---|---|---|
| ***FLAKE TYPE*** | Onondaga | Heated Onondaga | Local Till | **Totals** |
| primary | 0 | 0 | 0 | 0 |
| secondary | 12 | 0 | 1 | 13 |
| biface thinning | 265 | 1 | 4 | 270 |
| biface finishing | 33 | 0 | 0 | 33 |
| shatter | 3 | 0 | 0 | 3 |
| fragment | 152 | 3 | 1 | 156 |
| **Totals** | 465 | 4 | 6 | 475 |

A total of 475 pieces of chipping detritus were recovered Location 98. The debitage was analyzed for raw material type and flake morphology (Table 53). The majority of the flakes (98.7 %) are manufactured on high quality Onondaga chert although six pieces (1.3 %) were manufactured on what appears to be a local glacial till variety of chert. Four of the flakes show evidence of heating. The flakes are largely biface thinning and finishing flakes, flakes which are produced in the later stages of stone tool manufacture, although the presence of secondary flakes indicate that at least some core preparation took place on the site.

One biface was recovered from the site. It is a base fragment and measures 17 mm in width and 7 mm in thickness. It is manufactured on Onondaga chert.

One projectile point base was also recovered. It is manufactured on Onondaga chert and shows evidence of heating. It has a shoulder measurement of 22 mm and a base measurement of 30 mm.

A total of five scrapers were recovered from Location 98. Table 54 shows the metrics for each scraper. All were manufactured on Onondaga chert.

**Table 54: Scraper Metrics for Location 98. All measurements in millimetres**

| *CAT#* | *LENGTH* | *WIDTH* | *THICK* | *TYPE* | *BIT LENGTH* | *BIT HEIGHT* | *COMMENTS* |
|---|---|---|---|---|---|---|---|
| 1123 | 35 | 26 | 7 | side | 19 | 3 | |
| 1127 | 37 | 22 | 12 | side | 28 | 4 | ventral side worked |
| 1129 | 18 | 17 | 4 | end | 16 | 3 | |
| 1139 | 40 | 20 | 6 | side | 29 | 3 | ventral side worked |
| 1141 | 18 | 20 | 11 | end | 11 | 3 | |

Because Location 98 indicates a significant archaeological resource, a Stage 4 is recommended for this site if it cannot be avoided during future development.

## Location 99

The first part of the Stage 3 investigation on Location 99 involved relocating the test pits from the Stage 2 investigations. Four test units were hand excavated (see figure 48). The test units ranged from 22 to 35 centimetres in depth and consisted of a medium

brown sand plough zone overlying brown to yellow-orange sand subsoil. Artifact frequencies ranged from one to six artifacts per unit.

A total of ten pieces of chipping detritus were recovered from Location 99, including two flakes collected the Stage 2 investigations. The debitage was analyzed for raw material type and flake morphology. All were biface thinning flakes with one showing usewear along one edge. All were manufactured on high quality Onondaga chert. No subsurface features were recovered.

Because of the low artifact counts in the units at Location 99, the site has little information value. As such, no further fieldwork is warranted for Location 99.

**Location 100**

The first part of the Stage 3 investigation on Location 100 involved relocating the test pits from the Stage 2 investigations. Prior to the excavation, the trees around the location were removed. Although the test pits were relocated using the GPS coordinates, the area had been stripped to subsoil depth and no units could be excavated.

**Location 101**

Location 101 was originally located within a windbreak of trees located between Parcels A and B. Before Stage 3 investigations could commence on the site, the trees were removed from the area. The original test pits were mapped using GPS and so the area was relocated. The Stage 3 excavation removed two units from the area ranging from 25 to 37 centimetres in depth and consisting of a medium brown sand plough zone overlying brown to yellow-orange sand subsoil. Eight pieces of chipping detritus were removed from the units. All are manufactured on Onondaga chert with two showing evidence of heating. During the excavation, it became apparent that Location 101 could be merged with the northern edge of Location 11, which is located ten-metres to the south of Location 101 (Figure 9).

**Figure 43: Site Map Showing Stage 3 Results on Location 83**



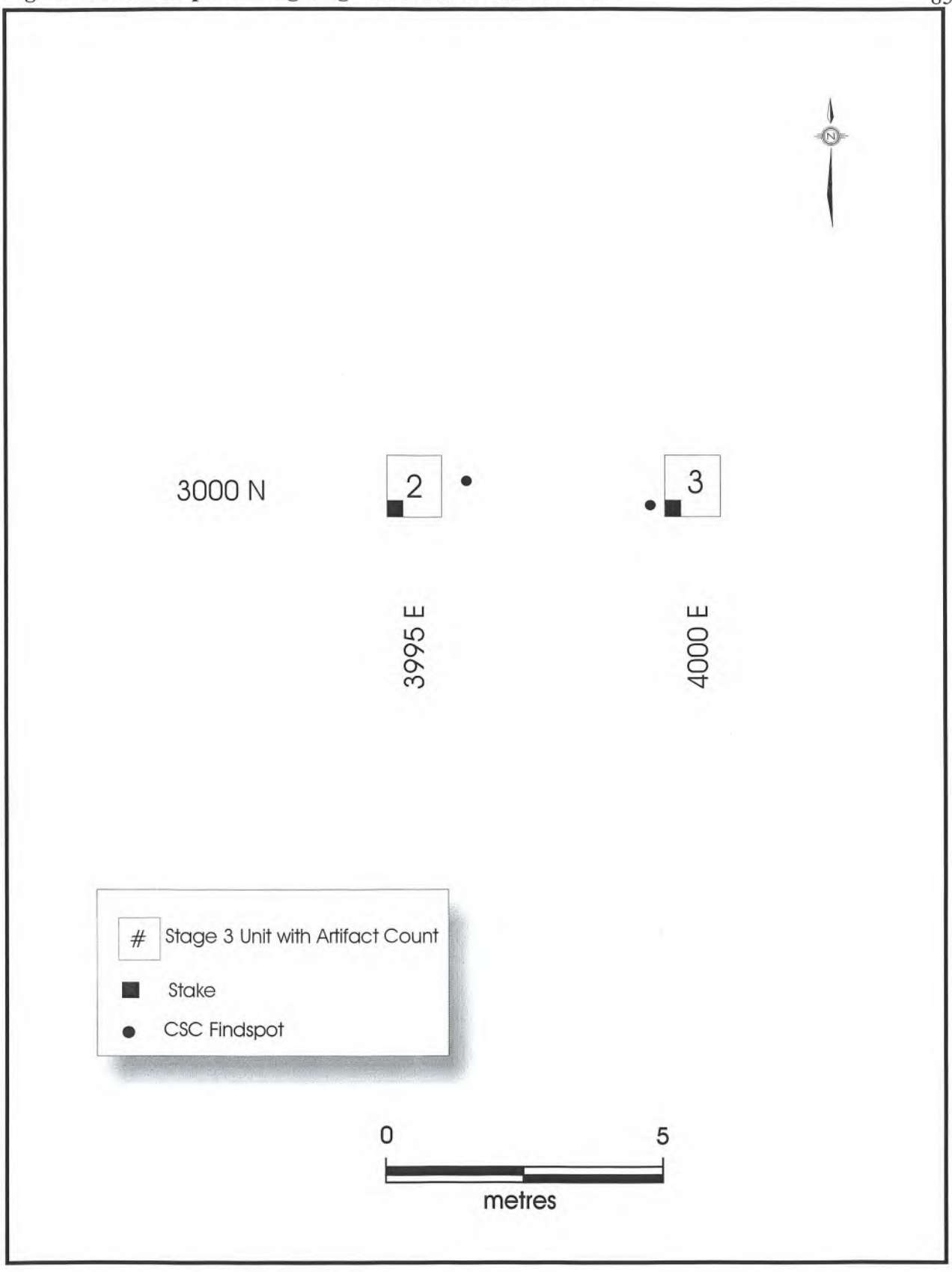


**Figure 44: Site Map with Stage 3 Results on Location 88**

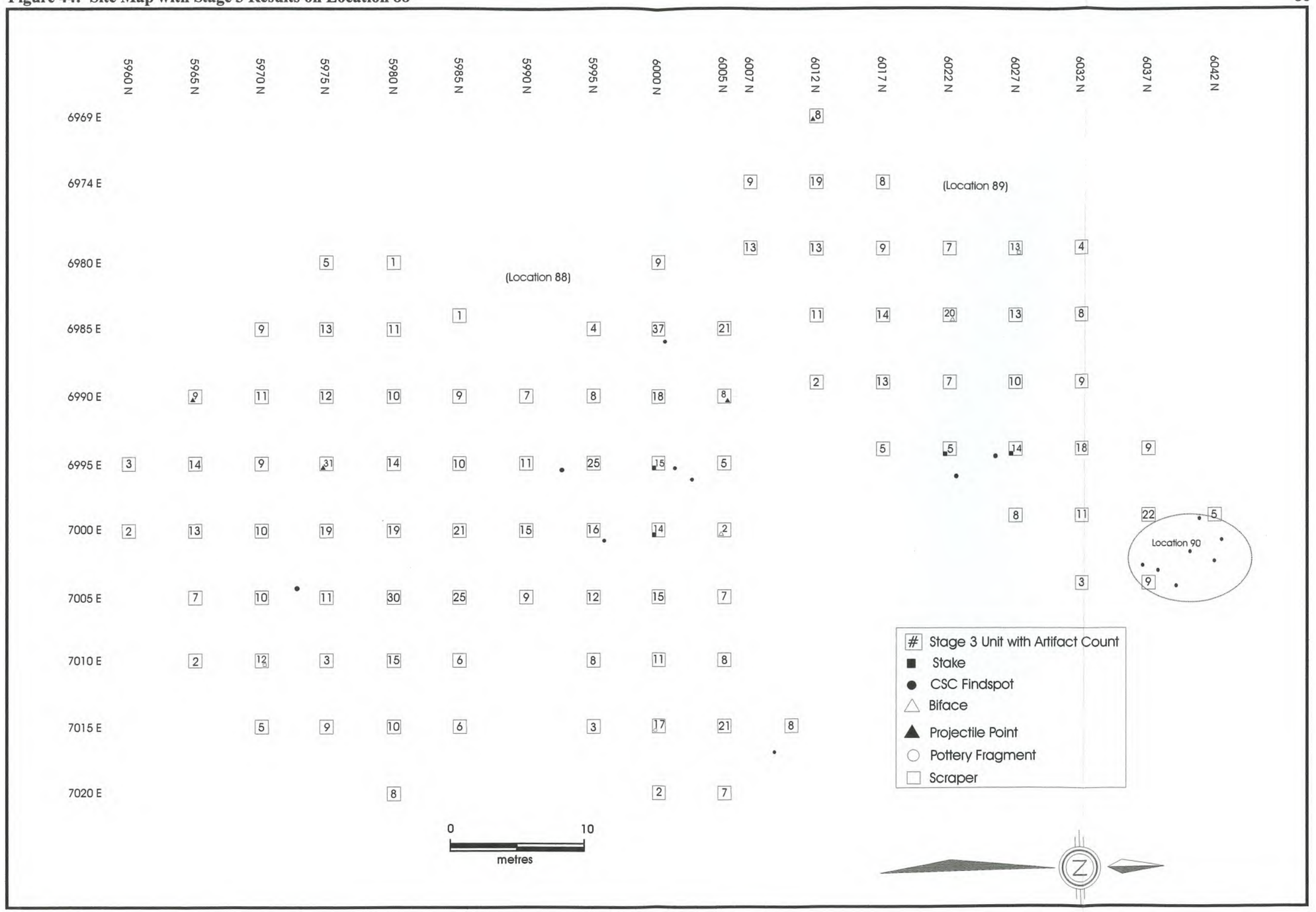


**Figure 45: Location 83, Unit 4000E 3000N, East Wall Profile**



**Figure 46: Crew at Work on Location 88, Facing East**



**Figure 47: Results of Stage 3 Excavations at Location 98**



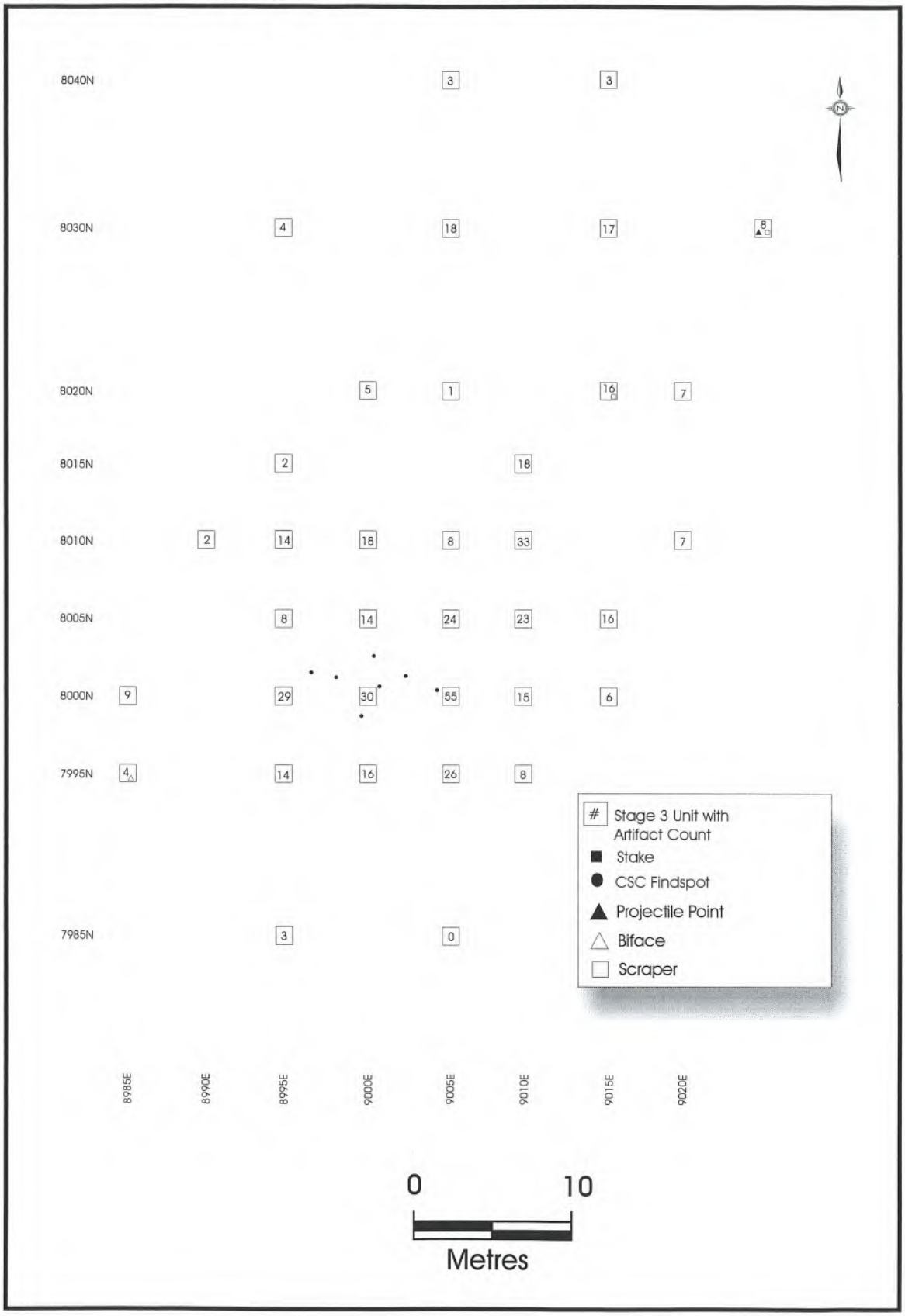


**Figure 48: Results of Stage 3 Investigations at Location 99**

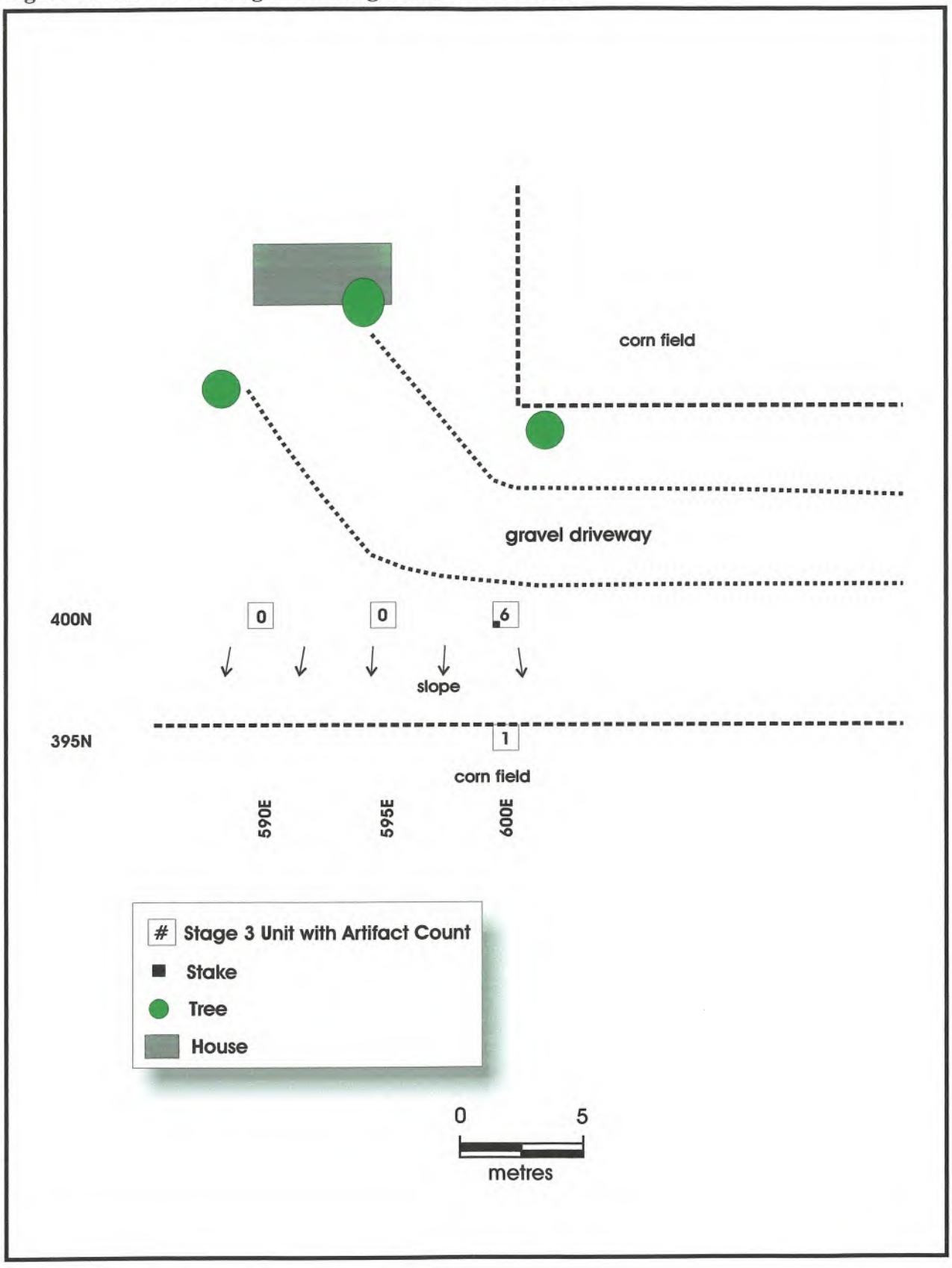


**Figure 49: Location 98, Unit 9005E 7995N, South Wall Profile**

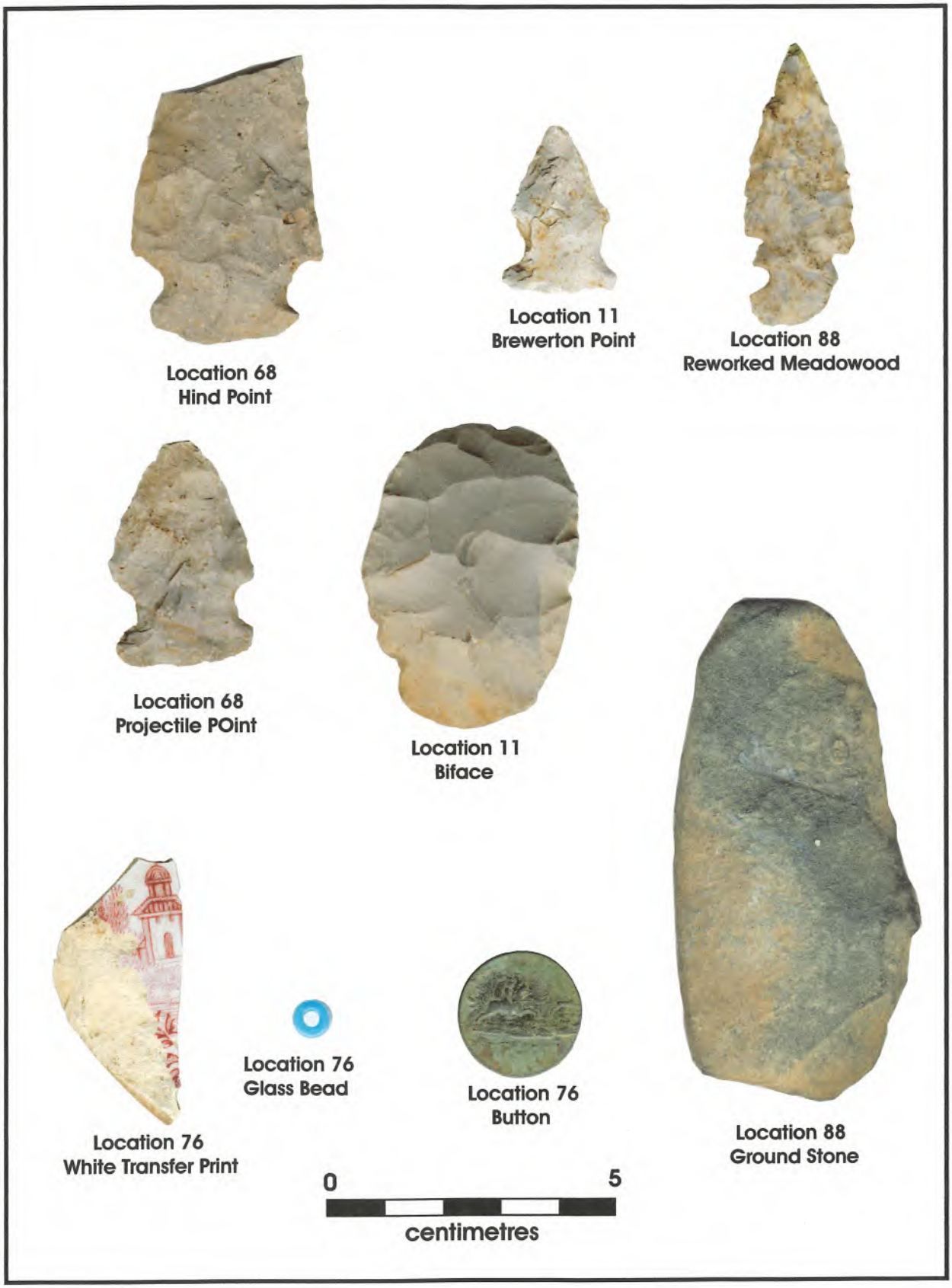


**Figure 50: Crew at Work on Location 101, Facing North**



**Figure 51: Artifacts Recovered During Stage 3 Excavations**





## RECOMMENDATIONS

A Stage 2 survey conducted on behalf of Planning Solutions resulted in the discovery of 101 archaeological locations. Forty-one of these sites were subject to Stage 3 excavations. The following recommendations are provided for consideration by Planning Solutions by the Ministry of Culture:

1. No additional fieldwork is required for Locations 15, 36, 47, 54, 58, 83, 99 or 101 because they did not yield a significant amount of artifacts during the Stage 3 survey.

2. If the sites cannot be avoided during construction, a Stage 4 excavation is warranted for Locations 4, 11, 17, 18, 23, 24, 62, 64, 65, 66, 69, 75, 76, 77, 82, 88, and 98 because they represent significant archaeological resources.

3. The above recommendations are subject to concurrence by the Ministry of Culture. It is an offence to destroy or alter an archaeological site without approval from the Ministry of Culture. No landscaping, grading or other activities that may result in the destruction or disturbance of any of the archaeological sites documented in this report is permitted prior to the Ministry of Culture's approval.

4. Although every reasonable effort was made to locate all archaeological resources, it is possible that some remain to be discovered within the study area. Should deeply buried archaeological material be found during construction, the Ministry of Culture in London (519-675-7742) and Mayer Heritage Consultants Inc. in London (519-652-1818 or 800-465-9990) should be immediately notified.

5. As on virtually any property in southern Ontario, it is possible that Aboriginal or Euro-Canadian burials could be present within the study area. In the event that human remains are encountered during construction, the proponent should immediately contact both the Ministry of Culture, and the Cemeteries Regulation Unit of the Ontario Ministry of Consumer and Commercial Relations in Toronto (416-326-8392), as well as the appropriate municipal police, the local coroner, and Mayer Heritage Consultants Inc.

5. The licensee shall keep in safekeeping all artifacts and records of archaeological fieldwork carried out under this licence, except where those artifacts and records are transferred to by the licensee to Her Majesty the Queen in right of Ontario or the licensee is directed to deposit them in a public institution in accordance with subsection 66(1) of the Act.

# Appendix A: Artifact Catalogue

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1000 | 69 | | | surface | projectile point | 1 | |
| 1001 | 85 | | | surface | biface | 1 | |
| 1002 | 53 | | | surface | scraper | 1 | end |
| 1003 | 33 | | | surface | scraper | 1 | end |
| 1004 | 38 | | | surface | scraper | 1 | end |
| 1005 | 67 | | | surface | biface | 1 | |
| 1006 | 64 | | | surface | projectile point | 1 | |
| 1007 | 56 | | | surface | biface | 1 | |
| 1008 | 49 | | | surface | projectile point | 1 | base |
| 1009 | 84 | | | surface | projectile point | 1 | missing tip |
| 1010 | 70 | | | surface | projectile point | 1 | Innes |
| 1011 | 58 | | | surface | biface | 1 | |
| 1012 | 58 | | | surface | scraper | 1 | side |
| 1013 | 39 | | | surface | scraper | 1 | end, side |
| 1014 | 68 | | | surface | scraper | 1 | end |
| 1015 | 12 | | | surface | biface | 1 | |
| 1016 | 14 | | | surface | scraper | 1 | side |
| 1017 | 14 | | | surface | scraper | 1 | side |
| 1018 | 80 | | | surface | projectile point | 1 | manufactured on Flint Ridge chert, Snyder |
| 1019 | 10 | | | surface | biface | 1 | |
| 1020 | 71 | | | surface | biface | 1 | |
| 1021 | 32 | | | surface | biface | 1 | |
| 1022 | 44 | | | surface | biface | 1 | |
| 1023 | 17 | | | surface | scraper | 1 | reworked projectile point |
| 1024 | 91 | | | surface | projectile point | 1 | Crawford Knoll |
| 1025 | 4 | | | surface | biface | 1 | |
| 1026 | 90 | | | surface | projectile point | 1 | base |
| 1027 | 21 | | | surface | biface | 1 | side |
| 1028 | 25 | | | surface | biface | 1 | |
| 1029 | 22 | | | surface | scraper | 1 | side |
| 1030 | 36 | | | surface | biface | 1 | |
| 1031 | 35 | | | surface | scraper | 1 | end |
| 1032 | 76 | | | surface | transfer printed white earthenware | 1 | black |
| 1033 | 76 | | | surface | flow transfer printed white earthenware | 1 | blue |
| 1034 | 76 | | | surface | stamped white earthenware | 1 | blue |
| 1035 | 81 | | | surface | edge white earthenware | 1 | green |
| 1036 | 99 | | Test pit #1 | | chipping detritus | 2 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1037 | 99 | | North cardinal | | pipe stem | 1 | |
| 1038 | 100 | | Test pit #2 | | chipping detritus | 2 | |
| 1039 | 58 | | CSC 2 | surface | chipping detritus | 1 | |
| 1040 | 58 | | CSC 6 | surface | chipping detritus | 1 | |
| 1041 | 58 | | CSC 4 | surface | chipping detritus | 1 | |
| 1042 | 58 | | CSC 7 | surface | chipping detritus | 1 | |
| 1043 | 58 | | CSC 8 | surface | chipping detritus | 1 | |
| 1044 | 58 | | 1995E 1000N | 0-34 cm | chipping detritus | 1 | |
| 1045 | 58 | | 2000E 1000N | 0-20 cm | chipping detritus | 3 | |
| 1046 | 58 | | 2000E 1005N | 0-23 cm | chipping detritus | 9 | |
| 1047 | 58 | | 2005E 1000N | 0-26 cm | chipping detritus | 3 | |
| 1048 | 66 | | CSC 2 | surface | chipping detritus | 1 | |
| 1049 | 66 | | CSC 3 | surface | chipping detritus | 1 | |
| 1050 | 66 | | CSC 6 | surface | chipping detritus | 1 | |
| 1051 | 66 | | CSC 7 | surface | chipping detritus | 2 | |
| 1052 | 66 | | CSC 8 | surface | chipping detritus | 2 | |
| 1053 | 66 | | 417E 287N | 0-26 cm | chipping detritus | 21 | |
| 1054 | 66 | | 427E 282N | 0-24 cm | chipping detritus | 10 | |
| 1055 | 66 | | 422E 297N | 0-26 cm | chipping detritus | 15 | |
| 1056 | 66 | | 432E 282N | 0-30 cm | chipping detritus | 5 | |
| 1057 | 66 | | 422E 287N | 0-24 cm | chipping detritus | 26 | |
| 1058 | 66 | | 417E 292N | 0-28 cm | chipping detritus | 19 | |
| 1059 | 66 | | 417E 282N | 0-27 cm | chipping detritus | 38 | |
| 1060 | 66 | | 417E 282N | 0-27 cm | projectile point | 1 | Hind |
| 1061 | 66 | | 422E 282N | 0-30 cm | chipping detritus | 31 | |
| 1062 | 66 | | 500E 400N | 0-32 cm | chipping detritus | 30 | |
| 1063 | 66 | | 427E 292N | 0-27 cm | chipping detritus | 14 | |
| 1064 | 66 | | 427E 287N | 0-22 cm | chipping detritus | 21 | |
| 1065 | 66 | | 427E 287N | 0-22 cm | projectile point | 1 | reworked Brewerton |
| 1066 | 66 | | 417E 277N | 0-27 cm | chipping detritus | 30 | |
| 1067 | 66 | | CSC 1 | surface | chipping detritus | 1 | |
| 1068 | 66 | | 427E 297N | 0-30 cm | chipping detritus | 4 | |
| 1069 | 66 | | 422E 302N | 0-30 cm | chipping detritus | 8 | |
| 1070 | 66 | | 432E 292N | 0-25 cm | chipping detritus | 5 | |
| 1071 | 66 | | 417E 297N | 0-22 cm | chipping detritus | 9 | |
| 1072 | 66 | | 412E 292N | 0-20 cm | chipping detritus | 6 | |
| 1073 | 75 | | CSC 1 | surface | chipping detritus | 2 | |
| 1074 | 75 | | CSC 2 | surface | scraper | 1 | |
| 1075 | 75 | | CSC 2 | surface | core | 1 | |
| 1076 | 75 | | CSC 4 | surface | chipping detritus | 2 | |
| 1077 | 75 | | CSC 5 | surface | chipping detritus | 1 | |
| 1078 | 75 | | CSC 6 | surface | chipping detritus | 1 | |
| 1079 | 75 | | CSC 7 | surface | chipping detritus | 12 | |
| 1080 | 75 | | 410E 210N | 0-26 cm | chipping detritus | 5 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1081 | 75 | | 400E 200N | 0-28 cm | chipping detritus | 3 | |
| 1082 | 75 | | 400E 210N | 0-25 cm | chipping detritus | 11 | |
| 1083 | 75 | | 400E 210N | 0-25 cm | utilised flake | 1 | |
| 1084 | 75 | | 400E 210N | 0-25 cm | scraper | 1 | side |
| 1085 | 75 | | 405E 210N | 0-28 cm | chipping detritus | 12 | |
| 1086 | 75 | | 405E 210N | 0-28 cm | core | 1 | |
| 1087 | 75 | | 395E 210N | 0-22 cm | chipping detritus | 4 | |
| 1088 | 75 | | 405E 215N | 0-25 cm | chipping detritus | 4 | |
| 1089 | 75 | | 405E 215N | 0-25 cm | utilised flake | 1 | |
| 1090 | 75 | | 405E 205N | 0-26 cm | chipping detritus | 47 | |
| 1091 | 75 | | 410E 205N | 0-25 cm | chipping detritus | 8 | |
| 1092 | 75 | | 405E 200N | 0-26 cm | chipping detritus | 5 | |
| 1093 | 75 | | 400E 215N | 0-21 cm | chipping detritus | 4 | |
| 1094 | 75 | | 395E 205N | 0-17 cm | chipping detritus | 4 | |
| 1095 | 15 | | CSC 1 | surface | chipping detritus | 1 | |
| 1096 | 15 | | CSC 2 | surface | chipping detritus | 1 | |
| 1097 | 15 | | 700E 200N | 0-41 cm | chipping detritus | 1 | |
| 1098 | 15 | | 705E 200N | 0-54 cm | chipping detritus | 2 | |
| 1099 | 102 | | CSC 1 | surface | projectile point | 1 | base |
| 1100 | 98 | | CSC 1 | surface | chipping detritus | 2 | |
| 1101 | 98 | | CSC 2 | surface | chipping detritus | 3 | |
| 1102 | 98 | | CSC 3 | surface | chipping detritus | 3 | |
| 1103 | 98 | | CSC 4 | surface | chipping detritus | 8 | |
| 1104 | 98 | | CSC 5 | surface | chipping detritus | 2 | |
| 1105 | 98 | | CSC 7 | surface | chipping detritus | 1 | |
| 1106 | 98 | | CSC 8 | surface | chipping detritus | 1 | |
| 1107 | 98 | | CSC 9 | surface | chipping detritus | 1 | |
| 1108 | 98 | | 8995E 8005N | 0-27 cm | chipping detritus | 7 | |
| 1109 | 98 | | 9020E 8020N | 0-27 cm | chipping detritus | 7 | |
| 1110 | 98 | | 9015E 8000N | 0-30 cm | chipping detritus | 5 | |
| 1111 | 98 | | 8985E 8000N | 0-28 cm | chipping detritus | 9 | |
| 1112 | 98 | | 9010E 8005N | 0-27 cm | chipping detritus | 20 | |
| 1113 | 98 | | 9000E 8010N | 0-27 cm | chipping detritus | 17 | |
| 1114 | 98 | | 9015E 8005N | 0-33 cm | chipping detritus | 14 | |
| 1115 | 98 | | 9010E 8010N | 0-28 cm | chipping detritus | 27 | |
| 1116 | 98 | | 9005E 7985N | 0-27 cm | chipping detritus | 4 | |
| 1117 | 98 | | 9005E 7985N | 0-27 cm | biface | 1 | |
| 1118 | 98 | | 9005E 7995N | 0-27 cm | chipping detritus | 26 | |
| 1119 | 98 | | 8995E 8010N | 0-27 cm | chipping detritus | 12 | |
| 1120 | 98 | | 9005E 8040N | 0-26 cm | chipping detritus | 4 | |
| 1121 | 98 | | 9000E 8020N | 0-24 cm | chipping detritus | 5 | |
| 1122 | 98 | | 9005E 8000N | 0-27 cm | chipping detritus | 52 | |
| 1123 | 98 | | 9005E 8000N | 0-27 cm | scraper | 1 | side |
| 1124 | 98 | | 8995E 8000N | 0-31 cm | chipping detritus | 28 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1125 | 98 | | 9025E 8030N | 0-37 cm | chipping detritus | 9 | |
| 1126 | 98 | | 9025E 8030N | 0-37 cm | projectile point | 1 | base |
| 1127 | 98 | | 9025E 8030N | 0-37 cm | scraper | 1 | side |
| 1128 | 98 | | 9010E 8000N | 0-27 cm | chipping detritus | 14 | |
| 1129 | 98 | | 9010E 8000N | 0-27 cm | scraper | 1 | end |
| 1130 | 98 | | 9000E 8005N | 0-26 cm | chipping detritus | 14 | |
| 1131 | 98 | | 9005E 8010N | 0-25 cm | chipping detritus | 8 | |
| 1132 | 98 | | 9005E 8030N | 0-31 cm | chipping detritus | 18 | |
| 1133 | 98 | | 9000E 7995N | 0-25 cm | chipping detritus | 14 | |
| 1134 | 98 | | 9000E 8000N | 0-21 cm | chipping detritus | 31 | |
| 1135 | 98 | | 9010E 7995N | 0-27 cm | chipping detritus | 9 | |
| 1136 | 98 | | 9020E 8030N | 0-28 cm | chipping detritus | 17 | |
| 1137 | 98 | | 9020E 8010N | 0-25 cm | chipping detritus | 8 | |
| 1138 | 98 | | 9015E 8020N | 0-22 cm | chipping detritus | 15 | |
| 1139 | 98 | | 9015E 8020N | 0-22 cm | scraper | 1 | side, ventral |
| 1140 | 98 | | 9005E 8005N | 0-27 cm | chipping detritus | 23 | |
| 1141 | 98 | | 9005E 8005N | 0-27 cm | scraper | 1 | end |
| 1142 | 98 | | 8995E 7995N | 0-28 cm | chipping detritus | 13 | |
| 1143 | 98 | | 9010E 8015N | 0-23 cm | chipping detritus | 9 | |
| 1144 | 98 | | 9005E 8020N | 0-20 cm | chipping detritus | 1 | |
| 1145 | 98 | | 9015E 8040N | 0-28 cm | chipping detritus | 3 | |
| 1146 | 98 | | 8985E 7995N | 0-29 cm | chipping detritus | 3 | |
| 1147 | 98 | | 8995E 8015N | 0-21 cm | chipping detritus | 2 | |
| 1148 | 98 | | 8995E 8030N | 0-26 cm | chipping detritus | 4 | |
| 1149 | 98 | | 8990E 8010N | 0-23 cm | chipping detritus | 2 | |
| 1150 | 11 | | CSC 1 | surface | chipping detritus | 4 | |
| 1151 | 11 | | CSC 2 | surface | chipping detritus | 1 | |
| 1152 | 11 | | CSC 3 | surface | chipping detritus | 1 | |
| 1153 | 11 | | CSC 5 | surface | utilised flake | 1 | |
| 1154 | 11 | | CSC 6 | surface | chipping detritus | 1 | |
| 1155 | 11 | | CSC 7 | surface | chipping detritus | 3 | |
| 1156 | 11 | | CSC 8 | surface | chipping detritus | 1 | |
| 1157 | 11 | | CSC 9 | surface | chipping detritus | 1 | |
| 1158 | 11 | | CSC 10 | surface | chipping detritus | 1 | |
| 1159 | 11 | | CSC 11 | surface | chipping detritus | 1 | |
| 1160 | 11 | | CSC 12 | surface | chipping detritus | 1 | |
| 1161 | 11 | | CSC 13 | surface | chipping detritus | 1 | |
| 1162 | 11 | | 510E 220N | 0-34 cm | chipping detritus | 20 | |
| 1163 | 11 | | 510E 220N | 0-34 cm | scraper | 1 | end |
| 1164 | 11 | | 505E 190N | 0-32 cm | chipping detritus | 12 | |
| 1165 | 11 | | 490E 210N | 0-43 cm | chipping detritus | 8 | |
| 1166 | 11 | | 490E 210N | 0-43 cm | scraper | 1 | side |
| 1167 | 11 | | 505E 200N | 0-26 cm | chipping detritus | 18 | |
| 1168 | 11 | | 510E 210N | 0-32 cm | chipping detritus | 11 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1169 | 11 | | 495E 215N | 0-28 cm | chipping detritus | 18 | |
| 1170 | 11 | | 500E 230N | 0-37 cm | chipping detritus | 19 | |
| 1171 | 11 | | 500E 200N | 0-36 cm | chipping detritus | 50 | |
| 1172 | 11 | | 500E 200N | 0-36 cm | projectile point | 1 | Brewerton |
| 1173 | 11 | | 495E 210N | 0-28 cm | chipping detritus | 14 | |
| 1174 | 11 | | 500E 195N | 0-26 cm | chipping detritus | 11 | |
| 1175 | 11 | | 500E 195N | 0-26 cm | scraper | 1 | side, worked on dorsal and ventral face |
| 1176 | 11 | | 520E 230N | 0-30 cm | chipping detritus | 5 | |
| 1177 | 11 | | 500E 205N | 0-40 cm | chipping detritus | 32 | |
| 1178 | 11 | | 500E 220N | 0-41 cm | chipping detritus | 48 | |
| 1179 | 11 | | 495E 185N | 0-27 cm | chipping detritus | 11 | |
| 1180 | 11 | | 490E 220N | 0-28 cm | chipping detritus | 7 | |
| 1181 | 11 | | 490E 205N | 0-30 cm | chipping detritus | 4 | |
| 1182 | 11 | | 490E 205N | 0-30 cm | biface | 1 | |
| 1183 | 11 | | 490E 205N | 0-30 cm | scraper | 1 | side |
| 1184 | 11 | | 495E 220N | 0-21 cm | chipping detritus | 18 | |
| 1185 | 11 | | 510E 230N | 0-30 cm | chipping detritus | 14 | |
| 1186 | 11 | | 515E 185N | 0-28 cm | chipping detritus | 1 | |
| 1187 | 11 | | 510E 195N | 0-35 cm | chipping detritus | 12 | |
| 1188 | 11 | | 495E 225N | 0-13 cm | chipping detritus | 3 | |
| 1189 | 11 | | 505E 195N | 0-34 cm | chipping detritus | 10 | |
| 1190 | 11 | | 520E 220N | 0-28 cm | chipping detritus | 1 | |
| 1191 | 11 | | 510E 240N | 0-33 cm | chipping detritus | 8 | |
| 1192 | 11 | | 505E 185N | 0-25 cm | chipping detritus | 2 | |
| 1193 | 11 | | 500E 190N | 0-43 cm | chipping detritus | 11 | |
| 1194 | 11 | | 500E 190N | 0-43 cm | utilised flake | 1 | |
| 1195 | 11 | | 520E 195N | 0-33 cm | chipping detritus | 2 | |
| 1196 | 11 | | 495E 205N | 0-26 cm | chipping detritus | 11 | |
| 1197 | 11 | | 495E 195N | 0-13 cm | chipping detritus | 4 | |
| 1198 | 11 | | 500E 240N | 0-35 cm | chipping detritus | 8 | |
| 1199 | 11 | | 495E 175N | 0-29 cm | chipping detritus | 5 | |
| 1200 | 11 | | 495E 200N | 0-17 cm | chipping detritus | 5 | |
| 1201 | 11 | | 510E 200N | 0-35 cm | chipping detritus | 9 | |
| 1202 | 11 | | 520E 210N | 0-35 cm | chipping detritus | 6 | |
| 1203 | 11 | | 490E 215N | 0-35 cm | chipping detritus | 2 | |
| 1204 | 11 | | 485E 185N | 0-65 cm | chipping detritus | 1 | |
| 1205 | 69 | | 805E 700N | 0-36 cm | chipping detritus | 4 | |
| 1206 | 69 | | 805E 700N | 0-36 cm | scraper | 1 | fragment |
| 1207 | 69 | | CSC 6 | surface | chipping detritus | 1 | |
| 1208 | 69 | | CSC 5 | surface | chipping detritus | 1 | |
| 1209 | 69 | | CSC 2 | surface | chipping detritus | 1 | |
| 1210 | 69 | | 795E 705N | 0-30 cm | chipping detritus | 6 | |
| 1211 | 69 | | 800E 710N | 0-31 cm | utilised flake | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1212 | 69 | | 800E 710N | 0-31 cm | chipping detritus | 7 | |
| 1213 | 69 | | 800E 705N | 0-27 cm | chipping detritus | 27 | |
| 1214 | 69 | | 800E 700N | 0-28 cm | chipping detritus | 9 | |
| 1215 | 69 | | 805E 705N | 0-32 cm | chipping detritus | 9 | |
| 1216 | 69 | | 810E 705N | 0-30 cm | chipping detritus | 5 | |
| 1217 | 69 | | 805E 710N | 0-30 cm | chipping detritus | 3 | |
| 1218 | 82 | | CSC 1 | surface | chipping detritus | 1 | |
| 1219 | 82 | | CSC 2 | surface | chipping detritus | 1 | |
| 1220 | 82 | | CSC 3 | surface | chipping detritus | 1 | |
| 1221 | 82 | | 5995E 5000N | 0-18 cm | chipping detritus | 6 | |
| 1222 | 82 | | 5995E 5000N | 0-18 cm | scraper | 1 | side, fragment, ventral |
| 1223 | 82 | | CSC 4 | surface | chipping detritus | 1 | |
| 1224 | 82 | | 6000E 5000N | 0-25 cm | chipping detritus | 13 | |
| 1225 | 82 | | 6000E 5005N | 0-28 cm | chipping detritus | 6 | |
| 1226 | 82 | | 6005E 5000N | 0-25 cm | chipping detritus | 3 | |
| 1227 | 54 | | CSC 1 | surface | chipping detritus | 1 | |
| 1228 | 54 | | 2995E 2000N | 0-28 cm | chipping detritus | 1 | |
| 1229 | 66 | | CSC 25 | surface | chipping detritus | 1 | |
| 1230 | 66 | | CSC 24 | surface | chipping detritus | 1 | |
| 1231 | 66 | | CSC 26 | surface | scraper | 1 | end |
| 1232 | 66 | | CSC 26 | surface | chipping detritus | 1 | |
| 1233 | 66 | | 390E 285N | 0-40 cm | chipping detritus | 19 | |
| 1234 | 66 | | 390E 285N | 0-40 cm | scraper | 1 | side |
| 1235 | 66 | | 385E 290N | 0-34 cm | bone fragment | 1 | mammal |
| 1236 | 66 | | 385E 290N | 0-34 cm | chipping detritus | 13 | |
| 1237 | 66 | | 412E 283N | 0-20 cm | chipping detritus | 7 | |
| 1238 | 66 | | 380E 285N | 0-52 cm | chipping detritus | 4 | |
| 1239 | 66 | | 380E 290N | 0-28 cm | chipping detritus | 2 | |
| 1240 | 66 | | 385E 285N | 0-42 cm | chipping detritus | 13 | |
| 1241 | 66 | | 385E 280N | 0-30 cm | chipping detritus | 7 | |
| 1242 | 66 | | 385E 280N | 0-30 cm | scraper | 1 | side |
| 1243 | 66 | | 407E 278N | 0-28 cm | chipping detritus | 9 | |
| 1244 | 66 | | 397E 283N | 0-32 cm | chipping detritus | 15 | |
| 1245 | 66 | | 397E 278N | 0-20 cm | chipping detritus | 8 | |
| 1246 | 66 | | 390E 280N | 0-24 cm | chipping detritus | 7 | |
| 1247 | 66 | | 407E 257N | 0-28 cm | chipping detritus | 3 | |
| 1248 | 66 | | 412E 257N | 0-24 cm | chipping detritus | 4 | |
| 1249 | 88 | | 6995E 5975N | 0-27 cm | chipping detritus | 29 | |
| 1250 | 88 | | 6995E 5975N | 0-27 cm | modified groundstone | 1 | heated |
| 1251 | 88 | | 6995E 5975N | 0-27 cm | scraper | 1 | reworked projectile point |
| 1252 | 88 | | 7005E 5985N | 0-23 cm | chipping detritus | 22 | |
| 1253 | 88 | | 7005E 5985N | 0-23 cm | utilised flake | 1 | |
| 1254 | 88 | | 7020E 6000N | 0-38 cm | chipping detritus | 23 | |
| 1255 | 88 | | 7020E 6000N | 0-38 cm | utilised flake | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1256 | 88 | | 7005E 5965N | 0-37 cm | chipping detritus | 7 | |
| 1257 | 88 | | 6990E 6005N | 0-27 cm | chipping detritus | 8 | |
| 1258 | 88 | | 6990E 6005N | 0-27 cm | projectile point | 1 | Normanskill |
| 1259 | 88 | | 7015E 6000N | 0-26 cm | chipping detritus | 16 | |
| 1260 | 88 | | 7015E 6000N | 0-26 cm | body sherd | 1 | |
| 1261 | 88 | | 6985E 6000N | 0-27 cm | chipping detritus | 37 | |
| 1262 | 88 | | 7015E 6010N | 0-32 cm | chipping detritus | 8 | |
| 1263 | 88 | | 6995E 5995N | 0-31 cm | chipping detritus | 25 | |
| 1264 | 88 | | 6990E 5975N | 0-29 cm | chipping detritus | 10 | |
| 1265 | 88 | | 6990E 5975N | 0-29 cm | scraper | 1 | side, fragment, heated |
| 1266 | 88 | | 6990E 5975N | 0-29 cm | scraper | 1 | side |
| 1267 | 88 | | 7015E 5985N | 0-26 cm | chipping detritus | 6 | |
| 1268 | 88 | | 7000E 6000N | 0-28 cm | chipping detritus | 13 | |
| 1269 | 88 | | 7000E 6000N | 0-28 cm | projectile point | 1 | reworked Meadowood |
| 1270 | 88 | | 6985E 6005N | 0-28 cm | chipping detritus | 21 | |
| 1271 | 88 | | 6995E 5980N | 0-37 cm | chipping detritus | 14 | |
| 1272 | 88 | | 7010E 5975N | 0-28 cm | chipping detritus | 2 | |
| 1273 | 88 | | 7020E 5980N | 0-24 cm | chipping detritus | 7 | |
| 1274 | 88 | | 7020E 6005N | 0-26 cm | chipping detritus | 7 | |
| 1275 | 88 | | 6990E 5995N | 0-29 cm | chipping detritus | 8 | |
| 1276 | 88 | | 6995E 5970N | 0-27 cm | chipping detritus | 11 | |
| 1277 | 88 | | 6985E 5980N | 0-27 cm | chipping detritus | 11 | |
| 1278 | 88 | | 6995E 6000N | 0-28 cm | chipping detritus | 14 | |
| 1279 | 88 | | 7015E 6005N | 0-26 cm | chipping detritus | 20 | |
| 1280 | 88 | | 6995E 5990N | 0-33 cm | chipping detritus | 11 | |
| 1281 | 88 | | 7000E 5980N | 0-25 cm | chipping detritus | 17 | |
| 1282 | 88 | | 7000E 5980N | 0-25 cm | scraper | 1 | fragment |
| 1283 | 88 | | 7000E 5990N | 0-31 cm | chipping detritus | 14 | |
| 1284 | 88 | | 6990E 6000N | 0-26 cm | chipping detritus | 18 | |
| 1285 | 88 | | 7005E 6005N | 0-30 cm | chipping detritus | 7 | |
| 1286 | 88 | | 7015E 5980N | 0-25 cm | chipping detritus | 10 | |
| 1287 | 88 | | 6980E 5975N | 0-27 cm | chipping detritus | 5 | |
| 1288 | 88 | | 7000E 5970N | 0-40 cm | chipping detritus | 11 | |
| 1289 | 88 | | 6990E 5990N | 0-33 cm | chipping detritus | 7 | |
| 1290 | 88 | | 7000E 5985N | 0-25 cm | chipping detritus | 21 | |
| 1291 | 88 | | 7005E 5980N | 0-20 cm | chipping detritus | 30 | |
| 1292 | 88 | | 7010E 5980N | 0-23 cm | chipping detritus | 17 | |
| 1293 | 88 | | 7015E 5975N | 0-30 cm | chipping detritus | 9 | |
| 1294 | 88 | | 7010E 5970N | 0-32 cm | chipping detritus | 11 | |
| 1295 | 88 | | 7010E 5970N | 0-32 cm | drill | 1 | bit fragment |
| 1296 | 88 | | 7005E 6000N | 0-28 cm | chipping detritus | 14 | |
| 1297 | 88 | | 7010E 5985N | 0-28 cm | chipping detritus | 6 | |
| 1298 | 88 | | 6995E 5960N | 0-32 cm | chipping detritus | 3 | |
| 1299 | 88 | | 7010E 5965N | 0-29 cm | chipping detritus | 2 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1300 | 76 | | CSC 8 | surface | red earthenware | 1 | tile |
| 1301 | 76 | | CSC 15 | surface | yellow earthenware, banded | 1 | mocha pattern, blue |
| 1302 | 76 | | CSC 5 | surface | ironstone | 3 | |
| 1303 | 76 | | CSC 10 | surface | ironstone | 1 | |
| 1304 | 76 | | CSC 10 | surface | yellow earthenware | 1 | slip |
| 1305 | 76 | | CSC 13 | surface | ironstone | 3 | |
| 1306 | 76 | | CSC 13 | surface | red earthenware | 1 | tile |
| 1307 | 76 | | CSC 20 | surface | white earthenware | 2 | |
| 1308 | 76 | | CSC 20 | surface | white earthenware, painted | 1 | late palette polychrome |
| 1309 | 76 | | CSC 4 | surface | yellow earthenware | 1 | |
| 1310 | 76 | | CSC 4 | surface | white earthenware, flow transfer printed | 1 | blue |
| 1311 | 76 | | CSC 18 | surface | ironstone | 1 | |
| 1312 | 76 | | CSC 18 | surface | white earthenware | 1 | |
| 1313 | 76 | | CSC 9 | surface | white earthenware, transfer printed | 1 | blue |
| 1314 | 76 | | CSC 14 | surface | white earthenware, painted | 1 | late palette polychrome |
| 1315 | 76 | | CSC 11 | surface | ironstone | 2 | |
| 1316 | 76 | | CSC 3 | surface | ironstone | 1 | handle |
| 1317 | 76 | | CSC 21 | surface | ironstone | 1 | |
| 1318 | 76 | | CSC 6 | surface | yellow earthenware | 1 | |
| 1319 | 76 | | CSC 7 | surface | ironstone | 1 | |
| 1320 | 76 | | CSC 19 | surface | ironstone | 2 | |
| 1321 | 76 | | CSC 16 | surface | white earthenware, painted | 1 | green; handle |
| 1322 | 76 | | CSC 16 | surface | white earthenware, painted | 1 | late palette polychrome |
| 1323 | 76 | | CSC 17 | surface | red earthenware | 2 | |
| 1324 | 76 | | CSC 17 | surface | ironstone | 1 | moulded |
| 1325 | 76 | | CSC 17 | surface | white earthenware, stamped | 1 | late palette polychrome |
| 1326 | 76 | | CSC 17 | surface | window glass | 1 | thick |
| 1327 | 76 | | CSC 2 | surface | ironstone | 2 | |
| 1328 | 76 | | CSC 2 | surface | window glass | 1 | thick |
| 1329 | 76 | | CSC 2 | surface | white earthenware, transfer printed | 4 | blue |
| 1330 | 76 | | CSC 2 | surface | yellow earthenware, banded | 1 | mocha pattern, blue |
| 1331 | 76 | | CSC 12 | surface | stoneware | 1 | glazed |
| 1332 | 76 | | CSC 12 | surface | white earthenware, painted | 1 | late palette polychrome |
| 1333 | 76 | | CSC 1 | surface | white earthenware, flow transfer printed | 2 | blue |
| 1334 | 76 | | CSC 1 | surface | ironstone | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1335 | 76 | | CSC 1 | surface | white earthenware | 1 | |
| 1336 | 76 | | CSC 1 | surface | white earthenware, transfer printed | 1 | red |
| 1337 | 76 | | 700E 815N | 0-19 cm | brick | 9 | red fragments |
| 1338 | 76 | | 700E 815N | 0-19 cm | bone fragment | 1 | butchered mammal |
| 1339 | 76 | | 700E 815N | 0-19 cm | window glass | 4 | thick |
| 1340 | 76 | | 700E 815N | 0-19 cm | window glass | 3 | thin |
| 1341 | 76 | | 700E 815N | 0-19 cm | bottle glass | 3 | clear |
| 1342 | 76 | | 700E 815N | 0-19 cm | nail, cut | 2 | |
| 1343 | 76 | | 700E 815N | 0-19 cm | nail, wire | 1 | |
| 1344 | 76 | | 700E 815N | 0-19 cm | red earthenware | 2 | glazed |
| 1345 | 76 | | 700E 815N | 0-19 cm | ironstone | 8 | |
| 1346 | 76 | | 700E 815N | 0-19 cm | white earthenware | 4 | |
| 1347 | 76 | | 700E 815N | 0-19 cm | white earthenware, flow transfer printed | 1 | blue |
| 1348 | 76 | | 700E 815N | 0-19 cm | white earthenware, transfer printed | 1 | red |
| 1349 | 76 | | 700E 805N | 0-22 cm | brick | 2 | red fragments |
| 1350 | 76 | | 700E 805N | 0-22 cm | chipping detritus | 1 | Onondaga chert |
| 1351 | 76 | | 700E 805N | 0-22 cm | white earthenware | 3 | |
| 1352 | 76 | | 700E 805N | 0-22 cm | ironstone | 1 | |
| 1353 | 76 | | 700E 805N | 0-22 cm | red earthenware | 2 | glazed |
| 1354 | 76 | | 700E 805N | 0-22 cm | white earthenware, transfer printed | 3 | blue |
| 1355 | 76 | | 700E 805N | 0-22 cm | ironstone | 1 | moulded |
| 1356 | 76 | | 700E 805N | 0-22 cm | ironstone, transfer printed | 1 | blue (recent) |
| 1357 | 76 | | 700E 800N | 0-18 cm | brick | 23 | red fragments |
| 1358 | 76 | | 700E 800N | 0-18 cm | brick | 2 | red/black fragments (recent) |
| 1359 | 76 | | 700E 800N | 0-18 cm | nail, cut | 2 | |
| 1360 | 76 | | 700E 800N | 0-18 cm | miscellaneous metal | 1 | ring fragment |
| 1361 | 76 | | 700E 800N | 0-18 cm | mortar | 1 | |
| 1362 | 76 | | 700E 800N | 0-18 cm | bone fragment | 2 | bird |
| 1363 | 76 | | 700E 800N | 0-18 cm | bone fragment | 1 | mammal |
| 1364 | 76 | | 700E 800N | 0-18 cm | window glass | 4 | thick |
| 1365 | 76 | | 700E 800N | 0-18 cm | window glass | 1 | thin |
| 1366 | 76 | | 700E 800N | 0-18 cm | bottle glass | 2 | clear |
| 1367 | 76 | | 700E 800N | 0-18 cm | red earthenware | 5 | glazed |
| 1368 | 76 | | 700E 800N | 0-18 cm | yellow earthenware, banded | 2 | mocha pattern, black |
| 1369 | 76 | | 700E 800N | 0-18 cm | yellow earthenware, banded | 1 | worm pattern |
| 1370 | 76 | | 700E 800N | 0-18 cm | ironstone | 3 | |
| 1371 | 76 | | 700E 800N | 0-18 cm | ironstone | 2 | moulded |
| 1372 | 76 | | 700E 800N | 0-18 cm | white earthenware | 4 | |
| 1373 | 76 | | 700E 800N | 0-18 cm | white earthenware, flow | 1 | blue |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| | | | | | transfer printed | | |
| 1374 | 76 | | 700E 800N | 0-18 cm | white earthenware, transfer printed | 3 | blue |
| 1375 | 76 | | 700E 800N | 0-18 cm | white earthenware, banded | 1 | blue |
| 1376 | 76 | | 700E 800N | 0-18 cm | white earthenware, edged | 1 | blue, unscalloped |
| 1377 | 76 | | 705E 815N | 0-31 cm | brick | 5 | red fragments |
| 1378 | 76 | | 705E 815N | 0-31 cm | nail, cut | 1 | |
| 1379 | 76 | | 705E 815N | 0-31 cm | wire | 1 | hook |
| 1380 | 76 | | 705E 815N | 0-31 cm | bone fragment | 6 | butchered mammal |
| 1381 | 76 | | 705E 815N | 0-31 cm | bone fragment | 1 | bird |
| 1382 | 76 | | 705E 815N | 0-31 cm | stoneware, salt-glazed | 1 | |
| 1383 | 76 | | 705E 815N | 0-31 cm | red earthenware | 1 | glazed |
| 1384 | 76 | | 705E 815N | 0-31 cm | porcelain | 1 | cup handle |
| 1385 | 76 | | 705E 815N | 0-31 cm | ironstone | 2 | |
| 1386 | 76 | | 705E 815N | 0-31 cm | white earthenware | 10 | |
| 1387 | 76 | | 705E 815N | 0-31 cm | white earthenware, transfer printed | 3 | blue |
| 1388 | 76 | | 705E 815N | 0-31 cm | white earthenware, painted | 1 | green |
| 1389 | 76 | | 705E 815N | 0-31 cm | window glass | 4 | thick |
| 1390 | 76 | | 705E 815N | 0-31 cm | window glass | 4 | thin |
| 1391 | 76 | | 705E 815N | 0-31 cm | bottle glass | 4 | clear |
| 1392 | 76 | | 705E 815N | 0-31 cm | bottle glass | 1 | frosted |
| 1393 | 76 | | 705E 815N | 0-31 cm | bottle glass | 1 | turquoise |
| 1394 | 76 | | 705E 815N | 0-31 cm | red earthenware | 1 | |
| 1395 | 76 | | 705E 810N | 0-15 cm | brick | 7 | red fragments |
| 1396 | 76 | | 705E 810N | 0-15 cm | bottle glass | 4 | clear |
| 1397 | 76 | | 705E 810N | 0-15 cm | bone fragment | 1 | tooth |
| 1398 | 76 | | 705E 810N | 0-15 cm | ironstone | 5 | |
| 1399 | 76 | | 705E 810N | 0-15 cm | ironstone | 1 | moulded |
| 1400 | 76 | | 705E 810N | 0-15 cm | red earthenware | 1 | glazed |
| 1401 | 76 | | 705E 810N | 0-15 cm | yellow earthenware | 2 | Rockingham |
| 1402 | 76 | | 705E 810N | 0-15 cm | white earthenware, painted | 1 | late palette polychrome |
| 1403 | 76 | | 705E 810N | 0-15 cm | white earthenware, transfer printed | 1 | red |
| 1404 | 76 | | 705E 810N | 0-15 cm | white earthenware, transfer printed | 2 | blue |
| 1405 | 76 | | 705E 810N | 0-15 cm | white earthenware, transfer printed | 2 | blue plate; "willow" pattern |
| 1406 | 76 | | 695E 805N | 0-20 cm | mortar | 3 | |
| 1407 | 76 | | 695E 805N | 0-20 cm | brick | 2 | red fragments |
| 1408 | 76 | | 695E 805N | 0-20 cm | window glass | 1 | thick |
| 1409 | 76 | | 695E 805N | 0-20 cm | window glass | 1 | thin |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1410 | 76 | | 695E 805N | 0-20 cm | button | 1 | 4-hole; shell |
| 1411 | 76 | | 695E 805N | 0-20 cm | miscellaneous metal | 1 | ring fragment |
| 1412 | 76 | | 695E 805N | 0-20 cm | porcelain | 1 | |
| 1413 | 76 | | 695E 805N | 0-20 cm | ironstone | 5 | |
| 1414 | 76 | | 695E 805N | 0-20 cm | white earthenware | 1 | |
| 1415 | 76 | | 695E 805N | 0-20 cm | white earthenware, transfer printed | 2 | blue |
| 1416 | 76 | | 695E 805N | 0-20 cm | white earthenware, transfer printed | 1 | mulberry |
| 1417 | 76 | | 695E 810N | 0-18 cm | brick | 5 | red fragments |
| 1418 | 76 | | 695E 810N | 0-18 cm | chipping detritus | 1 | Onondaga chert |
| 1419 | 76 | | 695E 810N | 0-18 cm | red earthenware | 1 | glazed |
| 1420 | 76 | | 695E 810N | 0-18 cm | white earthenware, transfer printed | 1 | red |
| 1421 | 76 | | 695E 810N | 0-18 cm | white earthenware, transfer printed | 2 | blue |
| 1422 | 76 | | 695E 810N | 0-18 cm | white earthenware, flow transfer printed | 1 | |
| 1423 | 76 | | 695E 810N | 0-18 cm | mortar | 2 | |
| 1424 | 76 | | 695E 810N | 0-18 cm | ironstone | 6 | |
| 1425 | 76 | | 695E 810N | 0-18 cm | window glass | 1 | thick |
| 1426 | 76 | | 695E 810N | 0-18 cm | window glass | 1 | thin |
| 1427 | 76 | | 695E 810N | 0-18 cm | bottle glass | 2 | clear |
| 1428 | 76 | | 695E 800N | 0-17 cm | bone fragment | 2 | butchered mammal |
| 1429 | 76 | | 695E 800N | 0-17 cm | bone fragment | 2 | shell |
| 1430 | 76 | | 695E 800N | 0-17 cm | stoneware | 1 | |
| 1431 | 76 | | 695E 800N | 0-17 cm | white earthenware, transfer printed | 2 | blue |
| 1432 | 76 | | 695E 800N | 0-17 cm | white earthenware, stamped | 1 | blue |
| 1433 | 76 | | 695E 800N | 0-17 cm | white earthenware, flow transfer printed | 1 | blue |
| 1434 | 76 | | 705E 800N | 0-17 cm | bone fragment | 1 | mammal |
| 1435 | 76 | | 705E 800N | 0-17 cm | brick | 8 | red fragments |
| 1436 | 76 | | 705E 800N | 0-17 cm | button | 1 | 4-hole; bone |
| 1437 | 76 | | 705E 800N | 0-17 cm | ironstone | 1 | "STONE WARE" maker's mark |
| 1438 | 76 | | 705E 800N | 0-17 cm | ironstone | 6 | |
| 1439 | 76 | | 705E 800N | 0-17 cm | white earthenware, banded | 1 | blue |
| 1440 | 76 | | 705E 800N | 0-17 cm | white earthenware, edged | 2 | blue |
| 1441 | 76 | | 705E 800N | 0-17 cm | white earthenware, transfer printed | 2 | blue |
| 1442 | 76 | | 705E 800N | 0-17 cm | white earthenware, transfer printed | 1 | black |
| 1443 | 76 | | 705E 800N | 0-17 cm | ironstone, painted | 2 | late palette polychrome |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1444 | 76 | | 705E 800N | 0-17 cm | window glass | 1 | thick |
| 1445 | 76 | | 705E 800N | 0-17 cm | window glass | 1 | thin |
| 1446 | 76 | | 705E 800N | 0-17 cm | bottle glass | 3 | clear |
| 1447 | 76 | | 700E 810N | 0-28 cm | cement | 1 | block fragment |
| 1448 | 76 | | 700E 810N | 0-28 cm | brick | 10 | red fragments |
| 1449 | 76 | | 700E 810N | 0-28 cm | nail, wire | 1 | |
| 1450 | 76 | | 700E 810N | 0-28 cm | window glass | 4 | thick |
| 1451 | 76 | | 700E 810N | 0-28 cm | window glass | 5 | thin |
| 1452 | 76 | | 700E 810N | 0-28 cm | bottle glass | 1 | clear |
| 1453 | 76 | | 700E 810N | 0-28 cm | ironstone | 1 | moulded |
| 1454 | 76 | | 700E 810N | 0-28 cm | ironstone | 4 | |
| 1455 | 76 | | 700E 810N | 0-28 cm | white earthenware | 5 | |
| 1456 | 76 | | 700E 810N | 0-28 cm | white earthenware, transfer printed | 4 | blue |
| 1457 | 76 | | 700E 810N | 0-28 cm | white earthenware, banded | 2 | brown, yellow |
| 1458 | 76 | | 700E 810N | 0-28 cm | ironstone, banded | 1 | green |
| 1459 | 76 | | 700E 810N | 0-28 cm | ironstone | 1 | maker's mark (bow) |
| 1460 | 76 | | 700E 810N | 0-28 cm | white earthenware, stamped | 1 | purple |
| 1461 | 76 | | 705E 805N | 0-19 cm | bone fragment | 2 | butchered mammal |
| 1462 | 76 | | 705E 805N | 0-19 cm | window glass | 2 | thick |
| 1463 | 76 | | 705E 805N | 0-19 cm | window glass | 1 | thin |
| 1464 | 76 | | 705E 805N | 0-19 cm | brick | 3 | red fragments |
| 1465 | 76 | | 705E 805N | 0-19 cm | ironstone | 2 | |
| 1466 | 76 | | 705E 805N | 0-19 cm | white earthenware | 3 | |
| 1467 | 76 | | 705E 805N | 0-19 cm | white earthenware, painted | 2 | black |
| 1468 | 76 | | 705E 805N | 0-19 cm | white earthenware, transfer printed | 2 | blue |
| 1469 | 76 | | 695E 815N | 0-21 cm | bone fragment | 1 | butchered mammal |
| 1470 | 76 | | 695E 815N | 0-21 cm | button | 1 | 4-hole; glass |
| 1471 | 76 | | 695E 815N | 0-21 cm | window glass | 8 | thick |
| 1472 | 76 | | 695E 815N | 0-21 cm | ironstone | 5 | |
| 1473 | 76 | | 695E 815N | 0-21 cm | white earthenware, banded | 1 | worm pattern |
| 1474 | 76 | | 695E 815N | 0-21 cm | white earthenware, flow transfer printed | 3 | blue |
| 1475 | 76 | | 695E 815N | 0-21 cm | red earthenware | 3 | glazed |
| 1476 | 76 | | 690E 810N | 0-19 cm | miscellaneous metal | 1 | stake |
| 1477 | 76 | | 690E 810N | 0-19 cm | ironstone | 3 | |
| 1478 | 76 | | 690E 810N | 0-19 cm | white earthenware, flow transfer printed | 1 | blue |
| 1479 | 76 | | 690E 810N | 0-19 cm | white earthenware, transfer printed | 1 | red |
| 1480 | 76 | | 710E 785N | 0-17 | chipping detritus | 3 | Onondaga chert |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1481 | 76 | | 710E 785N | 0-17 | bone fragment | 2 | butchered mammal |
| 1482 | 76 | | 710E 785N | 0-17 | red earthenware | 1 | glazed |
| 1483 | 76 | | 710E 785N | 0-17 | ironstone | 1 | |
| 1484 | 76 | | 710E 785N | 0-17 | white earthenware | 1 | |
| 1485 | 76 | | 710E 785N | 0-17 | white earthenware, transfer printed | 2 | blue |
| 1486 | 76 | | 710E 785N | 0-17 | window glass | 1 | thick |
| 1487 | 76 | | 710E 785N | 0-17 | bottle glass | 1 | aqua, neck |
| 1488 | 76 | | 710E 785N | 0-17 | miscellaneous metal | 1 | hinge fragment |
| 1489 | 76 | | 710E 785N | 0-17 | nail, indeterminate type | 1 | |
| 1490 | 76 | | 710E 790N | 0-18 cm | brick | 1 | red fragments |
| 1491 | 76 | | 710E 790N | 0-18 cm | nail, cut | 2 | |
| 1492 | 76 | | 710E 790N | 0-18 cm | bone fragment | 6 | mammal |
| 1493 | 76 | | 710E 790N | 0-18 cm | bottle glass | 4 | clear |
| 1494 | 76 | | 710E 790N | 0-18 cm | bottle glass | 1 | aqua |
| 1495 | 76 | | 710E 790N | 0-18 cm | window glass | 2 | thick |
| 1496 | 76 | | 710E 790N | 0-18 cm | window glass | 2 | thin |
| 1497 | 76 | | 710E 790N | 0-18 cm | chipping detritus | 1 | Onondaga chert |
| 1498 | 76 | | 710E 790N | 0-18 cm | ironstone | 14 | |
| 1499 | 76 | | 710E 790N | 0-18 cm | white earthenware | 3 | |
| 1500 | 88 | | 6990E 5970N | 0-30 cm | chipping detritus | 10 | |
| 1501 | 88 | | 7005E 5995N | 0-30 cm | chipping detritus | 11 | |
| 1502 | 88 | | 6990E 5985N | 0-31 cm | chipping detritus | 5 | |
| 1503 | 88 | | 6990E 5985N | 0-31 cm | scraper | 1 | end |
| 1504 | 88 | | 6980E 6000N | 0-32 cm | chipping detritus | 6 | |
| 1505 | 88 | | 7005E 5990N | 0-30 cm | chipping detritus | 9 | |
| 1506 | 88 | | 6985E 5995N | 0-28 cm | chipping detritus | 4 | |
| 1507 | 88 | | 6990E 5980N | 0-23 cm | chipping detritus | 11 | |
| 1508 | 88 | | 6990E 5965N | 0-35 cm | chipping detritus | 9 | |
| 1509 | 88 | | 6990E 5965N | 0-35 cm | projectile point | 1 | base |
| 1510 | 88 | | 7000E 6005N | 0-30 cm | chipping detritus | 1 | |
| 1511 | 88 | | 7000E 6005N | 0-30 cm | projectile point | 1 | |
| 1512 | 88 | | 7000E 5965N | 0-37 cm | chipping detritus | 12 | |
| 1513 | 88 | | 7000E 5965N | 0-37 cm | biface | 1 | heated, tip |
| 1514 | 88 | | 7005E 5970N | 0-27 cm | chipping detritus | 10 | |
| 1515 | 88 | | 7000E 5995N | 0-25 cm | chipping detritus | 16 | |
| 1516 | 88 | | 7000E 5975N | 0-25 cm | chipping detritus | 16 | |
| 1517 | 88 | | 7000E 5975N | 0-25 cm | projectile point | 1 | heated, base |
| 1518 | 88 | | 7005E 5975N | 0-25 cm | chipping detritus | 10 | |
| 1519 | 88 | | 7010E 5995N | 0-23 cm | chipping detritus | 8 | |
| 1520 | 88 | | 7000E 5960N | 0-30 cm | chipping detritus | 2 | |
| 1521 | 88 | | 7010E 6000N | 0-29 cm | chipping detritus | 11 | |
| 1522 | 88 | | 7015E 5995N | 0-33 cm | chipping detritus | 4 | |
| 1523 | 88 | | 6995E 5985N | 0-32 cm | chipping detritus | 10 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1524 | 88 | | 6985E 5970N | 0-27 cm | chipping detritus | 9 | |
| 1525 | 88 | | 6995E 5965N | 0-30 cm | chipping detritus | 13 | |
| 1526 | 88 | | 7015E 5970N | 0-27 cm | chipping detritus | 6 | |
| 1527 | 88 | | 6985E 5975N | 0-27 cm | chipping detritus | 13 | |
| 1528 | 88 | | 7010E 6005N | 0-30 cm | chipping detritus | 8 | |
| 1529 | 88 | | 7010E 5975N | 0-28 cm | chipping detritus | 3 | |
| 1530 | 88 | | 6980E 5980N | 0-30 cm | chipping detritus | 1 | |
| 1531 | 88 | | 6984E 5985N | 0-28 cm | chipping detritus | 1 | |
| 1532 | 88 | | 6995E 6005N | 0-31 cm | chipping detritus | 5 | |
| 1533 | 88 | | 6995E 6005N | 0-31 cm | scraper | 1 | side, ventral |
| 1534 | 88 | | CSC 1 | surface | chipping detritus | 1 | |
| 1535 | 88 | | CSC 2 | surface | chipping detritus | 1 | |
| 1536 | 88 | | CSC 4 | surface | biface | 1 | |
| 1537 | 88 | | CSC 5 | surface | chipping detritus | 1 | |
| 1538 | 88 | | CSC 6 | surface | chipping detritus | 1 | |
| 1539 | 88 | | CSC 7 | surface | chipping detritus | 1 | |
| 1540 | 76 | | 710E 790N | 0-18 cm | white earthenware, transfer printed | 1 | black |
| 1541 | 76 | | 710E 790N | 0-18 cm | porcelain | 1 | transfer printed |
| 1542 | 76 | | 710E 790N | 0-18 cm | white earthenware, flow transfer printed | 3 | blue |
| 1543 | 76 | | 710E 790N | 0-18 cm | red earthenware | 4 | glazed |
| 1544 | 76 | | 710E 790N | 0-18 cm | yellow earthenware | 1 | Rockingham |
| 1545 | 76 | | 715E 800N | 0-24 cm | window glass | 1 | thin |
| 1546 | 76 | | 715E 800N | 0-24 cm | window glass | 8 | thick |
| 1547 | 76 | | 715E 800N | 0-24 cm | bottle glass | 1 | aqua |
| 1548 | 76 | | 715E 800N | 0-24 cm | bottle glass | 5 | clear |
| 1549 | 76 | | 715E 800N | 0-24 cm | miscellaneous metal | 1 | bolt |
| 1550 | 76 | | 715E 800N | 0-24 cm | ironstone | 8 | |
| 1551 | 76 | | 715E 800N | 0-24 cm | white earthenware | 4 | |
| 1552 | 76 | | 715E 800N | 0-24 cm | porcelain | 1 | |
| 1553 | 76 | | 715E 800N | 0-24 cm | white earthenware, painted | 1 | late palette polychrome |
| 1554 | 76 | | 715E 800N | 0-24 cm | white earthenware, transfer printed | 2 | blue |
| 1555 | 76 | | 715E 800N | 0-24 cm | white earthenware, edged | 1 | blue |
| 1556 | 76 | | 710E 795N | 0-19 cm | nail, cut | 1 | |
| 1557 | 76 | | 710E 795N | 0-19 cm | bone fragment | 1 | butchered mammal |
| 1558 | 76 | | 710E 795N | 0-19 cm | window glass | 8 | thick |
| 1559 | 76 | | 710E 795N | 0-19 cm | red earthenware | 2 | glazed |
| 1560 | 76 | | 710E 795N | 0-19 cm | ironstone | 3 | |
| 1561 | 76 | | 710E 795N | 0-19 cm | white earthenware | 6 | |
| 1562 | 76 | | 710E 795N | 0-19 cm | white earthenware, banded | 2 | blue |
| 1563 | 76 | | 710E 795N | 0-19 cm | white earthenware, | 1 | blue |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| | | | | | edged | | |
| 1564 | 76 | | 710E 795N | 0-19 cm | white earthenware, painted | 1 | blue |
| 1565 | 76 | | 710E 795N | 0-19 cm | white earthenware, transfer printed | 4 | blue |
| 1566 | 76 | | 710E 795N | 0-19 cm | white earthenware, painted | 1 | green |
| 1567 | 76 | | 710E 795N | 0-19 cm | yellow earthenware | 1 | Rockingham |
| 1568 | 76 | | 715E 810N | 0-17 cm | bone fragment | 2 | mammal |
| 1569 | 76 | | 715E 810N | 0-17 cm | nail, cut | 1 | |
| 1570 | 76 | | 715E 810N | 0-17 cm | miscellaneous metal | 1 | hardware |
| 1571 | 76 | | 715E 810N | 0-17 cm | slate blackboard | 2 | |
| 1572 | 76 | | 715E 810N | 0-17 cm | bottle glass | 4 | clear |
| 1573 | 76 | | 715E 810N | 0-17 cm | bottle glass | 2 | aqua |
| 1574 | 76 | | 715E 810N | 0-17 cm | bottle glass | 1 | blue |
| 1575 | 76 | | 715E 810N | 0-17 cm | white earthenware | 3 | |
| 1576 | 76 | | 715E 810N | 0-17 cm | white earthenware, painted | 1 | late palette polychrome |
| 1577 | 76 | | 715E 810N | 0-17 cm | white earthenware, transfer printed | 1 | blue |
| 1578 | 76 | | 715E 810N | 0-17 cm | red earthenware | 3 | glazed |
| 1579 | 76 | | 695E 785N | 0-23 cm | bone fragment | 1 | mammal |
| 1580 | 76 | | 695E 785N | 0-23 cm | chipping detritus | 1 | Onondaga chert |
| 1581 | 76 | | 695E 785N | 0-23 cm | miscellaneous metal | 1 | copper fragment |
| 1582 | 76 | | 695E 785N | 0-23 cm | miscellaneous metal | 1 | decorative knob |
| 1583 | 76 | | 695E 785N | 0-23 cm | window glass | 6 | thick |
| 1584 | 76 | | 695E 785N | 0-23 cm | window glass | 1 | thin |
| 1585 | 76 | | 695E 785N | 0-23 cm | white earthenware | 3 | |
| 1586 | 76 | | 695E 785N | 0-23 cm | white earthenware, transfer printed | 2 | blue |
| 1587 | 76 | | 695E 785N | 0-23 cm | white earthenware, flow transfer printed | 1 | blue |
| 1588 | 76 | | 695E 785N | 0-23 cm | white earthenware, transfer printed | 1 | black |
| 1589 | 76 | | 695E 785N | 0-23 cm | white earthenware, painted | 1 | blue |
| 1590 | 76 | | 715E 815N | 0-21 cm | bone fragment | 2 | butchered mammal |
| 1591 | 76 | | 715E 815N | 0-21 cm | recent material | 1 | plastic lid "cutex" |
| 1592 | 76 | | 715E 815N | 0-21 cm | nail, recent | 1 | screw |
| 1593 | 76 | | 715E 815N | 0-21 cm | miscellaneous metal | 1 | clip |
| 1594 | 76 | | 715E 815N | 0-21 cm | stoneware, salt-glazed | 1 | |
| 1595 | 76 | | 715E 815N | 0-21 cm | red earthenware | 6 | glazed |
| 1596 | 76 | | 715E 815N | 0-21 cm | white earthenware, banded | 1 | green |
| 1597 | 76 | | 715E 815N | 0-21 cm | white earthenware, banded | 1 | blue |
| 1598 | 76 | | 715E 815N | 0-21 cm | white earthenware, | 1 | blue |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| | | | | | transfer printed | | |
| 1599 | 76 | | 715E 815N | 0-21 cm | white earthenware, transfer printed | 3 | brown |
| 1600 | 76 | | 715E 815N | 0-21 cm | porcelain | 2 | painted |
| 1601 | 76 | | 715E 815N | 0-21 cm | ironstone | 2 | |
| 1602 | 76 | | 715E 815N | 0-21 cm | white earthenware | 1 | |
| 1603 | 76 | | 715E 815N | 0-21 cm | creamware | 1 | |
| 1604 | 76 | | 715E 815N | 0-21 cm | window glass | 10 | thick |
| 1605 | 76 | | 715E 815N | 0-21 cm | bottle glass | 5 | clear |
| 1606 | 76 | | 715E 815N | 0-21 cm | drinking glass | 1 | clear |
| 1607 | 76 | | 710E 805N | 0-16 cm | brick | 3 | red fragments |
| 1608 | 76 | | 710E 805N | 0-16 cm | nail, cut | 1 | |
| 1609 | 76 | | 710E 805N | 0-16 cm | bottle glass | 1 | green |
| 1610 | 76 | | 710E 805N | 0-16 cm | bottle glass | 2 | clear |
| 1611 | 76 | | 710E 805N | 0-16 cm | red earthenware | 1 | glazed |
| 1612 | 76 | | 710E 805N | 0-16 cm | yellow earthenware | 1 | Rockingham |
| 1613 | 76 | | 710E 805N | 0-16 cm | white earthenware, transfer printed | 3 | blue |
| 1614 | 76 | | 710E 805N | 0-16 cm | white earthenware | 5 | |
| 1615 | 76 | | 710E 805N | 0-16 cm | ironstone | 1 | |
| 1616 | 76 | | CSC 24 | surface | white earthenware | 1 | |
| 1617 | 76 | | CSC 24 | surface | white earthenware, transfer printed | 1 | |
| 1618 | 76 | | CSC 22 | surface | ironstone | 2 | |
| 1619 | 76 | | 695E 790N | 0-17 cm | chipping detritus | 3 | Onondaga chert |
| 1620 | 76 | | 695E 790N | 0-17 cm | nail, cut | 3 | |
| 1621 | 76 | | 695E 790N | 0-17 cm | bone fragment | 2 | butchered mammal |
| 1622 | 76 | | 695E 790N | 0-17 cm | window glass | 3 | thick |
| 1623 | 76 | | 695E 790N | 0-17 cm | bottle glass | 3 | clear |
| 1624 | 76 | | 695E 790N | 0-17 cm | white earthenware, transfer printed | 8 | blue |
| 1625 | 76 | | 695E 790N | 0-17 cm | white earthenware, edged | 1 | blue |
| 1626 | 76 | | 695E 790N | 0-17 cm | white earthenware, flow transfer printed | 2 | blue |
| 1627 | 76 | | 695E 790N | 0-17 cm | white earthenware, banded | 1 | blue |
| 1628 | 76 | | 695E 790N | 0-17 cm | white earthenware | 12 | |
| 1629 | 76 | | 695E 790N | 0-17 cm | ironstone | 12 | |
| 1630 | 76 | | 695E 790N | 0-17 cm | white earthenware, painted | 1 | green |
| 1631 | 76 | | 695E 790N | 0-17 cm | white earthenware, painted | 1 | black |
| 1632 | 76 | | 695E 790N | 0-17 cm | white earthenware, transfer printed | 1 | red |
| 1633 | 76 | | 695E 790N | 0-17 cm | red earthenware | 12 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1634 | 76 | | 695E 790N | 0-17 cm | red earthenware | 1 | glazed |
| 1635 | 76 | | 695E 790N | 0-17 cm | brick | 2 | red fragments |
| 1636 | 76 | | 700E 685N | 0-22 cm | chipping detritus | 2 | Onondaga chert |
| 1637 | 76 | | 700E 685N | 0-22 cm | brick | 6 | red fragments |
| 1638 | 76 | | 700E 685N | 0-22 cm | window glass | 1 | thick |
| 1639 | 76 | | 700E 685N | 0-22 cm | window glass | 3 | thin |
| 1640 | 76 | | 700E 685N | 0-22 cm | miscellaneous metal | 1 | door handle |
| 1641 | 76 | | 700E 685N | 0-22 cm | miscellaneous metal | 1 | decorative knob |
| 1642 | 76 | | 700E 685N | 0-22 cm | miscellaneous metal | 1 | nut & bolt |
| 1643 | 76 | | 700E 685N | 0-22 cm | nail, cut | 1 | |
| 1644 | 76 | | 700E 685N | 0-22 cm | ironstone | 4 | |
| 1645 | 76 | | 700E 685N | 0-22 cm | white earthenware | 5 | |
| 1646 | 76 | | 700E 685N | 0-22 cm | white earthenware, transfer printed | 1 | red |
| 1647 | 76 | | 700E 685N | 0-22 cm | white earthenware, transfer printed | 1 | black |
| 1648 | 76 | | 700E 685N | 0-22 cm | white earthenware, transfer printed | 4 | blue |
| 1649 | 76 | | 700E 685N | 0-22 cm | white earthenware, banded | 1 | blue, tan |
| 1650 | 76 | | 715E 790N | 0-23 cm | bone fragment | 2 | mammal |
| 1651 | 76 | | 715E 790N | 0-23 cm | white earthenware, stamped | 1 | blue |
| 1652 | 76 | | 715E 790N | 0-23 cm | red earthenware | 1 | |
| 1653 | 76 | | 715E 790N | 0-23 cm | yellow earthenware | 1 | Rockingham |
| 1654 | 76 | | 715E 790N | 0-23 cm | window glass | 4 | thick |
| 1655 | 76 | | 715E 790N | 0-23 cm | bottle glass | 1 | clear |
| 1656 | 76 | | 715E 790N | 0-23 cm | brick | 1 | red fragments |
| 1657 | 76 | | 715E 795N | 0-19 cm | glass dish | 9 | vase fragments; clear |
| 1658 | 76 | | 715E 795N | 0-19 cm | window glass | 1 | thick |
| 1659 | 76 | | 715E 795N | 0-19 cm | bone fragment | 1 | mammal |
| 1660 | 76 | | 715E 795N | 0-19 cm | ironstone | 1 | |
| 1661 | 76 | | 715E 795N | 0-19 cm | white earthenware | 5 | |
| 1662 | 76 | | 715E 795N | 0-19 cm | white earthenware, transfer printed | 1 | blue |
| 1663 | 76 | | 715E 795N | 0-19 cm | red earthenware | 1 | glazed |
| 1664 | 76 | | 705E 820N | 0-26 cm | brick | 7 | red fragments |
| 1665 | 76 | | 705E 820N | 0-26 cm | nail, cut | 3 | |
| 1666 | 76 | | 705E 820N | 0-26 cm | miscellaneous metal | 1 | buckle fragment |
| 1667 | 76 | | 705E 820N | 0-26 cm | miscellaneous metal | 2 | flat sheet fragments |
| 1668 | 76 | | 705E 820N | 0-26 cm | window glass | 2 | thick |
| 1669 | 76 | | 705E 820N | 0-26 cm | window glass | 1 | thin |
| 1670 | 76 | | 705E 820N | 0-26 cm | bottle glass | 1 | clear |
| 1671 | 76 | | 705E 820N | 0-26 cm | bone fragment | 23 | butchered mammal |
| 1672 | 76 | | 705E 820N | 0-26 cm | bone fragment | 1 | tooth |
| 1673 | 76 | | 705E 820N | 0-26 cm | red earthenware | 8 | glazed |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1674 | 76 | | 705E 820N | 0-26 cm | white earthenware | 18 | |
| 1675 | 76 | | 705E 820N | 0-26 cm | ironstone | 4 | |
| 1676 | 76 | | 705E 820N | 0-26 cm | white earthenware, transfer printed | 3 | plate; mulberry |
| 1677 | 76 | | 705E 820N | 0-26 cm | white earthenware, transfer printed | 10 | blue |
| 1678 | 76 | | 705E 820N | 0-26 cm | white earthenware, transfer printed | 2 | bosses; plate; blue |
| 1679 | 76 | | 705E 820N | 0-26 cm | white earthenware, transfer printed | 1 | green |
| 1680 | 76 | | 705E 820N | 0-26 cm | white earthenware, flow transfer printed | 1 | blue |
| 1681 | 76 | | 705E 820N | 0-26 cm | white earthenware, painted | 1 | blue |
| 1682 | 76 | | 705E 820N | 0-26 cm | white earthenware, painted | 3 | late palette polychrome |
| 1683 | 76 | | 705E 820N | 0-26 cm | white earthenware, edged | 1 | green; scalloped |
| 1684 | 76 | | 705E 820N | 0-26 cm | white earthenware, banded | 2 | blue |
| 1685 | 76 | | 705E 820N | 0-26 cm | yellow earthenware | 1 | Rockingham |
| 1686 | 76 | | 705E 795N | 0-14 cm | button | 1 | "extra rich quality" |
| 1687 | 76 | | 705E 795N | 0-14 cm | window glass | 2 | thick |
| 1688 | 76 | | 705E 795N | 0-14 cm | window glass | 2 | thin |
| 1689 | 76 | | 705E 795N | 0-14 cm | bottle glass | 2 | clear |
| 1690 | 76 | | 705E 795N | 0-14 cm | glass dish | 1 | moulded |
| 1691 | 76 | | 705E 795N | 0-14 cm | white earthenware | 10 | |
| 1692 | 76 | | 705E 795N | 0-14 cm | ironstone | 2 | |
| 1693 | 76 | | 705E 795N | 0-14 cm | creamware | 1 | |
| 1694 | 76 | | 705E 795N | 0-14 cm | white earthenware, transfer printed | 4 | red |
| 1695 | 76 | | 705E 795N | 0-14 cm | red earthenware | 6 | glazed |
| 1696 | 76 | | 705E 795N | 0-14 cm | glass bead | 1 | blue |
| 1697 | 76 | | 705E 795N | 0-14 cm | white earthenware, transfer printed | 3 | blue |
| 1698 | 76 | | 705E 795N | 0-14 cm | white earthenware, flow transfer printed | 2 | blue |
| 1699 | 76 | | 690E 805N | 0-18 cm | nail, wire | 1 | |
| 1700 | 88 | | 6947E 6017N | 0-33 cm | chipping detritus | 8 | |
| 1701 | 88 | | 6969E 6012N | 0-33 cm | chipping detritus | 9 | |
| 1702 | 88 | | 6969E 6012N | 0-33 cm | projectile point | 1 | Haldimand |
| 1703 | 88 | | 6984E 6032N | 0-49 cm | chipping detritus | 9 | |
| 1704 | 88 | | 6984E 6032N | 0-30 cm | chipping detritus | 7 | |
| 1705 | 88 | | 6989E 6022N | 0-32 cm | chipping detritus | 7 | |
| 1706 | 88 | | 6974E 6012N | 0-28 cm | chipping detritus | 17 | |
| 1707 | 88 | | 6989E 6017N | 0-30 cm | chipping detritus | 13 | |
| 1708 | 88 | | 6999E 6042N | 0-32 cm | chipping detritus | 6 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1709 | 88 | | 6994E 6037N | 0-26 cm | chipping detritus | 10 | |
| 1710 | 88 | | 6979E 6027N | 0-35 cm | chipping detritus | 12 | |
| 1711 | 88 | | 6979E 6027N | 0-35 cm | scraper | 1 | end, ventral |
| 1712 | 88 | | 6999E 6037N | 0-32 cm | chipping detritus | 21 | |
| 1713 | 88 | | 6984E 6022N | 0-34 cm | chipping detritus | 20 | |
| 1714 | 88 | | 6984E 6022N | 0-34 cm | biface | 1 | |
| 1715 | 88 | | 6999E 6032N | 0-31 cm | chipping detritus | 11 | |
| 1716 | 88 | | 6999E 6027N | 0-28 cm | chipping detritus | 8 | |
| 1717 | 88 | | 6979E 6032N | 0-30 cm | chipping detritus | 4 | |
| 1718 | 88 | | 6979E 6022N | 0-35 cm | chipping detritus | 6 | |
| 1719 | 88 | | 6984E 6027N | 0-32 cm | chipping detritus | 12 | |
| 1720 | 88 | | 7004E 6032N | 0-30 cm | chipping detritus | 3 | |
| 1721 | 88 | | 7004E 6037N | 0-27 cm | chipping detritus | 9 | |
| 1722 | 88 | | 6994E 6032N | 0-37 cm | chipping detritus | 16 | |
| 1723 | 88 | | 6994E 6032N | 0-37 cm | scraper | 1 | fragment, ventral |
| 1724 | 88 | | 6984E 6012N | 0-30 cm | chipping detritus | 12 | |
| 1725 | 88 | | 6994E 6027N | 0-40 cm | chipping detritus | 15 | |
| 1726 | 88 | | 6994E 6022N | 0-33 cm | chipping detritus | 4 | |
| 1727 | 88 | | 6994E 6022N | 0-33 cm | projectile point | 1 | base |
| 1728 | 88 | | 6979E 6007N | 0-47 cm | chipping detritus | 12 | |
| 1729 | 88 | | 6989E 6012N | 0-27 cm | chipping detritus | 2 | |
| 1730 | 88 | | 6979E 6012N | 0-31 cm | chipping detritus | 12 | |
| 1731 | 88 | | 6979E 6012N | 0-31 cm | scraper | 1 | end, ventral |
| 1732 | 88 | | 6979E 6017N | 0-37 cm | chipping detritus | 10 | |
| 1733 | 88 | | 6994E 6017N | 0-31 cm | chipping detritus | 4 | |
| 1734 | 88 | | 6984E 6017N | 0-48 cm | chipping detritus | 14 | |
| 1735 | 88 | | 6989E 6027N | 0-31 cm | chipping detritus | 10 | |
| 1736 | 88 | | 6974E 6027N | 0-35 cm | chipping detritus | 7 | |
| 1737 | 88 | | 6989E 6032N | 0-27 cm | chipping detritus | 9 | |
| 1738 | 88 | | CSC 8 | surface | chipping detritus | 1 | |
| 1739 | 88 | | CSC 9 | surface | chipping detritus | 3 | |
| 1740 | 88 | | CSC 10 | surface | chipping detritus | 1 | Haldimand |
| 1741 | 66 | | 432E 277N | 0-24 cm | chipping detritus | 2 | |
| 1742 | 66 | | 395E 300N | 0-34 cm | chipping detritus | 21 | |
| 1743 | 66 | | 432E 287N | 0-28 cm | utilised flake | 1 | |
| 1744 | 66 | | 432E 287N | 0-28 cm | chipping detritus | 24 | |
| 1745 | 66 | | 432E 287N | 0-28 cm | scraper | 1 | side, ventral |
| 1746 | 66 | | 412E 272N | 0-64 cm | fragmentary sherds | 11 | |
| 1747 | 66 | | 432E 287N | 0-28 cm | chipping detritus | 52 | |
| 1748 | 66 | | 390E 290N | 0-27 cm | projectile point | 1 | |
| 1749 | 66 | | 390E 290N | 0-27 cm | chipping detritus | 23 | |
| 1750 | 66 | | 390E 290N | 0-27 cm | biface | 1 | |
| 1751 | 66 | | 402E 288N | 0-28 cm | chipping detritus | 20 | |
| 1752 | 66 | | 412E 287N | 0-22 cm | chipping detritus | 6 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1753 | 66 | | 437E 287N | 0-25 cm | chipping detritus | 4 | |
| 1754 | 66 | | 402E 283N | 0-30 cm | chipping detritus | 22 | |
| 1755 | 66 | | 390E 295N | 0-32 cm | chipping detritus | 18 | |
| 1756 | 66 | | 395E 305N | 0-32 cm | chipping detritus | 5 | |
| 1757 | 66 | | 422E 272N | 0-23 cm | chipping detritus | 8 | |
| 1758 | 66 | | 395E 295N | 0-29 cm | chipping detritus | 19 | |
| 1759 | 66 | | 412E 267N | 0-28 cm | chipping detritus | 11 | |
| 1760 | 66 | | 412E 267N | 0-28 cm | biface | 1 | |
| 1761 | 66 | | 412E 262N | 0-33 cm | chipping detritus | 4 | |
| 1762 | 66 | | 412E 262N | 0-33 cm | projectile point | 1 | base |
| 1763 | 66 | | 390E 300N | 0-20 cm | chipping detritus | 8 | |
| 1764 | 66 | | 385E 295N | 0-25 cm | chipping detritus | 8 | |
| 1765 | 66 | | 402E 293N | 0-21 cm | chipping detritus | 6 | |
| 1766 | 66 | | 402E 293N | 0-21 cm | projectile point | 1 | Adder orchard |
| 1767 | 66 | | 422E 277N | 0-35 cm | chipping detritus | 4 | |
| 1768 | 66 | | 400E 300N | 0-23 cm | chipping detritus | 3 | |
| 1769 | 66 | | 422E 267N | 0-23 cm | chipping detritus | 8 | |
| 1770 | 66 | | 412E 277N | 0-32 cm | chipping detritus | 23 | |
| 1771 | 66 | | 470E 288N | 0-23 cm | chipping detritus | 8 | |
| 1772 | 66 | | 417E 272N | 0-21 cm | chipping detritus | 23 | |
| 1773 | 66 | | 402E 278N | 0-40 cm | chipping detritus | 9 | |
| 1774 | 66 | | 427E 277N | 0-21 cm | chipping detritus | 9 | |
| 1775 | 66 | | 400E 305N | 0-29 cm | chipping detritus | 9 | |
| 1776 | 66 | | 397E 288N | 0-21 cm | chipping detritus | 8 | |
| 1777 | 66 | | 397E 288N | 0-21 cm | scraper | 1 | side |
| 1778 | 66 | | 417E 267N | 0-26 cm | chipping detritus | 6 | |
| 1779 | 66 | | 407E 267N | 0-30 cm | chipping detritus | 7 | |
| 1780 | 66 | | 407E 272N | 0-36 cm | chipping detritus | 3 | |
| 1781 | 66 | | CSC 1 | surface | chipping detritus | 1 | |
| 1782 | 66 | | CSC 6 | surface | chipping detritus | 1 | |
| 1783 | 66 | | CSC 4 | surface | chipping detritus | 1 | |
| 1784 | 66 | | CSC 10 | surface | core | 1 | |
| 1785 | 66 | | CSC 7 | surface | scraper | 1 | side, ventral |
| 1786 | 66 | | CSC 21 | surface | chipping detritus | 1 | |
| 1787 | 66 | | CSC 12 | surface | chipping detritus | 1 | |
| 1788 | 66 | | CSC 12 | surface | scraper | 1 | side |
| 1789 | 66 | | CSC 9 | surface | chipping detritus | 1 | |
| 1790 | 66 | | CSC 22 | surface | chipping detritus | 1 | |
| 1791 | 66 | | CSC 5 | surface | chipping detritus | 1 | |
| 1792 | 66 | | CSC 18 | surface | chipping detritus | 1 | |
| 1793 | 66 | | CSC 14 | surface | chipping detritus | 1 | |
| 1794 | 66 | | CSC 16 | surface | chipping detritus | 1 | |
| 1795 | 66 | | CSC 23 | surface | chipping detritus | 2 | |
| 1796 | 62 | | CSC 1 | surface | chipping detritus | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1797 | 62 | | CSC 5 | surface | chipping detritus | 1 | |
| 1798 | 62 | | 995E 900N | 0-25 cm | chipping detritus | 9 | |
| 1799 | 62 | | 1000E 900N | 0-21 cm | chipping detritus | 10 | |
| 1800 | 62 | | 995E 895N | 0-26 cm | chipping detritus | 4 | |
| 1801 | 62 | | 1000E 905N | 0-17 cm | chipping detritus | 8 | |
| 1802 | 62 | | 1005E 900N | 0-24 cm | chipping detritus | 3 | |
| 1803 | 18 | | 595E 300N | 0-28 cm | chipping detritus | 4 | |
| 1804 | 18 | | 600E 305N | 0-30 cm | chipping detritus | 18 | |
| 1805 | 18 | | 600E 300N | 0-35 cm | chipping detritus | 3 | |
| 1806 | 18 | | 590E 305N | 0-32 cm | chipping detritus | 2 | |
| 1807 | 18 | | 595E 305N | 0-28 cm | chipping detritus | 10 | |
| 1808 | 18 | | 595E 305N | 0-28 cm | scraper | 1 | side |
| 1809 | 18 | | 605E 305N | 0-30 cm | chipping detritus | 4 | |
| 1810 | 18 | | 600E 310N | 0-22 cm | chipping detritus | 6 | |
| 1811 | 18 | | 595E 310N | 0-35 cm | chipping detritus | 2 | |
| 1812 | 18 | | CSC 1 | surface | chipping detritus | 1 | |
| 1813 | 18 | | CSC 2 | surface | chipping detritus | 1 | |
| 1814 | 47 | | 5000E 4000N | 0-30 cm | chipping detritus | 2 | |
| 1815 | 76 | | 690E 805N | 0-18 cm | red earthenware | 3 | glazed |
| 1816 | 76 | | 690E 805N | 0-18 cm | red earthenware | 2 | |
| 1817 | 76 | | 690E 805N | 0-18 cm | brick | 2 | red fragments |
| 1818 | 76 | | 690E 805N | 0-18 cm | window glass | 2 | thick |
| 1819 | 76 | | 690E 805N | 0-18 cm | bottle glass | 1 | clear |
| 1820 | 76 | | 690E 805N | 0-18 cm | white earthenware, transfer printed | 1 | black |
| 1821 | 76 | | 690E 805N | 0-18 cm | yellow earthenware | 1 | |
| 1822 | 76 | | 690E 805N | 0-18 cm | white earthenware, transfer printed | 1 | blue |
| 1823 | 76 | | 690E 805N | 0-18 cm | white earthenware | 2 | |
| 1824 | 76 | | 700E 790N | 0-22 cm | bone fragment | 2 | butchered mammal |
| 1825 | 76 | | 700E 790N | 0-22 cm | red earthenware | 4 | glazed |
| 1826 | 76 | | 700E 790N | 0-22 cm | red earthenware | 7 | |
| 1827 | 76 | | 700E 790N | 0-22 cm | brick | 4 | red fragments |
| 1828 | 76 | | 700E 790N | 0-22 cm | ironstone | 12 | |
| 1829 | 76 | | 700E 790N | 0-22 cm | white earthenware | 5 | |
| 1830 | 76 | | 700E 790N | 0-22 cm | white earthenware, transfer printed | 1 | blue |
| 1831 | 76 | | 700E 790N | 0-22 cm | white earthenware, transfer printed | 1 | turquoise |
| 1832 | 76 | | 700E 790N | 0-22 cm | white earthenware, flow transfer printed | 3 | blue |
| 1833 | 76 | | 700E 790N | 0-22 cm | white earthenware, edged | 2 | blue |
| 1834 | 76 | | 700E 790N | 0-22 cm | white earthenware, edged | 1 | blue, scalloped |
| 1835 | 76 | | 700E 790N | 0-22 cm | white earthenware, | 1 | green |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| | | | | | painted | | |
| 1836 | 76 | | 700E 790N | 0-22 cm | white earthenware, transfer printed | 1 | brown |
| 1837 | 76 | | 700E 790N | 0-22 cm | window glass | 6 | thick |
| 1838 | 76 | | 700E 790N | 0-22 cm | bottle glass | 3 | aqua, "...B..." |
| 1839 | 76 | | 695E 795N | 0-20 cm | nail, wire | 1 | |
| 1840 | 76 | | 695E 795N | 0-20 cm | window glass | 3 | thick |
| 1841 | 76 | | 695E 795N | 0-20 cm | bottle glass | 1 | frosted |
| 1842 | 76 | | 695E 795N | 0-20 cm | yellow earthenware | 2 | Rockingham |
| 1843 | 76 | | 695E 795N | 0-20 cm | porcelain | 1 | figurine leg fragment |
| 1844 | 76 | | 695E 795N | 0-20 cm | white earthenware | 5 | |
| 1845 | 76 | | 695E 795N | 0-20 cm | white earthenware, transfer printed | 1 | red |
| 1846 | 76 | | 695E 795N | 0-20 cm | white earthenware, transfer printed | 1 | black |
| 1847 | 76 | | 695E 795N | 0-20 cm | white earthenware, transfer printed | 1 | mulberry |
| 1848 | 76 | | 695E 795N | 0-20 cm | white earthenware, painted | 1 | blue |
| 1849 | 76 | | 695E 795N | 0-20 cm | white earthenware, painted | 1 | green |
| 1850 | 76 | | 695E 795N | 0-20 cm | white earthenware, painted | 1 | black |
| 1851 | 76 | | 695E 795N | 0-20 cm | white earthenware, banded | 1 | olive |
| 1852 | 76 | | 695E 795N | 0-20 cm | white earthenware, banded | 1 | black, blue |
| 1853 | 76 | | 695E 795N | 0-20 cm | red earthenware | 1 | glazed |
| 1854 | 76 | | 695E 795N | 0-20 cm | red earthenware | 3 | |
| 1855 | 76 | | 705E 790N | 0-29 cm | brick | 6 | red fragments |
| 1856 | 76 | | 705E 790N | 0-29 cm | brick | 1 | yellow fragment |
| 1857 | 76 | | 705E 790N | 0-29 cm | mortar | 2 | |
| 1858 | 76 | | 705E 790N | 0-29 cm | nail, wire | 1 | |
| 1859 | 76 | | 705E 790N | 0-29 cm | bone fragment | 3 | butchered mammal |
| 1860 | 76 | | 705E 790N | 0-29 cm | scraper | 1 | end; Onondaga |
| 1861 | 76 | | 705E 790N | 0-29 cm | button | 1 | glass; 4-hole |
| 1862 | 76 | | 705E 790N | 0-29 cm | coal | 1 | |
| 1863 | 76 | | 705E 790N | 0-29 cm | coin | 1 | 1969 penny |
| 1864 | 76 | | 705E 790N | 0-29 cm | bottle glass | 1 | green |
| 1865 | 76 | | 705E 790N | 0-29 cm | bottle glass | 2 | clear |
| 1866 | 76 | | 705E 790N | 0-29 cm | window glass | 2 | thick |
| 1867 | 76 | | 705E 790N | 0-29 cm | window glass | 2 | thin |
| 1868 | 76 | | 705E 790N | 0-29 cm | white earthenware | 7 | |
| 1869 | 76 | | 705E 790N | 0-29 cm | ironstone | 7 | |
| 1870 | 76 | | 705E 790N | 0-29 cm | porcelain | 1 | |
| 1871 | 76 | | 705E 790N | 0-29 cm | red earthenware | 3 | glazed |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1872 | 76 | | 705E 790N | 0-29 cm | yellow earthenware | 2 | Rockingham |
| 1873 | 76 | | 705E 790N | 0-29 cm | white earthenware, transfer printed | 3 | blue |
| 1874 | 76 | | 705E 790N | 0-29 cm | white earthenware, flow transfer printed | 4 | blue |
| 1875 | 76 | | 705E 790N | 0-29 cm | white earthenware, painted | 1 | blue |
| 1876 | 76 | | 705E 790N | 0-29 cm | white earthenware, edged | 1 | blue |
| 1877 | 76 | | 710E 810N | 0-16 cm | coal | 2 | |
| 1878 | 76 | | 710E 810N | 0-16 cm | bone fragment | 5 | butchered mammal |
| 1879 | 76 | | 710E 810N | 0-16 cm | spoon | 1 | |
| 1880 | 76 | | 710E 810N | 0-16 cm | window glass | 3 | thick |
| 1881 | 76 | | 710E 810N | 0-16 cm | bottle glass | 2 | |
| 1882 | 76 | | 710E 810N | 0-16 cm | white earthenware | 7 | |
| 1883 | 76 | | 710E 810N | 0-16 cm | ironstone | 2 | |
| 1884 | 76 | | 710E 810N | 0-16 cm | white earthenware, painted | 1 | late palette polychrome |
| 1885 | 76 | | 710E 810N | 0-16 cm | white earthenware, transfer printed | 2 | blue |
| 1886 | 76 | | 710E 810N | 0-16 cm | white earthenware, flow transfer printed | 1 | blue |
| 1887 | 76 | | 710E 810N | 0-16 cm | red earthenware | 4 | glazed |
| 1888 | 76 | | 710E 810N | 0-16 cm | brick | 2 | red fragments |
| 1889 | 76 | | 710E 800N | 0-17 cm | nail, wire | 1 | |
| 1890 | 76 | | 710E 800N | 0-17 cm | nail, cut | 2 | |
| 1891 | 76 | | 710E 800N | 0-17 cm | bone fragment | 3 | butchered mammal |
| 1892 | 76 | | 710E 800N | 0-17 cm | glass dish | 1 | clear |
| 1893 | 76 | | 710E 800N | 0-17 cm | bottle glass | 2 | clear |
| 1894 | 76 | | 710E 800N | 0-17 cm | window glass | 1 | thick |
| 1895 | 76 | | 710E 800N | 0-17 cm | yellow earthenware | 2 | glazed |
| 1896 | 76 | | 710E 800N | 0-17 cm | bone fragment | 1 | calcined |
| 1897 | 76 | | 710E 800N | 0-17 cm | ironstone | 1 | |
| 1898 | 76 | | 710E 800N | 0-17 cm | white earthenware | 1 | |
| 1899 | 76 | | 710E 800N | 0-17 cm | white earthenware, transfer printed | 2 | mulberry |
| 1900 | 76 | | 710E 800N | 0-17 cm | white earthenware, painted | 1 | green |
| 1901 | 76 | | 710E 800N | 0-17 cm | white earthenware, painted | 1 | late palette polychrome |
| 1902 | 76 | | 710E 800N | 0-17 cm | red earthenware | 3 | glazed |
| 1903 | 76 | | 710E 800N | 0-17 cm | red earthenware | 4 | |
| 1904 | 76 | | 710E 800N | 0-17 cm | brick | 8 | red fragments |
| 1905 | 76 | | 710E 800N | 0-17 cm | white earthenware, transfer printed | 1 | blue |
| 1906 | 76 | | 710E 815N | 0-20 cm | chipping detritus | 1 | Onondaga chert |
| 1907 | 76 | | 710E 815N | 0-20 cm | nail, cut | 2 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1908 | 76 | | 710E 815N | 0-20 cm | bone fragment | 3 | butchered mammal |
| 1909 | 76 | | 710E 815N | 0-20 cm | bottle glass | 1 | aqua |
| 1910 | 76 | | 710E 815N | 0-20 cm | bottle glass | 1 | green, screw cap |
| 1911 | 76 | | 710E 815N | 0-20 cm | bottle glass | 1 | clear |
| 1912 | 76 | | 710E 815N | 0-20 cm | window glass | 3 | thick |
| 1913 | 76 | | 710E 815N | 0-20 cm | window glass | 1 | thin |
| 1914 | 76 | | 710E 815N | 0-20 cm | red earthenware | 5 | glazed |
| 1915 | 76 | | 710E 815N | 0-20 cm | white earthenware | 6 | |
| 1916 | 76 | | 710E 815N | 0-20 cm | white earthenware, banded | 1 | black, blue |
| 1917 | 76 | | 710E 815N | 0-20 cm | white earthenware, transfer printed | 1 | black |
| 1918 | 76 | | 710E 815N | 0-20 cm | white earthenware, transfer printed | 4 | blue |
| 1919 | 76 | | 710E 815N | 0-20 cm | white earthenware, edged | 2 | blue |
| 1920 | 76 | | 710E 815N | 0-20 cm | white earthenware, edged | 1 | blue, scalloped |
| 1921 | 76 | | 710E 815N | 0-20 cm | white earthenware, banded | 1 | green |
| 1922 | 76 | | 710E 815N | 0-20 cm | white earthenware, banded | 1 | blue |
| 1923 | 76 | | 710E 815N | 0-20 cm | ironstone, painted | 1 | green, yellow, moulded dish |
| 1924 | 76 | | 710E 819N | 0-22 cm | bone fragment | 18 | butchered mammal |
| 1925 | 76 | | 710E 819N | 0-22 cm | brick | 6 | red fragments |
| 1926 | 76 | | 710E 819N | 0-22 cm | white earthenware | 6 | |
| 1927 | 76 | | 710E 819N | 0-22 cm | porcelain | 2 | |
| 1928 | 76 | | 710E 819N | 0-22 cm | white earthenware, transfer printed | 1 | red |
| 1929 | 76 | | 710E 819N | 0-22 cm | white earthenware, transfer printed | 1 | black |
| 1930 | 76 | | 710E 819N | 0-22 cm | white earthenware, transfer printed | 2 | blue |
| 1931 | 76 | | 710E 819N | 0-22 cm | red earthenware | 2 | glazed |
| 1932 | 76 | | 710E 819N | 0-22 cm | yellow earthenware | 1 | |
| 1933 | 76 | | 710E 819N | 0-22 cm | window glass | 4 | thick |
| 1934 | 76 | | 710E 819N | 0-22 cm | window glass | 1 | thin |
| 1935 | 76 | | 710E 819N | 0-22 cm | bottle glass | 3 | clear |
| 1936 | 76 | | 710E 819N | 0-22 cm | glass lamp | 1 | clear |
| 1937 | 76 | | 710E 819N | 0-22 cm | glass dish | 1 | milk glass |
| 1938 | 76 | | 700E 795N | 0-20 cm | brick | 2 | red fragments |
| 1939 | 76 | | 700E 795N | 0-20 cm | brick | 7 | black and red fragments, recent |
| 1940 | 76 | | 700E 795N | 0-20 cm | cement | 2 | |
| 1941 | 76 | | 700E 795N | 0-20 cm | bone fragment | 1 | butchered mammal |
| 1942 | 76 | | 700E 795N | 0-20 cm | nail, wire | 1 | |
| 1943 | 76 | | 700E 795N | 0-20 cm | miscellaneous metal | 1 | decorative knob |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 1944 | 76 | | 700E 795N | 0-20 cm | window glass | 4 | thick |
| 1945 | 76 | | 700E 795N | 0-20 cm | window glass | 2 | thin |
| 1946 | 76 | | 700E 795N | 0-20 cm | bottle glass | 1 | clear |
| 1947 | 76 | | 700E 795N | 0-20 cm | bottle glass | 1 | aqua |
| 1948 | 76 | | 700E 795N | 0-20 cm | glass dish | 1 | moulded |
| 1949 | 76 | | 700E 795N | 0-20 cm | red earthenware | 1 | glazed |
| 1950 | 76 | | 700E 795N | 0-20 cm | white earthenware | 11 | |
| 1951 | 76 | | 700E 795N | 0-20 cm | ironstone | 3 | |
| 1952 | 76 | | 700E 795N | 0-20 cm | white earthenware, banded | 1 | green |
| 1953 | 76 | | 700E 795N | 0-20 cm | white earthenware, transfer printed | 1 | blue |
| 1954 | 76 | | 700E 795N | 0-20 cm | white earthenware, transfer printed | 1 | black |
| 1955 | 76 | | 700E 795N | 0-20 cm | chipping detritus | 1 | Onondaga chert |
| 1956 | 76 | | 705E 685N | 0-21 cm | bottle glass | 2 | clear |
| 1957 | 76 | | 705E 685N | 0-21 cm | bone fragment | 1 | butchered mammal |
| 1958 | 76 | | 705E 685N | 0-21 cm | chipping detritus | 1 | Onondaga chert |
| 1959 | 76 | | 705E 685N | 0-21 cm | nail, cut | 4 | |
| 1960 | 76 | | 705E 685N | 0-21 cm | red earthenware | 1 | glazed |
| 1961 | 76 | | 705E 685N | 0-21 cm | yellow earthenware | 1 | |
| 1962 | 76 | | 705E 685N | 0-21 cm | white clay pipe | 1 | bowl fragment; plain |
| 1963 | 76 | | 705E 685N | 0-21 cm | white earthenware | 3 | |
| 1964 | 76 | | 705E 685N | 0-21 cm | ironstone | 1 | |
| 1965 | 76 | | 705E 685N | 0-21 cm | creamware | 1 | |
| 1966 | 76 | | 705E 685N | 0-21 cm | white earthenware, banded | 2 | blue |
| 1967 | 76 | | 705E 685N | 0-21 cm | white earthenware, transfer printed | 2 | blue |
| 1968 | 76 | | 705E 685N | 0-21 cm | white earthenware, flow transfer printed | 1 | blue |
| 2000 | 64 | | 200E 110N | 0-42 cm | chipping detritus | 9 | |
| 2001 | 64 | | 200E 105N | 0-29 cm | chipping detritus | 8 | |
| 2002 | 64 | | 200E 100N | 0-9 cm | modified groundstone | 1 | fragment |
| 2003 | 64 | | 200E 100N | 0-9 cm | chipping detritus | 7 | |
| 2004 | 64 | | 200E 100N | 0-9 cm | biface | 1 | Selkirk |
| 2005 | 64 | | 195E 105N | 0-29 cm | chipping detritus | 4 | |
| 2006 | 64 | | CSC 4 | surface | chipping detritus | 1 | |
| 2007 | 64 | | CSC 3 | surface | chipping detritus | 2 | |
| 2008 | 64 | | CSC 5 | surface | biface | 1 | |
| 2009 | 64 | | CSC 6 | surface | chipping detritus | 1 | |
| 2010 | 65 | | CSC 1 | surface | chipping detritus | 1 | |
| 2011 | 65 | | 300E 200N | 0-25 cm | chipping detritus | 6 | |
| 2012 | 65 | | 310E 205N | 0-20 cm | chipping detritus | 2 | |
| 2013 | 65 | | 305E 210N | 0-34 cm | chipping detritus | 5 | |
| 2014 | 65 | | 305E 200N | 0-34 cm | chipping detritus | 7 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2015 | 65 | | 300E 205N | 0-26 cm | chipping detritus | 7 | |
| 2016 | 65 | | 300E 205N | 0-26 cm | utilised flake | 1 | |
| 2017 | 65 | | 305E 205N | 0-25 cm | chipping detritus | 15 | |
| 2018 | 77 | | 595E 510N | 0-20 cm | chipping detritus | 4 | |
| 2019 | 77 | | 600E 500N | 0-19 cm | chipping detritus | 3 | |
| 2020 | 77 | | 595E 505N | 0-28 cm | chipping detritus | 25 | |
| 2021 | 77 | | 595E 505N | 0-28 cm | utilised flake | 1 | |
| 2022 | 77 | | 595E 505N | 0-28 cm | scraper | 1 | side, ventral |
| 2023 | 77 | | 590E 505N | 0-18 cm | chipping detritus | 2 | |
| 2024 | 77 | | 590E 505N | 0-18 cm | utilised flake | 1 | |
| 2025 | 77 | | 600E 505N | 0-20 cm | chipping detritus | 3 | |
| 2026 | 77 | | 595E 500N | 0-20 cm | chipping detritus | 5 | |
| 2027 | 77 | | CSC 1 | surface | chipping detritus | 1 | |
| 2028 | 77 | | CSC 2 | surface | chipping detritus | 2 | |
| 2029 | 77 | | CSC 3 | surface | chipping detritus | 1 | |
| 2030 | 77 | | CSC 4 | surface | chipping detritus | 1 | |
| 2031 | 77 | | CSC 5 | surface | chipping detritus | 1 | |
| 2032 | 83 | | 3995E 3000N | 0-31 cm | chipping detritus | 2 | |
| 2033 | 83 | | 4000E 3000N | 0-30 cm | chipping detritus | 3 | |
| 2034 | 88 | | CSC 11 | surface | chipping detritus | 1 | |
| 2035 | 88 | | CSC 12 | surface | chipping detritus | 2 | |
| 2036 | 88 | | CSC 13 | surface | chipping detritus | 2 | |
| 2037 | 88 | | CSC 14 | surface | chipping detritus | 1 | |
| 2038 | 88 | | CSC 15 | surface | chipping detritus | 1 | |
| 2039 | 88 | | CSC 17 | surface | chipping detritus | 1 | |
| 2040 | 24 | 1 | 505E 310N | 0-34 cm | chipping detritus | 16 | |
| 2041 | 24 | 1 | 505E 310N | 0-34 cm | biface | 1 | |
| 2042 | 24 | 1 | 500E 315N | 0-32 cm | chipping detritus | 57 | |
| 2043 | 24 | 1 | 500E 315N | 0-32 cm | scraper | 1 | side |
| 2044 | 24 | 1 | 500E 315N | 0-32 cm | scraper | 1 | side |
| 2045 | 24 | 1 | 500E 325N | 0-30 cm | chipping detritus | 14 | |
| 2046 | 24 | 1 | 495E 330N | 0-30 cm | chipping detritus | 3 | |
| 2047 | 24 | 1 | 490E 315N | 0-38 cm | chipping detritus | 6 | |
| 2048 | 24 | 1 | 510E 310N | 0-25 cm | chipping detritus | 10 | |
| 2049 | 24 | 1 | 510E 310N | 0-25 cm | projectile point | 1 | reworked Meadowood |
| 2050 | 24 | 1 | 510E 305N | 0-31 cm | chipping detritus | 4 | |
| 2051 | 24 | 1 | 495E 305N | 0-34 cm | chipping detritus | 4 | |
| 2052 | 24 | 1 | 505E 300N | 0-31 cm | chipping detritus | 8 | |
| 2053 | 24 | 1 | 500E 305N | 0-31 cm | chipping detritus | 24 | |
| 2054 | 24 | 1 | 500E 305N | 0-31 cm | utilised flake | 1 | |
| 2055 | 24 | 1 | 500E 300N | 0-25 cm | chipping detritus | 4 | |
| 2056 | 24 | 1 | 500E 320N | 0-28 cm | chipping detritus | 30 | |
| 2057 | 24 | 1 | 500E 320N | 0-28 cm | scraper | 1 | fragment |
| 2058 | 24 | 1 | 494E 320N | 0-40 cm | chipping detritus | 15 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2059 | 24 | 1 | 494E 320N | 0-40 cm | core | 1 | |
| 2060 | 24 | 1 | 490E 320N | 0-31 cm | chipping detritus | 8 | |
| 2061 | 24 | 1 | 515E 315N | 0-25 cm | chipping detritus | 8 | |
| 2062 | 24 | 1 | 515E 315N | 0-25 cm | projectile point | 1 | |
| 2063 | 24 | 1 | 490E 325N | 0-27 cm | chipping detritus | 5 | |
| 2064 | 24 | 1 | 495E 325N | 0-30 cm | chipping detritus | 19 | |
| 2065 | 24 | 1 | 510E 315N | 0-28 cm | chipping detritus | 16 | |
| 2066 | 24 | 1 | 505E 315N | 0-32 cm | chipping detritus | 12 | |
| 2067 | 24 | 1 | 505E 305N | 0-32 cm | chipping detritus | 18 | |
| 2068 | 24 | 1 | 505E 325N | 0-30 cm | scraper | 1 | side, ventral |
| 2069 | 24 | 1 | 505E 325N | 0-30 cm | biface | 1 | |
| 2070 | 24 | 1 | 500E 310N | 0-30 cm | chipping detritus | 18 | |
| 2071 | 24 | 1 | 500E 310N | 0-30 cm | scraper | 1 | side, ventral |
| 2072 | 24 | 1 | 495E 315N | 0-30 cm | chipping detritus | 11 | |
| 2073 | 24 | 1 | 505E 320N | 0-36 cm | chipping detritus | 16 | |
| 2074 | 24 | 1 | 500E 330N | 0-26 cm | chipping detritus | 4 | |
| 2075 | 24 | 1 | 515E 310N | 0-28 cm | chipping detritus | 2 | |
| 2076 | 24 | 1 | CSC 1 | surface | chipping detritus | 4 | |
| 2077 | 24 | 1 | CSC 2 | surface | chipping detritus | 1 | |
| 2078 | 24 | 1 | CSC 3 | surface | chipping detritus | 2 | |
| 2079 | 24 | 1 | CSC 4 | surface | chipping detritus | 2 | |
| 2080 | 24 | 1 | CSC 8 | surface | chipping detritus | 2 | |
| 2081 | 24 | 1 | CSC 9 | surface | chipping detritus | 1 | |
| 2082 | 24 | 1 | CSC 6 | surface | chipping detritus | 3 | |
| 2083 | 24 | 1 | CSC 13 | surface | chipping detritus | 1 | |
| 2084 | 24 | 1 | CSC 14 | surface | chipping detritus | 1 | |
| 2085 | 24 | 1 | CSC 19 | surface | chipping detritus | 1 | |
| 2086 | 24 | 1 | CSC 19 | surface | biface | 1 | |
| 2087 | 24 | 1 | CSC 18 | surface | chipping detritus | 3 | |
| 2088 | 24 | 1 | CSC 15 | surface | chipping detritus | 1 | |
| 2089 | 24 | 1 | CSC 16 | surface | chipping detritus | 1 | |
| 2090 | 24 | 1 | CSC 17 | surface | chipping detritus | 2 | |
| 2091 | 24 | 1 | CSC 20 | surface | chipping detritus | 1 | |
| 2092 | 24 | 1 | CSC 21 | surface | chipping detritus | 2 | |
| 2093 | 24 | 1 | CSC 22 | surface | chipping detritus | 2 | |
| 2094 | 24 | 1 | 495E 310N | 0-31 cm | chipping detritus | 2 | |
| 2095 | 24 | 1 | 510E 320N | 0-30 cm | chipping detritus | 1 | |
| 2096 | 24 | 2 | 475E 315N | 0-35 cm | chipping detritus | 46 | |
| 2097 | 24 | 2 | 480E 310N | 0-32 cm | chipping detritus | 10 | |
| 2098 | 24 | 2 | 485E 315N | 0-33 cm | chipping detritus | 12 | |
| 2099 | 24 | 2 | 470E 315N | 0-26 cm | chipping detritus | 15 | |
| 2100 | 24 | 2 | 485E 320N | 0-30 cm | chipping detritus | 2 | |
| 2101 | 24 | 2 | 485E 310N | 0-32 cm | chipping detritus | 5 | |
| 2102 | 24 | 2 | 470E 310N | 0-28 cm | chipping detritus | 7 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2103 | 24 | 2 | 475E 320N | 0-30 cm | chipping detritus | 10 | |
| 2104 | 24 | 2 | 475E 310N | 0-36 cm | chipping detritus | 18 | |
| 2105 | 24 | 2 | 480E 315N | 0-36 cm | chipping detritus | 17 | |
| 2106 | 24 | 2 | 470E 320N | 0-27 cm | chipping detritus | 8 | |
| 2107 | 24 | 2 | 470E 320N | 0-27 cm | scraper | 1 | side |
| 2108 | 24 | 2 | 480E 305N | 0-28 cm | chipping detritus | 2 | |
| 2109 | 24 | 2 | 465E 315N | 0-31 cm | chipping detritus | 2 | |
| 2110 | 24 | 2 | 480E 320N | 0-32 cm | chipping detritus | 5 | |
| 2111 | 24 | 2 | 480E 320N | 0-32 cm | scraper | 1 | fragment |
| 2112 | 24 | 2 | 480E 320N | 0-32 cm | scraper | 1 | fragment |
| 2113 | 24 | 2 | CSC 23 | surface | chipping detritus | 2 | |
| 2114 | 24 | 2 | CSC 24 | surface | chipping detritus | 1 | |
| 2115 | 24 | 2 | CSC 25 | surface | chipping detritus | 1 | |
| 2116 | 24 | 2 | CSC 26 | surface | chipping detritus | 1 | |
| 2117 | 24 | 2 | CSC 27 | surface | chipping detritus | 4 | |
| 2118 | 24 | 2 | CSC 28 | surface | chipping detritus | 1 | |
| 2119 | 24 | 2 | CSC 29 | surface | chipping detritus | 1 | |
| 2120 | 24 | 2 | CSC 30 | surface | chipping detritus | 1 | |
| 2121 | 24 | 2 | CSC 31 | surface | chipping detritus | 1 | |
| 2122 | 24 | 2 | CSC 32 | surface | chipping detritus | 1 | |
| 2123 | 17 | | 695E 305N | 0-28 cm | chipping detritus | 3 | |
| 2124 | 17 | | 695E 305N | 0-28 cm | scraper | 1 | end |
| 2125 | 17 | | 690E 300N | 0-32 cm | chipping detritus | 7 | |
| 2126 | 17 | | 700E 305N | 0-18 cm | chipping detritus | 8 | |
| 2127 | 17 | | 695E 300N | 0-24 cm | chipping detritus | 21 | |
| 2128 | 17 | | 695E 295N | 0-35 cm | chipping detritus | 6 | |
| 2129 | 17 | | 700E 300N | 0-22 cm | chipping detritus | 7 | |
| 2130 | 17 | | CSC 1 | surface | chipping detritus | 1 | |
| 2131 | 17 | | CSC 2 | surface | chipping detritus | 1 | |
| 2132 | 17 | | CSC 3 | surface | chipping detritus | 1 | |
| 2133 | 23 | | 445E 295N | 0-26 cm | chipping detritus | 9 | |
| 2134 | 23 | | 450E 300N | 0-32 cm | chipping detritus | 11 | |
| 2135 | 23 | | 450E 300N | 0-32 cm | projectile point | 1 | Lamoka |
| 2136 | 23 | | 445E 300N | 0-25 cm | chipping detritus | 12 | |
| 2137 | 23 | | 450E 295N | 0-30 cm | chipping detritus | 3 | |
| 2138 | 23 | | 450E 295N | 0-30 cm | scraper | 1 | side, ventral |
| 2139 | 23 | | 440E 300N | 0-16 cm | chipping detritus | 1 | |
| 2140 | 23 | | 445E 305N | 0-29 cm | chipping detritus | 6 | |
| 2141 | 23 | | 450E 305N | 0-31 cm | chipping detritus | 9 | |
| 2142 | 23 | | 455E 300N | 0-35 cm | chipping detritus | 8 | |
| 2143 | 23 | | CSC 1 | surface | chipping detritus | 1 | |
| 2144 | 23 | | CSC 2 | surface | chipping detritus | 1 | |
| 2145 | 23 | | CSC 3 | surface | chipping detritus | 3 | |
| 2146 | 23 | | CSC 4 | surface | chipping detritus | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2147 | 23 | | CSC 5 | surface | chipping detritus | 1 | |
| 2148 | 23 | | CSC 6 | surface | chipping detritus | 1 | |
| 2149 | 23 | | CSC 7 | surface | chipping detritus | 1 | |
| 2150 | 23 | | CSC 8 | surface | chipping detritus | 1 | |
| 2151 | 23 | | CSC 9 | surface | chipping detritus | 1 | |
| 2152 | 23 | | CSC 10 | surface | chipping detritus | 1 | |
| 2153 | 23 | | CSC 11 | surface | chipping detritus | 1 | |
| 2154 | 23 | | CSC 12 | surface | chipping detritus | 1 | |
| 2155 | 23 | | CSC 13 | surface | chipping detritus | 1 | |
| 2156 | 4 | | 800E 450N | 0-24 cm | chipping detritus | 4 | |
| 2157 | 4 | | 810E 450N | 0-24 cm | chipping detritus | 9 | |
| 2158 | 4 | | 850E 440N | 0-27 cm | chipping detritus | 16 | |
| 2159 | 4 | | 810E 440N | 0-25 cm | chipping detritus | 15 | |
| 2160 | 4 | | 820E 410N | 0-30 cm | chipping detritus | 25 | |
| 2161 | 4 | | 820E 410N | 0-30 cm | utilised flake | 1 | |
| 2162 | 4 | | 830E 420N | 0-26 cm | chipping detritus | 6 | |
| 2163 | 4 | | 840E 440N | 0-28 cm | chipping detritus | 25 | |
| 2164 | 4 | | 840E 440N | 0-28 cm | scraper | 1 | side |
| 2165 | 4 | | 820E 440N | 0-23 cm | chipping detritus | 3 | |
| 2166 | 4 | | 820E 440N | 0-23 cm | scraper | 1 | side |
| 2167 | 4 | | 820E 430N | 0-22 cm | chipping detritus | 8 | |
| 2168 | 4 | | 860E 420N | 0-27 cm | chipping detritus | 13 | |
| 2169 | 4 | | 890E 420N | 0-26 cm | chipping detritus | 3 | |
| 2170 | 4 | | 775E 385N | 0-19 cm | chipping detritus | 7 | |
| 2171 | 4 | | 860E 430N | 0-28 cm | chipping detritus | 12 | |
| 2172 | 4 | | 860E 430N | 0-28 cm | utilised flake | 1 | |
| 2173 | 4 | | 775E 395N | 0-41 cm | chipping detritus | 1 | |
| 2174 | 4 | | 860E 440N | 0-27 cm | chipping detritus | 8 | |
| 2175 | 4 | | 765E 395N | 0-26 cm | chipping detritus | 22 | |
| 2176 | 4 | | 765E 395N | 0-26 cm | scraper | 1 | end |
| 2177 | 4 | | 830E 410N | 0-27 cm | chipping detritus | 5 | |
| 2178 | 4 | | 830E 410N | 0-27 cm | scraper | 1 | side |
| 2179 | 4 | | 840E 420N | 0-25 cm | chipping detritus | 9 | |
| 2180 | 4 | | 850E 410N | 0-32 cm | chipping detritus | 11 | |
| 2181 | 4 | | 840E 430N | 0-27 cm | chipping detritus | 11 | |
| 2182 | 4 | | 880E 430N | 0-32 cm | chipping detritus | 12 | |
| 2183 | 4 | | 870E 440N | 0-34 cm | chipping detritus | 7 | |
| 2184 | 4 | | 830E 440N | 0-19 cm | chipping detritus | 6 | |
| 2185 | 4 | | 775E 375N | 0-30 cm | chipping detritus | 5 | |
| 2186 | 4 | | 880E 440N | 0-27 cm | chipping detritus | 4 | |
| 2187 | 4 | | 850E 420N | 0-31 cm | chipping detritus | 19 | |
| 2188 | 4 | | 765E 375N | 0-43 cm | chipping detritus | 33 | |
| 2189 | 4 | | 840E 410N | 0-27 cm | chipping detritus | 28 | |
| 2190 | 4 | | 820E 420N | 0-26 cm | chipping detritus | 21 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2191 | 4 | | 870E 420N | 0-27 cm | chipping detritus | 6 | |
| 2192 | 4 | | 765E 405N | 0-48 cm | chipping detritus | 8 | |
| 2193 | 4 | | 840E 450N | 0-25 cm | chipping detritus | 4 | |
| 2194 | 4 | | 840E 450N | 0-25 cm | projectile point | 1 | |
| 2195 | 4 | | 850E 430N | 0-31 cm | chipping detritus | 17 | |
| 2196 | 4 | | 850E 430N | 0-31 cm | scraper | 1 | end |
| 2197 | 4 | | 850E 450N | 0-30 cm | chipping detritus | 8 | |
| 2198 | 4 | | 830E 430N | 0-27 cm | chipping detritus | 16 | |
| 2199 | 4 | | 870E 430N | 0-25 cm | chipping detritus | 12 | |
| 2200 | 4 | | 860E 410N | 0-34 cm | chipping detritus | 26 | |
| 2201 | 4 | | 860E 410N | 0-34 cm | biface | 1 | |
| 2202 | 4 | | 830E 410N | 0-30 cm | chipping detritus | 18 | |
| 2203 | 4 | | 830E 410N | 0-30 cm | projectile point | 1 | base, heated |
| 2204 | 4 | | 870E 410N | 0-25 cm | chipping detritus | 9 | |
| 2205 | 4 | | 820E 380N | 0-24 cm | chipping detritus | 11 | |
| 2206 | 4 | | 820E 380N | 0-24 cm | scraper | 1 | side |
| 2207 | 4 | | 870E 390N | 0-26 cm | chipping detritus | 15 | |
| 2208 | 4 | | 755E 385N | 0-38 cm | chipping detritus | 3 | |
| 2209 | 4 | | 880E 420N | 0-30 cm | chipping detritus | 6 | |
| 2210 | 4 | | 850E 390N | 0-24 cm | chipping detritus | 17 | |
| 2211 | 4 | | 880E 410N | 0-33 cm | chipping detritus | 9 | |
| 2212 | 4 | | 830E 380N | 0-27 cm | chipping detritus | 16 | |
| 2213 | 4 | | 830E 380N | 0-27 cm | biface | 1 | |
| 2214 | 4 | | 850E 380N | 0-25 cm | chipping detritus | 7 | |
| 2215 | 4 | | 800E 410N | 0-26 cm | chipping detritus | 10 | |
| 2216 | 4 | | 800E 410N | 0-26 cm | projectile point | 1 | |
| 2217 | 4 | | 810E 380N | 0-26 cm | chipping detritus | 7 | |
| 2218 | 4 | | 840E 390N | 0-28 cm | chipping detritus | 25 | |
| 2219 | 4 | | 840E 380N | 0-28 cm | chipping detritus | 15 | |
| 2220 | 4 | | 840E 380N | 0-28 cm | scraper | 1 | fragment |
| 2221 | 4 | | 765E 385N | 0-35 cm | chipping detritus | 88 | |
| 2222 | 4 | | 765E 385N | 0-35 cm | scraper | 1 | side, ventral |
| 2223 | 4 | | 765E 385N | 0-35 cm | drill | 1 | |
| 2224 | 4 | | 830E 390N | 0-24 cm | chipping detritus | 19 | |
| 2225 | 4 | | 830E 390N | 0-24 cm | biface | 1 | fragment |
| 2226 | 4 | | 830E 390N | 0-24 cm | projectile point | 1 | base, heated |
| 2227 | 4 | | 860E 390N | 0-26 cm | chipping detritus | 11 | |
| 2228 | 4 | | 870E 380N | 0-32 cm | chipping detritus | 8 | |
| 2229 | 4 | | 890E 410N | 0-37 cm | chipping detritus | 1 | |
| 2230 | 4 | | 860E 380N | 0-22 cm | chipping detritus | 4 | |
| 2231 | 4 | | 820E 390N | 0-25 cm | chipping detritus | 15 | |
| 2232 | 4 | | 755E 375N | 0-38 cm | chipping detritus | 4 | |
| 2233 | 4 | | 780E 400N | 0-33 cm | chipping detritus | 9 | |
| 2234 | 4 | | 790E 430N | 0-24 cm | chipping detritus | 3 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2235 | 4 | | 810E 420N | 0-23 cm | chipping detritus | 7 | |
| 2236 | 4 | | 800E 440N | 0-31 cm | chipping detritus | 24 | |
| 2237 | 4 | | 800E 440N | 0-31 cm | scraper | 1 | side |
| 2238 | 4 | | 800E 440N | 0-31 cm | scraper | 1 | fragment |
| 2239 | 4 | | 800E 440N | 0-31 cm | projectile point | 1 | fragment, heated |
| 2240 | 4 | | 860E 400N | 0-25 cm | chipping detritus | 25 | |
| 2241 | 4 | | 860E 400N | 0-25 cm | biface | 1 | |
| 2242 | 4 | | 800E 420N | 0-29 cm | chipping detritus | 13 | |
| 2243 | 4 | | 790E 440N | 0-26 cm | chipping detritus | 18 | |
| 2244 | 4 | | 880E 400N | 0-26 cm | chipping detritus | 69 | |
| 2245 | 4 | | 800E 390N | 0-25 cm | chipping detritus | 10 | |
| 2246 | 4 | | 830E 400N | 0-35 cm | chipping detritus | 41 | |
| 2247 | 4 | | 790E 410N | 0-30 cm | chipping detritus | 7 | |
| 2248 | 4 | | 810E 390N | 0-21 cm | chipping detritus | 9 | |
| 2249 | 4 | | 820E 400N | 0-31 cm | chipping detritus | 34 | |
| 2250 | 4 | | 820E 400N | 0-31 cm | scraper | 1 | side |
| 2251 | 4 | | 810E 410N | 0-26 cm | chipping detritus | 24 | |
| 2252 | 4 | | 780E 440N | 0-31 cm | chipping detritus | 5 | |
| 2253 | 4 | | 810E 400N | 0-28 cm | chipping detritus | 20 | |
| 2254 | 4 | | 810E 400N | 0-28 cm | utilised flake | 1 | |
| 2255 | 4 | | 870E 400N | 0-31 cm | chipping detritus | 36 | |
| 2256 | 4 | | 870E 400N | 0-31 cm | scraper | 1 | side |
| 2257 | 4 | | 800E 430N | 0-29 cm | chipping detritus | 14 | |
| 2258 | 4 | | 790E 400N | 0-43 cm | chipping detritus | 16 | |
| 2259 | 4 | | 890E 400N | 0-30 cm | chipping detritus | 14 | |
| 2260 | 4 | | 790E 390N | 0-24 cm | chipping detritus | 5 | |
| 2261 | 4 | | 840E 400N | 0-30 cm | chipping detritus | 22 | |
| 2262 | 4 | | 810E 430N | 0-24 cm | chipping detritus | 11 | |
| 2263 | 4 | | 820E 390N | 0-20 cm | chipping detritus | 8 | |
| 2264 | 4 | | 850E 400N | 0-29 cm | chipping detritus | 23 | |
| 2265 | 4 | | 800E 400N | 0-21 cm | chipping detritus | 11 | |
| 2266 | 4 | | 790E 420N | 0-24 cm | chipping detritus | 3 | |
| 2267 | 4 | | 790E 450N | 0-24 cm | chipping detritus | 1 | |
| 2268 | 4 | | CSC 75 | surface | chipping detritus | 1 | |
| 2269 | 4 | | CSC 99 | surface | chipping detritus | 2 | |
| 2270 | 4 | | CSC 84 | surface | chipping detritus | 3 | |
| 2271 | 4 | | CSC 92 | surface | utilised flake | 1 | |
| 2272 | 4 | | CSC 82 | surface | chipping detritus | 2 | |
| 2273 | 4 | | CSC 81 | surface | chipping detritus | 1 | |
| 2274 | 4 | | CSC 88 | surface | chipping detritus | 2 | |
| 2275 | 4 | | CSC 89 | surface | chipping detritus | 2 | |
| 2276 | 4 | | CSC 89 | surface | scraper | 1 | side, heated |
| 2277 | 4 | | CSC 96 | surface | chipping detritus | 2 | |
| 2278 | 4 | | CSC 80 | surface | chipping detritus | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2279 | 4 | | CSC 83 | surface | chipping detritus | 1 | |
| 2280 | 4 | | CSC 79 | surface | chipping detritus | 2 | |
| 2281 | 4 | | CSC 86 | surface | chipping detritus | 1 | |
| 2282 | 4 | | CSC 98 | surface | chipping detritus | 1 | |
| 2283 | 4 | | CSC 98 | surface | scraper | 1 | side |
| 2284 | 4 | | CSC 97 | surface | chipping detritus | 1 | |
| 2285 | 4 | | CSC 84 | surface | chipping detritus | 3 | |
| 2286 | 4 | | CSC 77 | surface | chipping detritus | 2 | |
| 2287 | 4 | | CSC 93 | surface | chipping detritus | 1 | |
| 2288 | 4 | | CSC 76 | surface | chipping detritus | 1 | |
| 2289 | 4 | | CSC 94 | surface | chipping detritus | 3 | |
| 2290 | 4 | | CSC 95 | surface | chipping detritus | 1 | |
| 2291 | 4 | | CSC 87 | surface | chipping detritus | 1 | |
| 2292 | 4 | | CSC 85 | surface | chipping detritus | 2 | |
| 2293 | 4 | | CSC 90 | surface | blade | 1 | |
| 2294 | 4 | | CSC 104 | surface | chipping detritus | 2 | |
| 2295 | 4 | | CSC 71 | surface | chipping detritus | 1 | |
| 2296 | 4 | | CSC 101 | surface | chipping detritus | 1 | |
| 2297 | 4 | | CSC 59 | surface | scraper | 1 | side, ventral |
| 2298 | 4 | | CSC 57 | surface | chipping detritus | 2 | |
| 2299 | 4 | | CSC 106 | surface | chipping detritus | 2 | |
| 2300 | 4 | | CSC 58 | surface | chipping detritus | 2 | |
| 2301 | 4 | | CSC 47 | surface | chipping detritus | 1 | |
| 2302 | 4 | | CSC 61 | surface | chipping detritus | 1 | |
| 2303 | 4 | | CSC 52 | surface | chipping detritus | 1 | |
| 2304 | 4 | | CSC 58 | surface | chipping detritus | 2 | |
| 2305 | 4 | | CSC 54 | surface | chipping detritus | 2 | |
| 2306 | 4 | | CSC 51 | surface | chipping detritus | 1 | |
| 2307 | 4 | | CSC 63 | surface | chipping detritus | 1 | |
| 2308 | 4 | | CSC 53 | surface | chipping detritus | 1 | |
| 2309 | 4 | | CSC 48 | surface | chipping detritus | 1 | |
| 2310 | 4 | | CSC 107 | surface | utilised flake | 1 | |
| 2311 | 4 | | CSC 69 | surface | chipping detritus | 1 | |
| 2312 | 4 | | CSC 108 | surface | chipping detritus | 2 | |
| 2313 | 4 | | CSC 108 | surface | scraper | 1 | side |
| 2314 | 4 | | CSC 103 | surface | chipping detritus | 1 | |
| 2315 | 4 | | CSC 64 | surface | chipping detritus | 2 | |
| 2316 | 4 | | CSC 19 | surface | chipping detritus | 2 | |
| 2317 | 4 | | CSC 105 | surface | chipping detritus | 3 | |
| 2318 | 4 | | CSC 8 | surface | chipping detritus | 1 | |
| 2319 | 4 | | CSC 67 | surface | chipping detritus | 1 | |
| 2320 | 4 | | CSC 70 | surface | utilised flake | 1 | |
| 2321 | 4 | | CSC 100 | surface | chipping detritus | 1 | |
| 2322 | 4 | | CSC 102 | surface | projectile point | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2323 | 4 | | CSC 73 | surface | chipping detritus | 1 | |
| 2324 | 4 | | CSC 43 | surface | chipping detritus | 1 | |
| 2325 | 4 | | CSC 72 | surface | chipping detritus | 2 | |
| 2326 | 4 | | CSC 68 | surface | chipping detritus | 3 | |
| 2327 | 4 | | CSC 62 | surface | scraper | 1 | reworked projectile point |
| 2328 | 4 | | CSC 60 | surface | chipping detritus | 1 | |
| 2329 | 4 | | CSC 55 | surface | chipping detritus | 3 | |
| 2330 | 4 | | CSC 67 | surface | scraper | 1 | side |
| 2331 | 4 | | CSC 45 | surface | chipping detritus | 4 | |
| 2332 | 4 | | CSC 42 | surface | chipping detritus | 2 | |
| 2333 | 4 | | CSC 20 | surface | chipping detritus | 3 | |
| 2334 | 4 | | CSC 18 | surface | chipping detritus | 2 | |
| 2335 | 4 | | CSC 22 | surface | chipping detritus | 1 | |
| 2336 | 4 | | CSC 29 | surface | chipping detritus | 1 | |
| 2337 | 4 | | CSC 41 | surface | chipping detritus | 5 | |
| 2338 | 4 | | CSC 16 | surface | chipping detritus | 1 | |
| 2339 | 4 | | CSC 10 | surface | chipping detritus | 1 | |
| 2340 | 4 | | CSC 2 | surface | chipping detritus | 1 | |
| 2341 | 4 | | CSC 15 | surface | chipping detritus | 1 | |
| 2342 | 4 | | CSC 36 | surface | chipping detritus | 3 | |
| 2343 | 4 | | CSC 56 | surface | scraper | 1 | side |
| 2344 | 4 | | CSC 65 | surface | chipping detritus | 1 | |
| 2345 | 4 | | CSC 30 | surface | chipping detritus | 1 | |
| 2346 | 4 | | CSC 25 | surface | chipping detritus | 1 | |
| 2347 | 4 | | CSC 4 | surface | biface | 1 | |
| 2348 | 4 | | CSC 7 | surface | chipping detritus | 1 | |
| 2349 | 4 | | CSC 39 | surface | chipping detritus | 1 | |
| 2350 | 4 | | CSC 12 | surface | chipping detritus | 1 | |
| 2351 | 4 | | CSC 21 | surface | chipping detritus | 1 | |
| 2352 | 4 | | CSC 13 | surface | chipping detritus | 1 | |
| 2353 | 4 | | CSC 6 | surface | chipping detritus | 1 | |
| 2354 | 4 | | CSC 38 | surface | chipping detritus | 1 | |
| 2355 | 4 | | CSC 17 | surface | scraper | 1 | side |
| 2356 | 4 | | CSC 34 | surface | utilised flake | 1 | |
| 2357 | 4 | | CSC 34 | surface | biface | 1 | |
| 2358 | 4 | | CSC 11 | surface | biface | 1 | heated |
| 2359 | 4 | | CSC 33 | surface | chipping detritus | 1 | |
| 2360 | 4 | | CSC 40 | surface | chipping detritus | 1 | |
| 2361 | 4 | | CSC 46 | surface | chipping detritus | 1 | |
| 2362 | 4 | | CSC 14 | surface | chipping detritus | 1 | |
| 2363 | 4 | | CSC 24 | surface | chipping detritus | 1 | |
| 2364 | 4 | | CSC 32 | surface | chipping detritus | 1 | |
| 2365 | 4 | | CSC 1 | surface | chipping detritus | 2 | |
| 2366 | 4 | | CSC 3 | surface | scraper | 1 | side, ventral |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2367 | 4 | | CSC 23 | surface | chipping detritus | 1 | |
| 2368 | 4 | | CSC 44 | surface | chipping detritus | 1 | |
| 2369 | 4 | | CSC 9 | surface | chipping detritus | 2 | |
| 2370 | 4 | | CSC 35 | surface | chipping detritus | 2 | |
| 2371 | 4 | | CSC 31 | surface | chipping detritus | 1 | |
| 2372 | 4 | | CSC 5 | surface | chipping detritus | 1 | |
| 2373 | 4 | | CSC 26 | surface | chipping detritus | 1 | |
| 2374 | 101 | | Test Pit 1 | | chipping detritus | 1 | |
| 2375 | 101 | | NE cardinal | | chipping detritus | 1 | |
| 2376 | 101 | | South cardinal | | chipping detritus | 1 | |
| 2377 | 101 | | North cardinal | | chipping detritus | 1 | |
| 2378 | 101 | | NW cardinal | | chipping detritus | 3 | |
| 2379 | 101 | | SW cardinal | | chipping detritus | 1 | |
| 2380 | 101 | | West cardinal | | chipping detritus | 1 | |
| 2381 | 11 | | 532E 350N | 0-37 cm | chipping detritus | 7 | |
| 2382 | 11 | | 532E 355N | 0-25 cm | utilised flake | 1 | |
| 2383 | 99 | | 595E 400N | 0-33 cm | brick | 12 | red fragments, recent |
| 2384 | 99 | | 595E 400N | 0-33 cm | earthenware, red | 1 | |
| 2385 | 99 | | 595E 400N | 0-33 cm | nail, cut | 12 | |
| 2386 | 99 | | 595E 400N | 0-33 cm | nail, wire | 1 | |
| 2387 | 99 | | 595E 400N | 0-33 cm | miscellaneous metal | 1 | eye hook |
| 2388 | 99 | | 595E 400N | 0-33 cm | wire | 1 | |
| 2389 | 99 | | 595E 400N | 0-33 cm | miscellaneous metal | 1 | staple |
| 2390 | 99 | | 595E 400N | 0-33 cm | ironstone | 2 | |
| 2391 | 99 | | 595E 400N | 0-33 cm | white earthenware | 1 | |
| 2392 | 99 | | 595E 400N | 0-33 cm | glass, bottle | 4 | |
| 2393 | 99 | | 595E 400N | 0-33 cm | glass, window | 2 | thin |
| 2394 | 99 | | 595E 400N | 0-33 cm | bone fragment | 2 | butchered mammal |
| 2395 | 99 | | 595E 400N | 0-33 cm | bone fragment | 1 | mammal tooth |
| 2396 | 99 | | 595E 400N | 0-33 cm | bone fragment | 1 | burnt mammal |
| 2397 | 99 | | 595E 400N | 0-33 cm | button | 1 | wood, 4-hole |
| 2398 | 99 | | 595E 400N | 0-33 cm | bottle cap | 1 | recent |
| 2399 | 99 | | 595E 400N | 0-33 cm | chipping detritus | 1 | |
| 2400 | 99 | | 600E 400N | 0-35 cm | brick | 15 | red fragments, recent |
| 2401 | 99 | | 600E 400N | 0-35 cm | bone fragment | 4 | butchered mammal |
| 2402 | 99 | | 600E 400N | 0-35 cm | glass, bottle | 7 | green |
| 2403 | 99 | | 600E 400N | 0-35 cm | chipping detritus | 6 | |
| 2404 | 99 | | 600E 400N | 0-35 cm | glass, bottle | 3 | frosted |
| 2405 | 99 | | 600E 400N | 0-35 cm | white earthenware | 3 | |
| 2406 | 99 | | 600E 400N | 0-35 cm | white earthenware, transfer print | 1 | blue |
| 2407 | 99 | | 600E 400N | 0-35 cm | nail, cut | 1 | |
| 2408 | 99 | | 600E 400N | 0-35 cm | miscellaneous metal | 2 | |
| 2409 | 99 | | 590E 400N | 0-27 cm | ironstone | 1 | |

| cat # | Location | Locus | Provenience | Depth | Description | Freq | Comments |
|---|---|---|---|---|---|---|---|
| 2410 | 99 | | 590E 400N | 0-27 cm | white earthenware, transfer print | 1 | blue |
| 2411 | 99 | | 600E 395N | 0-22 cm | utilised flake | 1 | |
| 2412 | 36 | | 700E 300N | 0-29 cm | chipping detritus | 2 | |
| 2413 | 66 | | 407E 283N | 0-30 cm | chipping detritus | 21 | |

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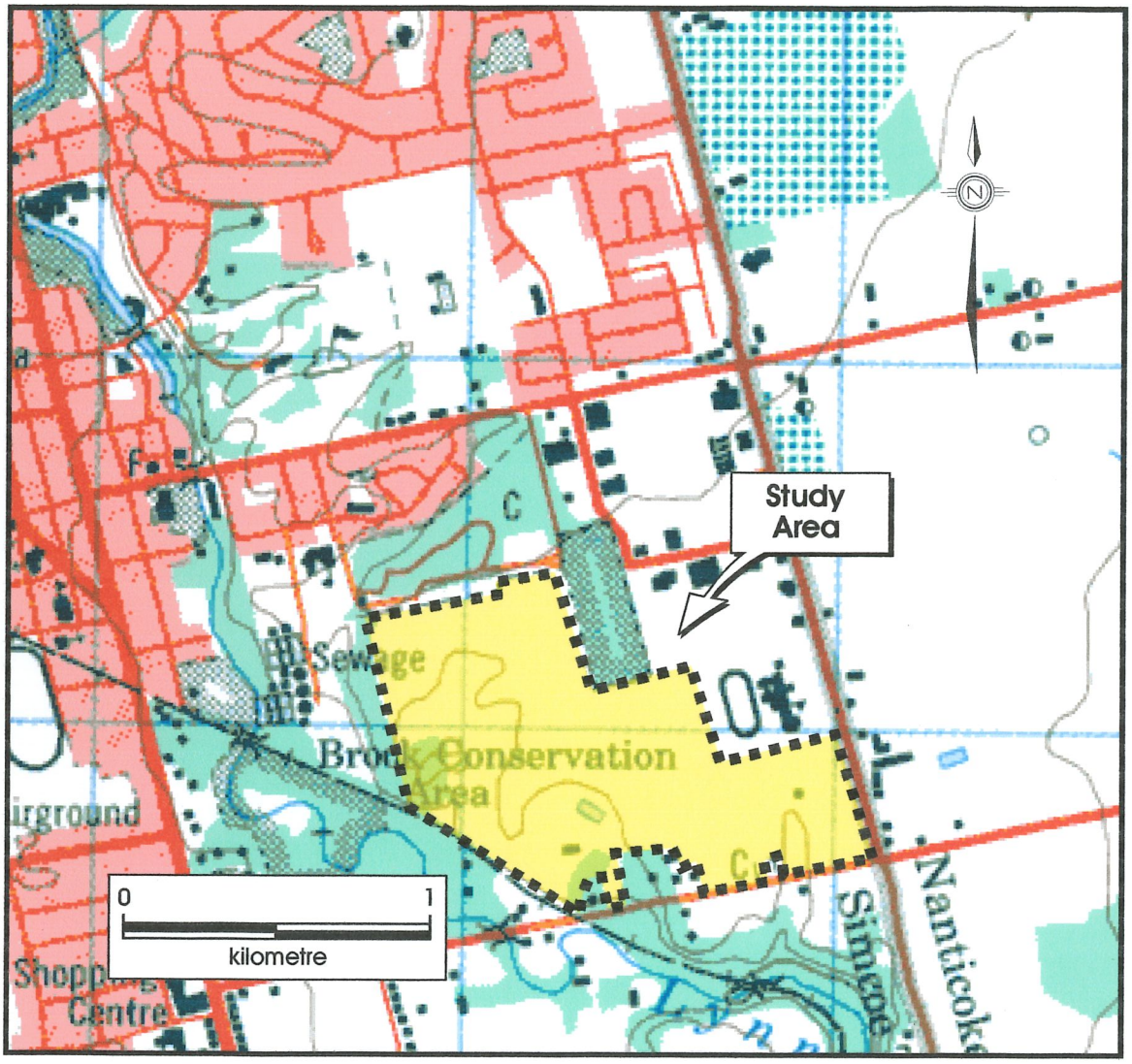
# Executive Summary of
# Archaeological Excavation (Stage 4)
# Proposed Development, Lots 1 to 3
# Concession 5, Simcoe, Ontario




Mayer
Heritage
Consultants Inc.

*Cultural Heritage Assessments and Archaeological Mitigative Excavations*

# Executive Summary of Archaeological Excavation (Stage 4) Proposed Development, Lots 1 to 3 Concession 5, Simcoe, Ontario

Submitted to

**Planning Solutions**
**c/o 2 Grand River St. S.**
**Paris, Ontario**
**N3L 2B2**

and

**Ontario Ministry of Culture**

Prepared by

Mayer Heritage Consultants Inc.
2509 Main Street, P. O. Box 456 Lambeth Station,
London, Ontario, N6P 1R1
Office: (519) 652-1818 Fax: (519) 652-1820
Toll Free: (800) 465-9990
E-Mail: MayerHeritage@bellnet.ca
Web Page: www.archaeologicalconsultants.com

Archaeological Consulting Licence Number P066
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Corporate Project Number 09-010

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## Project Personnel

| | |
|---|---|
| Project Manager | Kristy Snarey |
| Report Preparation | Becky Jones |
| Field Director | Kristy Snarey |
| Assistant Supervisor | Becky Jones |
| Field/Office Assistants | Ashley Bailey<br>Charles Felver<br>Kathryn Gilbert<br>Jordana Gonser<br>Allison Grey<br>Kelsey McLellan<br>Allison Nott<br>Danielle Quinney<br>Chris Sanza<br>Diane Servos<br>Don Snarey<br>Dennis Wilson |

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- ***Catharine Cooper, Planning Solutions***

# Archaeological Excavation (Stage 4)
# Proposed Development, Lots 1 to 3
# Concession 5, Simcoe, Ontario

## Introduction

Among other matters, the *Planning Act R.S.O. 1990*, establishes that the protection of features of archaeological interest is a matter of provincial concern. As such, an archaeological resource assessment (Stage 1 background research and Stage 2 general survey) was conducted as a standard condition of approval for the proposed development on Lots 1 to 3 (MHCI 2008) (*see* Figure 1). During the Stage 2 survey, 101 locations containing archaeological material were recovered. Forty-one of these locations warranted further investigations.

All forty-one locations were subjected to a Stage 3 investigation (MHCI 2008). Because a significant amount of material was recovered during these excavations, Stage 4 excavations were recommended for seventeen of these locations. The original size of the development was later reduced, therefore, of the seventeen locations only three were subject to a Stage 4 investigation at this time (*see* Figure 2). This report documents the results of the Stage 4 excavations at Locations 82, 88, and 98 between March 30 and August 15, 2009.

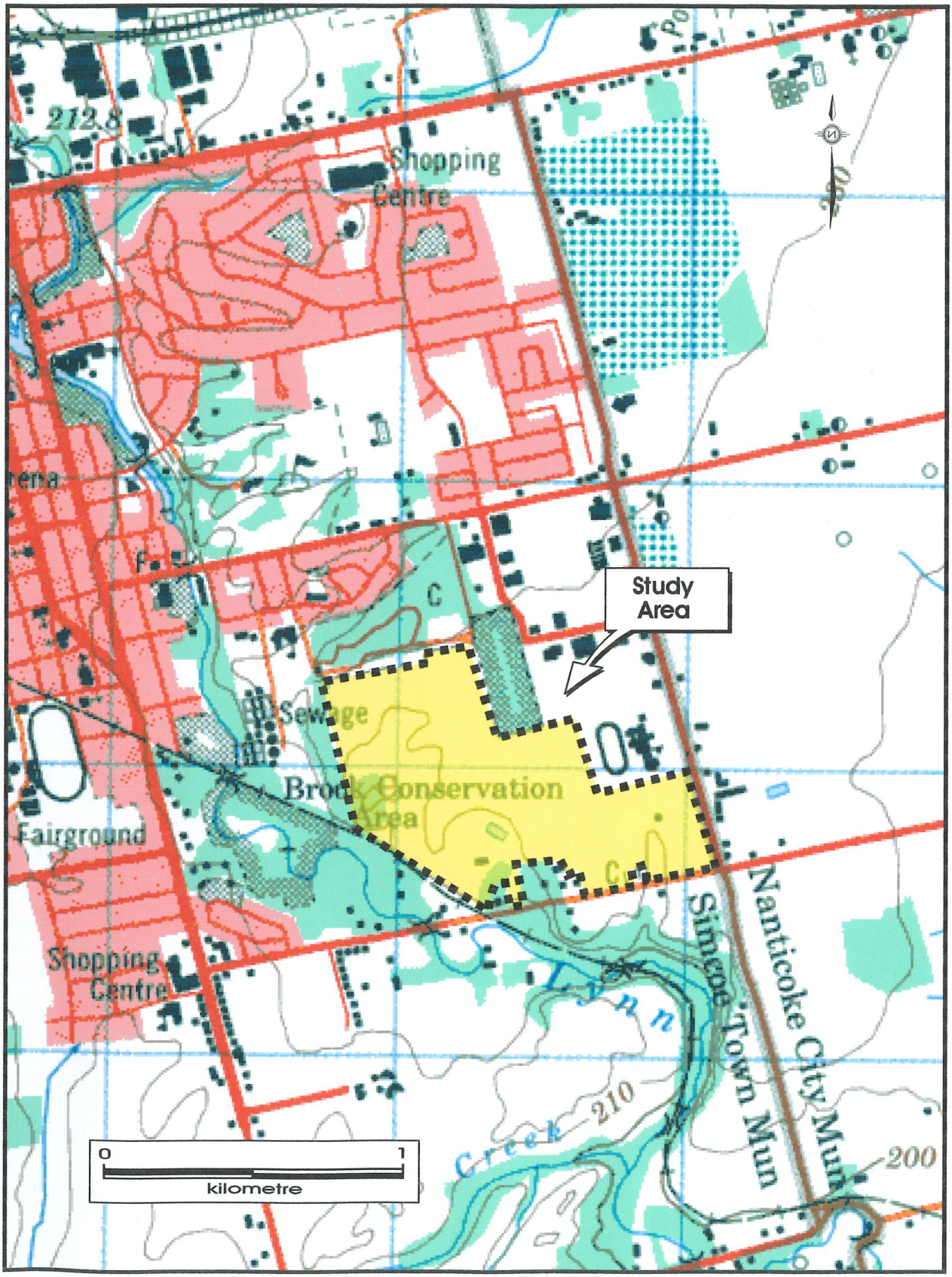
## Stage 4 Study Methodologies at Locations 82, 88, and 98

Locations 82, 88, and 98 were hand-excavated in one-metre square units, and all soil was screened through a six-millimetre wire mesh in order to maximize the potential for artifact recovery. For any one-metre unit that produced 10 artifacts or more during the Stage 3 excavations, all one metre units to the north, south, east and west were excavated on Location 82 until the artifact counts did not exceed 10 artifacts per unit. Because of the size of Locations 88 and 98 permission was given by the Ministry of Culture to hand excavate around those units that produced 15 artifacts or more during the Stage 3 excavations. Once hand excavation of the plough zone was complete, the floor of each unit was shovel-shined to expose any possible sub-surface cultural features.

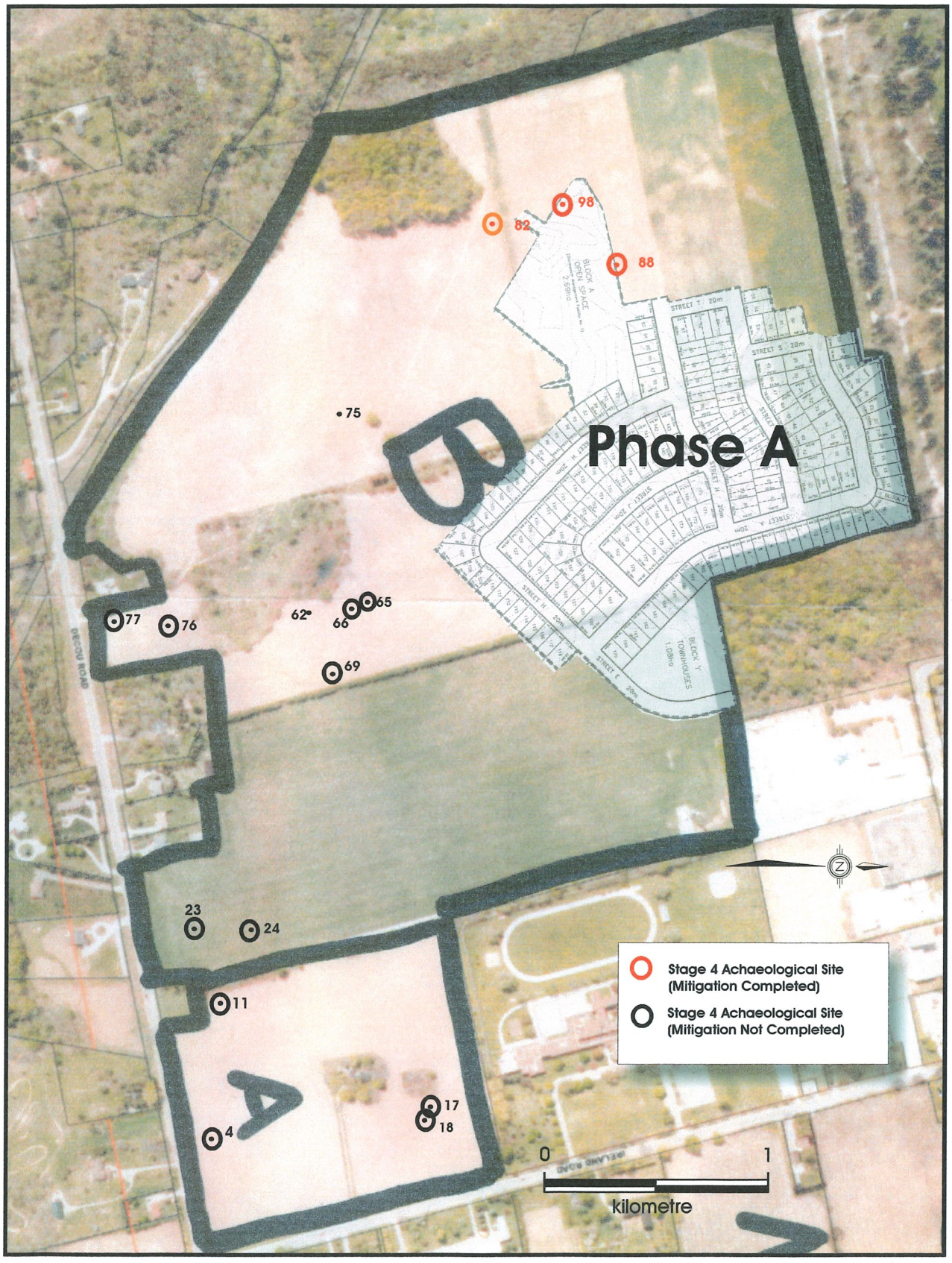
Because pottery fragments were recovered during Stage 3 excavations, subsequent to hand-excavation at Location 88, the plough zone was mechanically stripped to expose the subsoil. Once mechanical stripping was complete, the soil was shovel-shined to expose any possible cultural features. The area was stripped to at least ten metres beyond the site area identified during the Stage 4, and to at least ten metres beyond any soil stains and other possible features.

When possible features were uncovered at any of the three locations, each was mapped in using the Stage 3 grid and photographed and then cross-sectioned and the profile recorded. All soil removed from the feature and its surrounding area was screened through six-millimetre wire mesh in order to maximize the potential for artifact recovery. Even features that were determined to be non-cultural were screened to ensure that any artifacts were collected. A soil sample was taken from each cultural feature for flotation processing to collect any small artifacts and/or plant remains present in the feature. The size of the flotation soil sample was between one-quarter and one-half of the entire feature. All features were filled in upon completion of the excavation. Any artifacts exposed in the stripped piles of topsoil were also collected and catalogued.

**Figure 1: Location of the Study Area.**



## Figure 2: Site Map Showing Stage 4 Locations with Phase A Development Plan



## Stage 4 Results

## Location 82

During the course of the Stage 4 mitigative excavation, a total of 16 one-metre square units were hand-excavated at Location 82 (*see* Figure 8). The plough zone horizon ranged in depth from 23 to 36 centimeters in thickness. Artifact recovery rates per unit range from a low of 3 to a high of high of 23, with a total of 205 artifacts recovered from Location 82. Of the 205 artifacts, two were bifaces and one was a scraper.

Excavations are now complete at Location 88 and no further work is recommended.

### Artifact Analysis

Artifact analysis for Location 82 will be submitted with the Stage 4 final report.

### Features

No features or soil stains of any kind were found during the excavations.

## Location 88

During the course of the Stage 4 mitigative excavation, it was determined that Location 88 contained two separate loci, Locus 88A to the west and 88B to the east (*see* Figure 6). During mitigative excavation, approximately 1,269 one-metre square units were hand-excavated at Location 88. The plough zone horizon ranged in depth from 19 to 47 centimeters in thickness. Artifact recovery rates per unit ranged from a low of one to a high of 65, with an approximate total of 20,076 artifacts recovered from Location 88. Included in the artifact count are 38 projectile points, 35 bifaces, 24 scrapers, 3 drills, one core, and more than thirty pieces of aboriginal pottery. Following the hand-excavation of Location 88, there followed the mechanical excavation of the site to locate any features (*see* Figure 9). The stripped area was an 80 metre by 100-metre area, centred upon the Stage 4 excavations (*see* Figure 7).

Excavations are now complete at Location 88 and no further work is recommended.

### Artifact Analysis

Artifact analysis for Location 88 will be submitted with the Stage 4 final report.

### Features

A total of thirty-six features, including hearths and pits, were observed after the completion of shovel-shining the mechanically stripped area (*see* Figure 7). Each was recorded as a feature with artifacts such as chipping detritus, pottery, and charcoal recovered from those features.

**Figure 3: Site Map Showing Stage 4 Results on Location 82**



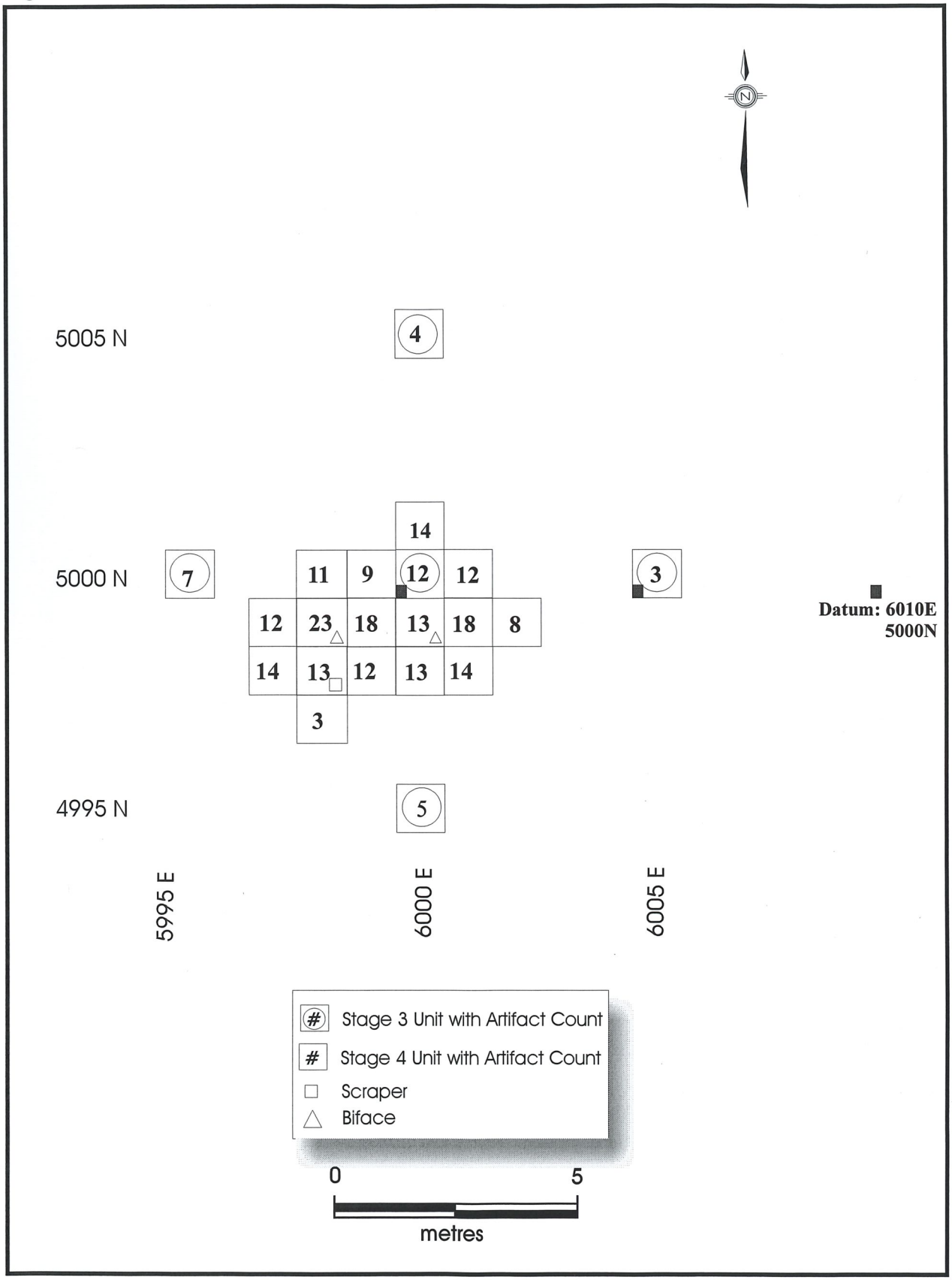


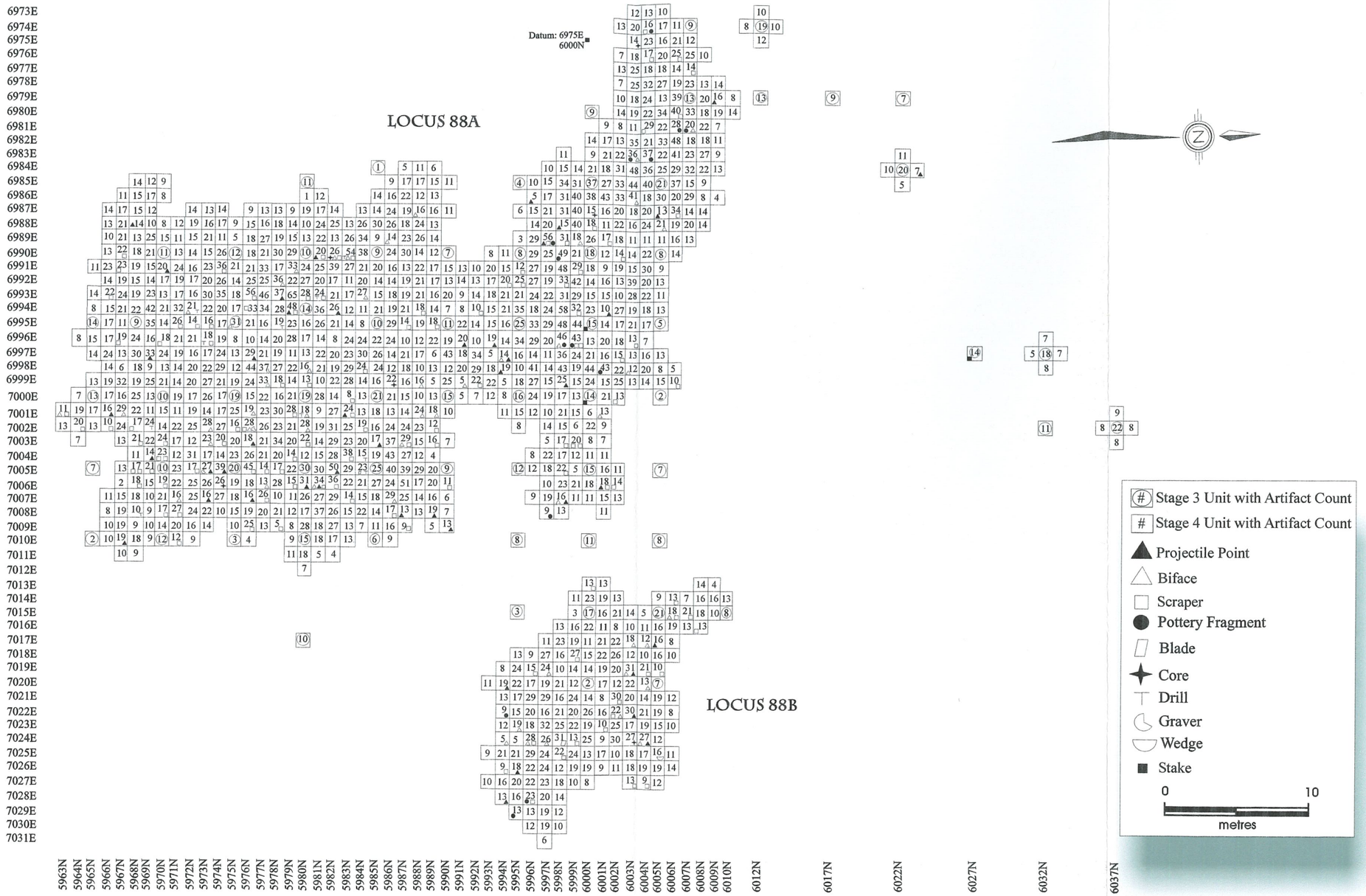
**Figure 4: Crew at Work on Location 82, Facing Southwest** 9



**Figure 5: Location 82, Unit 6001E 5000N, East Wall Profile**



**Figure 6: Site Map Showing Stage 4 Results at Location 88**



## Location 98

During the course of the Stage 4 mitigative excavation, a total of approximately 100 one-metre square units were hand-excavated at Location 98 (*see* Figure 10). The plough zone horizon ranged in depth from 20 to 30 centimeters in thickness. Artifact recovery rates per unit ranged from a low of 2 to a high of 57, with an approximate total of 3,000artifacts recovered from Location 88. Included in the artifact count are eight projectile points, seven bifaces and twelve scrapers.

Excavations are now complete at Location 98 and no further work is recommended.

### Artifact Analysis

Artifact analysis for Location 98 will be submitted with the Stage 4 final report.

### Features

No features or soil stains of any kind were found during the excavations.

**Figure 7: Select Artifacts Recovered During Stage 4 Investigations at Locations 82, 88, and 98**



**Location 82, Scraper**



**Location 82, Biface**



**Location 88, Projectile Point**



**Location 88, Projectile Point**



**Location 88, Scraper**



**Location 98, Scraper**



**Figure 8: Site Map Showing Features and Mechanically Stripped Area at Location 88**



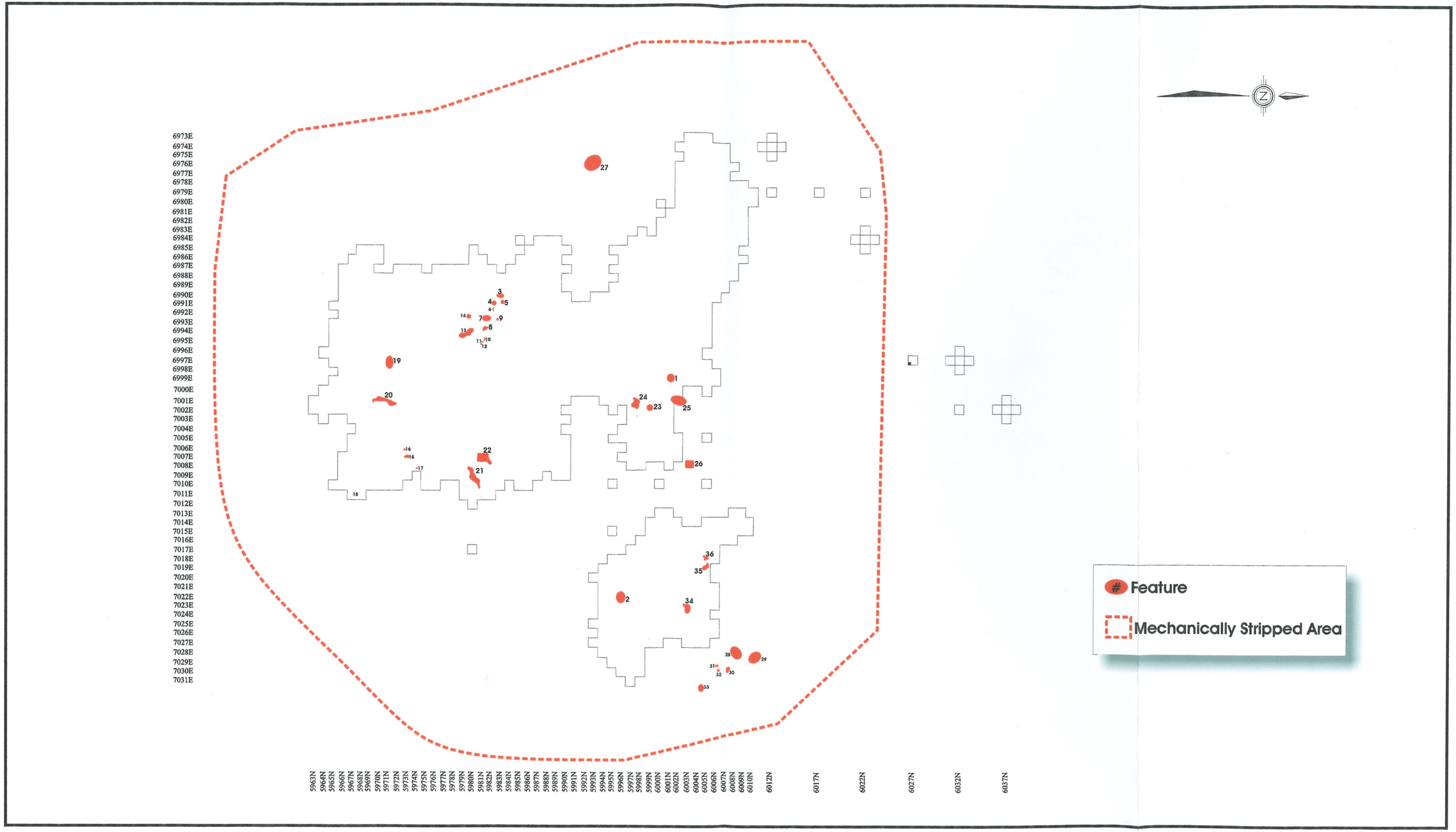


**Figure 9: Crew at Work on Location 88, Facing Northwest**





**Figure 10: Crew at Work on Mechanically Stripped Area of Location 88, Facing North**



**Figure 11: Site Map Showing Stage 4 Results at Location 98**

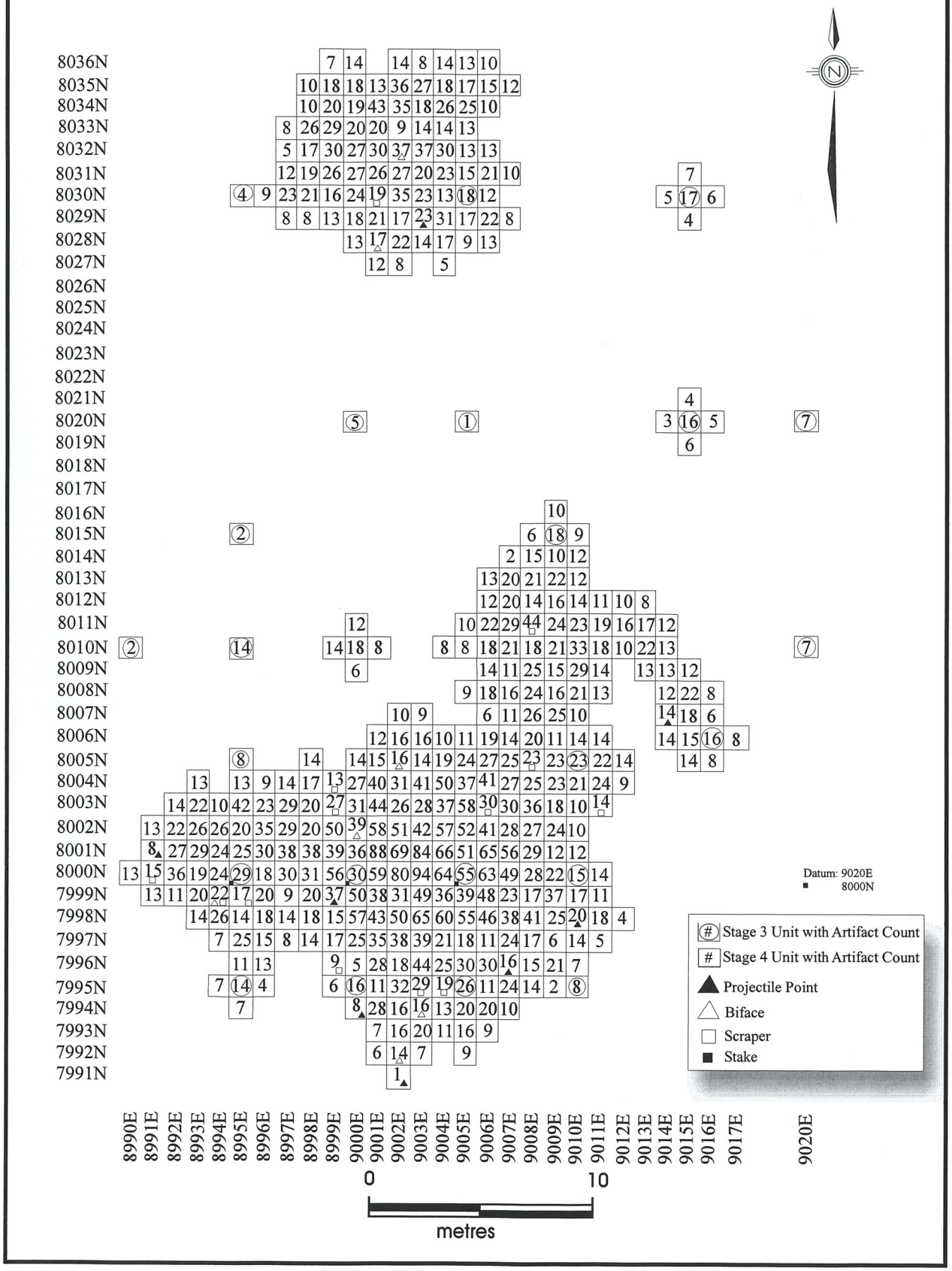


**Figure 12: Crew at Work on Location 98, Facing Southeast**



**Figure 13: Location 98, Unit 8997E 8033N, North Wall Profile**



## RECOMMENDATIONS

The following recommendations are provided by Mayer Heritage Consultants Inc. for consideration by Planning Solutions and by the Ministry of Culture:

1. Because Locations 82, 88, and 98 have now been fully excavated and documented, no additional fieldwork is recommended for the Phase A Development Land. The Ministry of Culture is requested to issue a letter of clearance for the archaeological condition attached to this development.

2. The above recommendation is subject to concurrence by the Ministry of Culture. It is an offence to destroy or alter an archaeological site without approval from the Ministry of Culture. No landscaping, grading or other activity that may result in the destruction or disturbance of any of the archaeological sites documented in this report is permitted prior to the Ministry of Culture's approval.

3. A final report will be prepared and submitted by Mayer Heritage Consultants Inc., and will be submitted as per the terms and conditions of Archaeological licence P066.

4. Although every reasonable effort was made to locate all archaeological resources, it is possible that some remain to be discovered within the study area. Should deeply buried archaeological material be found during construction, the Ministry of Culture in London (519-675-7742) and Mayer Heritage Consultants Inc. in London (519-652-1818 or 800-465-9990) should be immediately notified.

5 As on virtually any property in southern Ontario, it is possible that Aboriginal or Euro-Canadian burials could be present within the study area. In the event that human remains are encountered during construction, the proponent should immediately contact the Ministry of Culture and the Cemeteries Regulation Unit of the Ontario Ministry of Consumer and Commercial Relations in Toronto (416-326-8392), as well as the appropriate municipal police, the local coroner, and Mayer Heritage Consultants Inc.

6. The licensee shall keep in safekeeping all artifacts and records of archaeological fieldwork carried out under this licence, except where those artifacts and records are transferred to by the licensee to Her Majesty the Queen in right of Ontario or the licensee is directed to deposit them in a public institution in accordance with subsection 66(1) of the Act.

## References Cited and Consulted

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1990 ***The Archaeology of Southern Ontario to A.D. 1650***. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society Inc.

Mayer Heritage Consultants Inc.
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LVM
NAYLOR

ZITIA GROUP

# Residential Subdivision
# Decou Road and Ireland Road
# Simcoe, Ontario

## Geotechnical Investigation

## Report

December 2009
**Ref. No.: 7780G2.R01**
**(161-P030592-0100-GE-R001)**

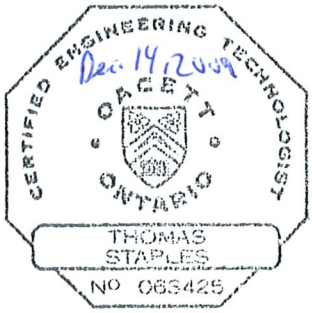
LVM
NAYLOR



Zitia Group

Geotechnical Investigation
Proposed Residential Subdivision
Decou Road and Ireland Road
Simcoe, Ontario

Prepared by:




Thom Staples, C.E.T.
Brantford Team Leader

Reviewed by:




Dennis Kelly, B.Sc., P.Eng.
Senior Consulting Engineer
jp/cs

**LVM-Naylor**
Division of Naylor Engineering Associates Ltd.
440 Hardy Road, Unit 3
Brantford (Ontario) Canada N3T 5L8
Telephone: 519.720.0078
Fax: 519.720.0976
Web site: www.lvmnaylor.com

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Test results mentioned herein are only valid for the sample(s) stated in this report.

LVM-Naylor's subcontractors who may have accomplished work either on site or in laboratory are duly qualified as stated in our Quality Manual's procurement procedure. Should you require any further information, please contact your Project Manager.

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# 1 INTRODUCTION

LVM-Naylor, Division of Naylor Engineering Associates Ltd. was retained by the Zitia Group to carry out a geotechnical investigation at the site of a proposed residential development in the southeast end of Simcoe, Ontario. This work was authorized by Mr. Peter Labiris on October 22, 2009.

The project involves the proposed construction of a residential subdivision to be situated on a 75 ha parcel of land located in Simcoe, Ontario at the location shown on Drawing 1, in Appendix 4. The development plans include six hundred and twenty-nine single detached lots, sixteen multi-unit blocks, a school block and twenty new streets. Access to the subdivision will be via Decou Road, Ireland Road, and Donly Drive. The house lots will be serviced with municipal sewer and water. A new stormwater management facility will be constructed in the north central part of the site.

The purpose of the investigation was to determine the subsurface soil and groundwater conditions at the site and, based on that information, prepare this engineering report with geotechnical recommendations pertaining to development including site grading, site servicing, pavement construction, house construction, excavations and dewatering, stormwater infiltration and stormwater management. The report does not address site environmental issues or concerns.

# 2 INVESTIGATION PROCEDURE

## 2.1 Previous Work

In July 2008, Naylor Engineering Associates Ltd. carried out a preliminary geotechnical investigation at the site. The fieldwork involved the excavating of seven test pits (Test Pits 1 to 7) to a depth of 3.1 m below ground surface. The results of this investigation were provided in our Preliminary Geotechnical Engineering Report No. 7780G1.R01, and the test pits logs are provided in Appendix 2.

In October 2008, Naylor Engineering Associates Ltd. carried out a geotechnical investigation for a new outfall sewer along the Lynn Valley Trail at the west side of the property from Decou Road to the Simcoe Water Pollution Control Plant. The fieldwork for this investigation comprised the drilling of five boreholes to a depth of 5.0 m. The results of this investigation were provided in our Geotechnical Engineering Report No. 7807G2.R01.

The relevant geotechnical information from the above noted reports has been incorporated into this report.

## 2.2 Field Program

The fieldwork for this investigation was carried out on November 4, 5, 6, 9 and 10, 2009, and involved the drilling of thirty-one boreholes (Boreholes 1 to 30 and 12A) to depths of 4.1 to 11.9 m, and the excavation of eleven test pits (Test Pits 101 to 111) to depths of 1.9 to 4.9 m. The fieldwork also included thirty-eight handholes to determine topsoil thicknesses across the site. The locations of the boreholes, test pits, and handholes are shown on the Site Plan, Drawing 2 in Appendix 4.

The boreholes were advanced with a CME-55 track mounted drillrig equipped with continuous flight solid stem augers supplied and operated by a specialist drilling contractor. The test pits were excavated with a tracked hydraulic backhoe supplied by an excavating contractor.

In the boreholes and test pits, representative samples of the overburden were recovered at regular intervals throughout the depths explored. Standard Penetration Tests (SPT) were carried out during sampling operations in the boreholes using conventional split spoon equipment. The SPT N-values recorded are plotted on the borehole logs in Appendix 2.

Thirty-eight topsoil thickness holes were dug throughout the property to expose the underlying subgrade. Where thick topsoil was encountered in the low lying areas, an excavator was used to dig the holes. The topsoil thicknesses noted at the handholes are summarized in Table 1.

Samples of the cohesive soils were tested using a hand-held pocket penetrometer to determine approximate shear strengths. The pocket penetrometer test results are plotted on the borehole logs.

Standpipes were installed in sixteen boreholes to allow measurement of the stabilized groundwater levels. The standpipe installations comprised 19 mm diameter pipes with slotted and filtered screens, as well as a bentonite seals near the ground surface. Details of the installations and groundwater observations and measurements are provided on the borehole logs, and the measurements are summarized in Table 2.

Monitoring wells were installed in Boreholes 27 and 30 to allow measurement of groundwater levels. The monitoring wells were constructed using flush-threaded 50 mm diameter Trilock pipe with 1.5 m long 10-slot well screens, delivered to the site pre-cleaned in individually sealed plastic bags. The screen and riser pipes were not allowed to come into contact with the ground or any drilling equipment prior to installation.

Groundwater observations were carried out in the test pits during and upon completion of excavating. The observations are summarized on the test pit logs in Appendix 2.

All boreholes without standpipes or monitoring wells were backfilled with bentonite in accordance with Ontario Regulation 372/07 (formerly Ontario Reg. 903). The standpipes and monitoring wells were tagged and a complete well record was submitted to the Ministry of Environment. A licensed well technician must properly decommission all standpipes and monitoring wells within six months of last use (water level measurements) and certainly before construction.

The fieldwork was monitored throughout by a member of our geotechnical engineering staff, who directed the drilling and excavating procedures; conducted SPT and pocket penetrometer tests, documented the soil stratigraphies, monitored the groundwater conditions, installed the standpipes and monitoring wells, and cared for the recovered soil samples.

The borehole and test pit locations and ground surface elevations were surveyed by B.A. Jacobs Surveying and supplied to us in AutoCAD format. It is understood that the elevations are related to a geodetic datum. The topsoil thickness hole locations were not surveyed and should be considered as approximate.

Groundwater levels were measured by LVM-Naylor on November 10 and December 10, 2009 and the groundwater measurements are provided on the borehole logs and in Table 2.

### 2.3 Laboratory Testing

All soil samples secured during this investigation were returned to our laboratory for visual examination, as well as moisture content tests. The moisture content test results are plotted on the borehole and test pit logs in Appendix 2.

The geotechnical laboratory tests carried out on selected samples of the major subsurface soils from the investigation comprised the following:

- seven particle size distribution analyses with the results plotted on Figures 1 and 2 in Appendix 3; and,
- two standard Proctor moisture density tests with results plotted on Figures 3 and 4 in Appendix 3.

The soil samples will be stored for a period of three months from the date of sampling. After this time, they will be discarded unless prior arrangements have been made for longer storage.

## 3 SUMMARIZED CONDITIONS

### 3.1 Site Description

The subject property covers approximately 75 ha and is located in the southeast part of Simcoe, Ontario. The property is bordered on the west by the Lynn Valley Trail and the Simcoe Sewage Treatment Plant, on the east by East Lynn Industrial Park, Fanshawe College and Ireland Road, on the south by Decou Road, and on the north by Oakwood Cemetery.

The property is currently used for agricultural purposes and was most recently planted with soy bean and clover crops. Bush areas are located at the west and south parts of the site. A small area at the west central part of the site has been stripped and the topsoil has been pushed into piles surrounding the area.

A gravel driveway extends north from Decou Road to a communication tower at the north end of the site.

An abandoned house and barn that was located at the east side of the site was removed prior to the site work.

The ground surface at the site generally slopes down from the northeast to the southwest with a topographical relief of approximately 22 m. A valley is located in the north central part of the property and a few smaller swales are located at the south. Photographs of the site are provided in Appendix 5.

## 3.2 Pleistocene Geology

The site is located within the physiographic region of Southern Ontario known as the Norfolk Sand Plain. The region is generally composed of broad plains of sand and silt which were deposited as a delta in Glacial Lakes Whittlesey and Warren. Small rivers and streams have cut deep valleys across the plains.

The region is underlain by Silurian bedrock of the Paleozoic system. The predominant rock types are dolomite, shale and gypsum of the Salina Formation. The bedrock is approximately 400 million years old and was formed in a shallow inland sea.

## 3.3 Subsoil Conditions

We refer to the appended test pit and borehole logs for detailed soil descriptions and stratigraphies; results of SPT and pocket penetrometer testing; moisture content profiles; details of standpipe and monitoring well installations; and, groundwater observations and measurements. We also refer to Drawings 3 and 4, in Appendix 4 for simplified cross-sections of the soil stratigraphy along Streets B and H.

In general, the subsurface stratigraphy contacted at the site comprise topsoil, overlying complex layered deposits of silt and sand, with localized deposits of sand and gravel, clay, and glacial till. Descriptions of the various soil deposits encountered are provided in the following subsections.

### 3.3.1 Topsoil

Topsoil was encountered surfically across the site. The topsoil is typically 100 to 650 mm thick. Thicker topsoil was encountered in a valley at the northeast corner of Phase 1 (see Test Pit 11 and Handholes 22 and 23) where the topsoil was 900 to 1800 mm thick and within swales at the southeast corner of the site where the topsoil thicknesses range between 1500 and 1600 mm (see Handholes 5, 6 and 8).

A summary of the topsoil thicknesses at the handhole locations is provided in the following table.

**TABLE 1: SUMMARY OF TOPSOIL THICKNESSES**

| Handhole Number | Thickness (mm) | Handhole Number | Thickness (mm) |
|---|---|---|---|
| 1 | 350 | 20 | 120 |
| 2 | 350 | 21 | 350 |
| 3 | 350 | 22 | 170 (1700) * |
| 4 | 650 | 23 | 100 (1000) * |
| 5 | 150 (1500) * | 24 | 110 |
| 6 | 160 (1600) * | 25 | 300 |
| 7 | 400 | 26 | 400 |
| 8 | 155 (1550) * | 27 | 400 |
| 9 | 650 | 28 | 350 |
| 10 | 500 | 29 | 650 |
| 11 | 500 | 30 | 300 |
| 12 | 550 | 31 | 550 |
| 13 | 350 | 32 | 350 |
| 14 | 400 | 33 | 300 |
| 15 | 600 | 34 | 300 |
| 16 | 400 | 35 | 350 |
| 17 | 450 | 36 | 350 |
| 18 | 500 | 37 | 300 |
| 19 | 100 | 38 | 300 |

* Second Buried Layer of Topsoil

It is noteworthy that a second buried layer of topsoil was encountered below the silt or sand in Test Pit 1 and Handholes 5, 6, 8, 22 and 23.

The topsoil typically comprises dark brown silt and was moist to very moist at the time of the fieldwork.

### 3.3.2 Silt

Silt deposits were contacted beneath the topsoil or layered with the sand in most of the boreholes and test pits drilled and excavated across the site. The silt deposits range from 0.3 to 7.2 m thick and extend below the termination depths of Boreholes 10, 11, 12, 14, 16, 17, 20, 21, 22, 24, 26, 29 and 30, and Test Pits 105, 108 and 109.

The texture of the silt ranges from silt with some sand to clayey silt with trace sand. The results of three grain size distribution analyses carried out on the samples of silt are provided on Figures 1 and 2 in Appendix 3, and show the samples contain 1 to 10% sand, 63 to 76% silt, and 20 to 34% clay.

The non-cohesive silt typically has a loose to very loose relative density in the upper 2.0 m, and compact to dense relative density below 2.0 m. The cohesive silt deposits typically have low plasticity and stiff consistency.

The silt is very moist to wet or about the plastic limit to wetter than the plastic limit based on natural moisture contents that range from 18 to 30%. The results of a standard Proctor moisture density test performed on a sample of clayey silt are plotted on Figure 3 in Appendix 3, and show a maximum dry density of 1.865 t/m$^3$ at an optimum moisture content of 12.9%.

### 3.3.3 Sand

Sand deposits were encountered throughout the site with the thickest strata noted at the northeast and south centre parts of the property. The sand deposits were contacted below the topsoil in Boreholes 2, 4, 5, 8, 18, 19, 21, 22 and 26, and Test Pits 101, 103, 4, 6, 7, and below thick layers of silt in Boreholes 1, 3, 6, 7, 9, 13, 15, 17, 23, 25 and 30, and Test Pits 102, 104, 106, 3 and 5. Thin seams of sand were also encountered within the silt in Boreholes 11, 12A, 16, 20 and 29.

The native sand has a compact to very dense relative density based on SPT N-values of 10 to 88 blows per 300 mm penetration of the split spoon sampler.

The sand generally ranged in gradation from sand and silt to sand with some gravel and trace silt. The results of five grain size distribution analyses carried out on samples of the sand are provided on Figures 1 and 2 in Appendix 3, and show the samples contain 0 to 15% gravel, 66 to 96% sand, 4 to 10% silt, and 0 to 8% clay.

The natural water content of the sand deposits typically ranged from 2 to 14% above the groundwater table indicating damp to moist conditions. Water bearing saturated sand deposits were encountered in Boreholes 3, 8, 13, 15, 16, 18, 26, 27, 29 and 30, and Test Pits 102 and 3. The results of a standard Proctor moisture density test performed on a sample of the sand are plotted on Figure 4 in Appendix 3, and show a maximum dry density of 2.05 t/m$^3$ at an optimum moisture content of 8.4%.

### 3.3.4 Sand and Gravel

Sand and gravel deposits were encountered in Boreholes 14, 24 and 38, and Test Pits 106, 107 and 1, and range in thickness from 0.6 to 2.4 m. The sand and gravel extends below the termination depth of Test Pit 106.

The sand and gravel has a compact to very dense relative density based on SPT N-values of 13 to 78 blows. The sand and gravel is generally damp to moist based on insitu moisture contents of 5 to 10%. The sand and gravel is saturated at Borehole 14.

A very large boulder erratic was encountered in Test Pit 105 at Block E. The boulder is more than 7 m long (north to south) and was encountered at a depth of 1.9 m.

### 3.3.5 Glacial Till

Glacial till was encountered in Boreholes 3 and 22, and Test Pit 103. The glacial till extends below the termination depth of Borehole 3 and Test Pit 103, and is 1.9 m thick in Borehole 22. The texture of the till ranges from silt with some gravel to silt with some clay with trace sand and gravel.

SPT N-values recorded in the non-cohesive till typically ranges from 36 to 51 blows per 300 mm indicating a dense to very dense relative density. Shear strengths determined with a pocket penetrometer in the cohesive till indicate a very stiff consistency.

Insitu moisture contents of the glacial till typically range from 10 to 20% indicating that the deposit is generally moist or drier than the plastic limit to about the plastic limit

### 3.3.6 Clay

Clay was encountered at the northwest end of the site at approximately Elevation 212 m in Borehole 28 and Test Pits 107 and 110, and extends below the termination depths of the borehole and test pits.

The silty clay is about the plastic limit to wetter than the plastic limit based on moisture contents of 25 to 27%. The clay has low plasticity and is over consolidated.

## 3.4 Groundwater

Groundwater observations and measurements carried out in the open boreholes and test pits, and in standpipes and monitoring wells installed in the boreholes and test pits, are provided on the appended borehole and test pit logs, and are summarized in the following table.

**TABLE 2: GROUNDWATER DEPTHS AND ELEVATIONS**

| Borehole Number | Groundwater Depth (m) | Groundwater Elevation (m) | Notes |
|---|---|---|---|
| 3 | 0.11 | 216.37 | Subartesian |
| 8 | 2.98 | 216.92 | Unconfined |
| 10 | 3.91 | 223.83 | Perched |
| 11 | 3.32 | 224.74 | Perched |
| 12 | 4.63 | 213.91 | Dilatant Silt |
| 13 | 0.53 | 216.87 | Subartesian |
| 14 | 2.55 | 215.45 | Subartesian |
| 15 | 8.44 | 207.28 | Subartesian |
| 16 | 0.64 | 215.55 | Subartesian |
| 17 | 3.88 | 209.54 | Perched |
| 18 | 3.28 | 216.03 | Unconfined |
| 20 | Dry | n/a | No Free Groundwater |
| 24 | 7.53 | 209.06 | Dilatant Silt |
| 26 | 1.99 | 217.95 | Perched |
| 27(MW) | 0.92 | 216.69 | Subartesian |
| 28 | 7.76 | 209.76 | Clay |
| 29 | 0.20* | 216.32 | Artesian |
| 30 (MW) | 0.14 | 216.26 | Subartesian |

Groundwater measurements taken on November 10, 2009

*Groundwater level at 0.20 m above ground surface

The groundwater observations indicate that the stabilized unconfined groundwater table typically occurs between Elevations 215 and 217 m throughout the centre and east half of the site. The groundwater table drops off along the southwest boundary ranging from Elevation 207 to 209 m. Sub-artesian and artesian conditions were encountered in the north central part of the property at Boreholes 3, 13 to 16, 27, 29 and 30. The horizontal hydraulic gradient is towards the southwest (Lynn River).

Groundwater seepage was noted from the sand deposits and the hydraulic conductivity would be in the order of $10^{-3}$ cm/sec for the sand and in the order of $10^{-5}$ cm/sec for the silt. Local variations and seasonal fluctuations in the groundwater levels would be expected.

# 4 DISCUSSIONS AND RECOMMENDATIONS

## 4.1 General

The project involves the proposed construction of a residential subdivision to be situated on a 75 ha parcel of land located in Simcoe, Ontario at the location shown on Drawing 1, in Appendix 4. The development plans include six hundred and twenty-nine single detached lots, sixteen multi-unit blocks, a school block and twenty new streets. Access to the subdivision will be via Decou Road, Ireland Road, and Donly Drive. The house lots will be serviced with municipal sewer and water. A new stormwater management facility will be constructed in the north central part of the site.

Based on the results of the geotechnical investigation, the subsurface stratigraphy comprises topsoil overlying major deposits of silt and sand.

The stabilized unconfined groundwater table generally occurs between Elevation 215 and 217 m except at the southwest boundary where the groundwater level is between 207 and 209 m. The horizontal hydraulic gradient is from the northeast to the southwest towards the Lynn River. Perched groundwater was encountered in the silt at the northwest corner of the site. Subartesian and artesian groundwater pressure was noted in the sand deposits at the north central area (see Boreholes 3, 13, 27, 29 and 30).

Based on the results of this geotechnical investigation the site is well suited for the proposed residential development; however, the presence of sub-artesian groundwater and shallow groundwater in the low-lying areas will affect design and construction. The following subsections of this report contain geotechnical recommendations pertaining to development of the property including site grading, site servicing, pavements, residential buildings, excavations and dewatering, and stormwater management.

## 4.2 Site Grading

Significant area grading of the property will be required to prepare the land for the construction of the proposed residential subdivision. It is planned to cut material from the high area at the northwest corner and in Block A (Stormwater Management Pond No. 1), and use it to raise grades in the lower sections of the site particularly at the southwest.

Prior to carrying out any cutting and engineered fill placement, the surficial topsoil should be removed from cuts and critical fill areas. In calculating the approximate quantity of topsoil to be stripped, we recommend that the topsoil thicknesses provided on Table 1 as well as the individual borehole and test pit logs be increased by 50 mm to account for variations and some stripping of the mineral soil below. The topsoil material could be used for landscaping fill to raise grades in the rear yards of the house lots or in park areas.

The topsoil typically is 100 to 650 mm thick; however, it is important to note that thicker topsoil and buried topsoil (900 to 1800 mm) was encountered in the low lying areas of the site.

Within the low-lying areas of the site where thick topsoil was encountered, and where the groundwater table is close to the existing ground surface, it will likely be necessary to remove the organic deposits with a tracked hydraulic excavator. Also, an enlarged excavation will be required to facilitate fill placement and groundwater control. Sump pumping with large capacity pumps from pits and trenches in the excavation subgrade should be sufficient to control the inflow. The groundwater control measures must be maintained until the engineered fills are placed and compacted to above the original water level.

In order to minimize the effects of groundwater on the site grading operations, it is recommended that the work be carried out during the normally drier summer months.

Following removal of the organic deposits, the exposed subgrade should be inspected by LVM-Naylor. Several metres of fill may be required to raise grades in the low-lying areas. The fill should be placed in maximum 300 mm thick lifts and compacted to the following minimum percentages of standard Proctor maximum dry density (SPMDD):

**TABLE 3: COMPACTION SPECIFICATIONS**

| Fill Use | Minimum Compaction Required |
|---|---|
| Structural fill to support houses | 98% SPMDD |
| Subgrade fill beneath streets or beneath services | 95% SPMDD |
| Bulk fill in landscaped areas | 90% SPMDD |

Major soils likely to be generated from the site are silt and sand. Based on the results of insitu moisture content and standard Proctor moisture density tests the majority of the on-site sand soils will be well suited for reuse for road subgrade fill and structural fill. If work is carried out during very dry weather then water may have to be added to the sand, to improve compaction.

The silt soils are suitable for reuse as road subgrade fill and engineered structural fill if the work is carried out during the normally drier summer months. If work is carried out during wet weather then the silt will only be suitable for reuse as road subgrade fill.

The native mineral soils are expected to undergo volume shrinkage during cut and fill operations. The estimated shrinkage factors are 0 to 5% for the glacial till, 5 to 10% for topsoil and silt, and 10 to 15% for sand/sand and gravel.

Where structural fill is placed on a wet subgrade in the low-lying areas, we suggest that only the sand or sand and gravel material be used for the bottom few lifts. Also, the initial lift may be up to 750 mm thick in order to ensure trafficability and minimize compaction problems associated with instability of the subgrade caused by vibratory equipment.

The structural fill pads should extend at least 1.0 m beyond the footing edge of any building and down to the subgrade level at a slope of 45° to the horizontal. A typical detail for structural fill placement beneath building foundations is shown on Drawing 5, in Appendix 4.

Full-time testing by experienced geotechnical personnel should be carried out during fill placement and compaction to examine and approve potential sources of fill material, and to carefully monitor the placement and verify the compaction by insitu density testing (ASTM D2167 or ASTM 2922).

Dust control measures may be required during periods of dry weather due to the fine nature of the soils. Work shall be in accordance with OPSS 506.

## 4.3 Site Servicing

### 4.3.1 Excavations and Dewatering

Following site grading operations, the subdivision will be serviced to provide the individual lots and blocks with full municipal services. It is understood that the invert levels for the watermain, storm, and sanitary sewers will be at conventional depths, some 2 to 5 m below finished grade through most of the site. The sanitary sewer will extend to depths of 7 to 11 m below road grade along the west side of the site with the deepest section at the outlet at Streets B and H. We recommend that LVM-Naylor be allowed to check the final site grading and servicing plans for the subdivision to ensure that the exploratory boreholes extend below the design sewer invert elevations.

Temporary excavations to conventional depths for installation of underground pipes at this site must comply with the Ontario Occupational Health and Safety Act and Regulations for Construction Projects. The predominant soils encountered in the boreholes would be classified as Type 3 soils (O.Reg. 213/91, s. 226(4)). Temporary side slopes must be cut at an inclination of 1 horizontal to 1 vertical or less from the base of the excavation for open cut pipe installation (exclusive of groundwater effects) as per O.Reg. 213/91, s. 234(2).

The trench sides slopes will have to be cut back at a shallower angle (3 horizontal to 1 vertical or less) where water bearing sand or sand and gravel deposits are encountered (see Boreholes 3, 8, 13, 14, 15, 16, 18, 26, 27 and 30).

The volume and rate of groundwater seepage is expected to be highly variable with moderate to high flow from the sand deposits, and low flow from the silt deposits.

Based on the invert levels of the sanitary sewer, the excavations for the sewer will extend into water bearing sand deposits on Street H, west of Street T (see Borehole 3 and 30), the north leg of Street Q (see Borehole 13), and the south intersection of Streets Q and B (see Borehole 18). A positive dewatering system installed by a specialist dewatering contractor will likely be required to lower the groundwater table in the deposit. The hydraulic conductivity of the sand is estimated to vary depending on the texture between $10^{-3}$ to $10^{-4}$ cm/sec.

The design of the dewatering system should be left to the contractor's discretion, and the system should meet a performance specification to maintain and control the groundwater at least 0.30 m below the invert level in order to provide a stable excavation base. Successful dewatering operations will depend on the contractor's own experience, construction techniques, sequencing, and efficiency of work force and plant. Also the dewatering must be in compliance with the Ontario Water Resources Act (OWRA) and the Water Taking and Transfer Regulation (O.Reg. 387/04).

It is recommended that several test pits be dug during the tendering stage of the project in order that prospective contractors may familiarize themselves with the soil and groundwater conditions to be contacted.

### 4.3.2 Pipe Bedding

The subgrade soils beneath the watermain and sewer pipes will comprise native mineral soils or compacted fill placed during the site grading operations. No support problems are anticipated for flexible or rigid pipes founded in the native deposits or compacted on-site soils.

The native sand is geotechnically suitable for use as pipe bedding (see Figures 1 and 2) but the sand must meet the specifications of Norfolk County, otherwise, the pipe bedding for water and sewer services should be conventional Class 'B' pipe bedding comprising a minimum of 150 mm thick layer of OPSS Granular 'a' below the pipe invert. Pipe bedding should be provided around the pipe to at least 300 mm above the pipe. The bedding aggregate should be compacted to a minimum of 95% standard Proctor maximum dry density.

A well-graded clear stone such as Coarse Aggregate for HL4 Asphaltic Concrete (OPSS 1003) could be used in the sewer trenches as bedding below the spring line of the pipe to facilitate sump pump dewatering, if necessary. The clear stone should be compacted with a plate tamper.

Basal heave and piping in the bottom of the excavations may occur on Street H and Street Q due to the artesian and subartesian groundwater pressure noted in the sand layers underlying the silt. The sand should be depressurized/dewatered prior to excavation in order to prevent potential basal heave instability.

The proposed sewers could create hydraulic connections between groundwater regimes that are not presently connected. To stop the movement of groundwater along the pipe bedding, it is recommended that concrete or clay collars be installed around the pipes. The collars should be at least 1.0 m long and in place of the standard bedding material. We would be pleased to provide specific recommendations for locations of the cut-off collars during final design.

### 4.3.3 Trench Backfilling

The trenches above the specified pipe bedding should be backfilled with inorganic on-site soils placed in 300 mm thick lifts and compacted to at least 95% SPMDD.

Based on the results of insitu moisture content and standard Proctor moisture density tests carried out on the native overburden deposits, the on-site excavated sand above the groundwater table will be compactable to the required density, but with the silt it may be difficult to achieve the specified density on all the trench backfill. Nevertheless, it is recommended that the native soils be used as backfill in the trenches to prevent problems with differential frost heaving of imported subgrade materials. Non conventional compaction equipment, such as a hoe pack, may be necessary.

If necessary, compensation for wet trench backfill conditions can be made with additional Granular 'B' in the pavement structure. It should be noted, however, that the wet backfill material must be compacted to at least 90% standard Proctor maximum dry density (SPMDD) or post-construction settlements could occur.

To minimize potential problems, backfilling operations should follow closely after excavation so that only a minimal length of trench is exposed. Care should be taken to protect side slopes of excavations by diverting surface run-off away from the excavations. If construction extends into the Winter, then the backfilling operations should be planned so that exposure of the backfill material to frost is kept to a minimum and to ensure that frozen material is not used as backfill.

Frequent compaction testing by experienced geotechnical personnel should be carried out to examine and approve backfill materials, and to verify that the specified degree of compaction has been achieved.

## 4.4 Pavements

### 4.4.1 Pavement Design

Following site grading and servicing operations, the pavement subgrade will comprise native and recompacted silt and sand soils. The following pavement component thicknesses are recommended based on the proposed pavement usage, and the frost-susceptibility and strength of the subgrade soils:

**TABLE 4: PAVEMENT COMPONENT THICKNESSES**

| Pavement Component | Residential Collector Street * (Sand Subgrade) | Residential Crescent or Cul-de-Sac (Sand Subgrade) | Residential Collector Street * (Silt Subgrade) | Residential Crescent or Cul-de-Sac (Silt Subgrade) |
|---|---|---|---|---|
| Asphaltic Concrete | 100 mm | 80 mm | 100 mm | 80 mm |
| Granular 'A' Base | 150 mm | 150 mm | 150 mm | 150 mm |
| Granular 'B' Subbase | 350 mm | 300 mm | 450 mm | 400 mm |

* Collector Streets include Streets A, B, C and E

The pavement designs are based on the assumption that construction will be carried out during the drier time of the year and that the subgrade soil is stable as determined by proof-rolling inspected by a Geotechnical Engineer. If the subgrade is wet and unstable additional granular subbase will be required particularly in areas where the subgrade comprises silt.

Samples of both the Granular 'A' and Granular 'B' aggregates should be checked for conformance to OPSS 1010 prior to utilization on site and during construction. The Granular 'B' subbase and Granular 'A' base courses must be compacted to 100% standard Proctor maximum dry density (SPMDD), as verified by insitu density testing.

The asphaltic concrete should comprise a binder layer of HL4 and a surface layer of HL3. It is recommended that the compacted thicknesses be 60 mm of HL4 binder and 40 mm of HL3 surface for the residential collector streets, and 45 mm of HL4 binder and 35 mm of HL3 surface for the crescents and cul-de-sacs.

The asphaltic concrete paving materials should conform to the requirements of OPSS 1150. The asphalt should be placed and compacted in accordance with OPSS 310. The Performance Graded Asphalt Cement designation for the asphaltic concrete is 58-28.

### 4.4.2 Subdrains

The sand soils have fair to good natural drainage and therefore subdrains will not be required where sand is encountered at subgrade. This should be confirmed by a Geotechnical Engineer at the time of subgrade preparation.

The silt subgrade soils have poor natural drainage and therefore we recommend that subdrains be installed beneath the low areas of the pavement and connected to the catch basins. The purpose of the subdrains is to remove excess subsurface water in order to improve pavement serviceability and increase the pavement life. A detail for a typical pavement subdrain is provided on Drawing 6, in Appendix 4.

The work of subdrain installation shall be in accordance with OPSS 405 and OPSD 216.021. The subdrain shall be 100 or 150 mm diameter perforated pipe conforming to OPSS 1801 or 1840, and wrapped with geotextile conforming to OPSS 1860.

### 4.4.3 Curbs and Sidewalks

The concrete for curbs and sidewalks should be proportioned, mixed, placed, and cured in accordance with the requirements of OPSS 353 and OPSS 1350, and shall meet the following specific requirements (OPSS 353.05.01):

- minimum 28-day compressive strength = 30 MPa
- coarse aggregate = 19.0 mm nominal max. size
- maximum slump = 60 mm for curbs and 90 mm for sidewalks
- air entrainment = 7.0 ± 1.5%

During cold weather (when the air temperature is at or is likely to fall below 5°C within 96 hours of concrete placement) the freshly placed concrete must be covered with insulating blankets to protect against freezing, as per OPSS 904. Ice and snow must be removed from the area where concrete is to be placed and the concrete must not be placed against frozen ground. All cold weather protection material shall be on site prior to each concrete placement.

The subgrade for the concrete sidewalks should comprise undisturbed native mineral soil or well-compacted fill. A minimum 150 mm thick layer of compacted Granular 'A' type aggregate should be placed beneath the sidewalk slabs. The subgrade and granular base should be prepared in accordance with the requirements of OPSS 315.

## 4.5 Residential Buildings

### 4.5.1 Foundations

In general, the undisturbed native mineral soils are considered suitable to support residential house foundations. Where the footing levels will be above existing native mineral soil grade, structural fill will probably be used. House footings constructed on the compact native mineral soil or approved structural fill may be designed using the minimum footing sizes provided in the Ontario Building Code.

All founding surfaces for residential dwellings on structural fill or native soils should be inspected by LVM-Naylor personnel prior to placing concrete. The purpose of the inspection is to ensure that the subgrade soils are capable of supporting the house foundations, and to confirm that the house envelope does not extend beyond the limits of the structural fill pad.

Further geotechnical investigation will be necessary for large structures such as schools, plazas or apartment buildings to provide specific recommendations for design of these structures.

The subgrade soils are considered to be frost susceptible and must be protected from freezing at all times including during construction. The exterior footings or footings in unheated areas should be provided with a minimum 1.20 m of earth cover upon final grading for frost protection.

### 4.5.2 Basements

The basement floors should be designed at least 0.6 m above the seasonally high groundwater levels. We recommend that the site grading plans be reviewed by LVM-Naylor to ensure that the basements meet this condition.

House basements at this site must be provided with perimeter weeping tile systems as per the Ontario Building Code (Section 9.14). The drain tile or pipe should be laid on undisturbed or well-compacted soil so that the top of the tile or pipe (minimum 100 mm diameter) is below the bottom of the basement floor slab. The top and sides of the drain tile or pipe shall be covered with not less than 150 mm of crushed stone or other clean coarse granular material containing no more than 10% of material that will pass the 4 mm sieve. The weeping tile must drain to a suitable frost-free outlet or sump. The sump shall be equipped with an automatic pump that will discharge the water into a sewer, drainage ditch or dry well.

The portion of the exterior basement wall below finished ground level must be damp-proofed as per Section 9.13.2 of the Ontario Building Code (2006). The basement wall backfill should be graded to prevent drainage towards the foundation after settling as per OBC 9.12.3.

The basement walls should be designed to resist the lateral earth pressure. For calculating the lateral earth pressure, the coefficient of earth pressure (K) may be assumed as 0.50 for cohesionless sandy soils and 1.0 for silt. The bulk unit weight of the retained backfill may be taken as 21 kN/m$^3$ for well-compacted soil. An appropriate factor of safety should be employed.

The subgrade for the basement floor slabs should comprise undisturbed native soil or well-compacted fill. A minimum 100 mm thick layer of coarse clean granular material containing not more than 10% material that will pass a 4 mm sieve shall be placed beneath slabs in houses as per Section 9.16.2 of the Ontario Building Code. If the subgrade soil is wet, we recommend that subfloor weeping tiles be placed and connected to the sump pit.

## 4.6 At-Source Infiltration

At-source infiltration of water from house leaders in the northeast and south central parts of the subdivision will be feasible provided the native soils are sand or sand and gravel and the natural groundwater level is below the bottom of the pit or gallery. The factored infiltration rate for the sand is in the order of 30 mm/h. The soak-away pits should be more than 5 m from the building foundations and located so that drainage is away from the houses as per the Ontario Building Code.

The native silt deposits are not free draining and are not suitable for at-source stormwater infiltration.

The soak-away pits must be checked by LVM-Naylor at the time of construction to confirm satisfactory soil conditions, and to check that the pits are being constructed in accordance with the specifications

## 4.7 Stormwater Management Facilities

Stormwater management facilities are to be constructed at Block A in the north central part of the site and Blocks E and T at the south. The main facility at Block A will consist of a dry pond and a forebay. It is understood that the bottom of the dry pond is to be constructed at Elevation 214.50 m, and the bottom of the forebay is to be constructed at Elevation 213.25 m.

The finished grades at Block A will be at Elevation 216.0 m and the permanent pool level of the forebay will be at Elevation 214.5 m. The existing grades in this area generally range from Elevation 221.5 m in the west to Elevation 214.0 m at the east.

The subsoils generally comprise thick topsoil overlying silt and sand. Groundwater occurs in the sand deposits.

### 4.7.1 Excavations

Excavations for the ponds will likely encounter flowing sand in the bottom of the excavations due to high groundwater levels including sub-artisian groundwater pressure noted in the sand layers underlying the silt at Block A (see Borehole 3). The sand should be depressurized/dewatered prior to excavation in order to prevent basal heave instability. The situation should be assessed by a specialist dewatering contractor and additional test holes are recommended.

Slope subdrains will likely have to be installed to control seepage from the pond sides. The subdrains should be set into the pond banks at the seepage areas and connected to solid tiles that will convey the flow to the bottom of the pond. If seepage leads to slumping of the soil, then a loose revetement shall be placed on the slopes.

The finished side slopes of the ponds should be constructed with an inclination of 5 horizontal to 1 vertical because of the wet deposits. The finished slopes and pond bases should be topsoiled and vegetated as soon as possible after construction to minimize surface erosion except in the forebay where only the finished slopes above the permanent pool level should be topsoiled and vegetated.

It is recommended that several test pits be dug during the tendering stage of the project in order that prospective contractors may familiarize themselves with the soil and groundwater conditions to be contacted. The design drawings for the stormwater management ponds should be checked by LVM-Naylor.

### 4.7.2 Berms

It is anticipated that low berms may be constructed around the perimeter of the pond. Prior to construction of the berms, the existing topsoil layer should be removed from beneath the plan area of the berms. Following removal of the topsoil, the subgrade should be inspected by LVM-Naylor.

If permeable sand soil is exposed at the berm subgrade a cut-off trench should be excavated down to the level of the underlying silt. The cut-off trench should be a minimum 1.2 m wide and should be backfilled with relatively impermeable till or clayey silt soil, compacted to at least 95% SPMDD. This will reduce under-seepage and the risk of erosion at the downstream toe of the berm. Dewatering will likely be required for construction of the cut-off trench.

After preparing the subgrade and cut-off trench (if necessary), the berms may be constructed as a homogeneous-type earth fill structure using on-site clayey silt or glacial till soils. Native silt and sand should not be used. The berm fill should be placed in 300 mm thick lifts and compacted with a pegfoot roller to minimum 95% SPMDD. We recommend that the berm slopes be constructed with an inclination of 3 horizontal to 1 vertical or less. The finished slopes should be topsoiled and vegetated as soon as possible after construction to minimize surface erosion. The minimum topsoil thickness should be 100 mm.

Erosion protection of slopes should be placed in accordance with OPSS Section 572. Erosion control blanket Type W secured with staples should be placed, as required.

The foundation for the earth berm will comprise native mineral soil. The native soil is adequate to support 2 to 3 m high berms without undergoing settlement. The factor of safety against sliding for the low berms constructed on the native soils is 1.5. Also, since the resultant force acts within the middle third of the embankment adequate safety against overturning is ensured.

Some routine maintenance of the slope surfaces will likely be required to address minor long-term weathering and erosion, and to check for the presence of burrowing animals in the face of the slopes.

### 4.7.3 Subdrains

The slope drains should comprise a 150 mm diameter perforated PVC subdrain tile in geotextile sock and bedded in filter sand (OPSS 1002 Fine Aggregate for Concrete). The filter sand must extend at least 150 mm below the pipe invert and to 150 mm on each side of the pipe. Sand must extend above the pipe to a minimum 300 mm from the surface. The filter sand must be compacted to 95% standard Proctor maximum dry density (SPMDD). All works should be as per OPSS 410, OPSS 314 and OPSS 1004. A typical detail for a slope subdrain is provided on Drawing 7, in Appendix 4.

If the bank seepage is too extensive (i.e. spread over the entire face of the bank) then loose revetments and 5 horizontal to 1 vertical slopes should be used.

### 4.7.4 Inlet / Outlet Structures

The outlet pipes should be carefully backfilled with excavated glacial till or clayey silt soils. The backfill should be in intimate contact with complete circumference of the pipe. In places where proper compaction may be difficult to achieve, lean concrete backfill should be used. We also recommend seepage collars be provided on the pipes to reduce the risk of internal piping erosion along the pipe/soil interface.

If headwall structures are proposed, then the support for these structures must be derived from the native mineral soil deposits. An allowable bearing pressure of 150 kPa is available in the undisturbed native soil. The founding soil must be inspected by a Geotechnical Engineer at the time of the construction in order to confirm the bearing capacity. The headwalls and wingwalls should be backfilled using free-draining granular material and may be designed using an active earth pressure coefficient of 0.35 and a unit weight of 21 kN/m$^3$. Any footings must be protected with a minimum 1.2 m of earth cover or equivalent insulation to provide protection against potential frost damage (concrete headwall as per OPSD 804.030).

Geotechnical inspections and insitu density testing should be conducted during stormwater management facility construction in order to verify that all organic deposits have been properly stripped and to ensure that all fill materials are being adequately compacted.

## 5. STATEMENT OF LIMITATIONS

The geotechnical recommendations provided in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known at the time of report preparation, we recommend that we be retained during the final design stage to verify that the geotechnical recommendations have been correctly interpreted in the design. We also recommend that we be retained during construction to confirm that the subsurface conditions do not deviate materially from those encountered in the boreholes and to ensure that our recommendations are properly understood.

The geotechnical recommendations provided in this report are intended for the use of the project designer. They are not intended as specifications or instructions to contractors. Any use which a contractor makes of this report, or decisions made based on it, are the responsibility of the contractor. The contractor must also accept the responsibility for means and methods of construction, seek additional information if required, and draw their own conclusions as to how the subsurface conditions may affect them.

It is important to note that the geotechnical investigation involves a limited sampling of the site gathered at specific test hole locations and the conclusions in this report are based on this information gathered. The subsurface conditions between and beyond the test holes will differ from those encountered at the test holes. Should subsurface conditions be encountered which differ materially from those indicated at the test holes, we request that we be notified in order to assess the additional information and determine whether or not changes should be made as a result of the conditions.

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# Appendix 1 List of Abbreviations

**(1 page)**

# LIST OF ABBREVIATIONS

The abbreviations commonly employed on the borehole logs, on the figures, and in the text of the report, are as follows:

| Sample Types | | Soil Tests and Properties | |
|---|---|---|---|
| AS | auger sample | SPT | Standard Penetration Test |
| CS | chunk sample | UC | unconfined compression |
| RC | rock core | FV | field vane test |
| SS | split spoon | ø | angle of internal friction |
| TW | thin-walled, open | $\gamma$ | unit weight |
| WS | wash sample | $w_p$ | plastic limit |
| | | w | water content |
| | | $w_l$ | liquid limit |
| | | $I_L$ | liquidity index |
| | | $I_p$ | plasticity index |
| | | PP | pocket penetrometer |

## Penetration Resistances

| | |
|---|---|
| Dynamic Penetration Resistance | The number of blows by a 63.5 kg (140 lb.) hammer dropped 0.76 m (30 in.) required to drive a 50 mm (2 in.) diameter 60 ° cone a distance 0.30 m (12 in.). The cone is attached to 'A' size drill rods and casing is not used. |
| Standard Penetration Resistance, N (ASTM D1586) | The number of blows by a 63.5 kg (140 lb.) hammer dropped 0.76 m (30 in.) required to drive a standard split spoon sampler 0.30 m (12 in.) |
| WH | sampler advanced by static weight of hammer |
| PH | sampler advanced by hydraulic pressure |
| PM | sampler advanced by manual pressure |

## Soil Description

| **Cohesionless Soils** | **SPT 'N' Value** | **$D_r$ (%)** |
|---|---|---|
| **Relative Density ($D_r$)** | (blows per 0.30 m) | |
| Very Loose | 0 to 4 | 0 to 20 |
| Loose | 4 to 10 | 20 to 40 |
| Compact | 10 to 30 | 40 to 60 |
| Dense | 30 to 50 | 60 to 80 |
| Very Dense | over 50 | 80 to 100 |

| **Cohesive Soils** | Undrained Shear Strength ($C_u$) | |
|---|---|---|
| **Consistency** | **kPa** | **psf** |
| Very Soft | less than 12 | less than 250 |
| Soft | 12 to 25 | 250 to 500 |
| Firm | 25 to 50 | 500 to 1000 |
| Stiff | 50 to 100 | 1000 to 2000 |
| Very Stiff | 100 to 200 | 2000 to 4000 |
| Hard | over 200 | over 4000 |

| | |
|---|---|
| DTPL | Drier than plastic limit |
| APL | About plastic limit |
| WTPL | Wetter than plastic limit |

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# Appendix 2 Borehole and Test Pit Logs

**(42 pages)**

Boreholes 1 to 30 and 12A
Test Pit Logs – Test Pits 101 to 111
Test Pits 1 to 7

LVM NAYLOR
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**Borehole Number: 1**

**Ground Elevation:** *226.84 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 226.84 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** dense to very dense brown silt, trace fine sand, very moist | | 226.00 | 1 | SS | 50 |
| | | | 225.00 | 2 | SS | 61 |
| 2.00 | | | | 3 | SS | 49 |
| 3.00 | ***SAND:*** compact brown silty fine to medium sand, very moist; some brown fine to medium sand layers, damp | | 224.00 | 4 | SS | 28 |
| 4.00 | | | 223.00 | | | |
| | compact light brown fine to medium sand, trace silt, damp | | | 5 | SS | 26 |
| 5.00 | | | 222.00 | | | |
| 6.00 | | | 221.00 | 6 | SS | 21 |
| | Borehole terminated at 6.55 m. | | 220.00 | | | |
| 7.00 | | | | | | |
| 8.00 | | | 219.00 | | | |
| 9.00 | | | 218.00 | | | |
| 10.00 | | | 217.00 | | | |
| 11.00 | | | 216.00 | | | |
| 12.00 | | | 215.00 | | | |
| | | | 214.00 | | | |

Dynamic Cone (X) and Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa and Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): WP – WL; 10 20 30

Groundwater Observations and Standpipe Details: bentonite seal; At drilling completion, dry cave at 6.55 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 2**

**Ground Elevation:** *222.13 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 222.13 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** loose rusty brown silty sand, moist | 221.00 | 1 | SS | 5 |
| 2.00 | loose to compact brown fine to coarse sand, trace silt and fine gravel, moist | 220.00 | 2 | SS | 10 |
| | compact brown fine to coarse sand, trace silt, damp | | 3 | SS | 12 |
| 3.00 | | 219.00 | 4 | SS | 14 |
| 4.00 | | 218.00 | | | |
| | dense, some fine gravel, damp | | 5 | SS | 44 |
| 5.00 | Borehole terminated at 5.03 m. | 217.00 | | | |
| 6.00 | | 216.00 | | | |
| 7.00 | | 215.00 | | | |
| 8.00 | | 214.00 | | | |
| 9.00 | | 213.00 | | | |
| 10.00 | | 212.00 | | | |
| 11.00 | | 211.00 | | | |
| 12.00 | | 210.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration (●) 20 40 60 80
Shear Strength (PP) kPa (▲) 50 100 150 200
Shear Strength (FV) kPa (■) 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

At drilling completion, dry cave at 5.03 m.

No free groundwater encountered during drilling.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 3**

**Ground Elevation:** *216.48 m*

**Project:** *Residential Subdivision*

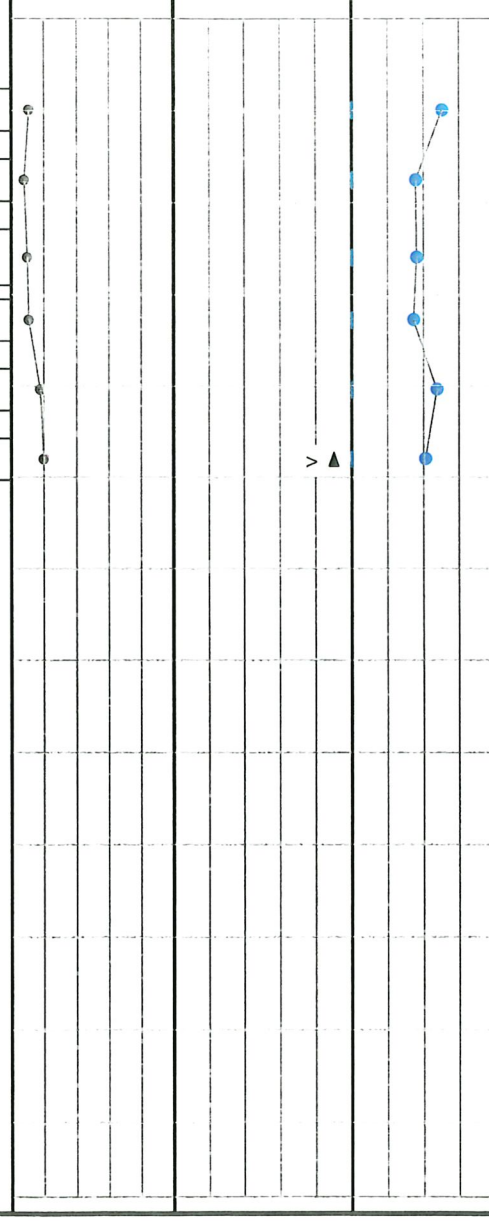
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

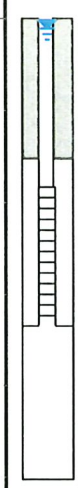
**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 216.48 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** loose to compact brown silt, trace fine sand, very moist to wet | 215.00 | 1 | SS | 11 |
| | | | 2 | SS | 8 |
| 2.00 | ***SAND:*** compact brown fine to coarse sand, some fine gravel, saturated (subartesian) | 214.00 | 3 | SS | 10 |
| 3.00 | | 213.00 | 4 | SS | 11 |
| | ***SILT:*** compact brown silt, wet | | | | |
| 4.00 | ***SILT TILL:*** very stiff grey silt, some clay and sand, trace fine gravel, APL | 212.00 | 5 | SS | 18 |
| | | | 6 | SS | 20 |
| 5.00 | Borehole terminated at 5.03 m. | 211.00 | | | |
| 6.00 | | 210.00 | | | |
| 7.00 | | 209.00 | | | |
| 8.00 | | 208.00 | | | |
| 9.00 | | 207.00 | | | |
| 10.00 | | 206.00 | | | |
| 11.00 | | 205.00 | | | |
| 12.00 | | 204.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: ● 20 40 60 80 ●
Shear Strength (PP) kPa: ▲ 50 100 150 200 ▲
Shear Strength (FV) kPa: ■ 50 100 150 200 ■
Water Content (%): WP WL 10 20 30




**Groundwater Observations and Standpipe Details**



Nov. 10, 2009
Water level at 0.11 m
(Elev. 216.37 m)

19 mm pipe

bentonite seal

1.5 m slotted filter

native cave

At drilling completion, wet cave at 1.52 m.

Upon completion of excavation, water level at 0.61 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 4**

**Ground Elevation:** *228.23 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 228.23 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** compact brown to rusty brown fine to medium sand, some silt, very moist | 227.00 | 1 | SS | 18 |
| | brown silt layer | | 2 | SS | 43 |
| 2.00 | ***SILT:*** dense brown silt, trace fine sand, moist to very moist | 226.00 | 3 | SS | 66 |
| 3.00 | | 225.00 | 4 | SS | 43 |
| 4.00 | | 224.00 | | | |
| 5.00 | | 223.00 | 5 | SS | 47 |
| 6.00 | ***SAND:*** dense brown fine to medium sand, trace silt, moist | 222.00 | 6 | SS | 41 |
| 7.00 | | 221.00 | | | |
| | compact | | 7 | SS | 27 |
| 8.00 | Borehole terminated at 8.08 m. | 220.00 | | | |
| 9.00 | | 219.00 | | | |
| 10.00 | | 218.00 | | | |
| 11.00 | | 217.00 | | | |
| 12.00 | | 216.00 | | | |

Dynamic Cone — Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200

Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): WP WL; 10 20 30

Groundwater Observations and Standpipe Details: bentonite seal; At drilling completion, dry cave at 8.08 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 2.44 to 3.66 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number:** 5

**Ground Elevation:** *226.41 m*

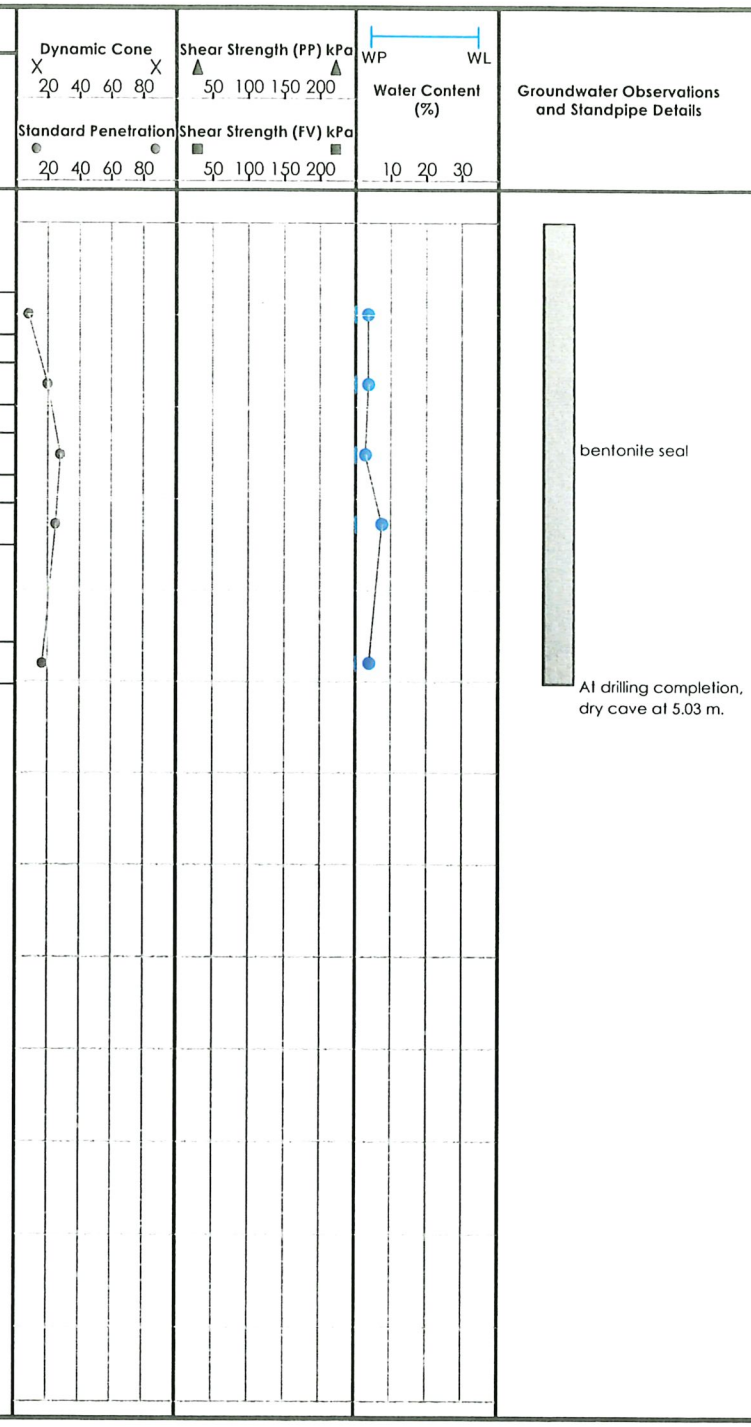
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 226.41 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SILT:*** rusty brown silt, moist | | 1 | SS | 8 |
| 1.00 | ***SAND:*** loose to compact brown fine to coarse sand, trace silt and fine gravel, damp | 225.00 | 2 | SS | 20 |
| 2.00 | compact brown fine to medium sand, trace silt, moist | 224.00 | 3 | SS | 28 |
| 3.00 | | 223.00 | 4 | SS | 25 |
| 4.00 | | 222.00 | 5 | SS | 17 |
| 5.00 | Borehole terminated at 5.03 m. | 221.00 | | | |
| 6.00 | | 220.00 | | | |
| 7.00 | | 219.00 | | | |
| 8.00 | | 218.00 | | | |
| 9.00 | | 217.00 | | | |
| 10.00 | | 216.00 | | | |
| 11.00 | | 215.00 | | | |
| 12.00 | | 214.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 6**

**Ground Elevation: 226.71 m**

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 226.71 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** compact brown silt, wet | | 226.00 | 1 | SS | 11 |
| | | | 225.00 | 2 | SS | 15 |
| 2.00 | ***SAND:*** compact brown fine to medium sand, trace silt, damp to moist | | | | | |
| 3.00 | | | 224.00 | 3 | SS | 28 |
| 4.00 | | | 223.00 | 4 | SS | 30 |
| 5.00 | | | 222.00 | 5 | SS | 19 |
| | Borehole terminated at 5.03 m. | | | | | |
| 6.00 | | | 221.00 | | | |
| 7.00 | | | 220.00 | | | |
| 8.00 | | | 219.00 | | | |
| 9.00 | | | 218.00 | | | |
| 10.00 | | | 217.00 | | | |
| 11.00 | | | 216.00 | | | |
| 12.00 | | | 215.00 | | | |
| | | | 214.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration 20 40 60 80

Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200

Water Content (%) WP WL 10 20 30

Groundwater Observations and Standpipe Details: bentonite seal

At drilling completion, dry cave at 5.03 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 7**

**Ground Elevation:** *226.70 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 226.70 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** dense brown silt, trace fine sand, very moist | 226.00 | 1 | SS | 35 |
| | | 225.00 | 2 | SS | 41 |
| 2.00 | very dense | | 3 | SS | 74 |
| | | 224.00 | | | |
| 3.00 | ***SAND:*** dense brown fine to coarse sand, trace silt, moist | | 4 | SS | 43 |
| | | 223.00 | | | |
| 4.00 | compact fine to medium sand, trace silt, damp | 222.00 | 5 | SS | 22 |
| 5.00 | | | | | |
| 6.00 | | 221.00 | 6 | SS | 27 |
| 7.00 | | 220.00 | | | |
| | | 219.00 | 7 | SS | 28 |
| 8.00 | Borehole terminated at 8.08 m. | | | | |
| 9.00 | | 218.00 | | | |
| 10.00 | | 217.00 | | | |
| 11.00 | | 216.00 | | | |
| 12.00 | | 215.00 | | | |
| | | 214.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30




Groundwater Observations and Standpipe Details

At drilling completion, dry cave at 8.08 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 8**

**Ground Elevation:** *219.90 m*

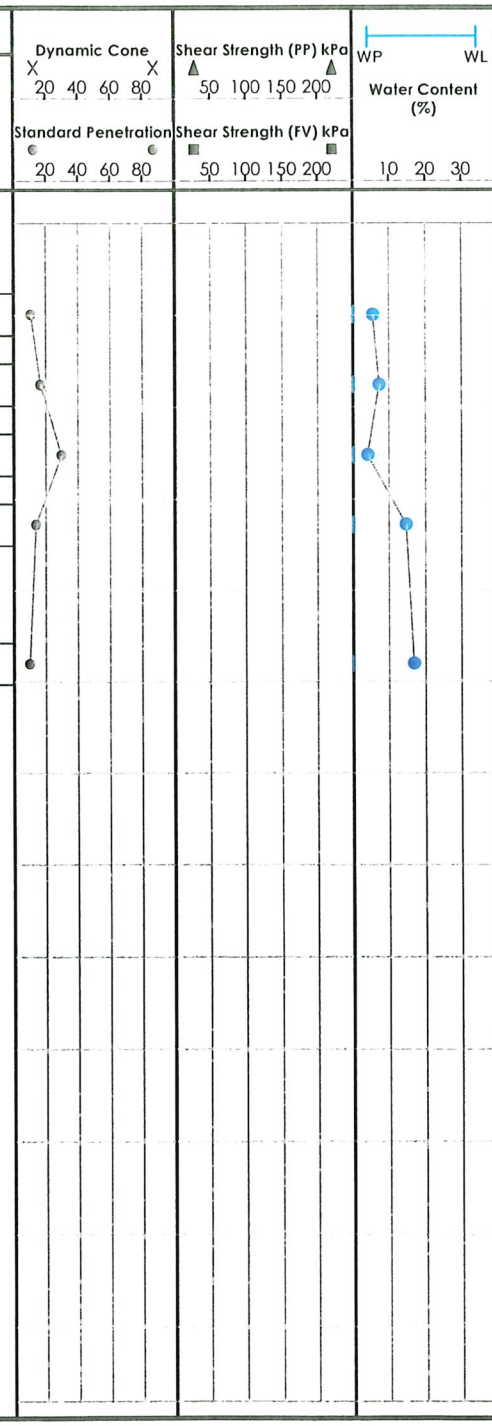
**Project:** *Residential Subdivision*

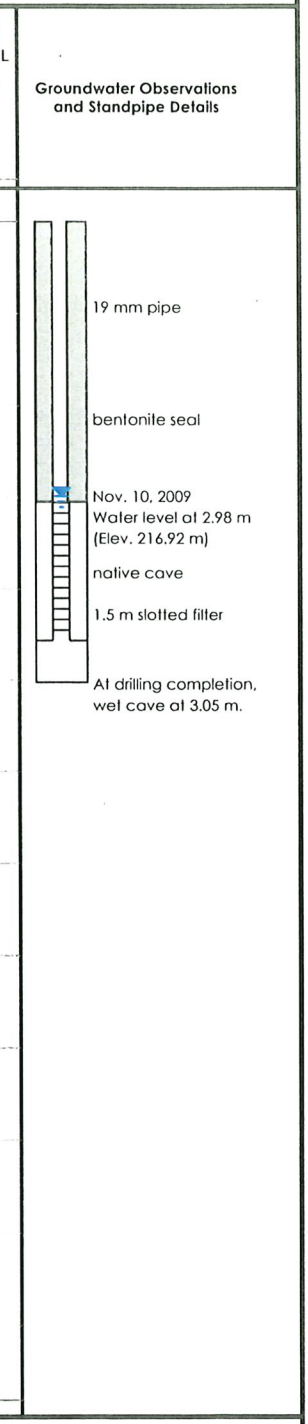
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 219.90 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** compact brown fine to coarse sand, trace silt and fine gravel, moist | 219.00 | 1 | SS | 11 |
| 2.00 | | 218.00 | 2 | SS | 17 |
| | | | 3 | SS | 30 |
| 3.00 | saturated | 217.00 | 4 | SS | 14 |
| 4.00 | | 216.00 | | | |
| 5.00 | | 215.00 | 5 | SS | 10 |
| | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 214.00 | | | |
| 7.00 | | 213.00 | | | |
| 8.00 | | 212.00 | | | |
| 9.00 | | 211.00 | | | |
| 10.00 | | 210.00 | | | |
| 11.00 | | 209.00 | | | |
| 12.00 | | 208.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 9**

**Ground Elevation: 223.30 m**

**Project: *Residential Subdivision***

**Job No.: *P030592***

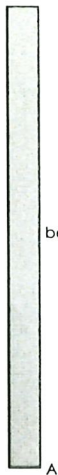
**Location: *Decou Road and Ireland Road, Simcoe, Ontario***

**Drill Date: *November 4, 2009***

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 223.30 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** very loose brown to rusty brown silt, wet | 222.00 | 1 | SS | 2 |
| | brown | | 2 | SS | 3 |
| 2.00 | | 221.00 | | | |
| | ***SAND:*** compact brown fine to coarse sand, trace silt, moist | | 3 | SS | 13 |
| 3.00 | | 220.00 | 4 | SS | 29 |
| 4.00 | | 219.00 | | | |
| | | | 5 | SS | 24 |
| 5.00 | Borehole terminated at 5.03 m. | 218.00 | | | |
| 6.00 | | 217.00 | | | |
| 7.00 | | 216.00 | | | |
| 8.00 | | 215.00 | | | |
| 9.00 | | 214.00 | | | |
| 10.00 | | 213.00 | | | |
| 11.00 | | 212.00 | | | |
| 12.00 | | 211.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details




At drilling completion, dry cave at 5.03 m

**Reviewed by: *TS***

**Drill Method: *Solid Stem Auger***

**Notes:**

**Field Tech.: *RM***

**Sheet: *1 of 1***

**Drafted by: *KS***

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 10**

**Ground Elevation: 227.74 m**

**Project: *Residential Subdivision***

**Job No.: *P030592***

**Location: *Decou Road and Ireland Road, Simcoe, Ontario***

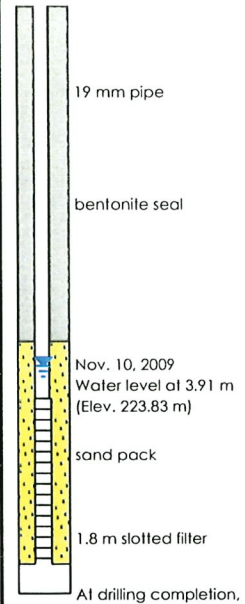
**Drill Date: *November 4, 2009***

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 227.74 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** compact to dense brown clayey silt, trace fine sand, very moist | 227.00 | 1 | SS | 17 |
| 2.00 | | 226.00 | 2 | SS | 39 |
| | very dense, moist; occasional fine sand seams to 2.59 m, | | 3 | SS | 48\150mm |
| 3.00 | damp moist | 225.00 | 4 | SS | 72 |
| 4.00 | | 224.00 | | | |
| 5.00 | | 223.00 | 5 | SS | 60\150mm |
| 6.00 | | 222.00 | 6 | SS | 52\150mm |
| | Borehole terminated at 6.40 m. | | | | |
| 7.00 | | 221.00 | | | |
| 8.00 | | 220.00 | | | |
| 9.00 | | 219.00 | | | |
| 10.00 | | 218.00 | | | |
| 11.00 | | 217.00 | | | |
| 12.00 | | 216.00 | | | |
| | | 215.00 | | | |

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): WP WL; 10 20 30




**Reviewed by: *TS***

**Drill Method: *Solid Stem Auger***

**Notes: *Bulk sample taken from 1.22 to 2.44 m.***

**Field Tech.: *RM***

**Sheet: *1 of 1***

**Drafted by: *KS***

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 11**

**Ground Elevation:** *228.06 m*

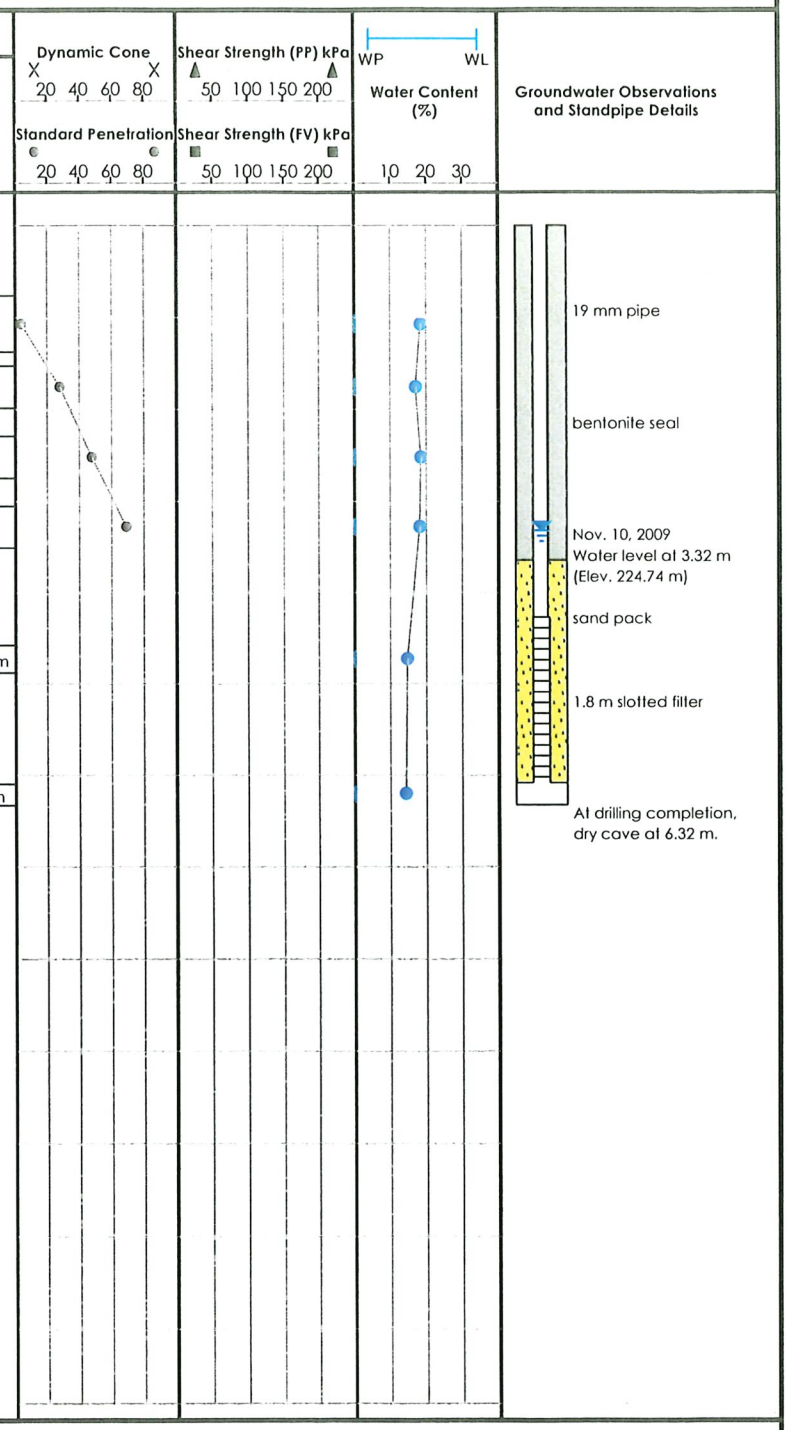
**Project:** *Residential Subdivision*

**Job No.:** *7780G2*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 228.06 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** very loose rusty brown fine sandy silt, very moist | 227.00 | 1 | SS | 4 |
| 2.00 | ***SAND:*** compact brown fine sand, some silt, very moist | 226.00 | 2 | SS | 28 |
| 3.00 | ***SILT:*** compact to dense brown silt, trace fine sand, moist; some fine sand layers, very moist | 225.00 | 3 | SS | 48 |
| | very dense | | 4 | SS | 69 |
| 4.00 | | 224.00 | | | |
| 5.00 | occasional brown clayey silt layers, DTPL | 223.00 | 5 | SS | 40\150mm |
| 6.00 | | 222.00 | 6 | SS | 50\75mm |
| | Borehole terminated at 6.32 m. | | | | |
| 7.00 | | 221.00 | | | |
| 8.00 | | 220.00 | | | |
| 9.00 | | 219.00 | | | |
| 10.00 | | 218.00 | | | |
| 11.00 | | 217.00 | | | |
| 12.00 | | 216.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 12**

**Ground Elevation:** *218.54 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 4, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 218.54 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** loose to compact brown silt, trace fine sand, very moist to wet | | 1 | SS | 8 |
| 2.00 | dilatant, saturated | 217.00 | 2 | SS | 18 |
| 3.00 | | 216.00 | 3 | SS | 13 |
| 4.00 | | 215.00 | 4 | SS | 16 |
| 5.00 | | 214.00 | 5 | SS | 15 |
| 6.00 | grey clayey silt, trace sand, APL | 213.00 | 6 | SS | 14 |
| 7.00 | Borehole terminated at 6.71 m. | 212.00 | 7 | SS | 8 |
| 8.00 | | 211.00 | | | |
| 9.00 | | 210.00 | | | |
| 10.00 | | 209.00 | | | |
| 11.00 | | 208.00 | | | |
| 12.00 | | 207.00 | | | |
| | | 206.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: ● 20 40 60 80 ●
Shear Strength (PP) kPa: ▲ 50 100 150 200 ▲
Shear Strength (FV) kPa: ■ 50 100 150 200 ■
WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details:
- 19 mm pipe
- bentonite seal
- sand pack
- Nov. 10, 2009 Water level at 4.63 m (Elev. 213.91 m)
- 1.8 m slotted filter
- At drilling completion, wet cave at 6.10 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 12A**

**Ground Elevation:** *218.84 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 218.84 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** loose to compact brown silt, trace fine sand, very moist to wet | 218.00 | | | |
| | dilatant, saturated | | | | |
| 2.00 | | 217.00 | | | |
| 3.00 | | 216.00 | | | |
| 4.00 | | 215.00 | | | |
| 5.00 | | 214.00 | | | |
| | grey clayey silt, trace sand, APL | | | | |
| 6.00 | | 213.00 | | | |
| | compact grey silt, some fine sand, saturated, dilatant | | | | |
| 7.00 | | 212.00 | | | |
| 8.00 | | 211.00 | 1 | SS | 15 |
| 9.00 | | 210.00 | | | |
| | ***SAND:*** very dense brown fine to medium sand, trace silt, moist | | 2 | SS | 53 |
| 10.00 | | 209.00 | | | |
| 11.00 | ***SILT:*** dense grey silt, some sand, saturated | 208.00 | 3 | SS | 39 |
| | ***SAND:*** dense brown fine to medium sand, moist | | | | |
| 12.00 | Borehole terminated at 11.13 m. | 207.00 | | | |
| | | 206.00 | | | |

Dynamic Cone (X) 20 40 60 80 — Standard Penetration 20 40 60 80

Shear Strength (PP) kPa 50 100 150 200 — Shear Strength (FV) kPa 50 100 150 200

Water Content (%) WP WL 10 20 30

Groundwater Observations and Standpipe Details: bentonite seal; native cave; At drilling completion, wet cave at 10.36 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Stratigraphy from 0.00 to 6.10 m is inferred from Borehole 12.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 13**

**Ground Elevation:** *217.40 m*

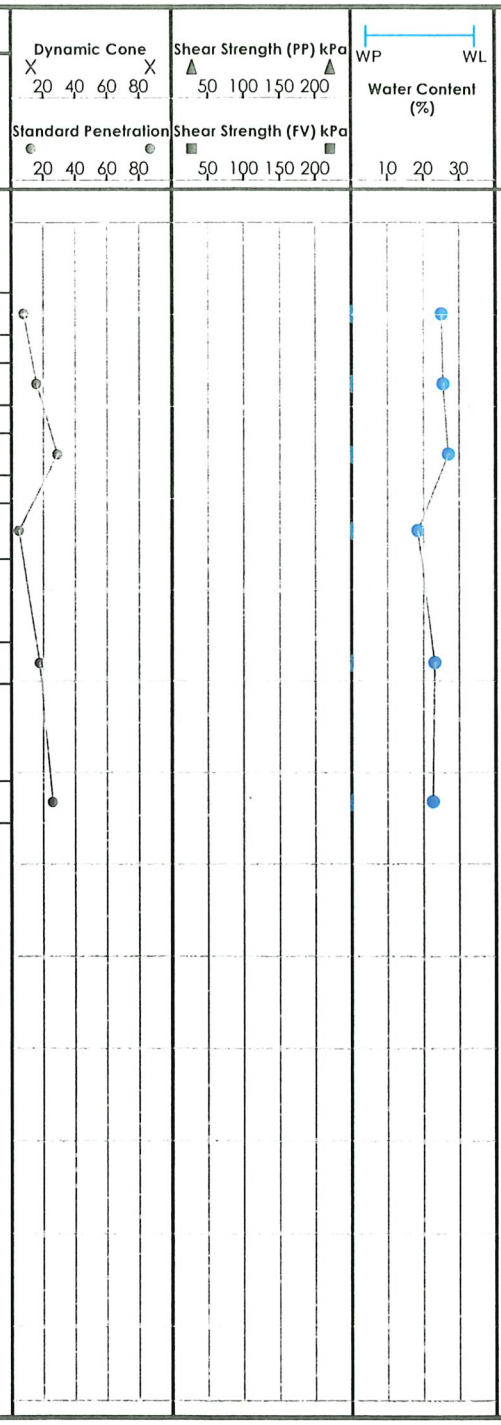
**Project:** *Residential Subdivision*

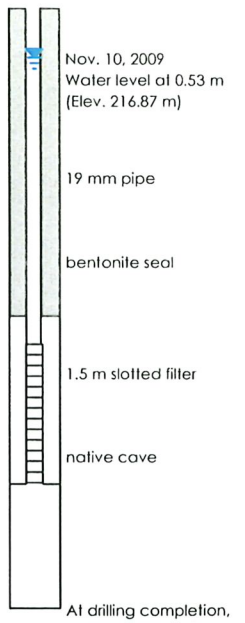
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 217.40 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** loose brown silt, trace fine sand and clay, saturated | 216.00 | 1 | SS | 8 |
| | compact | | 2 | SS | 16 |
| 2.00 | | 215.00 | 3 | SS | 29 |
| 3.00 | ***SAND:*** loose to compact brown fine to coarse sand, trace gravel to 3.05 m, saturated | 214.00 | 4 | SS | 5 |
| 4.00 | | 213.00 | | | |
| 5.00 | ***SILT:*** compact brown silt, trace fine sand, saturated, dilatant | 212.00 | 5 | SS | 18 |
| 6.00 | | 211.00 | 6 | SS | 26 |
| | Borehole terminated at 6.55 m. | | | | |
| 7.00 | | 210.00 | | | |
| 8.00 | | 209.00 | | | |
| 9.00 | | 208.00 | | | |
| 10.00 | | 207.00 | | | |
| 11.00 | | 206.00 | | | |
| 12.00 | | 205.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 14**

**Ground Elevation:** *218.00 m*

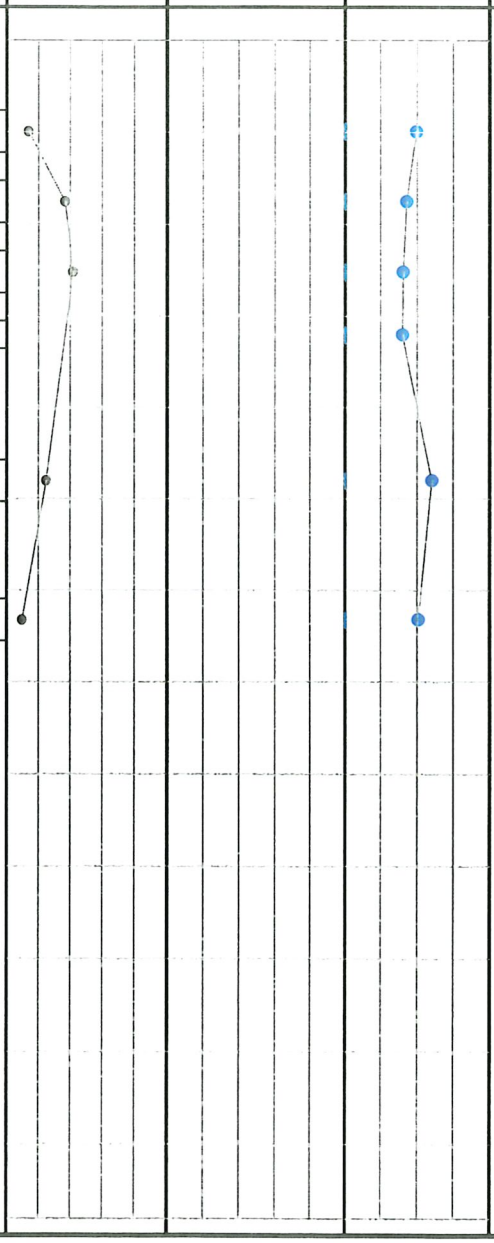
**Project:** *Residential Subdivision*

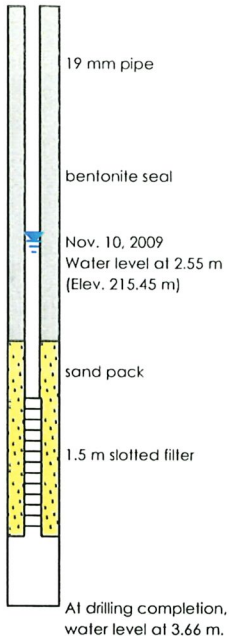
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 218.00 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** compact to dense brown silt, trace fine sand, very moist | | 217.00 | 1 | SS | 14 |
| 2.00 | | | 216.00 | 2 | SS | 37 |
| 3.00 | very dense | | 215.00 | 3 | SS | 42 |
| 4.00 | grey, moist | | 214.00 | 4 | SS | 35\150mm |
| | ***SAND AND GRAVEL:*** compact brown medium to coarse sand and fine gravel, saturated | | | 5 | SS | 25 |
| 5.00 | ***SILT:*** compact brown silt, saturated, dilatant | | 213.00 | | | |
| 6.00 | grey | | 212.00 | 6 | SS | 10 |
| | Borehole terminated at 6.55 m. | | | | | |
| 7.00 | | | 211.00 | | | |
| 8.00 | | | 210.00 | | | |
| 9.00 | | | 209.00 | | | |
| 10.00 | | | 208.00 | | | |
| 11.00 | | | 207.00 | | | |
| 12.00 | | | 206.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 1.52 to 3.05 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 15**

**Ground Elevation:** *215.72 m*

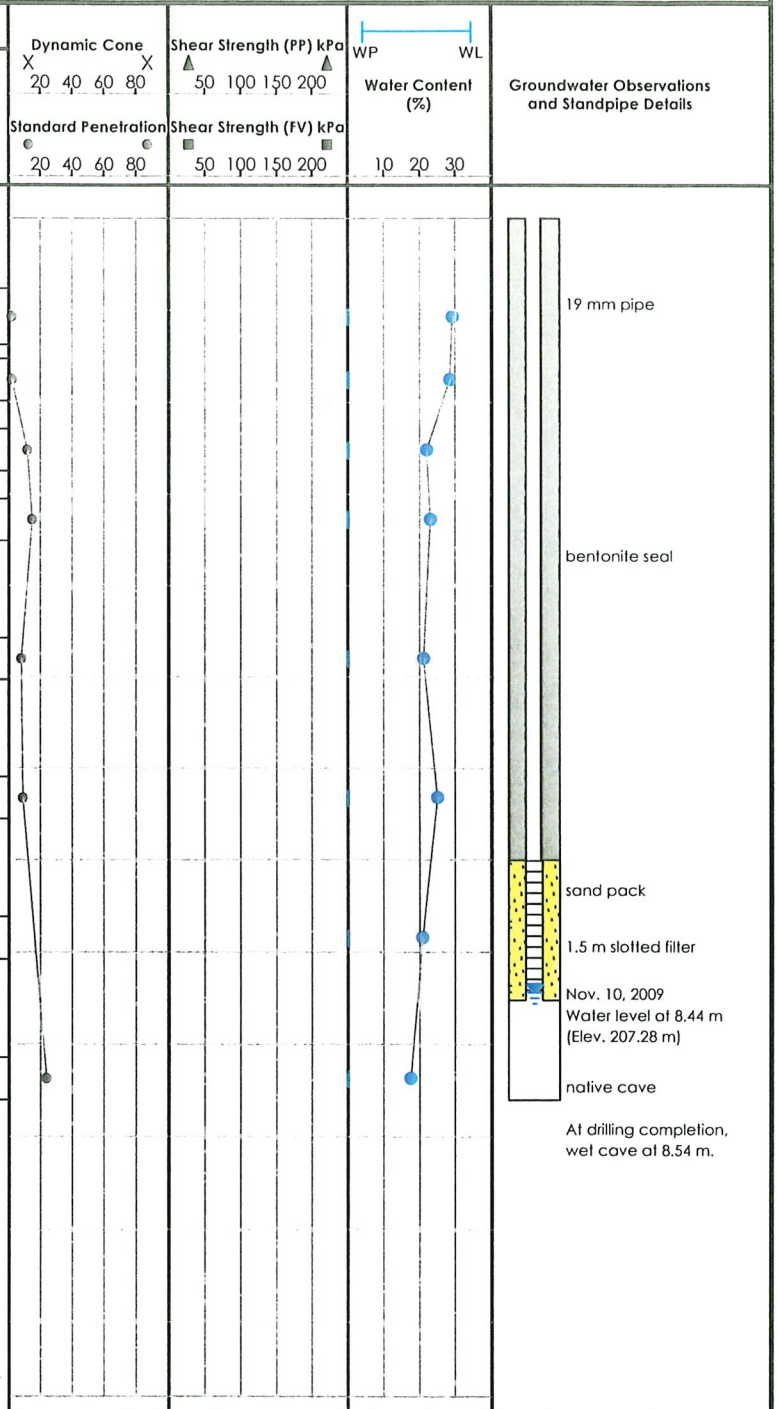
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 215.72 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** very loose brown silt, trace fine sand, saturated, dilatant; occasional fine sand seams to 2.50 m, saturated | 215.00 | 1 | SS | 2 |
| 2.00 | | 214.00 | 2 | SS | 2 |
| 2.00 | compact | | 3 | SS | 12 |
| 3.00 | | 213.00 | | | |
| 4.00 | | 212.00 | 4 | SS | 15 |
| 4.00 | loose, grey, some fine sand, saturated, dilatant | | | | |
| 5.00 | | 211.00 | 5 | SS | 8 |
| 6.00 | | 210.00 | 6 | SS | 9 |
| 7.00 | | 209.00 | | | |
| 7.00 | ***SAND:*** compact brown fine to coarse sand, some silt, some gravel to 7.92 m, saturated | 208.00 | 7 | SS | * |
| 8.00 | | | | | |
| 9.00 | | 207.00 | 8 | SS | 24 |
| 9.60 | Borehole terminated at 9.60 m. | 206.00 | | | |
| 10.00 | | | | | |
| 11.00 | | 205.00 | | | |
| 12.00 | | 204.00 | | | |
| | | 203.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 0.61 to 2.13 m. * Sampler bouncing*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 16**

**Ground Elevation:** *216.19 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

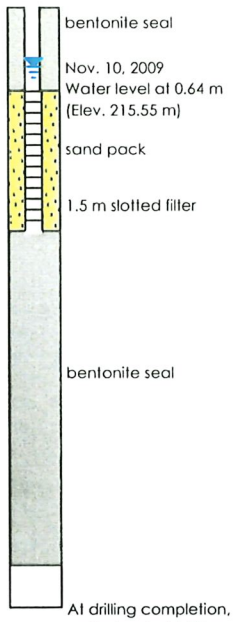
**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 216.19 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** loose brown silt, wet | | 215.00 | 1 | SS | 7 |
| | compact | | | 2 | SS | 10 |
| 2.00 | some fine sand layers, saturated | | 214.00 | | | |
| | ***SAND:*** light brown fine to coarse sand, saturated | | | 3 | SS | 11 |
| 3.00 | ***SILT:*** compact brown silt, trace fine sand, wet | | 213.00 | 4 | SS | 25 |
| 4.00 | grey, saturated | | 212.00 | | | |
| | dense to compact | | | 5 | SS | 34 |
| 5.00 | | | 211.00 | | | |
| 6.00 | | | 210.00 | 6 | SS | 20 |
| | Borehole terminated at 6.55 m. | | | | | |
| 7.00 | | | 209.00 | | | |
| 8.00 | | | 208.00 | | | |
| 9.00 | | | 207.00 | | | |
| 10.00 | | | 206.00 | | | |
| 11.00 | | | 205.00 | | | |
| 12.00 | | | 204.00 | | | |

Dynamic Cone (X) 20 40 60 80 — Standard Penetration 20 40 60 80

Shear Strength (PP) kPa 50 100 150 200 — Shear Strength (FV) kPa 50 100 150 200

WP WL — Water Content (%) 10 20 30




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 17**

**Ground Elevation: 213.42 m**

**Project: Residential Subdivision**

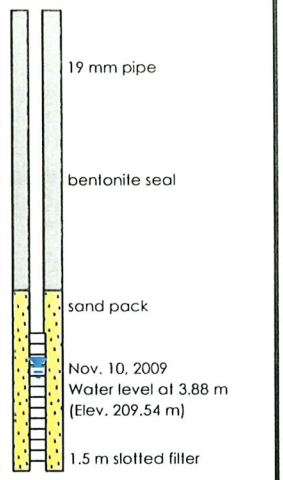
**Job No.: P030592**

**Location: Decou Road and Ireland Road, Simcoe, Ontario**

**Drill Date: November 5, 2009**

| Depth (m) | Description | Symbol | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 213.42 | | | |
| | **TOPSOIL:** dark brown silt, moist | | | | | |
| 1.00 | **SILT:** very loose brown silt, trace sand, wet; some silty sand layers, wet | | 212.00 | 1 | SS | 2 |
| 2.00 | **SAND:** compact brown fine to coarse sand, some gravel, trace silt and clay, damp | | 211.00 | 2 | SS | 22 |
| 3.00 | | | | 3 | SS | 31 |
| | trace fine gravel, moist | | 210.00 | 4 | SS | 11 |
| 4.00 | **SILT:** stiff grey clayey silt, APL to WTPL | | 209.00 | 5 | SS | 10 |
| 5.00 | Borehole terminated at 5.03 m. | | 208.00 | | | |
| 6.00 | | | 207.00 | | | |
| 7.00 | | | 206.00 | | | |
| 8.00 | | | 205.00 | | | |
| 9.00 | | | 204.00 | | | |
| 10.00 | | | 203.00 | | | |
| 11.00 | | | 202.00 | | | |
| 12.00 | | | 201.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30




At drilling completion, dry cave at 5.03 m.

**Reviewed by: TS**

**Drill Method: Solid Stem Auger**

**Notes:**

**Field Tech.: RM**

**Sheet: 1 of 1**

**Drafted by: KS**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 18**

**Ground Elevation:** *219.31 m*

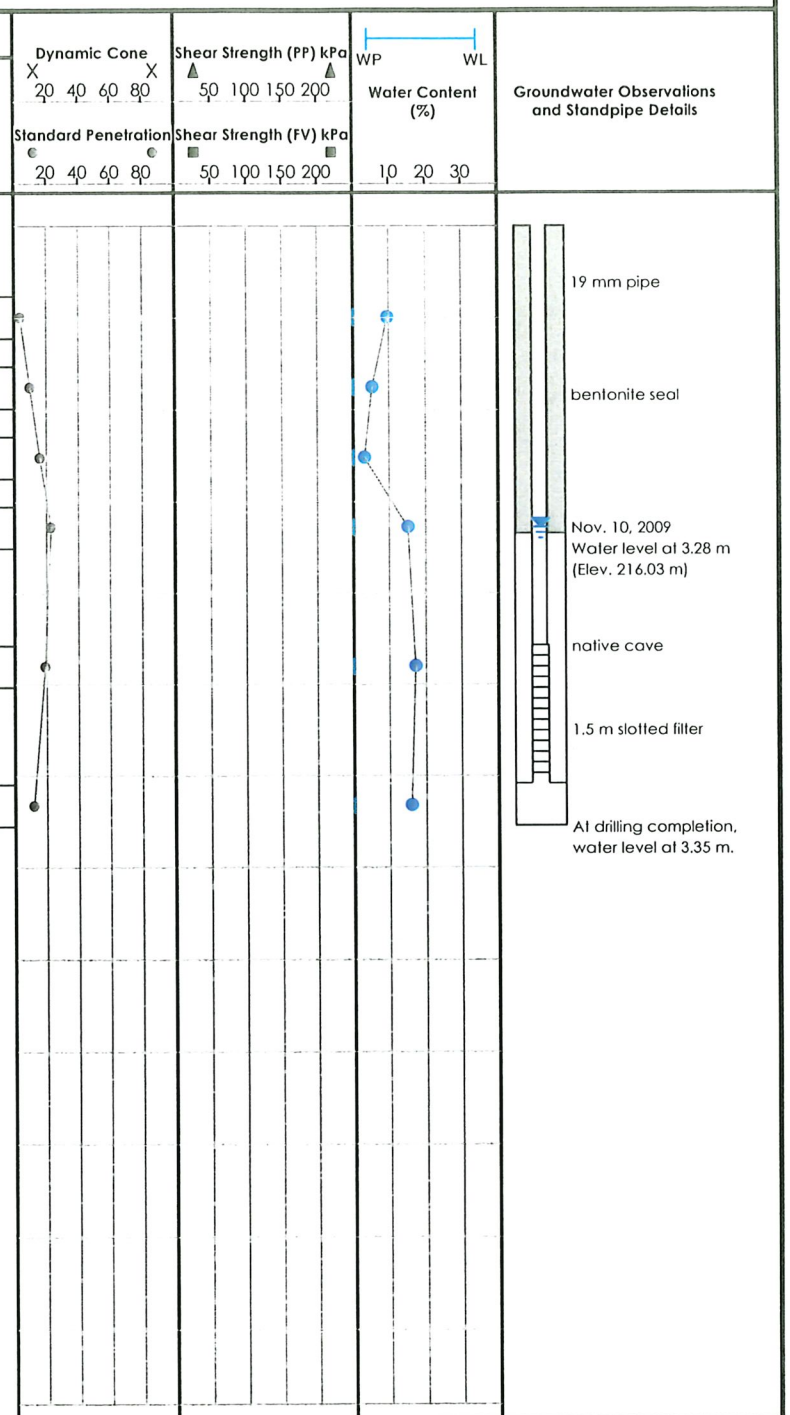
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 219.31 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SAND:*** loose rusty brown fine to medium sand, some silt, moist | | 1 | SS | 4 |
| 1.00 | brown, trace silt, damp | 218.00 | | | |
| | compact | | 2 | SS | 10 |
| 2.00 | compact brown fine to coarse sand, trace silt, damp | 217.00 | 3 | SS | 16 |
| 3.00 | saturated | 216.00 | 4 | SS | 23 |
| 4.00 | | 215.00 | | | |
| | trace fine gravel | | 5 | SS | 19 |
| 5.00 | | 214.00 | | | |
| 6.00 | | 213.00 | 6 | SS | 12 |
| | Borehole terminated at 6.55 m. | | | | |
| 7.00 | | 212.00 | | | |
| 8.00 | | 211.00 | | | |
| 9.00 | | 210.00 | | | |
| 10.00 | | 209.00 | | | |
| 11.00 | | 208.00 | | | |
| 12.00 | | 207.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 19**

**Ground Elevation:** *225.63 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 225.63 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** rusty brown silty sand, moist | 225.00 | 1 | SS | 25\150mm |
| | dense to very dense brown fine to medium sand, trace silt, damp | 224.00 | 2 | SS | 30\150mm |
| 2.00 | very dense silty fine sand, damp | | | | |
| | very dense fine to coarse sand, trace fine gravel, damp | 223.00 | 3 | SS | 50\150mm |
| 3.00 | occasional silt layers, very moist | | 4 | SS | 35\150mm |
| 4.00 | | 222.00 | | | |
| 5.00 | | 221.00 | 5 | SS | 40\150mm |
| | | 220.00 | | | |
| 6.00 | dense brown fine to medium sand, damp | | 6 | SS | 36 |
| 7.00 | | 219.00 | | | |
| | some sandy silt layers, very moist | 218.00 | 7 | SS | 59 |
| 8.00 | | | | | |
| 9.00 | damp | 217.00 | 8 | SS | 30 |
| | Borehole terminated at 9.60 m. | 216.00 | | | |
| 10.00 | | | | | |
| | | 215.00 | | | |
| 11.00 | | | | | |
| | | 214.00 | | | |
| 12.00 | | | | | |
| | | 213.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: ● 20 40 60 80 ●

Shear Strength (PP) kPa: ▲ 50 100 150 200 ▲
Shear Strength (FV) kPa: ■ 50 100 150 200 ■

WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

At drilling completion, dry cave at 9.60 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 2.44 to 4.27 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 20**

**Ground Elevation:** *225.80 m*

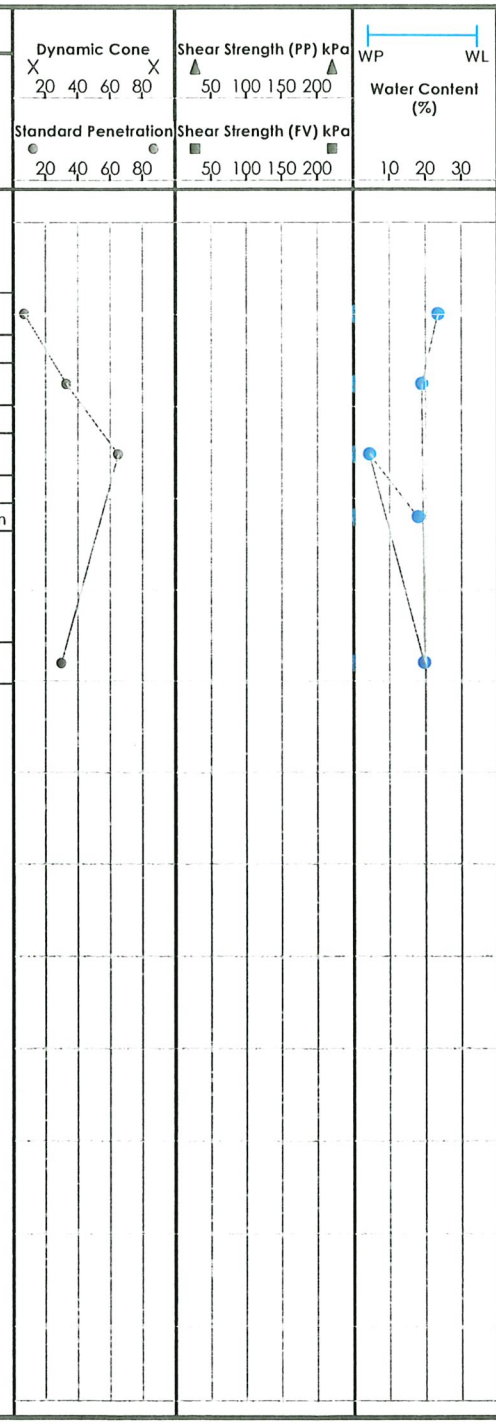
**Project:** *Residential Subdivision*

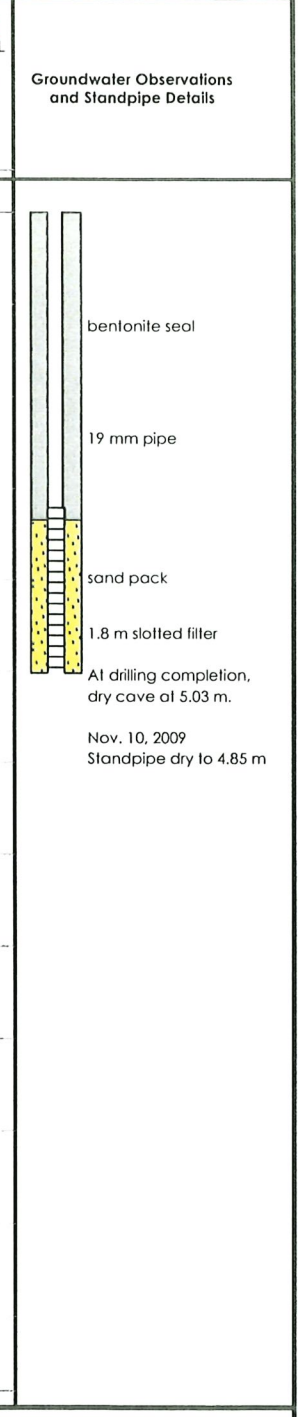
**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| | Ground Elevation | 225.80 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| | ***SILT:*** loose brown silt, very moist | 225.00 | 1 | SS | 7 |
| 1.00 | compact | | | | |
| | | 224.00 | 2 | SS | 33 |
| 2.00 | ***SAND:*** very dense brown fine to coarse sand, some gravel, trace silt, moist | | 3 | SS | 65 |
| | | 223.00 | 4 | SS | 46\150mm |
| 3.00 | ***SILT:*** very dense brown silt, very moist | | | | |
| 4.00 | | 222.00 | | | |
| | | 221.00 | 5 | SS | 30 |
| 5.00 | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 220.00 | | | |
| 7.00 | | 219.00 | | | |
| 8.00 | | 218.00 | | | |
| 9.00 | | 217.00 | | | |
| 10.00 | | 216.00 | | | |
| 11.00 | | 215.00 | | | |
| 12.00 | | 214.00 | | | |
| | | 213.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 21**

**Ground Elevation:** *226.59 m*

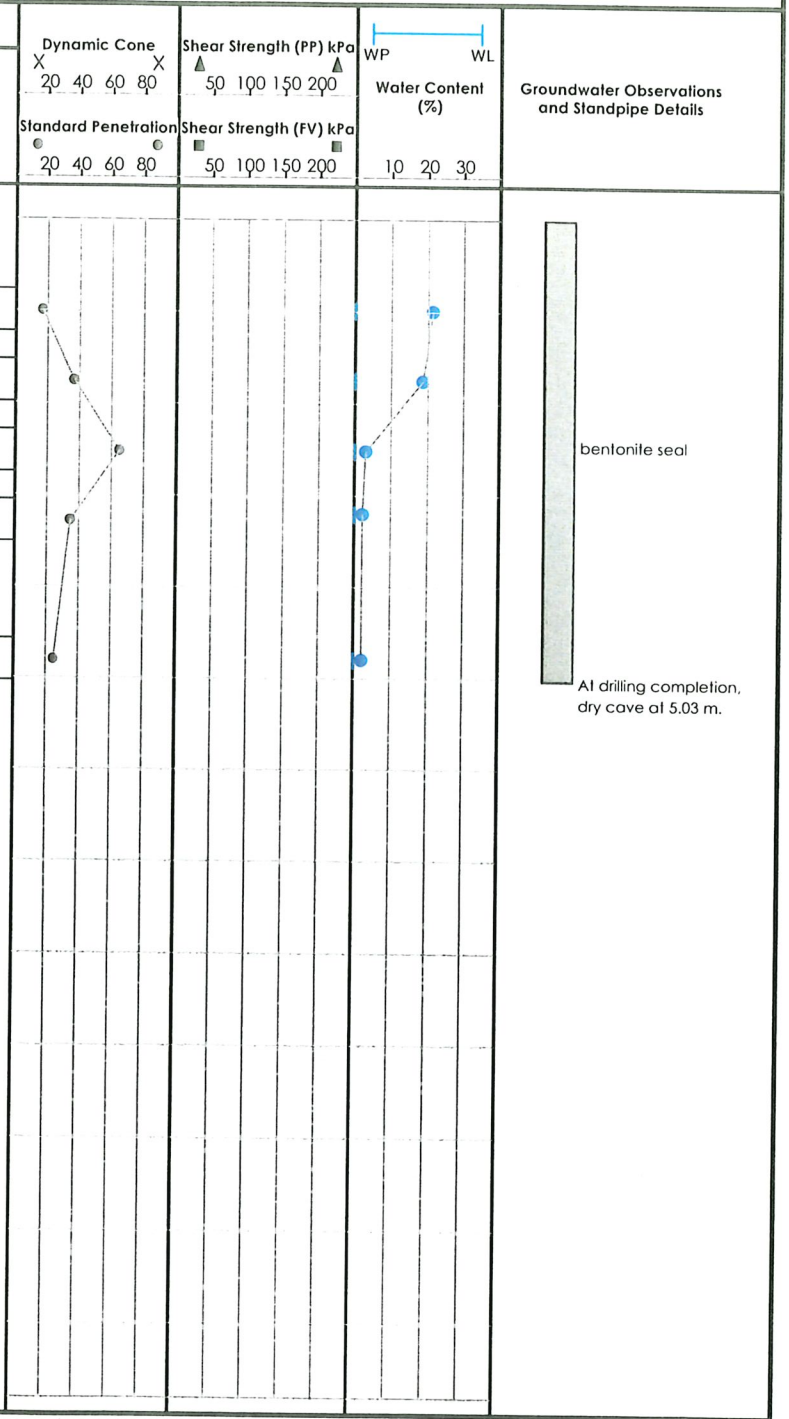
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 226.59 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | 226.00 | | | |
| 1.00 | ***SAND:*** brown silty sand, very moist | | 1 | SS | 17 |
| | ***SILT:*** compact to dense brown silt, trace fine sand, very moist | 225.00 | 2 | SS | 37 |
| 2.00 | | | | | |
| | ***SAND:*** dense to very dense brown fine to coarse sand, trace silt, trace gravel to 3.05 m, damp | 224.00 | 3 | SS | 65 |
| 3.00 | | | | | |
| | | | 4 | SS | 35 |
| 4.00 | | 223.00 | | | |
| | compact brown fine to medium sand, trace silt, damp | 222.00 | 5 | SS | 25 |
| 5.00 | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 221.00 | | | |
| 7.00 | | 220.00 | | | |
| 8.00 | | 219.00 | | | |
| 9.00 | | 218.00 | | | |
| 10.00 | | 217.00 | | | |
| 11.00 | | 216.00 | | | |
| 12.00 | | 215.00 | | | |
| | | 214.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 22**

**Project:** *Residential Subdivision*

**Ground Elevation:** *225.94 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 225.94 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SAND:*** compact brown fine to medium sand, some silt, moist | 225.00 | 1 | SS | 24 |
| 2.00 | ***SILT TILL:*** dense to very dense brown silt, some sand, trace gravel, moist | 224.00 | 2 | SS | 36 |
| | | | 3 | SS | 35\150mm |
| 3.00 | some sand layers, damp | 223.00 | 4 | SS | 51 |
| 4.00 | ***SAND:*** dense to very dense brown fine to medium sand, trace silt, damp | 222.00 | | | |
| 5.00 | ***SILT:*** very dense brown silt, very moist; some sand layers, very moist | 221.00 | 5 | SS | 66 |
| | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 220.00 | | | |
| 7.00 | | 219.00 | | | |
| 8.00 | | 218.00 | | | |
| 9.00 | | 217.00 | | | |
| 10.00 | | 216.00 | | | |
| 11.00 | | 215.00 | | | |
| 12.00 | | 214.00 | | | |

Dynamic Cone: 20 40 60 80
Standard Penetration: 20 40 60 80
Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200
WP WL
Water Content (%): 10 20 30




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Bulk sample taken from 1.83 to 3.05 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 23**

**Ground Elevation:** *224.70 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 6, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | SAMPLE Number | Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 224.70 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** dense brown silt, trace sand, moist | | 224.00 | 1 | SS | 35 |
| 2.00 | ***SAND:*** dense to very dense brown fine to coarse sand, trace silt and fine gravel, damp | | 223.00 | 2 | SS | 51 |
| | | | | 3 | SS | 48 |
| 3.00 | ***SILT:*** dense brown silt, trace fine sand, very moist | | 222.00 | 4 | SS | 38 |
| 4.00 | ***SAND:*** very dense brown sand, trace fine gravel, damp | | 221.00 | 5 | SS | 88 |
| 5.00 | Borehole terminated at 5.03 m. | | 220.00 | | | |
| 6.00 | | | 219.00 | | | |
| 7.00 | | | 218.00 | | | |
| 8.00 | | | 217.00 | | | |
| 9.00 | | | 216.00 | | | |
| 10.00 | | | 215.00 | | | |
| 11.00 | | | 214.00 | | | |
| 12.00 | | | 213.00 | | | |
| | | | 212.00 | | | |

Dynamic Cone (X) 20 40 60 80 X
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

At drilling completion, dry cave at 5.03 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 24**

**Ground Elevation:** *216.59 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

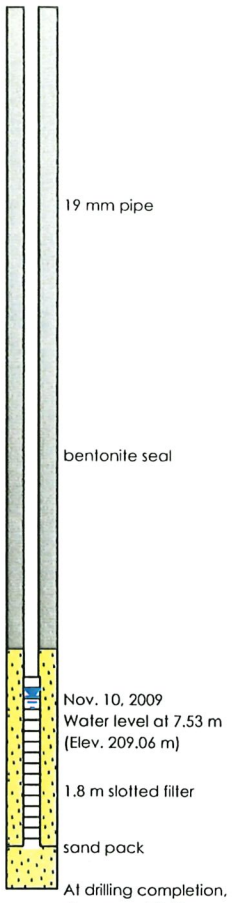
**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 5, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 216.59 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | 216.00 | | | |
| 1.00 | ***SILT:*** brown fine sandy silt, wet, dilatant | | 1 | SS | 50 |
| | ***SAND AND GRAVEL:*** dense brown sand and gravel, trace silt, moist | 215.00 | 2 | SS | 30\150mm |
| 2.00 | ***SILT:*** loose brown fine sandy silt, wet | | 3 | SS | 78 |
| 3.00 | ***SAND AND GRAVEL:*** very dense brown sand and gravel, trace silt, moist | 214.00 | 4 | SS | 33\150mm |
| 4.00 | | 213.00 | | | |
| | ***SAND:*** compact brown fine to medium sand, trace silt, moist | 212.00 | 5 | SS | 26 |
| 5.00 | | | | | |
| | ***SILT:*** compact brown silt, trace sand, clay and fine gravel, very moist | 211.00 | | | |
| 6.00 | | | 6 | SS | 24 |
| 7.00 | | 210.00 | | | |
| | compact grey silt, trace fine sand, saturated, dilatant | 209.00 | 7 | SS | 27 |
| 8.00 | | | | | |
| 9.00 | | 208.00 | | | |
| | | | 8 | SS | 22 |
| | Borehole terminated at 9.60 m. | 207.00 | | | |
| 10.00 | | | | | |
| 11.00 | | 206.00 | | | |
| | | 205.00 | | | |
| 12.00 | | 204.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details




At drilling completion, dry cave at 9.60 m.

Estimated water table at 7.62 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 25**

**Ground Elevation: 223.69 m**

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Elevation (m) | Number | Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 223.69 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** compact brown silt, wet | 223.00 | 1 | SS | 16 |
| | dense, trace clay | 222.00 | 2 | SS | 50 |
| 2.00 | | | | | |
| | | 221.00 | 3 | SS | 38 |
| 3.00 | ***SAND:*** very dense brown fine to medium sand, damp; some silt layers to 3.80 m, moist | | 4 | SS | 55\150mm |
| | | 220.00 | | | |
| 4.00 | | | | | |
| | dense, damp | 219.00 | 5 | SS | 46 |
| 5.00 | Borehole terminated at 5.03 m. | | | | |
| 6.00 | | 218.00 | | | |
| 7.00 | | 217.00 | | | |
| 8.00 | | 216.00 | | | |
| 9.00 | | 215.00 | | | |
| 10.00 | | 214.00 | | | |
| 11.00 | | 213.00 | | | |
| 12.00 | | 212.00 | | | |
| | | 211.00 | | | |

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa: 50 100 150 200
Shear Strength (FV) kPa: 50 100 150 200

WP WL
Water Content (%): 10 20 30




At drilling completion, dry cave at 5.03 m.

**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 26**

**Ground Elevation:** *219.94 m*

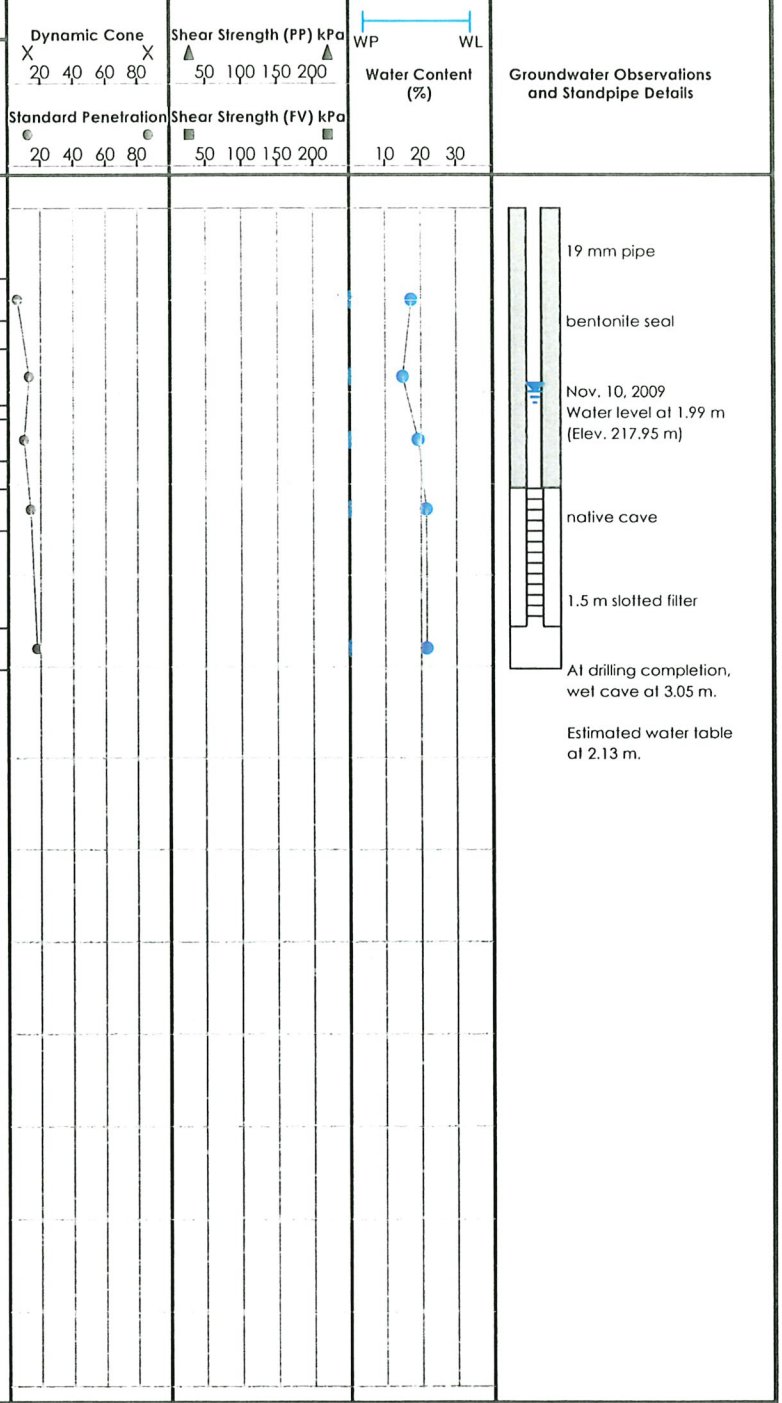
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 219.94 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SAND:*** loose brown to rusty brown silty fine to medium sand, very moist | | 219.00 | 1 | SS | 6 |
| 2.00 | saturated | | 218.00 | 2 | SS | 13 |
| | ***SILT:*** compact brown silt, some sand layers, saturated | | | 3 | SS | 10 |
| 3.00 | | | 217.00 | 4 | SS | 14 |
| 4.00 | compact grey silt, trace fine sand, saturated, dilatant | | 216.00 | | | |
| 5.00 | Borehole terminated at 5.03 m. | | 215.00 | 5 | SS | 18 |
| 6.00 | | | 214.00 | | | |
| 7.00 | | | 213.00 | | | |
| 8.00 | | | 212.00 | | | |
| 9.00 | | | 211.00 | | | |
| 10.00 | | | 210.00 | | | |
| 11.00 | | | 209.00 | | | |
| 12.00 | | | 208.00 | | | |




**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 27**

**Ground Elevation:** *217.61 m*

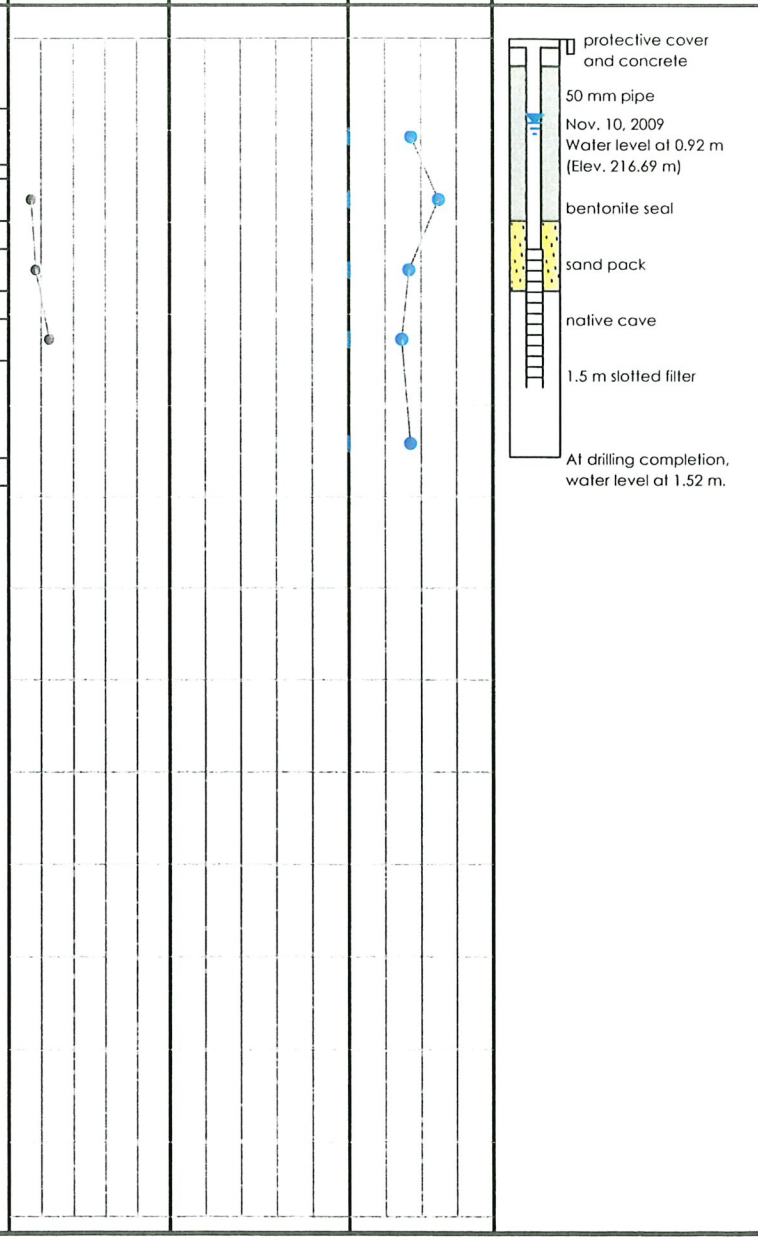
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 217.61 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** very loose rusty brown silt, some sand, very moist to wet | | 217.00 | 1 | SS | <1 |
| 2.00 | ***SAND:*** compact brown fine to coarse sand, trace silt, saturated | | 216.00 | 2 | SS | 14 |
| 3.00 | | | 215.00 | 3 | SS | 17 |
| 4.00 | | | 214.00 | 4 | SS | 25 |
| | Borehole terminated at 4.57 m. | | 213.00 | 5 | AS | |
| 5.00 | | | 212.00 | | | |
| 6.00 | | | | | | |
| 7.00 | | | 211.00 | | | |
| 8.00 | | | 210.00 | | | |
| 9.00 | | | 209.00 | | | |
| 10.00 | | | 208.00 | | | |
| 11.00 | | | 207.00 | | | |
| 12.00 | | | 206.00 | | | |
| | | | 205.00 | | | |







**Reviewed by:** *TS*

**Drill Method:** *Solid Stem Auger*

**Notes:** *Auger sample taken from 4.27 to 4.57 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 28**

**Ground Elevation:** *217.52 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

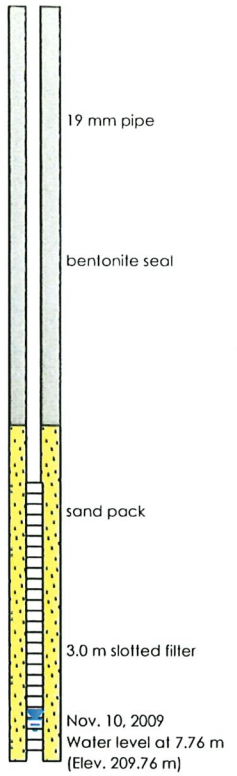
**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 217.52 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** loose brown silt, trace fine sand and clay, very moist | | 216.00 | 1 | SS | 6 |
| 2.00 | ***SAND AND GRAVEL:*** compact brown sand and gravel, trace silt, moist | | | 2 | SS | 13 |
| 3.00 | | | 215.00 | 3 | SS | 24 |
| | | | | 4 | SS | 19 |
| 4.00 | | | 214.00 | 5 | SS | 32 |
| | ***SAND:*** dense brown fine to coarse sand, trace gravel and silt, moist | | 213.00 | 6 | SS | 37 |
| 5.00 | fine to medium sand, moist | | | | | |
| | ***CLAY:*** firm to stiff grey silty clay, WTPL | | 212.00 | | | |
| 6.00 | | | | 7 | SS | 7 |
| 7.00 | | | 211.00 | | | |
| | | | 210.00 | 8 | SS | 8 |
| 8.00 | Borehole terminated at 8.23 m. | | | | | |
| 9.00 | | | 209.00 | | | |
| | | | 208.00 | | | |
| 10.00 | | | | | | |
| | | | 207.00 | | | |
| 11.00 | | | | | | |
| | | | 206.00 | | | |
| 12.00 | | | 205.00 | | | |

Dynamic Cone (X) / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content (%): WP WL; 10 20 30




Groundwater Observations and Standpipe Details

**Reviewed by:** *TS*

**Drill Method:** *Hollow Stem Auger*

**Notes:**

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 29**

**Ground Elevation:** *216.12 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|
| 0.00 | Ground Elevation | 216.12 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | |
| 1.00 | ***SILT:*** compact brown silt, trace fine sand, wet | 215.00 | 1 | SS | 15 |
| | | | 2 | SS | 35 |
| 2.00 | | 214.00 | | | |
| | ***SAND:*** compact brown fine to coarse sand, some fine gravel, saturated | | 3 | SS | 15 |
| 3.00 | | 213.00 | | | |
| | ***SILT:*** stiff grey clayey silt, WTPL; some grey silt layers, saturated | | 4 | SS | 11 |
| 4.00 | | 212.00 | | | |
| | | | 5 | SS | 14 |
| 5.00 | | 211.00 | | | |
| | | | 6 | SS | 14 |
| 6.00 | | 210.00 | | | |
| | | | 7 | SS | 12 |
| | Borehole terminated at 6.55 m. | | | | |
| 7.00 | | 209.00 | | | |
| 8.00 | | 208.00 | | | |
| 9.00 | | 207.00 | | | |
| 10.00 | | 206.00 | | | |
| 11.00 | | 205.00 | | | |
| 12.00 | | 204.00 | | | |

Dynamic Cone (X) 20 40 60 80
Standard Penetration 20 40 60 80
Shear Strength (PP) kPa 50 100 150 200
Shear Strength (FV) kPa 50 100 150 200
WP WL
Water Content (%) 10 20 30

**Groundwater Observations and Standpipe Details**

Nov. 10, 2009
Water level 0.20 m above ground surface (artesian) Elev. 216.32 m
19 mm pipe
bentonite seal
sand pack
0.6 m slotted filter
bentonite seal
At drilling completion, water level at 1.52 m.
Water rose to 0.91 m after SS3.

**Reviewed by:** *TS*
**Drill Method:** *Hollow Stem Auger*
**Notes:**

**Field Tech.:** *RM*
**Sheet:** *1 of 1*
**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Borehole Number: 30**

**Ground Elevation:** *216.40 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

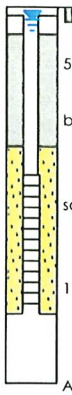
**Drill Date:** *November 9, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Sample Type | N-Value |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 216.40 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| 1.00 | ***SILT:*** brown silt, some fine sand, wet | | | 1 | AS | |
| | | | 215.00 | | | |
| 2.00 | ***SAND:*** compact brown fine to coarse sand and fine gravel, saturated | | | 2 | SS | 18 |
| | | | 214.00 | 3 | SS | 18 |
| 3.00 | | | | | | |
| | | | 213.00 | | | |
| | ***SILT:*** stiff grey clayey silt, WTPL | | | 4 | SS | 16 |
| 4.00 | Borehole terminated at 4.11 m. | | 212.00 | | | |
| 5.00 | | | | | | |
| | | | 211.00 | | | |
| 6.00 | | | | | | |
| | | | 210.00 | | | |
| 7.00 | | | | | | |
| | | | 209.00 | | | |
| 8.00 | | | | | | |
| | | | 208.00 | | | |
| 9.00 | | | | | | |
| | | | 207.00 | | | |
| 10.00 | | | | | | |
| | | | 206.00 | | | |
| 11.00 | | | | | | |
| | | | 205.00 | | | |
| 12.00 | | | | | | |
| | | | 204.00 | | | |

Dynamic Cone (X) 20 40 60 80 — Standard Penetration 20 40 60 80

Shear Strength (PP) kPa 50 100 150 200 — Shear Strength (FV) kPa 50 100 150 200

Water Content (%) WP WL 10 20 30




Groundwater Observations and Standpipe Details

At drilling completion, water level at 0.76 m.

Water rose to 0.76 m after SS2.

Nov. 10, 2009
Water level at 0.14 m
(Elev. 216.26 m)

**Reviewed by:** *TS*

**Drill Method:** *Hollow Stem Auger*

**Notes:** *Auger sample taken from 0.60 to 1.22 m.*

**Field Tech.:** *RM*

**Sheet:** *1 of 1*

**Drafted by:** *KS*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 101**

**Ground Elevation:** *220.93 m*

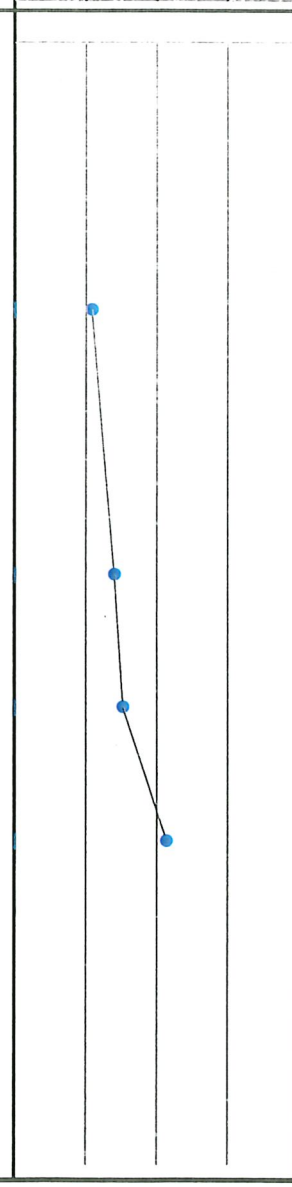
**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | Water Content (%) WP – WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| | Ground Elevation | | 220.93 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | 220.50 | | | |
| 1.00 | ***SAND:*** brown silty fine to medium sand, moist | | 220.00 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | 219.50 | | | |
| 2.00 | ***SAND:*** brown silty sand, moist | | 219.00 | | | |
| | some gravel | | 218.50 | | | |
| 3.00 | ***SILT:*** brown silt, trace fine sand, wet, dilatant | | 218.00 | | | |
| | Test pit terminated at 3.00 m. | | 217.50 | | | Test pit sidewalls vertically stable during excavation. No free groundwater encountered. |
| 4.00 | | | 217.00 | | | |




**Reviewed by:** *TS*

**Field Tech:** *RM*

**Notes:**

**Drafted by:** *KS*

**Sheet:** *1 of 1*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 102**

**Ground Elevation:** *224.55 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | WP — Water Content (%) — WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| 0.00 | Ground Elevation | | 224.55 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SILT:*** brown sandy silt, very moist | | 224.00 | | | |
| 1.00 | ***SAND:*** brown fine to medium sand, trace silt, damp | | 223.50 | | | |
| | | | 223.00 | | | |
| | brown fine to coarse sand, some gravel, occasional cobbles, damp | | | | | |
| 2.00 | | | 222.50 | | | |
| | ***SILT:*** brown silt, some fine sand, very moist | | 222.00 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | 221.50 | | | Test pit sidewalls vertically stable during excavation.<br>No free groundwater encountered. |
| | | | 221.00 | | | |
| 4.00 | | | 220.50 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 103**

**Ground Elevation:** *223.66 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| | Ground Elevation | | 223.66 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SAND:*** yellowish brown fine to medium sand, some silt, wet | | 223.00 | | | |
| 1.00 | ***SILT TILL:*** (hard) brown clayey silt, trace sand and gravel, DTPL | | 222.50 | | | |
| | | | 222.00 | | | |
| 2.00 | | | 221.50 | | | |
| | | | 221.00 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | 220.50 | | | Test pit sidewalls vertically stable during excavation. No free groundwater encountered. |
| | | | 220.00 | | | |
| 4.00 | | | 219.50 | | | |

**Reviewed by:** *TS*

**Field Tech:** *RM*

**Notes:**

**Drafted by:** *KS*

**Sheet:** *1 of 1*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 104**

**Project:** *Residential Subdivision*

**Ground Elevation:** *220.72 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 220.72 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | 220.50 | | | |
| | ***SILT:*** brown sandy silt, moist | | 220.00 | | | |
| 1.00 | | | 219.50 | | | |
| | ***SAND:*** brown fine to medium sand, trace silt, moist | | 219.00 | | | |
| 2.00 | | | 218.50 | | | |
| | fine to coarse sand, trace silt, damp | | 218.00 | | | |
| 3.00 | | | 217.50 | | | |
| | | | 217.00 | | | |
| 4.00 | Test pit terminated at 4.00 m. | | 216.50 | | | Test pit sidewalls caving below 1.50 m during excavation.<br>No free groundwater encountered. |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 105**

**Ground Elevation:** *214.06 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | WP — Water Content (%) — WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| 0.00 | Ground Elevation | | 214.06 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SILT:*** brown silt, trace fine sand, very moist; some thin brown clayey silt layers, APL | | 213.50 | | | |
| 1.00 | | | 213.00 | | | |
| | | | 212.50 | | | |
| 2.00 | Test pit terminated at 1.90 m on large boulder. | | 212.00 | | | Test pit sidewalls vertically stable during excavation.<br>No free groundwater encountered. |
| | | | 211.50 | | | |
| 3.00 | | | 211.00 | | | |
| | | | 210.50 | | | |
| 4.00 | | | 210.00 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 106**

**Ground Elevation:** *214.50 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| SOIL PROFILE | | | | SAMPLE | | |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation (m) | Number | WP — Water Content (%) — WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
| 0.00 | Ground Elevation | | 214.50 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SILT:*** brown silt, trace fine sand, occasional thin brown clayey silt layers, very moist to wet | | 214.00 | | | |
| 1.00 | | | 213.50 | | | |
| | | | 213.00 | | | |
| 2.00 | | | 212.50 | | | |
| | ***SAND:*** brown fine to coarse sand, trace silt and gravel, damp | | 212.00 | | | |
| | ***SAND and GRAVEL:*** brown sand and gravel, trace silt, damp | | | | | |
| 3.00 | | | 211.50 | | | |
| | Test pit terminated at 3.10 m. | | | | | Test pit sidewalls vertically stable during excavation. |
| | | | 211.00 | | | |
| 4.00 | | | 210.50 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 107**

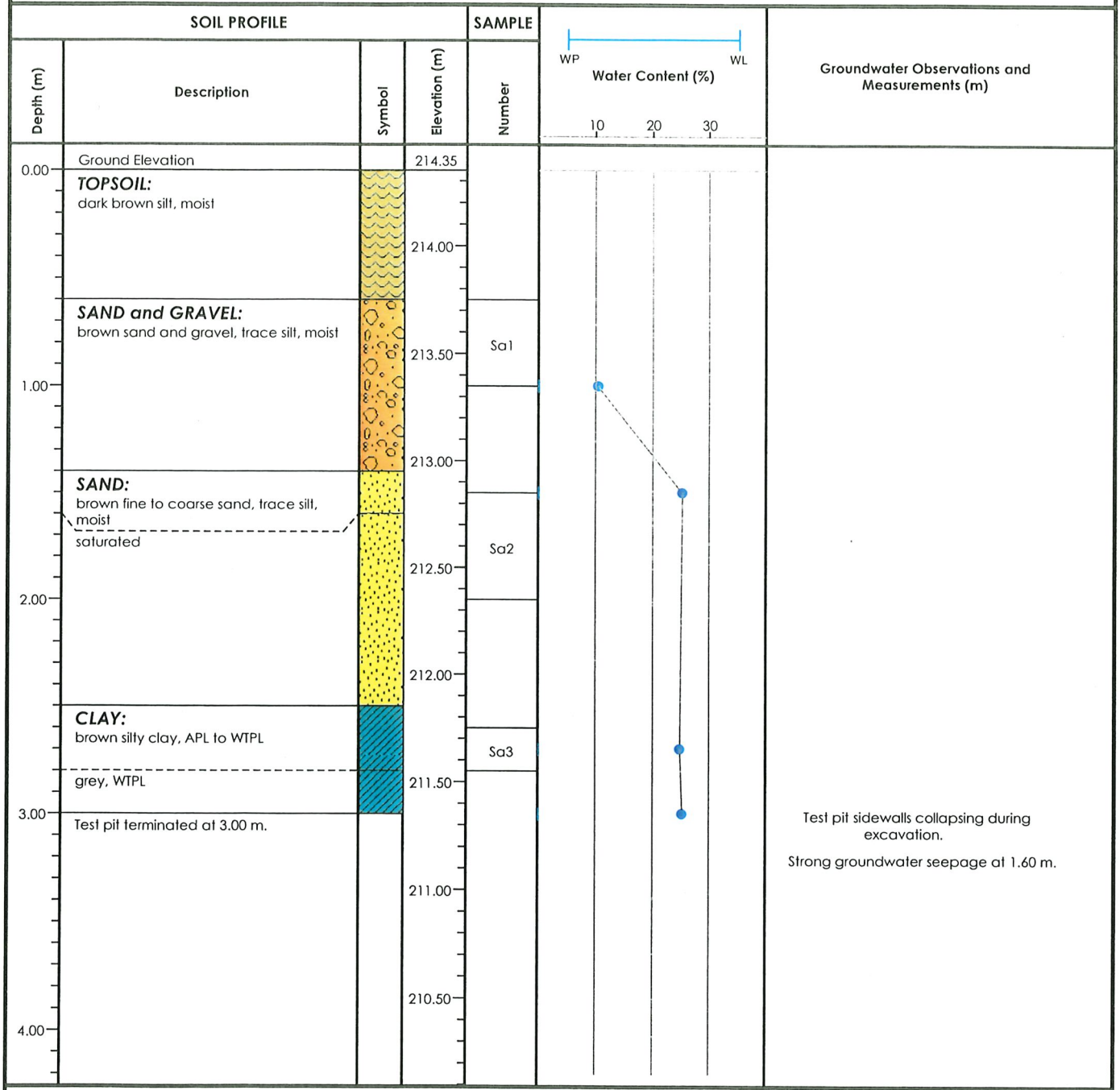
**Project:** *Residential Subdivision*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Ground Elevation:** *214.35 m*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*




**Reviewed by:** *TS*

**Field Tech:** *RM*

**Notes:**

**Drafted by:** *KS*

**Sheet:** *1 of 1*

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 108**

**Project:** *Residential Subdivision*

**Ground Elevation:** *221.94 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 221.94 | | | |
| | ***TOPSOIL:*** dark brown silt, moist | | 221.50 | | | |
| | ***SILT:*** brown silt, trace fine sand and clay, very moist | | 221.00 | | | |
| 1.00 | | | | | | |
| | | | 220.50 | | | |
| | some sand layers, saturated | | | | | |
| 2.00 | | | 220.00 | | | |
| | brown silt, some clay, trace sand, very moist to wet | | 219.50 | | | |
| | brown silt, trace fine sand and clay, very moist | | 219.00 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | | | | Test pit sidewalls vertically stable during excavation.<br>Minor groundwater seepage below 1.50 m to 2.70 m. |
| | | | 218.50 | | | |
| 4.00 | | | 218.00 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 109**

**Ground Elevation:** *219.04 m*

**Project:** *Residential Subdivision*

**Job No.:** *P030592*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| | Ground Elevation | | 219.04 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, moist | | | | | |
| | ***SILT:*** brown silt, trace fine sand and clay, wet | | 218.50 | Sa1 | | |
| 1.00 | | | 218.00 | | | |
| | | | 217.50 | | | |
| 2.00 | | | 217.00 | Sa2 | | |
| | | | 216.50 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | 216.00 | | | Test pit sidewalls vertically stable during excavation. Minor groundwater seepage below 2.00 m. Estimated water table at 2.00 m. |
| | | | 215.50 | | | |
| 4.00 | | | 215.00 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 110**

**Project:** *Residential Subdivision*

**Ground Elevation:** *215.45 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| | Ground Elevation | | 215.45 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, very moist | | 215.00 | | | |
| | ***SILT:*** brown silt, trace fine sand and clay, wet | | | | | |
| 1.00 | | | 214.50 | Sa1 | | |
| | | | 214.00 | | | |
| 2.00 | | | 213.50 | | | |
| | some brown sand layers, saturated | | | Sa2 | | |
| | brown silt, some clay, DTPL | | 213.00 | | | |
| | | | | Sa3 | | |
| | ***CLAY:*** grey silty clay, WTPL | | 212.50 | | | |
| 3.00 | Test pit terminated at 3.00 m. | | | | | Test pit sidewalls vertically stable during excavation. Minor groundwater seepage at 2.30 m. |
| | | | 212.00 | | | |
| 4.00 | | | 211.50 | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

LVM NAYLOR
Division of Naylor Engineering Associates Ltd

**Test Pit Number: 111**

**Project:** *Residential Subdivision*

**Ground Elevation:** *221.85 m*

**Location:** *Decou Road and Ireland Road, Simcoe, Ontario*

**Job No.:** *P030592*

**Excavation Date:** *November 10, 2009*

| Depth (m) | Description | Symbol | Elevation (m) | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| | Ground Elevation | | 221.85 | | | |
| 0.00 | ***TOPSOIL:*** dark brown silt, very moist | | 221.50 | | | |
| | | | 221.00 | | | |
| 1.00 | | | 220.50 | | | |
| | ***SAND:*** rusty brown fine to medium sand, some silt, moist | | 220.00 | | | |
| 2.00 | | | 219.50 | | | |
| | brown fine to coarse sand, trace silt and gravel, moist | | | | | |
| | some gravel | | 219.00 | | | |
| 3.00 | | | | | | |
| | Test pit terminated at 3.30 m. | | 218.50 | | | Test pit sidewalls vertically stable during excavation. No free groundwater encountered during excavation. |
| | | | 218.00 | | | |
| 4.00 | | | | | | |

**Reviewed by:** *TS*

**Drafted by:** *KS*

**Field Tech:** *RM*

**Sheet:** *1 of 1*

**Notes:**

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

**Test Pit Number: 1**

**Ground Elevation:** *216 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 216 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, trace gravel, moist | | | | | |
| | ***SILT:*** brown silt, some sand, trace clay, wet | | | 1 | | |
| 1.00 | | | 215 | | | |
| | | | | 2 | | |
| 2.00 | | | 214 | | | |
| | ***SAND AND GRAVEL:*** brown sand and gravel, some silt, moist | | | | | |
| | ***SAND:*** brown sand, some gravel, some silt, very moist | | | 3 | | |
| 3.00 | ***SILT:*** brown silt, trace sand, moist | | 213 | | | Test pit sidewalls vertically stable. No free groundwater encountered. |
| | Test pit terminated at 3.05 m. | | | | | |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

**Test Pit Number: 2**

**Ground Elevation:** *220 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) WP–WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 220 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, trace gravel, moist | | | | | |
| | ***SILT:*** brown silt, trace sand, trace clay, wet | | | 1 | | |
| 1.00 | | | 219 | | | |
| 2.00 | | | 218 | 2 | | |
| 3.00 | | | 217 | | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls vertically stable.<br>No free groundwater encountered. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

**Test Pit Number: 3**

**Ground Elevation:** *223 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) WP / WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 223 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SILT:*** light brown sandy silt, trace clay, moist | | | | | |
| 1.00 | | | 222 | 1 | | |
| | brown silt, trace sand, wet | | | | | |
| 2.00 | | | 221 | 2 | | |
| | ***SAND:*** brown sand, some gravel, trace silt, saturated | | | | | |
| 3.00 | | | 220 | 3 | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls caving below 2.74 m. Groundwater encountered at 2.74 m. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

**Test Pit Number: 4**

**Ground Elevation:** *222 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| SOIL PROFILE | | | | SAMPLE | | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| Depth (m) | Description | Symbol | Elevation | Number | Water Content (%) WP — WL; 10 20 30 | |
| 0.00 | Ground Elevation | | 222 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SAND:*** brown silty sand, trace gravel, moist | | | | | |
| 1.00 | | | 221 | 1 | | |
| 2.00 | brown sand, trace gravel and silt, damp | | 220 | 2 | | |
| 3.00 | Test pit terminated at 3.05 m. | | 219 | | | Test pit sidewalls caving below 2.74 m.<br>No free groundwater encountered. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

**Test Pit Number: 5**

**Ground Elevation:** *222 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 222 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SILT:*** light brown sandy silt, trace clay, trace gravel, moist | | | 1 | | |
| 1.00 | | | 221 | | | |
| | ***SAND:*** brown sand, trace silt, damp | | | | | |
| 2.00 | | | 220 | | | |
| | | | | 2 | | |
| 3.00 | | | 219 | | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls vertically stable.<br>No free groundwater encountered. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 6**

**Ground Elevation:** *225 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) WP–WL (10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 225 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SAND:*** brown silty sand, trace gravel, moist | | | 1 | | |
| 1.00 | | | 224 | | | |
| | brown sand, some gravel, trace silt, damp | | | 2 | | |
| 2.00 | | | 223 | | | |
| | brown sand, trace gravel and silt, damp | | | 3 | | |
| 3.00 | | | 222 | | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls caving below 2.44 m. No free groundwater encountered. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

Naylor Engineering Associates Ltd.

**Test Pit Number: 7**

**Ground Elevation:** *229 m*

**Project:** *Preliminary Geotechnical Investigation for Residential Subdivision*

**Job No.:** *7780G1*

**Location:** *DeCou Road, Simcoe, Ontario*

**Excavation Date:** *July 17, 2008*

| Depth (m) | Description | Symbol | Elevation | Sample Number | Water Content (%) (WP – WL; 10, 20, 30) | Groundwater Observations and Measurements (m) |
|---|---|---|---|---|---|---|
| 0.00 | Ground Elevation | | 229 | | | |
| | ***TOPSOIL:*** dark brown silt, some sand, moist | | | | | |
| | ***SAND:*** light brown silty sand, damp | | | 1 | | |
| 1.00 | | | 228 | | | |
| | ***SILT:*** light brown silt, trace sand, very moist | | | 2 | | |
| 2.00 | | | 227 | | | |
| 3.00 | | | 226 | 3 | | |
| | Test pit terminated at 3.05 m. | | | | | Test pit sidewalls vertically stable.<br>No free groundwater encountered. |

**Reviewed by:** *TS*

**Sheet:** *1 of 1*

**Field Tech:** *DB*

**Drafted by:** *KS (00d-2)*

**Notes:** *Ground elevation approximate.*

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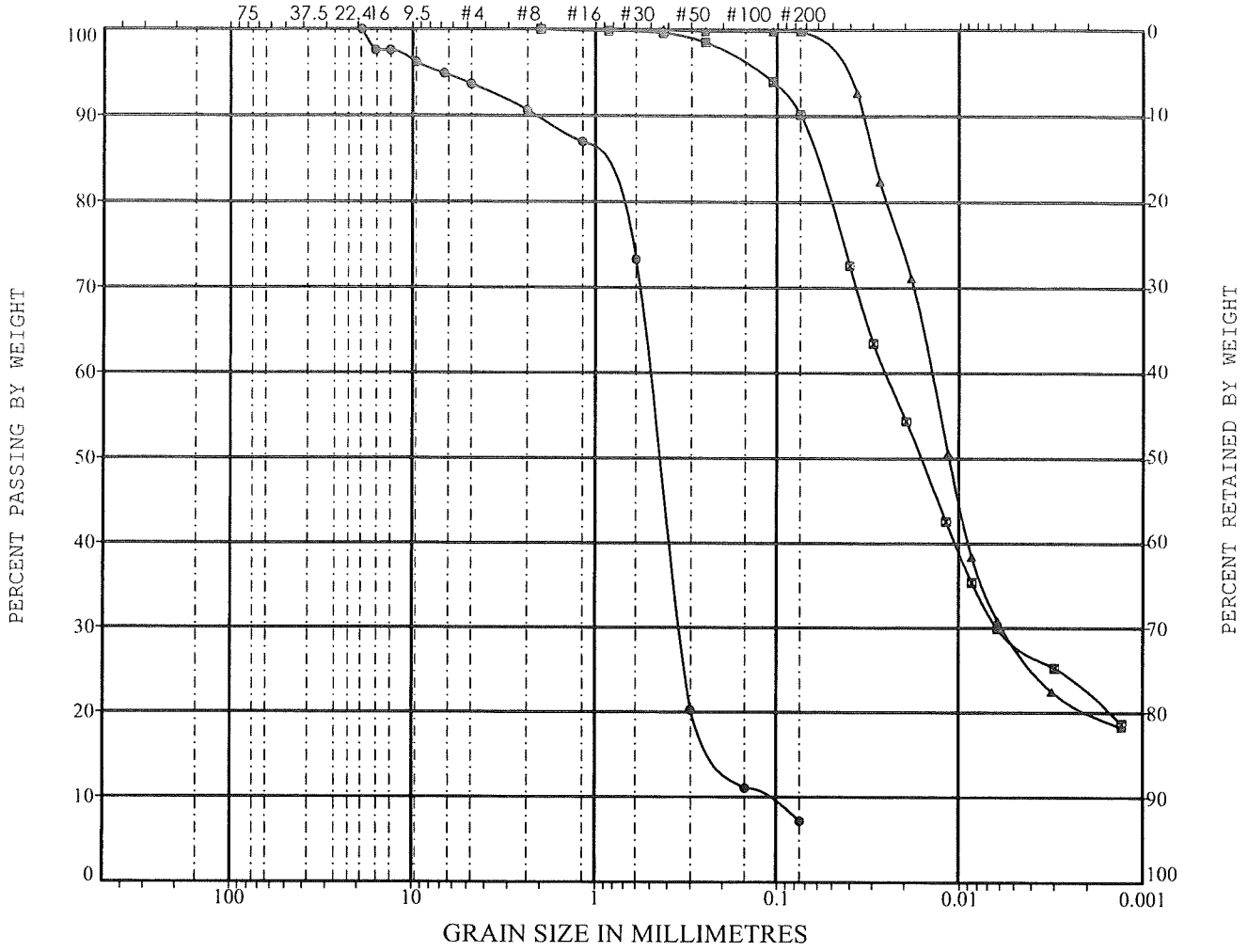
# Appendix 3 Figures
**(4 pages)**

Figures 1 and 2: Particle Size Distribution Analyses
Figures 3 and 4: Standard Proctor Moisture-Density Test Results

## UNIFIED SOIL CLASSIFICATION

| *COBBLES* | *GRAVEL* | | *SAND* | | | *SILT OR CLAY* |
|---|---|---|---|---|---|---|
| | COARSE | FINE | COARSE | MEDIUM | FINE | |
| U.S. SIEVE SIZE IN MILLIMETRES | | | U.S. STANDARD SIEVE No. | | | HYDROMETER |




PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

| CURVE ID | BOREHOLE/ TEST PIT | SAMPLE NO. | DEPTH (m) | SOIL DESCRIPTION |
|---|---|---|---|---|
| ● | BH8 | 4 | 3.05-3.51 | SAND, trace Silt and Gravel |
| ⊠ | BH10 | BS | 1.22-2.44 | Clayey SILT, trace Sand |
| ▲ | BH12 | 7 | 6.40-6.71 | Clayey SILT, trace Sand |

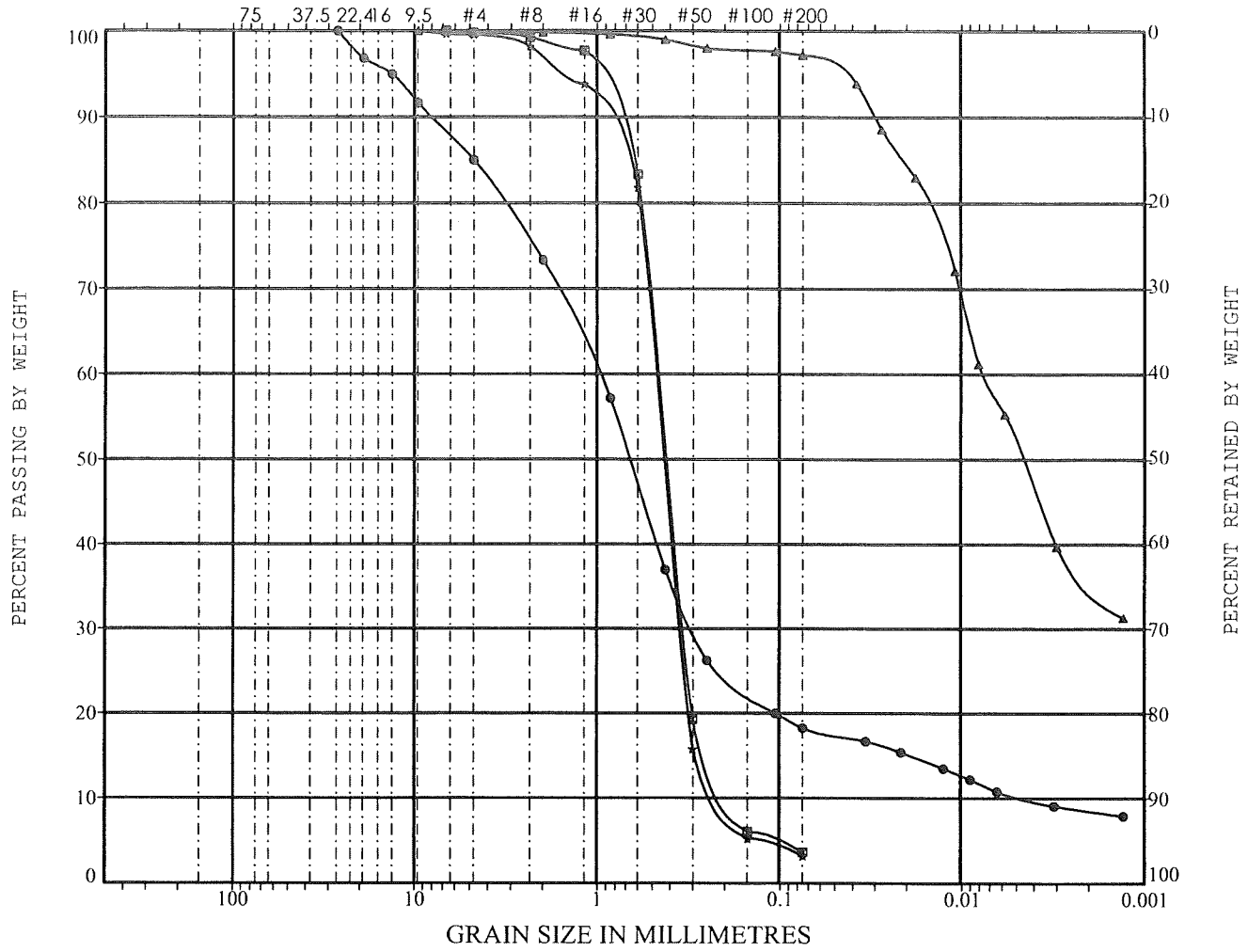
REMARKS

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

Figure No. 1

## UNIFIED SOIL CLASSIFICATION

| *COBBLES* | *GRAVEL* | | *SAND* | | | *SILT OR CLAY* |
|---|---|---|---|---|---|---|
| | COARSE | FINE | COARSE | MEDIUM | FINE | |
| U.S. SIEVE SIZE IN MILLIMETRES | | | U.S. STANDARD SIEVE No. | | | HYDROMETER |




PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

| CURVE ID | BOREHOLE/ TEST PIT | SAMPLE NO. | DEPTH (m) | SOIL DESCRIPTION |
|---|---|---|---|---|
| ● | BH17 | 3 | 2.29-2.74 | SAND, some Gravel, trace Silt and Clay |
| ⊠ | BH27 | 4 | 1.22-3.05 | SAND, trace Silt |
| ▲ | BH29 | 4 | 3.05-3.51 | Clayey SILT, trace Sand |
| ★ | BH30 | 3 | 2.29-2.74 | SAND, trace Silt and Gravel |

REMARKS

Naylor Engineering Associates Ltd.
CONSULTING ENGINEERS

Figure No. 2

LVM NAYLOR

FIGURE NO. 3

# LABORATORY PROCTOR MOISTURE-DENSITY TEST

PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

BOREHOLE NO. 10 DATE TESTED November 10, 2009

SAMPLE DEPTH 1.22 - 2.44 m TESTED BY LR

SOIL TYPE Clayey SILT, trace Sand MOISTURE CONTENT 16.2%

REMARKS Particle Size Analysis provided on Figure 1.

METHOD LS - 706

PROCEDURE: 1☑ 2☐ 3☐

Procedure 1 (Mold ø - 101.6 mm)
Procedure 2 (Mold ø - 101.6 mm)
Procedure 3 (Mold ø - 152.4 mm)

MAXIMUM DRY DENSITY 1.865 t/m³

OPTIMUM MOISTURE 12.9%

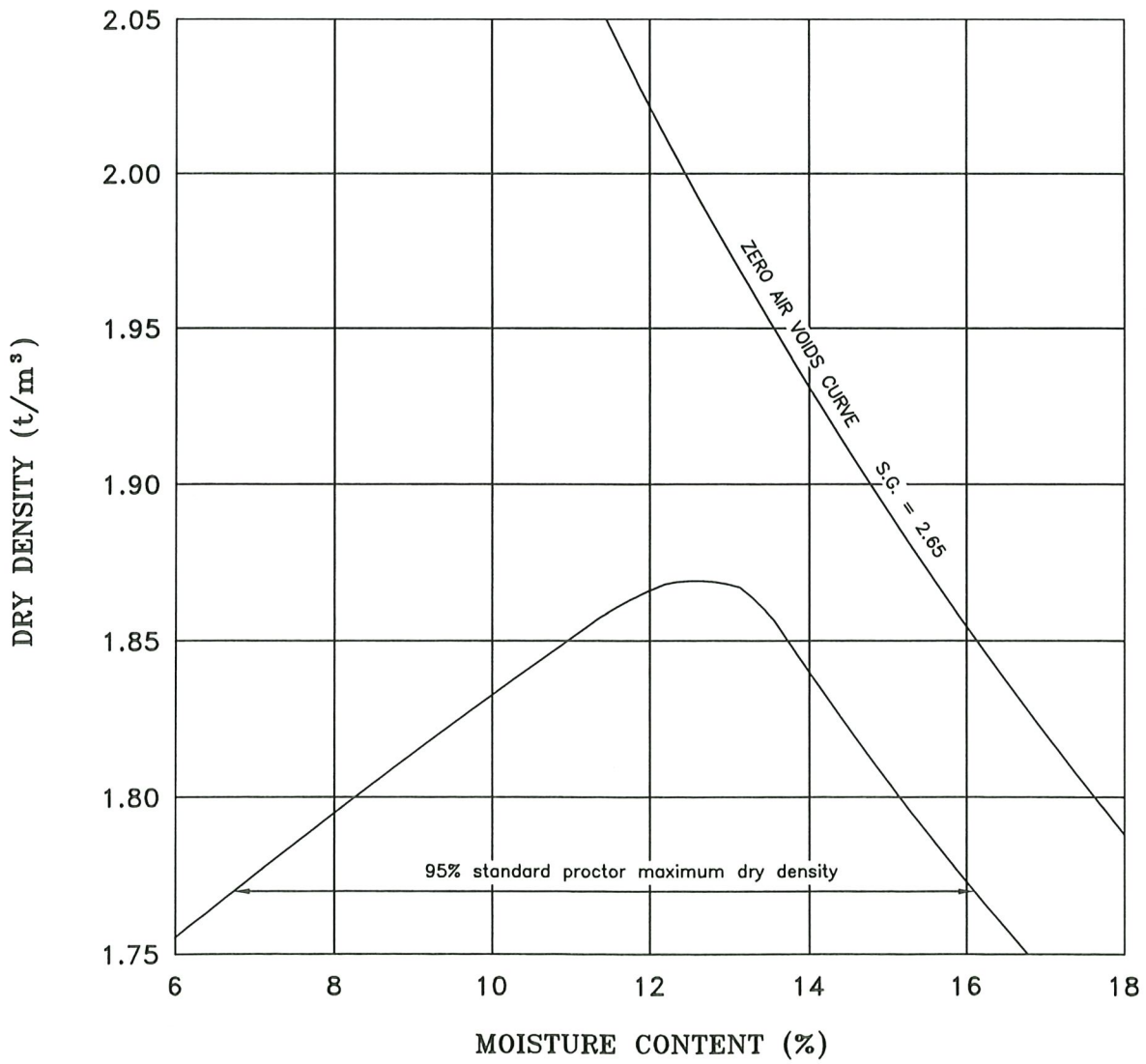


FIGURE NO. 4

LVM NAYLOR

# LABORATORY PROCTOR MOISTURE–DENSITY TEST

PROJECT Residential Subdivision

LOCATION Decou Road and Ireland Road, Simcoe, Ontario JOB NO. P030592

BOREHOLE NO. 19 DATE TESTED November 16, 2009

SAMPLE DEPTH 2.44 – 4.27 m TESTED BY LR

SOIL TYPE SAND MOISTURE CONTENT 4.5%

REMARKS

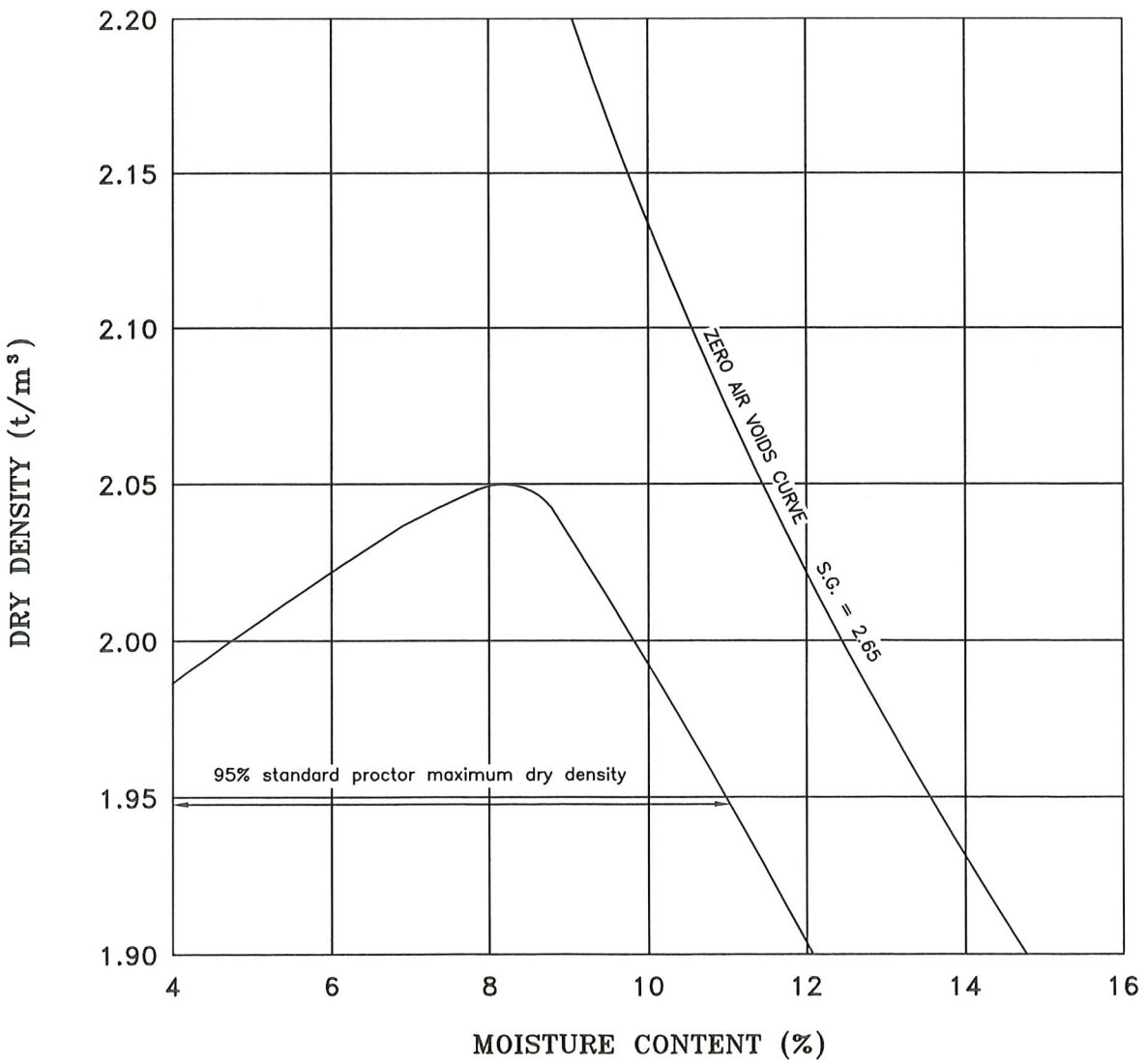
METHOD LS – 706

PROCEDURE: 1☑ 2☐ 3☐

Procedure 1 (Mold ø – 101.6 mm)
Procedure 2 (Mold ø – 101.6 mm)
Procedure 3 (Mold ø – 152.4 mm)

MAXIMUM DRY DENSITY 2.05 t/m³

OPTIMUM MOISTURE 8.4%



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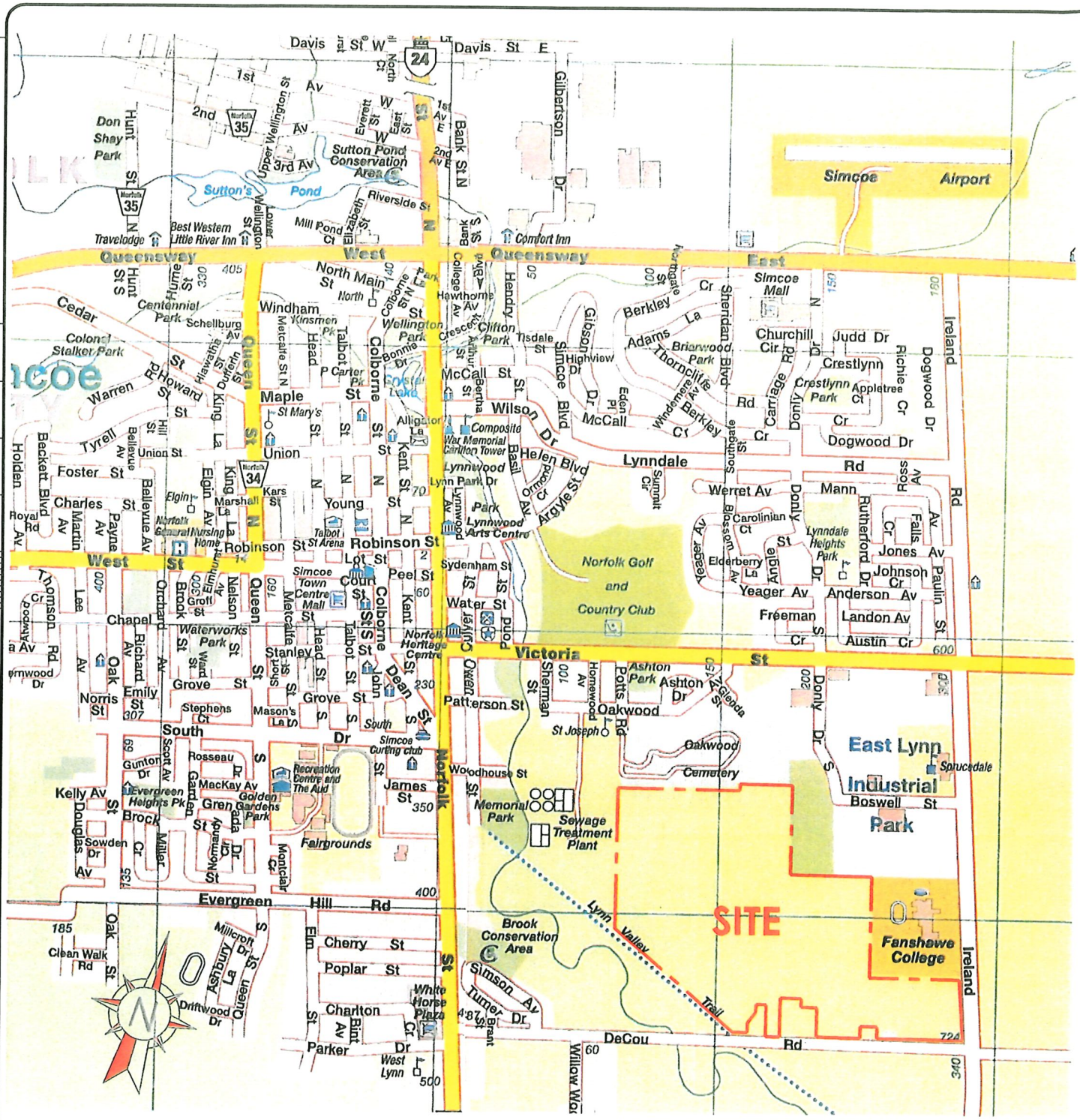
# Appendix 4 Drawings

**(6 pages)**

Drawing 1: Location Plan
Drawing 2: Site Plan
Drawings 3 and 4: Cross-Sections
Drawing 5: Structural Fill Pad Detail
Drawing 6: Typical Pavement Subdrain Detail
Drawing 7: Typical Pond Subdrain Detail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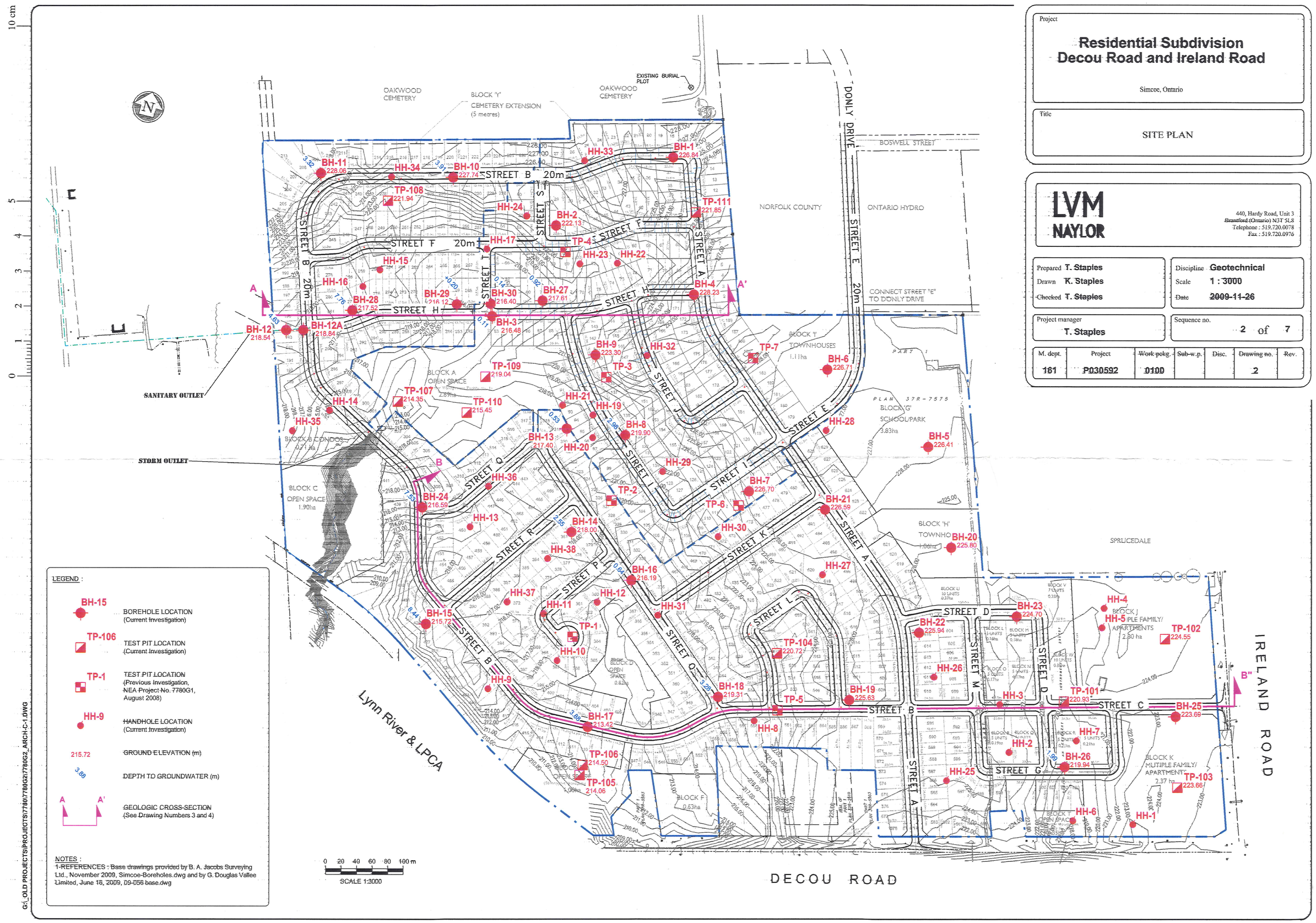
Davis St E
Simcoe Airport
Queensway West
Queensway East
Sutton's Pond
Sutton Pond Conservation Area
Best Western Little River Inn
Travelodge
Comfort Inn
Simcoe Mall
Windham
Centennial Park
Schellburg
Colonel Stalker Park
Maple
Union
Wilson
McCall
Lynndale
Werret Av
Mann
Rutherford
Jones Av
Johnson
Anderson Av
Landon Av
Austin Cr
Norfolk Golf and Country Club
Lynnwood Arts Centre
Composite War Memorial Carillon Tower
Robinson St
Simcoe Town Centre Mall
Waterworks Park
Norfolk Heritage Centre
Victoria St
Patterson St
Oakwood
Oakwood Cemetery
East Lynn Industrial Park
Boswell St
Sprucedale
Memorial Park
Sewage Treatment Plant
Recreation Centre and The Aud
Simcoe Curling Club
Fairgrounds
Golden Gardens Park
Brook Conservation Area
Lynn Valley Trail
SITE
Fanshawe College
Ireland
Evergreen Hill Rd
DeCou Rd
White Horse Plaza
Clean Walk
Driftwood Dr
Parker Dr
West Lynn
Crestlynn
Dogwood Dr
Lynndale Heights Park
Crestlynn Park
Ashton Park
Sydenham St
Water St
Peel St
Court St
Chapel
Grove St
Norris St
Emily St
South Dr
James St
Woodhouse St
Cherry St
Poplar St
Charlton Av
Simson Av
Turner Dr
Brant St
Willow St
Norfolk St
Queen St
Colborne St
Kent St
Head St
Talbot St
Dean St
John St
Stanley St
Nelson St
Orchard Brook
Richard Av
Oak Av
Douglas Av
Miller Dr
Montclair Dr
Millcroft Dr
Ashbury La
Elm St
Oak St
Kelly Av
Brock St
Sowden Dr
Gunton Dr
Scott Av
Rosseau Dr
MacKay Av
Everglen Heights Pk
Gren Gate Dr
Garden St
Thomson Cr
Lee Av
Woodyatt Dr
Holden Rd
Becket Blvd
Foster St
Charles St
Royal Rd
Marlin Av
Payne Av
Bellevue Av
Tyrell St
Hill St
Howard St
Warren Rd
Cedar St
Hunt St S
Don Shay Park
Hunt St N
Upper Wellington St
Lower Wellington St
Elizabeth St
Mill Pond Ct
Riverside St
Bank St N
Bank St S
Gilbertson Dr
Hawthorne Av
College Av
Henry Av
Clifton Park
Tisdale St
Gibson Dr
Highview Dr
Simcoe Blvd
Eden Pl
Windermere Av
Thorncliffe Berkley Cr
Briarwood Blvd
Adams La
Berkley La
Sheridan Cr
Churchill Cir
Judd Dr
Richie Cr
Carriage Rd
Donly Dr
Appletree Ct
Basil Rd
Helen Blvd
Ormond Cr
Argyle St
Summit Cr
Rossmount Av
Carolinian Ct
Blossom Ct
Yeager Av
Elderberry La
Angle St
Freeman Cr
Falls Av
Paulin St
Ashton Dr
Homewood Av
Potts Av
Sherman St
Glenda Dr
St Joseph Rd
Donly Dr
Queen St
Norfolk




LEGEND :

- BH-15 — BOREHOLE LOCATION (Current Investigation)
- TP-106 — TEST PIT LOCATION (Current Investigation)
- TP-1 — TEST PIT LOCATION (Previous Investigation, NEA Project No. 7780G1, August 2008)
- HH-9 — HANDHOLE LOCATION (Current Investigation)
- 215.72 — GROUND ELEVATION (m)
- 3.88 — DEPTH TO GROUNDWATER (m)
- A A' — GEOLOGIC CROSS-SECTION (See Drawing Numbers 3 and 4)

NOTES :

1. REFERENCES : Base drawings provided by B. A. Jacobs Surveying Ltd., November 2009, Simcoe-Boreholes.dwg and by G. Douglas Vallee Limited, June 16, 2009, 09-056 base.dwg

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

SITE PLAN


LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976


| | |
|---|---|
| Prepared T. Staples | Discipline Geotechnical |
| Drawn K. Staples | Scale 1 : 3000 |
| Checked T. Staples | Date 2009-11-26 |
| Project manager T. Staples | Sequence no. 2 of 7 |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 2 | |

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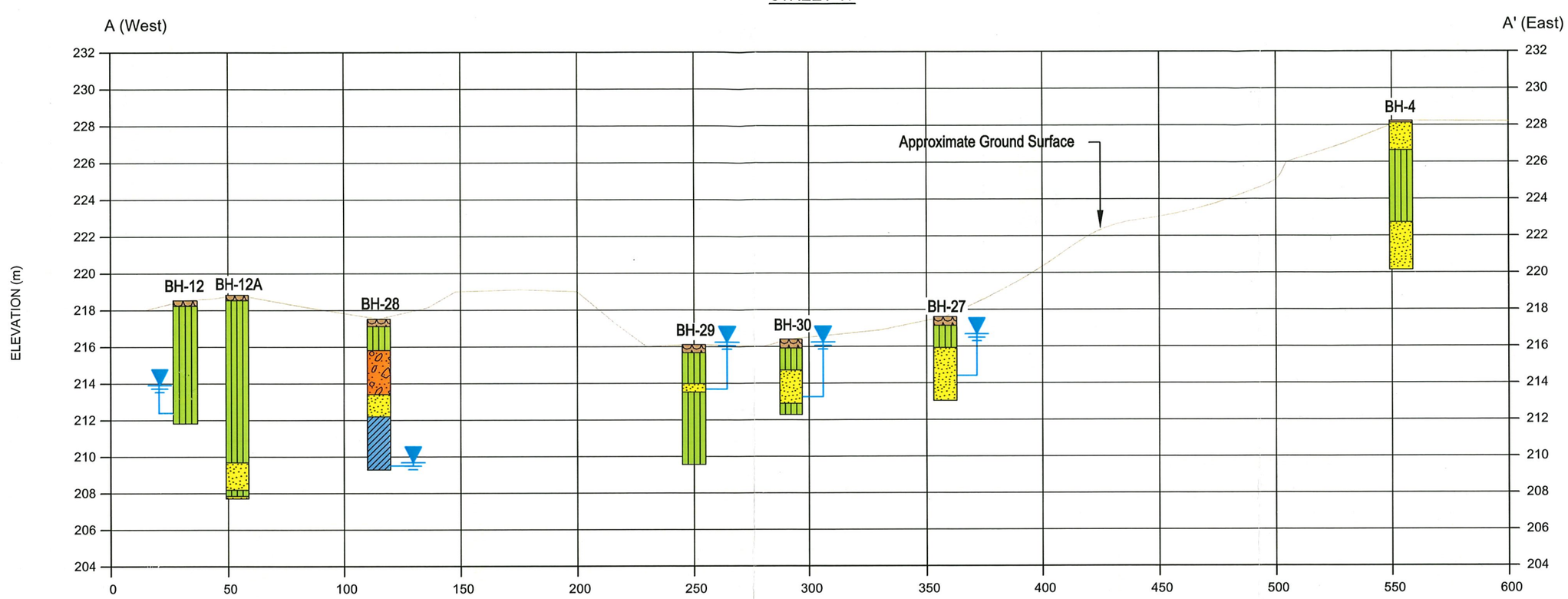
STREET 'H'




LEGEND :

- TOPSOIL
- CLAY
- SILT
- SAND
- SAND AND GRAVEL
- GROUNDWATER LEVEL

NOTES :

1-REFERENCES : B. A. Jacobs Surveying Ltd., November 2009, Simcoe-Boreholes.dwg and G. Douglas Vallee Limited, June 16, 2009, 09-056 base.dwg

2-Groundwater measurements taken on November 10, 2009. Seasonal fluctuations in groundwater levels would be expected.

3- The inferred stratigraphy shown on this cross-section is based on the subsurface stratigraphy contacted at the Boreholes. The subsurface conditions between the Boreholes will vary.

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

**GEOLOGIC CROSS-SECTION A - A'**
**STREET 'H'**


LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976


| | | | | | |
|---|---|---|---|---|---|
| Prepared D. Kelly | Discipline GEOTECHNICAL | | Project manager T. Staples | | |
| Drawn K. Staples | Scale Vertical : 1:250 Horizontal : 1:2000 | | Sequence no. 03 of 07 | | |
| Checked T. Staples | Date 2009-12-10 | | | | |
| M. dept. 161 | Project P030592 | Work pckg. 0100 | Sub-w.p. | Disc. | Drawing no. 3 | Rev. |

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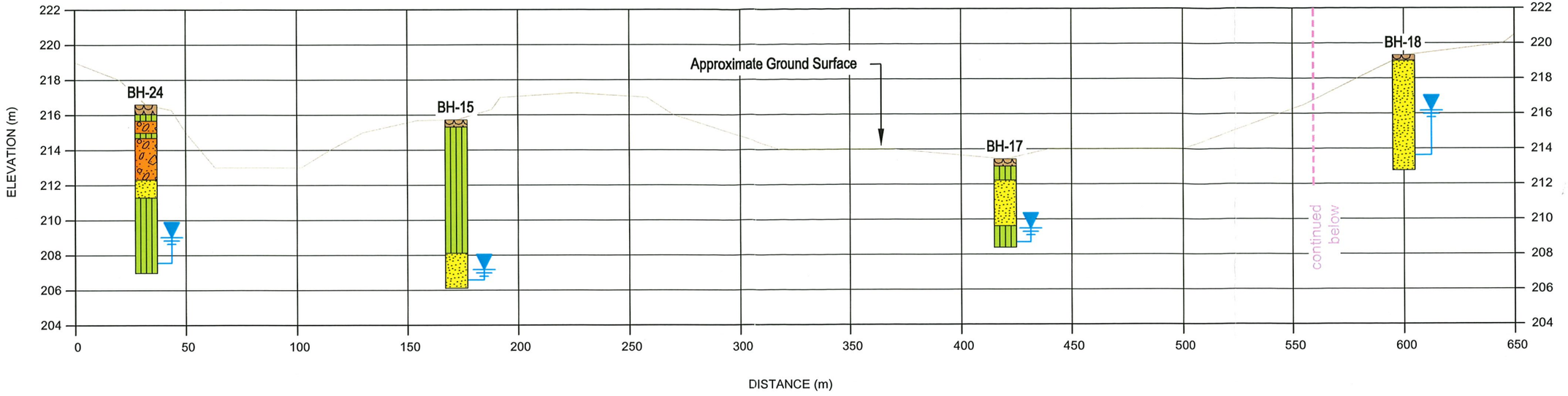
## STREET 'B'

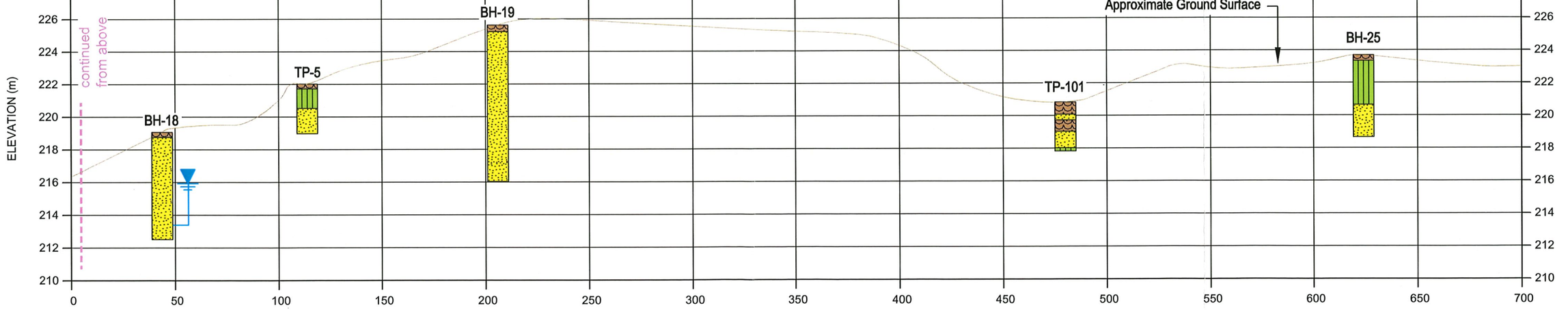
B (West) — B' (East)




DISTANCE (m)

## STREET 'B' AND STREET 'C'

B' (West) — B" (East)




DISTANCE (m)

LEGEND :

TOPSOIL
CLAY
SILT
SAND
SAND AND GRAVEL
GROUNDWATER LEVEL

NOTES :

1-REFERENCES : B. A. Jacobs Surveying Ltd., November 2009, Simcoe-Boreholes.dwg and G. Douglas Vallee Limited, June 16, 2009, 09-056 base.dwg

2-Groundwater measurements taken on November 10, 2009. Seasonal fluctuations in groundwater levels would be expected.

3- The inferred stratigraphy shown on this cross-section is based on the subsurface stratigraphy contacted at the Boreholes. The subsurface conditions between the Boreholes will vary.

Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

**GEOLOGIC CROSS-SECTION B - B"**
**STREET 'B'**


LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976


| | | | | | |
|---|---|---|---|---|---|
| Prepared D. Kelly | Discipline GEOTECHNICAL | | | | Project manager T. Staples |
| Drawn K. Staples | Scale Vertical : 1:250 Horizontal : 1:2000 | | | | Sequence no. 04 of 07 |
| Checked T. Staples | Date 2009-12-10 | | | | |
| M. dept. 161 | Project P030592 | Work pckg. 0100 | Sub-w.p. | Disc. | Drawing no. 4 | Rev. |

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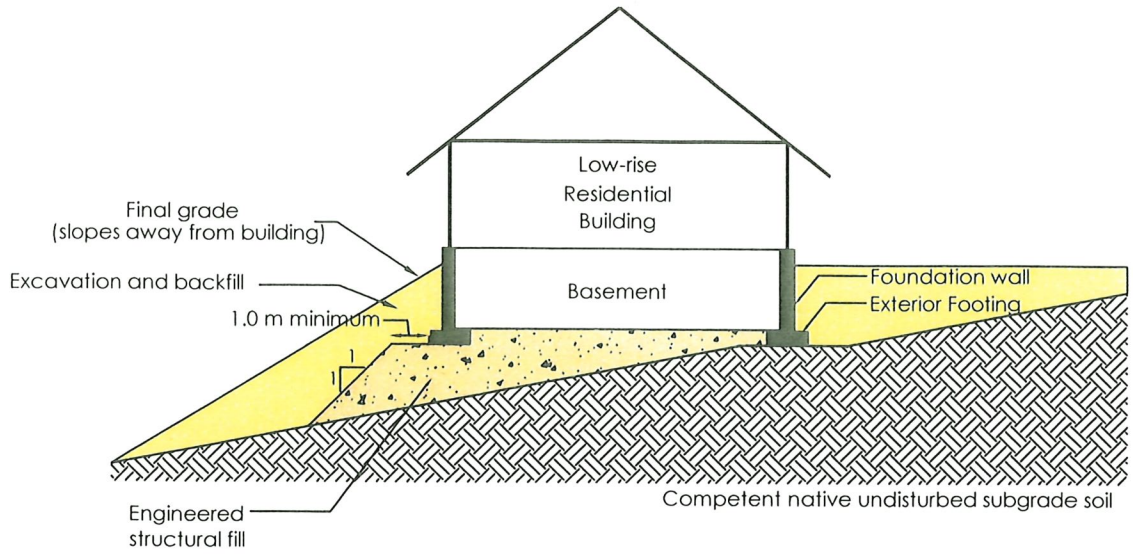


## GENERAL REQUIREMENTS FOR ENGINEERED STRUCTURAL FILL

1. The area must be excavated of all pre-existing loose fill, topsoil, and/or organic soil until competent native undisturbed soil is reached.

2. The excavation should allow for the structural fill to extend 1.0 m beyond the outside edge of the building footings and down to the approved subgrade soil at a slope of 1 horizontal to 1 vertical (45 ).

3. The subgrade below the engineered fill should be inspected and approved by a geotechnical engineer prior to fill construction. Fill placement and compaction operations to be carried out under full-time geotechnical supervision.

4. The structural fill should comprise sand and gravel aggregate placed in 300 mm thick lifts and compacted to at least 98 % Standard Proctor Maximum Dry Density (SPMDD). The exterior backfill should consist of approved inorganic soil also placed in 300 mm thick lifts and compacted to minimum 95 % SPMDD.

5. Exterior footings should be provided with minimum 1.2 m of soil cover for frost protection.

6. All excavations must be carried out in conformance with the current Ontario Occupational Health and Safety Act and Regulations 213/91 for construction projects.

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Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

**STRUCTURAL FILL PAD DETAIL**

LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | | | | | |
|---|---|---|---|---|---|
| Prepared | T. Staples | Discipline | GEOTECHNICAL | Project manager | T. Staples |
| Drawn | K. Staples | Scale | NTS | Sequence no. | 05 of 07 |
| Checked | T. Staples | Date | 2009-12-04 | | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
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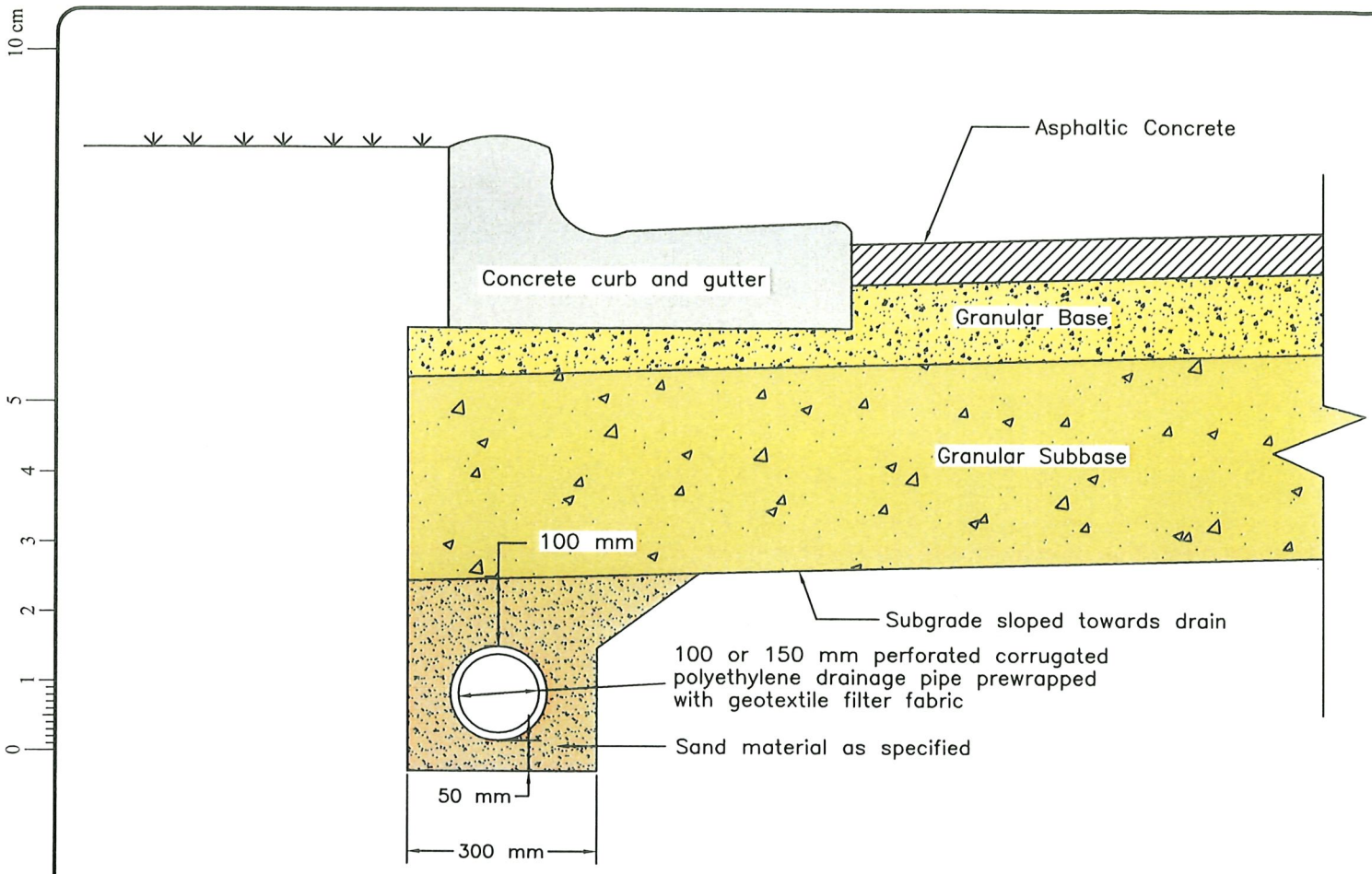


## GENERAL REQUIREMENTS FOR PAVEMENT SUBDRAINS

1. Perforated corrugated polyethylene drainage pipe shall meet the requirements of OPSS 1840.
2. Pipe filter fabric conforming to OPSS 1860 for geotextile Class 1 with a filtration opening size of 150 to 450 microns shall be supplied on all sections of perforated pipe.
3. The open upstream ends of pipes should be capped.
4. Subdrain pipes to be set on at least 1% grade draining to a positive frost-free outlet. If the subdrains are outletted to a ditch then the last 1.5 m of the outlet pipe should consist of a corrugated galvanized steel pipe equipped with a rodent gate.
5. Bedding and backfill material shall be concrete sand meeting the gradation requirements of OPSS 1002 (Fine Aggregate for Concrete).

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Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

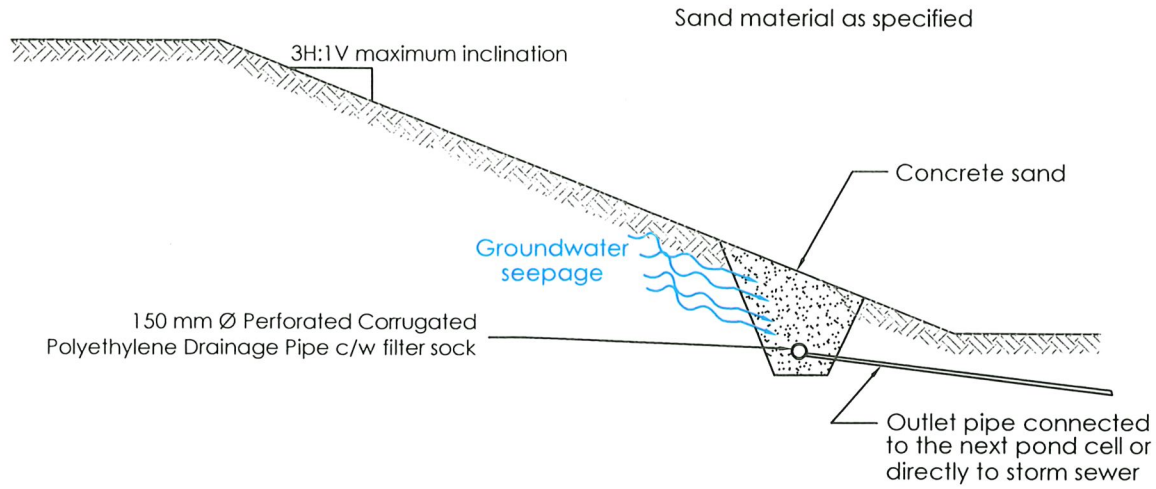
**TYPICAL PAVEMENT SUBDRAIN DETAIL**

LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | | | | | |
|---|---|---|---|---|---|
| Prepared | T. Staples | Discipline | GEOTECHNICAL | Project manager | T. Staples |
| Drawn | K. Staples | Scale | NTS | Sequence no. | 06 of 07 |
| Checked | T. Staples | Date | 2009-12-07 | | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 6 | |

# STORMWATER MANAGEMENT POND SLOPE SUBDRAIN INSTALLATION




## GENERAL REQUIREMENTS

1. Perforated corrugated polyethylene drainage pipe shall meet the requirements of OPSS 1840.
2. Pipe filter fabric conforming to OPSS 1860 for geotextile Class 1 with a filtration opening size of 150 to 450 microns shall be supplied on all sections of perforated pipe.
3. Subdrain pipes to be set on at least 1% grade and draining to a positive outlet. If the pipe is outletted to the pond, then the last 1.5 m should comprise a corrugated steel pipe equipped with a rodent gate.
4. Bedding and backfill material shall be concrete sand meeting the gradation requirements of OPSS 1002 (Fine Aggregate for Concrete).
5. The open upstream ends of pipes should be capped.
6. The subgrade on the original slope should be inspected and approved by Naylor Engineering Associates Ltd. prior to fill construction. Fill placement and compaction operations to be carried out under engineering supervision.

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Project

**Residential Subdivision**
**Decou Road and Ireland Road**

Simcoe, Ontario

Title

**TYPICAL POND SUBDRAIN DETAIL**

LVM NAYLOR
440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

| | | | | | |
|---|---|---|---|---|---|
| Prepared | T. Staples | Discipline | GEOTECHNICAL | Project manager | T. Staples |
| Drawn | K. Staples | Scale | NTS | Sequence no. | 07 of 07 |
| Checked | T. Staples | Date | 2001-12-07 | | |

| M. dept. | Project | Work pckg. | Sub-w.p. | Disc. | Drawing no. | Rev. |
|---|---|---|---|---|---|---|
| 161 | P030592 | 0100 | | | 7 | |

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# Appendix 5 Site Photographs

**(6 pages)**

Site Photos 1 to 11

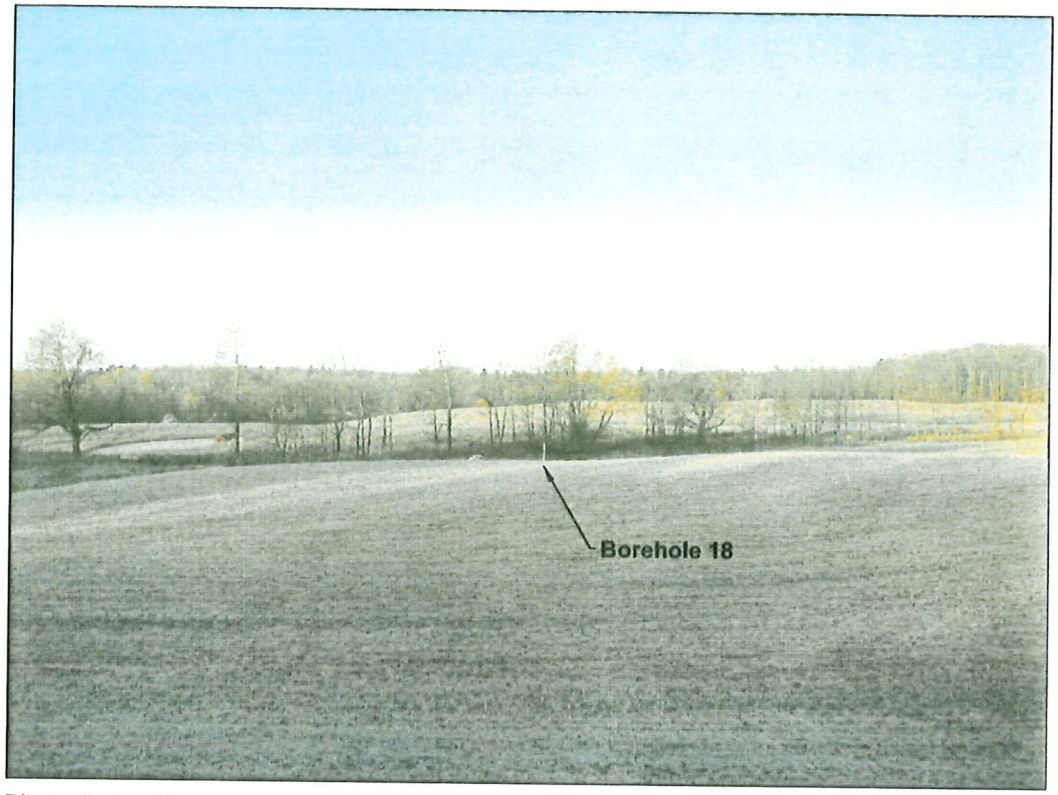


**Photo 1: Looking west towards Borehole 18.**




**Photo 2: Looking northwest towards Borehole 16.**

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November 18, 2009

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**Photo 3: Looking west from Borehole 7.**



**Photo 4: Looking north from Borehole 7.**

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November 18, 2009

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**Photo 5: Looking west from Borehole 4.**

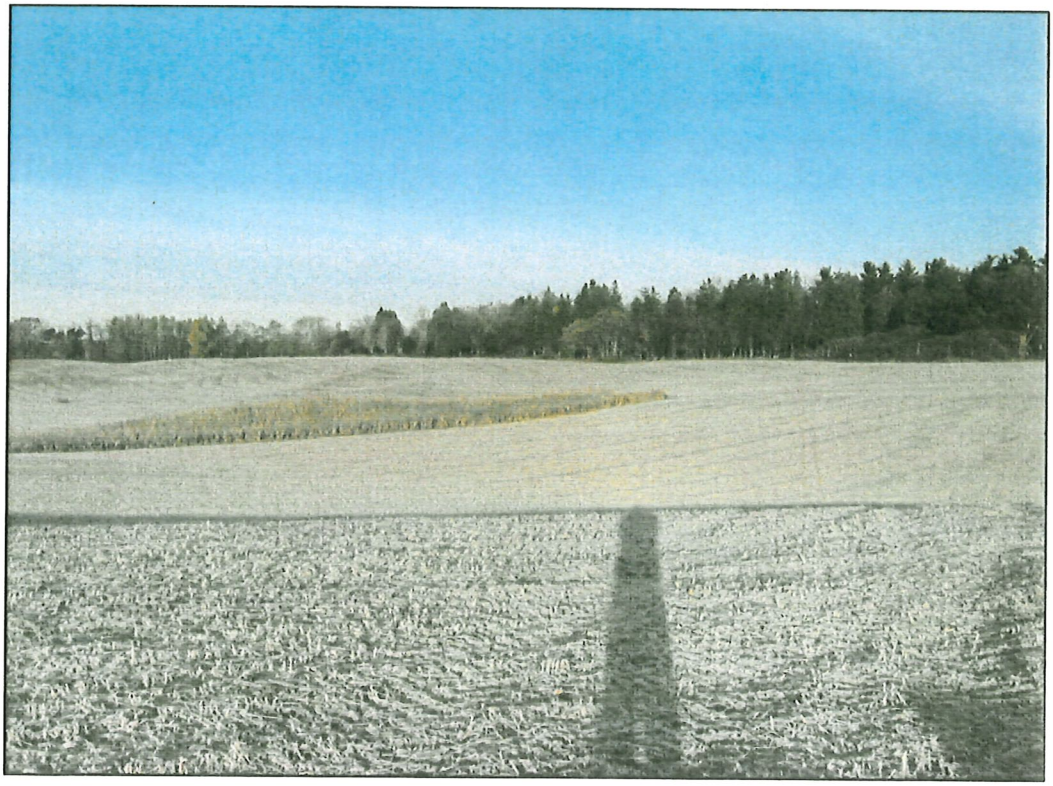

**Photo 6: Looking northwest from Borehole 4.**

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**Photo 7: Looking north from near Borehole 4.**




**Photo 8: Looking northwest from Borehole 5.**

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**Photo 9: Looking south from Borehole 5.**



**Photo 10: Looking southeast towards Ireland Road and Decou Road intersection.**

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**Photo 11: Looking north towards Borehole 26 from Decou Road.**

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November 18, 2009

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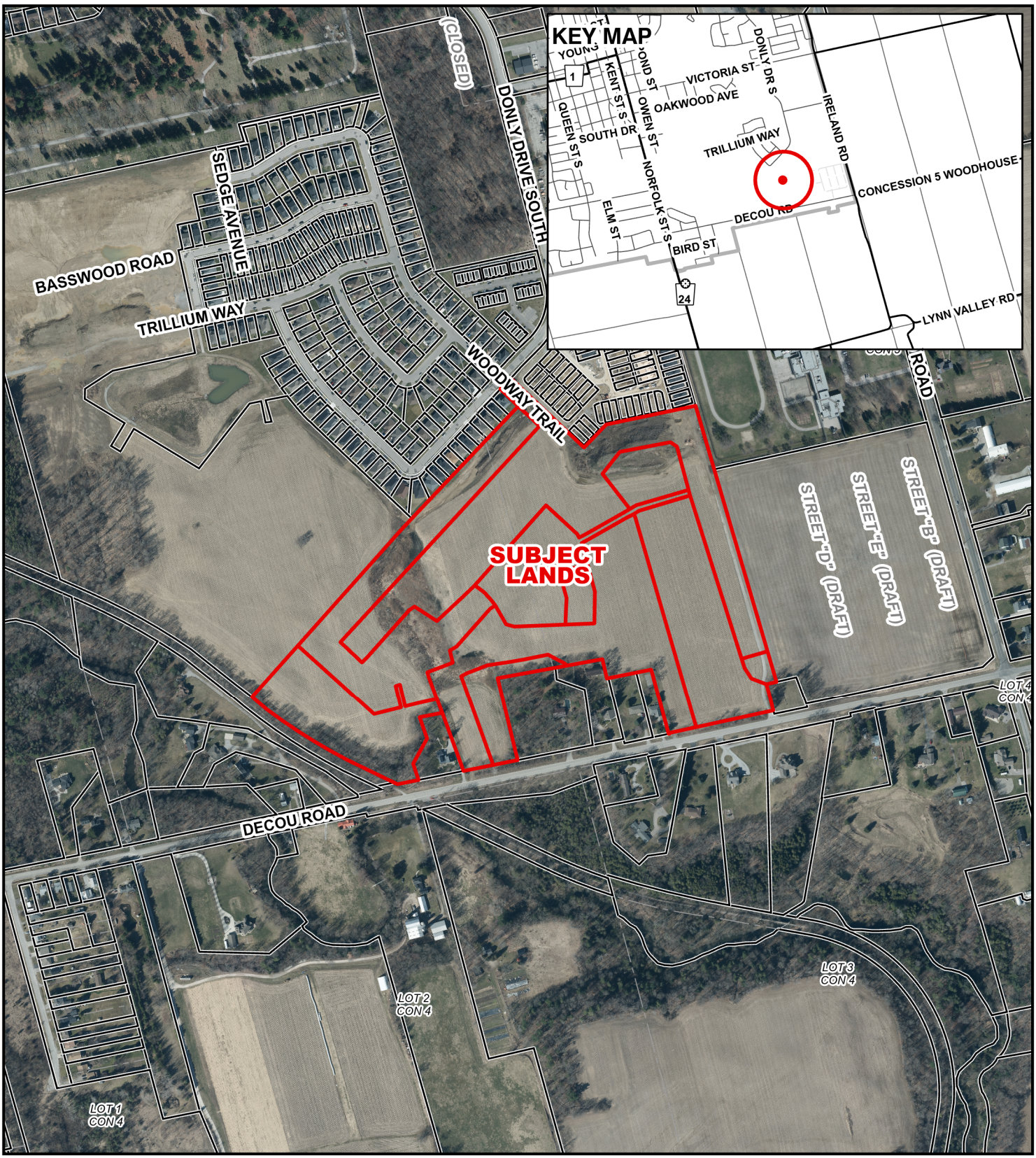
# MAP A

## CONTEXT MAP

Urban Area of SIMCOE

28TPL2026049
ZNPL2026046




4/13/2026

## Legend

Subject Lands

2020 Air Photo

N

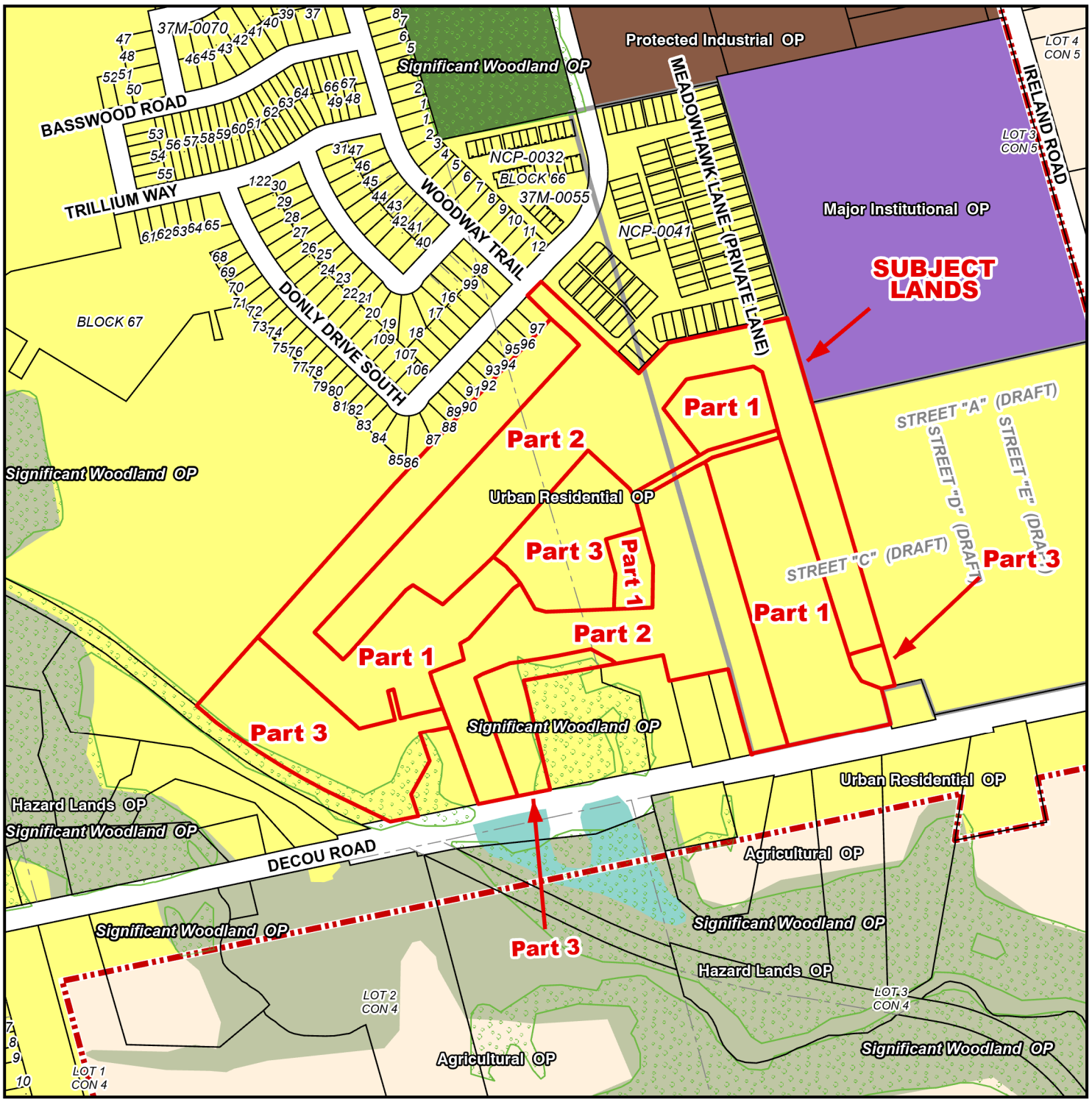
0 75 150 225 300 375 Metres

**MAP B**

# OFFICIAL PLAN MAP

Urban Area of SIMCOE

28TPL2026049
ZNPL2026046




## Legend

Subject Lands

### Official Plan Designations

- Agricultural
- Hazard Lands
- Provincially Significant Wetland
- Urban Residential
- Protected Industrial
- Major Institutional
- Parks & Open Space
- Urban Area Boundary
- Significant Woodland

4/13/2026

N

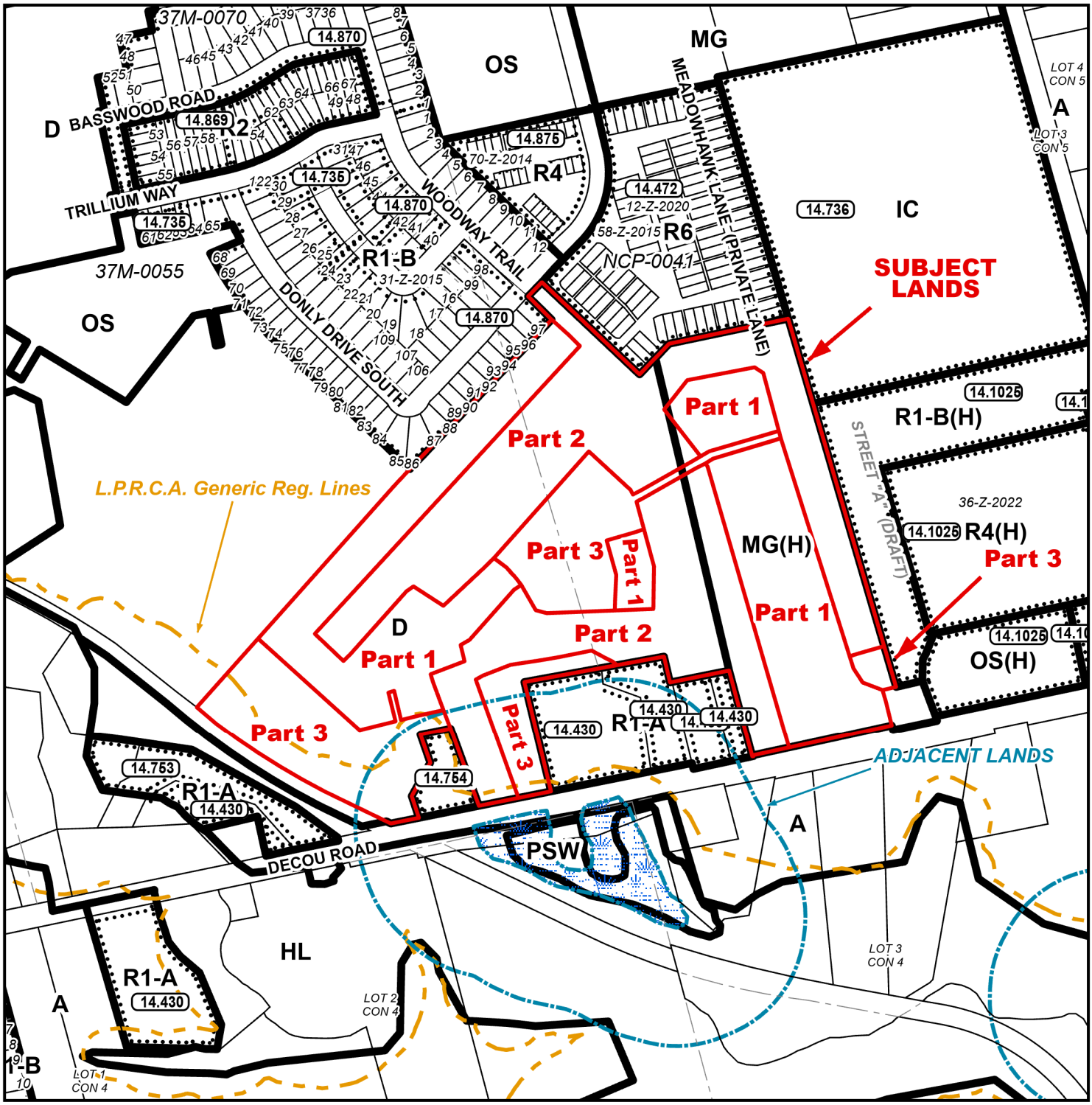
0 40 80 120 160 200 Metres

# MAP C

## PROPOSED ZONING BY-LAW AMENDMENT MAP

Urban Area of SIMCOE

28TPL2026049
ZNPL2026046




## LEGEND

- Subject Lands
- Adjacent Lands
- Wetland
- LPRCA Generic RegLines

ZONING BY-LAW 1-Z-2014

- (H) - Holding
- A - Agricultural Zone
- IC - Community Institutional Zone
- D - Development Zone
- MG - General Industrial Zone
- HL - Hazard Land Zone
- OS - Open Space Zone
- PSW - Provincially Significant Wetland Zone
- R1-A - Residential R1-A Zone
- R1-B - Residential R1-B Zone
- R2 - Residential R2 Zone
- R4 - Residential R4 Zone
- R6 - Residential R6 Zone

N

0 40 80 120 160 200 Metres

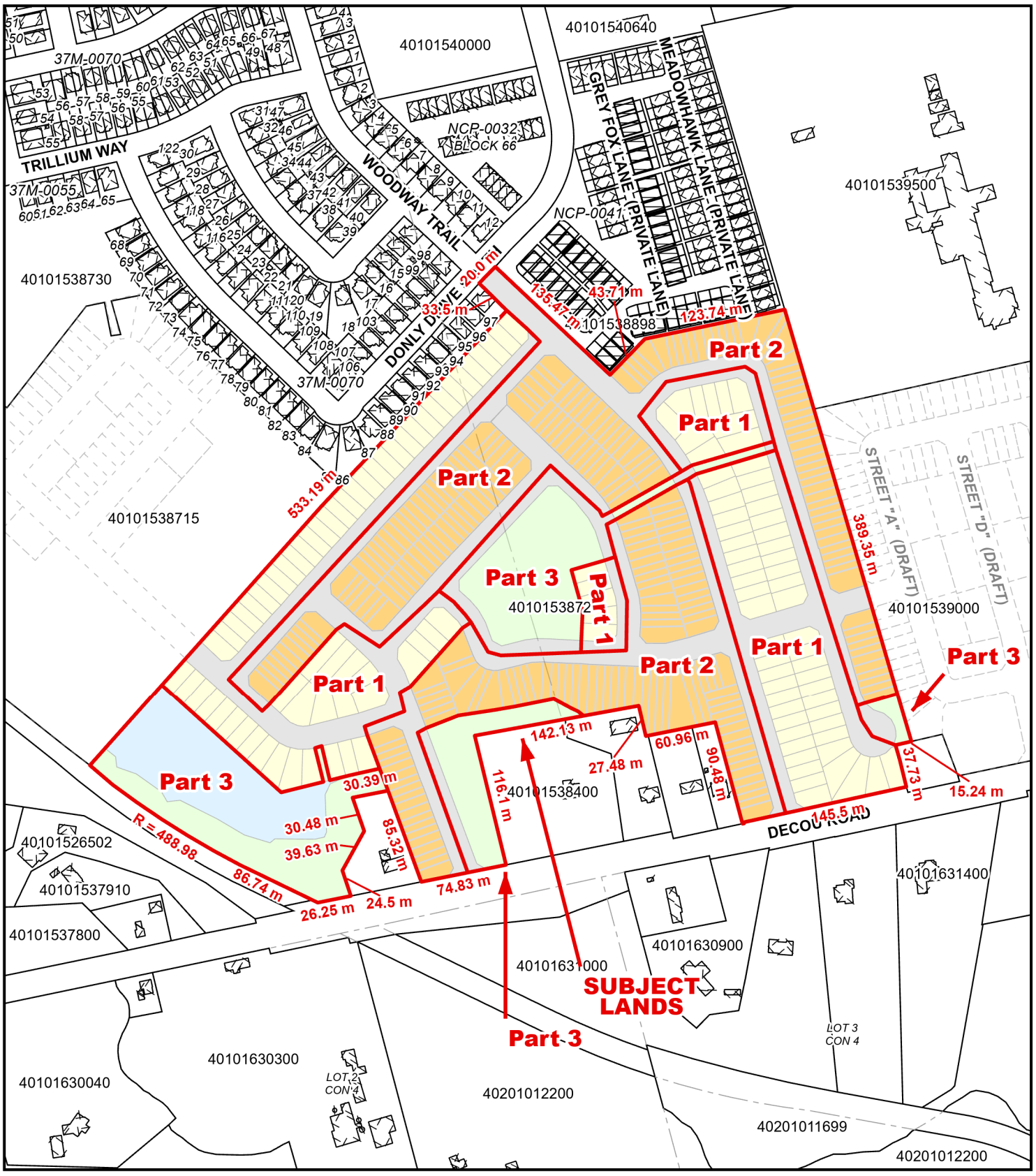
4/13/2026

# MAP D

## CONCEPTUAL PLAN

Urban Area of SIMCOE

28TPL2026049
ZNPL2026046




Legend

- Subject Lands
- Park
- Storm Water Pond
- Other

Proposed Lots By Type

- Single Family Dwelling
- Multi Family Dwellings

4/13/2026

N

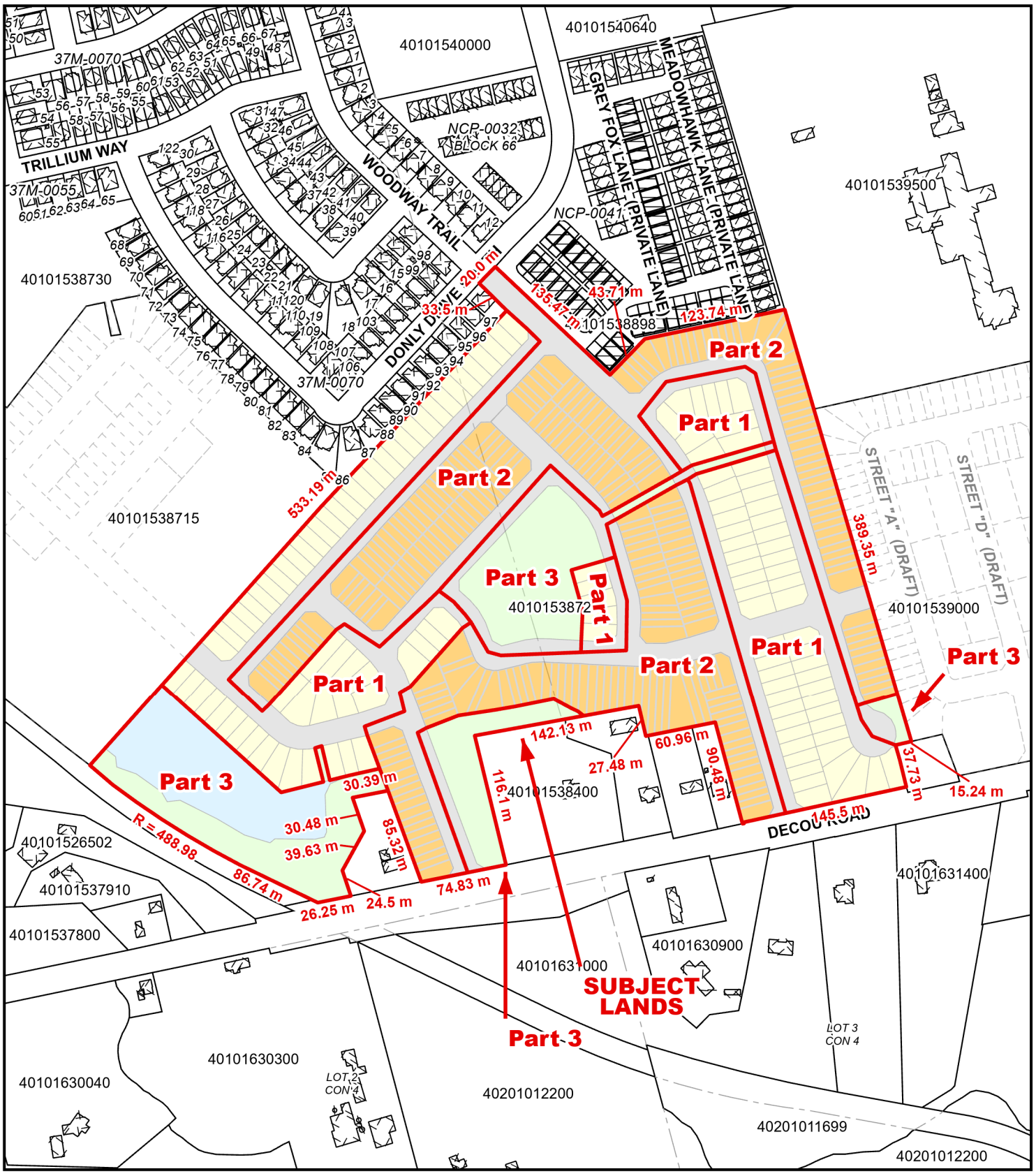
0 30 60 90 120 150 Metres

# LOCATION OF LANDS AFFECTED

## CONCEPTUAL PLAN

Urban Area of SIMCOE

28TPL2026049
ZNPL2026046




Legend

- Subject Lands
- Park
- Storm Water Pond
- Other

Proposed Lots By Type

- Single Family Dwelling
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4/13/2026

N

0 30 60 90 120 150 Metres