SHAPING GREAT COMMUNITIES

February 6, 2026 File No. 25032

Planning Department
planning@norfolkcounty.ca
185 Robinson Street
Suite 200
Simcoe, ON N3Y 5L6

RE: Draft Plan of Vacant Land Condominium and Zoning By-law Amendment
16 Fernwood Drive, Simcoe (Norfolk County)

On behalf of our client 2445680 Ontario Limited, GSP Group Inc., is pleased to submit concurrent Applications for Draft Plan of Vacant Land Condominium and Zoning By-law Amendment pertaining to lands known municipally as 16 Fernwood Drive in Simcoe.

Our client is proposing to develop the subject lands as a 68-unit condominium inclusive of 54 Group Townhouse Dwellings and 14 Semi-detached Dwellings.

The listed supporting materials in the chart below are provided to the County for review in accordance with the requirements set out in the related pre-consultation notes dated July 14, 2025.

1.0	Signed and Executed Development Planning Application Form for Vacant Land Condominium and Zoning By-law Amendment
2.0	Draft Plan of Vacant Land Condominium prepared by J.D. Barnes Ltd., signed January 26, 2026
3.0	Draft Zoning By-law Amendment and Schedule
4.0	Preliminary Site Plan prepared by GSP Group Inc., dated February 2026
5.0	Pre-consultation Notes, dated July 14, 2025.
6.0	Planning Justification Report prepared by GSP Group Inc. dated February 2026
7.0	Traffic Impact and Functional Operations Study prepared by CANDEVCON dated November 25, 2025
8.0	Stage 1 & 2 Archaeological Assessment prepared by Archaeological Consultants Canada, dated X.
9.0	Ministry of Citizenship and Multiculturalism Letter of Concurrence for Stage 1 & 2 Archaeological Assessment, dated December 9, 2025.

10.0	Record of Site Condition No. 225555 issued on X.
11.0	Functional Service Design Brief prepared by Counterpoint Engineering dated November 26, 2025
12.0	Stormwater Management Brief prepared by Counterpoint Engineering dated November 26, 2025
13.0	Civil Engineering Drawing Set (Preliminary) prepared by Counterpoint Engineering, dated X, inclusive of:
14.0	Fire Flow Test Report prepared by Hydrant testing Ontario, dated September 24, 2025.
15.0	Preliminary Landscape Plan prepared by Adesso Design Inc. dated January 27, 2026
16.0 - 16.3	Preliminary Typical Elevation Plans prepared by Peter Del Grosso
17.0	Topographic Survey prepared by J.D. Barnes Ltd., dated X.
18.0	Boundary Survey - Reference Plan 37R-11246
19.0	PIN Map
20.0	Parcel Register

Please note that the required review fee for the applications will be provided directly to the County Office in Simcoe by courier.

Should you have any questions, or require any additional information, please contact the undersigned at 226-929-6026 or by email at crohe@gspgroup.ca.

Respectfully submitted,

GSP GROUP INC.

Craig A. Rohe, RPP, MCIP
Senior Planner
crohe@gspgroup.ca
226-929-6026

Planning Department Development Application Form

Complete Application

A complete development application consists of the following:

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

Pre-Submission Consultation:

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

Development Application Process

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

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

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

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

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

Notification Sign Requirements

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

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

Contact Us

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

For Office Use Only:

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

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

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

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

The applications have been submitted to facilitate the development of a 68-unit condominium townhouse development that contains 54 Group Townhouse Dwellings and 14 Semi-detached Dwellings at 16 Fernwood Drive in Simcoe.

Property Assessment Roll Number: 40201004800

A. Applicant Information

Name of Owner 2445680 Ontario Limited

Address 23 Wingate Crescent

Town and Postal Code Richmond Hill, ON L4B 3J3

Phone Number

Cell Number 416-565-6548

Email rnischal@sympatico.ca

Name of Applicant 2445680 Ontario Limited

Address 23 Wingate Crescent

Town and Postal Code Richmond Hill, ON L3B 3J3

Phone Number

Cell Number 416-565-6548

Email rnischal@sympatico.ca

Name of Agent Craig Rohe, RPP, MCIP (GSP Group Inc.)

Address 162 Locke Street South

Town and Postal Code Hamilton, ON L8P 4A9

Phone Number 289-814-3090

Cell Number 226-929-6026

Email crohe@gspgroup.ca

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

☐ Owner ■ Agent ☐ Applicant

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

N/A

B. Location, Legal Description and Property Information

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):
   Part of Lot 18, Concession Gore, in the Geographic Township of Woodhouse in Norfolk County

   Municipal Civic Address: 16 Fernwood Drive, Simcoe

   Present Official Plan Designation(s): Urban Residential

   Present Zoning: Urban Residential Type 4 (R4)

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

   ■ Yes ☐ No If yes, please specify corresponding number:
   14.979.1

3. Present use of the subject lands:
   Vacant Lands

4. Please describe **all existing** buildings or structures on the subject lands and whether they will be retained, demolished or removed. If retaining the buildings or structures, please describe the type of buildings or structures, and illustrate the setback, in metric units, from the front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:
   There are no existing structures on the Subject Lands.

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

6. Please describe **all proposed** buildings or structures/additions on the subject lands. Describe the type of buildings or structures/additions, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:
   Group Townhouses and Semi-detached Dwellings are proposed.
   Please consult the preliminary site plan, draft zoning by-law amendment and Planning Report.

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

   If yes, identify and provide details of the building:

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

   Lands have not been developed any any point in time.

9. Existing use of abutting properties:

   Residential (W,N,E), Agricultural (S)

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

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

C. Purpose of Development Application

Note: Please complete all that apply.

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

   Development of a 68 unit condominium townhouse development. The Draft Plan of Vacant Land Condominium is required to establish tenure. The related Zoning Amendment is required to establish site performance criteria.

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

   The applicable site specific zoning relates to a previously approved development that did not proceed. The revised zoning proposed in this application reflects the current proposal and more closely aligns with the applicable provisions of the R4 zone in By-law 1-Z-2014.

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

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

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

   _____

   _____

   _____

6. Description of land intended to be severed in metric units:
   Frontage: N/A
   Depth: _____
   Width: _____
   Lot Area: _____
   Present Use: _____
   Proposed Use: _____
   Proposed final lot size (if boundary adjustment): _____
   If a boundary adjustment, identify the assessment roll number and property owner of the lands to which the parcel will be added: _____

   _____

   Description of land intended to be retained in metric units:
   Frontage: N/A
   Depth: _____
   Width: _____
   Lot Area: _____
   Present Use: _____
   Proposed Use: _____
   Buildings on retained land: _____
7. Description of proposed right-of-way/easement:
   Frontage: N/A
   Depth: _____
   Width: _____
   Area: _____
   Proposed use: _____
8. Name of person(s), if known, to whom lands or interest in lands to be transferred, leased or charged (if known):

   _____

Please see Draft Amendment included with the Application Submission

9. **Site Information**	**Zoning**	**Proposed**
Please indicate unit of measurement, for example: m, m^2 or %		
Lot frontage	_____	_____
Lot depth	_____	_____
Lot width	_____	_____
Lot area	_____	_____
Lot coverage	_____	_____
Front yard	_____	_____
Rear yard	_____	_____
Left Interior side yard	_____	_____
Right Interior side yard	_____	_____
Exterior side yard (corner lot)	_____	_____
Landscaped open space	_____	_____
Entrance access width	_____	_____
Exit access width	_____	_____
Size of fencing or screening	_____	_____
Type of fencing	_____	_____

10. Building Size

Number of storeys	_____	_____
Building height	_____	_____
Total ground floor area	_____	_____
Total gross floor area	_____	_____
Total useable floor area	_____	_____

11. Off Street Parking and Loading Facilities

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

12. Residential (if applicable)

Number of buildings existing: 0

Number of buildings proposed: 68 dwelling units across 18 buildings.

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

If yes, describe: _____

Type	**Number of Units**	**Floor Area per Unit in m2**
Single Detached		
Semi-Detached	14	Variable
Duplex		
Triplex		
Four-plex		
Group Townhouse	54	Variable
Stacked Townhouse		
Apartment - Bachelor		
Apartment - One bedroom		
Apartment - Two bedroom		
Apartment - Three bedroom		

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

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: _____

Number of buildings proposed: _____

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

If yes, describe:

_____

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

_____

_____

_____

Seating Capacity (for assembly halls or similar): _____

Total number of fixed seats: _____

Describe the type of business(es) proposed: _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

Is open storage required: ☐ Yes ☐ No

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

☐ Yes ☐ No If yes please describe:

_____

_____

14. Institutional (if applicable)

Describe the type of use proposed: _____

Seating capacity (if applicable): _____

Number of beds (if applicable): _____

Total number of staff proposed initially: _____

Total number of staff proposed in five years: _____

Maximum number of staff on the largest shift: _____

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

_____

_____

_____

15. Describe Recreational or Other Use(s) (if applicable)

_____

_____

_____

_____

_____

D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands? ■ Yes ☐ No ☐ Unknown
   If yes, specify the uses (for example: gas station or petroleum storage):
   Former landfill area used for discarding tin and metals.
2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites? ☐ Yes ■ No ☐ Unknown
3. Provide the information you used to determine the answers to the above questions:
   Phase 1 and 2 ESA prepared by Pinchin. A Record of Site Condition was file by the Ministry of the Environment, Conservation and Parks on May 1, 2019.
4. If you answered yes to any of the above questions in Section D, a previous use inventory showing all known former uses of the subject lands, or if appropriate, the adjacent lands, is needed. Is the previous use inventory attached? ☐ Yes ☐ No

E. Provincial Policy

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

   If no, please explain:

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

   If no, please explain:

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

   If no, please explain:

   _____

   _____

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

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

   Livestock facility or stockyard (submit MDS Calculation with application)

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

   Wooded area

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

   Municipal Landfill

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

   Sewage treatment plant or waste stabilization plant

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

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

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

   Floodplain

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

   Rehabilitated mine site

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

   Non-operating mine site within one kilometre

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

   Active mine site within one kilometre

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

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

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

   Active railway line

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

   Seasonal wetness of lands

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

   Erosion

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

   Abandoned gas wells

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

F. Servicing and Access

1. Indicate what services are available or proposed:

Water Supply

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

Sewage Treatment

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

Storm Drainage

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

2. Existing or proposed access to subject lands:

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

Name of road/street: Fernwood Drive

G. Other Information

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

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.
   Please see the Planning Justification Report prepared by GSP Group Inc.

H. Supporting Material to be submitted by Applicant

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

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

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

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

☐ Zoning Deficiency Form

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

☐ Architectural Plan

☐ Buildings Elevation Plan

☐ Cut and Fill Plan

☐ Erosion and Sediment Control Plan

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

☐ Landscape Plan

☐ Photometric (Lighting) Plan

☐ Plan and Profile Drawings

☐ Site Servicing Plan

☐ Storm water Management Plan

☐ Street Sign and Traffic Plan

☐ Street Tree Planting Plan

☐ Tree Preservation Plan

☐ Archaeological Assessment

☐ Environmental Impact Study

☐ Functional Servicing Report

☐ Geotechnical Study / Hydrogeological Review

☐ Minimum Distance Separation Schedule

☐ Noise or Vibration Study

☐ Record of Site Condition

☐ Storm water Management Report

☐ Traffic Impact Study – please contact the Planner to verify the scope required

Site Plan applications will require the following supporting materials:

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

Standard condominium exemptions will require the following supporting materials:

☐ Plan of standard condominium (2 paper copies and 1 electronic copy)

☐ Draft condominium declaration

☐ Property Identification Number (PIN) printout

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

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

I. Development Agreements

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

J. Transfers, Easements and Postponement of Interest

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

K. Permission to Enter Subject Lands

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

L. Freedom of Information

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

Owner/Applicant Signature	February 6, 2026 Date

M. Owner's Authorization

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

I/We Ram Nischal ASO for 2445680 Ontario Limited am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize Craig Rohe (GSP Group Inc.) to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

Owner	Dec 16/25 Date
Owner	Date

N. Declaration

I, Craig Rohe (GSP Group Inc.) of the City of Welland

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:

The City of Hamilton

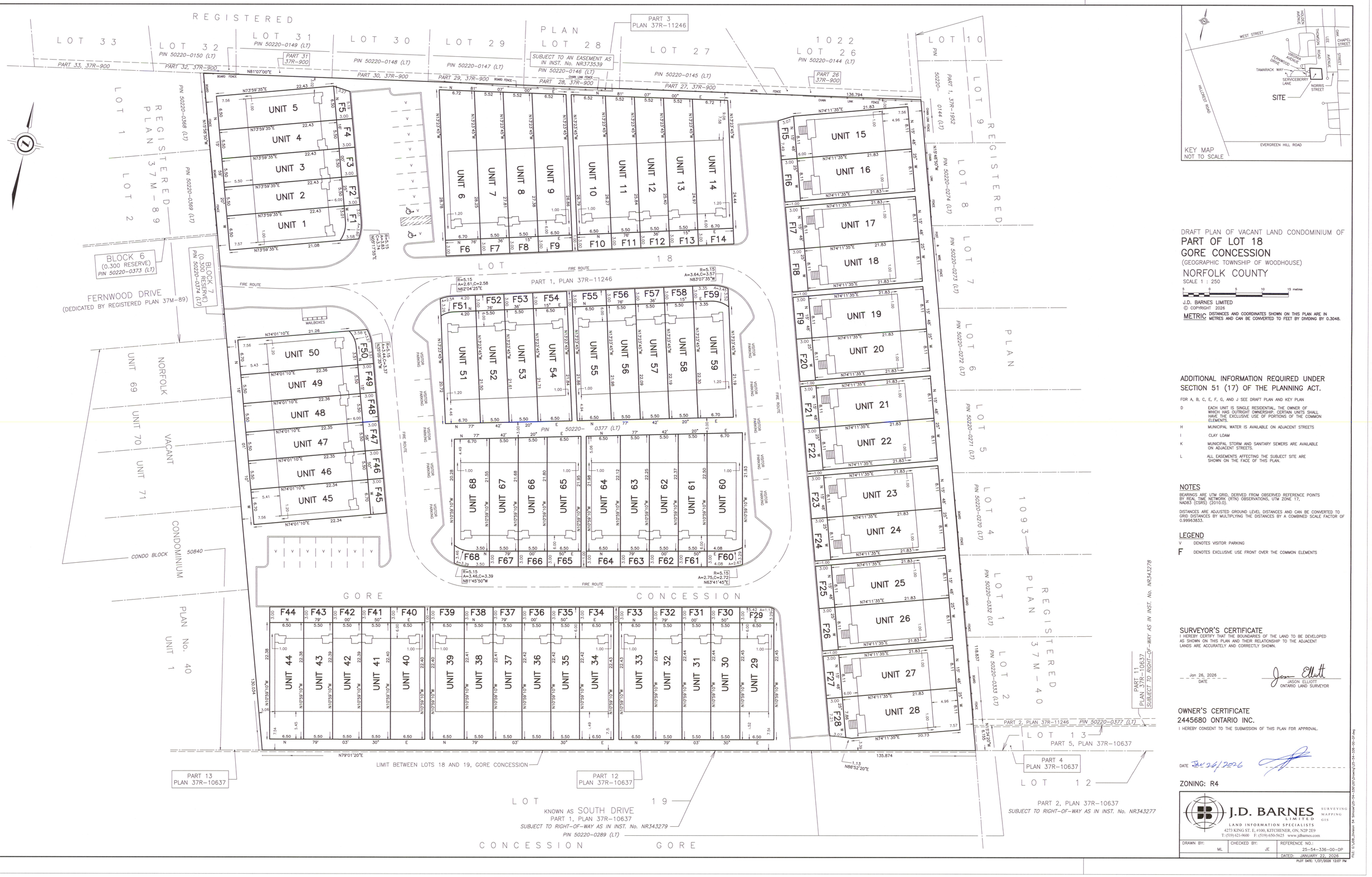
Owner/Applicant Signature

In Province of Ontario

This 26 day of February

A.D., 20 26

A Commissioner, etc.



DRAFT PLAN OF VACANT LAND CONDOMINIUM OF

PART OF LOT 18
GORE CONCESSION

(GEOGRAPHIC TOWNSHIP OF WOODHOUSE)

NORFOLK COUNTY

SCALE 1 : 250

5 0 5 10 15 metres

J.D. BARNES LIMITED

© COPYRIGHT 2026

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

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT.

FOR A, B, C, E, F, G, AND J SEE DRAFT PLAN AND KEY PLAN

D EACH UNIT IS SINGLE RESIDENTIAL. THE OWNER OF WHICH HAS OUTRIGHT OWNERSHIP. CERTAIN UNITS SHALL HAVE THE EXCLUSIVE USE OF PORTIONS OF THE COMMON ELEMENTS.

H MUNICIPAL WATER IS AVAILABLE ON ADJACENT STREETS

I CLAY LOAM

K MUNICIPAL STORM AND SANITARY SEWERS ARE AVAILABLE ON ADJACENT STREETS.

L ALL EASEMENTS AFFECTING THE SUBJECT SITE ARE SHOWN ON THE FACE OF THIS PLAN.

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE ADJUSTED GROUND LEVEL DISTANCES AND CAN BE CONVERTED TO GRID. DISTANCES BY MULTIPLYING THE DISTANCES BY A COMBINED SCALE FACTOR OF 0.99963833.

LEGEND

V DENOTES VISITOR PARKING

F DENOTES EXCLUSIVE USE FRONT OVER THE COMMON ELEMENTS

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE DEVELOPED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

Jan 26, 2026
DATE

JASON ELLIOTT
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

2445680 ONTARIO INC.

I HEREBY CONSENT TO THE SUBMISSION OF THIS PLAN FOR APPROVAL.

DATE JAN 26/2026

ZONING: R4

J.D. BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
4273 KING ST. E, #100, KITCHENER, ON, N2P 2E9
T: (519) 621-9600 F: (519) 650-5625 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
ML	JE	25-54-336-00-DP
		DATED: JANUARY 22, 2026

FILE: G:\JOB_Drawings\25-54-336\00\Drawing\25-54-336-00-DP.dwg
PLOT DATE: 1/27/2026 12:07 PM

The Corporation of Norfolk County

By-Law __-Z-2026

Being a By-Law to Amend Zoning By-Law 1-Z-2014, as amended, for property described as 16 Fernwood Drive in Simcoe

Whereas Norfolk Council is empowered to enact this By-Law, by virtue of the provisions of Section 34 of the Planning Act, R.S.O. 1990, CHAPTER P.13, 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 hereby enacts as follows:

1. That Schedule A of By-Law 1-Z-2014, as amended, is hereby further amended by changing the zoning of the subject lands identified on Part 1 of Map A (attached to and forming part of this By-Law) from Urban Residential Type 4 Zone (R4) with special provision 14.979 to Urban Residential Type 4 Zone (R4) with revised special provision 14.979;

2. That Subsection 14 Special Provisions is hereby further amended by deleting all previous special provisions under Provision 14.979 and replacing them with the following:

   14.979 In lieu of the corresponding provisions of the R4 Zone, the following provisions shall apply to Part 1:

   i) That the Condominium Units shall not be treated as Lots, and that the "Lot" for the purpose of zoning compliance is the subject property (16 Fernwood Drive, Simcoe)

   ii) Deemed Lot Frontage – Fernwood Drive

   iii) That the following Zoning Provisions are applicable to a Group Townhouse and/or Semi-Detached Dwelling under Vacant Land Condominium Tenure:

DRAFT

a)	Minimum Lot Area (per dwelling Unit)	195 m^2
b)	Minimum Lot Frontage	19.86 m (Fernwood Drive)
c)	Minimum Front Yard [1]	6.0 m from a private roadway
d)	Minimum Exterior Side Yard [1]	i) 2.5 m from the end wall of a dwelling to a private roadway ii) 1.5 m to a parking area or space
e)	Minimum Interior Side Yard	1.2 m from the end wall to a dwelling to an interior side yard lot line
f)	Minimum Rear Yard	7.5 m from the rear wall of a dwelling to a lot line.
		12.0 metres between the rear walls of dwellings
g)	Minimum Separation between Dwellings	2.0 m between side walls of dwellings
h)	Maximum Building Height	11.0 m

[1] – Measured to back of curb.

3. That the effective date of this By-Law shall be the date of passage thereof. Enacted and passed this date day of month, year.

_____
Mayor

_____
County Clerk

DRAFT

SCHEDULE ‘A’

ZONING BY-LAW AMENDMENT NO.____

TO THE

THE ZONING BY-LAW OF NORFOLK COUNTY 1-Z-2014

SCHEDULE "A-25"



FROM SITE-SPECIFIC URBAN RESIDENTIAL TYPE 4 (R4 - 14.979)
TO A MODIFIED SITE-SPECIFIC URBAN RESIDENTIAL TYPE 4 (R4 - 14.979)

N

N.T.S

FEBRUARY 2026

Explanation of the Purpose and Effect of
By-Law __-Z-2026

This By-Law affects a parcel of land described as 16 Fernwood Drive in Simcoe.

The purpose of this By-Law is to change the zoning on the subject lands from Urban Residential Type 4 (R4) with special provision 14.979 to Urban Residential Type 4 (R4) with revised special provision 14.979 on Part 1.

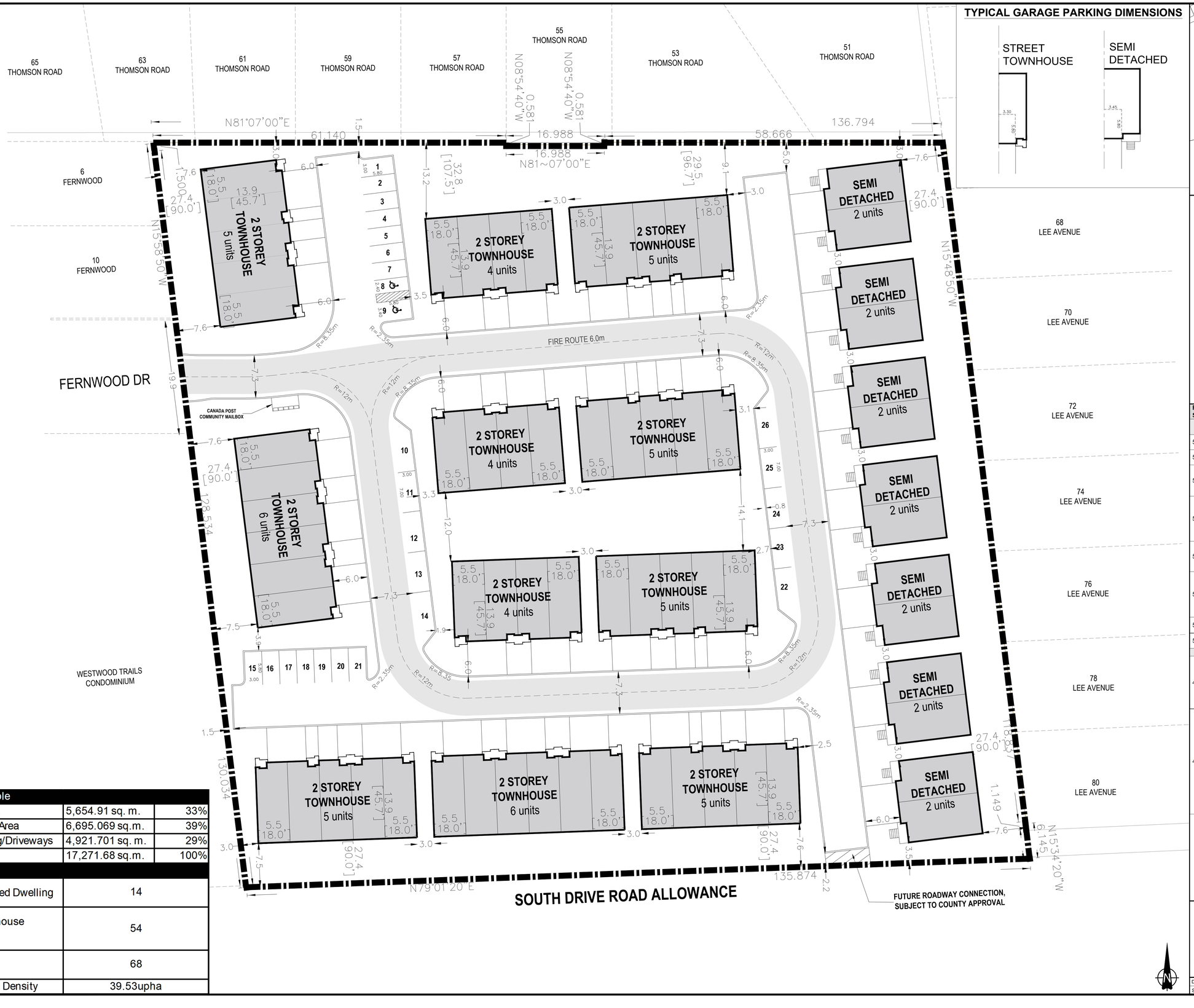
The change in provisions will allow the proposed development to be established as a Vacant Land Condominium containing Group Townhouses and Semi-detached dwellings, exclusively.

The provisions provided are derived from the base R4 Zone and are directed to be applied in a manner that does not treat the future condominium units like individual lots. Instead, setbacks are to be taken from the internal private roadway and adjacent lot lines, and between structures. All lot performance criteria is to be calculated on a Lot-wide basis.

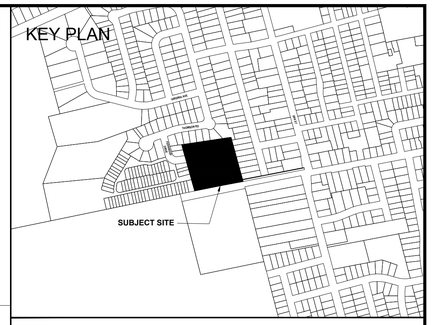
DRAFT

Applicant 2445680 Ontario Limited
File Number XXXX

DRAFT



TYPICAL GARAGE PARKING DIMENSIONS



SITE PLAN

Part of Lot 18
Concession of Gore
City of Simcoe
County of Norfolk

16 FERNWOOD DRIVE

Land Use Table		
Building Area	5,654.91 sq. m.	33%
Landscaped Area	6,695.069 sq.m.	39%
Road/Parking/Driveways	4,921.701 sq. m.	29%
Total	17,271.68 sq.m.	100%
Units		
Semi-Detached Dwelling	14	
Group Townhouse Dwellings	54	
Total Units	68	
Development Density	39.53upha	

Proposed Urban Residential Type 4 Zone (R4.14979)
Semi-Detached Dwelling & Group Townhouse Dwellings

Provision No.	Provision	Proposed Requirement	Provided
5.4.2 a)	Minimum Lot Area (per dwelling Unit)	195 m^2	254 m^2
5.4.2 b)	Minimum Lot Frontage	19.86 m (Fernwood Drive)	19.86 m (Fernwood Drive)
5.4.2 c)	Minimum Front Yard	6.0 m from a private roadway	6.0 m
5.4.2 d)	Minimum Exterior Side Yard	2.5 m from the end wall of a dwelling to a private roadway 1.5 m to a parking area or space	2.5 m (roadway) 1.8 m (parking)
5.4.2 e)	Minimum Interior Side Yard	1.2 m from the end wall to a dwelling to an interior side yard lot line	3.0 m
5.4.2 f)	Minimum Rear Yard	7.5 m from the rear wall of a dwelling to a lot line. 12.0 metres between the rear walls of dwellings	7.5 m 12.0 m
5.4.2 g)	Minimum Separation between Dwellings	2.0 m between side walls of dwellings	3.0 m
5.4.2 h)	Maximum Building Height	11.0 m	11.0 m
	Parking Requirements		
4.9.a)	single detached, semi-detached, duplex, tri-plex, four-plex, townhouse dwellings and vacation home [8-Z-2017]	2 spaces per dwelling unit (68 x 2 = 136)	136 spaces
4.9 f)	All apartment dwellings; and duplex dwellings, tri-plex dwellings, four-plex dwellings, townhouse dwellings or single detached or semi-detached dwellings as part of a condominium development or when they abut a private road [27-Z-2020].	1 visitor space for every 3 dwelling units (68 / 3 = 26.6)	26 visitor spaces

GSP group
PLANNING I URBAN DESIGN I LANDSCAPE ARCHITECTURE
gspgroup.ca

REVISIONS

Date: September 3, 2025	Drawn By: EF	Dwg. File Name: sp25032b.dwg
Scale: 1: 300	Project No.: 25032	

Norfolk County Pre-Consultation Checklist

Please select the type of application required:

☐ Official Plan Amendment

☒ Zoning By-law Amendment

☐ Draft Plan of Subdivision (Redline)

☒ Draft Plan of Condominium

☒ Site Plan

Please read all the information in this document on the requirements for future development planning applications. As a result of the information shared at the pre-consultation meeting dated June 11, 2025, the following applications and qualified professional documents/reports are required as part of a complete application. Please include all listed items with the application to ensure a complete application. The County reserves the right to change, reduce or add requirements for a complete application, particularly if the submission does not match the proposal as reviewed during the pre-submission consultation meeting.

Please note that various fees are associated with each application, and there are also costs for qualified professionals retained to complete various documents/reports. All requirements identified are minimum and determined as of the date of the pre- consultation meeting, with the information available at that time. As the proposal proceeds, more information is made public, additional applications, studies, reports, etc., may be required**. The information in this document is applicable for a maximum of one (1) year from the meeting date.**

Before you submit your application, please contact the assigned Planner to confirm submission requirements and the applicable fee. Fees will not be accepted until the submission has been reviewed and confirmed by the Planning Department.

1. Property Information and Proposal Summary

Registered owner: 3761801 Canada Inc.

Applicant/agent (if different than owner): GSP Group c/o Craig Rohe

Property address: 16 Fernwood Drive, Simcoe

Roll Number: 3310402010048000000

Current Official Plan designation and Zoning: designated Urban Residential, zoned Urban Residential Type 4 (R4) with special provision 14.979.

Proposal: The applicant proposes to amend the zoning to facilitate the development of 68 Group Townhouse units under Vacant Land Condo Tenure.

2. Assigned File Planner

Name and Title: Andrew Wallace, Planner

Phone Number: 519-426-5870 ext. 1059

E-mail: andrew.wallace@norfolkcounty.ca

3. Required Studies and Plans for Complete Application

Submission Materials	Required?	Notes:
Planning Requirements		
Completed Application Form	☑	
Concept Plan	☑	
Draft Plan of Vacant Land Condominium	☑	
Landscaping Plan	☑	Required at site plan stage
Site Plan and Site Plan Details	☑	
Survey/Legal Plan	☑	
Topographical Survey	☑	
Archeological Assessment	☑	
Parking Plan	☑	Can be shown on the required drawings
Planning Justification Report	☑	
Engineering Requirements		
General Plan of Services	☑	
Lighting Plan	☑	
Lot Grading Plan	☑	
Plan and Profile Drawings	☑	Required at site plan stage
Pavement Marking and Signage Plan	☑	Required at site plan stage

Submission Materials	Required?	Notes:
Siltation and Erosion Control Plan	☑	
Utility Plan	☑	Required at site plan stage
Capital and Operating Financial Impact Assessment		
Functional Servicing Report/ Stormwater Management Report	☑	
Geotechnical Study	☑	
Water Modelling (County Consultant)	☑	
Sanitary Drainage Plan	☑	
Sanitary Design Sheet	☑	
Sanitary Modelling (County Consultant)	☑	
Storm Water Management Report (including calculations)	☑	
Storm Water Drainage Plan	☑	
Anticipated Flow/Analysis to Receiving Collection System	☑	
Traffic Impact and Functional Operations Studies	☑	

4. Detailed Comments Pertinent to the Application:

i. Norfolk County Planning and Agreement

Contact Name(s) and Title(s): Andrew Wallace, Planner
Email: andrew.wallace@norfolkcounty.ca
Comments:

The proposal seeks to erect 68 group townhouse dwelling units on an undeveloped lot within the Urban Residential OP Designation/ Urban Residential Type 4 (R4) Zone of Simcoe. It is proposed that these will be vacant land condos.

This site has been the subject of a previous Zoning By-law amendment application which approved the change of use of the land to R4 with a special provisions as allowed through appeal. This allowed for both street and stacked townhouses. Following this, the subdivision application and site plan were also approved. It is my understanding that no agreement was ever registered on title.

Staff have concerns regarding the number of units with only one vehicle access. I have noticed that there is an unopened road allowance owned by the County to the south of the site (an extension of South Drive) that could perhaps allow for a second access to the site, directly onto municipal roads rather than through the neighbouring condo lands. This would also improve access in terms of emergency services. However, this is something you would need to discuss with our Realty team who have also included notes below.

Staff strongly recommend that all Zoning By-law parking requirements be adhered to.

This development also has a high density. The Norfolk County Official Plan states that for group townhouse developments, the density should be between 15 and 30 units per hectare. You are proposing a density of 41.6 units per hectare. This is quite high and although the previously approved development was also similarly high, this could trigger the need for an Official Plan Amendment application to allow a density of this level. Please address the density in the PJR and outline how it is being met.

This density also restricts the ability to provide on-site parkland or open space which in turn, could have implications for surface water drainage.

Previous studies for this site belong to the previous landowners and could not be applied to the proposed application.

i. Agreement Services

Annette Helmig, Agreement and Development Coordinator
Email: Annette.helmig@norfolkcounty.ca
Comments:

Thank you for your proposal. Conditions of draft approval will need to be cleared as part of your current condominium 28CDPL2018329 application and new site plan applications. One of these conditions will be to enter into a development agreement with the County. The agreement will be registered on title at the owner's expense. A Plan will also need to be registered to identify the condominium block and South Drive widening. We look forward to reviewing the condominium declaration and including municipal standard requirements. The County will collect and hold onto performance securities for the infrastructure and landscaping works until the end of the maintenance period. The owner will also be required to secure and keep in force commercial general liability insurance coverage, prior to and during the construction until after a successful site inspection and release of the performance securities. Contact the undersigned when you are ready to start your agreement or if you have any questions. The attached information sheet will assist you with a

complete submission. I look forward to working with you to complete your development.

All the best.

ii. Norfolk County Building

Contact Name(s) and Title(s): Lisa Jennings, Building Inspector II
Email: lisa.jennings@norfolkcounty.ca
Comments:

The proposed construction is considered Group C Occupancies (Residential) as defined by the Ontario Building Code (OBC). You will need to retain the services of a qualified individual with BCIN Small Buildings/Building Services, and possibly a Professional Engineer to complete the design documentation for this application.

The Designer may need to provide a Part 3 Building Code matrix depending on firewalls. This matrix represents selected elements from your detailed code analysis and presents a quick overview to the municipal building official of the key OBC factors concerning your design.
The plans will need to identify OBC review items such as fire separations, project description, building size, building classification, type of construction, plumbing fixture requirements and spatial separations.

Decks do not appear to be included in the design proposal, which could lead to zoning and building code complications at a later date. Prior to a planning submission it may be a good idea to include possible deck locations to help purchasers at a later date in obtaining building permits.

No Ontario Building Code review has been completed at this time and will be done at permit application stage.

Development charges:

Development charges are available online through this link, and fees are subject to change. Pre con would it be acceptable

Development Charges | Norfolk County

Items for Building Permit

Building and Renovating | Norfolk County

Step by Step Guide Building Permit Package has been attached to the minutes herein, this contains information on drawing requirements, designers, forms, contact information for Building Department etc.

If you have any questions on the building permit process or plans required, please contact permits@norfolkcounty.ca or 226-NORFOLK (226-667-3655) ext. 6016

iii. Norfolk County Zoning

Contact Name and Title: Troy Scriven, Zoning Administrator
Email: troy.scriven@norfolkcounty.ca
Comments:

A detailed zoning table shall be provided on the site plan drawings indicating all proposed and required zoning provisions such as building setbacks and parking calculations and any other relevant provisions. Any proposed zoning deficiencies shall also be clearly indicated within the zoning table.

Ensure that the attached garages meet the minimum requirements for a parking space. There needs to be an unobstructed space of 3.3m x 5.8m in the garages. Parking spaces shall be clearly dimensioned on the site plan

The previous approved development had two barrier-free parking spaces located in the visitors parking spaces and we would be looking to match that as per section 4.3 of the zoning by-law.

iv. Norfolk County Engineering and Infrastructure Services

Contact Name and Title: Bret Hamm, Development Technologist
Email: brett.hamm@norfolkcounty.ca
Comments:

At this point the development cannot be supported by development engineering based on current modelling numbers for water services.

Amended site plan must adhere to new criteria

- This requires system upgrades to provide required FF 150L/s.
- Current modelling for the approved SPPL2020093 only provides 108L/s (on the low end)

Upgrades to infrastructure and supporting reports (specifically FSR, Modelling) would be required to support the intensification.

Norfolk County may consider permitting the construction of a road within the unopened road allowance, subject to municipal approval. Any proposed road must be designed and constructed in accordance with current County standards. The County encourages you to contact the adjacent landowner, Prominent Homes Inc. (519-426-9186, c/o Sam Bunting), to explore the possibility of

entering into an inter-developer agreement to share the costs of any required road upgrades.

Development Engineering has no objections to the current SPPL2020093, as it has been previously approved.

Other Notes:

- As a part of the draft plan conditions, the 1' reserve perpendicular to Lee Ave. will be dedicated to Norfolk County as a block within the subdivision requirements.

- Construction access for any development shall be from south dr. extension, permission from neighbor required

v. Norfolk County Realty Services
Contact Name and Title: Alisha O'Brien, Corporate Services Generalist
Email: realty.services@norfolkcounty.ca
Comments:

The County will require postponements of any Charges/Mortgages registered on title to the County's site plan agreement. We recommend that you connect with your Lender(s) (if any) and/or your solicitors as early in the process as possible to avoid any delays.

Realty Services would not be supportive of selling the road allowance to the south; however you may have the option to build up the road to municipal standards to have access to an entrance from Oak or Lee.

vi. Norfolk County Accessibility:
Contact Name and Title: Sam McFarlane, Manager, Accessibility and Customer Experience
Email: sam.mcfarlane@norfolkcounty.ca
Comments:

If visitor parking is provided, 1 of these spaces shall be accessible (Type A minimum 3.4m wide equipped with a minimum 1.5m wide access aisle)

vii. Norfolk County Fire Services
Contact Name and Title: Katie Ballantyne, Community Safety Officer
Email: katie.ballantyne@norfolkcounty.ca
Comments:

Norfolk Fire has the following comments for this proposal:

- Ensure adequate access for fire department apparatus is provided
- If roads remain private, they are to be signed as a fire access route with no on-street parking except for the designated spots
- Notify NCFD if electric vehicle charging and/or battery storage (e.g., Tesla wall) infrastructure is provided

viii. Grand Erie Public Health

Contact Name and Title: Alex Dobias, Health Promoter
Email: adobias@geph.ca
Comments:
Provided the proposed development meets the intent and purpose of applicable policy, by-laws, codes and servicing capacity:

- The health unit supports sidewalks within the development (aligned with Norfolk County's Sidewalk Policy) to enhance walkability.

ix. Ministry of Transportation

Contact Name and Title: Michael Kilgore, Corridor Management Planner
Email: michael.kilgore@ontario.ca
Comments:

Thank you for providing the MTO with the opportunity to review and provide comments.

The proposed work within Norfolk County is not located adjacent to a provincial highway or within MTO's Permit Control Area, and as such, does not require MTO review, approval or permits.

As a result of this, please be advised that I will not be in attendance for the pre-con meeting being held on June 11, 2025. If you have any question or concerns, please feel free to contact me.

x. Mississaugas of the Credit First Nation

Contact Name and Title: Abby Lee LaForme, Consultation Coordinator
Email: abby.laforme@mncfn.ca
Comments:

The Mississaugas of the Credit First Nation (MCFN) are the Treaty Holders of the land on which the project will take place – specifically, the Between the Lakes Treaty No. 3 of 1792. The MCFN holds Indigenous and Treaty Rights specific to the project location and its environs, which may be adversely impacted by it. The Department of Consultation and Accommodation (DOCA) is designated by the MCFN to handle consultation matters on its behalf.

The DOCA consultation team has filed the project-related correspondence identified above. Upon our review, we have determined that **the project should be proceeded by, at minimum, a Stage 1 archaeological assessment** to determine the location's archaeological potential. DOCA must be notified of, invited to participate in, and provided the opportunity to review this archaeological assessment, as well as any environmental assessments. At its discretion, DOCA may request capacity funding from the proponent for its consultation and engagement activities relating to the project.

DOCA expects to be notified of any and all future project updates and/or changes.

If you have any questions for the DOCA consultation team, please feel free to contact us.

xi. Six Nations of the Grand River

Contact Name and Title: Tierra Henhawk, Archaeological Community Monitor Administrative Assistant and Daylon Gee, Resource Officer
Email: acmaa@sixnations.ca and lrluo2@sixnations.ca
Comments:

With the site having archaeological potential, SNGR request a minimum stage 1 archaeology assessment. SNGR Archaeological Supervisor Tanya Hill-Montour (tanyahill-montour@sixnations.ca) will require the Archaeological Assessment Report(s) for the project for her review and comments. Any archaeology that would proceed after the stage 1 assessment we request Six Nations archaeological monitor participation.

From an environmental perspective, Six Nations would also like to request a more robust landscape plan and plant trees where you can fit them in.

5. Notes and Clauses:

1. The purpose of this document is to identify the information required to commence processing a complete application as set out in the Planning Act, R.S.O. 1990, CHAPTER P.13, as amended and the County's Official Plan.
2. Pre-consultation does not imply or suggest any decision whatsoever on behalf of staff or the County to either support or refuse the application.
3. The application should be aware that the information provided is accurate as of the date of the pre-consultation meeting. Should an application not be submitted within a year, and should other policies, by-laws or procedures be

approved by the Province, County, or other agencies prior to the submission of a formal application, the applicant will be subject to any new policies, by-laws or procedures that are in effect at the time of the submission of a formal application. **If an application is not submitted within one (1) year, another pre-consultation meeting shall be required, unless an exception is granted in writing by the Director of Planning**

4. It is hereby understood that during the review of the application additional studies or information may be required as a result of issues arising during the processing of the application or the review of the submitted studies.
5. If the County does not have sufficient expertise to review and determine that a study is acceptable, the County may require a peer review. The terms of reference for a peer review is determined by the County and paid for by the applicant.
6. Please note if performance securities are required by the County to secure any internal and external development works, a recommended condition for your planning application approval will be to enter into a development agreement with the County. The agreement will be registered on title to the subject lands, at the owner's expense. The additional requirements for an agreement could include, but are not limited to the following:
    - Engineering drawing review
    - Engineer's schedule of costs for the works
    - Clearance letter and supporting documentation to support condition clearance
    - User fees and performance securities
    - Current property identification number (PIN printout)
    - Owner's commercial general liability insurance certificate
    - Professional liability insurance certificate
    - Postponement of interest
    - Transfers and / or transfer easements along with registered reference plan

Appendix A: Planning Reference Materials
Following is a summary of some land use planning reference materials. It is the requirement of the applicant to ensure compliance with applicable legislation, policies, and regulations.

Provincial Policy Statement, 2020
https://www.ontario.ca/page/provincial-policy-statement-2020

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

Section 9.6.1 outlines requirements in relation to requests to amend the Official Plan. Section 9.6.2 outlines requirements in relation to requests to amend the Zoning By-law.

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

Norfolk County Zoning By-Law 1-Z-2014
https://www.norfolkcounty.ca/government/planning/new-zoning-by-law/

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

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

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

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

Summary of Fees, Forms, and other information pertaining to the planning process can found by visiting https://www.norfolkcounty.ca/government/planning/

Norfolk County Engineering Design Standards

All applicants must adhere to Norfolk County's Design Criteria when undertaking a development project. Please contact Engineering and Infrastructure Services directly for a copy of Norfolk County's Design Criteria.

Planning Department – Agreement Services
Community Development Division
12 Gilbertson Drive, Simcoe Ontario, N3Y 4L1

INSURANCE REQUIREMENTS

For the Owner Entering Into a Development Agreement

Prior to the execution of the Development Agreement, the Owner shall purchase, at its expense, obtain and keep in force, during the term of the Agreement, until the end of the maintenance / guarantee period and return of all securities, insurance coverage. The insurance policy or policies shall be in the Owner's name as shown on the property identification number.

The issuance of such insurance policy or policies shall not be construed as relieving the Owner from responsibility for any other or larger claims in excess of such policy or policies, if any, for which the Owner may be held responsible. Such insurance policy or policies shall be in a form acceptable to Norfolk County and, without limiting the generality of the foregoing, shall provide:

1. **Commercial General Liability** insurance policy with and including the following coverages:

    a. a limit of liability of not less than five million dollars ($5,000,000) per occurrence;

    b. The Corporation of Norfolk County 50 Colborne Street South, Simcoe ON N3Y 4H3 named as an additional insured

    c. Non-owned automobile coverage with a limit of at least two million dollars ($2,000,000) per occurrence including contractual non-owned coverage

    d. Cross liability and severability of interest in respect of the named insured

    e. Products and completed operations

    f. Premises and operations liability

    g. Contingent employers liability

    h. Contractual liability

    i. Thirty (30) days prior written notice of any alteration, cancellation or change in policy terms, which reduces coverage, and any such notice of cancellation shall be given in writing to Norfolk County

2. **Environmental Impairment Liability** insurance with a limit of not less than two million dollars ($2,000,000) per claim

3. **Automobile Liability** insurance with a limit of not less than two million dollars ($2,000,000) per occurrence

If the Agreement is regarding a **Cannabis** development we request under the Description of Operations, the verbiage must specifically refer to a Cannabis Facility.

Norfolk County reserves the right to request such higher limits of insurance or other types of policies appropriate to the Agreement as Norfolk County may reasonably require from time to time.

Proof of Insurance

The Owner shall provide the certificate of insurance or certified copies of the above referred to policies, satisfactory to Norfolk County. Provided that if a certificate is provided, all requirements as above set forth must be shown on the said certificate and notwithstanding the provision of any certificate, Norfolk County may require that the Owner provide a certified copy of the policy, if required. Such certificates or policies shall be provided prior to the commencement of any work.

The Owner shall further provide evidence of the continuance of said insurance be filed at each policy renewal date for the duration of the Agreement until the end of maintenance period. In the event any renewal premium is not paid, Norfolk County, in order to prevent the lapse of such policy, may pay the renewal premium or premiums, and the Owner agrees to reimburse Norfolk County for the cost of such renewals within ten (10) days of the account therefore being rendered by Norfolk County. Further, prior to the commencement of the Agreement, the Owner shall cause its insurance broker to confirm in writing that it will accept any request from Norfolk County to renew such insurance and will extend the term of any such insurance policy held by the Owner in accordance with such request upon payment of the renewal premium(s) by Norfolk County.

Notice

Every party to the Agreement agrees to immediately notify all other parties of any occurrence, incident, or event, which may reasonably be expected to expose any of the parties to liability of any kind in relation to the development of the Lands.

REQUIRED INFORMATION

Development Name_____

Property Legal Description_____

Site Plan Number **SPPL**_____

Roll Number **3310**_____

PIN Number_____

For Residential Unit Type and Number

- Single Detached_____
- Semi-Detached_____
- Duplex_____
- Triplex_____
- Fourplex_____
- Street Townhouse_____
- Stacked Townhouse_____
- Apartment_____
- Affordable_____
- Accessible_____
- Rental_____

Existing and Proposed Street Names_____

Transfer Easements Block Number and Purpose_____

Transfer Block Number and Purpose_____

Geotechnical Report prepared for Lands	YES	NO	UNKNOWN
Lands are Within the Source Water Protection Area	YES	NO	UNKNOWN
Lands Contain any Contaminated or Impacted Soil	YES	NO	UNKNOWN
Lands Contain any Natural Watercourse	YES	NO	UNKNOWN
Lands Contain any Wetlands	YES	NO	UNKNOWN
Lands Contain any Archaeological Sites	YES	NO	UNKNOWN
Lands Contain an Existing Well and or Septic Field	YES	NO	UNKNOWN
Species at Risk Branch MECP Screening	YES	NO	UNKNOWN
Lands Contain any Endangered Species	YES	NO	UNKNOWN

OWNER

OWNER NAME (PIN)_____

CONTACT NAME_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

AGENT

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

ENGINEER

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

SURVEYOR

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

LAWYER / SOLICITOR

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

INSURANCE PROVIDER

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL_____

FINANCIAL INSTITUTION

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL_____

MORTGAGEE (IF APPLICABLE)

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

SPECIES AT RISK SCREENING

The Ontario Endangered Species Act inquiries and Species at Risk screening are handled by the Ministry of the Environment, Conservation and Parks, specifically the "Species at Risk Branch" and the e-mail address for handling these inquiries is SAROntario@ontario.ca.

TRANSFERS, EASEMENTS AND POSTPONEMENT OF INTEREST

The owner acknowledges and agrees that, it is their solicitor's responsibility on behalf of the owner for the registration of all transfer(s) of land to the County, free and clear of any charges or encumbrances, and/or transfer(s) of easement in favour of the County and/or utilities at no cost to the County. In addition, 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 to the County's agreements.

INSURANCE CERTIFICATES

Prior to the execution of the development agreement, the owner shall, at their expense, obtain and keep in force, during the term of this development agreement, commercial general liability insurance coverage satisfactory to the County. The owner further agrees and authorizes the County to discuss with their insurance provider the specific insurance requirements of the County for agreement purposes only. In addition, the County will require any professionals hired such as an engineer, surveyor or architect to carry professional liability insurance to provide coverage for acts, errors and omissions arising from their professional services performed.

OWNER'S AUTHORIZATION

I/We am/are the registered owner(s) of the lands that is the subject of this development agreement.

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

I/We authorize the Agreement Administrator to provide and receive information on my/our behalf in connection to the insurance coverage, letter of credit and agreement registration of my/our development.

I/We acknowledge that if there are any new charges or mortgage holders on the property they will be required to postpone their interest on the property to the County's development agreement for site plan approval.

Owner Signature Date

APPLICATION AND FEES

To start your agreement please apply on our **CityView Portal** **https://permits.norfolkcounty.ca/CityViewPortal/** Don't forget to fill out, sign and upload the first three pages of this document as part of a complete application. A payment slip will be provided to you identifying the user fees that will be applicable for your development. If paying by credit card, please contact ServiceNorfolk at 226-667-3655 extension 0 or you can visit ServiceNorfolk customer service desk at the County Administration Building at 50 Colborne Street South in Simcoe. The doors on Talbot Street South will be open for customers to enter during business hours Monday to Friday from 8:30 am to 4:30 pm. Please make your cheque payable to the Corporation of Norfolk County. You may also make payment by mail or courier to my contact information below. If you anticipate registration within four weeks please provide a certified cheque.

CONTACT FOR FURTHER INFORMATION AND QUESTIONS

Annette Helmig, Agreement and Development Coordinator
Norfolk County, Community Development Division, Planning Department, Agreement Services
12 Gilbertson Drive, Simcoe Ontario, N3Y 4L1
annette.helmig@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 N3Y 4H3.

DOCUMENTATION AND FEES REQUIRED FOR SITE PLAN AGREEMENT EXECUTION

Owner's agreement authorization (page 3 of this document)

Current parcel register (property identifier or PIN printout)

Owner's commercial general liability certificate of insurance

Professional liability insurance for engineer

Reference plan for any transfers or easements

Postponement of interest from mortgagee / chargee to agreement (if applicable)

Construction estimates (100% for external and landscaping and 10% for internal works)

Letter of credit, surety bond or certified cheque for performance securities

Property taxes up to date

User fees (according to the By-Law in effect at the time that payment is made)
(if time is of the essence a certified cheque is requested)

- $3,022 for preparation of the site plan agreement
- $487 for financial administration of this agreement
- $590 per tree cash-in-lieu of trees (if applicable)
- 2% or 5% land appraisal cash-in-lieu of parkland (if applicable)

Planning Justification Report

16 Fernwood Drive

Draft Plan of Vacant Land Condominium
Zoning By-law Amendment
GSP File No. 25032

Simcoe, Norfolk County

February 2026

Prepared for:
2445680 Ontario Limited
23 Wingate Crescent
Richmond Hill, ON L4B 3J3

Prepared by:
GSP Group Inc.
162 Locke Street South, Suite 200
City of Hamilton, ON
L8P 4A9

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Preamble

GSP Group Inc. ("GSP") has been retained by 2445680 Ontario Limited (the "Owner") to provide professional land use planning services regarding the property known as 16 Fernwood Drive (the "subject lands") in the community of Simcoe within Norfolk County.

The Owner is proposing to develop the subject lands as a residential condominium that will include fourteen (14) semi-detached dwellings and fifty-four (54) Group Townhouse dwellings, for a total of sixty-eight (68) dwelling units. To facilitate the proposal, the approval of concurrent Zoning By-law Amendment and Draft Plan of Vacant Land Condominium applications is required.

To demonstrate planning compliance and the merits of the applications, GSP Group has prepared this Planning Justification Report in accordance with the requirements of Policies 9.5.3 e) and f) of the Norfolk County Official Plan ("NCOP").

This Planning Justification Report is structured as follows:

Section 1.0 – Subject Lands and Surrounding Area Context	Overview of the subject lands, surrounding land uses, and transportation context.
Section 2.0 – Proposed Development and Planning Applications	Outline of the development proposal, the previous approvals granted on the subject lands, and the planning applications submitted by the Owner.
Section 3.0 – Supporting Studies	Overview of the technical and supporting studies provided with the Applications.
Section 4.0 – Planning Framework and Analysis	Evaluation of the proposed development in the context of the Planning Act R.S.O. (1990), Provincial Planning Statement (2024), Norfolk County Official Plan, and County of Norfolk Zoning By-law 1-Z-2014.
Section 5.0 – Land Use and Neighbourhood Compatibility	Review and assessment pertaining to the compatibility of the proposed development in the context of the surrounding neighbourhood.

Section 6.0 – Planning Opinion and Recommendations Report Conclusions and Planning Opinion

Within this report there are several policies that are inclusive of multiple parts and/or listed criteria. These policies have relevant elements listed in regular text, with the author's reply italicized and highlighted with a green background. (ex. *Reply)*

1. Subject Lands and Surrounding Area Context

1.1 Subject Lands

The subject lands are known municipally as 16 Fernwood Drive and legally as Part of Lots 13 & 18, Gore Concessions, Geographic Township of Woodhouse, County of Norfolk. The subject lands are situated within the southwest portion of the Simcoe Urban Area Boundary, which is located immediately adjacent to the southern lot line.

The property does not contain any existing development or structures and was cleared of some vegetation and preliminarily graded by the previous owner sometime between 2023 and 2024. There is an existing stockpile of topsoil on the northern end property.

The subject lands have been surveyed by J.D. Barnes Ltd. to measure 1.72 hectares in area with 19.9 metres of frontage along Fernwood Drive. The northern boundary line of the property also has a small "jog" that reflects a previously settled land titles matter with the adjacent property known as 55 Thomson Road. The subject lands have "Land Titles Absolute" status.

1.2 Surrounding Area and Context

The subject property is bounded to the west, north and south by existing residential development. The southern boundary of the property coincides with the limit of the Simcoe Settlement Area Boundary and an unopened road allowance associated with South Drive.

West

To the west, south of the Fernwood Drive access point to the subject property is a developed townhouse condominium site known as Westwood Trails. The development consists of Group Townhouse units that vary between one and two storeys in height.

North of the Fernwood Drive roadway access and west of the subject lands are two (2) recently developed single detached dwellings that are two-storeys in height (6 and 10 Fernwood Drive).

North

To the immediate north of the subject lands are single detached dwellings located along Thomson Road. These homes are a mix of one and two story dwellings.

East

Along the eastern boundary of the property are single detached dwellings located along the west side of Lee Avenue. These homes are a mix of one and two storey dwellings.

South

Immediately south of the subject lands is the Settlement Area Boundary and an unopened road allowance associated with a planned extension of South Drive. Beyond the road allowance are agricultural lands.

The location of the subject lands in the context of the surrounding area is shown in **Figure 1**, below. It is noted that the available air image from Norfolk County Community Map Viewer is from 2020 and does not show the completed development of Westwood Trails.



Figure 1 - 16 Fernwood Drive and Surrounding Lands
(https://norfolk.maps.arcgis.com/apps/webappviewer/index.html?id=c6683057b83744dfb36afb773ba09135)

2. Development Proposal and Planning Applications

2.1 Overview

The subject lands were purchased from the current Owner by 13761801 Canada Inc. on February 24, 2022. The current Owner held a mortgage on the property. In January 2026, 2445680 Ontario Limited completed foreclosure processes and took back full ownership of the property.

Previous Planning Approvals for the Property ("Meadows of Norfolk")

The subject lands were the subject of previous Planning Act approvals for a development called "Meadows of Norfolk" that included a Zoning By-law Amendment, Draft Plan of Subdivision and Site Plan Approval.

The previous Council-approved development proposal was a residential community consisting of street townhouse dwellings and stacked townhouses, for a total of 67 units. The development plan was proposed as Parcels-of-Tied-Land ("POTL") which included freehold lots that were accessible from a common privately owned roadway and "tied" in title. The previously proposed Site Plan, included as **Figure 2** on the following page visually illustrates the previously approved development plan for the site.

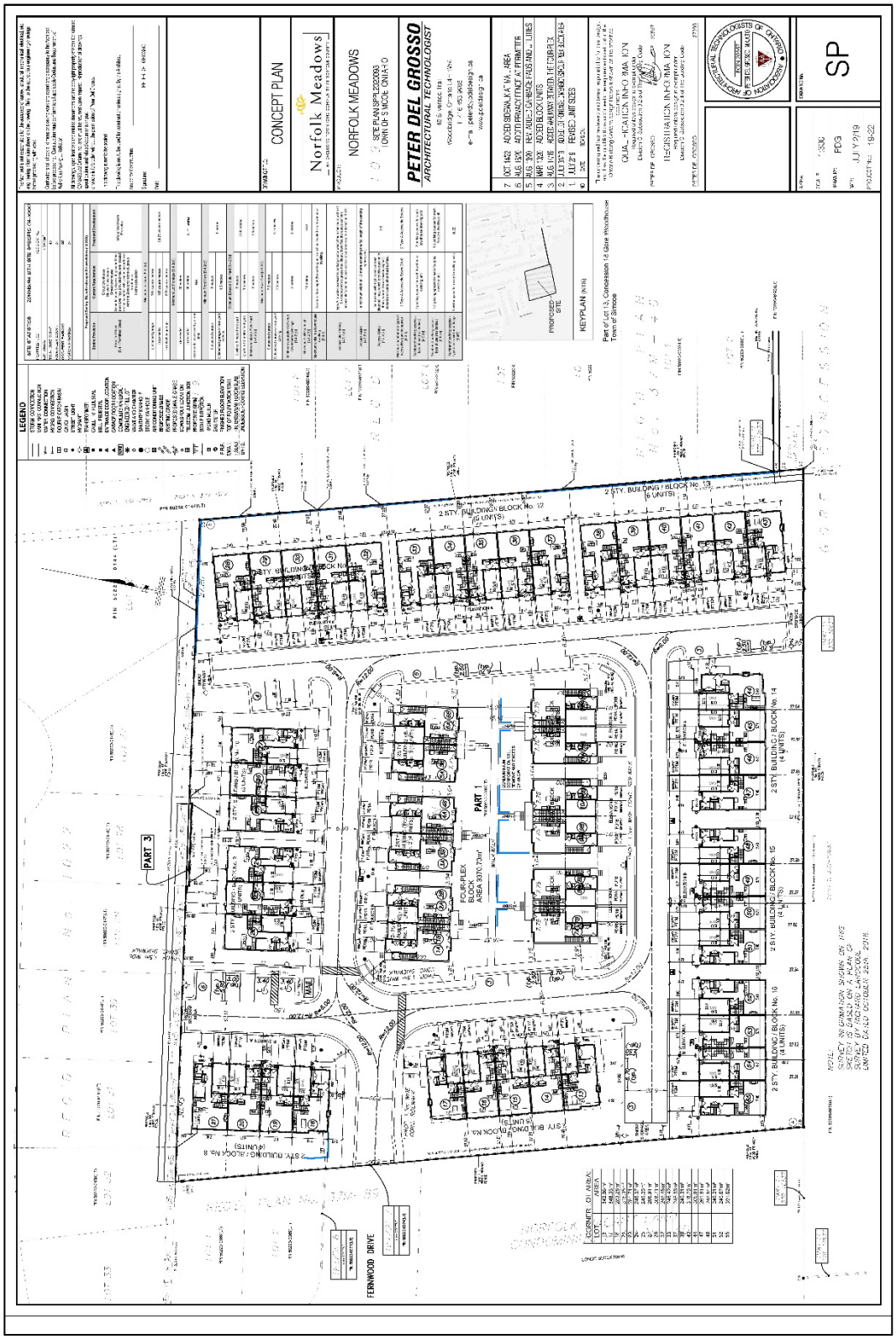


Figure 2 - Meadows of Norfolk - 67 Unit Site Plan

Current Development Proposal

The current development proposal submitted to the County by 2445680 Ontario Limited is like that previously approved by Norfolk County Council in both configuration and intensity; however, the current proposal includes 54 Group Townhouse Dwellings and 14 Semi-detached dwellings rather than Street Townhouses and Stacked Townhouse Dwellings. Group Townhouse and Semi-detached dwellings, are permitted as-of-right within the applicable R4 Zone of Norfolk County Zoning By-law 1-Z-2014.

The proposal seeks to develop the property as a Vacant Land Condominium, which would create Units of land that are inclusive of dwellings and exclusively accessible outdoor amenity space (i.e. private yards) and parking areas. All lands located outside of the proposed Unit boundaries and exclusive use areas would be “common element” and under the shared ownership and responsibility of the future condominium corporation. The common element will contain the private roadway system, 26 visitor parking areas, landscaping and tree plantings, servicing infrastructure, and community mailboxes.

The proposed site plan prepared by GSP Group Inc is provided as **Figure 3** on the following page and is attached as **Appendix I** to this report.

Preliminary Elevation Plans for the Group Townhouse and Semi-detached Dwellings prepared by P Del Design are included as **Appendix II**

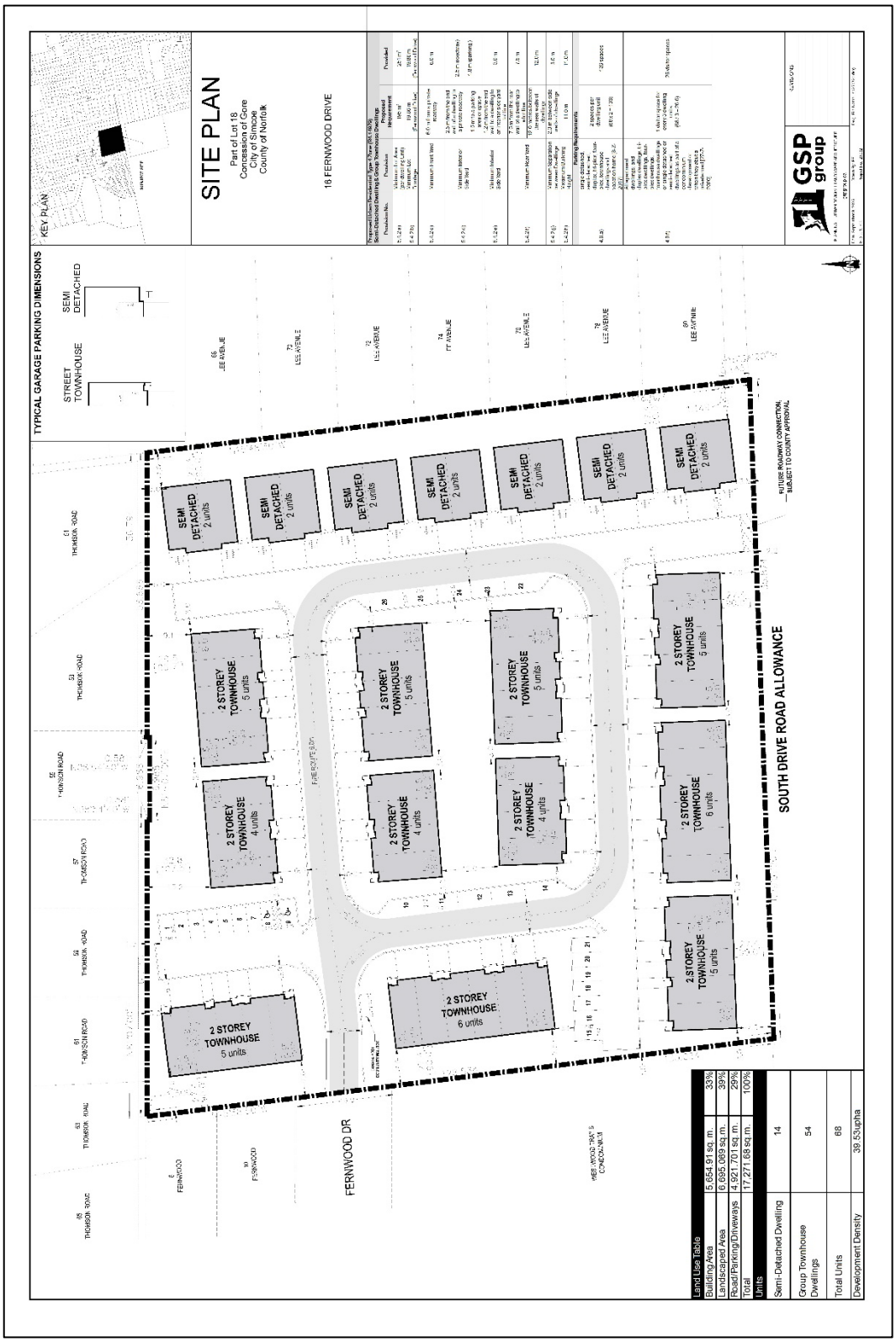


Figure 3 - Proposed Site Plan

2.2 Required Planning Applications

2.2.1 Pre-consultation Meeting (2025)

A pre-consultation meeting pertaining to the current proposal was hosted by Norfolk County on June 11, 2025, to discuss the proposed development plan for the site, and required applications. Copies of the formal consultation meeting notes have been included within this report as **Appendix III.**

As outlined in the final pre-consultation notes dated July 14, 2025, the following reports, studies, and plans are required to accompany the Zoning By-law Amendment and Draft Plan of Condominium submission:

- Planning Justification Report
- Stage 1 and 2 Archeological Assessment
- Transportation Impact Study
- Draft Plan of Vacant Land Condominium
- Preliminary Site Plan
- Functional Servicing Report
- Stormwater Management Report

The noted reports have been completed, reviewed, and considered prior to preparing this Planning Justification Report.

2.2.2 Draft Plan of Condominium (Vacant Land Condominium)

To create the Units of land that the dwellings will be located on, a Draft Plan of Vacant Land Condominium is proposed.

The Draft Plan is comprised of the following elements:

- Fifty-four (54) units for Group Townhouse Dwellings;
- Fourteen (14) units for Semi-detached Dwellings; *and*
- Common Element, inclusive of:
    - Private Roadway
    - Visitor Parking Areas

- Site Services
- Community Mailboxes
- Landscaped Areas

Exclusive Use of the driveway aprons for each unit is also denoted in the Draft Plan to ensure legal parking space dimension requirements are met.

A copy of the Draft Plan of Vacant Land Condominium prepared by J.D. Barnes Ltd. is provided as **Appendix IV**.

2.2.3 Zoning By-law Amendment

The subject lands are current zoned as site-specific Urban Residential Type 4 Zone (R4 – 14.979.1). This site-specific zoning was established by the previous applicant.

The proposed development will utilize the base Urban Residential Type 4 Zone (R4) Zoning provisions of Norfolk County Zoning By-law 1-Z-2014; however, additional site-specific provisions are proposed to more clearly regulate the placement of buildings within the Condominium. The proposed zoning approach identifies required setbacks from the private roadway, adjacent lot lines and between structures to achieve the desired built form, intensity, and configuration.

The site-specific provisions of the R4 (14.979.1) zone pertain to Street Townhouses and Stacked Townhouse dwelling types and irregular parking space sizes which are no longer required for this proposal. The in-effect site specific provisions are proposed to be deleted in their entirety through the amendment as they are not relevant or necessary to support this development proposal on the subject lands.

A copy of the Draft Zoning By-law Amendment is included as **Appendix V**.

3. Supporting Studies and Reports

3.1 Archeological Assessment – Stage 1-2 (Archaeological Consultants Canada)

The Owner retained Archaeological Consultants Canada ("ACC") to conduct a Stage 1-2 Archaeological assessment of the property in the summer of 2025.

A concurrent Stage 1 and 2 Report was prepared by ACC, with on-site field investigation taking place on September 19, 2025. Through the Stage 2 field study, no archaeological resources were encountered.

The combined Stage 1 & 2 Archaeological Assessment Report was submitted to the Ministry of Citizenship and Multiculturalism for review. The Ministry's Letter of Concurrence "approving" the Stage 1 & 2 Report was issued on December 9, 2026, and has been provided with the application submission.

3.2 Functional Servicing Design Brief (Counterpoint Engineering)

Counterpoint Engineering was retained by the applicant to prepare the required civil engineering materials for submission alongside the Draft Plan of Vacant Land Condominium and Zoning By-law Amendment. Counterpoint Engineering is a division of Dillon Consulting Limited and was the consulting engineer that prepared the engineering design and reports for the Meadows of Norfolk development that was previously approved on the subject lands.

As outlined within the Functional Servicing Design Brief prepared by Counterpoint Engineering, the subject lands will be serviced from an existing 300 mm municipal watermain and 200 mm sanitary sewer located within the Fernwood Drive cul-de-sac at the west end of the property.

A new privately owned and maintained 150 mm watermain will be constructed internally to the site to support the proposed development and firefighting needs. The availability of suitable water for firefighting purposes has been confirmed through the completion of Hydrant testing complete by Hydrant testing Ontario in September of 2025. A copy of the Hydrant test results has been submitted with the applications.

Sanitary services will be provided by a new 200 mm privately owned and maintained sanitary sewer. Due to the inverted elevation of the existing sewer, the report indicates that dwelling units will require individual grinder pumps to convey sanitary drainage.

Counterpoint Engineering has estimated a sanitary demand of 2.84 L/s for the development. Service Modelling will be completed by the County through the application review process to determine if the municipal system has adequate capacity to support the development.

3.3 Stormwater Management Brief (Counterpoint Engineering Ltd.)

In addition to the completed Functional Servicing Design Brief, Counterpoint Engineering prepared a Stormwater Management Brief pertaining to the proposed development. The report cites the findings and recommendations of the previous Stormwater Management Reports prepared by MTE Consultants Inc. (2016) and Dillon Consulting Limited (Westwood Trails - 2019), (Meadows of Norfolk – 2018 & 2020) for the previously approved development and the Westwood Trails Condominium development located to the immediate west of the subject lands.

The 2016 MTE Report cited by Counterpoint Engineering was prepared for the adjacent Westwood Trails development located to the west and northwest of the subject lands. The stormwater catchment area reviewed within that report included both the Westwood Trails development and 16 Fernwood Drive. The 2016 MTE report identified the need for a Stormwater Management Facility for these combined lands which was to include a wet pond and infiltration gallery designed to accommodate the 100-year storm event and achieve an 80% TSS Enhanced Treatment level for Water Quality. The Stormwater Management Facility utilizes infiltration into the groundwater system as the legal outlet for development.

The 2019 Dillon Report noted in Counterpoint Engineering's report was completed in support of the Westwood Trails applications to determine if the Stormwater Management Facility proposed in the 2016 MTE Report remained adequate to support the revised development plan. The 2019 Dillon Report concluded that the design remained adequate to support Westwood Trails' development.

In 2018, Dillon Consulting prepared a Stormwater Management Plan for Meadows of Norfolk development at 16 Fernwood Drive. This report concluded that the downstream storm sewers had sufficient capacity to support the development and the stormwater management facility remained capable of containing the 100-year storm event. A minor revision to the report was undertaken in 2020 which arrived at the same conclusions.

The 2025 Stormwater Management Brief prepared by Counterpoint Engineering in relation to the applications put forth by 2445680 Ontario Limited indicates that minor stormwater flows will be captured using on-site catch basins.

As shown on the preliminary Site Storm Drainage Plan (SW-STM) prepared by Counterpoint Engineering, stormwater will be directed through a proposed 250mm storm sewer on site to a manhole within the southeast corner of the Westwood Trails Condominium, before continuing on through that development's existing storm system to the stormwater management facility to the west. Counterpoint Engineering has advised the Owner that an agreement with the adjacent Condominium Corporation will be required to utilize the existing Stormwater Management System.

Counterpoint's Stormwater Management Brief concludes that proposed stormwater flows can be accommodated by downstream infrastructure and the existing wet pond facility.

3.4 Traffic Impact and Functional Operations Study (CANDEVCON)

The Applicant retained CANDEVCON to complete a Transportation Impact Study assessing the proposed development. The study was scoped in consultation with Norfolk County and completed in accordance with the Terms of Reference included as Appendix "A" to the Traffic Impact and Functional Operations Study.

Regarding new vehicle trips generated by the development, CANDEVCON has estimated that "*The proposed Residential Development is expected to generate a total of 47 trips during the A.M. Peak Hour (12 inbound trips and 35 outbound trips) and 52 trips during the P.M. Peak Hour (33 inbound trips and 19 outbound trips).*"

Based upon these estimated trips, CANDEVCON evaluated potential impacts on existing intersections within the Study Area, including Oak Street at Chapel Street, and West Street at Holden Avenue. CANDEVCON states within the report that the "*…intersections will continue to operate at an acceptable Levels of Service during the A.M. and P.M. Peak Hours*."

3.5 Environmental Site Assessments and Record of Site Condition (Pinchin)

The previously approved Meadows of Norfolk applications were accompanied by Phase 1 and 2 Environmental Site Assessments undertaken by Pinchin Ltd.

Through the Phase 1 ESA, Pinchin identified one Potentially Contaminating Activity (PCA) within the study area that could have an impact on the property. This PCA was located on the subject lands and was identified as a historical waste disposal site that contained surficial storage of tin and metal materials. Four (4) other PCA's were identified off-site however, they were not considered as Areas of Potential Concern affecting the subject lands.

The Phase 2 ESA, also completed by Pinchin, included an assessment of soil and groundwater quality. Fourteen boreholes were advanced into the subject property as part of the site study. Samples taken from the boreholes were sent for laboratory analysis and the findings did not yield any exceedance that would require site remediation or further investigation.

The final Phase 1 and 2 ESA reports were filed with the Ministry of Environment and Climate Change (MECP) in 2018 for review. The Record of Site Condition (RSC# 225555) for the property was certified on February 13, 2019, and filed on the Environmental Site Registry on May 1, 2019.

In the years since the filing, the subject lands have not been developed or used for any purpose. No additional study was requested by the County in support of the current applications.

3.6 Geotechnical Review (Pinchin Ltd.)

As part of the previous Bremont applications associated with the subject lands, a Geotechnical Analysis was also completed by Pinchin Ltd. in 2018.

Pinchin's study method included the advancement of five (5) boreholes to a depth of approximately 5.2 metres from existing grade and the collection of soil samples.

Groundwater was encountered in each of the boreholes at depths ranging between 2.3 to 2.6 metres below surface. Pinchin noted within their report that seasonal variations in the water table should be expected, including during wet weather events. These factors have been evaluated and considered by the project engineer and architect in the design of the proposed development.

3.7 Preliminary Landscape Plan (Adesso Design Inc).

A preliminary landscape plan has been developed by Adesso Design Inc. to outline how and where landscape efforts will be directed.

As shown on the plan which has been submitted under separate cover, the preliminary scheme includes street trees, various foundation planting configurations, 1.8 metre tall wood board perimeter privacy fencing, and entrance pillars.

This preliminary design will be further refined through the site plan process.

4. Planning Framework

4.1 Ontario Planning Act, R.S.O. 1990, c. P.13

Section 2 – Matters of Provincial Interest

Section 2 of the Planning Act sets out matters of Provincial Interest that are to be considered by Planning Authorities when considering and carrying out responsibilities under the Act. **Table 1** provides an analysis of the proposed development in relation to matters of Provincial interest set out in Section 2 of the Act.

Table 1 – Matters of Provincial Interest

Provincial Interest	Policy Response
a) The protection of ecological systems, including natural areas, features and functions	The subject property does not contain, and is not adjacent to any natural areas, features or functions that have been mapped by the County or Long Point Region Conservation Authority ("LPRCA"). No impacts on ecological systems will occur due to the proposal.
b) The protection of the agricultural resources of the Province	The subject lands are located within the Simcoe Settlement Area boundary and are designated for urban, residential development. The proposed development will not occur on agricultural lands or impact agricultural resources.
c) The conservation and management of natural resources and the mineral resource base	As identified on Schedule C-4 of the NCOP, the subject lands do not contain any identified natural resources or mineral resources.

Table 1 – Matters of Provincial Interest

Provincial Interest	Policy Response
d) The conservation of features of significant architectural, cultural, historical, archaeological or scientific interest	Archaeological Consultants Canada (ACC) was retained by the Owner to complete a Stage 1-2 Archaeological Assessment of the subject lands. Through investigation, no archaeological resources were encountered. No additional investigation has been recommended. ACC has recommended the application of typical warning clauses to the property to conserve any deeply buried resources that could potentially be encountered through construction.
e) The supply, efficient use and conservation of energy and water	The development will be serviced with municipal water, which is the required form of servicing for development within the Settlement Area Boundary. This development will utilize existing municipal infrastructure. Energy saving opportunities will be reviewed through detailed design when considering site lighting, house design, and construction materials.
f) The adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems	The proposed development will utilize existing municipal services, stormwater management infrastructure, and utilities to support development. The site has been designed to accommodate municipal waste collection vehicles, as well.
g) The minimization of waste	The proposed development is not anticipated to result in an increase in overall waste.

Table 1 – Matters of Provincial Interest

Provincial Interest	Policy Response
h) The orderly development of safe and healthy communities; (h.1) the accessibility for persons with disabilities to all facilities, services and matters to which this Act applies	The proposed development is orderly and appropriate for the subject lands and surrounding community. The development is within walking distance of municipal parkland and is within an overall walkable neighbourhood. As outlined within the various supporting studies associated with the applications, the development will have no significant impact or negative affect on water, the natural environment of transportation systems.
i) The adequate provision and distribution of educational, health, social, cultural and recreational facilities	The Simcoe community contains a variety of educational, health, social, cultural, and recreational facilities and businesses. The proposed development will not have a significant impact on these resources.
j) The adequate provision of a full range of housing, including affordable housing	The proposed development will include Group Townhouses and Semi-detached Dwellings. These dwelling types contribute to a fulsome range of housing options in the surrounding neighbourhood and Simcoe community, in general.
k) The adequate provision of employment opportunities	The subject lands are designated and zoned for Residential land uses. Employment uses are not proposed as part of the applications or permitted as-of-right on the subject lands.
l) The protection of the financial and economic well-being of the Province and its municipalities	The proposed development will be constructed at the cost of the developer with no identified need for municipal expenditures or off-site upgrades needed. The development will generate development charge revenue and grow the municipal tax base.

Table 1 – Matters of Provincial Interest

Provincial Interest	Policy Response
m) The co-ordination of planning activities of public bodies	There is no planning activity proposed as part of the application submission that requires the coordination of public bodies.
n) The resolution of planning conflicts involving public and private interests	There are no identified planning conflicts involving public and private interests associated with the subject lands.
o) The protection of public health and safety	The subject lands are identified as a former landfill site on Schedule J-4 of the NCOP. The previous use of the lands has been evaluated through Phase a1 and 2 Environmental Site Assessments completed by Pinchin Ltd. A Record of Site Condition was issued by the Ministry of Environment, Conservation and Parks in 2019 allowing for the development of residential land uses on the property.
p) The appropriate location of growth and development	The subject lands are designated “Urban Residential” in the NCOP and are zoned Urban Residential Type 4 Zone (R4, 14.979.1) in Zoning By-law 1-Z-2014 The subject lands are a permitted and appropriate location for residential development. The proposed dwellings forms and density are compatible with surrounding land uses.
q) The promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians	The proposed development form is compact and has a higher density than adjacent developments. The development is walkable within and located within a short distance from public parkland. The subject lands are not accessible by public transit, currently.

Table 1 – Matters of Provincial Interest

Provincial Interest	Policy Response
r) The promotion of built form that, (i) is well-designed, (ii) encourages a sense of place, and (iii) provides for public spaces that are of high quality, safe, accessible, attractive and vibrant	The proposed built form is similar to that within the Westwood Trails condominium to the west of the subject lands. The preliminary design of the dwelling units is traditionally inspired and is not starkly different than adjacent, longer standing development. The proposal is compact evokes a sense of community with all dwellings sharing a central looped roadway and common landscaped streets. The condominium application negates the need for public spaces; however, the property is located within close proximity to a municipal park. The mix of quality architectural design and a robust landscaping plan, inclusive f entry features, will ensure the development evokes a clear sense of place to future residents.
s) The mitigation of greenhouse gas emissions and adaptation to a changing climate	The proposed development will occur on vacant, urban lands that do not contain natural heritage features. The development of the subject lands will include appropriate management of stormwater runoff and integrate landscaping and trees to support climate change mitigation objectives.

Section 51 (24) – Plans of Subdivision

Applications for lot creation, inclusive of Draft Plans of Subdivision and Condominium, are subject to the requirements of Section 53 of the Planning Act.

Section 53 (12) requires that the approval authority (i.e. municipality) must have regard for the legislative framework set forth in Section 51 (24) of the Planning Act when considering Draft Plan applications.

Section 51 (24) the Act directs that *"In considering a draft plan of subdivision, regard shall be had, among other matters, to the health, safety, convenience, accessibility for persons with disabilities and welfare of the present and future inhabitants of the municipality and to,"* items a) to m). An overview of how each item is addressed is provide below in italics.

a) the effect of development of the proposed subdivision on matters of provincial interest as referred to in section 2;

As demonstrated previously in this report, the applications have appropriate regard for the relevant matters of Provincial interest included in Section 2 of the Planning Act.

b) whether the proposed subdivision is premature or in the public interest;

The proposed Condominium Application is not premature. The development is appropriate to propose within the Settlement Area Boundary and will include permitted residential dwelling forms.

The advancement of the applications will develop the site and contribute to overall housing supply, and a range and mix of dwelling types within Simcoe. The development and expansion of housing supply is a matter of public interest.

c) whether the plan conforms to the official plan and adjacent plans of subdivision, if any;

The Condominium Application and overall development plan conforms with the relevant policies of the NCOP, specifically including those found within Section 9.6.4 of the Plan. A fulsome and detailed analysis of conformity with the relevant policies of the NCOP is provided in ***Section 4.3*** *of this report.*

d) the suitability of the land for the purposes for which it is to be subdivided;

The lands are suitable for residential development and have a developable area that can accommodate the proposed number of dwellings without causing any significant impacts on adjacent land uses, the existing transportation system, or municipal services.

The subject lands are considered development ready as they have available municipal service connections available at the property line and frontage on a public roadway. The lands are generally flat in terms of topography, with no need for significant earth works to facilitate construction.

(d.1) if any affordable housing units are being proposed, the suitability of the proposed units for affordable housing;

The proposed dwelling units are not proposed to be marketed as "affordable housing" units, per applicable provincial definitions.

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 subject lands have accessible vehicular access from Fernwood Drive, only. Fernwood Drive is a local roadway that connects through adjacent neighbourhoods to Highway 3 and Highway 24, which are the main roadways within Simcoe.

It is preliminarily proposed within the Site Plan that a future connection to South Drive be opened to provide secondary access to the subject site at some point in the future. The opening of this access will be subject to County approval.

The applications are supported by a Transportation Impact Study that was prepared by CANDEVCON. Based on the assessment completed, there will be no significant impact on the adjacent roadways and intersections in proximity to the subject lands.

f) the dimensions and shapes of the proposed lots;

The proposed condominium units are generally rectangular in shape and of similar sizing – although, "end units" for the Group Townhouses and the Semi-detached dwellings have some additional unit area assigned to accommodate access for maintenance and roof overhangs.

As shown on the Draft Plan of Vacant Land Condominium prepared by J.D. Barnes Ltd., the proposed Units range in size from 118.85 square metres (Unit 52) to 177.04 square metres (Units 16-27)

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 to the development of the subject lands.

h) conservation of natural resources and flood control;

The subject lands do not contain natural resources and are not impacted by, or adjacent to a floodplain.

i) the adequacy of utilities and municipal services;

Counterpoint Engineering was retained by the Owner to provide recommendations on the servicing of the subject lands. As outlined in their submitted reports and plans, the subject lands can be adequately supported by existing water, sanitary and stormwater management services, and systems.

Utilities are available at the property line and will be designed through the site plan process. Comments from the utility providers will be obtained through the Planning process to inform future design needs.

j) the adequacy of school sites;

The subject land is located approximately 750 metres southwest from the closest school in Simcoe (Elgin Avenue Public School).

Comments pertaining to the adequacy of nearby schools will be provided from the School Boards through the application review process.

k) the area of land, if any, within the proposed subdivision that, exclusive of highways, is to be conveyed or dedicated for public purposes;

The County did not identify a need for any land conveyance as part of the applications. Parkland will be dedicated as cash-in-lieu.

l) the extent to which the plan's design optimizes the available supply, means of supplying, efficient use and conservation of energy; and

Energy efficient design will be explored through the development of detailed building plans for the new dwellings.

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. 1994, c. 23, s. 30; 2001, c. 32, s. 31 (2); 2006, c. 23, s. 22 (3, 4); 2016, c. 25, Sched. 4, s. 8 (2).

The proposed development will be subject to Site Plan Control.

Preliminary reports and studies related to typical site plan control matters such as civil engineering, traffic, landscaping and built form have been provided with the Condominium application.

4.2 Provincial Planning Statement (2024)

On August 20, 2024, the Ministry of Municipal Affairs and Housing (MMAH) introduced the 2024 Provincial Planning Statement. This document has replaced the 2020 Provincial Policy Statement and 2019 Growth Plan for the Greater Golden Horseshoe. Relevant policies of the 2024 Provincial Planning Statement (PPS) are identified and evaluated in this Section of the Planning Justification Report.

Chapter 2: Building Homes, Sustaining Strong and Competitive Communities

2.2 Housing

Policy 2.2.1 of the PPS states:

"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:

a) 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

b) all types of residential intensification, including the development and redevelopment of underutilized commercial and institutional sites (e.g., shopping malls and plazas) for residential use, development and introduction of new housing options within previously developed areas, and redevelopment, which results in a net increase in residential units in accordance with policy 2.3.1.3;

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."*

The applications facilitate intensified residential development within the Simcoe Settlement Area inclusive of two dwelling forms (townhouses, semi-detached dwellings) and an overall total of 68 units.

The development plan efficiently utilizes serviced residentially designated and zoned land for new housing development while balancing built form with landscaping and appropriate setbacks from existing, low-density development on adjacent lands.

2.3 Settlement Areas and Settlement Area Boundary Expansions

Section 2.3 of the PPS (2024) pertains to Settlement Areas and Settlement Area Boundary Expansions.

The subject lands are located within the Simcoe Settlement Area Boundary (i.e. Urban Boundary).

Settlement Areas are defined in the PPS (2024) as "… *urban areas and rural settlement areas within municipalities (such as cities, towns, villages and hamlets). Ontario's settlement areas vary significantly in terms of size, density, population, economic activity, diversity and intensity of land uses, service levels, and types of infrastructure available."*

The definition further states that "Settlement Areas" are 1) built-up areas where development is concentrated and which have a mix of land uses; and 2) lands which have been designated in an official plan for development over the long term.

As stated in Policy 2.3.1 of the PPLS:

"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."

The applications are consistent with Policy 2.3.1 of the PPS (2024) as they propose and facilitate permitted residential development within the Simcoe Settlement Area Boundary on lands that have been designated and zoned by the County for residential growth and development for the long term.

Chapter 3: Infrastructure and Facilities

3.6 Sewage, Water and Stormwater

Section 3.6 of the PPS (2024) pertains to development servicing methods related to water, sewage, and stormwater management.

Policy 3.6.2 of the PPS (2024) states that:

"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 subject lands are located within the Simcoe Settlement Area Boundary and are proposed to be connected to existing municipal water and sanitary sewer systems, consistent with the direction of Policy 3.6.2 of the PPS (2024).

The Functional Servicing Report prepared by Counterpoint Engineering should be consulted for a detailed overview of the proposed servicing method for the development.

Policy 3.6.8 of the PPS (2024) pertains to Stormwater Management, and states that:

"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."*

As outlined within the Stormwater Management Brief prepared by Counterpoint Engineering, the proposed development will build upon previous design efforts and utilize Stormwater Management infrastructure that was established in support of the adjacent Westwood Trails Condominium development to the west of the subject lands.

Future stormwater flows generated as a result of the development of the subject lands was considered in the design and construction of the existing external stormwater management infrastructure established through the Westwood Trails development.

Overall, the stormwater management report indicated a reduction in pre to post development conditions on the subject lands, which is consistent with the direction of Policy 3.6.8 b) of the PPS (2024).

On the subject lands, development is intended to be supported by a mix of grass swales, catch basins and storm sewers. The existing stormwater management facility (i.e. wet pond) that will receive stormwater flows from the subject lands utilizes an infiltration cell, and releases treated stormwater back into the groundwater table. This approach is sustainable and low impact. Based on Counterpoint Engineering's analysis, there is sufficient capacity in the Stormwater Management System to support the planned development at 16 Fernwood Drive.

Chapter 4: Wise Use and Management of Resources

4.6 Cultural Heritage and Archaeology

Section 4.6 of the PPS (2024) pertains to cultural heritage resources and archaeology. As noted previously within this report, the subject lands were identified as exhibiting Archaeological Potential through pre-consultation.

Policy 4.6.2 of the PPS (2024) directs that:

"Planning authorities shall not permit development and site alteration on lands containing archaeological resources or areas of archaeological potential unless the significant archaeological resources have been conserved.

To determine if the site contained any resources that would require conservation, the Owner retained Archaeological Consultants Canada (ACC) to complete Stage 1 & 2 Archaeological Assessments of the property in September of 2025. This work included a desktop analysis

of the subject lands and on-site test pitting of the property. No archaeological resources were encountered on the subject lands through site investigation.

The completed Stage 1 and 2 Archaeological Assessment Consultants Canada was submitted to the Ontario Ministry of Citizenship and Multiculturalism (MCM) for review and approval. MCM has reviewed the report and issued a Letter of Concurrence on December 9, 2025 "approving" the report and recommendations. Accordingly, the proposal is consistent with Section 4.6 of the PPS (2024).

5.1 General Policies for Natural and Human-Made Hazards

Policy 5.1.1 of the PPS (2024) states:

"Development shall be directed away from areas of natural or human-made hazards where there is an unacceptable risk to public health or safety or of property damage, and not create new or aggravate existing hazards."

The subject lands were previously identified through professional study as a former waste disposal site and are shown as a "Closed Waste Disposal Site" on Schedule J-4 of the NCOP.

To determine if the subject lands are an appropriate and safe location to accommodate sensitive development without unacceptable risk to public health or safety, the previous applicant commissioned the preparation of Phase 1 and 2 Environmental Site Assessments by Pinchin Ltd. To permit residential development on the subject lands, a Record of Site Condition (225555) was filed and obtained from MECP in 2019.

As the necessary evaluation and testing of the site has been completed and the site is now deemed appropriate for residential development, the applications are consistent with Policy 5.1.1 of the PPS (2024).

5.3 Human-Made Hazards

The policies of Section 5.3 of the PPS 92024) are specific to human-made hazards, which include contamination and hazards to human through industrial and extractive processes.

Policy 5.3.1 states that:

"Development on, abutting or adjacent to lands affected by mine hazards; oil, gas and salt hazards; or former mineral mining operations, mineral aggregate operations or petroleum

resource operations may be permitted only if rehabilitation or other measures to address and mitigate known or suspected hazards are under way or have been completed."

Policy 5.3.2 states that:

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

Schedule J-4 of the NCOP delineates the subject lands as being inclusive and proximate to a Closed Waste Disposal Site. Such uses can present risks to human health and safety and must be reviewed prior to permitted development on or adjacent to potentially contaminated lands.

As part of previous applications associated with the subject lands, Phase 1 and 2 Environmental Site Assessments were completed for the subject property by Pinchin Ltd. Within the Phase 2 report, Pinchin states that:

"The chain of title, previous environmental report, as well as a telephone interview with the Site Representative indicated that a waste disposal Site (APEC #1) was formerly present on the Phase One Property. The 1981 MOECC document indicated that a waste disposal site was present on the Phase One Property when the land use was owned by "Canadian Canners Limited". Information provided by Client indicated that wastes were stored on ground surface and once the wastes were removed, grading activities were completed; however, no backfilling material was imported to the Site."

Record of Site Condition (RSC) No. 225555 was filed by the Ministry of the Environmental, Parks and Conservation on May 1, 2019. This approval allows for the development of the subject lands for residential purposes and confirms that there are no further risks to human health and safety on the subject property.

4.3 Norfolk County Official Plan

The Norfolk County Official Plan ("NCOP") applies to all lands within Norfolk County.

In addition to general land use planning policies for the County, the Plan also contains specific land use policies that pertain to growth and development in Urban Areas, including Simcoe where the property is located.

Land Use Designations

As shown in **Figure 4**, the subject lands are designated "Urban Residential" on Schedule B-15 of the NCOP. Lands to the west, north and east are also designated as "Urban Residential". Lands to the south are outside of the settlement area boundary and are designated as "Agricultural".

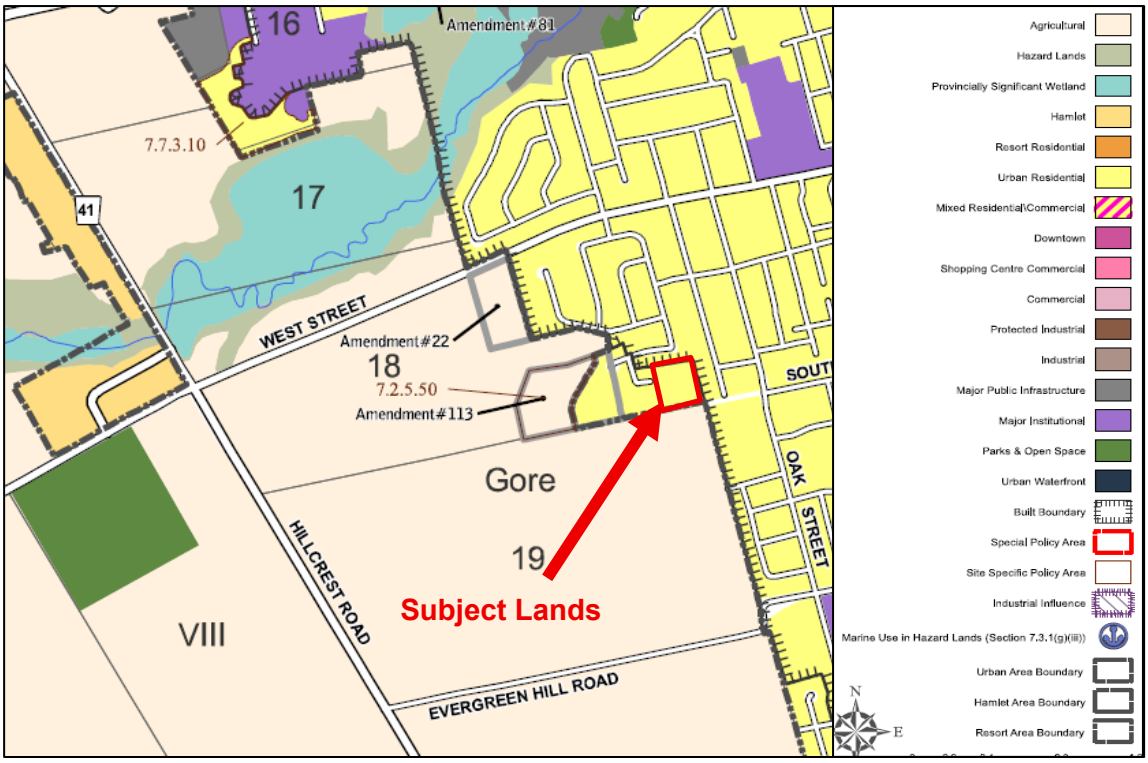


Figure 4 – Norfolk County Official Plan – Schedule B-15 – Simcoe Urban Area

The Urban Residential policies of the NCOP are found in Section 7.7 and are evaluated further on in this report.

2.0 NORFOLK COUNTY IN 2036: A VISION

Norfolk County's planning vision is outlined within Section 2.1 of the NCOP states that:

"Norfolk County strives to balance a commitment to the land and emerging opportunities for growth and development."

To achieve the planning vision, the Official Plan builds upon six strategic themes of Council's 2004 Strategic Plan, which include:

- A Strong and Diversified Economy (2.2.1)
- Protecting and Enhancing the Natural Environment (2.2.2)
- Maintaining and Enhancing the Rural and Small Town Character (2.2.3)
- Maintaining a High Quality of Life (2.2.4)
- Upgrading and Expanding Infrastructure (2.2.5)
- A Well Governed, Well Planned and Sustainable Community (2.2.6)

The themes of "Maintaining and Enhancing the Rural and Small Town Character" (2.2.3), "Maintaining a High Quality of Life" (2.2.4), and "A Well Governed, Well Planned and Sustainable Community" (2.2.6) are relevant to the applications and development proposal.

<u>Maintaining and Enhancing the Rural and Small Town Character (2.2.3)</u>

The outlined goal within Policy 2.2.3.1 of the Official Plan related to maintaining and enhancing town character is to:

"Protect the unique character of Norfolk's cultural landscapes, Urban Areas, Hamlet Areas and Agricultural Area through heritage conservation, community design and redevelopment policies that promote community health, safety and broad aesthetic appeal."

The Goal is to be achieved through satisfying the objectives set out in Policy 2.2.3.2, which include:

a) *Preserve and enhance the history and cultural heritage of the County.*
b) *Encourage the beautification, improvement and/or redevelopment of the County.*
c) *Revitalize and reuse underutilized land in the County.*

d) *identify and protect key cultural heritage elements in the County through the appropriate use of available planning tools.*
e) *Develop land use patterns in the Urban Areas that are compact and efficient.*
f) *Maintain and enhance the rural character of Norfolk's many Hamlet Areas through appropriate infill development.*
g) *Protect and improve the significant cultural heritage resources and cultural heritage landscapes, and encourage the conservation of historical buildings, all of which contribute to Norfolk's unique character.*
h) *Identify and conserve artefacts of historic, architectural and archaeological interest.*
i) *Protect and conserve those natural and cultural landscape features that contribute to the County's unique character.*

Objectives c) and e) are relevant to the proposal and are satisfied through the development of the subject lands which have been a long standing vacant parcel of land within the Urban Area that has been anticipated to be developed. The Owner's proposal utilizes compact development form, and compatible, ground based dwellings that include Group Townhouses and Semi-detached Dwellings to achieve an appropriate and reasonable amount of development on the lands that will contribute to municipal housing and growth targets.

Maintaining a High Quality of Life", (2.2.4)

With regard to "Maintaining a High Quality of Life", the stated goal within Policy 2.2.4.1 of the Official Plan is to:

"Reinforce Norfolk's strong sense of community through the provision of public services, the development of safe and attractive communities and the celebration of Norfolk's unique cultural and natural heritage, by involving residents in making decisions on planning matters and by promoting a healthy community through active lifestyles."

This Goal is to be achieved through satisfying the objectives set out in Policy 2.2.4.2, which include:

a) *Provide for a variety of housing forms, tenures and levels of affordability through development, redevelopment, intensification and infilling projects.*
b) *Support the maintenance and development of public service resources, such as education facilities, community-based care facilities and programs, and leisure and recreation opportunities in the County.*

c) *Ensure that new development is designed in a manner that provides a safe, aesthetically appropriate, and stimulating environment.*
d) *Provide for the development of a multi-purpose trail system through a linked open space system, respecting the needs and privacy of private landowners and the agricultural community.*
e) *Provide for a wide variety of recreation opportunities, including active, passive, indoor, outdoor and targeted leisure activities.*
f) *Improve accessibility to the lakeshore area and increase the number of access points to the waterfront.*
g) *Enhance opportunities for all residents to access healthy food options.*
h) *Ensure that all public buildings and facilities and new development are accessible to all members of the public including people with disabilities.*

Objective a) is relevant to the proposal and is satisfied through the provision of two housing forms within the proposal (group townhouses, semi-detached dwellings) and the utilization of Condominium tenure. Objective c), pertaining to safe and well-designed environments is satisfied through the provision of a compact development that is inclusive of well-designed homes, a robust landscaping plan, and a treed streetscape.

A Well Planned and Sustainable Community (2.2.6)

The goal associated with "A Well Planned and Sustainable Community" is found in Policy 2.2.6.1, and is to:

"Support an open and responsive municipal government that actively builds public and private sector partnerships in the pursuit of the responsible and efficient use of land, resources, and services, while ensuring community and financial sustainability."

This Goal is to be achieved through satisfying the objectives set out in Policy 2.2.6.2, which include:

a) *Offer an open and responsive County which provides clear opportunities for public input into the land use planning process.*
b) *Communicate and collaborate with other jurisdictions in the planning and development of infrastructure and services, and to support other initiatives such as environmental and air quality projects and programs.*

c) *Communicate and cooperate with private sector interests to review development initiatives, and where deemed appropriate, to support those projects that will benefit the County.*

d) *Ensure the responsible use of land by encouraging the redevelopment, intensification and infilling of underutilized land and the efficient use of greenfield lands in Urban Areas.*

e) *Direct new urban development to Urban Areas and Hamlet Areas, ensuring a compact form, and an appropriate mix of land uses and densities, resulting in the efficient use of land, infrastructure, and public services and facilities.*

f) *Reduce conflicts between existing and proposed land uses through buffering, setbacks, landscaping and other measures, as appropriate.*

g) *Ensure that all new development in Urban Areas occurs on full municipal services, except in areas specifically provided for in this Plan, to ensure the maintenance of healthy communities and the natural environment.*

h) *Ensure that all new development will be a long-term financial benefit to the County.*

i) *Utilize the provisions of the Development Charges Act and other provincial legislation to reduce growth related capital costs borne by the existing residents of the County.*

j) *Encourage the development of a broad, balanced tax base.*

The applications and proposal support the achievement of Objectives d), e), f, g) and h) of section 2.2.6 of the NCOP.

With specific regard to Objectives d), e) and f), the proposed development is planned to occur on vacant urban lands within Simcoe. The proposed development form is compact due to the utilization of a Condominium tenure and allows for an appropriate amount of housing to be provided on the property. Although the density on the site is higher than that found on adjacent lands with low density zoning (i.e. R1 and R2), the location and functionality of the site as its own community and proximity to a planned extension of a collector roadway (South Drives) provides an appropriate transition. Furthermore, regarding Objective f), large setbacks, perimeter fencing and robust landscaping has been provided within the development to assist in softening the interface between the proposed development and existing homes.

Regarding Objective g), the proposed development will be connected to full municipal services. These available municipal services, including a stormwater management facility, have been developed to accommodate the development of the site at the proposed intensity. The condominium tenure proposed for the development also will require the future condominium corporation to own and maintain on site services, rather than the

municipality. This approach supports objective h) and is of long term financial benefit of the municipality

3.0 SUTAINABLE NATURAL HERITAGE

As shown in **Figure 5**, the subject lands are identified on Schedule C-4 (Natural Heritage) of the NCOP as containing a “Significant Woodland” feature.

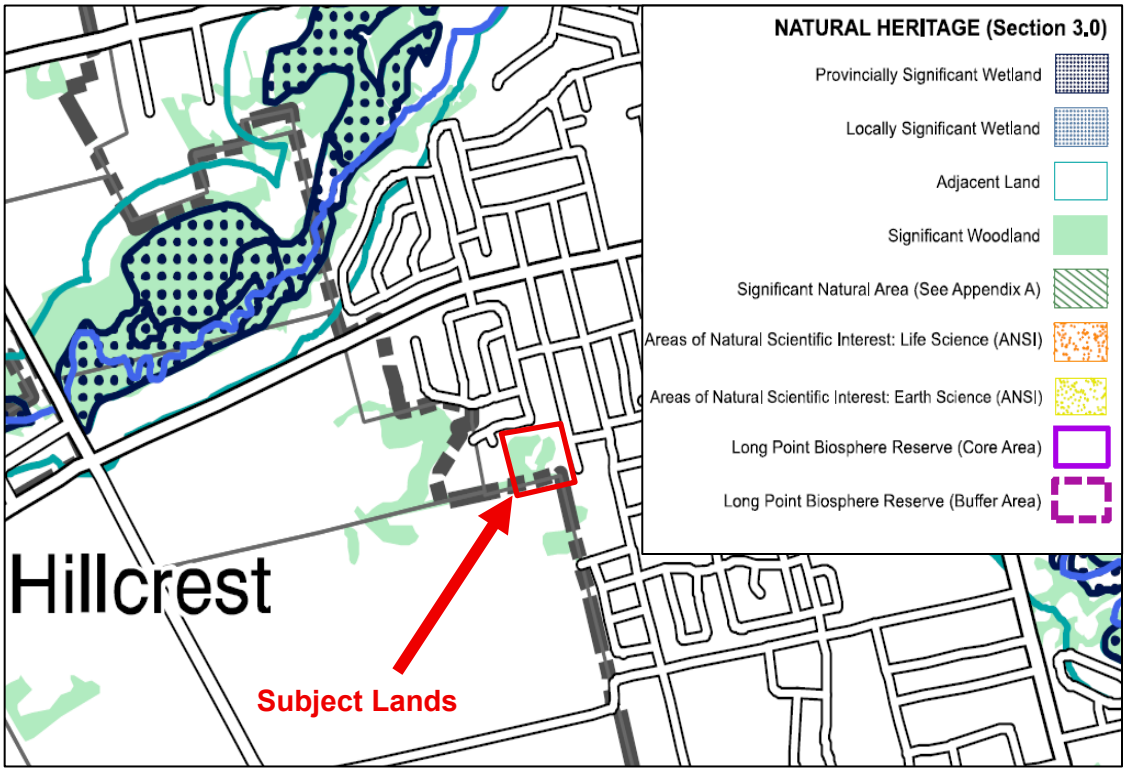


Figure 5 - Schedule C-4 - Natural Heritage

As confirmed through site visits and aerial photography, the subject lands do not contain a “significant woodland” feature. An Environmental Impact Study was not required by Norfolk County in support of the applications.

The subject lands do not contain any natural heritage features and therefore the policies of Section 3.0 of the NCOP are not relevant to the applications.

4.0 ENSURING ECONOMIC VITALITY

4.8 Potentially Contaminated Sites

As shown in **Figure 6,** the subject lands are identified on Schedule J-4 (Natural Resources) of the NCOP as containing a “closed waste disposal site”.

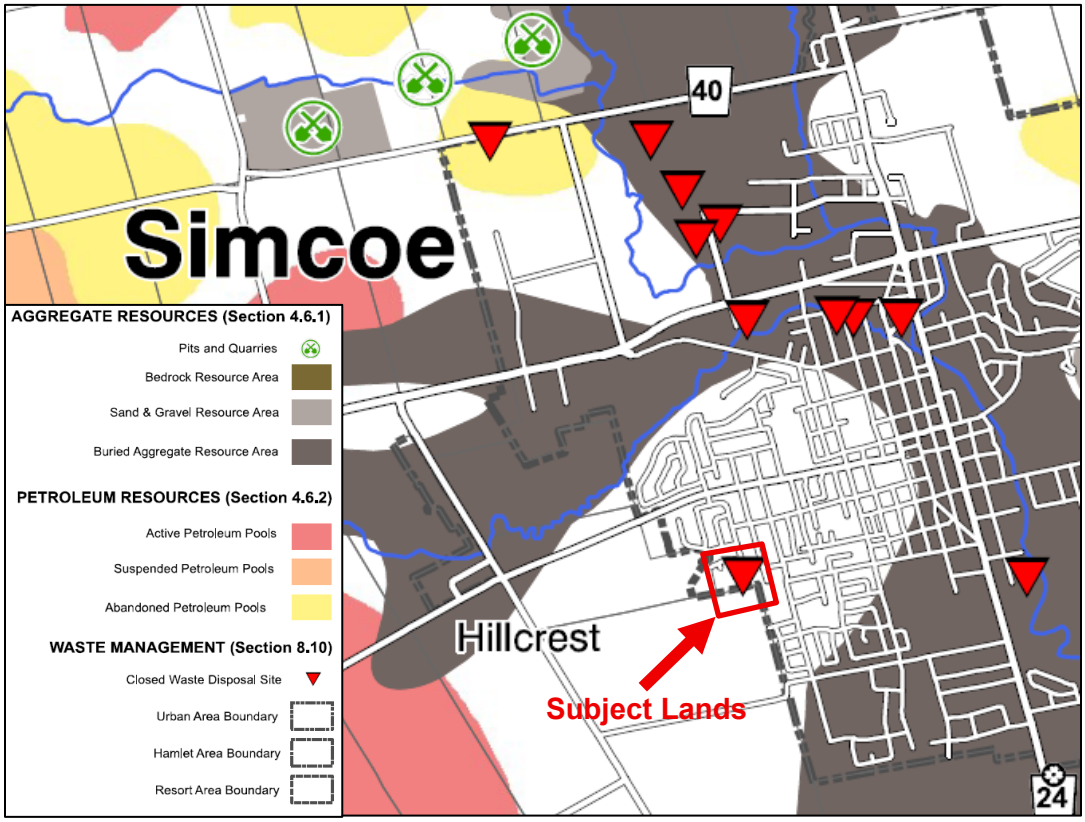


Figure 6 - Schedule J-4 Natural Resources (Simcoe)

Policies 4.8 a), b) and c) of the NCOP relate to closed waste disposal sites and are relevant to the applications and require conformity. The noted policies are outlined below:

a) *The County encourages the identification of contaminated sites, their remediation, and appropriate redevelopment, in accordance with the Environmental Protection Act and its regulations and in accordance with the procedures and the policies of this Plan.*

b) *Where the development or redevelopment of land involves the change of use of the property to a more sensitive use, a Record of Site Condition shall be completed*

by a qualified person and filed on the Brownfields Environmental Site Registry, in accordance with the requirements of Ontario Regulation 153/04, before the issuance of a building permit for the proposed use. The issuance of any building permit for the proposed use shall also be consistent with any certificate of property use or order issued for the property on the Environmental Site Registry.

c) *The County shall ensure that the decommissioning and remediation of contaminated sites are completed in an environmentally responsible manner.*

As part of previous development approvals process associated with the property (Meadows of Norfolk), Phase 1 and 2 Environmental Site Assessments were completed by Pinchin Ltd. Through detailed site analysis Pinchin confirmed that the subject lands previously contained metal waste associated with a historical canning business, however no site contaminant exceedances were discovered through soil sampling and analysis Due to the nature of former land use required the obtainment of a Record of Site Condition to allow for the subject land to be utilized for residential purposes (i.e. more sensitive use).

Record of Site Condition (RSC) No. 225555 was filed by the Ministry of the Environmental, Parks, and Conservation on May 1, 2019. The ESA reports and RSC materials has been submitted with the Applications.

Sub policies d) and e) of Policy 4.8 pertain to source water protection and municipally initiated Community Improvement Plans and are not relevant to the applications.

5.0 MAINTAINING HEALTHY COMMUNITIES

5.3 Housing

5.3.1 Residential Intensification

The subject lands are designated as Urban Residential on Schedule B-15 of the NCOP and are located outside of the delineated Built Boundary in Simcoe. Accordingly, the proposed dwelling units are considered as “greenfield” development and are not “intensification”, per the policy direction set out in Policy 5.3.1 b).

Although Section 5.3.1 of the NCOP is focused primarily on intensification as defined in the Plan, Policy 5.1.3 d) applies to lands outside of the built boundary in Simcoe and states that:

"On lands designated Urban Residential and located outside of the Built-Up areas of Simcoe, Port Dover, Delhi, Waterford and Port Rowan, the minimum overall density of residential development shall be 15 units per hectare of developable land area. Developable land shall not include Hazard Lands, Provincially Significant Wetlands and Significant Natural Areas."

The proposed development density is 39.53 units per hectare. This density exceeds and conforms with the minimum density requirements of Policy 5.3.1 d) of the NCOP.

5.4 Community Design

Policies and requirements related to the physical design of neighbourhoods within the County are found in Section 5.4 of the NCOP. The relevant design considerations and requirements of Section 5.4 are evaluated below.

a) Through implementation of this Plan, the County shall seek to maintain and improve the physical design characteristics of the Urban Areas in the context of new and existing development and stress a generally high quality of settlement design throughout the County.

The proposal will advance the anticipated development on the subject lands to complete the development fabric within this area of the Simcoe Settlement Area. The provision of well-designed homes and landscaping is preferable to the current state of the lands and will compliment adjacent development.

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;
   ii) shall promote efficient and cost-effective development design patterns that minimize land consumption;
   iii) shall promote the improvement of the physical character, appearance and safety of streetscapes, civic spaces, and parks;
   iv) shall encourage tree retention and tree replacement;

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

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

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.

The proposed development form is appropriate for the subject property and compatible with the surrounding neighbourhood. The provision of Group Townhouses and Semi-detached dwellings is not without precedent in the surrounding area, nor is the utilization of condominium style design approaches to more efficiently and compactly use urban land.

The subject lands are designated and zoned for residential development with no restriction on the forms of dwellings that can be considered for utilized on site. The lands have been included within previous servicing studies and allocated capacity within constructed servicing infrastructure and roadways networks since 2016.

The proposed dwelling forms and orientation of structures is similar to that within the surrounding area with backyards and amenity areas against each other (back-to-back) and large physical separation between homes. The proposed dwelling forms are more traditional in architectural style and integrate well into the area, as opposed to more modern architectural styles or other higher density dwelling forms such as an apartment building or stacked townhouses. The proposed dwelling units will function in the same manner as existing ground-based dwelling forms on adjacent lands, with driveways, private yards, and a maximum of two storeys with pitched roofs. The common element areas within the development will be landscaped and include street trees.

The Condominium tenure limits the need for municipal servicing and roadway assumption on the site, saving money for the municipality in the long term. The maintenance of these elements would be the responsibility of the condominium corporation.

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.

The proposed residential land uses are compatible with adjacent residential land uses. Setbacks of a minimum of 7.5 metres from the shared lot line with adjacent properties is provided. Where dwellings and structures are closest, specifically at the northern end of the site, setbacks greater than 9.1 metres are proposed. In situations where side walls are located adjacent to existing development, 3.0 metre setbacks are provided.

Internally, trees and other landscaping interventions will fill the space between the proposed dwellings to provide privacy and character.

d) Development design that establishes reverse lotting on Provincial Highways and County Roads will not be permitted. Development design that requires features such as noise attenuation or privacy fencing will be discouraged. Wherever possible, new development will be oriented toward streets or parks.

The subject lands are not adjacent to Provincial Highways or County Roads, and are not subject to noise attenuation measures. The proposed dwellings within the development are oriented to face the internal, private roadway

[…]

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.

Internal to the site, street trees and grassed boulevards are provided. This design form reflects that found on adjacent public streets, including Thomson Road, but at a more compact scale. Streetscaping is also intended to be supplemented with

foundation plantings for each dwelling unit, per the preliminary landscape plan prepared by Adesso Design Inc.

The preliminary landscape plan also proposes stonework ornamental entry features at the Fernwood access point to the site.

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.

Parkland dedication in the form of land is not proposed as part of this application.

[…]

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

The subject lands are not located along any planned pedestrian, cycling or trail routes.

A future southern access point has been provisionally proposed within the development design that will provide vehicular and pedestrian linkages to areas south and southeast of the subject lands.

[…]

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 proposed development will have lighting included within the common element and all homes will be facing towards the internal roadway to provide adequate passive surveillance.

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.

The proposed development has not been deliberately designed to meet LEED ND standards, however the design does align with several of the review criteria found in Policy 11.8.2.1 c) and 11.8.2.1 d) of the Lakeshore Special Policy Area Secondary Plan ***including****:*

11.8.2.1 c)

i) ***the creation of more compact, walkable oriented neighbourhoods;***

ii) the promotion of mixed use developments as opposed to isolated single-use commercial or institutional complexes;

iii) ***the promotion of the creation of human scale environments;***

iv) the provision of opportunities for residents daily activities to occur within walking distances;

v) the creation of a modified grid pattern with interconnected road networks;

vi) ***and the continuation or extension of existing street patterns and neighbourhood forms where feasible and appropriate.***

11.8.2.1 d)

i) ***encourage higher density uses along arterial and collector roads;***

ii) provide bicycle facilities, particularly in combination with higher density uses and large traffic generating uses;

iii) ***promote an interconnected street network to minimize trip lengths;***

iv) identify a strategy to accommodate public parking facilities at key locations to minimize vehicular trips;

v) promote the development of green roofs to improve energy efficiency;

vi) promote the use of porous pavement materials to increase water infiltration;

vii) encourage the reduction of energy and residential combustion emissions through a range of approaches including the development of R-2000 homes and similar commercial construction standards such as LEED, and the incorporation of Energy Star appliances;

viii) *review the layout of new developments to promote energy conservation measures;*

ix) ***encourage landscape design that promotes the use of native species and enhancement of ecological functions;***

x) *and encourage the development of buildings powered by renewable energy systems, both passive and active.*

o) The County shall review site plans and drawings submitted in accordance with Section 41 of the Planning Act and Section 9.6.5 (Site Plan Control of this Plan) regarding accessibility for persons with disabilities including but not limited to areas of accessible parking, exterior paths of travel, lighting, ramps, entrances and street furniture.

The proposed development will be subject to Site Plan Approval and will be reviewed in accordance with Section 41 of the Planning Act and the Site Plan policies of the NCOP.

5.7 Cultural Heritage

5.7.4 Archaeological Resources

Through pre-consultation the Owner was advised by Norfolk County and both the Mississaugas of the Credit First Nation and Six Nations of the Grand River that the subject lands are considered to have archaeological potential and must be assessed. An archaeological assessment of the site was not undertaken by the previous applicants.

The policies within Section 5.7.4 of the NCOP pertain to archaeological resources. Within this section, policies a) and b) are relevant to private applications. These policies are stated below:

a) Archaeological potential areas shall be determined through the use of Provincial screening criteria, or criteria developed based on the known archaeological record within the County by a licensed archaeologist as part of an archaeological management plan.

b) For a proposed development within an area of archaeological potential, an archaeological assessment shall be required prior to final planning approval, or as a condition of final planning approval. Archaeological assessment reports prepared by licensed archaeologists shall be in compliance with guidelines set out

by the Ministry of Tourism, Culture and Sport, as well as licensing requirements developed under the Ontario Heritage Act.

In conformity with the requirements of Section 5.7.4, the Owner retained Archaeological Consultants Canada (ACC) to complete a Stage 1 & 2 Archaeological Assessment of the subject lands. The required assessment work was completed under the supervision of a licensed archaeologist and completed in accordance with Ministry Guidelines and yielded no resource finds.

The completed Stage 1 & 2 Archaeological Assessment Report was submitted to the Ministry of Citizenship and Multiculturism for review by ACC. The Ministry issued a Letter of Concurrence "approving" the report on December 9, 2025.

6.0 MANAGING GROWTH

6.4 Urban Areas

The policies contained within Section 6.4 of the NCOP pertain to lands located within Norfolk's designated "Urban Areas".
Within the policy subset of Section 6.4 evaluated below, Policies a), b), c), and i) are relevant to the submitted applications at 16 Fernwood Drive in Simcoe. The additional policies of this section relate to municipal-led initiatives and urban boundary expansions, which are not relevant to these applications, or proposed.

a) The locations of the Urban Areas are illustrated on Schedule "A" – Community Structure. Each Urban Area is unique and will accommodate a varied range and type of growth and development.

The subject lands are located within the Simcoe Urban Area and therefore the applications and proposed development must conform to the relevant policies of Section 6.4 of the NCOP.

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

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

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

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 proposed development contains two (2) forms of residential dwellings including Group Townhouses and Semi-detached Dwellings. The provision of these dwelling forms will contribute to a wider and full range of housing opportunities in the community. The utilization of Condominium tenure also provides additional variety in home ownership type.

The preliminary servicing and civil design materials prepared by Counterpoint Engineering state that the development can and will utilize existing urban service connections to support the development, including planned capacity in the storm sewer network and wet pond facility located west of the subject property. Urban services are required to be used for all development within Urban Areas in Norfolk County.

The subject lands will have an internal private roadway network that provides access to each dwelling unit. There is driveway and garage parking spaces provided exclusively for each Unit, as well as in the common element for visitors. The Traffic Impact and Functional Operations Study prepared by CANDEVCON has confirmed that the development will not negatively impact existing roads and intersections that are in proximity to the subject lands.

The subject lands are located 200 metres, or a 2-minute walk from the Westwood Acres Park access on Thomson Road. This park contains public amenity and natural heritage features, and provides suitable recreational and passive outdoor space to support the development with a convenient pathway connection to the northwest through the Thomson Road cul-de-sac.

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.

Together, the applications facilitate development on a single, vacant parcel of land within the Simcoe Urban Area. This property is located amongst existing residential developments to the west, north and south and the urban boundary limit to the south of varying ages.

The development of the property will fill in a physical gap in the existing urban fabric and utilize existing municipal investments in infrastructure and roads. There would be no infrastructure extensions or upgrade costs to the County caused or required because of the approval of the applications.

[…]

i) Development of vacant land within the Urban Area boundary on the edge of the existing built-up portions of the Urban Areas shall include efficient provision of water supply, sanitary sewers, roads, parks, schools, and other public, community and municipal services. Development shall proceed in a staged and sequential manner, considering the existing pattern of the Urban Area.

The subject lands are currently vacant and situated along the boundary of the Simcoe Urban Area. The future development of the property has been anticipated and accommodated through external development and construction through the provision of ready connections to municipal services, allocated capacity within the stormwater management network and the provision of public roadway access.

The subject lands are located within a ~200 metre walk of municipal parkland (Westwood Acres Park) and schools.

[…]

6.5 Specific Urban Areas

6.5.1 Simcoe Urban Area

6.5.1.1 Introduction

Policy 6.5.1.1. of the NCOP outlines the role and planned function of the Simcoe Urban Area, and states that:

The Simcoe Urban Area, as identified on Schedule "A", is the largest Urban Area in the County. The County shall support and promote the continued development of Simcoe as a complete, balanced and sustainable urban community containing an efficient pattern of

development. Simcoe plays an important role as a major employment and commercial node, and as an agricultural support centre."

The applications do not conflict with the intended function of the Simcoe Community as outlined in Policy 6.5.1.1. The proposed development is appropriately located within the Simcoe Urban Area, Built-up Area, and Urban Residential land use designation.

7.0 MANAGING LAND USE

Section 7 of the NCOP contains policies related to the multiple Land Use Designations that are applied across the County on the various Schedule B's of the NCOP.

As illustrated in **Figure 4**, previously, the subject lands are designated as "Urban Residential" in their entirety and therefore the applications must be evaluated against the Policies of Section 7.7 of the NCOP.

7.7 Urban Residential Designation

The following policies apply to land designated Urban Residential in the NCOP:

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.

The proposed development is inclusive of semi-detached dwellings; however, these units are mixed in with Group Townhouse Dwellings (i.e. Block Townhouses in the Official Plan) and subject to the same R4 zoning provisions. Furthermore, these uses occur on the same property for which density is calculated on an overall basis. Accordingly, it is appropriate to consider the Medium Density policies of Section 7.7.b as being most relevant to the applications based on the unit composition, the use of low and medium density forms of dwellings, and physical design elements.

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 NCOP does not have any residential land use designations that pertain to specific density ranges – instead, all applications are reviewed for compatibility with adjacent land uses through the criteria of Section 7.7. of the Plan.

The proposed development is inclusive of two-storey Group Townhouses and Semi-detached dwellings. Semi-detached dwellings are considered as a "low density" dwelling form" and townhouses are considered a "medium density" housing form by the policies of the NCOP. "High density" building forms include apartment dwellings or other similar multi-residential dwelling forms, which are not proposed. Due to the design and functional similarity of the semi-detached dwellings and townhouses proposed, the development is best categorized as a medium density development.

The proposed development density for the 68 planned dwellings is 39.5 units per hectare, which is outside of the general range of 15-30 units per hectare for medium density developments outlined in Policy 7.7.2 b. The proposed development is not considered to be high density in terms of context, built form or functionality as all units are ground based with driveways and garages, amenity yards, and limited building height, similar to other low and medium density developments in the surrounding area.

Furthermore, the built form only represents 33% of the site, whereas higher density development typically has a higher building coverage percentage and/or extensive parking needs which emulate a more intense physical development form. In this proposal the roadway and parking areas represent only 29% of the total area, with the balance being landscaped.

Although the density exceeds the general range for medium density prescribed in policy, the physical intensity of development is not high density in character. The proposed development better aligns with the medium density development policies than those for high density uses found in Policy 7.7.2 c).

It is noted that the previously approved Meadows of Norfolk development had a density of 38.9 units per hectare. The proposal is less than 1 unit per hectare in density greater than that which is approved as-of-right.

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;

The interfaces between existing residential development to the west, north and east with the proposal has been tempered using building placement, large physical setbacks, perimeter fencing, landscaping and dwelling types.

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

The subject lands have roadway access provided from Fernwood Drive only, which is a local roadway.

A secondary access to the future extension of South Drive is also contemplated in-plan, subject to County approval. The existing portion of South Drive is classified as a Collector Road on Schedule E-2 (Transportation) of the NCOP.

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;

The preliminary Functional Servicing Brief prepared by Counterpoint Engineering indicates that the proposed development can be supported by existing municipal water and sanitary services. Additional modelling for sanitary capacity will be carried out by the County as part of the application review process to confirm this.

All external service connections and internal service networks (water, sanitary sewer, storm sewer) will be developed at the cost of the developer.

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

The subject land is located within 200 metres of Westwood Acres Park, located to the northwest of the property. This park has walking paths and playground equipment.

The subject lands are not located within proximity to any school sites. The adequacy of schools will be confirmed through comments from the local school board.

vi. in developments incorporating walk-up apartments, block townhouse dwellings and medium-profile residential buildings, on-site recreational *facilities or amenities such as playground equipment may be required;*

The proposed development is a Vacant Land Condominium that includes Group Townhouses (i.e. Block Townhouses) and semi-detached dwellings of similar design.

Each dwelling unit is allocated individual private amenity space in the functional rear yard in lieu of a common amenity area.

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 applications are accompanied by a preliminary landscape plan prepared by Adesso Design Inc. Within the Plan a 1.8 metre perimeter privacy fence is proposed to provide physical separation and a visual barrier between proposed and existing development. Additional screening will be provided in the form of entrance features, foundation plantings and trees within the development that will mature to provide additional on-site screening to mitigate sporadic minor visual and/or noise impacts.

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

The complete application requirements for the applications included the provision of a Servicing Report and Traffic Study. The reports conclude that the existing service and transportation networks are adequate to support the planned development.

A detailed summary of the findings and conclusions of the noted reports is found in Section 3 of this report.

ix. triplexes, fourplexes, freehold street townhouses or other similar smallscale developments, may be subject to site plan control, in accordance with the policies of Section 9.6.5 (Site Plan Control) of this Plan.

The proposed development is inclusive of semi-detached and Block Townhouse (Group Townhouse) dwellings totaling 68 units. These dwelling forms are similar to the other noted multi-residential dwelling forms and are commonly utilized in smaller scale developments such as Condominiums.

The development is subject to Site Plan Control.

8.0 NETWORKS AND INFRASTRUCTURE

8.2 The Transportation Network

Section 8.2.2.6 of the NCOP pertains to “Unopened Road Allowances”. This Section of the NCOP is relevant to the applications as the subject lands are located immediately adjacent (north) to the South Drive Extension Road Allowance.

Policies a), b), c) and d) are evaluated in the context of the applications. Policy e) and f) are not applicable to the applications as no closure or usage of the road allowance is proposed.

a) It is general policy of the County that unopened road allowances shall not be used for motor vehicle travel purposes, and that any cutting down of trees or grading or removing of aggregate or fill or farming on unopened road allowances is prohibited without the express approval of Council.

The adjacent road allowance is not proposed to be utilized for travel or access to support this application. No development or site alteration is proposed within the adjacent road allowance.

b) There is no commitment on the part of the County that the unopened road allowance will be improved or developed as a public road.

The construction of the South Drive extension is not required to support development. However, as the road may be established in the future, the development plan provides a provisional connection to the roadway at the southeast corner of the site.

c) Development of land requiring access to an unopened road allowance will not be permitted.

The subject lands have legal and accessible lot frontage at the end of Fernwood Drive. The South Drive Road Allowance is not required to facilitate the development of the subject lands

d) The crossing of unopened road allowances by private roads or driveways or the use of an unopened road allowance may be permitted subject to conditions that are satisfactory to the County.

At this time, no crossing or use of the South Drive Road Allowance is proposed.

8.2.3 Parking

The County's position and requirements regarding the provision of off-street parking are outlined within Section 8.2.3 of the NCOP.

Policy a) is relevant to the applications and states that:

a) Except in Downtown Areas, all new development and redevelopment, including re-use of existing buildings, shall be required to provide adequate off-street parking and loading spaces in accordance with standards established in the Zoning By-law. Access and egress to all off-street parking or loading spaces shall be limited in number and designed to minimize danger to vehicular and pedestrian traffic.

The proposed development plan complies with the off-street and visitor parking requirements of the Official Plan and Section 4.0 (Off Street Parking) of Zoning By-law 1-Z-2014.

No site-specific reductions or adjustments to the required parking ratios or dimension requirements are proposed as part of the Zoning By-law Amendment.

8.9 Water and Wastewater Services

8.9.1 Services in Urban Areas

[…]

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 proposed development will connect to a municipal watermain and sanitary sewer located at the terminus of Fernwood Drive. Privately owned urban services will be constructed within the Condominium to support the development at the cost of the developer. These services shall be owned and maintained by the Condominium Corporation.

d) In Urban Areas, priority shall be given to the development of land that is presently serviced by watermains and sanitary sewer systems, or those areas that can most easily be serviced, at minimal expense.

The subject lands have available municipal service connections at the Fernwood Drive property line. All costs for external servicing work and the internal servicing of the site will be completed at the developer's expense.

e) Infilling of vacant areas within the Urban Areas which are already provided with full municipal services is encouraged, and shall be a criterion when evaluating

proposed plans of subdivision and consents, with respect to the extension of services, utilities or the associated construction.

The subject property is located within the Simcoe Urban Area and therefore any proposed development must be supported by full municipal services.

The applications conform with Policies c), d) and e) as the proposed development will utilize existing municipal watermain and sanitary sewer connections available at the property line at Fernwood Drive. As the proposed tenure type of the development will be a Condominium, required services within the development will be privately owned and maintained by the future condominium corporation and constructed at the developers cost.

8.9.3 Servicing Allocation and Phasing

Policy 8.9.3 pertains to availability of servicing capacity and phasing of development. Policies a) b) and e) are considered relevant to the applications and are evaluated. Policies c) and d) pertain to developments that have been draft approved, or require a sanitary pumping station to proceed and are not relevant to the proposal.

The following shall be the policy of the County:

a) When unallocated servicing capacity does not exist for a proposed development, the County shall defer the processing of the planning application until capacity is available, or until a servicing agreement is in place to ensure that such capacity will be available to service the development. Draft approved plans of subdivision may only proceed to registration if sufficient servicing capacity continues to exist.

At this time, there are no known capacity issues that would limit the ability of the application to be considered by Norfolk County.

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;
ii) a compact form and pattern of development is maintained;
iii) the provision of all municipal services, as appropriate, proceeds in an economically viable manner; and

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

The subject land will be serviced from existing water and sanitary sewer connections available at the terminus of the Fernwood Drive cul-de-sac.

As outlined in the Functional Servicing Design Brief prepared by Counterpoint Engineering, there is adequate capacity in County servicing systems to support the development. It is noted that no external municipal servicing enhancements or reconstructions are required to support this development. All servicing infrastructure required to support the development will be at the cost of the developer and placed under the ownership of the future Condominium Corporation.

The proposed development form is compact like the existing Westwood Trails condominium development to the west of the property. The proposed development will similarly utilize existing, vacant land within the Urban Area for new development.

[…]

e) The County may insert a clause in the conditions of development approval, including conditions of draft plan approval, reflecting the policies of this Section.

This is a common and typical approach for Draft Plan Approvals and would be appropriate to utilize for this Draft Plan of Vacant Land Condominium Application.

8.9.4 Stormwater Management

Policy 8.9.4 pertains to stormwater management, and more specifically, the provision of stormwater management facilities. The policies of Section 8.94 are outlined below:

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.
b) Storm water management facilities must be located within the Urban Area or Hamlet Area in which the development is located.

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.

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.

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.

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

g) The County shall ensure that the design of stormwater management facilities considers long-term maintenance, public health and safety requirements.

h) The cost of stormwater management facilities, including its design, engineering, and construction, shall be the responsibility of the applicant. Before development approval, the County shall be satisfied that the necessary financial arrangements, including any cost-sharing agreements or mechanisms involving other properties,

are in place to cover the cost of constructing, operating and maintaining the storm water management facility.

i) The Ministry of Transportation shall be consulted in relation to stormwater management plans and facilities in proximity to Provincial Highways.

j) The County may develop a comprehensive storm water management asset database, including installed low impact development measures, to assist in the management and maintenance of storm water management systems.

The proposed development has had stormwater capacity allocated into the existing wet pond stormwater management facility located to the west of the Westwood Trails condominium. On-site stormwater that does not infiltrate into the ground will be captured through swales, gutters and catch basins and directed through a private storm sewer to the adjacent Westwood Trails stormwater system and eventually on to the wet pond facility located further west.

Based upon the analysis and recommendations of Counterpoint Engineering, no new stormwater management facilities are required to support the proposal.

8.10 Waste Management

Section 8.10 of the NCOP has policies related to Closed Waste Disposal Sites that are shown on Schedule J.

f) Closed Waste Disposal Sites and Waste Transfer Sites are identified on Schedule "J" to this Plan. Notwithstanding the general nature of the denotation of Waste Disposal Sites in this Plan, new or the expansion of existing waste disposal sites shall proceed by way of Official Plan Amendment, in accordance with Section 9.6.1 (Official Plan Amendments) of this Plan. Prior to approval of the Official Plan Amendment, new Waste Disposal Sites or expansions, shall obtain an Environmental Compliance Approval from the Ministry of the Environment and Climate Change. New or expanding Waste Disposal Sites shall be re-designated as a site-specific policy area within the Major Public Infrastructure Designation and be subject to the applicable policies of Section 7.17 (Major Public Infrastructure Designation) of this Plan.

g) Development proposals within 500 metres of either an active or closed Waste Disposal Site shall be accompanied by a hydrogeologic/engineering study prepared by the proponent that satisfies the County and the requirements of the Ministry of the Environment and Climate Change guidelines related to land uses on

or near landfills and dumps. The study shall address any mitigation measures required. The requirement for a hydrogeologic/engineering study within 500 metres of either an active or closed Waste Disposal Site may be modified as follows:

i. Where hydrogeologic/engineering studies have determined the actual influence area to be less than 500 metres, the study area can be reduced to coincide with the actual influence area; or

ii. Where hydrogeologic/engineering studies have determined that significant impacts may be encountered at or beyond 500 metres, the area in which an assessment for a change in land use shall be required shall be extended beyond the 500 metre area.

h) Redevelopment of closed Waste Disposal Sites may be permitted by way of Official Plan and Zoning By-law amendments, upon the County consulting with the Ministry of the Environment and Climate Change and/or other appropriate jurisdiction, and subject to the following policies:

i. written approval has been received from the Ministry of the Environment and Climate Change, and/or other appropriate jurisdiction, that the development satisfies the provisions of the Environmental Protection Act;

ii. the studies required by the Ministry of the Environment and Climate Change shall be carried out to the satisfaction of the Ministry and the County and shall demonstrate that development is compatible and can proceed without unmitigated negative impact;

iii. the County shall require the construction and phasing of all development to coincide with the control of any problems identified by the engineering studies;

iv. the required studies of methane gas, leachate and hydrogeology shall be completed to the satisfaction of the County in consultation with the Ministry of the Environment and Climate Change; and

v. the County shall be satisfied with respect to any matter regarding structural stability, safety and integrity of any and all structures

Through the Phase 1 and 2 Environmental Site Assessments prepared by Pinchin and the issuance of Record of Site Condition #225555, the subject lands have been demonstrated to be suitable for residential development.

Regarding policy 8.10 h), the proposed zoning by-law amendment is required to establish performance criteria for the placement of buildings on the property. Residential land uses are already permitted on the subject lands by the NCOP and Zoning By-law 1-Z-2014.

9.0 IMPLEMENTATION AND MONITORING

9.5.3 Pre-Consultation and Complete Application

A pre-consultation meeting regarding the proposed development and required application was held virtually by Norfolk County on June 11, 2025.

In conformity with the policies of Section 9.5.3, all materials requested as part of a Complete Application submission that were listed in the Pre-consultation meeting notes, including this Planning Justification Report, have been prepared and provided with the Applications for staff review.

The submission materials have been provided along with the duly completed and signed application forms.

9.6.2 Zoning By-law Amendments

As stated in Section 9.6.2 of the NCOP, Amendments to the Zoning By-law are permitted subject to the provision of required materials and justification.

Policy 9.6.2 indicates that Amendments will be considered based on the criteria established in Policy 9.6.1 of the NCOP, which are also applied to Official Plan Amendments. The noted criteria are listed and evaluated below to demonstrate conformity with this section of the NCOP.

i) the manner in which the proposed amendment conforms to prevailing Provincial policy and regulations;

The Applications have regard for, and satisfy the Sections 2, 51 (24) and 53 of the Planning Act, and are consistent with the 2024 Provincial Planning Statement. The development also complies with Ontario Regulation 153/04 pertaining to Records of Site Condition.

ii) the manner in which the proposed amendment conforms to the Strategic Plan prepared in support on this Plan;

The Norfolk Strategic Plan (Our Future Norfolk Strategic Plan) has been established for the current term of Council from 2022-2026. The Plan contains five (5) strategic areas of focus that include:

- *Empowering Norfolk*
- *Building Norfolk -*
- *Connecting Norfolk*
- *Serving Norfolk*
- *Sustaining Norfolk*

The proposed applications are most correlated with the "Building Norfolk" area of focus. This area of focus pertains to developing the infrastructure and support needed to ensure complete communities and aims to achieve the following objectives:

- *Ensure the health, safety and wellbeing of the community Facilitating the necessary supports to ensure affordable, accessible, and equitable service options.*
- *Provide a solid infrastructure foundation Ensuring that Norfolk has all of the hard infrastructure (water, sewer, roads, parks) for current and future needs.*
- *Ensure responsible growth policies and strategies Developing policies and processes that foster responsible growth in Norfolk.*

The applications will facilitate the development of urban lands that are designated and zoned for residential development. The provision of new housing will help to ensure an adequate supply of dwellings units is available for future and current residents. The Condominium tenure proposed for the development will alleviate the need for the County to provide and maintain additional infrastructure in support of development, as all proposed servicing infrastructure and roads within the development will be privately owned and maintained by the future condominium corporation. Preliminary study by Counterpoint Engineering has concluded that there is adequate capacity within the existing servicing networks and that no external works or upgrades are needed to accommodate development.

iii) the manner in which the proposed amendment conforms to the Goals and Objectives, and policies of this Plan;

The relevant goals and objectives are found within Section 2.2 of the NCOP and relate to the following six strategic areas of interest:

- *Strong and Diversified Economy (2.2.1)*
- *Protecting and Enhancing the Natural Environment (2.2.2)*
- *Maintaining and Enhancing the Rural and Small Town Character (2.2.3)*
- *Maintaining a High Quality of Life (2.2.4)*
- *Upgrading and Expanding Infrastructure (2.2.5)*
- *A Well Governed, Well Planned and Sustainable Community (2.2.6)*

An assessment of conformity and alignment with these goals has been previously provided in this section of the report regarding Section 2.0 of the NCOP and should be consulted for analysis.

iv) the impacts of the proposed amendment on the provision of and demand for municipal services, infrastructure and facilities;

As demonstrated within the Functional Servicing Design Brief, Stormwater Management Brief and Transportation Impact Study, the proposed development will not result in any significant or negative impacts on the existing municipal servicing or transportation networks.

v) the adequacy of the proposed servicing solution with respect to the servicing policies of this Plan;

The proposed development will be serviced by existing municipal watermain and sanitary sewer located at the terminus of Fernwood Drive.

The Functional Servicing Design Brief prepared by Counterpoint Engineering concludes that there is adequate water supply and pressure for domestic and firefighting purposes available to support the proposed development.

As part of the review process, the County will complete its own sanitary modelling to confirm if there is adequate sanitary capacity to support the development.

vi) the impact of the proposed amendment on surrounding land uses, the transportation system, municipal services and community amenities and services;

Impacts associated with transportation and municipal services were evaluated through the Transportation Study prepared by CANDEVCON and the Functional Servicing and Stormwater Management reports prepared by Counterpoint Engineering.

The CANDEVCON Traffic Report has concluded that the development will have no negative impact on roadways and intersections in proximity to the subject lands. Furthermore, auto-turn diagrams have also concluded that the site can accommodate municipal waste collection vehicles.

The servicing reports prepared by Counterpoint Engineering have concluded that there will be adequate capacity within the municipal servicing system, including the stormwater management wet pond facility to the west to support the development with no impacts foreseen on adjacent development. It is noted within the Functional Servicing Design brief that the County will need to complete sanitary modelling, however, this is understood to be a required activity.

Community amenities and services are limited in surrounding area to municipal parkland. The park is not expected to be negatively affected or overutilized by the proposed amendment as the proposed development will be inclusive of private amenity for each dwelling unit.

vii) the impact of the proposed amendment on the community structure and nature of the Urban Areas and/or Hamlet Areas;

The proposed Zoning amendment will not impact the community structure or nature of the Simcoe Urban Area. The development proposal consists of residential land uses that are permitted as-of-right on the subject lands by the Zoning By-law. The number of units provided is only one (1) unit greater than previously approved for the property by Norfolk County.

viii) the impact of the proposed amendment on cultural heritage resources and/or Natural Heritage Features;

The subject lands are not located adjacent to, or near any built cultural heritage resources or existing natural heritage features.

The subject lands were identified as being within an Area of Archaeological Significance through pre-consultation. A Stage 1 & 2 Archaeological Assessment was undertaken by Archaeological Consultants Canada in 2025 with no resource finds. The related Assessment Report was submitted to and reviewed by MCM who issued a Letter of Concurrence on December 9, 2025.

ix) the impact on agricultural uses and land;

The Zoning By-law Amendment pertains to land within the Simcoe Settlement Area and does not include Agricultural lands.

To the south of the subject lands are lands that are designated and zoned for Agricultural purposes, however, these lands will not be impacted by the proposed development of 16 Fernwood Drive. Additionally, between the subject lands and the agricultural area is road allowance associated with a proposed westward extension of South Drive that would serve as a physical buffer between land uses and provide additional separation.

x) the impact of the proposed amendment on the financial sustainability of the County; and

The proposed amendment seeks site-specific deviations from the existing site-specific Zoning to permit the proposed layout of the Condominium site. The amendment will have no impact on the financial sustainability of the County as all development costs will be borne by the developer. Future maintenance of the infrastructure provided will be the responsibility of the Condominium Corporation.

xi) any other information determined by the County, in consultation with the appropriate agencies, to be relevant and applicable.

There was no further information required to be provided by the County.

9.6.4 Draft Plan of Subdivision and Condominium Approval

Policy 9.6.4 contains policies that are specifically applied to Draft Plans of Subdivision and Condominium within Norfolk County. These policies are relevant as the proposed tenure type for the site will be a Vacant Land Condominium.

a) The provisions of the Planning Act relating to subdivision control, including subdivision agreements, shall be used by Council to ensure that the land use designations and policies of this Plan are complied with, and that a high standard of design is maintained in all development.

The noted Planning Act provisions have been addressed within Section 4.1 of this Planning Justification Report.

b) Prior to approval of an application for plan of subdivision or plan of condominium, the County shall confirm the availability of adequate servicing infrastructure and allocation in accordance with Section 8.9.3 (Servicing Allocation and Phasing), waste collection and disposal services, and roads.

The Condominium Application has been submitted with a Functional Servicing Design Brief and Stormwater Management Brief prepared by Counterpoint Engineering that conclude there is adequate capacity and servicing infrastructure to support the development.

The development has been designed to accommodate a municipal waste collection vehicle in accordance with municipal standards.

CANDEVCON prepared a Transportation report that has determined the traffic that will be generated by the development and has concluded that there will be no significant impacts on intersections and roadways in the immediate area.

c) Applications for plan of subdivision or plan of condominium approval shall be considered premature if appropriate services and servicing capacity is not available. Additionally, Council may consider other criteria as reason to deem an application for plan of subdivision or plan of condominium approval to be premature.

The Functional Servicing Report and Stormwater Management Brief prepared by Counterpoint Engineering state that there is adequate capacity within municipal servicing systems to support the proposed development.

d) The review of plans of subdivision or plan of condominium shall be based in part on the consideration of the community design policies included in Section 5.4 (Community Design) and Section 11.8 (Community Design Strategy) of the Lakeshore Special Policy Area Secondary Plan of this Plan.

The subject lands are not located within the Lakeshore Area and are only subject to the policies of Section 5.4 (Community Design). These policies have been evaluated for conformity previously in this report.

e) All lots within a plan of subdivision shall have frontage on a public road maintained on a year-round basis, constructed to an acceptable County standard. Plans of condominium shall have access to a public road maintained on a year-round basis, however, it is recognized that development within the condominium plan may occur on private roads.

The proposed condominium units abut and have access to a private roadway that will be owned and maintained by the Condominium corporation. The private roadway system will be connected to Fernwood Drive which is an open public roadway that is maintained all year.

f) Provincially Significant Features and Natural Heritage Features shall be protected and preserved in the design of any plan of subdivision or condominium.

The subject lands do not contain and are not adjacent to any Provincially significant features or natural heritage features that require protection within the Plan of Condominium.

g) Plans of subdivision or condominium shall be appropriately phased to ensure orderly and staged development.

The proposed condominium will be developed in one phase based on the design and scale of development.

h) All plans of subdivision shall be subject to a subdivision agreement between the County and the development proponent.

This policy is not applicable to condominiums.

i) All plans of condominium shall be subject to a development agreement between the County and the development proponent.

This requirement is acknowledged and appropriate to apply to the Condominium.

j) Parkland dedication shall be provided pursuant to Section 9.10.5 (Parkland Dedication) of this Plan. Land to be dedicated for park purposes must be acceptable to the County. Under no circumstances shall the County be obligated to accept parkland being offered in a proposed plan of subdivision.

The County did not request any land dedication for parkland purposes. The developer will provide cash-in-lieu of parkland dedication.

k) The County shall consult with the appropriate Conservation Authority and the Province, as well as other relevant agencies, in considering an application for approval of a plan of subdivision or condominium.

The subject lands are not located within the regulatory area of the Long Point Conservation Authority (LPCA). Circulation to the LPCA may not be required for this application.

4.4. Norfolk County Zoning By-law 1-Z-2014

As shown in **Figure 7**, the subject lands are currently zoned as site specific Urban Residential Type 4 Zone (R4, 14.979.1) which reflects the previously approved development plan for the subject lands (Meadows of Norfolk).

The submitted Zoning By-law Amendment proposes amendments to the existing site-specific zoning to reflect the currently proposed development design and Condominium tenure.

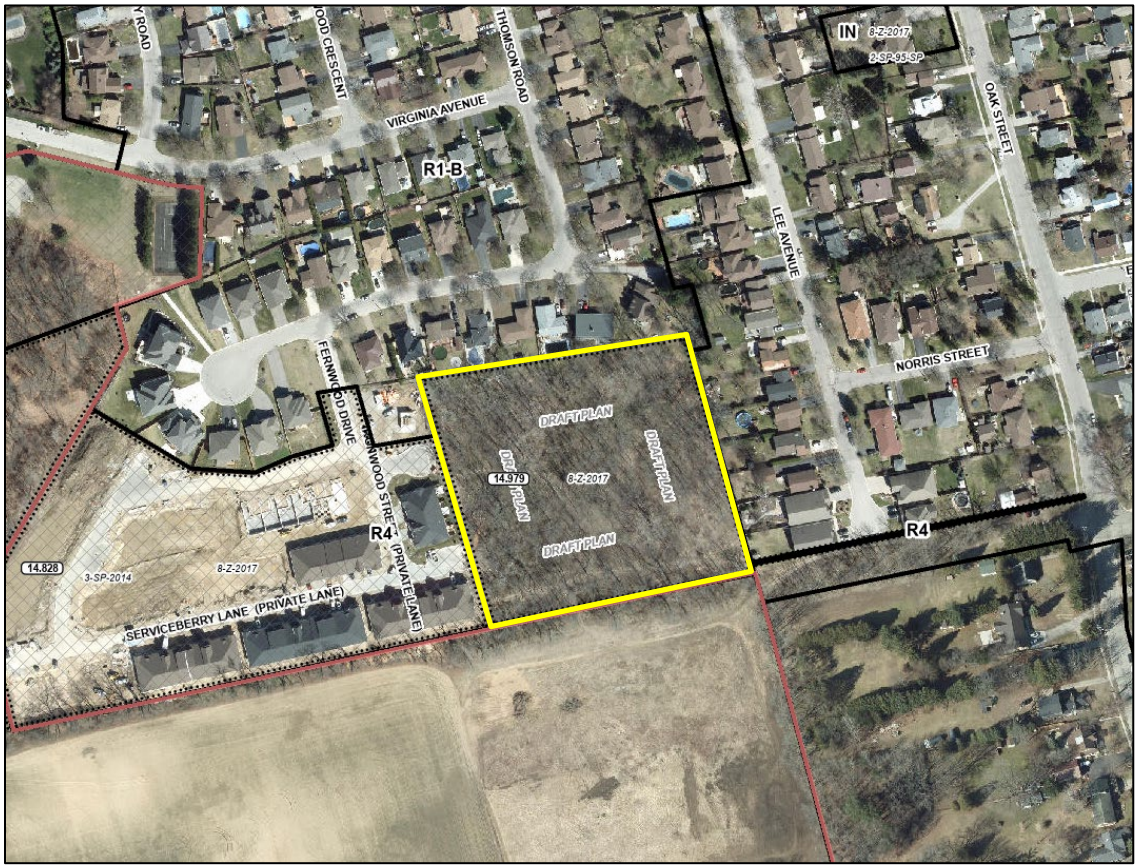


Figure 7 - Norfolk County Online Map Viewer - Zoning

(https://www.norfolkcounty.ca/home-property-and-neighbourhood/maps-and-data/online-maps/#community)

4.4.1 Permitted Uses

As listed in Section 5.4.1 of Zoning By-law 1-Z-2014, the Urban Residential Type 4 Zone (R4) Zone permits the following residential dwelling types and uses on the subject lands:

a) Group Townhouse
b) Stacked Townhouse
c) Street townhouse
d) Semi-detached, duplex, tri-plex and four-plex dwellings provided that they are located on the same lot with, and in accordance with the zone provisions of, group townhouse
e) Home occupation
f) Accessory residential dwelling unit, subject to Subsection 3.2.3 (7-Z-2020)

The proposed development includes a mix of Group Townhouse Dwellings (54) and Semi-detached Dwellings (14) on the same lot. As per Provision 5.4.1 d), the Group Townhouse provisions of Section 5.4.2 shall also govern the proposed semi-detached dwelling forms within the development.

4.4.2 Zone Provisions

The shared R4 Lotting Criteria for Group Townhouse Dwellings and Semi-detached Dwellings and proposed provisions are outlined in the **Zoning Table** included on the following pages:

Proposed Urban Residential Type 4 Zone (R4.14979) Semi-Detached Dwelling & Group Townhouse Dwellings			
Provision No.	**Provision**	**Proposed Requirement**	**Provided**
a)	Minimum Lot Area (per dwelling Unit)	195 m^2	254 m^2
b)	Minimum Lot Frontage	19.86 m (Fernwood Drive)	19.86 m (Fernwood Drive)
c)	Minimum Front Yard	6.0 m from a private roadway	6.0 m
d)	Minimum Exterior Side Yard	2.5 m from the end wall of a dwelling to a private roadway 1.5 m to a parking area or space	2.5 m (roadway) 1.8 m (parking)
e)	Minimum Interior Side Yard	1.2 m from the end wall to a dwelling to an interior side yard lot line	3.0 m
f)	Minimum Rear Yard	7.5 m from the rear wall of a dwelling to a lot line.	7.5 m
		12.0 metres between the rear walls of dwellings	12.0 m
g)	Minimum Separation between Dwellings	2.0 m between side walls of dwellings	3.0 m
h)	Maximum Building Height	11.0 m	11.0 m
Parking Requirements			
4.9.a)	single detached, semi-detached, duplex, tri-plex, four-plex, townhouse dwellings and	2 spaces per dwelling unit (68 x 2 = 136)	136 spaces

Proposed Urban Residential Type 4 Zone (R4.14979) Semi-Detached Dwelling & Group Townhouse Dwellings			
Provision No.	**Provision**	**Proposed Requirement**	**Provided**
	vacation home [8-Z-2017]		
4.9 f)	All apartment dwellings; and duplex dwellings, tri-plex dwellings, four-plex dwellings, townhouse dwellings or single detached or semi-detached dwellings as part of a condominium development or when they abut a private road [27-Z-2020].	1 visitor space for every 3 dwelling units (68 / 3 = 26.6)	26 visitor spaces

4.4.3 Proposed Site-Specific Provisions

Condominium Units vs. Lots

Zoning By-law 1-Z-2014 defines a "Lot as:

"…a parcel of land which can be legally conveyed. Where two (2) adjoining lots are in common ownership and a main building straddles the lots, the two (2) lots are deemed to be one (1) lot for the purposes of establishing interior side yards."

The Zoning By-law does not contain a definition for "Condominium" or "Condominium Unit"

Based on the definition, the subject lands (16 Fernwood Drive) are considered a Lot under the zoning by-law. It is the opinion of the undersigned that Condominium Units, although conveyable are not Lots, and accordingly, should not be subject to zoning criteria that are based on typical or traditional Lots and lot sizes. This interpretation can lead to zoning compliance issues and also, in some instances, an over regulation of built form that does not allow for any flexibility during the detailed design process.

It is proposed that the Zoning Amendment specifically cite this matter and ensure that provisions that would pertain to Lots (as defined) only pertain to the overall subject lands (16 Fernwood Drive). Specifically, these matters include minimum lot frontage calculations along Fernwood Drive, minimum lot area per dwelling unit, height of structures, and parking requirements. All other performance criteria, such as setbacks, are proposed to be taken from either 1) the private roadway or parking areas (back of curb), 2) and adjacent Lot line, or between structures.

Application of Setbacks for a Condominium

To ensure the desired development configuration and to provide clarity from a Zoning and implementation standpoint, it has been proposed that Zoning measurements be conducted as follows:

- Front Yard Setbacks shall be taken from the front wall of a dwelling to the private roadway (back of curb).
- Rear Yard Setbacks will be taken from the rear wall of dwellings to adjacent lot lines. In back-to-back configurations, a minimum distance between rear walls of dwellings is also prescribed for dwellings on the centre "island".
- Side Yard Setbacks shall be taken between dwelling side walls (interior) or adjacent lot lines (Interior). Exterior side yard setbacks shall be taken from the private road or adjacent parking area (back of curb) the closest side wall of a dwelling.

Building Height

The previous approvals associated with the Meadows of Norfolk development included a maximum building height of 9.8 metres, whereas 11.0 metres permitted as-of-right in the current R4 Zone.

This tempered height was implemented because of public feedback from adjacent landowners. It is noted that within the existing site-specific zoning that the 9.8 metre maximum height only applies to Street Townhouses and Stacked Townhouse Dwellings located adjacent to R1-B and R2 Zones. Dwellings with the R1-B Zone are located to the north of the subject lands along Thomason Road, and R2 zones are located to the east along Lee Avenue

The Owner desires to utilize the 11.0 metre height permission permitted as-of-right for Group Townhouses and Semi-detached dwellings in the base R4 Zone rather than the 9.8 metres previously approved by Council.

Within new residential construction 9-foot ceilings on the second floor are now commonly provided, rather than typical 8 foot ceilings. Utilization of the 11.0 metre height allows for flexibility in design and for the added ceiling height to be accommodated in design.

The utilization of the 11.0 metre height limitation is appropriate for the proposed development as the dwellings will be two storeys in height only. Regardless of a 9.8 m or 11.0 metre height, the vertical location of second storey windows will be generally the same and the balance of the building height will be allocated to the pitched roofs.

5. Land Use and Neighbourhood Compatibility

As required by the County for proposed Zoning By-law Amendments, a brief assessment of Land Use and Neighbourhood Compatibility is provided in this Section of the Planning Justification Report.

Typically, compatibility matters include nuisance from new or existing land uses such as industrial, or the potential to alter the typical functionality of the area. Design and architectural characteristics can also factor in the assessment of neighbourhood compatibility depending on the age and context of the neighbourhood, established building heights and setbacks, and lotting patterns. Impacts on public safety and/or increases in traffic volume are also relevant to determining compatibility.

An analysis of compatibility is provided regarding the following factors:

- Function and Intensity of Development
- Existing Dwelling Types and Built Form
- Public Safety and Access

The limits of the compatibility assessment include Lee Avenue (east), Thomson Road (north), Fernwood Drive and Westwood Trails Condominium (west) and the South Drive Road allowance (south). The limits of evaluation area are shown in **Figure 8**, below.



Figure 8 – Evaluation Area

5.1 Function and Intensity of Development

The proposed use of the subject property is for residential purposes that includes the provision of 54 Group Townhouse dwellings and 14 Semi-detached dwellings. The proposed dwellings will be established within a Vacant Land Condominium, which is like a Subdivision plan as each dwelling will also be provided with a "lot" of land (i.e. the Condominium Unit) for their exclusive use and ownership. The Unit will contain the dwelling, exclusive amenity area, and parking.

The intensity of the proposed development is 68 units, which equates to an overall development density of 39.5 units per hectare. This development intensity and density is generally the same as that which was previously approved for the site as part of the Meadows of Norfolk Development which had 67 units and a density of 38.9 units per hectare.

To the west, the Westwood Trails Condominium is inclusive of 72 units. This property measures approximately +/- 2.6 hectares and has an approximate density of 26units per hectare.

Although the proposed development has higher density, the functionality, character and physical size of the proposed dwelling units and development blocks is similar and compatible to surrounding land uses.

The proposed development will have a higher density than adjacent detached development found along Thomson Road and Lee Avenue, however, the functionality of the dwellings will be the same, relying on roadway access to each Lot/Unit, having garage and driveway parking, on-street parking, and private amenity yards. Accordingly, the proposal is considered to be similar and functionally compatible with the existing neighbourhood.

5.2 Existing Dwelling Types and Built Form

The surrounding neighbourhood contains a mix of single detached dwellings of similar architectural style and heights (bungalows, two-storey) along Lee Avenue and Thomson Road. Newer, larger scale detached construction is found around the cul-de-sac at the western terminus of Thomson Road, and smaller infill singles are found immediately north of Fernwood Drive access to the subject property.

The lotting fabric of the homes to the north and east of the subject lands are reflective traditional, and grid-like with backyards abutting against the subject land boundary. This

interface has been matched along the west, north, and east sides of the proposal, with minimum rear yard setbacks of 7.5 metres inclusive of at grade private amenity yards located adjacent to the lot lines.

Condominium Townhouses in the form of 1.5 story bungalofts are located within the Westwood Trails Condominium Development to the west of the subject property. This development includes Townhouse Blocks ranging from three (3) to seven (7) units wide. The proposed development has similar block sizes and has placed development in back-to-back orientation with the townhouses at the eastern end of the Westwood trails development to match the planned interfaces with the adjacent detached dwellings along Fernwood Drive, Thomson Road, and Lee Avenue.

The development will be visually buffered from surrounding lands through the provision of a 1.8 metre wood board perimeter privacy fence and landscaping. Dwellings will have limited visibility from the Fernwood access point to the site.

5.3 Public Safety and Access

Currently, site access is limited to Fernwood Drive and the existing cul-de-sac. Secondary access to the property is provisionally proposed at the southeast corner of the site to the South Drive road allowance. This road allowance is not opened or constructed; however, it may provide an opportunity for pedestrian or vehicle connectivity in the future.

Potential traffic impacts from the proposed growth and single site access were evaluated by CANDEVCON. As outlined in Section 3 of this report, the analysis concluded that the development would not have any significant impacts on nearby roads or intersections. No impacts on public safety are anticipated to be created because of the development of the subject lands.

To ensure opportunities for exit from the site in case of emergency or blockages in the private roadway, the circular internal roadway provided redundancy and a clear path of travel out of the site.

6. Planning Opinion and Recommendations

The Owner has proposed Draft Plan of Vacant Land Condominium and Zoning By-law Amendment applications to facilitate the development of the subject property as a residential community inclusive of fifty-four (54) Group Townhouse Dwellings and fourteen (14) Semi-detached dwellings. The proposed development is similar in layout and intensity to the Meadows of Norfolk development that was previously approved on the subject lands, but did not proceed.

The proposal is compatible with adjacent development including detached and townhouse dwellings. The proposed architectural design of the units emulates traditional design features with a maximum of two storeys proposed. Streetscaping, perimeter fencing, individual dwelling landscaping, and prominent entry features will contribute to good design, privacy, and buffering. The subject lands are in land titles absolute status and are therefore eligible to be registered as a Condominium.

Consultant reports prepared in support of the application have concluded that the development can be serviced by existing municipal watermain, sanitary sewer and stormwater management infrastructure without the need for any external upgrades. The development will also not cause any significant transportation impacts on adjacent roadways or intersections in the immediate area.

The required Environmental Assessments of the subject lands and Record of Site Condition to allow the subject lands to be used for residential development were completed by the previous developer and remain valid for the property. A Stage 1 and 2 Archaeological Assessment was commissioned by the current Owner and did not result in any resource finds that would restrict the use of the lands.

Upon review and assessment of the development proposal, applicable policies and requirements, and with due consideration for the conclusions and recommendations of the supporting reports and studies, it is my independent professional planning opinion that the submitted applications for Draft Plan of Vacant Land Condominium and Zoning By-law Amendment:

i) Have due regard for, and satisfy the requirements of Section 2, 51 (24), and 53 of the Planning Act; *and*
ii) Are consistent with the relevant policies of the Provincial Planning Statement (2024);
iii) Conform to the relevant policies of the Norfolk County Official Plan;
iv) Reflect a logical and functional approach to developing and zoning the subject lands in a manner aligns with the as-of-right provisions and overall intent of the Urban Residential Type 4 (R4) Zone.

v) Represent good land use planning, are in the public interest, and facilitate the development of the subject lands for their intended purpose.

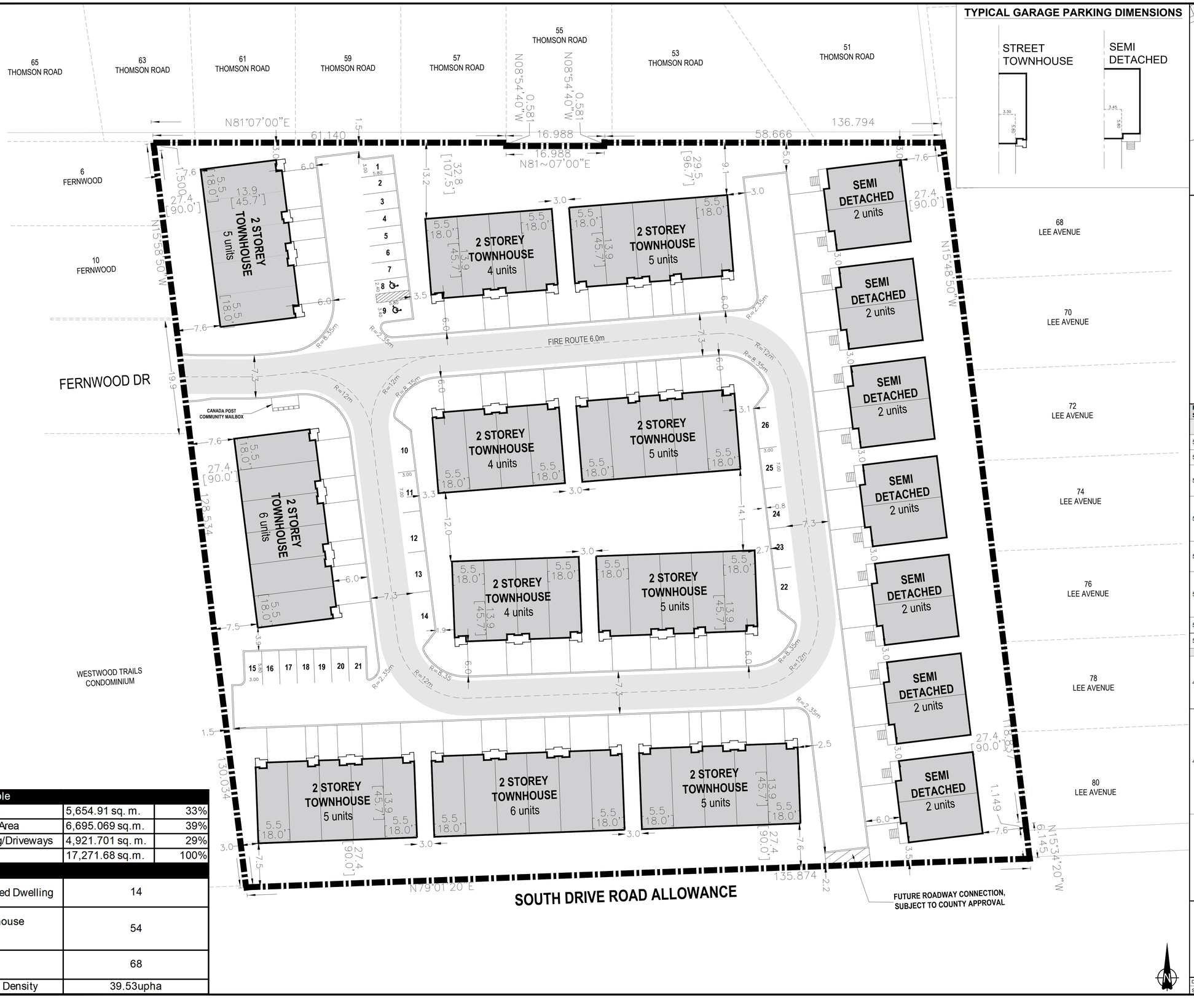
Respectfully submitted,



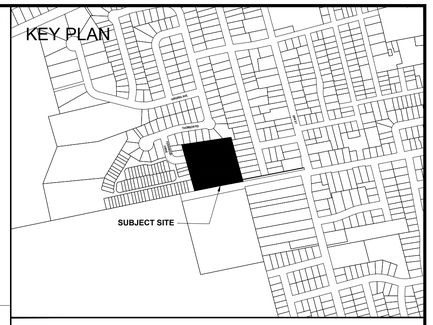
Craig A. Rohe, MCIP, RPP
Senior Planner
GSP Group Inc. – Hamilton Office

Appendix I

Preliminary Site Plan



TYPICAL GARAGE PARKING DIMENSIONS



SITE PLAN

Part of Lot 18
Concession of Gore
City of Simcoe
County of Norfolk

16 FERNWOOD DRIVE

Land Use Table		
Building Area	5,654.91 sq. m.	33%
Landscaped Area	6,695.069 sq.m.	39%
Road/Parking/Driveways	4,921.701 sq. m.	29%
Total	17,271.68 sq.m.	100%
Units		
Semi-Detached Dwelling	14	
Group Townhouse Dwellings	54	
Total Units	68	
Development Density	39.53upha	

Proposed Urban Residential Type 4 Zone (R4.14979)
Semi-Detached Dwelling & Group Townhouse Dwellings

Provision No.	Provision	Proposed Requirement	Provided
5.4.2 a)	Minimum Lot Area (per dwelling Unit)	195 m^2	254 m^2
5.4.2 b)	Minimum Lot Frontage	19.86 m (Fernwood Drive)	19.86 m (Fernwood Drive)
5.4.2 c)	Minimum Front Yard	6.0 m from a private roadway	6.0 m
5.4.2 d)	Minimum Exterior Side Yard	2.5 m from the end wall of a dwelling to a private roadway 1.5 m to a parking area or space	2.5 m (roadway) 1.8 m (parking)
5.4.2 e)	Minimum Interior Side Yard	1.2 m from the end wall to a dwelling to an interior side yard lot line	3.0 m
5.4.2 f)	Minimum Rear Yard	7.5 m from the rear wall of a dwelling to a lot line. 12.0 metres between the rear walls of dwellings	7.5 m 12.0 m
5.4.2 g)	Minimum Separation between Dwellings	2.0 m between side walls of dwellings	3.0 m
5.4.2 h)	Maximum Building Height	11.0 m	11.0 m
	Parking Requirements		
4.9.a)	single detached, semi-detached, duplex, tri-plex, four-plex, townhouse dwellings and vacation home [8-Z-2017]	2 spaces per dwelling unit (68 x 2 = 136)	136 spaces
4.9 f)	All apartment dwellings; and duplex dwellings, tri-plex dwellings, four-plex dwellings, townhouse dwellings or single detached or semi-detached dwellings as part of a condominium development or when they abut a private road [27-Z-2020].	1 visitor space for every 3 dwelling units (68 / 3 = 26.6)	26 visitor spaces

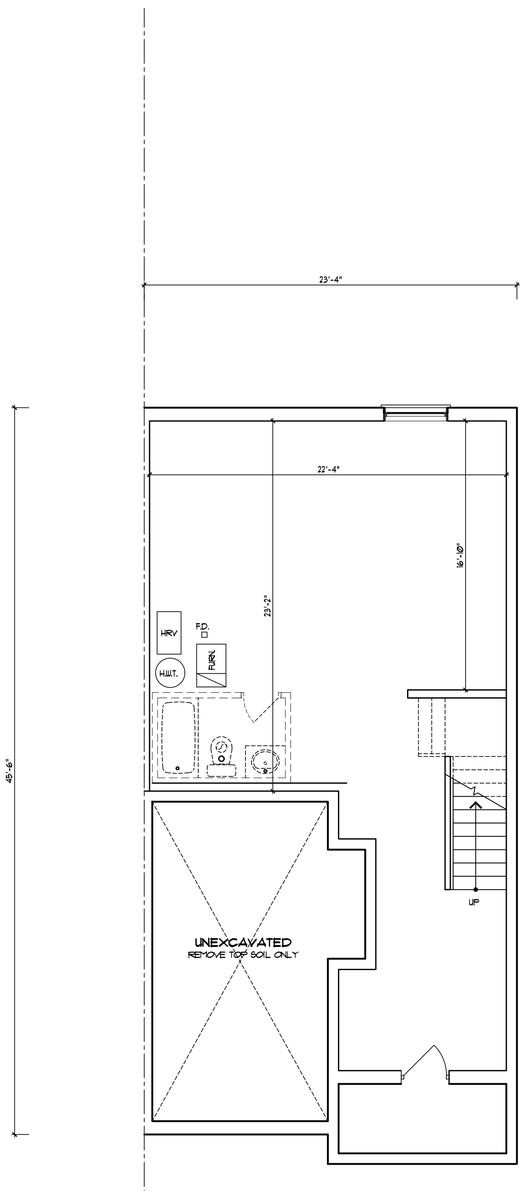
GSP group
PLANNING I URBAN DESIGN I LANDSCAPE ARCHITECTURE
gspgroup.ca

REVISIONS

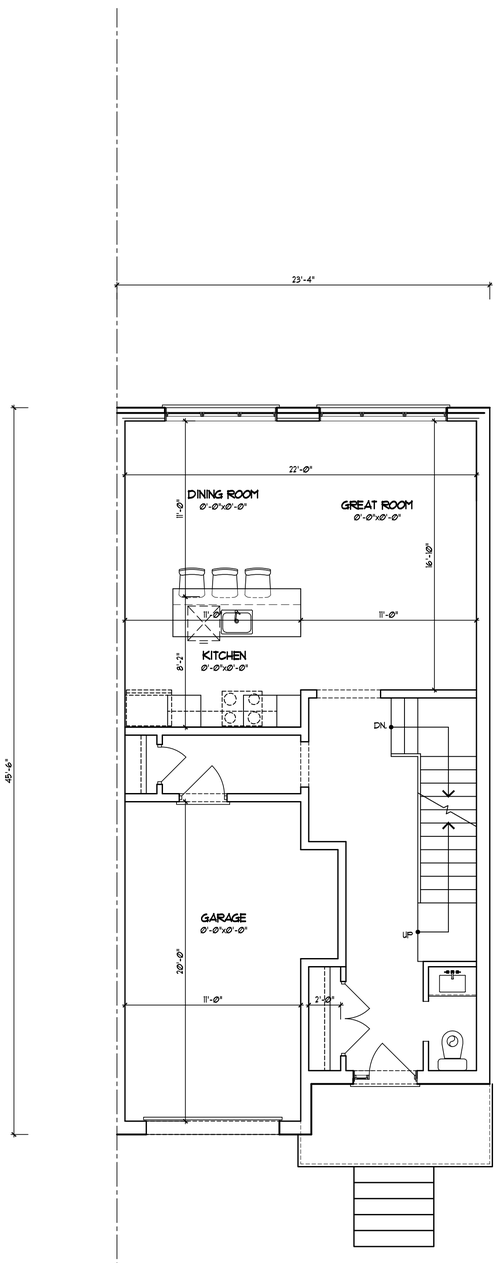
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Appendix II

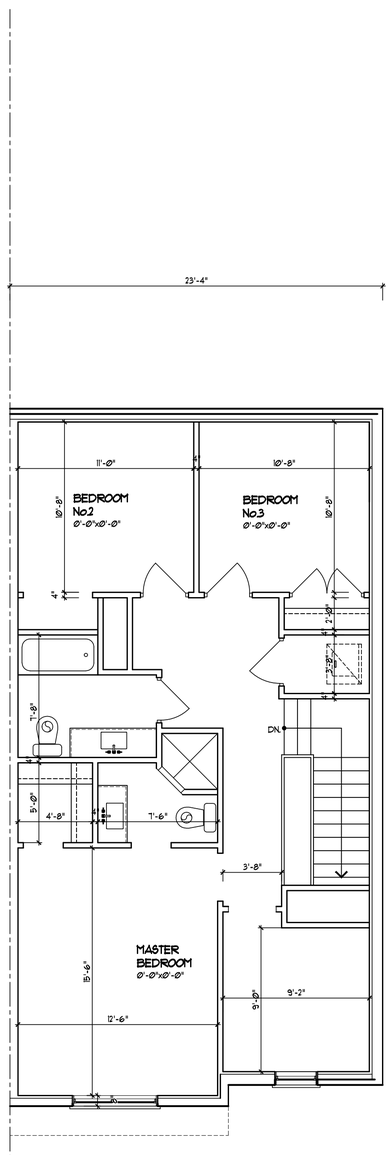
Preliminary Building Elevations



BASEMENT FLOOR PLAN
FIRST FLR: 998 SQ.FT.
SECOND FLR 875 SQ.FT.
TOTAL: 1873 SQ.FT.



GROUND FLOOR PLAN
FIRST FLR: 998 SQ.FT.
SECOND FLR 875 SQ.FT.
TOTAL: 1873 SQ.FT.



SECOND FLOOR PLAN
FIRST FLR: 998 SQ.FT.
SECOND FLR 875 SQ.FT.
TOTAL: 1873 SQ.FT.

BASEMENT FLOOR PLAN

COMPLIANCE PACKAGE "A1"

The Architectural Technologist is not responsible for the accuracy of survey, structural, mechanical, electrical, etc. engineering information shown on the drawing. Refer to the appropriate engineering drawings before proceeding with work.

Contractor shall check all dimensions on the work and report any discrepancy to the Architectural Technologist before proceeding. Construction must conform to all applicable Codes and Requirement of Authorities having Jurisdiction.

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This drawing is not to be scaled.

This drawing is not to be used for construction unless signed by the Architectural Technologist.

NO:	DATE:	REVISION:

DRAWING TITLE:

FLOOR PLANS

P DEL DESIGN
4370 Steeles Avenue West,
Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

QUALIFICATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

REGISTRATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.4 of The Building Code

PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O.

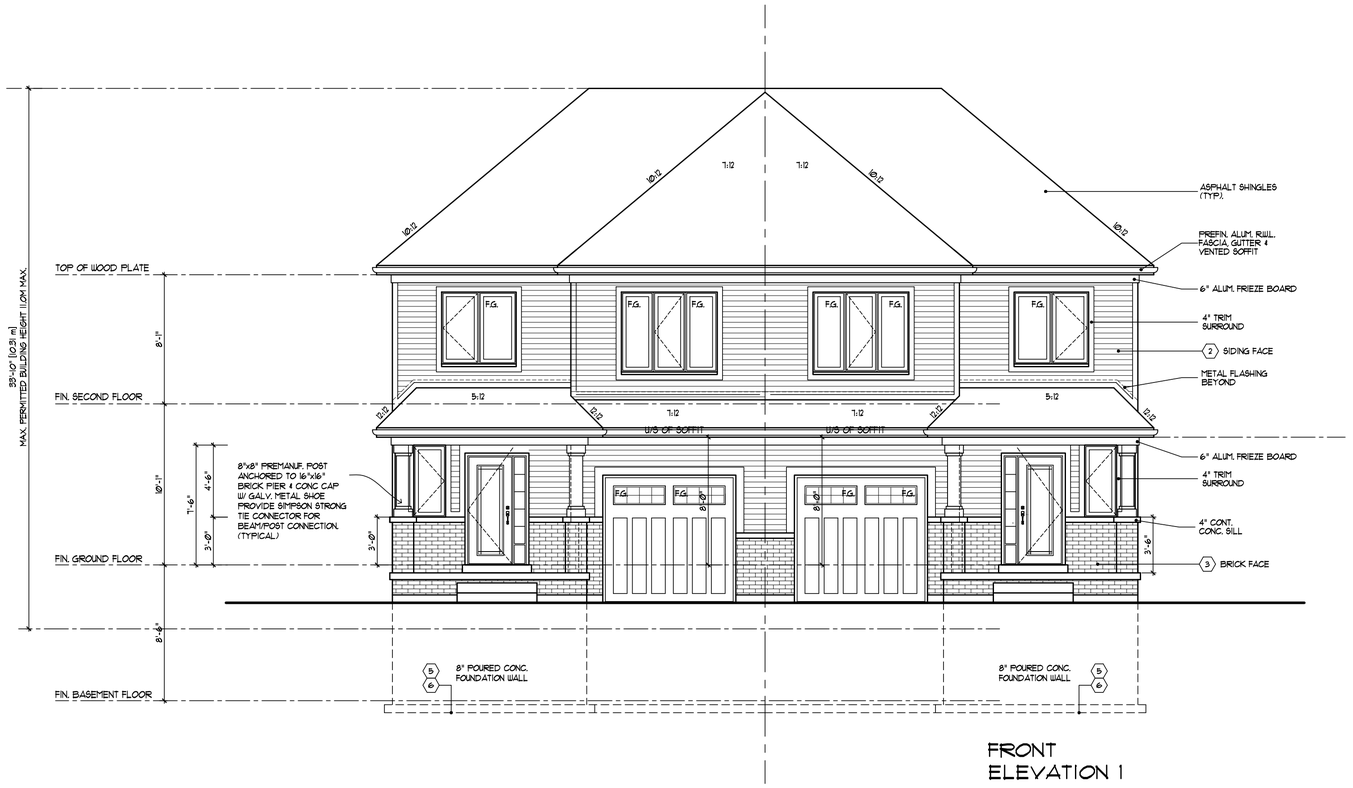
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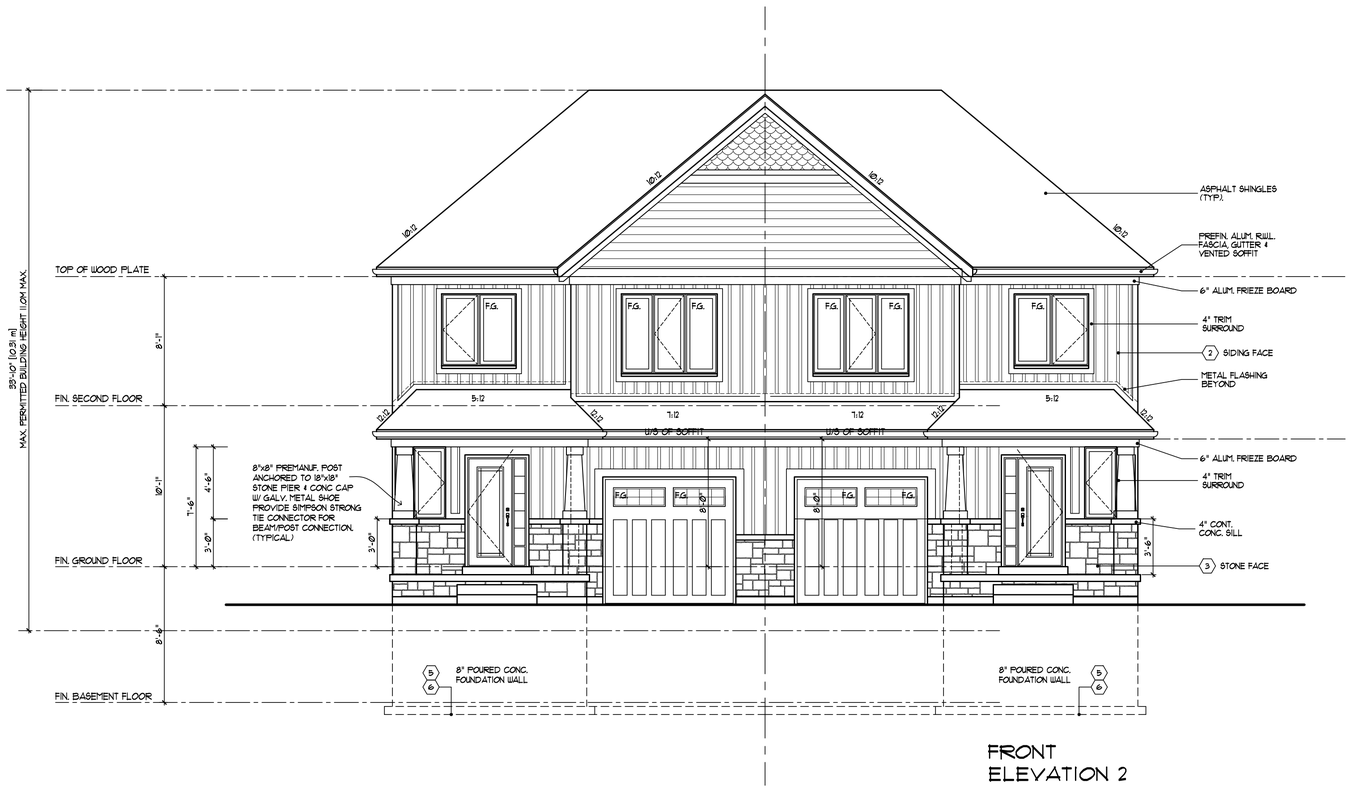
DRAWING No.:

A-01

PROJECT No.:



FRONT
ELEVATION 1



FRONT
ELEVATION 2

BASEMENT FLOOR PLAN

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

DRAWING TITLE:
FRONT ELEVATIONS

P DEL DESIGN
4370 Steeles Avenue West,
Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

QUALIFICATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

REGISTRATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.4 of The Building Code

PETER DEL GROSSO 27288

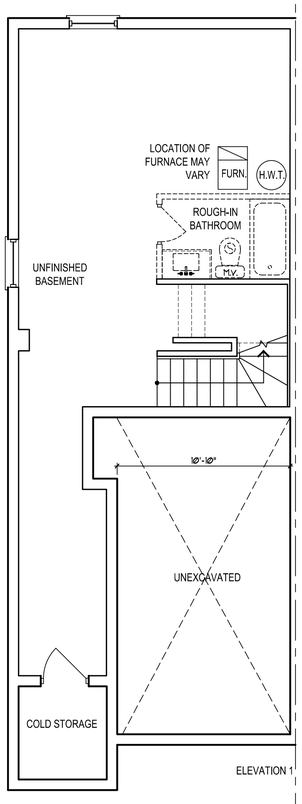
ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O.

PROJECT:

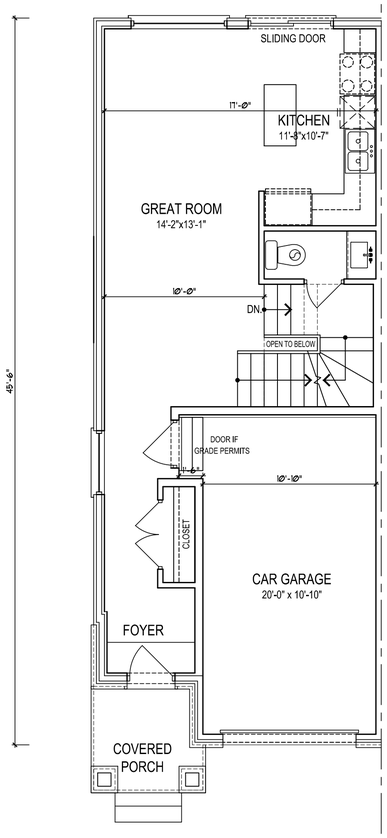
AREA:		DATE:	
SCALE:	3/16"=1'-0"	DRAWN BY:	PDG

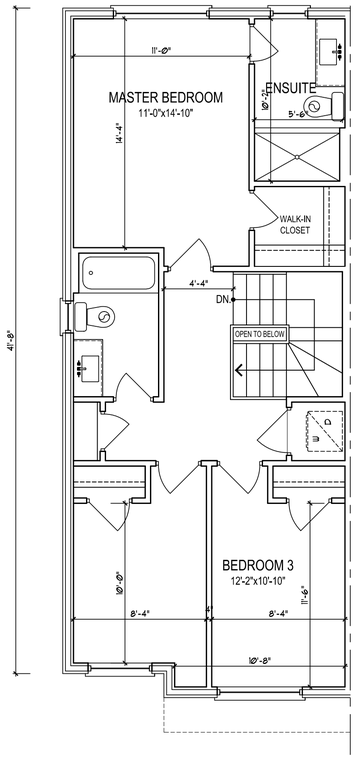
DRAWING No.:
A-01

PROJECT No.:



ELEVATION 1





FLOOR PLANS

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

AREA CALCULATION

GROUND FLOOR AREA	554	SQ. FT.
SECOND FLOOR AREA	768	SQ. FT.
SUBTOTAL	**1322**	**SQ. FT.**
	122.82	**M2**
DEDUCT ALL OPEN AREAS	0	SQ. FT.
TOTAL NET AREA	**1322**	**SQ. FT.**
	122.82	**M2**
FINISHED BSMT. AREA	0	SQ. FT.
COVERAGE W/O PORCH	796	SQ. FT.
	73.95	**M2**
COVERAGE W/PORCH	838	SQ. FT.
	77.85	**M2**

DRAWING TITLE:

END UNIT

P DEL DESIGN
4370 Steeles Avenue West,
Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

QUALIFICATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

REGISTRATION INFORMATION
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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

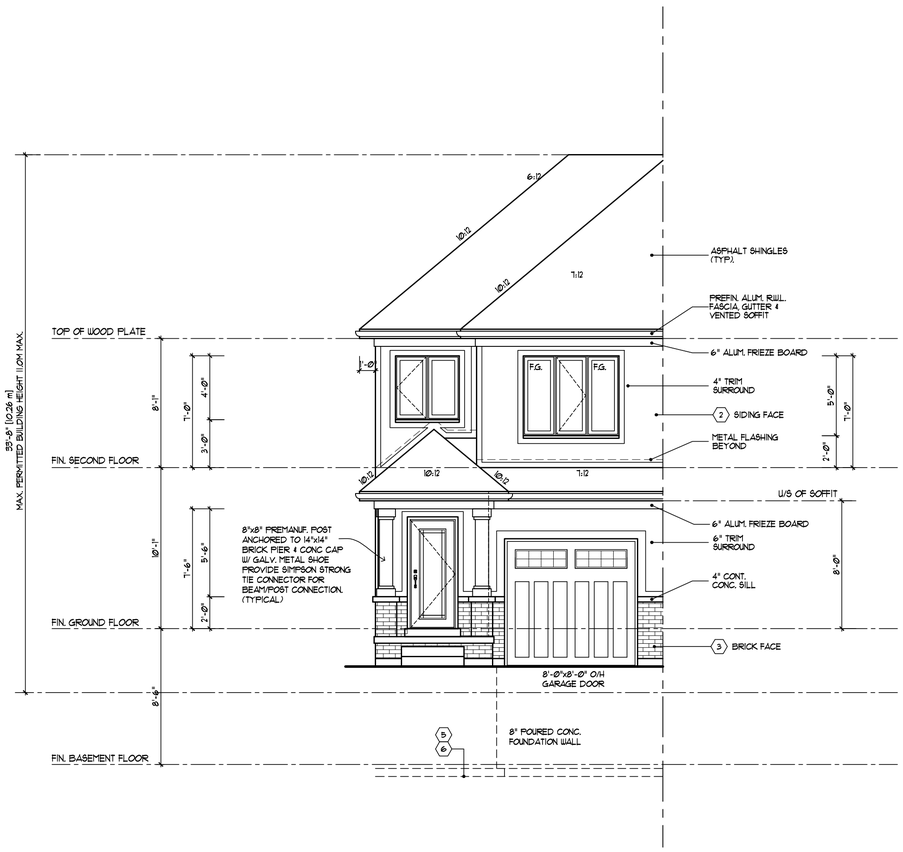
16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1322 SQ.FT.	**DATE:**	JAN. 2/26
SCALE:	3/16"=1'-0"	**DRAWN BY:**	PDG

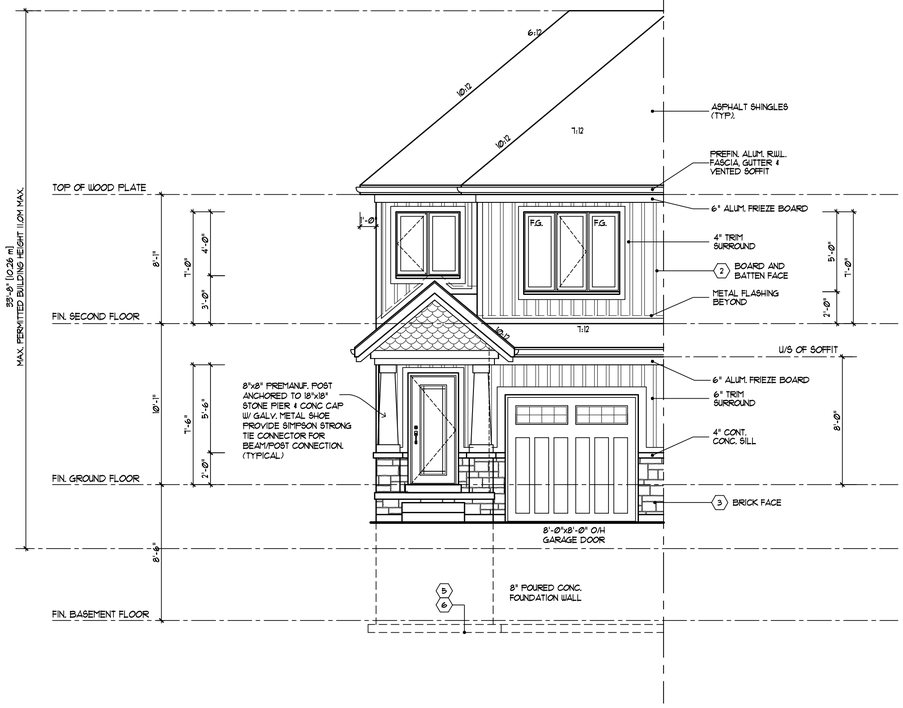
DRAWING No.:

A-01

PROJECT No.:



FRONT
ELEVATION 1



FRONT
ELEVATION 2

FRONT
ELEVATION

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

AREA CALCULATION

GROUND FLOOR AREA	554	SQ. FT.
SECOND FLOOR AREA	768	SQ. FT.
SUBTOTAL	**1322**	**SQ. FT.**
	122.82	**M2**
DEDUCT ALL OPEN AREAS	0	SQ. FT.
TOTAL NET AREA	**1322**	**SQ. FT.**
	122.82	**M2**
FINISHED BSMT. AREA	0	SQ. FT.
COVERAGE W/O PORCH	796	SQ. FT.
	73.95	**M2**
COVERAGE W/PORCH	838	SQ. FT.
	77.85	**M2**

DRAWING TITLE:

END UNIT

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www.pdeldesign.ca

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PETER DEL GROSSO 20567

REGISTRATION INFORMATION
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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1322 SQ.FT.	**DATE:**	JAN. 2/26
SCALE:	3/16"=1'-0"	**DRAWN BY:**	PDG

DRAWING No.:

A-02

PROJECT No.:





FRONT
ELEVATION A

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

AREA CALCULATION

GROUND FLOOR AREA	554	SQ. FT.
SECOND FLOOR AREA	768	SQ. FT.
SUBTOTAL	**1322**	**SQ. FT.**
	122.82	**M2**
DEDUCT ALL OPEN AREAS	0	SQ. FT.
TOTAL NET AREA	**1322**	**SQ. FT.**
	122.82	**M2**
FINISHED BSMT. AREA	0	SQ. FT.
COVERAGE W/O PORCH	796	SQ. FT.
	73.95	**M2**
COVERAGE W/PORCH	838	SQ. FT.
	77.85	**M2**

DRAWING TITLE:

FRONT ELEVATION A

P DEL DESIGN
4370 Steeles Avenue West,
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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	**DATE:**	JAN. 2/26
SCALE:	3/16"=1'-0"	**DRAWN BY:**	PDG

DRAWING No.:

A-04

PROJECT No.:





RIGHT SIDE
ELEVATION A

REFER TO TRUSS SHOP DWGS. FOR COMPLETE TRUSS LAYOUT AND SPECIFICATIONS

REFER TO JOIST MANUFACTURER'S SPECIFICATIONS FOR ALL TECHNICAL DETAILS & INFO.

ACTUAL FINISH GRADES MAY VARY DEPENDING ON LOT CONDITIONS. (REFER TO GRADING PLANS)

RAILING REQUIRED WHEN GRADE IS MORE THAN 2'-0"

COMPLIANCE PACKAGE "A1"

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NO.	DATE:	REVISION:

DRAWING TITLE:
RIGHT SIDE ELEVATION A

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ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:
PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	DATE:	JAN. 2/26
SCALE:	3/16"=1'-0"	DRAWN BY:	PDG

DRAWING No.:
A-05

PROJECT No.:





LEFT SIDE
ELEVATION A

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

DRAWING TITLE:

LEFT SIDE ELEVATION A

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BCIN 20567
PETER DEL GROSSO, M.A.A.T.O.

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	DATE:	JAN. 2/26
SCALE:	3/16"=1'-0"	DRAWN BY:	PDG

DRAWING No.:

A-06

PROJECT No.:



FLOOR PLANS

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

AREA CALCULATION

GROUND FLOOR AREA	561	SQ. FT.
SECOND FLOOR AREA	777	SQ. FT.
SUBTOTAL	**1338**	**SQ. FT.**
	124.30	**M2**
DEDUCT ALL OPEN AREAS	0	SQ. FT.
TOTAL NET AREA	**1338**	**SQ. FT.**
	124.30	**M2**
FINISHED BSMT. AREA	0	SQ. FT.
COVERAGE W/O PORCH	794	SQ. FT.
	73.77	**M2**
COVERAGE W/PORCH	829	SQ. FT.
	77.02	**M2**

DRAWING TITLE:

INTERIOR UNIT

P DEL DESIGN
4370 Steeles Avenue West,
Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
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BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

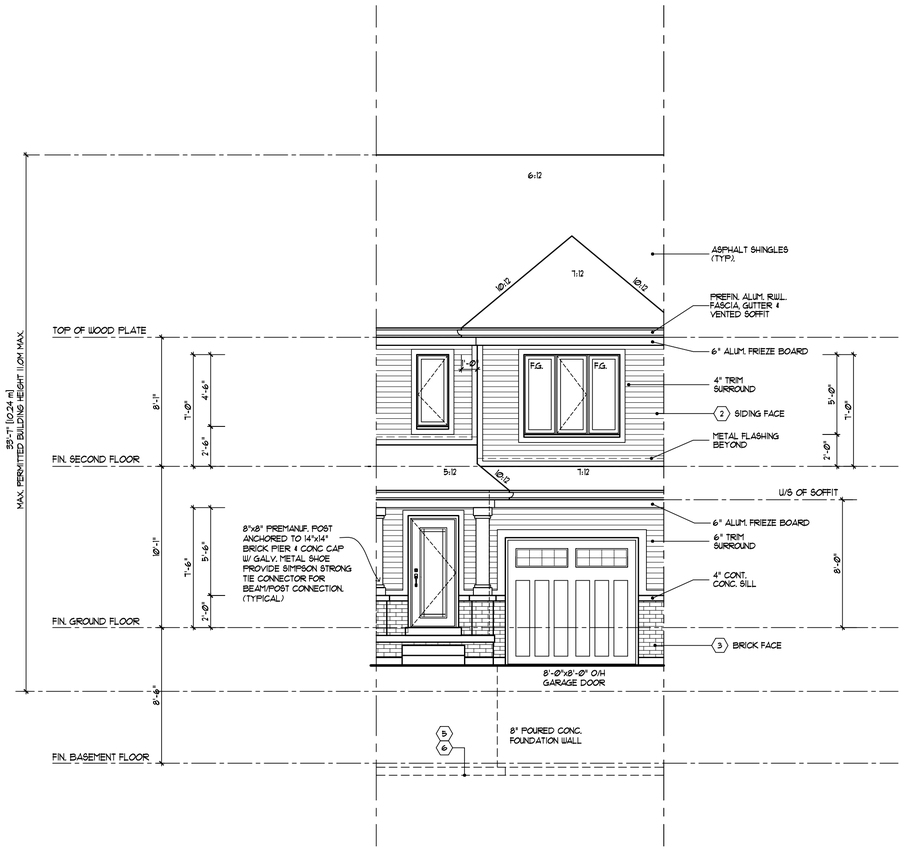
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SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	**DATE:**	JAN. 2/26
SCALE:	3/16"=1'-0"	**DRAWN BY:**	PDG

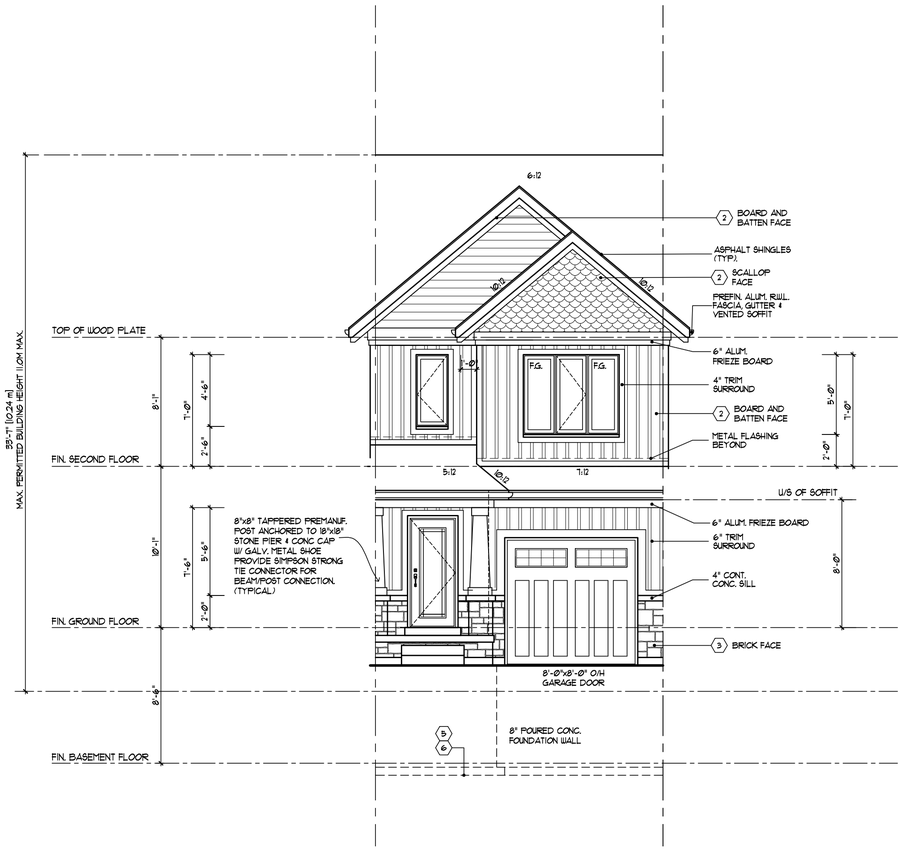
DRAWING No.:

A-01

PROJECT No.:



FRONT
ELEVATION 1



FRONT
ELEVATION 2

FRONT
ELEVATION

COMPLIANCE PACKAGE "A1"

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PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	DATE:	JAN. 2/26
SCALE:	3/16"=1'-0"	DRAWN BY:	PDG

DRAWING No.:

A-02

PROJECT No.:

Appendix III

Pre-consultation Notes

Norfolk County Pre-Consultation Checklist

Please select the type of application required:

☐ Official Plan Amendment

☒ Zoning By-law Amendment

☐ Draft Plan of Subdivision (Redline)

☒ Draft Plan of Condominium

☒ Site Plan

Please read all the information in this document on the requirements for future development planning applications. As a result of the information shared at the pre-consultation meeting dated June 11, 2025, the following applications and qualified professional documents/reports are required as part of a complete application. Please include all listed items with the application to ensure a complete application. The County reserves the right to change, reduce or add requirements for a complete application, particularly if the submission does not match the proposal as reviewed during the pre-submission consultation meeting.

Please note that various fees are associated with each application, and there are also costs for qualified professionals retained to complete various documents/reports. All requirements identified are minimum and determined as of the date of the pre- consultation meeting, with the information available at that time. As the proposal proceeds, more information is made public, additional applications, studies, reports, etc., may be required**. The information in this document is applicable for a maximum of one (1) year from the meeting date.**

Before you submit your application, please contact the assigned Planner to confirm submission requirements and the applicable fee. Fees will not be accepted until the submission has been reviewed and confirmed by the Planning Department.

1. Property Information and Proposal Summary

Registered owner: 3761801 Canada Inc.

Applicant/agent (if different than owner): GSP Group c/o Craig Rohe

Property address: 16 Fernwood Drive, Simcoe

Roll Number: 3310402010048000000

Current Official Plan designation and Zoning: designated Urban Residential, zoned Urban Residential Type 4 (R4) with special provision 14.979.

Proposal: The applicant proposes to amend the zoning to facilitate the development of 68 Group Townhouse units under Vacant Land Condo Tenure.

2. Assigned File Planner

Name and Title: Andrew Wallace, Planner

Phone Number: 519-426-5870 ext. 1059

E-mail: andrew.wallace@norfolkcounty.ca

3. Required Studies and Plans for Complete Application

Submission Materials	Required?	Notes:
Planning Requirements		
Completed Application Form	☑	
Concept Plan	☑	
Draft Plan of Vacant Land Condominium	☑	
Landscaping Plan	☑	Required at site plan stage
Site Plan and Site Plan Details	☑	
Survey/Legal Plan	☑	
Topographical Survey	☑	
Archeological Assessment	☑	
Parking Plan	☑	Can be shown on the required drawings
Planning Justification Report	☑	
Engineering Requirements		
General Plan of Services	☑	
Lighting Plan	☑	
Lot Grading Plan	☑	
Plan and Profile Drawings	☑	Required at site plan stage
Pavement Marking and Signage Plan	☑	Required at site plan stage

Submission Materials	Required?	Notes:
Siltation and Erosion Control Plan	☑	
Utility Plan	☑	Required at site plan stage
Capital and Operating Financial Impact Assessment		
Functional Servicing Report/ Stormwater Management Report	☑	
Geotechnical Study	☑	
Water Modelling (County Consultant)	☑	
Sanitary Drainage Plan	☑	
Sanitary Design Sheet	☑	
Sanitary Modelling (County Consultant)	☑	
Storm Water Management Report (including calculations)	☑	
Storm Water Drainage Plan	☑	
Anticipated Flow/Analysis to Receiving Collection System	☑	
Traffic Impact and Functional Operations Studies	☑	

4. Detailed Comments Pertinent to the Application:

i. Norfolk County Planning and Agreement

Contact Name(s) and Title(s): Andrew Wallace, Planner
Email: andrew.wallace@norfolkcounty.ca
Comments:

The proposal seeks to erect 68 group townhouse dwelling units on an undeveloped lot within the Urban Residential OP Designation/ Urban Residential Type 4 (R4) Zone of Simcoe. It is proposed that these will be vacant land condos.

This site has been the subject of a previous Zoning By-law amendment application which approved the change of use of the land to R4 with a special provisions as allowed through appeal. This allowed for both street and stacked townhouses. Following this, the subdivision application and site plan were also approved. It is my understanding that no agreement was ever registered on title.

Staff have concerns regarding the number of units with only one vehicle access. I have noticed that there is an unopened road allowance owned by the County to the south of the site (an extension of South Drive) that could perhaps allow for a second access to the site, directly onto municipal roads rather than through the neighbouring condo lands. This would also improve access in terms of emergency services. However, this is something you would need to discuss with our Realty team who have also included notes below.

Staff strongly recommend that all Zoning By-law parking requirements be adhered to.

This development also has a high density. The Norfolk County Official Plan states that for group townhouse developments, the density should be between 15 and 30 units per hectare. You are proposing a density of 41.6 units per hectare. This is quite high and although the previously approved development was also similarly high, this could trigger the need for an Official Plan Amendment application to allow a density of this level. Please address the density in the PJR and outline how it is being met.

This density also restricts the ability to provide on-site parkland or open space which in turn, could have implications for surface water drainage.

Previous studies for this site belong to the previous landowners and could not be applied to the proposed application.

i. Agreement Services

Annette Helmig, Agreement and Development Coordinator
Email: Annette.helmig@norfolkcounty.ca
Comments:

Thank you for your proposal. Conditions of draft approval will need to be cleared as part of your current condominium 28CDPL2018329 application and new site plan applications. One of these conditions will be to enter into a development agreement with the County. The agreement will be registered on title at the owner's expense. A Plan will also need to be registered to identify the condominium block and South Drive widening. We look forward to reviewing the condominium declaration and including municipal standard requirements. The County will collect and hold onto performance securities for the infrastructure and landscaping works until the end of the maintenance period. The owner will also be required to secure and keep in force commercial general liability insurance coverage, prior to and during the construction until after a successful site inspection and release of the performance securities. Contact the undersigned when you are ready to start your agreement or if you have any questions. The attached information sheet will assist you with a

complete submission. I look forward to working with you to complete your development.

All the best.

ii. Norfolk County Building

Contact Name(s) and Title(s): Lisa Jennings, Building Inspector II
Email: lisa.jennings@norfolkcounty.ca
Comments:

The proposed construction is considered Group C Occupancies (Residential) as defined by the Ontario Building Code (OBC). You will need to retain the services of a qualified individual with BCIN Small Buildings/Building Services, and possibly a Professional Engineer to complete the design documentation for this application.

The Designer may need to provide a Part 3 Building Code matrix depending on firewalls. This matrix represents selected elements from your detailed code analysis and presents a quick overview to the municipal building official of the key OBC factors concerning your design.
The plans will need to identify OBC review items such as fire separations, project description, building size, building classification, type of construction, plumbing fixture requirements and spatial separations.

Decks do not appear to be included in the design proposal, which could lead to zoning and building code complications at a later date. Prior to a planning submission it may be a good idea to include possible deck locations to help purchasers at a later date in obtaining building permits.

No Ontario Building Code review has been completed at this time and will be done at permit application stage.

Development charges:

Development charges are available online through this link, and fees are subject to change. Pre con would it be acceptable

Development Charges | Norfolk County

Items for Building Permit

Building and Renovating | Norfolk County

Step by Step Guide Building Permit Package has been attached to the minutes herein, this contains information on drawing requirements, designers, forms, contact information for Building Department etc.

If you have any questions on the building permit process or plans required, please contact permits@norfolkcounty.ca or 226-NORFOLK (226-667-3655) ext. 6016

iii. Norfolk County Zoning

Contact Name and Title: Troy Scriven, Zoning Administrator
Email: troy.scriven@norfolkcounty.ca
Comments:

A detailed zoning table shall be provided on the site plan drawings indicating all proposed and required zoning provisions such as building setbacks and parking calculations and any other relevant provisions. Any proposed zoning deficiencies shall also be clearly indicated within the zoning table.

Ensure that the attached garages meet the minimum requirements for a parking space. There needs to be an unobstructed space of 3.3m x 5.8m in the garages. Parking spaces shall be clearly dimensioned on the site plan

The previous approved development had two barrier-free parking spaces located in the visitors parking spaces and we would be looking to match that as per section 4.3 of the zoning by-law.

iv. Norfolk County Engineering and Infrastructure Services

Contact Name and Title: Bret Hamm, Development Technologist
Email: brett.hamm@norfolkcounty.ca
Comments:

At this point the development cannot be supported by development engineering based on current modelling numbers for water services.

Amended site plan must adhere to new criteria

- This requires system upgrades to provide required FF 150L/s.
- Current modelling for the approved SPPL2020093 only provides 108L/s (on the low end)

Upgrades to infrastructure and supporting reports (specifically FSR, Modelling) would be required to support the intensification.

Norfolk County may consider permitting the construction of a road within the unopened road allowance, subject to municipal approval. Any proposed road must be designed and constructed in accordance with current County standards. The County encourages you to contact the adjacent landowner, Prominent Homes Inc. (519-426-9186, c/o Sam Bunting), to explore the possibility of

entering into an inter-developer agreement to share the costs of any required road upgrades.

Development Engineering has no objections to the current SPPL2020093, as it has been previously approved.

Other Notes:

- As a part of the draft plan conditions, the 1' reserve perpendicular to Lee Ave. will be dedicated to Norfolk County as a block within the subdivision requirements.

- Construction access for any development shall be from south dr. extension, permission from neighbor required

v. Norfolk County Realty Services
Contact Name and Title: Alisha O'Brien, Corporate Services Generalist
Email: realty.services@norfolkcounty.ca
Comments:

The County will require postponements of any Charges/Mortgages registered on title to the County's site plan agreement. We recommend that you connect with your Lender(s) (if any) and/or your solicitors as early in the process as possible to avoid any delays.

Realty Services would not be supportive of selling the road allowance to the south; however you may have the option to build up the road to municipal standards to have access to an entrance from Oak or Lee.

vi. Norfolk County Accessibility:
Contact Name and Title: Sam McFarlane, Manager, Accessibility and Customer Experience
Email: sam.mcfarlane@norfolkcounty.ca
Comments:

If visitor parking is provided, 1 of these spaces shall be accessible (Type A minimum 3.4m wide equipped with a minimum 1.5m wide access aisle)

vii. Norfolk County Fire Services
Contact Name and Title: Katie Ballantyne, Community Safety Officer
Email: katie.ballantyne@norfolkcounty.ca
Comments:

Norfolk Fire has the following comments for this proposal:

- Ensure adequate access for fire department apparatus is provided
- If roads remain private, they are to be signed as a fire access route with no on-street parking except for the designated spots
- Notify NCFD if electric vehicle charging and/or battery storage (e.g., Tesla wall) infrastructure is provided

viii. Grand Erie Public Health

Contact Name and Title: Alex Dobias, Health Promoter
Email: adobias@geph.ca
Comments:
Provided the proposed development meets the intent and purpose of applicable policy, by-laws, codes and servicing capacity:

- The health unit supports sidewalks within the development (aligned with Norfolk County's Sidewalk Policy) to enhance walkability.

ix. Ministry of Transportation

Contact Name and Title: Michael Kilgore, Corridor Management Planner
Email: michael.kilgore@ontario.ca
Comments:

Thank you for providing the MTO with the opportunity to review and provide comments.

The proposed work within Norfolk County is not located adjacent to a provincial highway or within MTO's Permit Control Area, and as such, does not require MTO review, approval or permits.

As a result of this, please be advised that I will not be in attendance for the pre-con meeting being held on June 11, 2025. If you have any question or concerns, please feel free to contact me.

x. Mississaugas of the Credit First Nation

Contact Name and Title: Abby Lee LaForme, Consultation Coordinator
Email: abby.laforme@mncfn.ca
Comments:

The Mississaugas of the Credit First Nation (MCFN) are the Treaty Holders of the land on which the project will take place – specifically, the Between the Lakes Treaty No. 3 of 1792. The MCFN holds Indigenous and Treaty Rights specific to the project location and its environs, which may be adversely impacted by it. The Department of Consultation and Accommodation (DOCA) is designated by the MCFN to handle consultation matters on its behalf.

The DOCA consultation team has filed the project-related correspondence identified above. Upon our review, we have determined that **the project should be proceeded by, at minimum, a Stage 1 archaeological assessment** to determine the location's archaeological potential. DOCA must be notified of, invited to participate in, and provided the opportunity to review this archaeological assessment, as well as any environmental assessments. At its discretion, DOCA may request capacity funding from the proponent for its consultation and engagement activities relating to the project.

DOCA expects to be notified of any and all future project updates and/or changes.

If you have any questions for the DOCA consultation team, please feel free to contact us.

xi. Six Nations of the Grand River

Contact Name and Title: Tierra Henhawk, Archaeological Community Monitor Administrative Assistant and Daylon Gee, Resource Officer
Email: acmaa@sixnations.ca and lrluo2@sixnations.ca
Comments:

With the site having archaeological potential, SNGR request a minimum stage 1 archaeology assessment. SNGR Archaeological Supervisor Tanya Hill-Montour (tanyahill-montour@sixnations.ca) will require the Archaeological Assessment Report(s) for the project for her review and comments. Any archaeology that would proceed after the stage 1 assessment we request Six Nations archaeological monitor participation.

From an environmental perspective, Six Nations would also like to request a more robust landscape plan and plant trees where you can fit them in.

5. Notes and Clauses:

1. The purpose of this document is to identify the information required to commence processing a complete application as set out in the Planning Act, R.S.O. 1990, CHAPTER P.13, as amended and the County's Official Plan.
2. Pre-consultation does not imply or suggest any decision whatsoever on behalf of staff or the County to either support or refuse the application.
3. The application should be aware that the information provided is accurate as of the date of the pre-consultation meeting. Should an application not be submitted within a year, and should other policies, by-laws or procedures be

approved by the Province, County, or other agencies prior to the submission of a formal application, the applicant will be subject to any new policies, by-laws or procedures that are in effect at the time of the submission of a formal application. **If an application is not submitted within one (1) year, another pre-consultation meeting shall be required, unless an exception is granted in writing by the Director of Planning**

4. It is hereby understood that during the review of the application additional studies or information may be required as a result of issues arising during the processing of the application or the review of the submitted studies.
5. If the County does not have sufficient expertise to review and determine that a study is acceptable, the County may require a peer review. The terms of reference for a peer review is determined by the County and paid for by the applicant.
6. Please note if performance securities are required by the County to secure any internal and external development works, a recommended condition for your planning application approval will be to enter into a development agreement with the County. The agreement will be registered on title to the subject lands, at the owner's expense. The additional requirements for an agreement could include, but are not limited to the following:
    - Engineering drawing review
    - Engineer's schedule of costs for the works
    - Clearance letter and supporting documentation to support condition clearance
    - User fees and performance securities
    - Current property identification number (PIN printout)
    - Owner's commercial general liability insurance certificate
    - Professional liability insurance certificate
    - Postponement of interest
    - Transfers and / or transfer easements along with registered reference plan

Appendix A: Planning Reference Materials
Following is a summary of some land use planning reference materials. It is the requirement of the applicant to ensure compliance with applicable legislation, policies, and regulations.

Provincial Policy Statement, 2020
https://www.ontario.ca/page/provincial-policy-statement-2020

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

Section 9.6.1 outlines requirements in relation to requests to amend the Official Plan. Section 9.6.2 outlines requirements in relation to requests to amend the Zoning By-law.

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

Norfolk County Zoning By-Law 1-Z-2014
https://www.norfolkcounty.ca/government/planning/new-zoning-by-law/

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

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

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

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

Summary of Fees, Forms, and other information pertaining to the planning process can found by visiting https://www.norfolkcounty.ca/government/planning/

Norfolk County Engineering Design Standards

All applicants must adhere to Norfolk County's Design Criteria when undertaking a development project. Please contact Engineering and Infrastructure Services directly for a copy of Norfolk County's Design Criteria.

Planning Department – Agreement Services
Community Development Division
12 Gilbertson Drive, Simcoe Ontario, N3Y 4L1

INSURANCE REQUIREMENTS

For the Owner Entering Into a Development Agreement

Prior to the execution of the Development Agreement, the Owner shall purchase, at its expense, obtain and keep in force, during the term of the Agreement, until the end of the maintenance / guarantee period and return of all securities, insurance coverage. The insurance policy or policies shall be in the Owner's name as shown on the property identification number.

The issuance of such insurance policy or policies shall not be construed as relieving the Owner from responsibility for any other or larger claims in excess of such policy or policies, if any, for which the Owner may be held responsible. Such insurance policy or policies shall be in a form acceptable to Norfolk County and, without limiting the generality of the foregoing, shall provide:

1. **Commercial General Liability** insurance policy with and including the following coverages:

    a. a limit of liability of not less than five million dollars ($5,000,000) per occurrence;

    b. The Corporation of Norfolk County 50 Colborne Street South, Simcoe ON N3Y 4H3 named as an additional insured

    c. Non-owned automobile coverage with a limit of at least two million dollars ($2,000,000) per occurrence including contractual non-owned coverage

    d. Cross liability and severability of interest in respect of the named insured

    e. Products and completed operations

    f. Premises and operations liability

    g. Contingent employers liability

    h. Contractual liability

    i. Thirty (30) days prior written notice of any alteration, cancellation or change in policy terms, which reduces coverage, and any such notice of cancellation shall be given in writing to Norfolk County

2. **Environmental Impairment Liability** insurance with a limit of not less than two million dollars ($2,000,000) per claim

3. **Automobile Liability** insurance with a limit of not less than two million dollars ($2,000,000) per occurrence

If the Agreement is regarding a **Cannabis** development we request under the Description of Operations, the verbiage must specifically refer to a Cannabis Facility.

Norfolk County reserves the right to request such higher limits of insurance or other types of policies appropriate to the Agreement as Norfolk County may reasonably require from time to time.

Proof of Insurance

The Owner shall provide the certificate of insurance or certified copies of the above referred to policies, satisfactory to Norfolk County. Provided that if a certificate is provided, all requirements as above set forth must be shown on the said certificate and notwithstanding the provision of any certificate, Norfolk County may require that the Owner provide a certified copy of the policy, if required. Such certificates or policies shall be provided prior to the commencement of any work.

The Owner shall further provide evidence of the continuance of said insurance be filed at each policy renewal date for the duration of the Agreement until the end of maintenance period. In the event any renewal premium is not paid, Norfolk County, in order to prevent the lapse of such policy, may pay the renewal premium or premiums, and the Owner agrees to reimburse Norfolk County for the cost of such renewals within ten (10) days of the account therefore being rendered by Norfolk County. Further, prior to the commencement of the Agreement, the Owner shall cause its insurance broker to confirm in writing that it will accept any request from Norfolk County to renew such insurance and will extend the term of any such insurance policy held by the Owner in accordance with such request upon payment of the renewal premium(s) by Norfolk County.

Notice

Every party to the Agreement agrees to immediately notify all other parties of any occurrence, incident, or event, which may reasonably be expected to expose any of the parties to liability of any kind in relation to the development of the Lands.

REQUIRED INFORMATION

Development Name_____

Property Legal Description_____

Site Plan Number **SPPL**_____

Roll Number **3310**_____

PIN Number_____

For Residential Unit Type and Number

- Single Detached_____
- Semi-Detached_____
- Duplex_____
- Triplex_____
- Fourplex_____
- Street Townhouse_____
- Stacked Townhouse_____
- Apartment_____
- Affordable_____
- Accessible_____
- Rental_____

Existing and Proposed Street Names_____

Transfer Easements Block Number and Purpose_____

Transfer Block Number and Purpose_____

Geotechnical Report prepared for Lands	YES	NO	UNKNOWN
Lands are Within the Source Water Protection Area	YES	NO	UNKNOWN
Lands Contain any Contaminated or Impacted Soil	YES	NO	UNKNOWN
Lands Contain any Natural Watercourse	YES	NO	UNKNOWN
Lands Contain any Wetlands	YES	NO	UNKNOWN
Lands Contain any Archaeological Sites	YES	NO	UNKNOWN
Lands Contain an Existing Well and or Septic Field	YES	NO	UNKNOWN
Species at Risk Branch MECP Screening	YES	NO	UNKNOWN
Lands Contain any Endangered Species	YES	NO	UNKNOWN

OWNER

OWNER NAME (PIN)_____

CONTACT NAME_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

AGENT

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

ENGINEER

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

SURVEYOR

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

LAWYER / SOLICITOR

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

INSURANCE PROVIDER

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL_____

FINANCIAL INSTITUTION

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL_____

MORTGAGEE (IF APPLICABLE)

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

SPECIES AT RISK SCREENING

The Ontario Endangered Species Act inquiries and Species at Risk screening are handled by the Ministry of the Environment, Conservation and Parks, specifically the "Species at Risk Branch" and the e-mail address for handling these inquiries is SAROntario@ontario.ca.

TRANSFERS, EASEMENTS AND POSTPONEMENT OF INTEREST

The owner acknowledges and agrees that, it is their solicitor's responsibility on behalf of the owner for the registration of all transfer(s) of land to the County, free and clear of any charges or encumbrances, and/or transfer(s) of easement in favour of the County and/or utilities at no cost to the County. In addition, 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 to the County's agreements.

INSURANCE CERTIFICATES

Prior to the execution of the development agreement, the owner shall, at their expense, obtain and keep in force, during the term of this development agreement, commercial general liability insurance coverage satisfactory to the County. The owner further agrees and authorizes the County to discuss with their insurance provider the specific insurance requirements of the County for agreement purposes only. In addition, the County will require any professionals hired such as an engineer, surveyor or architect to carry professional liability insurance to provide coverage for acts, errors and omissions arising from their professional services performed.

OWNER'S AUTHORIZATION

I/We am/are the registered owner(s) of the lands that is the subject of this development agreement.

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

I/We authorize the Agreement Administrator to provide and receive information on my/our behalf in connection to the insurance coverage, letter of credit and agreement registration of my/our development.

I/We acknowledge that if there are any new charges or mortgage holders on the property they will be required to postpone their interest on the property to the County's development agreement for site plan approval.

Owner Signature Date

APPLICATION AND FEES

To start your agreement please apply on our **CityView Portal** **https://permits.norfolkcounty.ca/CityViewPortal/** Don't forget to fill out, sign and upload the first three pages of this document as part of a complete application. A payment slip will be provided to you identifying the user fees that will be applicable for your development. If paying by credit card, please contact ServiceNorfolk at 226-667-3655 extension 0 or you can visit ServiceNorfolk customer service desk at the County Administration Building at 50 Colborne Street South in Simcoe. The doors on Talbot Street South will be open for customers to enter during business hours Monday to Friday from 8:30 am to 4:30 pm. Please make your cheque payable to the Corporation of Norfolk County. You may also make payment by mail or courier to my contact information below. If you anticipate registration within four weeks please provide a certified cheque.

CONTACT FOR FURTHER INFORMATION AND QUESTIONS

Annette Helmig, Agreement and Development Coordinator
Norfolk County, Community Development Division, Planning Department, Agreement Services
12 Gilbertson Drive, Simcoe Ontario, N3Y 4L1
annette.helmig@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 N3Y 4H3.

DOCUMENTATION AND FEES REQUIRED FOR SITE PLAN AGREEMENT EXECUTION

Owner's agreement authorization (page 3 of this document)

Current parcel register (property identifier or PIN printout)

Owner's commercial general liability certificate of insurance

Professional liability insurance for engineer

Reference plan for any transfers or easements

Postponement of interest from mortgagee / chargee to agreement (if applicable)

Construction estimates (100% for external and landscaping and 10% for internal works)

Letter of credit, surety bond or certified cheque for performance securities

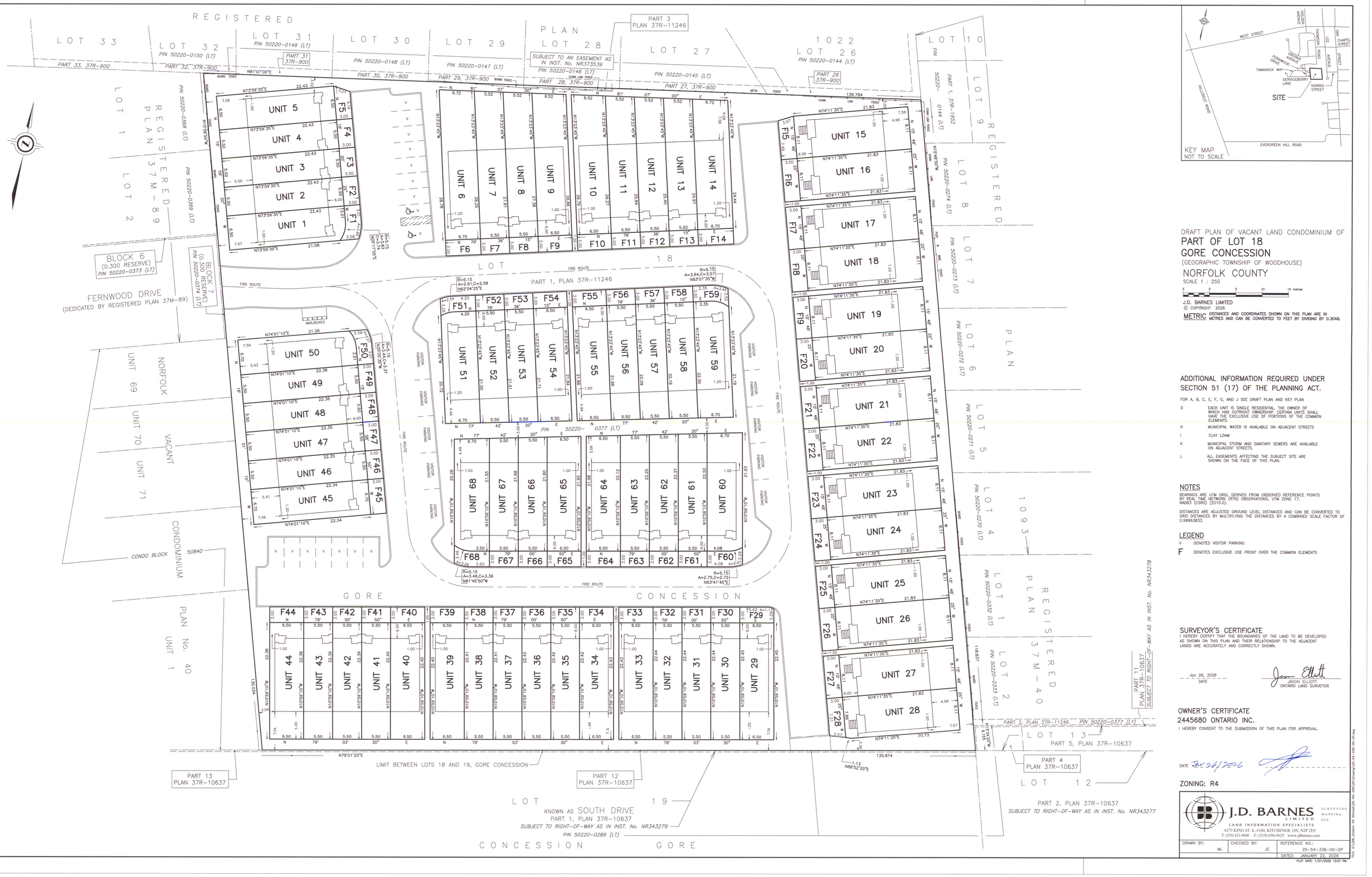
Property taxes up to date

User fees (according to the By-Law in effect at the time that payment is made)
(if time is of the essence a certified cheque is requested)

- $3,022 for preparation of the site plan agreement
- $487 for financial administration of this agreement
- $590 per tree cash-in-lieu of trees (if applicable)
- 2% or 5% land appraisal cash-in-lieu of parkland (if applicable)

Appendix IV

Draft Plan of Vacant Land Condominium



DRAFT PLAN OF VACANT LAND CONDOMINIUM OF

PART OF LOT 18
GORE CONCESSION

(GEOGRAPHIC TOWNSHIP OF WOODHOUSE)

NORFOLK COUNTY

SCALE 1 : 250

5 0 5 10 15 metres

J.D. BARNES LIMITED

© COPYRIGHT 2026

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

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT.

FOR A, B, C, E, F, G, AND J SEE DRAFT PLAN AND KEY PLAN

D EACH UNIT IS SINGLE RESIDENTIAL. THE OWNER OF WHICH HAS OUTRIGHT OWNERSHIP. CERTAIN UNITS SHALL HAVE THE EXCLUSIVE USE OF PORTIONS OF THE COMMON ELEMENTS.

H MUNICIPAL WATER IS AVAILABLE ON ADJACENT STREETS

I CLAY LOAM

K MUNICIPAL STORM AND SANITARY SEWERS ARE AVAILABLE ON ADJACENT STREETS.

L ALL EASEMENTS AFFECTING THE SUBJECT SITE ARE SHOWN ON THE FACE OF THIS PLAN.

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE ADJUSTED GROUND LEVEL DISTANCES AND CAN BE CONVERTED TO GRID. DISTANCES BY MULTIPLYING THE DISTANCES BY A COMBINED SCALE FACTOR OF 0.99963833.

LEGEND

V DENOTES VISITOR PARKING

F DENOTES EXCLUSIVE USE FRONT OVER THE COMMON ELEMENTS

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE DEVELOPED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

Jan 26, 2026
DATE

JASON ELLIOTT
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

2445680 ONTARIO INC.

I HEREBY CONSENT TO THE SUBMISSION OF THIS PLAN FOR APPROVAL.

DATE JAN 26/2026

ZONING: R4

J.D. BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
4273 KING ST. E, #100, KITCHENER, ON, N2P 2E9
T: (519) 621-9600 F: (519) 650-5625 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
ML	JE	25-54-336-00-DP
		DATED: JANUARY 22, 2026

FILE: G:\JOB_Drawings\25-54-336\00\Drawing\25-54-336-00-DP.dwg
PLOT DATE: 1/27/2026 12:07 PM

Appendix V

Draft Zoning By-law Amendment

The Corporation of Norfolk County

By-Law __-Z-2026

Being a By-Law to Amend Zoning By-Law 1-Z-2014, as amended, for property described as 16 Fernwood Drive in Simcoe

Whereas Norfolk Council is empowered to enact this By-Law, by virtue of the provisions of Section 34 of the Planning Act, R.S.O. 1990, CHAPTER P.13, 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 hereby enacts as follows:

1. That Schedule A of By-Law 1-Z-2014, as amended, is hereby further amended by changing the zoning of the subject lands identified on Part 1 of Map A (attached to and forming part of this By-Law) from Urban Residential Type 4 Zone (R4) with special provision 14.979 to Urban Residential Type 4 Zone (R4) with revised special provision 14.979;

2. That Subsection 14 Special Provisions is hereby further amended by deleting all previous special provisions under Provision 14.979 and replacing them with the following:

   14.979 In lieu of the corresponding provisions of the R4 Zone, the following provisions shall apply to Part 1:

   i) That the Condominium Units shall not be treated as Lots, and that the "Lot" for the purpose of zoning compliance is the subject property (16 Fernwood Drive, Simcoe)

   ii) Deemed Lot Frontage – Fernwood Drive

   iii) That the following Zoning Provisions are applicable to a Group Townhouse and/or Semi-Detached Dwelling under Vacant Land Condominium Tenure:

DRAFT

a)	Minimum Lot Area (per dwelling Unit)	195 m^2
b)	Minimum Lot Frontage	19.86 m (Fernwood Drive)
c)	Minimum Front Yard [1]	6.0 m from a private roadway
d)	Minimum Exterior Side Yard [1]	i) 2.5 m from the end wall of a dwelling to a private roadway ii) 1.5 m to a parking area or space
e)	Minimum Interior Side Yard	1.2 m from the end wall to a dwelling to an interior side yard lot line
f)	Minimum Rear Yard	7.5 m from the rear wall of a dwelling to a lot line.
		12.0 metres between the rear walls of dwellings
g)	Minimum Separation between Dwellings	2.0 m between side walls of dwellings
h)	Maximum Building Height	11.0 m

[1] – Measured to back of curb.

3. That the effective date of this By-Law shall be the date of passage thereof. Enacted and passed this date day of month, year.

_____
Mayor

_____
County Clerk

DRAFT

SCHEDULE ‘A’

ZONING BY-LAW AMENDMENT NO.____

TO THE

THE ZONING BY-LAW OF NORFOLK COUNTY 1-Z-2014

SCHEDULE "A-25"



FROM SITE-SPECIFIC URBAN RESIDENTIAL TYPE 4 (R4 - 14.979)
TO A MODIFIED SITE-SPECIFIC URBAN RESIDENTIAL TYPE 4 (R4 - 14.979)

N

N.T.S

FEBRUARY 2026

Explanation of the Purpose and Effect of
By-Law __-Z-2026

This By-Law affects a parcel of land described as 16 Fernwood Drive in Simcoe.

The purpose of this By-Law is to change the zoning on the subject lands from Urban Residential Type 4 (R4) with special provision 14.979 to Urban Residential Type 4 (R4) with revised special provision 14.979 on Part 1.

The change in provisions will allow the proposed development to be established as a Vacant Land Condominium containing Group Townhouses and Semi-detached dwellings, exclusively.

The provisions provided are derived from the base R4 Zone and are directed to be applied in a manner that does not treat the future condominium units like individual lots. Instead, setbacks are to be taken from the internal private roadway and adjacent lot lines, and between structures. All lot performance criteria is to be calculated on a Lot-wide basis.

DRAFT

Applicant 2445680 Ontario Limited
File Number XXXX

DRAFT

CANDEVCON GROUP INC.
CONSULTING ENGINEERS & PLANNERS

GTA WEST OFFICE
9358 GOREWAY DRIVE
BRAMPTON, ONTARIO L6P 0M7
T: (905) 794-0600 F: (905) 794-0611

PROVIDING CONSULTING SERVICES IN:
MUNICIPAL ENGINEERING
TRANSPORTATION PLANNING
TRAFFIC & PARKING STUDIES
ROADS & BRIDGES
STRUCTURAL ENGINEERING
DEVELOPMENT ENGINEERING SERVICES
WATER RESOURCES
ENVIRONMENTAL NOISE STUDIES
LAND USE & ENVIRONMENTAL PLANNING

November 26th, 2025

Norfolk County
50 Colborne Street South
Simcoe, ON
N3Y 4H3

Attn: Mr. Brett Hamm, Development Technologist

Re: Traffic Impact and Functional Operations Study
Proposed Residential Development
16 Fernwood Drive
2445680 Ontario Limited
Norfolk County
Our File No. W25053

Dear Mr. Hamm:

CANDEVCON GROUP INC. has been retained by 2445680 Ontario Limited to prepare a Traffic Impact and Functional Operations Study for the proposed Residential Development at 16 Fernwood Drive, in Norfolk County. The proposed Residential Development is approximately 250 metres west of Oak Street and 500 metres south of West Street. The Location Plan is provided in **Figure 1**.

Study parameters, assumptions and analytical approaches were presented through the terms of reference, which were submitted to Norfolk County staff. Information was subsequently exchanged with the County and the principal study assumptions and the scope of work were agreed upon. The terms of reference and the comments received are provided in **Appendix A**.

The proposed Residential Development comprises 54 townhouse units, 14 semi-detached homes and a private road that will connect with the south end of Fernwood Drive. The proposed Site Plan is provided in **Figure 2**.

The Traffic Impact and Functional Operations Study will determine the impacts from site-generated traffic and review the internal traffic circulation for waste collection, fire emergency and passenger vehicles.



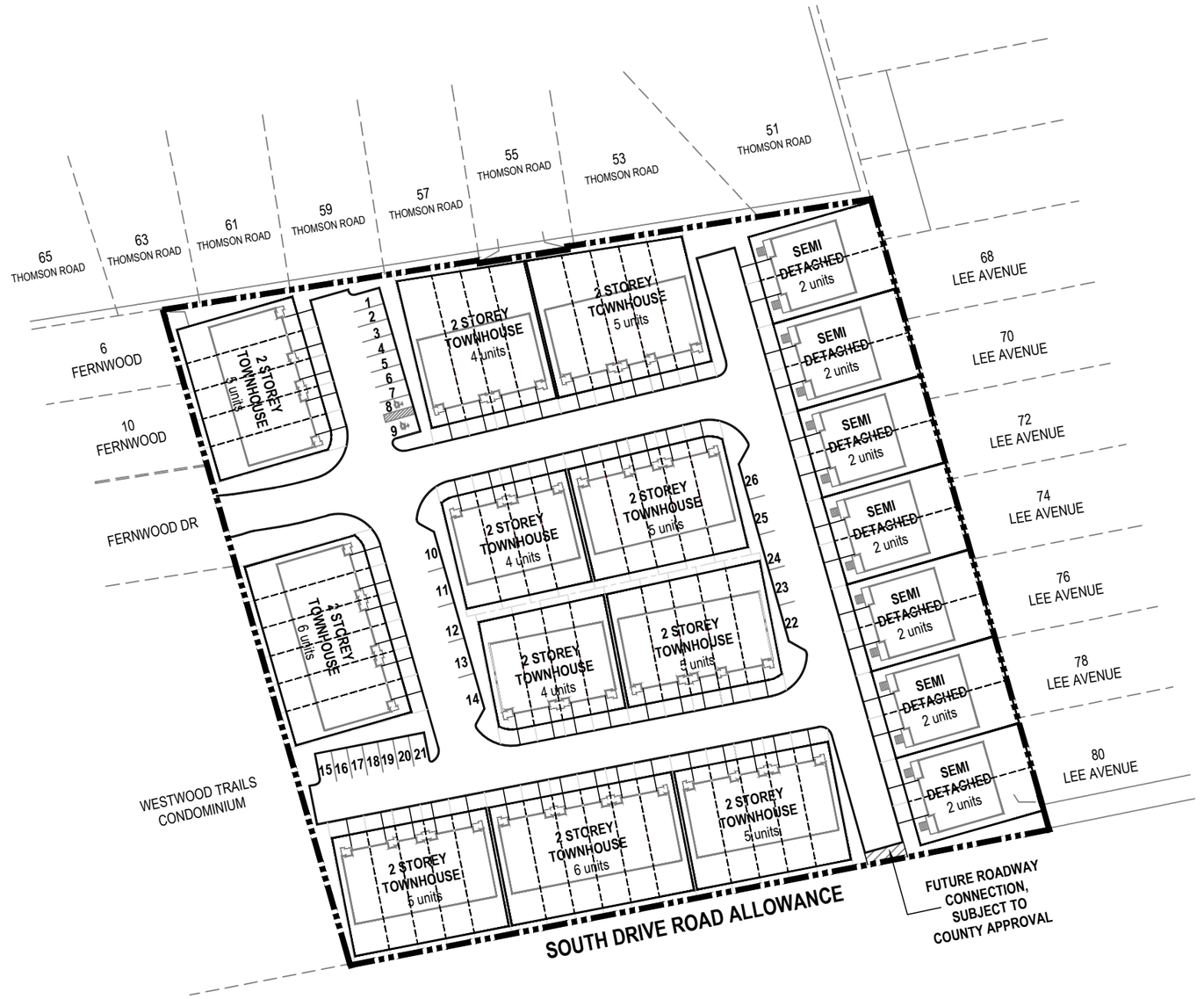
TRAFFIC IMPACT AND FUNCTIONAL OPERATIONS STUDY

PROPOSED RESIDENTIAL DEVELOPMENT
2445680 ONTARIO LIMITED
16 FERNWOOD DRIVE
NORFOLK COUNTY

LOCATION PLAN

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE
BRAMPTON ON. L6P 0M7
TEL (905) 794-0600
FAX (905) 794-0611

DATE: OCT. 7th 2025	JOB No. W25053
DESIGN: S.N.	FIG. No. 1
SCALE: N.T.S	



TRAFFIC IMPACT AND FUNCTIONAL OPERATIONS STUDY

PROPOSED RESIDENTIAL DEVELOPMENT
2445680 ONTARIO LIMITED
16 FERNWOOD DRIVE
NORFOLK COUNTY

PROPOSED SITE PLAN

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE
BRAMPTON ON. L6P 0M7
TEL (905) 794-0600
FAX (905) 794-0611

DATE: OCT. 21st 2025	JOB No. W25053
DESIGN: S.N.	FIG. No. 2
SCALE: 1:1000	

Attn: Mr. Brett Hamm, Development Technologist
Re: Traffic Impact and Functional Operations Study
Proposed Residential Development
16 Fernwood Drive
2445680 Ontario Limited
Norfolk County
Our File No. W25053

To determine the impacts from site-generated traffic, the Traffic Impact and Functional Operations Study will analyze the operations of the Oak Street at Chapel Street and West Street at Holden Avenue intersection. As a result, the Study Area comprises West Street from Holden Avenue to Oak Street and Oak Street from West Street to Chapel Street.

Existing Road Network

West Street is an east-west arterial road that is under the jurisdiction of Norfolk County. Within the Study Area, the roadway has a posted speed limit of 50 km/h. West of Holden Avenue, West Street is a two (2) lane roadway with a rural cross-section. East of Holden Avenue, West Street is a four (4) lane roadway with an urban cross-section and a pedestrian sidewalk on the south side.

Oak Street is a north-south collector road that is under the jurisdiction of Norfolk County. Within the Study Area, Oak Street is a two (2) lane roadway with an urban cross-section, a posted speed limit of 50 km/h and a pedestrian sidewalk on the west side.

Holden Avenue is a local road that is under the jurisdiction of Norfolk County. From Kennedy Road and Thomson Road, Holden Avenue travels in the north direction before gradually travelling in the east direction to connect with Beckett Boulevard. Holden Avenue is a two (2) lane roadway with an urban cross-section and a posted speed limit of 50 km/h.

Chapel Street is an east-west local road that is under the jurisdiction of Norfolk County. Chapel Street has a westerly connection with Thompson Road and an easterly connection with Colborne Street South. Within the vicinity of the Study Area, Chapel Street is a two (2) lane roadway with an urban cross-section and an assumed speed limit of 50 km/h.

Oak Street at Chapel Street is an un-signalized intersection with stop-controls at the eastbound and westbound approaches. The lane configuration comprises a shared left-through-right turning lane at all of the approaches.

Attn: Mr. Brett Hamm, Development Technologist
Re: Traffic Impact and Functional Operations Study
Proposed Residential Development
16 Fernwood Drive
2445680 Ontario Limited
Norfolk County
Our File No. W25053

West Street at Holden Avenue is an un-signalized intersection with stop-controls at the northbound and southbound approaches. The lane configuration comprises a shared left-through-right turning lane at the northbound, eastbound and southbound approaches; and a shared through-left and a shared through-right turning lane at the westbound approach.

Trip Generation and Distribution

For the semi-detaches homes (Land Use 215) and the townhouse units (Land Use 220), trip generation rates and formulae from the ITE Trip Generation Manual Edition 11th Edition were applied for the A.M. and P.M. Peak Hours of adjacent street traffic[1]. Between the trip generation rate and the trip generation formulae, the worst-case was used for each scenario.

Table 1 summarizes the trip generation rates and formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 1: Trip Generation Rates and Formulae with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trip Rate/ Fitted Curve Equation	% In	% Out	Trip Rate/ Fitted Curve Equation	% In	% Out
Single-Family Attached Housing (LU 215)	0.48 (Note 1)	25%	75%	0.57 (Note 1)	59%	41%
Multifamily Housing (Low-Rise) (LU 220)	T = 0.31X + 22.85 (Note 2)	24%	76%	T = 0.43X + 20.55 (Note 2)	63%	37%

Note 1: Trip Rate is per dwelling unit.
Note 2: T represents the total number of trips and X represents the number of dwelling units.

[1] Trip Generation Manual (11th Edition), Institute of Transportation Engineers, September 2021.

The resulting number of trips generated were determined using the trip generation rates and formulae provided in **Table 1** and the number of dwelling units. The proposed Residential Development comprises 54 townhouse units and 14 semi-detached homes.

The resulting number of trips generated is provided in **Table 2** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 2: Site Generated Trips

ITE Land Use	No. of Dwelling Units	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Attached Housing (LU 215)	14	2	5	7	5	3	8
Multifamily Housing (Low-Rise) (LU 220)	54	10	30	40	28	16	44
TOTAL	68	12	35	**47**	33	19	**52**

The proposed Residential Development is expected to generate a total of 47 trips during the A.M. Peak Hour (12 inbound trips and 35 outbound trips) and 52 trips during the P.M. Peak Hour (33 inbound trips and 19 outbound trips).

The A.M. Peak Period trip distribution from the 2022 Transportation Tomorrow Survey and the existing road network was utilized for the assumed trip distribution and trip assignment. The 2022 Transportation Tomorrow Survey query that was used to determine the assumed trip distribution and trip assignment is provided in **Appendix B**. The results from the 2022 Transportation Tomorrow Survey indicate that all of the trips will use Chapel Street to access Norfolk Street and/or St. John's Road.

As a result, the assumed trip distribution and assignment will be as follows:

- 100% (100%) to/from the east via Chapel Street.

The trip assignment for the proposed Residential Development is provided in **Figures 3 and 4**.

Traffic Operations Assessment

To evaluate the traffic impacts from the trips generated by the proposed Residential Development, traffic counts along West Street and Oak Street were received from Norfolk County. Correspondence with Norfolk County is provided in **Appendix C**.

The traffic counts determined the following:

- West Street – Between Brook Street and Elmhurst Avenue – 2024 AADT – 5984 vehicles,
- Oak Street – Between West Street and South Drive – 2024 AADT – 2204 vehicles.

This Study assumed that the worse-case peak hour volume is 10 percent of the AADT; resulting in a peak hour volume of 600 vehicles for West Street and 220 vehicles for Oak Street for both directions. With the low volumes on West Street and Oak Street along with the site-generated trips from the proposed Residential Development, it is anticipated that the Oak Street at Chapel Street and West Street at Holden Avenue intersections will continue to operate at an acceptable Levels of Service during the A.M. and P.M. Peak Hours.

Trip Assignment of Subject Development - A.M. Peak Hour

W25053
Proposed Residential Development
Norfolk County
2445680 Ontario Limited

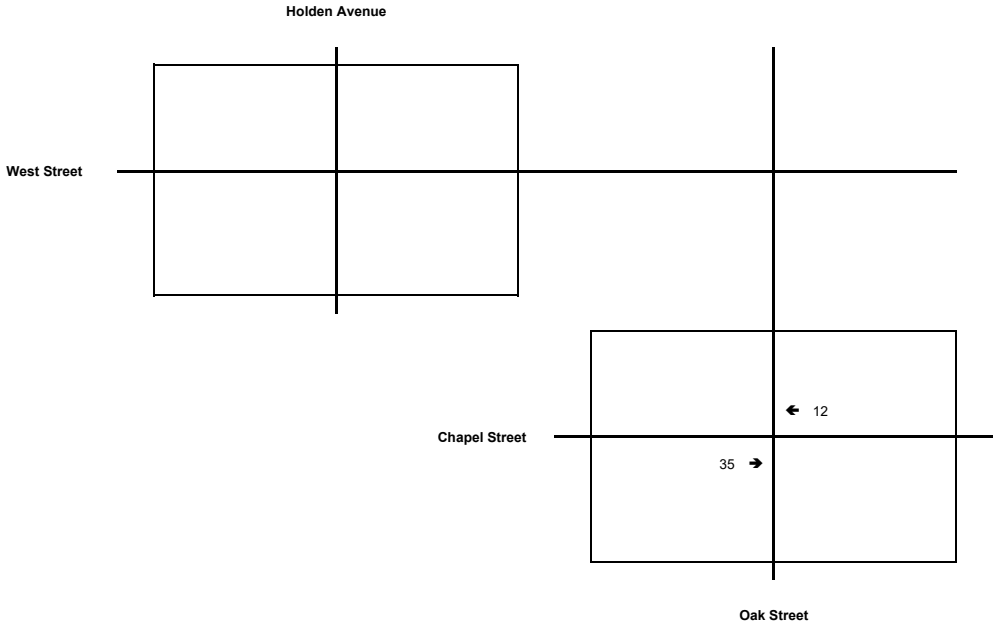


Figure No: 3

Date: November 13 2025

Prepared by: B.W.

N

Trip Assignment of Subject Development - P.M. Peak Hour

W25053
Proposed Residential Development
Norfolk County
2445680 Ontario Limited

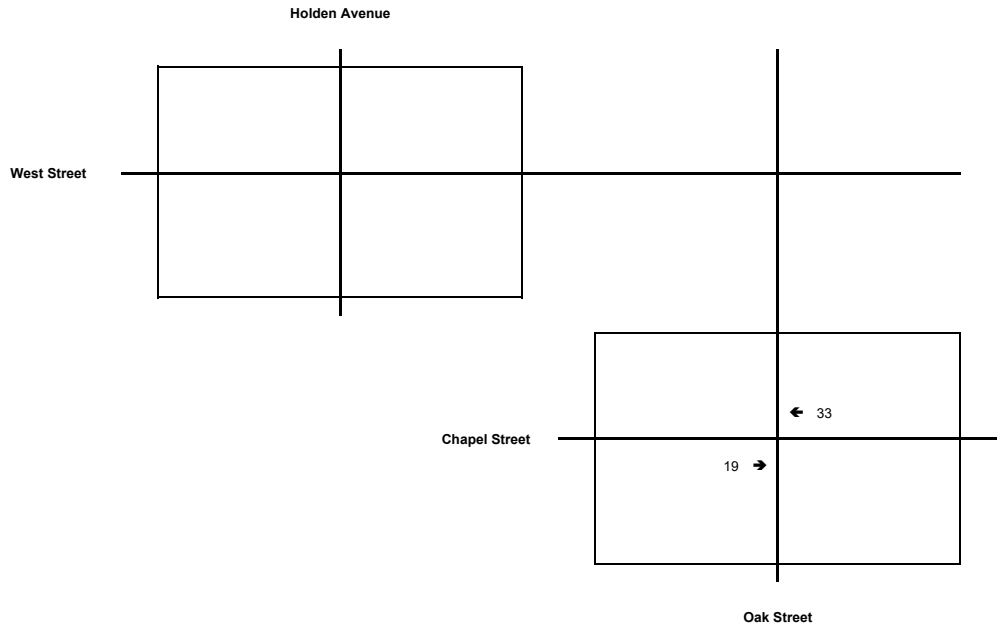


Figure No: 4

Date: November 13 2025

Prepared by: B.W.

N

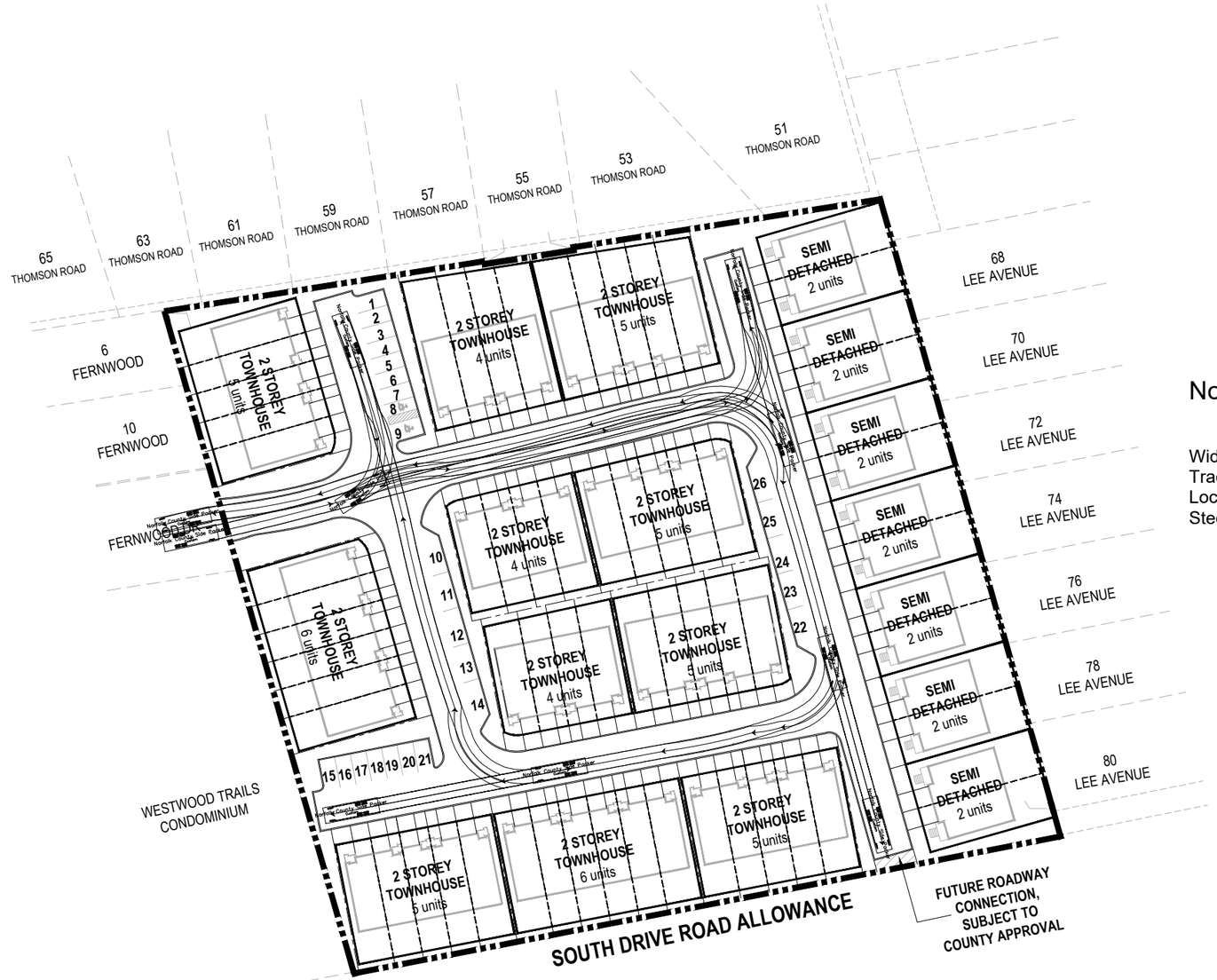
Internal Circulation

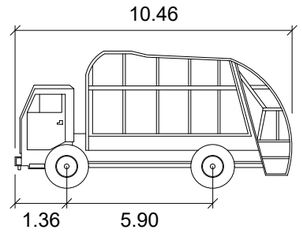
Using the proposed Site Plan that is provided in **Figure 2**, the traffic circulation was analyzed for waste collection, fire emergency and passenger vehicles using the AutoTURN software.

Waste collection vehicles will service the proposed Residential Development via curbside pick-up. With the exception of when the waste collection vehicles are servicing the dwelling units located at the corners of the Subject Property, waste collection vehicles will move forward. To service the dwelling units located at the corners of the Subject Property, waste collection vehicles will move forward to the terminal end of the roadway before backing-out and continuing along its path by moving forward. The reversing of waste collections vehicles may be avoided through the use of waste collection pads at the internal intersections of the private roadway, subject to County approval. The swept path plan for waste collection vehicles is provided in **Figure 5**.

With the exception of when the fire emergency vehicles are servicing the dwelling units located at the corners of the Subject Property, fire emergency vehicles will move forward for the entirety of its path. To service the dwelling units located at the corners of the Subject Property, fire emergency vehicles will move forward to the terminal end of the roadway before backing-out and continuing along its path by moving forward. The swept path plan for fire emergency vehicles is provided in **Figure 6**.

In addition, the swept path plan for passenger vehicles that is provided in **Figure 7** demonstrates that passenger vehicles can utilize the parallel and perpendicular parking spaces for visitors.





Norfolk County Side Packer

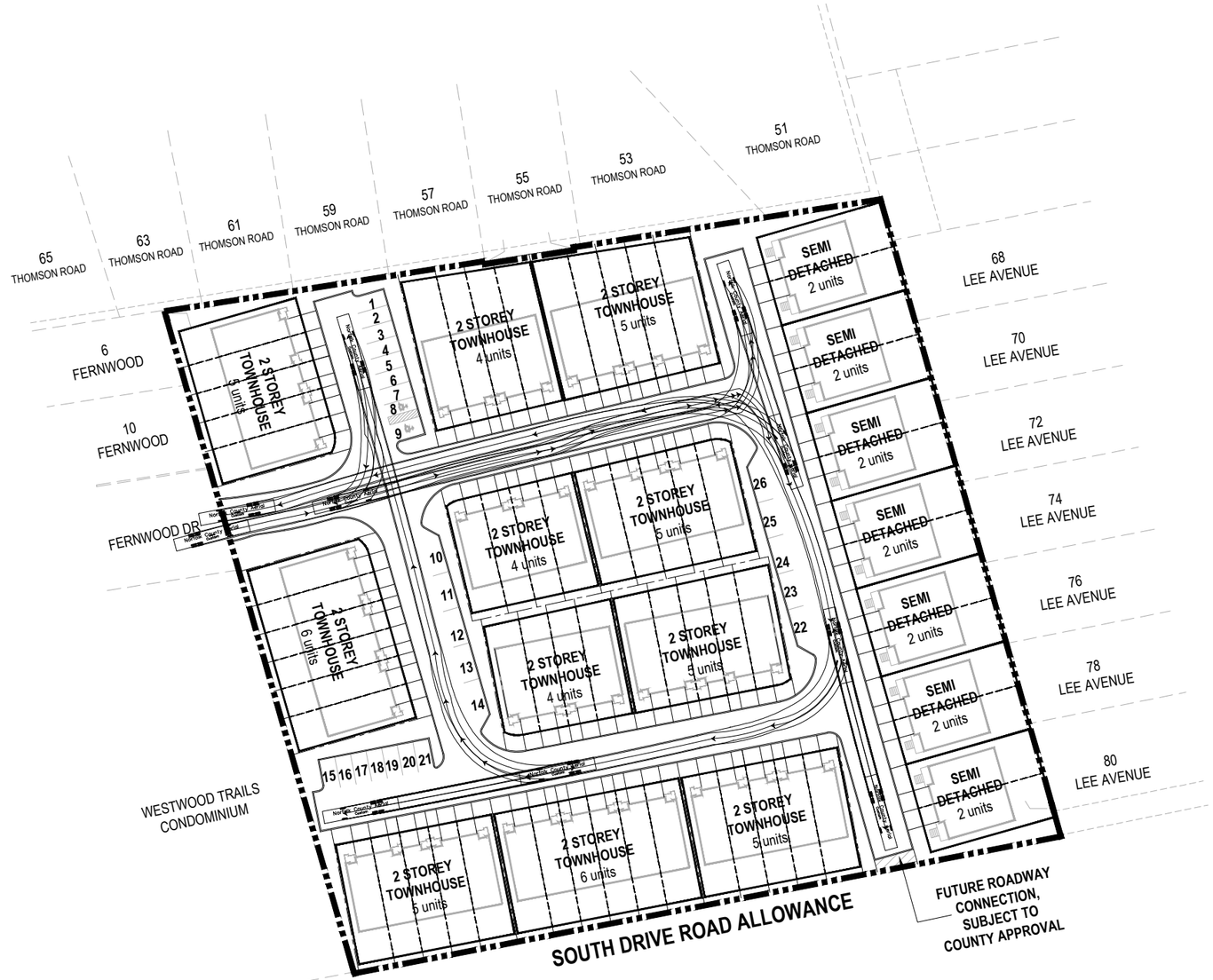
	meters
Width	: 2.98
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

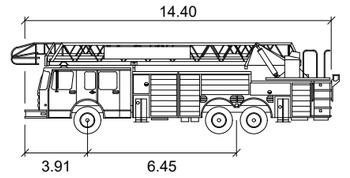
TRAFFIC IMPACT AND FUNCTIONAL OPERATIONS STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
2445680 ONTARIO LIMITED
16 FERNWOOD DRIVE
NORFOLK COUNTY

WASTE COLLECTION SWEPT PATH PLAN

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE
BRAMPTON ON. L6P-0M7
TEL (905) 794-0600
FAX (905) 794-0611

DATE: NOV. 14th 2025	JOB No. W25053
DESIGN: B.W.	FIG. No. 5
SCALE: 1:1000	





Norfolk County Aerial

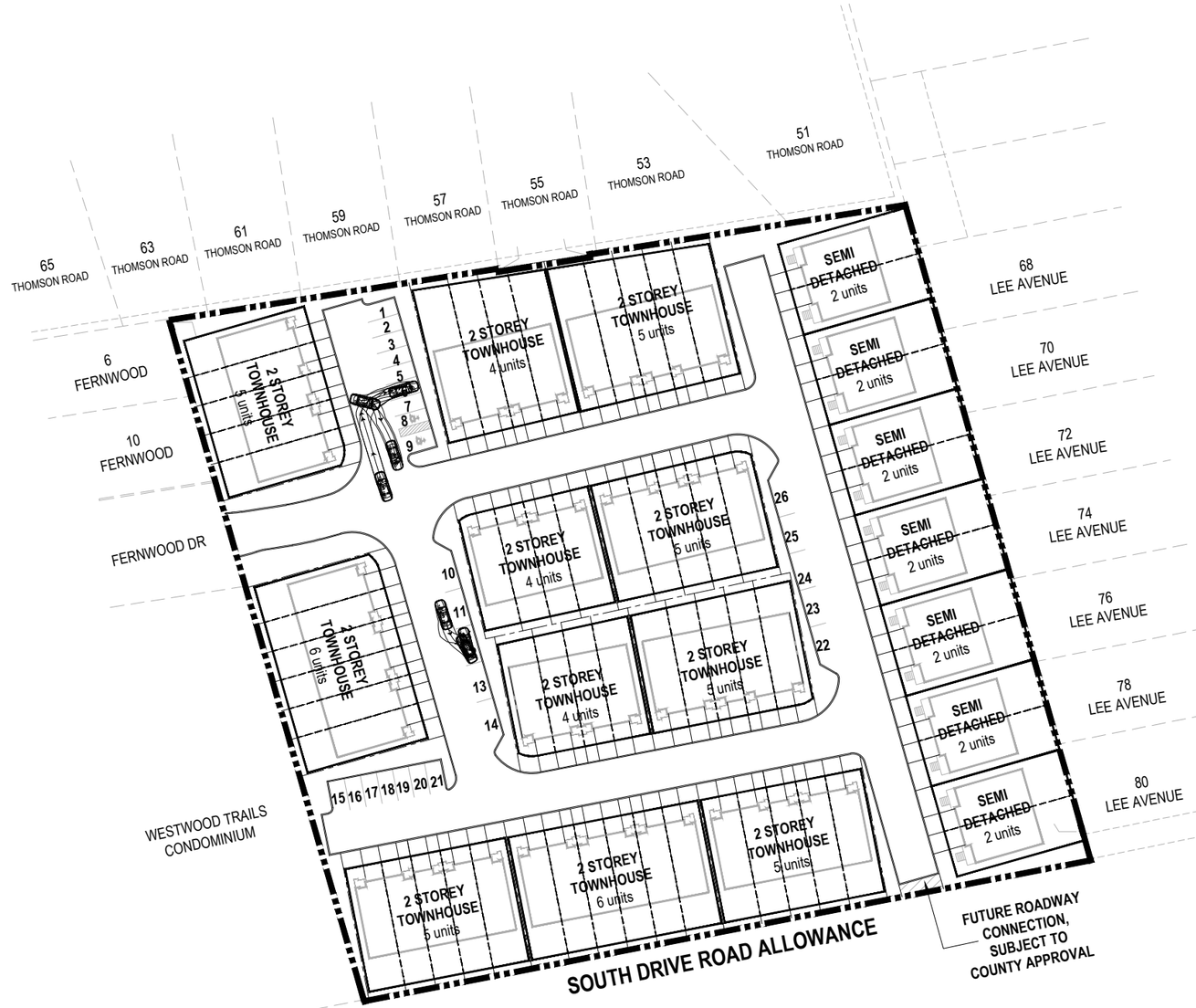
	meters
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Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

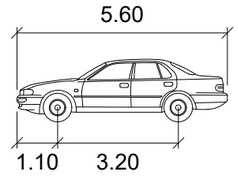
TRAFFIC IMPACT AND FUNCTIONAL OPERATIONS STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
2445680 ONTARIO LIMITED
16 FERNWOOD DRIVE
NORFOLK COUNTY

FIRE EMERGENCY SWEPT PATH PLAN

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE
BRAMPTON ON. L6P-0M7
TEL (905) 794-0600
FAX (905) 794-0611

DATE: NOV. 14th 2025	JOB No. W25053
DESIGN: B.W.	FIG. No. 6
SCALE: 1:1000	





P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

TRAFFIC IMPACT AND FUNCTIONAL OPERATIONS STUDY
PROPOSED RESIDENTIAL DEVELOPMENT
2445680 ONTARIO LIMITED
16 FERNWOOD DRIVE
NORFOLK COUNTY

PASSENGER VEHICLE SWEPT PATH PLAN

CANDEVCON GROUP INC.
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE
BRAMPTON ON. L6P-0M7
TEL (905) 794-0600
FAX (905) 794-0611

DATE: NOV. 14th 2025	JOB No. W25053
DESIGN: B.W.	FIG. No. 7
SCALE: 1:1000	

Attn: Mr. Brett Hamm, Development Technologist

Re: Traffic Impact and Functional Operations Study
Proposed Residential Development
16 Fernwood Drive
2445680 Ontario Limited
Norfolk County
Our File No. W25053

We trust that this letter is satisfactory. However, if you have any questions or concerns or if we may be of further assistance, please do not hesitate to call us.

Yours truly,

CANDEVCON GROUP INC.





Brian Wong, P. Eng.
Intermediate Transportation Engineer

David Lee, P. Eng.
Project Manager

Attachments: Appendix A – Terms of Reference,
Appendix B – Transportation Tomorrow Survey Data,
Appendix C – Traffic Counts Received from Norfolk County.

APPENDIX A

TERMS OF REFERENCE

Traffic Impact and Functional Operations Study – Terms of Reference

a) Assemble, review and confirm background data (i.e. traffic volume/flow on the adjacent road network during weekday peak hours) available from official sources, existing road geometry and access locations.

b) Consult with Norfolk County to confirm data as required (i.e. growth trends, other proposed development timing etc.), issues/developments to be addressed and any anticipated future road improvements.

c) Assess future trips generated by the proposed Residential Development during Weekday AM and Weekday PM Peak Hours.

d) Develop the trip distribution and traffic assignment for the proposed Residential Development during Weekday AM and Weekday PM Peak Hours.

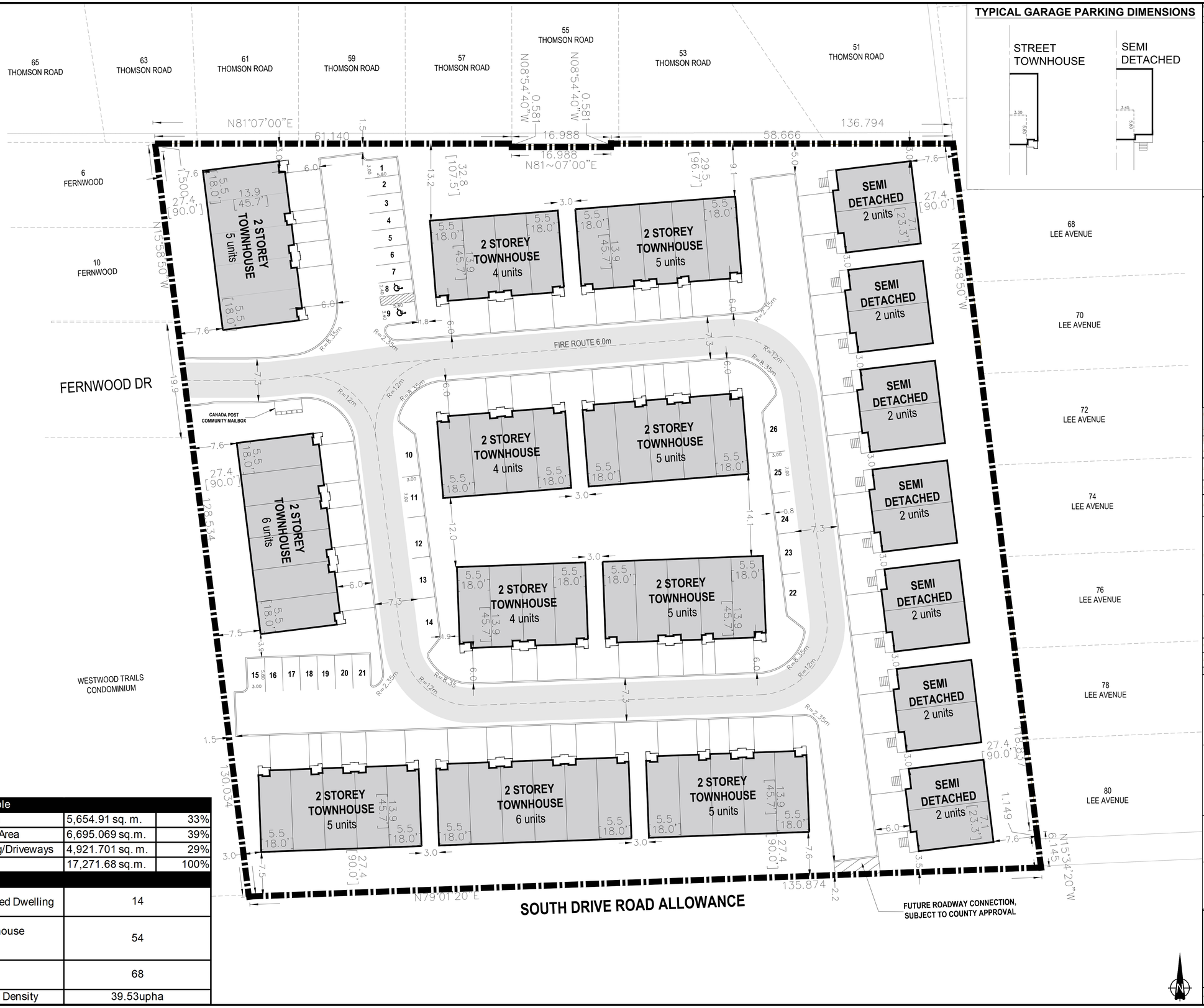
e) Review the turning movement counts during peak periods at the following key site access points. (To be confirmed with Norfolk County)

- Oak Street at Chapel Street,
- West Street at Holden Avenue.

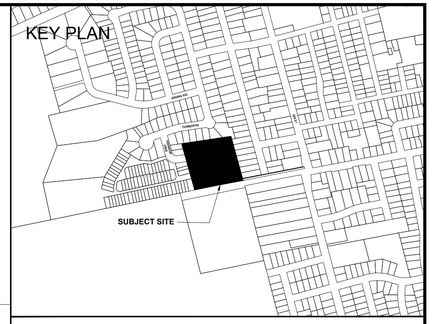
f) Analyze the turning movements of waste collection vehicles, fire emergency vehicles and passenger vehicles for future traffic circulation within the proposed Residential Development.

g) Prepare a Study to summarize the findings of the traffic impact analyses, as well as recommend any improvements required to mitigate the traffic impacts. Submit Study to Norfolk County for review/comments.

h) Provide and circulate copies of the Study to all applicable approval authorities (first submission only).



TYPICAL GARAGE PARKING DIMENSIONS



SITE PLAN

Part of Lot 18
Concession of Gore
City of Simcoe
County of Norfolk

16 FERNWOOD DRIVE

Land Use Table		
Building Area	5,654.91 sq. m.	33%
Landscaped Area	6,695.069 sq.m.	39%
Road/Parking/Driveways	4,921.701 sq. m.	29%
Total	17,271.68 sq.m.	100%
Units		
Semi-Detached Dwelling	14	
Group Townhouse Dwellings	54	
Total Units	68	
Development Density	39.53upha	

Urban Residential Type 4 (R4.14979)

Semi-Detached Dwelling & Group Townhouse Dwellings

Provision No.	Provision	Requirement	Proposed
5.4.2 a)	Minimum Lot Area (per dwelling Unit)	195 m^2	254m^2
5.4.2 b)	Minimum Lot Frontage	19.86 m (Fernwood Drive)	19.86 m
5.4.2 c)	Minimum Front Yard	6.0 m from a private roadway	6.0 m
5.4.2 d)	Minimum Exterior Side Yard	3.0 m from the end wall of a dwelling to a private roadway	3.0 m
5.4.2 e)	Minimum Interior Side Yard	1.2 m from the end wall to a dwelling to an interior side yard lot line	1.5 m
5.4.2 f)	Minimum Rear Yard	7.5 m from the rear wall of a dwelling to a lot line.	7.5 m
		12.0 metres between the rear walls of dwellings	12m
5.4.2 g)	Minimum Separation between Dwellings	2.0 m	3.0 m
5.4.2 h)	Maximum Building Height	9.8 m	9.8 m
	Parking Requirements		
4.9.a)	single detached, semi-detached, duplex, tri-plex, four-plex, townhouse dwellings and vacation home [8-Z-2017]	2 spaces per dwelling unit (68 x 2 = 136)	136 spaces
4.9 f)	All apartment dwellings; and duplex dwellings, tri-plex dwellings, four-plex dwellings, townhouse dwellings or single detached or semi-detached dwellings as part of a condominium development or when they abut a private road [27-Z-2020].	1 visitor space for every 3 dwelling units (68 / 3 = 26.6)	26 visitor spaces

GSP group
PLANNING I URBAN DESIGN I LANDSCAPE ARCHITECTURE
gspgroup.ca

REVISIONS

Date: September 3, 2025	Drawn By: EF	Dwg. File Name: sp25032a.dwg
Scale: 1: 300	Project No.: 25032	

Brian Wong

From: Brett Hamm <Brett.Hamm@norfolkcounty.ca>
Sent: October 3, 2025 1:41 PM
To: Brian Wong
Cc: 'crohe@gspgroup.ca'; David Lee; Filing West
Subject: RE: W25053 - 16 Fernwood Drive - Traffic Impact and Functional Operations Study Terms of Reference (Norfolk)

Good afternoon, Brian

Thanks for circulating. The terms of reference look good for the proposed development, just wanted to note that,

- The County does not have traffic data available for the subject site
- The TIS should use ITE Gen Manual 11 or 12 for trip generation rates/equations

Best regards,
Brett Hamm

Brett Hamm
Development Technologist
Gilbertson Administration Building
Engineering and Asset Management
Public Works
12 Gilbertson Drive, Simcoe, Ontario, N3Y 4N5
519-426-5870 x1081 | 226-NORFOLK

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From: Brian Wong <brian@candevcon.com>
Sent: Monday, September 29, 2025 10:12 AM
To: Brett Hamm <Brett.Hamm@norfolkcounty.ca>
Cc: crohe@gspgroup.ca; David Lee <david@candevcon.com>; Filing West <filingwest@candevcon.com>
Subject: W25053 - 16 Fernwood Drive - Traffic Impact and Functional Operations Study Terms of Reference (Norfolk)

You don't often get email from brian@candevcon.com. Learn why this is important

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

Good Morning Brett,

We are preparing a Traffic Impact and Functional Operations Study for a proposed Residential Development that is approximately 250 metres west of Oak Street and 500 metres south of West Street. Please find the Terms of Reference and the latest site plan attached for your review and comment.

If you require any further information, please do not hesitate to contact me.

Brian Wong, P.Eng.

Intermediate Transportation Engineer

CANDEVCON GROUP INC.
CONSULTING ENGINEERS & PLANNERS
GTA WEST OFFICE (CORPORATE)
9358 Goreway Drive, Brampton, Ontario, L6P 0M7
Tel.: (905)794-0600 Ext 2059

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APPENDIX B

TRANSPORTATION TOMORROW SURVEY DATA

Thu Nov 13 2025 13:49:05 GMT-0500 (Eastern Standard Time) - Run Time: 3001ms

Cross Tabulation Query Form - Trip - 2022

Row: Planning district of origin - pd_orig
Column: Planning district of destination - pd_dest

Filters:
(Planning district of origin - pd_orig In 125
and
Start time of trip - start_time In 700-859)

Trip 2022
Table:

	Hamilton	Welland	Cambridge	Wilmot	Brant	Brantford
Haldimand-Norfolk	47	117	8	13	23	120

APPENDIX C

TRAFFIC COUNTS RECEIVED FROM NORFOLK COUNTY

Brian Wong

From: Matthew Stam <matthew.stam@norfolkcounty.ca>
Sent: October 1, 2025 1:34 PM
To: Brian Wong
Cc: David Lee; Filing West
Subject: RE: W25053 - 16 Fernwood Drive - Traffic Counts (Norfolk County)

Good Afternoon Brian,

Thank you for following up and sorry for the delay. Please see the below list:

- **West Street –** Between Brook Street & Elmhurst Avenue – 2024 AADT – 5984 vehicles
- **Oak Street –** Between West Street & South Drive – 2024 AADT – 2204 vehicles

Unfortunately, these are the most up-to-date and relevant count locations and figures I have at this time.

Thanks,

Matthew Stam, C.E.T.
Project Manager
Gilbertson Administration Building
Engineering and Asset Management
Public Works
185 Robinson St., Simcoe, Ontario, N3Y 5L6
519-426-5870 x8020 | 226-NORFOLK

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From: Brian Wong <brian@candevcon.com>
Sent: Wednesday, October 1, 2025 9:34 AM
To: Matthew Stam <matthew.stam@norfolkcounty.ca>
Cc: David Lee <david@candevcon.com>; Filing West <filingwest@candevcon.com>
Subject: RE: W25053 - 16 Fernwood Drive - Traffic Counts (Norfolk County)

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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.

Hello Matthew,

I am just following up with the email below.

If you require any further information, please do not hesitate to contact me.

Brian Wong, P.Eng.

Intermediate Transportation Engineer

CANDEVCON GROUP INC.
CONSULTING ENGINEERS & PLANNERS
GTA WEST OFFICE (CORPORATE)
9358 Goreway Drive, Brampton, Ontario, L6P 0M7
Tel.: (905)794-0600 Ext 2059

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From: Brian Wong
Sent: September 24, 2025 2:40 PM
To: 'matthew.stam@norfolkcounty.ca' <matthew.stam@norfolkcounty.ca>
Cc: David Lee <david@candevcon.com>; Filing West <filingwest@candevcon.com>
Subject: W25053 - 16 Fernwood Drive - Traffic Counts (Norfolk County)

Hello Matthew,

Thank you for speaking with me over the phone today. As discussed, do you have recent traffic counts on Oak Street that is within the vicinity of Chapel Street and on West Street that is within the vicinity of Holden Avenue.

If you require any further information, please do not hesitate to contact me.

Brian Wong, P.Eng.

Intermediate Transportation Engineer

CANDEVCON GROUP INC.
CONSULTING ENGINEERS & PLANNERS
GTA WEST OFFICE (CORPORATE)
9358 Goreway Drive, Brampton, Ontario, L6P 0M7
Tel.: (905)794-0600 Ext 2059

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ACC

ARCHAEOLOGICAL
CONSULTANTS CANADA

Stage 1 & 2 Archaeological Assessment

Proposed Residential Development

16 Fernwood Drive, Simcoe, Part of Lot 18, Gore Concession, Geographic Township of Woodhouse, Norfolk County, Ontario

Original Report

Prepared for:

Ontario Ministry of Citizenship and Multiculturalism

Prepared by:

Archaeological Licensee: Kristy O'Neal, M.A., P066
Archaeological Consultants Canada
1042 Garner Road West, Unit A101
Ancaster, ON L9G 3K9
www.onarch.ca
info@onarch.ca
289.683.7844

PIF #: P066-0654-2025
Project No. 380-12-25
December 9, 2025

EXECUTIVE SUMMARY

Archaeological Consultants Canada (ACC) was contracted by the Proponent to conduct a Stage 1 & 2 archaeological assessment, including background research and property survey, for a site plan of a residential subdivision including townhouses, and semidetached homes. An archaeological assessment was conducted during the pre-approval process and was required under the *Planning Act, R.S.O 1990*. The assessed area, or the "subject property", is located at municipal address 16 Fernwood Drive, in the unincorporated community of Simcoe, on Part of Lot 18, Gore Concession, Former Geographic Township of Woodhouse, City of Simcoe, Norfolk County, Ontario (Figure 1). The subject property measures 1.68 hectares (ha). The Proponent verified the subject property limits as defined within this report and provided a site plan confirming the boundaries (Figure 2).

The Stage 1 & 2 assessment was conducted under Professional Archaeological License P066, held by Kristy O'Neal. Fieldwork was conducted under the direction of Melanie Chan (R1434). The Ontario Ministry of Citizenship and Multiculturalism (MCM) assigned Project Information Form (PIF) number P066-0654-2025 to this project. The licensee of ACC received permission from the Proponent to access the property and to conduct all required archaeological fieldwork activities including the removal of artifacts, as necessary.

Stage 1 background research indicated that the subject property has general archaeological potential due to the following factors:

- The subject property is comprised of well-drained sandy soil that is suitable for human habitation.
- There are 3 registered Indigenous archaeological sites within one km of the subject property.

A visual property inspection determined that there were no areas of low to no archaeological potential within the subject property. The entirety of the subject property retained archaeological potential and was recommended for Stage 2 assessment, which was conducted by test pit survey at 5 m intervals. No artifacts or other archaeological resources were identified during the Stage 1 & 2 archaeological assessment.

The following recommendation is provided for consideration by the Proponent and by the MCM:

1. No artifacts or other archaeological resources were identified during the Stage 1 & 2 archaeological assessment of the subject property. The subject property has now been fully assessed according to MCM's 2011 *Standards and Guidelines for Consultant Archaeologists*. No further archaeological assessment of the subject property is required.

TABLE OF CONTENTS

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LIST OF ABBREVIATIONS

The following is a list of abbreviations and acronyms used throughout this report.

ACC	Archaeological Consultants Canada
CHVI	Cultural Heritage Value or Interest
cm	centimetre
ha	hectares
km	kilometre
m	metre
MCM	Ministry of Citizenship and Multiculturalism
OASD	Ontario Archaeological Sites Database
OHA	Ontario Heritage Act
PIF	Project Information Form
%	percent

PROJECT PERSONNEL

Project Manager:	Matthew Muttart, M.A., P1208
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Field Director:	Melanie Chan, B.A. R1434
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Stage 1 & 2 Archaeological Assessment

Proposed Residential Development

16 Fernwood Drive, Simcoe, Part of Lot 18, Gore Concession, Geographic Township of Woodhouse, Norfolk County, Ontario

1.0 PROJECT CONTEXT

1.1 Development Context

Archaeological Consultants Canada (ACC) was contracted by the Proponent to conduct a Stage 1 & 2 archaeological assessment, including background research and property survey, for a site plan of a residential subdivision including townhouses, and semidetached homes. An archaeological assessment was conducted during the pre-approval process and was required under the *Planning Act, R.S.O 1990*. The assessed area, or the "subject property", is located at municipal address 16 Fernwood Drive, in the unincorporated community of Simcoe, on Part of Lot 18, Gore Concession, Former Geographic Township of Woodhouse, City of Simcoe, Norfolk County, Ontario (Figure 1). The subject property measures 1.68 hectares (ha). The Proponent verified the subject property limits as defined within this report and provided a site plan confirming the boundaries (Figure 2).

The objective of a Stage 1 background study is to provide information about the subject property's geography, history, previous archaeological fieldwork, and current land conditions. A Stage 1 study evaluates the subject property's archaeological potential in order to recommend appropriate strategies for the Stage 2 survey.

The objective of a Stage 2 property assessment is to document all archaeological resources present on the property and to make a determination about whether these resources, if present, have Cultural Heritage Value or Interest (CHVI). Archaeological resources consist of artifacts (Indigenous 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). If any archaeological resources are present that exhibit CHVI, a Stage 2 survey will determine whether these resources require further assessment and, if necessary, recommend appropriate Stage 3 strategies for identified archaeological sites.

The Stage 1 & 2 assessment was conducted under Professional Archaeological License P066, held by Kristy O'Neal. Fieldwork was conducted under the direction of Melanie Chan (Applied Research License R1434). The Ontario Ministry of Citizenship and Multiculturalism (MCM) assigned Project Information Form (PIF) number P066-0654-2025 to this project. The licensee of ACC received permission from the Proponent to access the property and to conduct all required archaeological fieldwork activities including the removal of artifacts, as necessary.

All fieldwork and reporting were completed using MCM's 2011 *Standards and Guidelines for Consultant Archaeologists.* This report documents the research, the field methods and results, and the conclusions and recommendations based on the Stage 1 & 2 archaeological assessment. All documents and records related to this project will be curated at the offices of ACC, in accordance with subsection 66(1) of the *Ontario Heritage Act* (OHA).

1.2 Historical Context

1.2.1 Background Research

Stage 1 background research was conducted to determine the potential for finding and identifying archaeological resources including sites within the current subject property and to determine the necessity of conducting a Stage 2 survey. This is done by reviewing geographic, archaeological, and historical data for the property and the surrounding area. The background research was conducted to:

- amass all the readily available information on any previous archaeological surveys in the area.
- determine the locations of any registered and unregistered sites within and around the subject property.
- develop a historical framework for assigning levels of potential significance to any new sites discovered during fieldwork.

1.2.2 A Cultural Chronology for Southern Ontario

Over their thousands of years of occupation in the general region, Indigenous peoples have left behind, to a greater or lesser degree, physical evidence of their lifeway activities and settlements at many locations. Based upon a published synthesis of Indigenous cultural occupations (Wright, 1968). Table 1 is a general outline of the cultural history of southern Ontario that is applicable to the subject property. Ellis and Ferris (1990) provide greater detail of the distinctive characteristics of each time period and cultural group. This general outline uses longstanding labels that are used to describe the archaeological record in North America. Archaeological terms like Paleoindian, Archaic, and Woodland, are used here as a way to divide time and should be treated as such.

It is likely that Ontario was occupied soon after the retreat of the Ice Age glaciers. The earliest known human occupation in the area was during the Paleoindian period (between 12,000 and 9,500 years ago) wherein small groups of nomadic peoples hunted big game such as caribou in a cool sub-arctic climate. Sites are typically found near glacial features such as the shorelines of glacial lakes or kettle ponds which would have allowed access to the low-lying environments that were favoured by caribou and other wildlife. These people were few and their small, temporary campsites are relatively rare. Paleoindian sites are recognized by the presence of distinctive artifacts such as fluted projectile points, beaked scrapers, and gravers and by the preference for light colored chert, such as Collingwood chert. The Paleoindian Period is divided into two sub-periods, Early Paleoindian, and Late Paleoindian.

Table 1: General Cultural Chronology for Southern Ontario

PERIOD	SUBDIVISION I	SUBDIVISION II	YEARS BEFORE PRESENT	COMMENTS
PALEOINDIAN	Early Paleoindian	Fluted Point Horizon	12,000-10,500	big game hunters
	Late Paleoindian	Holcombe & Hi-Lo Horizons	10,500-9,500	small nomadic groups
ARCHAIC	Early Archaic	Side Notched Horizon	10,000-9,700	nomadic hunters and gatherers
		Corner-Notched Horizon	9,700-8,900	
		Bifurcate Horizon	8,900-8,000	
	Middle Archaic	Middle Archaic I/Stemmed Horizon	8,000-5,500	territorial settlements
		Middle Archaic II	5,500-4,500	polished ground stone tools
	Late Archaic	Narrow Point Horizon	4,500-3,500	
		Broad Point Horizon	4,000-3,500	
		Small Point Horizon (including Haldimand and Glacial Kame Complexes)	3,500-2,800	burial ceremonialism
WOODLAND	Early Woodland	Meadowood Complex	2,900-2,400	introduction of pottery
		Middlesex Complex	2,500-2,000	
	Middle Woodland	SW Ontario: Saugeen	2,300-1,500	long distance trade networks
		Western Basin: Couture	2,300-1,500	
	Transitional Woodland	SW Ontario:		
		Princess Point	1,500/1,400-1,200	incipient agriculture
		Western Basin:		
		Riviere au Vase	1500/1400-1200/1100	
	Late Woodland: Ontario Iroquois Tradition	Early: Glen Meyer	1200/100-750/700	transition to village life
		Middle I: Uren	720/700-710/670	large villages with palisades
		Middle II: Middleport	710/670-670/600	wide distribution of ceramic styles
		Late: Neutral	600-450	
	Late Woodland: Western Basin Tradition	Younge Phase	1200/1100-800	
		Springwells Phase	800-600	
		Wolf Phase	600-450	
HISTORIC	SW Ontario Iroquois	Historic Neutral	450-350	tribal warfare
	European Contact	Initial Contact	380-300	tribal displacement
		European Settlement	200 >	European settlement
		First Nations Resettlement	200 >	

(Compiled from Adams, 1994, Ellis *et al.,* 1990, Wright, 1968)

During the Archaic period (*circa* 10,000 to 2,800 years ago) people were still primarily nomadic hunters, but they adapted to a more temperate climate. Groups were dispersed during winter months and converged around watercourses from the spring to fall in large fishing campsites. The Archaic period is characterized by the appearance of ground stone tools, notched, or stemmed projectile points. The Archaic Period is divided into three sub-periods, Early, Middle, and Late Archaic. During the Archaic Period, groups began to establish territorial settlements

and introduce burial ceremonialism. There is a marked increase in the number and size of sites, especially during the Late Archaic period.

The Woodland period is distinguished by the introduction of pottery vessels for storage and cooking. Sites of the Woodland period (*circa* 3,000 to 400 years ago) are usually the most numerous because the population levels in southern Ontario had significantly increased, especially along the shores of Lakes Erie and Ontario. The Woodland Period is also marked by the establishment of complex long distance trading networks. The Woodland Period is divided into three sub-periods, Early, Middle and Late Woodland. During the Late Woodland Period, there was increasing sedentarism and the establishment of horticulture, a reliance on tribal warfare, and the introduction of semi-permanent villages with large protective palisades. The Late Woodland period also envelops the emergence of Iroquoian tribes and confederacies.

The historic period (from A.D. 1650 to 1900) begins with the arrival of Euro-Canadian groups. Sites of this period document European exploration, trade, and the displacement and devastation of native groups caused by warfare and infectious disease. The most common sites of this period include Euro-Canadian homesteads, industries, churches, schools, and cemeteries.

While North America had been visited by Europeans on an increasing scale since the end of the 15th century, the first European to venture into what would become southern Ontario was Étienne Brûlé. Brûlé was sent by Samuel de Champlain in the summer of 1610 to consolidate an emerging relationship between the French and the First Nations, and to learn their languages and customs. Other Europeans would subsequently be sent by the French to train as interpreters. These men played an essential role in communications with the First Nations (Gervais and Rothe, 2004:182).

The late 17th and early 18th centuries saw the growth and spread of the fur trade, with the establishment and maintenance of trading posts along the Great Lakes. In 1754, hostilities over trade and the territorial ambitions of the French and the British led to the Seven Years' War, which ended when the French surrendered in 1760 (Smith, 1987:22). In addition to cementing British control over the Province of Quebec, the British victory over the French also proved pivotal in catalyzing the Euro-Canadian settlement process.

During pre-contact and early contact times, the vicinity of the subject property would have contained a mixture of deciduous trees, coniferous trees, and open areas. In the early 19th century, Euro-Canadian settlers arrived via easily accessible colonization routes and began to clear the forests for agricultural purposes. In the 19th and early 20th centuries, the subject property and surrounding land were primarily used for agricultural purposes. Mixed farming was common, with wheat crops and beef cattle dominating the landscape (Chapman and Putnam, 1984:177).

The subject property was historically located on Part of Lot 18, Gore Concession, in the Township of Woodhouse, County of Norfolk. In 1791, the provinces of Lower Canada and Upper Canada were created from the former province of Quebec by a British parliamentary act. Colonel John Graves Simcoe was appointed as the Lieutenant Governor of Upper Canada and

was tasked with governing and directing its settlement, as well as establishing a constitutional government based on Britain's model (Coyne et al, 1895:33).

Norfolk County was first settled in 1789 by United Empire Loyalists emigrating from the United States after the American Revolutionary War (Carter, 1984). The county itself was created in 1792 by Lieutenant-Governor John Graves Simcoe, who named it after Norfolk County, England (Mika & Mika, 1983). The population of Norfolk County was 9,626 in 1841. Early settlers in the county were primarily of Dutch, British and German descent, who settled in the county to take advantage of the rich soils (Mutrie, 2004). By 1844, a total of 56,899 acres were being cultivated, and there were 50 sawmills and 10 grist mills in operation (Smith 1846:186).

Woodhouse Township most likely was named after Woodhouse in Lincolnshire, England; differing from the rest of the townships of Norfolk County, which were named after areas in in Norfolk, England (Rayburn, 1997). Early settlement in what would become Woodhouse Township was concentrated along the lakefront around Long Point and began in the 1790s (Smith, 1846). By 1846 Woodhouse Township was described as a well-settled township, with the major areas of settlement listed as the town of Simcoe and the shipping communities of Port Dover and Port Ryerse (Smith, 1846). Of importance through the township was the Plank Road from Hamilton to Port Dover, connecting inland settlements to Lake Erie. By 1846 the township boasted three grist mills and eleven sawmills (Smith, 1846).

The Town of Simcoe was historically located 0.7 kilometres (km) to the northwest of the subject property. The hamlet of Simcoe, named after Lieutenant Governor Simcoe, was settled in 1795 (MacDonald, 2012a). John Graves Simcoe spent the night in the area and granted lands to colonizers including Aaron Culver, a United Empire Loyalist who built grist and sawmills, drawing other settlers to the area. Between 1819 and 1822, Culver divided his land into town lots and proposed the village be named Simcoe. Culver built the first church and school in Simcoe at his own expense. Other early industry focused on lumber, tobacco, and carriage works. Simcoe was partially destroyed by fire during the War of 1812 (MacDonald, 2012a). A post office opened in the town in 1829, and a courthouse and jail were constructed in 1836 (Carter, 1984:398-399). Simcoe was incorporated as a village in 1851 and a town in 1878 (Canadian Encyclopedia, 2015).

Historical records and mapping were examined for evidence of early Euro-Canadian occupation within and near the subject property in the mid- to late-19th century. Tremaine's 1856 *Map of Norfolk County, Canada West* lists an individual with the initials T.K. as the owner of the subject property (Figure 3). There are no structures illustrated within or near the subject property at this time. The subject property is located 700 metres (m) to the west of the historic limits Town of Simcoe. A branch of Kents Creek is shown 800 m to the northeast of the subject property. A branch of the Lake Huron and Port Dover Railroad runs through the Town of Simcoe, approximately 1.4 km to the east of the subject property.

H.R. Page & Co's 1877 map of Woodhouse Township in the *Illustrated Historical Atlas of the County of Norfolk, Ontario* lists Charles Shemeld as the owner of the subject property lands. There are no structures illustrated within the subject property. The subject property is located 700 m to the west of the historic limits Town of Simcoe. A branch of Kents Creek is shown 800

m to the northeast of the subject property. A branch of the Lake Huron and Port Dover Railroad runs through the Town of Simcoe, approximately 1.4 km to the east of the subject property (Figure 4).

It should be noted that while there are no structures illustrated within the subject property on the historical atlas maps, it does not necessarily mean that one or more structures were not present at that time, earlier or later. Not all features of interest were mapped systematically on the Ontario series of historical maps and atlases, given that they were financed by subscription, and subscribers were given preference regarding the level of detail provided on the maps (Caston, 1977:100).

1.3 Archaeological Context

1.3.1 Natural Environment

The subject property is located within the Norfolk Sand Plain physiographic region (Chapman and Putnam 1984). This wedge-shaped area has a curved base along the coast of Lake Erie and tapers to a point at Brantford. The region is made up of sand deposited from meltwater of the Grand River that formed a delta of glacial Lakes Whittlesey and Warren. It is made up of light textured soils left behind by retreating glaciers that is best used for tobacco crops.

The *Soils of Norfolk County* (Presant and Acton, 1984) indicates that there are two dominant surface soil types within the subject property (Figure 5). The majority of the subject property consists of Plainfield sand. This soil type is characterized by Eolian fine sand which forms into dunes and has rapid and good drainage. The northwestern portion of the subject property is made up of Walsher loam. This soil type is characterized by sandy soils over lacustrine silty loam subsoil with good drainage.

Water has been identified as the major determinant of site selection and the presence of potable water is the single most important resource necessary for any extended human occupation or settlement. Primary water sources include, among others, lakes, rivers, creeks, and streams. Secondary water sources include intermittent streams, creeks, springs, marshes, and swamps. Past water sources, such as raised beach ridges, relic water channels, and glacial shorelines are also considered to have archaeological potential. Swamps and marshes are also important as resource extraction areas, and any resource areas are considered to have archaeological potential. There are no water sources within 300 m of the subject property. The nearest water source is Kents Creek, located 800 m to the northwest of the subject property.

1.3.2 Current Land Use

Figure 6 provides the current land use of the subject property. The subject property consists of a former woodlot that is now overgrown scrub. The subject property is surrounded to the east and north by residential subdivisions, and to the west by a recently constructed subdivision development. Agricultural fields are directly south.

Fieldwork for the project was conducted on September 19, 2025.

1.3.3 Previous Archaeological Investigations

1.3.3.1 Registered Archaeological Sites

Previously registered archaeological sites can be used to indicate archaeological potential. To determine if any previous assessments have yielded archaeological sites, either within or surrounding the current subject property, two main sources were consulted. These include the *Ontario Archaeological Sites Database* (OASD) and the *Public Register of Archaeological Reports,* both of which are maintained by MCM.

The OASD contains archaeological sites registered within the Borden system (Borden, 1952). The Borden system divides Canada into 13 km by 18.5 km blocks based on longitude and latitude. Each Borden block is designated with a four-letter label and sites identified within the block are numbered sequentially as they are registered. The subject property is located within the *AfHb* Borden block.

According to the OASD, no archaeological sites have been registered within the subject property, however, 3 sites have been registered within one km of the subject property (MCM, 2025a). The nearest of these sites is over 300 m from the current subject property. All three sites are of Indigenous cultural affiliation and include a campsite and scatters.

Table 2 lists the sites within 1 km along with the current CHVI for each site. CHVI is a term used by MCM and consultant archaeologists to describe archaeological resources that meet one or more criteria that recommend further fieldwork in MCM's *Standards and Guidelines for Consultant Archaeologists*. Under the OHA and its regulations, archaeological resources that have been determined to possess CHVI are protected as archaeological sites under Section 48 of the act. Information in Table 2 is provided by MCM through the OASD (MCM, 2025a).

Table 2: Registered Archaeological Sites within 1 km of the Subject Property

REG. #	NAME	TIME PERIOD	CULTURAL AFFILIATION	SITE TYPE	STATUS
AeHb-124	P1	Pre-Contact	Indigenous	scatter	Further CHVI
AfHb-108	Chanyi Pit #2	Pre-Contact	Indigenous	scatter	Further CHVI
AfHb-135	-	Archaic, Middle	Indigenous	hunting, campsite	No Further CHVI

Information concerning specific site locations is protected by provincial policy and is not fully subject to the *Freedom of Information Act.* The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. MCM will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

1.3.3.2 Previous Archaeological Reports

A review of archaeological reports within the *Public Register of Archaeological Reports* indicated that there are no reports detailing previous archaeological fieldwork within the subject

property entered into MCM's register at the time this report was written (MCM, 2025b). There is one report detailing previous fieldwork within 50 m of the subject property within the register.

Reports were searched based on registered site information, historic lots and concessions, and nearby streets. To the best of ACC's knowledge, there are no other reports concerning archaeological work conducted within 50 m of the subject property; however, it should be noted that the MCM does not maintain a database of all properties that have had past archaeological investigations and searches of the MCM's public register do not always result in a complete listing of all archaeological work conducted in a given area.

> ***Stage 1-2 Archaeological Assessment of Westwood Trail Thomson Rd., Lot 18, Gore (Geographic Township of Woodhouse), City of Simcoe, County of Norfolk.*** **AMICK Consultants Limited. Report dated June 4, 2015. PIF P384-016-2013.**

AMICK Consultants Limited conducted a Stage 1 & 2 archaeological assessment of a 5.61 ha property located directly west of the current subject property. Small sections of the property were determined to be low-lying and permanently wet or steeply sloping. The remainder of the property was subject to Stage 2 assessment by test pit survey at 5 m intervals. No archaeological resources were discovered, and no further fieldwork was recommended (AMICK Consultants Limited, 2015:25).

1.3.4 Historical Plaques and Monuments

MCM's *Standards and Guidelines for Consultant Archaeologists* (MCM, 2011:17) stipulates that areas of early Euro-Canadian settlement (including places of early military pioneer settlement, pioneer homesteads, isolated cabins, farmstead complexes, early wharf or dock complexes, pioneer churches, and early cemeteries) are considered to have archaeological potential. There may be commemorative markers of their history, such as local, provincial, or federal monuments, plaques, cairns, or heritage parks. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the OHA or a federal, provincial, or municipal historic landmark or site, and properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations are also considered to have archaeological potential.

There are no plaques or commemorative markers within or near the subject property (Ontario Provincial Plaques, 2025).

1.3.5 Archaeological Master Plans

Archaeological site predictive models and master plans are tools used to assist in determining the probability of encountering archaeological sites. Probability models are created using consideration of variables such as distance to water, soil type, drainage, physiographic region, degree of slope, proximity to registered archaeological sites, and degree of disturbance.

While Norfolk County does not have an archaeological master plan or potential model, it does have an official plan that sets out directions and policies that guide economic, environmental, and community planning decisions for the region. The plan requires an archaeological and cultural heritage assessment for any proposed development or site alteration. The policy requires

that any area undergo archaeological assessment prior to any development (County of Norfolk, 2023).

1.3.6 Cemeteries

A search of the subject property and surrounding area determined that there were no cemeteries located within or near the subject property. The Bereavement Authority of Ontario's Public Register does not list any cemeteries within the subject property (Bereavement Authority of Ontario, 2025).

2.0 FIELD METHODS

The subject property measures 1.68 ha. The Stage 1 & 2 assessment was conducted concurrently on September 19th, 2025, with advance permission to enter the subject property obtained from the Proponent. Weather conditions during the assessment were excellent, with clear and a maximum daily high temperature of 23 degrees Celsius.

The Stage 1 assessment of the subject property began with an on-site property inspection to gain first-hand knowledge of the geography, topography, and current condition of the property. The entirety of the subject property was accessible and was inspected. Appropriate photographic documentation was taken during the visual inspection. The Stage 1 property inspection took place when the ground was fully visible, and under conditions that allowed for full viewing of archaeological potential. Coverage of the property was sufficient to identify the presence or absence of features of archaeological potential, meeting the requirements of Section 1.2 Standard 1 of the *Standards and Guidelines for Consultant Archaeologists*.

Areas of low to no archaeological potential include lands that have been previously disturbed, lands that have steeply sloping topography, and lands that are low-lying and permanently wet. No areas of low to no archaeological potential were observed within the subject property and entirety of the subject property, or 100 percent (%), was determined to retain archaeological potential and require Stage 2 archaeological assessment.

The property consists of overgrown lawn and scrub that could not be ploughed. Stage 2 archaeological assessment was conducted by test pit survey at 5 m intervals in accordance with Section 2.1.2 of the *Standards and Guidelines for Consultant Archaeologists.* Each test pit was dug by hand and was 30 centimetres (cm) in diameter and was dug to at least 5 cm into the subsoil. Test pits were examined for stratigraphy, cultural features, or evidence of fill. As the entire subject property retained archaeological potential, the requirement to test pit to within 1 m of disturbances and other areas of low archaeological potential was not applicable. All soil was screened through 6-millimetre mesh to maximize the potential for artifact recovery. Appropriate photographic documentation was taken, and all test pits were backfilled upon completion. As no artifacts were observed during the test pit assessment no intensified survey was conducted.

There were no weather, ground, or lighting conditions detrimental to the recovery of artifacts. As such, it is confirmed that the Stage 2 assessment met Section 2.1 Standard 3 of the *Standards and Guidelines for Consultant Archaeologists* regarding weather and lighting.

The entirety of the subject property was assessed. The results of the Stage 1 & 2 assessment are shown in Figures 7 and 8. Images of the assessment are provided in Section 9.0.

3.0 RECORD OF FINDS

3.1 Soils

Test pits contained approximately 20 to 35 cm of dark brown sandy loam topsoil above yellow to light brown sandy loam subsoil.

3.2 Archaeological Resources

No artifacts or other archaeological resources were observed during the Stage 1 & 2 assessment of the subject property.

3.3 Documentary Record

All fieldwork-related activities were documented and kept, including field notes and observations and detailed maps. Appropriate photographic records were kept of the assessment and all image descriptions were recorded in a photo log.

A detailed list of field records is presented in Table 3. All digital items have been duplicated, and all paper items have been scanned and stored as digital documents. All items are housed in the corporate offices of ACC.

Under Section 6 of Regulation 881 of the OHA, ACC will keep in safekeeping all objects of archaeological significance that are found under the authority of the license and all field records that are made in the course of the work authorized by the license, except where the objects and records are donated to His Majesty the King in right of Ontario or are directed to be deposited in a public institution under subsection 66 (1) of the Act.

Table 3: Inventory of Documentary and Material Records

PROJECT INFORMATION		
ACC project number	380-12-25	
Licensee	Kristy O'Neal	
MCM PIF numbers	P066-0654-2025	
DOCUMENT/MATERIAL	**NUMBER**	**DESCRIPTION**
field notes & photo logs	1	pages (paper, with digital copies)
maps	1 1	aerial imagery of subject property plan of survey of the subject property
photographs	6	digital colour photographs

4.0 ANALYSIS AND CONCLUSIONS

4.1 Assessing Potential for Archaeological Resources

Archaeological potential is defined as the likelihood of finding archaeological sites within a subject area. For planning purposes, determining archaeological potential provides a preliminary indication that significant sites might be found within the subject area, and consequently, that it may be necessary to allocate time and resources for archaeological survey and mitigation.

The framework for assigning levels of potential archaeological significance is drawn from provincial guidelines found in the *Standards and Guidelines for Consultant Archaeologists* (MCM, 2011: Sections 1.3.1 and 1.3.2). The following are features or characteristics that can indicate archaeological potential:

- previously identified archaeological sites
- water sources (It is important to distinguish types of water and shoreline, and to distinguish natural from artificial water sources, as these features affect site locations and types to varying degrees.).
    - primary water sources (e.g., lakes, rivers, streams, creeks)
    - secondary water sources (e.g., intermittent streams and creeks, springs, marshes, swamps)
    - features indicating past water sources (e.g., glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches)
    - accessible or inaccessible shoreline (e.g., high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh)
- elevated topography (e.g., eskers, drumlins, large knolls, plateaus)
- pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground
- distinctive land formation that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings.
- resource areas, including:
    - food or medicinal plants (e.g., migratory routes, spawning areas, prairie)
    - scarce raw materials (e.g., quartz, copper, ochre or outcrops of chert)
    - early Euro-Canadian industry (e.g., fur trade, logging, prospecting, mining)

- areas of early Euro-Canadian settlement. These include places of early military or pioneer settlement (e.g., pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches and cemeteries. There may be commemorative markers of their history, such as local provincial, or federal monuments or heritage parks
- early historical transportation routes (e.g., trails, passes, roads, railways, portages)
- property listed on a municipal register or designated under the OHA or that is in a federal, provincial, or municipal historic landmark site
- property that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations

Archaeological potential can be determined not to be present for either the entire property or parts of it when the area under consideration has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources. This is commonly referred to as "disturbed" or "disturbance" and may include:

- quarrying
- major landscaping involving grading below topsoil
- building footprints
- sewage and infrastructure development
- activities such as agricultural cultivation, gardening, minor grading, and landscaping do not necessarily affect archaeological potential.

4.2 Analysis and Discussion

Section 1.3.1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM, 2011) lists criteria indicative of archaeological potential. MCM stipulates the following requirements for Stage 2 property survey based on archaeological potential.

- No areas within 300 m of a previously identified site, water sources, areas of early Euro-Canadian settlement, or locations identified through local knowledge or informants can be recommended for exemption from further assessment.
- No areas within 100 m of early transportation routes can be recommended for exemption from further assessment.
- No areas within the property containing elevated topography, pockets of well-drained sandy soil, distinctive land formations, or resource areas can be recommended for exemption from further assessment.

Stage 1 background research indicated that the subject property has general archaeological potential due to the following factors:

- The subject property is comprised of well-drained sandy soil that is suitable for human habitation.
- There are 3 registered Indigenous archaeological sites within one km of the subject property.

Given the above criteria, background archival research indicated that the subject property exhibited general archaeological potential for the discovery of both pre/post-contact Indigenous and Euro-Canadian archaeological resources therefore, a Stage 2 archaeological assessment was required.

The subject property measures 1.68 ha. A visual property inspection determined that there were no areas of low to no archaeological potential within the subject property. The entirety of the subject property retained archaeological potential and was recommended for Stage 2 assessment, which was conducted by test pit survey at 5 m intervals.

No artifacts or other archaeological resources were identified during the Stage 1 & 2 archaeological assessment.

5.0 RECOMMENDATIONS

Subject to acceptance of the results and approval of the recommendations, MCM is requested to deem this report compliant with ministry requirements for archaeological fieldwork and reporting and to issue a letter accepting this report into the *Ontario Public Register of Archaeological Reports*, as provided for in Section 65.1 of the OHA.

The following recommendation is provided for consideration by the Proponent and by the MCM:

1. No artifacts or other archaeological resources were identified during the Stage 1 & 2 archaeological assessment of the subject property. The subject property has now been fully assessed according to MCM's 2011 *Standards and Guidelines for Consultant Archaeologists*. No further archaeological assessment of the subject property is required.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

The following advice on compliance with current legislation is provided for consideration:

a. This report is submitted to the Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c O.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Citizenship and Multiculturalism, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

b. It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such a time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

c. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

d. The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) requires that any person discovering human remains must notify the police or coroner and the Registrar, Burials Unit, at the Ministry of Public and Business Service Delivery and Procurement.

e. Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

7.0 CLOSURE

This report was prepared for the exclusive use of the Proponent, unless otherwise expressly stated in the report or contract. This report documents work that was performed in accordance with the accepted professional standards at the time and location in which the services were provided.

The report is based solely on data and information collected during the archaeological assessment as described in this report. All information received from the Proponent or third parties in the preparation of this report has been assumed by ACC to be factual and accurate. ACC assumes no responsibility for any deficiency, misstatement, or inaccuracy in information received from others. ACC disclaims any obligation to update this report for events or information that becomes available to ACC after the assessment has been completed.

Conclusions made within this report consist of ACC's professional opinion as of the time of the writing of this report and are based solely on the scope and extent of work described in the report, the limited data available, and the results of the work. The conclusions are based on the conditions encountered by ACC at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, it is possible that unforeseen and undiscovered archaeological resources may be present within the assessed area. ACC does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire property. No other representations, warranties, or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential archaeological resources associated with the identified property.

Any use of this report by any third party is prohibited. This report is not to be given over to any third party, for any purpose whatsoever, without the written permission of ACC, which shall not be unreasonably withheld. Any use which a third party makes of this report, in whole or in part, or any reliance on or decisions to be made based on any information and conclusions in the report, are the responsibility of the third party. ACC assumes no responsibility for losses, damages, liabilities or claims of any kind whatsoever, howsoever arising, from third party use of this report.

ACC makes no other representations whatsoever, including those concerning the legal significance of the report's findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein.

8.0 BIBLIOGRAPHY AND SOURCES

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9.0 IMAGES



Image 1: Subject property, from northwestern corner, facing southeast.



Image 2: Subject property, from centre, facing west.



Image 3: Subject property, from northeastern corner, facing southwest.



Image 4: Subject property, from southeastern corner, facing west.



Image 5: Subject property, from southwestern corner, facing northeast.

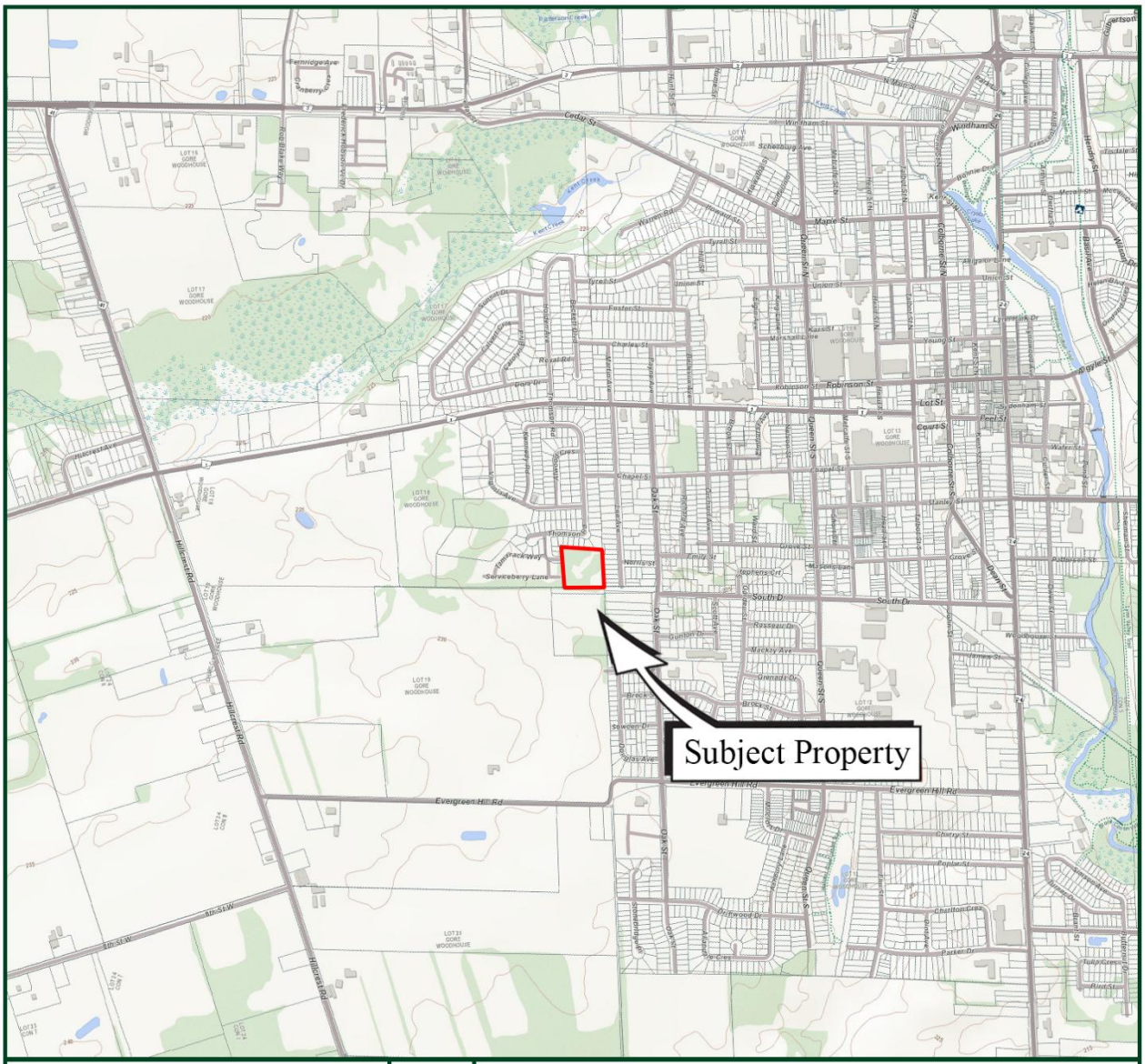


Image 6: Typical test pit.

10.0 FIGURES

See the following pages for detailed assessment mapping and figures.

Figure 1: Location of the Subject Property on a 1:50,000 Scale Topographic Map



Scale:

0 1

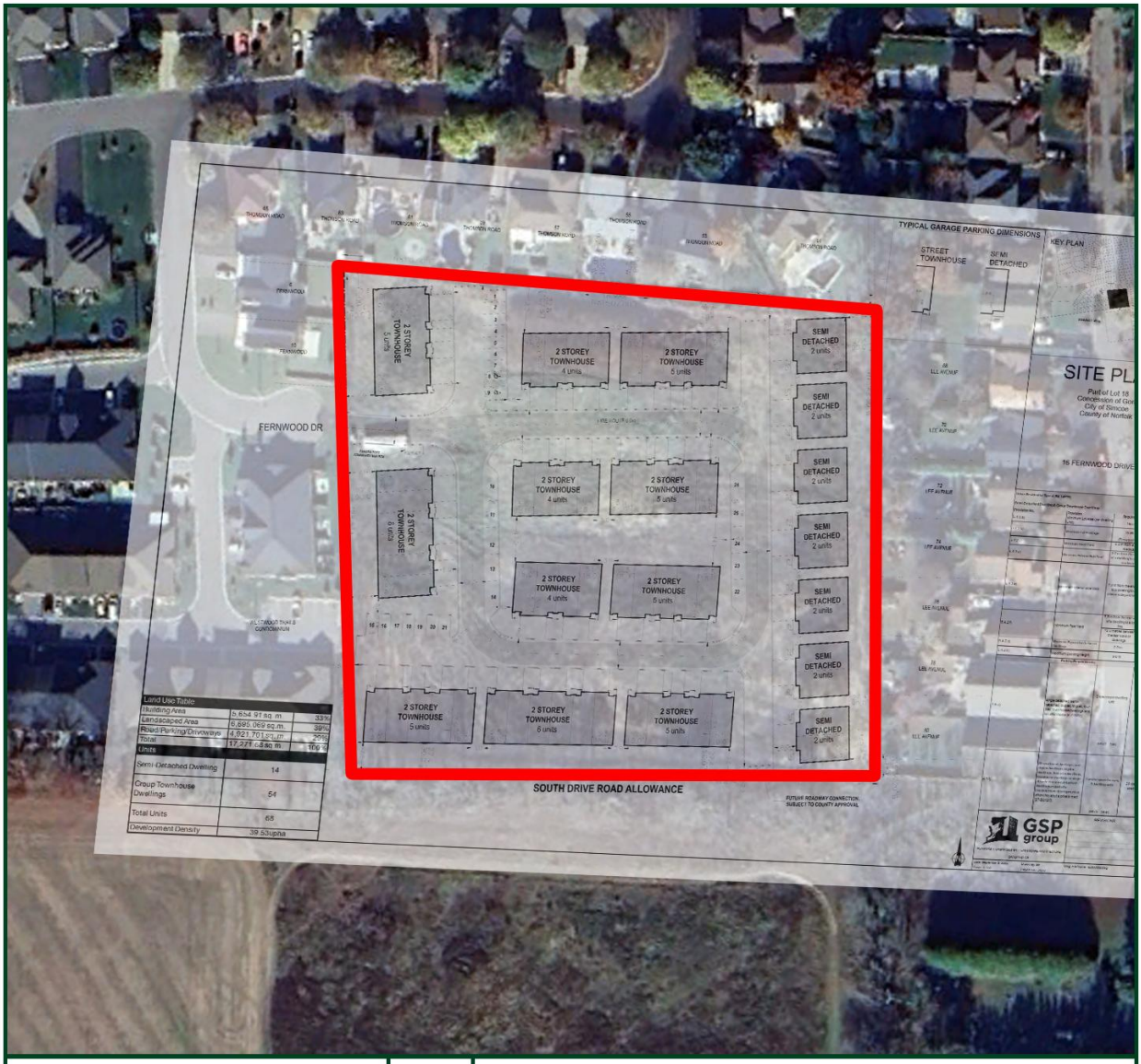
kilometre

Reference:
Natural Resources Canada, 1996

Legend:

subject property

Figure 2: Plan of Survey of the Subject Property



Scale:

0 80

meter

Reference:
ESRI, 2025
GSP Group, 2025

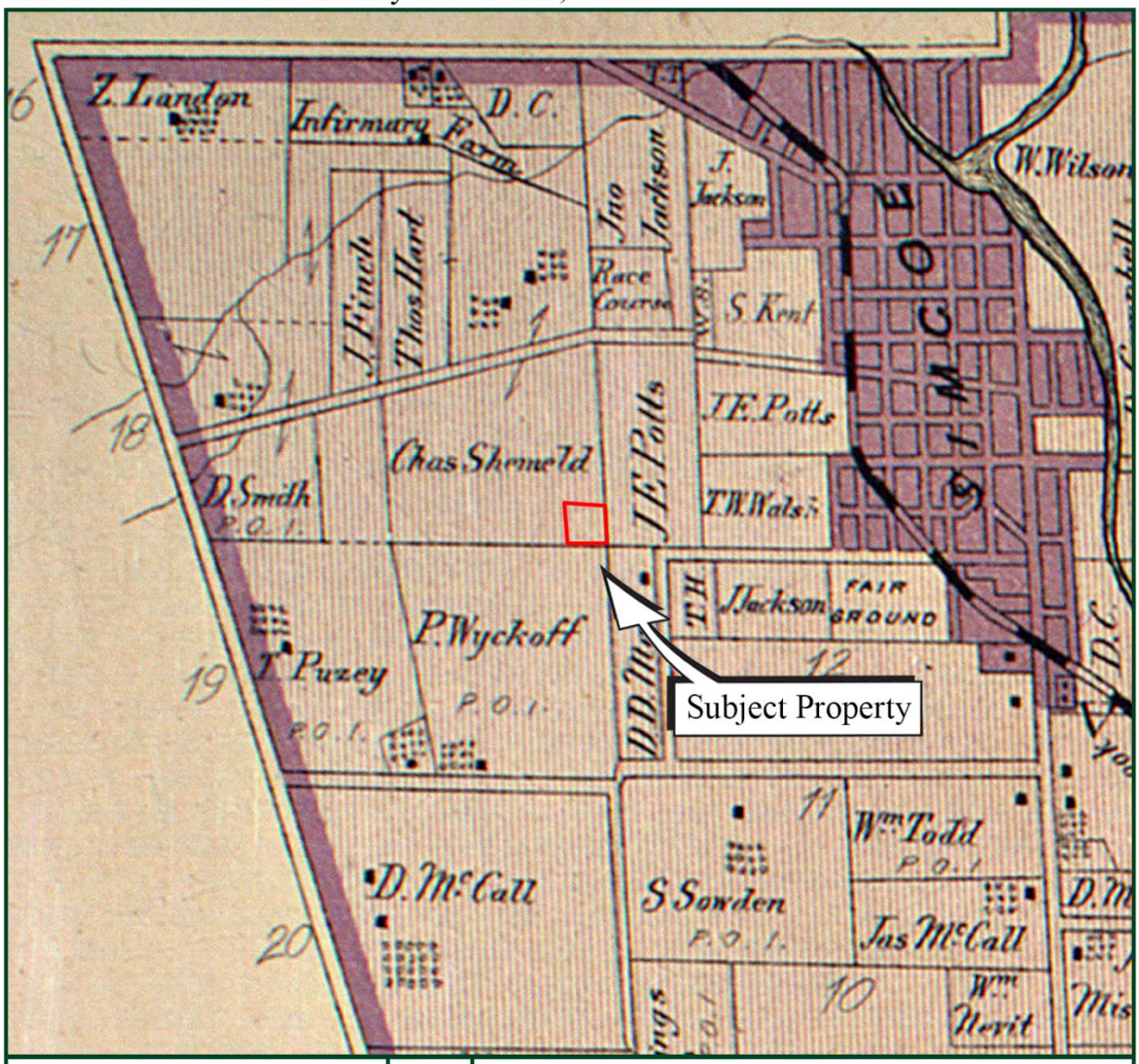
Legend:

subject property

Figure 3: Location of the Subject Property on Tremaine's 1856 Map of Norfolk County



Figure 4: Location of the Subject Property on H.R. Page & Co's 1877 Illustrated Historical Atlas of the County of Norfolk, Ontario



Scale:
0 1
kilometre

Reference:
H.R. Page & Co, 1877

Legend:
subject property

Figure 5: Location of the Subject Property on a Map of Norfolk County Soils

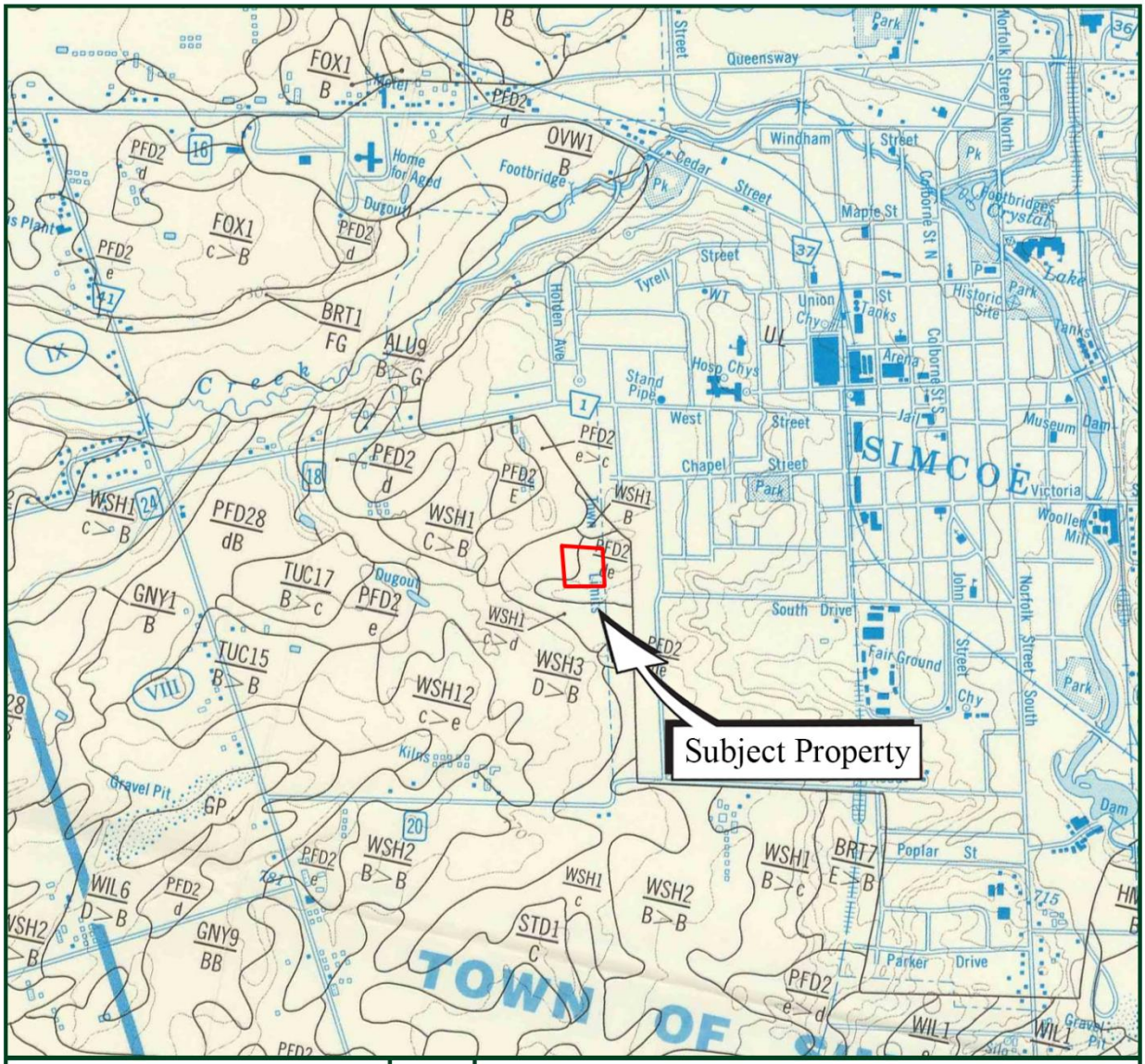


Figure 6: Current Land Use of the Subject Property



Scale:
0 80
meter

Reference:
ESRI, 2025

Legend:
subject property

Figure 7: Aerial Imagery Showing the Results of the Stage 1 & 2 Archaeological Assessment of the Subject Property



Scale:
0 80
meter

Reference:
ESRI, 2025

Legend:
subject property
test pit surveyed at 5m intervals
photograph location and direction
test pit photograph location

Figure 8: Plan of Survey Showing the Results of the Stage 1 & 2 Archaeological Assessment of the Subject Property



Scale:

0 80

meter

Reference:
ESRI, 2025
GSP Group, 2025

Legend:

- subject property
- test pit surveyed at 5m intervals
- # photograph location and direction
- # test pit photograph location

Ministry of Citizenship and Multiculturalism (MCM)

Archaeology Program Unit
Heritage Operations Branch
Citizenship, Inclusion and Heritage Division
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Tel.: (613) 790-0486
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Ministère des Affaires civiques et du Multiculturalisme (MCM)

Unité des programme d'archéologie
Direction des opérations du patrimoine
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Dec 9, 2025

Kristy O'Neal (P066)
Archaeological Consultants Canada
A101 - 1042 Garner Ancaster ON L9G 3K9

RE: Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 1 &2 Archaeological Assessment Proposed Residential Development 16 Fernwood Drive, Simcoe, Part of Lot 18, Gore Concession, Geographic Township of Woodhouse, Norfolk County, Ontario", Dated Dec 9, 2025, Filed with MCM on N/A, MCM Project Information Form Number P066-0654-2025, MCM File Number 0024300

Dear Kristy O'Neal (P066):

The above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18, has been entered into the Ontario Public Register of Archaeological Reports without technical review.[1]

Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require further information, please do not hesitate to send your inquiry to Archaeology@Ontario.ca

cc. Archaeology Licensing Officer
Graig Rohe,2445680 Ontario Limited
Andrew Wallace,County of Norfolk

1*In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.*

Ontario

Record of Site Condition
Under Part XV.1 of the Environmental Protection Act

Summary

Record of Site Condition Number	225555
Date Filed to Environmental Site Registry	2019/05/01
Certification Date	2019/02/13
Current Property Use	Industrial
Intended Property Use	Residential
Certificate of Property Use Number	No CPU
Applicable Site Condition Standards	Full Depth Generic Site Conditions Standard, with Potable Ground Water, Coarse Textured Soil, for Residential property use
Property Municipal Address	No Municipal Address, Norfolk County

Notice to Readers Concerning Due Diligence

This record of site condition (RSC) has been filed in the Environmental Site Registry to which the public has access and which contains a notice advising users of the Environmental Site Registry who have dealings with any property to consider conducting their own due diligence with respect to the environmental condition of the property, in addition to reviewing information in the Environmental Site Registry.

Contents of this Record of Site Condition

This RSC consists of this document which is available to be printed directly from the Environmental Site Registry as well as all supporting documentation indicated in this RSC to have been submitted in electronic format to the Ministry of the Environment, Conservation and Parks.

Part 1: Property Ownership, Property Information and Owner's Certifications

Information about the owner who is submitting or authorizing the submission of the record of site condition

Owner name	WILLIAM ALEXANDER DOUGLAS SMITH
Owner type	Individual
Mailing address	64 BERKLEY CRESCENT, SIMCOE Ontario, Canada
Postal Code	N3Y 2K5
Phone	(519) 426-1582
Fax	
Email address	smitsz2motorsports@yahoo.com

Information about other current owners

Owner name	JENNY CATHARINE SMITH
Owner type	Individual
Mailing address	64 BERKLEY CRESCENT, SIMCOE Ontario, Canada
Postal Code	N3Y 2K5
Phone	(519) 426-1582
Fax	
Email address	smitsz2motorsports@yahoo.com

Record of site condition property location information

Municipal address(es)	No municipal address
Municipality	Norfolk County
Legal description	**See attached Lawyer's letter**
Assessment roll number(s)	402-010-04800-0000
Property identifier number(s)	50220-0290 (LT)

Record of site condition property geographical references

Coordinate system	**UTM**
Datum	**NAD 83**
Zone	17
Easting	555,685.00
Northing	4,742,091.00

Record of site condition property use information

The following types of property uses are defined by the Regulation: Agricultural or other use, Commercial use, Community use, Industrial use, Institutional use, Parkland use, and Residential use.

Current property use	Industrial
Intended property use	Residential
Certificate of property use has been issued under section 168.6 of the Environmental Protection Act	No

Please see the signed statements of property owner, or agent, or receiver at the end of this record of site condition

The rest of this page has been left intentionally blank

Part 2: List of reports, summary of site conditions and qualified person's statements and certifications

Qualified person's information

Name	FRANCESCO GAGLIARDI
Type of licence under Professional Engineers Act	Limited licence
Licence number	100198332
Quallified person's employer name	PINCHIN LTD.
Mailing address	SUITE 200, 6-875 MAIN STREET WEST, HAMILTON Ontario, L8S 4P9 Canada
Phone	(905) 577-6206
Fax	(905) 577-6207
Email address	fgagliardi@pinchin.com

Municipal information

Local or single-tier municipality	Norfolk County

Ministry of the Environment, Conservation and Parks District Office

District office	Hamilton District Office
District office address	9th floor, 119 King St. W., Hamilton ON L8P 4Y7

Phase one environmental site assessment report

Document used as the phase one environmental site assessment report and updates in submitting the record of site condition for filing

The date the last work on all of the records review, interviews and site reconnaissance components of the phase one environmental site assessment was done (refer to clause 28(1)(a) of O. Reg. 153/04)	(yyyy/mm/dd) 2018-06-15

Type of report	Report title	Date of report (yyyy/mm/dd)	Author of report	Name of consulting company
Phase one environmental site assessment	Phase One Environmental Site Assessment, Part of Lot 13, Concession 18, Gore Woodhouse, Town of Simcoe, Ontario	2018-06-15	Amber Harvey, Francesco Gagliardi	PINCHIN LTD.

Reports and other documents related to the phase one environmental site assessment

Reports and other documents relied upon in certifying the information set out in section 10 of Schedule A or otherwise used in conducting the phase one environmental site assessment

Report title	Date of report (yyyy/mm/dd)	Author of report	Name of consulting company
N/A			

Phase two environmental site assessment report

Document used as the phase two environmental site assessment report and updates in submitting the record of site condition for filing

The date the last work on all of the planning of the site investigation and conducting the site investigation components of the phase two environmental site assessment was done (refer to clause 33.5(1)(a) of O. Reg. 153/04)	(yyyy/mm/dd) 2019-02-13

Type of report	Report title	Date of report (yyyy/mm/dd)	Author of report	Name of consulting company
Phase two environmental site assessment	Phase Two Environmental Site Assessment at Part of Lot 13, Concession 18, Gore Woodhouse, Town of Simcoe, Ontario	2019-03-11	Celine Hanna, Francesco Gagliardi	PINCHIN LTD.

Reports and other documents related to the phase two environmental site assessment

Reports and other documents relied upon in making any certifications in the record of site condition for the purposes of Part IV of Schedule A or otherwise used in conducting the phase two environmental site assessment

Report title	Date of report (yyyy/mm/dd)	Author of report	Name of consulting company
N/A			

Environmental condition

Section 41 applies?	No
Section 43.1 applies?	No

Site condition information

Certification date (yyyy/mm/dd)	2019/02/13
Total area of record of site condition property (in hectares)	1.72819
Number of any previously filed record of site condition that applies to any part of the record of site condition property	
Number of any previously filed transition notice that applies to any part of the record of site condition property	
Soil texture	Coarse
Assessment/restoration approach	Full depth generic
Site investigation includes the investigation, sampling and analysis of ground water?	Yes
Is there soil present that is sufficient to investigate, sample and analyze soil on, in or under the property in accordance with s. 6, Schedule E of O.Reg. 153/04?	Yes
Site investigation includes the investigation, sampling and analysis of soil on, in or under the property which is used in the record of site condition?	Yes
Name of the laboratory used to analyze any samples collected of soil, ground water or sediment	MAXXAM ANALYTICS INC.
Ground water condition (potable, non-potable)	Potable
Applicable site condition standard	TABLE 2

Table 1 – Maximum contaminant concentrations compared to applicable site condition standards

Measured concentration for contaminants in soil

Contaminant name		Maximum concentration		Applicable site condition	Unit of measure
1	Mercury		**0.2**	0.27	µg/g
2	Antimony		**0.54**	7.5	µg/g
3	Arsenic		**2.6**	18	µg/g
4	Selenium	<	0.5	2.4	µg/g
5	Barium		**180**	390	µg/g
6	Beryllium		**0.26**	4	µg/g
7	Boron (total)		**6.1**	120	µg/g
8	Cadmium		**0.28**	1.2	µg/g
9	Chromium Total		**11**	160	µg/g
10	Cobalt		**4.7**	22	µg/g
11	Copper		**35**	140	µg/g
12	Lead		**68**	120	µg/g
13	Molybdenum		**1.4**	6.9	µg/g
14	Nickel		**7.2**	100	µg/g
15	Silver	<	0.2	20	µg/g
16	Thallium		**0.075**	1	µg/g
17	Uranium		**0.36**	23	µg/g
18	Vanadium		**20**	86	µg/g
19	Zinc		**160**	340	µg/g

Table 1 – Maximum contaminant concentrations compared to applicable site condition standards (Continued)

Ground water

Contaminant name		Maximum concentration		Applicable site condition	Unit of measure
1	Mercury	<	0.1	0.29	µg/L
2	Antimony	<	0.5	6	µg/L
3	Arsenic	<	1	25	µg/L
4	Selenium	<	2	10	µg/L
5	Barium		**38**	1000	µg/L
6	Beryllium	<	0.5	4	µg/L
7	Boron (total)		**15**	5000	µg/L
8	Cadmium	<	0.1	2.7	µg/L
9	Chromium Total	<	5	50	µg/L
10	Cobalt		**0.61**	3.8	µg/L
11	Copper		**5.9**	87	µg/L
12	Lead	<	0.5	10	µg/L
13	Molybdenum	<	0.5	70	µg/L
14	Nickel	<	1	100	µg/L
15	Silver	<	0.1	1.5	µg/L
16	Thallium	<	0.05	2	µg/L
17	Uranium		**0.47**	20	µg/L
18	Vanadium	<	0.05	6.2	µg/L
19	Zinc		**6.6**	1100	µg/L

Remedial action and mitigation

Remediated soils

Estimated quantities of the soil, if any, originating at and remaining on the record of site condition property that have been remediated, at a location either on or off the property, to reduce the concentration of contaminants in the soil. Indicate the remediation process or processes used and the estimated amount of soil remediated by each identified process.

Soil remediation process	Estimated quantity of soil (in ground-volume in cubic metres)
None	0.0

Description of remediation

Description of any action taken to reduce the concentration of contaminants (including soil removals) on, in or under the record of site condition property.
None.

Soil or sediment removed and not returned

Estimated quantities of soil or sediment, if any, removed from and not returned to the record of site condition property.

Estimated quantity of soil (in ground-volume in cubic metres)	0.0
Estimated quantity of sediment (in ground-volume in cubic metres)	0.0

Soil brought to the property

Estimated quantity of the soil, if any, being brought from another property to and deposited at the record of site condition property, not including any soil that may have originated at but been remediated off the record of site condition property and that is identified in section 28 of Schedule A.

Estimated quantity of soil brought to the property (in ground-volume in cubic metres)	0.0

Ground water control or treatment measures

Ground water control or treatment measures that were required for the record of site condition property prior to the certification date for the purpose of submitting the record of site condition for filing.
None.

Ground water control or treatment measures that are required for the record of site condition property after the certification date.
None.

Estimated volume of ground water, if any, removed from and not returned to the record of site condition property.

Estimated volume of ground water (in litres)	0.0

Other activities including risk management measures

Constructed works that prior to the certification date for the purpose of submitting the record of site condition for filing, were required to control or otherwise mitigate the release or movement of known existing contaminants at the record of site condition property.
None.

Constructed works that after the certification date, are required to control or otherwise mitigate the release or movement of known existing contaminants at the record of site condition property.
None.

Monitoring or Maintenance

Soil Management Measures

Soil monitoring requirements or any requirements for care, maintenance or replacement or any monitoring or control works for known existing contaminants, if any, on the record of site condition property, after the certification date.
None.

Ground water management measures

Ground water monitoring requirements or requirements for care, maintenance or replacement of any monitoring or control works or known existing contaminants, if any, on the record of site condition property, after the certification date.
None.

Remediated or removed soil, sediment or ground water from near property boundary

Has any soil, sediment or ground water at the record of site condition property that is or was located within 3 metres of the record of site condition property boundary been remediated or removed for the purpose of remediation?	No

C

Qualified person's statements and certifications

As the qualified person, I certify that:

☑ A phase one environmental site assessment of the record of site condition property, which includes the evaluation of the information gathered from a records review, site reconnaissance, interviews, a report and any updates required, has been conducted in accordance with the regulation by or under the supervision of a qualified person as required by the regulation.

☑ A phase two environmental site assessment of the record of site condition property, which includes the evaluation of the information gathered from planning and conducting a site investigation, a report, and any updates required, has been conducted in accordance with the regulation by or under the supervision of a qualified person as required by the regulation.

☑ The information represents the site conditions at the sampling points at the time of sampling only and the conditions between and beyond the sampling points may vary.

☑ As of 2019/02/13, in my opinion, based on the phase one environmental site assessment and the phase two environmental site assessment, and any confirmatory sampling, there is no evidence of any contaminants in the soil, ground water or sediment on, in or under the record of site condition property that would interfere with the type of property use to which the record of site condition property will be put, as specified in the record of site condition.

☑ Ground water sampling has been conducted in accordance with the regulation by or under the supervision of a qualified person as required by the regulation.

☑ As of 2019/02/13, in my opinion, based on the phase one and phase two environmental site assessments and any confirmatory sampling, the record of site condition property meets the applicable full depth generic site condition standards prescribed by section 36 of the regulation for all contaminants prescribed by the regulation in relation to the type of property use for which this record of site condition is filed, except for those contaminants (if any) specified in this record of site condition at Table 2, Maximum contaminant concentrations compared to standards specified in a risk assessment.

☑ As of 2019/02/13, the maximum known concentration of each contaminant in soil, sediment and ground water at the record of site condition property for which sampling and analysis has been performed is specified in this record of site condition at Table 1, maximum contaminant concentrations compared to applicable full depth generic site condition standards.

☑ I am a qualified person and have the qualifications required by section 5 of the regulation.

☑ I have in place an insurance policy that satisfies the requirements of section 7 of the regulation.

☑ I acknowledge that the record of site condition will be submitted for filing in the Environmental Site Registry, that records of site condition that are filed in the Registry are available for examination by the public and that the Registry contains a notice advising users of the Registry who have dealings with any property to consider conducting their own due diligence with respect to the environmental condition of the property, in addition to reviewing information in the Registry.

☑ The opinions expressed in this record of site condition are engineering or scientific opinions made in accordance with generally accepted principles and practices as recognized by members of the environmental engineering or science profession or discipline practising at the same time and in the same or similar location.

☑ I do not hold and have not held and my employer PINCHIN LTD. does not hold and has not held a direct or indirect interest in the record of site condition property or any property which includes the record of site condition property and was the subject of a phase one or environmental site assessment or risk assessment upon which this record of site condition is based.

☑ To the best of my knowledge, the certifications and statements in this part of the record of site condition are true as of 2019/02/13.

☑ By signing this record of site condition, I make no express or implied warranties or guarantees.

By checking the boxes above, and entering my membership/licence number in this submission, I, FRANCESCO GAGLIARDI, a qualified person as defined in section 5 of O. Reg. 153/04 am, on 2019/03/15:

a) signing this record of site condition submission as a qualified person; and
b) making all certifications required as a qualified person for this record of site condition.

☑

☑ **I agree**

Additional documentation provided by property owner or agent

The following documents have been submitted to the Ministry of the Environment, Conservation and Parks as part of the record of site condition

Lawyer's letter consisting of a legal description of the property
Copy of any deed(s), transfer(s) or other document(s) by which the record of site condition property was acquired
A Current plan of survey
Area(s) of potential environmental concern
Table of current and past uses of the phase one property
Phase 2 conceptual site model
Owner or agent certification statements

10.1.2

As an owner of the record of site property:

1. I acknowledge that the record of site condition will be submitted for filing in the Environmental Site Registry, that records of site condition that are filed in the Registry are available for examination by the public and that the Registry contains a notice advising users of the Registry who have dealings with any property to consider conducting their own due diligence with respect to the environmental condition of the property, in addition to reviewing information in the Registry.
2. I have conducted reasonable inquiries to obtain all information relevant to this record of site condition, including information from the other current owners of the record of site condition property named in this part of the record of site condition and I have obtained all information relevant to this record of site condition of which I am aware.
3. I have disclosed all information referred to in paragraph 2 to any qualified person named in this record of site condition.
4. To my knowledge, the statements made in this part of the record of site condition are true as of NOVEMBER 1, 2018 (date).
5. I have ensured that access to the entire property, including the phase one property, any phase two property and the record of site condition property, has been afforded to the qualified person and to persons supervised by the qualified person, for purposes of conducting the site reconnaissance.

Name of owner: William Alexander Douglas Smith and Jenny Catharine Smith

Signature  Date signed Nov. 1, 2018

MEMO

TO: 2445680 Ontario Ltd.
FROM: Jake Howkins, P.Eng.
DATE: November 26, 2025
SUBJECT: Functional Servicing Design Brief – 16 Fernwood Drive, Simcoe, Ontario
OUR FILE: 251467

Introduction

The purpose of this memo is to provide an update to the previous Functional Servicing Design Brief (provided in **Appendix A**) dated April 3, 2020 (Revised August 17, 2020) prepared by Dillon Consulting which was site plan approved for the Bremont Homes Development - Meadows of Norfolk. The development site ("the Site") is now under the new ownership of 2445680 Ontario Ltd. ("Client") and continues to be municipally known as 16 Fernwood Drive, Simcoe, Ontario. The proposed development has been updated from the originally approved site plan to now include a total of 54 townhome units and 14 semi-detached units for a total of 68 units. The overall site remains 1.72 ha.

The purpose of this memo is to demonstrate that the site is still in conformance with the previously approved site plan control application.

Proposed Concept Plan and Contour Plan

The conceptual layout of the Site was prepared by GSP Group. The Site Plan architect is Peter Del Grosso Design. The plan depicts the layout of the private road network, the connection to Fernwood Drive, and the lot layout. The Site Plan is included in **Appendix B**.

Storm Servicing

Proposed Servicing

The overall storm sewer servicing concept for the Site remains unchanged from the originally approved Functional Servicing Design Brief. A Stormwater Management ("SWM") Brief for the site has been prepared and is submitted under the same cover. The SWM Brief provides details of the developments SWM design and how it addresses the stormwater management requirements for the Site. The storm sewer system for the site will require the use of the storm sewer system and SWM facilities in existing neighbouring development, known as Westwood Trails Phase 2, for a legal stormwater outlet. The Site will be required to enter into an agreement with Westwood Trails Phase 2 for the use of the downstream storm sewer system and SWM facilities. Refer to the SWM Brief for further details.

Sanitary Servicing

Proposed Servicing

The overall sanitary servicing concept remains unchanged from the original Functional Servicing Design Brief. The sites wastewater outlet is a connection to the existing 200mmØ sanitary sewer in Fernwood Drive. Due to the invert elevation of the sanitary outlet, individual grinder pumps will be required in the basements of the units to provide wastewater drainage.

The proposed wastewater demand from the site is **2.84 L/s**. The county of Norfolk will undertake a modeling exercise to determine whether the existing municipal wastewater system has sufficient capacity to accept the additional wastewater flows generated from the development. An addendum to this memo will be provided upon receipt of the County's modeling results which outlines conclusions related to wastewater servicing capacity. Detailed sanitary demand calculations along with a sanitary sewer design sheet are included in **Appendix C**. Refer to drawing **SW-SAN** for the **Site Sanitary Drainage Plan.**

Water Servicing

Proposed Conditions

The previously approved water servicing design indicated that the existing 300mmØ watermain in the Fernwood Drive cul-de-sac had sufficient capacity to supply the proposed development with an internal private 150mmØ watermain. This conclusion was support by a modeling report completed by R.V. Anderson Limited dated Feb 13, 2020 (Report Number: 19448.24) that was provided by Norfolk County. However, Norfolk County has since updated their municipal servicing design standards and the previous report conclusions are no longer applicable.

The new County standards require a minimum fire flow available at the municipal main as follows:

- Residential – Multi Unit > 3units (Simcoe Township) = 150 L/s at min. pressure of 140 kPa
- Residential – Multi Unit < 3units (Simcoe Township) = 125 L/s at min. pressure of 140 kPa
- Water Demand - Consumption =285 L/p/d

The sites total water demand is the greater of either the maximum daily demand plus fire flow or maximum hourly demand.

The proposed water demand for the site was calculated using municipal guidelines and resulted in the following rates:

- Base Water Demand = 0.57 L/s
- Max Day Demand = 1.28 L/s
- Peak Hour Demand = 2.27 L/s
- Required Fire Flow = 150 L/s (Based on the greatest demand of Residential – Multi Units from County of Norfolk Design Guidelines as per the proposed site plan design)
- Max Day + Required Fire Flow = 151.28 L/s

Hydrant flow testing was conducted to ensure adequate flow and pressure is available from the municipal watermain proposed to service the site. The existing hydrant located on the Fernwood Drive cul-de-sac

was tested and resulted in an available fire flow of 153 L/s at 20psi. Based on this result, the municipal watermain has sufficient flow to service the proposed development. Additional watermain modeling will be conducted by Norfolk County utilizing the water demands outlined in this memo to verify our findings. An addendum to this memo will be provided upon receipt of the County's modeling results which outlines conclusions related to water servicing capacity. The hydrant testing report is attached in **Appendix D**.

Conclusion

The current proposed design for site servicing maintains the original servicing concept outlined in the Functional Servicing Design Brief dated April 3, 2020 (Revised August 17, 2020) prepared by Dillon Consulting which was site plan approved for the development site. Norfolk County will verify through modeling that the existing municipal watermain, and sanitary infrastructure will have capacity to provide water and sanitary servicing to the proposed development. An addendum to this letter will provided upon Dillon receiving the results. Stormwater management for the site is outlined in a separator SWM Brief memo submitted under the same cover.

DILLON CONSULTING LIMITED
VAUGHAN, ONTARIO



Jake Howkins, P.Eng
Associate
(416) 389-9135
jhowkins@dillon.ca

Gian-Michael Di Luca, P.Eng
Associate
(416) 886-1075
gdiluca@dillon.ca

APPENDIX A – Previously Approved Functional Servicing Design Memo

MEMO

DILLON CONSULTING

TO: Bremont Developments (Norfolk)
FROM: Gary Tran, P.Eng.
DATE: April 3, 2020 (Revised August 17, 2020)
SUBJECT: Functional Servicing Design Brief Addendum – Meadows of Norfolk, Simcoe, Ontario
OUR FILE: 18-8454

Introduction

The purpose of this addendum is to provide an update to the previous Functional Servicing Design Brief (provided in Appendix A) dated December 7, 2018 (prepared by Dillon Consulting) for the site plan approval of the Bremont Homes Development - Meadows of Norfolk ("the Site") in Simcoe, Ontario. The proposed development has been updated to include a total of 43 townhome units and 24 four-plex units for a total of 67 units.

Proposed Concept Plan and Contour Plan

The conceptual layout of the Site was prepared by A. J. Clarke & Associates and used in the original Functional Servicing Brief. The Site Plan was prepared by Peter Del Grosso Design. The plan depicts the layout of the private road network, the connection to Fernwood Drive, and the lot layout. The Site Plan is included in Appendix B.

Storm Servicing

Proposed Servicing

The overall storm sewer servicing concept for the Site remains unchanged from the original Functional Servicing Design Brief. A Stormwater Management ("SWM") Brief for the Meadows of Norfolk has been prepared and is submitted under the same cover. The SWM Brief provides details of the Site SWM design and how it addresses the stormwater management requirements for the Site. The storm sewer system from Meadows of Norfolk will require the use of the storm sewer system and SWM facilities in Westwood Trails Phase 2 for a legal stormwater outlet. The Site will be required to enter into an agreement with Westwood Trails Phase 2 for the use of the downstream storm sewer system and SWM facilities.

Sanitary Servicing

Proposed Servicing

The sanitary servicing remains unchanged from the original Functional Servicing Design Brief. Due to the invert elevation of the sanitary outlet, individual grinder pumps will be required in the basements of the units to provide drainage.

DILLON REPORT (AUGUST 17, 2020)

The sanitary sewer modelling undertaken for Westwood Trails Phase 2 indicated that there is a section of sanitary sewer in the vicinity of Cedar Street/Queen Street N/Maple Street, Simcoe that will require upgrading. Similar to the Westwood Trail Phase 2 Agreement for storm sewers, this can be addressed through an agreement with Norfolk County.

Water Servicing

Proposed Conditions

Based on the water modelling report (prepared by R.V. Anderson Limited dated Feb 13, 2020, Report Number: 19448.24) that was provided by Norfolk County, the Site can be serviced with 150mm diameter pipes. This report concludes that there is sufficient capacity within the overall municipal water supply network to internally service the site by 150mm diameter watermain via connection to an existing 300mm stub in the Fernwood Drive cul-de-sac.

Conclusion

The current proposed design for site servicing maintains the original servicing concept outlined in the Functional Servicing Design Brief in 2018. The existing watermain, sanitary, and private storm infrastructure that are external to the Site will have capacity to provide water, sanitary and storm servicing to the proposed development.

DILLON REPORT
(AUGUST 17, 2020)

DILLON CONSULTING LIMITED
KITCHENER, ONTARIO



Gary Tran, P.Eng

APPENDIX A – Original Functional Servicing Design Brief

DILLON REPORT
(AUGUST 17, 2020)

MEMO

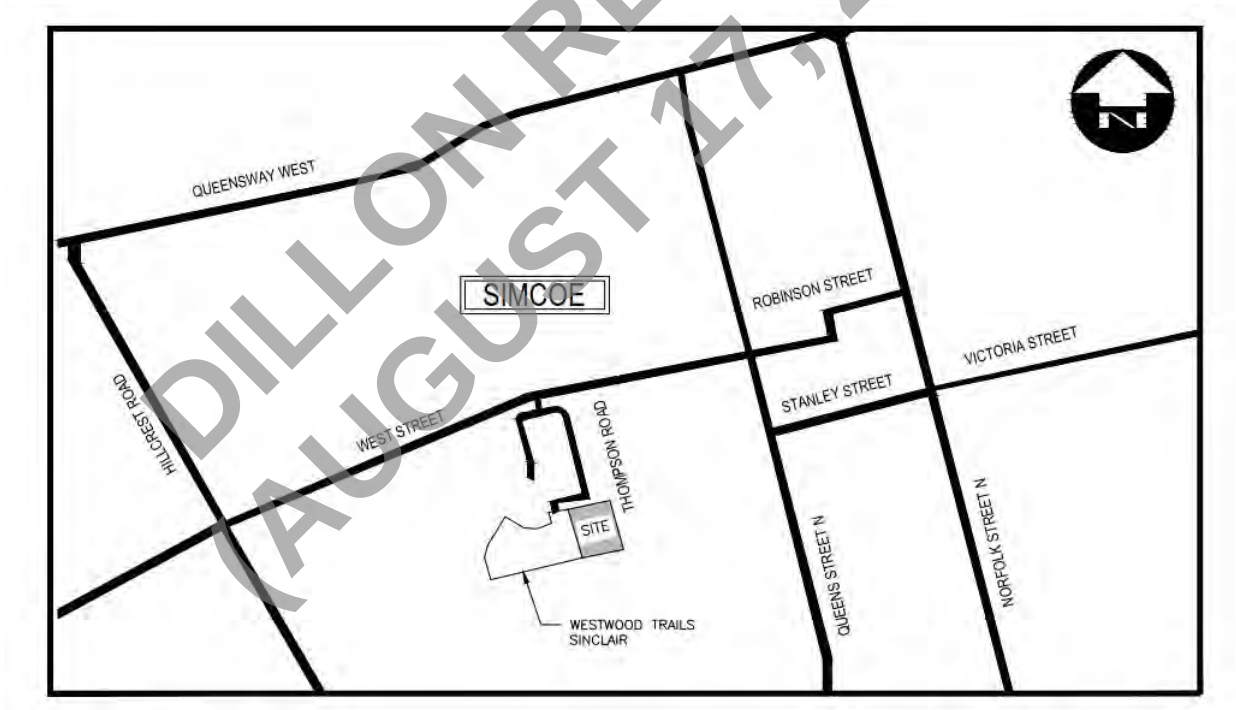
DILLON CONSULTING

TO:	Bremont Developments (Norfolk)
FROM:	Ron Antuma, - P.E., Associate Jason Johnson, P.Eng. – Partner
DATE:	December 7, 2018
SUBJECT:	Functional Servicing Design Brief – Meadows of Norfolk
OUR FILE:	18-8454

Introduction

The purpose of this design brief is to outline appropriate municipal servicing requirements for site plan approval of the Bremont Homes Development "Meadows of Norfolk" in Simcoe, Ontario in the County of Norfolk. Norfolk County will be the approval authority under the site plan approval process. The proposed development is located off of Fernwood Drive in Simcoe as shown on the location plan and will consist of 50 townhome units and 24 four-plex units for a total of 74 units. The site boundary drawing and concept plan is attached.

DILLON REPORT (AUGUST 17, 2020)



Location Plan

Proposed Concept Plan

The conceptual layout of the development was prepared by A. J. Clarke & Associates and can be found in Appendix A. The plan depicts the layout of the private road network, the connection to Fernwood Drive,

and the 50 townhouse units including 24 four-plex units. The plan also includes a table specifying the site statistics and proposed zoning.

Existing Contour Plan

A topographic and boundary survey was prepared by The Laroque Group of St. Catharines, Ontario and is included in Appendix B. The existing general direction of high to low is from the south to the north. The project will require regrading to direct the drainage as specified under the storm servicing section within this memo.

General Plan of Servicing

The general plan of servicing can be found in Figure 1. This plan depicts the layout of the proposed development including the roads, intersections, private to public road connections, 50 townhouse units and 24 four-plex units. The plan also includes the proposed layout of the watermain, sanitary sewers, and storm sewers depicting anticipated sizes, flow direction, and connection points. General overland flow arrows have also been provided on this plan to show the anticipated major storm runoff directions. Not depicted is the private utilities such as gas, electric and telecommunications that will come from the public road at Fernwood Drive into this development.

Storm Servicing

Existing Conditions

The existing site is approximately 1.7 ha in size and is vacant and undeveloped, consisting of treed and grassed areas with the general topography of the site running from south to north.

Proposed Conditions

A storm water management pond is proposed for the neighboring Westwood Trails Development that was designed by Dillon Consulting Limited. The storm water management pond was sized to include a portion of the rear yards from an existing development off of Thompson Road; the Westwood Trails Development by Warren D. Sinclair Construction and for this Meadows of Norfolk Development, by Bremont Developments (Norfolk) as shown on Post Development Catchment Areas in Appendix C.

The proposed storm sewer layout is shown on Figure 1. All internal storm sewers will run towards a 450mm diameter storm sewer partway from the South East Corner of the Westwood Trails Development and drains west to the Stormwater Management (SWM) pond. Overland flow will be directed towards the South West Corner draining along a private road in “The Meadows of Norfolk Development” and eventually into the SWM pond. As a result, major overland flow will spill onto the road network of the Westwood Trails development in order for the water to drain towards the SWM pond.

For reference Table 1 below shows the Pre to Post Development Discharges. A cross property servicing agreement will need to be established between Bremont Developments (Norfolk) and Warren D. Sinclair Construction to allow connection to the 450mm storm sewer, overland flow route and SWM Pond system for common use.

DILLON REPORT
(AUGUST 17, 2020)

DILLON REPORT
(AUGUST 17, 2020)

THOMPSON ROAD

FERNWOOD DRIVE

LEE AVENUE

HORRIS STREET

WESTWOOD TRAIL
DEVELOPMENT

FILENAME: C:\PROJECTWISE\WORKING DIRECTORY\PROJECTS 2018\105SS\DMS483751\188454-02-MSRV-CONLDNG PLOTTED BY: SPEAR, BRIAN
PLOT DATE: 2018-12-10 @ 1:56:13 PM PLOT SCALE: 1:25.4 PLOT STYLE: DILLON-STANDARD.CTB
DILLON CONSULTING LIMITED 130 DUFFERIN AVENUE, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-9209

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

BREMONT™ Designed For Living.

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY

DESIGN: RSS	REVIEWED BY: RDA
DRAWN: RSS	CHECKED BY: RDA
DATE: DEC 2018	
SCALE: 1:500	

MEADOWS OF NORFOLK
BREMONT HOMES

PROJECT NO. 188454

MASTER SERVICING PLAN

SHEET NO. FIG 1

The SWM pond and storm sewers have been sized to accept this development, as proposed, for both collection and storm water treatment through the proposed SWM facility (within Westwood Trails) for quality, quantity and discharge through infiltration and overland flow up to a 100 year storm. This SWM facility and storm collection system was designed by Dillon Consulting Limited as part of the Westwood Trails Development dated December 2018 in accordance with Norfolk County's Design Standards.

Table 1: Pre- and Post-Development Discharges

Return Period	Pre-Development Discharge (L/s)	Post-Development Discharge (L/s)
2 Year	37.40	208.87
5 Year	49.46	275.44
10 Year	89.10	321.30
25 Year	67.80	376.14
50 Year	75.44	417.81
100 Year	82.72	457.80

DILLON REPORT (AUGUST 17, 2020)

Sanitary Servicing

Existing Conditions

The site is bounded by Thompson Road and Lee Avenue, both consisting of existing 200mm diameter sanitary sewer. The existing sanitary sewer on Thompson Road initially flows west to east then changes direction to flow north towards West Street. The existing sanitary sewer on Lee Avenue flows north and connects to the sanitary sewer on Norris Street.

Proposed Conditions

Improvements to Fernwood Drive are planned as part of the Westwood Trails Development. They will be extending Fernwood Drive which will include extending a 200mm sanitary sewer from Thompson Road to its east property line in common with the west property line of this Meadows of Norfolk Development. The sanitary sewer system will drain to the near northwest corner of its property tying into the previously described proposed 200mm sanitary sewer near the proposed terminus of Fernwood Drive extended. Refer to Figure 1.

Water Servicing

Existing Conditions

There is an existing 300 mm diameter watermain on the east side of Fernwood Drive which flows to Thomson Drive. The Westwood Trails development have proposed to extend a 150 mm diameter watermain along Fernwood Drive and stub it at the entrance of the proposed development.

Proposed Conditions

A 150 mm diameter watermain is proposed for the development and will connect to the 150mm diameter watermain stub on Fernwood Drive as shown on **Figure 1**. Three hydrants will be installed within the road network to provide appropriate coverage for fire flow. At dead ends either a 50mm blow off or hydrant will be installed in accordance with Norfolk County requirements. Norfolk County will run an analysis of the water model for this site confirming adequate watermain sizing for both flow and pressure.

Integrated Sustainable Master Plan

Norfolk County Council adopted by resolution the Integrated Sustainable Master Plan (ISMP) in November of 2016. The FSR is to confirm that the ISMP was reviewed and due consideration of it was taken in the design of the development.

Dillon Consulting Limited reviewed the ISMP to ensure the development plan with its transportation connectivity and municipal servicing were in line with the report. Given this will be a private development with only one connection point for both the water system and public road network there will be minimal to no impact to the existing ISMP. The drainage system will be public only in that there will be a cross-property servicing agreement between 2 private condominium developments including a storm-water management facility.

DILLON CONSULTING LIMITED
LONDON, ONTARIO



Ron Antuma
Associate

Jason Johnson, P.Eng.
Partner

DILLON REPORT
(AUGUST 17, 2020)

Appendix A

Concept Plan

DILLON REPORT
(AUGUST 17, 2020)

MEADOWS OF NORFOLK



NOTE:
SURVEY INFORMATION SHOWN ON THIS SKETCH IS BASED ON A PLAN OF SURVEY BY RICHARD LAROCQUE LIMITED DATED OCTOBER 25th, 2018.

Site Statistics - Summary	
Area of site	± 17,479 m²
Visitor parking	25 spaces
Occupant parking	135 spaces
Townhouse count	50 units
Four-plex count	24 units
Total unit count	74 units

Proposed Zoning: R4, with site-specific provisions (14.XXX)

Zoning Provision	Current Requirement	Proposed Development
Permitted Uses [5.4.1 Permitted Uses]	Group townhouse Stacked townhouse Street townhouse Semi-detached, duplex, tri-plex and four-plex dwellings provided they are located on the same lot with, and in accordance with this Zone provisions of, group townhouse Home occupation	Group townhouse Four-plex
Minimum Lot Area [5.4.2(a)]		
i) attached garage	195 square metres	165.05 square metres
ii) corner lot	195 square metres	
iii) detached garage	215 square metres	
Minimum Lot Frontage [5.4.2(b)]		
i) interior lot	30 metres	6.0 metres
ii) corner lot	30 metres	
iii) corner lot accessed by a rear lane	N/A	
Minimum Front Yard [5.4.2(c)]		
i) attached garage	6 metres	5.22 metres
ii) detached garage or rear yard parking	1.5 metres	
Minimum Exterior Side Yard [5.4.2(d)]		
i) with a 6 metre front yard	6 metres	2.78 metres
ii) with a 1.5 metre front yard	1.5 metres	
Minimum Interior Side Yard [5.4.2(e)]	3 metres	1.5 metres
Minimum Rear Yard [5.4.2(f)]		
i) attached garage	7.5 metres	6.97 metres
ii) detached garage or rear yard parking	7.5 metres	
Minimum separation between townhouse dwellings [5.4.2(g)]	2 metres	3 metres
Maximum building height [5.4.2(h)]	11 metres	TBD
Maximum units in a townhouse dwelling [5.4.4]	No more than eight (8) dwelling units shall be located in a townhouse dwelling.	
Accessible Parking [4.3.1(a)]	type A, a wider accessible parking space which has a minimum width of 3.4 metres with signage that clearly identifies the space as "van accessible" plus an access aisle in accordance with Subsection 4.3.2;	
Access Aisles [4.3.2(a)]	a minimum width of 1.5 metre extending the full length of the parking space; and,	
Access Aisles [4.3.2(c)]	be marked with high tonal contrast diagonal lines, which prohibits parking in them, where the surface is asphalt, concrete or some other hard surface.	OK
Minimum number and type of accessible parking spaces [4.3.3]	1 Type A Accessible Space (Van)	2 Type A Accessible Spaces
Number of parking spaces - type of use (residential) [4.9(a)]	2 parking spaces for each townhouse dwelling unit	2 parking spaces for each townhouse dwelling unit
Number of parking spaces - type of use (residential) [4.9(a)]	1.5 parking spaces for each four/plex dwelling unit	1.5 parking spaces for each four/plex dwelling unit
Number of parking spaces - type of use (visitor parking) [4.9(f)]	1 visitor space for every 3 dwelling units	25 spaces



KEYPLAN (NTS)

No.	Revision	Date	By
4	Boundary Adjustment	11/28/18	SS
3	Revised as per client comments	11/19/18	SS
2	Revised as per revised plan received Oct. 1 '18	10/22/18	SS
1	Issued for Pre-Consultation submission	06/02/18	SS

REVISIONS

Part of Lot 13, Concession 18 Gore Woodhouse
Town of Simcoe

PROJECT OWNER:

BREMONT™ Acquisitions

4908 Hwy 7
Woodbridge ON, L4L 1S8
Main: 905.266.1851 Ext. 28
Email: mmarsili@mybremont.ca
Web: www.mybremont.ca

NOT ISSUED FOR CONSTRUCTION

MUNICIPALITY:

TOWN OF SIMCOE

PROJECT NAME:

Norfolk Meadows
AN EXCLUSIVE TOWNHOME COMMUNITY IN NORFOLK COUNTY

A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: 905 528-8761 Fax: 905 528-2289
email: ajc@ajclarke.com

TITLE:

CONCEPT PLAN

SCALE: 1: 300	DATE: FEB 2018
DESIGN:	DRAWN: L.H.
DWG: 188013	SHT: SP

H:\Jobs\2018 Projects\188013 (Fernwood Drive)\Planning\Concepts\SENT\Nov. 28-2018\CONCEPT - Standard\CONCEPT.dwg, 28/11/2018 11:38:30 AM, Adobe PDF

Appendix B

Contour Plan

DILLON REPORT
(AUGUST 17, 2020)

SITE CONDITION PLAN
PART OF LOTS 13 & 18
GORE CONCESSION
(GEOGRAPHIC TOWNSHIP OF WOODHOUSE)
NORFOLK COUNTY

SCALE 1:250 METRIC
5m 0 5m 10m

THOMPSON ROAD

FERNWOOD DRIVE

REG'D PLAN No. 1022

LOT 33 | PIN 50220-0150(LT) LOT 32 | PIN 50220-0149(LT) LOT 31 | PIN 50220-0148(LT) LOT 30 | PIN 50220-0147(LT) LOT 29 | PIN 50220-0146(LT) LOT 28 | PIN 50220-0145(LT) LOT 27 | PIN 50220-0144(LT) LOT 26

PART 33, 37R-900 | PART 32, 37R-900 | PART 31, 37R-900 | PART 30, 37R-900 | PART 29, 37R-900 | PART 28, 37R-900 | PART 27, 37R-900 | PART 26, 37R-900

LOT 33
0.30M RESERVE

NORTH 136.784

PART 2, 37R-1952
PART 1, 37R-1952
PIN 50220-0144(LT)

LOT 10
LOT 9
LOT 8
PIN 50220-0274(LT)
LOT 7
PIN 50220-0273(LT)
LOT 6
PIN 50220-0272(LT)
LOT 5
PIN 50220-0271(LT)
LOT 4
PIN 50220-0270(LT)
LOT 1
PIN 50220-0333(LT)
LOT 2
PIN 50220-0333(LT)

LEE AVENUE

LOT 12 | LOT 13 | LOT 14

REG'D PLAN No. 1093

NORRIS STREET

LOT 3 | LOT 2 | LOT 1

LEE AVENUE

REG'D PLAN No. 37M-40

LOT 3

PART 2, 37R-8623
LOT 13
PIN 50220-0331(LT)
GORE CONCESSION

LOT 4
PIN 50220-0335(LT)

LOT 5
0.30M RESERVE
PIN 50220-0336(LT)

OAK STREET
(CLOSED & ASSUMED)
PIN 50277-0001(LT)

PART 11, 37R-10637 | PART 10, 37R-10637 | PART 9, 37R-10637 | PART 8, 37R-10637

PART 1, 37R-9748

PART 3, 37R-8623

PIN 50220-0290(LT)

N78°36'30"E 170.763

N78°35'20"E 170.810

PART 4, 37R-10637 | PART 5, 37R-10637 | PART 6, 37R-10637 | PART 7, 37R-10637

PIN 50220-0289(LT)

PART 2, 37R-10637 | LOT 13 | PART 3, 37R-10637

PART 12, 37R-10637

PART 13, 37R-10637

PIN 50220-0289(LT)

PART 1, 37R-10637

NORTH 1.083

GORE CONCESSION

LOT 6
PIN 50220-0289(LT)
LOT 5
PIN 50220-0288(LT)
LOT 4
PIN 50220-0287(LT)
LOT 3
PIN 50220-0286(LT)
LOT 2
PIN 50220-0285(LT)
LOT 1
PIN 50220-0284(LT)

NORTH 136.874

GORE CONCESSION

DILLON REPORT
(AUGUST 17, 2020)

LEGEND

85.00 DENOTES EXISTING ELEVATION

BEARING NOTE

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED REFERENCE POINTS BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONGITUDE, ZONE 17, UNIVERSAL TRANSVERSE MERCATOR (6° UTM). THESE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERENCE SYSTEM.

METRIC NOTE

DISTANCES AND CO-ORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND LEVEL DISTANCES AND NOT GRID. TO OBTAIN GRID CO-ORDINATES BY MULTIPLYING THE DISTANCES BY A COMBINED SCALE FACTOR OF 0.9996353.

THE LAROCQUE GROUP
O.L.S./PROJECT CONSULTANTS/LAND MANAGEMENT
12 LYMAN STREET, ST. CATHARINES, ONTARIO
905-688-1413
6386 COLBORNE STREET, NIAGARA FALLS, ONTARIO
905-358-8400
www.larocquegroup.ca

DATE : NOVEMBER 30, 2018 FILE No. : 2018-097
DWG.FILE : 2018-097-SKE

Appendix C

STORM WATER MANAGEMENT

DILLON REPORT
(AUGUST 17, 2020)

LEGEND

PROJECT BOUNDARY
DRAINAGE AREA

A1 — AREA DESIGNATION
0.4 — AREA (Ha)
0.60 — RUNOFF COEFFICIENT

Part 2, Plan 37R-837
Part 3, Plan 37R-837
Part 1, Plan 37R-837
Part 1, Plan 37R-837
Part 1, Plan 37R-10825
Part 1, Plan 37R-10511

CONCESSION GORE
Township of Woodhouse)
TOWN OF SIMCOE

N82°23'25"E (Meas.) (N82°22'00"E P3) 112.049 (Meas.) (112.101 P3)
N69°48'05"E (Meas.) (N69°48'30"E P3) 81.673 (Meas.) (81.646 P3)
N20°42'30"E (Meas.) (N20°41'30"E P3) 107.603 (Meas.) (107.630 P3)
N84°01'30"E (P3 & Meas.) 168.760 (P3 & Meas.)
N31°01'10"E (P3 & Meas.)
N15°58'00"W (P1 & Meas.) 130.065

Lot 1, Lot 2, Lot 3, Lot 4, Lot 5, Lot 6, Lot 7, Lot 8, Lot 9, Lot 32, Lot 33, Lot 34, Lot 35
Block 10
Registered Plan No. 1022

THOMPSON ROAD
(Established by Plan 37M-76)
(20.000 Wide)

THOMPSON ROAD
(Established by Judge's Order Inst. No. NR379269)
(20.000 Wide)

FERNWOOD DRIVE
(Established by Plan 37M-76 & Registered Plan No. 1022)
(20.117 Wide)

MARACK WAY
IRONWOOD CRESCENT
SERVICEBERRY LANE

BLOCK 11
PLAN 37M-76

INFILTRATION GALLERY
FOREBAY
WET CELL
SWM FACILITY

A1 0.3 0.75
A2 0.09 0.75
A3a 0.16 0.75
A3b 1.76 0.75
A3Total 1.92 0.75
A4 0.37 0.75
A5 0.28 0.75
A6 0.31 0.75
A7 0.19 0.75
A8 0.10 0.75
A9 0.27 0.75
A10 0.17 0.75
A11 0.40 0.75
A12 0.06 0.75
A13 0.05 0.75
A14 0.11 0.75
A15 0.42 0.25

8.7–250 STM @ 1.00%
50.1–300 STM @ 1.20%
24.1–300 STM @ 1.44%
47.8–300 STM @ 1.22%
51.3–300 STM @ 1.16%
20.3–250 STM @ 1.00%
16.6–250 STM @ 0.61%
12.3–675 STM @ 0.35%
8.5–675 STM @ 0.35%
26.5–675 STM @ 0.30%
35.0–675 STM @ 0.30%
16.1–300 STM @ 1.16%
88.7–450 STM @ 1.00%
88.5–450 STM @ 0.90%
30.6–450 STM @ 0.50%
30.1–375 STM @ 0.50%
10.3–250 STM @ 1.00%

STMH43 STMH44 STMH45 STMH46 STMH47 STMH48 STMH49 STMH50 STMH51 STMH52 STMH53 STMH54 STMH55 STMH56 STMH57 STMH58 STMH78

DILLON REPORT (AUGUST 17 2020)

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WARREN SINCLAIR HOMES

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
02	RE-ISSUED FOR NORFOLK COUNTY REVIEW	DEC 2018	RDA
01	ISSUED FOR REVIEW	JULY 2018	RDA

DESIGN: RDA — REVIEWED BY: RDA
DRAWN: BJP — CHECKED BY: JDJ
DATE: DECEMBER 2018
SCALE: 1:500

WARREN D. SINCLAIR CONSTRUCTION LTD.
WESTWOOD TRAILS

PROJECT NO. 18-7395

STORM DRAINAGE AREAS

SHEET NO. 11

FILENAME: C:\PROJECTWISE WORKING DIRECTORY\PROJECTS 2018\108P\DN5114488\187395-STM-DESIGNG.DWG PLOTTED BY: PETERSEN, BRENDAN
PLOT DATE: 2018-12-07 @ 11:57:4 AM PLOT SCALE: 1:254 PLOT STYLE: DILLON-STANDARD.CTB
LONDON

STORM SEWER DESIGN SHEET

RUNOFF COEFFICIENT 'C' VALUES

THE FOLLOWING 'C' VALUES WILL APPLY WHEN DESIGNING STORM SEWERS:

PARKS, OPEN SPACE	0.20
SINGLE FAMILY/SEMI DETACHED	0.60
TOWNHOUSE/ROWHOUSE	0.75
APARTMENTS	0.75
COMMERCIAL, INSTITUTIONAL & INDUSTRIAL	0.75 - 0.90
DENSELY BUILT, PAVED	0.90

FLOW Q = 2.78 x C x A x I

WHERE Q = PEAK FLOW IN LITRES PER SECOND (L/sec)
A = AREA IN HECTARES (Ha)
C = RUNOFF COEFFICIENT
I = RAINFALL INTENSITY (mm/hr)
RETURN PERIOD = 5 YEARS

DATE: 06-Dec-18

DESIGNED BY: BJP

PROJECT NAME: WESTWOOD TRAILS DEVELOPMENT, SIMCOE ONTARIO

PROJECT FILE NO.: 18-7395

LOCATION				AREA		TOTAL (A X C)						RAINFALL INTENSITY				SEWER DESIGN							PROFILE				
Area No.	Street	From Manhole	To Manhole	Delta Hectares	Total Hectares	C	AxC	Total Section	Total Lateral	Total Sewer	Total 2.78AxC	Time Entry (min) Section	Time Entry (min) Accum	Intensity mm/hr	Q L/sec	n	Pipe Size mm	Slope %	Capacity L/sec	Velocity m/sec	Length m	Time of Flow	Fall in Sewer	Headloss	Drop in U.S. M.H.	Invert Elevation U.S.	Invert Elevation D.S.
4	**Street B**			0.37	0.37	0.20	0.07	0.07			0.21		30.00	49.90	**10.27**												
2	**Street A**	STMH50	STMH49	0.09	0.09	0.75	0.07	0.07			0.19		30.00	49.90	**9.36**	0.013	300.00	0.50	68.38	0.97	30.1	0.52	0.151		0.050	234.800	234.650
3	**Street B**	STMH76	STMH49	1.92	1.92	0.75	1.44	1.44			4.00		30.00	49.90	**199.76**	0.013	450.00	0.50	201.60	1.27	30.6	0.40	0.153		0.050	233.800	233.647
5	**Street B**	STMH49	STMH48	0.28	2.29	0.75	0.21	1.72			4.77		30.52	49.36	**235.66**	0.013	450.00	0.90	270.48	1.70	88.5	0.87	0.797		0.050	233.597	232.801
6	**Street B**	STMH48	STMH68	0.31	2.60	0.75	0.23	1.95			5.42		31.39	48.48	**262.80**	0.013	450.00	1.00	285.11	1.79	88.7	0.82	0.887		0.050	232.751	231.864
7	**Street D**	STMH58	STMH57	0.19	0.19	0.75	0.14	0.14			0.40		30.00	49.90	**19.77**	0.013	300.00	1.22	106.81	1.51	47.8	0.53	0.583		0.050	234.480	233.897
8	**Street D**	STMH57	STMH56	0.10	0.29	0.75	0.08	0.22			0.60		30.53	49.35	**29.84**	0.013	300.00	1.44	116.04	1.64	24.1	0.24	0.347		0.050	233.847	233.500
9	**Street D**	STMH56	STMH55	0.27	0.56	0.75	0.20	0.42			1.17		30.77	49.10	**57.32**	0.013	300.00	1.20	105.93	1.50	50.1	0.56	0.601		0.050	233.450	232.849
10	**Street C**	STMH57	STMH56	0.17	0.73	0.75	0.13	0.55			1.52		31.33	48.53	**73.87**	0.013	300.00	1.15	103.70	1.47	51.3	0.58	0.590		0.050	232.799	232.209
11	**Backyard**	DI	STMH54	0.40	0.40	0.75	0.30	0.30			0.83		20.00	106.72	**89.00**	0.013	250.00	2.25	89.20	1.82	14.5	0.13	0.326		0.050	232.535	232.209
12	**Street C**	STMH54	STMH53	0.06	1.19	0.75	0.05	0.89			2.48		31.91	47.96	**119.00**	0.013	375.00	1.15	188.02	1.70	17.8	0.17	0.205		0.050	232.159	231.954
13	**Street C**	STMH53	STMH47	0.05	1.24	0.75	0.04	0.93			2.59		32.09	47.80	**123.57**	0.013	375.00	1.15	188.02	1.70	16.1	0.16	0.185		0.050	231.904	231.719
14	**Street B**	STMH47	STMH46	0.11	3.84	0.75	0.08	2.96			8.24		32.21	47.68	**392.66**	0.013	675.00	0.30	460.41	1.29	35.0	0.45	0.105		0.300	231.419	231.314
	Access Road	STMH46	STMH45		3.84	0.75	0.00	2.96			8.24		32.66	47.25	**389.14**	0.013	675.00	0.30	460.41	1.29	26.5	0.34	0.080		0.050	231.264	231.184
15	**Access Road**	DI	STMH47	0.42	4.26	0.25	0.11	3.07			8.53		33.01	46.93	**400.23**	0.013	675.00	0.35	497.30	1.39	6.0	0.07	0.021		0.050	231.727	231.706
	Access Road	STMH45	STMH44		4.26	0.75	0.00	3.07			8.53		33.08	46.87	**399.67**	0.013	675.00	0.35	497.30	1.39	12.3	0.15	0.043		0.050	231.134	231.091
	Access Road	STMH44	Outlet		4.26	0.75	0.00	3.07			8.53		33.23	46.73	**398.52**	0.013	675.00	0.35	497.30	1.39	8.5	0.10	0.030		0.050	231.041	231.012

DRAFT FLOW REPORT (AUGUST 17, 2020)

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WARREN SINCLAIR HOMES

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
02	RE-ISSUED FOR NORFOLK COUNTY REVIEW	DEC. 2018	RDA
01	ISSUED FOR REVIEW	JULY 2018	RDA

DESIGN: RDA | REVIEWED BY: RDA
DRAWN: BJP | CHECKED BY: JDJ
DATE: DECEMBER 2018
SCALE: 1:500

SINCLAIR HOMES
WESTWOOD TRAILS

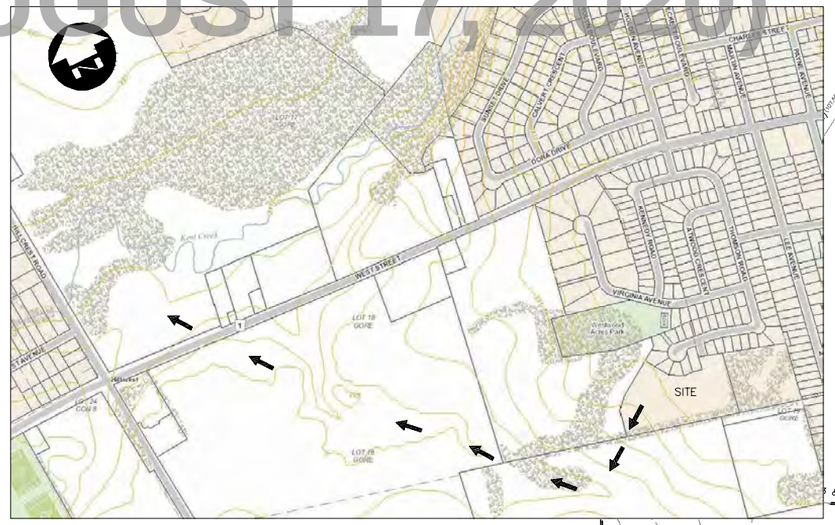
STORM SEWER DESIGN SHEET

PROJECT NO. 18-7395

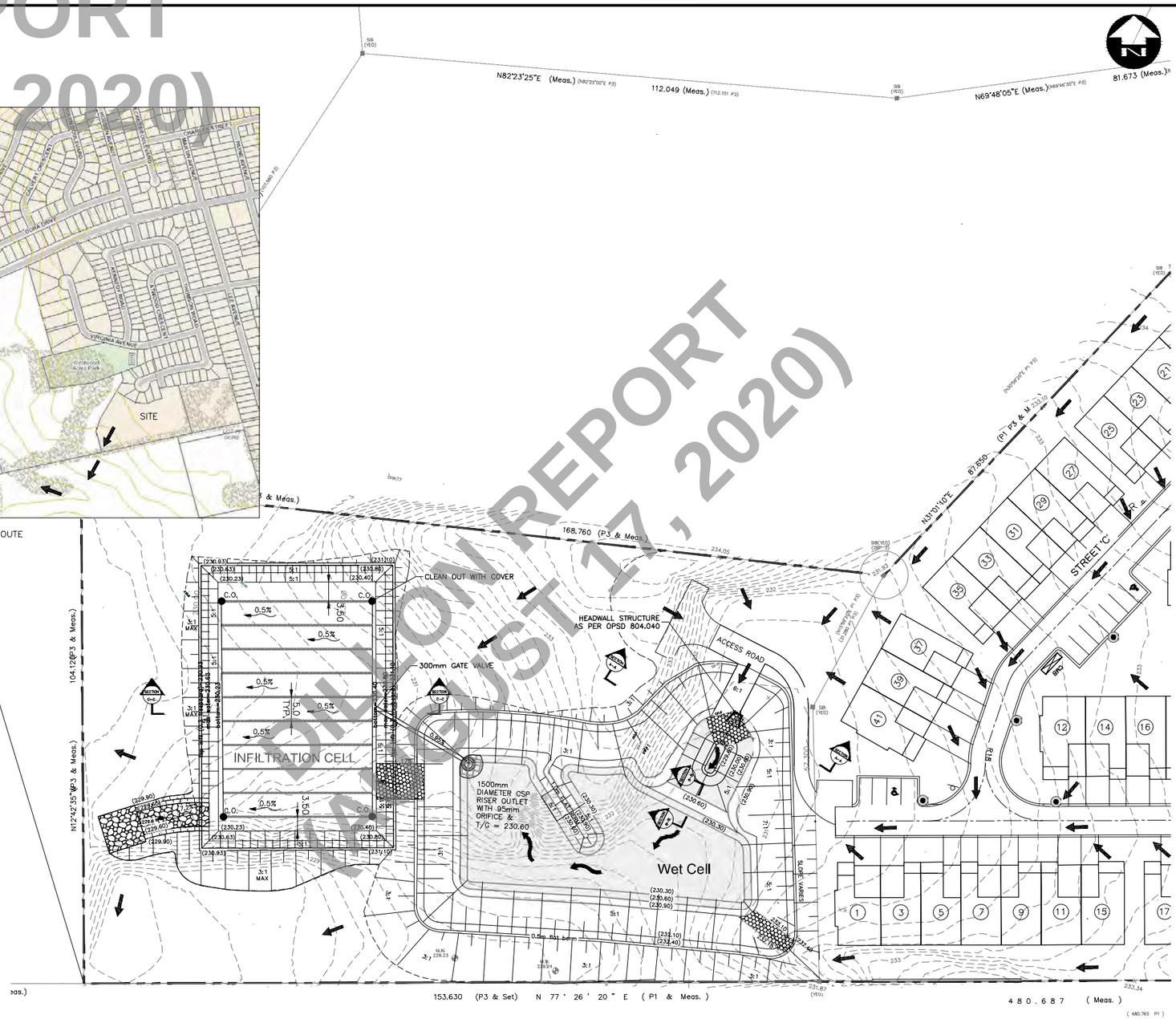
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LONDON

DILLON REPORT
(AUGUST 17, 2020)



OVERLAND DRAINAGE FLOW ROUTE
NTS.



NOTES:

1. FOREBAY AND WET CELL COMPONENTS OF SWM FACILITY TO BE BUILT WITH 1.0M LAYER OF RELATIVE IMPERVIOUS MATERIAL (T-TIME=40MIN/CM OR SLOWER) (CLAYEY SILT AVAILABLE ON SITE)
2. TYPE B SEED MIX:

BY ONTARIO SEED COMPANY (519) 886-0557
OR APPROVED EQUAL
SEED MIX – TO BE USED AROUND SWMP WHERE INDICATED

		(%)
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	25%
AGROSTIS SCABRA	TICKLEGRASS	25%
CAREX VULPINOIDEA	FOX SEDGE	25%
POA PALUSTRIS	FOWL BLUEGRASS	25%
SEED RATE: 25kg/ha		100%

PROVIDE A NURSE CROP OF ANNUAL RYEGRASS TO BE PLANTED AT A RATE OF 22kg/ha

NOTE:
SEED TICKETS MUST BE PROVIDED TO THE LANDSCAPE ARCHITECT CONSULTANT PRIOR TO APPLICATION. THE LANDSCAPE ARCHITECT MUST NOTIFY THE PLANNING, DESIGN & DEVELOPMENT DEPARTMENT SECTION IN ADVANCE OF SEED DELIVERY TO THE SITE.

LEGEND

- PROPOSED GROUND GRADE
- PROPOSED GROUND ELEVATION
- PROPOSED SWALE GRADE
- PROPOSED SWALE ELEVATION
- EXISTING ELEVATION
- REAR YARD SWALE
- PROPOSED GABION MAT
- RIP RAP
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED STEP IN BUILDING
- MINOR OVERLAND FLOW ROUTE

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01	ISSUED FOR REVIEW	OCT 2018	RDA

DESIGN HJF | REVIEWED BY RDA
DRAWN HJF | CHECKED BY RDA
DATE DECMBER 2018
SCALE 1:500

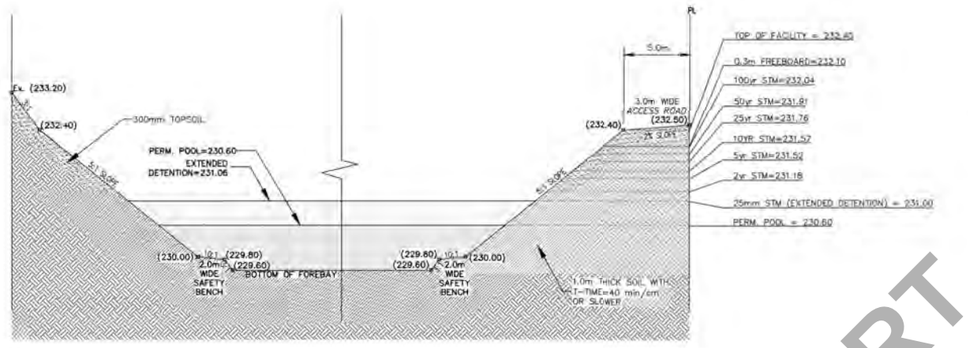
WARREN D. SINCLAIR CONSTRUCTION LTD.
WESTWOOD TRAILS DEVELOPMENT

PROJECT NO. 18-7395

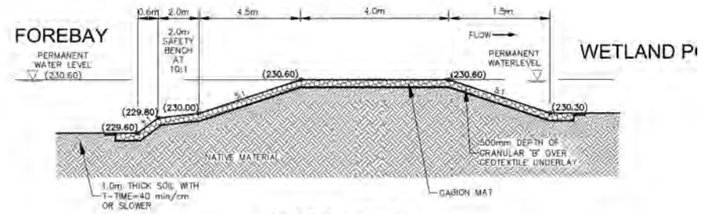
STORM WATER MANAGEMENT PLAN

SHEET NO. SW1.1

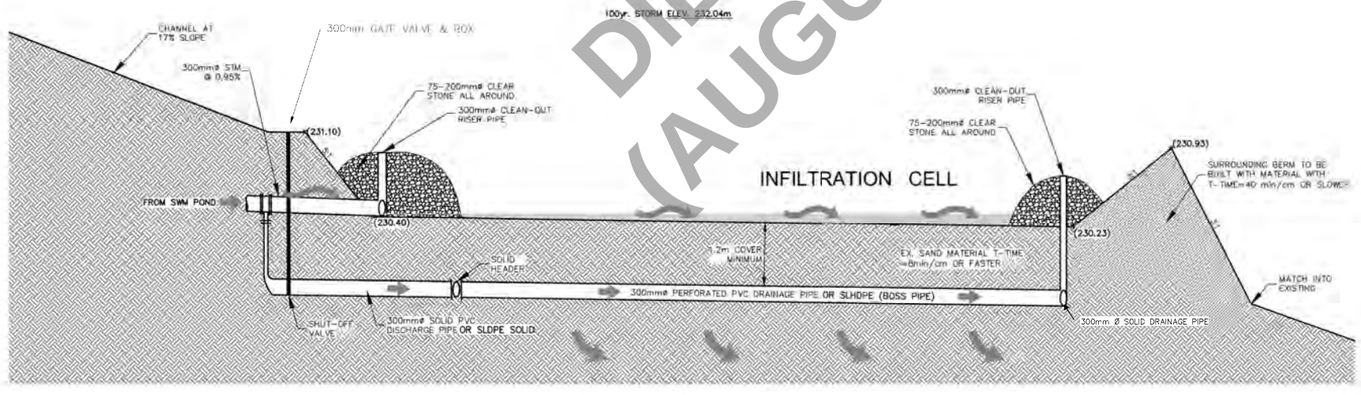
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LONDON OFFICE



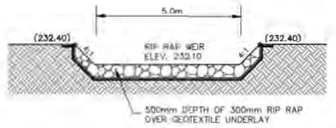
SECTION A–A
FOREBAY CROSS–SECTION
SCALE: 1:200 HOR.
1:50 VERT.



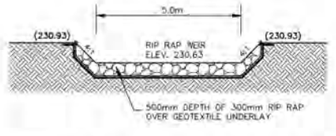
SECTION B–B
FOREBAY OUTLET BERM
N.T.S.



SECTION C–C
INFILTRATION CELL CROSS–SECTION
SCALE: 1:200 HOR.
1:50 VERT.



WET CELL EMERGENCY
OVERFLOW OUTLET WEIR DETAIL
N.T.S.



INFILTRATION CELL EMERGENCY
OVERFLOW OUTLET WEIR DETAIL
N.T.S.

DILLON REPORT
(AUGUST 17, 2020)

Conditions of Use

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DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
RDA	ISSUED FOR REVIEW	AUG 2018	RDA

DESIGN	REVIEWED BY
HJF	RDA
DRAWN	CHECKED BY
HJF	RDA
DATE	AUGUST 2018
SCALE	1:500

WARREN D. SINCLAIR CONSTRUCTION LTD.
WESTWOOD TRAILS DEVELOPMENT

SWM DETAILS

PROJECT NO. 18-7395

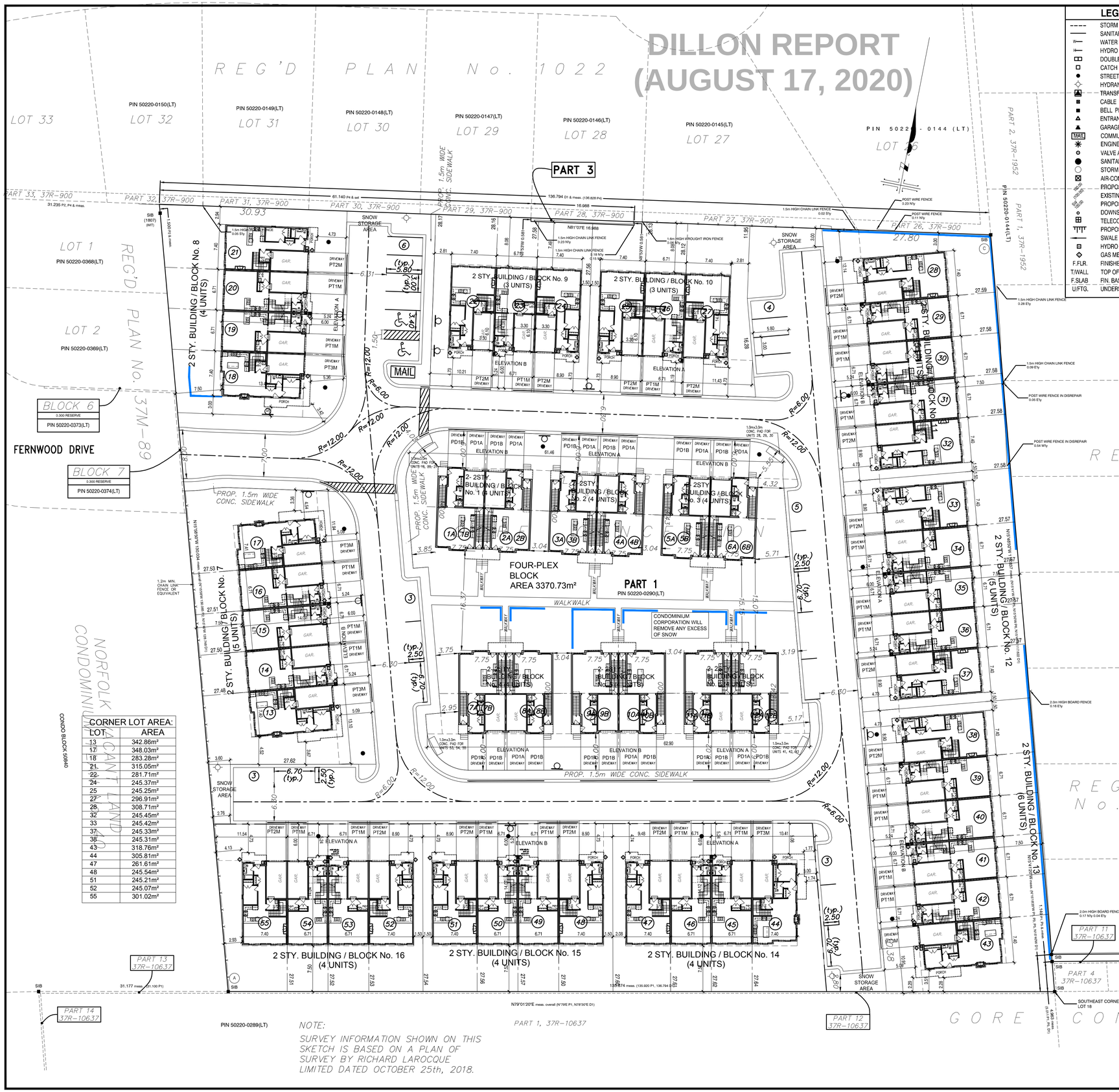
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PLOT DATE: 2018-10-09 @ 12:56:19 PM PLOT SCALE: 1:254.4 PLOT STYLE: DILLON-STANDARD.CTB
LONDON OFFICE

Appendix B - Proposed Site Plan

DILLON REPORT
(AUGUST 17, 2020)

DILLON REPORT (AUGUST 17, 2020)



CORNER LOT AREA:	
LOT	AREA
13	342.86m²
17	348.03m²
18	283.28m²
21	315.05m²
22	281.71m²
24	245.37m²
25	245.25m²
27	296.91m²
28	308.71m²
32	245.45m²
33	245.42m²
37	245.33m²
38	245.31m²
43	318.76m²
44	305.81m²
47	261.61m²
48	245.54m²
51	245.21m²
52	245.07m²
55	301.02m²

NOTE:
SURVEY INFORMATION SHOWN ON THIS SKETCH IS BASED ON A PLAN OF SURVEY BY RICHARD LAROCQUE LIMITED DATED OCTOBER 25th, 2018.

LEGEND

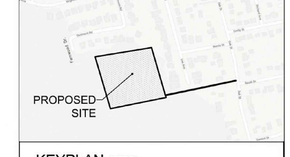
- STORM CONNECTION
- SANITARY CONNECTION
- WATER CONNECTION
- HYDRO CONNECTION
- DOUBLE CATCH BASIN
- CATCH BASIN
- STREET LIGHT
- HYDRANT
- TRANSFORMER
- CABLE TV PEDESTAL
- BELL PEDESTAL
- ENTRANCE DOOR LOCATION
- GARAGE DOOR LOCATION
- MAIL — COMMUNITY MAILBOX
- ENGINEERED FILL LOT
- VALVE AND CHAMBER
- SANITARY MANHOLE
- STORM MANHOLE
- AIR-CONDITIONING UNIT
- PROPOSED GRADE
- EXISTING GRADE
- PROPOSED SWALE GRADE
- DOWNSPOUT LOCATION
- TELECOM. JUNCTION BOX
- PROPOSED BERM
- SWALE DIRECTION
- HYDRO METER
- GAS METER
- F.F.LR. — FINISHED FLOOR ELEVATION
- T/WALL — TOP OF FOUNDATION WALL
- F.SLAB — FIN. BASEMENT FLOOR SLAB
- U/FTG. — UNDERSIDE FOOTING ELEVATION

SITE STATISTICS ZONING: R4 WITH SITE SPECIFIC (14-XXX)

PERMITTED USE:	RESIDENTIAL
LOT AREA:	11,479m²
TOWN-HOME COUNT:	43
FOUR-PLEX COUNT:	24
OCCUPANT PARKING:	122
VISITOR PARKING:	24

Proposed Zoning: R4, with site-specific provisions (14.XXX)

Zoning Provision	Current Requirement	Proposed Development
Permitted Uses [5.4.1 Permitted Uses]	Group townhouse Stacked townhouse Street townhouse Semi-detached, duplex, tri-plex and four-plex dwellings provided they are located on the same lot with, and in accordance with the Zone provisions of, group townhouse Home occupation	Group townhouse Four-plex
Minimum Lot Area [5.4.2(a)]		
i) attached garage	195 square metres	184.79 square metres
ii) corner lot	195 square metres	
iii) detached garage	215 square metres	
Minimum Lot Frontage [5.4.2(b)]		
i) interior lot	30 metres	6.71 metres
ii) corner lot	30 metres	
iii) corner lot accessed by a rear lane	N/A	
Minimum Front Yard [5.4.2(c)]		
i) attached garage	6 metres	6 metres
ii) detached garage or rear yard parking	1.5 metres	
Minimum Exterior Side Yard [5.4.2(d)]		
i) with a 6 metre front yard	6 metres	2.78 metres
ii) with a 1.5 metre front yard	1.5 metres	
Minimum Interior Side Yard [5.4.2(e)]	3 metres	1.5 metres
Minimum Rear Yard [5.4.2(f)]		
i) attached garage	7.5 metres	7.5 metres
ii) detached garage or rear yard parking	7.5 metres	
Minimum separation between townhouse dwellings [5.4.2(g)]	2 metres	3 metres
Maximum building height [5.4.2(h)]	11 metres	TBD
Maximum units in a townhouse dwelling [5.4.4]	No more than eight (8) dwelling units shall be located in a townhouse dwelling.	
Accessible Parking [4.3.1(a)]	type A, a wider accessible parking space which has a minimum width of 3.4 metres with signage that clearly identifies the space as "van accessible" plus an access aisle in accordance with Subsection 4.3.2;	
Access Aisles [4.3.2(a)]	a minimum width of 1.5 metre extending the full length of the parking space; and,	
Access Aisles [4.3.2(b)]	be marked with high tonal contrast diagonal lines, which prohibits parking in them, where the surface is asphalt, concrete or some other hard surface.	OK
Minimum number and type of accessible parking spaces [4.3.3]	1 Type A Accessible Space (Van)	2 Type A Accessible Spaces
Number of parking spaces - type of use (residential) [4.9(a)]	2 parking spaces for each townhouse dwelling unit	2 parking spaces for each townhouse dwelling unit
Number of parking spaces - type of use (residential) [4.9(a)]	1.5 parking spaces for each fourplex dwelling unit	1.5 parking spaces for each fourplex dwelling unit
Number of parking spaces - type of use (visitor parking) [4.9(f)]	1 visitor space for every 3 dwelling units	0.35



KEYPLAN (NTS)

Part of Lot 13, Concession 18 Gore Woodhouse
Town of Simcoe

The Architect is not responsible for the accuracy of survey, structural, mechanical, electrical, etc. engineering information shown on the drawing. Refer to the appropriate engineering drawings before proceeding with work.

Contractor shall check all dimensions on the work and report any discrepancy to the Architect before proceeding. Construction must conform to all applicable Codes and Requirement of Authorities having Jurisdiction.

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This drawing is not to be used for construction unless signed by the Architect.

Issued for Construction: _____

Signature: PETER DEL GROSSO

Date: _____

BREMONT™ HOMES
Designed For Living.

DRAWING TITLE:
CONCEPT PLAN

Norfolk Meadows
AN EXCLUSIVE TOWNHOME COMMUNITY IN NORFOLK COUNTY

PROJECT:
NORFOLK MEADOWS
109 SITE PLAN SPPL2020093
TOWN OF SIMCOE, ONTARIO

PETER DEL GROSSO
ARCHITECTURAL TECHNOLOGIST
45 Silverado Trail
Woodbridge, Ontario L4H 1W4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

NO:	DATE.	REVISION.
5.	AUG. 13/20	REV. ADDED GARBAGE PADS AND UTILITIES
4.	MAR. 10/20	ADDED BLOCK UNITS
3.	AUG. 14/19	ADDED WALKWAY BETWEEN THE FOUR-PLEX
2.	JULY 31/19	ADDED LOT FONTAGE DIMENSIONS/FOUR-PLEX BLOCK AREA
1.	JULY 2/19	REVISED UNIT SIZES

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

QUALIFICATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

REGISTRATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.4 of The Building Code

PETER DEL GROSSO 27288

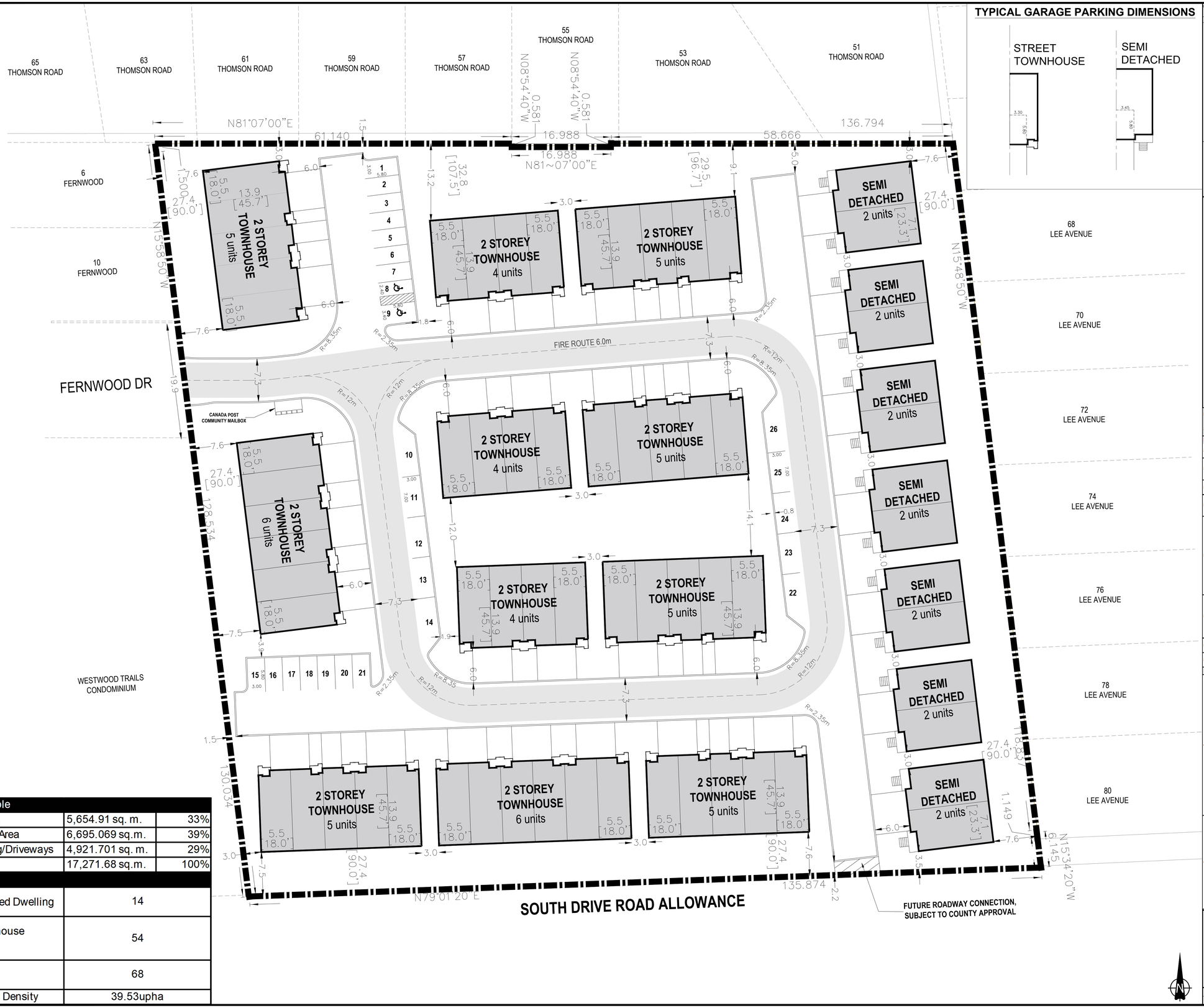
ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

AREA:	
SCALE:	1:300
DRAWN BY:	PDG
DATE:	JULY 2/19
PROJECT No.:	19-22

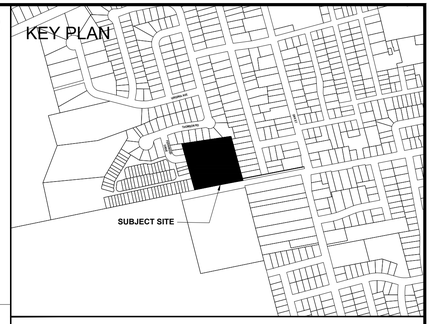
DRAWING No.:
SP

A MEMBER OF PERFECT COMMUNITIES

APPENDIX B – Proposed Site Plan



TYPICAL GARAGE PARKING DIMENSIONS



SITE PLAN

Part of Lot 18
Concession of Gore
City of Simcoe
County of Norfolk

16 FERNWOOD DRIVE

Land Use Table		
Building Area	5,654.91 sq. m.	33%
Landscaped Area	6,695.069 sq.m.	39%
Road/Parking/Driveways	4,921.701 sq. m.	29%
Total	17,271.68 sq.m.	100%
Units		
Semi-Detached Dwelling	14	
Group Townhouse Dwellings	54	
Total Units	68	
Development Density	39.53upha	

Urban Residential Type 4 (R4.14979)

Semi-Detached Dwelling & Group Townhouse Dwellings

Provision No.	Provision	Requirement	Proposed
5.4.2 a)	Minimum Lot Area (per dwelling Unit)	195 m^2	254m^2
5.4.2 b)	Minimum Lot Frontage	19.86 m (Fernwood Drive)	19.86 m
5.4.2 c)	Minimum Front Yard	6.0 m from a private roadway	6.0 m
5.4.2 d)	Minimum Exterior Side Yard	3.0 m from the end wall of a dwelling to a private roadway	3.0 m
5.4.2 e)	Minimum Interior Side Yard	1.2 m from the end wall to a dwelling to an interior side yard lot line	1.5 m
5.4.2 f)	Minimum Rear Yard	7.5 m from the rear wall of a dwelling to a lot line.	7.5 m
		12.0 metres between the rear walls of dwellings	12m
5.4.2 g)	Minimum Separation between Dwellings	2.0 m	3.0 m
5.4.2 h)	Maximum Building Height	9.8 m	9.8 m
	Parking Requirements		
4.9.a)	single detached, semi-detached, duplex, tri-plex, four-plex, townhouse dwellings and vacation home [8-Z-2017]	2 spaces per dwelling unit (68 x 2 = 136)	136 spaces
4.9 f)	All apartment dwellings; and duplex dwellings, tri-plex dwellings, four-plex dwellings, townhouse dwellings or single detached or semi-detached dwellings as part of a condominium development or when they abut a private road [27-Z-2020].	1 visitor space for every 3 dwelling units (68 / 3 = 26.6)	26 visitor spaces

GSP group
PLANNING I URBAN DESIGN I LANDSCAPE ARCHITECTURE
gspgroup.ca

REVISIONS

Date: September 3, 2025	Drawn By: EF	Dwg. File Name: sp25032a.dwg
Scale: 1: 300	Project No.: 25032	

Appendix C – Sanitary Demand Calculations

Counterpoint Engineering Inc.

SUMMARY OF PEAK FLOWS

Project: 16 Fernwood Drive
Project No: 251467
Location: Norfolk County (Simcoe)

Block	Site Area (ha)	Retail Area (Ha)	Residential Population (Persons)	Peak Flow with Infiltration (l/s)
Existing Site	1.73	-	-	**0.48**
Proposed Site		-	172	**2.84**
			Net Increase =	**2.36**

Counterpoint Engineering Inc.

EXISTING BUILDING/SITE

Project: 16 Fernwood Drive
Project No: 251467
Location: Norfolk County (Simcoe)
Site Area: 1.727 ha

Per Captia Flow for External Reviews

Residential	285	litres/person/day
Commercial	180,000	litres/floor ha/day
Infiltration (Dry)	0.28	litres/ha/second

Residential Population Criteria

1 Bedroom	1.6	ppu
1 Bedroom + Den	1.6	ppu
2 Bedroom	2	ppu
3 Bedroom	2.4	ppu
Townhome	3	ppu

North Phase of Development
Site Area: 1.727 ha

Building	No. of Units	1 Bedroom	1 Bedroom Plus Den	2 Bedroom	3 Bedroom	Townhome	Retail Area (Ha)	Total Res Population
Existing	0	0	0	0	0	0	0.000	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0.000**	**0**

Harmon Peaking Factor Residential: (Min=2.0, Max=5.0), Commerical: 0.0

Building	Total Population	Harmon Peak Factor
Residential	0	4.5

Townhouse Peak Residential flow with Infiltration:	0.48	**l/s**
Townhouse Total Peak Flow:	0.00	**l/s**
North Phase - Total Peak Flow:	**0.48**	**l/s**

Counterpoint Engineering Inc.

PROPOSED BUILDING/SITE

Project: 16 Fernwood Drive
Project No: 251467
Location: Norfolk County (Simcoe)
Site Area: 1.727 ha

Per Captia Flow for External Reviews

Residential	285	litres/person/day
Commercial	180,000	litres/floor ha/day
Infiltration (Dry)	0.28	litres/ha/second

Residential Population Criteria

1 Bedroom	1.6	ppu
2 Bedroom	1.6	ppu
3 Bedroom	2	ppu
Townhome	2.4	ppu
Single & Semi-Detached	3	Persons/100m2

Townhouses (Outlet to Fernwood Drive Sanitary Sewer)

Site Area: 1.727 ha

Building	No. of Units	1 Bedroom	2 Bedroom	3 Bedroom	Townhome	Single/Semi-Detached	Total Res Population
Residential Units	68	0	0	0	54	14	172
TOTAL	**68**	**0**	**0**	**0**	**54**		**172**

Harmon Peaking Factor Residential: (Min=2.0, Max=5.0), Commerical: 0.0

Building	Total Population	Harmon Peak Factor
Residential	172	4.2

Peak Residential flow:	2.36	**l/s**
Total Infiltration Flow:	0.48	**l/s**
Total Peak Flow:	**2.84**	**l/s**

Proposed Conditions - Sanitary Flow
Fernwood Drive Sewer

Composite population density
per unit Single/Semi-Detached = 3.0
Townhouse = 2.4

P = population = sum p A site

M = 1+ (14/(4+(P/ Min=2, Max=5
I = 0.28 x A gross l/s
q = 285 l/person/day (For the analysis of existing sewers - residential)

Pflow = M q P / 86400 = population flow l/s
Q TOTAL = P flow + I l/s

Infiltration (Dry Conditions)= 0.28 l/s/ha
Flow (Residential), Q= 285 l/person/day

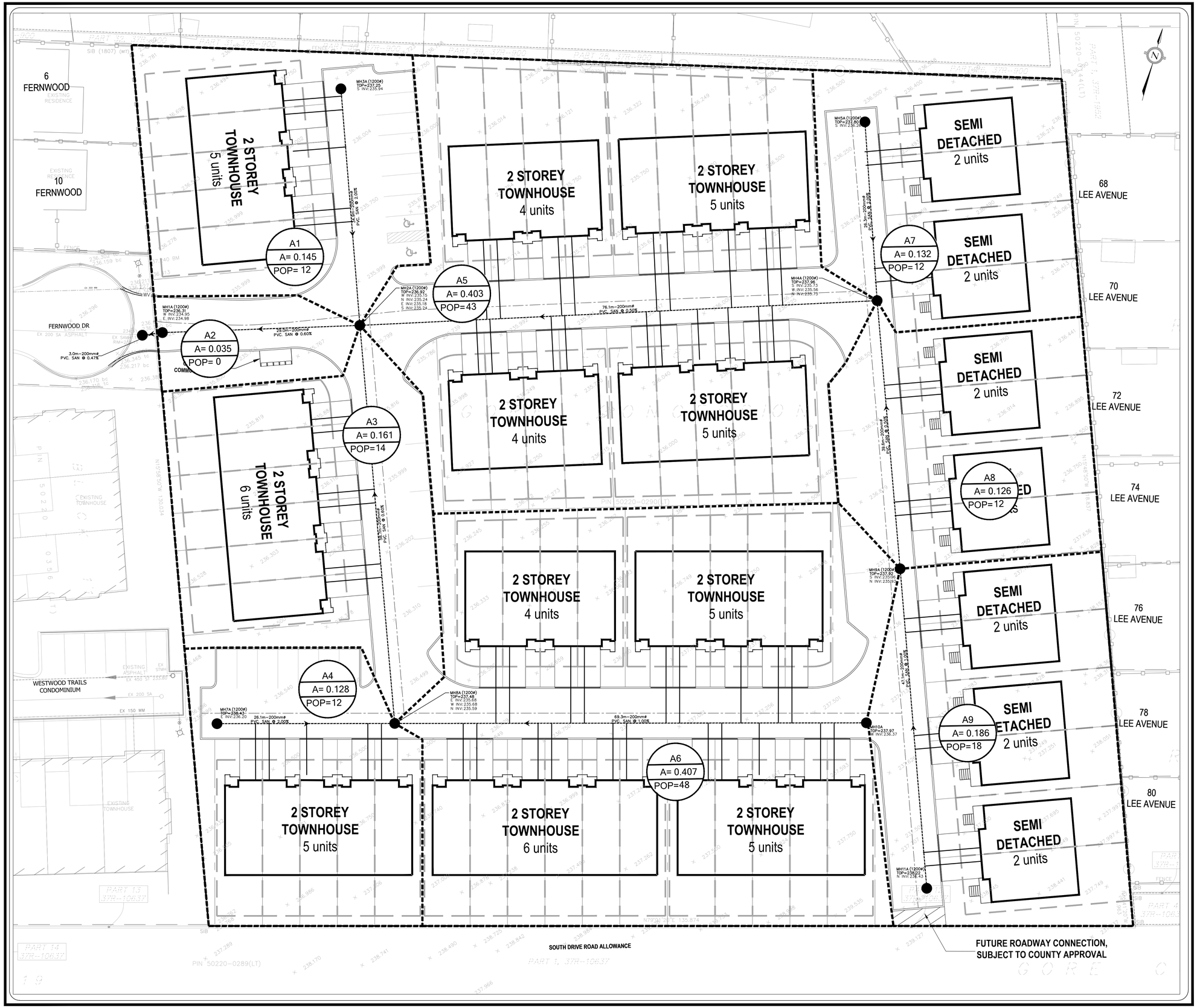
Date: Nov 27 2025
Designed by: TS
Checked by: GD

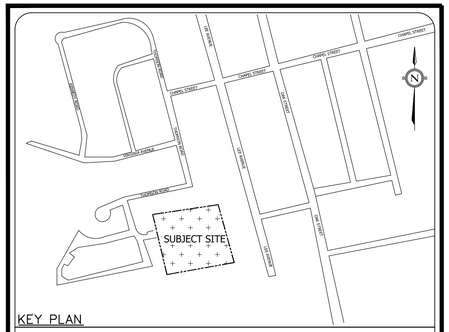
p - Equivalent residential population density (based on ppl/ha)
AREA - Area of the commercial/institutional/industrial site
EQUIV RES P - Equivalent residential population (based on ppl/ha)

RES UNITS - Residential number of units
RES POP P - Residential population
A SITE - Residential Area

A GROSS - Cumulative Residential + Non-Residential Area

CATCHMENT AREA	MANHOLE		RESIDENTIAL CUMULATIVE					A	I	Prop.	Q	LENGTH	SLOPE	D	TYPE	ROUGH.	Q	Velocity	Capacity
	FROM	TO	RES. AREA ha	EQUIV. POP P	ACCUM. EQUIV. POP P	M	PEAK FLOW l/s	Infiltrated Area ha	l/s	Foundation Drain l/s	TOTAL l/s	(m)	S %	(mm)	OF PIPE	COEFF.	FULL (L/s)	Full (m/s)	(%)
Fernwood																			
East Street																			
A9	MH11A	MH9A	0.186	18	18	4.39	0.3	0.19	0.05	0.00	0.3	47.1	1.00	200	PVC	0.013	34.1	1.05	1%
A8	MH9A	MH4A	0.126	12	30	4.35	0.4	0.31	0.09	0.00	0.5	39.6	0.50	200	PVC	0.013	24.1	0.75	2%
A7	MH5A	MH4A	0.132	12	12	4.41	0.2	0.13	0.04	0.00	0.2	26.3	2.00	200	PVC	0.013	48.3	1.49	0%
South Street																			
A6	MH10A	MH8A	0.407	48	48	4.32	0.7	0.41	0.11	0.00	0.8	69.3	1.00	200	PVC	0.013	34.1	1.05	2%
A4	MH7A	MH8A	0.128	12	12	4.41	0.2	0.13	0.04	0.00	0.2	26.1	2.00	200	PVC	0.013	48.3	1.49	0%
											0.0								
West Street																			
A3	MH8A	MH2A	0.161	14	74	4.28	1.0	0.70	0.19	0.00	1.2	58.7	0.60	200	PVC	0.013	26.4	0.82	5%
A1	MH3A	MH2A	0.145	12	12	4.41	0.2	0.15	0.04	0.00	0.2	34.9	2.00	200	PVC	0.013	48.3	1.49	0%
North Street																			
A5	MH4A	MH2A	0.403	43	85	4.26	1.2	0.85	0.24	0.00	1.4	76.1	0.50	200	PVC	0.013	24.1	0.75	6%
A2	MH2A	MH1A	0.035	0	172	4.17	2.4	1.72	0.48	0.00	2.8	29.0	0.60	200	PVC	0.013	26.4	0.82	11%





KEY PLAN

LEGEND

- EXISTING LIGHT STANDARD
- EXISTING MANHOLE
- EXISTING WATERMAIN CHAMBER
- EXISTING HYDRANT AND VALVE
- EXISTING CATCHBASIN
- PROPOSED SANITARY SEWER AND MH
- EXISTING EASEMENT LINE
- PROPERTY LINE
- SANITARY DRAINAGE BOUNDARY
- AREA ID (110 / A= 0.93 / POP= / 91%)
- DRAINAGE AREA (HECTARES)
- IMPERVIOUSNESS (%)

TOPOGRAPHY & LEGAL

PROVIDED BY: THE LOROCQUE GROUP
12 LYMAN STREET
ST. CATHERINES, ON, L2R 5M7
PHONE:(905) 688-1413

BEARING

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED POINTS BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONIDTUDE, ZONE 17, UNIVERAL TRANSVERSE MERCATOR (6° UTM). THERE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERNCE SYSTEM.

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR ZBA/DPOC/SPA #1	NOV 27 2025	G.D.	
1.	ISSUED FOR COORDINATION	NOV 21 2025	G.D.	

counterpoint ENGINEERING
A SUBSIDIARY OF DILLON CONSULTING LIMITED
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER J. S. YOGANATHAN 100100545 NOV 27 25 PROVINCE OF ONTARIO

ENGINEER'S STAMP

APPLICANT:
2445680 ONTARIO LIMITED
23 WINGATE CRESCENT,
RICHMOND HILL, ON, L4B 3J3
PHONE:
FAX:
CONTACT:

SITE LOCATION:
16 FERNWOOD
16 FERNWOOD DRIVE,
SIMCOE, ON, N3Y 0E5

SITE PLAN FILE No.:

SITE SANITARY DRAINAGE PLAN

DESIGNED BY: J.Y	CHECKED BY: J.H	DATE: NOV 2025
DRAWING BY: J.Y.S	CHECKED BY: G.D	PROJECT NO. 251467
SWM BY: J.Y	CHECKED BY: J.H	
SCALE: 1:250m (0m 5m 10m 15m 20m)		DRAWING NO. SW-SAN

REGION FILE No.:

Appendix D - Water Demand Calculations

Counterpoint Engineering Inc.

WATER DEMANDS BY BLOCK AND BUILDING

Project: 16 Fernwood
Project No: 251467
Location: Norfolk County (Simcoe)

Per Capita Demand

Waste Consumption	285	litres/person/day

Retail/Residential Population Criteria

1 Bedroom	1.6	ppu
2 Bedroom	1.6	ppu
3 Bedroom	2.0	ppu
Townhouse	2.4	ppu
Single & Semi-Detached	3.0	persons/100m^2

Unit and Floor Area Breakdown

POPULATION AND AVERAGE DAY DEMANDS SUMMARY								
Building	**1 Bedroom Units**	**2 Bedroom Units**	**3 Bedroom Units**	**Townhouse**	**Single/Semi-Detached**	**Total Residential Units***	**Total Residential Population**	**Residential Average Demand**
	1.6 persons/unit	**1.6 persons/unit**	**2 persons/unit**	**3.4 persons/unit**	**3.0 persons/unit**	**Units**	**Equivalent Population**	**L/s**
Townhouse Units	0	0	0	54	14	68	172	0.57
Totals:	**0**	**0**	**0**	**54**	**14**	**68**	**172**	**0.57**

Peaking Factors

Land Use	Maximum Hour	Maximum Day
Residential	4.00	2.25
Commercial	2.00	2.25
Industrial	2.00	2.25
Institutional	2.00	2.25

Summary of Demands

Building	Daily Water Demand (L/sec)	Max Day Water Demand (L/sec)	Peak Hour Water Demand (L/sec)	Fire Demand Required (L/sec)	Max Day plus Fire Demand (L/sec)	
Townhouse Units	0.57	1.28	2.27	150.0	151.3	governs = max fire flow plus total max day
Total:	**0.57**	**1.28**	**2.27**	**150.0**	**151.3**	

Hydrant Testing Ontario
Tel: 289-354-1942
Info@HTOntario.ca

REPORT
N°. 2690

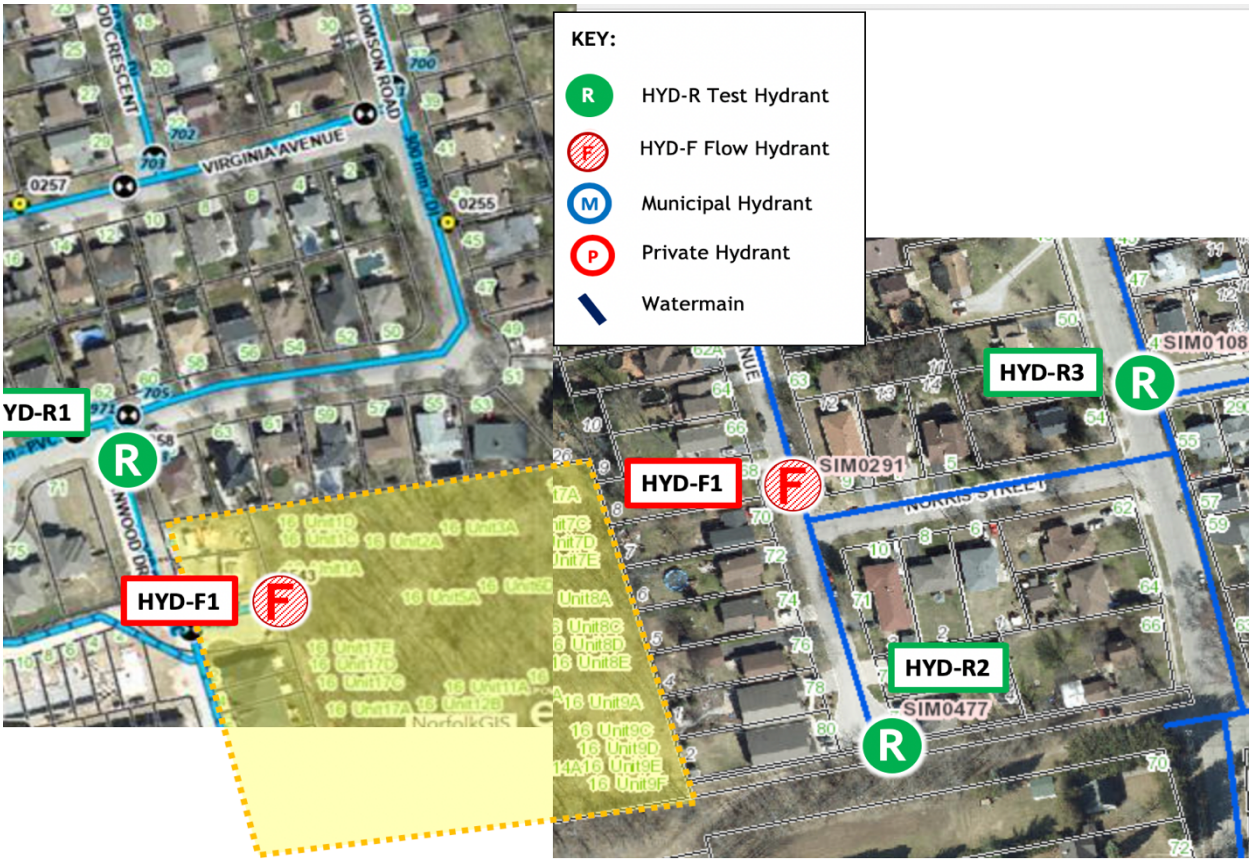
October 3, 2025

To: Gian-Michael Di Luca, P. Eng Associate
Counterpoint Land Development by Dillion Consulting Limited
gdiluca@counterpointend.com
8395 Jane Street, SUITE 100
Vaughan, Onatrio, L4K 5Y2

RE: Hydrant Flow Test - 16 FERNWOOD COURT, NORFOLK - SIMCOE

Please find the Report for the following works

Scope: Conducted Hydrant Flow Test as per NFPA291 Recommended Practices for Water Flow Testing and Marking of Hydrants.



HYDRANT FLOW TEST

NORFOLK TEST R1

DATE: September 16, 2025 TIME: 2:27 PM

R -TEST HYDRANT	9 FERNWOOD COURT	HYDRANT No.	HYD-R1
HYDRANT MODEL:	CENTURY	COLOUR:	BLUE
STATIC PRESSURE psi (hr-20^0.54):	41	VARIANCE:	20%
Q - FLOW HYDRANT	16 FERNWOOD COURT	HYDRANT No.	HYD-F1
HYDRANT MODEL:	AVK	COLOUR:	BLUE

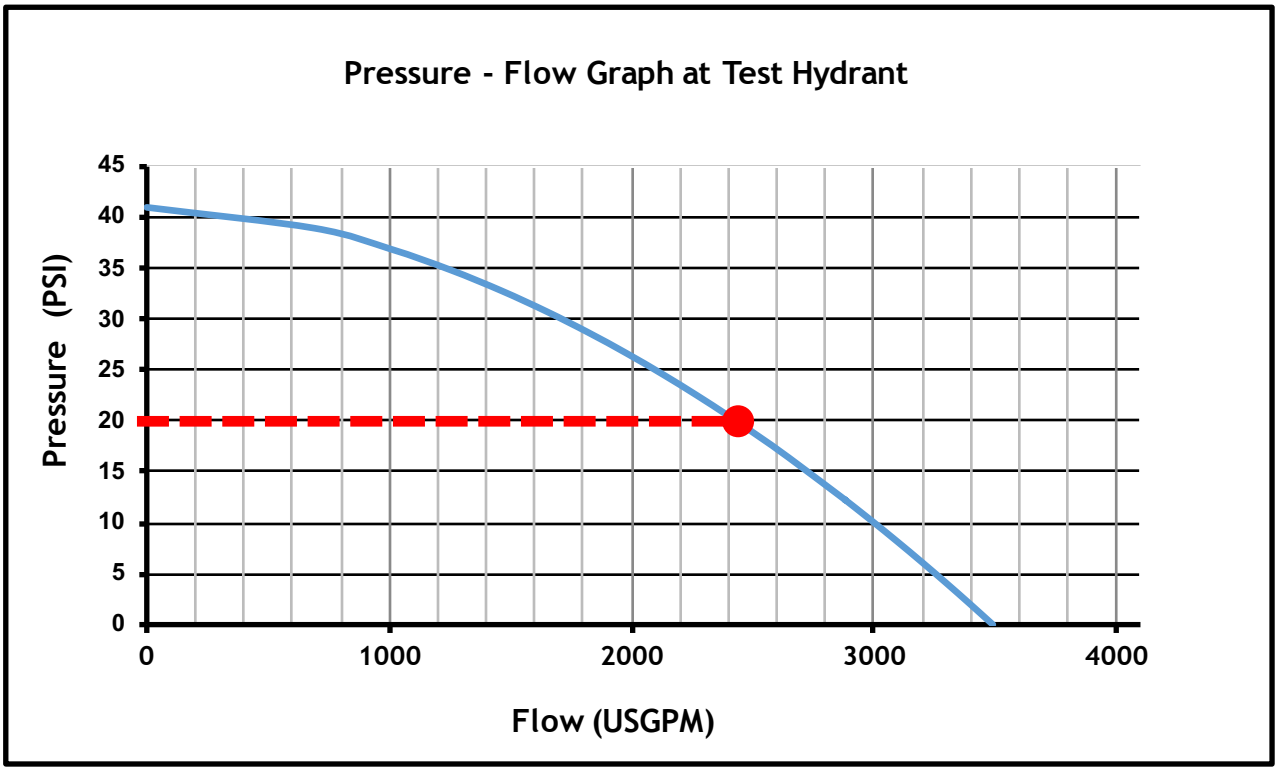
No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	38	2.5	0.9	30	1021
2	33	2.5	0.9	15	722
			Q_F = Total Flow (USGPM)		**1444**

Q_R = flow predicted @ 20 psi

$Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

2432	USGPM
153	L/s

NFPA Rating: **CLASS AA - BLUE**



HYDRANT FLOW TEST

NORFOLK TEST R2

DATE: September 16, 2025 TIME: 3:10 PM

R -TEST HYDRANT 79 LEE AVENUE HYDRANT No. HYD-R2

HYDRANT MODEL: CENTURY COLOUR: ORANGE

STATIC PRESSURE psi (hr-20^0.54): **44** VARIANCE: 45%

Q - FLOW HYDRANT Opp. 70 LEE AVENUE HYDRANT No. HYD-F2

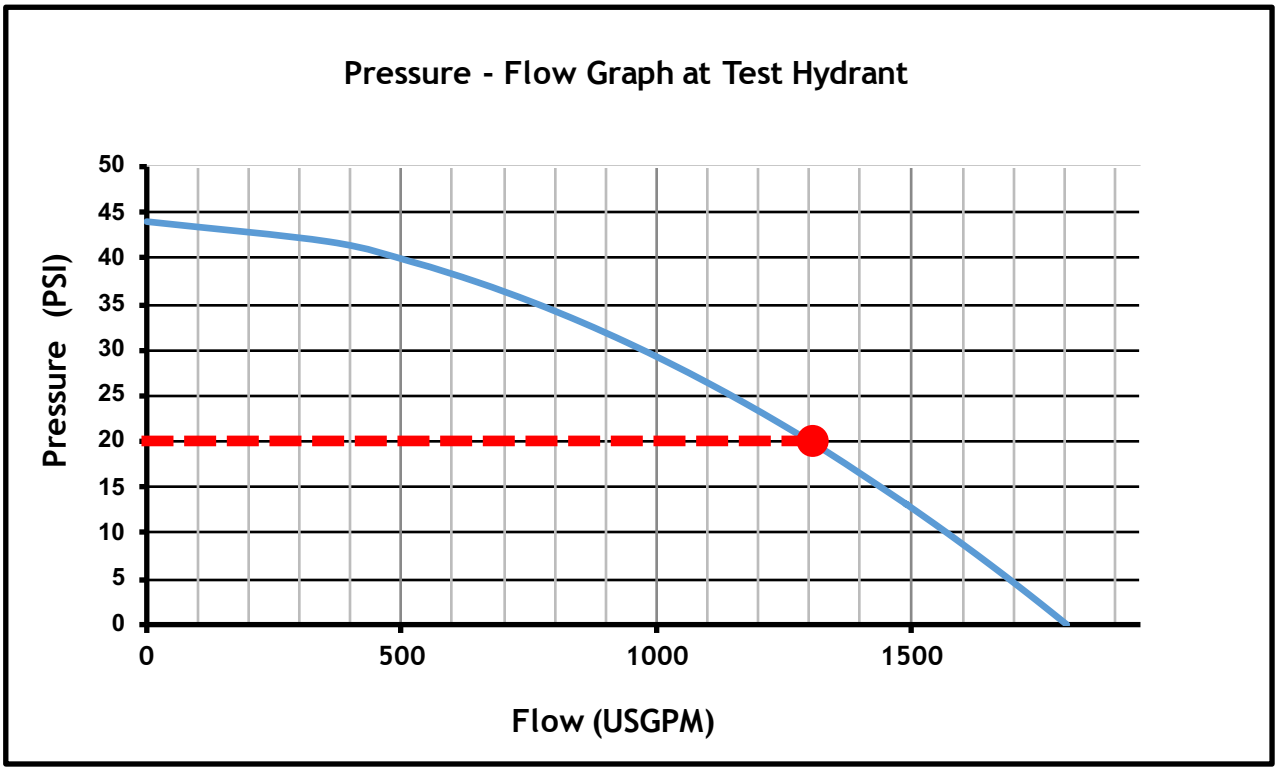
HYDRANT MODEL: CENTURY COLOUR: GREEN

No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	32	2.5	0.9	25	932
2	24	2.5	0.9	10	590
			Q_F = Total Flow (USGPM)		**1179**

Q_R = flow predicted @ 20 psi $Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

1301	USGPM
82	L/s

NFPA Rating: **CLASS A - GREEN**



HYDRANT FLOW TEST

NORFOLK TEST R3

DATE: September 16, 2025 TIME: 3:10 PM

R -TEST HYDRANT 49 OAK STREET HYDRANT No. HYD-R3

HYDRANT MODEL: CENTURY COLOUR: BLUE

STATIC PRESSURE psi (hr-20^0.54): **43** VARIANCE: 10%

Q - FLOW HYDRANT Opp 70 LEE AVENUE HYDRANT No. HYD-F3

HYDRANT MODEL: CENTURY COLOUR: GREEN

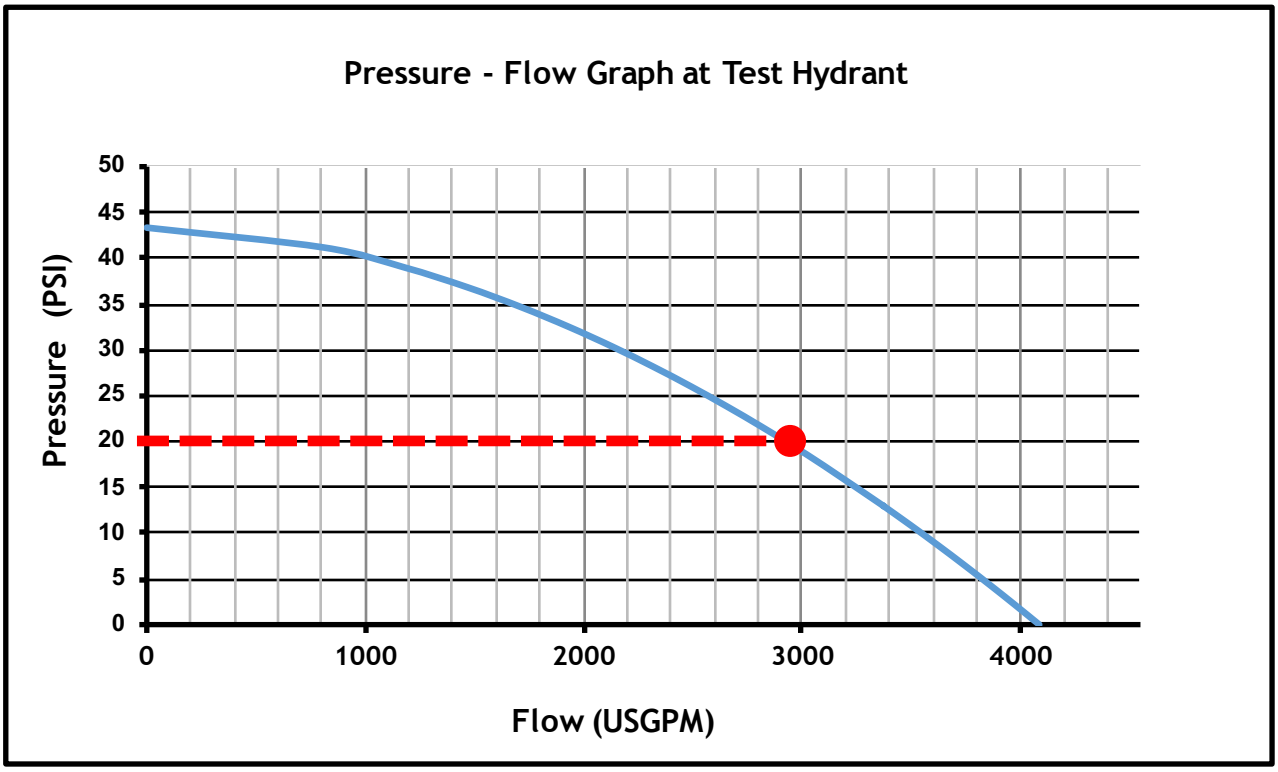
No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	41	2.5	0.9	25	932
3	39	2.5	0.9	10	590
			Q_F = Total Flow (USGPM)		**1179**

Q_R = flow predicted @ 20 psi

$Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

2925	USGPM
185	L/s

NFPA Rating: **CLASS AA - BLUE**



Test Conclusion

The system at the time of testing produced a theorectical projected flow rate of:

LOCATION	Total USGPM	USGPM at 20 psi	lps at 20 psi	Test #
FERNWOOD DR	1444	2432	153	R1
LEE AVENUE	1179	1301	82	R2
OAK STREET	1179	2925	185	R3

Hydrants are classified in accordance with their rated capacities as per NFPA291.

COLOUR	CLASS	Available Flow @ 20psi
BLUE	AA	1500 GPM or more
GREEN	A	1000 – 1499 GPM
ORANGE	B	500 – 999 GPM
RED	C	Below 500 GPM

We strongly feel that all attempts have been made to ensure that the required data as stipulated was captured, stored and presented in an accurate, efficient and timely manner for the required period.

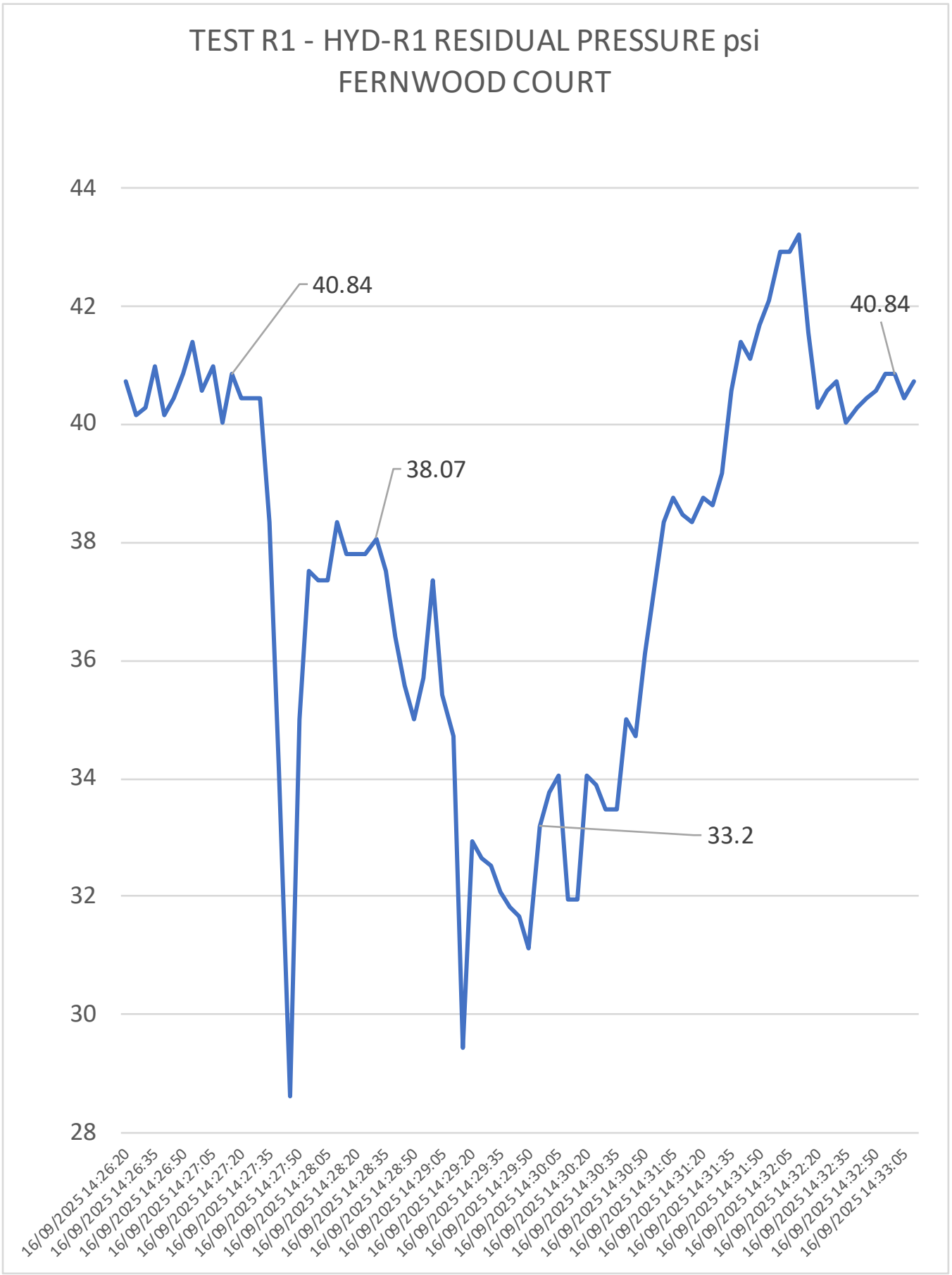
We look forward to working with you in the future.

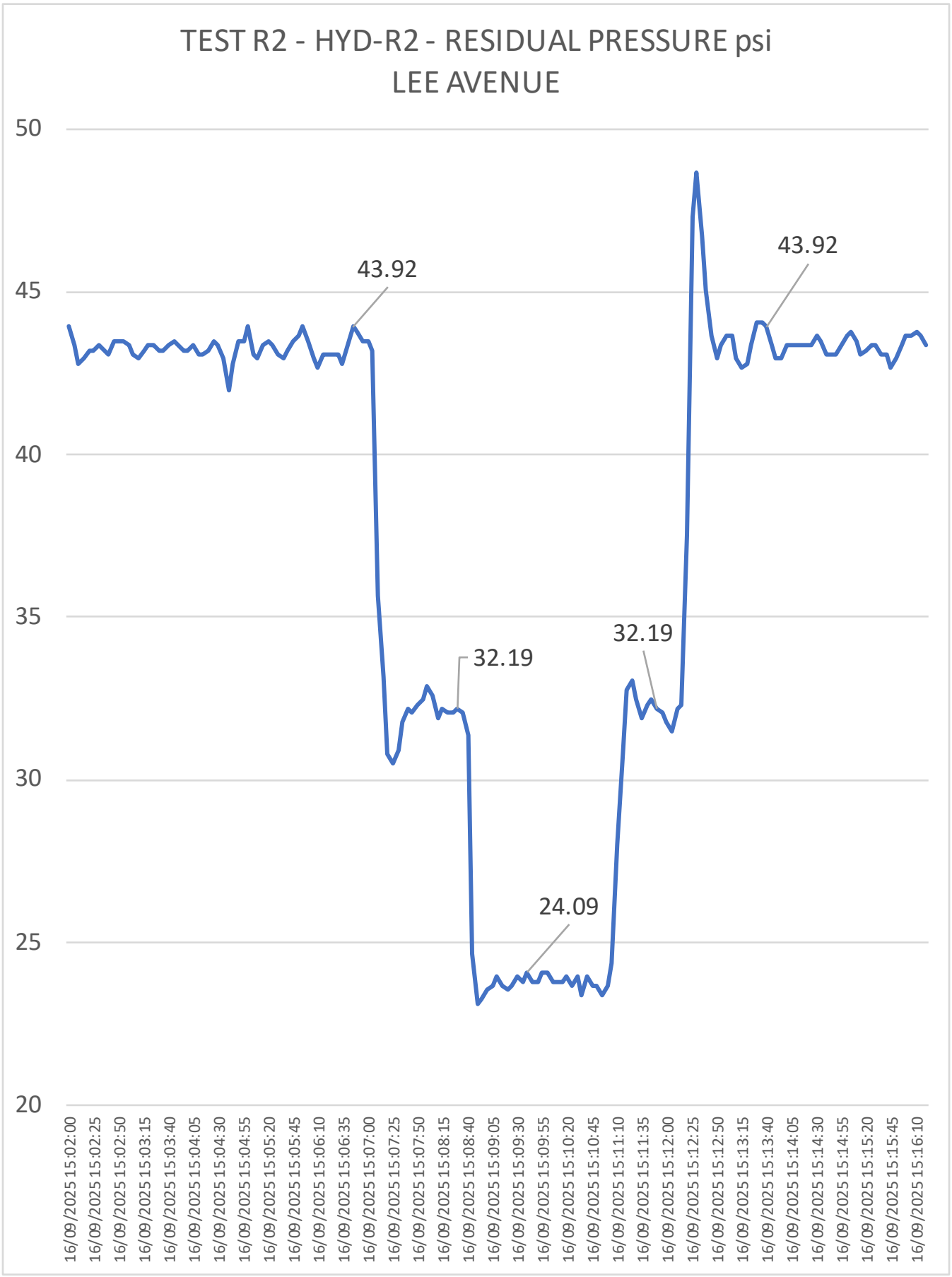
Please feel free to contact the undersigned should you require any further information.

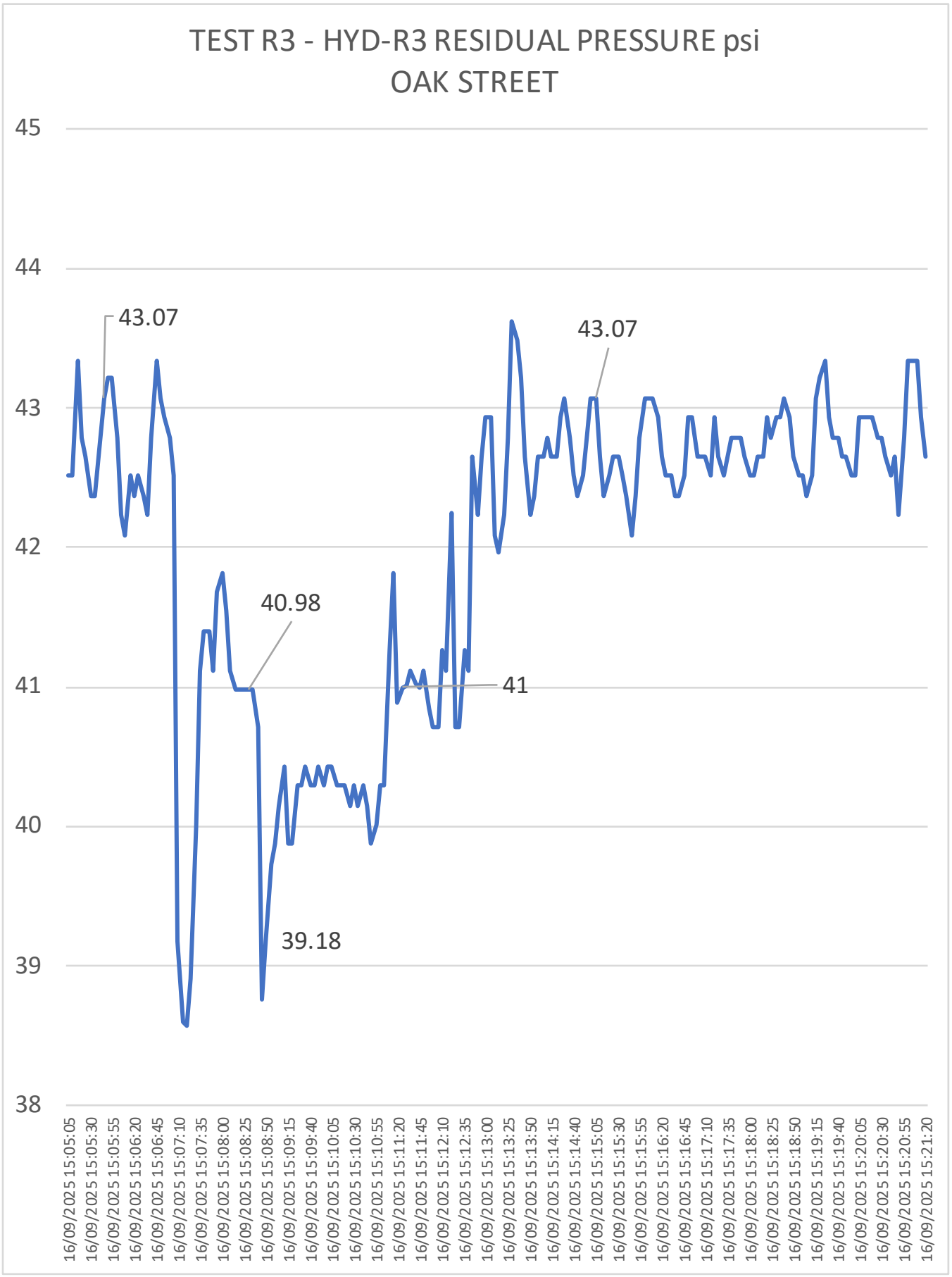
Best Regards



Rob Gamache E.P
Manager of Operations
Hydrant Testing Ontario
Info@HTOntario.ca


TEST R1 - HYD-R1 RESIDUAL PRESSURE psi
FERNWOOD COURT
44
42
40
38
36
34
32
30
28
40.84
38.07
33.2
40.84
16/09/2025 14:26:20
16/09/2025 14:26:35
16/09/2025 14:26:50
16/09/2025 14:27:05
16/09/2025 14:27:20
16/09/2025 14:27:35
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16/09/2025 14:32:50
16/09/2025 14:33:05


TEST R2 - HYD-R2 - RESIDUAL PRESSURE psi
LEE AVENUE
50
45
40
35
30
25
20
43.92
32.19
24.09
32.19
43.92
16/09/2025 15:02:00
16/09/2025 15:02:25
16/09/2025 15:02:50
16/09/2025 15:03:15
16/09/2025 15:03:40
16/09/2025 15:04:05
16/09/2025 15:04:30
16/09/2025 15:04:55
16/09/2025 15:05:20
16/09/2025 15:05:45
16/09/2025 15:06:10
16/09/2025 15:06:35
16/09/2025 15:07:00
16/09/2025 15:07:25
16/09/2025 15:07:50
16/09/2025 15:08:15
16/09/2025 15:08:40
16/09/2025 15:09:05
16/09/2025 15:09:30
16/09/2025 15:09:55
16/09/2025 15:10:20
16/09/2025 15:10:45
16/09/2025 15:11:10
16/09/2025 15:11:35
16/09/2025 15:12:00
16/09/2025 15:12:25
16/09/2025 15:12:50
16/09/2025 15:13:15
16/09/2025 15:13:40
16/09/2025 15:14:05
16/09/2025 15:14:30
16/09/2025 15:14:55
16/09/2025 15:15:20
16/09/2025 15:15:45
16/09/2025 15:16:10


TEST R3 - HYD-R3 RESIDUAL PRESSURE psi
OAK STREET
45
44
43
42
41
40
39
38
43.07
43.07
40.98
41
39.18
16/09/2025 15:05:05
16/09/2025 15:05:30
16/09/2025 15:05:55
16/09/2025 15:06:20
16/09/2025 15:06:45
16/09/2025 15:07:10
16/09/2025 15:07:35
16/09/2025 15:08:00
16/09/2025 15:08:25
16/09/2025 15:08:50
16/09/2025 15:09:15
16/09/2025 15:09:40
16/09/2025 15:10:05
16/09/2025 15:10:30
16/09/2025 15:10:55
16/09/2025 15:11:20
16/09/2025 15:11:45
16/09/2025 15:12:10
16/09/2025 15:12:35
16/09/2025 15:13:00
16/09/2025 15:13:25
16/09/2025 15:13:50
16/09/2025 15:14:15
16/09/2025 15:14:40
16/09/2025 15:15:05
16/09/2025 15:15:30
16/09/2025 15:15:55
16/09/2025 15:16:20
16/09/2025 15:16:45
16/09/2025 15:17:10
16/09/2025 15:17:35
16/09/2025 15:18:00
16/09/2025 15:18:25
16/09/2025 15:18:50
16/09/2025 15:19:15
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16/09/2025 15:21:20

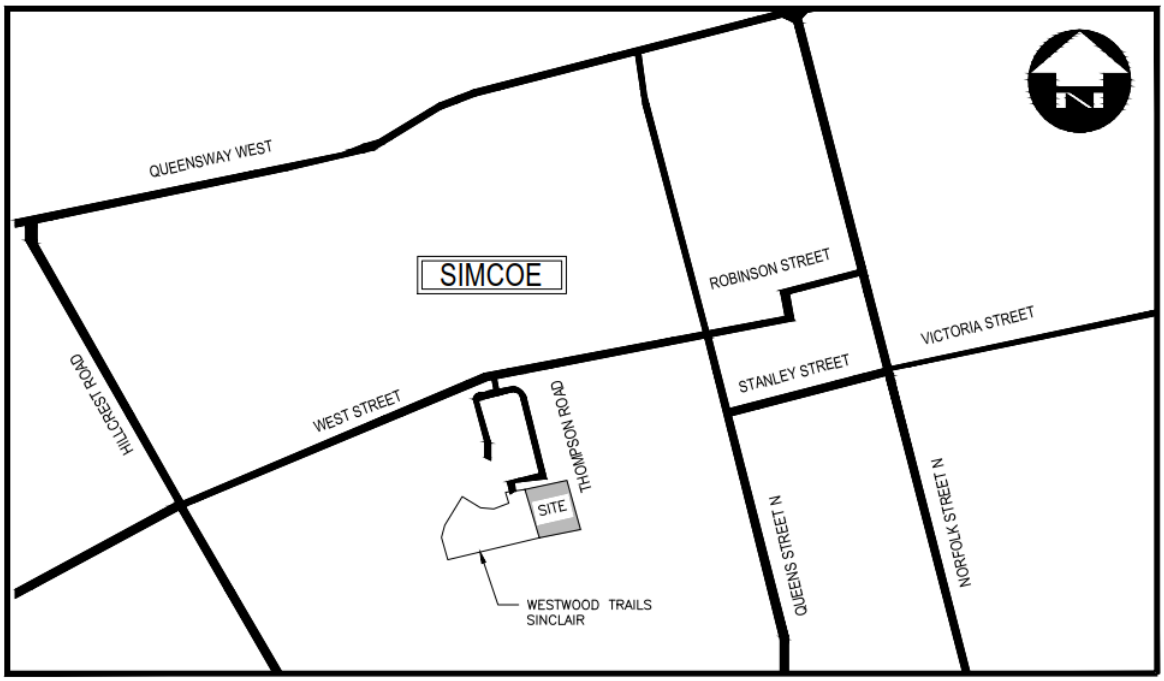
MEMO

TO: 2445680 Ontario Ltd.
FROM: Jake Howkins, P.Eng.
DATE: November 26, 2025
SUBJECT: Stormwater Management Brief – 16 Fernwood Drive, Simcoe, Ontario
OUR FILE: 251467

Introduction

The purpose of this memo is to provide an update to the previous Stormwater Management Brief (provided in **Appendix A**) dated April 3, 2020 (Revised October 26, 2020) prepared by Dillon Consulting which was site plan approved for the Bremont Homes Development - Meadows of Norfolk. The development site ("the Site") is now under the new ownership of 2445680 Ontario Ltd. ("Client") and continues to be municipally known as 16 Fernwood Drive, Simcoe, Ontario. The proposed development has been updated from the originally approved site plan to now include a total of 54 townhome units and 14 semi-detached units for a total of 68 units. The overall site remains 1.72 ha.

The purpose of this brief is to provide details of the stormwater management (SWM) design and how it addresses the municipal stormwater management requirements.



Location Plan
N.T.S

Previous Studies

Previous reports have been prepared by MTE Consultants Inc. and by Dillon Consulting Limited regarding the proposed stormwater management works for this Site. The following is a list and summary of the previous reports. Reports are provided in **Appendix A**.

1. Westwood Trails Subdivision Functional Stormwater Management Report by MTE Consultants Inc. (MTE file: 38750-124, dated March 9, 2016).

   This report prepared by MTE Consultants was in support of the development (Westwood Trails Development) immediately to the west and northwest of the Site. The subject area in the report included the Westwood Trails Development as well as the Meadows of Norfolk Development (referred to as the Smith Property in the report). As part of their investigation, they identified the need for a SWM facility for all properties which included a pond and infiltration gallery located at the western limit of the Westwood Trails Development to receive a post-development drainage area of 5.50ha. Both the stormwater management pond and infiltration cell has been designed to treat the 100-year storm. This area of 5.50ha included the Westwood Trails and Smith Property, as well as additional external areas located outside of the development lands. The proposed SWM facility was designed to achieve the following post-development criteria:

   Quantity Control: Post-development peak flows are controlled to pre-development levels up to and included the 100-year storm event in Norfolk County.

   Quality Control: MOE and LPRCA (Long Point Region Conservation Authority) requires an "Enhanced" (80% TSS Removal) level of water quality protection for areas draining to the Long Point Region Watershed.

2. Westwood Trail Subdivision Memo by Dillon Consulting Limited. (Dillon File: 18-7395, dated January 8, 2019).

   This purpose of this memo was to evaluate if the SWM facility design proposed by MTE Consultants in 2016 was still applicable, based upon the detailed design of the Westwood Trails Development. This memo determined that with the revised catchment areas, the SWM facility needed an increase in the height of the permanent pool of 0.05 metres and the top of pond of 0.04 metres. However, the memo concluded that the increase in height was insignificant and was within construction tolerances and recommended that the design provided by MTE Consultants was still applicable and remained as outlined in their original report in 2016.

3. Functional Servicing Design Brief – Meadows of Norfolk by Dillon Consulting Limited (Dillon File 18-8454, dated December 7, 2018)

   This brief provided preliminary details of the servicing for the Meadows of Norfolk Development. Based on the preliminary design, the downstream storm sewers have capacity to service the minor system drainage and the downstream SWM facility has capacity for up to the 100-year storm for the Site.

4. Functional Servicing Design Brief – Meadows of Norfolk by Dillon Consulting Limited (Dillon File 18-8454, dated April 3, 2020 – Revised October 26, 2020)

   This brief provided revisions to the previous SWM brief discussed in #3 above. Based on the design, the downstream storm sewers have capacity to service the minor system drainage and the downstream SWM facility has capacity for up to the 100-year storm for the Site.

Proposed Storm Drainage

Minor System Drainage

The runoff from the proposed Site was calculated based on the Rational Formula:

$$Q = Ca \times iAR$$

Where:
A = Area (hectares, ha)
i = Rainfall Intensity (mm/hr)
R = Runoff Coefficient
Ca = Antecedent Precipitation Factor for less frequent storms

Based on Norfolk County Design Criteria, the following IDF parameters were used:

$$i = \frac{A}{(t+B)^C}$$

Storm Event	A	B	C
5-year	583.017	3.007	0.703
100-year	801.041	1.501	0.657

An initial Time of Concentration (t) of 19.0 minutes was used for the most upstream leg of each storm pipe. A Runoff Coefficient of R = 0.75 for townhouses was used based on the land-use type of the development. Refer to **Appendix B** for the storm sewer design sheet.

Based on the Westwood Trails Development design, a total of 1.92 ha and runoff coefficient of 0.75 (AxR = **1.44**) was estimated to contribute into the 450mm diameter storm sewer (Refer to drawing **SW-STM** for the **Site Storm Drainage Plan**) at the easterly end of Serviceberry Lane in Westwood Trails Phase 2. The private storm sewer system in the Westwood Trail Phase 2 will convey the drainage to the SWM facility. The proposed storm sewer design in the site has a total AxR of **1.38** which is lower than the design AxR (1.44) used in the Westwood Trails Phase 2 storm sewer design. Therefore, there is adequate capacity for the external downstream storm sewer to accept the minor system drainage from the proposed Site.

Minor system drainage will be captured by catchbasins and into the storm sewers located in the road. As mentioned above, the drainage from the Site will be discharged into the Westwood Trail Phase 2 private storm sewers. An agreement will be entered into with Westwood Trails Phase 2 for the use of their private

storm collection system. The storm collection system in Westwood Trails Phase 2 ultimately is discharged into the privately owned SWM facility (which has been previously approved). The private SWM facility has a legal outlet directly into the ground via an infiltration cell.

Major System Drainage

As mentioned in the previous section, the SWM facility in Westwood Trail Phase 2 was designed to accommodate drainage up to the 100-year storm for the Site.

The internal roads of the Site have been graded such that overland flow can be conveyed west via Fernwood Drive, where it is conveyed overland on the roads in Westwood Trail Phase 2 and into the SWM facility. An overland flow route has been proposed at the connection to the existing Fernwood drive cul-de-sac to ultimately be conveyed through the internal roads of Westwood Trails Phase 2 (onto Serviceberry Lane). As proposed in the original design for Westwood Trails Phase 2, the drainage from the Site can be conveyed ultimately to the SWM facility which has been designed to accommodate the drainage from the Site.

Conclusion

Based on the current design, the proposed Site can be serviced as follows:

- Minor system flows are captured using on-site catchbasins and are conveyed southwesterly into the sewer system in the Westwood Trails Phase 2 lands immediately west of the Site.
- The proposed AxR (**1.38**) is less than the design contributing AxR (**1.44**) from the Westwood Trails Design. Therefore, there is capacity in the downstream sewers that receive the flows.
- The Site has been graded such that the major system flow can be conveyed overland by the sites connection to Fernwood Drive, west along Serviceberry Lane and ultimately is received by the SWM facility based on the Functional Stormwater Management report by MTE Consultants Inc.
- The requirements for quality and quantity control for the Site listed above can be achieved by the stormwater management pond and infiltration cell in the Westwood Trails Phase 2 lands based on the Functional Stormwater Management report by MTE Consultants Inc.
- The infiltration cell in the Westwood Trails SWM facility is the legal outlet that discharges the stormwater via infiltration into the ground.

DILLON CONSULTING LIMITED
VAUGHAN, ONTARIO



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Gian-Michael Di Luca, P.Eng
Associate
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APPENDIX A – BACKGROUND DOCUMENTS

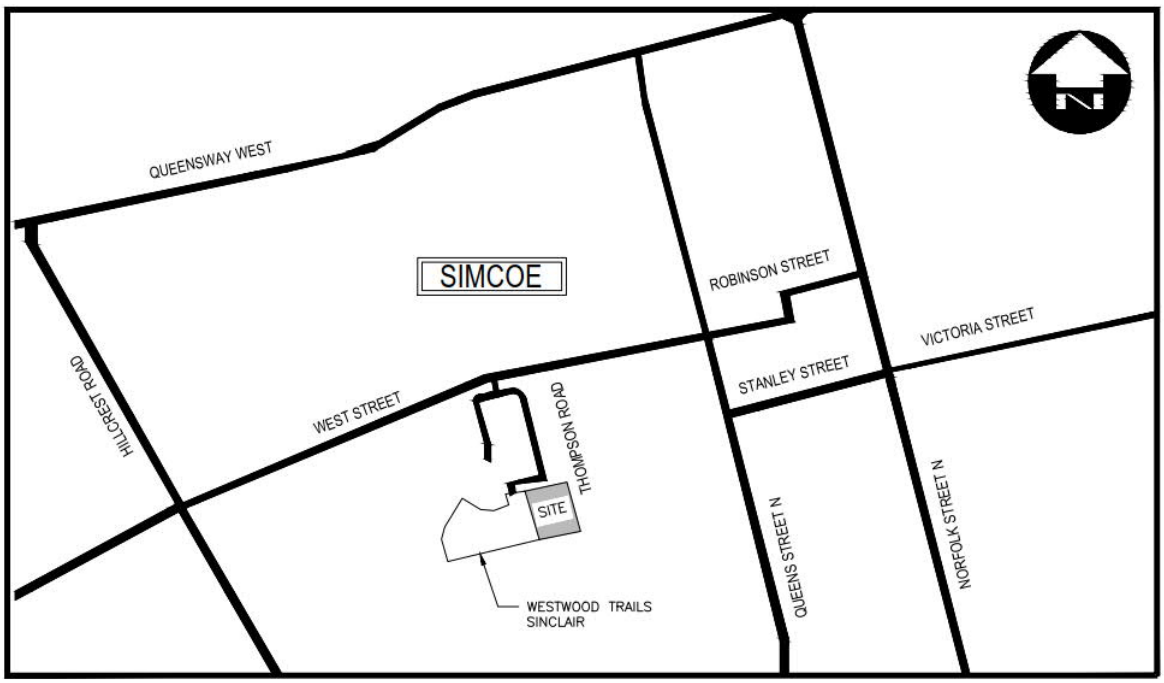
MEMO

DILLON CONSULTING

TO: Bremont Developments (Norfolk)
FROM: Gary Tran, P.Eng
DATE: April 3, 2020 (Revised October 26, 2020)
SUBJECT: Stormwater Management Brief – Meadows of Norfolk, Simcoe, Ontario
OUR FILE: 18-8454

Introduction

The proposed development, Meadows of Norfolk ("the Site") is located in Simcoe, Ontario in the County of Norfolk. The proposed development is located at the end of Fernwood Drive in Simcoe as shown on the location plan below. The overall Site is 1.72 ha and will consist of 43 townhome units and 24 four-plex units for a total of 67 units. The purpose of this brief is to provide details of the stormwater management (SWM) design and how it addresses the stormwater management requirements.



Location Plan
N.T.S

Previous Studies

Previous reports have been prepared by MTE Consultants Inc. and by Dillon Consulting regarding the proposed stormwater management works for this Site. The following is a list and summary of the previous reports. Reports are provided in Appendix A.

1. Westwood Trails Subdivision Functional Stormwater Management Report by MTE Consultants Inc. (MTE file: 38750-124, dated March 9, 2016).

   This report prepared by MTE Consultants was in support of the development (Westwood Trails Development) immediately to the west and northwest of the Site. The subject area in the report included the Westwood Trails Development as well as the Meadows of Norfolk Development (referred to as the Smith Property in the report). As part of their investigation, they identified the need for a SWM facility for all properties which included a pond and infiltration gallery located at the western limit of the Westwood Trails Development to receive a post-development drainage area of 5.50ha. Both the stormwater management pond and infiltration cell has been designed to treat the 100-year storm. This area of 5.50ha included the Westwood Trails and Smith Property, as well as additional external areas located outside of the development lands. The proposed SWM facility was designed to achieve the following post-development criteria:

   Quantity Control: Post-development peak flows are controlled to pre-development levels up to and included the 100-year storm event in Norfolk County.

   Quality Control: MOE and LPRCA (Long Point Region Conservation Authority) requires an "Enhanced" (80% TSS Removal) level of water quality protection for areas draining to the Long Point Region Watershed.

2. Westwood Trail Subdivision Memo by Dillon Consulting Limited. (Dillon File: 18-7395, dated January 8, 2019).

   This purpose of this memo was to evaluate if the SWM facility design proposed by MTE Consultants in 2016 was still applicable, based upon the detailed design of the Westwood Trails Development. This memo determined that with the revised catchment areas, the SWM facility needed an increase in the height of the permanent pool of 0.05 metres and the top of pond of 0.04 metres. However the memo concluded that the increase in height was insignificant and was within construction tolerances and recommended that the design provided by MTE Consultants was still applicable and remained as outlined in their original report in 2016.

3. Functional Servicing Design Brief – Meadows of Norfolk by Dillon Consulting Limited (Dillon File 18-8454, dated December 7, 2018)

   This brief provided preliminary details of the servicing for the Meadows of Norfolk Development. Based on the preliminary design, the downstream storm sewers have capacity to service the minor system drainage and the downstream SWM facility has capacity for up to the 100-year storm for the Site.

Proposed Storm Drainage

Minor System Drainage

The runoff from the proposed Site was calculated based on the Rational Formula:

$$Q = Ca \times iAR$$

Where:
A = Area (hectares, ha)
i = Rainfall Intensity (mm/hr)
R = Runoff Coefficient
Ca = Antecedent Precipitation Factor for less frequent storms

Based on Norfolk County Design Criteria, the following IDF parameters were used:

$$i = \frac{A}{(t+B)^C}$$

Storm Event	A	B	C
5-year	583.017	3.007	0.703
100-year	801.041	1.501	0.657

An initial Time of Concentration (t) of 19.0 minutes was used for the most upstream leg of each storm pipe. A Runoff Coefficient of R = 0.75 for townhouses was used based on the land-use type of the development (see Appendix A for the storm sewer drainage plan and design sheet for details).

Based on the Westwood Trails Development design, a total of 1.92 ha and runoff coefficient of 0.75 (AxR = 1.44) was estimated to contribute into the 450mm diameter storm sewer (see Storm Drainage Plan in Appendix A) at the easterly end of Serviceberry Lane in Westwood Trails Phase 2. The private storm sewer system in the Westwood Trail Phase 2 will convey the drainage to the SWM facility. The proposed storm sewer design in the site has a total AxR of 1.352 which is lower than the design AxR (1.44) used in the Westwood Trails Phase 2 storm sewer design. Therefore, there is adequate capacity for the external downstream storm sewer to accept the minor system drainage from the proposed Site.

Minor system drainage will be captured by catchbasins and into the storm sewers located in the road. As mentioned above, the drainage from the Site will be discharged into the Westwood Trail Phase 2 private storm sewers. An agreement will be entered into with Westwood Trails Phase 2 for the use of their private storm collection system. The storm collection system in Westwood Trails Phase 2 ultimately is discharged into the privately owned SWM facility (which has been previously approved). The private SWM facility has a legal outlet directly into the ground via an infiltration cell.

Major System Drainage

As mentioned in the previous section, the SWM facility in Westwood Trail Phase 2 was designed to accommodate drainage up to the 100-year storm for the Site.

The internal roads of the Site have been graded such that overland flow can be conveyed west via Fernwood Drive and Street C, where it is conveyed overland on the roads in Westwood Trail Phase 2 and into the SWM facility. An overland flow route has been proposed at the southwestern limit of the Site on Street C to convey drainage onto Serviceberry Lane. Overland drainage on Fernwood Drive will be conveyed into the internal roads of Westwood Trails Phase 2. As proposed in the original design for

Westwood Trails Phase 2, the drainage from the Site can be conveyed ultimately to the SWM facility which has been designed to accommodate the drainage from the Site.

Conclusion

Based on the current design, the proposed Site is able to be serviced as follows:

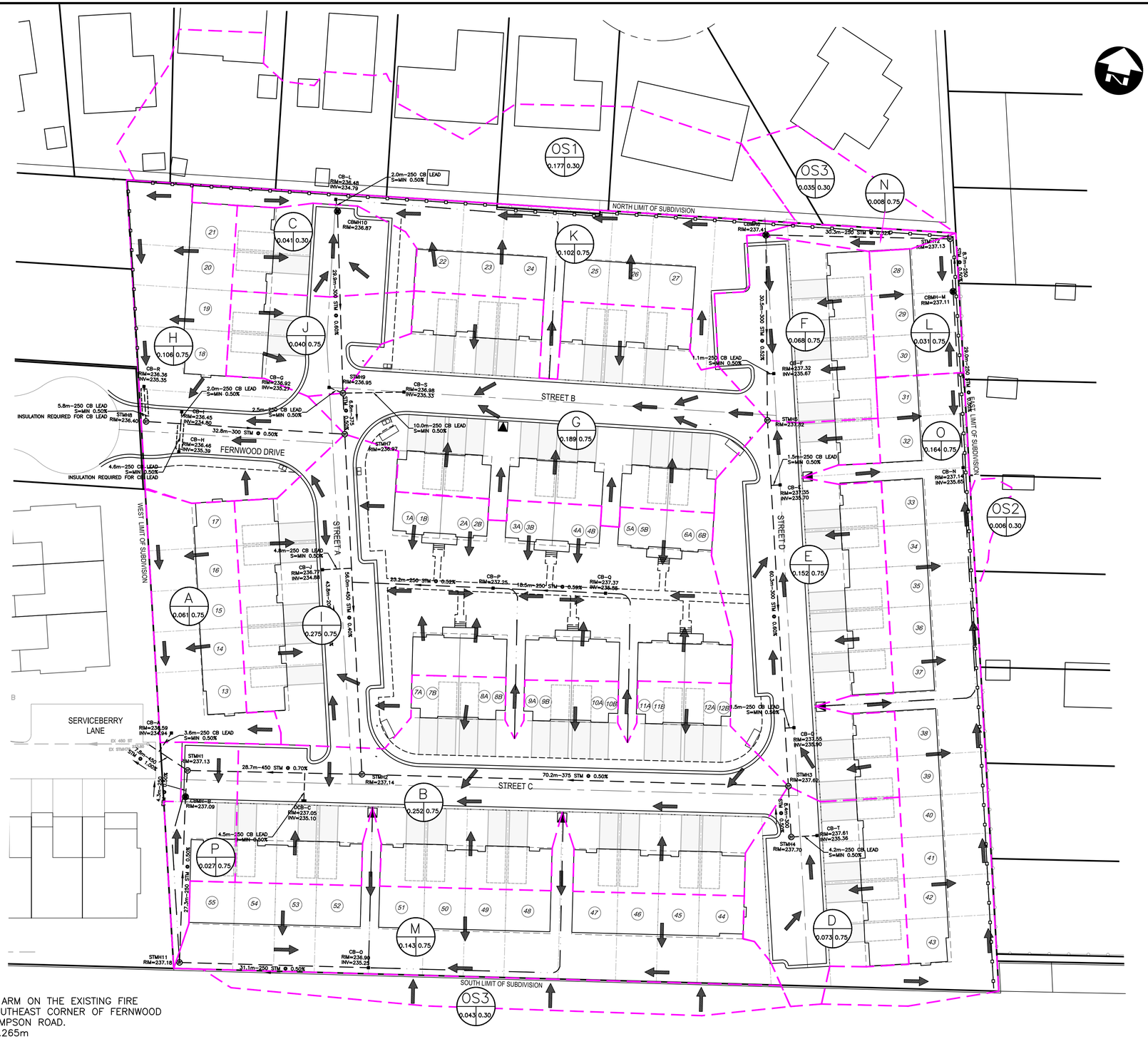
- Minor system flows are captured using on-site catchbasins and are conveyed southwesterly into the sewer system in the Westwood Trails Phase 2 lands immediately west of the Site.
- The proposed AxR (1.352) is less than the design contributing AxR (1.44) from Westwood Trails Design. Therefore, there is capacity in the downstream sewers that receive the flows.
- The Site has been graded such that the major system flow can be conveyed by Fernwood Drive and an overland flow route at the west limit of Street C into Westwood Trails Phase 2.
- The requirements for quality and quantity control for the Site listed above can be achieved by the stormwater management pond and infiltration cell in the Westwood Trails Phase 2 lands based on the Functional Stormwater Management report by MTE Consultants Inc.
- The infiltration cell in the Westwood Trails SWM facility is the legal outlet that discharges the stormwater via infiltration into the ground.

DILLON CONSULTING LIMITED
KITCHENER, ONTARIO



Gary Tran, P.Eng.

APPENDIX A – BACKGROUND DOCUMENTS



BENCHMARK:
TOP OF LARGE ARM ON THE EXISTING FIRE HYDRANT AT SOUTHEAST CORNER OF FERNWOOD DRIVE AND THOMPSON ROAD.
ELEVATION: 237.265m

LEGEND

- DRAINAGE AREA
- A1 — AREA DESIGNATION; 0.4 — AREA (Ha); 0.60 — RUNOFF COEFFICIENT
- OVERLAND FLOW DIRECTION
- TRANSFORMER
- PROPOSED FENCE (REFER TO LANDSCAPE DWG)

SCALE 1:350 METRES

SPPL2020093

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

LICENSED PROFESSIONAL ENGINEER — G. TRAN — 100224397 — PROVINCE OF ONTARIO — OCT/30/2020

NOT FOR CONSTRUCTION

BREMONT™ Designed For Living.

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
C	ISSUED FOR 3RD SITE PLAN SUBMISSION	2020-10-29	GT
B	ISSUED FOR 2ND SITE PLAN SUBMISSION	2020-08-17	GT
A	ISSUED FOR 1ST SITE PLAN SUBMISSION	2020-04-03	GT

DESIGN	GT
REVIEWED BY	LR
DRAWN	BS
CHECKED BY	GT
DATE	MARCH 2020
SCALE	1:350

MEADOWS OF NORFOLK
BREMONT (NORFOLK) HOMES

PROJECT NO. 188454

STORM DRAINAGE AREAS

SHEET NO. 14

FILENAME: C:\PW WORKING DIRECTORY\PROJECTS 2018\34ATC\DN039302\188454-02-UTIL-CON.DWG PLOTTED BY: CAIN, ARYN
PLOT DATE: 2020-10-30 @ 8:41:26 AM PLOT SCALE: 1:254.4 PLOT STYLE: DILLON-STANDARD.CTB
DILLON CONSULTING LIMITED 130 DUFFERIN AVENUE, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-8209

PROJECT TITLE:	Meadows of Norfolk
PROJECT No.:	18 8454
CLIENT:	Bremont Homes (Norfolk)
ISSUED FOR:	3rd Submission (October 29, 2020)

STORM WATER DESIGN SHEET
5 - YEAR STORM
TOWN OF SIMCOE - NORFOLK COUNTY

ENGINEER'S SEAL

PREPARED BY:

NOTES, STANDARDS AND DESIGN INPUT PARAMETERS

Inlet Time (mins): **19.00**

Run-off Coefficients:

Grass Areas	0.20
Backyards	0.75
Townhousing	**0.75**
Institutional	
Commercial/Asphalt	
Other (if applicable)	

IDF Parameters:

Storm:	A	B	C
5 - Year	583.02	3.007	0.703
25 - Year	721.53	2.253	0.679
100 - Year	801.04	1.501	0.657

Formula: $I_{YR} = \frac{A}{(t + B)^C}$

where; I= Intensity (mm/hr)
t= Time of Concentration (MIN)

Note: PVC pipe is manufactured in metric dimensions, therefore, the pipe diameter stated is used to calculate capacity and velocity. However, since concrete pipe is manufactured in imperial dimensions, standard imperial equivalent sizes for the diameter stated have been used to calculate capacity and velocity.

Catchment	STREET	Upstream Manhole	Downstream Manhole	A Grass Areas (ha)	A Backyards (ha)	A Townhousing (ha)	A Institutional (ha)	A Commercial/ Asphalt (ha)	A Other - Specified Above (ha)	A x R This Section (ha)	Acc. AR (ha)	t (min)	I (5yr) (mm/hr)	Q (5yr) (l/s)	I (25yr) (mm/hr)	Q (25yr) (l/s)	I (100yr) (mm/hr)	Q (100yr) (l/s)	Q(design) (l/s)	Type	Pipe (mm)	Grade (%)	Capacity (l/s)	Length (m)	Velocity (m/s)	Down-stream Velocity (m/s)	Change in Velocity (m/s)	Time (min)	Total Time (min)	Capacity (%)
O and OS2		CB N	CBMH M	**0.006**	**0.164**					0.124	0.124	19.00	66.35	22.89	90.56	31.24	110.11	37.99	22.89	PVC	**250**	**0.50**	42.05	**29.0**	0.86	0.86	0.00	0.564	19.56	54%
L		CBMH M	12		**0.031**					0.023	0.147	19.56	65.18	26.70	88.96	36.44	108.16	44.30	26.70	PVC	**250**	**0.50**	42.05	**8.7**	0.86	0.87	0.02	0.169	19.73	63%
N and OS3		12	CBMH 6	**0.035**		**0.008**				0.013	0.160	19.73	64.84	28.90	88.50	39.45	107.59	47.96	28.90	PVC	**250**	**0.52**	42.88	**30.3**	0.87	0.99	0.11	0.578	20.31	67%
F	Street D	CBMH 6	5			**0.068**				0.051	0.211	20.31	63.71	37.42	86.95	51.08	105.71	62.10	37.42	PVC	**300**	**0.52**	69.73	**30.5**	0.99	1.06	0.07	0.515	20.83	54%
E	Street D	5	3			**0.152**				0.114	0.326	20.83	62.74	56.76	85.63	77.47	104.10	94.18	56.76	PVC	**300**	**0.60**	74.90	**60.3**	1.06	1.12	0.06	0.948	21.78	76%
D	Street D	4	3			**0.073**				0.055	0.055	19.00	66.35	10.15	90.56	13.85	110.11	16.84	10.15	PVC	**300**	**0.50**	68.38	**8.4**	0.97	1.12	0.16	0.145	19.14	15%
	Street C	3	2			**0.000**				0.000	0.381	21.78	61.04	64.56	83.32	88.12	101.30	107.13	64.56	PVC	**375**	**0.50**	123.98	**70.2**	1.12	1.52	0.39	1.042	22.82	52%
K & OS1 & C		CB L	10	**0.177**	**0.102**	**0.041**				0.142	0.142	19.00	66.35	26.24	90.56	35.81	110.11	43.54	26.24	PVC	**250**	**0.50**	42.05	**2.0**	0.86	1.06	0.20	0.039	19.04	62%
J	Street A	10	9			**0.040**				0.030	0.172	19.04	66.27	31.73	90.45	43.30	109.97	52.65	31.73	PVC	**300**	**0.60**	74.90	**29.9**	1.06	1.12	0.06	0.470	19.51	42%
G	Street A	9	7			**0.189**				0.142	0.314	19.51	65.29	56.97	89.12	77.75	108.35	94.53	56.97	PVC	**375**	**0.50**	123.98	**6.8**	1.12	1.15	0.02	0.101	19.61	46%
H	Fernwood Drive Ext.	8	7			**0.106**				0.080	0.080	19.00	66.35	14.65	90.56	20.00	110.11	24.32	14.65	PVC	**300**	**0.50**	68.38	**32.8**	0.97	1.15	0.18	0.565	19.57	21%
I	Street A	7	2			**0.275**				0.206	0.600	19.61	65.09	108.47	88.84	148.04	108.01	179.99	108.47	CONC	**450**	**0.40**	188.11	**56.0**	1.15	1.52	0.37	0.815	20.42	58%
B	Street C	2	1			**0.252**				0.189	1.170	22.82	59.30	192.66	80.95	263.02	98.42	319.78	192.66	CONC	**450**	**0.70**	248.85	**28.7**	1.52	1.81	0.30	0.316	23.13	77%
M & OS3		CB-O	11	**0.043**	**0.143**					0.116	0.116	19.00	66.35	21.36	90.56	29.15	110.11	35.44	21.36	PVC	**250**	**0.50**	42.05	**31.1**	0.86	0.86	0.00	0.605	19.61	51%
P		11	CBMH B			**0.027**				0.021	0.136	19.61	65.10	24.67	88.85	33.67	108.02	40.94	24.67	PVC	**250**	**0.50**	42.05	**27.3**	0.86	0.86	0.00	0.531	20.14	59%
		CBMH B	1							0.000	0.136	20.14	64.05	24.27	87.41	33.13	106.27	40.28	24.27	PVC	**250**	**0.50**	42.05	**4.3**	0.86	1.81	0.96	0.084	20.22	58%
A	Street C	1	ext MH76			**0.061**				0.046	1.352	23.13	58.79	220.77	80.27	301.42	97.59	366.48	220.77	CONC	**450**	**1.00**	297.43	**7.8**	1.81	1.43	0.39	0.072	23.20	74%
		Total HA		**0.261**	**0.440**	**1.293**																								
		Overal Area (ha.)				**1.994**																								

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DATE: MARCH 2020
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BREMONT (NORFOLK) HOMES

STORM SEWER SYSTEM
STORM SEWER DESIGN SHEET

PROJECT NO.: **188454**
SHEET NO.: **15**

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WESTWOOD TRAILS SUBDIVISION

Functional

Stormwater Management Report

Project Location:
Simcoe, ON

Prepared for:
Westwood Trail Developments Inc.
c/o Mike McArthur and Dave Pond
34 Virginia Avenue
Simcoe, ON N3Y 5M4

MTE File: 38750-124

March 9, 2016



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MTE CONSULTANTS INC.
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MTE Drawing No. SW1.2 Rev. 2 ..... Encl.
MTE Drawing No. LG1.1 Rev. 7 ..... Encl.

1.0 INTRODUCTION AND BACKGROUND

1.1 Overview

MTE Consultants Inc. was retained by Westwood Trail Developments Inc. (WTD) to undertake a Functional Stormwater Management (SWM) Study in support of the proposed Westwood Trails development in the Town of Simcoe (see Figure 1 for location plan).

The property is located to the south of the end of Fernwood Drive. The subject site is bounded by Residential dwellings to the north, agricultural farmland to the south and a woodlot to the east and west. It is located on a 5.50ha parcel of land. The Site is currently vacant land with mature trees and unmaintained vegetation. There is no vehicle access to the Site and there are no structures on the property.

Development plans for the Westwood Trails Subdivision and Smith property includes the construction of approximately twenty (20) single family dwelling units and approximately seventy (70) townhouse condominium units with required roads, stormwater management (SWM) facility and municipal services (storm, sanitary, water). The SWM facility will be located west of the proposed development located on lands also owned by the owner. This SWM facility will be designed to service the entire Westwood Trails property.

In 2014 a preliminary report accompanied a full engineering submission. During a subsequent meeting to discuss planning and engineering matters, it was noted that the pond could not be placed where it was proposed, due to various planning issues. Since that time, the construction of Phase 1 infrastructure has been completed and an arrangement has been made such that the pond can be located as shown within this report.

Through discussions with the County of Norfolk and the LPRCA, it is noted that there is no "legal outlet" available for overland flow. The proposed solution will incorporate 100% infiltration for flows from the site through the use of a large infiltration gallery. Also, from discussions with the client and the County; we have included the "Smith" lands to the east of the development, an area that is already designated 'Urban" in the OP and can be designed to drain through these lands to the proposed SWM facility.

1.2 Purpose of Study

The purpose of this study is to develop a functional stormwater management strategy for the current development proposal, taking the findings of previous studies into consideration, which is acceptable to the County of Norfolk, the Long Point Region Conservation Authority (LPRCA), and the Ministry of the Environment (MOE).

TOWN OF SIMCOE

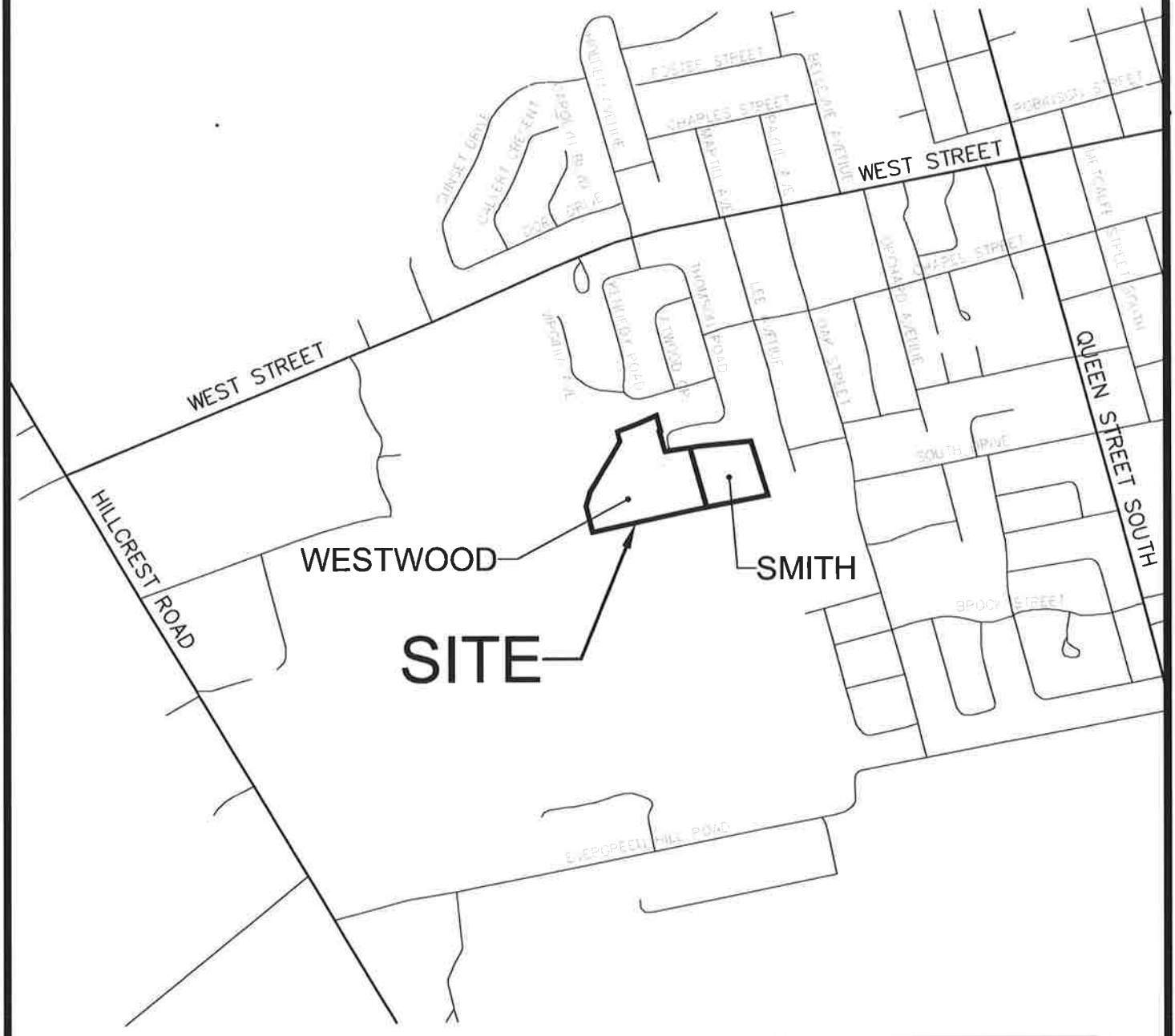


Figure 1 Date: Feb..2016 Scale: N.T.S.

Location Plan
Westwood Trails Subdivision

MTE
Engineers | Scientists | Surveyors

Project No.: 38750-124

March 4, 2016 1:58 p.m. Plotted By: bboyd

1.3 Objectives

The objective of this stormwater management plan is to ensure that the proposed development includes the necessary controls to protect the hydrology and water quality of the receiving water systems. The primary objectives of this study are as follows:

- Establish criteria for the management of stormwater runoff from the study area.
- Assess impacts of development on the peak flow rates at the downstream outlet of the study area.
- Recommend a comprehensive strategy for controlling the quantity and quality of stormwater runoff from the study area.
- Recommend a comprehensive strategy for controlling the volume of infiltration to groundwater.
- Deal with limited outlet options through use of infiltration.

1.4 Background Information

The following documents were referenced in the preparation of this report:

Ref. 1: Preliminary *Geotechnical Investigation, Proposed Development Fernwood Drive, prepared by CMT Engineering Inc., June 30, 2014.*

Ref. 2: Draft Hydrogeological Investigation, *Proposed Residential Development, prepared by MTE Consultants Inc., July 30, 2014.*

Ref. 3: *MOE Stormwater Management Practices Planning and Design Manual,* Ministry of Environment, March 2003.

Ref. 4: The Corporation of Norfolk County, Design Criteria, May 2009.

Ref. 5: Hydrometer Analysis, Westwood Project, *prepared by CMT Engineering Inc., Sep 2, 2014.*

1.5 Geotechnical Investigations

A geotechnical investigation was carried out by *CMT Engineering Inc.* dated June 30, 2014 to determine the existing subsurface soil conditions for the undeveloped Westwood Trails property lands. Eight (8) boreholes (referenced as MW 1-14 to 7-14 and BH 8-14) were drilled at depths varying between 5.94m and 12.19m below the existing ground surface. Topsoil depths varied between 50mm and 460mm. The subsurface conditions are generally comprised topsoil, fill, silty sand/sand, sand and gravel, silt and clayey silt. Bedrock was not encountered during the drilling activities.

A Hydrogeological Investigation was carried out by MTE Consultants dated July 30, 2014 to determine the existing subsurface soil conditions for the undeveloped Edgewater property lands. Eight (8) boreholes (referenced as MW 1-14 to 7-14 and BH 8-14) were drilled at depths varying between 5.94m and 12.19m below the existing ground surface. Monitoring wells were installed in all of the boreholes with the exception of BH8-14. Hydraulic conductivity testing was completed in select Monitoring

wells and groundwater flow and velocity were also analyzed. It was found that shallow overburden groundwater generally mimics the topography and flows across the Site in a westerly to southwesterly direction. The report also determines the groundwater quality based on select monitoring wells.

Additional test pits were completed on August 15, 2014 and a grain size analysis was completed by CMT Engineering. This analysis shows that the T-time of the sand layer (between 2.5 and 3.0m thick) is 8 min/cm.

2.0 STORMWATER MANAGEMENT CRITERIA

The Westwood Trails subdivision and Smith property is located in the Town of Simcoe and the County of Norfolk within the Long Point Region Watershed. New developments are required to provide stormwater management in accordance with the LPRCA as well as provincial and municipal policies including:

- Stormwater Management Practices, Planning and Design Manual MOE, March 2003;
- Long Point Region Conservation Authority (LPRCA);
- The Corporation of Norfolk County, Design Criteria, May 2009.

Based on the above policies and the above referenced documents, the following stormwater management criteria have been established for this site:

2.1 Quantity Control

Norfolk County requires that post development peak flows are controlled to pre-development levels for all storm events up to and including the 100-year level.

2.2 Quality Control

Storm runoff from the proposed development area will drain to the Long Point Region Watershed Area. MOE and LPRCA require an "Enhanced" (80% TSS removal) level of water quality protection for areas draining to the Long Point Region Watershed. As such, an "Enhanced" (80% TSS removal) level of protection will be applied to the site SWM servicing in accordance with the Stormwater Management Planning and Design Manual (MOE, March 2003).

2.3 Erosion Control

The LPRCA, MOE and Norfolk County require sufficient erosion control storage to mitigate downstream erosion. The erosion control strategy for the development has been based on the MOE design manual recommendation that the 25mm storm event be detained and released over a 24 to 48 hour period as a means of providing erosion control. This criterion will be applied to the proposed development.

3.0 EXISTING CONDITIONS

3.1 Westwood Trails Drainage Catchments

Under existing conditions, runoff from the Westwood Trails and Smith property site travels north to south and there is a small berm separating the Site from the agricultural farmland to the south. West of the proposed development is a heavily wooded ridge that runs north to south.

3.2 Pre-Development Hydrologic Modeling

As previously discussed, under pre-development conditions, storm runoff generated from the Westwood Trails and Smith property site outlets to one main area west of the proposed development. A hydrologic model has been created to model this one (1) catchment under existing conditions. It should be noted that this area includes an area external to the site. This external area is located west of the development and will drain to the proposed SWM facility. The area has been delineated as catchment area 101 (Refer to Figure 2 - Pre-Development Drainage Area Plan). Table 3.1 provides a brief description of the catchment area as well as the design parameters used in the hydrologic modeling.

TABLE 3.1 – PRE DEVELOPMENT CATCHMENT PARAMETERS

Catchment ID	Description	Area (ha) [1]	HSG [2]	T_p (hrs) [3]	Perv. CN [4]	Pervious Initial Abstraction (mm) [5]
101	Existing wooded Westwood property draining North to South	7.87	A	0.45	58	2.50
	Total	***7.87***				

Notes:
[1] Drainage area based on topographic Survey by MTE.
[2] Hydrologic soil group selected based on the aforementioned geotechnical reports.
[3] Time to peak values (see appendix B for calculations).
[4] CN values based on the aforementioned geotechnical reports.
[5] Initial abstraction values based on the aforementioned geotechnical reports.

Using the design parameters listed in Table 3.1, the existing conditions were assessed using the SWMHYMO hydrologic modeling program developed by J.F. Sabourin & Associates for the Norfolk County IDF curve and the 4-hour Chicago storm distribution. Pre-development peak flow rates were established for the 25mm to 100-year storm events. Appendix B contains detailed hydrologic modeling parameters and input/output printouts for the existing conditions. Table 3.2 summarizes the allowable discharge for the catchment.

TABLE 3.2 – PRE-DEVELOPMENT CONDITIONS PEAK DISCHARGE RATES

Storm Event	Rainfall Depth (mm) [1]	Allowable Release Rate (m^3/s) [2]
25mm	25.3	0.035
2-year	35.2	0.063
5-year	49.0	0.115
10-year	57.9	0.158
25-year	69.4	0.216
50-year	78.3	0.267
100-year	87.1	0.318

Notes:
[1] Rainfall depth taken from SWMHYMO output.
[2] Total discharge taken from SWMHYMO output.

LEGEND

CATCHMENT BOUNDARY

EXISTING DIRECTION OF DRAINAGE

101 — ID No.
6.32 — AREA (Ha)
0.9 — % IMPERVIOUSNESS

PROPERTY LINE BOUNARY

326 — EXISTING CONTOURS

VIRGINIA AVENUE

THOMSON ROAD

N

101
7.87
0

Figure2

Date: Feb. 2016
Scale: 1:1500

Pre-Development Catchment Areas

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March 4, 2016 2:11 p.m. Plotted By: bboyd

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4.0 PROPOSED DEVELOPMENT AND SWM STRATEGY

4.1 Proposed Area Grading

Finished Grade Contour Plan 38750-124 LG1.1 Rev. 7 illustrating finished road and site grades is included and has been used for the functional storm water management report. The configuration of the Phase 2 condominium is unknown and may not reflect the final design. The grading design of the site is controlled by many factors which include servicing constraints (both sanitary and storm), matching existing grades along the adjacent properties and environmental features, as well as maintaining a cut/fill balance for the development. It should be noted that the final condominium configuration has not been finalized and thus the grading plan is still preliminary. The conceptual design of the Smith lands was completed to minimize the potential of surface flows toward adjacent properties and direct flow to the proposed SWM facility.

4.2 Post Development Conditions

Under post-development conditions (refer to Figure 3 – Post-Development Catchment Areas), the Westwood Trails and Smith property (catchment 201 + 202) has a total area of 5.50 ha and has been assumed to be in a developed condition and will drain to the proposed SWM facility via the future urbanization of Street B, C, D and Fernwood Drive. Additional external area located outside of the development will drain to the SWM facility, noted as Areas 102 and 103.

The development consists primarily of single family dwelling units and townhouse condominium units. The stormwater management facility will be located west of the development (on property also owned by the applicant) and will be providing quantity and quality control. As discussed previously, the SWM facility will be constructed to service the proposed Westwood Trails development. The majority of the proposed Westwood Trails development drains to the proposed SWM facility, via a proposed storm sewer system that will be sized to convey the County of Norfolk 5 year storm event. The proposed SWM facility wet cell will be sized to contain the 100 year storm and slowly discharge stormwater to an infiltration cell to allow water to infiltrate into the ground.

The post-development drainage area was delineated into six (6) sub-catchments. Table 4.1 provides a brief description of each sub-catchment area as well as the design parameters used in the hydrologic modeling. Figure 3 provides an illustration of the post development catchment areas. Appendix B contains detailed hydrologic modeling parameters and input/output printouts for the proposed conditions.

LEGEND

- CATCHMENT BOUNDARY
- OVERLAND FLOW ROUTE
- EXISTING DIRECTION OF DRAINAGE
- 101 / 6.32 / 0.9 — ID No. / AREA (Ha) / % IMPERVIOUSNESS
- PROPERTY LINE BOUNDRY
- 326 — EXISTING CONTOURS

VIRGINIA AVENUE

THOMSON ROAD

THOMSON ROAD

SMITH LANDS

Wet Cell

102 / 1.29 / 0

103 / 0.37 / 0

201 / 0.39 / 36

202 / 5.11 / 55

203 / 0.46 / 50

204 / 0.25 / 50

N

Figure3

Date: Feb.2016
Scale: 1:1500

Post-Development Catchment Areas

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Project No.: 38750-124

March 4, 2016 2:11 p.m. Plotted By: bboyd

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4.3 Post Development Drainage Catchments

Catchment 201
Front yards of the residential lots of the Thomson Road Cul-de-sac and the road area of the cul-de-sac itself make up this catchment area. The major and minor storm events from this area will drain uncontrolled to Thomson Road and the existing storm sewer.

Catchment 202
The Westwood Trails subdivision and Smith property which is comprised of residential development and associated road ways. Runoff from this catchment will be collected and conveyed by proposed storm sewers and right-of-ways and will drain to the proposed SWM facility.

Catchment 203
This catchment is comprised of the proposed Westwood Trails SWM pond, specifically the forebay cell and wet cell of the proposed SWM facility.

Catchment 204
This catchment is comprised of the proposed Westwood Trails SWM pond, specifically the infiltration cell of the proposed SWM facility.

Catchment 102
This catchment is comprised of the existing wooded ravine located west of the proposed development which drains overland to the proposed SWM facility, specifically the wet cell of the proposed SWM facility.

Catchment 103
This catchment is comprised of the existing wooded area located east of the proposed infiltration cell. Runoff from this catchment will drain overland to the proposed SWM facility, specifically the infiltration cell of the proposed SWM facility.

TABLE 4.1 – POST DEVELOPMENT CATCHMENT PARAMETERS

Sub-Catchment	Description	Area (ha) [1]	HSG [2]	T Imp. (%) [3]	X Imp. (%) [4]	I_a PER (mm) [5]	I_a IMP (mm) [5]	Perv. CN [6]
201	Front Yards of Residential Lots of the Thomson Road Cul-de-sac (uncontrolled)	0.39	A	36	36	2.50	1.0	72
202	The Proposed Westwood Trails Subdivision + Smith Property	5.11	A	55	55	2.50	1.0	72
203	Westwood SWM Facility - Wet Cell	0.46	A	50	50	2.50	1.0	72
204	Westwood SWM Facility - Infiltration Cell	0.25	A	50	50	2.50	1.0	72
102	External Drainage to SWM Facility - Wet Cell	1.29	A	N/A	N/A	2.50	N/A	58
103	External Drainage to SWM Facility - Infiltration Cell	0.37	A	N/A	N/A	2.50	N/A	58
	Total (developed area + undeveloped external drainage)	***7.87***						

Notes:
[1] Drainage area based on topographic Survey by MTE.
[2] Hydrologic soil group selected based on the aforementioned geotechnical reports.
[3] Total percent impervious based on proposed subdivision plan.
[4] Directly connected percent impervious conservatively estimated to be equal to total percent impervious.
[5] Initial abstraction values selected based on the aforementioned geotechnical reports.
[6] CN values based on the aforementioned geotechnical reports and proposed land use.

5.0 STORMWATER MANAGEMENT DESIGN

5.1 Hydrologic Modeling

A hydrologic model was developed to provide a quantitative estimate of flows across the site under existing and proposed development conditions and to design stormwater management systems capable of meeting the criteria previously outlined in Section 2.0. The SWMHYMO hydrologic modeling program (J.F Sabourin and Associates) was utilized for the storm event simulations. Existing and proposed development conditions were modeled for the:

- Quality event (25mm depth, 4-hour Chicago storm distribution),
- 2 - 100 year return period rainfall events (4-hr Chicago storm distribution derived from the County of Norfolk Intensity-Duration-Frequency parameters)

Refer to Appendix A for SWM facility design details and Appendix B for Hydrologic Modeling Input/Output Files.

5.2 Rainfall Data

Previous hydrologic modeling for the Westwood Trails development utilizes the County of Norfolk Intensity-Duration-Frequency (I-D-F) curve parameters and a 4-hour Chicago storm distribution. Hydrologic modeling for this study uses the same rainfall distribution. Precipitation files were generated using the County of Norfolk parameters, with a 4-hr Chicago storm distribution.

5.3 Stormwater Quality Control

The proposed SWM facility has been designed as wetland pond/infiltration facilities with a permanent pool depth of 0.3m and a 1.0m deep micro pool near outlet of the wet cell. These facilities offer the benefits of dilution and settling of sediment within the forebay and the wet pond components. A planting scheme will be prepared that carefully selects plant species and their location in and around the basins to stabilize banks, mitigate temperature increases, deter waterfowl from nesting within the area, and provide aesthetics and safety benefits.

The SWM Facility is divided into three cells: the first cell consists of a sediment forebay accepting minor storm event flows, the second is the quality control portion, and the third is an infiltration area - accepting storm runoff from the main wet pond, under all storm events up to and including the 100 year storm. A perforated CSP riser with a 75mm diameter orifice will be located at the west end of the wet pond, at the permanent pool elevation of 230.60m.

The sediment forebay will accept minor storm event flows from proposed storm sewers designed to convey up to the 5 year storm flows from area 202 totaling 5.11 ha as shown on Figure 3.0. The second cell consists of the main wetland pond/detention storage area of the pond. Berms have been added to increase the length-to-width ratio to maximize flow path and minimize short-circuiting potential. The sediment forebay has been provided at the inlet point to the facility with a designed treatment level of 80% TSS removal. Maintenance of the forebay at all points in the sediment accumulation/clean-out cycle minimizes the potential for scour and re-suspension of previously settled sediments. Please refer to Appendix A for forebay design details and cleanout requirements.

Since the majority of annual rainfall occurs in storms less than or equal to a 25mm event, the majority of water borne sediment is also transported to the SWM facility in these less intense events. Therefore, the sediment forebay is designed targeting the smaller flows for quality control. Furthermore, larger storm events will have greater peak flows, there is potential for re-suspension of accumulated sediment. Thus, the smaller flows into the forebay will be separated from the larger flows which will by-pass the forebay and will discharge to the wet cell and outlet to the existing channel. Since the storm sewer system within the subdivision has been designed to convey up to the 5 year storm, larger storm events will travel overland by street right-of-ways to the wet cell. Grading within the subdivision, specifically area 202, has been designed such that these major flows will be directed to the wet cell by the aforementioned street right-of-ways.

Refer to MTE Drawings SW1.1 for a preliminary plan view of the SWM Facility.

5.3.1 Sediment Forebay Design

The forebay design is based on the design guidance presented in the MOE's 2003 *Stormwater Management Practices Planning and Design Manual.* As recommended in that document, the forebay area is less than 20% of the total permanent pool area. The methodology for classic particle settling and flow dispersion equations also presented in that document suggest that the design flow for the settling length of the forebay should be taken as the peak outflow from the facility. A forebay is typically designed to treat minor storm flows. Therefore, the main pond will essentially be empty (or at its permanent pool level) and there will be no mass of water at the outlet of the forebay that would control the flow through the forebay to the main ponds discharge rate.

This being the case, the design of the forebay should be based on the notion that the flow into the forebay equals the flow through the forebay, which equals the flow out of the forebay. In using this approach, the recommended settling velocity of 0.0003 m/s (from MOE 2003) results in extremely large and un-achievable forebay lengths.

Therefore, the forebay is designed to satisfy the following four conditions:

- Settling length based on a settling velocity of 0.0003m/s using the main pond peak discharge for the 25 mm event (as per MOE 2003).
- Settling length based on a settling velocity of 0.0055 m/s using the forebay inflow/outflow for the 25 mm event.
- Dispersion length such that, based on flow and depth of water, the velocity through the forebay is less than 0.5 m/s.
- Velocity based on flow divided by cross-sectional area is less than 0.15 m/s to prevent scouring.

The 2003 MOE document suggests that the clean-out frequency for the SWM facility be based on the sediment loading within the entire pond. The recommended clean-out frequency calculations for the proposed SWM facility can be found in the forebay design calculations in Appendix A. As is noted in Section 7, it is recommended that observations of sediment accumulation within the pond be completed on a regular basis.

5.3.2 Water Quality Volume

Based on the MOE's 2003 Stormwater Management Guidelines, an Enhanced Level (formerly Level 1) of water quality protection is required. Quality control measures proposed will take the form of a wetland pond SWM facility, servicing a total drainage area of 6.86ha with an average imperviousness of 45%. An Enhanced Level of water quality control (based on a wet pond using an imperviousness of 45%) requires a storage volume of 92m^3/ha. Of this volume, all but 40m^3/ha represents the permanent pool requirement.

Considering the total post-development drainage area draining to the SWM facility of 6.86ha, which is made up of areas 202, 203, and 102 this equates to a required permanent pool volume of 357m^3. The permanent pool volume provided in the main wet pond area is 344m^3. The permanent pool volume provided in the forebay totals 95m^3. The main pond and forebay combine to provide a total permanent pool volume of 439m^3, which exceeds the required volume recommended by the MOE.

Table 5.1 outlines the design of the proposed SWM facility. Appendix A contains design calculations for the sediment forebay, stage storage discharge information for the SWM facility as well as draw down calculations for the SWM facility.

TABLE 5.1 – WATER QUALITY CONTROL DETAILS

Pond Characteristics	Required	Provided
Water Quality – Level of Protection	Enhanced – 80% long-term S.S. removal	
Total Contributing Area (Area 201+202+203+204+102)	6.86 ha	
Imperviousness (development + external drainage)	45%	
Storage Volumes:		
* Unit Area Storage Volume Requirements as per SWMMP (MOE 2003)	$92m^3$/ha	
Permanent Pool Volume (based on 52 m^3/ha)	$357m^3$	$439m^3$
Extended Detention Volume (based on $40m^3$/ha)	$274m^3$	25mm storm
Extended Detention Volume (based on 25mm storm)	25mm storm = $761m^3$	
Elevations:		
Bottom of Pond (Forebay)	229.60	
Bottom of Pond (Main Pond)	230.30	
Bottom of Pond (Micro Pool in Main Pond)	229.60	
Permanent Pool	230.60	
Extended Detention (25mm storm)	231.00	
High Water Level (0.3m freeboard)	232.10	
Top of Pond	232.40	
Forebay Length	13.0m	13.5m
Peak Release Rates:		
Extended Detention (25mm storm)	$0.012m^3$/s	
Approximate Drawdown Time in Wet Cell (25mm storm event)	24hr	31.5hr
Approximate Drawdown Time in Wet Cell (100 year storm event)	-	79.3hr
Outlet Controls to Infiltration Cell		
Fully Perforated 1500mm dia. CSP Riser c/w Stone Jacket		
Outlet pipe – 300 mm dia. at 0.95%		
Orifice Diameter (Extended Detention)	75mm	
Orifice Elevation (Extended Detention)	230.60	
5.0m Emergency Overflow Weir – Elevation	232.10	
5.0m wide, 0.3m deep Emergency Overflow Channel - Slope	17%	
Infiltration Cell		
Bottom Elevation	230.23 - 230.40	
Bottom slope	0.5%	
25mm ponding level (230.33) area	1045 m^2	
High Water Level (0.3m freeboard)	230.63	
Top of Pond	230.93 - 231.10	
Approximate Drawdown Time (100 year storm event)	11.5hr	
5.0m Emergency Overflow Weir – Elevation	230.63	
5.0m wide, 0.3m deep Emergency Overflow Channel - Slope	7.2%	

* Note: of this storage volume $40m^3$/ha is extended detention

5.4 Stormwater Quantity Control and Infiltration Cell

The most significant design feature of this facility is the use of the infiltration cell as the outlet. Considering the sandy nature of the area, all outflows up to and including the 100 year storm, can be infiltrated. The sandy soils in the area have a T-time of 8 min/cm, which converts to a percolation rate of 0.00002m/s (75mm/hr.) For calculation purposes, we have assumed a factor of safety of approximately 2 and will use a percolation rate of 0.00001m/s (36mm/hr.)

Considering that the outlet is an infiltration cell, rather than an overland flow, the drawdown within the pond is dependent upon the amount of water that can be reasonably infiltrated into the ground. The overall objective was to create a cell that could infiltrate the 4 hour 100 year storm in approximately 96 hours. Based on the above infiltration rate, we have determined that a cell approximately 33m wide by 52m long as shown on Drawing SW1.1 will accommodate this infiltration. All other flows will be drained in less time than this. Since the drawdown of the lesser storms are normally based on downstream erosion potential and since there is no overland flow outlet, the drawdown of the wetpond will be equal to the ability of the infiltration cell to accommodate the flows.

Sizing of the infiltration cell is based on the MOE SWM Planning & Design Manual (Equation 4.3: A = 1000V / P n t), using the storm runoff volume from the 100 year event (3,680 m^3). The bottom area required for a 96 hour drawdown time (using a percolation rate of 0.00001m/s), requires a bottom area of 1065 m^2. However, to account for the 20% infiltration contingency, sloped bottom of the infiltration basin, and storage configuration/depth requirements, the actual area provided for the bottom of the infiltration cell (230.4 m) is 1,789 m^2. (170% of flat area required). This sizing calculation assumes that the 100 year storm event will be contained within the infiltration cell and will drawdown in 96 hours. However, the detention facility (wet cell) has been designed to accommodate the maximum storage of the 100 year storm, slowly releasing into the infiltration cell through the use of a CSP riser with a 75mm diameter outlet control. Thus the actual maximum volume in the infiltration cell for the 100 year storm is significantly less (451 m^3). As a result, the drawdown time of the infiltration cell for the 100 year storm, based on stage-storage characteristics, is approximately 11.5 hours. The drawdown time of the wet pond for the 100 year storm, based on stage-storage characteristics, is approximately 79.3 hours, all other storm events drain in shorter time periods. Please refer to Appendix A for further details on drawdown time and detailed stage-storage-discharge relationships for the SWM facility.

An infiltration rate, for the Infiltration Cell, was established based on Darcy's Law (Q=kiA). As previously mentioned, k = 10^{-3}cm/s (0.00001m/s). The ground contact area (i.e. A) of the Infiltration Cell varies from 726m^2 at elevation 230.30 to 1,966 m^2 at elevation 230.60m. The hydraulic gradient (i) is assumed to be 1. Therefore; Q_{max} = 0.00001m/s x 1 x 1,996m^2 = 0.0200m^3/s (elevation 230.60m). The maximum release rate from the SWM facility (wet cell) during the 100 year storm is 0.023m^3/s. Additional storage volumes within the infiltration cell will accommodate the difference. The

maximum required volume within the infiltration cell for the 100 year storm is 451m^3 while the infiltration cell can accommodate a storage volume of 527m^3 at 0.3m freeboard (230.60m).

During a very severe storm event, an additional 5.0m wide emergency overflow weir has been provided. While it is unlikely that this weir will get used, it is felt that this additional protection would be prudent.

As an additional feature, small buried perforated pipes will be provided below frost cover to distribute the flow across the entire infiltration cell and will also allow for infiltration during the frozen periods.

To ensure the integrity of the wetland facility, the wet cell portion of the SWM facility will be lined with relatively impervious materials available from elsewhere within this property. The adjacent boreholes show a relatively impervious silty clay material with a very slow infiltration rate that will limit the infiltration from occurring within the main wet pond and forebay area.

TABLE 5.2 – STAGE-STORAGE-DISCHARGE INFORMATION (WET POND)

Elevation (m)	Discharge (m^3/s)	Volume (m^3)	Remarks
230.60	0	0	Permanent Pool elevation, 75 mm orifice invert
230.70	0.0045	178	Contour
230.80	0.0077	359	Contour
230.90	0.0099	554	Contour
231.00	0.0117	761	Contour
231.10	0.0133	982	Ext. Detention Elevation (25mm storm – 231.06)
231.20	0.0147	1214	Contour
231.30	0.0160	1460	Contour
231.40	0.0172	1718	Contour
231.50	0.0183	1988	Contour
231.60	0.0193	2271	Contour
231.70	0.0203	2567	Contour
231.80	0.0212	2876	Contour
231.90	0.0221	3197	Contour
232.00	0.0230	3530	Contour
232.10	0.0238	3877	0.3m Freeboard, 5.0m wide Emergency Overflow Weir
232.20	0.2928	4238	Contour
232.30	0.8268	4618	Contour
232.40	1.5773	5015	Top of Pond

TABLE 5.3 – STAGE-STORAGE-DISCHARGE INFORMATION (INFILTRATION CELL)

Elevation (m)	Discharge (m^3/s)	Volume (m^3)	Remarks
230.23	0.0000	0	Bottom of Infiltration Cell
230.30	0.0073	25	Contour
230.40	0.0179	151	Contour
230.50	0.0188	334	Contour
230.60	0.0197	527	0.3m Freeboard, 5.0m wide Emergency Overflow Weir - Elevation = 230.63
230.70	0.1750	728	Contour
230.80	0.6395	938	Contour
230.90	1.3267	1158	Top of Infiltration Cell

A summary of the post development peak flows (uncontrolled) to Thomson Road is provided in Table 5.4.

TABLE 5.4 – POST DEVELOPMENT CONDITIONS PEAK DISCHARGES

Storm Event	Rainfall Depth (mm) [1]	Total Allowable Discharge under Pre-Development Conditions (m^3/s) [2]	Total Discharge to Thomson Road (Uncontrolled) under Post-Development Conditions (m^3/s) [3]
25mm	25.3	0.035	0.023
2-year	35.2	0.063	0.029
5-year	49.0	0.115	0.041
10-year	57.9	0.158	0.049
25-year	69.4	0.216	0.062
50-year	78.3	0.267	0.072
100-year	87.1	0.318	0.083

Notes:
[1] Rainfall depth taken from SWMHYMO output.
[2] Taken from table 3.2.
[3] Total discharge taken from SWMHYMO output.

TABLE 5.5 – SUMMARY OF SWM FACILITY PONDING ELEVATIONS-STORAGE-OUTFLOW (WET POND)

Storm Event	Maximum Storage Volume Used (m^3) [1]	Maximum Ponding Elevation (m)	Wet Pond Outflow (m^3/s) [2]
25mm	757	231.00	0.012
2-year	1,156	231.18	0.014
5-year	1,766	231.52	0.017
10-year	2,189	231.57	0.019
25-year	2,756	231.76	0.021
50-year	3,217	231.91	0.022
100-year	3,680	232.04	0.023

Notes:
[1] Taken from SWMHYMO output.
[2] Pond discharge taken from SWMHYMO output.

TABLE 5.6 – SUMMARY OF SWM FACILITY PONDING ELEVATIONS-STORAGE-OUTFLOW (INFILTRATION CELL)

Storm Event	Maximum Storage Volume Used (m^3) [1]	Maximum Ponding Elevation (m)	Outflow/Infiltration (m^3/s) [2]
25mm	68	230.33	0.011
2-year	100	230.36	0.014
5-year	139	230.39	0.017
10-year	174	230.41	0.018
25-year	263	230.46	0.018
50-year	352	230.51	0.019
100-year	451	230.56	0.019

Notes:
[1] Taken from SWMHYMO output.
[2] Pond discharge taken from SWMHYMO output.

The analysis indicates the following:

- The post development peak flow is made up of two components. Discharge from the SWM pond (controlled) + discharge to Thomson Road (controlled). Since all stormwater from the pond will be infiltrated into the ground via the infiltration cell, this component of the equation is effectively zero (0). Thus the post development peak flow is only comprised of the uncontrolled discharge to Thomson Road as shown in Table 5.4.
- For the entire development the post development condition peak flow rates are less than the respective pre-development condition flow rates for all storm events, see Table 5.4.
- Sufficient storage volume has been provided within the wet pond portion of the SWM facility to store the 100 year storm event. The maximum anticipated ponding elevation within the wet pond portion of the SWM facility will be 232.04m, or 1.44m above the permanent pool level. An emergency overflow weir is provided with a sill elevation of 232.10 and the top of pond elevation is 232.40. Proposed wet pond ponding elevations are illustrated in Table 5.5. The SWMHYMO input and output can be found in Appendix B.
- Sufficient volume has been provided within the infiltration cell portion of the SWM facility to store the 100 year storm event based on discharge from a 75mmØ orifice from the wet pond. The maximum anticipated ponding elevation within the infiltration cell will be 230.56m, or 0.33m above the bottom of the infiltration cell. An emergency overflow weir is provided with a sill elevation of 230.63 and the top of infiltration cell elevation at the downstream end is 230.93. Proposed infiltration cell ponding elevations are illustrated in Table 5.6. The SWMHYMO input and output can be found in Appendix B.
- The storm sewers within the development are sufficiently sized to collect and convey the 5-year peak flow rates. The proposed storm sewer connecting the wet pond to the infiltration cell is sufficiently sized to convey the 100 year peak flow rate based on discharge from a 75mmØ orifice from the wet cell.

5.5 Stormwater Management Facility Design Summary

Details for the proposed SWM facility are provided on MTE Drawing SW1.1 and SW1.2 and are appended to this report. The following list of SWM facility design characteristics, read in conjunction with the above drawing, outlines all significant design aspects and rationales.

- As previously described in Section 5.3, the SWM facility has been designed as a wetland pond/infiltration facility with sufficient permanent and active storage volumes to achieve an Enhanced (formerly Level 1) degree of protection.
- The outlet control structures for the SWM facility will be in the form of a perforated CSP riser c/w a 75mmØ orifice connected to a 300mmØ storm pipe that connects the wet cell to the infiltration cell. The storm pipe has been designed to ensure sufficient capacity during a 100 year storm. This outlet control orifice located within the CSP riser has been designed to provide a minimum of

24 hours of drawdown time for the extended detention volume. The drawdown time for extended detention is important to prevent erosion within the infiltration cell.

- A 5m wide emergency overflow weir along with a 5m wide emergency overflow channel connecting the wet cell to the infiltration cell has also been incorporated into the design of the SWM facility.
- The design of the SWM facility has incorporated internal side slopes of 5:1 (for safety) throughout the facility above the permanent water level where pedestrian access could be achieved. A 2.0m wide safety bench with 10:1 side slopes has also been incorporated into the design below the permanent water level and 3:1 side slopes below this to the bottom of the pond. Also a 5m wide buffer has been provided adjacent to the top of the SWM facility (west side) as per drawing SW1.1.
- Freeboard of 0.30m has been provided to the top of the berming around the SWM facility for both the wet cell and the infiltration cell above the 100 year high water level.
- Operation and maintenance of the SWM facility will be the responsibility of the County of Norfolk once the facility has been "assumed" by the municipality. Maintenance responsibilities include regular inspection of the basin. It should be noted that the estimated sediment clean-out frequencies outlined in the forebay calculation sheet might be reduced during the interval prior to complete stabilization of the upstream contributing drainage areas.

5.6 Water Balance

The UTRCA states that water balance mitigation measures must be implemented on new developments to maintain the existing local water budget to the extent technically, physically, and economically practical.

Wherever feasible, the following measures will be implemented to promote infiltration in the single family residential areas:

- Roof leaders will be directed to rear yards;
- Lots will be graded with split drainage to direct runoff to the rear yards; and
- Runoff from the rear yards will be collected and conveyed as surface flow in the Park/Walkway Blocks

Similarly, runoff from the proposed single family dwelling units and the townhouse condominium units will be directed to landscape features wherever feasible to promote infiltration.

Furthermore, since the outlet for the SWM pond is an infiltration cell, effectively 100% of the runoff will be infiltrated into the ground.

6.0 EROSION AND SEDIMENT CONTROL MEASURES

Precautions will be taken during construction to limit erosion and sedimentation. Erosion and Sediment Control Plans will be prepared at the design stage in the future. The plans will illustrate the erosion and sediment control measures to be implemented during construction, which will limit impacts associated with site development.

Typically, the recommended construction sequence for erosion and sediment control measures will be as follows:

- Placement of all sediment control fencing where required.
- Construction of permanent and temporary stormwater management ponds which will serve as sedimentation basins for the site during construction.
- Construction of temporary swales to direct runoff to sedimentation basins, with rock check dams as required to control velocities.
- Stripping and strategic placement of topsoil stockpiles. Placement of sediment control fencing around all stockpile areas.
- Re-vegetation of completed areas as soon as possible after construction, including those areas not slated for construction within 60 days.

Where rock check dams are proposed to promote sedimentation and reduce velocities, clean aggregate is to be placed perpendicular to the direction of flow in the swale, with a small volume of excavation on the upstream side to provide storage for accumulated sediment.

Sediment control fencing shall consist of filter fabric attached to paige wire fencing and sealed at ground level. It will be installed at the perimeter of the work areas and intermittently on sloped areas where required. Sediment control fencing will be placed around all topsoil stockpiles.

Extended Detention storage consistent with the MOE requirement of $40m^3$/ha ($274m^3$) and a permanent pool volume of 52 m^3/ha ($357m^3$), will be provided. This storage will be provided to ensure that suspended material will have ample time to settle out. In addition, the sediment basin will be sized with sufficient capacity to allow flows to pass without breaching. Once the active construction and grading activities have been completed, the sedimentation basins can be cleaned out.

Access to topsoil or fill storage areas will be located on the upstream side of storage piles. This practice will ensure continuity of the sediment control fencing in the downslope direction which is most vulnerable to erosion and sediment deposition. Further, topsoil and hydroseed will be placed on all exposed areas following the completion of grading activities.

The findings of this report and the above conclusions lead to the following recommendations:

1. That a quality/quantity control wetland pond facility be constructed to provide control of stormwater as described in Sections 4 and 5 of this report.
2. That during the site grading operations, soils be selectively excavated and placed in the wet cell location, under the supervision of a geotechnical engineer, in order to ensure the wetland pond functions as intended.
3. That major overland flows be directed to the outlet as described in Sections 4 and 5 of this report.
4. That erosion and sediment controls be implemented prior to construction as described in Section 6 of this report.
5. That the SWM facility maintenance recommendations described in Section 7.0 of this report be implemented.

All of which is respectfully submitted,

MTE CONSULTANTS INC.

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Designer

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APPENDIX A

SWM FACILITY DESIGN DETAILS

Pond Design
STORMWATER MANAGEMENT
Town of Simcoe, Ontario

Project Number:	38750-124
Date:	February 26, 2016
Design By:	MXM
File:	Q:\38750\124\SWM\Design Sheets - Second Submission - Jan 2016\38750-124 Final SWM Design_Rev2.xls

Step 1: Choose Level of Water Quality Control

Enhanced 80% long-term S.S. removal

Step 2: Choose Type of Facility

Wetlands

Step 3: Define Catchment area and Imperviousness

Catchment Area (ha)	Imperviousness (%)
6.86	44.32

Interpolated Storage Volume Requirement (m^3/ha)

91.65

Permanent Pool Required (m^3)

354.34

Extended Detention Volume Required (m^3)

274.40

Note: Areas 102, 202, and 203 draing to the Wetland for a total of 6.86 ha

Table 3.2 Water Quality Storage Requirements based on Receiving Waters (from MOE Stormwater Management Planning and Design Manual, March 2003)

Protection Level	SWMP Type	Storage Volume (m^3/ha) for Impervious Level			
		35	55	70	85
Enhanced 80% long-term S.S. removal	*Wetlands*	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. Removal	*Wetlands*	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. Removal	*Wetlands*	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

WESTWOOD TRAILS SUBDIVISION
FINAL POND DESIGN
TOWN OF SIMCOE, ONTARIO

Project Number: 38750-124
Date: Friday, March 04, 2016
File: Q:\38750\124\SWM\Design Sheets - Second Submission - Jan 2016\38750-124 Stage-Storage-Discharge Relationship and Drawdown_Rev2.xls

STAGE-STORAGE RELATIONSHIP

Stage	Active Depth	Forebay (Permanent Pool)			Main Pond			Total Pond Volume	Active Storage Volume	Volume Summary		Comments	Stage
		Area	Volume	Cumulative Volume	Area	Volume	Cumulative Volume						
m	m	m^2	m^3	m^3	m^2	m^3	m^3	m^3	m^3	m^3			m
229.60		13	0	0	31	0	0	0				Bottom of Forebay	229.60
229.70		16	1	1	46	4	4	5					229.70
229.80		23	2	3	62	5	9	13					229.80
229.90		43	3	7	81	7	16	23					229.90
230.00		75	6	13	103	9	26	38					230.00
230.10		89	8	21	127	11	37	58					230.10
230.20		112	10	31	153	14	51	82					230.20
230.30		134	12	43	607	38	89	132				Bottom of Wetcell	230.30
230.40		158	15	58	682	64	153	211					230.40
230.50		184	17	75	757	72	225	300					230.50
230.60	0.00	218	20	95	1608	118	344	439	0	439		Permanent Pool	230.60
230.70	0.10				1743	178	522	617	178				230.70
230.80	0.20				1877	181	703	798	359				230.80
230.90	0.30				2012	194	898	992	554				230.90
231.00	0.40				2138	208	1105	1200	761				231.00
231.10	0.50				2264	220	1325	1420	982				231.10
231.20	0.60				2391	233	1558	1653	1214				231.20
231.30	0.70				2517	245	1803	1898	1460				231.30
231.40	0.80				2643	258	2061	2156	1718				231.40
231.50	0.90				2769	271	2332	2427	1988				231.50
231.60	1.00				2895	283	2615	2710	2271				231.60
231.70	1.10				3021	296	2911	3006	2567				231.70
231.80	1.20				3148	308	3219	3314	2876				231.80
231.90	1.30				3274	321	3540	3635	3197				231.90
232.00	1.40				3400	334	3874	3969	3530				232.00
232.10	1.50				3526	346	4220	4315	3877			0.3m Freeboard	232.10
232.20	1.60				3705	362	4582	4677	4238				232.20
232.30	1.70				3884	379	4961	5056	4618				232.30
232.40	1.80				4063	397	5359	5454	5015			Top of Pond	232.40

WESTWOOD TRAILS SUBDIVISION
FINAL POND DESIGN
TOWN OF SIMCOE, ONTARIO

Cd	Description
0.63	Orifice Plate
0.82	Eccentric Reducer

Project Number: 38750-124
Date: March 4, 2016
File: Q:\38750\124\SWM\Design Sheets - Second Submission - Jan 2016\38750-124 Stage-Storage-Discharge Relationship and Drawdown_Rev2.xls

Orifice Calculations
$Q_o=C_d*A_o*(2*g*H_o)^{0.5}$

	Orifice 1	Orifice 2	Orifice 3
C_d	0.63	0.63	0.63
Invert (m)	230.6	313	500
Width (m)	0.00	0.00	0.00
Diameter/Height (m)	0.095	0.075	0.09
Type (H/V)	V	V	V

Wetcell Weir Calculations
$Q_w=C_w*(H_w)^{1.5}*((L-0.2*H_w)+(0.8*TAN(THETA)*H_w))$

Cw	1.60
Invert (m)	232.1
Length (m)	5
Side Slope (H:V)	4
Side Slope (rad)	1.326

Infiltration Cell Weir Calculations
$Q_w=C_w*(H_w)^{1.5}*((L-0.2*H_w)+(0.8*TAN(THETA)*H_w))$

Cw	1.60
Invert (m)	230.63
Length (m)	5
Side Slope (H:V)	4
Side Slope (rad)	1.326

STAGE-DISCHARGE RELATIONSHIP

Quality Pond Cell							Infiltration Cell						
Stage	Active Volume	Orifice 1 Area	Orifice 1 H_o	Orifice 1 Flow	Weir Flow from Wetcell	Discharge from Wetpond	Area	Volume	Cumulative Volume	Infiltration	Weir Flow from Infiltration cell	Discharge from Infiltration cell	Comments
m	m^3	m^2	m	m^3/s	m^3/s	m^3/s	m^2	m^3	m^3	m^3/s	m^3/s	m^3/s	
230.23							0	0	0	0.0000	0.0000	0.0000	
230.30							726	25	25	0.0073	0.0000	0.0073	
230.40							1789	126	151	0.0179	0.0000	0.0179	
230.50							1877	183	334	0.0188	0.0000	0.0188	
230.60	0						1966	192	527	0.0197	0.0000	0.0197	0.3m Freeboard
230.70	178	0.01	0.05	0.0045	0.0000	0.0045	2058	201	728	0.0206	0.1544	0.1750	
230.80	359	0.01	0.15	0.0077	0.0000	0.0077	2152	210	938	0.0215	0.6179	0.6395	
230.90	554	0.01	0.25	0.0099	0.0000	0.0099	2247	220	1158	0.0225	1.3042	1.3267	Top of Infiltration Cell
231.00	761	0.01	0.35	0.0117	0.0000	0.0117							
231.10	982	0.01	0.45	0.0133	0.0000	0.0133							
231.20	1214	0.01	0.55	0.0147	0.0000	0.0147							
231.30	1460	0.01	0.65	0.0160	0.0000	0.0160							
231.40	1718	0.01	0.75	0.0172	0.0000	0.0172							
231.50	1988	0.01	0.85	0.0183	0.0000	0.0183							
231.60	2271	0.01	0.95	0.0193	0.0000	0.0193							
231.70	2567	0.01	1.05	0.0203	0.0000	0.0203							
231.80	2876	0.01	1.15	0.0212	0.0000	0.0212							
231.90	3197	0.01	1.25	0.0221	0.0000	0.0221							
232.00	3530	0.01	1.35	0.0230	0.0000	0.0230							
232.10	3877	0.01	1.45	0.0238	0.0000	0.0238							
232.20	4238	0.01	1.55	0.0246	0.2682	0.2928							
232.30	4618	0.01	1.65	0.0254	0.8014	0.8268							
232.40	5015	0.01	1.75	0.0262	1.5512	1.5773							

WESTWOOD TRAILS SUBDIVISION
STORMWATER MANAGEMENT
TOWN OF SIMCOE, ONTARIO

Project Number: 38750-124
Date: March 4, 2016
Design By: MXM
File: Q:\38750\124\SWM\Design Sheets - Second Submission - Jan 2016\38750-124 Forebay Design.xls

FOREBAY DESIGN CALCULATIONS

MOE SWM Planning and Design Manual, 2003

Forebay Design Flows

Flow into forebay during the 1:5-year return period event	0.824 m^3/s	(from SWMHYMO)
Flow into forebay during the 25 mm - 4 hour design stormm event	0.462 m^3/s	(from SWMHYMO)
Peak flow from main pond outlet for the 25mm design storm event	0.008 m^3/s	(from SWMHYMO)

Forebay Characteristics

b =	2.0 *m*	bottom width
y =	1 *m*	depth
z =	5 :1	side slope
w =	7.0 *m*	average width
R =	0.57 *m*	hydraulic radius
A =	7.0 m^2	cross-sectional area

1. Length Calculation Based on Settling Velocity

L = forebay flow length *(m)*
r = length-to-width ratio
Q_p = peak flow rate through forebay *(m^3/s)*
v_s = settling velocity *(m/s)*

$$L = \sqrt{\frac{rQ_p}{v_s}}$$ Equation 4.5: Forebay Settling Length

a) Required Settling Length (assuming Q_p = forebay through-flow & v_s = 0.0055 m/s)

Q_p =	0.46 m^3/s	peak flow rate through forebay
v_s =	0.0055 *m/s*	settling velocity
r =	1.70	length-to-width ratio
L =	11.9 *m*	required settling length
L =	*11.9 m*	*trial length*

b) Required Settling Length (assuming Q_p = pond discharge & v_s = 0.0003 m/s)

Q_p =	0.008 m^3/s	peak flow rate through forebay
v_s =	0.0003 *m/s*	settling velocity
r =	0.54	length-to-width ratio
L =	3.8 *m*	required settling length
L =	*3.8 m*	*trial length*

Table 1: Average settling velocities

	Mass Removed	Particle Size Range	Average Settling Velocity
	%	*μm*	*m/s*
	60 - 100	x ≤ 20	0.00000254
Enhanced:	70 - 80	20 < x ≤ 40	0.00001300
Normal:	60 - 70	40 < x ≤ 60	0.00002540
Basic:	40 - 60	60 < x ≤ 130	0.00012700
Medium Sand:	20 - 40	130 < x ≤ 400	0.00059267
Gross Grit:	0 - 20	400 < x ≤ 4000	0.00550333

2. Length Calculation Based on Flow Dispersion Length

Q =	0.82 m^3/s	inlet flow rate
d =	1 *m*	depth of permanent pool in forebay
V_f =	0.50 *m/s*	desired velocity in forebay (typical value ≤ 0.50 *m/s*)
L =	13.2 m	required length of dispersion

$$L_D = \frac{8Q}{dV_f}$$ Equation 4.6: Dispersion Length

3. Required Forebay Length

L =	**13.2 *m***	**design length**	**Set L = 13.5m**
$r_{calculated}$ =	1.88	design length-to-width ratio (typical minimum of 2.0)	
r_{design} =	1.93		

4. Scour Velocity

v_s =	0.15 *m/s*	scour velocity (typical value = 0.15 *m/s*)
v =	**0.12 *m/s***	**actual velocity** OK

5. Weir Flow From Forebay

L =	3.5 *m*	length of crest of weir
α =	1.65	coefficient
H =	0.3 *m*	head
Q =	**0.95 m^3/s**	**discharge**

$$Q = \alpha L H^{1.5}$$ Equation 4.4: Weir Flow

OK The weir flow from the forebay exceeds the flow entering the forebay

6. Estimated Cleanout Frequencies

a) Forebay

Forebay volume	95 m^3
Estimated TSS removal efficiency	80%
Impervious level	45%
Estimated annual sediment loading	1.3 m^3/ha
Contributing area	6.86 *ha*
Annual sediment volume	7 m^3/yr
Cleanout frequency for 33% volume reduction	**4.6 *years***

Table 2: Annual sediment loading

Impervious Level	Annual Loading
%	m^3/ha
35%	0.6
55%	1.9
70%	2.8
85%	3.8

b) Stormwater Management Pond

Wetpond volume (excluding forebay)	344 m^3
Estimated TSS removal efficiency	80%
Impervious level	45%
Estimated annual sediment loading	1.3 m^3/ha
Contributing area	6.86 *ha*
Annual sediment volume	7 m^3/yr
Cleanout frequency for 33% volume reduction	**16.5 *years***

WESTWOOD TRAILS SUBDIVISION
STORMWATER MANAGEMENT
TOWN OF SIMCOE, ONTARIO

Project Number: 38750-124
Date: February 26, 2016
Design By: MXM
File: Q:\38750\124\SWM\Design Sheets - Second Submission - Jan 2016\38750-124 Draw-Down Calculation (Stage Discharge)_Rev1.xls

STAGE DISCHARGE DRAWDOWN CALCULATION - SWM Facility (Wetpond)
25 mm Storm Event - Wetpond only - Quality Control drawdown

Stage	Elevation *m*	Discharge m^3/s	Volume m^3	Comments
	230.600	0.0000	0	
1	230.700	0.0049	178	
2	230.800	0.0085	359	
3	230.900	0.0110	554	
4	231.000	0.0130	761	25mm Storm event = 231.00
5	231.100	0.0147	982	
6	231.200	0.0163	1214	
7	231.300	0.0177	1460	
8	231.400	0.0190	1718	
9	231.500	0.0202	1988	
10	231.600	0.0214	2271	
11	231.700	0.0225	2567	
12	231.800	0.0235	2876	
13	231.900	0.0245	3197	
14	232.000	0.0255	3530	
15	232.100	0.0264	3877	

h_1 =	230.998	*m*	starting elevation
h_2 =	230.600	*m*	bottom elevation
V =	757	m^3	starting volume
t =	10.0	*min*	time step

Drawdown Time = 31.50 *hrs*

25 *mm* remaining
45.4 m^3 remaining

Remaining after:	m^3	*mm*
12 *hrs*	305	170
24 *hrs*	96	54
36 *hrs*	29	16
48 *hrs*	9	5
72 *hrs*	1	0

WESTWOOD TRAILS SUBDIVISION
STORMWATER MANAGEMENT
TOWN OF SIMCOE, ONTARIO

Project Number: 38750-124
Date: February 26, 2016
Design By: MXM
File: Q:\38750\124\SWM\Design Sheets - Second Submission - Jan 2016\38750-124 Draw-Down Calculation (Stage Discharge)_Rev1.xls

STAGE DISCHARGE DRAWDOWN CALCULATION - SWM Facility (Wetpond)

100 yr Storm Event - Wetpond drawdown

Stage	Elevation *m*	Discharge m^3/s	Volume m^3	Comments
	230.600	0.0000	0	
1	230.700	0.0045	178	
2	230.800	0.0077	359	
3	230.900	0.0099	554	
4	231.000	0.0117	761	
5	231.100	0.0133	982	
6	231.200	0.0147	1214	
7	231.300	0.0160	1460	
8	231.400	0.0172	1718	
9	231.500	0.0183	1988	
10	231.600	0.0193	2271	
11	231.700	0.0203	2567	
12	231.800	0.0212	2876	
13	231.900	0.0221	3197	
14	232.000	0.0230	3530	
15	232.100	0.0238	3877	100yr Storm event = 232.04

h_1 =	232.041	*m*	starting elevation
h_2 =	230.600	*m*	bottom elevation
V =	3671	m^3	starting volume
t =	10.0	*min*	time step

Drawdown Time = 79.33 *hrs*

25 *mm* remaining
45.3 m^3 remaining

12.612397

Remaining after:	m^3	*mm*
12 *hrs*	2704	1144
24 *hrs*	1870	856
36 *hrs*	1171	582
48 *hrs*	628	336
72 *hrs*	89	50

WESTWOOD TRAILS SUBDIVISION
STORMWATER MANAGEMENT
TOWN OF SIMCOE, ONTARIO

Project Number: 38750-124
Date: February 26, 2016
Design By: MXM
File: Q:\38750\124\SWM\Design Sheets - Second Submission - Jan 2016\38750-124 Draw-Down Calculation (Stage Discharge)_Rev1.xls

STAGE DISCHARGE DRAWDOWN CALCULATION - SWM Facility (Infiltration Cell Only)
100 yr Storm Event - Infiltration Cell drawdown

Stage	Elevation *m*	Discharge m^3/s	Volume m^3	Comments
	230.230	0.0000	0	
1	230.300	0.0073	25	
2	230.400	0.0179	151	
3	230.500	0.0188	334	
4	230.600	0.0197	527	100 Year Storm event = 230.56

h_1 =	230.560	*m*	starting elevation
h_2 =	230.230	*m*	bottom elevation
V =	449	m^3	starting volume
t =	10.0	*min*	time step

Drawdown Time = 11.50 *hrs*

0 *mm* remaining
0.2 m^3 remaining

Remaining after:	m^3	*mm*
12 *hrs*	0	0
24 *hrs*	0	0
36 *hrs*	0	0
48 *hrs*	0	0
72 *hrs*	0	0

APPENDIX B

HYDROLOGIC MODELING INPUT/OUTPUT

WESTWOOD TRAILS SUBDIVISION
TOWN OF SIMCOE, ONTARIO
STORMWATER MANAGEMENT

EXISTING CONDITIONS HYDROLOGIC MODELING PARAMETERS

Catchment ID	Catchment Description	Hydrograph Method	Area (ha)	Perv. CN	Perv. Ia (mm)	Impervious (%)		Flow Length (m)		Manning "n"		Slope (%)		Time to Peak Tp (hrs)
						TIMP	XIMP	Perv.	Imperv.	Perv.	Imperv.	Perv.	Imperv.	
101	Existing wooded Westwood property draining North to South and Smith property	NASHYD	7.87	58	2.50									0.45
Total			**7.87**											

PROPOSED CONDITIONS HYDROLOGIC MODELING PARAMETERS

Catchment ID	Catchment Description	Hydrograph Method	Area (ha)	Perv. CN	Perv. Ia (mm)	Impervious (%)		Flow Length (m)		Manning "n"		Slope (%)		Time to Peak Tp (hrs)
						TIMP	XIMP	Perv.	Imperv.	Perv.	Imperv.	Perv.	Imperv.	
201	Front Yards of Residential Lots of the Thomson Road Cul-de-sac	STANDHYD	0.39	72	2.50	36	36	40	50	0.250	0.013	2.0	2.0	
202	The Proposed Westwood Trails Subdivision + Smith Property	STANDHYD	5.11	72	2.50	55	55	40	185	0.250	0.013	2.0	2.0	
203	Westwood SWM Facility - Wet Cell	STANDHYD	0.46	72	2.50	50	50	10	55	0.250	0.013	20.0	0.5	
204	Westwood SWM Facility - Infiltration Cell	STANDHYD	0.25	72	2.50	50	50	10	40	0.250	0.013	20.0	0.5	
102	External Drainage to SWM Facility - Wet Cell	NASHYD	1.29	58	2.50									0.32
103	External Drainage to SWM Facility - Infiltration Cell	NASHYD	0.37	58	2.50									0.20
Total			**7.87**											

- Depression Storage over Impervious areas (DPSI) = 1.0 mm

WESTWOOD TRAILS SUBDIVISION
TOWN OF SIMCOE, ONTARIO
STORMWATER MANAGEMENT

Time to Peak Calculations - Pre-Development Conditions

Time to peak (Tp) values derived from time of concentration (Tc) calculations based on the Airport Method Equation:

$$T_c = \frac{3.26(1.1-C)L^{0.5}}{S_w^{0.33}}$$ *(MTO Drainage Manual Design Chart 1.12)*

T_c = Overland flow time of concentration (min)
L = Flow length (m)
S = Basin slope (%)
C = Runoff coefficient

From this, **Time-to-peak (Tp) = 0.67 Tc**

The time to peak values used in the NASHYD command for the existing conditions hydrologic modeling are shown below.

Catchment ID	Area (ha)	Length (m)	"C"	Slope (m/m)	Tc (min)	Tp (min)	Tp (hrs)
101	7.87	336	0.25	0.02	40.41	27.07	0.45
102	1.29	196	0.25	0.025	28.67	19.21	0.32
103	0.37	113	0.25	0.048	17.55	11.76	0.20

WESTWOOD TRAILS SUBDIVISION
TOWN OF SIMCOE, ONTARIO
STORMWATER MANAGEMENT

Design Storm Information

Design storm information used in the hydrologic modeling was based on Chicago Storm distribution Intensity-Duration-Frequency (IDF) equations for the County of Norfolk in the form:

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

Where: i = Rainfall intensity (mm/hr)
t = Time of duration (minutes)
A,B & C = Constant (see below)

The value of the parameters for the various storm events is provided below:

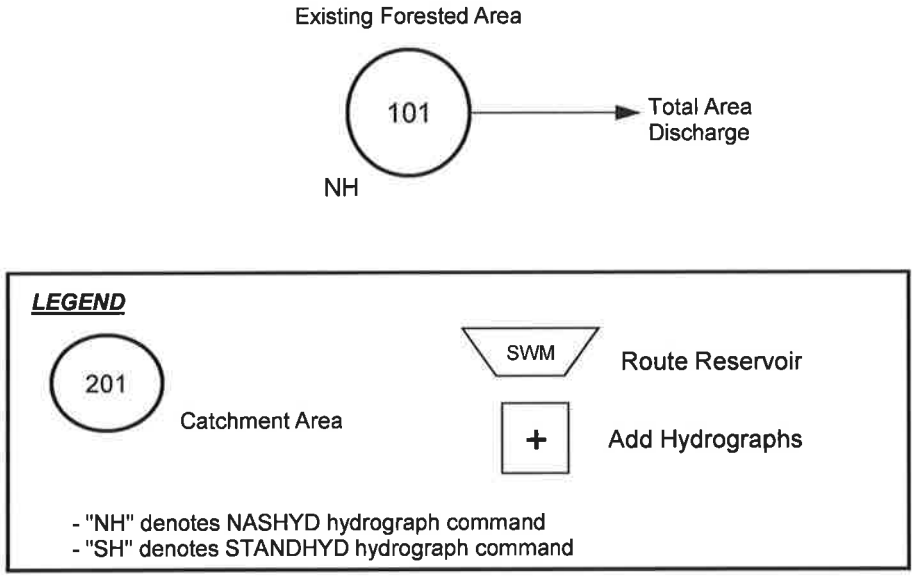
Constant [A]	2-Yr. [B]	5-Yr.	10-Yr.	25-Yr.	50-Yr.	100-Yr.
A	529.711	583.017	670.324	721.533	766.038	801.041
B	4.501	3.007	3.007	2.253	1.898	1.501
C	0.745	0.703	0.698	0.679	0.668	0.657

[A] IDF parameters from Section 7.4.02 - "Section 7 - Storm water management and drainage" (Norfolk County Design Criteria, May 2009).

[B] IDF equations used to generate rainfall files with Duration (TD) = 4 hours and Time-to-Peak Ratio (TPR) = 0.333

WESTWOOD TRAILS SUBDIVISION
SIMCOE, ONTARIO
STORMWATER MANAGEMENT

EXISTING CONDITIONS MODEL SCHEMATIC



```
2     Metric units
*|#####################################################################|
*#  Project Name: Westwood Trails
*#               Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
                    NC25MM.stm
*
READ STORM          STORM_FILENAME "STORM.001"
*
*|#####################################################################|
*#
*#                    EXISTING CONDITIONS HYDROLOGIC MODELING
*#               ++++++++++++++++++++++++++++++++++++++++++++++
*#
*|#####################################################################|
*
*|*********************************************************************|
CALIB NASHYD        ID=[1], NHYD=["101"], DT=[1]min, AREA=[7.87](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[2.5](mm),
                    N=[3], TP=[0.45]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*|------------------|--------------------------------------------------|
*|*********************************************************************|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    NC4002.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                    NC4005.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                    NC4010.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                    NC4025.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                    NC4050.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                    NC4100.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   # 3053466
       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: MTE Consultants Inc.                  **********
 ++++++++++                in any City          SERIAL#:3053466  **********
 ************************************************************************

 ************************************************************************
 **********          ++++++ 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: 2016-02-26      TIME: 11:57:36      RUN COUNTER: 000105    *
 ************************************************************************
 * Input  filename: Q:\38750\124\SWM\SWMHYMO\SECOND~1\WestPRE.dat          *
 * Output  filename: Q:\38750\124\SWM\SWMHYMO\SECOND~1\WestPRE.out         *
 * Summary filename: Q:\38750\124\SWM\SWMHYMO\SECOND~1\WestPRE.sum         *
 * User comments:                                                         *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 ************************************************************************
```

```
001:0001----------------------------------------------------------------------
*#**********************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
| START              |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
-------------------- Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   1
          #  1=NC25MM.stm
```

```
001:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: 25mm 4-HOUR (A=555 B=3.89 C=0.813)
| Ptotal=  25.27 mm|    Comments: 25mm 4-HOUR (A=555 B=3.89 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  58.384  |  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
```

```
001:0003----------------------------------------------------------------------
*
*#**********************************************************************|
*#
*#                  EXISTING CONDITIONS HYDROLOGIC MODELING
*#               ==============================================
*#
*#**********************************************************************|
*
*#*********************************************************************|
--------------------
| CALIB NASHYD     |   Area    (ha)=    7.87   Curve Number    (CN)=58.00
| 01:101    DT= 1.00 |  Ia      (mm)=    2.500   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=     .450

     Unit Hyd Qpeak  (cms)=      .668

     PEAK FLOW       (cms)=      .035 (i)
     TIME TO PEAK    (hrs)=     1.917
     RUNOFF VOLUME    (mm)=     2.508
     TOTAL RAINFALL   (mm)=    25.268
     RUNOFF COEFFICIENT    =     .099

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
001:0004----------------------------------------------------------------------
*#**********************************************************************|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
  ** END OF RUN :   1

************************************************************************
```

```
--------------------
| START              |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
-------------------- Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 002
    NSTORM=   1
          #  1=NC4002.stm
```

```
002:0002----------------------------------------------------------------------
*#**********************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
```

```
002:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: 2-YR 4hr Norfolk County Chicago Storm
| Ptotal=  35.21 mm|    Comments: 2-YR 4hr Norfolk County Chicago Storm
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
            hrs   mm/hr  |   hrs   mm/hr  |   hrs   mm/hr  |   hrs   mm/hr
            .17   2.679  |  1.17  17.689  |  2.17   5.897  |  3.17   3.144
            .33   3.237  |  1.33  72.243  |  2.33   5.088  |  3.33   2.937
            .50   3.931  |  1.50  22.776  |  2.50   4.496  |  3.50   2.759
            .67   4.764  |  1.67  12.624  |  2.67   4.042  |  3.67   2.605
            .83   5.486  |  1.83   8.980  |  2.83   3.682  |  3.83   2.469
           1.00   8.020  |  2.00   7.077  |  3.00   3.388  |  4.00   2.349
```

```
002:0003----------------------------------------------------------------------
*
*#**********************************************************************|
*#
*#                  EXISTING CONDITIONS HYDROLOGIC MODELING
*#               ==============================================
*#
*#**********************************************************************|
*
*#*********************************************************************|
--------------------
| CALIB NASHYD     |   Area    (ha)=    7.87   Curve Number    (CN)=58.00
| 01:101    DT= 1.00 |  Ia      (mm)=    2.500   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=     .450

     Unit Hyd Qpeak  (cms)=      .668

     PEAK FLOW       (cms)=      .063 (i)
     TIME TO PEAK    (hrs)=     1.917
     RUNOFF VOLUME    (mm)=     4.939
     TOTAL RAINFALL   (mm)=    35.210
     RUNOFF COEFFICIENT    =     .140

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
002:0004----------------------------------------------------------------------
*#**********************************************************************|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
```

```
002:0002----------------------------------------------------------------------
*
  ** END OF RUN :   4

************************************************************************
```

```
--------------------
| START              |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
-------------------- Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 005
    NSTORM=   1
          #  1=NC4005.stm
```

```
005:0002----------------------------------------------------------------------
*#**********************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
```

```
005:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: 5-YR 4hr Norfolk County Chicago Storm
| Ptotal=  49.03 mm|    Comments: 5-YR 4hr Norfolk County Chicago Storm
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
            hrs   mm/hr  |   hrs   mm/hr  |   hrs   mm/hr  |   hrs   mm/hr
            .17   4.234  |  1.17  23.219  |  2.17   8.640  |  3.17   4.871
            .33   4.718  |  1.33  96.032  |  2.33   7.359  |  3.33   4.575
            .50   5.418  |  1.50  29.330  |  2.50   6.756  |  3.50   4.320
            .67   6.437  |  1.67  17.134  |  2.67   6.131  |  3.67   4.096
            .83   8.091  |  1.83  12.618  |  2.83   5.630  |  3.83   3.899
           1.00  11.391  |  2.00  10.186  |  3.00   5.217  |  4.00   3.723
```

```
005:0003----------------------------------------------------------------------
*
*#**********************************************************************|
*#
*#                  EXISTING CONDITIONS HYDROLOGIC MODELING
*#               ==============================================
```

```
*#
*#**********************************************************************|
*
*#*********************************************************************|
-------------------
| CALIB NASHYD      |   Area     (ha)=    7.87   Curve Number    (CN)=58.00
| 01:101    DT= 1.00 |   Ia       (mm)=   2.500   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=      .668

     PEAK FLOW       (cms)=      .115 (i)
     TIME TO PEAK    (hrs)=    1.900
     RUNOFF VOLUME    (mm)=    9.395
     TOTAL RAINFALL   (mm)=   49.032
     RUNOFF COEFFICIENT   =     .192

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

-----------------------------------------------------------------------------
005:0004-------------------------------------------------------------------
*#**********************************************************************|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
-----------------------------------------------------------------------------
005:0002-------------------------------------------------------------------
*
-----------------------------------------------------------------------------
005:0002-------------------------------------------------------------------
*
  ** END OF RUN :   9

*****************************************************************************
```

```
-------------------
| START             |  Project  dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
-------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 010
    NSTORM=   1
          #  1=NC4010.stm
-----------------------------------------------------------------------------
010:0002-------------------------------------------------------------------
*#**********************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
-----------------------------------------------------------------------------
010:0002-------------------------------------------------------------------
*
--------------------
| READ STORM        |    Filename: 10-YR 4hr Norfolk County Chicago Storm
| Ptotal=  57.94 mm|    Comments: 10-YR 4hr Norfolk County Chicago Storm
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .17   5.044 |  1.17  27.426 |  2.17  10.305 |  3.17   5.837
             .33   5.656 |  1.33 111.838 |  2.33   9.026 |  3.33   5.486
             .50   6.487 |  1.50  34.576 |  2.50   8.074 |  3.50   5.182
             .67   7.696 |  1.67  20.309 |  2.67   7.334 |  3.67   4.916
             .83   9.656 |  1.83  14.999 |  2.83   6.739 |  3.83   4.680
            1.00  13.552 |  2.00  12.131 |  3.00   6.249 |  4.00   4.471

-----------------------------------------------------------------------------
010:0003-------------------------------------------------------------------
*
*#########################################################################|
*#
*#                    EXISTING CONDITIONS HYDROLOGIC MODELING
*#                 ---------------------------------------
*#
*#*********************************************************************|
*
*#*********************************************************************|
-------------------
| CALIB NASHYD      |   Area     (ha)=    7.87   Curve Number    (CN)=58.00
| 01:101    DT= 1.00 |   Ia       (mm)=   2.500   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=      .668

     PEAK FLOW       (cms)=      .158 (i)
     TIME TO PEAK    (hrs)=    1.900
     RUNOFF VOLUME    (mm)=   12.842
     TOTAL RAINFALL   (mm)=   57.945
     RUNOFF COEFFICIENT   =     .222

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

-----------------------------------------------------------------------------
010:0004-------------------------------------------------------------------
*#**********************************************************************|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
-----------------------------------------------------------------------------
010:0002-------------------------------------------------------------------
*
-----------------------------------------------------------------------------
010:0002-------------------------------------------------------------------
*
-----------------------------------------------------------------------------
010:0002-------------------------------------------------------------------
*
  ** END OF RUN :  24

*****************************************************************************
```

```
-------------------
| START             |  Project  dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
-------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 025
    NSTORM=   1
          #  1=NC4025.stm
-----------------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*#**********************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
-----------------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*
--------------------
| READ STORM        |    Filename: 25-YR 4hr Norfolk County Chicago Storm
| Ptotal=  69.38 mm|    Comments: 25-YR 4hr Norfolk County Chicago Storm
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .17   6.337 |  1.17  31.838 |  2.17  12.580 |  3.17   7.296
             .33   7.077 |  1.33 131.625 |  2.33  11.084 |  3.33   6.872
             .50   8.075 |  1.50  39.740 |  2.50   9.962 |  3.50   6.505
             .67   9.514 |  1.67  23.971 |  2.67   9.084 |  3.67   6.182
             .83  11.821 |  1.83  17.983 |  2.83   8.376 |  3.83   5.897
            1.00  16.325 |  2.00  14.697 |  3.00   7.790 |  4.00   5.642

-----------------------------------------------------------------------------
025:0003-------------------------------------------------------------------
*
*#########################################################################|
*#
*#                    EXISTING CONDITIONS HYDROLOGIC MODELING
*#                 ---------------------------------------
*#
*#*********************************************************************|
*
*#*********************************************************************|
-------------------
| CALIB NASHYD      |   Area     (ha)=    7.87   Curve Number    (CN)=58.00
| 01:101    DT= 1.00 |   Ia       (mm)=   2.500   # of Linear Res.(N)= 3.00
--------------------  U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=      .668

     PEAK FLOW       (cms)=      .216 (i)
     TIME TO PEAK    (hrs)=    1.900
     RUNOFF VOLUME    (mm)=   17.833
     TOTAL RAINFALL   (mm)=   69.379
     RUNOFF COEFFICIENT   =     .257

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

-----------------------------------------------------------------------------
025:0004-------------------------------------------------------------------
*#**********************************************************************|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
-----------------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*
-----------------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*
-----------------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*
-----------------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*
  ** END OF RUN :  49

*****************************************************************************
```

```
-------------------
| START             |  Project  dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
-------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 050
    NSTORM=   1
          #  1=NC4050.stm
-----------------------------------------------------------------------------
050:0002-------------------------------------------------------------------
*#**********************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
-----------------------------------------------------------------------------
050:0002-------------------------------------------------------------------
*
--------------------
| READ STORM        |    Filename: 50-YR 4hr Norfolk County Chicago Storm
| Ptotal=  78.32 mm|    Comments: 50-YR 4hr Norfolk County Chicago Storm
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .17   7.355 |  1.17  35.403 |  2.17  14.377 |  3.17   8.442
             .33   8.195 |  1.33 146.499 |  2.33  12.707 |  3.33   7.962
             .50   9.324 |  1.50  43.934 |  2.50  11.449 |  3.50   7.545
             .67  10.946 |  1.67  26.910 |  2.67  10.463 |  3.67   7.179
             .83  13.530 |  1.83  20.358 |  2.83   9.664 |  3.83   6.854
```

```
            1.00  18.528 |   2.00  16.730 |   3.00   9.002 |   4.00   6.563
-----------------------------------------------------------------------------
050:0003----------------------------------------------------------------------
*
*#############################################################################|
*#
*#                     EXISTING CONDITIONS HYDROLOGIC MODELING
*#                  ---------------------------------------
*#
*#############################################################################|
*
*****************************************************************************|
-------------------
| CALIB NASHYD      |   Area    (ha)=    7.87   Curve Number    (CN)=58.00
| 01:101    DT= 1.00 |   Ia      (mm)=   2.500   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=      .668

     PEAK FLOW       (cms)=      .267 (i)
     TIME TO PEAK    (hrs)=    1.900
     RUNOFF VOLUME    (mm)=   22.131
     TOTAL RAINFALL   (mm)=   70.320
     RUNOFF COEFFICIENT   =     .283

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

-----------------------------------------------------------------------------
050:0004----------------------------------------------------------------------
*****************************************************************************|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
-----------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
  ** END OF RUN :  99

*****************************************************************************
```

```
-------------------
| START             |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND-1\
--------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND-1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 100
    NSTORM=   1
          #  1=NC4100.stm
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*#***************************************************************************|
*#  Project Name: Westwood Trails
*#               Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPRE.DAT
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
-------------------
| READ STORM        |    Filename: 100-YR 4hr Norfolk County Chicago Storm
| Ptotal= 87.09 mm  |    Comments: 100-YR 4hr Norfolk County Chicago Storm
-------------------
            TIME     RAIN |   TIME     RAIN |   TIME     RAIN |   TIME     RAIN
             hrs    mm/hr |    hrs    mm/hr |    hrs    mm/hr |    hrs    mm/hr
             .17    8.399 |   1.17   38.699 |   2.17   16.168 |   3.17    9.613
             .33    9.336 |   1.33  160.972 |   2.33   14.334 |   3.33    9.078
             .50   10.593 |   1.50   47.723 |   2.50   12.948 |   3.50    8.612
             .67   12.391 |   1.67   29.715 |   2.67   11.857 |   3.67    8.202
             .83   15.237 |   1.83   22.675 |   2.83   10.971 |   3.83    7.838
            1.00   20.689 |   2.00   18.738 |   3.00   10.236 |   4.00    7.512

-----------------------------------------------------------------------------
100:0003----------------------------------------------------------------------
*
*#############################################################################|
*#
*#                     EXISTING CONDITIONS HYDROLOGIC MODELING
*#                  ---------------------------------------
*#
*#############################################################################|
*
*****************************************************************************|
-------------------
| CALIB NASHYD      |   Area    (ha)=    7.87   Curve Number    (CN)=58.00
| 01:101    DT= 1.00 |   Ia      (mm)=   2.500   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .450

     Unit Hyd Qpeak  (cms)=      .660

     PEAK FLOW       (cms)=      .318 (i)
     TIME TO PEAK    (hrs)=    1.883
     RUNOFF VOLUME    (mm)=   26.647
     TOTAL RAINFALL   (mm)=   87.089
     RUNOFF COEFFICIENT   =     .306

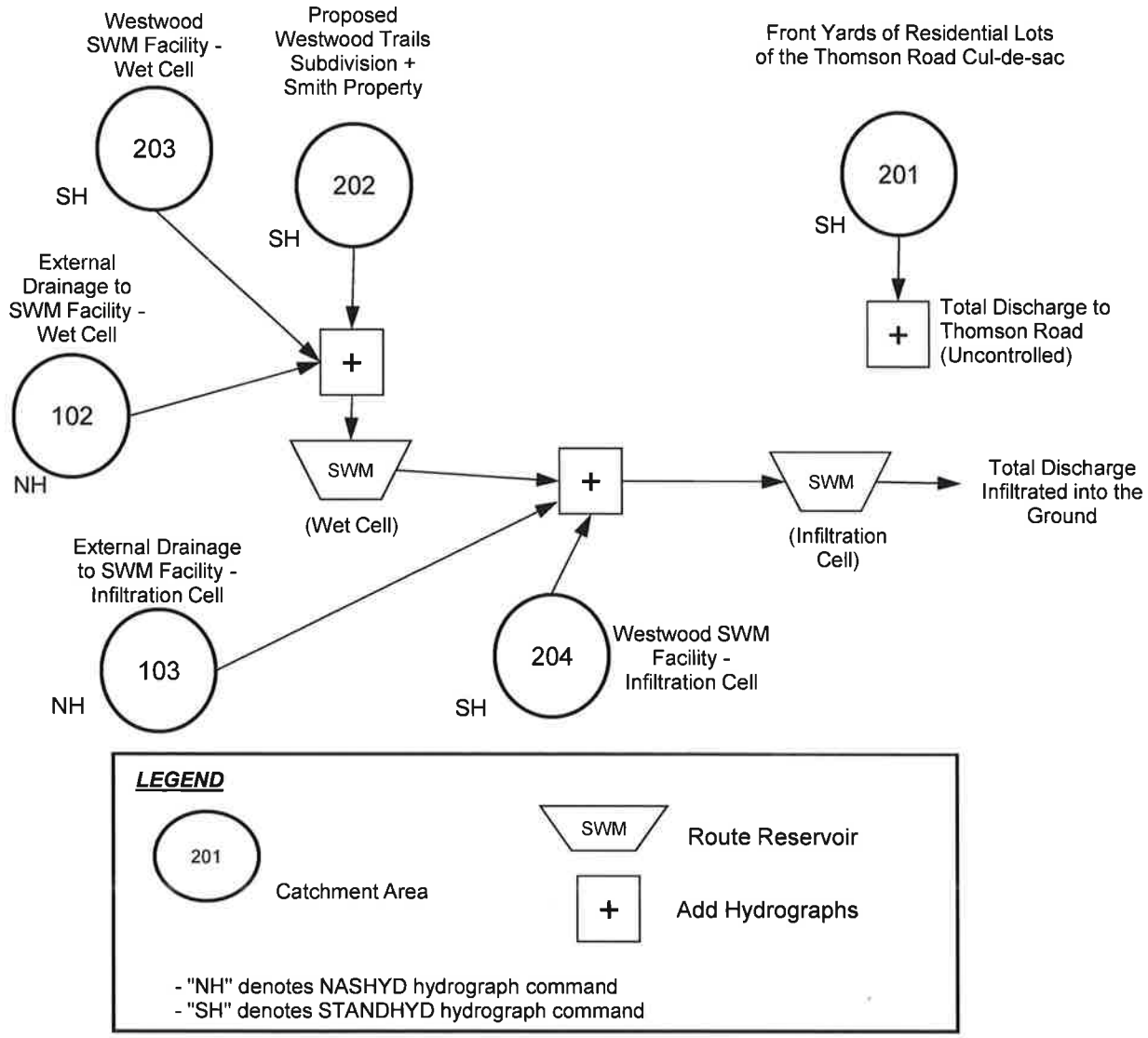
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
100:0004----------------------------------------------------------------------
*****************************************************************************|
```

```
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
      FINISH
-----------------------------------------------------------------------------
*****************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2016-02-26     at 11:57:37
=============================================================================
```

WESTWOOD TRAILS SUBDIVISION
SIMCOE, ONTARIO
STORMWATER MANAGEMENT

PROPOSED CONDITIONS MODEL SCHEMATIC



```
2     Metric units
*************************************************************************|
**  Project Name: Westwood Trails
**                Simcoe - Norfolk County
**   JOB NUMBER  : 38750-124
**        Date   : FEBRUARY 2016
**     Company   : MTE CONSULTANTS INC.
**        File   : WestPOST.DAT
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
                    NC25MM.stm
*
READ STORM          STORM_FILENAME "STORM.001"
*
*#######################################################################|
**
**                PROPOSED CONDITIONS HYDROLOGIC MODELING
**              ------------------------------------------
**
*#######################################################################|
*%-----------------|---------------------------------------------------|
*************************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property
*************************************************************************|
CALIB STANDHYD      ID=[4], NHYD=["203"], DT=[1.0](min), AREA=[5.11](ha),
                    XIMP=[0.55], TIMP=[0.55], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[72],
                    Pervious   surfaces: IAper=[2.5](mm), SLPP=[2.0](%),
                                         LGP=[40](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[2.0](%),
                                         LGI=[100](m), MNI=[0.013], SCI=[0](min)
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|---------------------------------------------------|
*************************************************************************|
*AREA 203 - Westwood SWM Block - Wet Cell
*************************************************************************|
CALIB STANDHYD      ID=[5], NHYD=["204"], DT=[1.0](min), AREA=[0.46](ha),
                    XIMP=[0.50], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[72],
                    Pervious   surfaces: IAper=[2.5](mm), SLPP=[20.0](%),
                                         LGP=[10](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[0.5](%),
                                         LGI=[55](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|---------------------------------------------------|
*************************************************************************|
*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell
*************************************************************************|
CALIB NASHYD        ID=[6], NHYD=["102"], DT=[1.0]min, AREA=[1.29](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[2.5](mm),
                    N=[3], TP=[0.32]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------|
*************************************************************************|
* Total Area draining to Pond = 202+203+102
*************************************************************************|
ADD HYD             IDsum=[1], NHYD=["PONDIN"], IDs to add=[4,5,6]
*%-----------------|---------------------------------------------------|
*************************************************************************|
*#  SWM Pond - Wet Cell
*************************************************************************|
ROUTE RESERVOIR     IDout=[3],   NHYD=["POND-WET"],  IDin=[1],
                    RDT=[2](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)

  0.0000      0.0000
  0.0045      0.0178
  0.0077      0.0359
  0.0099      0.0554
  0.0117      0.0761
  0.0133      0.0982
  0.0147      0.1214
  0.0160      0.1460
  0.0172      0.1718
  0.0183      0.1988
  0.0193      0.2271
  0.0203      0.2567
  0.0212      0.2876
  0.0221      0.3197
  0.0230      0.3530
  0.0238      0.3877
                    -1        -1    (max twenty pts)
                         IDovf=[4], NHYDovf=["OVF-POND"]
*%-----------------|---------------------------------------------------|
*************************************************************************|
*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell
*************************************************************************|
CALIB NASHYD        ID=[5], NHYD=["103"], DT=[1.0]min, AREA=[0.37](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[2.5](mm),
                    N=[3], TP=[0.20]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------|
*************************************************************************|
*AREA 204 - Westwood SWM Block - Infiltration Cell
*************************************************************************|
CALIB STANDHYD      ID=[6], NHYD=["205"], DT=[1.0](min), AREA=[0.25](ha),
                    XIMP=[0.50], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[72],
                    Pervious   surfaces: IAper=[2.5](mm), SLPP=[20.0](%),
                                         LGP=[10](m), MNP=[0.025], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[0.5](%),
                                         LGI=[35](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|---------------------------------------------------|
* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103
ADD HYD             IDsum=[7], NHYD=["INFIL-IN"], IDs to add=[3,4,5,6]
*%-----------------|---------------------------------------------------|
*************************************************************************|
*#  SWM Pond - Infiltration Cell
*************************************************************************|
ROUTE RESERVOIR     IDout=[1],   NHYD=["POND-INFIL"],  IDin=[7],
                    RDT=[2](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)

  0.0000      0.0000
  0.0073      0.0025
  0.0179      0.0131
  0.0188      0.0334
  0.0197      0.0527
                    -1        -1    (max twenty pts)
                         IDovf=[3], NHYDovf=["OVF-POND"]
*%-----------------|---------------------------------------------------|
*************************************************************************|
*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road
*************************************************************************|
CALIB STANDHYD      ID=[4], NHYD=["201"], DT=[1.0](min), AREA=[0.39](ha),
                    XIMP=[0.36], TIMP=[0.36], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[72],
                    Pervious   surfaces: IAper=[2.5](mm), SLPP=[2.0](%),
                                         LGP=[40](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[2.0](%),
                                         LGI=[50](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|---------------------------------------------------|
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    NC4002.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                    NC4005.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                    NC4010.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                    NC4025.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                    NC4050.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                    NC4100.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 MM M  HHHHHH    Y     M MM 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   M    M  H    H    Y     M    M   OOO             9      9     ==========
                                                              9   9  9   9    # 3053466
       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: MTE Consultants Inc.                       **********
**********                 in any City          SERIAL#:3053466      **********
*********************************************************************

*********************************************************************
*********          ++++++ 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: 2016-02-26      TIME: 13:40:55      RUN COUNTER: 000106         *
*********************************************************************
* Input   filename: Q:\38750\124\SWM\SWMHYMO\SECOND~1\WestPOST.dat             *
* Output  filename: Q:\38750\124\SWM\SWMHYMO\SECOND~1\WestPOST.out             *
* Summary filename: Q:\38750\124\SWM\SWMHYMO\SECOND~1\WestPOST.sum             *
* User comments:                                                              *
* 1:_____________________________________________________________             *
* 2:_____________________________________________________________             *
* 3:_____________________________________________________________             *
*********************************************************************

001:0001-------------------------------------------------------------------
*#*****************************************************************|
*#  Project Name: Westwood Trails                                    |
*#               Simcoe - Norfolk County                             |
*#  JOB NUMBER  : 38750-124                                          |
*#       Date   : FEBRUARY 2016                                      |
*#    Company   : MTE CONSULTANTS INC.                               |
*#       File   : WestPOST.DAT                                       |
*

| START              |  Project  dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
                      |  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   1
          #  1=NC25MM.stm

001:0002-------------------------------------------------------------------
*

| 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 58.586 |  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

001:0003-------------------------------------------------------------------
*
*#*****************************************************************|
*#                                                                  |
*#                  PROPOSED CONDITIONS HYDROLOGIC MODELING         |
*#                  ---------------------------------------         |
*#                                                                  |
*#*****************************************************************|
*#*****************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property
*#*****************************************************************|

| CALIB STANDHYD     |   Area    (ha)=    5.11
| 04:203    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.81          2.30
     Dep. Storage     (mm)=      1.00          2.50
     Average Slope     (%)=      2.00          2.00
     Length            (m)=    180.00         10.00
     Mannings n            =     .013          .250

     Max.eff.Inten.(mm/hr)=     58.58          4.99
               over (min)         4.00         27.00
     Storage Coeff. (min)=      3.66 (ii)     27.07 (ii)
     Unit Hyd. Tpeak (min)=     4.00         27.00
     Unit Hyd. peak  (cms)=      .30           .04
                                                      *TOTALS*
     PEAK FLOW       (cms)=      .42           .02        .421 (iii)
     TIME TO PEAK    (hrs)=     1.33          1.82       1.333
     RUNOFF VOLUME    (mm)=    24.27          4.26      15.267
     TOTAL RAINFALL   (mm)=    25.27         25.27      25.268
     RUNOFF COEFFICIENT    =     .96           .17        .604

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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.

001:0004-------------------------------------------------------------------
*#*****************************************************************|
*AREA 203 - Westwood SWM Block - Wet Cell
*#*****************************************************************|

| CALIB STANDHYD     |   Area    (ha)=    .46
| 05:204    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .23           .23
     Dep. Storage     (mm)=      1.00          2.50
     Average Slope     (%)=      2.00         20.00
     Length            (m)=     55.00         10.00
     Mannings n            =     .013          .250

     Max.eff.Inten.(mm/hr)=     58.58          9.17
               over (min)         3.00          7.00
     Storage Coeff. (min)=      2.72 (ii)     6.72 (ii)
     Unit Hyd. Tpeak (min)=     3.00          7.00
     Unit Hyd. peak  (cms)=      .40           .17
                                                      *TOTALS*
     PEAK FLOW       (cms)=      .04           .00        .039 (iii)
     TIME TO PEAK    (hrs)=     1.33          1.42       1.333
     RUNOFF VOLUME    (mm)=    24.27          4.26      14.266
     TOTAL RAINFALL   (mm)=    25.27         25.27      25.268
     RUNOFF COEFFICIENT    =     .96           .17        .565

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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.

001:0005-------------------------------------------------------------------
*#*****************************************************************|
*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell
*#*****************************************************************|

| CALIB NASHYD       |   Area    (ha)=   1.29   Curve Number    (CN)=58.00
| 06:102    DT= 1.00 |   Ia      (mm)=   2.500  # of Linear Res.(N)= 3.00
                      |   U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=      .134

     PEAK FLOW       (cms)=      .007 (i)
     TIME TO PEAK    (hrs)=     1.733
     RUNOFF VOLUME    (mm)=     2.507
     TOTAL RAINFALL   (mm)=    25.268
     RUNOFF COEFFICIENT    =     .099

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

001:0006-------------------------------------------------------------------
*#*****************************************************************|
* Total Area draining to Pond = 202+203+102
*#*****************************************************************|

| ADD HYD (PONDIN    ) | ID: NHYD          AREA     QPEAK    TPEAK    R.V.     DWF
                        |                   (ha)     (cms)    (hrs)    (mm)     (cms)
                      ID1 04:203            5.11      .421     1.33    15.27     .000
                    +ID2 05:204              .46      .039     1.33    14.27     .000
                    +ID3 06:102             1.29      .007     1.73     2.51     .000
                      ==========================================================
                      SUM 01:PONDIN         6.86      .461     1.33    12.80     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0007-------------------------------------------------------------------
*#*****************************************************************|
*#  SWM Pond - Wet Cell                                             |
*#*****************************************************************|

| ROUTE RESERVOIR    |     Requested routing time step =  2.0 min.
|  IN>01:(PONDIN)    |
| OUT<03:(POND-W)    |     =========  OUTFLOW STORAGE TABLE  ========
                        OUTFLOW    STORAGE  |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)  |    (cms)    (ha.m.)
                          .000  .0000E+00   |     .017  .1718E+00
                          .004  .1780E-01   |     .018  .1988E+00
                          .008  .3590E-01   |     .019  .2271E+00
                          .010  .5540E-01   |     .020  .2567E+00
                          .012  .7610E-01   |     .021  .2876E+00
                          .013  .9820E-01   |     .022  .3197E+00
                          .015  .1214E+00   |     .023  .3530E+00
                          .016  .1460E+00   |     .024  .3877E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------            (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (PONDIN)       6.86      .461     1.333     12.800
     OUTFLOW<03: (POND-W)       6.86      .012     4.067     12.800
    OVERFLOW<04: (OVF-PO)        .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](%)=    2.529
                  TIME SHIFT OF PEAK FLOW         (min)=   164.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.7572E-01

001:0008-------------------------------------------------------------------
*#*****************************************************************|
*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell
*#*****************************************************************|

| CALIB NASHYD       |   Area    (ha)=    .37   Curve Number    (CN)=58.00
| 05:103    DT= 1.00 |   Ia      (mm)=   2.500  # of Linear Res.(N)= 3.00
                      |   U.H. Tp(hrs)=    .200

     Unit Hyd Qpeak  (cms)=      .071
```

```
     PEAK FLOW       (cms)=     .003 (i)
     TIME TO PEAK    (hrs)=    1.367
     RUNOFF VOLUME    (mm)=    2.507
     TOTAL RAINFALL   (mm)=   25.268
     RUNOFF COEFFICIENT    =     .099

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

001:0009------------------------------------------------------------------------
*#*************************************************************************|
*AREA 204 - Westwood SWM Block - Infiltration Cell
*#*************************************************************************|

| CALIB STANDHYD     |   Area     (ha)=     .25
| 06:205     DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00

                        IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=      .13          .13
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=      .50        20.00
     Length            (m)=    35.00        10.00
     Mannings n           =     .013         .025

     Max.eff.Inten.(mm/hr)=    58.58        10.96
           over (min)          2.00         3.00
     Storage Coeff.  (min)=    2.07 (ii)    3.51 (ii)
     Unit Hyd. Tpeak (min)=    2.00         3.00
     Unit Hyd. peak  (cms)=     .38          .37
                                          *TOTALS*
     PEAK FLOW       (cms)=     .02          .00          .023 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.35         1.333
     RUNOFF VOLUME    (mm)=   24.27         4.26        14.266
     TOTAL RAINFALL   (mm)=   25.27        25.27        25.268
     RUNOFF COEFFICIENT    =     .96          .17          .565

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

001:0010------------------------------------------------------------------------
* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103

| ADD HYD (INFIL-IN  ) | | ID: NHYD          AREA     QPEAK    TPEAK    R.V.     DWF
                         |                    (ha)     (cms)    (hrs)    (mm)     (cms)
                      ID1 03:POND-WET        6.86      .012    4.07    12.80     .000
                    +ID2 04:OVF-POND          .00      .000     .00      .00     .000
                    +ID3 05:103               .37      .003    1.67     2.51     .000
                    +ID4 06:205               .25      .023    1.33    14.27     .000
                     ================================================================
                     SUM 07:INFIL-IN         7.48      .030    1.33    12.34     .000

   NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0011------------------------------------------------------------------------
*************************************************************************|
*# SWM Pond - Infiltration Cell
*************************************************************************|

| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>07:(INFIL-)    |
| OUT<01:(POND-I)    |    ========= OUTFLOW STORAGE TABLE =========
                         OUTFLOW     STORAGE   |  OUTFLOW     STORAGE
                           (cms)     (ha.m.)   |    (cms)     (ha.m.)
                           .000   .0000E+00    |    .019   .3340E-01
                           .007   .2500E-02    |    .020   .5270E-01
                           .018   .1510E-01    |    .300   .0000E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK       R.V.
     ---------------              (ha)     (cms)     (hrs)       (mm)
     INFLOW >07: (INFIL-)         7.48      .030    1.333     12.340
     OUTFLOW<01: (POND-I)         7.48      .011    6.317     12.340
     OVERFLOW<03: (OVF-PO)         .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](%)=   36.032
                    TIME SHIFT OF PEAK FLOW         (min)=  311.00
                    MAXIMUM  STORAGE  USED       (ha.m.)=.6771E-02

001:0012------------------------------------------------------------------------
*************************************************************************|
*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road
*************************************************************************|

| CALIB STANDHYD     |   Area     (ha)=     .39
| 04:201     DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00

                        IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=      .14          .25
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=    50.00        40.00
     Mannings n           =     .013         .250

     Max.eff.Inten.(mm/hr)=    58.58         5.20
           over (min)          2.00        25.00
     Storage Coeff.  (min)=    1.70 (ii)   24.73 (ii)
     Unit Hyd. Tpeak (min)=    2.00        25.00
     Unit Hyd. peak  (cms)=     .62          .05
                                          *TOTALS*
     PEAK FLOW       (cms)=     .02          .00          .023 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.77         1.333
     RUNOFF VOLUME    (mm)=   24.27         4.26        11.466
     TOTAL RAINFALL   (mm)=   25.27        25.27        25.268
     RUNOFF COEFFICIENT    =     .96          .17          .454

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

001:0013------------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
  ** END OF RUN :   1

**************************************************************************

| START              |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
                        Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
     TZERO =    .00 hrs on      0
     METOUT=   2 (output = METRIC)
     NRUN  = 002
     NSTORM=   1
                  #  1=NC1002.stm

002:0002------------------------------------------------------------------------
*#*************************************************************************|
*#  Project Name: Westwood Trails
*#               Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPOST.DAT
*

002:0002------------------------------------------------------------------------
*

| READ STORM         |    Filename: 2-YR 4hr Norfolk County Chicago Storm
| Ptotal=  35.21 mm  |    Comments: 2-YR 4hr Norfolk County Chicago Storm

     TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
     hrs   mm/hr  |  hrs   mm/hr  |  hrs   mm/hr  |  hrs   mm/hr
     .17   2.679  |  1.17  17.689 |  2.17   5.897 |  3.17   3.144
     .33   3.037  |  1.33  72.243 |  2.33   5.088 |  3.33   2.937
     .50   3.531  |  1.50  22.776 |  2.50   4.496 |  3.50   2.759
     .67   4.264  |  1.67  12.624 |  2.67   4.042 |  3.67   2.605
     .83   5.486  |  1.83   8.980 |  2.83   3.682 |  3.83   2.469
    1.00   8.320  |  2.00   7.077 |  3.00   3.388 |  4.00   2.349

002:0003------------------------------------------------------------------------
*
*#########################################################################|
*#
*#                 PROPOSED CONDITIONS HYDROLOGIC MODELING
*#
*#
*#*************************************************************************|
*#*************************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property
*#*************************************************************************|

| CALIB STANDHYD     |   Area     (ha)=    5.11
| 04:203     DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00

                        IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=     2.81         2.30
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=   185.00        40.00
     Mannings n           =     .013         .250

     Max.eff.Inten.(mm/hr)=    72.24         9.84
           over (min)          3.00        21.00
     Storage Coeff.  (min)=    3.36 (ii)   21.20 (ii)
     Unit Hyd. Tpeak (min)=    3.00        21.00
     Unit Hyd. peak  (cms)=     .35          .03
                                          *TOTALS*
     PEAK FLOW       (cms)=     .53          .04          .541 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.67         1.333
     RUNOFF VOLUME    (mm)=   34.21         8.14        22.478
     TOTAL RAINFALL   (mm)=   35.21        35.21        35.210
     RUNOFF COEFFICIENT    =     .97          .23          .638

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

002:0004------------------------------------------------------------------------
*#*************************************************************************|
*AREA 203 - Westwood SWM Block - Wet Cell
*#*************************************************************************|

| CALIB STANDHYD     |   Area     (ha)=     .46
| 05:204     DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00

                        IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=      .23          .23
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=      .50        20.00
     Length            (m)=    55.00        10.00
     Mannings n           =     .013         .250

     Max.eff.Inten.(mm/hr)=    72.24        16.15
           over (min)          3.00         6.00
     Storage Coeff.  (min)=    2.50 (ii)    5.70 (ii)
     Unit Hyd. Tpeak (min)=    3.00         6.00
     Unit Hyd. peak  (cms)=     .42          .20
                                          *TOTALS*
     PEAK FLOW       (cms)=     .05          .01          .051 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.40         1.333
     RUNOFF VOLUME    (mm)=   34.21         8.14        21.174
     TOTAL RAINFALL   (mm)=   35.21        35.21        35.210
     RUNOFF COEFFICIENT    =     .97          .23          .601

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

002:0005----------------------------------------------------------------------
*#*****************************************************************|
*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell
*#*****************************************************************|
--------------------
| CALIB NASHYD      |   Area    (ha)=    1.29   Curve Number    (CN)=50.00
| 06:102    DT= 1.00 |   Ia      (mm)=   2.500   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=      .154

     PEAK FLOW       (cms)=      .013 (i)
     TIME TO PEAK    (hrs)=    1.733
     RUNOFF VOLUME    (mm)=    4.939
     TOTAL RAINFALL   (mm)=   35.210
     RUNOFF COEFFICIENT   =     .140

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

002:0006----------------------------------------------------------------------
*#*****************************************************************|
* Total Area draining to Pond = 202+203+102
*#*****************************************************************|
----------------------
| ADD HYD (PONDIN     ) | ID: NHYD          AREA     QPEAK    TPEAK    R.V.     DWF
----------------------                      (ha)     (cms)    (hrs)    (mm)    (cms)
                      ID1 04:203            5.11     .541    1.33   22.48     .000
                     *ID2 05:204             .46     .051    1.33   21.17     .000
                     *ID3 06:102            1.29     .013    1.73    4.94     .000
                      ================================================================
                      SUM 01:PONDIN         6.86     .595    1.33   19.09     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

002:0007----------------------------------------------------------------------
*#*****************************************************************|
*#  SWM Pond - Wet Cell
*#*****************************************************************|
--------------------
| ROUTE RESERVOIR   |     Requested routing time step =  2.0 min.
|  IN>01:(PONDIN)   |
| OUT<03:(POND-W)   |     =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)  |    (cms)     (ha.m.)
                           .000  .0000E+00    |     .017  .1718E+00
                           .004  .1780E-01    |     .018  .1988E+00
                           .008  .3590E-01    |     .019  .2271E+00
                           .010  .5540E-01    |     .020  .2567E+00
                           .012  .7610E-01    |     .021  .2876E+00
                           .013  .9820E-01    |     .022  .3197E+00
                           .015  .1214E+00    |     .023  .3530E+00
                           .016  .1460E+00    |     .024  .3877E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------            (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (PONDIN)       6.86      .595     1.333     19.092
     OUTFLOW<03: (POND-W)       6.86      .014     4.100     19.092
    OVERFLOW<04: (OVF-PO)        .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](%)=    2.413
                  TIME SHIFT OF PEAK FLOW          (min)=   166.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=.1156E+00

002:0008----------------------------------------------------------------------
*#*****************************************************************|
*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell
*#*****************************************************************|
--------------------
| CALIB NASHYD      |   Area    (ha)=     .37   Curve Number    (CN)=58.00
| 05:103    DT= 1.00 |   Ia      (mm)=   2.500   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .200

     Unit Hyd Qpeak  (cms)=      .071

     PEAK FLOW       (cms)=      .005 (i)
     TIME TO PEAK    (hrs)=    1.550
     RUNOFF VOLUME    (mm)=    4.938
     TOTAL RAINFALL   (mm)=   35.210
     RUNOFF COEFFICIENT   =     .140

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

002:0009----------------------------------------------------------------------
*#*****************************************************************|
*AREA 204 - Westwood SWM Block - Infiltration Cell
*#*****************************************************************|
--------------------
| CALIB STANDHYD    |   Area    (ha)=     .23
| 06:205    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
--------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     .13          .13
     Dep. Storage     (mm)=    1.00         2.50
     Average Slope     (%)=     .50        20.00
     Length            (m)=   35.00        10.00
     Mannings n            =    .013         .025

     Max.eff.Inten.(mm/hr)=   72.24        17.96
               over (min)     2.00         3.00
     Storage Coeff.  (min)=    1.91 (ii)    2.68 (ii)
     Unit Hyd. Tpeak (min)=    2.00         3.00
     Unit Hyd. peak  (cms)=     .58          .40
                                                    *TOTALS*
     PEAK FLOW       (cms)=     .02          .01        .030 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.33       1.333
     RUNOFF VOLUME    (mm)=   34.21         8.14      21.174
     TOTAL RAINFALL   (mm)=   35.21        35.21      35.210
     RUNOFF COEFFICIENT   =     .97          .23        .601

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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----------------------------------------------------------------------
* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103
----------------------
| ADD HYD (INFIL-IN  ) | ID: NHYD          AREA     QPEAK    TPEAK    R.V.     DWF
----------------------                      (ha)     (cms)    (hrs)    (mm)    (cms)
                      ID1 03:POND-WET       6.86      .014    4.10   19.09     .000
                     *ID2 04:OVF-POND        .00      .000     .00     .00     .000
                     *ID3 05:103             .37      .005    1.55    4.94     .000
                     +ID4 06:205             .25      .030    1.33   21.17     .000
                      ================================================================
                      SUM 07:INFIL-IN       7.48      .040    1.33   18.46     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

002:0011----------------------------------------------------------------------
*#*****************************************************************|
*#  SWM Pond - Infiltration Cell
*#*****************************************************************|
--------------------
| ROUTE RESERVOIR   |     Requested routing time step =  2.0 min.
|  IN>07:(INFIL-)   |
| OUT<01:(POND-I)   |     =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)  |    (cms)     (ha.m.)
                           .000  .0000E+00    |     .019  .3340E-01
                           .007  .2500E-02    |     .020  .5270E-01
                           .018  .1510E-01    |     .030  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------            (ha)     (cms)     (hrs)       (mm)
     INFLOW >07: (INFIL-)       7.48      .040     1.333     18.461
     OUTFLOW<01: (POND-I)       7.48      .014     6.917     18.461
    OVERFLOW<03: (OVF-PO)        .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](%)=   33.652
                  TIME SHIFT OF PEAK FLOW          (min)=   335.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=.9974E-02

002:0012----------------------------------------------------------------------
*#*****************************************************************|
*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road
*#*****************************************************************|
--------------------
| CALIB STANDHYD    |   Area    (ha)=     .39
| 04:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
--------------------

                        IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     .14          .25
     Dep. Storage     (mm)=    1.00         2.50
     Average Slope     (%)=    2.00         2.00
     Length            (m)=   50.00        40.00
     Mannings n            =    .013         .250

     Max.eff.Inten.(mm/hr)=   72.24        10.29
               over (min)     2.00        19.00
     Storage Coeff.  (min)=    1.56 (ii)   19.09 (ii)
     Unit Hyd. Tpeak (min)=    2.00        19.00
     Unit Hyd. peak  (cms)=     .65          .06
                                                    *TOTALS*
     PEAK FLOW       (cms)=     .03          .00        .029 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.63       1.333
     RUNOFF VOLUME    (mm)=   34.21         8.14      17.524
     TOTAL RAINFALL   (mm)=   35.21        35.21      35.210
     RUNOFF COEFFICIENT   =     .97          .23        .498

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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----------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
002:0002----------------------------------------------------------------------
*
  ** END OF RUN :  4

**********************************************************************



--------------------
| START             |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
--------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 005
    NSTORM=   1
          #  1=NC4005.stm
005:0002----------------------------------------------------------------------
*#*****************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPOST.DAT
```

```
*
005:0002----------------------------------------------------------------------
*
-------------------
| READ STORM      |    Filename: 5-YR 4hr Norfolk County Chicago Storm
| Ptotal= 49.03 mm|    Comments: 5-YR 4hr Norfolk County Chicago Storm
-------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              .17   4.204 |  1.17  23.219 |  2.17   8.640 |  3.17   4.871
              .33   4.718 |  1.33  96.032 |  2.33   7.559 |  3.33   4.575
              .50   5.418 |  1.50  29.330 |  2.50   6.756 |  3.50   4.320
              .67   6.437 |  1.67  17.134 |  2.67   6.131 |  3.67   4.096
              .83   8.091 |  1.83  12.618 |  2.83   5.630 |  3.83   3.899
             1.00  11.391 |  2.00  10.186 |  3.00   5.217 |  4.00   3.729

005:0003----------------------------------------------------------------------
*
*#*****************************************************************************|
*#                                                                             |
*#                    PROPOSED CONDITIONS HYDROLOGIC MODELING                  |
*#                    ---------------------------------------                  |
*#                                                                             |
*******************************************************************************|
*#*****************************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property
*#*****************************************************************************|
-------------------
| CALIB STANDHYD  |   Area    (ha)=    5.11
| 04:203    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
-------------------
                        IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=     2.81          2.30
     Dep. Storage    (mm)=     1.00          2.50
     Average Slope    (%)=     2.00          2.00
     Length           (m)=   180.00         40.00
     Mannings n         =     .013          .250

     Max.eff.Inten.(mm/hr)=    96.03         18.99
           over (min)          3.00         17.00
     Storage Coeff.  (min)=    3.00 (ii)    16.72 (ii)
     Unit Hyd. Tpeak (min)=    3.00         17.00
     Unit Hyd. peak  (cms)=     .38           .07
                                                      *TOTALS*
     PEAK FLOW       (cms)=     .72           .07        .743 (iii)
     TIME TO PEAK    (hrs)=    1.33          1.58       1.333
     RUNOFF VOLUME    (mm)=   48.03         14.90      33.123
     TOTAL RAINFALL   (mm)=   49.03         49.03      49.032
     RUNOFF COEFFICIENT   =     .98           .30        .676

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

005:0004----------------------------------------------------------------------
*#*****************************************************************************|
*AREA 203 - Westwood SWM Block - Wet Cell
*#*****************************************************************************|
-------------------
| CALIB STANDHYD  |   Area    (ha)=     .46
| 05:204    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
-------------------
                        IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=      .23           .23
     Dep. Storage    (mm)=     1.00          2.50
     Average Slope    (%)=      .50         20.00
     Length           (m)=   55.00         10.00
     Mannings n         =     .013          .250

     Max.eff.Inten.(mm/hr)=    96.03         29.64
           over (min)          2.00          5.00
     Storage Coeff.  (min)=    2.23 (ii)     4.74 (ii)
     Unit Hyd. Tpeak (min)=    2.00          5.00
     Unit Hyd. peak  (cms)=     .52           .23
                                                      *TOTALS*
     PEAK FLOW       (cms)=     .06           .01        .074 (iii)
     TIME TO PEAK    (hrs)=    1.33          1.67       1.333
     RUNOFF VOLUME    (mm)=   48.03         14.90      31.467
     TOTAL RAINFALL   (mm)=   49.03         49.03      49.032
     RUNOFF COEFFICIENT   =     .98           .30        .642

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

005:0005----------------------------------------------------------------------
*#*****************************************************************************|
*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell
*#*****************************************************************************|
-------------------
| CALIB NASHYD    |   Area    (ha)=    1.29   Curve Number    (CN)=58.00
| 06:102    DT= 1.00 |   Ia      (mm)=    2.500   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=     .320

     Unit Hyd Qpeak  (cms)=      .154

     PEAK FLOW       (cms)=      .023 (i)
     TIME TO PEAK    (hrs)=    1.717
     RUNOFF VOLUME    (mm)=    9.395
     TOTAL RAINFALL   (mm)=   49.032
     RUNOFF COEFFICIENT   =     .192

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

005:0006----------------------------------------------------------------------
*#*****************************************************************************|
* Total Area draining to Pond = 202+203+102
*#*****************************************************************************|
-------------------
| ADD HYD (PONDIN     ) | ID: NHYD          AREA     QPEAK    TPEAK    R.V.    DWF
-------------------------                    (ha)     (cms)    (hrs)    (mm)    (cms)
                        ID1 04:203          5.11      .743    1.33   33.12     .000
                       +ID2 05:204           .46      .074    1.33   31.47     .000
                       +ID3 06:102          1.29      .023    1.72    9.40     .000
                        ==========================================================
                        SUM 01:PONDIN       6.86      .823    1.33   28.55     .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

005:0007----------------------------------------------------------------------
*#*****************************************************************************|
*#  SWM Pond - Wet Cell
*#*****************************************************************************|
-------------------
| ROUTE RESERVOIR |     Requested routing time step =  2.0 min.
|  IN>01:(PONDIN) |
| OUT<03:(POND-W) |     ==========  OUTFLOW STORAGE TABLE  ==========
-------------------     OUTFLOW    STORAGE  |  OUTFLOW    STORAGE
                          (cms)     (ha.m.)  |   (cms)     (ha.m.)
                          .000   .0000E+00   |   .017   .1718E+00
                          .004   .1780E-01   |   .018   .1988E+00
                          .008   .3590E-01   |   .019   .2271E+00
                          .010   .5540E-01   |   .020   .2567E+00
                          .012   .7610E-01   |   .021   .2876E+00
                          .013   .9820E-01   |   .022   .3197E+00
                          .015   .1214E+00   |   .023   .3530E+00
                          .016   .1460E+00   |   .024   .3877E+00

     ROUTING RESULTS          AREA     QPEAK     TPEAK       R.V.
     ---------------          (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (PONDIN)     6.86      .823    1.333      28.550
     OUTFLOW<03: (POND-W)     6.86      .017    4.183      28.549
    OVERFLOW<04: (OVF-PO)      .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)(%)=    2.113
                TIME SHIFT OF PEAK FLOW          (min)=   171.00
                MAXIMUM  STORAGE   USED        (ha.m.)=.1766E+00

005:0008----------------------------------------------------------------------
*#*****************************************************************************|
*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell
*#*****************************************************************************|
-------------------
| CALIB NASHYD    |   Area    (ha)=     .37   Curve Number    (CN)=58.00
| 05:103    DT= 1.00 |   Ia      (mm)=    2.500   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=     .200

     Unit Hyd Qpeak  (cms)=      .071

     PEAK FLOW       (cms)=      .009 (i)
     TIME TO PEAK    (hrs)=    1.550
     RUNOFF VOLUME    (mm)=    9.394
     TOTAL RAINFALL   (mm)=   49.032
     RUNOFF COEFFICIENT   =     .192

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

005:0009----------------------------------------------------------------------
*#*****************************************************************************|
*AREA 204 - Westwood SWM Block - Infiltration Cell
*#*****************************************************************************|
-------------------
| CALIB STANDHYD  |   Area    (ha)=     .25
| 06:205    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
-------------------
                        IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=      .13           .13
     Dep. Storage    (mm)=     1.00          2.50
     Average Slope    (%)=      .50         20.00
     Length           (m)=   35.00         10.00
     Mannings n         =     .013          .025

     Max.eff.Inten.(mm/hr)=    96.03         32.30
           over (min)          2.00          2.00
     Storage Coeff.  (min)=    1.70 (ii)     2.31 (ii)
     Unit Hyd. Tpeak (min)=    2.00          2.00
     Unit Hyd. peak  (cms)=     .62           .31
                                                      *TOTALS*
     PEAK FLOW       (cms)=     .03           .01        .043 (iii)
     TIME TO PEAK    (hrs)=    1.33          1.33       1.333
     RUNOFF VOLUME    (mm)=   48.03         14.90      31.467
     TOTAL RAINFALL   (mm)=   49.03         49.03      49.032
     RUNOFF COEFFICIENT   =     .98           .30        .642

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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----------------------------------------------------------------------
* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103
-------------------
| ADD HYD (INFIL-IN   ) | ID: NHYD          AREA     QPEAK    TPEAK    R.V.    DWF
-------------------------                    (ha)     (cms)    (hrs)    (mm)    (cms)
                        ID1 03:POND-WET     6.86      .017    4.18   28.55     .000
                       +ID2 04:OVF-POND      .00      .000     .00     .00     .000
                       +ID3 05:103           .37      .009    1.55    9.39     .000
                       +ID4 06:205           .25      .043    1.33   31.47     .000
                        ==========================================================
                        SUM 07:INFIL-IN     7.48      .057    1.33   27.70     .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

005:0011----------------------------------------------------------------------
*#*****************************************************************************|
*#  SWM Pond - Infiltration Cell
*#*****************************************************************************|
-------------------
| ROUTE RESERVOIR |     Requested routing time step =  2.0 min.
| IN>07:(INFIL-)  |
```

```
| OUT<01:(POND-I)    |     ========  OUTFLOW STORAGE TABLE  =========
---------------------     OUTFLOW     STORAGE   |  OUTFLOW     STORAGE
                            (cms)      (ha.m.)  |    (cms)     (ha.m.)
                            .000   .0000E+00    |    .019   .3340E-01
                            .007   .2300E-02    |    .020   .5270E-01
                            .018   .1510E-01    |    .000   .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------            (ha)     (cms)     (hrs)       (mm)
    INFLOW >07: (INFIL-)        7.48      .057    1.333     27.699
    OUTFLOW<01: (POND-I)        7.48      .017    6.250     27.699
   OVERFLOW<03: (OVF-PO)         .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](%)=    29.437
                  TIME SHIFT OF PEAK FLOW          (min)=   295.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=.1393E-01

------------------------------------------------------------------------------
005:0012----------------------------------------------------------------------
*#*************************************************************************|
*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road
*#*************************************************************************|

---------------------
| CALIB STANDHYD     |   Area    (ha)=     .39
| 04:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------

                          IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=      .14          .25
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=    50.00        40.00
     Mannings n           =     .013         .250

     Max.eff.Inten.(mm/hr)=    96.03        20.02
           over (min)          1.00        15.00
     Storage Coeff.  (min)=    1.39 (ii)   14.82 (ii)
     Unit Hyd. Tpeak (min)=    1.00        15.00
     Unit Hyd. peak  (cms)=     .87          .08
                                                  *TOTALS*
     PEAK FLOW       (cms)=     .04          .01        .041 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.55       1.333
     RUNOFF VOLUME    (mm)=   48.03        14.90      26.828
     TOTAL RAINFALL   (mm)=   49.03        49.03      49.032
     RUNOFF COEFFICIENT   =     .98          .30        .547

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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----------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
------------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*
  ** END OF RUN :   9

**************************************************************************




---------------------
| START              |  Project  dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
---------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 010
    NSTORM=   1
         #  1=NC4010.stm
------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*#*************************************************************************|
*#  Project Name: Westwood Trails
*#               Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPOST.DAT
*
------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*
---------------------
| READ STORM         |    Filename: 10-YR 4hr Norfolk County Chicago Storm
| Ptotal= 57.94 mm|    Comments: 10-YR 4hr Norfolk County Chicago Storm
---------------------
            TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
             hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
             .17   5.044 |  1.17  27.426 |  2.17  10.303 |  3.17   5.837
             .33   5.656 |  1.33 111.838 |  2.33   9.026 |  3.33   5.486
             .50   6.487 |  1.50  34.576 |  2.50   8.074 |  3.50   5.182
             .67   7.696 |  1.67  20.309 |  2.67   7.334 |  3.67   4.916
             .83   9.636 |  1.83  14.999 |  2.83   6.739 |  3.83   4.680
            1.00  13.552 |  2.00  12.131 |  3.00   6.249 |  4.00   4.471

------------------------------------------------------------------------------
010:0003----------------------------------------------------------------------
*
*#########################################################################|
*#
*#                    PROPOSED CONDITIONS HYDROLOGIC MODELING
*#                    ---------------------------------------
*#
*************************************************************************|
*#***********************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property

*#*************************************************************************|

---------------------
| CALIB STANDHYD     |   Area    (ha)=     5.11
| 04:203    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
---------------------

                          IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=     2.81         2.30
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=   180.00        40.00
     Mannings n           =     .013         .250

     Max.eff.Inten.(mm/hr)=   111.84        26.91
           over (min)          3.00        15.00
     Storage Coeff.  (min)=    2.82 (ii)   14.75 (ii)
     Unit Hyd. Tpeak (min)=    3.00        15.00
     Unit Hyd. peak  (cms)=     .39          .08
                                                  *TOTALS*
     PEAK FLOW       (cms)=     .84          .11        .886 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.55       1.333
     RUNOFF VOLUME    (mm)=   56.94        19.93      40.290
     TOTAL RAINFALL   (mm)=   57.94        57.94      57.945
     RUNOFF COEFFICIENT   =     .98          .34        .695

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

------------------------------------------------------------------------------
010:0004----------------------------------------------------------------------
*#*************************************************************************|
*AREA 203 - Westwood SWM Block - Wet Cell
*#*************************************************************************|

---------------------
| CALIB STANDHYD     |   Area    (ha)=     .46
| 05:204    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
---------------------

                          IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=      .23          .23
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     .50         20.00
     Length            (m)=    55.00        10.00
     Mannings n           =     .013         .250

     Max.eff.Inten.(mm/hr)=   111.84        40.55
           over (min)          2.00         4.00
     Storage Coeff.  (min)=    2.10 (ii)    4.31 (ii)
     Unit Hyd. Tpeak (min)=    2.00         4.00
     Unit Hyd. peak  (cms)=     .54          .27
                                                  *TOTALS*
     PEAK FLOW       (cms)=     .07          .02        .090 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.35       1.333
     RUNOFF VOLUME    (mm)=   56.94        19.93      38.439
     TOTAL RAINFALL   (mm)=   57.94        57.94      57.945
     RUNOFF COEFFICIENT   =     .98          .34        .663

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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.

------------------------------------------------------------------------------
010:0005----------------------------------------------------------------------
*#*************************************************************************|
*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell
*#*************************************************************************|

---------------------
| CALIB NASHYD       |   Area    (ha)=    1.29   Curve Number    (CN)=58.00
| 06:102    DT= 1.00 |   Ia      (mm)=    2.500  # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=     .320

     Unit Hyd Qpeak  (cms)=     .154

     PEAK FLOW       (cms)=     .032 (i)
     TIME TO PEAK    (hrs)=    1.717
     RUNOFF VOLUME    (mm)=   12.842
     TOTAL RAINFALL   (mm)=   57.945
     RUNOFF COEFFICIENT   =     .222

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

------------------------------------------------------------------------------
010:0006----------------------------------------------------------------------
*#*************************************************************************|
* Total Area draining to Pond = 202+203+102
*#*************************************************************************|

------------------------
| ADD HYD (PONDIN     ) | ID: NHYD          AREA     QPEAK    TPEAK   R.V.    DWF
------------------------                     (ha)     (cms)    (hrs)   (mm)    (cms)
                      ID1 04:203            5.11     .886     1.33   40.29    .000
                    *ID2 05:204             .46     .090     1.33   38.44    .000
                    *ID3 06:102            1.29     .032     1.72   12.84    .000
                     ==========================================================
                     SUM 01:PONDIN         6.86     .984     1.33   35.00    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
010:0007----------------------------------------------------------------------
*#*************************************************************************|
*#  SWM Pond - Wet Cell
*#*************************************************************************|

--------------------
| ROUTE RESERVOIR  |     Requested routing time step =  2.0 min.
|  IN>01:(PONDIN)  |
| OUT<03:(POND-W)  |     =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW     STORAGE   |  OUTFLOW     STORAGE
                           (cms)      (ha.m.)  |    (cms)     (ha.m.)
                           .000   .0000E+00    |    .017   .1718E+00
                           .004   .1780E-01    |    .018   .1988E+00
                           .008   .3590E-01    |    .019   .2271E+00
                           .010   .5540E-01    |    .020   .2567E+00
                           .012   .7610E-01    |    .021   .2876E+00
                           .013   .9820E-01    |    .022   .3197E+00
                           .015   .1214E+00    |    .023   .3530E+00
                           .016   .1460E+00    |    .024   .3877E+00
```

```
     ROUTING RESULTS              AREA      QPEAK     TPEAK       R.V.
     ---------------              (ha)      (cms)     (hrs)       (mm)
     INFLOW >01: (PONDIN)         6.86       .984    1.333      35.004
     OUTFLOW<03: (POND-W)         6.86       .019    4.217      35.003
    OVERFLOW<04: (OVF-PO)          .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](%)=    1.931
                    TIME SHIFT OF PEAK FLOW          (min)=   173.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=.2189E+00
```

```
010:0008----------------------------------------------------------------------
*#*****************************************************************|
*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell
*#*****************************************************************|
-----------------------
| CALIB NASHYD      |   Area     (ha)=     .37   Curve Number    (CN)=58.00
| 05:103    DT= 1.00 |   Ia       (mm)=  2.500   # of Linear Res.(N)= 3.00
--------------------- U.H. Tp(hrs)=     .200

     Unit Hyd Qpeak  (cms)=      .071

     PEAK FLOW       (cms)=      .012 (i)
     TIME TO PEAK    (hrs)=     1.533
     RUNOFF VOLUME    (mm)=    12.842
     TOTAL RAINFALL   (mm)=    57.945
     RUNOFF COEFFICIENT   =      .222

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
010:0009----------------------------------------------------------------------
*#*****************************************************************|
*AREA 204 - Westwood SWM Block - Infiltration Cell
*#*****************************************************************|
-----------------------
| CALIB STANDHYD    |   Area     (ha)=     .25
| 06:205    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
---------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=      .13          .13
     Dep. Storage      (mm)=     1.00         2.50
     Average Slope      (%)=      .50        20.00
     Length             (m)=    35.00        10.00
     Mannings n            =     .013         .025

     Max.eff.Inten.(mm/hr)=   111.84        42.69
               over (min)        2.00         2.00
     Storage Coeff.  (min)=     1.60 (ii)    2.15 (ii)
     Unit Hyd. Tpeak (min)=     2.00         2.00
     Unit Hyd. peak  (cms)=      .64          .53
                                                  *TOTALS*
     PEAK FLOW       (cms)=      .04          .01       .052 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.33      1.333
     RUNOFF VOLUME    (mm)=    56.94        19.93     38.439
     TOTAL RAINFALL   (mm)=    57.94        57.94     57.945
     RUNOFF COEFFICIENT   =      .98          .34       .663

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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----------------------------------------------------------------------
* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103
-----------------------
| ADD HYD (INFIL-IN  ) | ID: NHYD          AREA      QPEAK    TPEAK    R.V.     DWF
---------------------- ---------------     (ha)      (cms)    (hrs)    (mm)     (cms)
                        ID1 03:POND-WET     6.86       .019    4.22   35.00      .000
                      +ID2 04:OVF-POND       .00       .000     .00     .00      .000
                      +ID3 05:103            .37       .012    1.53   12.84      .000
                      +ID4 06:205            .25       .052    1.33   38.44      .000
                       ================================================================
                       SUM 07:INFIL-IN       7.48       .069    1.33   34.02      .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
010:0011----------------------------------------------------------------------
*#*****************************************************************|
*#  SWM Pond - Infiltration Cell
*#*****************************************************************|
-----------------------
| ROUTE RESERVOIR   |     Requested routing time step =  2.0 min.
|  IN>07:(INFIL-)   |
| OUT<01:(POND-I)   |     ========== OUTFLOW STORAGE TABLE ==========
---------------------     OUTFLOW     STORAGE   |  OUTFLOW     STORAGE
                            (cms)     (ha.m.)   |    (cms)     (ha.m.)
                             .000  .0000E+00    |     .019  .3340E-01
                             .007  .2500E-02    |     .020  .5270E-01
                             .018  .1510E-01    |     .000  .0000E+00

     ROUTING RESULTS              AREA      QPEAK     TPEAK       R.V.
     ---------------              (ha)      (cms)     (hrs)       (mm)
     INFLOW >07: (INFIL-)         7.48       .069    1.333      34.022
     OUTFLOW<01: (POND-I)         7.48       .018    8.550      34.022
    OVERFLOW<03: (OVF-PO)          .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](%)=   26.047
                    TIME SHIFT OF PEAK FLOW          (min)=  433.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=.1737E-01
```

```
010:0012----------------------------------------------------------------------
*#*****************************************************************|
*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road
*#*****************************************************************|
-----------------------
| CALIB STANDHYD    |   Area     (ha)=     .39
| 04:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=      .14          .25
     Dep. Storage      (mm)=     1.00         2.50
     Average Slope      (%)=     2.00         2.00
     Length             (m)=    30.00        40.00
     Mannings n            =     .013         .250

     Max.eff.Inten.(mm/hr)=   111.84        28.81
               over (min)        1.00        13.00
     Storage Coeff.  (min)=     1.31 (ii)   12.92 (ii)
     Unit Hyd. Tpeak (min)=     1.00        13.00
     Unit Hyd. peak  (cms)=      .91          .09
                                                  *TOTALS*
     PEAK FLOW       (cms)=      .04          .01       .049 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.32      1.333
     RUNOFF VOLUME    (mm)=    56.94        19.93     33.257
     TOTAL RAINFALL   (mm)=    57.94        57.94     57.945
     RUNOFF COEFFICIENT   =      .98          .34       .574

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0     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----------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
010:0002----------------------------------------------------------------------
*
010:0002----------------------------------------------------------------------
*
010:0002----------------------------------------------------------------------
*
  ** END OF RUN :  24

**********************************************************************
```

```
-----------------
| START           |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
----------------- Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on      0
    METOUT=  2 (output = METRIC)
    NRUN  = 025
    NSTORM=  1
          # 1=NC4025.stm
```

```
025:0002----------------------------------------------------------------------
*#*****************************************************************|
*#  Project Name: Westwood Trails
*#               Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPOST.DAT
*
----------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
-----------------
| READ STORM      |    Filename: 25-YR 4hr Norfolk County Chicago Storm
| Ptotal= 69.38 mm|    Comments: 25-YR 4hr Norfolk County Chicago Storm
-----------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	6.337	1.17	31.838	2.17	12.580	3.17	7.296
.33	7.077	1.33	131.625	2.33	11.084	3.33	6.872
.50	8.075	1.50	39.740	2.50	9.962	3.50	6.505
.67	9.514	1.67	23.971	2.67	9.084	3.67	6.182
.83	11.821	1.83	17.983	2.83	8.376	3.83	5.897
1.00	16.325	2.00	14.697	3.00	7.790	4.00	5.642

```
025:0003----------------------------------------------------------------------
*
*#*****************************************************************|
*#
*#                PROPOSED CONDITIONS HYDROLOGIC MODELING
*#             ============================================
*#
*#*****************************************************************|
*#*****************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property
*#*****************************************************************|
-----------------------
| CALIB STANDHYD    |   Area     (ha)=    5.11
| 04:203    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
---------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=     2.81         2.30
     Dep. Storage      (mm)=     1.00         2.50
     Average Slope      (%)=     2.00         2.00
     Length             (m)=   180.00        40.00
     Mannings n            =     .013         .250

     Max.eff.Inten.(mm/hr)=   131.62        39.00
               over (min)        3.00        13.00
     Storage Coeff.  (min)=     2.65 (ii)   12.93 (ii)
     Unit Hyd. Tpeak (min)=     3.00        13.00
     Unit Hyd. peak  (cms)=      .41          .09
                                                  *TOTALS*
     PEAK FLOW       (cms)=     1.00          .16      1.073 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.32      1.333
     RUNOFF VOLUME    (mm)=    68.38        27.00     49.758
     TOTAL RAINFALL   (mm)=    69.38        69.38     69.379
     RUNOFF COEFFICIENT   =      .99          .39       .717

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
       CN* =  72.0    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.
```

025:0004

*AREA 203 - Westwood SWM Block - Wet Cell

| CALIB STANDHYD | 05:204 DT= 1.00 | Area (ha)= .46 | Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.23	.23
Dep. Storage (mm)=	1.00	2.50
Average Slope (%)=	.50	20.00
Length (m)=	55.00	10.00
Mannings n =	.013	.250
Max.eff.Inten.(mm/hr)=	131.63	54.36
over (min)	2.00	4.00
Storage Coeff. (min)=	1.97 (ii)	3.93 (ii)
Unit Hyd. Tpeak (min)=	2.00	4.00
Unit Hyd. peak (cms)=	.56	.29

		TOTALS
PEAK FLOW (cms)=	.08	.03	.110 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.333
RUNOFF VOLUME (mm)=	68.38	27.00	47.690
TOTAL RAINFALL (mm)=	69.38	69.38	69.379
RUNOFF COEFFICIENT =	.99	.39	.687

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

025:0005

*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell

| CALIB NASHYD | 06:102 DT= 1.00 | Area (ha)= 1.29 Curve Number (CN)=58.00 | Ia (mm)= 2.500 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= .320

Unit Hyd Qpeak (cms)= .154

PEAK FLOW (cms)= .043 (i)
TIME TO PEAK (hrs)= 1.700
RUNOFF VOLUME (mm)= 17.833
TOTAL RAINFALL (mm)= 69.379
RUNOFF COEFFICIENT = .257

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

025:0006

* Total Area draining to Pond = 202+203+102

ADD HYD (PONDIN)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1	01:203	5.11	1.073	1.33	49.76	.000
+ID2	05:204	.46	.110	1.33	47.69	.000
+ID3	06:102	1.29	.043	1.70	17.83	.000
SUM	01:PONDIN	6.86	1.196	1.33	43.62	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

025:0007

*# SWM Pond - Wet Cell

| ROUTE RESERVOIR | IN>01:(PONDIN) | OUT<03:(POND-W) | Requested routing time step = 2.0 min.

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.000	.0000E+00	.017	.1718E+00
.004	.1780E-01	.018	.1988E+00
.008	.3590E-01	.019	.2271E+00
.010	.5340E-01	.020	.2567E+00
.012	.7610E-01	.021	.2876E+00
.013	.9820E-01	.022	.3197E+00
.015	.1214E+00	.023	.3530E+00
.016	.1460E+00	.024	.3877E+00

ROUTING RESULTS	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW >01: (PONDIN)	6.86	1.196	1.333	43.616
OUTFLOW<03: (POND-W)	6.86	.021	4.250	43.616
OVERFLOW<04: (OVF-PO)	.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](%)= 1.743
TIME SHIFT OF PEAK FLOW (min)= 175.00
MAXIMUM STORAGE USED (ha.m.)=.2756E+00

025:0008

*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell

| CALIB NASHYD | 05:103 DT= 1.00 | Area (ha)= .37 Curve Number (CN)=58.00 | Ia (mm)= 2.500 # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= .200

Unit Hyd Qpeak (cms)= .071

PEAK FLOW (cms)= .016 (i)
TIME TO PEAK (hrs)= 1.533
RUNOFF VOLUME (mm)= 17.833
TOTAL RAINFALL (mm)= 69.379
RUNOFF COEFFICIENT = .257

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

025:0009

*AREA 204 - Westwood SWM Block - Infiltration Cell

| CALIB STANDHYD | 06:205 DT= 1.00 | Area (ha)= .25 | Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.13	.13
Dep. Storage (mm)=	1.00	2.50
Average Slope (%)=	.50	20.00
Length (m)=	35.00	10.00
Mannings n =	.013	.025
Max.eff.Inten.(mm/hr)=	131.63	56.98
over (min)	2.00	2.00
Storage Coeff. (min)=	1.50 (ii)	1.99 (ii)
Unit Hyd. Tpeak (min)=	2.00	2.00
Unit Hyd. peak (cms)=	.66	.56

			TOTALS
PEAK FLOW (cms)=	.05	.02	.064 (iii)
TIME TO PEAK (hrs)=	1.33	1.33	1.333
RUNOFF VOLUME (mm)=	68.38	27.00	47.690
TOTAL RAINFALL (mm)=	69.38	69.38	69.379
RUNOFF COEFFICIENT =	.99	.39	.687

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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

* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103

ADD HYD (INFIL-IN)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1	03:POND-WET	6.86	.021	4.25	43.62	.000
+ID2	04:OVF-POND	.00	.000	.00	.00	.000
+ID3	05:103	.37	.016	1.53	17.83	.000
+ID4	06:205	.25	.064	1.33	47.69	.000
SUM	07:INFIL-IN	7.48	.084	1.33	42.48	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

025:0011

*# SWM Pond - Infiltration Cell

| ROUTE RESERVOIR | IN>07:(INFIL-) | OUT<01:(POND-I) | Requested routing time step = 2.0 min.

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
.000	.0000E+00	.019	.3340E-01
.007	.2500E-02	.020	.5270E-01
.018	.1510E-01	.000	.0000E+00

ROUTING RESULTS	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW >07: (INFIL-)	7.48	.084	1.333	42.476
OUTFLOW<01: (POND-I)	7.48	.018	14.750	42.476
OVERFLOW<03: (OVF-PO)	.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](%)= 21.836
TIME SHIFT OF PEAK FLOW (min)= 805.00
MAXIMUM STORAGE USED (ha.m.)=.2629E-01

025:0012

*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road

| CALIB STANDHYD | 04:201 DT= 1.00 | Area (ha)= .39 | Total Imp(%)= 36.00 Dir. Conn.(%)= 36.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.14	.25
Dep. Storage (mm)=	1.00	2.50
Average Slope (%)=	2.00	2.00
Length (m)=	50.00	40.00
Mannings n =	.013	.250
Max.eff.Inten.(mm/hr)=	131.63	42.75
over (min)	1.00	11.00
Storage Coeff. (min)=	1.23 (ii)	11.14 (ii)
Unit Hyd. Tpeak (min)=	1.00	11.00
Unit Hyd. peak (cms)=	.95	.10

			TOTALS
PEAK FLOW (cms)=	.05	.02	.062 (iii)
TIME TO PEAK (hrs)=	1.33	1.48	1.333
RUNOFF VOLUME (mm)=	68.38	27.00	41.896
TOTAL RAINFALL (mm)=	69.38	69.38	69.379
RUNOFF COEFFICIENT =	.99	.39	.604

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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----------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
025:0022----------------------------------------------------------------------
*
025:0022----------------------------------------------------------------------
*
025:0022----------------------------------------------------------------------
*
025:0022----------------------------------------------------------------------
*
  ** END OF RUN :  49

*************************************************************************


--------------------
| START            |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND-1\
--------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND-1\
   TZERO =   .00 hrs on      0
   METOUT=   2 (output = METRIC)
   NRUN  = 050
   NSTORM=  1
            #  1=NC4050.stm

050:0002----------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: Westwood Trails
*#               Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPOST.DAT
*
050:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: 50-YR 4hr Norfolk County Chicago Storm
| Ptotal= 78.32 mm |    Comments: 50-YR 4hr Norfolk County Chicago Storm
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .17   7.355 |   1.17  35.403 |   2.17  14.377 |   3.17   8.442
             .33   8.195 |   1.33 146.499 |   2.33  12.707 |   3.33   7.962
             .50   9.324 |   1.50  43.934 |   2.50  11.449 |   3.50   7.545
             .67  10.946 |   1.67  26.910 |   2.67  10.463 |   3.67   7.179
             .83  13.530 |   1.83  20.358 |   2.83   9.664 |   3.83   6.854
            1.00  18.528 |   2.00  16.730 |   3.00   9.002 |   4.00   6.563

050:0003----------------------------------------------------------------------
*
*#*****************************************************************|
*#
*#                  PROPOSED CONDITIONS HYDROLOGIC MODELING
*#                  ---------------------------------------
*#
*#*****************************************************************|
*#*****************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property
*#*****************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    5.11
| 04:203    DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
----------------------
                        IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=     2.81          2.30
     Dep. Storage    (mm)=     1.00          2.50
     Average Slope   (%)=      2.00          2.00
     Length          (m)=    180.00         40.00
     Mannings n        =      .013          .250

     Max.eff.Inten.(mm/hr)=  146.50         49.58
           over (min)        3.00          12.00
     Storage Coeff.  (min)=  2.53 (ii)     11.88 (ii)
     Unit Hyd. Tpeak (min)=  3.00          12.00
     Unit Hyd. peak  (cms)=   .42           .09
                                                    *TOTALS*
     PEAK FLOW       (cms)=  1.12           .20      1.221 (iii)
     TIME TO PEAK    (hrs)=  1.33          1.50      1.333
     RUNOFF VOLUME    (mm)=  77.32         32.92     57.342
     TOTAL RAINFALL   (mm)=  78.32         78.32     78.320
     RUNOFF COEFFICIENT   =   .99           .42       .732

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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.

050:0004----------------------------------------------------------------------
*#*****************************************************************|
*AREA 203 - Westwood SWM Block - Wet Cell
*#*****************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    .46
| 05:204    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
----------------------
                        IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=      .23           .23
     Dep. Storage    (mm)=     1.00          2.50
     Average Slope   (%)=      .50          20.00
     Length          (m)=    55.00         10.00
     Mannings n        =      .013          .250

     Max.eff.Inten.(mm/hr)=  146.50         65.61
           over (min)        2.00          4.00
     Storage Coeff.  (min)=  1.89 (ii)     3.71 (ii)
     Unit Hyd. Tpeak (min)=  2.00          4.00
     Unit Hyd. peak  (cms)=   .58           .30
                                                    *TOTALS*
     PEAK FLOW       (cms)=   .09           .03       .126 (iii)
     TIME TO PEAK    (hrs)=  1.33          1.33      1.333
     RUNOFF VOLUME    (mm)=  77.32         32.92     55.123
     TOTAL RAINFALL   (mm)=  78.32         78.32     78.320
     RUNOFF COEFFICIENT   =   .99           .42       .704

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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.

050:0005----------------------------------------------------------------------
*#*****************************************************************|
*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell
*#*****************************************************************|
----------------------
| CALIB NASHYD       |   Area    (ha)=   1.29   Curve Number    (CN)=58.00
| 06:102    DT= 1.00 |   Ia      (mm)=   2.300  # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=     .154

     PEAK FLOW       (cms)=     .053 (i)
     TIME TO PEAK    (hrs)=    1.700
     RUNOFF VOLUME    (mm)=   22.131
     TOTAL RAINFALL   (mm)=   78.320
     RUNOFF COEFFICIENT   =     .283

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

050:0006----------------------------------------------------------------------
*#*****************************************************************|
* Total Area draining to Pond = 202+203+102
*#*****************************************************************|
-------------------------
! ADD HYD (PONDIN       ! ! ID: NHYD          AREA     QPEAK    TPEAK    R.V.     DWF
-------------------------                     (ha)     (cms)    (hrs)    (mm)     (cms)
                       ID1 04:203             5.11     1.221    1.33    57.34     .000
                      +ID2 05:204              .46      .126    1.33    55.12     .000
                      +ID3 06:102             1.29      .053    1.70    22.13     .000
                       ================================================================
                       SUM 01:PONDIN          6.86     1.363    1.33    50.57     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

050:0007----------------------------------------------------------------------
*#*****************************************************************|
*#  SWM Pond - Wet Cell
*#*****************************************************************|
----------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>01:(PONDIN)    |
| OUT<03:(POND-W)    |    ========  OUTFLOW STORAGE TABLE  ========
--------------------       OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                             (cms)     (ha.m.)  |    (cms)     (ha.m.)
                             .000   .0000E+00   |     .017   .1718E+00
                             .004   .1780E-01   |     .018   .1980E+00
                             .008   .3590E-01   |     .019   .2271E+00
                             .010   .5540E-01   |     .020   .2567E+00
                             .012   .7610E-01   |     .021   .2876E+00
                             .013   .9820E-01   |     .022   .3197E+00
                             .015   .1214E+00   |     .023   .3530E+00
                             .016   .1460E+00   |     .024   .3877E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     ---------------           (ha)     (cms)     (hrs)        (mm)
      INFLOW >01: (PONDIN)     6.86     1.363     1.333      50.572
     OUTFLOW<03: (POND-W)      6.86      .022     4.267      50.571
    OVERFLOW<04: (OVF-PO)       .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](%)=    1.625
                  TIME SHIFT OF PEAK FLOW       (min)=   176.00
                  MAXIMUM  STORAGE   USED     (ha.m.)=.3217E+00

050:0008----------------------------------------------------------------------
*#*****************************************************************|
*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell
*#*****************************************************************|
----------------------
| CALIB NASHYD       |   Area    (ha)=    .37   Curve Number    (CN)=58.00
| 05:103    DT= 1.00 |   Ia      (mm)=   2.500  # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .230

     Unit Hyd Qpeak  (cms)=     .071

     PEAK FLOW       (cms)=     .020 (i)
     TIME TO PEAK    (hrs)=    1.533
     RUNOFF VOLUME    (mm)=   22.131
     TOTAL RAINFALL   (mm)=   78.320
     RUNOFF COEFFICIENT   =     .283

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

050:0009----------------------------------------------------------------------
*#*****************************************************************|
*AREA 204 - Westwood SWM Block - Infiltration Cell
*#*****************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    .25
| 06:205    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
----------------------
                        IMPERVIOUS     PERVIOUS (i)
     Surface Area    (ha)=      .13           .13
     Dep. Storage    (mm)=     1.00          2.50
```

```
     Average Slope     (%)=        .50         20.00
     Length            (m)=      35.00         10.00
     Mannings n            =      .013          .025

     Max.eff.Inten.(mm/hr)=     146.50         68.58
           over (min)           1.00          2.00
     Storage Coeff.  (min)=     1.14 (ii)     1.89 (ii)
     Unit Hyd. Tpeak (min)=     1.00          2.00
     Unit Hyd. peak  (cms)=      .85           .58
                                                      *TOTALS*
     PEAK FLOW       (cms)=      .05           .02        .073 (iii)
     TIME TO PEAK    (hrs)=     1.33          1.33       1.333
     RUNOFF VOLUME    (mm)=    77.32         32.93      55.122
     TOTAL RAINFALL   (mm)=    78.32         78.32      78.320
     RUNOFF COEFFICIENT    =     .99           .42        .704

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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-------------------------------------------------------------------------
* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103
--------------------
| ADD HYD (INFIL-IN  ) | ID: NHYD        AREA     QPEAK    TPEAK    R.V.     DWF
---------------------------------------  (ha)     (cms)    (hrs)    (mm)     (cms)
                       ID1 03:POND-WET    6.86      .022    4.27    50.57     .000
                      *ID2 04:OVF-POND     .00      .000     .00      .00     .000
                      *ID3 05:103          .37      .020    1.33    22.13     .000
                      *ID4 06:205          .25      .073    1.33    55.12     .000
                       ================================================================
                       SUM 07:INFIL-IN    7.48      .097    1.33    49.32     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

050:0011-------------------------------------------------------------------------
*#*********************************************************************|
*#  SWM Pond - Infiltration Cell
*#*********************************************************************|
--------------------
| ROUTE RESERVOIR    |     Requested routing time step =  2.0 min.
|  IN>07:(INFIL-)    |
| OUT<01:(POND-I)    |     =========  OUTFLOW STORAGE TABLE  =========
--------------------       OUTFLOW     STORAGE    |  OUTFLOW     STORAGE
                             (cms)      (ha.m.)    |    (cms)     (ha.m.)
                              .000   .0000E+00     |     .019   .3340E-01
                              .007   .2500E-02     |     .020   .5270E-01
                              .018   .1510E-01     |     .000   .0000E+00

     ROUTING RESULTS          AREA      QPEAK      TPEAK       R.V.
     ---------------          (ha)      (cms)      (hrs)       (mm)
     INFLOW >07: (INFIL-)     7.48       .097     1.333      49.316
     OUTFLOW<01: (POND-I)     7.48       .019    18.867      49.316
    OVERFLOW<03: (OVF-PO)      .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](%)=    19.542
                  TIME SHIFT OF PEAK FLOW          (min)=  1052.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=.3518E-01

050:0012-------------------------------------------------------------------------
*#*********************************************************************|
*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road
*#*********************************************************************|
--------------------
| CALIB STANDHYD     |   Area     (ha)=     .39
| 04:201     DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      .14          .25
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=    50.00        40.00
     Mannings n            =     .013         .250

     Max.eff.Inten.(mm/hr)=   146.50        55.17
           over (min)           1.00        10.00
     Storage Coeff.  (min)=     1.18 (ii)   10.13 (ii)
     Unit Hyd. Tpeak (min)=     1.00        10.00
     Unit Hyd. peak  (cms)=      .97          .11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      .06          .02        .072 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.45       1.333
     RUNOFF VOLUME    (mm)=    77.32        32.92      48.907
     TOTAL RAINFALL   (mm)=    78.32        78.32      78.320
     RUNOFF COEFFICIENT    =     .99          .42        .624

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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-------------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
050:0002-------------------------------------------------------------------------
*
050:0002-------------------------------------------------------------------------
*
050:0002-------------------------------------------------------------------------
*
050:0002-------------------------------------------------------------------------
*
050:0002-------------------------------------------------------------------------
*
  ** END OF RUN :  99

************************************************************************



--------------------
| START              |  Project dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
----------------------  Rainfall dir.: Q:\38750\124\SWM\SWMHYMO\SECOND~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 100
    NSTORM=   1
        #  1=NC4100.stm
100:0002-------------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: Westwood Trails
*#                Simcoe - Norfolk County
*#  JOB NUMBER  : 38750-124
*#       Date   : FEBRUARY 2016
*#    Company   : MTE CONSULTANTS INC.
*#       File   : WestPOST.DAT
*
100:0002-------------------------------------------------------------------------
*
--------------------
| READ STORM         |  Filename: 100-YR 4hr Norfolk County Chicago Storm
| Ptotal= 87.09 mm   |  Comments: 100-YR 4hr Norfolk County Chicago Storm
--------------------
              TIME     RAIN |   TIME     RAIN |   TIME     RAIN |   TIME     RAIN
              hrs     mm/hr |    hrs    mm/hr |    hrs    mm/hr |    hrs    mm/hr
              .17     8.399 |   1.17   38.699 |   2.17   16.168 |   3.17    9.613
              .33     9.336 |   1.33  160.972 |   2.33   14.334 |   3.33    9.078
              .50    10.593 |   1.50   47.723 |   2.50   12.948 |   3.50    8.612
              .67    12.391 |   1.67   29.715 |   2.67   11.857 |   3.67    8.202
              .83    15.237 |   1.83   22.675 |   2.83   10.971 |   3.83    7.838
             1.00    20.689 |   2.00   18.738 |   3.00   10.236 |   4.00    7.512

100:0003-------------------------------------------------------------------------
*
*#*********************************************************************|
*#
*#                  PROPOSED CONDITIONS HYDROLOGIC MODELING
*#                  ---------------------------------------
*#
*#####################################################################|
*#*********************************************************************|
*AREA 202 - The Proposed Westwood Trails Subdivision and Smith Property
*#*********************************************************************|
--------------------
| CALIB STANDHYD     |   Area     (ha)=    5.11
| 04:203     DT= 1.00 |   Total Imp(%)=   55.00   Dir. Conn.(%)=   55.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     2.81         2.30
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=   180.00        40.00
     Mannings n            =     .013         .250

     Max.eff.Inten.(mm/hr)=   160.97        61.74
           over (min)           2.00        11.00
     Storage Coeff.  (min)=     2.44 (ii)   11.00 (ii)
     Unit Hyd. Tpeak (min)=     2.00        11.00
     Unit Hyd. peak  (cms)=      .49          .10
                                                      *TOTALS*
     PEAK FLOW       (cms)=     1.24          .25       1.379 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.47       1.333
     RUNOFF VOLUME    (mm)=    86.09        39.02      64.909
     TOTAL RAINFALL   (mm)=    87.09        87.09      87.089
     RUNOFF COEFFICIENT    =     .99          .45        .745

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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.

100:0004-------------------------------------------------------------------------
*#*********************************************************************|
*AREA 203 - Westwood SWM Block - Wet Cell
*#*********************************************************************|
--------------------
| CALIB STANDHYD     |   Area     (ha)=     .46
| 05:204     DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      .23          .23
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=      .50        20.00
     Length            (m)=   55.00        10.00
     Mannings n            =     .013         .250

     Max.eff.Inten.(mm/hr)=   160.97        77.12
           over (min)           2.00         4.00
     Storage Coeff.  (min)=     1.82 (ii)    3.52 (iii)
     Unit Hyd. Tpeak (min)=     2.00         4.00
     Unit Hyd. peak  (cms)=      .59          .31
                                                      *TOTALS*
     PEAK FLOW       (cms)=      .10          .04        .142 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.35       1.333
     RUNOFF VOLUME    (mm)=    86.09        39.02      62.556
     TOTAL RAINFALL   (mm)=    87.09        87.09      87.089
     RUNOFF COEFFICIENT    =     .99          .45        .718

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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.

100:0005-------------------------------------------------------------------------
```

```
*#*****************************************************************|
*AREA 102 - External Drainage to Westwood SWM Block - Wet Cell
*#*****************************************************************|

| CALIB NASHYD      |   Area    (ha)=    1.29   Curve Number    (CN)=58.00
| 06:102    DT= 1.00 |   Ia      (mm)=   2.500   # of Linear Res.(N)= 3.00
                      U.H. Tp(hrs)=    .320

     Unit Hyd Qpeak  (cms)=      .154

     PEAK FLOW       (cms)=      .064 (i)
     TIME TO PEAK    (hrs)=     1.900
     RUNOFF VOLUME    (mm)=    26.647
     TOTAL RAINFALL   (mm)=    87.089
     RUNOFF COEFFICIENT   =      .306

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

100:0006-----------------------------------------------------------------
*#*****************************************************************|
* Total Area draining to Pond = 202+203+102
*#*****************************************************************|

| ADD HYD (PONDIN     ) | ID: NHYD          AREA     QPEAK    TPEAK    R.V.    DWF
                        |                   (ha)     (cms)    (hrs)    (mm)    (cms)
                      ID1 04:203             5.11     1.379    1.33   64.91    .000
                     +ID2 05:204              .46     .142     1.33   62.56    .000
                     +ID3 06:102             1.29     .061     1.70   26.65    .000
                      ================================================================
                      SUM 01:PONDIN          6.86     1.542    1.33   57.56    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

100:0007-----------------------------------------------------------------
*#*****************************************************************|
*#  SWM Pond - Wet Cell
*#*****************************************************************|

| ROUTE RESERVOIR   |     Requested routing time step =  2.0 min.
|  IN>01:(PONDIN)   |
| OUT<03:(POND-W)   |     =========  OUTFLOW STORAGE TABLE  =========
                      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                        (cms)    (ha.m.)   |    (cms)    (ha.m.)
                         .000  .0000E+00    |     .017  .1718E+00
                         .004  .1780E-01    |     .018  .1988E+00
                         .008  .3590E-01    |     .019  .2271E+00
                         .010  .5540E-01    |     .020  .2567E+00
                         .012  .7610E-01    |     .021  .2876E+00
                         .013  .9820E-01    |     .022  .3197E+00
                         .015  .1214E+00    |     .023  .3530E+00
                         .016  .1460E+00    |     .024  .3877E+00

     ROUTING RESULTS             AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (PONDIN)        6.86     1.542     1.333     57.556
     OUTFLOW<03: (POND-W)        6.86      .023     4.283     57.555
    OVERFLOW<04: (OVF-PO)         .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)(%)=    1.514
                TIME SHIFT OF PEAK FLOW          (min)=   177.00
                MAXIMUM  STORAGE   USED        (ha.m.)=.3680E+00

100:0008-----------------------------------------------------------------
*#*****************************************************************|
*AREA 103 - External Drainage to Westwood SWM Block - Infiltration Cell
*#*****************************************************************|

| CALIB NASHYD      |   Area    (ha)=     .37   Curve Number    (CN)=58.00
| 05:103    DT= 1.00 |   Ia      (mm)=  2.500   # of Linear Res.(N)= 3.00
                      U.H. Tp(hrs)=    .200

     Unit Hyd Qpeak  (cms)=      .071

     PEAK FLOW       (cms)=      .024 (i)
     TIME TO PEAK    (hrs)=     1.533
     RUNOFF VOLUME    (mm)=    26.647
     TOTAL RAINFALL   (mm)=    87.089
     RUNOFF COEFFICIENT   =      .306

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

100:0009-----------------------------------------------------------------
*#*****************************************************************|
*AREA 204 - Westwood SWM Block - Infiltration Cell
*#*****************************************************************|

| CALIB STANDHYD    |   Area    (ha)=     .25
| 06:205    DT= 1.00 |   Total Imp(%)=   50.00   Dir. Conn.(%)=   50.00

                        IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=      .13          .13
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=      .50        20.00
     Length            (m)=    35.00        10.00
     Mannings n            =     .013         .025

     Max.eff.Inten.(mm/hr)=   160.97        80.48
               over (min)        1.00         2.00
     Storage Coeff.  (min)=    1.38 (ii)    1.81 (iii)
     Unit Hyd. Tpeak (min)=    1.00         2.00
     Unit Hyd. peak  (cms)=     .87          .60
                                                    *TOTALS*
     PEAK FLOW       (cms)=     .06          .03       .082 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.33      1.333
     RUNOFF VOLUME    (mm)=   86.09        39.02     62.555
     TOTAL RAINFALL   (mm)=   87.09        87.09     87.089
     RUNOFF COEFFICIENT   =     .99          .45       .718

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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-----------------------------------------------------------------
* Total Area draining to Infiltration Cell = Wet Cell outflow+204+103
-------------------------------------------------------------------------

| ADD HYD (INFIL-IN   ) | ID: NHYD          AREA     QPEAK    TPEAK    R.V.    DWF
                        |                   (ha)     (cms)    (hrs)    (mm)    (cms)
                      ID1 03:POND-WET        6.86     .023     4.28   57.55    .000
                     +ID2 04:OVF-POND         .00     .000      .00     .00    .000
                     +ID3 05:103              .37     .024     1.53   26.65    .000
                     +ID4 06:205              .25     .082     1.33   62.56    .000
                      ================================================================
                      SUM 07:INFIL-IN        7.48     .109     1.33   56.19    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

100:0011-----------------------------------------------------------------
*#*****************************************************************|
*#  SWM Pond - Infiltration Cell
*#*****************************************************************|

| ROUTE RESERVOIR   |     Requested routing time step =  2.0 min.
|  IN>07:(INFIL-)   |
| OUT<01:(POND-I)   |     =========  OUTFLOW STORAGE TABLE  =========
                      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                        (cms)    (ha.m.)   |    (cms)    (ha.m.)
                         .000  .0000E+00    |     .019  .3340E-01
                         .007  .2500E-02    |     .020  .5270E-01
                         .018  .1910E-01    |     .000  .0000E+00

     ROUTING RESULTS             AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW >07: (INFIL-)        7.48      .109     1.333     56.193
     OUTFLOW<01: (POND-I)        7.48      .019    22.633     56.193
    OVERFLOW<03: (OVF-PO)         .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)(%)=   17.752
                TIME SHIFT OF PEAK FLOW          (min)=  1278.00
                MAXIMUM  STORAGE   USED        (ha.m.)=.4568E-01

100:0012-----------------------------------------------------------------
*#*****************************************************************|
*AREA 201 - Thomson Road Cul-de-sac Uncontrolled to Thomson Road
*#*****************************************************************|

| CALIB STANDHYD    |   Area    (ha)=     .39
| 04:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00

                        IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=      .14          .25
     Dep. Storage     (mm)=     1.00         2.50
     Average Slope     (%)=     2.00         2.00
     Length            (m)=    50.00        40.00
     Mannings n            =     .013         .250

     Max.eff.Inten.(mm/hr)=   160.97        67.60
               over (min)        1.00         9.00
     Storage Coeff.  (min)=    1.13 (ii)    9.39 (ii)
     Unit Hyd. Tpeak (min)=    1.00         9.00
     Unit Hyd. peak  (cms)=    1.00          .12
                                                    *TOTALS*
     PEAK FLOW       (cms)=     .06          .03       .083 (iii)
     TIME TO PEAK    (hrs)=    1.33         1.43      1.333
     RUNOFF VOLUME    (mm)=   86.09        39.02     56.966
     TOTAL RAINFALL   (mm)=   87.09        87.09     87.089
     RUNOFF COEFFICIENT   =     .99          .45       .643

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  72.0    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-----------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (Norfolk County 2 TO 100-YR)
*
100:0002-----------------------------------------------------------------
*
100:0002-----------------------------------------------------------------
*
100:0002-----------------------------------------------------------------
*
100:0002-----------------------------------------------------------------
*
100:0002-----------------------------------------------------------------
*
100:0002-----------------------------------------------------------------
*
100:0002-----------------------------------------------------------------
*
      FINISH
-------------------------------------------------------------------------
*************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2016-02-26     at 13:40:57
-------------------------------------------------------------------------
```

MTE FILE No: 38750-124-LG1.1

LOT GRADING PLAN

P:\P_38750\124\38750-124-LG1

LEGEND

- SITE BOUNDARY
- EXISTING DRIPLINE
- EXISTING FENCE
- LIMIT OF GRADING
- EXISTING CONTOURS
- PROPOSED ELEVATION
- EXISTING ELEVATION
- OVERLAND FLOW ROUTE (MAJOR STORM)
- EXISTING DIRECTION OF DRAINAGE/SWALE
- DIRECTION OF DRAINAGE/SWALE
- DRAINAGE SPLIT (RIDGE)
- EMBANKMENT (SLOPE AS NOTED)
- PROPOSED FENCE
- MONITORING WELL/BOREHOLE
- PROPOSED BUILDING ENVELOPE

S DENOTES SPLIT LOT DRAINAGE

L/O DENOTES LOOKOUT LOT DRAINAGE

MINIMUM BASEMENT FLOOR ELEVATION

MINIMUM TOP OF FOUNDATION WALL ELEVATION

SAN MH | STM MH | CBMH | DCBMH | DCB | CB — PROPOSED STRUCTURES

FUT. SAN. MH | FUT. STM. MH | FUT. CBMH | FUT. DCBMH | FUT. DCB | FUT. CB — FUTURE STRUCTURES

- CANADA POST MAILBOX
- PROP. HYDRO PADMOUNT TRANSFORMER
- PROP. HYDRO POLEMOUNT TRANSFORMER
- BELL PEDESTAL
- PROP. CABLE PEDESTAL
- EX. CABLE PEDESTAL
- PROP. LIGHTING PEDESTAL
- PROP. STREET LIGHT
- EX. HYDRO POLEMOUNT TRANSFORMER

NOTE:
TO BE READ IN CONJUNCTION WITH MTE DRAWING No. LG1.2

VIRGINIA AVENUE

WESTWOOD PARK

TENNIS COURTS

EXISTING RESIDENTIAL

THOMSON ROAD

EXISTING OPEN SPACE

ADDITIONAL LAND (OWNED BY APPLICANT)

FUTURE PARK

PROPOSED SWM FACILITY AND INFILTRATION GALLERY

CONFIGURATION OF CONDOMINIUM IS NOT FINALIZED AND GRADING DETAILS HAVE NOT BEEN FINALIZED.

FUTURE PRIVATE ROAD 'A'

FUTURE PRIVATE ROAD 'B'

FUTURE PUMPING STATION

FUTURE PRIVATE ROAD 'C'

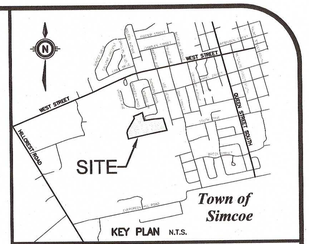
AGRICULTURAL LAND

SMITH LANDS

SOUTH DRIVE R.O.W.

EXISTING

NOTE:
LOTTING AND STREET CONFIGURATION WITHIN THE SMITH LANDS IS CONCEPTUAL AND TO BE USED FOR DISCUSSION PURPOSES ONLY.



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SITE BENCHMARK ELEV. =237.265 m

TOP OF LARGE ARM OF FIRE HYDRANT HOUSING. LOCATED ON FERNWOOD AVENUE, ADJACENT TO #65 THOMSON ROAD.

No.	REVISION	BY	DATE
7.	UPDATED PHASE 2 FOR SWM	SJR	MAR.04/16
6.	REVISED PER COUNTY COMMENTS	MJG	MAR.18/15
5.	ISSUED FOR APPROVAL	SJR	FEB.20/15
4.	REVISED PER COUNTY COMMENTS	SJR	DEC.16/14
3.	ISSUED FOR TENDER	SJR	NOV.13/14
2.	ISSUED FOR MOE APPROVAL	SJR	OCT.09/14
1.	ISSUED FOR 1ST SUBMISSION	SJR	AUG.08/14

MTE
Engineers | Scientists | Surveyors
Land Development Division
Ph. (905)639-2552 www.mte85.com

OWNER
WESTWOOD TRAIL DEVELOPMENTS INC.
34 Virginia Avenue Simcoe, ON

PROJECT
WESTWOOD TRAIL SUBDIVISION-PHASE 1
Simcoe, ON

DRAWING
LOT GRADING PLAN

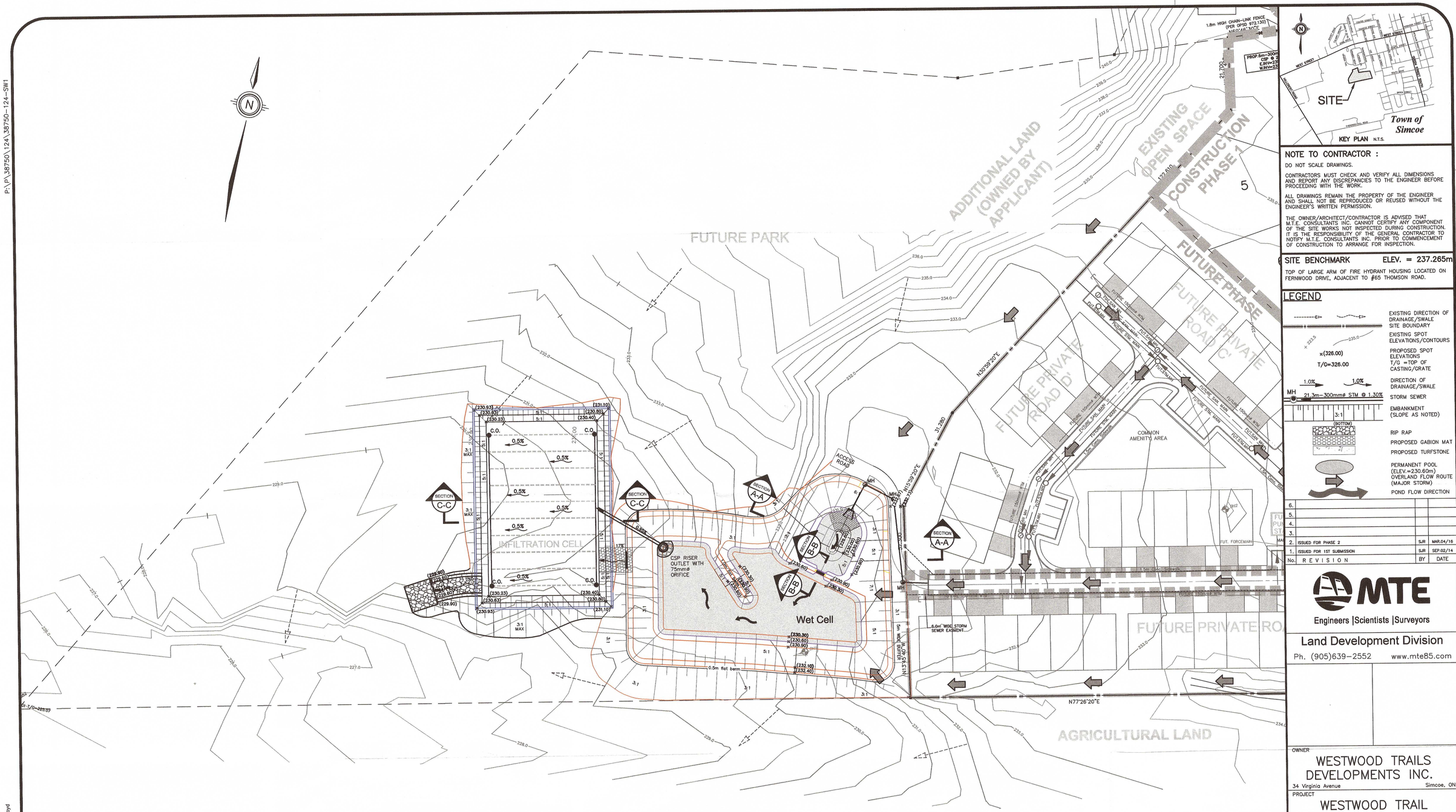
Project Manager	S.ROORDA	Project No.	38750-124
Design By	MJG/JRA	Checked By	
Drawn By	BWB	Checked By	
Surveyed By	OTHERS, MTE	Drawing No.	LG1.1
Date	Feb.18/16		
Scale	1:750	Sheet 7 of 12	

February 25, 2016 - 2:18 p.m. - Plotted By: bboyd

MTE FILE No: 38750-124-SW1.1

STORM WATER MANAGEMENT PLAN

P:\P\38750\124\38750-124-SW1



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SITE BENCHMARK ELEV. = 237.265m

TOP OF LARGE ARM OF FIRE HYDRANT HOUSING LOCATED ON FERNWOOD DRIVE, ADJACENT TO #65 THOMSON ROAD.

LEGEND

- EXISTING DIRECTION OF DRAINAGE/SWALE
- SITE BOUNDARY
- + 223.5 / 235.0 — EXISTING SPOT ELEVATIONS/CONTOURS
- x(326.00) T/G=326.00 — PROPOSED SPOT ELEVATIONS T/G =TOP OF CASTING/GRATE
- 1.0% 1.0% — DIRECTION OF DRAINAGE/SWALE
- MH 21.3m-300mø STM @ 1.30% — STORM SEWER
- 3:1 — EMBANKMENT (SLOPE AS NOTED)
- (BOTTOM) — RIP RAP
- PROPOSED GABION MAT
- PROPOSED TURFSTONE
- PERMANENT POOL (ELEV.=230.60m) OVERLAND FLOW ROUTE (MAJOR STORM)
- POND FLOW DIRECTION

NOTE: FOREBAY AND WET CELL COMPONENTS OF SWM FACILITY TO BE BUILT WITH 1.0m LAYER OF RELATIVE IMPERVIOUS MATERIAL (T-TIME = 40 min/cm OR SLOWER) (CLAYEY SILT AVAILABLE ONSITE).

No.	REVISION	BY	DATE
6.			
5.			
4.			
3.			
2.	ISSUED FOR PHASE 2	SJR	MAR.04/16
1.	ISSUED FOR 1ST SUBMISSION	SJR	SEP.02/14

MTE
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Land Development Division
Ph. (905)639-2552 www.mte85.com

OWNER
WESTWOOD TRAILS DEVELOPMENTS INC.
34 Virginia Avenue Simcoe, ON

PROJECT
WESTWOOD TRAIL SUBDIVISION
Simcoe, ON

DRAWING
STORM WATER MANAGEMENT PLAN

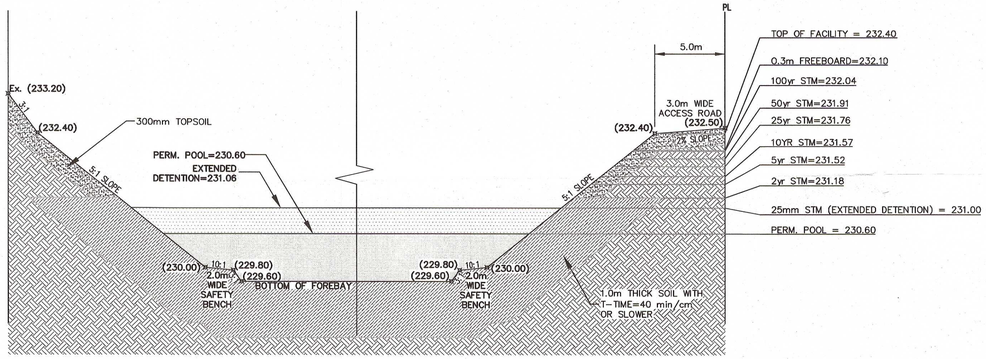
Project Manager	S.ROORDA	Project No.	38750-124
Design By	MXM/JRA	Checked By	SJR
Drawn By	BWB	Checked By	SJR
Surveyed By	OTHERS, MTE	Drawing No.	SW1.1
Date	Feb.26/16		
Scale	1:500	Sheet 5 of 12	

February 13, 2016 - 1:04 p.m. - Plotted By: bboyd

MTE FILE No: 38750-124-SW1.2

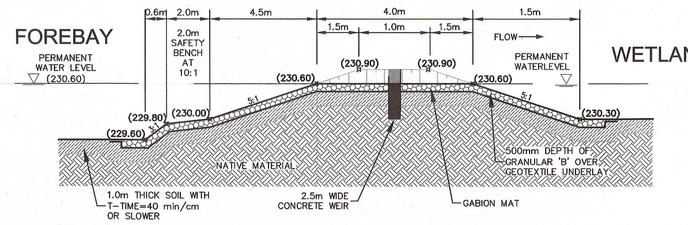
STORM WATER DETAILS PLAN

P:\P\38750\124\38750-124-SW1



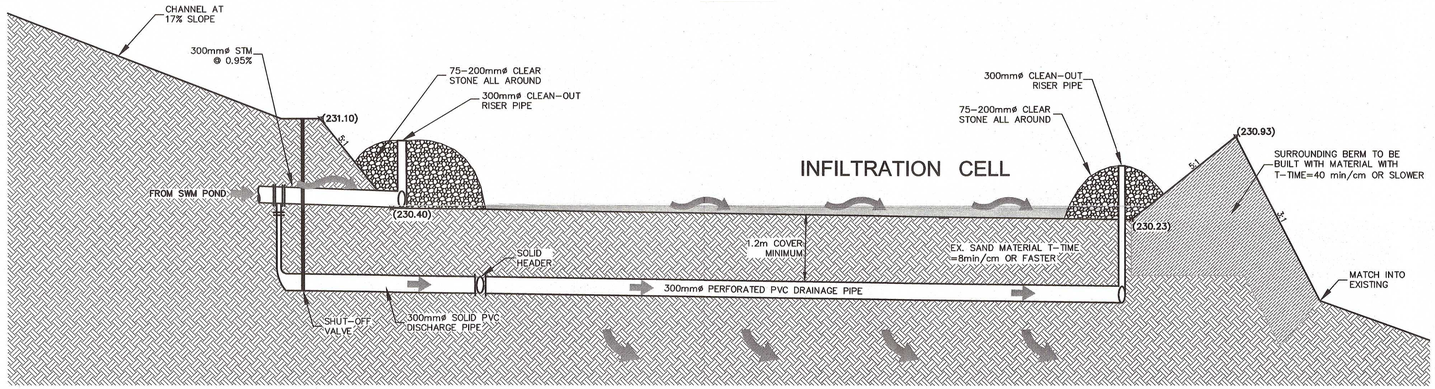
SECTION A–A
FOREBAY CROSS–SECTION

SCALE: 1:200 HOR.
1:50 VERT.



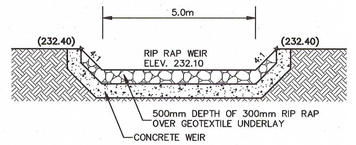
SECTION B–B
FOREBAY OUTLET BERM

N.T.S.



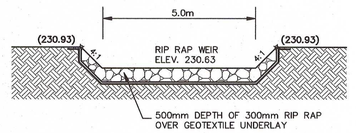
SECTION C–C
INFILTRATION CELL CROSS–SECTION

SCALE: 1:200 HOR.
1:50 VERT.



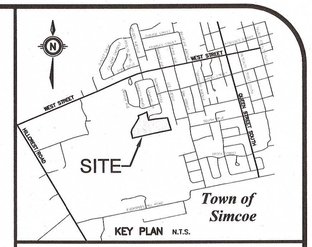
WET CELL EMERGENCY
OVERFLOW OUTLET WEIR DETAIL

N.T.S.



INFILTRATION CELL EMERGENCY
OVERFLOW OUTLET WEIR DETAIL

N.T.S.



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SITE BENCHMARK ELEV. = 237.265m

TOP OF LARGE ARM OF FIRE HYDRANT HOUSING LOCATED ON FERNWOOD DRIVE, ADJACENT TO #65 THOMSON ROAD.

No.	REVISION	BY	DATE
6.			
5.			
4.			
3.			
2.			
1.	ISSUED FOR 1ST SUBMISSION	SJR	SEP.02/14

MTE
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OWNER
WESTWOOD TRAILS DEVELOPMENTS INC.
34 Virginia Avenue Simcoe, ON

PROJECT
WESTWOOD TRAILS SUBDIVISION
Simcoe, ON

DRAWING
STORM WATER DETAILS PLAN

Project Manager: S.ROORDA	Project No.: 38750–124
Design By: MXM/JRA	Checked By: SJR
Drawn By: BWB	Checked By: SJR
Surveyed By: OTHERS, MTE	Drawing No.: SW1.2
Date: Feb.26/16	
Scale: AS NOTED	Sheet 6 of 15

February 13, 2016 – 1:04 p.m. – Plotted By: bboyd

MEMO

TO: Devin Hunter, C.E.T, CMMI – Director, Development Engineering, Public Works at the County of Norfolk

FROM: Dragan Sredojevic, P.Eng., M.E.Sc., Dillon Consulting Limited

FOR: Ron Antuma, P.E., Dillon Consulting Limited

DATE: January 8, 2019

SUBJECT: Westwood Trail Subdivision

OUR FILE: 18-7395

Introduction

Dillon Consulting Limited (Dillon) was retained by Warren D. Sinclair Construction Ltd. to undertake a detailed design and confirm if the stormwater management design proposed by MTE Consultants Inc. in 2016 is still applicable, in support of the proposed Westwood Trails Subdivision development in the Town of Simcoe.

This memo summarizes Dillon's review of the Westwood Trails Subdivision Functional Stormwater Management Report by MTE Consultants Inc. (MTE File: 38750-124), dated March 9, 2016. This memo should be read in conjunction with MTE's report (previously submitted to Norfolk County) and Dillon's engineering drawings set (dated December 2018).

A comparison of updated information provided on Dillon's Consulting's engineering drawing set and MTE's report revealed that the wet pond drainage area has a higher imperviousness than shown in MTE's report/modelling.

This memo is to confirm/justify in sections below if the proposed wet pond (quality and erosion control) and stormwater quantity control/infiltration cell design (by MTE) will remain or if design revisions are required due to higher drainage area imperviousness.

The other sections of MTE's report (such as background information, geotechnical investigations, stormwater management criteria, existing conditions, water balance, erosion and sediment control measures and operation and maintenance) stay unchanged, therefore they are outside of the scope of this review.

Post Development Conditions

The post-development drainage area was delineated into six sub-catchments. Table 1 (Modified MTE Table 4.1) below provides a brief description of each sub-catchment area as well as the design parameters used in the hydrologic modelling. Figure 2 provided in MTE's report provides an illustration of the post development catchment areas. The proposed drainage catchments are as follows:

Catchment 201

Front yards of the residential lots of the Thomson Road cul-de-sac and the road area of the cul-de-sac itself make up this catchment area. The major and minor storm events from this area will drain

uncontrolled to Thomson Road and the existing storm sewer. This catchment was not changed, therefore it was not remodeled.

Catchment 202

The Westwood Trails subdivision, Smith property and Thompson Road single house backyards are comprised of residential development (mainly condominium) and associated roadways both public and private. The flow from this catchment will be collected and conveyed by proposed storm sewers while major flows (higher than 5-year storm) will drain overland to the proposed SWM facility.

Catchment 203

This catchment is comprised of the proposed Westwood Trails SWM pond, specifically the forebay cell and wet cell of the proposed SWM facility.

Catchment 204

This catchment is comprised of the proposed Westwood Trails SWM pond, specifically the infiltration cell of the proposed SWM facility.

Catchment 102

This catchment is comprised of the existing wooded ravine located west of the proposed development which drains overland to the proposed SWM facility, specifically the wet cell of the proposed SWM facility.

Catchment 103

This catchment is comprised of the existing wooded area located east of the proposed infiltration cell. Run-off from this catchment will drain overland to the proposed SWM facility, specifically the infiltration cell of the proposed SWM facility.

TABLE 1 – POST DEVELOPMENT CATCHMENT PARAMETERS (MODIFIED MTE TABLE 4.1)

Sub-Catchment	Description	Area (ha)	HSG	T Imp. (%)	X Imp. (%)	I_a PER (mm)	I_a IMP (mm)	Perv. CN
201	Front Yards of Residential Lots of the Thomson Road Cul-de-sac (uncontrolled)	0.39	A	36	36	2.50	1.0	72
***202**	**The Proposed Westwood Trails Subdivision + Smith Property**	**5.04**	**A**	**73**	**73**	**2.50**	**1.0**	**72**
203	Westwood SWM Facility – Wet Cell	0.46	A	50	50	2.50	1.0	72
204	Westwood SWM Facility – Infiltration Cell	0.25	A	50	50	2.50	1.0	72
102	External Drainage to SWM Facility – Wet Cell	1.29	A	N/A	N/A	2.50	N/A	58
103	External Drainage to SWM Facility – Infiltration Cell	0.37	A	N/A	N/A	2.50	N/A	58
	Total (developed area + undeveloped external drainage)	***7.80***						

Notes:
*Drainage area based on Dillon's Consulting Storm Sewer Drainage Plan, Sheet No.11. Drainage area is comprised of a single houses catchment A15 (single house backyards) at run-off coefficient of 0.3 and condo catchments (A1-A14) at estimated run-off coefficient of 0.75. The composite run-off coefficient was calculated to be 0.71 ([4.62x0.75+0.42X0.3]/5.04).

The composite run-off coefficient 0.71 was converted to imperviousness as follow:
0.9x+0.2(1-x)=0.71→0.7x=0.51→x=**73%**

It should be noted that the Catchment 202 imperviousness of 73% is higher than the imperviousness of 55% used for Catchment 202 in MTE's report and modelling. All other catchments stay the same. The existing MTE SWMHYMO hydrologic model was updated to confirm if the increases in imperviousness will trigger revisions to the proposed stormwater management ponds (quality and quantity) design. Modelling and supporting calculation results are explained in the following sections.

Hydrologic Modelling

The Visual OTHYMO hydrologic modelling program was utilized using the existing MTE SWMHYMO hydrologic model parameters, with exception of updated post-development Catchment 202. The proposed development conditions were modeled for the:

- Quality event (25 mm depth, 4-hour Chicago storm distribution)
- Two – 100 year return period rainfall events (4-hr Chicago storm distribution derived from the County of Norfolk Intensity-Duration-Frequency parameters).

A Hydrologic Modelling Schematic and Input/Output Files are attached to this memo.

Stormwater Management Overview

The SWM Facility is divided into three cells: the first cell consists of a sediment forebay accepting minor storm event flows, the second is the quality control portion, and the third is an infiltration area – accepting storm run-off from the main wet pond, under all storm events up to and including the 100 year storm.

Sediment Forebay Design

Dillon's review of the forebay design provided in Appendix A of MTE's report has confirmed that the forebay design stays the same (as per MTE's design); therefore, the forebay design is not further discussed in this memo.

Review of Water Quality Volume

As presented in MTE's report, an Enhanced Level (formerly Level 1) of water quality protection is required. Quality control requirements will be provided by a wetland pond SWM facility, servicing a total drainage area of 6.79 ha with an average imperviousness of 58%. An Enhanced Level of water quality control (based on a wet pond using an imperviousness of 58%) requires a storage volume of 108 m^3/ha. Of this volume, 68 m^3/ha represents permanent pool requirement while 40 m^3/ha is provided for extended pond detention.

Considering the total post-development drainage area draining to the SWM facility of 6.79 ha (catchment areas 202, 203, and 102) the required permanent pool volume was calculated to be 462 m^3. The permanent pool volume provided in the main wet pond area is 344 m^3. The permanent pool volume provided in the forebay totals 95 m^3. The main pond and forebay combine to provide a total permanent pool volume of 439 m^3, which is not sufficient to provide an Enhanced Level of water quality protection. Review of stage-storage-discharge relationship provided in Appendix A of MTE's report indicates that increasing berm/permanent pool height by 0.05 m to a total height of 1.05 (elevation of 260.65) will provide a permanent pool volume of 534 m^3 (428 m^3 main pond + 106 m^3 forebay) which exceeds the required volume recommended by the MOE. Therefore increasing the permanent pool height by 5 cm will provide the required quality control.

Review of the Wet Pond Design

The detailed design of the proposed wet pond is presented in MTE's report and Dillon's engineering drawing set (Sheets No. SW1.1 & SW1.2). Dillon's Visual OTHYMO hydrologic modelling results for the proposed wet pond are summarized in Table 2 below while a detailed hydrologic modelling schematic and output files are attached to this memo.

TABLE 2 – SUMMARY OF SWM FACILITY PONDING ELEVATIONS-STORAGE- OUTFLOW (WET POND)

Storm Event	Maximum Storage Volume Used (m^3) *	Maximum Ponding Elevation (m)	Wet Pond Outflow (m^3/s) *
25 mm	900	231.06	0.013
2-year	1,334	231.25	0.016
5-year	2,009	231.51	0.018
10-year	2,459	231.66	0.020
25-year	3,055	231.86	0.022
50-year	3,533	232.00	0.023
100-year	4,011	232.14	0.024

Notes:
*Taken from Dillon's Visual OTHYMO output.

Sufficient storage volume has been provided within the wet pond portion of the SWM facility to store the 100 year storm event. The maximum anticipated ponding elevation within the wet pond portion of the SWM facility will be 232.14 m, which is higher than the anticipated ponding elevation of 232.04 m, shown in Table 5.5 of MTE's report. Therefore, an emergency overflow weir (5.0 m wide) should be set to the elevation of 232.14 m (comparing to the emergency overflow weir elevation of 232.10 m in MTE's report). Accordingly, the top of pond elevation should be set to the elevation of 232.44 m (comparing to the top of the pond elevation of 232.40 m in MTE's report), in order to provide 0.3 m free board. Therefore, the required increase in the height of the wet pond is just 4 cm.

Wet Pond Outflow Control

Dillon's review of MTE's report has revealed that a 75 mm diameter orifice is shown on the drawings and in the report while a 95 mm diameter orifice is shown in the stage-storage-discharge relationship and hydraulic modelling. Dillon's calculation has confirmed that the **95 mm** diameter orifice is required to provide required flow attenuation. Therefore, a perforated CSP riser with a 95 mm diameter orifice will be located at the west end of the wet pond, at the permanent pool elevation.

The above findings indicate that the required increase in height of the permanent pool (around 5 cm) and top of the pond (around 4 cm) is insignificant and is within construction tolerance. Therefore, we propose that the wet pond design (with exception of the orifice size) stays as per MTE design:

- Permanent pool elevation of 231.60 m
- 95 mm diameter orifice to be located at the permanent pool elevation of 231.60 m
- An emergency overflow weir (5 m wide) is to be provided at the elevation of 232.10 and the top of pond is to be at the elevation of 232.40 m.

Review of the Infiltration Pond Design

The infiltration pond was designed to infiltrate post development flows, including the 100-year storm. The detailed design of the proposed infiltration pond is presented in MTE's report and Dillon's engineering drawing set (Sheets No. SW1.1 & SW1.2). Dillon's Visual OTHYMO hydrologic modelling results for the proposed infiltration pond are summarized in Table 3 below while a detailed hydrologic modelling schematic and output files are attached to this memo.

TABLE 3 – SUMMARY OF SWM FACILITY PONDING ELEVATIONS-STORAGE – OUTFLOW (INFILTRATION CELL)

Storm Event	Maximum Storage Volume Used (m^3) *	Maximum Ponding Elevation (m)	Outflow/Infiltration (m^3/s) *
25 mm	79	230.34	0.012
2-year	112	230.37	0.015
5-year	147	230.40	0.018
10-year	192	230.42	0.018
25-year	294	230.48	0.019
50-year	394	230.53	0.019
100-year	502	230.59	0.020
Notes: *Taken from Dillon's Visual OTHYMO output.			

Table 3 above indicates that ponding elevations are just 1-3 cm higher than those presented in MTE's report. Therefore, the proposed infiltration pond design by MTE stays unchanged.

Conclusions and Recommendations

The increase in height of the permanent pool (around 5 cm) and top of the pond (around 4 cm) is insignificant and is within construction tolerance. The modelling results for the infiltration pond show that the proposed design by MTE is still applicable. Therefore, we recommend that the proposed wet and infiltration ponds design (with exception of the orifice size) remain as outlined in MTE's report submitted to Norfolk County in 2016. Wet pond and Infiltration pond design details are presented on Dillon's Stormwater Management Plan and SWM Details Drawings (Sheet SW1.1 and SW1.2).



DILLON CONSULTING LIMITED
LONDON, ONTARIO

Dragan Sredojevic, P.Eng., M.E.Sc.
Water Resources Engineer

Ron Antuma, P.E., - Associate
Project Manager

PROJECT- 18-7395 (Westwood Trail Subdivision)

Name: WET POND

Date : December 21, 2018

POND STORAGE AND DISCHARGE

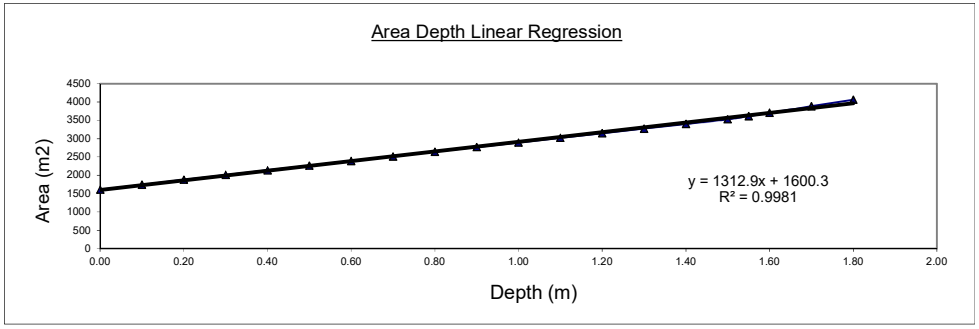
Orifice #1(Plate)	
Orifice Invert Elevation	230.60m
Diameter of Orifice	95mm
Orifice Constant	0.63

Orifice #2(Pipe)	
Orifice Invert Elevation	360.45m
Diameter of Orifice	0mm
Orifice Constant	0.63

Weir(Trapezoidal)	
Weir Invert Elevation	233.10m
Bottom Length	5.00m
Side Slope (X:1)	4:1

Elevation (m)	Area (m^2)	Volume (m^3)	Cum.Storage Volume (m^3)	Depth over Orifice (m)	Depth to Center of Orifice (m)	Infiltration m3/sec	Flow (m^3/sec)	Depth over Orifice (m)	Depth to Center of Orifice (m)	Flow (m^3/sec)	Depth over Weir (m)	Flow (m^3/sec)	Total Flow m^3
230.60	1608	0	0	0.00	-0.05	0.000	-	-	-	-			-
230.70	1743	178	178	0.10	0.05	0.000	0.00453	-	-	-			**0.0045**
230.80	1877	181	359	0.20	0.15	0.000	0.00773	-	-	-			**0.0077**
230.90	2012	194	553	0.30	0.25	0.000	0.00994	-	-	-			**0.0099**
231.00	2138	207	761	0.40	0.35	0.000	0.01175	-	-	-			**0.0117**
231.10	2264	220	981	0.50	0.45	0.000	0.01331	-	-	-			**0.0133**
231.20	2391	233	1214	0.60	0.55	0.000	0.01471	-	-	-			**0.0147**
231.30	2517	245	1459	0.70	0.65	0.000	0.01598	-	-	-			**0.0160**
231.40	2643	258	1717	0.80	0.75	0.000	0.01717	-	-	-			**0.0172**
231.50	2769	271	1988	0.90	0.85	0.000	0.01827	-	-	-			**0.0183**
231.60	2895	283	2271	1.00	0.95	0.000	0.01931	-	-	-			**0.0193**
231.70	3021	296	2567	1.10	1.05	0.000	0.02030	-	-	-			**0.0203**
231.80	3148	308	2875	1.20	1.15	0.000	0.02124	-	-	-			**0.0212**
231.90	3274	321	3196	1.30	1.25	0.000	0.02215	-	-	-			**0.0221**
232.00	3400	334	3530	1.40	1.35	0.000	0.02301	-	-	-	-	-	**0.0230**
232.10	3526	346	3876	1.50	1.45	0.000	0.02385	-	-	-	-	-	**0.0238**
232.15	3615.5	179	4055	1.55	1.50	0.000	0.02426						**0.0243**
232.20	3705	362	4238	1.60	1.55	0.000	0.02466	-	-	-	-	-	**0.0247**
232.30	3884	379	4617	1.70	1.65	0.000	0.02544	-	-	-	-	-	**0.0254**
232.40	4061	397	5015	1.80	1.75	0.000	0.02620	-	-	-	-	-	**0.0262**

VO2 Rating Table Input	
$Q(m^3/s)$	Store(ha.m)
-	0.0000
0.0045	0.0178
0.0077	0.0359
0.0099	0.0553
0.0117	0.0761
0.0133	0.0981
0.0147	0.1214
0.0160	0.1459
0.0172	0.1717
0.0183	0.1988
0.0193	0.2271
0.0203	0.2567
0.0212	0.2875
0.0221	0.3196
0.0230	0.3530
0.0238	0.3876
0.0243	0.4055
0.0247	0.4238
0.0254	0.4617
0.0262	0.5015

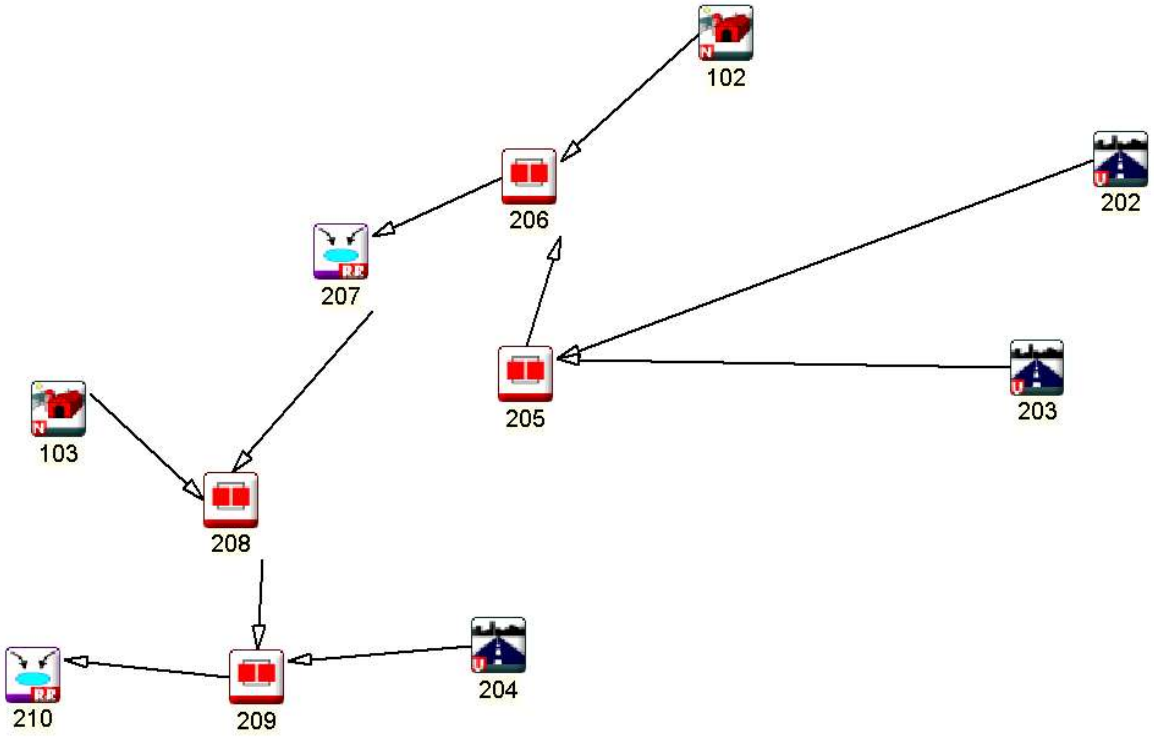


EXTENDED DETENTION ONLY		
Intercept of Regression, C3	1599.60	
Slope of Regression, C2	1313.300	
Extended Det. Ponding Elevation (O1)	231.04	m
Depth over Orifice	0.440	m
Orifice Area	0.0071	m^2

Drawdown Time	=	121,846	sec
	=	33.85	hr

[Drawdown time Equation is Eqn 4.11 Stormwater Management Planning and Design Manual MOE,

Visual OTHYMO Modelling Schematic



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

       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM, Version 2.0
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O   Licensed To: Dillon
Consulting Limited
        OOO     T      T    H   H    Y    M   M   OOO                vo20082


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


  Input   filename: C:\Program Files\Visual OTTHYMO v2.0\voin.dat

  Output  filename:
\\Dillon.ca\dillon_dfs\London\LONDON~2\PROJECTS\DRAFT\187395\WESTWO~1\Scenario1.out

  Summary filename:
\\Dillon.ca\dillon_dfs\London\LONDON~2\PROJECTS\DRAFT\187395\WESTWO~1\Scenario1.sum



DATE: 12/18/2018                          TIME: 5:53:24 PM

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
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  ***************************
  ** SIMULATION NUMBER:   1 **
  ***************************
```

CHICAGO STORM
Ptotal= 25.27 mm

IDF curve parameters: A= 555.000
B= 5.890
C= .813
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	1.50	1.17	13.45	2.17	3.73	3.17	1.80
.33	1.73	1.33	58.58	2.33	3.14	3.33	1.67
.50	2.06	1.50	17.82	2.50	2.72	3.50	1.55
.67	2.56	1.67	9.09	2.67	2.41	3.67	1.45
.83	3.43	1.83	6.11	2.83	2.16	3.83	1.37
1.00	5.36	2.00	4.62	3.00	1.96	4.00	1.29

CALIB STANDHYD (0204) ID= 1 DT= 1.0 min

Area (ha)= .25
Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	.13	.13
Dep. Storage	(mm)=	1.00	2.50
Average Slope	(%)=	.50	20.00
Length	(m)=	10.00	40.00
Mannings n	=	.013	.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.017	1.50	1.017	13.45	2.017	3.73	3.02	1.80
.033	1.50	1.033	13.45	2.033	3.73	3.03	1.80
.050	1.50	1.050	13.45	2.050	3.73	3.05	1.80
.067	1.50	1.067	13.45	2.067	3.73	3.07	1.80
.083	1.50	1.083	13.45	2.083	3.73	3.08	1.80
.100	1.50	1.100	13.45	2.100	3.73	3.10	1.80
.117	1.50	1.117	13.45	2.117	3.73	3.12	1.80
.133	1.50	1.133	13.45	2.133	3.73	3.13	1.80

.150	1.50	1.150	13.45	2.150	3.73	3.15	1.80
.167	1.50	1.167	13.45	2.167	3.73	3.17	1.80
.183	1.73	1.183	58.58	2.183	3.14	3.18	1.67
.200	1.73	1.200	58.58	2.200	3.14	3.20	1.67
.217	1.73	1.217	58.58	2.217	3.14	3.22	1.67
.233	1.73	1.233	58.58	2.233	3.14	3.23	1.67
.250	1.73	1.250	58.58	2.250	3.14	3.25	1.67
.267	1.73	1.267	58.58	2.267	3.14	3.27	1.67
.283	1.73	1.283	58.58	2.283	3.14	3.28	1.67
.300	1.73	1.300	58.58	2.300	3.14	3.30	1.67
.317	1.73	1.317	58.58	2.317	3.14	3.32	1.67
.333	1.73	1.333	58.58	2.333	3.14	3.33	1.67
.350	2.06	1.350	17.82	2.350	2.72	3.35	1.55
.367	2.06	1.367	17.82	2.367	2.72	3.37	1.55
.383	2.06	1.383	17.82	2.383	2.72	3.38	1.55
.400	2.06	1.400	17.82	2.400	2.72	3.40	1.55
.417	2.06	1.417	17.82	2.417	2.72	3.42	1.55
.433	2.06	1.433	17.82	2.433	2.72	3.43	1.55
.450	2.06	1.450	17.82	2.450	2.72	3.45	1.55
.467	2.06	1.467	17.82	2.467	2.72	3.47	1.55
.483	2.06	1.483	17.82	2.483	2.72	3.48	1.55
.500	2.06	1.500	17.82	2.500	2.72	3.50	1.55
.517	2.56	1.517	9.09	2.517	2.41	3.52	1.45
.533	2.56	1.533	9.09	2.533	2.41	3.53	1.45
.550	2.56	1.550	9.09	2.550	2.41	3.55	1.45
.567	2.56	1.567	9.09	2.567	2.41	3.57	1.45
.583	2.56	1.583	9.09	2.583	2.41	3.58	1.45
.600	2.56	1.600	9.09	2.600	2.41	3.60	1.45
.617	2.56	1.617	9.09	2.617	2.41	3.62	1.45
.633	2.56	1.633	9.09	2.633	2.41	3.63	1.45
.650	2.56	1.650	9.09	2.650	2.41	3.65	1.45
.667	2.56	1.667	9.09	2.667	2.41	3.67	1.45
.683	3.43	1.683	6.11	2.683	2.16	3.68	1.37
.700	3.43	1.700	6.11	2.700	2.16	3.70	1.37
.717	3.43	1.717	6.11	2.717	2.16	3.72	1.37
.733	3.43	1.733	6.11	2.733	2.16	3.73	1.37
.750	3.43	1.750	6.11	2.750	2.16	3.75	1.37
.767	3.43	1.767	6.11	2.767	2.16	3.77	1.37
.783	3.43	1.783	6.11	2.783	2.16	3.78	1.37
.800	3.43	1.800	6.11	2.800	2.16	3.80	1.37
.817	3.43	1.817	6.11	2.817	2.16	3.82	1.37
.833	3.43	1.833	6.11	2.833	2.16	3.83	1.37
.850	5.36	1.850	4.62	2.850	1.96	3.85	1.29
.867	5.36	1.867	4.62	2.867	1.96	3.87	1.29
.883	5.36	1.883	4.62	2.883	1.96	3.88	1.29
.900	5.36	1.900	4.62	2.900	1.96	3.90	1.29
.917	5.36	1.917	4.62	2.917	1.96	3.92	1.29
.933	5.36	1.933	4.62	2.933	1.96	3.93	1.29

.950	5.36	1.950	4.62	2.950	1.96	3.95	1.29
.967	5.36	1.967	4.62	2.967	1.96	3.97	1.29
.983	5.36	1.983	4.62	2.983	1.96	3.98	1.29
1.000	5.36	2.000	4.62	3.000	1.96	4.00	1.29

			TOTALS
Max.Eff.Inten.(mm/hr)=	58.58	7.81	
over (min)	5.00	6.00	
Storage Coeff. (min)=	.98 (ii)	5.36 (ii)	
Unit Hyd. Tpeak (min)=	5.00	6.00	
Unit Hyd. peak (cms)=	.48	.20	
PEAK FLOW (cms)=	.02	.00	.022 (iii)
TIME TO PEAK (hrs)=	1.33	1.40	1.33
RUNOFF VOLUME (mm)=	24.27	4.26	14.25
TOTAL RAINFALL (mm)=	25.27	25.27	25.27
RUNOFF COEFFICIENT =	.96	.17	.56

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

CALIB			
NASHYD (0103)	Area (ha)=	.37	Curve Number (CN)= 58.0
ID= 1 DT= 1.0 min	Ia (mm)=	2.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	.20	

Unit Hyd Qpeak (cms)= .071

PEAK FLOW (cms)= .003 (i)
TIME TO PEAK (hrs)= 1.567
RUNOFF VOLUME (mm)= 2.506
TOTAL RAINFALL (mm)= 25.266
RUNOFF COEFFICIENT = .099

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

CALIB			
STANDHYD (0202)	Area (ha)=	5.04	
ID= 1 DT= 1.0 min	Total Imp(%)=	71.00	Dir. Conn.(%)= 71.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.58	1.46	
Dep. Storage	(mm)=	1.00	2.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	183.30	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)	=	58.58	7.81	
over (min)		5.00	10.00	
Storage Coeff. (min)	=	3.70 (ii)	9.81 (ii)	
Unit Hyd. Tpeak (min)	=	5.00	10.00	
Unit Hyd. peak (cms)	=	.27	.11	
				TOTALS
PEAK FLOW	(cms)=	.52	.02	.535 (iii)
TIME TO PEAK	(hrs)=	1.35	1.47	1.35
RUNOFF VOLUME	(mm)=	24.27	4.26	18.46
TOTAL RAINFALL	(mm)=	25.27	25.27	25.27
RUNOFF COEFFICIENT	=	.96	.17	.73

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

CALIB			
STANDHYD (0203)	Area (ha)=	.46	
ID= 1 DT= 1.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.23	.23	
Dep. Storage	(mm)=	1.00	2.50	
Average Slope	(%)=	.50	20.00	
Length	(m)=	55.40	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)	=	58.58	7.81	
over (min)		5.00	8.00	
Storage Coeff. (min)	=	2.73 (ii)	7.11 (ii)	
Unit Hyd. Tpeak (min)	=	5.00	8.00	
Unit Hyd. peak (cms)	=	.32	.15	
				TOTALS
PEAK FLOW	(cms)=	.04	.00	.038 (iii)
TIME TO PEAK	(hrs)=	1.33	1.43	1.35
RUNOFF VOLUME	(mm)=	24.27	4.26	14.26

```
     TOTAL RAINFALL   (mm)=      25.27        25.27          25.27
     RUNOFF COEFFICIENT   =        .96          .17            .56


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    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.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0205) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0202):     5.04    .535     1.35    18.46
        + ID2= 2 (0203):      .46    .038     1.35    14.26
          ================================================
          ID = 3 (0205):     5.50    .573     1.35    18.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=   1.29   Curve Number   (CN)= 58.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   2.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .32

     Unit Hyd Qpeak  (cms)=    .154

     PEAK FLOW       (cms)=    .007 (i)
     TIME TO PEAK    (hrs)=   1.733
     RUNOFF VOLUME    (mm)=   2.507
     TOTAL RAINFALL   (mm)=  25.266
     RUNOFF COEFFICIENT   =    .099

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

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0206) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0205):     5.50    .573     1.35    18.11
        + ID2= 2 (0102):     1.29    .007     1.73     2.51
```

```
          ================================================
          ID = 3 (0206):     6.79    .575     1.35    15.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0207) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000   |    .0180      .1988
                           .0050      .0178   |    .0190      .2271
                           .0080      .0359   |    .0200      .2567
                           .0100      .0554   |    .0210      .2876
                           .0120      .0761   |    .0220      .3197
                           .0130      .0982   |    .0230      .3530
                           .0150      .1214   |    .0240      .3877
                           .0160      .1460   |    .0243      .4055
                           .0170      .1718   |    .0000      .0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0206)      6.79       .57      1.35      15.15
     OUTFLOW: ID= 1 (0207)      6.79       .01      4.07      13.84

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.20
                   TIME SHIFT OF PEAK FLOW         (min)=163.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  .0900

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0208) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):      .37    .003     1.57     2.51
        + ID2= 2 (0207):     6.79    .013     4.07    13.84
          ================================================
          ID = 3 (0208):     7.16    .014     1.70    13.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0209) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0204):	.25	.022	1.33	14.25
+ ID2= 2 (0208):	7.16	.014	1.70	13.25
ID = 3 (0209):	7.41	.031	1.35	13.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0210)				
IN= 2---> OUT= 1				
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	.0000	.0000	.0188	.0334
	.0073	.0025	.0197	.0527
	.0179	.0151	.0000	.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0209)	7.41	.03	1.35	13.28
OUTFLOW: ID= 1 (0210)	7.41	.01	7.62	13.16

PEAK FLOW REDUCTION [Qout/Qin](%)= 38.67
TIME SHIFT OF PEAK FLOW (min)=376.00
MAXIMUM STORAGE USED (ha.m.)= .0079

****
** SIMULATION NUMBER: 2 **
****

CHICAGO STORM	
Ptotal= 35.21 mm	IDF curve parameters: A= 529.711
	B= 4.501
	C= .745

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	2.68	1.17	17.69	2.17	5.90	3.17	3.14
.33	3.04	1.33	72.24	2.33	5.09	3.33	2.94
.50	3.53	1.50	22.78	2.50	4.50	3.50	2.76
.67	4.26	1.67	12.62	2.67	4.04	3.67	2.60

.83	5.49	1.83	8.98	2.83	3.68	3.83	2.47
1.00	8.02	2.00	7.08	3.00	3.39	4.00	2.35

CALIB STANDHYD (0204) ID= 1 DT= 1.0 min	Area (ha)= .25 Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	.13	.13
Dep. Storage	(mm)=	1.00	2.50
Average Slope	(%)=	.50	20.00
Length	(m)=	10.00	40.00
Mannings n	=	.013	.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.017	2.68	1.017	17.69	2.017	5.90	3.02	3.14
.033	2.68	1.033	17.69	2.033	5.90	3.03	3.14
.050	2.68	1.050	17.69	2.050	5.90	3.05	3.14
.067	2.68	1.067	17.69	2.067	5.90	3.07	3.14
.083	2.68	1.083	17.69	2.083	5.90	3.08	3.14
.100	2.68	1.100	17.69	2.100	5.90	3.10	3.14
.117	2.68	1.117	17.69	2.117	5.90	3.12	3.14
.133	2.68	1.133	17.69	2.133	5.90	3.13	3.14
.150	2.68	1.150	17.69	2.150	5.90	3.15	3.14
.167	2.68	1.167	17.69	2.167	5.90	3.17	3.14
.183	3.04	1.183	72.24	2.183	5.09	3.18	2.94
.200	3.04	1.200	72.24	2.200	5.09	3.20	2.94
.217	3.04	1.217	72.24	2.217	5.09	3.22	2.94
.233	3.04	1.233	72.24	2.233	5.09	3.23	2.94
.250	3.04	1.250	72.24	2.250	5.09	3.25	2.94
.267	3.04	1.267	72.24	2.267	5.09	3.27	2.94
.283	3.04	1.283	72.24	2.283	5.09	3.28	2.94
.300	3.04	1.300	72.24	2.300	5.09	3.30	2.94
.317	3.04	1.317	72.24	2.317	5.09	3.32	2.94
.333	3.04	1.333	72.24	2.333	5.09	3.33	2.94
.350	3.53	1.350	22.78	2.350	4.50	3.35	2.76
.367	3.53	1.367	22.78	2.367	4.50	3.37	2.76
.383	3.53	1.383	22.78	2.383	4.50	3.38	2.76
.400	3.53	1.400	22.78	2.400	4.50	3.40	2.76
.417	3.53	1.417	22.78	2.417	4.50	3.42	2.76

.433	3.53	1.433	22.78	2.433	4.50	3.43	2.76
.450	3.53	1.450	22.78	2.450	4.50	3.45	2.76
.467	3.53	1.467	22.78	2.467	4.50	3.47	2.76
.483	3.53	1.483	22.78	2.483	4.50	3.48	2.76
.500	3.53	1.500	22.78	2.500	4.50	3.50	2.76
.517	4.26	1.517	12.62	2.517	4.04	3.52	2.60
.533	4.26	1.533	12.62	2.533	4.04	3.53	2.60
.550	4.26	1.550	12.62	2.550	4.04	3.55	2.60
.567	4.26	1.567	12.62	2.567	4.04	3.57	2.60
.583	4.26	1.583	12.62	2.583	4.04	3.58	2.60
.600	4.26	1.600	12.62	2.600	4.04	3.60	2.60
.617	4.26	1.617	12.62	2.617	4.04	3.62	2.60
.633	4.26	1.633	12.62	2.633	4.04	3.63	2.60
.650	4.26	1.650	12.62	2.650	4.04	3.65	2.60
.667	4.26	1.667	12.62	2.667	4.04	3.67	2.60
.683	5.49	1.683	8.98	2.683	3.68	3.68	2.47
.700	5.49	1.700	8.98	2.700	3.68	3.70	2.47
.717	5.49	1.717	8.98	2.717	3.68	3.72	2.47
.733	5.49	1.733	8.98	2.733	3.68	3.73	2.47
.750	5.49	1.750	8.98	2.750	3.68	3.75	2.47
.767	5.49	1.767	8.98	2.767	3.68	3.77	2.47
.783	5.49	1.783	8.98	2.783	3.68	3.78	2.47
.800	5.49	1.800	8.98	2.800	3.68	3.80	2.47
.817	5.49	1.817	8.98	2.817	3.68	3.82	2.47
.833	5.49	1.833	8.98	2.833	3.68	3.83	2.47
.850	8.02	1.850	7.08	2.850	3.39	3.85	2.35
.867	8.02	1.867	7.08	2.867	3.39	3.87	2.35
.883	8.02	1.883	7.08	2.883	3.39	3.88	2.35
.900	8.02	1.900	7.08	2.900	3.39	3.90	2.35
.917	8.02	1.917	7.08	2.917	3.39	3.92	2.35
.933	8.02	1.933	7.08	2.933	3.39	3.93	2.35
.950	8.02	1.950	7.08	2.950	3.39	3.95	2.35
.967	8.02	1.967	7.08	2.967	3.39	3.97	2.35
.983	8.02	1.983	7.08	2.983	3.39	3.98	2.35
1.000	8.02	2.000	7.08	3.000	3.39	4.00	2.35

Max.Eff.Inten.(mm/hr)=	72.24	13.55	
over (min)	5.00	5.00	
Storage Coeff. (min)=	.90 (ii)	4.93 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	.49	.23	
			TOTALS
PEAK FLOW (cms)=	.03	.00	.029 (iii)
TIME TO PEAK (hrs)=	1.33	1.38	1.33
RUNOFF VOLUME (mm)=	34.21	8.14	21.16
TOTAL RAINFALL (mm)=	35.21	35.21	35.21
RUNOFF COEFFICIENT =	.97	.23	.60

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

CALIB			
NASHYD (0103)	Area (ha)=	.37	Curve Number (CN)= 58.0
ID= 1 DT= 1.0 min	Ia (mm)=	2.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	.20	

Unit Hyd Qpeak (cms)= .071

PEAK FLOW (cms)= .005 (i)
TIME TO PEAK (hrs)= 1.550
RUNOFF VOLUME (mm)= 4.937
TOTAL RAINFALL (mm)= 35.210
RUNOFF COEFFICIENT = .140

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

CALIB			
STANDHYD (0202)	Area (ha)=	5.04	
ID= 1 DT= 1.0 min	Total Imp(%)=	71.00	Dir. Conn.(%)= 71.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.58	1.46	
Dep. Storage	(mm)=	1.00	2.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	183.30	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		72.24	13.55	
over (min)		5.00	10.00	
Storage Coeff. (min)=		3.40 (ii)	9.02 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		.29	.12	
				TOTALS
PEAK FLOW	(cms)=	.66	.04	.679 (iii)
TIME TO PEAK	(hrs)=	1.33	1.47	1.35
RUNOFF VOLUME	(mm)=	34.21	8.14	26.65
TOTAL RAINFALL	(mm)=	35.21	35.21	35.21

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     RUNOFF COEFFICIENT   =        .97          .23           .76


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=    .46
|ID= 1 DT= 1.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .23          .23
     Dep. Storage     (mm)=       1.00         2.50
     Average Slope     (%)=        .50        20.00
     Length            (m)=      55.40        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      72.24        13.55
               over (min)         5.00         7.00
     Storage Coeff.  (min)=       2.51 (ii)    6.54 (ii)
     Unit Hyd. Tpeak (min)=       5.00         7.00
     Unit Hyd. peak  (cms)=        .34          .17
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .04          .01           .049 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42          1.33
     RUNOFF VOLUME    (mm)=      34.21         8.14         21.17
     TOTAL RAINFALL   (mm)=      35.21        35.21         35.21
     RUNOFF COEFFICIENT   =        .97          .23           .60


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD   (0205) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0202):     5.04    .679     1.35    26.65
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        + ID2= 2 (0203):      .46    .049     1.33    21.17
          ================================================
          ID = 3 (0205):     5.50    .729     1.35    26.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=   1.29   Curve Number   (CN)= 58.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   2.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .32

     Unit Hyd Qpeak  (cms)=    .154

     PEAK FLOW       (cms)=    .013 (i)
     TIME TO PEAK    (hrs)=   1.733
     RUNOFF VOLUME    (mm)=   4.938
     TOTAL RAINFALL   (mm)=  35.210
     RUNOFF COEFFICIENT   =    .140

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

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--------------------
| ADD HYD   (0206) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0205):     5.50    .729     1.35    26.19
        + ID2= 2 (0102):     1.29    .013     1.73     4.94
          ================================================
          ID = 3 (0206):     6.79    .732     1.35    22.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0207) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000   |    .0180      .1988
                           .0050      .0178   |    .0190      .2271
                           .0080      .0359   |    .0200      .2567
                           .0100      .0554   |    .0210      .2876
                           .0120      .0761   |    .0220      .3197
                           .0130      .0982   |    .0230      .3530
```

	.0150	.1214	.0240	.3877
	.0160	.1460	.0243	.4055
	.0170	.1718	.0000	.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0206)	6.79	.73	1.35	22.15
OUTFLOW: ID= 1 (0207)	6.79	.02	4.10	18.98

PEAK FLOW REDUCTION [Qout/Qin](%)= 2.12
TIME SHIFT OF PEAK FLOW (min)=165.00
MAXIMUM STORAGE USED (ha.m.)= .1344

ADD HYD (0208)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0103):	.37	.005	1.55	4.94
	+ ID2= 2 (0207):	6.79	.016	4.10	18.98
	ID = 3 (0208):	7.16	.017	1.60	18.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0209)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0204):	.25	.029	1.33	21.16
	+ ID2= 2 (0208):	7.16	.017	1.60	18.25
	ID = 3 (0209):	7.41	.040	1.35	18.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0210)					
IN= 2---> OUT= 1					
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	.0000	.0000	.0188	.0334	
	.0073	.0025	.0197	.0527	
	.0179	.0151	.0000	.0000	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0209)	7.41	.04	1.35	18.35
OUTFLOW: ID= 1 (0210)	7.41	.01	7.37	18.06

PEAK FLOW REDUCTION [Qout/Qin](%)= 36.62
TIME SHIFT OF PEAK FLOW (min)=361.00
MAXIMUM STORAGE USED (ha.m.)= .0112

****
** SIMULATION NUMBER: 3 **
****

CHICAGO STORM
Ptotal= 49.03 mm

IDF curve parameters: A= 583.017
B= 3.007
C= .703
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	4.20	1.17	23.22	2.17	8.64	3.17	4.87
.33	4.72	1.33	96.03	2.33	7.56	3.33	4.58
.50	5.42	1.50	29.33	2.50	6.76	3.50	4.32
.67	6.44	1.67	17.13	2.67	6.13	3.67	4.10
.83	8.09	1.83	12.62	2.83	5.63	3.83	3.90
1.00	11.39	2.00	10.19	3.00	5.22	4.00	3.72

CALIB STANDHYD (0204) ID= 1 DT= 1.0 min

Area (ha)= .25
Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	.13	.13
Dep. Storage	(mm)=	1.00	2.50
Average Slope	(%)=	.50	20.00
Length	(m)=	10.00	40.00
Mannings n	=	.013	.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.017	4.20	1.017	23.22	2.017	8.64	3.02	4.87
.033	4.20	1.033	23.22	2.033	8.64	3.03	4.87
.050	4.20	1.050	23.22	2.050	8.64	3.05	4.87
.067	4.20	1.067	23.22	2.067	8.64	3.07	4.87
.083	4.20	1.083	23.22	2.083	8.64	3.08	4.87
.100	4.20	1.100	23.22	2.100	8.64	3.10	4.87
.117	4.20	1.117	23.22	2.117	8.64	3.12	4.87
.133	4.20	1.133	23.22	2.133	8.64	3.13	4.87
.150	4.20	1.150	23.22	2.150	8.64	3.15	4.87
.167	4.20	1.167	23.22	2.167	8.64	3.17	4.87
.183	4.72	1.183	96.03	2.183	7.56	3.18	4.58
.200	4.72	1.200	96.03	2.200	7.56	3.20	4.58
.217	4.72	1.217	96.03	2.217	7.56	3.22	4.58
.233	4.72	1.233	96.03	2.233	7.56	3.23	4.58
.250	4.72	1.250	96.03	2.250	7.56	3.25	4.58
.267	4.72	1.267	96.03	2.267	7.56	3.27	4.58
.283	4.72	1.283	96.03	2.283	7.56	3.28	4.58
.300	4.72	1.300	96.03	2.300	7.56	3.30	4.58
.317	4.72	1.317	96.03	2.317	7.56	3.32	4.58
.333	4.72	1.333	96.03	2.333	7.56	3.33	4.58
.350	5.42	1.350	29.33	2.350	6.76	3.35	4.32
.367	5.42	1.367	29.33	2.367	6.76	3.37	4.32
.383	5.42	1.383	29.33	2.383	6.76	3.38	4.32
.400	5.42	1.400	29.33	2.400	6.76	3.40	4.32
.417	5.42	1.417	29.33	2.417	6.76	3.42	4.32
.433	5.42	1.433	29.33	2.433	6.76	3.43	4.32
.450	5.42	1.450	29.33	2.450	6.76	3.45	4.32
.467	5.42	1.467	29.33	2.467	6.76	3.47	4.32
.483	5.42	1.483	29.33	2.483	6.76	3.48	4.32
.500	5.42	1.500	29.33	2.500	6.76	3.50	4.32
.517	6.44	1.517	17.13	2.517	6.13	3.52	4.10
.533	6.44	1.533	17.13	2.533	6.13	3.53	4.10
.550	6.44	1.550	17.13	2.550	6.13	3.55	4.10
.567	6.44	1.567	17.13	2.567	6.13	3.57	4.10
.583	6.44	1.583	17.13	2.583	6.13	3.58	4.10
.600	6.44	1.600	17.13	2.600	6.13	3.60	4.10
.617	6.44	1.617	17.13	2.617	6.13	3.62	4.10
.633	6.44	1.633	17.13	2.633	6.13	3.63	4.10
.650	6.44	1.650	17.13	2.650	6.13	3.65	4.10
.667	6.44	1.667	17.13	2.667	6.13	3.67	4.10
.683	8.09	1.683	12.62	2.683	5.63	3.68	3.90
.700	8.09	1.700	12.62	2.700	5.63	3.70	3.90

.717	8.09	1.717	12.62	2.717	5.63	3.72	3.90
.733	8.09	1.733	12.62	2.733	5.63	3.73	3.90
.750	8.09	1.750	12.62	2.750	5.63	3.75	3.90
.767	8.09	1.767	12.62	2.767	5.63	3.77	3.90
.783	8.09	1.783	12.62	2.783	5.63	3.78	3.90
.800	8.09	1.800	12.62	2.800	5.63	3.80	3.90
.817	8.09	1.817	12.62	2.817	5.63	3.82	3.90
.833	8.09	1.833	12.62	2.833	5.63	3.83	3.90
.850	11.39	1.850	10.19	2.850	5.22	3.85	3.72
.867	11.39	1.867	10.19	2.867	5.22	3.87	3.72
.883	11.39	1.883	10.19	2.883	5.22	3.88	3.72
.900	11.39	1.900	10.19	2.900	5.22	3.90	3.72
.917	11.39	1.917	10.19	2.917	5.22	3.92	3.72
.933	11.39	1.933	10.19	2.933	5.22	3.93	3.72
.950	11.39	1.950	10.19	2.950	5.22	3.95	3.72
.967	11.39	1.967	10.19	2.967	5.22	3.97	3.72
.983	11.39	1.983	10.19	2.983	5.22	3.98	3.72
1.000	11.39	2.000	10.19	3.000	5.22	4.00	3.72

Max.Eff.Inten.(mm/hr)=	96.03	24.66	
over (min)	5.00	5.00	
Storage Coeff. (min)=	.80 (ii)	4.40 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	.50	.25	
			TOTALS
PEAK FLOW (cms)=	.03	.01	.041 (iii)
TIME TO PEAK (hrs)=	1.33	1.37	1.33
RUNOFF VOLUME (mm)=	48.03	14.90	31.46
TOTAL RAINFALL (mm)=	49.03	49.03	49.03
RUNOFF COEFFICIENT =	.98	.30	.64

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

CALIB			
NASHYD (0103)	Area (ha)=	.37	Curve Number (CN)= 58.0
ID= 1 DT= 1.0 min	Ia (mm)=	2.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	.20	

Unit Hyd Qpeak (cms)= .071

```
     PEAK FLOW       (cms)=    .009 (i)
     TIME TO PEAK    (hrs)=   1.550
     RUNOFF VOLUME    (mm)=   9.394
     TOTAL RAINFALL   (mm)=  49.033
     RUNOFF COEFFICIENT   =    .192

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

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--------------------
| CALIB            |
| STANDHYD  (0202) |   Area    (ha)=   5.04
|ID= 1 DT= 1.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.58         1.46
     Dep. Storage     (mm)=       1.00         2.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     183.30        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=      96.03        24.66
               over (min)         5.00         9.00
     Storage Coeff.  (min)=       3.03 (ii)    8.05 (ii)
     Unit Hyd. Tpeak (min)=       5.00         9.00
     Unit Hyd. peak  (cms)=        .31          .14
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .89          .07          .937 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.43          1.35
     RUNOFF VOLUME    (mm)=      48.03        14.90         38.42
     TOTAL RAINFALL   (mm)=      49.03        49.03         49.03
     RUNOFF COEFFICIENT   =        .98          .30           .78


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=    .46
|ID= 1 DT= 1.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .23          .23
```

Dep. Storage	(mm)=	1.00	2.50	
Average Slope	(%)=	.50	20.00	
Length	(m)=	55.40	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		96.03	24.66	
over (min)		5.00	6.00	
Storage Coeff. (min)=		2.24 (ii)	5.84 (ii)	
Unit Hyd. Tpeak (min)=		5.00	6.00	
Unit Hyd. peak (cms)=		.36	.19	
				TOTALS
PEAK FLOW	(cms)=	.06	.01	.070 (iii)
TIME TO PEAK	(hrs)=	1.33	1.38	1.33
RUNOFF VOLUME	(mm)=	48.03	14.90	31.46
TOTAL RAINFALL	(mm)=	49.03	49.03	49.03
RUNOFF COEFFICIENT	=	.98	.30	.64

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

ADD HYD (0205)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0202):		5.04	.937	1.35	38.42
+ ID2= 2 (0203):		.46	.070	1.33	31.46
ID = 3 (0205):		5.50	1.007	1.35	37.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0102)				
ID= 1 DT= 1.0 min	Area (ha)=	1.29	Curve Number (CN)=	58.0
	Ia (mm)=	2.50	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.32		

Unit Hyd Qpeak (cms)=	.154	
PEAK FLOW (cms)=	.023	(i)
TIME TO PEAK (hrs)=	1.717	

RUNOFF VOLUME (mm)= 9.395
TOTAL RAINFALL (mm)= 49.033
RUNOFF COEFFICIENT = .192

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

ADD HYD (0206)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0205):	5.50	1.007	1.35	37.84
	+ ID2= 2 (0102):	1.29	.023	1.72	9.39
	ID = 3 (0206):	6.79	1.015	1.35	32.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0207)					
IN= 2---> OUT= 1					
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	.0000	.0000	.0180	.1988	
	.0050	.0178	.0190	.2271	
	.0080	.0359	.0200	.2567	
	.0100	.0554	.0210	.2876	
	.0120	.0761	.0220	.3197	
	.0130	.0982	.0230	.3530	
	.0150	.1214	.0240	.3877	
	.0160	.1460	.0243	.4055	
	.0170	.1718	.0000	.0000	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0206)	6.79	1.01	1.35	32.44
OUTFLOW: ID= 1 (0207)	6.79	.02	4.13	24.75

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.78
TIME SHIFT OF PEAK FLOW (min)=167.00
MAXIMUM STORAGE USED (ha.m.)= .2009

ADD HYD (0208)

```
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):      .37    .009     1.55     9.39
        + ID2= 2 (0207):     6.79    .018     4.13    24.75
          ================================================
          ID = 3 (0208):     7.16    .024     1.58    23.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| ADD HYD   (0209) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0204):      .25    .041     1.33    31.46
        + ID2= 2 (0208):     7.16    .024     1.58    23.95
          ================================================
          ID = 3 (0209):     7.41    .056     1.35    24.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| RESERVOIR (0210) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000   |    .0188      .0334
                           .0073      .0025   |    .0197      .0527
                           .0179      .0151   |    .0000      .0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0209)      7.41       .06      1.35      24.21
     OUTFLOW: ID= 1 (0210)      7.41       .02      6.52      23.30

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 31.30
                   TIME SHIFT OF PEAK FLOW         (min)=310.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  .0147
```

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  ***************************
  ** SIMULATION NUMBER:   4 **
  ***************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 670.324
```

| Ptotal= 57.94 mm |

B= 3.007
C= .698

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	5.04	1.17	27.43	2.17	10.30	3.17	5.84
.33	5.66	1.33	111.84	2.33	9.03	3.33	5.49
.50	6.49	1.50	34.58	2.50	8.07	3.50	5.18
.67	7.70	1.67	20.31	2.67	7.33	3.67	4.92
.83	9.66	1.83	15.00	2.83	6.74	3.83	4.68
1.00	13.55	2.00	12.13	3.00	6.25	4.00	4.47

| CALIB |
| STANDHYD (0204) |
|ID= 1 DT= 1.0 min |

Area (ha)= .25
Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	.13	.13
Dep. Storage	(mm)=	1.00	2.50
Average Slope	(%)=	.50	20.00
Length	(m)=	10.00	40.00
Mannings n	=	.013	.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.017	5.04	1.017	27.43	2.017	10.30	3.02	5.84
.033	5.04	1.033	27.43	2.033	10.30	3.03	5.84
.050	5.04	1.050	27.43	2.050	10.30	3.05	5.84
.067	5.04	1.067	27.43	2.067	10.30	3.07	5.84
.083	5.04	1.083	27.43	2.083	10.30	3.08	5.84
.100	5.04	1.100	27.43	2.100	10.30	3.10	5.84
.117	5.04	1.117	27.43	2.117	10.30	3.12	5.84
.133	5.04	1.133	27.43	2.133	10.30	3.13	5.84
.150	5.04	1.150	27.43	2.150	10.30	3.15	5.84
.167	5.04	1.167	27.43	2.167	10.30	3.17	5.84
.183	5.66	1.183	111.84	2.183	9.03	3.18	5.49

.200	5.66	1.200	111.84	2.200	9.03	3.20	5.49
.217	5.66	1.217	111.84	2.217	9.03	3.22	5.49
.233	5.66	1.233	111.84	2.233	9.03	3.23	5.49
.250	5.66	1.250	111.84	2.250	9.03	3.25	5.49
.267	5.66	1.267	111.84	2.267	9.03	3.27	5.49
.283	5.66	1.283	111.84	2.283	9.03	3.28	5.49
.300	5.66	1.300	111.84	2.300	9.03	3.30	5.49
.317	5.66	1.317	111.84	2.317	9.03	3.32	5.49
.333	5.66	1.333	111.84	2.333	9.03	3.33	5.49
.350	6.49	1.350	34.58	2.350	8.07	3.35	5.18
.367	6.49	1.367	34.58	2.367	8.07	3.37	5.18
.383	6.49	1.383	34.58	2.383	8.07	3.38	5.18
.400	6.49	1.400	34.58	2.400	8.07	3.40	5.18
.417	6.49	1.417	34.58	2.417	8.07	3.42	5.18
.433	6.49	1.433	34.58	2.433	8.07	3.43	5.18
.450	6.49	1.450	34.58	2.450	8.07	3.45	5.18
.467	6.49	1.467	34.58	2.467	8.07	3.47	5.18
.483	6.49	1.483	34.58	2.483	8.07	3.48	5.18
.500	6.49	1.500	34.58	2.500	8.07	3.50	5.18
.517	7.70	1.517	20.31	2.517	7.33	3.52	4.92
.533	7.70	1.533	20.31	2.533	7.33	3.53	4.92
.550	7.70	1.550	20.31	2.550	7.33	3.55	4.92
.567	7.70	1.567	20.31	2.567	7.33	3.57	4.92
.583	7.70	1.583	20.31	2.583	7.33	3.58	4.92
.600	7.70	1.600	20.31	2.600	7.33	3.60	4.92
.617	7.70	1.617	20.31	2.617	7.33	3.62	4.92
.633	7.70	1.633	20.31	2.633	7.33	3.63	4.92
.650	7.70	1.650	20.31	2.650	7.33	3.65	4.92
.667	7.70	1.667	20.31	2.667	7.33	3.67	4.92
.683	9.66	1.683	15.00	2.683	6.74	3.68	4.68
.700	9.66	1.700	15.00	2.700	6.74	3.70	4.68
.717	9.66	1.717	15.00	2.717	6.74	3.72	4.68
.733	9.66	1.733	15.00	2.733	6.74	3.73	4.68
.750	9.66	1.750	15.00	2.750	6.74	3.75	4.68
.767	9.66	1.767	15.00	2.767	6.74	3.77	4.68
.783	9.66	1.783	15.00	2.783	6.74	3.78	4.68
.800	9.66	1.800	15.00	2.800	6.74	3.80	4.68
.817	9.66	1.817	15.00	2.817	6.74	3.82	4.68
.833	9.66	1.833	15.00	2.833	6.74	3.83	4.68
.850	13.55	1.850	12.13	2.850	6.25	3.85	4.47
.867	13.55	1.867	12.13	2.867	6.25	3.87	4.47
.883	13.55	1.883	12.13	2.883	6.25	3.88	4.47
.900	13.55	1.900	12.13	2.900	6.25	3.90	4.47
.917	13.55	1.917	12.13	2.917	6.25	3.92	4.47
.933	13.55	1.933	12.13	2.933	6.25	3.93	4.47
.950	13.55	1.950	12.13	2.950	6.25	3.95	4.47
.967	13.55	1.967	12.13	2.967	6.25	3.97	4.47
.983	13.55	1.983	12.13	2.983	6.25	3.98	4.47

```
              1.000   13.55 | 2.000   12.13 | 3.000    6.25 |  4.00    4.47

     Max.Eff.Inten.(mm/hr)=     111.84        33.22
               over (min)        5.00         5.00
     Storage Coeff.  (min)=        .76 (ii)    4.14 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .51          .26
                                                        *TOTALS*
     PEAK FLOW       (cms)=        .04          .01          .049 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.37          1.33
     RUNOFF VOLUME    (mm)=      56.94        19.93         38.43
     TOTAL RAINFALL   (mm)=      57.94        57.94         57.94
     RUNOFF COEFFICIENT   =        .98          .34           .66

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0103) |   Area    (ha)=    .37   Curve Number   (CN)= 58.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   2.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .20

     Unit Hyd Qpeak  (cms)=    .071

     PEAK FLOW       (cms)=    .012 (i)
     TIME TO PEAK    (hrs)=   1.533
     RUNOFF VOLUME    (mm)=  12.841
     TOTAL RAINFALL   (mm)=  57.945
     RUNOFF COEFFICIENT   =    .222

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0202) |   Area    (ha)=   5.04
|ID= 1 DT= 1.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.58          1.46
     Dep. Storage     (mm)=       1.00          2.50
```

Average Slope (%)=	2.00	2.00	
Length (m)=	183.30	40.00	
Mannings n =	.013	.250	
Max.Eff.Inten.(mm/hr)=	111.84	33.22	
over (min)	5.00	8.00	
Storage Coeff. (min)=	2.85 (ii)	7.57 (ii)	
Unit Hyd. Tpeak (min)=	5.00	8.00	
Unit Hyd. peak (cms)=	.32	.15	
			TOTALS
PEAK FLOW (cms)=	1.05	.10	1.118 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	56.94	19.93	46.21
TOTAL RAINFALL (mm)=	57.94	57.94	57.94
RUNOFF COEFFICIENT =	.98	.34	.80

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

CALIB	
STANDHYD (0203)	Area (ha)= .46
ID= 1 DT= 1.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=		.23	.23	
Dep. Storage (mm)=		1.00	2.50	
Average Slope (%)=		.50	20.00	
Length (m)=		55.40	40.00	
Mannings n =		.013	.250	
Max.Eff.Inten.(mm/hr)=		111.84	33.22	
over (min)		5.00	6.00	
Storage Coeff. (min)=		2.11 (ii)	5.49 (ii)	
Unit Hyd. Tpeak (min)=		5.00	6.00	
Unit Hyd. peak (cms)=		.37	.20	
				TOTALS
PEAK FLOW (cms)=		.07	.02	.085 (iii)
TIME TO PEAK (hrs)=		1.33	1.38	1.33
RUNOFF VOLUME (mm)=		56.94	19.93	38.43
TOTAL RAINFALL (mm)=		57.94	57.94	57.94
RUNOFF COEFFICIENT =		.98	.34	.66

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD   (0205) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0202):     5.04   1.118     1.33    46.21
        + ID2= 2 (0203):      .46    .085     1.33    38.43
          ================================================
          ID = 3 (0205):     5.50   1.203     1.33    45.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=   1.29   Curve Number   (CN)= 58.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   2.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .32

     Unit Hyd Qpeak  (cms)=    .154

     PEAK FLOW       (cms)=    .032 (i)
     TIME TO PEAK    (hrs)=   1.717
     RUNOFF VOLUME    (mm)=  12.842
     TOTAL RAINFALL   (mm)=  57.945
     RUNOFF COEFFICIENT   =    .222

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

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--------------------
| ADD HYD   (0206) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0205):     5.50   1.203     1.33    45.56
        + ID2= 2 (0102):     1.29    .032     1.72    12.84
          ================================================
          ID = 3 (0206):     6.79   1.213     1.35    39.34
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0207)				
IN= 2---> OUT= 1				
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	.0000	.0000	.0180	.1988
	.0050	.0178	.0190	.2271
	.0080	.0359	.0200	.2567
	.0100	.0554	.0210	.2876
	.0120	.0761	.0220	.3197
	.0130	.0982	.0230	.3530
	.0150	.1214	.0240	.3877
	.0160	.1460	.0243	.4055
	.0170	.1718	.0000	.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0206)	6.79	1.21	1.35	39.34
OUTFLOW: ID= 1 (0207)	6.79	.02	4.13	27.81

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.62
TIME SHIFT OF PEAK FLOW (min)=167.00
MAXIMUM STORAGE USED (ha.m.)= .2459

ADD HYD (0208)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0103):	.37	.012	1.53	12.84
+ ID2= 2 (0207):	6.79	.020	4.13	27.81
ID = 3 (0208):	7.16	.028	1.57	27.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0209)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0204):	.25	.049	1.33	38.43
+ ID2= 2 (0208):	7.16	.028	1.57	27.03

```
          ================================================
          ID = 3 (0209):     7.41    .067     1.35    27.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0210) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000   |    .0188      .0334
                           .0073      .0025   |    .0197      .0527
                           .0179      .0151   |    .0000      .0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0209)      7.41       .07      1.35      27.42
     OUTFLOW: ID= 1 (0210)      7.41       .02     10.82      26.17

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 27.04
                    TIME SHIFT OF PEAK FLOW         (min)=568.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  .0192

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  ***************************
  ** SIMULATION NUMBER:   5 **
  ***************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 721.533
| Ptotal= 69.38 mm |                          B=   2.253
--------------------                          C=    .679
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  4.00 hrs
                         Storm time step    = 10.00 min
                         Time to peak ratio =   .33

                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                 .17    6.34 |  1.17   31.84 |  2.17   12.58 |  3.17    7.30
                 .33    7.08 |  1.33  131.63 |  2.33   11.08 |  3.33    6.87
                 .50    8.07 |  1.50   39.74 |  2.50    9.96 |  3.50    6.50
                 .67    9.51 |  1.67   23.97 |  2.67    9.08 |  3.67    6.18
                 .83   11.82 |  1.83   17.98 |  2.83    8.38 |  3.83    5.90
                1.00   16.33 |  2.00   14.70 |  3.00    7.79 |  4.00    5.64
```

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--------------------
| CALIB            |
| STANDHYD  (0204) |   Area    (ha)=    .25
|ID= 1 DT= 1.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .13          .13
     Dep. Storage     (mm)=       1.00         2.50
     Average Slope     (%)=        .50        20.00
     Length            (m)=      10.00        40.00
     Mannings n           =       .013         .250

         NOTE:  RAINFALL WAS TRANSFORMED TO   1.0 MIN. TIME STEP.


                    ---- TRANSFORMED HYETOGRAPH ----
  TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
  .017    6.34 | 1.017   31.84 | 2.017   12.58 |  3.02    7.30
  .033    6.34 | 1.033   31.84 | 2.033   12.58 |  3.03    7.30
  .050    6.34 | 1.050   31.84 | 2.050   12.58 |  3.05    7.30
  .067    6.34 | 1.067   31.84 | 2.067   12.58 |  3.07    7.30
  .083    6.34 | 1.083   31.84 | 2.083   12.58 |  3.08    7.30
  .100    6.34 | 1.100   31.84 | 2.100   12.58 |  3.10    7.30
  .117    6.34 | 1.117   31.84 | 2.117   12.58 |  3.12    7.30
  .133    6.34 | 1.133   31.84 | 2.133   12.58 |  3.13    7.30
  .150    6.34 | 1.150   31.84 | 2.150   12.58 |  3.15    7.30
  .167    6.34 | 1.167   31.84 | 2.167   12.58 |  3.17    7.30
  .183    7.08 | 1.183  131.62 | 2.183   11.08 |  3.18    6.87
  .200    7.08 | 1.200  131.63 | 2.200   11.08 |  3.20    6.87
  .217    7.08 | 1.217  131.63 | 2.217   11.08 |  3.22    6.87
  .233    7.08 | 1.233  131.63 | 2.233   11.08 |  3.23    6.87
  .250    7.08 | 1.250  131.63 | 2.250   11.08 |  3.25    6.87
  .267    7.08 | 1.267  131.63 | 2.267   11.08 |  3.27    6.87
  .283    7.08 | 1.283  131.63 | 2.283   11.08 |  3.28    6.87
  .300    7.08 | 1.300  131.63 | 2.300   11.08 |  3.30    6.87
  .317    7.08 | 1.317  131.63 | 2.317   11.08 |  3.32    6.87
  .333    7.08 | 1.333  131.63 | 2.333   11.08 |  3.33    6.87
  .350    8.07 | 1.350   39.74 | 2.350    9.96 |  3.35    6.50
  .367    8.07 | 1.367   39.74 | 2.367    9.96 |  3.37    6.50
  .383    8.07 | 1.383   39.74 | 2.383    9.96 |  3.38    6.50
  .400    8.07 | 1.400   39.74 | 2.400    9.96 |  3.40    6.50
  .417    8.07 | 1.417   39.74 | 2.417    9.96 |  3.42    6.50
  .433    8.07 | 1.433   39.74 | 2.433    9.96 |  3.43    6.50
  .450    8.07 | 1.450   39.74 | 2.450    9.96 |  3.45    6.50
  .467    8.07 | 1.467   39.74 | 2.467    9.96 |  3.47    6.50
```

.483	8.07	1.483	39.74	2.483	9.96	3.48	6.50
.500	8.07	1.500	39.74	2.500	9.96	3.50	6.50
.517	9.51	1.517	23.97	2.517	9.08	3.52	6.18
.533	9.51	1.533	23.97	2.533	9.08	3.53	6.18
.550	9.51	1.550	23.97	2.550	9.08	3.55	6.18
.567	9.51	1.567	23.97	2.567	9.08	3.57	6.18
.583	9.51	1.583	23.97	2.583	9.08	3.58	6.18
.600	9.51	1.600	23.97	2.600	9.08	3.60	6.18
.617	9.51	1.617	23.97	2.617	9.08	3.62	6.18
.633	9.51	1.633	23.97	2.633	9.08	3.63	6.18
.650	9.51	1.650	23.97	2.650	9.08	3.65	6.18
.667	9.51	1.667	23.97	2.667	9.08	3.67	6.18
.683	11.82	1.683	17.98	2.683	8.38	3.68	5.90
.700	11.82	1.700	17.98	2.700	8.38	3.70	5.90
.717	11.82	1.717	17.98	2.717	8.38	3.72	5.90
.733	11.82	1.733	17.98	2.733	8.38	3.73	5.90
.750	11.82	1.750	17.98	2.750	8.38	3.75	5.90
.767	11.82	1.767	17.98	2.767	8.38	3.77	5.90
.783	11.82	1.783	17.98	2.783	8.38	3.78	5.90
.800	11.82	1.800	17.98	2.800	8.38	3.80	5.90
.817	11.82	1.817	17.98	2.817	8.38	3.82	5.90
.833	11.82	1.833	17.98	2.833	8.38	3.83	5.90
.850	16.33	1.850	14.70	2.850	7.79	3.85	5.64
.867	16.33	1.867	14.70	2.867	7.79	3.87	5.64
.883	16.33	1.883	14.70	2.883	7.79	3.88	5.64
.900	16.33	1.900	14.70	2.900	7.79	3.90	5.64
.917	16.33	1.917	14.70	2.917	7.79	3.92	5.64
.933	16.33	1.933	14.70	2.933	7.79	3.93	5.64
.950	16.33	1.950	14.70	2.950	7.79	3.95	5.64
.967	16.33	1.967	14.70	2.967	7.79	3.97	5.64
.983	16.33	1.983	14.70	2.983	7.79	3.98	5.64
1.000	16.33	2.000	14.70	3.000	7.79	4.00	5.64

Max.Eff.Inten.(mm/hr)=	131.63	45.22	
over (min)	5.00	4.00	
Storage Coeff. (min)=	.71 (ii)	3.88 (ii)	
Unit Hyd. Tpeak (min)=	5.00	4.00	
Unit Hyd. peak (cms)=	.51	.29	
			TOTALS
PEAK FLOW (cms)=	.05	.02	.060 (iii)
TIME TO PEAK (hrs)=	1.33	1.35	1.33
RUNOFF VOLUME (mm)=	68.38	27.00	47.68
TOTAL RAINFALL (mm)=	69.38	69.38	69.38
RUNOFF COEFFICIENT =	.99	.39	.69

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

CN* = 72.0 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.

CALIB			
NASHYD (0103)	Area (ha)= .37	Curve Number (CN)= 58.0	
ID= 1 DT= 1.0 min	Ia (mm)= 2.50	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= .20		

Unit Hyd Qpeak (cms)= .071

PEAK FLOW (cms)= .016 (i)
TIME TO PEAK (hrs)= 1.533
RUNOFF VOLUME (mm)= 17.832
TOTAL RAINFALL (mm)= 69.379
RUNOFF COEFFICIENT = .257

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

CALIB			
STANDHYD (0202)	Area (ha)= 5.04		
ID= 1 DT= 1.0 min	Total Imp(%)= 71.00	Dir. Conn.(%)= 71.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	3.58	1.46	
Dep. Storage	(mm)=	1.00	2.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	183.30	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		131.63	45.22	
over (min)		5.00	8.00	
Storage Coeff. (min)=		2.67 (ii)	7.09 (ii)	
Unit Hyd. Tpeak (min)=		5.00	8.00	
Unit Hyd. peak (cms)=		.33	.15	
				TOTALS
PEAK FLOW	(cms)=	1.24	.13	1.345 (iii)
TIME TO PEAK	(hrs)=	1.33	1.42	1.33
RUNOFF VOLUME	(mm)=	68.38	27.00	56.38
TOTAL RAINFALL	(mm)=	69.38	69.38	69.38
RUNOFF COEFFICIENT	=	.99	.39	.81

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

CALIB STANDHYD (0203) | ID= 1 DT= 1.0 min	Area (ha)= .46 Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.23	.23	
Dep. Storage	(mm)=	1.00	2.50	
Average Slope	(%)=	.50	20.00	
Length	(m)=	55.40	40.00	
Mannings n	=	.013	.250	
Max.Eff.Inten.(mm/hr)=		131.63	45.22	
over (min)		5.00	6.00	
Storage Coeff. (min)=		1.98 (ii)	5.15 (ii)	
Unit Hyd. Tpeak (min)=		5.00	6.00	
Unit Hyd. peak (cms)=		.38	.21	
				TOTALS
PEAK FLOW	(cms)=	.08	.02	.104 (iii)
TIME TO PEAK	(hrs)=	1.33	1.38	1.33
RUNOFF VOLUME	(mm)=	68.38	27.00	47.68
TOTAL RAINFALL	(mm)=	69.38	69.38	69.38
RUNOFF COEFFICIENT	=	.99	.39	.69

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

ADD HYD (0205) | 1 + 2 = 3 |	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0202):	5.04	1.345	1.33	56.38
+ ID2= 2 (0203):	.46	.104	1.33	47.68
ID = 3 (0205):	5.50	1.449	1.33	55.65

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| NASHYD    (0102) |   Area    (ha)=   1.29   Curve Number   (CN)= 58.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   2.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .32

     Unit Hyd Qpeak  (cms)=    .154

     PEAK FLOW       (cms)=    .043 (i)
     TIME TO PEAK    (hrs)=   1.700
     RUNOFF VOLUME    (mm)=  17.833
     TOTAL RAINFALL   (mm)=  69.379
     RUNOFF COEFFICIENT   =    .257

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

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| ADD HYD   (0206) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0205):     5.50   1.449     1.33    55.65
        + ID2= 2 (0102):     1.29    .043     1.70    17.83
          ================================================
          ID = 3 (0206):     6.79   1.462     1.33    48.47

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0207) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          .0000      .0000    |    .0180      .1988
                          .0050      .0178    |    .0190      .2271
                          .0080      .0359    |    .0200      .2567
                          .0100      .0554    |    .0210      .2876
                          .0120      .0761    |    .0220      .3197
                          .0130      .0982    |    .0230      .3530
                          .0150      .1214    |    .0240      .3877
                          .0160      .1460    |    .0243      .4055
                          .0170      .1718    |    .0000      .0000
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                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0206)      6.79      1.46      1.33      48.47
     OUTFLOW: ID= 1 (0207)      6.79       .02      4.15      31.32

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.47
                   TIME SHIFT OF PEAK FLOW         (min)=169.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  .3055

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--------------------
| ADD HYD   (0208) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):      .37    .016     1.53    17.83
        + ID2= 2 (0207):     6.79    .022     4.15    31.32
          ================================================
          ID = 3 (0208):     7.16    .033     1.55    30.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0209) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0204):      .25    .060     1.33    47.68
        + ID2= 2 (0208):     7.16    .033     1.55    30.63
          ================================================
          ID = 3 (0209):     7.41    .082     1.35    31.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0210) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000   |    .0188      .0334
                           .0073      .0025   |    .0197      .0527
                           .0179      .0151   |    .0000      .0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
```

INFLOW : ID= 2 (0209)	7.41	.08	1.35	31.20
OUTFLOW: ID= 1 (0210)	7.41	.02	16.73	28.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.65
TIME SHIFT OF PEAK FLOW (min)=923.00
MAXIMUM STORAGE USED (ha.m.)= .0294

****
** SIMULATION NUMBER: 6 **
****

CHICAGO STORM	Ptotal= 78.32 mm

IDF curve parameters: A= 766.038
B= 1.898
C= .668
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	7.35	1.17	35.40	2.17	14.38	3.17	8.44
.33	8.19	1.33	146.50	2.33	12.71	3.33	7.96
.50	9.32	1.50	43.93	2.50	11.45	3.50	7.55
.67	10.95	1.67	26.91	2.67	10.46	3.67	7.18
.83	13.53	1.83	20.36	2.83	9.66	3.83	6.85
1.00	18.53	2.00	16.73	3.00	9.00	4.00	6.56

CALIB STANDHYD (0204)	ID= 1 DT= 1.0 min

Area (ha)= .25
Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	.13	.13
Dep. Storage	(mm)=	1.00	2.50
Average Slope	(%)=	.50	20.00
Length	(m)=	10.00	40.00
Mannings n	=	.013	.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.017	7.35	1.017	35.40	2.017	14.38	3.02	8.44
.033	7.35	1.033	35.40	2.033	14.38	3.03	8.44
.050	7.35	1.050	35.40	2.050	14.38	3.05	8.44
.067	7.35	1.067	35.40	2.067	14.38	3.07	8.44
.083	7.35	1.083	35.40	2.083	14.38	3.08	8.44
.100	7.35	1.100	35.40	2.100	14.38	3.10	8.44
.117	7.35	1.117	35.40	2.117	14.38	3.12	8.44
.133	7.35	1.133	35.40	2.133	14.38	3.13	8.44
.150	7.35	1.150	35.40	2.150	14.38	3.15	8.44
.167	7.35	1.167	35.40	2.167	14.38	3.17	8.44
.183	8.19	1.183	146.50	2.183	12.71	3.18	7.96
.200	8.19	1.200	146.50	2.200	12.71	3.20	7.96
.217	8.19	1.217	146.50	2.217	12.71	3.22	7.96
.233	8.19	1.233	146.50	2.233	12.71	3.23	7.96
.250	8.19	1.250	146.50	2.250	12.71	3.25	7.96
.267	8.19	1.267	146.50	2.267	12.71	3.27	7.96
.283	8.19	1.283	146.50	2.283	12.71	3.28	7.96
.300	8.19	1.300	146.50	2.300	12.71	3.30	7.96
.317	8.19	1.317	146.50	2.317	12.71	3.32	7.96
.333	8.19	1.333	146.50	2.333	12.71	3.33	7.96
.350	9.32	1.350	43.94	2.350	11.45	3.35	7.55
.367	9.32	1.367	43.93	2.367	11.45	3.37	7.55
.383	9.32	1.383	43.93	2.383	11.45	3.38	7.55
.400	9.32	1.400	43.93	2.400	11.45	3.40	7.55
.417	9.32	1.417	43.93	2.417	11.45	3.42	7.55
.433	9.32	1.433	43.93	2.433	11.45	3.43	7.55
.450	9.32	1.450	43.93	2.450	11.45	3.45	7.55
.467	9.32	1.467	43.93	2.467	11.45	3.47	7.55
.483	9.32	1.483	43.93	2.483	11.45	3.48	7.55
.500	9.32	1.500	43.93	2.500	11.45	3.50	7.55
.517	10.95	1.517	26.91	2.517	10.46	3.52	7.18
.533	10.95	1.533	26.91	2.533	10.46	3.53	7.18
.550	10.95	1.550	26.91	2.550	10.46	3.55	7.18
.567	10.95	1.567	26.91	2.567	10.46	3.57	7.18
.583	10.95	1.583	26.91	2.583	10.46	3.58	7.18
.600	10.95	1.600	26.91	2.600	10.46	3.60	7.18
.617	10.95	1.617	26.91	2.617	10.46	3.62	7.18
.633	10.95	1.633	26.91	2.633	10.46	3.63	7.18
.650	10.95	1.650	26.91	2.650	10.46	3.65	7.18
.667	10.95	1.667	26.91	2.667	10.46	3.67	7.18
.683	13.53	1.683	20.36	2.683	9.66	3.68	6.85
.700	13.53	1.700	20.36	2.700	9.66	3.70	6.85
.717	13.53	1.717	20.36	2.717	9.66	3.72	6.85
.733	13.53	1.733	20.36	2.733	9.66	3.73	6.85
.750	13.53	1.750	20.36	2.750	9.66	3.75	6.85

.767	13.53	1.767	20.36	2.767	9.66	3.77	6.85
.783	13.53	1.783	20.36	2.783	9.66	3.78	6.85
.800	13.53	1.800	20.36	2.800	9.66	3.80	6.85
.817	13.53	1.817	20.36	2.817	9.66	3.82	6.85
.833	13.53	1.833	20.36	2.833	9.66	3.83	6.85
.850	18.53	1.850	16.73	2.850	9.00	3.85	6.56
.867	18.53	1.867	16.73	2.867	9.00	3.87	6.56
.883	18.53	1.883	16.73	2.883	9.00	3.88	6.56
.900	18.53	1.900	16.73	2.900	9.00	3.90	6.56
.917	18.53	1.917	16.73	2.917	9.00	3.92	6.56
.933	18.53	1.933	16.73	2.933	9.00	3.93	6.56
.950	18.53	1.950	16.73	2.950	9.00	3.95	6.56
.967	18.53	1.967	16.73	2.967	9.00	3.97	6.56
.983	18.53	1.983	16.73	2.983	9.00	3.98	6.56
1.000	18.53	2.000	16.73	3.000	9.00	4.00	6.56

Max.Eff.Inten.(mm/hr)=	146.50	55.17	
over (min)	5.00	4.00	
Storage Coeff. (min)=	.68 (ii)	3.71 (ii)	
Unit Hyd. Tpeak (min)=	5.00	4.00	
Unit Hyd. peak (cms)=	.52	.30	
			TOTALS
PEAK FLOW (cms)=	.05	.02	.069 (iii)
TIME TO PEAK (hrs)=	1.33	1.35	1.33
RUNOFF VOLUME (mm)=	77.32	32.93	55.11
TOTAL RAINFALL (mm)=	78.32	78.32	78.32
RUNOFF COEFFICIENT =	.99	.42	.70

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 72.0 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.

CALIB			
NASHYD (0103)	Area (ha)=	.37	Curve Number (CN)= 58.0
ID= 1 DT= 1.0 min	Ia (mm)=	2.50	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	.20	

Unit Hyd Qpeak (cms)=	.071	
PEAK FLOW (cms)=	.020 (i)	
TIME TO PEAK (hrs)=	1.533	
RUNOFF VOLUME (mm)=	22.130	

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     TOTAL RAINFALL   (mm)=  78.320
     RUNOFF COEFFICIENT   =    .283

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

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--------------------
| CALIB            |
| STANDHYD  (0202) |   Area    (ha)=   5.04
|ID= 1 DT= 1.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.58         1.46
     Dep. Storage     (mm)=       1.00         2.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     183.30        40.00
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     146.50        55.17
               over (min)         5.00         7.00
     Storage Coeff.  (min)=       2.56 (ii)    6.80 (ii)
     Unit Hyd. Tpeak (min)=       5.00         7.00
     Unit Hyd. peak  (cms)=        .33          .16
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.39          .17          1.530 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.40           1.33
     RUNOFF VOLUME    (mm)=      77.32        32.92          64.44
     TOTAL RAINFALL   (mm)=      78.32        78.32          78.32
     RUNOFF COEFFICIENT   =        .99          .42            .82


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=    .46
|ID= 1 DT= 1.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .23          .23
     Dep. Storage     (mm)=       1.00         2.50
     Average Slope     (%)=        .50        20.00
     Length            (m)=      55.40        40.00
```

```
     Mannings n           =       .013         .250

     Max.Eff.Inten.(mm/hr)=     146.50        55.17
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       1.89 (ii)    4.93 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .38          .23
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .09          .03           .121 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.37          1.33
     RUNOFF VOLUME    (mm)=      77.32        32.92         55.12
     TOTAL RAINFALL   (mm)=      78.32        78.32         78.32
     RUNOFF COEFFICIENT   =        .99          .42           .70


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    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.
```

```
--------------------
| ADD HYD   (0205) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0202):     5.04   1.530     1.33    64.44
        + ID2= 2 (0203):      .46    .121     1.33    55.12
          ================================================
          ID = 3 (0205):     5.50   1.650     1.33    63.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
--------------------
| CALIB            |
| NASHYD    (0102) |   Area    (ha)=   1.29   Curve Number   (CN)= 58.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   2.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .32

     Unit Hyd Qpeak  (cms)=    .154

     PEAK FLOW       (cms)=    .053 (i)
     TIME TO PEAK    (hrs)=   1.700
     RUNOFF VOLUME    (mm)=  22.131
     TOTAL RAINFALL   (mm)=  78.320
     RUNOFF COEFFICIENT   =    .283
```

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

ADD HYD (0206)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0205):		5.50	1.650	1.33	63.66
+ ID2= 2 (0102):		1.29	.053	1.70	22.13
ID = 3 (0206):		6.79	1.667	1.33	55.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0207)	IN= 2---> OUT= 1	DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
			.0000	.0000	.0180	.1988
			.0050	.0178	.0190	.2271
			.0080	.0359	.0200	.2567
			.0100	.0554	.0210	.2876
			.0120	.0761	.0220	.3197
			.0130	.0982	.0230	.3530
			.0150	.1214	.0240	.3877
			.0160	.1460	.0243	.4055
			.0170	.1718	.0000	.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0206)	6.79	1.67	1.33	55.77
OUTFLOW: ID= 1 (0207)	6.79	.02	4.17	33.73

PEAK FLOW REDUCTION [Qout/Qin](%)= 1.38
TIME SHIFT OF PEAK FLOW (min)=170.00
MAXIMUM STORAGE USED (ha.m.)= .3533

ADD HYD (0208)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):		.37	.020	1.53	22.13

```
        + ID2= 2 (0207):     6.79    .023     4.17    33.73
          ================================================
          ID = 3 (0208):     7.16    .038     1.55    33.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0209) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0204):      .25    .069     1.33    55.11
        + ID2= 2 (0208):     7.16    .038     1.55    33.13
          ================================================
          ID = 3 (0209):     7.41    .094     1.35    33.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0210) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000   |    .0188      .0334
                           .0073      .0025   |    .0197      .0527
                           .0179      .0151   |    .0000      .0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0209)      7.41       .09      1.35      33.87
     OUTFLOW: ID= 1 (0210)      7.41       .02     20.72      29.40

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.26
                   TIME SHIFT OF PEAK FLOW         (min)=******
                   MAXIMUM  STORAGE   USED       (ha.m.)=  .0394

--------------------------------------------------------------------------------
  ***************************
  ** SIMULATION NUMBER:   7 **
  ***************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 801.041
| Ptotal= 87.09 mm |                          B=   1.501
--------------------                          C=    .657
                        used in:   INTENSITY =  A / (t + B)^C
```

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	8.40	1.17	38.70	2.17	16.17	3.17	9.61
.33	9.34	1.33	160.97	2.33	14.33	3.33	9.08
.50	10.59	1.50	47.72	2.50	12.95	3.50	8.61
.67	12.39	1.67	29.71	2.67	11.86	3.67	8.20
.83	15.24	1.83	22.67	2.83	10.97	3.83	7.84
1.00	20.69	2.00	18.74	3.00	10.24	4.00	7.51

CALIB STANDHYD (0204) ID= 1 DT= 1.0 min	Area (ha)= .25 Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	.13	.13
Dep. Storage	(mm)=	1.00	2.50
Average Slope	(%)=	.50	20.00
Length	(m)=	10.00	40.00
Mannings n	=	.013	.250

NOTE: RAINFALL WAS TRANSFORMED TO 1.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.017	8.40	1.017	38.70	2.017	16.17	3.02	9.61
.033	8.40	1.033	38.70	2.033	16.17	3.03	9.61
.050	8.40	1.050	38.70	2.050	16.17	3.05	9.61
.067	8.40	1.067	38.70	2.067	16.17	3.07	9.61
.083	8.40	1.083	38.70	2.083	16.17	3.08	9.61
.100	8.40	1.100	38.70	2.100	16.17	3.10	9.61
.117	8.40	1.117	38.70	2.117	16.17	3.12	9.61
.133	8.40	1.133	38.70	2.133	16.17	3.13	9.61
.150	8.40	1.150	38.70	2.150	16.17	3.15	9.61
.167	8.40	1.167	38.70	2.167	16.17	3.17	9.61
.183	9.34	1.183	160.97	2.183	14.33	3.18	9.08
.200	9.34	1.200	160.97	2.200	14.33	3.20	9.08
.217	9.34	1.217	160.97	2.217	14.33	3.22	9.08
.233	9.34	1.233	160.97	2.233	14.33	3.23	9.08

.250	9.34	1.250	160.97	2.250	14.33	3.25	9.08
.267	9.34	1.267	160.97	2.267	14.33	3.27	9.08
.283	9.34	1.283	160.97	2.283	14.33	3.28	9.08
.300	9.34	1.300	160.97	2.300	14.33	3.30	9.08
.317	9.34	1.317	160.97	2.317	14.33	3.32	9.08
.333	9.34	1.333	160.97	2.333	14.33	3.33	9.08
.350	10.59	1.350	47.73	2.350	12.95	3.35	8.61
.367	10.59	1.367	47.72	2.367	12.95	3.37	8.61
.383	10.59	1.383	47.72	2.383	12.95	3.38	8.61
.400	10.59	1.400	47.72	2.400	12.95	3.40	8.61
.417	10.59	1.417	47.72	2.417	12.95	3.42	8.61
.433	10.59	1.433	47.72	2.433	12.95	3.43	8.61
.450	10.59	1.450	47.72	2.450	12.95	3.45	8.61
.467	10.59	1.467	47.72	2.467	12.95	3.47	8.61
.483	10.59	1.483	47.72	2.483	12.95	3.48	8.61
.500	10.59	1.500	47.72	2.500	12.95	3.50	8.61
.517	12.39	1.517	29.72	2.517	11.86	3.52	8.20
.533	12.39	1.533	29.71	2.533	11.86	3.53	8.20
.550	12.39	1.550	29.71	2.550	11.86	3.55	8.20
.567	12.39	1.567	29.71	2.567	11.86	3.57	8.20
.583	12.39	1.583	29.71	2.583	11.86	3.58	8.20
.600	12.39	1.600	29.71	2.600	11.86	3.60	8.20
.617	12.39	1.617	29.71	2.617	11.86	3.62	8.20
.633	12.39	1.633	29.71	2.633	11.86	3.63	8.20
.650	12.39	1.650	29.71	2.650	11.86	3.65	8.20
.667	12.39	1.667	29.71	2.667	11.86	3.67	8.20
.683	15.24	1.683	22.68	2.683	10.97	3.68	7.84
.700	15.24	1.700	22.67	2.700	10.97	3.70	7.84
.717	15.24	1.717	22.67	2.717	10.97	3.72	7.84
.733	15.24	1.733	22.67	2.733	10.97	3.73	7.84
.750	15.24	1.750	22.67	2.750	10.97	3.75	7.84
.767	15.24	1.767	22.67	2.767	10.97	3.77	7.84
.783	15.24	1.783	22.67	2.783	10.97	3.78	7.84
.800	15.24	1.800	22.67	2.800	10.97	3.80	7.84
.817	15.24	1.817	22.67	2.817	10.97	3.82	7.84
.833	15.24	1.833	22.67	2.833	10.97	3.83	7.84
.850	20.69	1.850	18.74	2.850	10.24	3.85	7.51
.867	20.69	1.867	18.74	2.867	10.24	3.87	7.51
.883	20.69	1.883	18.74	2.883	10.24	3.88	7.51
.900	20.69	1.900	18.74	2.900	10.24	3.90	7.51
.917	20.69	1.917	18.74	2.917	10.24	3.92	7.51
.933	20.69	1.933	18.74	2.933	10.24	3.93	7.51
.950	20.69	1.950	18.74	2.950	10.24	3.95	7.51
.967	20.69	1.967	18.74	2.967	10.24	3.97	7.51
.983	20.69	1.983	18.74	2.983	10.24	3.98	7.51
1.000	20.69	2.000	18.74	3.000	10.24	4.00	7.51

Max.Eff.Inten.(mm/hr)= 160.97 65.43

```
                over (min)        5.00         4.00
     Storage Coeff.  (min)=        .65 (ii)    3.58 (ii)
     Unit Hyd. Tpeak (min)=       5.00         4.00
     Unit Hyd. peak  (cms)=        .52          .30
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .06          .02          .077 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.35          1.33
     RUNOFF VOLUME    (mm)=      86.09        39.02         62.55
     TOTAL RAINFALL   (mm)=      87.09        87.09         87.09
     RUNOFF COEFFICIENT   =        .99          .45           .72

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0103) |   Area    (ha)=    .37   Curve Number   (CN)= 58.0
|ID= 1 DT= 1.0 min |   Ia      (mm)=   2.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .20

     Unit Hyd Qpeak  (cms)=    .071

     PEAK FLOW       (cms)=    .024 (i)
     TIME TO PEAK    (hrs)=   1.533
     RUNOFF VOLUME    (mm)=  26.646
     TOTAL RAINFALL   (mm)=  87.089
     RUNOFF COEFFICIENT   =    .306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0202) |   Area    (ha)=   5.04
|ID= 1 DT= 1.0 min |   Total Imp(%)=  71.00   Dir. Conn.(%)=  71.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.58         1.46
     Dep. Storage     (mm)=       1.00         2.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=     183.30        40.00
     Mannings n           =       .013         .250
```

```
     Max.Eff.Inten.(mm/hr)=     160.97        65.43
               over (min)        5.00         7.00
     Storage Coeff.  (min)=       2.47 (ii)    6.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00         7.00
     Unit Hyd. peak  (cms)=        .34          .17
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.54          .20          1.704 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.40           1.33
     RUNOFF VOLUME    (mm)=      86.09        39.02          72.44
     TOTAL RAINFALL   (mm)=      87.09        87.09          87.09
     RUNOFF COEFFICIENT   =        .99          .45            .83


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0203) |   Area    (ha)=    .46
|ID= 1 DT= 1.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       .23          .23
     Dep. Storage     (mm)=      1.00         2.50
     Average Slope     (%)=       .50        20.00
     Length            (m)=     55.40        40.00
     Mannings n           =      .013         .250

     Max.Eff.Inten.(mm/hr)=     160.97        65.43
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.82 (ii)    4.75 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .39          .23
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .10          .04           .136 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.37           1.33
     RUNOFF VOLUME    (mm)=      86.09        39.02          62.55
     TOTAL RAINFALL   (mm)=      87.09        87.09          87.09
     RUNOFF COEFFICIENT   =        .99          .45            .72


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  72.0    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.

ADD HYD (0205)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0202):	5.04	1.704	1.33	72.44
	+ ID2= 2 (0203):	.46	.136	1.33	62.55
	ID = 3 (0205):	5.50	1.840	1.33	71.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0102)	Area	(ha)=	1.29	Curve Number (CN)=	58.0
ID= 1 DT= 1.0 min	Ia	(mm)=	2.50	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		.32		

Unit Hyd Qpeak (cms)= .154

PEAK FLOW (cms)= .064 (i)
TIME TO PEAK (hrs)= 1.700
RUNOFF VOLUME (mm)= 26.647
TOTAL RAINFALL (mm)= 87.089
RUNOFF COEFFICIENT = .306

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

ADD HYD (0206)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0205):	5.50	1.840	1.33	71.61
	+ ID2= 2 (0102):	1.29	.064	1.70	26.65
	ID = 3 (0206):	6.79	1.859	1.33	63.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------
| RESERVOIR (0207) |
| IN= 2---> OUT= 1 |
| DT=  2.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                           .0000      .0000    |    .0180      .1988
                           .0050      .0178    |    .0190      .2271
                           .0080      .0359    |    .0200      .2567
                           .0100      .0554    |    .0210      .2876
                           .0120      .0761    |    .0220      .3197
                           .0130      .0982    |    .0230      .3530
                           .0150      .1214    |    .0240      .3877
                           .0160      .1460    |    .0243      .4055
                           .0170      .1718    |    .0000      .0000

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0206)      6.79      1.86      1.33      63.07
     OUTFLOW: ID= 1 (0207)      6.79       .02      4.18      36.01

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  1.30
                   TIME SHIFT OF PEAK FLOW         (min)=171.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  .4011

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0208) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0103):      .37    .024     1.53    26.65
        + ID2= 2 (0207):     6.79    .024     4.18    36.01
          ================================================
          ID = 3 (0208):     7.16    .043     1.55    35.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0209) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0204):      .25    .077     1.33    62.55
        + ID2= 2 (0208):     7.16    .043     1.55    35.52
          ================================================
          ID = 3 (0209):     7.41    .106     1.35    36.43
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0210)					
IN= 2---> OUT= 1					
DT= 2.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	.0000	.0000	.0188	.0334	
	.0073	.0025	.0197	.0527	
	.0179	.0151	.0000	.0000	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0209)	7.41	.11	1.35	36.43
OUTFLOW: ID= 1 (0210)	7.41	.02	24.22	30.11

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.53
TIME SHIFT OF PEAK FLOW (min)=******
MAXIMUM STORAGE USED (ha.m.)= .0502

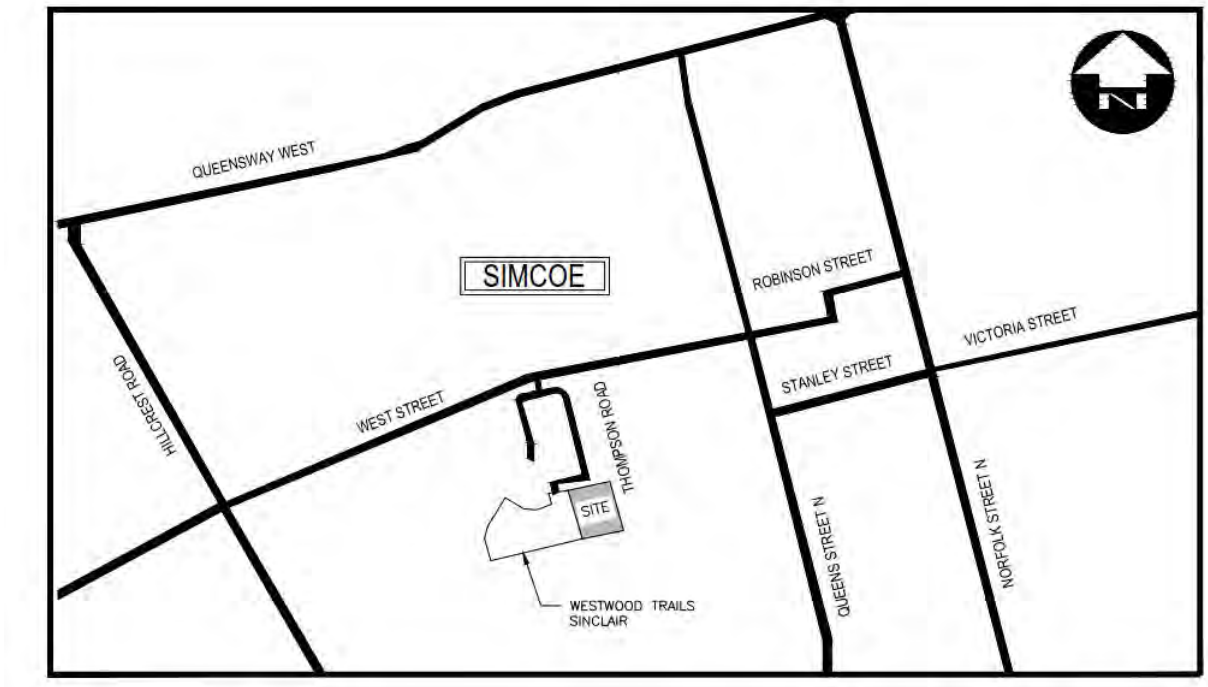
FINISH

MEMO

TO:	Bremont Developments (Norfolk)
FROM:	Ron Antuma, - P.E., Associate Jason Johnson, P.Eng. – Partner
DATE:	December 7, 2018
SUBJECT:	Functional Servicing Design Brief – Meadows of Norfolk
OUR FILE:	18-8454

Introduction

The purpose of this design brief is to outline appropriate municipal servicing requirements for site plan approval of the Bremont Homes Development "Meadows of Norfolk" in Simcoe, Ontario in the County of Norfolk. Norfolk County will be the approval authority under the site plan approval process. The proposed development is located off of Fernwood Drive in Simcoe as shown on the location plan and will consist of 50 townhome units and 24 four-plex units for a total of 74 units. The site boundary drawing and concept plan is attached.



Location Plan

Proposed Concept Plan

The conceptual layout of the development was prepared by A. J. Clarke & Associates and can be found in Appendix A. The plan depicts the layout of the private road network, the connection to Fernwood Drive,

and the 50 townhouse units including 24 four-plex units. The plan also includes a table specifying the site statistics and proposed zoning.

Existing Contour Plan

A topographic and boundary survey was prepared by The Laroque Group of St. Catharines, Ontario and is included in Appendix B. The existing general direction of high to low is from the south to the north. The project will require regrading to direct the drainage as specified under the storm servicing section within this memo.

General Plan of Servicing

The general plan of servicing can be found in Figure 1. This plan depicts the layout of the proposed development including the roads, intersections, private to public road connections, 50 townhouse units and 24 four-plex units. The plan also includes the proposed layout of the watermain, sanitary sewers, and storm sewers depicting anticipated sizes, flow direction, and connection points. General overland flow arrows have also been provided on this plan to show the anticipated major storm runoff directions. Not depicted is the private utilities such as gas, electric and telecommunications that will come from the public road at Fernwood Drive into this development.

Storm Servicing

Existing Conditions

The existing site is approximately 1.7 ha in size and is vacant and undeveloped, consisting of treed and grassed areas with the general topography of the site running from south to north.

Proposed Conditions

A storm water management pond is proposed for the neighboring Westwood Trails Development that was designed by Dillon Consulting Limited. The storm water management pond was sized to include a portion of the rear yards from an existing development off of Thompson Road; the Westwood Trails Development by Warren D. Sinclair Construction and for this Meadows of Norfolk Development, by Bremont Developments (Norfolk) as shown on Post Development Catchment Areas in Appendix C.

The proposed storm sewer layout is shown on Figure 1. All internal storm sewers will run towards a 450mm diameter storm sewer partway from the South East Corner of the Westwood Trails Development and drains west to the Stormwater Management (SWM) pond. Overland flow will be directed towards the South West Corner draining along a private road in “The Meadows of Norfolk Development” and eventually into the SWM pond. As a result, major overland flow will spill onto the road network of the Westwood Trails development in order for the water to drain towards the SWM pond.

For reference Table 1 below shows the Pre to Post Development Discharges. A cross property servicing agreement will need to be established between Bremont Developments (Norfolk) and Warren D. Sinclair Construction to allow connection to the 450mm storm sewer, overland flow route and SWM Pond system for common use.



FILENAME: C:\PROJECTWISE\WORKING DIRECTORY\PROJECTS 2018\108ES\DMS48375\188454-02-MSRV-CONLDWG PLOTTED BY: SPEAR, BRENDON, CONSULTING LIMITED 130 DUFFERIN AVENUE, LONDON, ONTARIO, N6A 5R2, PHONE (519) 438-6192, FAX (519) 672-9209
PLOT DATE: 2018-12-10 @ 1:56:13 PM PLOT SCALE: 1:254.4 PLOT STYLE: DILLON-STANDARD.CTB

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BREMONT™ Designed For Living.

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY

DESIGN	REVIEWED BY
RSS	RDA
DRAWN	CHECKED BY
RSS	RDA
DATE	
DEC 2018	
SCALE	
1:500	

MEADOWS OF NORFOLK
BREMONT HOMES

PROJECT NO.
188454

MASTER SERVICING PLAN

SHEET NO.
FIG 1

The SWM pond and storm sewers have been sized to accept this development, as proposed, for both collection and storm water treatment through the proposed SWM facility (within Westwood Trails) for quality, quantity and discharge through infiltration and overland flow up to a 100 year storm. This SWM facility and storm collection system was designed by Dillon Consulting Limited as part of the Westwood Trails Development dated December 2018 in accordance with Norfolk County's Design Standards.

Table 1: Pre- and Post-Development Discharges

Return Period	Pre-Development Discharge (L/s)	Post-Development Discharge (L/s)
2 Year	37.40	208.87
5 Year	49.46	275.44
10 Year	89.10	321.30
25 Year	67.80	376.14
50 Year	75.44	417.81
100 Year	82.72	457.80

Sanitary Servicing

Existing Conditions

The site is bounded by Thompson Road and Lee Avenue, both consisting of existing 200mm diameter sanitary sewer. The existing sanitary sewer on Thompson Road initially flows west to east then changes direction to flow north towards West Street. The existing sanitary sewer on Lee Avenue flows north and connects to the sanitary sewer on Norris Street.

Proposed Conditions

Improvements to Fernwood Drive are planned as part of the Westwood Trails Development. They will be extending Fernwood Drive which will include extending a 200mm sanitary sewer from Thompson Road to its east property line in common with the west property line of this Meadows of Norfolk Development. The sanitary sewer system will drain to the near northwest corner of its property tying into the previously described proposed 200mm sanitary sewer near the proposed terminus of Fernwood Drive extended. Refer to Figure 1.

Water Servicing

Existing Conditions

There is an existing 300 mm diameter watermain on the east side of Fernwood Drive which flows to Thomson Drive. The Westwood Trails development have proposed to extend a 150 mm diameter watermain along Fernwood Drive and stub it at the entrance of the proposed development.

Proposed Conditions

A 150 mm diameter watermain is proposed for the development and will connect to the 150mm diameter watermain stub on Fernwood Drive as shown on **Figure 1**. Three hydrants will be installed within the road network to provide appropriate coverage for fire flow. At dead ends either a 50mm blow off or hydrant will be installed in accordance with Norfolk County requirements. Norfolk County will run an analysis of the water model for this site confirming adequate watermain sizing for both flow and pressure.

Integrated Sustainable Master Plan

Norfolk County Council adopted by resolution the Integrated Sustainable Master Plan (ISMP) in November of 2016. The FSR is to confirm that the ISMP was reviewed and due consideration of it was taken in the design of the development.

Dillon Consulting Limited reviewed the ISMP to ensure the development plan with its transportation connectivity and municipal servicing were in line with the report. Given this will be a private development with only one connection point for both the water system and public road network there will be minimal to no impact to the existing ISMP. The drainage system will be public only in that there will be a cross-property servicing agreement between 2 private condominium developments including a storm-water management facility.

DILLON CONSULTING LIMITED
LONDON, ONTARIO

LICENSED PROFESSIONAL ENGINEER
12/10/18
J. D. JOHNSON
PROVINCE OF ONTARIO

Ron Antuma
Associate

Jason Johnson, P.Eng.
Partner

Appendix A

Concept Plan

DILLON CONSULTING

MEADOWS OF NORFOLK



NOTE:
SURVEY INFORMATION SHOWN ON THIS SKETCH IS BASED ON A PLAN OF SURVEY BY RICHARD LAROCQUE LIMITED DATED OCTOBER 25th, 2018.

Site Statistics - Summary	
Area of site	± 17,479 m²
Visitor parking	25 spaces
Occupant parking	135 spaces
Townhouse count	50 units
Four-plex count	24 units
Total unit count	74 units

Proposed Zoning: R4, with site-specific provisions (14.XXX)

Zoning Provision	Current Requirement	Proposed Development
Permitted Uses [5.4.1 Permitted Uses]	Group townhouse Stacked townhouse Street townhouse Semi-detached, duplex, tri-plex and four-plex dwellings provided they are located on the same lot with, and in accordance with this Zone provisions of, group townhouse Home occupation	Group townhouse Four-plex
Minimum Lot Area [5.4.2(a)]		
i) attached garage	195 square metres	165.05 square metres
ii) corner lot	195 square metres	
iii) detached garage	215 square metres	
Minimum Lot Frontage [5.4.2(b)]		
i) interior lot	30 metres	6.0 metres
ii) corner lot	30 metres	
iii) corner lot accessed by a rear lane	N/A	
Minimum Front Yard [5.4.2(c)]		
i) attached garage	6 metres	5.22 metres
ii) detached garage or rear yard parking	1.8 metres	
Minimum Exterior Side Yard [5.4.2(d)]		
i) with a 6 metre front yard	6 metres	2.78 metres
ii) with a 1.5 metre front yard	1.5 metres	
Minimum Interior Side Yard [5.4.2(e)]	3 metres	1.5 metres
Minimum Rear Yard [5.4.2(f)]		
i) attached garage	7.5 metres	6.97 metres
ii) detached garage or rear yard parking	7.5 metres	
Minimum separation between townhouse dwellings [5.4.2(g)]	2 metres	3 metres
Maximum building height [5.4.2(h)]	11 metres	TBD
Maximum units in a townhouse dwelling [5.4.4]	No more than eight (8) dwelling units shall be located in a townhouse dwelling.	
Accessible Parking [4.3.1(a)]	type A, a wider accessible parking space which has a minimum width of 3.4 metres with signage that clearly identifies the space as "van accessible" plus an access aisle in accordance with Subsection 4.3.2;	
Access Aisles [4.3.2(d)]	a minimum width of 1.5 metre extending the full length of the parking space; and,	
Access Aisles [4.3.2(i)]	be marked with high tonal contrast diagonal lines, which prohibits parking in them, where the surface is asphalt, concrete or some other hard surface.	OK
Minimum number and type of accessible parking spaces [4.3.3]	1 Type A Accessible Space (Van)	2 Type A Accessible Spaces
Number of parking spaces - type of use (residential) [4.9(a)]	2 parking spaces for each townhouse dwelling unit	2 parking spaces for each townhouse dwelling unit
Number of parking spaces - type of use (residential) [4.9(a)]	1.5 parking spaces for each fourplex dwelling unit	1.5 parking spaces for each fourplex dwelling unit
Number of parking spaces - type of use (visitor parking) [4.9(f)]	1 visitor space for every 3 dwelling units	25 spaces



KEYPLAN (NTS)

No.	Revision	Date	By
4	Boundary Adjustment	11/28/18	SS
3	Revised as per client comments	11/19/18	SS
2	Revised as per revised plan received Oct. 1 '18	10/22/18	SS
1	Issued for Pre-Consultation submission	06/02/18	SS

REVISIONS

Part of Lot 13, Concession 18 Gore Woodhouse
Town of Simcoe

PROJECT OWNER:

BREMONT™ Acquisitions

4908 Hwy 7
Woodbridge ON, L4L 1S8
Main: 905.266.1851 Ext. 28
Email: mmarsili@mybremont.ca
Web: www.mybremont.ca

NOT ISSUED FOR CONSTRUCTION

MUNICIPALITY:

TOWN OF SIMCOE

PROJECT NAME:

Norfolk Meadows
AN EXCLUSIVE TOWNHOME COMMUNITY IN NORFOLK COUNTY

A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: 905 528-8761 Fax: 905 528-2289
email: ajc@ajclarke.com

TITLE:

CONCEPT PLAN

SCALE: 1: 300	DATE: FEB 2018
DESIGN:	DRAWN: L.H.
DWG: 188013	SHT: SP

H:\Jobs\2018 Projects\188013 (Fernwood Drive)\Planning\Concepts\SENT\Nov. 28-2018\CONCEPT - Standard\CONCEPT.dwg, 28/11/2018 11:38:30 AM, Adobe PDF

Appendix B

Contour Plan

DILLON CONSULTING

SITE CONDITION PLAN
PART OF LOTS 13 & 18
GORE CONCESSION
(GEOGRAPHIC TOWNSHIP OF WOODHOUSE)
NORFOLK COUNTY

SCALE 1:250 METRIC
5m 0 5m 10m

THOMPSON ROAD

FERNWOOD DRIVE

REG'D PLAN No. 1022

LOT 33 | PIN 50220-0150(LT) LOT 32 | PIN 50220-0149(LT) LOT 31 | PIN 50220-0148(LT) LOT 30 | PIN 50220-0147(LT) LOT 29 | PIN 50220-0146(LT) LOT 28 | PIN 50220-0145(LT) LOT 27 | PIN 50220-0144(LT) LOT 26

PART 33, 37R-900 | PART 32, 37R-900 | PART 31, 37R-900 | PART 30, 37R-900 | PART 29, 37R-900 | PART 28, 37R-900 | PART 27, 37R-900 | PART 26, 37R-900

LOT 65
FLOOD RESERVE

PART 2, 37R-13527

PIN 50220-0144(LT)
PART 1, 37R-13527

LOT 10

LOT 9

LOT 8
PIN 50220-0274(LT)

LOT 7
PIN 50220-0273(LT)

LOT 6
PIN 50220-0272(LT)

LOT 5
PIN 50220-0271(LT)

LOT 4
PIN 50220-0270(LT)

LOT 1
PIN 50220-0333(LT)

LOT 2
PIN 50220-0334(LT)

LEE AVENUE

LOT 12 | LOT 13 | LOT 14

REG'D PLAN No. 1093

NORRIS STREET

LOT 3 | LOT 2 | LOT 1

LEE AVENUE

LOT 3

REG'D PLAN No. 37M-40

LOT 6
0.300 WIDTH
PIN 50220-0336(LT)

LOT 4
PIN 50220-0335(LT)

PART 2, 37R-8623
LOT 13
PIN 50220-0331(LT)
GORE CONCESSION

OAK STREET
PIN 50217-0001(LT)

PART 11 37R-10637 | PART 10 37R-10637 | PART 9 37R-10637 | PART 8 37R-10637

PART 13 37R-10637 | PART 12 37R-10637

PART 14 37R-10637

PART 4 37R-10637

PART 5, 37R-10637

PART 6 37R-10637

PART 7, 37R-10637

PART 1, 37R-9748

PART 3, 37R-8623

PART 1, 37R-10637

PART 2, 37R-10637

PART 3, 37R-10637

PIN 50220-0290(LT)

PIN 50220-0289(LT)

N78°36'30"E 170.783

N78°35'30"E 170.810

N78°01'20"E 130.879

N11°24'30"W 1.083

GORE CONCESSION

LOT 13

GORE CONCESSION

PIN 50220-0288(LT)

LEGEND

85.00 DENOTES EXISTING ELEVATION

BEARING NOTE

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED REFERENCE POINTS BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONGITUDE, ZONE 17, UNIVERSAL TRANSVERSE MERCATOR (6° UTM). THESE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERENCE SYSTEM.

METRIC NOTE

DISTANCES AND CO-ORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND DISTANCES AND CAN BE CONVERTED TO GRID CO-ORDINATES BY MULTIPLYING THE DISTANCES BY A COMBINED SCALE FACTOR OF 0.9996363.

THE LAROCQUE GROUP
O.L.S./PROJECT CONSULTANTS/LAND MANAGEMENT
12 LYMAN STREET, ST. CATHARINES, ONTARIO
905-688-1413
6386 COLBORNE STREET, NIAGARA FALLS, ONTARIO
905-358-5400

DATE : NOVEMBER 30, 2018 FILE No. : 2018-087
DWG.FILE : 2018-087-DP

Appendix C

STORM WATER MANAGEMENT

DILLON CONSULTING

LEGEND

PROJECT BOUNDARY
DRAINAGE AREA

A1 — AREA DESIGNATION
0.4 — AREA (Ha)
0.60 — RUNOFF COEFFICIENT

Part 1, Plan 37R-837
Part 2, Plan 37R-837
Part 3, Plan 37R-837
Part 1, Plan 37R-10825
Part 1, Plan 37R-10511
Registered Plan No. 1022
CONCESSION GORE
Township of Woodhouse)
TOWN OF SIMCOE
THOMPSON ROAD (Established by Judge's Order Inst. No. NR379269) (20.000 Wide)
THOMPSON ROAD (Established by Plan 37M-76) (20.000 Wide)
FERNWOOD DRIVE (Registered Plan No. 1022) (20.117 Wide)
IRONWOOD GATE
SERVICEBERRY LANE
MARACK WAY
PLAN 37M-76
BLOCK 11
Block 10
Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
Lot 6
Lot 7
Lot 8
Lot 9
Lot 32
Lot 33
Lot 34
Lot 35
Lot 85 (0.305 Reserve)
N82°23'25"E (Meas.) (N82°22'00"E P3) 112.049 (Meas.) (112.101 P3)
N69°48'05"E (Meas.) (N69°48'30"E P3) 81.673 (Meas.) (81.646 P3)
N20°42'30"E (Meas.) (N20°41'30"E P3) 107.603 (Meas.) (107.660 P3)
N84°01'30"E (P3 & Meas.) 168.760 (P3 & Meas.)
N31°01'10"E 87.650 (P1 P3 & Meas.)
N14°30'00"W (P1 P3 & Set) 21.700 (P1 P3 & Meas.)
N59°00'50"W (P1 & Meas.) 23.370
34.280 (P1 & Meas.)
26.275 (P1 P3 & Meas.)
8.635
N69°40'10"E (Meas.) (N69°42'00"E P1) 45.390 (P1 & Meas.) 42.670 (P1 & Meas.)
N16°00'05"W (Meas.) 23.622 (P1 & Set)
20.032 (P1 & Set)
2.276 (P1 & Set)
N81° 06'30"E (P1 & Meas.) 20.272 (P1 & Meas.)
51.507 (P1 & Meas.)
22.655 (P1 & Meas.)
8.580 (P1 & Meas.)
N87°21'45"W 32.190 (P1 & Set)
N67°00'00"E 20.150 (P1 & Meas.)
N74°01'00"E 21.050 (P1 & Meas.)
227.300
130.065
N15°58'00"W
8.7-250 STM @ 1.00%
50.1-300 STM @ 1.20%
24.1-300 STM @ 1.44%
47.8-300 STM @ 1.22%
51.3-300 STM @ 1.15%
20.3-250 STM @ 1.00%
16.6-250 STM @ 0.61%
12.3-675 STM @ 0.35%
8.5-675 STM @ 0.35%
26.5-675 STM @ 0.30%
35.0-675 STM @ 0.30%
16.1-300 STM @ 1.15%
88.7-450 STM @ 1.00%
88.5-450 STM @ 0.90%
30.6-450 STM @ 0.50%
30.1-375 STM @ 0.50%
10.3-250 STM @ 1.00%
STMH43 STMH44 STMH45 STMH46 STMH47 STMH48 STMH49 STMH50 STMH51 STMH52 STMH53 STMH54 STMH55 STMH56 STMH57 STMH58 STMH59 STMH60 STMH61 STMH62 STMH63 STMH64 STMH65 STMH66 STMH67 STMH68 STMH69 STMH70 STMH71 STMH72 STMH73 STMH74 STMH75 STMH76 STMH77 STMH78
INFILTRATION GALLERY
FOREBAY
WET CELL
SWM FACILITY
A1 0.3 0.75
A2 0.09 0.75
A3a 0.16 0.75
A3b 1.76 0.75
A3Total 1.92 0.75
A4 0.37 0.75
A5 0.28 0.75
A6 0.31 0.75
A7 0.19 0.75
A8 0.10 0.75
A9 0.27 0.75
A10 0.17 0.75
A11 0.40 0.75
A12 0.06 0.75
A13 0.05 0.75
A14 0.11 0.75
A15 0.42 0.25

FILENAME: C:\PROJECTWSE\WORKING DIRECTORY\PROJECTS 2018\108P\DM\314480\187395-STM-DESJDWG PLOTTED BY: PETERSEN, BRENDAN
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WARREN SINCLAIR HOMES

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
02	RE-ISSUED FOR NORFOLK COUNTY REVIEW	DEC 2018	RDA
01	ISSUED FOR REVIEW	JULY 2018	RDA

DESIGN	RDA
REVIEWED BY	RDA
DRAWN	BJP
CHECKED BY	JDJ
DATE	DECEMBER 2018
SCALE	1:500

WARREN D. SINCLAIR CONSTRUCTION LTD.
WESTWOOD TRAILS

PROJECT NO. 18-7395

STORM DRAINAGE AREAS

SHEET NO. 11

STORM SEWER DESIGN SHEET

RUNOFF COEFFICIENT 'C' VALUES

THE FOLLOWING 'C' VALUES WILL APPLY WHEN DESIGNING STORM SEWERS:

PARKS, OPEN SPACE	0.20
SINGLE FAMILY/SEMI DETACHED	0.60
TOWNHOUSE/ROWHOUSE	0.75
APARTMENTS	0.75
COMMERCIAL, INSTITUTIONAL & INDUSTRIAL	0.75 - 0.90
DENSELY BUILT, PAVED	0.90

FLOW Q=2.78 x C x A x I

WHERE Q = PEAK FLOW IN LITRES PER SECOND (L/sec)
A = AREA IN HECTARES (Ha)
C = RUNOFF COEFFICIENT
I = RAINFALL INTENSITY (mm/hr)
RETURN PERIOD = 5 YEARS

DATE: 06-Dec-18

DESIGNED BY: BJP

PROJECT NAME: WESTWOOD TRAILS DEVELOPMENT, SIMCOE ONTARIO

PROJECT FILE NO.: 18-7395

LOCATION				AREA		TOTAL (A X C)						RAINFALL INTENSITY				SEWER DESIGN							PROFILE				
												Time Entry (min)		Intensity	Q										Invert Elevation	
Area No.	Street	From Manhole	To Manhole	Delta Hectares	Total Hectares	C	AxC	Total Section	Total Lateral	Total Sewer	Total 2.78AxC	Section	Accum.	mm/hr	L/sec	n	Pipe Size mm	Slope %	Capacity L/sec	Velocity m/sec	Length m	Time of Flow	Fall in Sewer	Headloss	Drop in U.S. M.H.	U.S.	D.S.
4	**Street B**			0.37	0.37	0.20	0.07	0.07			0.21		30.00	49.90	**10.27**											
2	**Street A**	STMH50	STMH49	0.09	0.09	0.75	0.07	0.07			0.19		30.00	49.90	**9.36**	0.013	300.00	0.50	68.38	0.97	30.1	0.52	0.151		0.050	234.800	234.650
3	**Street B**	STMH76	STMH49	1.92	1.92	0.75	1.44	1.44			4.00		30.00	49.90	**199.76**	0.013	450.00	0.50	201.60	1.27	30.6	0.40	0.153		0.050	233.800	233.647
5	**Street B**	STMH49	STMH48	0.28	2.29	0.75	0.21	1.72			4.77		30.52	49.36	**235.66**	0.013	450.00	0.90	270.48	1.70	88.5	0.87	0.797		0.050	233.597	232.801
6	**Street B**	STMH48	STMH68	0.31	2.60	0.75	0.23	1.95			5.42		31.39	48.48	**262.80**	0.013	450.00	1.00	285.11	1.79	88.7	0.82	0.887		0.050	232.751	231.864
7	**Street D**	STMH58	STMH57	0.19	0.19	0.75	0.14	0.14			0.40		30.00	49.90	**19.77**	0.013	300.00	1.22	106.81	1.51	47.8	0.53	0.583		0.050	234.480	233.897
8	**Street D**	STMH57	STMH56	0.10	0.29	0.75	0.08	0.22			0.60		30.53	49.35	**29.84**	0.013	300.00	1.44	116.04	1.64	24.1	0.24	0.347		0.050	233.847	233.500
9	**Street D**	STMH56	STMH55	0.27	0.56	0.75	0.20	0.42			1.17		30.77	49.10	**57.32**	0.013	300.00	1.20	105.93	1.50	50.1	0.56	0.601		0.050	233.450	232.849
10	**Street C**	STMH57	STMH56	0.17	0.73	0.75	0.13	0.55			1.52		31.33	48.53	**73.87**	0.013	300.00	1.15	103.70	1.47	51.3	0.58	0.590		0.050	232.799	232.209
11	**Backyard**	DI	STMH54	0.40	0.40	0.75	0.30	0.30			0.83		20.00	106.72	**89.00**	0.013	250.00	2.25	89.20	1.82	14.5	0.13	0.326		0.050	232.535	232.209
12	**Street C**	STMH54	STMH53	0.06	1.19	0.75	0.05	0.89			2.48		31.91	47.96	**119.00**	0.013	375.00	1.15	188.02	1.70	17.8	0.17	0.205		0.050	232.159	231.954
13	**Street C**	STMH53	STMH47	0.05	1.24	0.75	0.04	0.93			2.59		32.09	47.80	**123.57**	0.013	375.00	1.15	188.02	1.70	16.1	0.16	0.185		0.050	231.904	231.719
14	**Street B**	STMH47	STMH46	0.11	3.84	0.75	0.08	2.96			8.24		32.21	47.68	**392.66**	0.013	675.00	0.30	460.41	1.29	35.0	0.45	0.105		0.300	231.419	231.314
	Access Road	STMH46	STMH45		3.84	0.75	0.00	2.96			8.24		32.66	47.25	**389.14**	0.013	675.00	0.30	460.41	1.29	26.5	0.34	0.080		0.050	231.264	231.184
15	**Access Road**	DI	STMH47	0.42	4.26	0.25	0.11	3.07			8.53		33.01	46.93	**400.23**	0.013	675.00	0.35	497.30	1.39	6.0	0.07	0.021		0.050	231.727	231.706
	Access Road	STMH45	STMH44		4.26	0.75	0.00	3.07			8.53		33.08	46.87	**399.67**	0.013	675.00	0.35	497.30	1.39	12.3	0.15	0.043		0.050	231.134	231.091
	Access Road	STMH44	Outlet		4.26	0.75	0.00	3.07			8.53		33.23	46.73	**398.52**	0.013	675.00	0.35	497.30	1.39	8.5	0.10	0.030		0.050	231.041	231.012

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WARREN SINCLAIR HOMES

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
02	RE-ISSUED FOR NORFOLK COUNTY REVIEW	DEC. 2018	RDA
01	ISSUED FOR REVIEW	JULY 2018	RDA

DESIGN: RDA | REVIEWED BY: RDA
DRAWN: BJP | CHECKED BY: JDJ
DATE: DECEMBER 2018
SCALE: 1:500

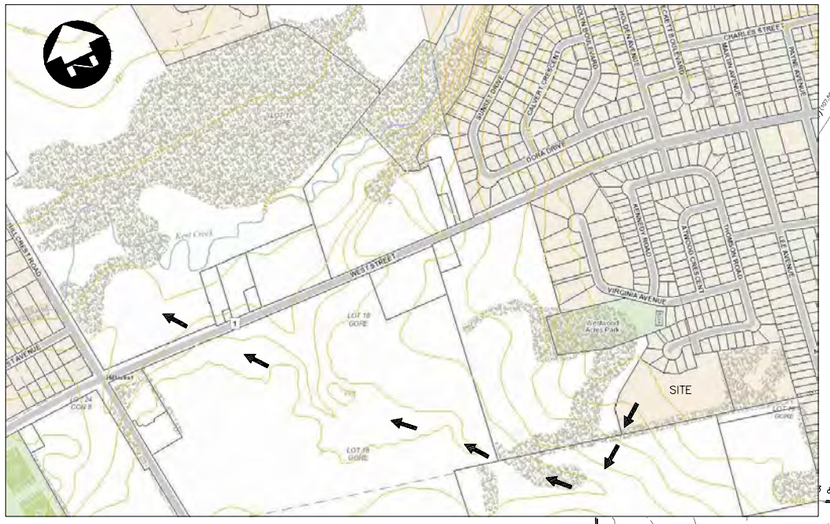
SINCLAIR HOMES
WESTWOOD TRAILS

STORM SEWER DESIGN SHEET

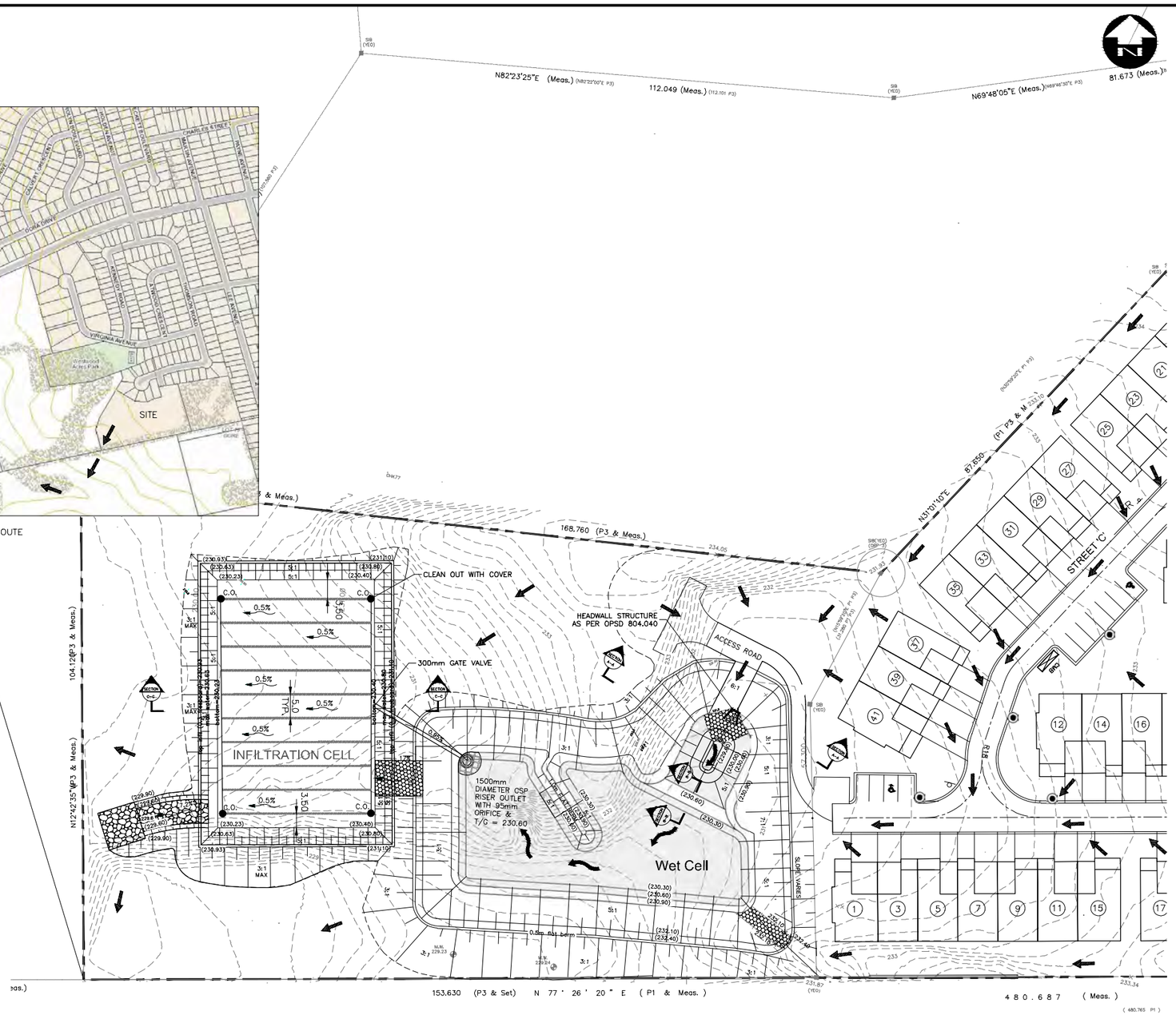
PROJECT NO.: 18-7395

SHEET NO.: 12

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PLOT DATE: 2018-12-07 @ 8:41:56 AM PLOT SCALE: 1:254.4 PLOT STYLE: DILLON-STANDARD.CTB
LONDON



OVERLAND DRAINAGE FLOW ROUTE
NTS.



NOTES:

1. FOREBAY AND WET CELL COMPONENTS OF SWM FACILITY TO BE BUILT WITH 1.0M LAYER OF RELATIVE IMPERVIOUS MATERIAL (T-TIME=40MIN/CM OR SLOWER) (CLAYEY SILT AVAILABLE ON SITE)
2. TYPE B SEED MIX:

BY ONTARIO SEED COMPANY (519) 886-0557
OR APPROVED EQUAL
SEED MIX – TO BE USED AROUND SWMP WHERE INDICATED

		(%)
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	25%
AGROSTIS SCABRA	TICKLEGRASS	25%
CAREX VULPINOIDEA	FOX SEDGE	25%
POA PALUSTRIS	FOWL BLUEGRASS	25%
SEED RATE: 25kg/ha		100%

PROVIDE A NURSE CROP OF ANNUAL RYEGRASS TO BE PLANTED AT A RATE OF 22kg/ha

NOTE:
SEED TICKETS MUST BE PROVIDED TO THE LANDSCAPE ARCHITECT CONSULTANT PRIOR TO APPLICATION. THE LANDSCAPE ARCHITECT MUST NOTIFY THE PLANNING, DESIGN & DEVELOPMENT DEPARTMENT SECTION IN ADVANCE OF SEED DELIVERY TO THE SITE.

LEGEND

- PROPOSED GROUND GRADE
- PROPOSED GROUND ELEVATION
- PROPOSED SWALE GRADE
- PROPOSED SWALE ELEVATION
- EXISTING ELEVATION
- REAR YARD SWALE
- PROPOSED GABION MAT
- RIP RAP
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED STEP IN BUILDING
- MINOR OVERLAND FLOW ROUTE

Conditions of Use

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WARREN SINCLAIR HOMES

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
02	REISSUED FOR NORFOLK COUNTY REVIEW	DEC 2018	RDA
01	ISSUED FOR REVIEW	OCT 2018	RDA

DESIGN	HJF
REVIEWED BY	RDA
DRAWN	HJF
CHECKED BY	RDA
DATE	DECMBER 2018
SCALE	1:500

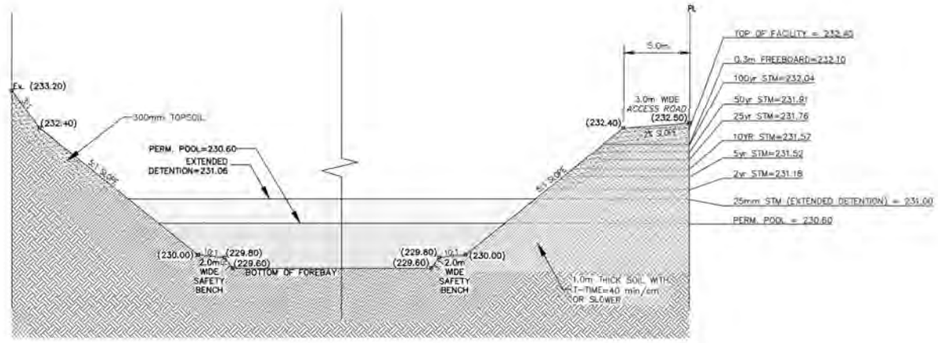
WARREN D. SINCLAIR CONSTRUCTION LTD.
WESTWOOD TRAILS DEVELOPMENT

PROJECT NO. 18-7395

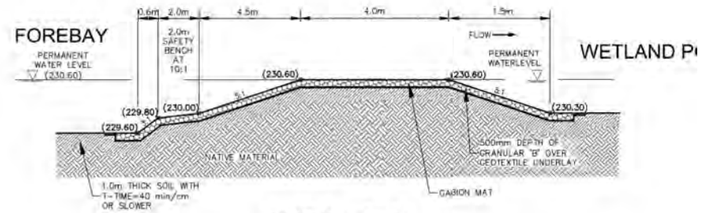
STORM WATER MANAGEMENT PLAN

SHEET NO. SW1.1

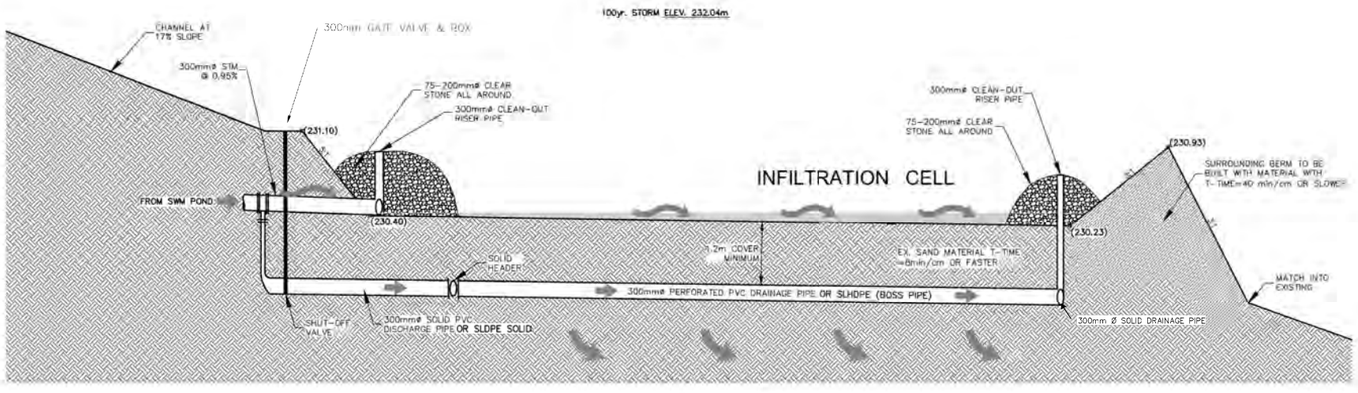
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PLOT DATE: 2018-12-07 @ 7:20:43 PM PLOT SCALE: 1:25.4 PLOT STYLE: DILLON-STANDARD.CTB LONDON OFFICE



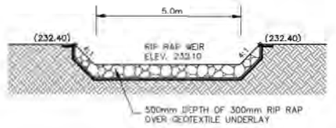
SECTION A–A
FOREBAY CROSS–SECTION
SCALE: 1:200 HOR.
1:50 VERT.



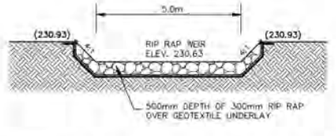
SECTION B–B
FOREBAY OUTLET BERM
N.T.S.



SECTION C–C
INFILTRATION CELL CROSS–SECTION
SCALE: 1:200 HOR.
1:50 VERT.



WET CELL EMERGENCY
OVERFLOW OUTLET WEIR DETAIL
N.T.S.



INFILTRATION CELL EMERGENCY
OVERFLOW OUTLET WEIR DETAIL
N.T.S.

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WARREN SINCLAIR HOMES

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
RDA	ISSUED FOR REVIEW	AUG 2018	RDA

DESIGN	REVIEWED BY
HJF	RDA
DRAWN	CHECKED BY
HJF	RDA
DATE	AUGUST 2018
SCALE	1:500

WARREN D. SINCLAIR CONSTRUCTION LTD.
WESTWOOD TRAILS DEVELOPMENT

PROJECT NO. 18-7395

SWM DETAILS

SHEET NO. SW1.2

FILENAME: C:\PROJECTWISE\WORKING DIRECTORY\PROJECTS 2018\18PYDM514488\187395-SWM POND.DWG PLOTTED BY: PETERSEN, BRENDAN
PLOT DATE: 2018-10-09 @ 12:56:19 PM PLOT SCALE: 1:254.4 PLOT STYLE: DILLON-STANDARD.CTB LONDON OFFICE

APPENDIX B – SWM DRAINAGE PLANS & STORM SEWER DESIGN SHEET

Counterpoint Engineering Inc.

Project:	**16 Fernwood**
Project No:	**251467**
Client:	**2445680 Ontario limited**
Date:	**November 27, 2025**
Prepared by:	**TS**
Checked by:	**JY**

STORM WATER DESIGN SHEET
5 - YEAR STORM
TOWN OF SIMCOE - NORFOLK COUNTY

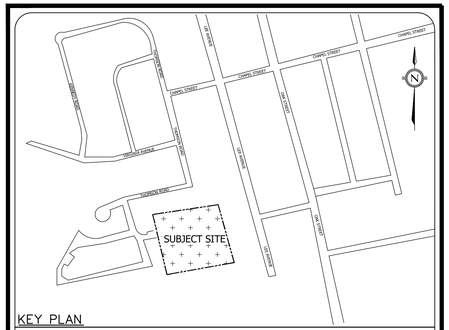
Rainfall Data and Input Parameters

	5 Year
a	583.017
b	3.007
c	0.703

Inlet Time (min)		19
Run-off coeffiecnts	Grass Lands	0.30
	Townhousing	0.75
	Backyards	0.75

	From	To	Diam.	Length	Slope	Area	C	A x C	Accum	Rainfall	Time of	Area Flow	Other	Total	Diameter	Pipe	Hydraulic	Pipe	Pipe	Velocity	Time of	Ratio	Cap.
DRAINAGE AREA	**Node**	**Node**	**(nominal)**	**Pipe**	**Pipe**				**AxC**	**Intensity**	**Conc. (Tc)**	**Q**	**Flows**	**Flow**	**Actual**	**Area**	**Radius**	**Mat.**	**Capacity**		**Flow**	**Q/Q full**	**Check**
			(mm)	**(m)**	**(%)**	**(ha)**		**(ha)**	**(ha)**	**mm/hr**	**(min)**	**(l/s)**	**(l/s)**	**(l/s)**	**(m)**	**(sq.m)**	**(m)**		**(l/s)**	**(m/s)**	**(min)**		
EXT 2	CB17	CBMH1	*250*	*5.5*	*1.00%*	*0.030*	*0.30*	*0.009*	*0.009*	*66.4*	*19.00*	*1.7*	*0.0*	*1.7*	*0.251*	*0.05*	*0.063*	*PVC*	*60.1*	*1.21*	*0.08*	*0.03*	OK
1	CBMH1	MH1	*250*	*29.9*	*0.50%*	*0.094*	*0.75*	*0.071*	*0.080*	*66.2*	*19.08*	*14.6*	*0.0*	*14.6*	*0.251*	*0.05*	*0.063*	*PVC*	*42.5*	*0.86*	*0.58*	*0.34*	OK
4	MH1	MH7	*300*	*70.1*	*0.50%*	*0.222*	*0.75*	*0.166*	*0.246*	*65.0*	*19.66*	*44.4*	*0.0*	*44.4*	*0.298*	*0.07*	*0.075*	*PVC*	*67.2*	*0.96*	*1.21*	*0.66*	OK
EXT 1	CB1	CBMH2	*250*	*5.5*	*1.00%*	*0.181*	*0.30*	*0.054*	*0.054*	*66.4*	*19.00*	*10.0*	*0.0*	*10.0*	*0.251*	*0.05*	*0.063*	*PVC*	*60.1*	*1.21*	*0.08*	*0.17*	OK
2	CBMH2	MH7	*250*	*35.0*	*0.50%*	*0.170*	*0.75*	*0.127*	*0.181*	*66.2*	*19.08*	*33.3*	*0.0*	*33.3*	*0.251*	*0.05*	*0.063*	*PVC*	*42.5*	*0.86*	*0.68*	*0.78*	OK
3	CB20	MH6	*250*	*12.1*	*1.00%*	*0.048*	*0.75*	*0.036*	*0.036*	*66.4*	*19.00*	*6.6*	*0.0*	*6.6*	*0.251*	*0.05*	*0.063*	*PVC*	*60.1*	*1.21*	*0.17*	*0.11*	*OK*
8	CB5	MH6	*250*	*11.7*	*1.00%*	*0.044*	*0.75*	*0.033*	*0.033*	*66.4*	*19.00*	*6.1*	*0.0*	*6.1*	*0.251*	*0.05*	*0.063*	*PVC*	*60.1*	*1.21*	*0.16*	*0.10*	*OK*
7	MH6	MH7	*250*	*29.8*	*0.50%*	*0.059*	*0.75*	*0.044*	*0.113*	*66.0*	*19.17*	*20.7*	*0.0*	*20.7*	*0.251*	*0.05*	*0.063*	*PVC*	*42.5*	*0.86*	*0.58*	*0.49*	*OK*
6	MH7	MH8	*375*	*51.9*	*0.50%*	*0.146*	*0.75*	*0.110*	*0.650*	*62.7*	*20.87*	*113.1*	*0.0*	*113.1*	*0.381*	*0.11*	*0.095*	*PVC*	*129.3*	*1.13*	*0.76*	*0.87*	*OK*
-	MH8	MH9	*375*	*7.2*	*0.50%*	*0.000*	*0.00*	*0.000*	*0.650*	*61.3*	*21.63*	*110.7*	*0.0*	*110.7*	*0.381*	*0.11*	*0.095*	*PVC*	*129.3*	*1.13*	*0.11*	*0.86*	*OK*
5	MH2	MH3	*300*	*47.1*	*0.50%*	*0.288*	*0.75*	*0.216*	*0.216*	*66.4*	*19.00*	*39.9*	*0.0*	*39.9*	*0.298*	*0.07*	*0.075*	*PVC*	*67.2*	*0.96*	*0.82*	*0.59*	*OK*
14	MH3	MH5	*300*	*5.9*	*0.50%*	*0.078*	*0.75*	*0.059*	*0.275*	*64.7*	*19.82*	*49.4*	*0.0*	*49.4*	*0.298*	*0.07*	*0.075*	*PVC*	*67.2*	*0.96*	*0.10*	*0.74*	*OK*
EXT 4			-	-	-	*0.022*	*0.30*	*0.007*	*0.007*	*66.4*	*19.00*	*1.2*	*0.0*	*1.2*	-	-	-	-	-	-	-	-	-
13	MH4	MH5	*250*	*13.7*	*0.50%*	*0.080*	*0.75*	*0.060*	*0.067*	*66.4*	*19.00*	*12.3*	*0.0*	*12.3*	*0.251*	*0.05*	*0.063*	*PVC*	*42.5*	*0.86*	*0.27*	*0.29*	*OK*
EXT 3			-	-	-	*0.048*	*0.30*	*0.014*	*0.014*	*66.4*	*19.00*	*2.7*	*0.0*	*2.7*	-	-	-	-	-	-	-	-	-
12	MH5	MH9	*450*	*70.1*	*0.75%*	*0.344*	*0.75*	*0.258*	*0.614*	*64.5*	*19.92*	*109.9*	*0.0*	*109.9*	*0.448*	*0.16*	*0.112*	*PVC*	*244.0*	*1.55*	*0.75*	*0.45*	*OK*
11	MH9	MH10	*450*	*30.7*	*1.25%*	*0.133*	*0.75*	*0.100*	*1.364*	*61.1*	*21.74*	*231.5*	*0.0*	*231.5*	*0.448*	*0.16*	*0.112*	*PVC*	*315.0*	*2.00*	*0.26*	*0.73*	*OK*
10	CB22	MH10	*250*	*12.0*	*1.00%*	*0.009*	*0.75*	*0.006*	*0.006*	*66.4*	*19.00*	*1.2*	*0.0*	*1.2*	*0.251*	*0.05*	*0.063*	*PVC*	*60.1*	*1.21*	*0.16*	*0.02*	*OK*
-	MH10	MH11	*450*	*4.8*	*1.00%*	*0.000*	*0.00*	*0.000*	*1.370*	*60.7*	*21.99*	*230.9*	*0.0*	*230.9*	*0.448*	*0.16*	*0.112*	*PVC*	*281.7*	*1.79*	*0.04*	*0.82*	*OK*
9	CB21	MH11	*250*	*7.0*	*1.00%*	*0.013*	*0.75*	*0.010*	*0.010*	*66.4*	*19.00*	*1.8*	*0.0*	*1.8*	*0.251*	*0.05*	*0.063*	*PVC*	*60.1*	*1.21*	*0.10*	*0.03*	*OK*
-	MH11	EX MH	*450*	*3.1*	*1.00%*	*0.000*	*0.00*	*0.000*	*1.380*	*60.6*	*22.04*	*232.3*	*0.0*	*232.3*	*0.448*	*0.16*	*0.112*	*PVC*	*281.7*	*1.79*	*0.03*	*0.82*	*OK*





KEY PLAN

LEGEND

- PROPERTY LINE
- PROPOSED STORM SEWER AND MH / OGS
- PROPOSED SINGLE CATCHBASIN
- DRAINAGE BOUNDARY
- AREA ID / DRAINAGE AREA (HECTARES) / RUN-OFF COEFFICIENT (6 / A= 100 / C=0.3)
- EXISTING STORM SEWER

TOPOGRAPHY & LEGAL

PROVIDED BY: THE LOROCQUE GROUP
12 LYMAN STREET
ST. CATHERINES, ON, L2R 5M7
PHONE:(905) 688-1413

BEARING

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED POINTS BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONIDTUDE, ZONE 17, UNIVERAL TRANSVERSE MERCATOR (6° UTM). THERE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERNCE SYSTEM.

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR ZBA/DPOC/SPA #1	NOV 27 2025	G.D.	
1.	ISSUED FOR COORDINATION	NOV 21 2025	G.D.	

counterpoint ENGINEERING
A SUBSIDIARY OF DILLON CONSULTING LIMITED
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER J. S. YOGANATHAN 100100545 NOV 27/25 PROVINCE OF ONTARIO
ENGINEER'S STAMP

APPLICANT:
2445680 ONTARIO LIMITED
23 WINGATE CRESCENT,
RICHMOND HILL, ON, L4B 3J3
PHONE:
FAX:
CONTACT:

SITE LOCATION:
16 FERNWOOD
16 FERNWOOD DRIVE,
SIMCOE, ON, N3Y 0E5

SITE PLAN FILE No.:

SITE STORM DRAINAGE PLAN

DESIGNED BY: J.Y	CHECKED BY: J.H	DATE: NOV 2025
DRAWING BY: J.Y.S	CHECKED BY: G.D	PROJECT NO. 251467
SWM BY: J.Y	CHECKED BY: J.H	
SCALE: 1: 300m (0m 6m 12m 18m)		DRAWING NO. SW-STM

REGION FILE No.:

GENERAL NOTES

1. ATLEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION FOR SERVICES ON ANY EXISTING ROAD ALLOWANCE AND EXISTING SERVICE WITHIN AN EXISTING EASEMENT MAINTAINED BY NORFOLK COUNTY, THE CONTRACTOR IS REQUIRED TO HAVE A PERMIT OF APPROVED WORK FORM NORFOLK COUNTY.

2. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY MEASURES TO CONTROL SILT ENTERING THE STORM DRAINAGE SYSTEM TO THE SPECIFICATIONS OUTLINED IN THE GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES PREPARED BY THE MINISTRY OF NATURAL RESOURCES. THESE MEASURES ARE TO BE INSTALLED PRIOR TO COMMENCING ANY CONSTRUCTION AND ARE TO REMAIN IN PLACE UNTIL CONSTRUCTION HAS BEEN COMPLETED TO THE SPECIFICATIONS OF NORFOLK COUNTY. THE CONTRACTOR IS TO REMOVE ALL TEMPORARY MEASURES AFTER WORKS ARE ESTABLISHED

3. ALL WORK SHALL MEET THE MINIMUM STANDARDS AND SPECIFICATIONS OF NORFOLK COUNTY OR ONTARIO PROVINCIAL STANDARDS

4. NO FOUNDATION DRAIN CONNECTIONS WILL BE PERMITTED. SUMP PUMPS SHALL BE DISCHARGED TO THE OUTSIDE GROUND SURFACE DRAINING AWAY FROM THE BUILDING. THIS IS REQUIRED TO CONFORM WITH OBC, DIV. B.9.1.4

5. THE STRUCTURAL DESIGN OF SEWERS IS BASED ON THE TRANSITION WIDTH UNLESS OTHERWISE NOTED.

6. WATER SERVICE CONNECTIONS FOLLOWING CONSTRUCTION OF CURB, GUTTER, CONCRETE SIDEWALK, AND/OR ASPHALT WEARING SURFACE SHALL NOT BE MADE USING "OPEN CUT METHODS". THEY MUST BE MADE USING DRILLING OR BORING TECHNIQUES TO ELIMINATE THE POSSIBILITY OF SETTLEMENT. THIS POLICY APPLIES UNLESS NORFOLK COUNTY DEEMS THE USE OF DRILLING AND BORING METHODS UNREASONABLE OR UNECONOMICAL DUE TO GROUND CONDITIONS.

7. THE CONTRACTOR IS REQUIRED TO NOTIFY NORFOLK COUNTY IN WRITING AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION. PERMITS ARE REQUIRED PRIOR TO COMMENCEMENT OF WORK, AND 48 HOURS IS REQUIRED PRIOR TO INSPECTION REQUESTS

8. THE SUBDIVIDER/DEVELOPER MUST MEET ALL REQUIREMENTS OF THE OWNERS OF THE UTILITIES ON THIS PLAN AND MAKE SATISFACTORY ARRANGEMENTS WITH UTILITY COMPANIES FOR CROSSING THEIR INSTALLATIONS AND FOR PROVIDING ADEQUATE PROTECTION DURING CONSTRUCTION.

9. IF COMMON TRENCH CONSTRUCTION IS USED FOR STORM AND SANITARY SEWERS, THE POC'S (POINT OF CONNECTION) ARE TO BE CONSTRUCTED AT LEAST 2 METERS BEHIND THE CURB LINE AT THE SAME TIME AS THE SEWERS

10. ALL ORGANIC, UNSTABLE, OR UNSUITABLE MATERIALS BENEATH THE ROAD ALLOWANCES OR HOUSE FOUNDATIONS MUST BE REMOVED AND BACKFILLED WITH AN APPROVED FILL MATERIAL, ALL TO THE SATISFACTION OF A GEOTECHNICAL ENGINEER.

11. TRAFFIC CONTROL: A "ROAD CLOSED" SIGN SHALL BE PLACED AT THE END OF THE FERNWOOD DRIVE CUL-DE-SAC. THE CONTRACTOR SHALL INSTALL APPROPRIATE MEASURES TO ENSURE THE PUBLIC DOES NOT ACCESS THE CONSTRUCTION SITE.

12. 150MM PERFORATED PVC SUB-DRAINS ARE TO BE INSTALLED IN SIDE YARD SWALES WHERE THE GRADE IS LESS THAN 2% SEE DETAIL ON SHEET 10 FOR DETAILS.

13. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT FOR ANY WORK DONE ON NORFOLK COUNTY PROPERTY.

14. ALL WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH THE APPLICABLE HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS. PRIOR TO STARTING ANY WORKS, THE CONTRACTOR MUST ENSURE THAT ALL NECESSARY APPROVALS ARE IN PLACE FROM THE NORFOLK COUTRY AND OTHER EXTERNAL AGENCIES AS REQUIRED.

15. ALL WORK, MATERIALS AND CONSTRUCTION METHODS TO CONFORM WITH THE LATEST STANDARDS, SPECIFICATIONS, POLICIES, REGULATIONS, GUIDELINES AND LAWS FOR THE NORFOLK COUNTY, THE ONTARIO BUILDING CODE (OBC), MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP), ONTARIO PROVINCIAL STANDARD DRAWINGS AND SPECIFICATIONS (OPSD AND OPSS). THE ENVIRONMENTAL PROTECTION ACT AND THE WATER RESOURCES ACT. THE MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.

16. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH ALL OTHER CONTRACTORS AND PREVENT CONSTRUCTION CONFLICTS.

17. THE INFORMATION SHOWN FOR EXISTING UTILITIES WAS PROVIDED BY OTHERS. THE INFORMATION IS SHOWN FOR GENERAL INFORMATION ONLY AND THE ACCURACY OR COMPLETENESS OF THE PROVIDED INFORMATION HAS NOT BEEN CONFIRMED BY COUNTERPOINT ENGINEERING INC. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION. ALL EXISTING UTILITIES MUST BE LOCATED AND VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK. ANY VARIANCE IS TO BE IMMEDIATELY REPORTED TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY THE ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTOR'S EXPENSE.

18. THIS PLAN SHOULD BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS PLANS. ANY DISCREPANCIES SHALL BE CLARIFIED PRIOR TO CONSTRUCTION. INFORMATION RELATED TO DIMENSIONS FOR PRIVATE ROADS, PARKING, CURBING, BUILDING LOCATION AND SETBACKS SHALL BE TAKEN FROM THE SITE PLAN PREPARED BY THE SITE ARCHITECT.

19. INSPECTIONS: ALL WORK IN THE MUNICIPAL RIGHT OF WAY AND EASEMENTS IS TO BE INSPECTED BY THE COUNTY PRIOR TO BACKFILLING. ALL WORK RELATING TO WATERMAINS AND SEWERS TO BE INSPECTED BY THE MUNICIPALITY AS PER THE SITE PLAN AGREEMENT.

20. ALL RESTORATIONS AND RELOCATION SHALL BE COMPLETED TO THE SATISFACTION OF THE DIRECTOR OF ENGINEERING. ALL AREAS WITHIN PUBLIC RIGHT OF WAYS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. GRASSED AREAS SHALL BE PROVIDED WITH 200mm OF TOPSOIL AND SODDED TO THE SATISFACTION OF THE TOWN OF CARLETON PLACE.

21. A MINIMUM HORIZONTAL CLEARANCE OF 1.0M SHALL BE MAINTAINED BETWEEN ALL ABOVE GROUND SERVICES AND UTILITIES.

22. ALL DIMENSIONS, ELEVATIONS AND OTHER INFORMATION SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES FOUND MUST BE REPORTED IMMEDIATELY TO THE ENGINEER PRIOR TO CONSTRUCTION.

23. ALL TRENCHING SHALL BE IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT. TRENCH SIDES SHALL BE FLATTENED IN ACCORDANCE WITH DIRECTIONS FROM THE GEOTECHNICAL ENGINEER. CONSTRUCTION OF SHORING, BRACING AND PROTECTION SCHEMES SHALL CONFORM TO OPSS 538 & 539.

24. ALL ENGINEERED FILL AND BACKFILLING OPERATIONS TO BE INSPECTED BY THE PROJECT GEOTECHNICAL ENGINEER.

    FOR DETAILED SPECIFICATIONS REGARDING:

    - SITE STRIPPING
    - SITE GRADING
    - FILL PLACEMENT
    - ENGINEERED FILL

    PAVEMENT STRUCTURE RECOMMENDATIONS TO BE PROVIDED BY GEOTECHNICAL ENGINEER

    REFERENCE IS TO BE MADE TO THE GEOTECHNICAL REPORT(S) AND SPECIFICATIONS PREPARED FOR THIS PROJECT.

25. ALL TRAFFIC CONTROL AND SIGNAGE SHALL BE IN ACCORDANCE WITH MTO'S "ONTARIO TRAFFIC MANUAL".

26. UPON COMPLETION OF SITE SERVICING AND GRADING WORKS, THE CONTRACTOR IS TO SUBMIT AN AS-CONSTRUCTED SURVEY, IN AUTOCAD AND HARDCOPY FORMATS, PREPARED BY AN ONTARIO LAND SURVEYOR, INDICATING ALL ABOVE GROUND AND BELOW GROUND AS BUILT INFORMATION, INCLUDING PIPE SIZES, SLOPES, INVERTS AT MANHOLES AND CATCHBASINS, MH AND CB TOPS, ALL SURFACE FEATURES AND SURFACE TYPES, TOP AND BOTTOM OF CURB ELEVATIONS, CURB DEPRESSIONS, SWALES, AND WITH ELEVATION POINTS CLARIFYING DRAINAGE DIRECTIONS FOR THE ENTIRE SITE. THE SURVEY IS TO EXTEND TO THE MUNICIPAL CURB AT ALL ROAD FRONTAGES.

27. BOULEVARDS TO BE GRADED, TOP SOILED WITH 200mm DEPTH AND SODDED BY OWNER/CONTRACTOR TO THE TOWN'S SATISFACTION.

28. ALL EXISTING PAVEMENT, CURBS, SIDEWALKS, DRIVEWAYS AND BOULEVARD AREAS DISTURBED BY THE CONSTRUCTION MUST BE REINSTATED TO THE SATISFACTION OF THE TOWN.

29. THE CONTRACTOR/OWNER IS RESPONSIBLE FOR ALL UTILITY LOCATES AND ANY DAMAGE OR DISTURBANCE DURING CONSTRUCTION.

30. ALL BARRIER FREE ENTRANCES AND BARRIER FREE PATHS OF TRAVEL MUST COMPLY WITH O.B.C. 3.8.

31. THE OWNER/CONTRACTOR SHALL SUPPLY ALL FIRE ROUTE AND HANDICAP SIGNS AS SET OUT IN THE MUNICIPALITY'S BY-LAWS AND DESIGN CRITERIA.

32. ALL EXTERIOR ILLUMINATION TO BE DIRECTED DOWNWARD AS WELL AS INWARD AND DESIGNED TO MAINTAIN ZERO CUTOFF LIGHT DISTRIBUTION AT THE PROPERTY LINE.

SEWERS

SANITARY AND STORM SEWERS

1. CONSTRUCTION OF SANITARY & STORM SEWERS & PRIVATE DRAINS SHALL BE IN ACCORDANCE WITH MUNICIPALITY STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS (MECP) GUIDELINES (LATEST EDITION) & ONTARIO BUILDING CODE (LATEST EDITION).

2. COVER AND BEDDING MATERIAL FOR CONCRETE PIPE SHALL BE GRANULAR 'A' MATERIAL AS PER OPSD 802.030 OR 802.033, CLASS 'B' BEDDING.

3. COVER AND BEDDING MATERIAL FOR PVC PIPE SHALL BE GRANULAR 'A' MATERIAL AS PER OPSD 802.010 OR 802.013.

4. PVC PIPE WILL REQUIRE SPECIAL CONSTRUCTION PROCEDURES AS PER MUNICIPALITY SPECIFICATIONS.

5. ALL SEWERS TO BE FLUSHED PRIOR TO VIDEO INSPECTION.

6. MANHOLE FRAMES AND COVERS SHALL BE AS PER OPSD 401.010 (STORM-OPEN, SANITARY-CLOSED).

7. SANITARY SEWER (200mm TO 250mm DIA) SHALL BE PVC PIPE, CSA B182.2. SDR-35.

8. STORM SEWER (250mm TO 375mm DIA.) SHALL BE PVC PIPE SDR26. EXCEPT FOR TEMPORARY CORRUGATED STEEL CULVERTS AND SEWERS TO DRAIN LOW AREAS AS SHOWN OF THE SERVICING PLAN SW-S.

9. STORM SEWER > 375mm DIA. SHALL BE CONCRETE PIPE, CSA A257.2 CLASS 140-D

10. PVC (SANITARY AND STORM) SEWERS ARE TO BE TESTED FOR DEFLECTION (MANDREL PASSAGE) AFTER INSTALLATION. SANITARY SEWERS SHALL ALSO BE TESTED FOR LEAKAGE (LOW AIR PRESSURE). PRIOR TO ASSUMPTION BY THE COUNTY, PIPE DEFLECTION TESTING SHALL BE REPEATED.

11. ALTERNATE MATERIALS MAY BE ACCEPTABLE PROVIDED APPROVAL HAS FIRST BEEN OBTAINED FROM THE COUNTY/ENGINEER.

12. THE REUSE OF EXISTING SEWERS ON PRIVATE PROPERTY IS AT THE OWNER'S SOLE RISK AND RESPONSIBILITY. SEWER LATERALS WITHIN THE MUNICIPAL ROAD ALLOWANCE OR WITHIN MUNICIPAL EASEMENTS MAY BE REUSED IF IN GOOD WORKING CONDITION, MEET BY-LAW REQUIREMENTS AND ARE OF ADEQUATE CAPACITY TO MEET THE REQUIREMENTS OF THE SITE. THE OWNER OR THEIR CONTRACTOR IS RESPONSIBLE FOR HAVING THE LATERAL TO BE REUSED VIDEO INSPECTED WHILE THE TOWN OF CARLETON PLACE SEWER INSPECTOR IS PRESENT. CONTACT PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT, GROWTH MANAGEMENT DIVISION, DEVELOPMENT ENGINEERING CONSTRUCTION SECTION AT (905)546-2424 X7860 TO ARRANGE FOR AN INSPECTION.

13. SHOULD AN EXISTING SEWER DRAIN ON PRIVATE PROPERTY, INTENDED TO BE REUSED, EITHER FAIL DURING CONSTRUCTION OR AFTER COMPLETION OF THE PROPOSED WORKS, THE COUNTY WILL NOT BE RESPONSIBLE, AND THE OWNER IS REQUIRED TO OBTAIN ADDITIONAL PERMITS ETC. TO UNDERTAKE REPLACEMENT OF THE FAILED SECTIONS.

14. ALL EXISTING UNUSED SEWER DRAINS SERVICING A PROPERTY BEING REDEVELOPED, IN WHOLE OR IN PART, MUST BE EITHER REMOVED FROM MUNICIPAL PROPERTY (I.E. ROAD ALLOWANCE ETC., WITH AN APPROPRIATE REPAIR TO THE MUNICIPAL SEWER MAIN TO WHICH THEY CONNECT), AND REMOVED FROM PRIVATE PROPERTY, OR, ALTERNATIVELY, UNUSED SEWER DRAINS MAY BE ABANDONED IN ACCORDANCE WITH MUNICIAPLITY MINIMUM REQUIREMENTS I.E. TRENCHLESS ABANDONMENT BY FILLING THE LATERAL WITH GROUT WITHIN THE ENTIRE ROW.

15. ALL STORM AND SANITARY MANHOLES (MH) SHALL BE PRECAST AND CONSTRUCTED IN ACCORDANCE WITH CURRENT ONTARIO PROVINCIAL STANDARDS.

16. CATCHBASINS ARE TO BE INSTALLED AS PER OPSD 705.010 AND APPLICABLE AMENDMENTS TO THE OPSD BY THE THE TOWN OF CARLETON PLACE INCLUDING GOSS TRAPS.

17. WHERE INDICATED IN THE SERVICING PLAN SW-S THE PROPOSED STORM PIPES SHALL BE INSULATED AS PER DETAIL IN DRAWING SW-D2.

WATERMAINS AND WATER SERVICES

WATERMAINS

1. CONSTRUCTION OF WATERMAINS & PRIVATE SERVICES SHALL BE IN ACCORDANCE WITH NORFOLK COUNTY STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT (MOECP) GUIDELINES (LATEST EDITION).

2. WATERMAINS TO BE INSTALLED TO A MINIMUM DEPTH OF 2.10m BELOW PROPOSED CENTERLINE ROAD GRADE ON ALL ROADS OR BELOW GROUND ELSEWHERE.

3. PVC PIPE IN SIZES 100mm THROUGH 300mm SHALL BE CLASS 150 DR18 CONFORMING TO AWWA C900. FOR 400mm, SEE SECTION 7: SPECIAL NOTES.

4. TRACER WIRE SHALL BE INSTALLED WITH PVC PIPE IN ACCORDANCE WITH FORM 400. IT SHALL BE 12 GAUGE TW75, TWU75 OR RW90XLPE COATED COPPER AND SHALL BE POSITIONED ALONG THE TOP OF THE PIPE AND FASTENED AT 6 METER INTERVALS. THE WIRE IS TO BE INSTALLED BETWEEN EACH VALVE AND/OR THE END OF THE NEW PVC WATERMAIN. JOINTS IN THE WIRE BETWEEN VALVES ARE NOT PERMITTED. AT EACH GATE VALVE A LOOP WIRE IS TO BE BROUGHT UP INSIDE THE VALVE BOX TO THE CAP. THE TRACER WIRE SHALL BE BROUGHT TO THE SURFACE AT THE SECONDARY VALVE ON ALL FIRE HYDRANTS. THE TRACER WIRE SHALL ALSO BE CONNECTED TO THE CATHODIC PROTECTION SYSTEM AS REQUIRED.

5. MOLDED PVC FITTINGS FOR PIPE SIZES 100mm TO 300mm SHALL CONFORM TO AWWA C900 AND CERTIFIED TO CSA B137.2.

6. FABRICATED FITTINGS 250mm AND 300mm SHALL BE MANUFACTURED FROM SEGMENTS OF AWWA C900, CLASS 150 (DR18) PVC PIPE, BONDED TOGETHER AND OVER-WRAPPED WITH FIBERGLASS-REINFORCED POLYESTER TO MEET THE REQUIREMENTS OF CSA B137.3.

7. WHERE METAL FITTINGS ARE TO BE USED ON PVC MAINS SUFFICIENT CATHODIC PROTECTION MUST BE PROVIDED AS PER THE FOLLOWING REQUIREMENTS:
   I. MINIMUM OF ONE 11KG ZINC ANODE SHALL BE INSTALLED FOR EVERY 1000M OF TRACER WIRE;
   II. ONE 11KG ZINC ANODE SHALL BE INSTALLED FOR EACH COPPER WATER SERVICE CONNECTION;
   III. ONE 11KG ZINC ANODE SHALL BE INSTALLED ON EVERY VALVE, HYDRANT, BEND, TEE, SLEEVE, REDUCER, PLUG, CAP, JOINT RESTRAINT, COUPLING, ETC., CONNECTED TO THE PVC PIPE.

8. BEDDING AND BACKFILL AS PER WM-200.01 AND WM-200.02 GRANULAR 'A' MATERIAL FOR MAINS AND SERVICES GREATER THAN 50mm.
   WATERMAIN DEFLECTION FOR PVC PIPE:
   MAXIMUM ALLOWABLE DEFLECTION OF 1.5 DEGREES PER JOINT UP TO 250mm DIAMETER (160mm PER 6.1M PIPE LENGTH) AND 1.2 DEGREES FOR 300mm DIAMETER (128mm PER 6.1M PIPE LENGTH) SHALL NOT BE EXCEEDED.ALL JOINTS SHALL BE DEFLECTED AN EQUAL AMOUNT.

9. ALL BACKFLOW PREVENTION DEVICES MUST BE SELECTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MUNICIPALITY, INCLUDING THE MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION ETC., AND GUIDELINES SET OUT IN THE MOST RECENT VERSIONS OF THE AWWA CANADIAN CROSS CONNECTION CONTROL MANUAL AND THE CSA. B64.10 / 07 / B64. 10.1-07 STANDARDS. IN SELECTING A BACKFLOW DEVICE FOR A PROPERTY, CONSIDERATION MUST BE GIVEN TO FUTURE POSSIBLE USES OF THE SITE WHICH COULD RESULT IN A HIGHER RISK TO THE MUNICIPAL DRINKING WATER SYSTEM, THUS MAKING THE DEVICE INITIALLY CHOSEN INADEQUATE FOR THE NEW PURPOSE AND REQUIRING FUTURE CHANGE OUT AT THE OWNER'S EXPENSE.

10. IT WILL BE THE RESPONSIBILITY OF THE DEVELOPER'S CONTRACTOR TO PERFORM ANY WATERMAIN CONNECTION(S) REQUIRED. THIS SHALL BE COMPLETED IN THE PRESENCE OF A DESIGNATED MUNICIPAL WATER OPERATOR AND THE SELECTED CONTRACTOR SHALL PROVE TO THE SATISFACTION OF THE TOWN THAT THEY ARE COMPETENT TO PERFORM THE WORKS PRIOR TO INITIATING CONSTRUCTION.

11. ALL WATERMAIN VALVES ARE TO BE COUNTERCLOCKWISE TO OPEN TO PROVIDE CONSISTENCY AMONG MUNICIPAL VALVES FOR FUTURE OPERATION BY PUBLIC WORKS.

12. HYDRANT SPECIFICATION TO BE CANADA VALVE -CENTURY HYDRANT OR CLOW BRIGADIER HYDRANT COMPLETE TO BE RED (PRIVATE) WITH A THREADED CONNECTION, STORZ CONNECTIONS WILL NOT BE PERMITTED.

SITE GRADING NOTES

1. INSPECTION OF SUBGRADE REQUIRED BY GEOTECHNICAL CONSULTANT PRIOR TO PLACEMENT OF GRANULAR MATERIALS. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF INSPECTIONS WITH GEOTECHNICAL CONSULTANT.
2. ALL DISTURBED GRASSED AREAS OUTSIDE OF PROPERTY LIMITS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER, WITH SOD ON MINIMUM 100mm TOPSOIL. ALL TREE AND SHRUB RELOCATION SUBJECT TO APPROVAL BY THE LANDSCAPE ARCHITECT.
3. COMPACTION OF ALL MATERIALS AS PER GEOTECHNICAL RECOMMENDATIONS.
4. BARRIER CURB WITHIN THE SITE TO BE CONSTRUCTED AS PER OPSD 600.110. HEIGHT OF EXPOSED CURB FACE TO ALL BE 0.15m UNLESS OTHERWISE SHOWN IN SITE GRADING PLAN. ALL BARRIER CURBS, FLUSH BARRIER CURB, AND SIDEWALKS AS SHOWN ON THIS DRAWING ARE TO BE PRICED IN THE SITEWORKS PORTION OF THE CONTRACT. CONCRETE PADS, SIDEWALKS, CONCRETE APRONS ABUTTING THE BUILDING ARE TO BE PRICED IN THE BUILDING PORTION OF THE CONTRACT.
5. REFER TO ARCHITECTURAL SITE PLAN FOR ALL DIMENSIONS AND SITE DETAILS INCLUDING RAMPS, WALKWAYS, SIDEWALKS, CURBS, CONCRETE PADS AND ISLANDS.
6. EMBANKMENTS TO BE SLOPED AT MAX. 3:1, UNLESS OTHERWISE SPECIFIED.
7. METHOD OF TERMINATION FOR CONCRETE CURB AND GUTTER AS PER OPSD 608.010.
8. ENGINEERED FILL USED UNDERNEATH THE PROPOSED BUILDING FLOOR SLAB, USED TO BACKFILL AREAS OF SUB-EXCAVATIONS, OR TO RAISE THE EXISTING GRADE TO THE DESIGNED FINISHED SUBGRADE ELEVATION, SHALL BE GEOTECHNICAL ENGINEER AS PER RECOMMENDATIONS.
9. ALL IMPORT FILL MATERIAL MUST BE APPROVED BY THE GEOTECHNICAL AND ENVIRONMENTAL PRIOR TO PLACEMENT ON THE SITE.
10. PERFORATED SUBDRAINS ARE TO BE CONNECTED TO INTERNAL CATCHBASINS AND AS PER DETAIL ON DRAWING SW-D2. CONTRACTOR IS TO ENSURE POSITIVE DRAINAGE INTO SUBDRAINS.
11. PERFORATED SUBDRAINS SHALL BE PLACED AT THE SUBGRADE INTERFACE BETWEEN HEAVY DUTY ASPHALT AND LIGHT DUTY ASPHALT 300mm BELOW THE BOTTOM OF THE UNDERSIDE OF PARKING LOT SUB-BASE AND CONNECTED TO THE CATCHBASINS/MANHOLES TO PROVIDE POSITIVE DRAINAGE. SUBDRAIN PIPE TO BE 100mm PERFORATED, CORRUGATED, POLYETHYLENE ENCASED IN FILTER FABRIC "SOCK" AS PER OPSS 405 AND 1860. BACKFILL WITH 19mm WELL GRADED FREE DRAINING GRANULAR MATERIAL.
12. REFER TO LANDSCAPE DRAWINGS FOR LOCATION AND TYPE OF ALL HARD LANDSCAPE SURFACE INCLUDING CONCRETE SIDEWALKS, CONCRETE ISLANDS, PAVING STONES, COLORED CONCRETE ETC. IN THE EVENT OF A DISCREPANCY, THE CONTRACTOR SHALL INFORM THE ENGINEER.
13. RECYCLED, RECLAIMED OR PROCESSED GRANULAR MATERIAL IS CONSIDERED AN ALTERNATIVE AND SHALL NOT BE USED WITHOUT PRIOR APPROVAL BY GEOTECHNICAL ENGINEER.
14. FOR TREE REMOVAL/PRESERVATION REFER TO LANDSCAPE DRAWINGS.

PAVING NOTES

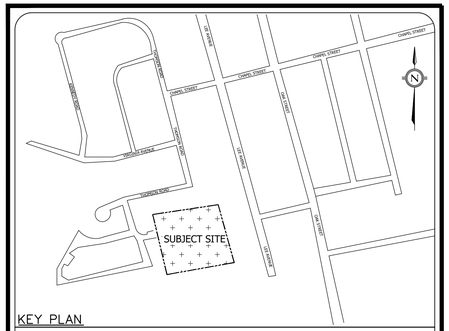
1. ALL GRANULAR BASE MATERIALS SHALL BE COMPACTED AS PER GEOTECHNICAL INVESTIGATION REPORT PREPARED BY PNCHIN, DATED AUGUST 30, 2018
2. INSPECTION OF SUB-GRADE REQUIRED BY GEOTECHNICAL CONSULTANT PRIOR TO PLACEMENT OF PAVEMENT STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF INSPECTIONS WITH GEOTECHNICAL CONSULTANT.
3. LIGHT DUTY PAVEMENT TO BE CONSTRUCTED AS FOLLOWS:
   35mm HL3 ASPHALTIC CONCRETE
   55mm HL8 ASPHALTIC CONCRETE
   150mm OPSS GRANULAR 'A' BASE
   450mm OPSS GRANULAR 'B' SUB-BASE.
4. HEAVY DUTY PAVEMENT TO BE CONSTRUCTED AS FOLLOWS:
   35mm HL3 ASPHALTIC CONCRETE
   85mm HL8 ASPHALTIC CONCRETE
   150mm OPSS GRANULAR 'A' BASE
   600mm OPSS GRANULAR 'B' TYPE I OR II SUB-BASE.
5. ALL PAVEMENT MARKING, LINE PAINTING, DIRECTIONAL LINES/ARROWS ETC. SHALL BE PLACED IN ACCORDANCE WITH THE ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT BASED PAINT IN ACCORDANCE WITH OPSS 1712.

EROSION AND SEDIMENT CONTROL MEASURE NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION AND MAINTENANCE OF ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REMOVAL UPON COMPLETION OF THE PROJECT AFTER SITE HAS BEEN STABILIZED. PROTECT ALL EXPOSED SURFACES AND CONTROL ALL DUST AND RUNOFF DURING CONSTRUCTION.
2. THE LOCATION OF ALL EROSION AND SEDIMENT CONTROL MEASURES ARE SHOWN IN THE ESC PLAN SCHEMATICALLY.
3. SEDIMENT TRAPS ON CATCHBASIN STRUCTURES, SILT FENCES, AND FILTER ROLL DAMS ARE TO BE INSTALLED PRIOR TO COMMENCEMENT OF WORKS AND TO BE MAINTAINED UNTIL ALL CONSTRUCTION IS COMPLETE AND SITE IS STABILIZED. LAYFIELD CATCHBASIN SEDIMENT TRAPS ARE TO BE PROVIDED ON EXISTING CATCHBASIN AND NEW CATCHBASINS DURING CONSTRUCTION AS SHOWN LOCATIONS.
4. SURFACE ROUGHENING OF SLOPES OVER 10% SHALL BE COMPLETED USING TRACKING EQUIPMENT.
5. ALL COLLECTED SEDIMENT TO BE DISPOSED OF AT AN APPROVED LOCATION.
6. ADDITIONAL EROSION AND SEDIMENT CONTROL MATERIALS (i.e. SILT FENCE, STRAW BALES, CLEAR STONE, FILLTER ROLLS, ETC.) ARE TO BE KEPT ON SITE FOR EMERGENCIES AND REPAIRS.
7. ALL CONTROL MEASURES SHALL BE INSPECTED WEEKLY (MINIMUM) AND AFTER EVERY RAINFALL, AND SHALL BE CLEANED AND MAINTAINED AS APPLICABLE UNTIL GROUND COVER HAS BEEN ESTABLISHED AND BUILDING ACTIVITY COMPLETED, ALL TO THE SATISFACTION OF THE TOWN'S ENGINEER.
8. ALL TOPSOIL STOCKPILES INTENDED TO REMAIN IN PLACE FOR MORE THAN 30 DAYS ARE REQUIRED TO BE SEEDED TO PREVENT WIND EROSION.
9. THE CONTRACTOR SHALL UNDERTAKE MEASURES TO CONTROL DUST DURING CONSTRUCTION, RELATED SOIL EXCAVATION OR DURING SOIL REMEDIATION /EXCAVATION ACTIVITIES. AREAS OUTSIDE THE CONSTRUCTION AREA TO BE KEPT CLEAN OF MUD AND DEBRIS BEING TRACKED BY VEHICLES. SWEEPING OF ADJACENT PAVEMENT TO BE COMPLETED AS REQUIRED.
10. SINCE THE LOCATION AND TYPE OF EROSION AND SEDIMENT CONTROL MEASURES WILL BE MODIFIED AS THE CONSTRUCTION OF THE SITE PROCEEDS, THIS PLAN IS DYNAMIC AND ADJUSTMENTS TO THE LOCATION AND TYPE OF ESC MEASURES WILL BE REQUIRED TO REDUCE THE AMOUNT OF SEDIMENT LEAVING THE SITE AND ONTO ADJACENT AREAS.
11. AMOUNT OF BARE SOIL EXPOSED AT ONE TIME IS TO BE MINIMIZED. DISTURBED SOILS ARE TO THE STABILIZED AS QUICKLY AS PRACTICAL. ALL STRIPPED AND BARE SOIL TO BE STABILIZED WITHIN 30 DAYS OF INACTIVITY.

COUNTERPOINT ENGINEERING INC. CONFORMANCE REQUIREMENTS

1. THE FOLLOWING ITEMS ARE TO BE PROVIDED TO COUNTERPOINT NO LESS THAN 10 WORKING DAYS PRIOR TO THE REQUEST FOR A LETTER OF GENERAL CONFORMANCE/FINAL CERTIFICATION. THE DOCUMENTS MUST INDICATE THAT THE SITE HAS BEEN CONSTRUCTED IN GENERAL CONFORMANCE WITH THE APPROVED DESIGN;
   - AS-CONSTRUCTED TOPOGRAPHIC/UNDERGROUND SURVEY COMPLETED BY A REGISTERED LAND SURVEYOR AS PER THE SPECIFICATIONS OUTLINED WITHIN THE CONTRACT DOCUMENT;
   - GEOTECHNICAL ENGINEER CERTIFICATION LETTER, WHICH INCLUDES SUB-GRADE COMPACTION RESULTS, BEDDING AND BACKFILL COMPACTION AND MATERIAL ACCEPTANCE, GRANULAR, ASPHALT, SITE CONCRETE MATERIAL ACCEPTANCE AND COMPACTION RESULTS;
   - CCTV INSPECTION OF FLUSHED STORM AND SANITARY PIPES AND STRUCTURES;
2. SHOULD THE SUBMITTED MATERIALS INDICATE NON-CONFORMANCE OR DEFICIENCIES, THEY MUST BE ADDRESSED TO COUNTERPOINT'S SATISFACTION WITH AN UPDATED SUBMITTAL PRIOR TO ISSUANCE OF A LETTER OF GENERAL CONFORMANCE/FINAL CERTIFICATION.
3. COUNTERPOINT MUST ALSO COMPLETE ANY SITE INSPECTIONS AS NEEDED TO CONFIRM SERVICING INFRASTRUCTURE AND GRADING HAS BEEN CONSTRUCTED IN GENERAL CONFORMANCE OF THE APPROVED DRAWINGS.



KEY PLAN

LEGEND

TOPOGRAPHY & LEGAL

PROVIDED BY: THE LOROCQUE GROUP
12 LYMAN STREET
ST. CATHERINES, ON, L2R 5M7
PHONE: (905) 688-1413

BEARING

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED POINTS BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONIDTUDE, ZONE 17, UNIVERAL TRANSVERSE MERCATOR (6° UTM). THERE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERNCE SYSTEM.

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR ZBA/DPOC/SPA #1	NOV 27 2025	G.D.	
1.	ISSUED FOR COORDINATION	NOV 21 2025	G.D.	

counterpoint ENGINEERING
A SUBSIDIARY OF DILLON CONSULTING LIMITED
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER
J. S. YOGANATHAN
100100545
NOV 27 25
PROVINCE OF ONTARIO

ENGINEER'S STAMP

APPLICANT:
2445680 ONTARIO LIMITED
23 WINGATE CRESCENT,
RICHMOND HILL, ON, L4B 3J3
PHONE:
FAX:
CONTACT:

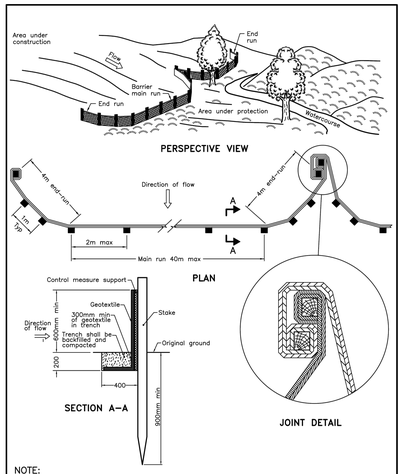
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16 FERNWOOD
16 FERNWOOD DRIVE,
SIMCOE, ON, N3Y 0E5

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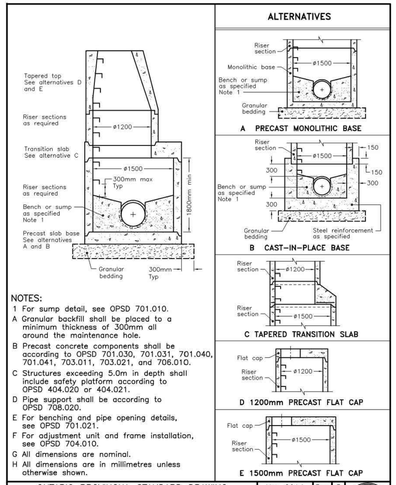
NOTES

DESIGNED BY: J.Y	CHECKED BY: J.H	DATE: NOV 2025
DRAWING BY: J.Y.S	CHECKED BY: G.D	PROJECT NO. 251467
SWM BY: J.Y	CHECKED BY: J.H	
SCALE:		DRAWING NO. SW-N

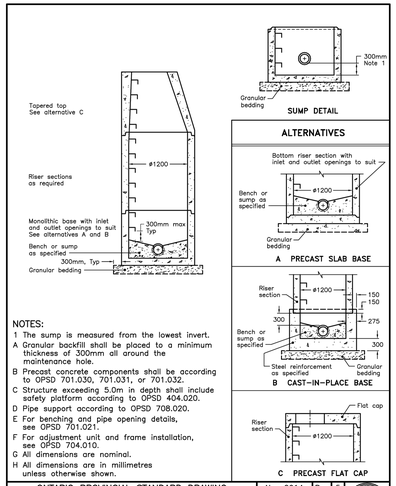
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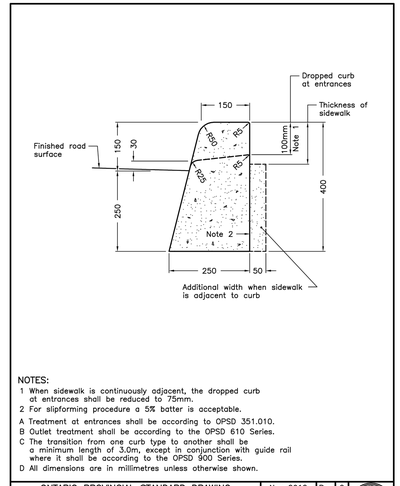
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3
HEAVY-DUTY SILT FENCE BARRIER		OPSD 219.130



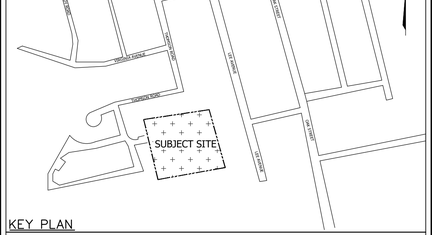
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1500mm DIAMETER		OPSD 701.011

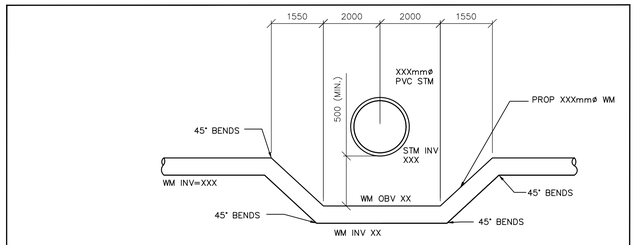


ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 5
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER		OPSD 701.010



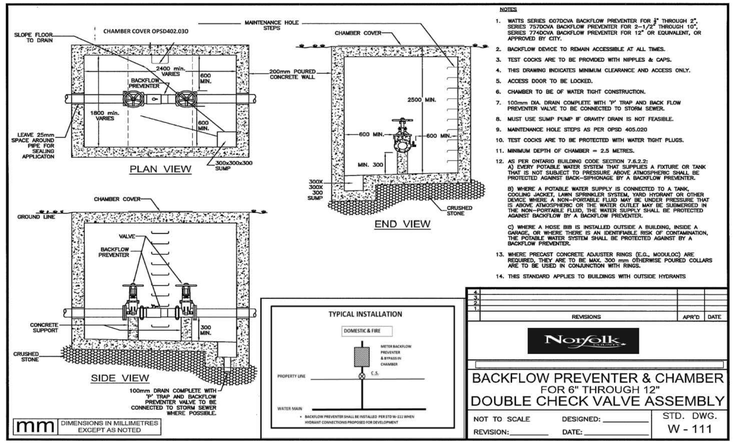
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		OPSD 600.110


CHERRY STREET
CHERRY STREET
CHERRY STREET



NOTES:
1. MINIMUM 0.50m SEPARATION BETWEEN STORM AND WATERMAIN TO BE MAINTAINED AT ALL TIMES.
2. WATERMAIN DEFLECTION TO BE CENTERED TO EXISTING STORM.
3. CONTRACTOR TO VERIFY INVERTS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER
4. GRANULAR BEDDING AS PER GEOTECHNICAL AND MUNICIPAL REQUIREMENTS.
5. INSTALL THRUST BLOCKS AT BENDS AS PER CITY STANDARD.
6. ALL DIMENSIONS ARE IN MILLIMETERS.

WATERMAIN DEFLECTION DETAIL



NOTES:
1. WATTS SERIES 007DCVA BACKFLOW PREVENTER FOR 3/4" THROUGH 2", SERIES 757DCVA BACKFLOW PREVENTER FOR 2-1/2" THROUGH 10", SERIES 774DCVA BACKFLOW PREVENTER FOR 12" OR EQUIVALENT, OR APPROVED BY CITY.
2. BACKFLOW DEVICE TO REMAIN ACCESSIBLE AT ALL TIMES.
3. TEST COCKS ARE TO BE PROVIDED WITH NIPPLES & CAPS.
4. THIS DRAWING INDICATES MINIMUM CLEARANCE AND ACCESS ONLY.
5. ACCESS DOOR TO BE LOCKED.
6. CHAMBER TO BE OF WATER TIGHT CONSTRUCTION.
7. 100mm DIA. DRAIN COMPLETE WITH "P" TRAP AND BACK FLOW PREVENTER VALVE TO BE CONNECTED TO STORM SEWER.
8. MUST USE SUMP PUMP IF GRAVITY DRAIN IS NOT FEASIBLE.
9. MAINTENANCE HOLE STEPS AS PER OPSD 405.020
10. TEST COCKS ARE TO BE PROTECTED WITH WATER TIGHT PLUGS.
11. MINIMUM DEPTH OF CHAMBER = 2.5 METRES.
12. AS PER ONTARIO BUILDING CODE SECTION 7.6.2.2:
    A) EVERY POTABLE WATER SYSTEM THAT SUPPLIES A FIXTURE OR TANK THAT IS NOT SUBJECT TO PRESSURE ABOVE ATMOSPHERIC SHALL BE PROTECTED AGAINST BACK-SIPHONAGE BY A BACKFLOW PREVENTER.
    B) WHERE A POTABLE WATER SUPPLY IS CONNECTED TO A TANK, COOLING JACKET, LAWN SPRINKLER SYSTEM, YARD HYDRANT OR OTHER DEVICE WHERE A NON-POTABLE FLUID MAY BE UNDER PRESSURE THAT IS ABOVE ATMOSPHERIC OR THE WATER OUTLET MAY BE SUBMERGED IN THE NON-POTABLE FLUID, THE WATER SUPPLY SHALL BE PROTECTED AGAINST BACKFLOW BY A BACKFLOW PREVENTER.
    C) WHERE A HOSE BIB IS INSTALLED OUTSIDE A BUILDING, INSIDE A GARAGE, OR WHERE THERE IS AN IDENTIFIABLE RISK OF CONTAMINATION, THE POTABLE WATER SYSTEM SHALL BE PROTECTED AGAINST BY A BACKFLOW PREVENTER.
13. WHERE PRECAST CONCRETE ADJUSTER RINGS (E.G., MODULOC) ARE REQUIRED, THEY ARE TO BE MAX. 300 mm. OTHERWISE POURED COLLARS ARE TO BE USED IN CONJUNCTION WITH RINGS.
14. THIS STANDARD APPLIES TO BUILDINGS WITH OUTSIDE HYDRANTS

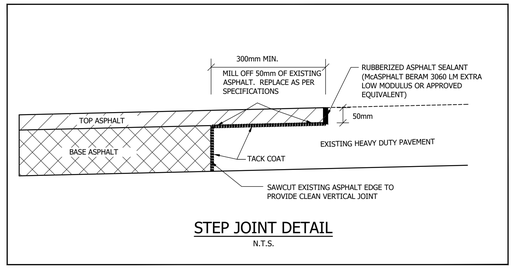
No.	REVISIONS	APR'D	DATE
3			
2			
1			

Norfolk

BACKFLOW PREVENTER & CHAMBER FOR 6" THROUGH 12" DOUBLE CHECK VALVE ASSEMBLY

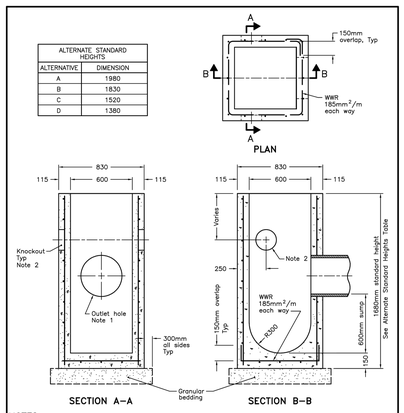
NOT TO SCALE	DESIGNED:	STD. DWG.
REVISION:	DATE:	W - 111

mm DIMENSIONS IN MILLIMETRES EXCEPT AS NOTED



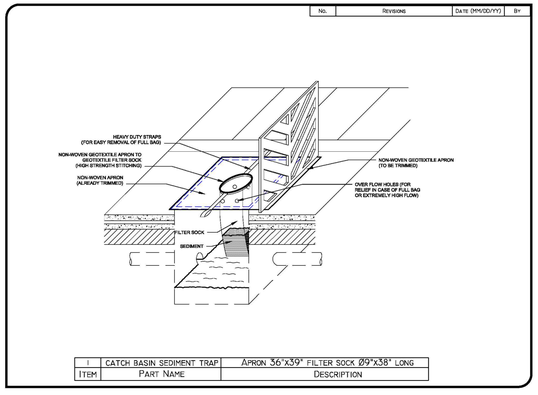
STEP JOINT DETAIL

N.T.S.

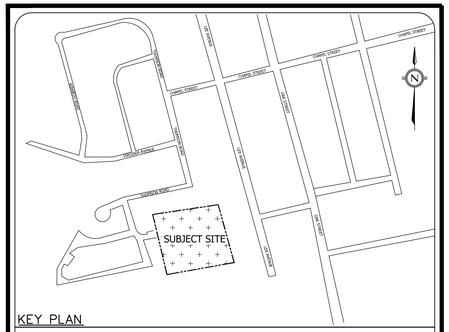


NOTES:
1 Outlet hole size 525mm diameter maximum, location as required.
2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.
A Centre reinforcing in base slab and walls ±20mm.
B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.
C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.
D Pipe support shall be according to OPSD 708.020.
E All dimensions are nominal.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE CATCH BASIN 600x600mm		
	OPSD 705.010	



ITEM	PART NAME	DESCRIPTION
1	CATCH BASIN SEDIMENT TRAP	APRON 36"x39" FILTER SOCK Ø9"x38" LONG



KEY PLAN

LEGEND

TOPOGRAPHY & LEGAL

PROVIDED BY: THE LOROCQUE GROUP
12 LYMAN STREET
ST. CATHERINES, ON, L2R 5M7
PHONE:(905) 688-1413

BEARING

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED POINTS BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONIDTUDE, ZONE 17, UNIVERAL TRANSVERSE MERCATOR (6° UTM). THERE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERNCE SYSTEM.

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR ZBA/DPOC/SPA #1	NOV 27 2025	G.D.	
1.	ISSUED FOR COORDINATION	NOV 21 2025	G.D.	

counterpoint ENGINEERING
A SUBSIDIARY OF DILLON CONSULTING LIMITED
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER
J. S. YOGANATHAN
100100545
NOV 27/25
PROVINCE OF ONTARIO

ENGINEER'S STAMP

APPLICANT:
2445680 ONTARIO LIMITED
23 WINGATE CRESCENT
RICHMOND HILL, ON, L4B 3J3
PHONE:
FAX:
CONTACT:

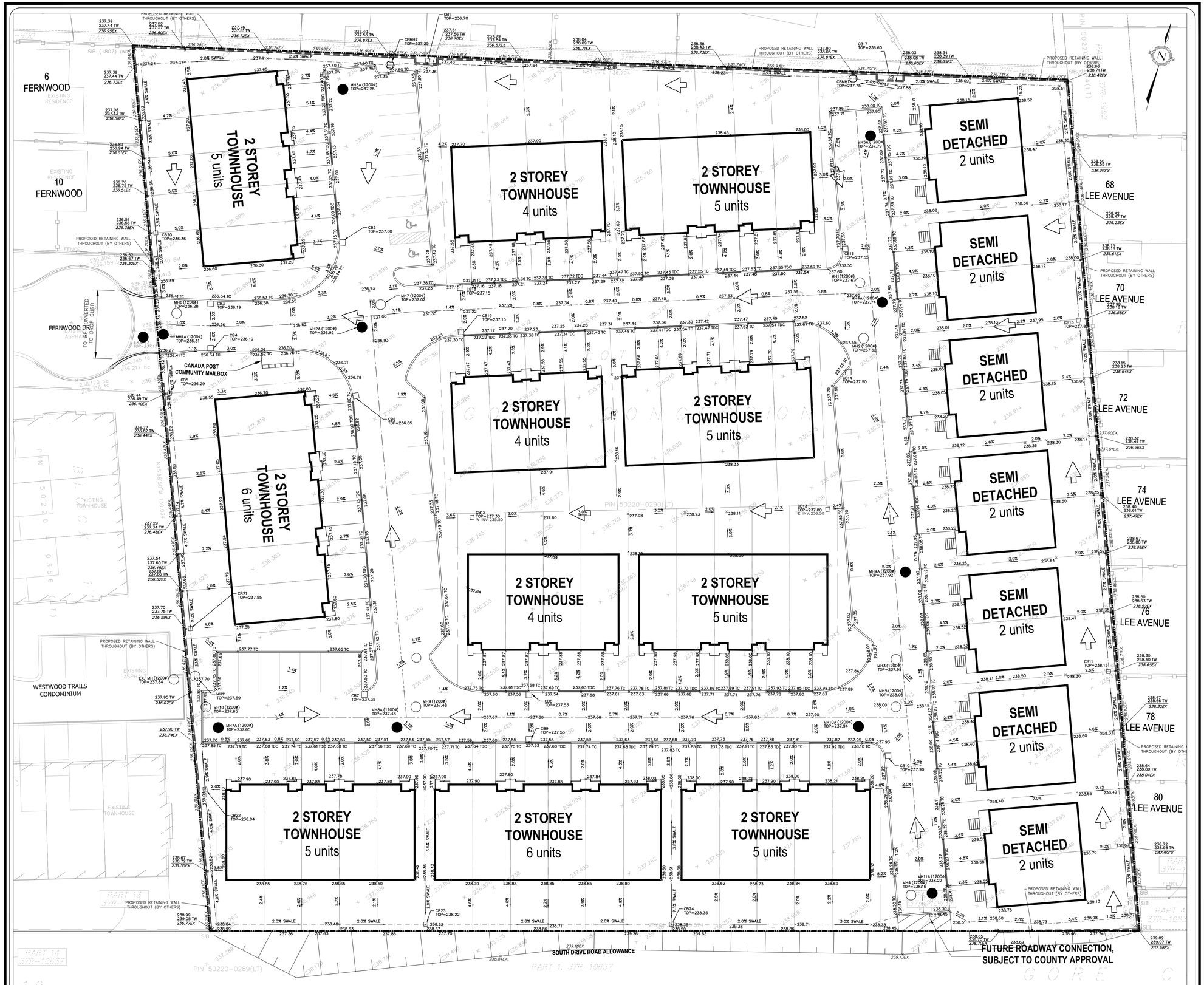
SITE LOCATION:
16 FERNWOOD
16 FERNWOOD DRIVE,
SIMCOE, ON, N3Y 0E5

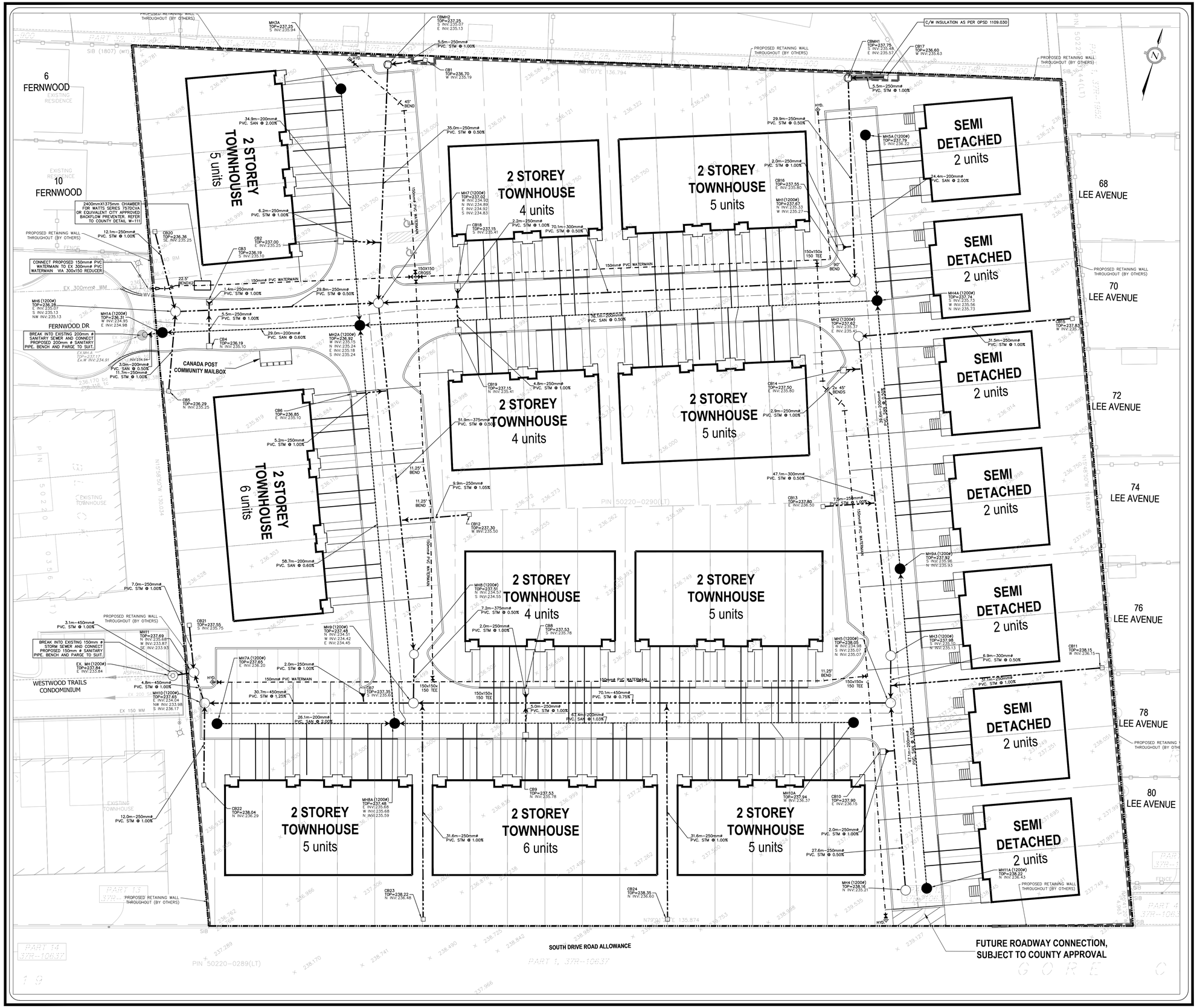
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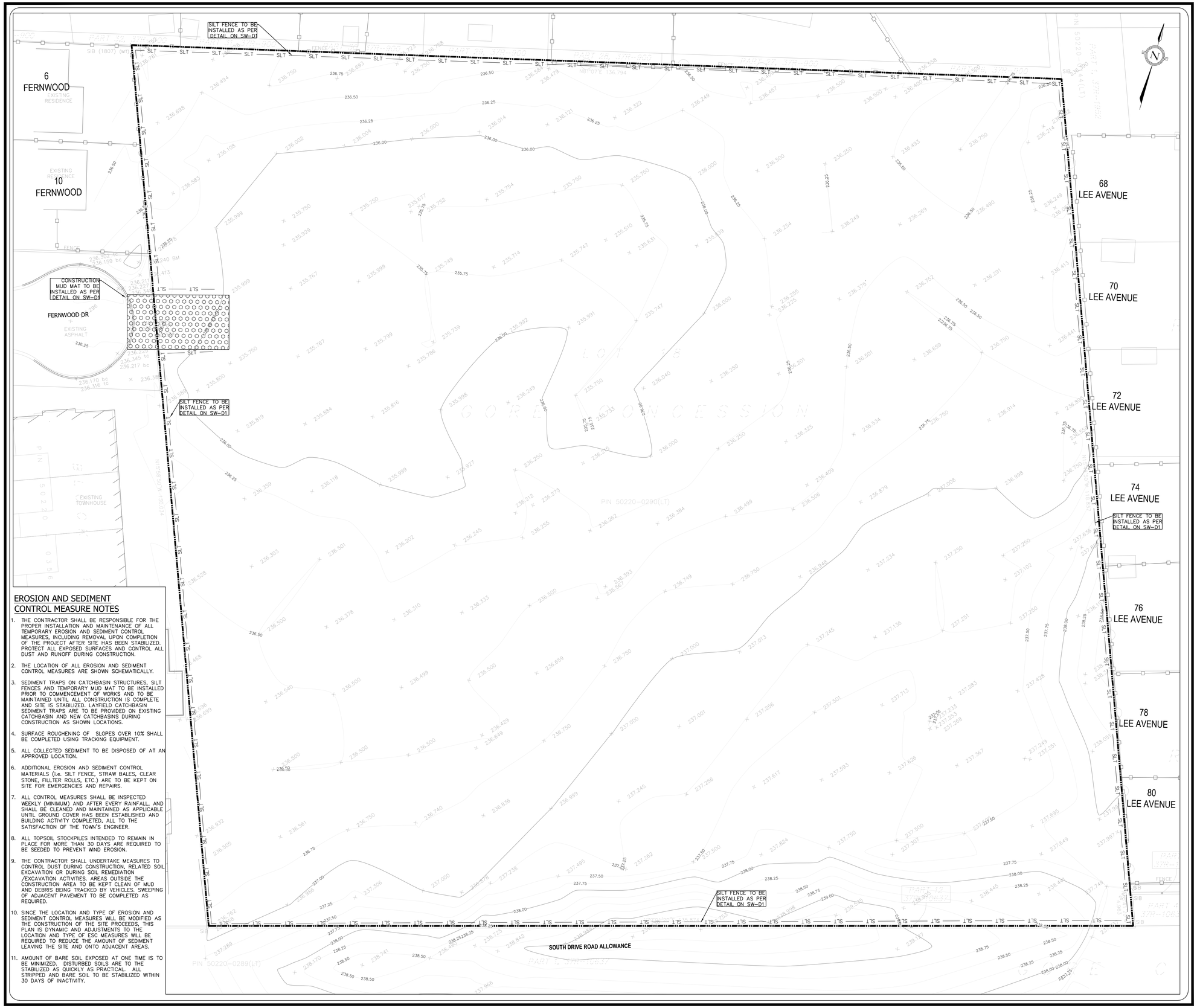
DETAILS

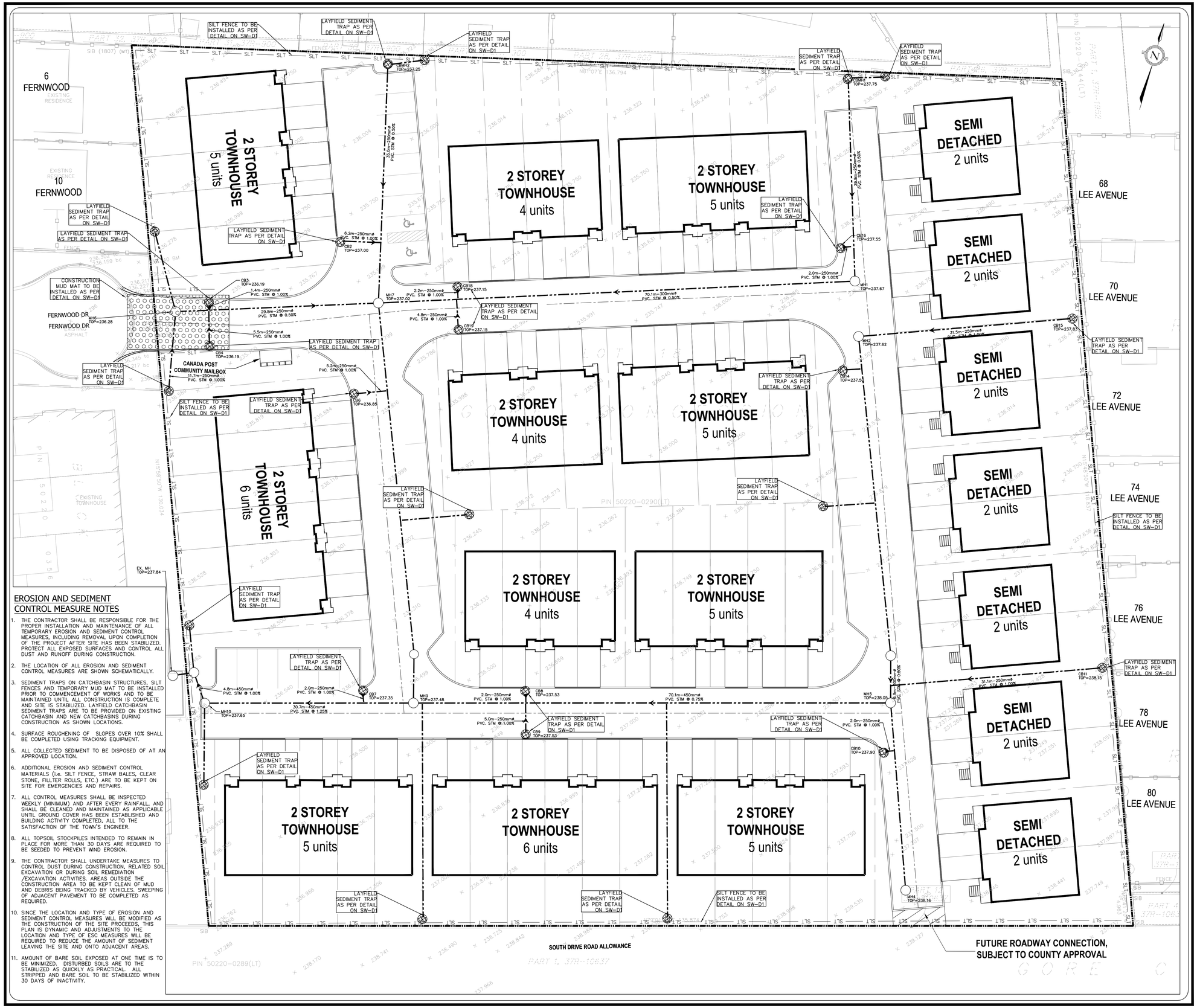
DESIGNED BY: J.Y	CHECKED BY: J.H	DATE: NOV 2025
DRAWING BY: J.Y.S	CHECKED BY: G.D	PROJECT NO. 251467
SWM BY: J.Y	CHECKED BY: J.H	
SCALE:		DRAWING NO. SW-D2

REGION FILE No.:


6
FERNWOOD
EXISTING RESIDENCE
10
FERNWOOD
EXISTING RESIDENCE
2 STOREY TOWNHOUSE
5 units
2 STOREY TOWNHOUSE
4 units
2 STOREY TOWNHOUSE
5 units
2 STOREY TOWNHOUSE
6 units
2 STOREY TOWNHOUSE
4 units
2 STOREY TOWNHOUSE
5 units
2 STOREY TOWNHOUSE
5 units
2 STOREY TOWNHOUSE
6 units
2 STOREY TOWNHOUSE
5 units
SEMI DETACHED
2 units
SEMI DETACHED
2 units
SEMI DETACHED
2 units
SEMI DETACHED
2 units
SEMI DETACHED
2 units
68 LEE AVENUE
70 LEE AVENUE
72 LEE AVENUE
74 LEE AVENUE
76 LEE AVENUE
78 LEE AVENUE
80 LEE AVENUE
FERNWOOD DR
TO BE CONVERTED TO CURB CUTS
CANADA POST COMMUNITY MAILBOX
WESTWOOD TRAILS CONDOMINIUM
EXISTING TOWNHOUSE
EXISTING TOWNHOUSE
PROPOSED RETAINING WALL THROUGHOUT (BY OTHERS)

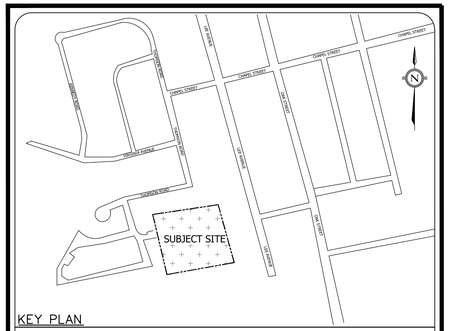

2 STOREY TOWNHOUSE 5 units
2 STOREY TOWNHOUSE 4 units
2 STOREY TOWNHOUSE 5 units
2 STOREY TOWNHOUSE 6 units
2 STOREY TOWNHOUSE 4 units
2 STOREY TOWNHOUSE 5 units
2 STOREY TOWNHOUSE 5 units
2 STOREY TOWNHOUSE 6 units
2 STOREY TOWNHOUSE 5 units
SEMI DETACHED 2 units
SEMI DETACHED 2 units
SEMI DETACHED 2 units
SEMI DETACHED 2 units
SEMI DETACHED 2 units
SEMI DETACHED 2 units
6 FERNWOOD
10 FERNWOOD
68 LEE AVENUE
70 LEE AVENUE
72 LEE AVENUE
74 LEE AVENUE
76 LEE AVENUE
78 LEE AVENUE
80 LEE AVENUE
WESTWOOD TRAILS CONDOMINIUM
FERNWOOD DR
CANADA POST COMMUNITY MAILBOX
SOUTH DRIVE ROAD ALLOWANCE
FUTURE ROADWAY CONNECTION, SUBJECT TO COUNTY APPROVAL
PROPOSED RETAINING WALL THROUGHOUT (BY OTHERS)
C/W INSULATION AS PER OPSD 1109.030
CONNECT PROPOSED 150mmø PVC WATERMAIN TO EX 300mmø PVC WATERMAIN VIA 300x150 REDUCER
BREAK INTO EXISTING 200mm ø SANITARY SEWER AND CONNECT PROPOSED 200mm ø SANITARY PIPE, BENCH AND PARGE TO SUIT
BREAK INTO EXISTING 150mm ø STORM SEWER AND CONNECT PROPOSED 150mm ø SANITARY PIPE, BENCH AND PARGE TO SUIT
2400mmX1375mm CHAMBER FOR WATTS SERIES 757DCVA OR EQUIVALENT CITY APPROVED BACKFLOW PREVENTER, REFER TO COUNTY DETAIL W-111
EX. MH (1200ø) TOP=237.84 E INV:233.64
MH1 TOP=237.69 N INV:235.68 W INV:233.87 SE INV:233.93
MH2 (1200ø) TOP=237.62 E INV:235.37 E INV:235.37
MH2A (1200ø) TOP=236.92 W INV:235.15 N INV:235.24 E INV:235.18 S INV:235.24
MH3 TOP=237.25 S INV:235.94
MH3A TOP=237.25 S INV:235.94
MH4 (1200ø) TOP=238.16 N INV:235.21
MH4A (1200ø) TOP=237.74 S INV:235.73 W INV:235.56 N INV:235.73
MH5 (1200ø) TOP=236.90 W INV:234.98 S INV:235.02 N INV:235.07
MH5A (1200ø) TOP=237.79 S INV:236.22
MH6 (1200ø) TOP=236.28 E INV:235.07 S INV:235.13 NW INV:235.13
MH7 (1200ø) TOP=237.22 W INV:234.92 N INV:234.89 E INV:234.92 S INV:234.83
MH7A (1200ø) TOP=237.65 E INV:236.20
MH8 (1200ø) TOP=237.51 N INV:234.57 S INV:234.55
MH8A (1200ø) TOP=237.48 E INV:235.88 W INV:235.68 N INV:235.59
MH9 (1200ø) TOP=237.45 N INV:234.51 W INV:234.42 E INV:234.45
MH9A (1200ø) TOP=237.09 S INV:235.96 N INV:235.93
MH10 (1200ø) TOP=237.65 E INV:234.04 NW INV:233.98 S INV:236.17
MH10A TOP=237.94 W INV:236.37
MH11 TOP=237.69 N INV:235.68 W INV:233.87 SE INV:233.93
MH11A (1200ø) TOP=238.22 N INV:236.43
MH12 (1200ø) TOP=237.67 E INV:235.37 E INV:235.37
CB1 TOP=236.70 W INV:235.19
CB2 TOP=237.00 E INV:235.25
CB3 TOP=236.19 S INV:235.10
CB4 TOP=236.19 N INV:235.10
CB5 TOP=236.29 N INV:235.25
CB6 TOP=236.85 E INV:235.70
CB7 TOP=237.35 S INV:235.61
CB8 TOP=237.53 E INV:235.78
CB9 TOP=237.53 N INV:235.78
CB10 TOP=237.90 E INV:236.15
CB11 TOP=238.15 W INV:236.15
CB12 TOP=237.30 W INV:235.50
CB13 TOP=237.80 E INV:236.20
CB14 TOP=237.50 E INV:235.80
CB15 TOP=237.83 W INV:236.20
CB16 TOP=237.55 E INV:235.80
CB17 TOP=236.60 W INV:235.63
CB18 TOP=237.15 S INV:235.41
CB19 TOP=237.15 N INV:235.41
CB20 TOP=236.36 SE INV:235.25
CB21 TOP=237.55 S INV:235.75
CB22 TOP=238.04 N INV:236.29
CB23 TOP=238.22 N INV:236.48
CB24 TOP=238.35 N INV:236.60
12.1m–250mmø PVC. STM @ 1.00%
6.2m–250mmø PVC. STM @ 1.00%
34.9m–200mmø PVC. SAN @ 2.00%
35.0m–250mmø PVC. STM @ 0.50%
2.2m–250mmø PVC. STM @ 1.00%
70.1m–300mmø PVC. STM @ 0.50%
29.8m–250mmø PVC. STM @ 0.50%
1.4m–250mmø PVC. STM @ 1.00%
5.5m–250mmø PVC. STM @ 1.00%
29.0m–200mmø PVC. SAN @ 0.60%
3.0m–200mmø PVC. SAN @ 0.50%
11.7m–250mmø PVC. STM @ 1.00%
5.2m–250mmø PVC. STM @ 1.00%
58.7m–200mmø PVC. SAN @ 0.60%
51.9m–375mmø PVC. STM @ 0.50%
9.9m–250mmø PVC. STM @ 1.05%
4.8m–250mmø PVC. STM @ 1.00%
7.0m–250mmø PVC. STM @ 1.00%
3.1m–450mmø PVC. STM @ 1.00%
4.8m–450mmø PVC. STM @ 1.00%
12.0m–250mmø PVC. STM @ 1.00%
30.7m–450mmø PVC. STM @ 1.25%
26.1m–200mmø PVC. SAN @ 2.00%
5.0m–250mmø PVC. STM @ 1.00%
67.4m–200mmø PVC. SAN @ 1.03%
70.1m–450mmø PVC. STM @ 0.75%
31.6m–250mmø PVC. STM @ 1.00%
2.9m–250mmø PVC. STM @ 1.00%
47.1m–300mmø PVC. STM @ 0.50%
7.5m–250mmø PVC. STM @ 1.00%
29.9m–250mmø PVC. STM @ 0.50%
24.4m–200mmø PVC. SAN @ 2.00%
31.5m–250mmø PVC. STM @ 1.00%
6.9m–300mmø PVC. STM @ 0.50%
31.1m–250mmø PVC. STM @ 1.00%
47.1m–200mmø PVC. SAN @ 1.00%
27.6m–250mmø PVC. STM @ 0.50%
2.0m–250mmø PVC. STM @ 1.00%
150mmø PVC WATERMAIN
150x150 CROSS
150x150x 150 TEE
150x150x 150 TEE
90° BEND
45° BEND
2x 45° BENDS
22.5° BEND
11.25° BEND
11.25° BEND
HYD.
EX 300mmø WM
EX 150 WM
PROPOSED RETAINING WALL THROUGHOUT (BY OTHERS)


SILT FENCE TO BE INSTALLED AS PER DETAIL ON SW-D1
6
FERNWOOD
EXISTING RESIDENCE
10
FERNWOOD
EXISTING RESIDENCE
CONSTRUCTION MUD MAT TO BE INSTALLED AS PER DETAIL ON SW-D1
FERNWOOD DR
EXISTING ASPHALT
SILT FENCE TO BE INSTALLED AS PER DETAIL ON SW-D1
EXISTING TOWNHOUSE
68
LEE AVENUE
70
LEE AVENUE
72
LEE AVENUE
74
LEE AVENUE
SILT FENCE TO BE INSTALLED AS PER DETAIL ON SW-D1
76
LEE AVENUE
78
LEE AVENUE
80
LEE AVENUE
SILT FENCE TO BE INSTALLED AS PER DETAIL ON SW-D1
SOUTH DRIVE ROAD ALLOWANCE
PIN 50220-0289(LT)
PIN 50220-0290(LT)
PIN 50220-0291(LT)
PIN 50220-0292(LT)
PIN 50220-0293(LT)
PIN 50220-0294(LT)
PIN 50220-0295(LT)
PIN 50220-0296(LT)
PIN 50220-0297(LT)
PIN 50220-0298(LT)
PIN 50220-0299(LT)
PIN 50220-0300(LT)
PIN 50220-0301(LT)
PIN 50220-0302(LT)
PIN 50220-0303(LT)
PIN 50220-0304(LT)
PIN 50220-0305(LT)
PIN 50220-0306(LT)
PIN 50220-0307(LT)
PIN 50220-0308(LT)
PIN



EROSION AND SEDIMENT CONTROL MEASURE NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION AND MAINTENANCE OF ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REMOVAL UPON COMPLETION OF THE PROJECT AFTER SITE HAS BEEN STABILIZED. PROTECT ALL EXPOSED SURFACES AND CONTROL ALL DUST AND RUNOFF DURING CONSTRUCTION.
2. THE LOCATION OF ALL EROSION AND SEDIMENT CONTROL MEASURES ARE SHOWN SCHEMATICALLY.
3. SEDIMENT TRAPS ON CATCHBASIN STRUCTURES, SILT FENCES AND TEMPORARY MUD MAT TO BE INSTALLED PRIOR TO COMMENCEMENT OF WORKS AND TO BE MAINTAINED UNTIL ALL CONSTRUCTION IS COMPLETE AND SITE IS STABILIZED. LAYFIELD CATCHBASIN SEDIMENT TRAPS ARE TO BE PROVIDED ON EXISTING CATCHBASIN AND NEW CATCHBASINS DURING CONSTRUCTION AS SHOWN LOCATIONS.
4. SURFACE ROUGHENING OF SLOPES OVER 10% SHALL BE COMPLETED USING TRACKING EQUIPMENT.
5. ALL COLLECTED SEDIMENT TO BE DISPOSED OF AT AN APPROVED LOCATION.
6. ADDITIONAL EROSION AND SEDIMENT CONTROL MATERIALS (i.e. SILT FENCE, STRAW BALES, CLEAR STONE, FILLTER ROLLS, ETC.) ARE TO BE KEPT ON SITE FOR EMERGENCIES AND REPAIRS.
7. ALL CONTROL MEASURES SHALL BE INSPECTED WEEKLY (MINIMUM) AND AFTER EVERY RAINFALL, AND SHALL BE CLEANED AND MAINTAINED AS APPLICABLE UNTIL GROUND COVER HAS BEEN ESTABLISHED AND BUILDING ACTIVITY COMPLETED, ALL TO THE SATISFACTION OF THE TOWN'S ENGINEER.
8. ALL TOPSOIL STOCKPILES INTENDED TO REMAIN IN PLACE FOR MORE THAN 30 DAYS ARE REQUIRED TO BE SEEDED TO PREVENT WIND EROSION.
9. THE CONTRACTOR SHALL UNDERTAKE MEASURES TO CONTROL DUST DURING CONSTRUCTION, RELATED SOIL EXCAVATION OR DURING SOIL REMEDIATION /EXCAVATION ACTIVITIES. AREAS OUTSIDE THE CONSTRUCTION AREA TO BE KEPT CLEAN OF MUD AND DEBRIS BEING TRACKED BY VEHICLES. SWEEPING OF ADJACENT PAVEMENT TO BE COMPLETED AS REQUIRED.
10. SINCE THE LOCATION AND TYPE OF EROSION AND SEDIMENT CONTROL MEASURES WILL BE MODIFIED AS THE CONSTRUCTION OF THE SITE PROCEEDS, THIS PLAN IS DYNAMIC AND ADJUSTMENTS TO THE LOCATION AND TYPE OF ESC MEASURES WILL BE REQUIRED TO REDUCE THE AMOUNT OF SEDIMENT LEAVING THE SITE AND ONTO ADJACENT AREAS.
11. AMOUNT OF BARE SOIL EXPOSED AT ONE TIME IS TO BE MINIMIZED. DISTURBED SOILS ARE TO THE STABILIZED AS QUICKLY AS PRACTICAL. ALL STRIPPED AND BARE SOIL TO BE STABILIZED WITHIN 30 DAYS OF INACTIVITY.



KEY PLAN

LEGEND

- EXISTING LIGHT STANDARD
- EXISTING MANHOLE
- EXISTING WATERMAIN CHAMBER
- EXISTING HYDRANT AND VALVE
- EXISTING CATCHBASIN
- EXISTING STORM SEWER AND MH
- EXISTING EASEMENT LINE
- PROPERTY LINE
- SLT SLT SLT — SEDIMENT CONTROL FENCE
- CONSTRUCTION FENCE
- LAYFIELD SEDIMENT TRAP
- EXISTING OVERLAND FLOW DIRECTION
- TEMPORARY CONSTRUCTION MUD MAT
- LIMIT OF GRADING
- PROPOSED STORM SEWER AND MH / OGS
- PROPOSED WATERMAIN
- PROPOSED SINGLE/DOUBLE CATCHBASIN

TOPOGRAPHY & LEGAL

PROVIDED BY: THE LOROCQUE GROUP
12 LYMAN STREET
ST. CATHERINES, ON, L2R 5M7
PHONE:(905) 688-1413

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1.	ISSUED FOR COORDINATION	NOV 21 2025	G.D.	

counterpoint ENGINEERING
A SUBSIDIARY OF DILLON CONSULTING LIMITED
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER
J. S. YOGANATHAN
100100545
NOV 27 25
PROVINCE OF ONTARIO
ENGINEER'S STAMP

APPLICANT:
2445680 ONTARIO LIMITED
23 WINGATE CRESCENT,
RICHMOND HILL, ON, L4B 3J3
PHONE:
FAX:
CONTACT:

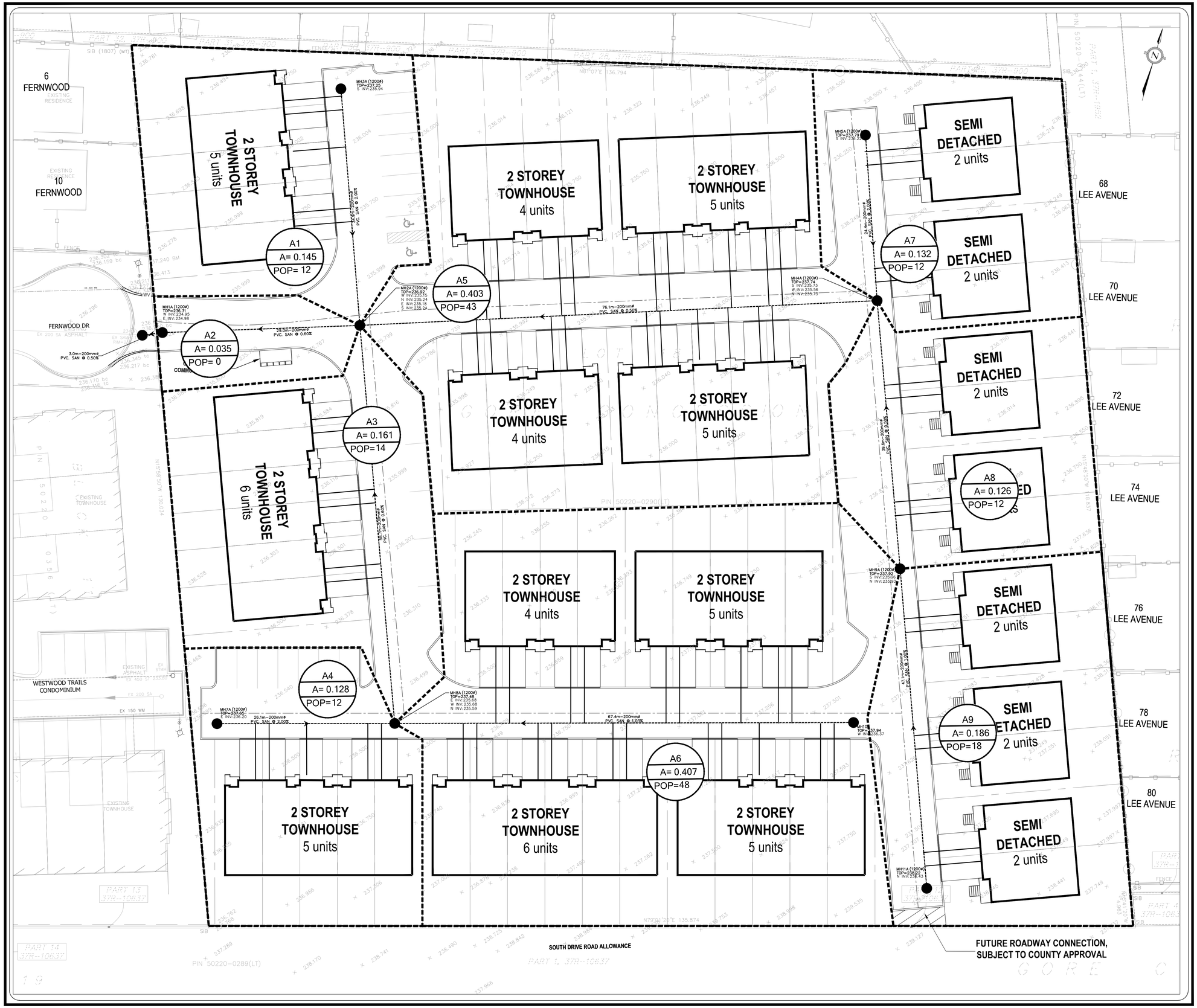
SITE LOCATION:
16 FERNWOOD
16 FERNWOOD DRIVE,
SIMCOE, ON, N3Y 0E5

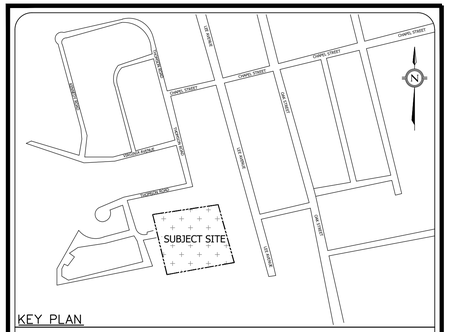
SITE PLAN FILE No.:

EROSION AND SEDIMENT CONTROL PLAN - STAGE 2

DESIGNED BY: J.Y	CHECKED BY: J.H	DATE: NOV 2025
DRAWING BY: J.Y.S	CHECKED BY: G.D	PROJECT NO. 251467
SWM BY: J.Y	CHECKED BY: J.H	
SCALE: 1:250m (0m 5m 10m 15m 20m)		DRAWING NO. SW-ESC2

REGION FILE No.:





LEGEND

- EXISTING LIGHT STANDARD
- EXISTING MANHOLE
- EXISTING WATERMAIN CHAMBER
- EXISTING HYDRANT AND VALVE
- EXISTING CATCHBASIN
- PROPOSED SANITARY SEWER AND MH
- EXISTING EASEMENT LINE
- PROPERTY LINE
- SANITARY DRAINAGE BOUNDARY
- AREA ID
- DRAINAGE AREA (HECTARES)
- IMPERVIOUSNESS (%)

TOPOGRAPHY & LEGAL

PROVIDED BY: THE LOROCQUE GROUP
12 LYMAN STREET
ST. CATHERINES, ON, L2R 5M7
PHONE:(905) 688–1413

BEARING

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED POINTS BY REAL–TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONIDTUDE, ZONE 17, UNIVERAL TRANSVERSE MERCATOR (6° UTM). THERE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERNCE SYSTEM.

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR ZBA/DPOC/SPA #1	NOV 27 2025	G.D.	
1.	ISSUED FOR COORDINATION	NOV 21 2025	G.D.	

counterpoint ENGINEERING
A SUBSIDIARY OF DILLON CONSULTING LIMITED
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER J. S. YOGANATHAN 100100545 NOV 27 25 PROVINCE OF ONTARIO
ENGINEER'S STAMP

APPLICANT:
2445680 ONTARIO LIMITED
23 WINGATE CRESCENT,
RICHMOND HILL, ON, L4B 3J3
PHONE:
FAX:
CONTACT:

SITE LOCATION:
16 FERNWOOD
16 FERNWOOD DRIVE,
SIMCOE, ON, N3Y 0E5

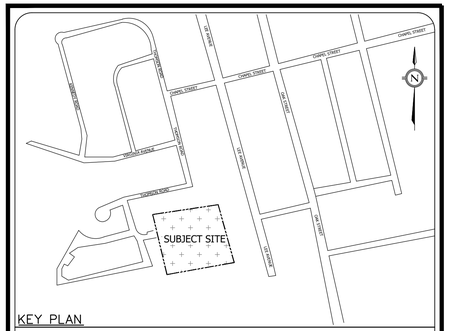
SITE PLAN FILE No.:

SITE SANITARY DRAINAGE PLAN

DESIGNED BY: J.Y	CHECKED BY: J.H	DATE: NOV 2025
DRAWING BY: J.Y.S	CHECKED BY: G.D	PROJECT NO. 251467
SWM BY: J.Y	CHECKED BY: J.H	
SCALE: 1:250m (0m 5m 10m 15m 20m)		DRAWING NO. SW-SAN

REGION FILE No.:





KEY PLAN

LEGEND

- PROPERTY LINE
- PROPOSED STORM SEWER AND MH / OGS
- PROPOSED SINGLE CATCHBASIN
- DRAINAGE BOUNDARY
- 6 / A= 100 / C=0.3 — AREA ID / DRAINAGE AREA (HECTARES) / RUN-OFF COEFFICIENT
- EXISTING STORM SEWER

TOPOGRAPHY & LEGAL

PROVIDED BY: THE LOROCQUE GROUP
12 LYMAN STREET
ST. CATHERINES, ON, L2R 5M7
PHONE: (905) 688-1413

BEARING

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED POINTS BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°00'W LONIDTUDE, ZONE 17, UNIVERAL TRANSVERSE MERCATOR (6° UTM). THERE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERNCE SYSTEM.

No.	REVISIONS/ISSUED	DATE	BY	CITY
2.	ISSUED FOR ZBA/DPOC/SPA #1	NOV 27 2025	G.D.	
1.	ISSUED FOR COORDINATION	NOV 21 2025	G.D.	

counterpoint ENGINEERING
A SUBSIDIARY OF DILLON CONSULTING LIMITED
8395 Jane St., Suite 100, Vaughan, ON L4K 5Y2 Phone 905.326.1404 Fax 905.326.1405

LICENSED PROFESSIONAL ENGINEER J. S. YOGANATHAN 100100545 NOV 27 25 PROVINCE OF ONTARIO

ENGINEER'S STAMP

APPLICANT:
2445680 ONTARIO LIMITED
23 WINGATE CRESCENT,
RICHMOND HILL, ON, L4B 3J3
PHONE:
FAX:
CONTACT:

SITE LOCATION:
16 FERNWOOD
16 FERNWOOD DRIVE,
SIMCOE, ON, N3Y 0E5

SITE PLAN FILE No.:

SITE STORM DRAINAGE PLAN

DESIGNED BY: J.Y	CHECKED BY: J.H	DATE: NOV 2025
DRAWING BY: J.Y.S	CHECKED BY: G.D	PROJECT NO. 251467
SWM BY: J.Y	CHECKED BY: J.H	
SCALE: 1:300m (0m 6m 12m 18m)		DRAWING NO. SW-STM

REGION FILE No.:

Hydrant Testing Ontario
Tel: 289-354-1942
Info@HTOntario.ca

REPORT
N°. 2690

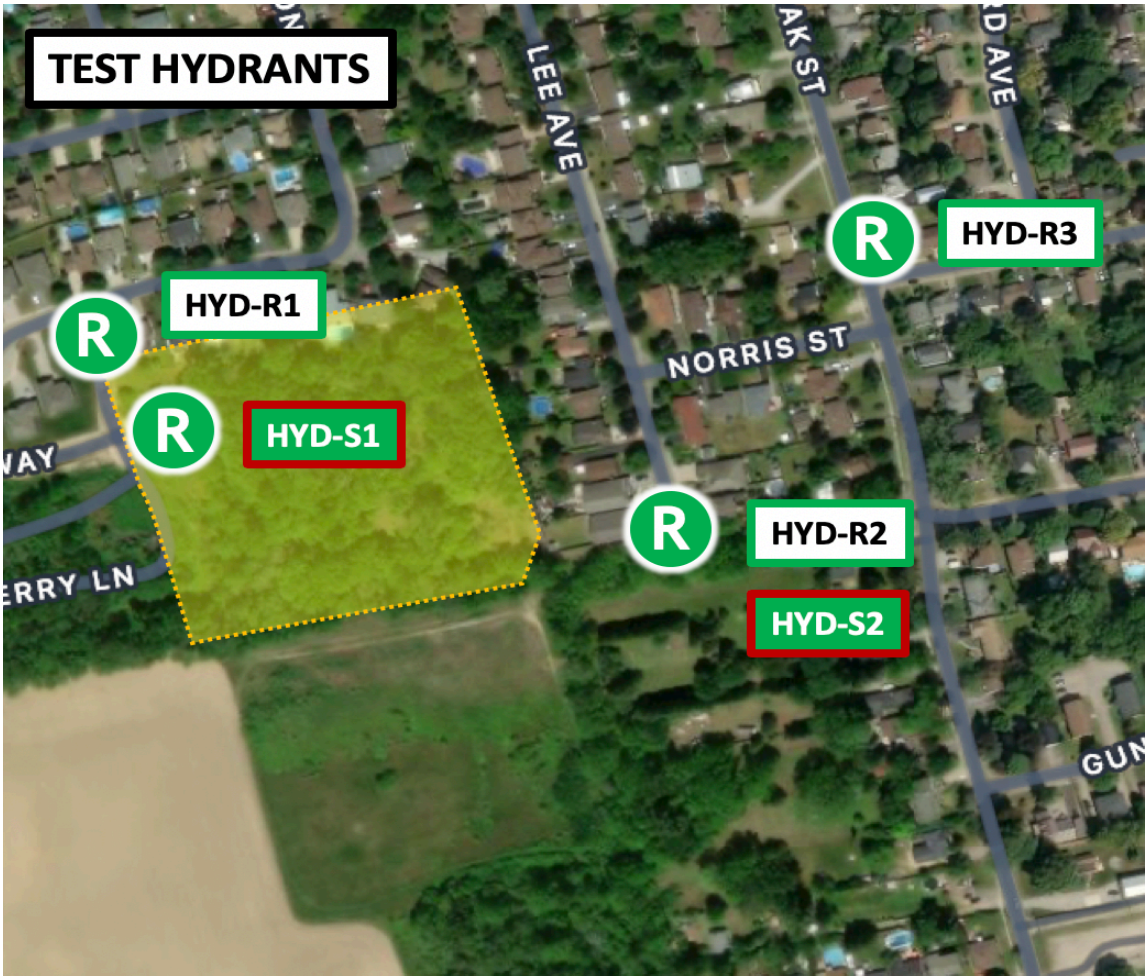
September 24, 2025

To: Gian-Michael Di Luca, P. Eng Associate
Counterpoint Land Development by Dillion Consulting Limited
gdiluca@counterpointend.com
8395 Jane Street, SUITE 100
Vaughan, Onatrio, L4K 5Y2

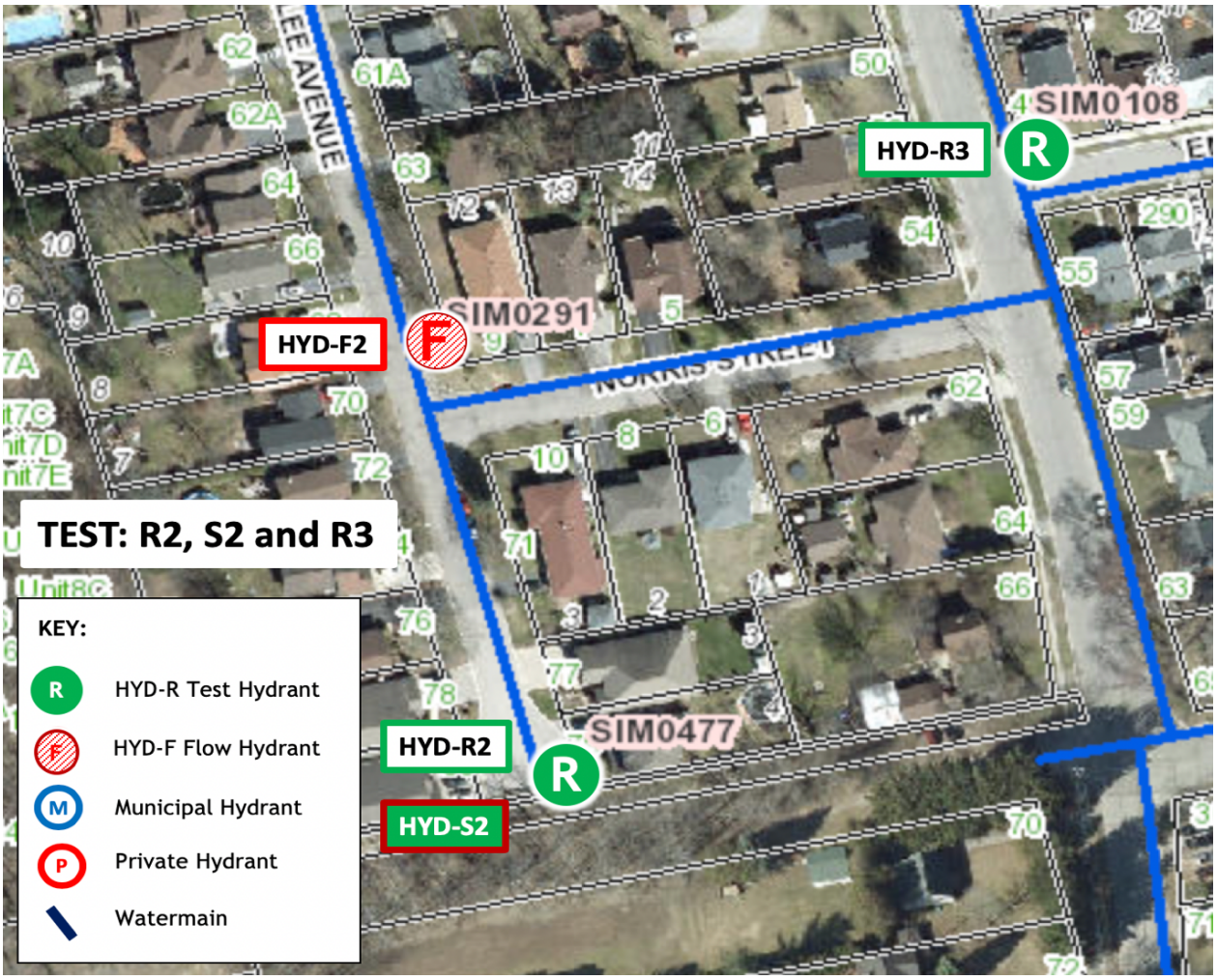
RE: Hydrant Flow Test - 16 FERNWOOD COURT, NORFOLK - SIMCOE

Please find the Report for the following works

Scope: Conducted Hydrant Flow Test as per NFPA291 Recommended Practices for Water Flow Testing and Marking of Hydrants.




TEST: R1 and S1
HYD-R1
HYD-F1
HYD-S1
KEY:
HYD-R Test Hydrant
HYD-F Flow Hydrant
Municipal Hydrant
Private Hydrant
Watermain


TEST: R2, S2 and R3
HYD-R3
HYD-F2
HYD-R2
HYD-S2
SIM0108
SIM0291
SIM0477
KEY:
HYD-R Test Hydrant
HYD-F Flow Hydrant
Municipal Hydrant
Private Hydrant
Watermain

HYDRANT FLOW TEST

TEST R1

DATE: September 16, 2025 TIME: 2:27 PM

R -TEST HYDRANT 9 FERNWOOD COURT HYDRANT No. HYD-R1

HYDRANT MODEL: CENTURY COLOUR: BLUE

STATIC PRESSURE psi (hr-20^0.54): **41** VARIANCE: 17%

Q - FLOW HYDRANT 16 FERNWOOD COURT HYDRANT No. HYD-F1

HYDRANT MODEL: AVK COLOUR: BLUE

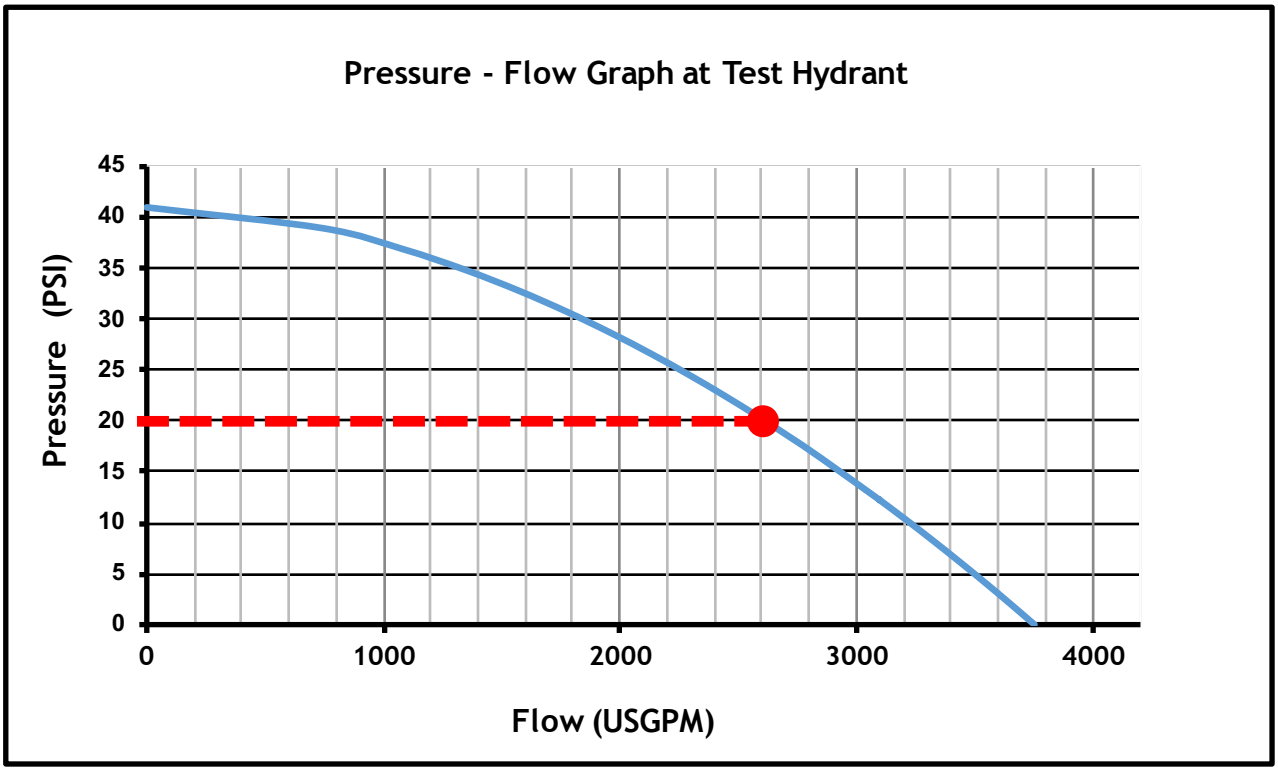
No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	38	2.5	0.9	15	722
2	34	2.5	0.9	15	722
			Q_F = Total Flow (USGPM)		**1444**

Q_R = flow predicted @ 20 psi

$Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

2614	USGPM
165	L/s

NFPA Rating: **CLASS AA - BLUE**



HYDRANT FLOW TEST

NORFOLK TEST S1 SINGLE

DATE: September 16, 2025 TIME: 2:34 PM

R -TEST HYDRANT 16 FERNWOOD COURT HYDRANT No. HYD-S1

HYDRANT MODEL: AVK COLOUR: BLUE

STATIC PRESSURE psi (hr-20^0.54): **41** VARIANCE: 15%

Q - FLOW HYDRANT 16 FERNWOOD COURT HYDRANT No. HYD-S1

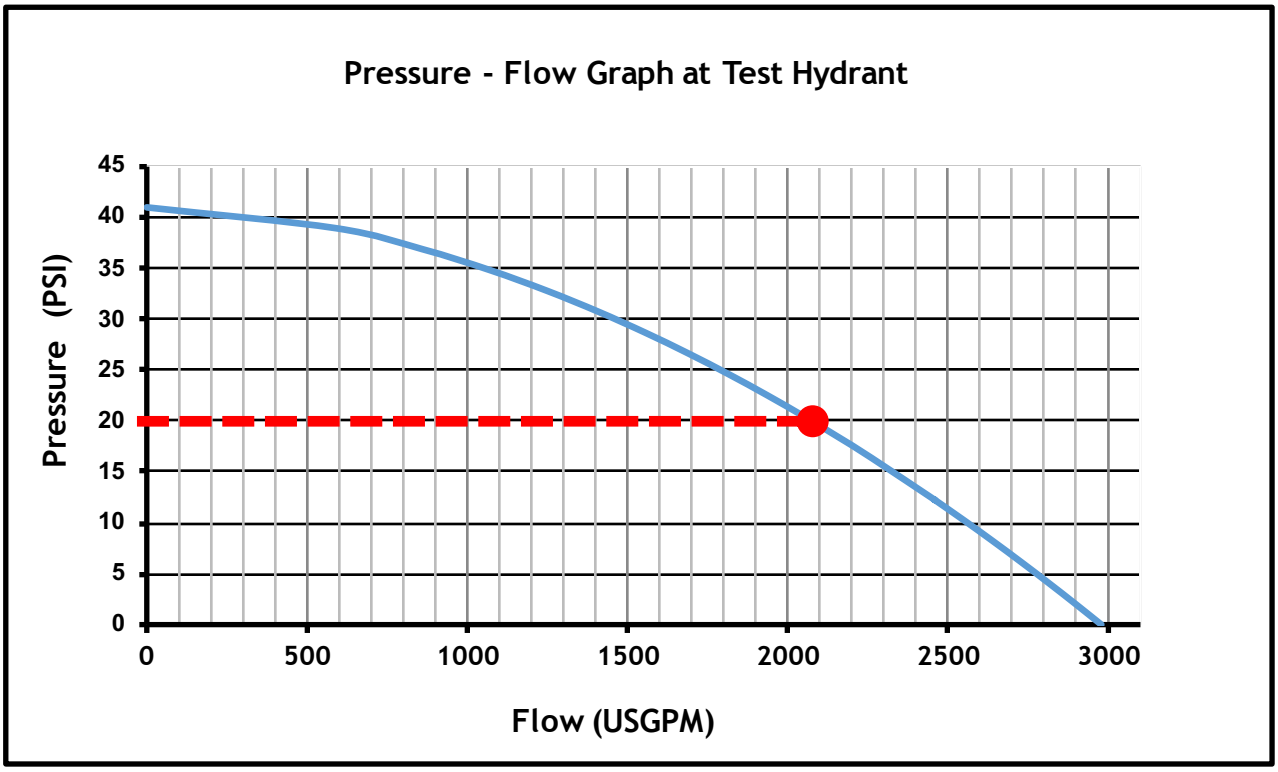
HYDRANT MODEL: AVK COLOUR: BLUE

No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	35	2.5	0.9	32	1055
			Q_F = Total Flow (USGPM)		**1055**

Q_R = flow predicted @ 20 psi $Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

2075	USGPM
131	L/s

NFPA Rating: **CLASS AA - BLUE**



HYDRANT FLOW TEST

NORFOLK TEST S2 SINGLE

DATE: September 16, 2025 TIME: 2:57 PM

R -TEST HYDRANT 79 LEE AVENUE HYDRANT No. HYD-S2

HYDRANT MODEL: CENTURY COLOUR: ORANGE

STATIC PRESSURE psi (hr-20^0.54): **43** VARIANCE: 37%

Q - FLOW HYDRANT 79 LEE AVENUE HYDRANT No. HYD-S2

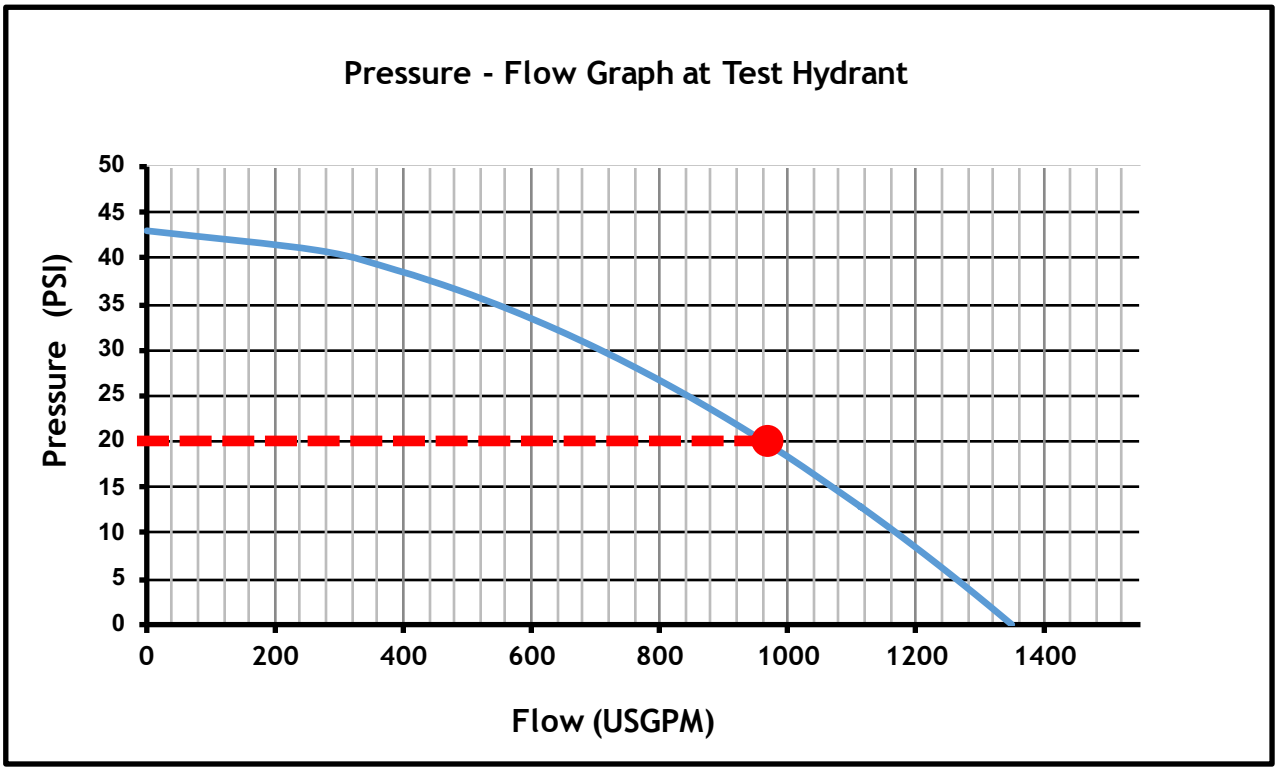
HYDRANT MODEL: CENTURY COLOUR: ORANGE

No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	27	2.5	0.9	18	791
			Q_F = Total Flow (USGPM)		**791**

Q_R = flow predicted @ 20 psi $Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

962	USGPM
61	L/s

NFPA Rating: **CLASS B - ORANGE**



HYDRANT FLOW TEST

NORFOLK TEST R2

DATE: September 16, 2025 TIME: 3:10 PM

R -TEST HYDRANT 79 LEE AVENUE HYDRANT No. HYD-R2

HYDRANT MODEL: CENTURY COLOUR: ORANGE

STATIC PRESSURE psi (hr-20^0.54): **44** VARIANCE: 45%

Q - FLOW HYDRANT Opp. 70 LEE AVENUE HYDRANT No. HYD-F2

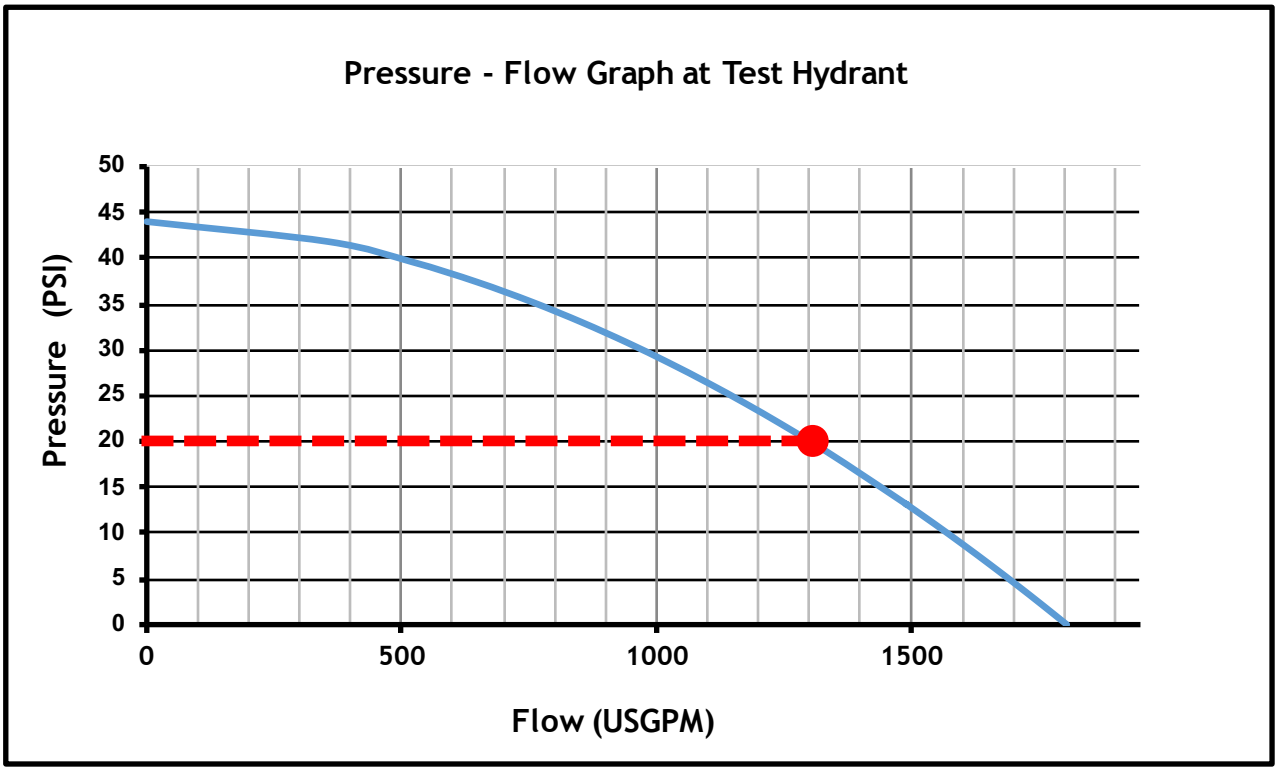
HYDRANT MODEL: CENTURY COLOUR: GREEN

No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	32	2.5	0.9	25	932
2	24	2.5	0.9	10	590
			Q_F = Total Flow (USGPM)		**1179**

Q_R = flow predicted @ 20 psi $Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

1301	USGPM
82	L/s

NFPA Rating: **CLASS A - GREEN**



HYDRANT FLOW TEST

NORFOLK TEST R3

DATE: September 16, 2025 TIME: 3:10 PM

R -TEST HYDRANT 49 OAK STREET HYDRANT No. HYD-R3

HYDRANT MODEL: CENTURY COLOUR: BLUE

STATIC PRESSURE psi (hr-20^0.54): **43** VARIANCE: 10%

Q - FLOW HYDRANT Opp 70 LEE AVENUE HYDRANT No. HYD-F3

HYDRANT MODEL: CENTURY COLOUR: GREEN

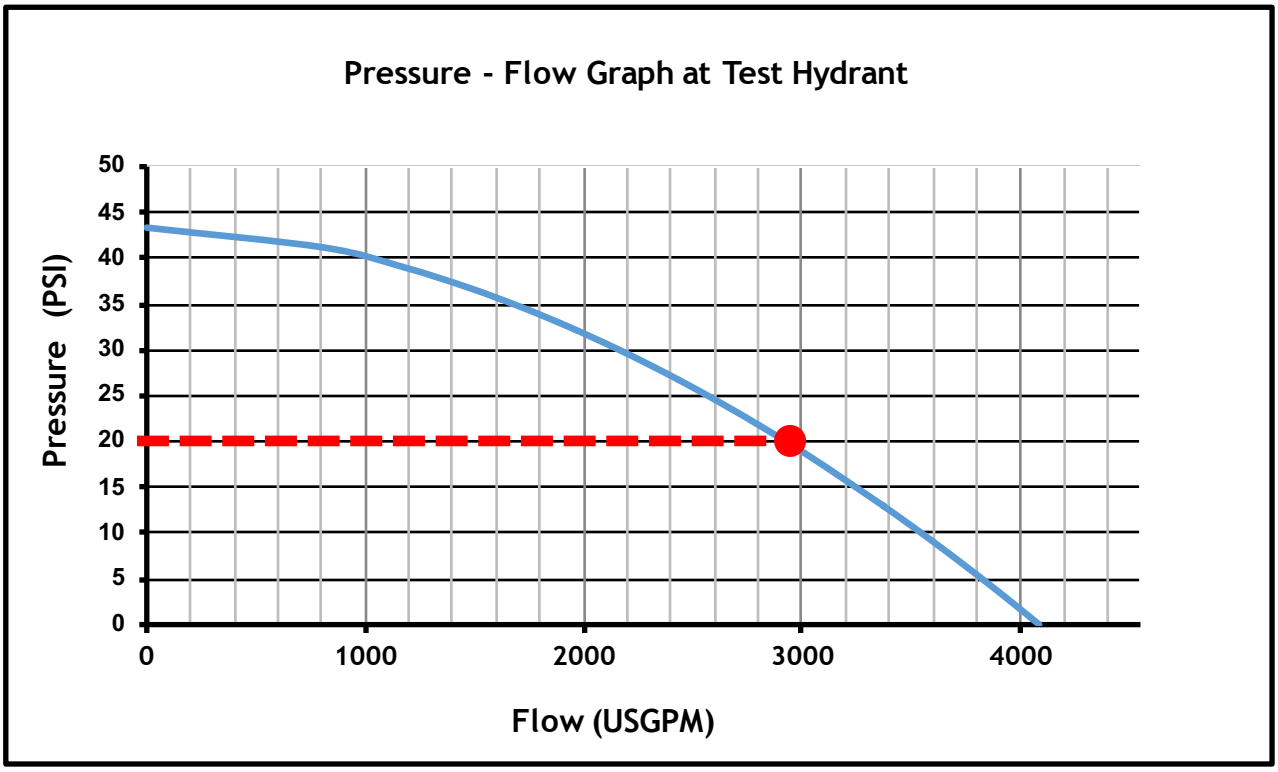
No. Outlets	Residual Pressure (hf-R^0.54)	Orifice Dia Dia. (in.) (d^2)	Coefficient	Nozzle PSI $(\sqrt{psi})$	Q = Flow (USGPM) $Q = 29.83\,(c)\,(d2)\,(\sqrt{psi})$
1	41	2.5	0.9	25	932
3	39	2.5	0.9	10	590
			Q_F = Total Flow (USGPM)		**1179**

Q_R = flow predicted @ 20 psi

$Q_R = Q_F * (H_r - 20^{\wedge 0.54}) / (H_f - R^{\wedge 0.54})$

2925	USGPM
185	L/s

NFPA Rating: **CLASS AA - BLUE**



Test Conclusion

The system at the time of testing produced a theorectical projected flow rate of:

LOCATION	Total USGPM	USGPM at 20 psi	lps at 20 psi	Test #
FERNWOOD DR	1444	2614	165	R1
LEE AVENUE	1179	1301	82	R2
OAK STREET	1179	2925	185	R3

Hydrants are classified in accordance with their rated capacities as per NFPA291.

COLOUR	CLASS	Available Flow @ 20psi
BLUE	AA	1500 GPM or more
GREEN	A	1000 – 1499 GPM
ORANGE	B	500 – 999 GPM
RED	C	Below 500 GPM

We strongly feel that all attempts have been made to ensure that the required data as stipulated was captured, stored and presented in an accurate, efficient and timely manner for the required period.

We look forward to working with you in the future.

Please feel free to contact the undersigned should you require any further information.

Best Regards



Rob Gamache E.P
Manager of Operations
Hydrant Testing Ontario
Info@HTOntario.ca

project #: 25-072

north

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

PROPOSED 1.8m HT WOOD PRIVACY FENCE MOUNTED ON PROPOSED RETAINING WALL (TYP.) -SEE DETAIL D 5/L-3

PROPOSED WOOD SCREEN FENCE (TYP.)

SEE SHEET L-2 FOR UNIT PLANTING PLAN

(1) Cercis canadensis

(5) Tilia americana 'Boulevard'

(1) Acer rubrum

(1) Cercis canadensis

(7) Pennisetum alopecuroides 'Piglet'

(7) Hemerocallis x 'Gentle Shepherd'

(3) Taxus x media 'Wardii'

FERNWOOD DRIVE

(4) Celtis occidentalis 'Prairie Sentinel'

(3) Celtis occidentalis 'Prairie Sentinel'

PROPOSED ENTRY FEATURE COLUMNS AND DECORATIVE METAL FENCE -SEE DETAIL D 6/L-3

(8) Hemerocallis x 'Gentle Shepherd'

(10) Pennisetum alopecuroides 'Piglet'

(4) Taxus x media 'Wardii'

PROPOSED 1.8m HT WOOD PRIVACY FENCE BETWEEN UNITS (TYP.) -SEE DETAIL D 5/L-3

SEE SHEET L-2 FOR UNIT PLANTING PLAN

(4) Tilia americana 'Boulevard'

(1) Acer rubrum

PROPOSED RETAINING WALL - REFER TO CIVIL DRAWINGS

(1) Ostrya virginiana

(1) Amelanchier laevis

(1) Acer rubrum

(6) Carpinus betulus 'Fastigiata'

FIRE ROUTE (10.0m)

2 STOREY TOWNHOUSE 5 UNITS

2 STOREY TOWNHOUSE 4 UNITS

2 STOREY TOWNHOUSE 6 UNITS

SEMI DETACHED 2 UNITS

136.794

130.034

PROPOSED WOOD SCREEN FENCE (TYP.)

FUTURE ROADWAY CONNECTION (SUBJECT TO COUNTY APPROVAL)

PART 13, PLAN 37R-10637

PART 15, PLAN 37R-10637

LOT 31 PLAN 40

LOT 28 PLAN 40

LOT 27 PLAN 40

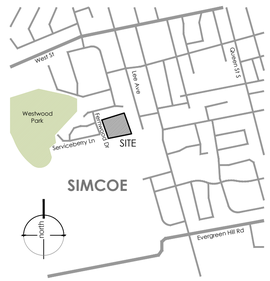
LOT 26 PLAN 40

REGISTERED PLAN No. 40

LANDSCAPE NOTES:

1. All work to be carried out in accordance with by-laws and codes having jurisdiction over site location.
2. Complete all work to the satisfaction of the Landscape Architect.
3. Report any changes, discrepancies or substitutions to the Landscape Architect for review. Obtain approval from the Landscape Architect before proceeding.
4. It is the contractor's responsibility to determine existing service locations.
5. Exact locations of plant material will be determined by placement of site services such as hydro vaults, meters, utilities roof rain water leaders, driveways, light standards, etc.
6. All plant material locations to be staked or marked out and approved by Landscape Architect prior to installation.
7. Supply all plant material in accordance with the Canadian Standards for Nursery Stock (8th ed.).
8. Install plant material according to details shown.
9. Supply and place mulch in accordance with Canadian Landscape Standard (Section 10, Mulching). Disturbed soil areas around trees and shrubs are to be covered with shredded conifer bark mulch such as 'Cedar Bark Mulch' by All Treat Farms or 'Classic Cedar Mulch' by Gro-Bark, or approved equivalent. Alternative mulches must be approved by the Landscape Architect.
10. Contractor to utilize layout dimensions where provided
11. Provide planting bed area as noted on the drawing or to accommodate mature size of plant material.
12. All support systems must be removed by the contractor at time of final acceptance. No extras will be paid to complete this work
13. Supply and place topsoil in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) to a minimum depth of 150mm unless otherwise specified.
14. Supply and place sod in accordance with Canadian Landscape Standard (Section 7, Lawns & Grass and Section 8, Turfgrass Sod)unless otherwise specified.
15. Supply and place seed in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) unless otherwise specified. All 5:1 or greater slopes to be seeded with tacifier. Contractor to provide necessary erosion control protection as required to ensure soil stabilization and proper seed germination.
16. All dimensions in meters unless otherwise noted.
17. If discrepancies arise between plant material count shown on drawing and plant list, the drawing shall be considered correct.
18. Contractor to provide minimum one (1) year warranty (including trees on municipal property) from date accepted on all work unless otherwise specified.
19. Any site plan or grading and servicing shown is for information only. Refer to approved drawings.
20. Not for construction unless stamped, signed and dated by Landscape Architect.
21. Drawings not to be reproduced without written consent from Landscape Architect.
22. Approval of landscape plan to be obtained from municipality.
23. All plant material to be planted a minimum of 1.0m from any swales or ditches.
24. For grading and servicing information refer to the consulting Engineer's drawings.
25. For lighting information and power distribution refer to the electrical consultant's drawings.

KEY MAP - N.T.S.



LEGEND

- property line
- existing tree to remain
- proposed deciduous tree
- proposed shrub
- proposed perennial
- existing elevation
- proposed elevation
- min. 150mm topsoil, fine grade & sod
- C.I.P. concrete
- precast concrete unit pavers

NOT FOR CONSTRUCTION
ISSUED FOR REVIEW & COMMENTS ONLY

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2026-01-27	Issued for submission

STAMP

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
MEMBER

CLIENT
2445680 Ontario Ltd.

MUNICIPALITY
Norfolk County

PROJECT
Fernwood Towns
16 Fernwood Drive
Simcoe

MUNICIPAL FILE NUMBER

SHEET
Landscape Plan

L-1

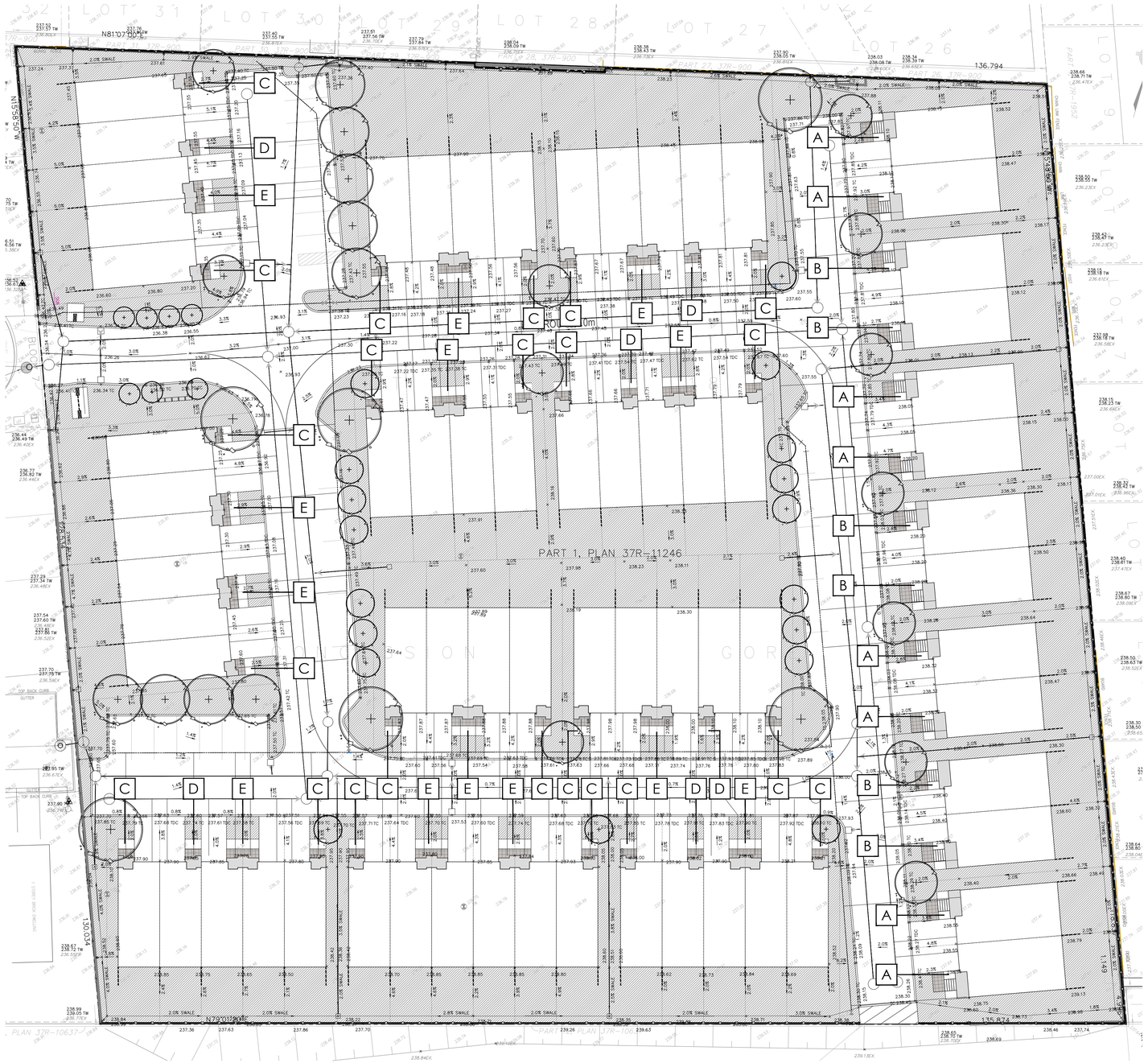
adesso
69 John Street South, Suite 250
Hamilton, ON L8N 2B9
t. 905.526.8876
e. info@adessodesigninc.ca
www.adessodesigninc.ca

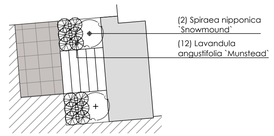
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LAST SAVED BY:Brittaine14, Tuesday, January 27, 2026 9:43:06 AM, PLOTTED BY:Brittaine14, Tuesday, January 27, 2026 9:43:39 AM

project #: 25-072

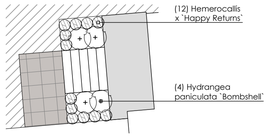
north

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

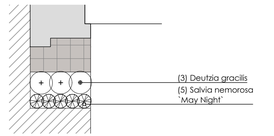




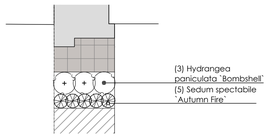
A x8



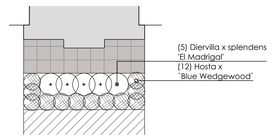
B x6



C x22



D x6

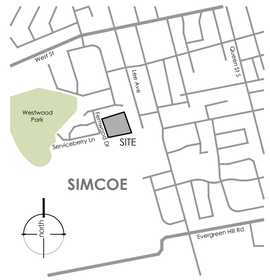


E x13

PLANT SCHEDULE LANDSCAPE

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
SHRUBS								
66	*Deutzia gracilis*	*Slender Deutzia*	40cm	#3 cont.	0.80	0.80	0.70	
65	*Diervilla x splendens 'El Madrigal'*	*Firefly Nightglow Bush Honeysuckle*	60cm	#3 cont.	0.80	0.80	0.75	
42	*Hydrangea paniculata 'Bombshell'*	*Bombshell Hydrangea*	60cm	#3 cont.	0.80	0.80	0.75	
6	*Spiraea japonica 'Little Princess'*	*Little Princess Japanese Spirea*	40cm	#3 cont.	0.50	0.60	0.50	
20	*Spiraea nipponica 'Snowmound'*	*Snowmound Spirea*	60cm	#3 cont.	1.25	1.0	0.70	
PERENNIALS								
72	*Hemerocallis x 'Happy Returns'*	*Happy Returns Daylily*	--	#1 cont.	0.40	0.40	0.30	Rebloomer
156	*Hosta x 'Blue Wedgewood'*	*Blue Wedgewood Hosta*	--	#1 cont.	0.50	0.60	0.50	
84	*Lavandula angustifolia 'Munstead'*	*Munstead English Lavender*	--	#1 cont.	0.30	0.50	0.40	
110	*Salvia nemorosa 'May Night'*	*May Night Meadow Sage*	--	#1 cont.	0.40	0.50	0.40	
30	*Sedum spectabile 'Autumn Fire'*	*Autumn Fire Stonecrop*	--	#1 cont.	0.40	0.50	0.40	

KEY MAP - N.T.S.



LEGEND

- property line
- existing tree to remain
- proposed deciduous tree
- proposed shrub
- proposed perennial
- existing elevation
- 237.55 proposed elevation
- min. 150mm topsoil, fine grade & sod
- C.I.P. concrete
- precast concrete unit pavers

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ISSUED FOR REVIEW & COMMENTS ONLY

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2026-01-27	Issued for submission

STAMP

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
MARIO PATINO
2444
MEMBER

CLIENT
2445680 Ontario Ltd.

MUNICIPALITY
Norfolk County

PROJECT
Fernwood Towns
16 Fernwood Drive
Simcoe

MUNICIPAL FILE NUMBER

SHEET
Unit Planting Plan

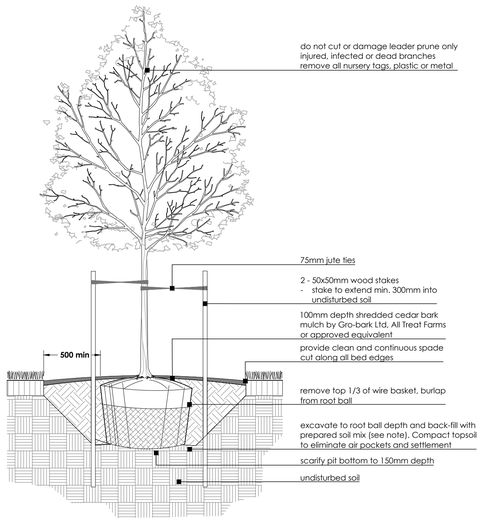
L-2

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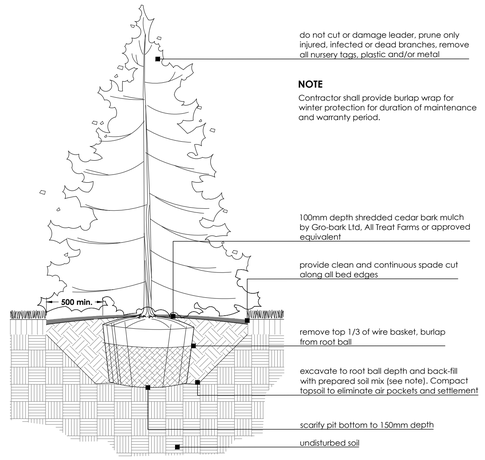
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project #: 25-072



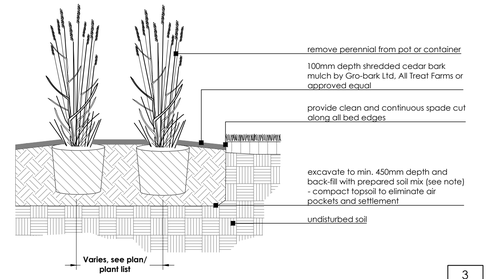
BALLED AND BURLAP /WIRE BASKET DECIDUOUS TREE — 1 / L-3

N.T.S



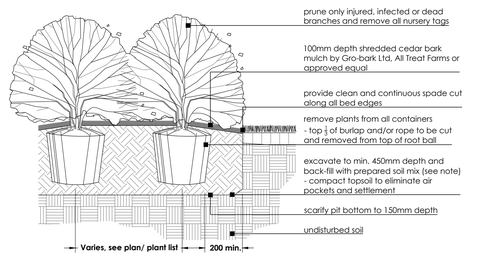
BALLED AND BURLAP/WIRE BASKET CONIFEROUS TREE — 2 / L-3

N.T.S



CONTAINER GROWN PERENNIAL — 3 / L-3

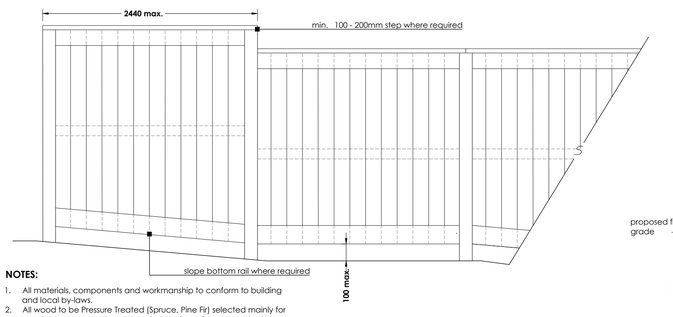
N.T.S



CONTAINER GROWN SHRUB — 4 / L-3

N.T.S

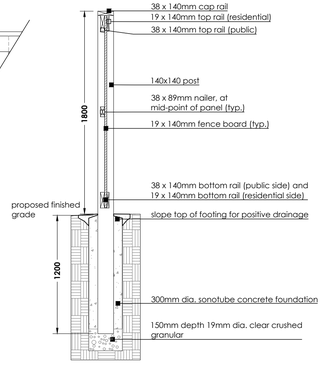
ELEVATION



NOTES:

1. All materials, components and workmanship to conform to building and local by-laws.
2. All wood to be Pressure Treated (Spruce, Pine Fir) selected mainly for good appearance all members shall be free of wane and bark pockets. All torn grain shall be eliminated by sanding and planning. Members exhibiting moderate to heavy knots shall be well distributed throughout the site.
3. All cuts and holes that expose untreated wood should be liberally brush-coated with two applications of an end-cut preservative (copper naphthenate in ground contact or zinc naphthenate above ground) before the wood is installed. Follow the manufacturer's recommendations re: the application of suitable preservatives.
4. All wood to bear lumber grading stamp.
5. All fasteners shall have exterior grade finishes suitable for use with Pressure Treated lumber. Stainless steel, galvanized, zinc-dipped or ceramic-coated wood/deck screws are acceptable.
6. All galvanizing to be hot dipped in conformance to CSA standard C164.
7. Drive all fastener heads below surface of wood. Use sufficient size and quantity of fasteners to ensure a stable, secure structure.
8. Step fence panels minimum of 100 - 200mm at posts as required by grade conditions. Sloping of panels may be required for certain grade conditions - Consultant's approval required.
9. Lumber sizes are actual sizes rather than nominal sizes.
10. Concrete to have minimum compressive strength of 25 MPa @ 28 days with 5-7% air entertainment.
11. See landscape plan for fence location.

SECTION



GENERAL LAYOUT NOTES

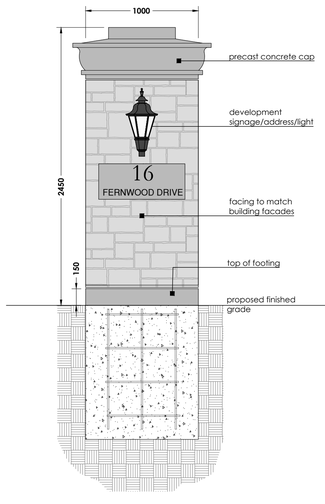
1. All fences adjacent to road allowances and walkways to be erected 0.15m onto private property. Fencing is not to be erected on the lot line or into any road allowance or easement.

2. Footing and excavation to be entirely on proposed development lands.

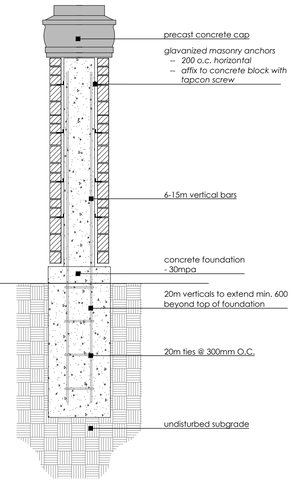
WOOD PRIVACY FENCE (1.8M HEIGHT - PRESSURE TREATED) — 5 / L-3

N.T.S.

ELEVATION



SECTION



ENTRY FEATURE WALL — 6 / L-3

N.T.S.

PLANTING NOTES:

1. Soil mixture: four (4) parts native soil, one (1) part well rotted compost.If existing soil is not suitable provide triple mix topsoil or approved equal.
2. Saucer shall be soaked with water and mulched immediately following planting.
3. Massed shrubs shall be planted in continuous mulched beds unless otherwise noted.
4. Staking schedule;
   - < 30mm caliper size/ 2500mm ht. - one stake
   - > 30mm caliper size/ 2500mm ht. - two stakes
   - > 70mm caliper - three stakes
5. All support systems must be removed once tree is established.
6. All trees to be straight and planted vertically regardless of slope.
7. Top of root flare shall be positioned 50mm above grade.
8. The following depths of soil are required for planting;
   - 15cm topsoil for sod;
   - 30cm of topsoil for perennials;
   - 45cm of topsoil for shrubs;
   - 90cm of topsoil for trees

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REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2026-01-27	Issued for submission

STAMP

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — MANNO PATTAKOS — OALA — MEMBER

CLIENT
2445680 Ontario Ltd.

MUNICIPALITY
Norfolk County

PROJECT
Fernwood Towns
16 Fernwood Drive
Simcoe

MUNICIPAL FILE NUMBER

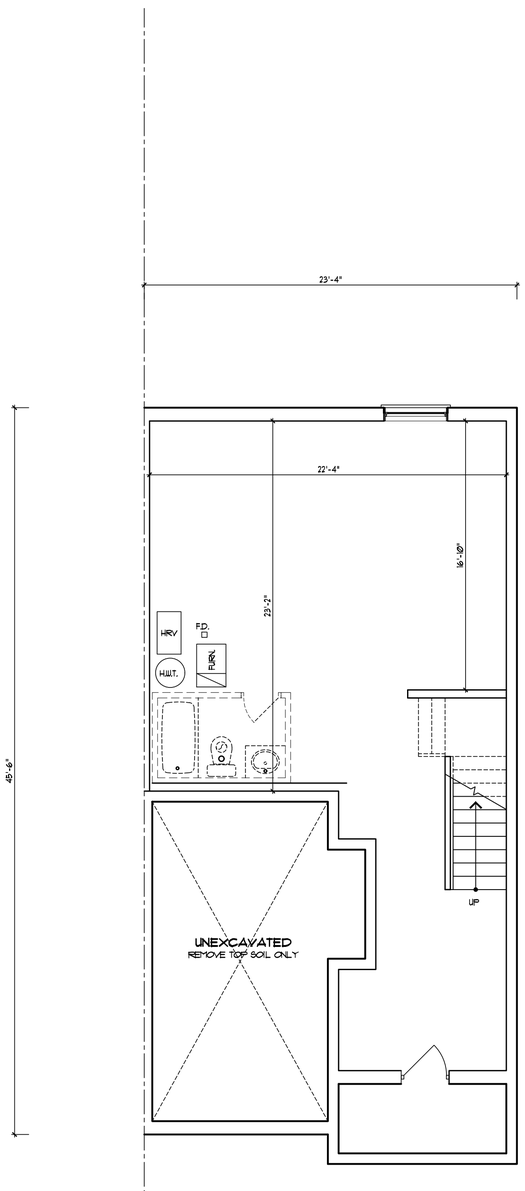
SHEET
Details

L-3

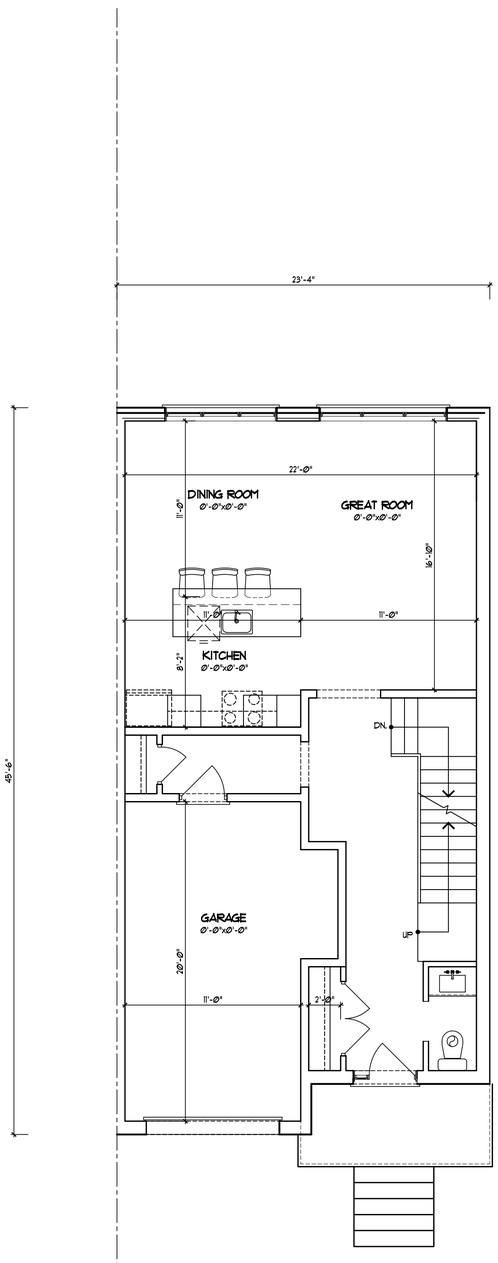
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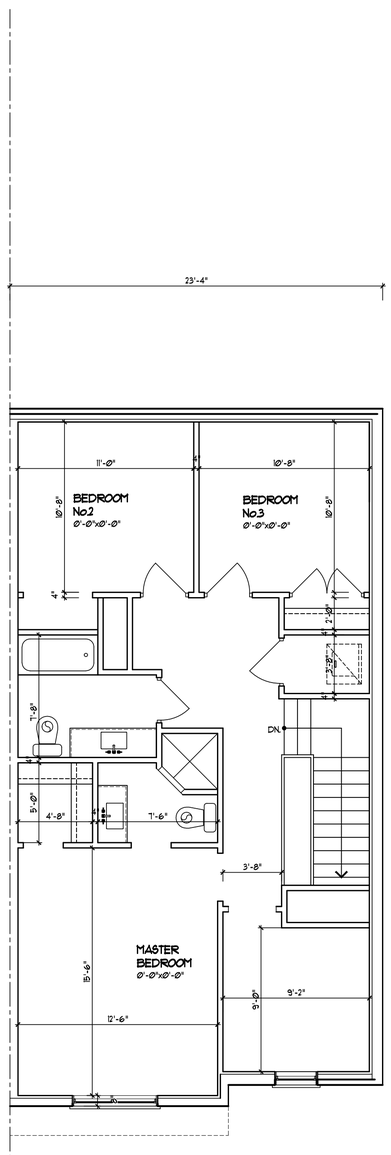
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BASEMENT FLOOR PLAN
FIRST FLR: 998 SQ.FT.
SECOND FLR 875 SQ.FT.
TOTAL: 1873 SQ.FT.



GROUND FLOOR PLAN
FIRST FLR: 998 SQ.FT.
SECOND FLR 875 SQ.FT.
TOTAL: 1873 SQ.FT.



SECOND FLOOR PLAN
FIRST FLR: 998 SQ.FT.
SECOND FLR 875 SQ.FT.
TOTAL: 1873 SQ.FT.

BASEMENT FLOOR PLAN

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

DRAWING TITLE:

FLOOR PLANS

P DEL DESIGN
4370 Steeles Avenue West,
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Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

QUALIFICATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

REGISTRATION INFORMATION
Required unless design is exempt under
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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O.

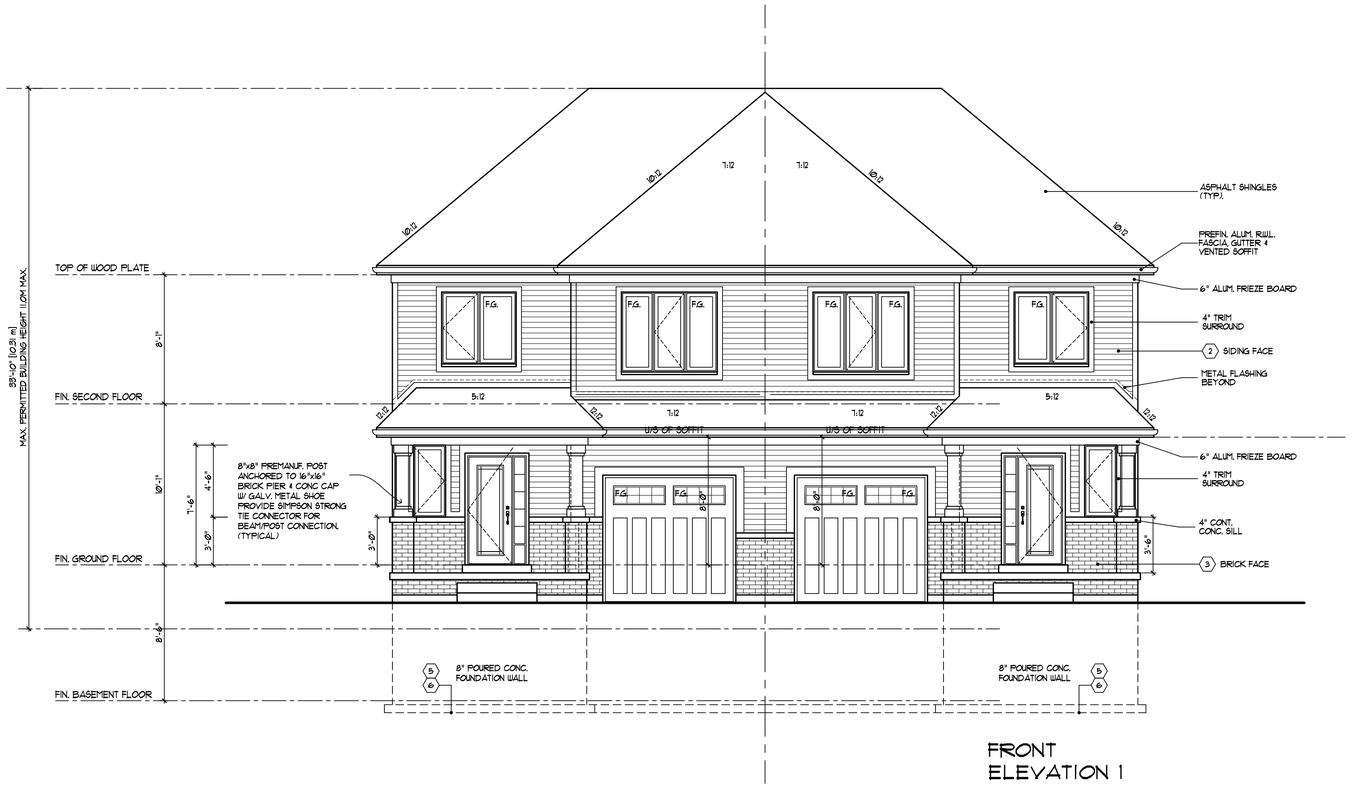
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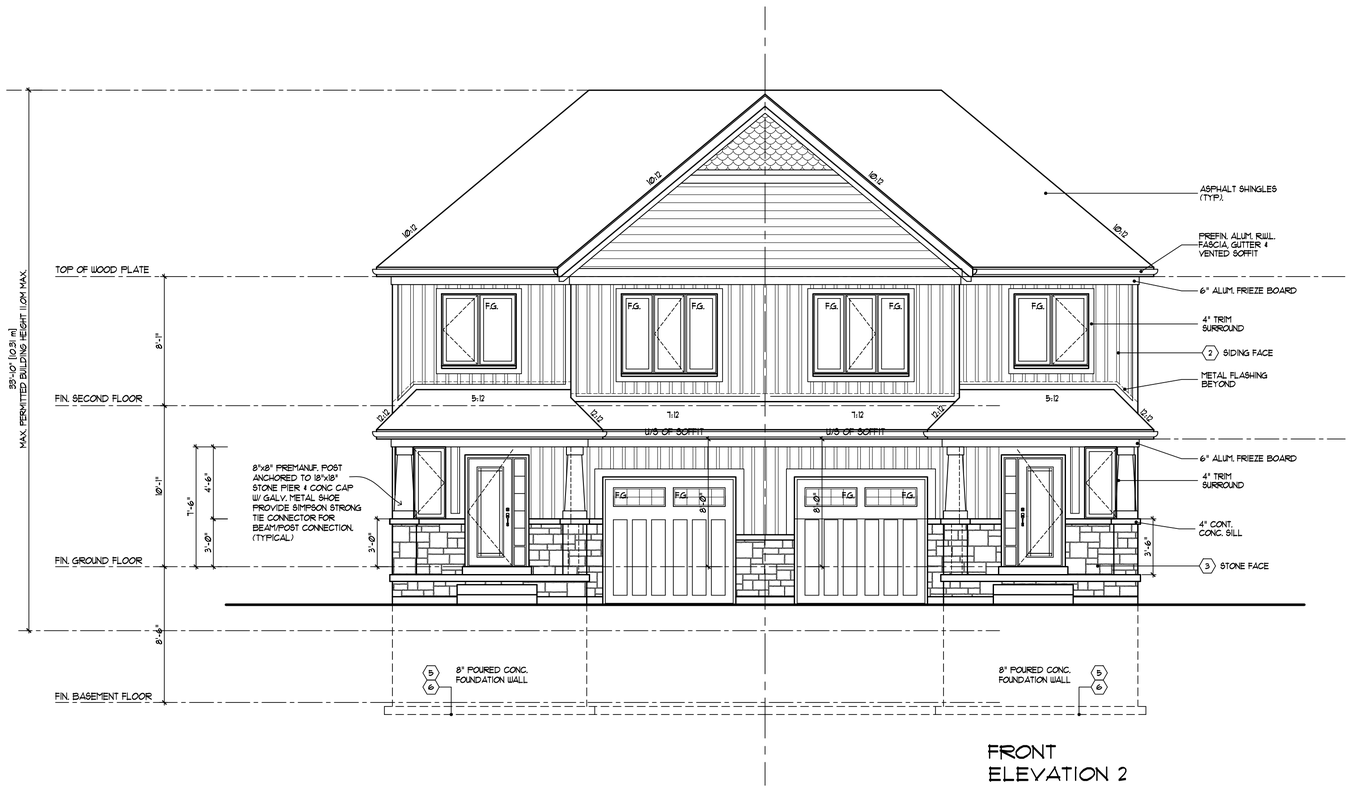
DRAWING No.:

A-01

PROJECT No.:



FRONT
ELEVATION 1



FRONT
ELEVATION 2

BASEMENT FLOOR PLAN

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NO:	DATE:	REVISION:

DRAWING TITLE:
FRONT ELEVATIONS

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Woodbridge, Ontario L4L 4Y4
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e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

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PETER DEL GROSSO 20567

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PETER DEL GROSSO 27288

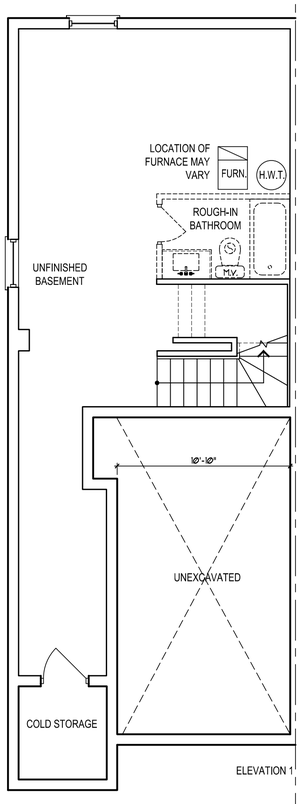
ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O.

PROJECT:

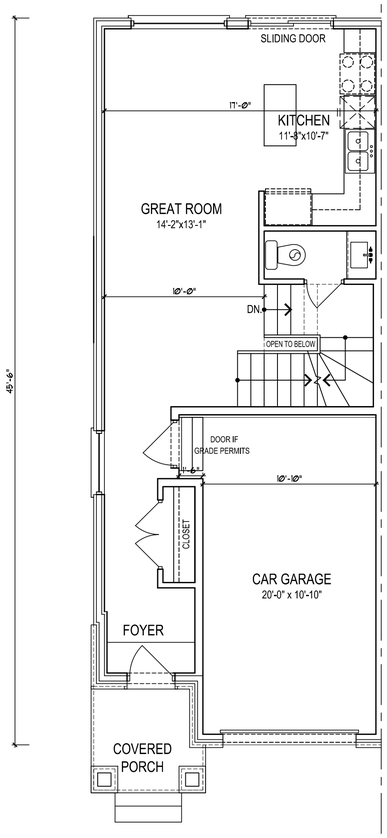
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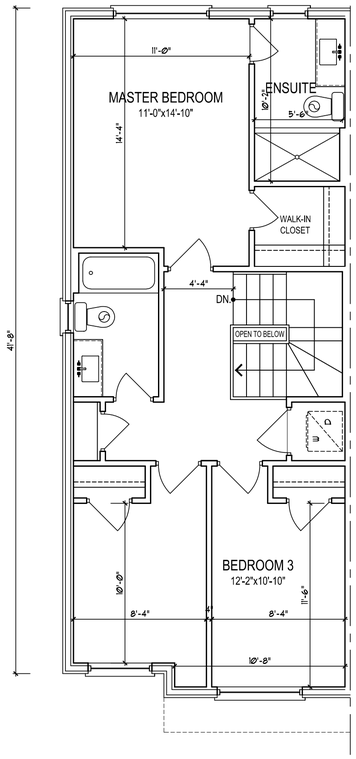
DRAWING No.:
A-01

PROJECT No.:



ELEVATION 1





FLOOR PLANS

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

AREA CALCULATION

GROUND FLOOR AREA	554	SQ. FT.
SECOND FLOOR AREA	768	SQ. FT.
SUBTOTAL	**1322**	**SQ. FT.**
	122.82	**M2**
DEDUCT ALL OPEN AREAS	0	SQ. FT.
TOTAL NET AREA	**1322**	**SQ. FT.**
	122.82	**M2**
FINISHED BSMT. AREA	0	SQ. FT.
COVERAGE W/O PORCH	796	SQ. FT.
	73.95	**M2**
COVERAGE W/PORCH	838	SQ. FT.
	77.85	**M2**

DRAWING TITLE:

END UNIT

P DEL DESIGN
4370 Steeles Avenue West,
Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

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PETER DEL GROSSO 20567

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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

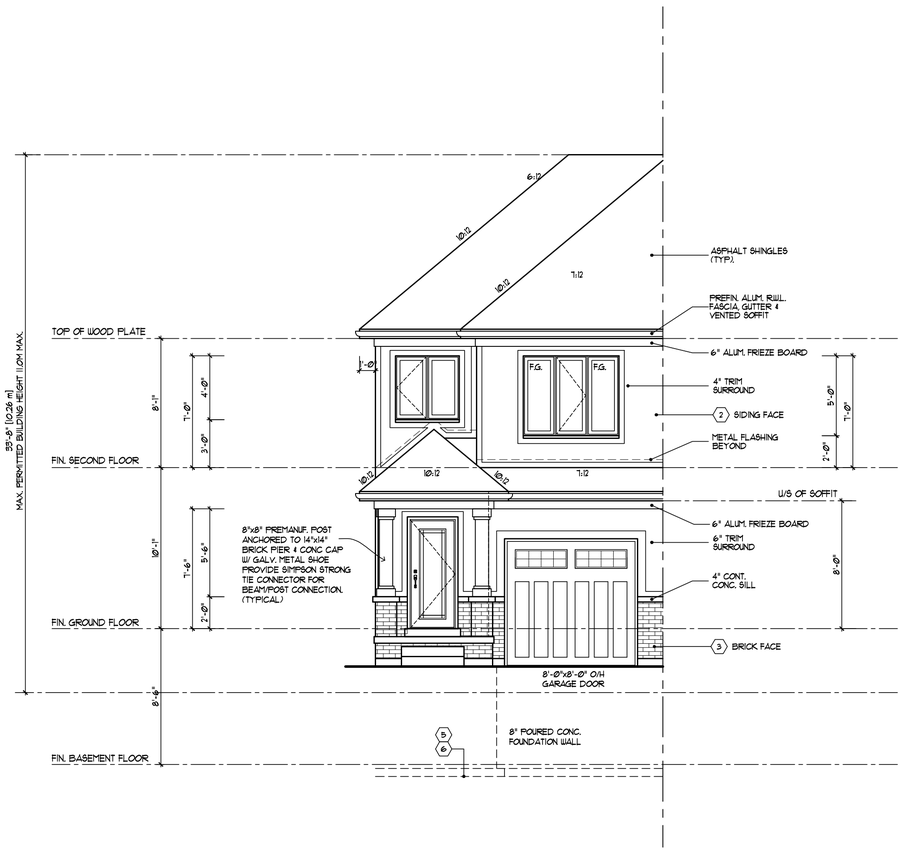
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SIMCOE, ONTARIO

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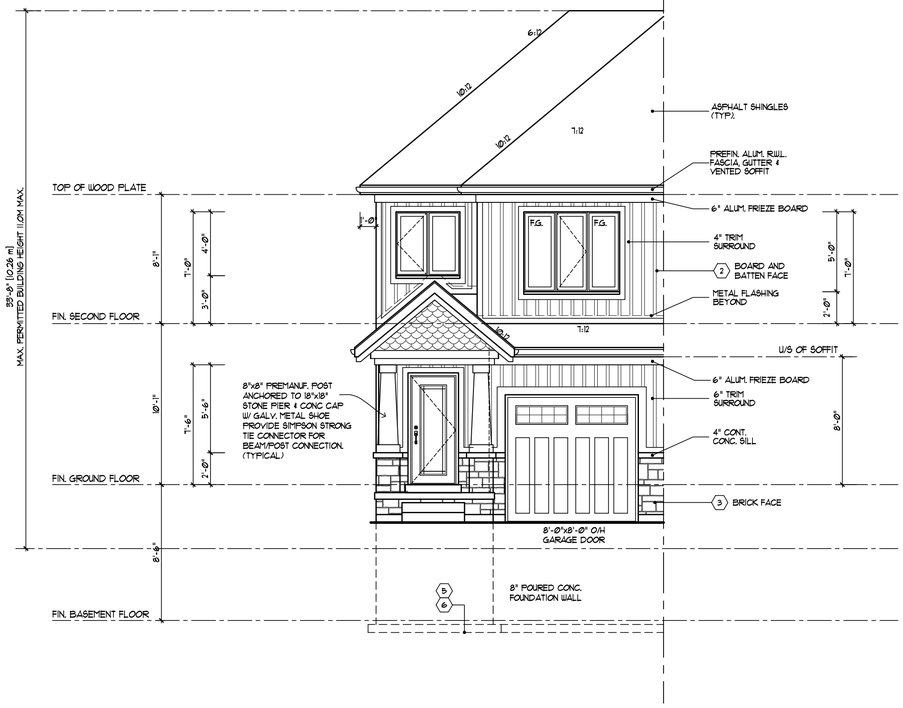
DRAWING No.:

A-01

PROJECT No.:



FRONT
ELEVATION 1



FRONT
ELEVATION 2

FRONT
ELEVATION

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

AREA CALCULATION

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SECOND FLOOR AREA	768	SQ. FT.
SUBTOTAL	**1322**	**SQ. FT.**
	122.82	**M2**
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COVERAGE W/O PORCH	796	SQ. FT.
	73.95	**M2**
COVERAGE W/PORCH	838	SQ. FT.
	77.85	**M2**

DRAWING TITLE:

END UNIT

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e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

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Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1322 SQ.FT.	**DATE:**	JAN. 2/26
SCALE:	3/16"=1'-0"	**DRAWN BY:**	PDG

DRAWING No.:

A-02

PROJECT No.:





FRONT
ELEVATION A

COMPLIANCE PACKAGE "A1"

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COVERAGE W/PORCH	838	SQ. FT.
	77.85	**M2**

DRAWING TITLE:

FRONT ELEVATION A

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e-mail: peterd@pdeldesign.ca
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Division C, Subsection 3.2.4 of The Building Code

PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	**DATE:**	JAN. 2/26
SCALE:	3/16"=1'-0"	**DRAWN BY:**	PDG

DRAWING No.:

A-04

PROJECT No.:





RIGHT SIDE
ELEVATION A

REFER TO TRUSS SHOP DWGS. FOR COMPLETE TRUSS LAYOUT AND SPECIFICATIONS

REFER TO JOIST MANUFACTURER'S SPECIFICATIONS FOR ALL TECHNICAL DETAILS & INFO.

ACTUAL FINISH GRADES MAY VARY DEPENDING ON LOT CONDITIONS. (REFER TO GRADING PLANS)

RAILING REQUIRED WHEN GRADE IS MORE THAN 2'-0"

COMPLIANCE PACKAGE "A1"

The Architectural Technologist is not responsible for the accuracy of survey, structural, mechanical, electrical, etc. engineering information shown on the drawing. Refer to the appropriate engineering drawings before proceeding with work.

Contractor shall check all dimensions on the work and report any discrepancy to the Architectural Technologist before proceeding. Construction must conform to all applicable Codes and Requirement of Authorities having Jurisdiction.

All drawings, specifications and related documents are the copyright property of Peter Del Grosso O/A 2493572 Ontario Inc. and must be returned upon request. Reproduction of drawings, specifications and related documents in part or whole is forbidden without the permission of Peter Del Grosso.

This drawing is not to be scaled.

This drawing is not to be used for construction unless signed by the Architectural Technologist.

NO.	DATE:	REVISION:

DRAWING TITLE:
RIGHT SIDE ELEVATION A

P DEL DESIGN
4370 Steeles Avenue West,
Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to design the work shown on the attached documents

QUALIFICATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

REGISTRATION INFORMATION
Required unless design is exempt under
Division C, Subsection 3.2.4 of The Building Code

PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:
PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	DATE:	JAN. 2/26
SCALE:	3/16"=1'-0"	DRAWN BY:	PDG

DRAWING No.:
A-05

PROJECT No.:





LEFT SIDE
ELEVATION A

COMPLIANCE PACKAGE "A1"

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NO:	DATE:	REVISION:

DRAWING TITLE:

LEFT SIDE ELEVATION A

P DEL DESIGN
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Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
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PETER DEL GROSSO 20567

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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O.

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	DATE:	JAN. 2/26
SCALE:	3/16"=1'-0"	DRAWN BY:	PDG

DRAWING No.:

A-06

PROJECT No.:



FLOOR PLANS

COMPLIANCE PACKAGE "A1"

The Architectural Technologist is not responsible for the accuracy of survey, structural, mechanical, electrical, etc. engineering information shown on the drawing. Refer to the appropriate engineering drawings before proceeding with work.

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NO:	DATE:	REVISION:

AREA CALCULATION

GROUND FLOOR AREA	561	SQ. FT.
SECOND FLOOR AREA	777	SQ. FT.
SUBTOTAL	**1338**	**SQ. FT.**
	124.30	**M2**
DEDUCT ALL OPEN AREAS	0	SQ. FT.
TOTAL NET AREA	**1338**	**SQ. FT.**
	124.30	**M2**
FINISHED BSMT. AREA	0	SQ. FT.
COVERAGE W/O PORCH	794	SQ. FT.
	73.77	**M2**
COVERAGE W/PORCH	829	SQ. FT.
	77.02	**M2**

DRAWING TITLE:

INTERIOR UNIT

P DEL DESIGN
4370 Steeles Avenue West,
Suite 203
Woodbridge, Ontario L4L 4Y4
T: 416 453 9985
e-mail: peterd@pdeldesign.ca
www.pdeldesign.ca

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QUALIFICATION INFORMATION
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Division C, Subsection 3.2.5 of The Building Code

PETER DEL GROSSO 20567

REGISTRATION INFORMATION
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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

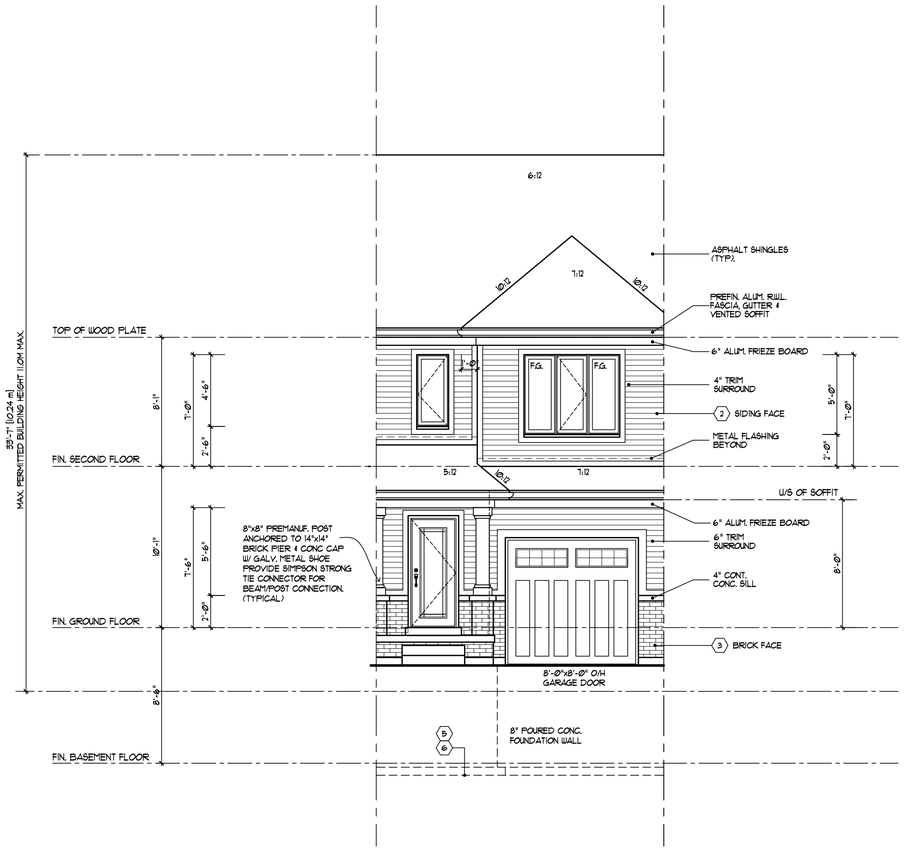
16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	**DATE:**	JAN. 2/26
SCALE:	3/16"=1'-0"	**DRAWN BY:**	PDG

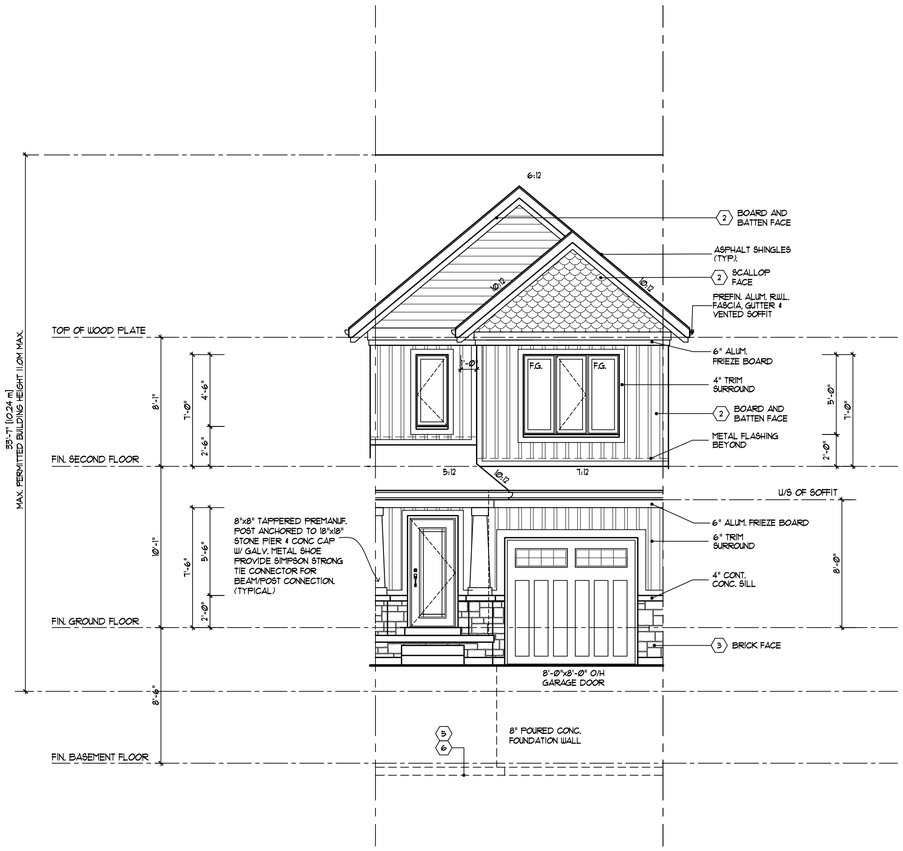
DRAWING No.:

A-01

PROJECT No.:



FRONT
ELEVATION 1



FRONT
ELEVATION 2

FRONT
ELEVATION

COMPLIANCE PACKAGE "A1"

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DRAWING TITLE:

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PETER DEL GROSSO 27288

ASSOCIATION OF ARCHITECTURAL TECHNOLOGISTS OF ONTARIO
BCIN 20567
PETER DEL GROSSO, M.A.A.T.O

PROJECT:

PROPOSED 2 STOREY TOWNHOUSE

16 FERNWOOD DRIVE
SIMCOE, ONTARIO

AREA:	1338 SQ.FT.	DATE:	JAN. 2/26
SCALE:	3/16"=1'-0"	DRAWN BY:	PDG

DRAWING No.:

A-02

PROJECT No.:

TOPOGRAPHIC SITE PLAN
OF PART OF
LOT 18
CONCESSION GORE
IN THE GEOGRAPHIC
TOWNSHIP OF WOODHOUSE
IN
NORFOLK COUNTY
SCALE: 1 : 250

2.5 0 10 METRES

JEWITT AND DIXON LTD.

METRIC NOTE:
DISTANCES AND COORDINATES ARE IN METRES AND CAN BE CONVERTED TO IMPERIAL BY DIVIDING BY 0.3048

LOT 33 | LOT 32 | REGISTERED PLAN 1022 LOT 31 | LOT 30 | LOT 29 | LOT 28 | LOT 27 | LOT 26 | LOT 10

PART 33, 37R-900 | PART 32, 37R-900 | PART 31, 37R-900 | PART 30, 37R-900 | PART 29, 37R-900 | PART 28, 37R-900 | PART 27, 37R-900 | PART 26, 37R-900 | PART 1, 37R-1852

N81°07'00"E

136.794

REGISTERED PLAN 37M-89

LOT 9 | LOT 8 | LOT 7 | LOT 6 | LOT 5 | LOT 4 | LOT 1 | LOT 2 REGISTERED PLAN 37M-40

N15°58'50"W

N15°58'50"W

BLOCK 6

FERNWOOD DRIVE
(PLAN 37M-89)

BLOCK 77

LOT 18

PART 1, PLAN 37R-11246

UNIT 69 | UNIT 70 | UNIT 71 NORFOLK VACANT CONDOMINIUM PLAN No. 40 UNIT 1

CONCESSION GORE

128.534

130.034

N79°01'20"E

PART 13, PLAN 37R-10637 | PART 12, PLAN 37R-10637

135.874

118.837

1.149

4.936

N15°34'20"W
6.155

PART 1, PLAN 37R-11246
PART 11, PLAN 37R-10637
PART 4, PLAN 37R-10637
PART 2, PLAN 37R-10637

LOT 13 | LOT 12

LOT 19

PART 1, PLAN 37R-10637
SUBJECT TO RIGHT-OF-WAY AS IN NR343279

CONCESSION GORE

DATED: NOVEMBER 24, 2025

JASON ELLIOTT, O.L.S.

CAUTION

THIS IS NOT A PLAN OF SURVEY, BOUNDARY INFORMATION HAS BEEN COMPILED FROM AVAILABLE SURVEY RECORDS

LEGEND

LOT LINES	SHOWN	
DEED LINES	SHOWN	
FENCE LINES	SHOWN	-X-X-X-X-
ROAD LINES	SHOWN	
BELL/FIBRE BOX OR PEDESTAL	SHOWN	BXP
BENCH MARK	SHOWN	BM
CATCH BASIN	SHOWN	CB
HYDRO VAULT	SHOWN	HV
OVERHEAD HYDRO LINE	SHOWN	O/H
FIRE HYDRANT	SHOWN	FH
TEST WELL	SHOWN	TW
GAS METER/PLANT	SHOWN	GM
MANHOLE	SHOWN	MH
DECIDUOUS TREE	SHOWN	TRD
CONTROL POINT – MAGNETIC NAIL	SHOWN	MAG
CONTROL POINT – IRON BAR	SHOWN	IB

NOTES:

BEARINGS ARE UTM GRID AND WERE DERIVED FROM OBSERVED REFERENCE POINTS AS SHOWN AND DESCRIBED ON PLAN 37R-11246

DISTANCES ARE ADJUSTED GROUND LEVEL DISTANCES AND CAN BE CONVERTED TO GRID AS SHOWN AND DESCRIBED ON PLAN 37R-11246

ALL MONUMENTS SHOWN HEREON ARE (700) UNLESS OTHERWISE SHOWN

ELEVATIONS ARE REFERRED TO CANADIAN GEODETIC DATUM, NAD83 (CSRS) HT-2.0 (2010) (CGVD28)

THIS SKETCH WAS COMPLETED FROM FIELD WORK COMPLETED ON THE 21ST DAY OF NOVEMBER, 2025

JEWITT AND DIXON SURVEYING MAPPING GIS
ONTARIO LAND SURVEYORS
A Division of Kim Husted Surveying Ltd.
650 Ireland Rd., Simcoe, ON N3Y 4K2
T: (519) 426-0842 www.jdsurnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
J.L.M.	K.H.	25-54-336-00
		DATED: NOVEMBER 24, 2025

PLAN OF SURVEY
PART OF LOTS 13 & 18
GORE CONCESSION
(GEOGRAPHIC TOWNSHIP OF WOODHOUSE)
NORFOLK COUNTY

THOMPSON ROAD

FERNWOOD DRIVE

REG'D PLAN No. 1022

LOT 33 | LOT 32 | LOT 31 | LOT 30 | LOT 29 | LOT 28 | LOT 27 | LOT 26

PIN 50220-0150(LT) | PIN 50220-0149(LT) | PIN 50220-0148(LT) | PIN 50220-0147(LT) | PIN 50220-0146(LT) | PIN 50220-0145(LT) | PIN 50220 - 0144 (LT)

PART 25, 37R-1100 | PART 26, 37R-1100 | PART 27, 37R-1100 | PART 28, 37R-1100 | PART 29, 37R-1100 | PART 30, 37R-1100 | PART 31, 37R-1100 | PART 32, 37R-1100

N81°07'E meas. (N78°41'30"E P2, N81°07'E P4, N80°35'E D1)

61.140 P4 & int | 136.794 D1 & meas. (136.828 P4)

31.235 P2, P4 & meas.

SIB | SIB (18807) (MT) | 1.000 x 0.400 meas.

1.5m HIGH BOARD FENCE 0.05 S'ly

16.988

N81°07'E 16.988

1.5m HIGH CHAIN LINK FENCE 0.23 N'ly

1.5m HIGH CHAIN LINK FENCE 0.15 W'ly | 0.15 W'ly

1.6m HIGH WROUGHT IRON FENCE 0.08 W'ly

1.5m HIGH CHAIN LINK FENCE 0.02 S'ly

RAILWAY TIE 0.18 S'ly

RAILWAY TIE 0.09 S'ly

POST WIRE FENCE 0.11 N'ly

POST WIRE FENCE 0.23 W'ly

PART 3

PIN 50220-0144(LT)

LOT 80
0.305 RESERVE

LOT 1
PIN 50220-0368(LT)

LOT 2
PIN 50220-0369(LT)

REG'D PLAN No. 1022

BLOCK 6
0.300 RESERVE
PIN 50220-0373(LT)

BLOCK 7
0.300 RESERVE
PIN 50220-0374(LT)

FERNWOOD DRIVE

LOT 18

GORE CONCESSION

PART 1
PIN 50220-0290(LT)

CONDO BLOCK 50840
VACANT LAND CONDOMINIUM PLAN No. 40

N15°52'W 135.874 meas. (135.920 P1, 136.794 D1)

PART 13, 37R-10637

31.177 meas. (31.100 P1)

SIB

PART 14, 37R-10637

PIN 50220-0289(LT)

LOT 19

PART 12, 37R-10637

N79°01'20"E meas. overall (N79°E P1, N78°30"E D1)

PART 1, 37R-10637

SOUTHEAST CORNER LOT 18

N15°52'W 118.837 meas. (N15°52'W P4, N15°52'W P5, N15°52'W 118.837 D1)

2.0m HIGH BOARD FENCE 0.18 E'ly

PART 4, 37R-10637

PIN 50220-0290(LT)

PART 11, 37R-10637

2.0m HIGH BOARD FENCE 0.17 W'ly 0.04 S'ly

2.0m HIGH BOARD FENCE 0.24 W'ly

52.071 P1 & meas.

PART 10, 37R-10637

LOT 5
0.300 RESERVE
PIN 50220-0336(LT)

PART 2

PIN 50220-0335(LT)

N78°36'50"E P1, P5 rst. & meas. overt 170.783 meas. overall (N78°34'30"E P1, P3, N78°34'30"E 170.810 P5, N78°02'E 170.810 D1)

123.203 P1 & meas.

N78°35'20"E P1, P5 rst. & meas. overall (N78°33'E P1, P5, N78°02'E D1) 170.810 P1, P3, D1 & meas. overall

85.235 P1 & meas.

PART 5, 37R-10637

PIN 50220-0289(LT)

PART 2, 37R-10637

PART 1, 37R-10637

GORE CONCESSION

PART 3, 37R-10637

LOT 13

2.0m HIGH BOARD FENCE 0.07 W'ly

14.021 P1 & meas.

PART 9, 37R-10637

PART 8, 37R-10637

33.457 meas. (33.504 P3)

33.586 P1 & meas.

PART 6, 37R-10637

PIN 50220-0290(LT)

PART 7, 37R-10637

N15°52'W 49.191 P3 rst. & int. (N15°52'W P3 rst. & int. D1)

OAK STREET
(CLOSED BY BY-LAW No. 1000)
PIN 50221-0001(LT)

LOT 9

LOT 8
PIN 50220-0274(LT)

LOT 7
PIN 50220-0273(LT)

1.5m HIGH CHAIN LINK FENCE 0.28 E'ly

1.5m HIGH CHAIN LINK FENCE 0.09 E'ly

POST WIRE FENCE IN DISREPAIR 0.05 E'ly

POST WIRE FENCE IN DISREPAIR 0.54 W'ly

REG'D PLAN No. 1095

LOT 6
PIN 50220-0272(LT)

LOT 5
PIN 50220-0271(LT)

LOT 4
PIN 50220-0270(LT)

LOT 1
PIN 50220-0332(LT)

REG'D PLAN No. 37M-40

LOT 2
PIN 50220-0333(LT)

LOT 3

LOT 12 | LOT 13 | LOT 14

LOT 3 | LOT 2 | LOT 1

LEE AVENUE

NORRIS STREET

LOT 15
PIN 50220-0331(LT)

GORE CONCESSION

LOT 18

LOT 19

SCHEDULE – LAND TITLES

PART	LOT	CONCESSION	P.I.N.	AREA (m²)	NAME OF MOST RECENT TRANSFEREE
1	PART OF LOT 18	GORE	ALL OF 50220-0290(LT)	17,272.1	BREMONT (NORFOLK) CORPORATION
2	PART OF LOT 13			191.1	
3	PART OF LOT 18			9.9	

CO-ORDINATE SCHEDULE

POINT ID.	NORTHING	EASTING
A	4742012.723	555641.739
B	4742077.162	555941.067
C	4742158.803	555741.046
D	4742132.867	555575.114

ALL CO-ORDINATES ARE IN METRES, ARE REFERRED TO UTM ZONE-17 (81°W LONGITUDE) NAD83 (CSRS) EPOCH 2010.0 AND HAVE A RELATIVE ACCURACY OF ± 0.10m. THE REQUIREMENTS OF AN URBAN AREA AT 95% CONFIDENCE LEVEL.
THE CO-ORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH THE CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT
DATE : AUGUST 16, 2019
BRENT LAROCQUE O.L.S

PLAN 37R -11246
RECEIVED AND DEPOSITED
DATE : Sept 24, 2019
REPRESENTATIVE FOR THE LAND REGISTRAR FOR THE LAND TITLES DIVISION OF NORFOLK (No. 37)

SCALE 1:250 METRIC
5m 0 5m 10m

LEGEND

●—	DENOTES SURVEY MONUMENT FOUND
—○—	DENOTES SURVEY MONUMENT PLANTED
CP	DENOTES CONCRETE PLUG
IB	DENOTES IRON BAR
SIB	DENOTES STANDARD IRON BAR
SIB	DENOTES STANDARD IRON BAR
(700)	DENOTES H. V. JEWITT, O.L.S.
(18807)	DENOTES M. W. YEO, O.L.S.
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
meas.	DENOTES MEASURED
REG'D	DENOTES REGISTERED
P1	DENOTES REFERENCE PLAN BEARING COMPARISON
P1	DENOTES REFERENCE PLAN No. 37R-10637 (0°02'20" COUNTER-CLOCKWISE)
P2	DENOTES REGISTERED PLAN No. 37M-76
P3	DENOTES REGISTERED PLAN No. 37M-40
P4	DENOTES REGISTERED PLAN No. 1022
P5	DENOTES REFERENCE PLAN No. 37R-8623 (0°02'20" COUNTER-CLOCKWISE)
P6	DENOTES REGISTERED PLAN No. 1095
D1	DENOTES INSTRUMENT No. NR459578

BEARING NOTE

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED REFERENCE POINTS (A) AND (B) BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN, 81°00'W LONGITUDE, ZONE 17, UTM 3° TRANSVERSE MERCATOR (3° UTM). THESE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERENCE SYSTEM.

FOR BEARING COMPARISONS, A ROTATION EITHER COUNTER-CLOCKWISE OR CLOCKWISE WAS APPLIED TO THE BEARINGS AS SHOWN IN THE LEGEND.

METRIC NOTE

DISTANCES AND CO-ORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND LEVEL DISTANCES AND CAN BE USED TO DERIVE GRID CO-ORDINATES BY MULTIPLYING THE DISTANCES BY A COMBINED SCALE FACTOR OF 0.99983833.

GENERAL NOTES

1. ALL FOUND MONUMENTS ARE (700) UNLESS SHOWN OTHERWISE.
2. ALL PLANTED MONUMENTS ARE IRON BARS UNLESS SHOWN OTHERWISE.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYORS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THIS SURVEY WAS COMPLETED ON THE 30th DAY OF MAY, 2019.

O.L.S.
AUGUST 16th 2019 BRENT LAROCQUE

RICHARD LAROCQUE LIMITED
ONTARIO LAND SURVEYORS & CONSULTANTS
12 LYMAN STREET, ST. CATHARINES, ONTARIO
905-688-1413
6385 COLBORNE STREET, NIAGARA FALLS, ONTARIO
905-358-8400
www.larocquegroup.ca

DATE : AUGUST 16, 2019 FILE No. : 2018-097
DWG.FILE : 2018-097-11

X-2067

PLAN OF SURVEY
PART OF LOTS 13 & 18
GORE CONCESSION
(GEOGRAPHIC TOWNSHIP OF WOODHOUSE)
NORFOLK COUNTY

THOMPSON ROAD

FERNWOOD DRIVE

REG'D PLAN No. 1022

LOT 33 | LOT 32 | LOT 31 | LOT 30 | LOT 29 | LOT 28 | LOT 27 | LOT 26

PIN 50220-0150(LT) | PIN 50220-0149(LT) | PIN 50220-0148(LT) | PIN 50220-0147(LT) | PIN 50220-0146(LT) | PIN 50220-0145(LT) | PIN 50220 - 0144 (LT)

PART 25, 37R-1100 | PART 26, 37R-1100 | PART 27, 37R-1100 | PART 28, 37R-1100 | PART 29, 37R-1100 | PART 30, 37R-1100 | PART 31, 37R-1100 | PART 32, 37R-1100

N81°07'E meas. (N78°41'30"E P2, N81°07'E P4, N80°35'E D1)

61.140 P4 & int | 136.794 D1 & meas. (136.828 P4)

31.235 P2, P4 & meas.

SIB | SIB (18807) (MT) | 1.000 x 0.400 meas.

1.5m HIGH BOARD FENCE 0.05 S'ly

16.988

N81°07'E 16.988

1.5m HIGH CHAIN LINK FENCE 0.23 N'ly

1.5m HIGH CHAIN LINK FENCE 0.15 W'ly | 0.15 W'ly

1.6m HIGH WROUGHT IRON FENCE 0.08 W'ly

1.5m HIGH CHAIN LINK FENCE 0.02 S'ly

RAILWAY TIE 0.18 S'ly

RAILWAY TIE 0.09 S'ly

POST WIRE FENCE 0.11 N'ly

POST WIRE FENCE 0.23 W'ly

PART 3

PIN 50220-0144(LT)

LOT 80
0.305 RESERVE

LOT 1
PIN 50220-0368(LT)

LOT 2
PIN 50220-0369(LT)

REG'D PLAN No. 1022

BLOCK 6
0.300 RESERVE
PIN 50220-0373(LT)

BLOCK 7
0.300 RESERVE
PIN 50220-0374(LT)

FERNWOOD DRIVE

LOT 18

GORE CONCESSION

PART 1
PIN 50220-0290(LT)

CONDO BLOCK 50840
VACANT LAND CONDOMINIUM PLAN No. 40

N15°52'W 135.874 meas. (135.920 P1, 136.794 D1)

PART 13, 37R-10637

31.177 meas. (31.100 P1)

SIB

PART 14, 37R-10637

PIN 50220-0289(LT)

LOT 19

PART 12, 37R-10637

N79°01'20"E meas. overall (N79°E P1, N78°30"E D1)

PART 1, 37R-10637

SOUTHEAST CORNER LOT 18

N15°52'W 118.837 meas. (N15°52'W P4, N15°52'W P5, N15°52'W 118.837 D1)

2.0m HIGH BOARD FENCE 0.18 E'ly

PART 4, 37R-10637

PIN 50220-0290(LT)

PART 11, 37R-10637

2.0m HIGH BOARD FENCE 0.17 W'ly 0.04 S'ly

2.0m HIGH BOARD FENCE 0.24 W'ly

52.071 P1 & meas.

PART 10, 37R-10637

LOT 5
0.300 RESERVE
PIN 50220-0336(LT)

PART 2

PIN 50220-0335(LT)

N78°36'50"E P1, P5 rst. & meas. overt 170.783 meas. overall (N78°34'30"E P1, P3, N78°34'30"E 170.810 P5, N78°02'E 170.810 D1)

123.203 P1 & meas.

N78°35'20"E P1, P5 rst. & meas. overall (N78°33'E P1, P5, N78°02'E D1) 170.810 P1, P3, D1 & meas. overall

85.235 P1 & meas.

PART 5, 37R-10637

PIN 50220-0289(LT)

PART 2, 37R-10637

PART 1, 37R-10637

GORE CONCESSION

PART 3, 37R-10637

LOT 13

2.0m HIGH BOARD FENCE 0.07 W'ly

14.021 P1 & meas.

PART 9, 37R-10637

PART 8, 37R-10637

33.457 meas. (33.504 P3)

33.586 P1 & meas.

PART 6, 37R-10637

PIN 50220-0290(LT)

PART 7, 37R-10637

N15°52'W 49.191 P3 rst. & int. (N15°52'W P3 rst. & int. D1)

OAK STREET
(CLOSED BY BY-LAW No. 1000)
PIN 50221-0001(LT)

LOT 9

LOT 8
PIN 50220-0274(LT)

LOT 7
PIN 50220-0273(LT)

1.5m HIGH CHAIN LINK FENCE 0.28 E'ly

1.5m HIGH CHAIN LINK FENCE 0.09 E'ly

POST WIRE FENCE IN DISREPAIR 0.05 E'ly

POST WIRE FENCE IN DISREPAIR 0.54 W'ly

REG'D PLAN No. 1095

LOT 6
PIN 50220-0272(LT)

LOT 5
PIN 50220-0271(LT)

LOT 4
PIN 50220-0270(LT)

LOT 1
PIN 50220-0332(LT)

REG'D PLAN No. 37M-40

LOT 2
PIN 50220-0333(LT)

LOT 3

LOT 12 | LOT 13 | LOT 14

LOT 3 | LOT 2 | LOT 1

LEE AVENUE

NORRIS STREET

LOT 15
PIN 50220-0331(LT)

GORE CONCESSION

LOT 18

LOT 19

SCHEDULE – LAND TITLES

PART	LOT	CONCESSION	P.I.N.	AREA (m²)	NAME OF MOST RECENT TRANSFEREE
1	PART OF LOT 18	GORE	ALL OF 50220-0290(LT)	17,272.1	BREMONT (NORFOLK) CORPORATION
2	PART OF LOT 13			191.1	
3	PART OF LOT 18			9.9	

CO-ORDINATE SCHEDULE

POINT ID.	NORTHING	EASTING
A	4742012.723	555641.739
B	4742077.162	555941.067
C	4742158.803	555741.046
D	4742132.867	555575.114

ALL CO-ORDINATES ARE IN METRES, ARE REFERRED TO UTM ZONE-17 (81°W LONGITUDE) NAD83 (CSRS) EPOCH 2010.0 AND HAVE A RELATIVE ACCURACY OF ± 0.10m. THE REQUIREMENTS OF AN URBAN AREA AT 95% CONFIDENCE LEVEL.
THE CO-ORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH THE CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT
DATE : AUGUST 16, 2019
BRENT LAROCQUE O.L.S

PLAN 37R -11246
RECEIVED AND DEPOSITED
DATE : Sept 24, 2019
REPRESENTATIVE FOR THE LAND REGISTRAR FOR THE LAND TITLES DIVISION OF NORFOLK (No. 37)

SCALE 1:250 METRIC
5m 0 5m 10m

LEGEND

●—	DENOTES SURVEY MONUMENT FOUND
—○—	DENOTES SURVEY MONUMENT PLANTED
CP	DENOTES CONCRETE PLUG
IB	DENOTES IRON BAR
SIB	DENOTES STANDARD IRON BAR
SIB	DENOTES STANDARD IRON BAR
(700)	DENOTES H. V. JEWITT, O.L.S.
(18807)	DENOTES M. W. YEO, O.L.S.
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
meas.	DENOTES MEASURED
REG'D	DENOTES REGISTERED
P1	DENOTES REFERENCE PLAN BEARING COMPARISON
P1	DENOTES REFERENCE PLAN No. 37R-10637 (0°02'20" COUNTER-CLOCKWISE)
P2	DENOTES REGISTERED PLAN No. 37M-76
P3	DENOTES REGISTERED PLAN No. 37M-40
P4	DENOTES REGISTERED PLAN No. 1022
P5	DENOTES REFERENCE PLAN No. 37R-8623 (0°02'20" COUNTER-CLOCKWISE)
P6	DENOTES REGISTERED PLAN No. 1095
D1	DENOTES INSTRUMENT No. NR459578

BEARING NOTE

BEARINGS HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVED REFERENCE POINTS (A) AND (B) BY REAL-TIME NETWORK OBSERVATIONS (LEICA SMARTNET) AND ARE REFERRED TO THE CENTRAL MERIDIAN, 81°00'W LONGITUDE, ZONE 17, UTM 3° TRANSVERSE MERCATOR (3° UTM). THESE VALUES ARE NAD83 (CSRS v6) EPOCH 2010.0 REFERENCE SYSTEM.

FOR BEARING COMPARISONS, A ROTATION EITHER COUNTER-CLOCKWISE OR CLOCKWISE WAS APPLIED TO THE BEARINGS AS SHOWN IN THE LEGEND.

METRIC NOTE

DISTANCES AND CO-ORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND LEVEL DISTANCES AND CAN BE USED TO DERIVE GRID CO-ORDINATES BY MULTIPLYING THE DISTANCES BY A COMBINED SCALE FACTOR OF 0.99983833.

GENERAL NOTES

1. ALL FOUND MONUMENTS ARE (700) UNLESS SHOWN OTHERWISE.
2. ALL PLANTED MONUMENTS ARE IRON BARS UNLESS SHOWN OTHERWISE.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

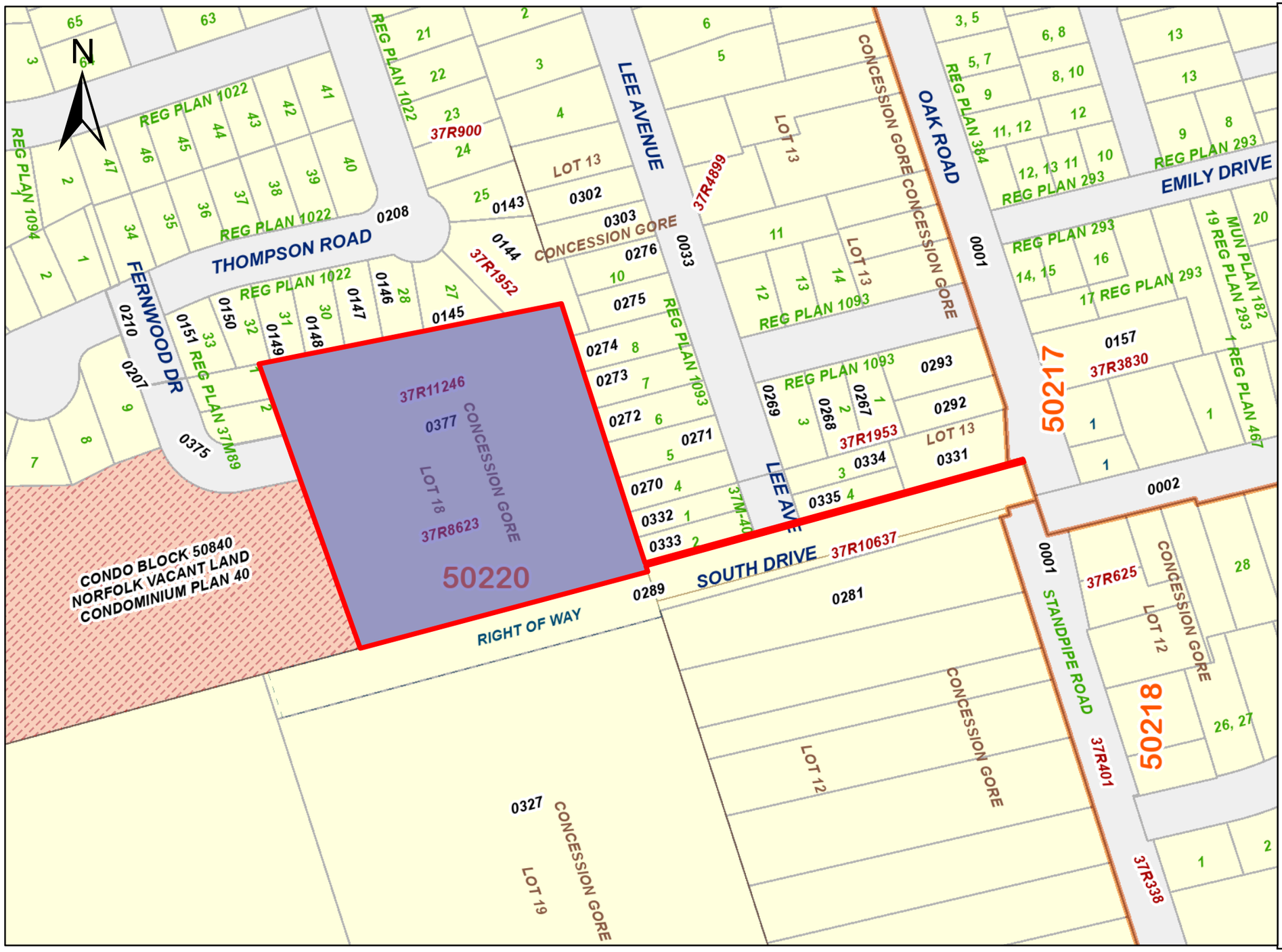
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYORS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THIS SURVEY WAS COMPLETED ON THE 30th DAY OF MAY, 2019.

O.L.S.
AUGUST 16th 2019 BRENT LAROCQUE

RICHARD LAROCQUE LIMITED
ONTARIO LAND SURVEYORS & CONSULTANTS
12 LYMAN STREET, ST. CATHARINES, ONTARIO
905-688-1413
6385 COLBORNE STREET, NIAGARA FALLS, ONTARIO
905-358-8400
www.larocquegroup.ca

DATE : AUGUST 16, 2019 FILE No. : 2018-097
DWG.FILE : 2018-097-11

X-2067



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FOR CRAIG

SCALE

0 20 40 60 80 meters

PROPERTY INDEX MAP

NORFOLK(No. 37)

LEGEND

FREEHOLD PROPERTY	
LEASEHOLD PROPERTY	
LIMITED INTEREST PROPERTY	
CONDOMINIUM PROPERTY	
RETIRED PIN (MAP UPDATE PENDING)	
PROPERTY NUMBER	*0449*
BLOCK NUMBER	**08050**
GEOGRAPHIC FABRIC	
EASEMENT	

THIS IS NOT A PLAN OF SURVEY

NOTES

REVIEW THE TITLE RECORDS FOR COMPLETE PROPERTY INFORMATION AS THIS MAP MAY NOT REFLECT RECENT REGISTRATIONS

THIS MAP WAS COMPILED FROM PLANS AND DOCUMENTS RECORDED IN THE LAND REGISTRATION SYSTEM AND HAS BEEN PREPARED FOR PROPERTY INDEXING PURPOSES ONLY

FOR DIMENSIONS OF PROPERTIES BOUNDARIES SEE RECORDED PLANS AND DOCUMENTS

ONLY MAJOR EASEMENTS ARE SHOWN

REFERENCE PLANS UNDERLYING MORE RECENT REFERENCE PLANS ARE NOT ILLUSTRATED

Ontario

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MAP A

CONTEXT MAP

Geographic Township of WOODHOUSE

28CDPL2026029
ZNPL2026028



4/17/2026

Legend

Subject Lands

2025 Air Photo

N

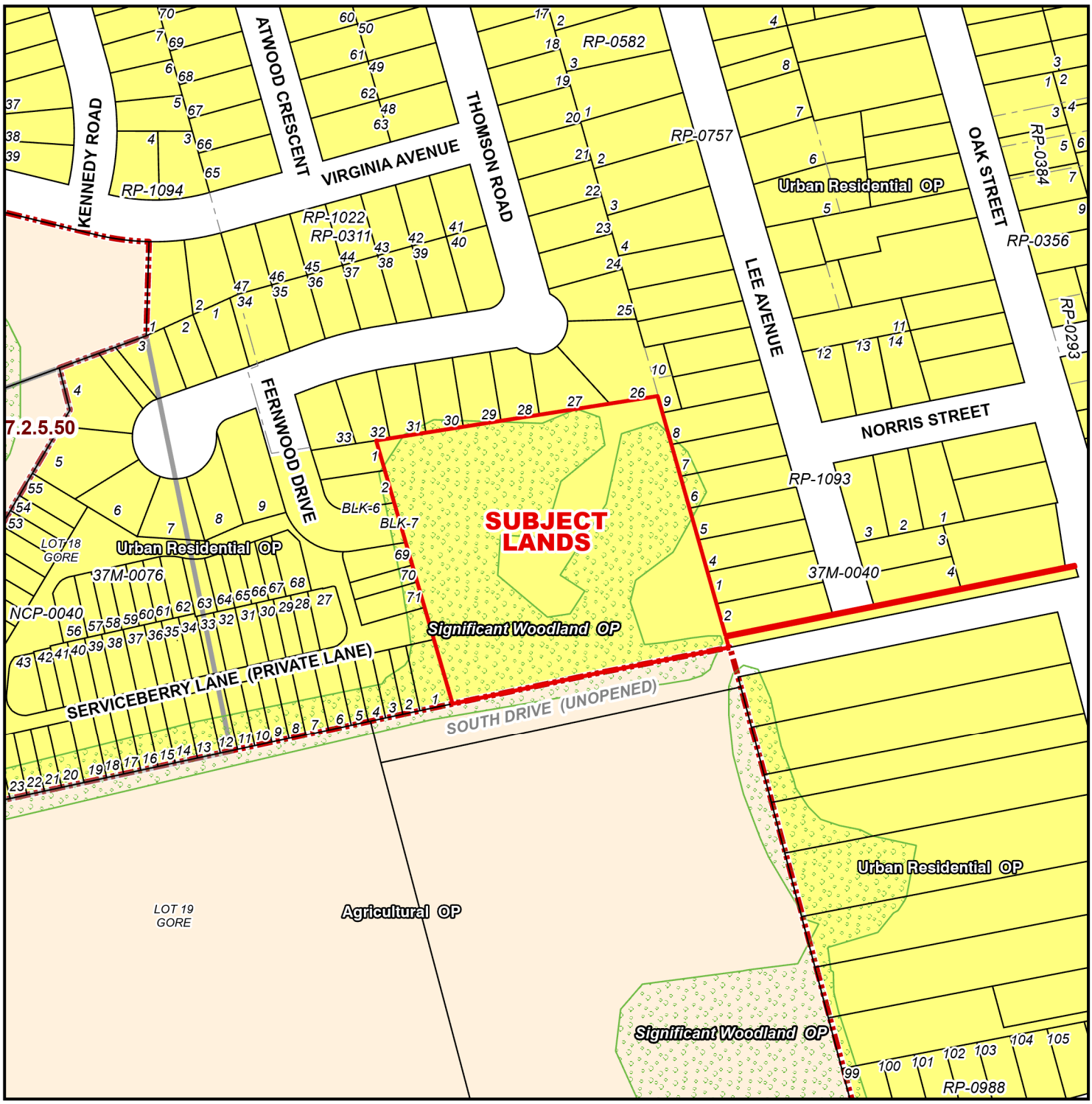
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MAP B

OFFICIAL PLAN MAP

Geographic Township of WOODHOUSE

28CDPL2026029
ZNPL2026028



Legend

- Subject Lands

Official Plan Designations

- Agricultural
- Urban Residential
- Urban Area Boundary
- Significant Woodland

4/17/2026

N

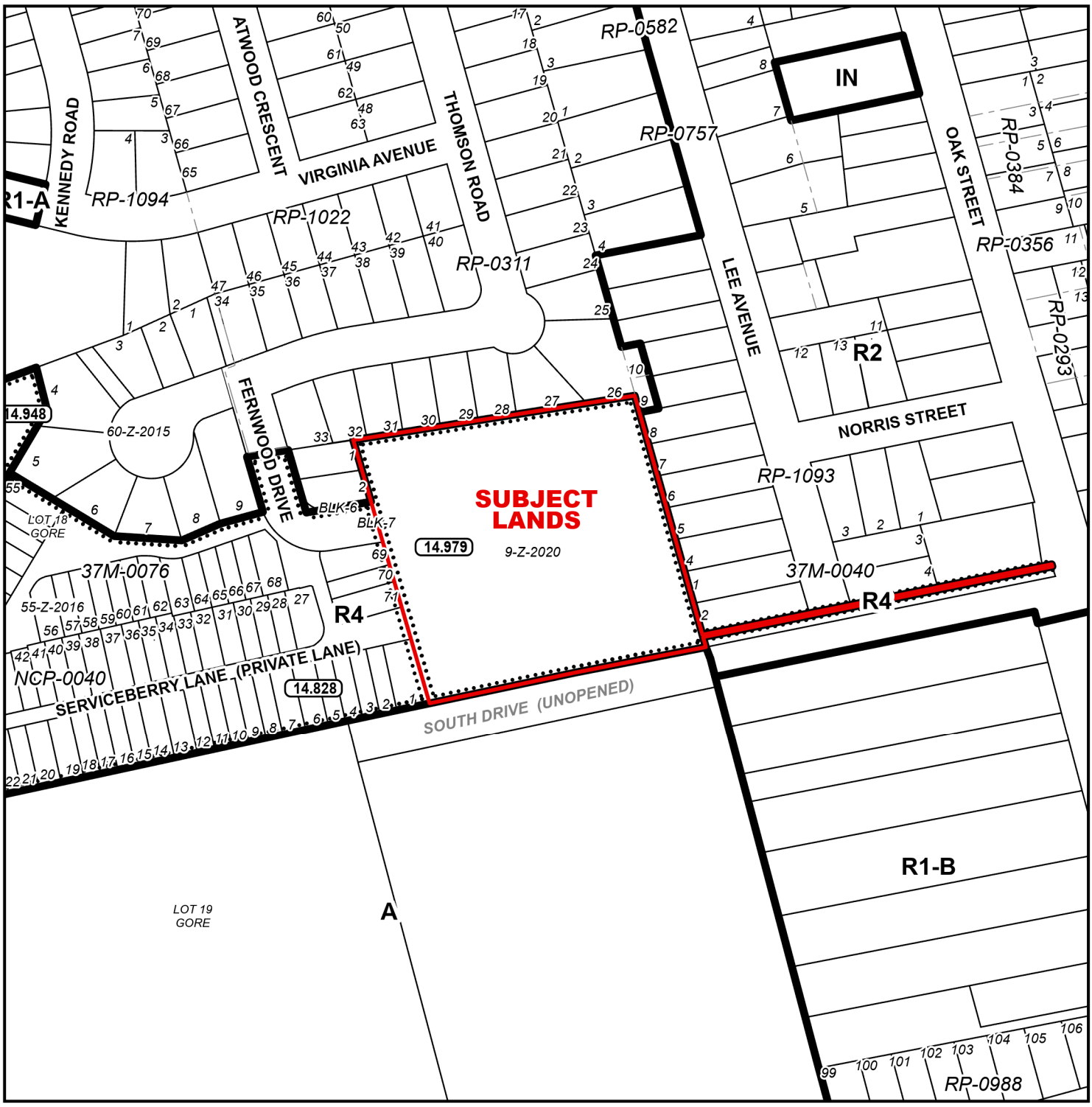
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MAP C

PROPOSED ZONING BY-LAW AMENDMENT MAP

Geographic Township of WOODHOUSE

28CDPL2026029
ZNPL2026028



LEGEND

Subject Lands

ZONING BY-LAW 1-Z-2014

(H) - Holding

A - Agricultural Zone

IN - Neighbourhood Institutional Zone

R1-A - Residential R1-A Zone

R1-B - Residential R1-B Zone

R2 - Residential R2 Zone

R4 - Residential R4 Zone

N

0 20 40 60 80 100 Metres

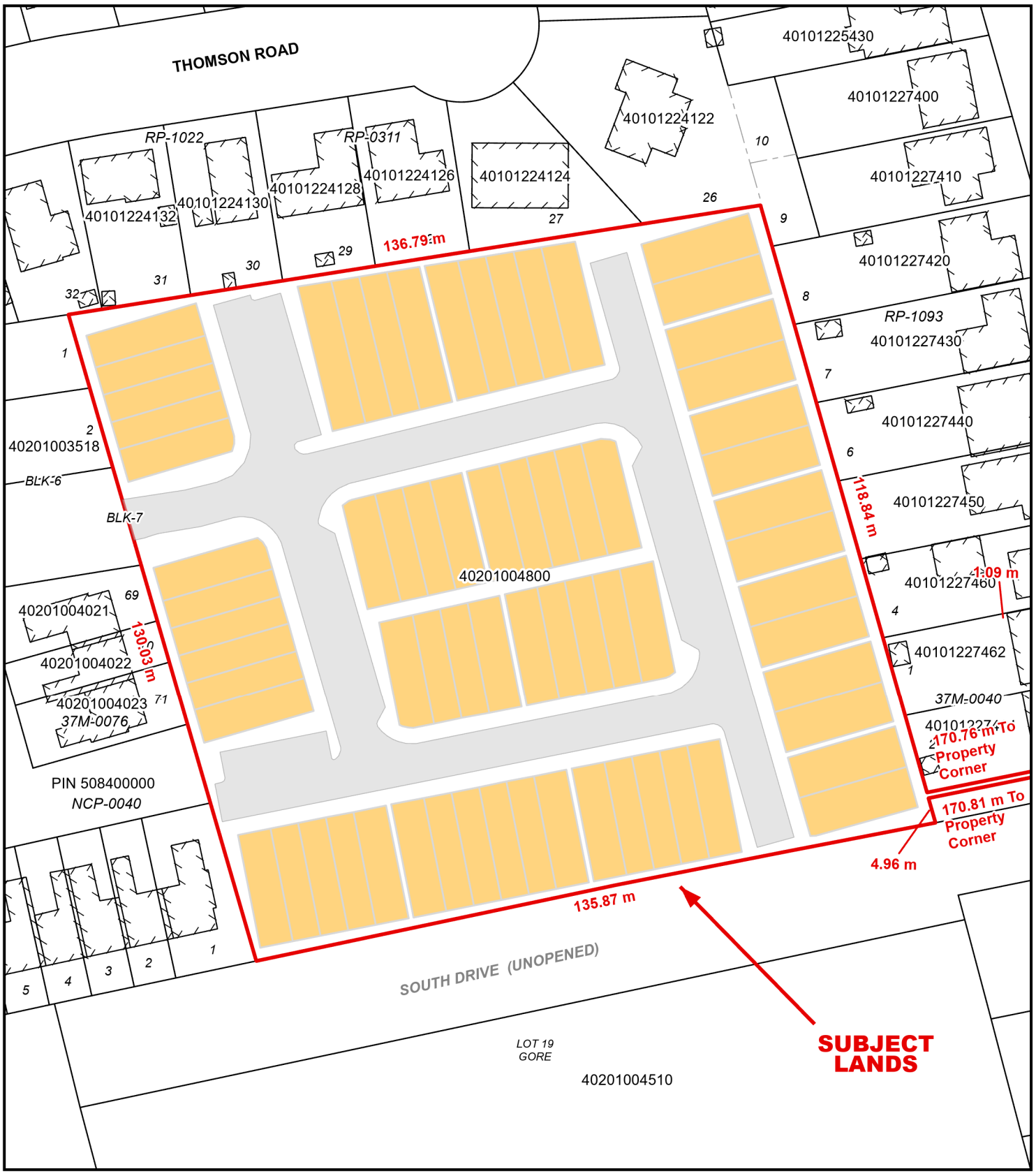
4/17/2026

MAP D

CONCEPTUAL PLAN

Geographic Township of WOODHOUSE

28CDPL2026029
ZNPL2026028



Legend

- Subject Lands
- Proposed Lots By Type
  - Single Family Dwelling
  - Multi Family Dwellings
- Park
- Storm Water Pond
- Other

4/17/2026

N

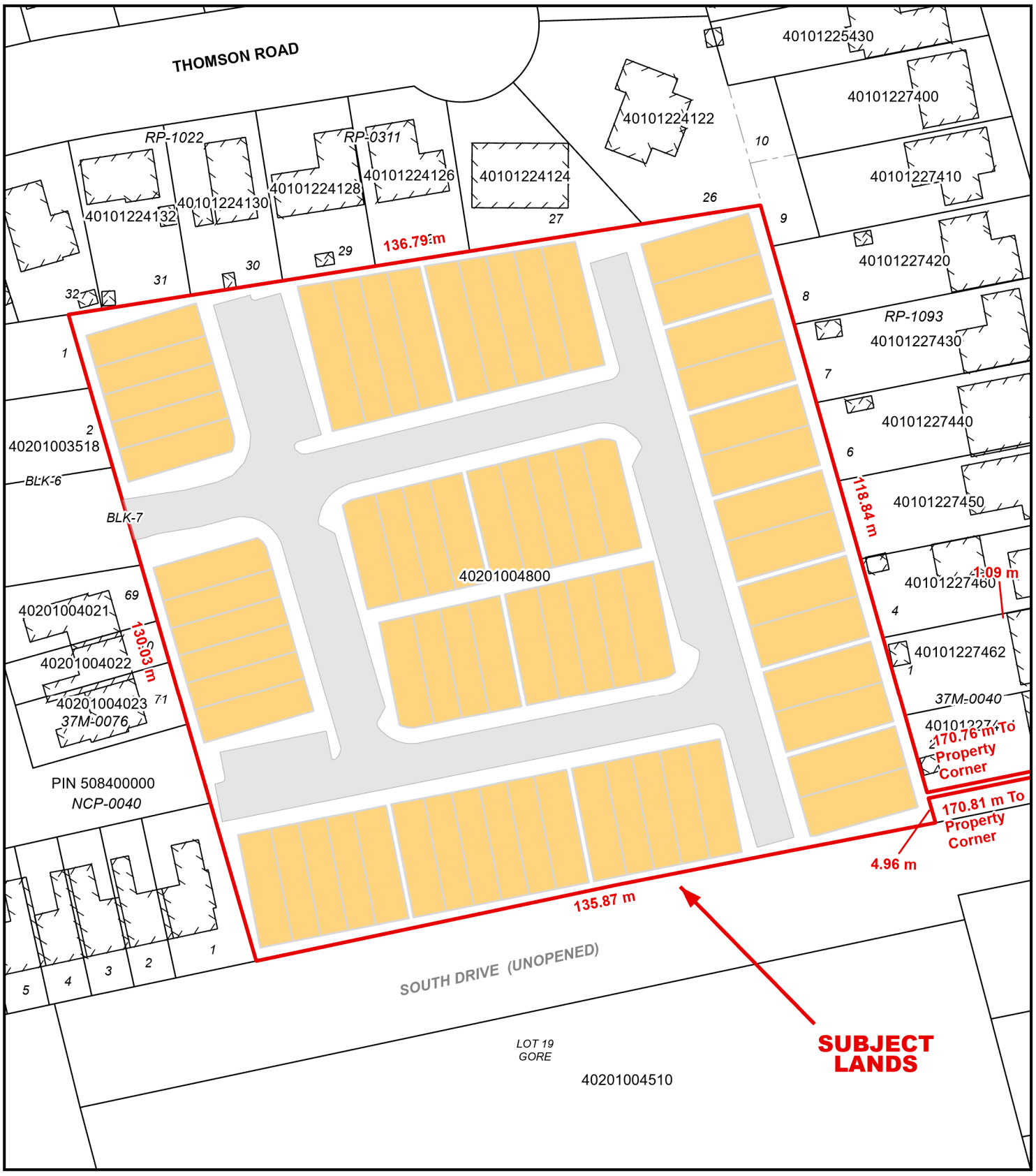
0 8.5 17 25.5 34 42.5 Metres

LOCATION OF LANDS AFFECTED

CONCEPTUAL PLAN

Geographic Township of WOODHOUSE

28CDPL2026029
ZNPL2026028



Legend

- Subject Lands
- Proposed Lots By Type
  - Single Family Dwelling
  - Multi Family Dwellings
- Park
- Storm Water Pond
- Other

4/17/2026

N

0 8.5 17 25.5 34 42.5 Metres